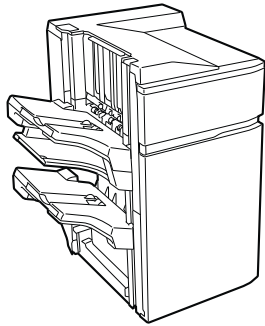
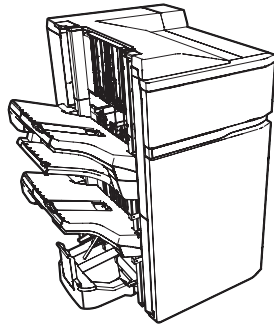


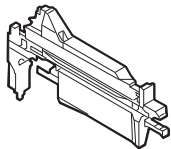
SERVICE MANUAL



MX-FN21



MX-FN22



MX-PN13


DIGITAL MULTIFUNCTIONAL SYSTEM OPTIONS FINISHER PUNCH UNIT

MX-FN21
MX-FN22
MX-PN13

MODEL

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Parts marked with “” are important for maintaining the safety of the set.

Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.



Description on marks

The following marks are used in this Service Manual.

Mark	Meaning	Mark	Meaning
	Indicates that connectors are disconnected.		Indicates that a screw is removed.
	Indicates that connectors are connected.		Indicates that a screw is attached.
	Indicates that wires are disengaged from a cable guide or wire saddle.		Indicates that a pawl is disengaged.
	Indicates that wires are engaged with a cable guide or wire saddle.		Indicates that a pawl is engaged.

The descriptions on this Service Manual are based on the following principles.

1. Each chapter describes the purpose and the role of each function, the relationship between the electrical system and the mechanical system, and the operating timing of each part.

"" on the drawings indicates mechanical drive transmission. If  is used together with a signal name, it indicates a flow of electricity.

"Power supply" in each chapter indicates that the power switch is turned ON, that the front door is closed, that the paper exit door is closed, and that the power is supplied to the machine.

2. In the descriptions of the digital circuits of this machine, "1" is used when the voltage level of a signal is high, and "0" is used when it is low. The voltage value, however, depends on the circuit.

Though a CPU is used in this machine, since the internal operation check of the CPU is virtually impossible, the operating descriptions of the CPU are omitted. In addition, since the printed board is not repaired on the customer side in principle, the circuit descriptions of the printed board are limited to rough descriptions using block diagrams.

Therefore, the circuit descriptions are provided in the following three kinds:

- Descriptions from the sensor to the input section of the circuit board which is provided with the control function and the drive function.
- Descriptions from the output section of the circuit board which is provided with the control function and the drive function.
- Descriptions of the block diagram of each function.

including the sensors and the input section of the circuit board which is provided with the control function and drive function.

Some descriptions may be changed according to modifications on the products, and the information on any change will be informed by Service Information (Technical Information) occasionally.

To read this Service Manual and Service Information (Technical Information) issued occasionally for understanding the machine fully and correctly is an advisable way for obtaining the skills and knowledge to maintain the product performance for a longer time and to perform troubleshooting efficiently.

There is a portion currently expressed with the illustration of a conventional model in this manual.

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SAFETY PRECAUTIONS

Note before servicing

Note:

Before servicing, be sure to turn OFF the power by the specified procedures and disconnect the power plug from the power outlet.

Note:

During execution of downloading, do not turn OFF the power switch. If the power switch is turned OFF during execution of downloading, the machine may not be operated.

1

PRODUCT OUTLINE

- + Features
- + Specifications
- + Part names of each section
- + Optional composition

Features

- The gripper function is provided in the intermediate process tray section, improving alignment capability of paper discharged to the load tray. (Valid only in the sort mode and the staple sort mode)
- The four-wheel caster improves the maintenance efficiency.
- The inner puncher and the inner trimmer can be optionally installed to the finisher, realizing a compact system for a variety of paper/book outputs.
- A high amount of paper loading of 4,250 sheets in total: Max. 250 sheets for the middle tray, max. 1,500 sheets for the upper tray, and max. 2,500 sheet of the lower tray.

Specifications

Model name	MX-FN21	MX-FN22	
Name	Finisher	Saddle finisher	
Type	Floor type		
Paper transport reference	Center reference		
Loading method	Upper/Lower tray: Lift type offset tray Middle tray: Non-offset tray	Upper/Lower: Lift type offset tray Middle: Non-offset tray saddle stitch paper exit tray	
Mode kind	Non staple, staple	Non staple, staple, saddle stitch	
Operation section	No		
Display section	No		
Installing type	Fixing externally to the machine		
Door open detection	Yes: Front cover, oscillation guide		
Reliability	MCBJ: Conforms to the machine. MCBF: Conforms to the machine.		
Life	Conforms to the machine.		
Power consumption	Standby: 22 w or less (P) Operating: 178 w or less (P)	Standby: 30 w or less (P) Operating: 200 w or less (P)	
Power cord	Domestic: Optional power, Overseas: Optional power		
External dimensions (when stored in the tray), External dimensions (when pulled out)	654mm x 765mm x 1040mm 782mm x 765mm x 1040mm	767mm x 765mm x 1040mm 896mm x 765mm x 1040mm	
Weight	61kg	108kg	
Stacker section			
Paper exit enable paper size/weight	Refer to Table 1.		
Offset enable paper size/weight	Refer to Table 1.		
Offset amount	30mm		
Stacking capability	Non-offset	Side shift: 30mm or less Lead edge shift: 50mm or less (Offset tray in non-stapling)	Side shift: 30mm or less Lead edge shift: 50mm or less (Offset tray in non-stapling)
	Offset	Side shift in bundle: within 20mm Side shift between bundles: 20mm or above	Side shift in bundle: within 20mm Side shift between bundles: 20mm or above
Alignment	Max. shift width: 2.5mm		
Paper detection	Yes		

Number of paper exit and storing sheets (excluding folded sheets)	Non-staple	Upper tray /Lower tray	Plain paper S size: Height 195mm ± 3mm (corresponding to 1500 sheets) Plain paper L size: Height 97mm ± 3mm (corresponding to 750 sheets) * For the lower tray only, enable up to 325mm± 3mm (corresponding to 2,500 sheets) in continuous non-sort operations of the same size of A4,B5,8.5" x11". Coated paper S/L size: Height 97mm ± 3mm (corresponding to 750 sheets)
		Middle tray	S size: Height 32.3mm ± 3mm (corresponding to 250 sheets) L size: Height 16mm ± 3mm (corresponding to 125 sheets) * For paper of 432mm or more long, up to 30 sheets.
Paper exit storing quantity (Z-fold / 2-fold)	Intermediate process tray	Upper tray	Z-fold paper only: 10 sheets (A3, B4, 11" x17")
		Lower tray	A3/B4/11" x17": 30 sheets, A4R/8.5" x11"R/8.5" x14": 10 sheets
Mixed load quantity (without folding)	Size mixed load	Middle tray	Height: 16mm ± 3mm
		Upper tray /Lower tray	Height: 97mm ± 3mm
	Staple mixed load	Upper tray /Lower tray	Plain paper S size: Height 195mm ± 3mm, Plain paper L size: Height 97mm ± 3mm or S size Max. 100 copies, L size Max. 50 copies, Coated paper S/L Size: Height 97mm ± 3mm or Max. 50 copies
		Mode mixed load	Plain paper Only combination among A4,B5,8.5" x11": Height 195mm ± 3mm, The other combination: Height 97mm ± 3mm
Mixed load quantity (Z-fold / 2-fold)	Intermediate process tray	Z-fold paper only: MAX10 sheets for every copy (A3、B4、11" x17")	
	Upper tray /Lower tray	A3/B4/11" x17" Plain paper Height 195mm ± 3mm or when the accumulated number of folded sheets reaches 30. Coated paper: Height 97mm ± 3mm or when the accumulated number of folded sheets reaches 30.	
	Mode mixed load	A4R/8.5" x11"R/8.5" x14" Disable	

Staple section			
Stapling position	Front 1-position stapling Back 1-position stapling 2-position stapling		
Staple size/ Weight	Refer to Table 1.		
Staple number of sheets	Refer to Table 1.		
Staple charge system	Exclusive-use staple cartridge (5,000 staples)		
Staple empty detection	Yes		
Manual stapler mode	No		
Cue function	Yes		
Saddle stitcher specifications			
Load system	Fixed-type folding bundle tray		
Stapling system/method	Upper-lower division / Semi-flat clinch / Center 2-position stapling		
Folding system/position	Roller pressure 2-fold / Center fold		
Saddle enable paper size / Weight	Refer to Table 1.		
Saddle enable weight	Refer to Table 1.		
Staple number of sheets	Without stapling (2-fold)	Plain paper	1 - 5 sheets (60 - 105g/m ²)
		Coated paper	1 - 3 sheets (105 - 209g/m ²)
	With stapling (Saddle stitch)	Plain paper	2 - 20 sheets (60 - 81.4g/m ²)
			2 - 10 sheets (81.4 - 105g/m ²)
		Coated paper	2 - 3 sheets (105 - 209g/m ²)
		Cover paper	60 - 300g/m ²
Load capacity	Without stapling	Plain paper 1 (60 - 105g/m ²): 5 copies	
	With cover	Plain paper 1 (60 - 81.4g/m ²) 1 - 5 sheets: 25 copies, 6 - 10 sheets: 15 copies, 11 - 15 sheets: 10 copies, 16 - 20 sheets: 5 copies, Plain paper 2 (81.4 - 105g/m ²) 1 - 5 sheets: 25 copies, 6 - 10 sheets: 15 copies	
	With cover	Plain paper 1 (60 - 81.4g/m ²) 1 - 15 sheets: 10 copies, 16 - 20 sheets: 5 copies, Plain paper 2 (81.4 - 105g/m ²) 1 - 10 sheets: 10 copies	
Stapling position	Refer to the specifications of the MX-PN13 (Chapter.7).		
Staple load system	Exclusive-use cartridge		
Cartridge capacity	5,000 staples		
Staple empty detection	Yes		
Paper empty detection	Yes		

Table 1

		Sub tray (Middle stage) No offset	Offset tray (Upper / Lower)	Offset enable Paper size	Staple enable Paper size (number of sheets)	Saddle stitch (Bundle fold / Center stapling) (Number of sheets)	Saddle stitch (Bundle fold only)	
Min. weight		55g/m ²	55g/m ²	60g/m ²	60g/m ²	60g/m ²	60g/m ²	
Max. weight		300g/m ²	300g/m ²	300g/m ²	300g/m ²	300g/m ²	220g/m ²	
Paper type	Thin paper	Yes	Yes	Yes	No	No	No	
	Plain paper	Yes	Yes	Yes	Yes	Yes(20)	Yes(5)	
	Recycled paper	Yes	Yes	Yes	Yes	Yes(20)	Yes(5)	
	Color paper	Yes	Yes	Yes	Yes	Yes(20)	Yes(5)	
	Letterhead	Yes	Yes	Yes	Yes	No	No	
	Printed paper	Yes	Yes	Yes	Yes	No	No	
	Punch sheet	Yes	Yes	Yes	Yes	No	No	
	Heavy paper 1 106 – 176	Yes	Yes	Yes	Yes*2	Yes (Cover paper) *3	Yes(3)	
	Heavy paper 2 177 – 220	Yes	Yes	Yes	Yes*2	Yes (Cover paper) *3	Yes(3)	
	Heavy paper 3 221 – 256	Yes	Yes	Yes	Yes*2	Yes (Cover paper) *3	No	
	Heavy paper 4 257 – 300	Yes	Yes	Yes	Yes*2	Yes (Cover paper) *3	No	
	Embossed paper	Yes	Yes	Yes	Yes*2	Yes (Cover paper) *3	Yes(3)	
	Tab paper	Yes	Yes	Yes	No	No	No	
	OHP	Yes	Yes	No	No	No	No	
Label paper	Yes	Yes	Yes	No	No	No		
Gloss paper	Yes	Yes	Yes	Yes*2	Yes (Cover paper) *3	Yes(3)		
User type 1 – 9		Yes	Yes	Yes	Yes	Yes	Yes	
Paper size	12"x18" (A3W)	305x457	Yes	Yes	No	No	Yes(20)	Yes(5)
	Ledger (11"x17")	279x432	Yes	Yes	Yes	Yes(50)	Yes(20)	Yes(5)
	Ledger (11"x17") Z-fold	279x216	Yes	Yes	Yes	Yes(10)	-	-

			Sub tray (Middle stage) No offset	Offset tray (Upper / Lower)	Offset enable Paper size	Staple enable Paper size (number of sheets)	Saddle stitch (Bundle fold / Center stapling) (Number of sheets)	Saddle stitch (Bundle fold only)
Paper size	Legal (8.5"x14")	216x356	Yes	Yes	Yes	Yes(50)	Yes(20)	Yes(5)
	Legal (8.5"x14") Z-fold	216x178	Yes	Yes	No	No	-	-
	Asian legal (8.5"x13.5")	216x343	Yes	Yes	Yes	Yes(50)	Yes(20)	Yes(5)
	Mexican legal (8.5"x13.4")	216x340	Yes	Yes	Yes	Yes(50)	Yes(20)	Yes(5)
	Foolscap (8.5"x13")	216x330	Yes	Yes	Yes	Yes(50)	Yes(20)	Yes(5)
	Letter (8.5"x11")	279x216	Yes	Yes	Yes	Yes(100)	No	
	Letter R(8.5"x11"R)	216x279	Yes	Yes	Yes	Yes(50)	Yes(20)	Yes(5)
	Letter R (8.5"x11"R) Z-fold	216x140	Yes	Yes	No	No	-	-
	Letter R (8.5"x11"R) 2-fold	216x140	Yes	Yes	No	No	-	-
	Invoice (5.5"x8.5") *1	216x140	-	-	-	-	-	-
	Invoice R(5.5"x8.5"R)	140x216	Yes	Yes	No	No	No	No
	Executive R (7.25"x10.5"R)	184x266	Yes	Yes	No	No	No	No
	9x12 (A4W)	305x229	Yes	Yes	No	No	No	No
	A3	297x420	Yes	Yes	Yes	Yes(50)	Yes(20)	Yes(5)
	A3 Z-fold	297x210	Yes	Yes	Yes	Yes(10)	-	-
	B4	257x364	Yes	Yes	Yes	Yes(50)	Yes(20)	Yes(5)
	B4 Z-fold	257x182	Yes	Yes	Yes	Yes(10)	-	-
	A4	297x210	Yes	Yes	Yes	Yes(100)	-	-
	A4-R	210x297	Yes	Yes	Yes	Yes(50)	Yes(20)	Yes(5)
	A4-R Z-fold	210x148	Yes	Yes	No	No	-	-
	A4-R 2-fold	210x148	Yes	Yes	No	No	No	No
B5	257x182	Yes	Yes	Yes	Yes(100)	No	No	
B5-R	182x257	Yes	Yes	No	No	No	No	
A5 *1	210x148	-	-	-	-	-	-	

			Sub tray (Middle stage) No offset	Offset tray (Upper / Lower)	Offset enable Paper size	Staple enable Paper size (number of sheets)	Saddle stitch (Bundle fold / Center stapling) (Number of sheets)	Saddle stitch (Bundle fold only)
Paper size	A5-R	148x210	Yes	Yes	No	No	No	No
	SRA3	320x450	Yes	Yes	No	No	Yes(20)	Yes(5)
	SRA4	320x225	Yes	Yes	No	No	No	No
	Kiku 8	318x234.75	-	-	-	-	-	-
	A series 8	312.5x220	-	-	-	-	-	-
	Kiku 4	318x469.5	-	-	-	-	-	-
	A series 4	312.5x440	-	-	-	-	-	-
	8K	270x390	Yes	Yes	Yes	Yes(50)	Yes(20)	Yes(5)
	16K	270x195	Yes	Yes	Yes	Yes(100)	No	No
	16K-R	195x270	Yes	Yes	No	No	No	No
	Postcard	100x148	Yes	Yes	No	No	No	No
	Monarch	98x191	Yes	Yes	Yes	No	No	No
	COM10	105x241	Yes	Yes	Yes	No	No	No
	DL	110x220	Yes	Yes	Yes	No	No	No
	C5	229x162	Yes	Yes	Yes	No	No	No
	Long No. 3	120x235	Yes	Yes	Yes	No	No	No
	Long No. 4	90x205	Yes	Yes	Yes	No	No	No
	Western No. 2	114x162	Yes	Yes	Yes	No	No	No
	Western No. 4	105x235	Yes	Yes	Yes	No	No	No
	Square No. 2	240x332	Yes	Yes	Yes	No	No	No
	Square No. 3	216x277	Yes	Yes	Yes	No	No	No
	Special - custom size		Yes	Yes	No	No	Yes	Yes
	Custom range	Min X (Sub scan)	148 (5.875)	148 (5.875)	-	-	279 (11)	279 (11)
		Max X (Sub scan)	457 (18)	457 (18)	-	-	457 (18)	457 (18)
		Min Y (Main scan)	90 (3.625)	90 (3.625)	-	-	210(8.3)	210 (8.3)
		Max Y (Main scan)	320 (12.5)	320 (12.5)	-	-	320 (12.5)	320 (12.5)
	Special - size undetermined		Yes	Yes*1	No	No	No	No

			Sub tray (Middle stage) No offset	Offset tray (Upper / Lower)	Offset enable Paper size	Staple enable Paper size (number of sheets)	Saddle stitch (Bundle fold / Center stapling) (Number of sheets)	Saddle stitch (Bundle fold only)
Paper size	Long-scale paper	Width: 90 - 305, Length: 457 - 1200	Yes	Yes	No	No	No	No

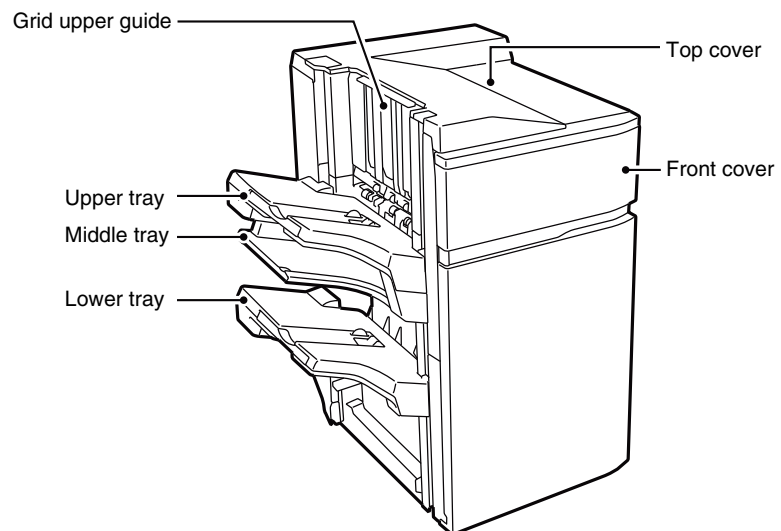
*1: Invoice and A5 are treated as special paper.

*2: Heavy paper (Enable only 2 sheets (cover, back cover) + plain paper 98 sheets)

*3: Heavy paper (Enable only 1 cover + plain paper), Staplable number of sheets
(1 cover sheet of 300g/m² + 19 sheets of 90g/m²)

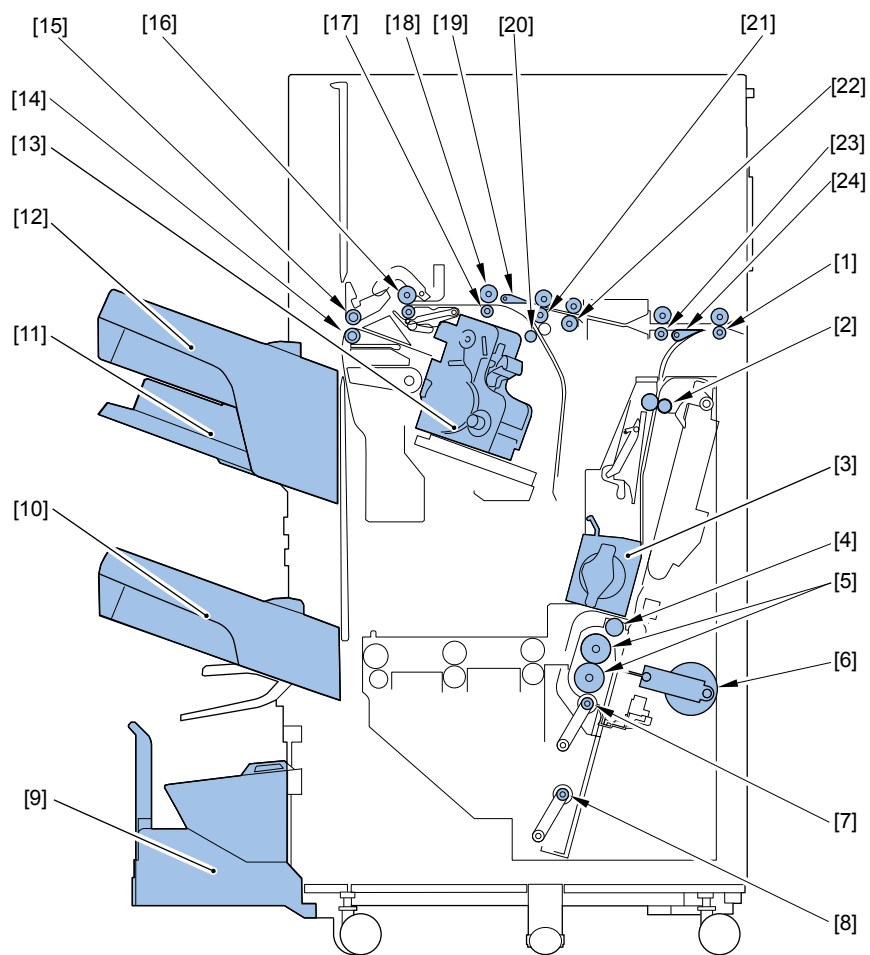
Part names of each section

External view (front)



F-1-3

Cross sectional view



F-1-8

- | | |
|-------------------------------------------------------|-----------------------------------------------|
| [1] Saddle inlet port roller
(Only FN22) | [13] Stapler unit |
| [2] Saddle inlet port transport roller
(Only FN22) | [14] Bundle paper exit lower roller |
| [3] Stitcher unit
(Only FN22) | [15] Bundle paper exit upper roller |
| [4] Pull-out roller
(Only FN22) | [16] Paper exit front roller |
| [5] Folding transport roller
(Only FN22) | [17] Transport roller 3 |
| [6] Paper push plate
(Only FN22) | [18] Separation roller |
| [7] Alignment roller (Upper)
(Only FN22) | [19] Buffer flapper |
| [8] Alignment roller (Lower)
(Only FN22) | [20] Buffer roller |
| [9] Saddle paper exit tray
(Only FN22) | [21] Transport roller 2 |
| [10] Tray 2 | [22] Transport roller 1 |
| [11] Escape tray | [23] Inlet port roller
(Only FN22) |
| [12] Tray 1 | [24] Saddle inlet port flapper
(Only FN22) |

T-1-6

Optional composition

The option which can be connected to the machine is only the unit as follows:

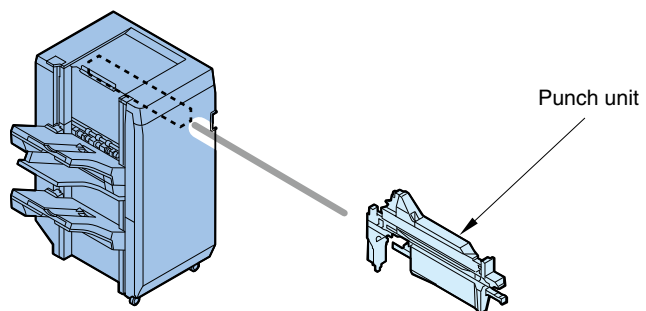
- Punch unit

Punch unit: 2-hole

Punch unit: 2-hole / 3-hole

Punch unit: 2-hole / 4-hole

Punch unit: 4-hole (Wide)



F-1-10

2

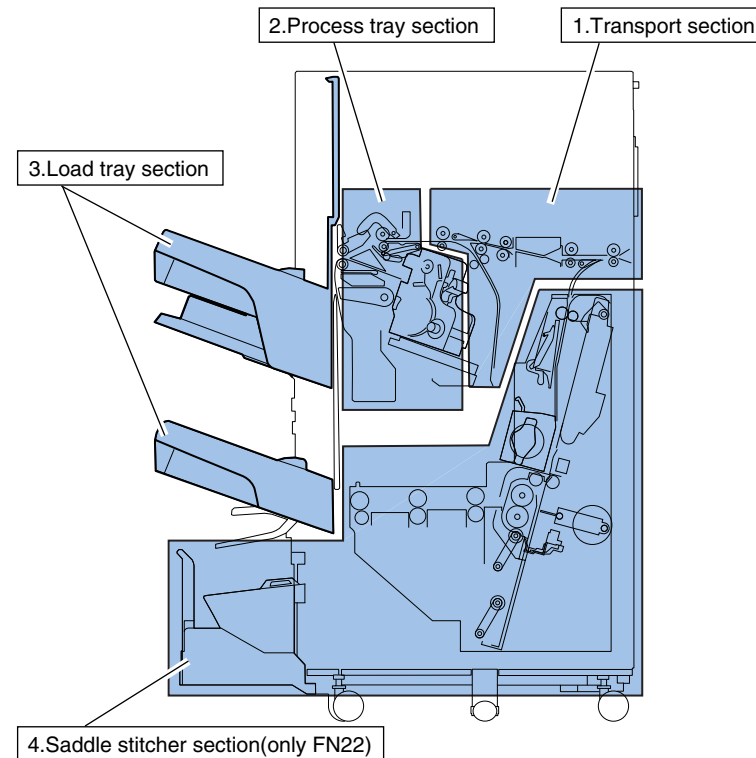
TECHNICAL DESCRIPTIONS

- + Basic Composition
- + Transport section
- + Load Tray Section
- + Process Tray Section
- + Saddle Stitcher Section
- + Controller Section
- + Power Source

Basic Composition

● Functional composition

This machine is largely composed of the transport section, the process tray section, the load tray section, and the saddle stitcher section(only FN22).



F-2-1

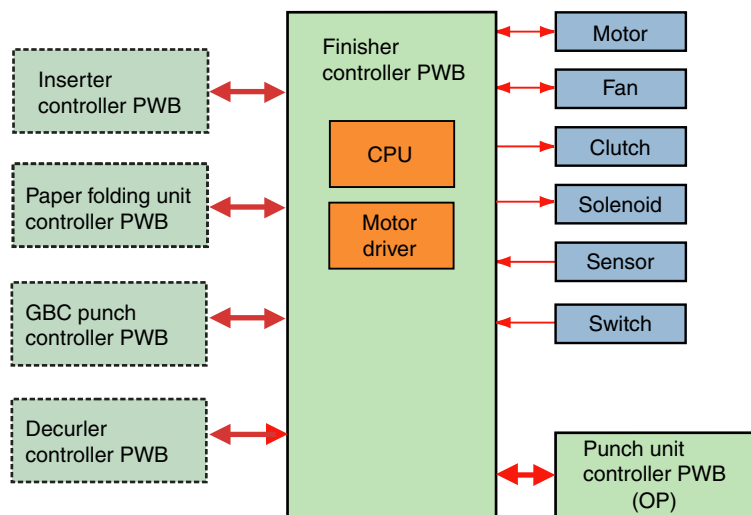
Outline of electrical circuits

The operation sequence of this machine is controlled by the finisher controller PWB, which uses the 16bit CPU for sequence control. It also performs communication between the machine body and the optional punch unit.

The CPU on the finisher controller PWB is provided with a ROM which stores the operation sequence program.

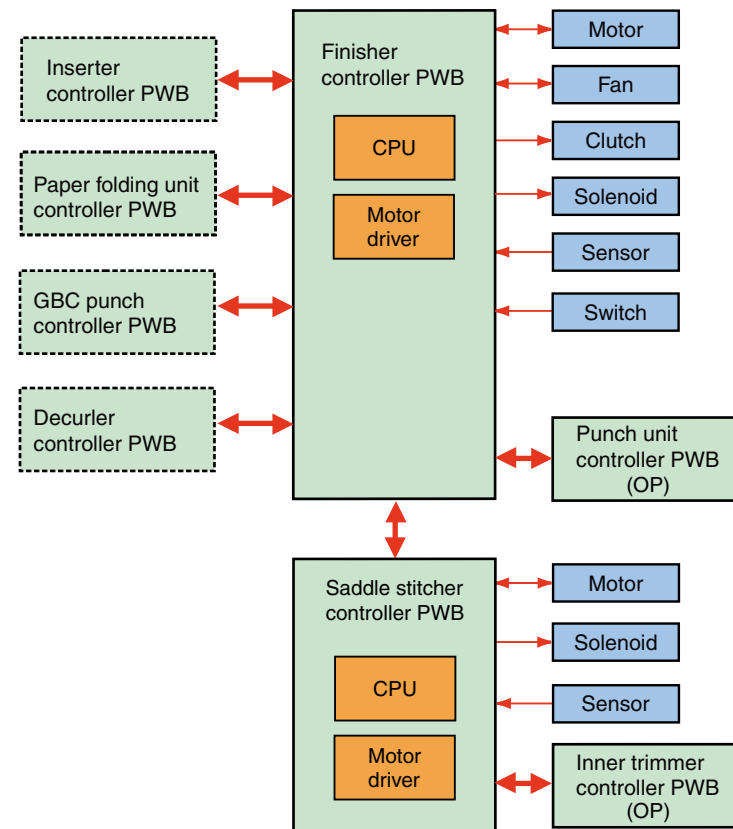
The finisher controller PWB drives the motors, the clutches and the solenoids according to the various commands sent from the machine body via the communication cable. In addition, it notifies information on the sensors and switches to the machine body via the communication cable.

- Finisher



F-2-3

- Saddle finisher



Control functions

Item		Reference page
1. Transport section	Outline	Refer to page 2-3.
	Basic operations	Refer to page 2-4.
	Straight transport operation	Refer to page 2-4.
	Process tray transport operation	Refer to page 2-6.
	Buffer transport operation	Refer to page 2-6.
2. Load tray section	Stack tray operation	Refer to page 2-9.
	Shutter operation	Refer to page 2-11.
3. Process tray section	Outline	Refer to page 2-12.
	Basic operations	Refer to page 2-13.
	Load operation	Refer to page 2-14.
	Shift operation	Refer to page 2-15.
	Staple operation	Refer to page 2-16.
	Bundle exit operation	Refer to page 2-18.
	Oscillation height detection control	Refer to page 2-18.
4. Saddle Stitcher Section		Refer to page 2-19.
5. Controller section	Outline	Refer to page 2-28.
	Finisher controller PWB	Refer to page 2-29.
6. Power source	Outline	Refer to page 2-32.
	Protection function	Refer to page 2-32.

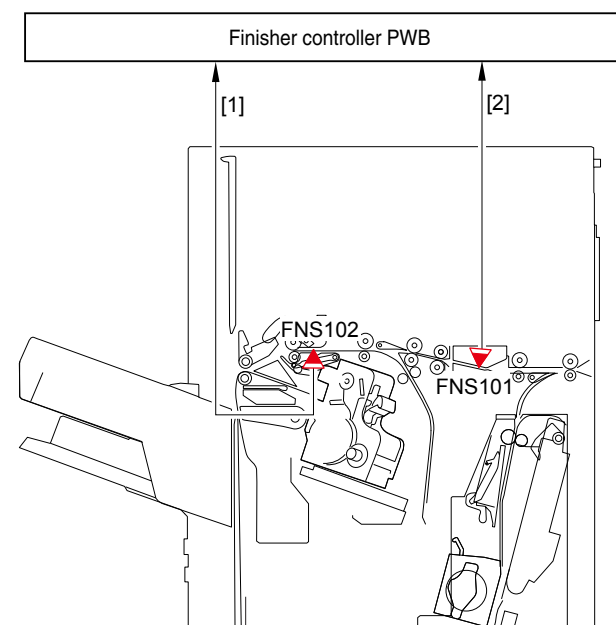
T-2-1

Transport Section

Outline

The transport section follows instructions from the finisher controller PWB to transport paper to the load tray section.

The paper transport path to the load tray section is provided with two sensors: the Finisher paper enter detector (FNS101) and the Finisher paper JAM detector (FNS102) for detection of paper transport and paper jams.



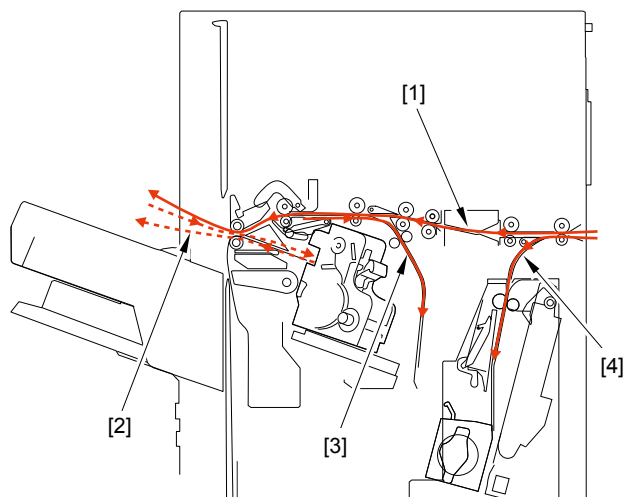
F-2-7

- | | | | |
|-----|--------------------------------|--------|-------------------------------|
| [1] | Transport JAM detection signal | FNS102 | Finisher Paper JAM Detector |
| [2] | Paper enter detection signal | FNS101 | Finisher paper enter detector |

Basic operations

This machine performs following four basic operations for transport of paper.

- [1] Straight transport operation
Paper sent from the connected unit is discharged to the load tray section.
- [2] Process tray transport operation
Paper sent from the connected unit is stacked to the process tray, and aligned and stapled, then discharged to the load tray section.
- [3] Buffer transport section
Paper sent from the connected unit is transported to the buffer path section.
- [4] Paper switch section
Paper sent from the connected unit is switched to the saddle stitcher section.



F-2-8

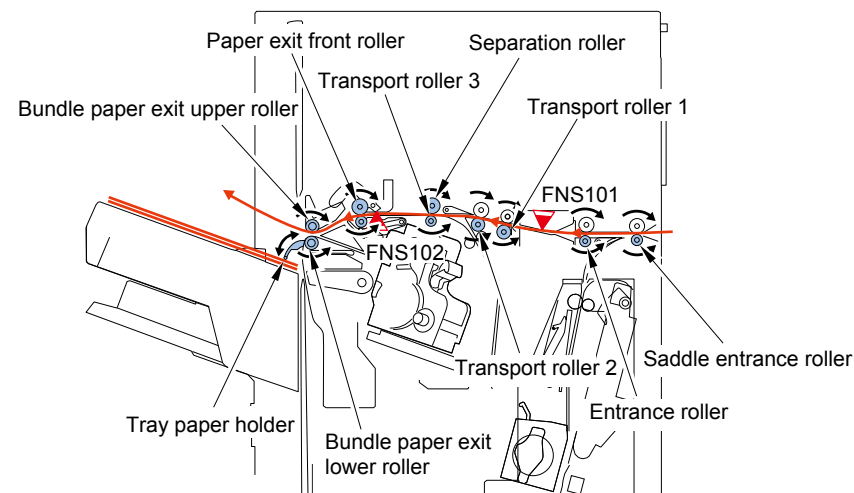
Straight transport operation

When the shift operation and the staple operation are not performed, this machine discharges paper to the load tray section without transporting paper to the process tray section.

In the straight transport operation, paper sent from the connected unit is discharged to the load tray section one by one.

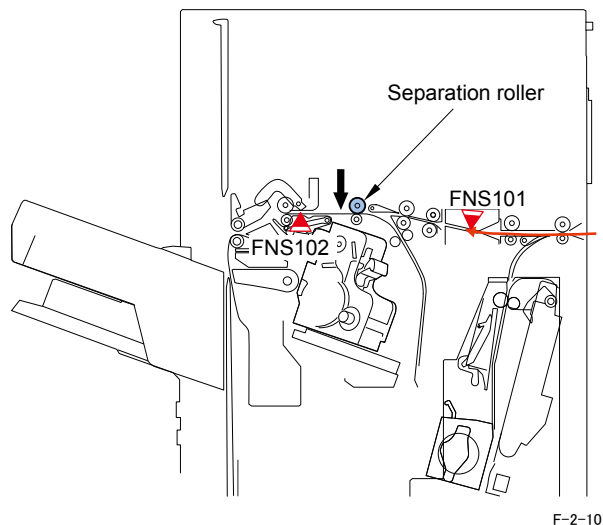
Paper is driven by the Finisher paper transport motor 1 (FSM200) and sent inside the machine by the inlet roller to turn ON the Finisher paper enter detector (FNS101), driving the Finisher paper transport motor 1 (FSM200) and the Finisher paper transport motor 2 (FSM102).

As a result, paper is transported and discharged by the transport roller 1, the transport roller 2, the transport roller 3, the paper exit front roller, and the bundle exit upper/lower rollers.



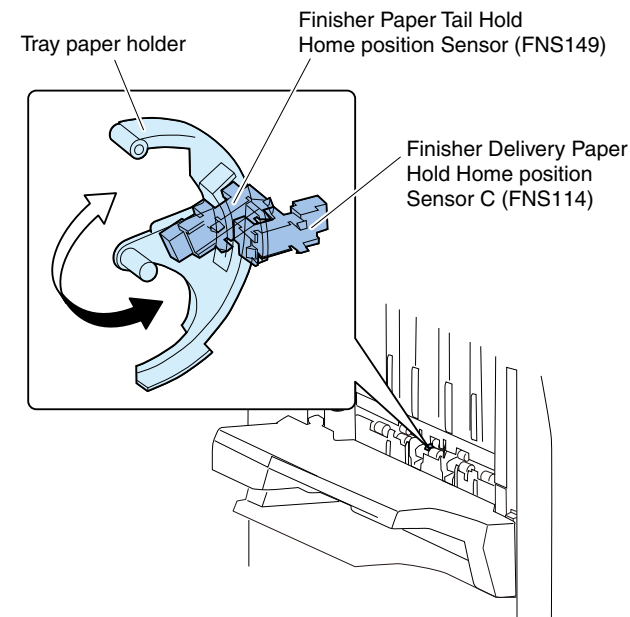
F-2-9

At that time, if the paper length is less than 257mm, the Finisher Paper Transport Roller Lift Motor (FNM119) is driven to bring the separation roller and the transport roller 3 into contact.



F-2-10

When paper turns ON the Finisher paper JAM detector (FNS102), the tray paper holder presses paper on the load tray. At that time, the position of the tray paper holder is detected by the Finisher Delivery Paper Hold Home position Sensor C (FNS114) and the Finisher Paper Tail Hold Home position Sensor (FNS149). Then, when paper turns OFF the finisher jam detector (FNS102), the tray paper holder returns to the home position.



F-2-11

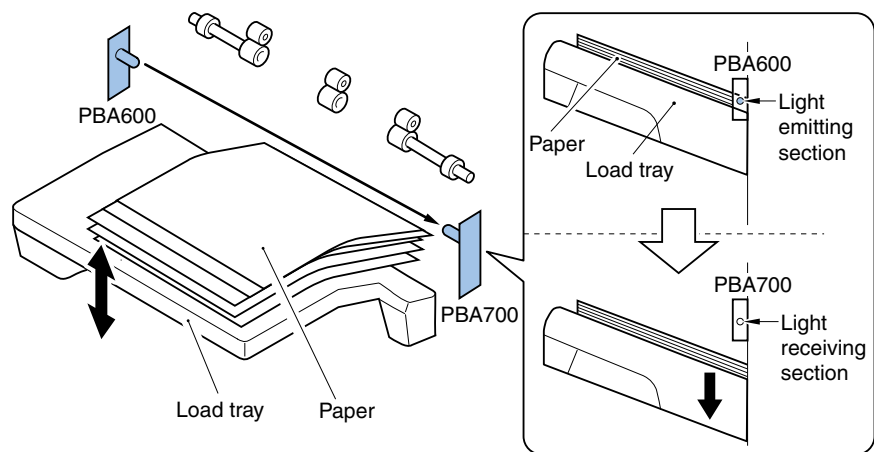
After discharging paper, the load tray is lowered or lifted by the tray paper holder position detected by the Finisher Delivery Paper Hold Home position Sensor C (FNS114) and the Finisher Paper Tail Hold Home position Sensor (FNS149), the number of discharged sheets (0.5mm lowered for every 7 sheets of discharged paper), the Finisher Paper Level Sensor (PBA600) and the Finisher Paper Level Detector (PBA700).

Tray paper holder position	HP	High	Middle	Low
Finisher Delivery Paper Hold Home position Sensor C (FNS114)	ON	OFF	OFF	ON
Finisher Paper Tail Hold Home position Sensor (FNS149)	ON	ON	OFF	OFF
Load tray up/down	-	0.5mm up	-	0.5mm down

T-2-3

The paper surface on the load tray section (upper tray / lower tray) is detected by the light emitting section (PBA600) and the light receiving section (PBA700) of the tray paper surface sensor (Finisher Paper Level Sensor / Finisher Paper Level Detector).

When the tray paper surface sensor is shielded to detect paper, the load tray is lowered by 2mm.

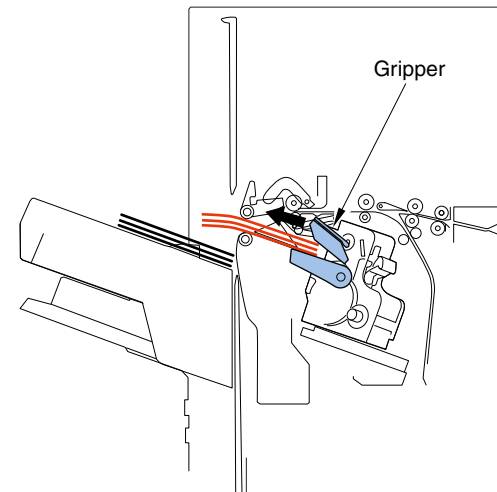


F-2-12

Process tray transport operation

When the shift operation or the staple operation is performed, this machine loads paper on the process tray section and then discharges paper to the load tray section.

Paper loaded on the process tray is subject to the shift operation or the staple operation, then discharged to the load tray section by the gripper.



F-2-13

In the shift operation, the number of sheets of the bundle discharged to the load tray section is as shown in the table below.

	Number of sheets of bundle	
	Plain paper	Coated paper / Heavy paper
Paper length > 216mm	3 sheets	2 sheets
216mm ≥ Paper length	4 sheets	

T-2-4

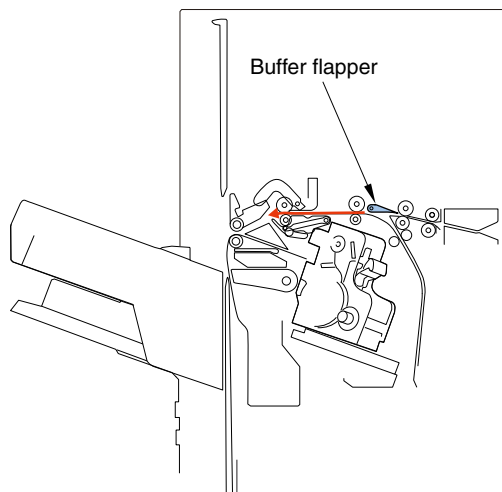
Buffer transport operation

While the shift operation or the staple operation is performed in the process tray section, paper sent from the connected unit is loaded to the buffer path.

Paper size for the buffer transport operation: A4, B5, LTR

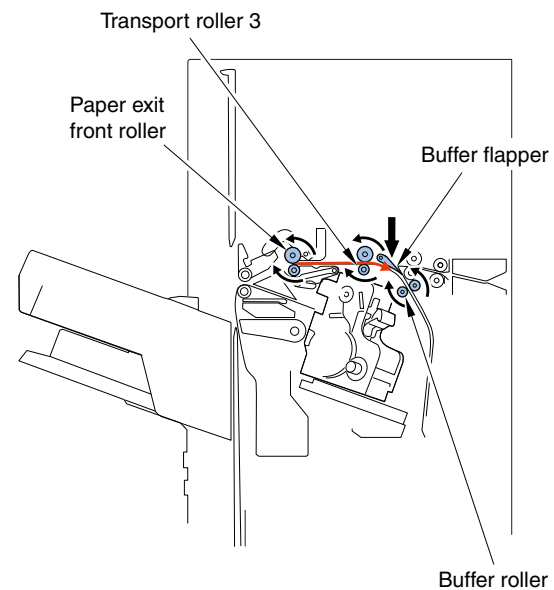
Number of sheets enable for buffer path loading: 1 sheet or 2 sheets

The paper rear edge is transported from the buffer flapper section to the specified distance.



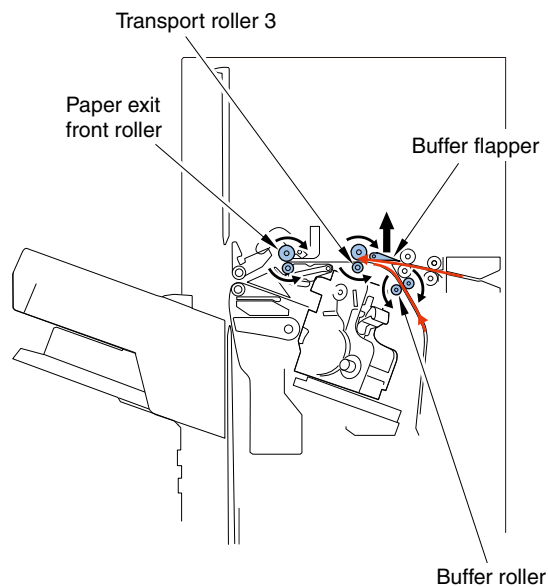
F-2-14

The buffer flapper is switched by the Finisher Paper Transport Roller Lift Motor (FNM119). The Finisher Paper Transport Motor2 (FSM102) is reversed to transport paper so that the paper lead edge reaches the specified distance in the buffer path section.



F-2-15

The buffer flapper is switched by the Finisher Paper Transport Roller Lift Motor (FNM119) to rotate the Finisher Paper Transport Motor2 (FSM102), transporting the next paper and the paper loaded in the buffer section overlapped together.



F-2-16

When a sheet of paper is loaded in the buffer section, overlapped paper is transported to the process tray section.

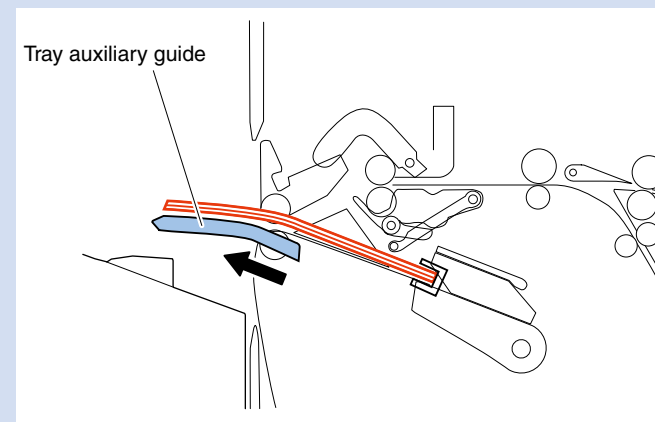
When two sheets of paper are loaded in the buffer section, overlapped paper is loaded to the buffer path section, and transported to the process tray section together with the next paper.

Memo :

Bundle exit auxiliary mechanism

When stacking long paper, the paper lead edge falls by its own weight. It may cause an alignment trouble of loaded paper in the process tray.

When, therefore, loading long paper, the tray auxiliary guide is extended to prevent the paper lead edge from falling.



F-2-18

Load Tray Section

Stack tray operation

This machine is provided with three paper exit trays: the upper tray, the middle tray, and the lower tray from the top.

The middle tray is fixed to the lower section of the upper tray. The upper tray and the lower tray perform lifting operations independently.

The middle tray is provided with the Finisher Paper Delivery Middle Tray Paper Detector (FNS130). When the middle tray becomes full, the finisher controller PWB notifies the connected unit that the middle tray is full.

The finisher controller PWB switches the drive directions of the Finisher Upper Tray Lift Motor (FNM105), the Finisher Lower Tray Lift Motor (FNM106) (included in the motor driver PWB) to control up/down movement of the upper tray and the lower tray.

To detect presence of paper in the upper tray and the lower tray, the Finisher Paper Delivery Upper Tray Paper Detector (FNS104) and the Finisher Paper Delivery Lower Tray Paper Detector (FNS105) are provided.

The home position of the upper tray is detected by the upper tray paper surface sensor (FNS118), and the home position of the lower tray is detected by the lower tray paper surface sensor (FNS143).

The home position is the top surface of paper when paper is loaded in the upper tray, or the position where the tray edge is detected when no paper is loaded in the upper tray.

The Finisher Lower Tray Paper Level Detector (FNS143) detects the paper surface when paper of 651 sheets or more is loaded in the lower tray.

When the power is supplied, the finisher controller PWB drives the Finisher Upper Tray Lift Motor (FNM105) and the Finisher Lower Tray Lift Motor (FNM106) to return the upper tray and the lower tray to their home positions.

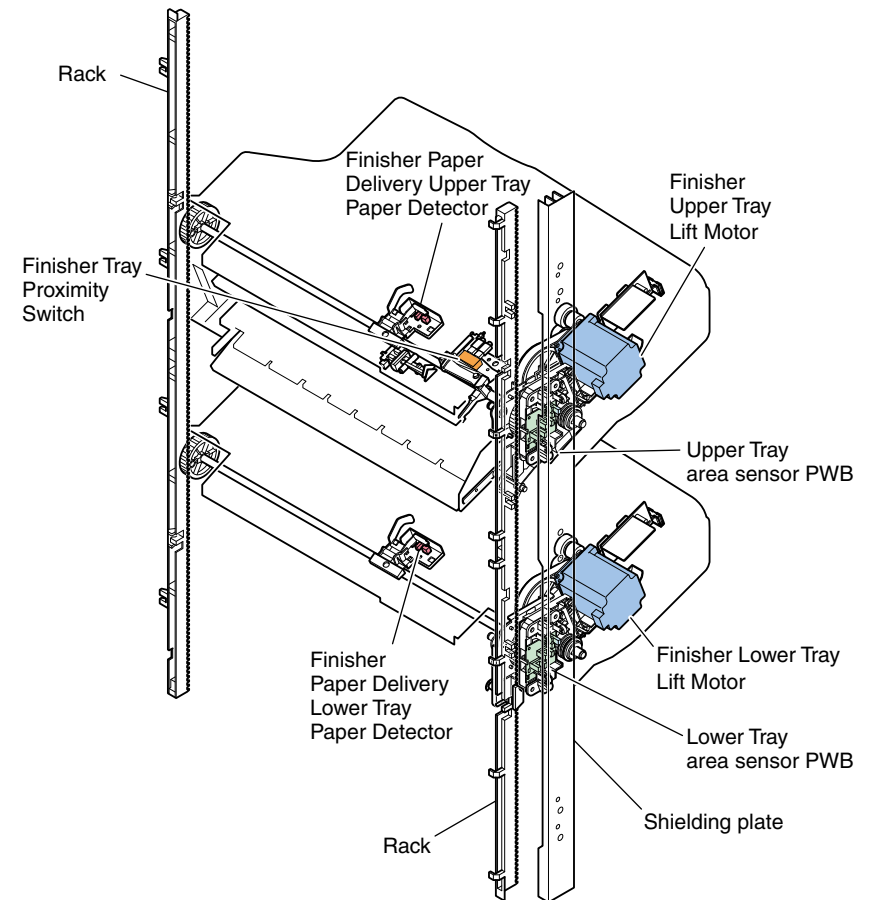
If the tray is on the home position from the beginning, it is shifted from the home position and returned to the home position again. When both of the upper tray and the lower tray are on their home positions, this operation is performed in the sequence of the lower tray and then the upper tray. When the lower tray is specified by the connected unit, the finisher controller PWB lifts the lower tray so that it is at the paper exit port.

When paper is loaded to the tray, the Finisher Upper Tray Lift Motor (FNM105) or the Finisher Lower Tray Lift Motor (FNM106) is driven by the specified number of pulses to lower the tray. Then, the tray returns to the home position for next loading.

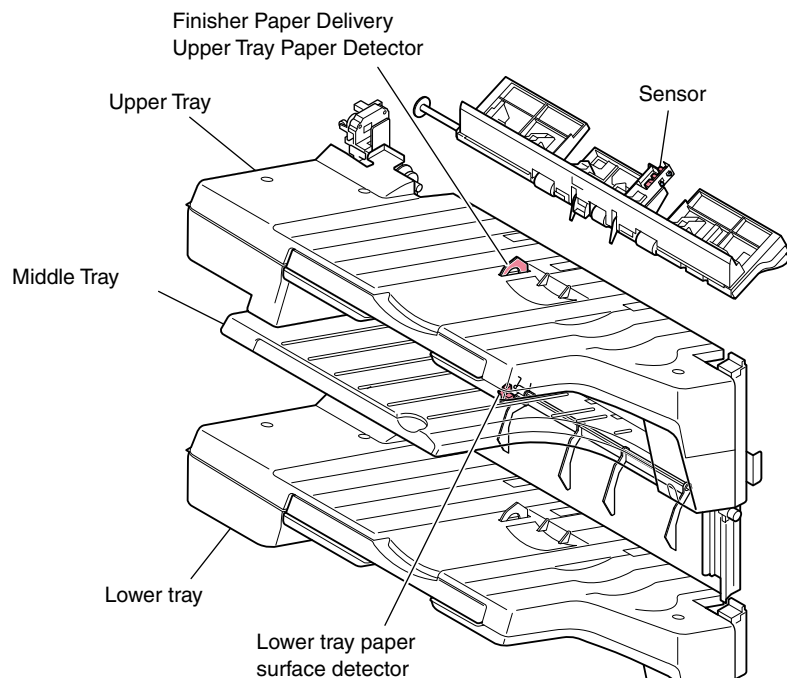
The upper and the lower limits of the tray are detected by the three area sensors on the upper tray/lower tray shift area sensor PWB.

When the finisher controller PWB detects the upper limit or the lower limit of the tray, it stops the Finisher Upper Tray Lift Motor (FNM105) and Finisher Lower Tray Lift Motor (FNM106). It also detects an overload of large-size paper and mixed paper by the combination of ON/OFF of the area sensors.

When the Finisher Tray Proximity Switch (FNSW110) is turned ON, the finisher controller PWB shuts off supply of +24V to the Finisher Upper Tray Lift Motor (FNM105), stopping the operation of the finisher.



F-2-19



F-2-20

Detection item	Upper tray shift area sensor PWB		
	Finisher Upper Tray Position Sensor1	Finisher Upper Tray Position Sensor2	Finisher Upper Tray Position Sensor3
Upper tray upper limit detection	OFF	ON	ON
Paper load capacity 650 sheets over detection	ON	OFF	OFF
Paper load capacity 1300 sheets over detection	ON	ON	OFF
Upper tray lower limit detection	ON	ON	OFF

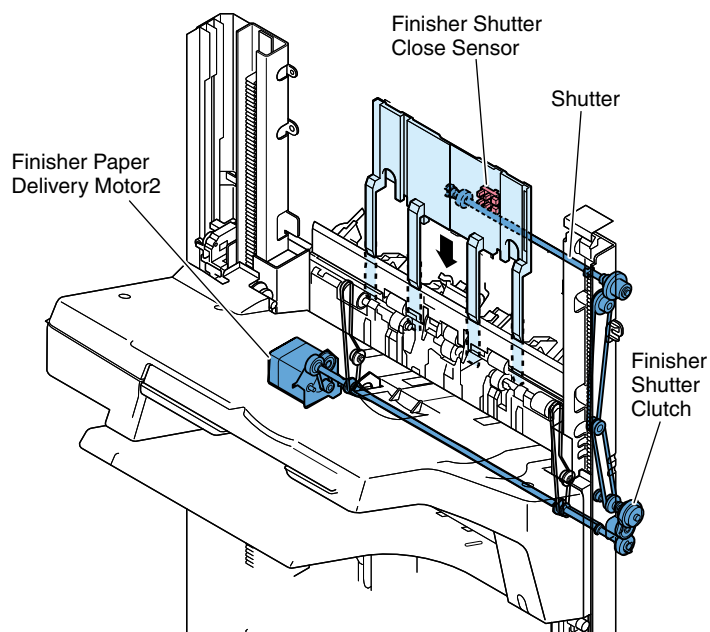
Detection item	Lower tray shift area sensor PWB		
	Finisher Lower Tray Position Sensor1	Finisher Lower Tray Position Sensor2	Finisher Lower Tray Position Sensor3
Lower tray upper limit detection	OFF	ON	OFF
Paper load capacity 650 sheets over detection	ON	OFF	OFF
Paper load capacity 1700 sheets over detection	ON	ON	ON
Paper load capacity 2450 sheets over detection	OFF	ON	ON
Lower tray lower limit detection	ON	OFF	ON

※ Since the upper tray shift area sensor PWB is the same as the lower tray shift area sensor PWB, the codes of area sensors of the both PWB's are the same.

Shutter operation

When the upper tray with paper loaded passes the paper exit section, the loaded paper may be caught by paper exit section. To prevent this, the paper exit section is provided with a shutter. When the upper tray passes the paper exit section, the shutter is closed. This operation is performed even when there is no paper in the tray.

The shutter is lifted up (closed) when the Finisher Paper Delivery Motor2 (FNM122) rotates normally with the Finisher Shutter Clutch (FNCL102) and the Finisher Shutter Close Sensor (FNS148) ON, and is lowered (opened) when the motor rotates reversely to allow paper exit. Open/close of the shutter is detected by the Finisher Shutter Open Sensor (FNS106).



F-2-21

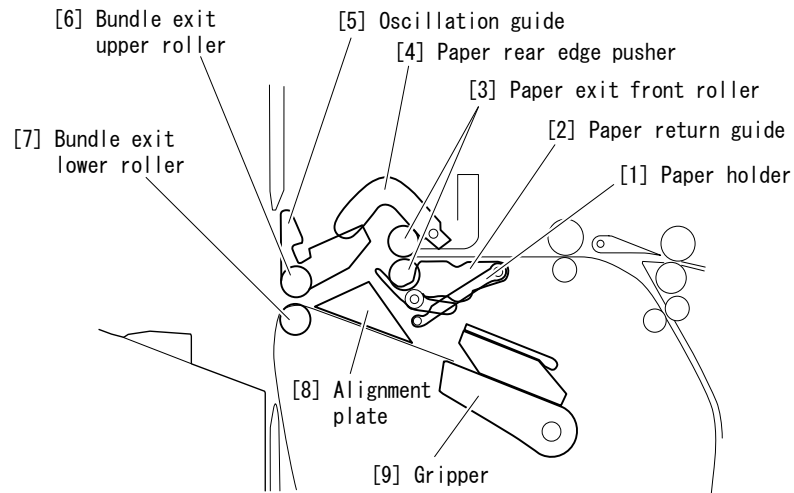
Process Tray Section

Outline

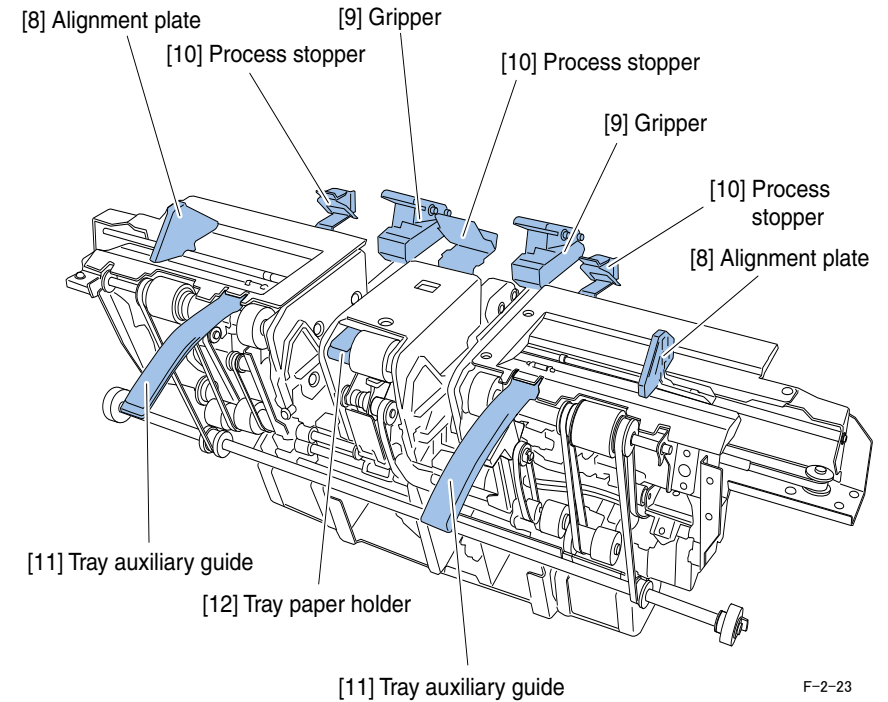
In the process tray section, transported paper is stacked and shifted or stapled, then the paper bundle is discharged to the load tray.

If, however, the straight paper exit is performed without the shift operation or the staple operation, stacking is not performed in the process tray section.

The names and functions of the parts on the intermediate process tray section are shown in the figure below.



F-2-22



F-2-23

No.	Name	Function
[1]	Paper holder	Holds paper stacked in the process tray section to prevent the paper from being discharged or transported during stacking operation.
[2]	Paper return guide	Holds paper when it is stacked in the process tray section, and transports it to the process stopper.
[3]	Paper exit front roller	Transports paper to the process tray section.
[4]	Paper rear edge pusher	Pushes down the rear edge of paper discharged from the paper exit front roller, and faces the rear edge of paper toward the process tray.
[5]	Oscillation guide	Moves the bundle exit upper roller up and down to nip/release paper.
[6]	Bundle exit upper roller	Discharges paper and transport it to the process tray section.
[7]	Bundle exit lower roller	Discharges paper and transport it to the process tray section. (Does not operate when there is some paper in the process tray section.)
[8]	Alignment plate	Aligns paper stacked in the process tray section.
[9]	Gripper	Grips paper bundle attacked in the process tray section, and discharges it to the load tray.
[10]	Process stopper	Strikes the paper rear edge when feeding paper to the process tray.
[11]	Tray auxiliary guide	Prevents improper alignment due to warp of paper when long size paper is stacked.
[12]	Tray paper holder	Holds paper on the load tray to prevent against improper alignment in the straight paper exit operation.

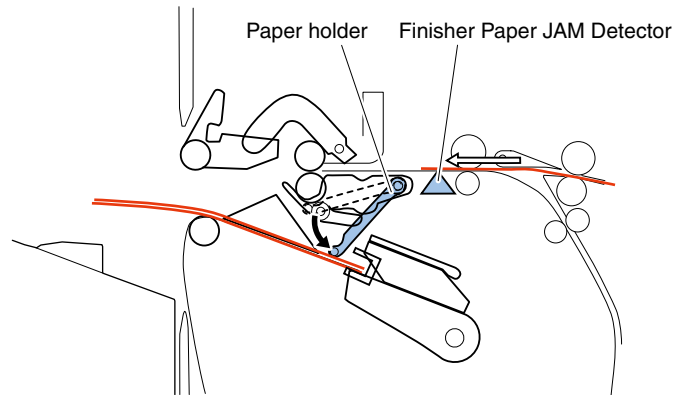
Basic operations

The basic operations of the process tray section are composed of the following four operations:

1. Loading operation
 - Loads paper sent from the transport section onto the process tray section.
2. Shift operation
 - Shifts the load position of the paper bundle to the front or the rear side. (Only when the shift mode is selected.)
3. Staple operation
 - Staples paper bundles at the specified positions. (Only when the staple mode is selected.)
4. Bundle exit operation
 - Discharges paper stacked in the process tray to the upper tray, the lower tray, or the middle tray. When the staple mode is selected, paper is not discharged to the middle tray.

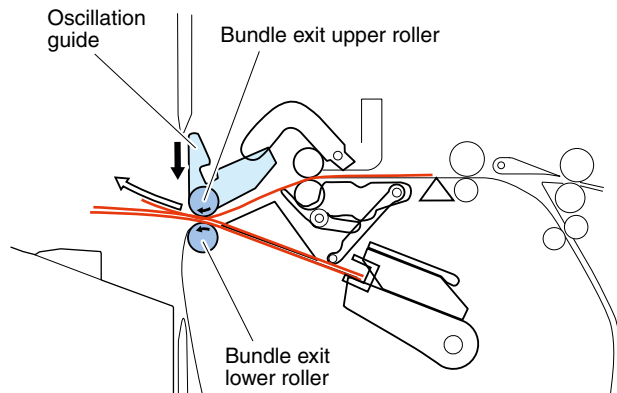
Load operation

- 1) When paper sent from the transport section reaches the Finisher Paper JAM Detector (FNS102), if there is some paper on the process tray, the Finisher Paper Tail Push Down Motor (FNM118) is driven to lower the paper holder, pressing paper on the process tray.



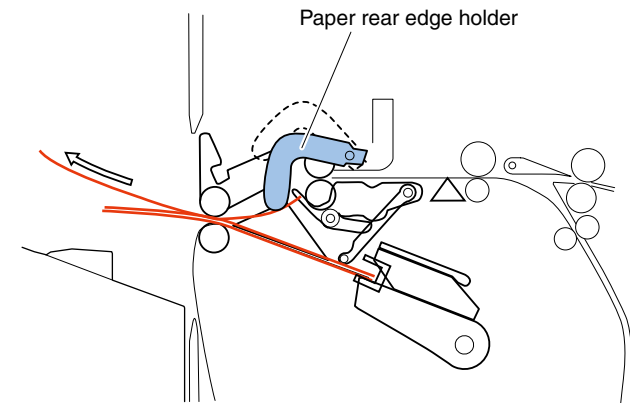
F-2-24

- 2) When the paper lead edge reaches the bundle exit roller section, the Finisher Delivery Roller Lift Motor (FNM110) is driven to lower the oscillation guide, transporting paper from the bundle exit roller. When paper is stacked on the process tray, the bundle exit lower roller is not driven to protect paper from being discharged.



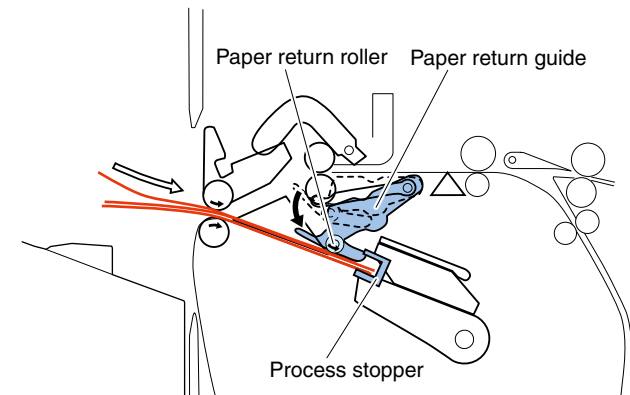
F-2-25

- 3) When the paper rear edge passes through the paper exit front roller, the Finisher Paper Tail Holding Motor (FNM113) is driven to lower the paper rear edge holder, pushing the paper rear edge down to the process tray stacking direction.



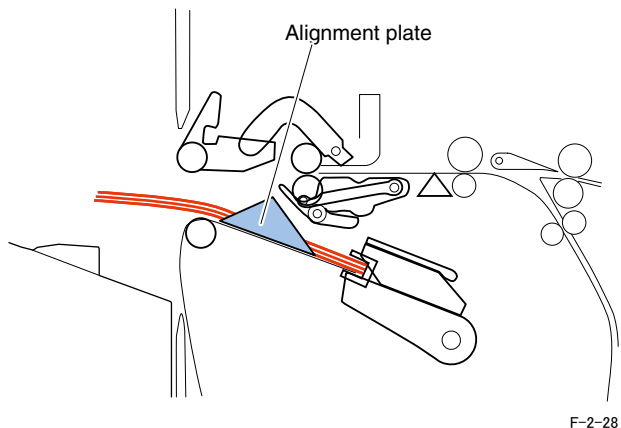
F-2-26

- 4) The bundle exit roller is rotated reversely to transport paper to the process tray. At that time, the Finisher Paper Alignment Roller Lift Motor (FNM112) is driven to lower the paper return guide, pushing the paper transported to the process tray. In addition, the Finisher Paper Transport Alignment Motor (FNM121) is driven to rotate the paper return roller, transporting the paper until it makes in contact with the process stopper.



F-2-27

- 5) The Finisher Paper Alignment Motor F/R (FNM108/FNM109) are driven to operate the alignment plates (Front/Rear) to align paper stacked in the process tray. Alignment is performed every time when paper is transported to the process tray.



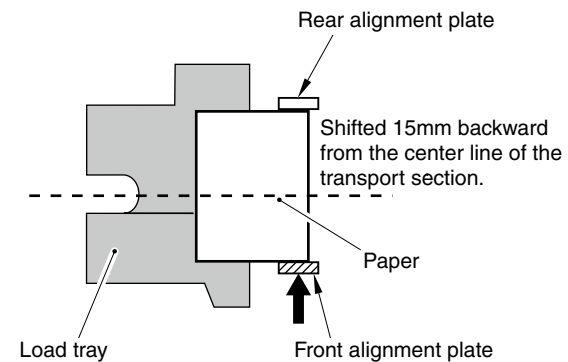
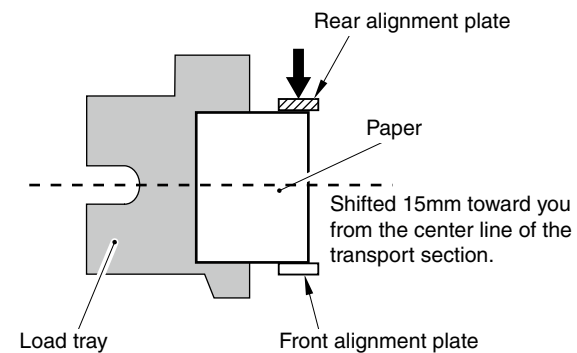
Shift operation

Paper transported to the process tray is aligned to the front side or to the rear side by the alignment plate.

The alignment positions are as follows:

Front alignment: 15mm toward you from the center reference

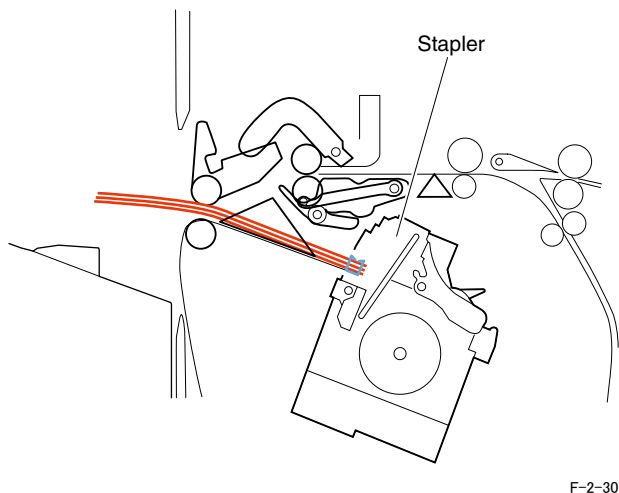
Rear alignment: 15mm away from you from the center reference



F-2-29

Staple operation

After completion of transportation and alignment in the process tray, staple operation is performed by the stapler.

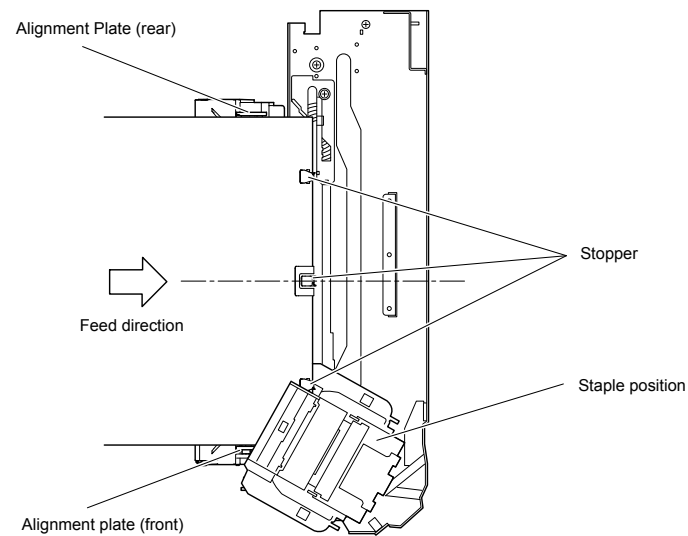


F-2-30

The stapling position and the alignment position in the staple mode are shown below.

- Front 1 position binding

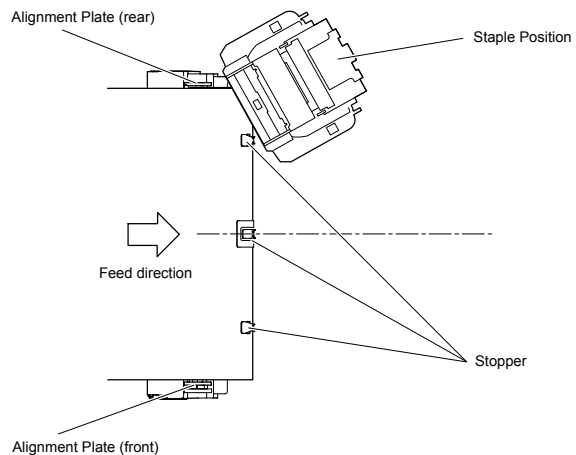
Alignment position: Center reference when the paper width exceeds 216mm, or 15mm toward you from the center reference when the paper width is 216mm or less.



F-2-31

- Rear 1-position binding

Alignment plate: Center reference when the paper width exceeds 216mm, or 15mm away from you from the center reference when the paper width is 216mm or less.



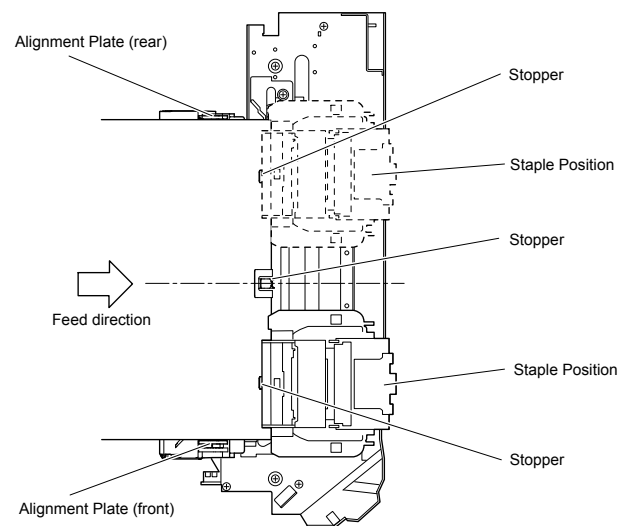
F-2-32

- 2-position binding

Stapling is performed first on the rear side, then on the front side.

Alignment position: Center reference

When, however, the number of sheets of paper of A4R/LTRR/B5R is 20 or less, the paper bundle is shifted 43mm to the front from the center reference after stapling so that the front side is stapled at a position where the gripper and the stapler do not interfere with each other, allowing discharge from the gripper promptly.

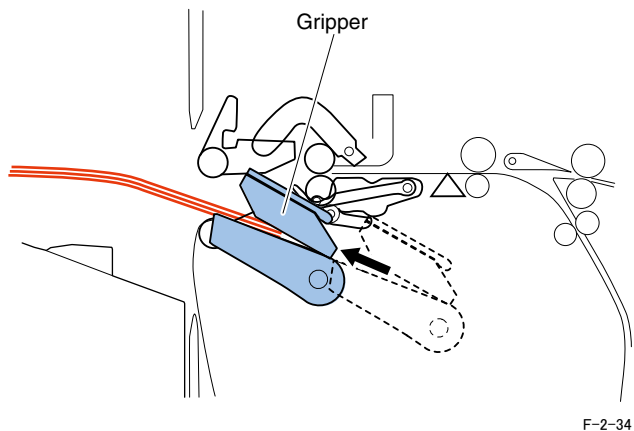


F-2-33

Bundle exit operation

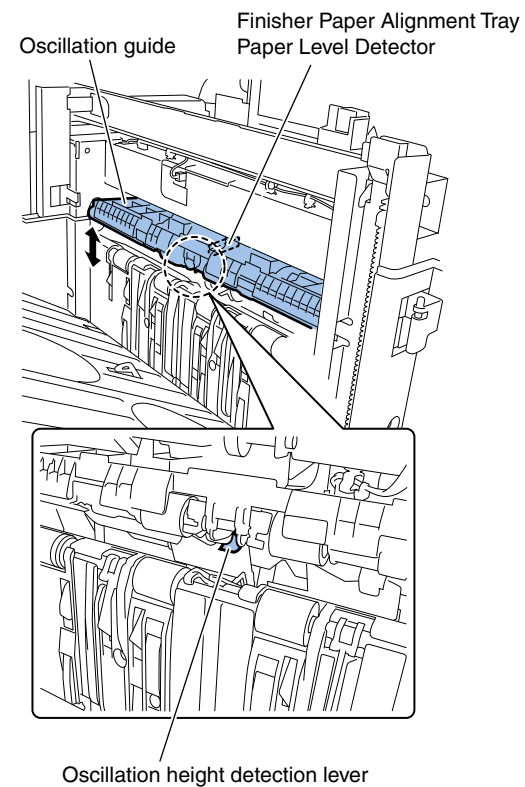
Paper is loaded in the process tray section. The paper rear edge is gripped by the Finisher Gripper Arm Motor (FNM116) and the Finisher Gripper Motor (FNM117), and the paper bundle is transported to the load tray section and discharged.

The paper bundle transport speed by the gripper is higher than normal when bundle of 10 sheets or less of paper width 216mm or less or when the bundle of 2 sheets or less of paper width greater than 216mm.



Oscillation height detection control

The height of paper stacked on the process tray is detected by the Finisher Paper Alignment Tray Paper Level Detector (FNS118), and the oscillation unit height is controlled to the proper level when paper is loaded on the process tray to reduce generation of scratches on images produced by the frictions between the loaded paper and the transported paper.



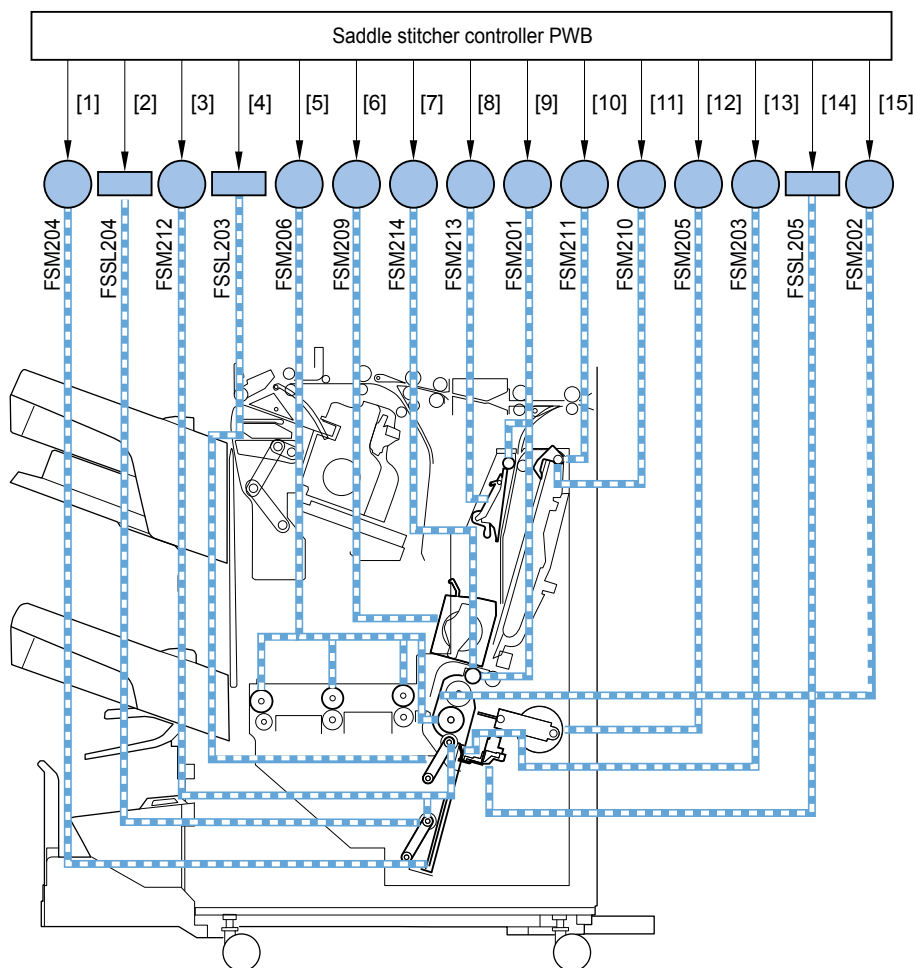
F-2-35

Saddle Stitcher Section

Outline

The saddle stitcher section follows instructions from the saddle stitcher controller PWB to perform center stapling or other stapling operations, then discharging paper to the saddle paper exit belt.

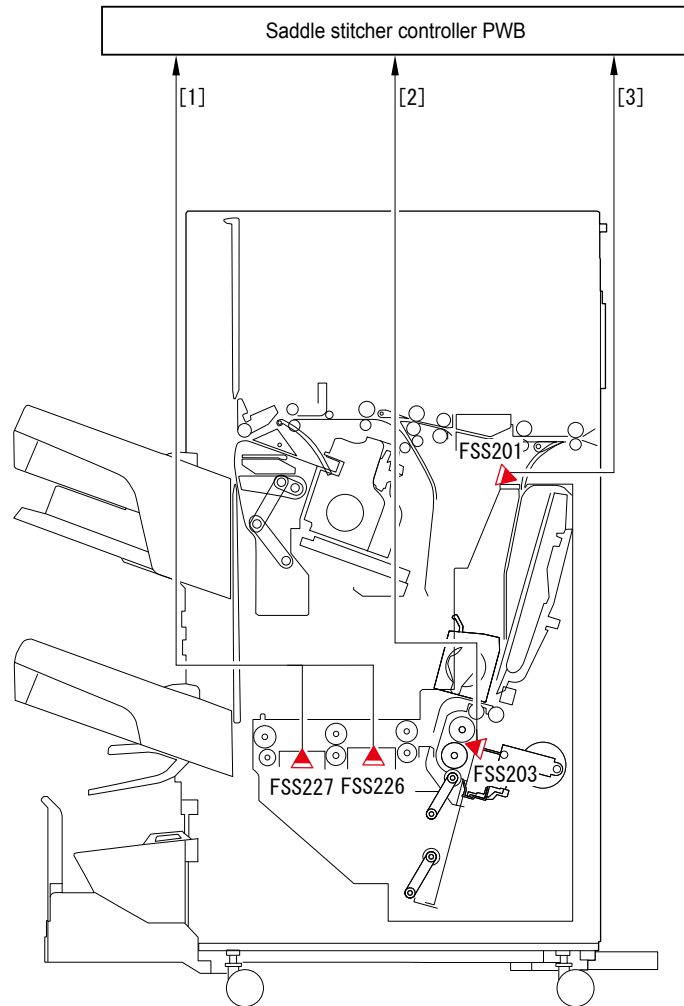
The transport path of paper is provided with six sensors to detect paper jams



[1]	Saddle guide motor drive signal	FSM201	Saddle transport motor
[2]	Alignment roller separation solenoid (lower) drive signal	FSM202	Saddle alignment guide motor
[3]	Saddle alignment roller drive signal	FSM203	Saddle lead edge stopper motor
[4]	Alignment roller separation solenoid (upper) drive signal	FSM204	Saddle guide motor
[5]	Saddle fold/transport motor drive signal	FSM205	Saddle paper push plate motor
[6]	Stitcher motor drive signal	FSM206	Saddle fold/transport motor
[7]	Saddle takeup separation motor drive signal	FSM209	Saddle stitcher motor
[8]	Saddle flapping motor drive signal	FSM210	Saddle rear edge press motor
[9]	Saddle transport motor drive signal	FSM211	Saddle rear edge shift motor
[10]	Saddle rear edge shift motor drive signal	FSM212	Saddle alignment roller motor
[11]	Saddle rear edge press motor drive signal	FSM213	Saddle flapping motor
[12]	Saddle paper push plate drive signal	FSM214	Saddle takeup roller separation motor
[13]	Saddle lead edge stopper motor drive signal	FSSL203	Alignment roller separation solenoid (upper)
[14]	Lead edge gripper solenoid drive signal	FSSL204	Alignment roller separation solenoid (lower)
[15]	Saddle alignment motor drive signal	FSSL205	Saddle lead edge gripper solenoid

T-2-7

F-2-36



F-2-37

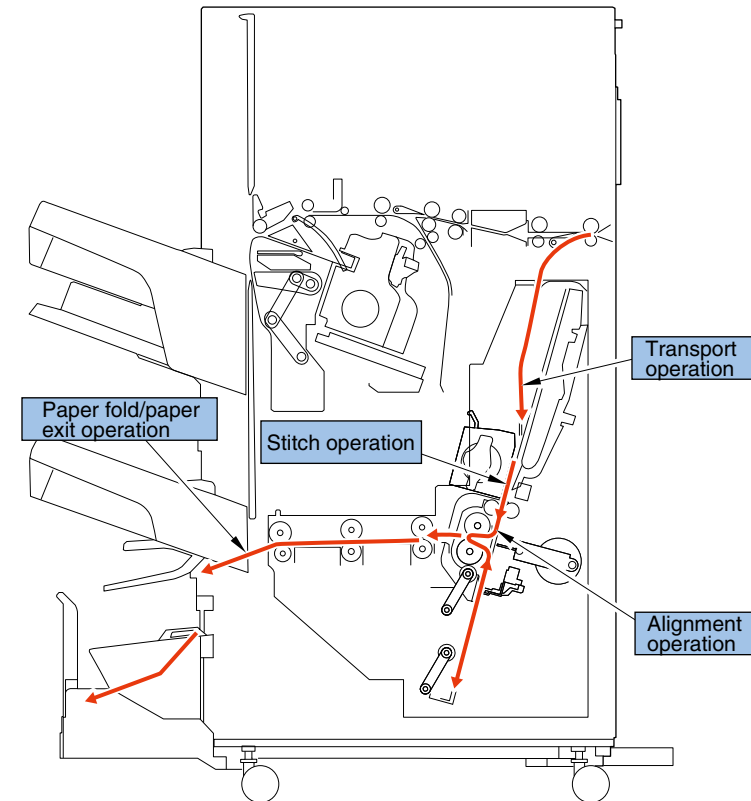
- [1] Saddle paper exit sensor 1, 2 detection signal
- [2] Saddle vertical path sensor detection signal
- [3] Saddle inlet port sensor detection signal
- FSS201 Saddle inlet port sensor
- FSS203 Saddle vertical path sensor
- FSS226 Saddle paper exit sensor 1
- FSS227 Saddle paper exit sensor 2

T-2-8

Basic operations

The basic operations of the saddle stitcher section are divided into the following four categories:

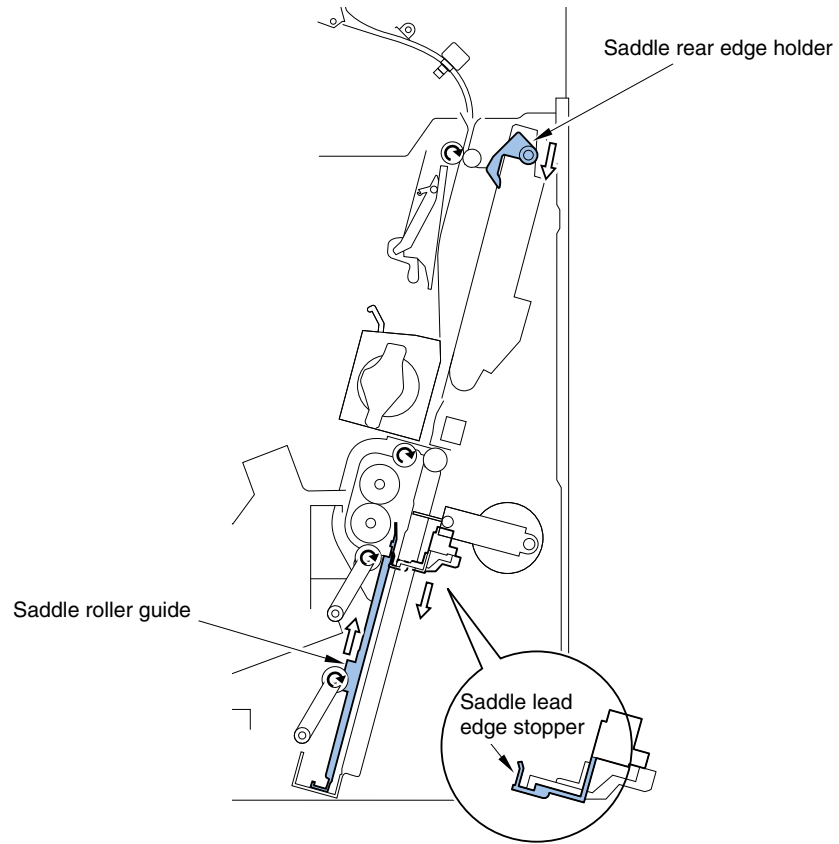
1. Transport operation
Paper sent from the transport section is passed to the vertical path section,
2. Alignment operation
Paper sent to the vertical path section is aligned.
3. Stitch operation
The stitcher is used to staple at the center of paper.
4. Paper fold/paper exit operation
Paper is folded in two and discharged to the saddle paper exit tray.



F-2-38

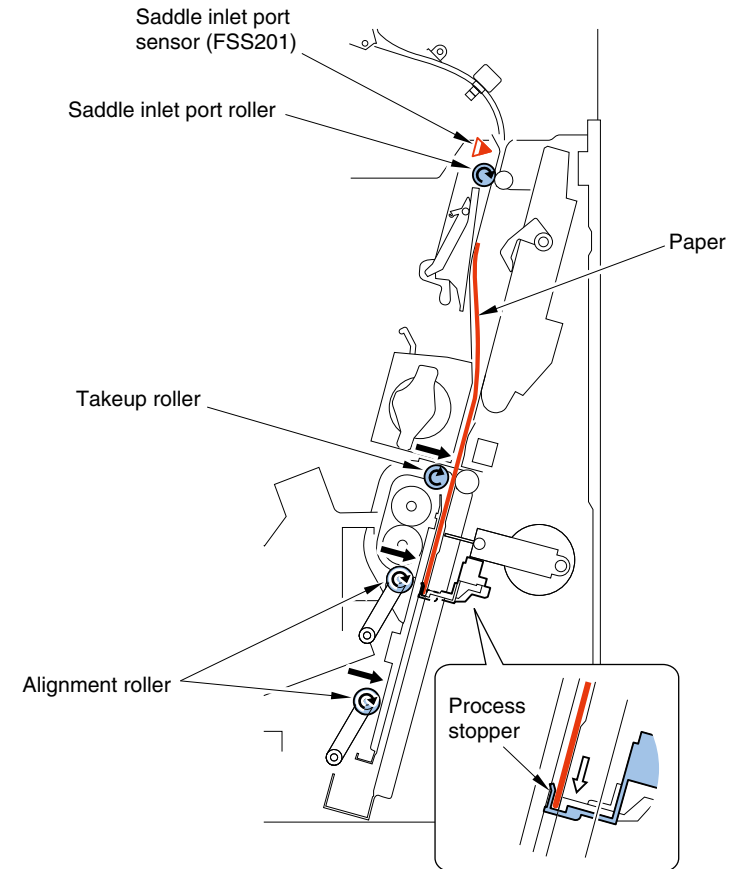
Transport operation

- 1) Shift the saddle lead edge stopper and the saddle rear edge holder to the position corresponding to the paper size. Then, lift the saddle roller guide. (For thin paper, execute the roller guide shift control.)



F-2-39

- 2) The saddle transport roller transports paper to the stitcher section.
- 3) When the saddle inlet port sensor (FSS201) detects paper, the saddle alignment roller rotates to drive the saddle takeup roller separation motor and the saddle alignment roller separation solenoid. The takeup roller and the alignment roller transports the paper until it is stopped by the process stopper.

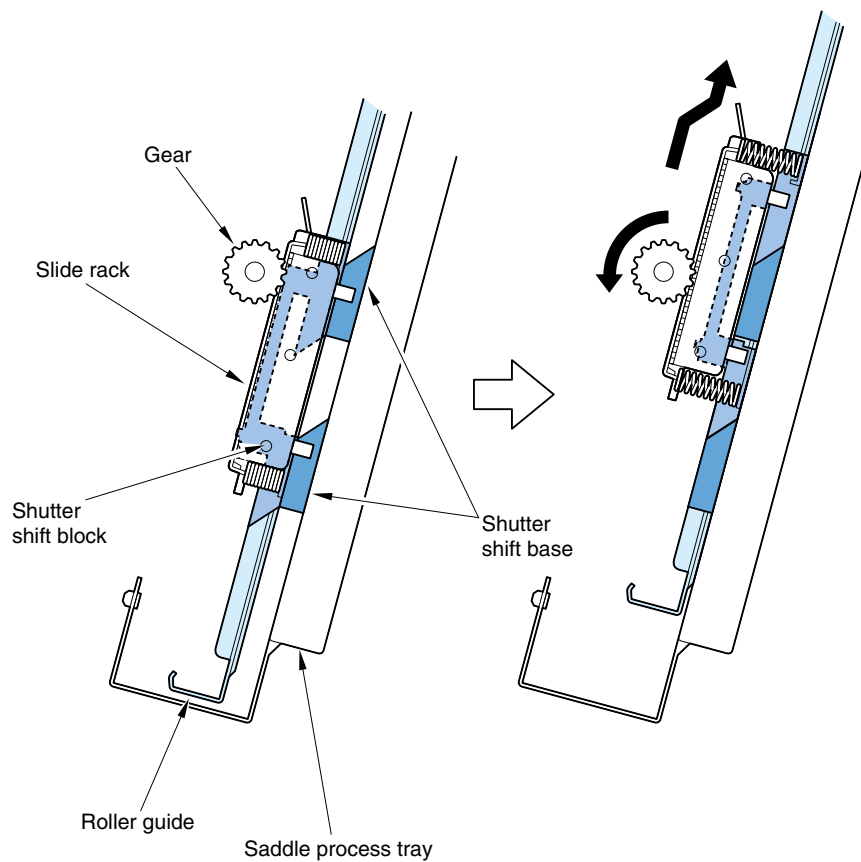


F-2-40

Roller guide width control

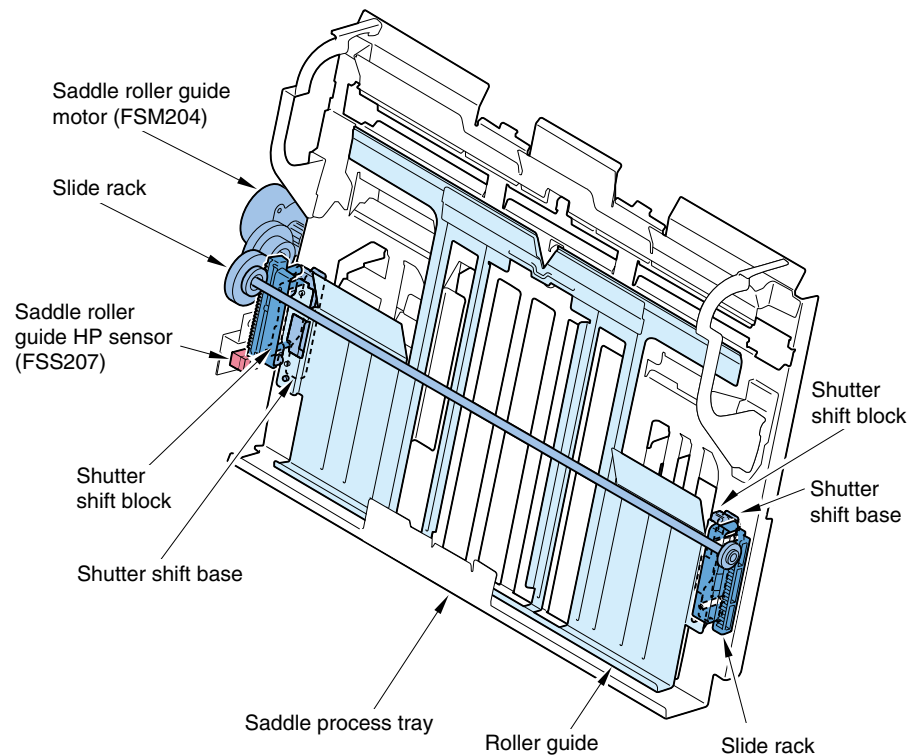
When the roller guide width and the saddle process tray width are too great for thin paper, paper bundle is warped and alignment operation cannot be performed properly.

For thin paper, therefore, make the roller guide width and the saddle process tray width narrower than for the other paper. When several sheets of paper are sent to the saddle process tray, the width is extended according to the paper width. Every time when 5 sheets of paper are sent to the saddle process tray, the width is extended by the specified amount



F-2-41

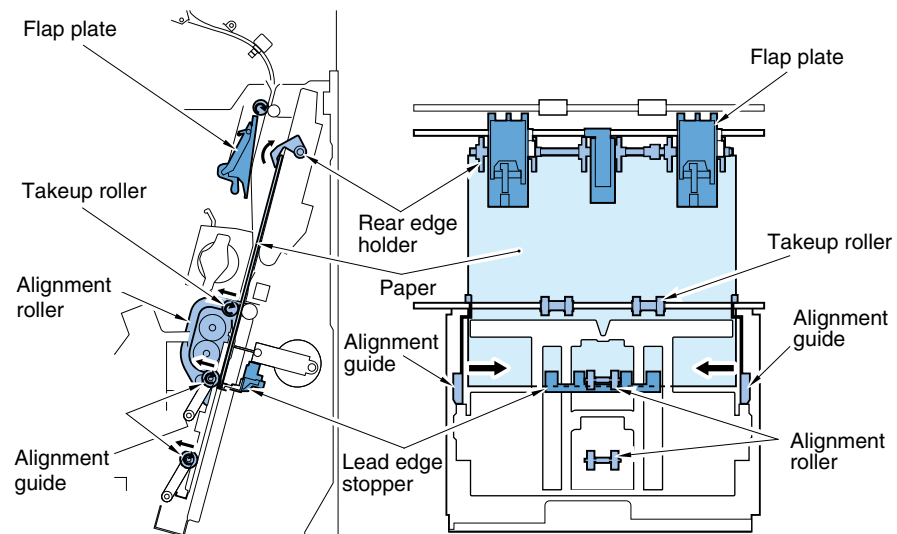
The roller guide width and the saddle process tray width vary according to the position of the shutter shift block (hereinafter abbreviated as shift block). The shift block is lifted by the saddle roller guide motor (FSM204). Since the shutter block is in contact with the shutter shift base at the beginning, it shifts with a fixed width. When it reaches the edge of the shutter shift base, it starts shifting so that the width is narrowed. For thin paper, the shift block is lifted until the specified width is reached. Then after that, the shift block is descended for every 5 sheets to widen the width.



F-2-42

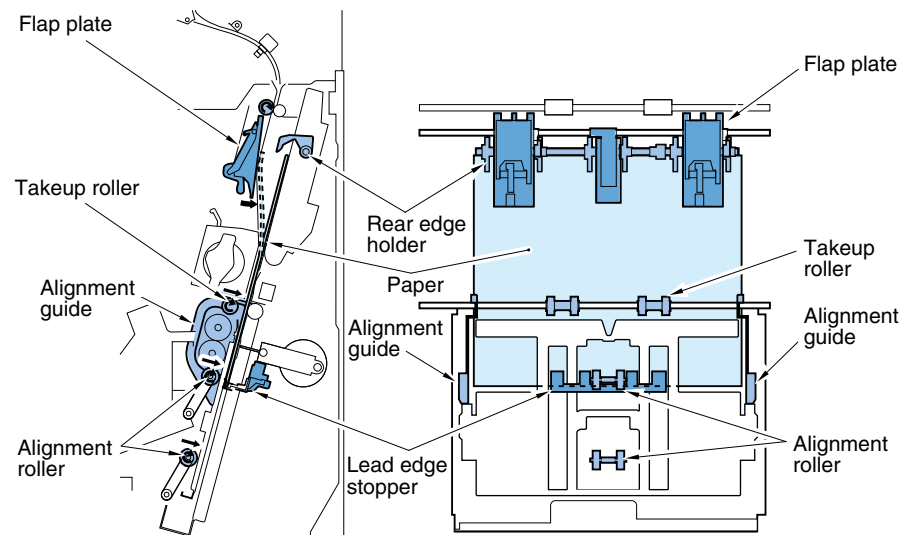
Alignment operation

- 1) Open the rear edge holder, and separate the alignment roller and the takeup roller. Shift the alignment guide to the paper size to align the paper bundle.



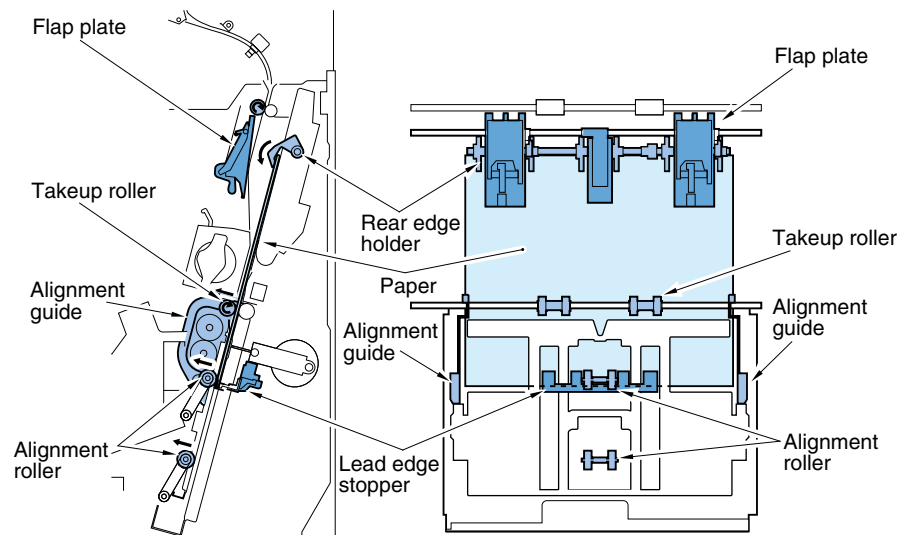
F-2-43

- 2) Ground the alignment roller again, push the paper onto the lead edge stopper, and flap the rear edge of paper with the flap plate.



F-2-44

- 3) Separate the alignment roller, and press the rear edge of paper with the rear edge holder.

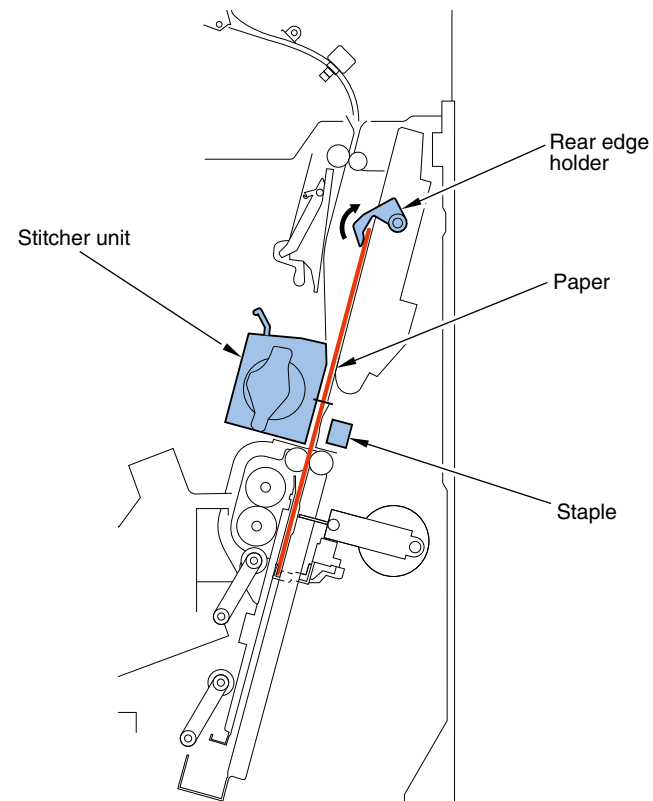


F-2-45

- 4) The above operations are performed for every paper to align the paper bundle.

Stitch operation

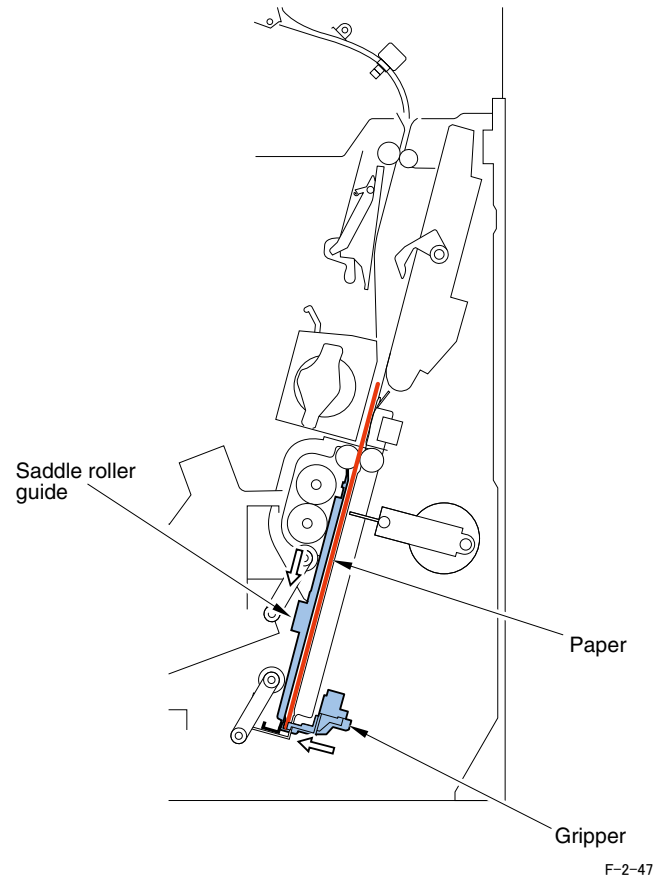
- 1) One stitcher unit is provided in the front side of the machine, and the other in the rear side. After completion of alignment operation, the rear edge holder is released and stitching of the paper bundle is performed by the stitcher unit.



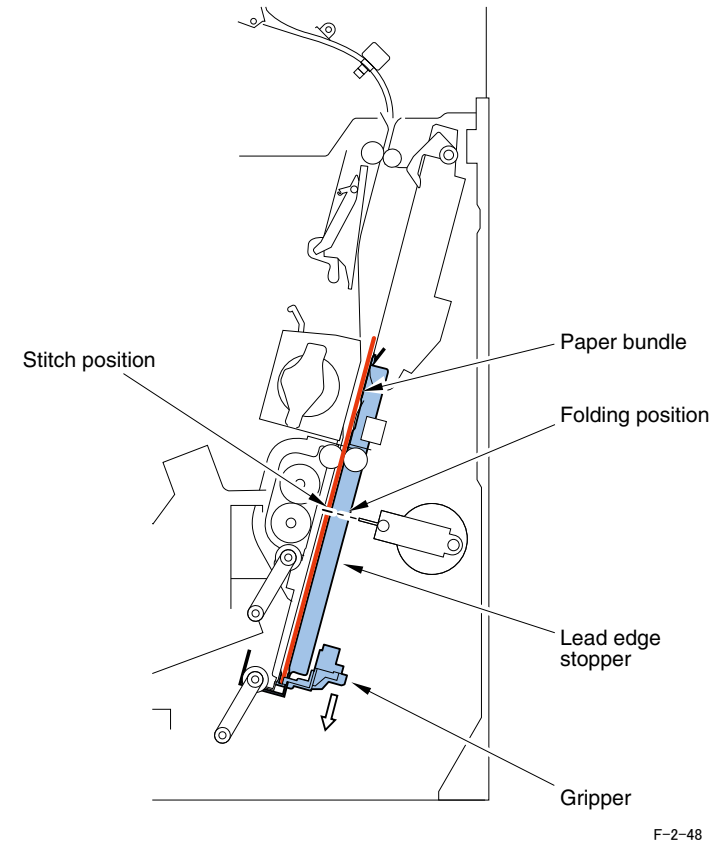
F-2-46

Paper folding/paper exit operation

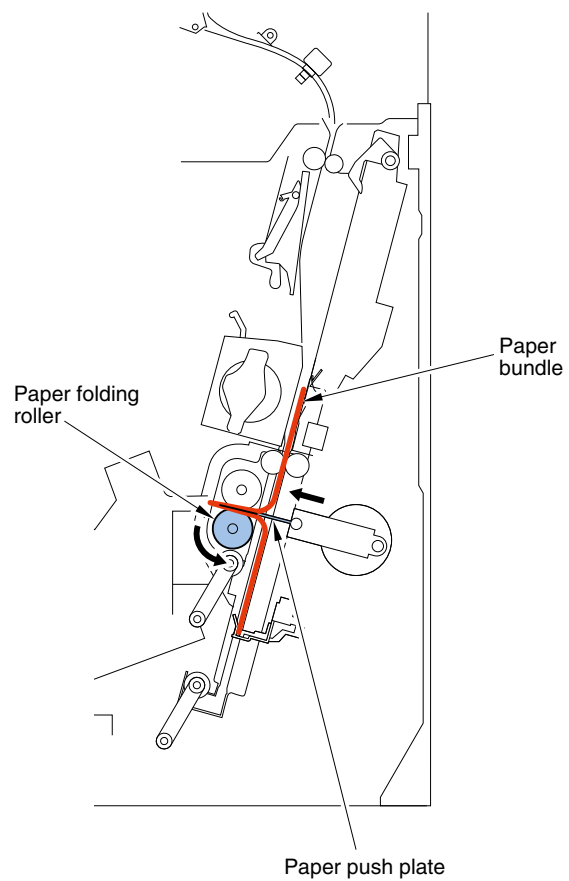
- 1) After lowering the saddle roller guide, the saddle lead edge stopper solenoid (FSSL205) is turned ON to grip paper with the gripper.



- 2) While gripping the paper bundle with the gripper, the paper positioning plate is lowered to shift the paper bundle in the arrow direction, fitting the stitch position and the folding position together.



- 3) The paper folding roller rotates in the arrow direction, and the paper push plate shifts in the arrow direction. Then folding of the paper bundle is started. After that, the paper push plate returns to the original position and stops there.



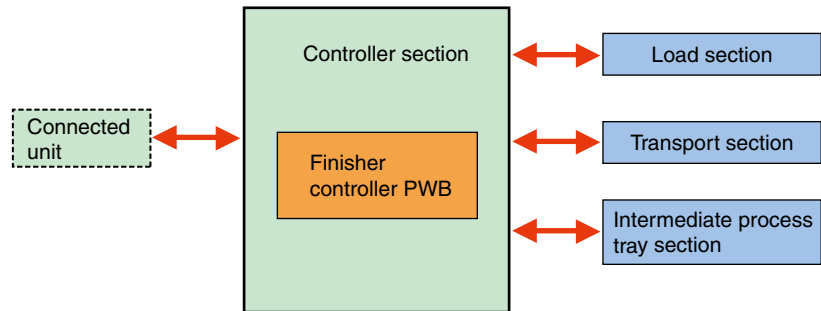
F-2-49

Controller Section

Outline

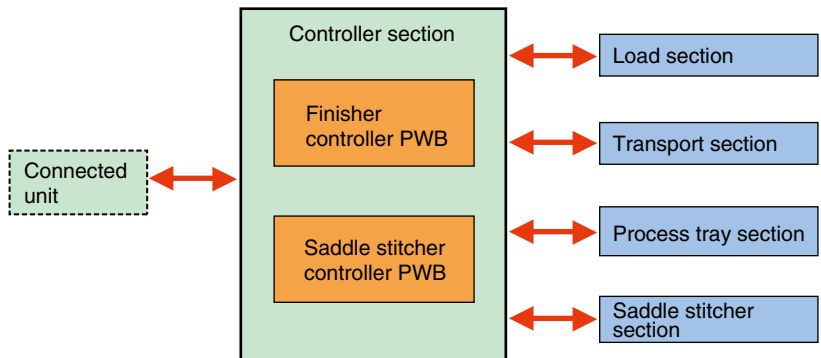
The controller section performs the overall control of the whole machine, and controls the load section, the transport section, the process tray section, and the saddle sticher section.

- Finisher



F-2-50

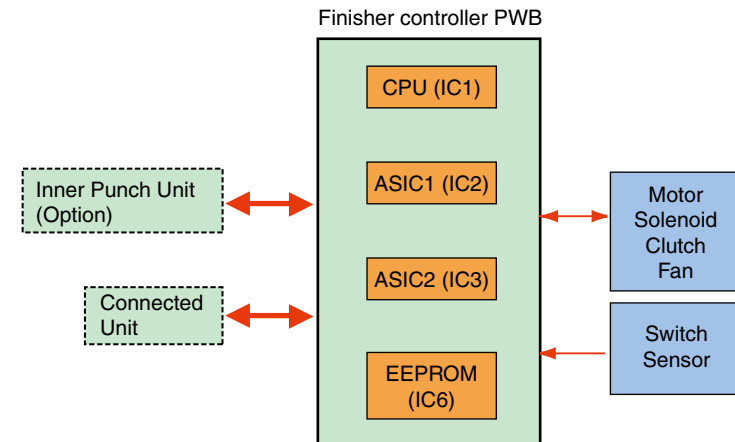
- Saddle finisher



Finisher controller PWB

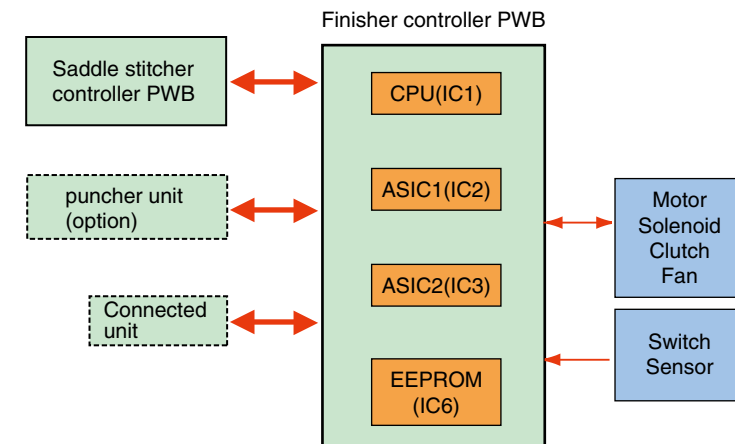
The finisher controller PWB drives the loads (motors, solenoids, etc.) and notifies information on the sensor and switch status to the connected unit. It also controls the inner punch unit, and the saddle sticher unit.

- Finisher



F-2-52

- Saddle finisher

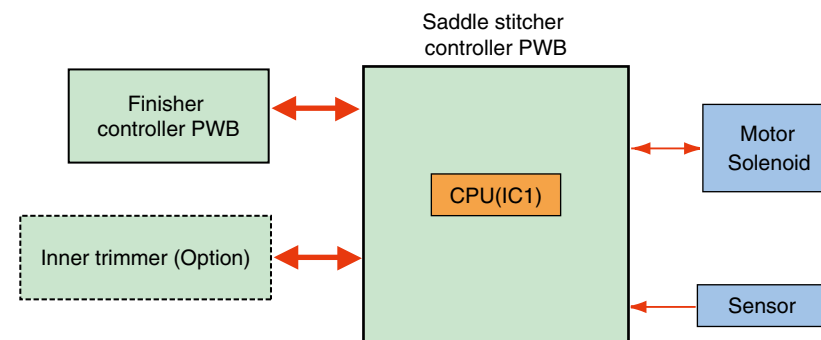


The major roles of the major IC's used in this circuit are described below.

Name	Role
CPU (IC1)	Controls communication between this circuit and the connected unit. Controls ASIC1 / ASIC2. Stores the firmware which operates the machine.
ASIC1 (IC2)	Controls communication with option units. Drives and controls the loads.
ASIC2 (IC3)	Drives and controls the loads.
EEPROM (IC6)	Stores the counter values and the adjustment values.

T-2-9

Saddle stitcher controller PWB



F-2-54

The major roles of the major IC's used in this circuit are described below.

Name	Role
CPU (IC1)	Controls communication between this circuit and the finisher. Drives and controls the loads. Stores the firmware which operates the machine.

T-2-10

Power Source

Outline

The DC power for this machine is supplied by the power unit.

The function and the power distribution of the power unit are as shown in the table below.

Name	Function
Power unit	Generates the DC power (24V series). Supplies the DC power to the finisher controller PWB.
Finisher Safety Switch1 (Front cover switch) (FNSW101) Finisher Safety Switch3 (Oscillation guide switch (Front) (Rear)) (FNSW102) Finisher Safety Switch2 (Stapler safety switch) (FNSW103) Finisher Tray Proximity Switch (Upper tray / Middle tray) (FNSW110)	Turns ON/OFF the DC power of 24V.

Protection function

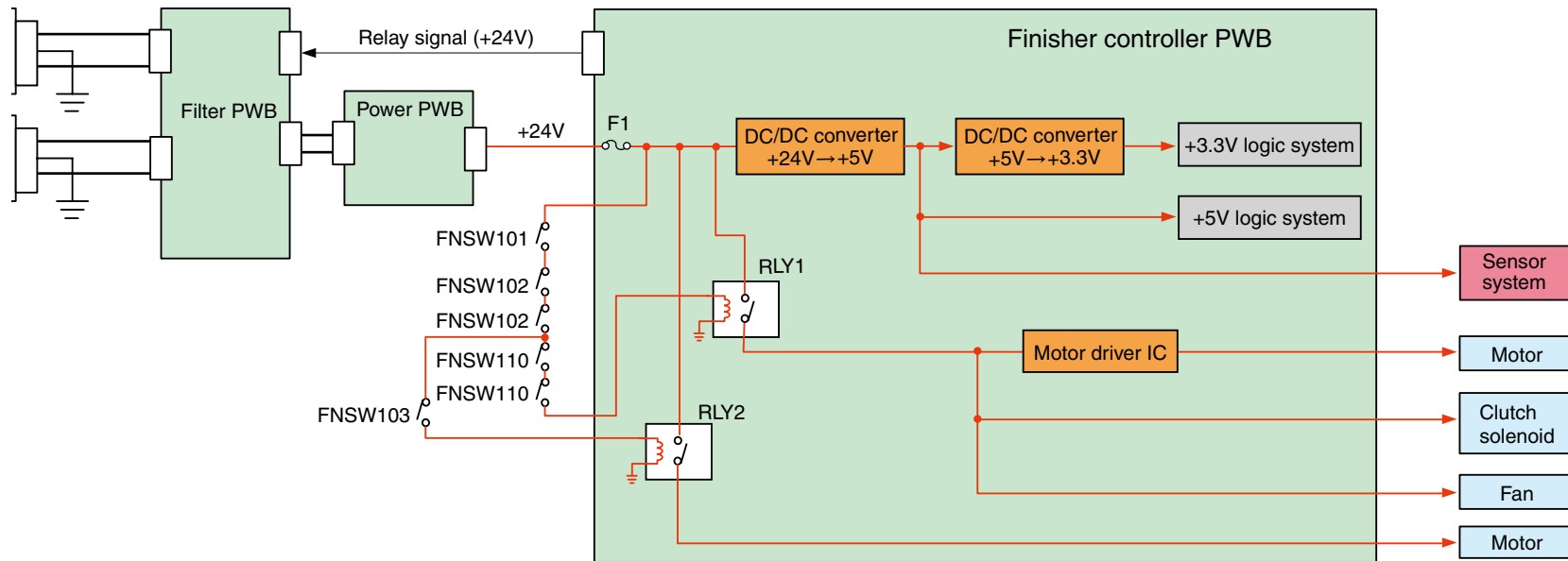
For overcurrent protection of 24V DC to drive the motor, the motor driver is provided which includes a fuse or an overcurrent protection function.

A fuse is provided also in the 24V DC input section of each controller PWB, and it will melt down when an overcurrent flows.

The power PWB is provided with the overvoltage/overcurrent protection function which interrupts the output voltage automatically to prevent the power circuit from being damaged when an overcurrent or an overvoltage is generated due to a short circuit or a trouble on the load side.

The circuit is also provided with a fuse, which is melt down to interrupt power conduction when an overcurrent flows in the AC line.

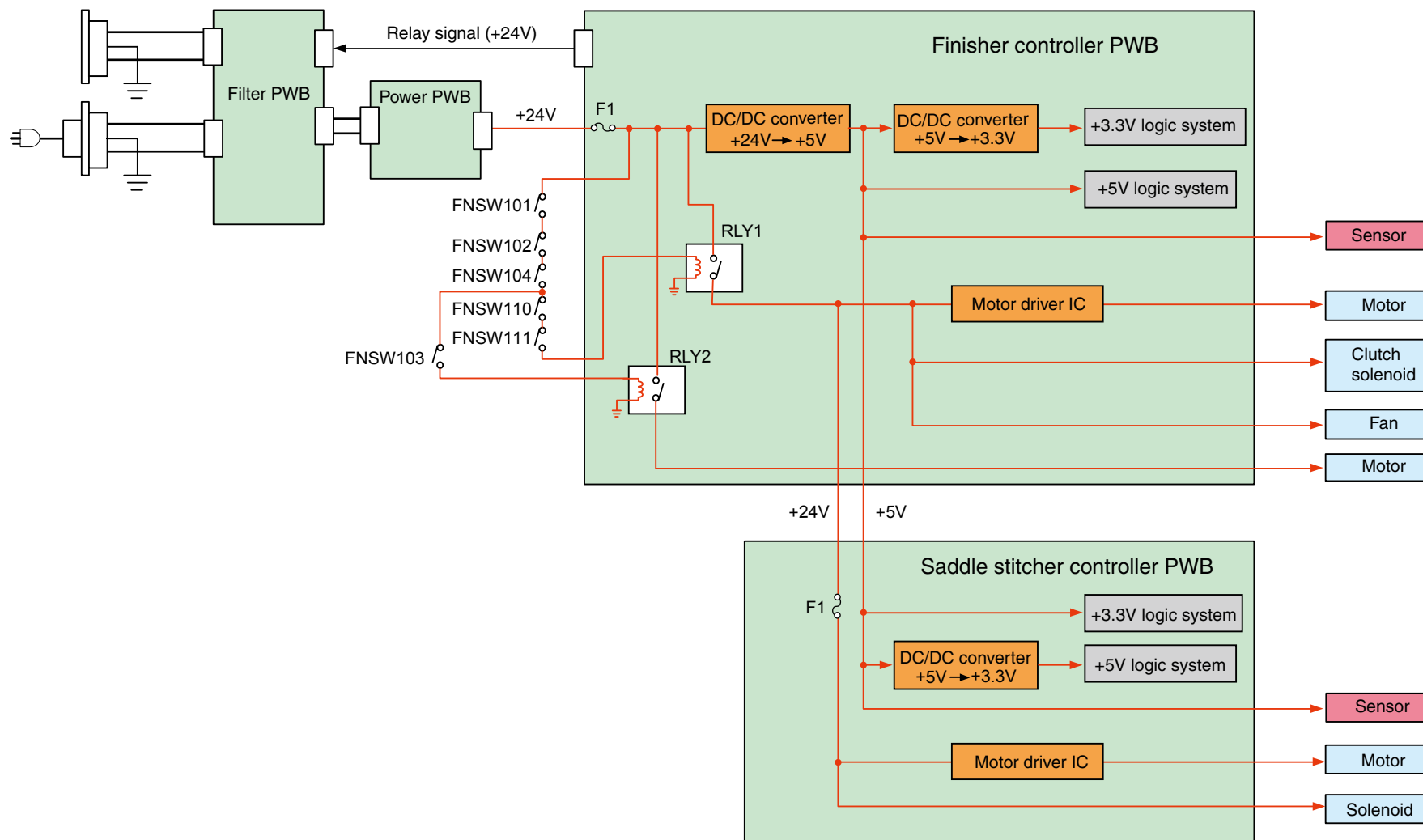
L Finisher



- FNSW101: Finisher Safety Switch1 (Front cover switch)
 FNSW102: Finisher Safety Switch3 (Oscillation guide switch (Front) (Rear))
 FNSW103: Finisher Safety Switch2 (Stapler safety switch)
 FNSW110: Finisher Tray Proximity Switch (Upper tray / Middle tray)

F-2-57

L Saddle finisher



- FNSW101: Finisher Safety Switch1 (Front cover switch)
- FNSW102: Finisher Safety Switch3 F (Oscillation guide switch (Front))
- FNSW103: Finisher Safety Switch2 (Stapler safety switch)
- FNSW104: Finisher Safety Switch3 R (Oscillation guide switch (Rear))
- FNSW110: Finisher Tray Proximity Switch (Tray 1 lower)
- FNSW111: Finisher fax Tray Proximity Switch (Escape Tray lower)



MAINTENANCE

† Maintenance List

Maintenance List

× : Check (Clean, replace, or adjust as needed.) ○ : Clean ▲ : Replace △ : Adjust ☆ : Lubricate □ : Shift position

No.	Part name	When calling	When machine maintenance	Remark	Reference
1	Discharge needle (Transport guide section)	×	×	Replace at 1,000K reference.	Refer to page 4-26
2	Discharge needle (Front) (Oscillation guide section)	×	×	Replace at 1,000K reference.	Refer to page 4-32
3	Discharge needle (Rear) (Oscillation guide section)	×	×	Replace at 1,000K reference.	Refer to page 4-32
4	Bundle exit upper roller (Front/Rear)	×	×	Clean with alcohol.	Refer to page 4-34
5	Bundle exit upper roller (Center)	×	×	Clean with alcohol.	Refer to page 4-34
6	Finisher Shutter clutch	×	×	Replace at 1,000K reference.	Refer to page 4-42
7	Finisher Safety Switchover Solenoid	×	×	Replace at 1,000K reference.	Refer to page 4-37
8	Paper holder torque limiter	×	×	Replace at 1,000K reference.	Refer to page 4-29
9	Paper return roller (Front)	×	×	Clean with alcohol. Replace at 1,000K reference.	Refer to page 4-39
10	Paper return roller (Rear)	×	×	Clean with alcohol. Replace at 1,000K reference.	Refer to page 4-39
11	Torque limiter (Upper / Lower tray paper holder)	×	×	Replace at 1,000K reference.	Refer to page 4-38
12	Paper holder rubber	×	×		Refer to page 4-36
13	Paper holder roller	×	×		Refer to page 4-42
14	Torque limiter (Sub guide)	×	×		Refer to page 4-35
15	Staple unit	-	-	Replacement reference: Replace the unit at 500K staple.	Refer to page 4-28
16	Discharge needle (Grid lower guide section)	×	×	Replace at 1,000K reference.	Refer to page 4-36
17	Shutter torque limiter	×	×	Replace at 1,000K reference.	Refer to page 4-28
18	Upper tray torque limiter	×	×	Replace at 200K reference.	Refer to page 4-30
19	Lower tray torque limiter	×	×	Replace at 200K reference.	Refer to page 4-31
20	One-way clutch	×	×	Replace at 1,000K reference.	
21	Saddle stapler unit	-	-	Replacement reference: Replace the unit at 100K staples.	
22	Punch unit	-	-	Replacement reference: Replace the unit at 1000K punching.	
23	Staple cartridge	-	-	User replacement at every 5,000 staples.	
24	Saddle staple cartridge	-	-	User replacement at every 2,000 staples.	
25	Gears	×	×		
26	Belts	×	×		
27	Sensors	×	×		

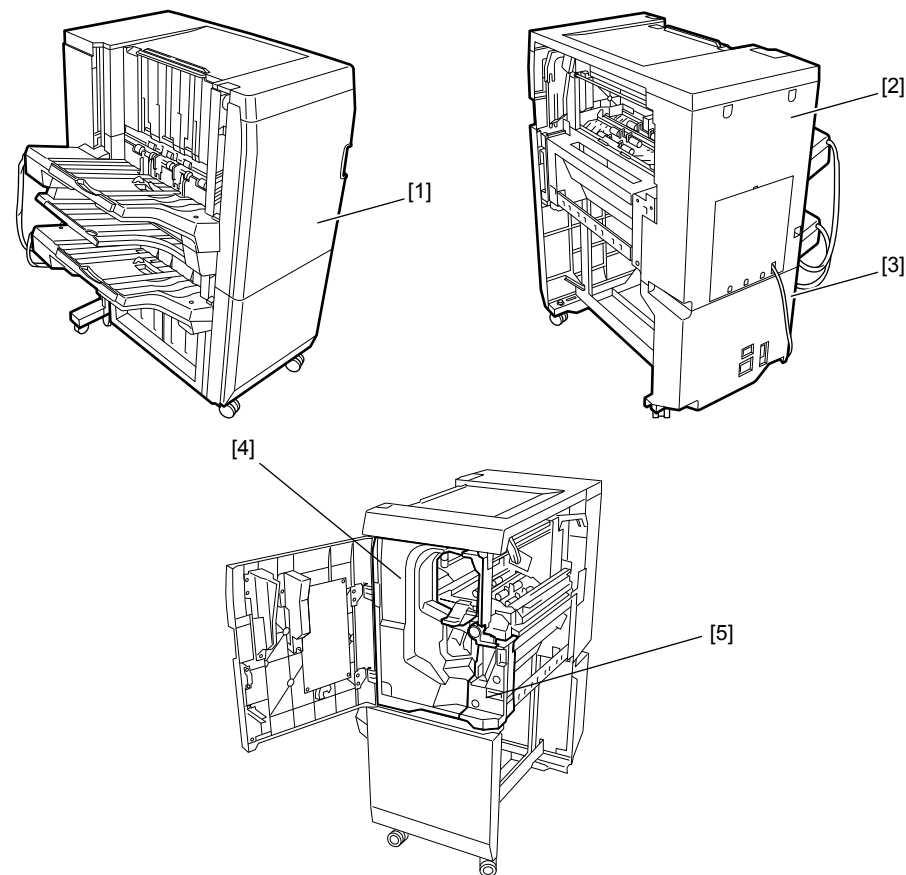
4

DISASSEMBLY
AND
ASSEMBLY

- + Parts View
- + External/Internal Cover
- + Major Units
- + Periodic/Consumable Parts, Cleaning Positions
- + Motors
- + Switches
- + PWB's
- + Rollers
- + Saddle stitcher section

Parts View

● External/Internal covers view



F-4-1

F-4-2

No.	Name	Reference
[1]	Front door	Refer to page 4-13.
[2]	Rear upper cover	Refer to page 4-14.
[3]	Rear lower cover	Refer to page 4-14.
[4]	Left inside cover	Refer to page 4-15.
[5]	Right inside cover	Refer to page 4-15.

T-4-1

Major units view

No.	Name	Reference
[1]	Grid upper guide	Refer to page 4-16.
[2]	Upper tray/Lower tray	Refer to page 4-17.
[3]	Grid lower guide	Refer to page 4-19.
[4]	Staple drive unit	Refer to page 4-20.
[5]	Process tray unit	Refer to page 4-22.

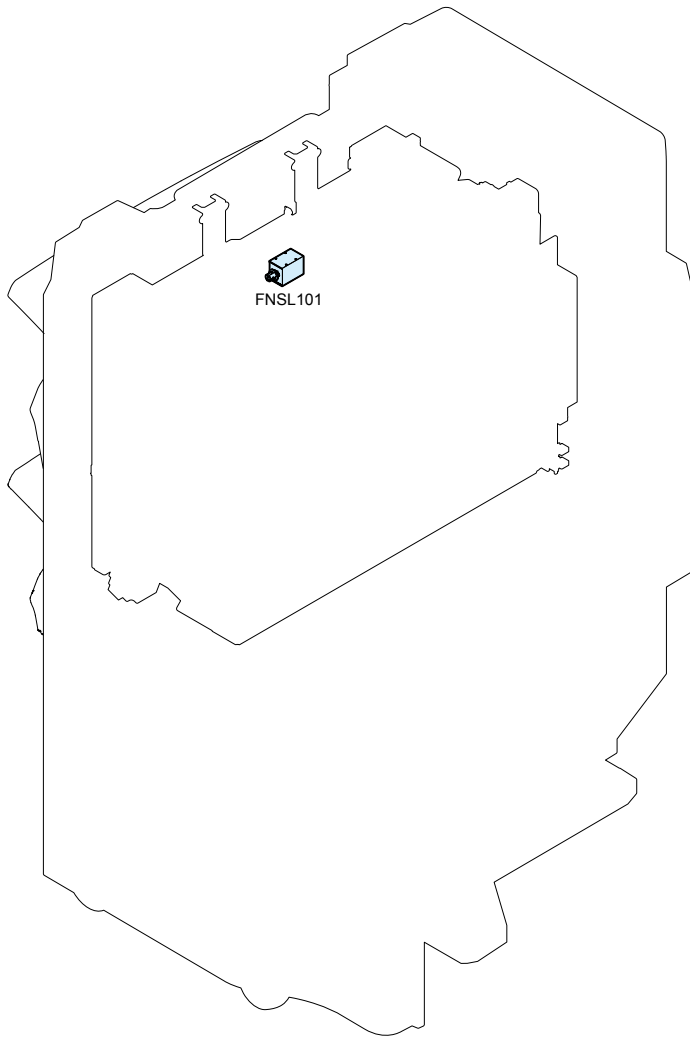
Periodic/consumable parts, cleaning positions view

No.	Name	Reference
[1]	Discharge needle (Transport guide section)	Refer to page 4-27.
[2]	Shutter torque limiter	Refer to page 4-28.
[3]	Staple unit	Refer to page 4-28.
[4]	Paper holder torque limiter	Refer to page 4-29.
[5]	Upper tray torque limiter	Refer to page 4-30.
[6]	Lower tray torque limiter	Refer to page 4-31.
[7]	Discharge needle (Oscillation guide section)	Refer to page 4-32.
[8]	Bundle exit upper roller	Refer to page 4-34.
[9]	Sub guide torque limiter	Refer to page 4-35.
[10]	Discharge needle (Grid lower guide section)	Refer to page 4-36.
[11]	Paper holder rubber	Refer to page 4-36.
[12]	Finisher Safety Switch2 solenoid	Refer to page 4-37.
[13]	Torque limiter (Upper / Lower tray paper holder)	Refer to page 4-38.
[14]	Paper return roller (Front)	Refer to page 4-39.
[15]	Paper return roller (Rear)	
[16]	Paper holder roller	Refer to page 4-42.
[17]	Finisher Shutter clutch	Refer to page 4-42.

T-4-4

Solenoid view

Finisher

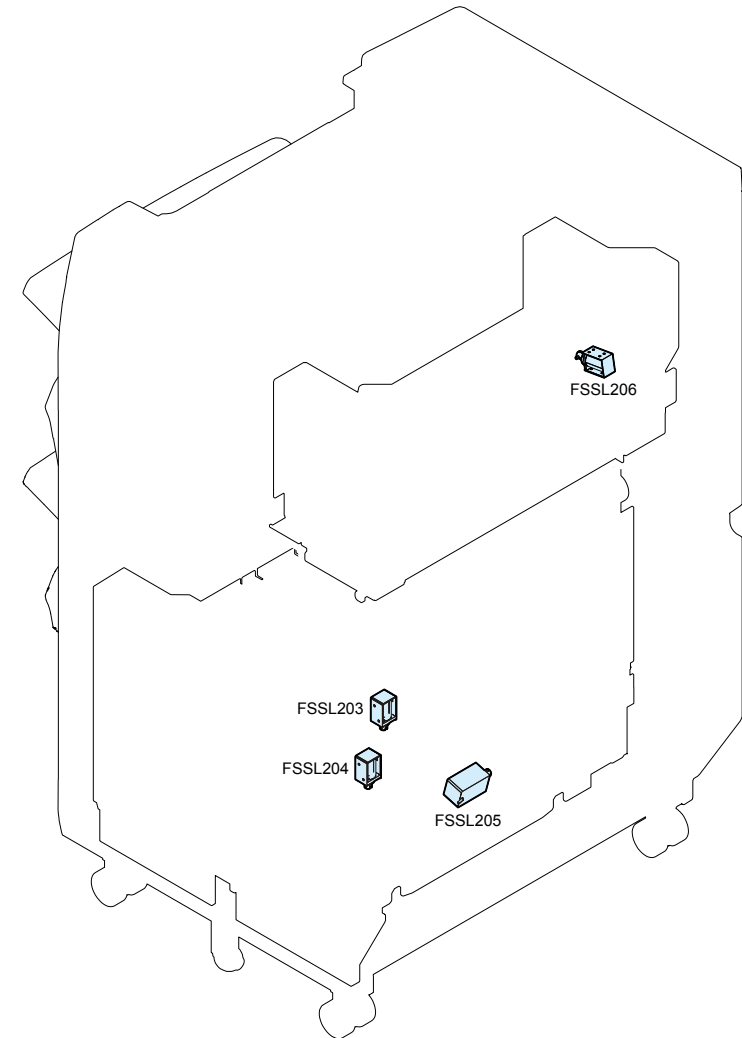


F-4-5

Code	Name	Reference
FNSL101	Finisher Safety Switchch2 Solenoid	Refer to page 4-37.

T-4-5

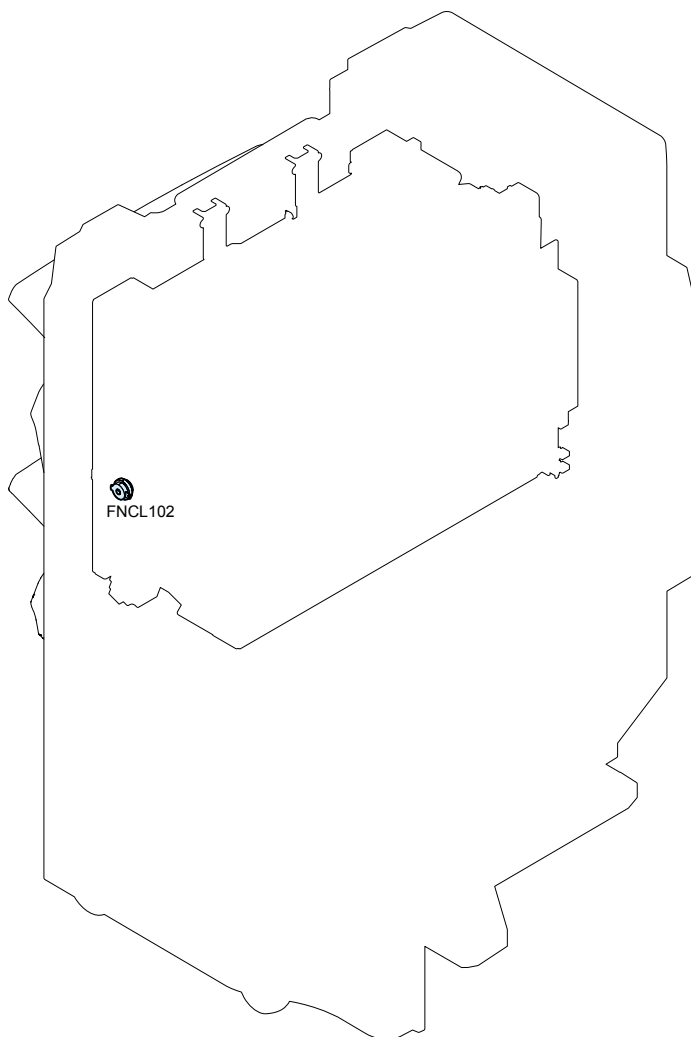
Saddle finisher



No	Name	Reference
FSSL203	Saddle alignment estrangement solenoid1	-
FSSL204	Saddle alignment estrangement solenoid2	-
FSSL205	Saddle front edge stopper solenoid	-
FSSL206	Saddle Paper transport solenoid	Refer to page 4-86.

T-4-6

Clutch view

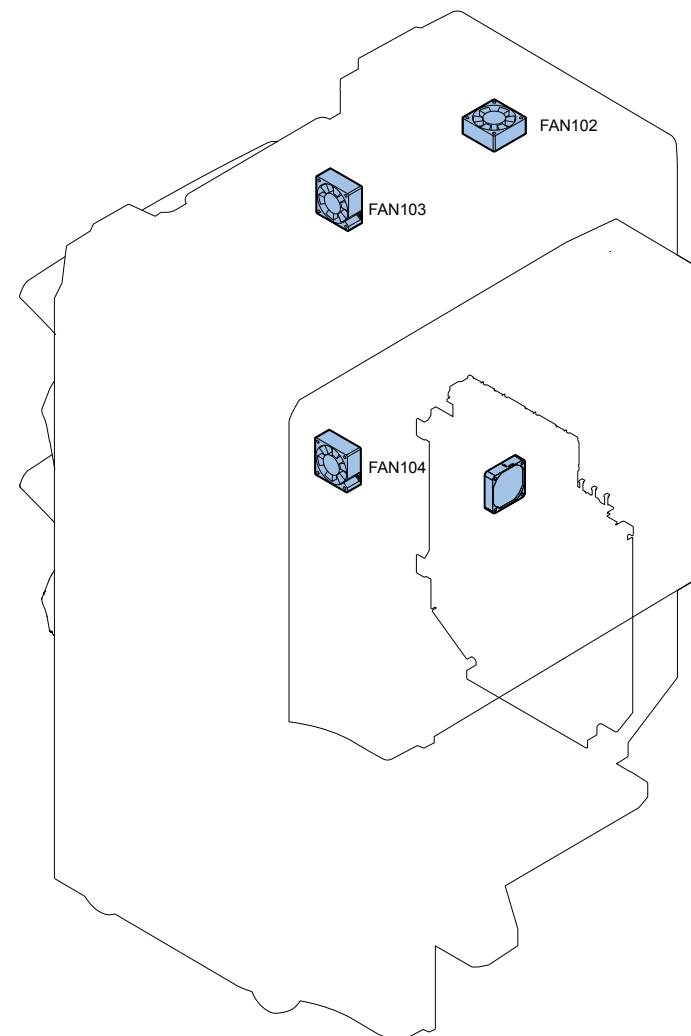


F-4-7

Code	Name	Reference
FNCL102	Finisher Shutter Clutch	Refer to page 4-42.

T-4-7

Fan view

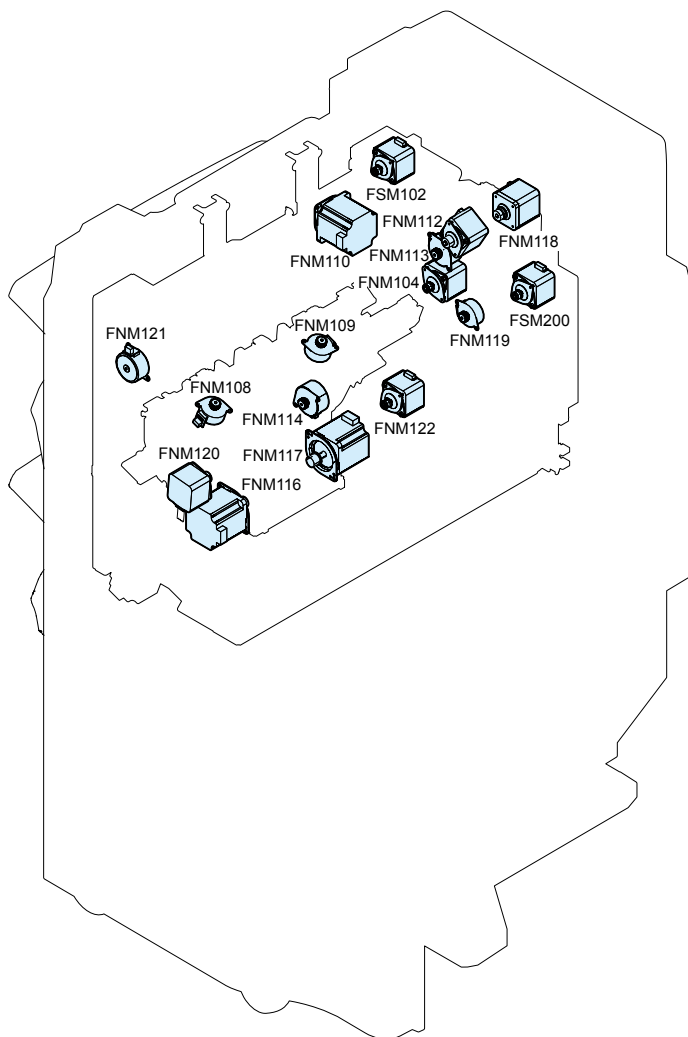


F-4-8

Code	Name	Reference
	Power cooling fan	-
FNFAN102	PWB cooling fan	-
FNFAN103	Paper Delivery Unit Cooling Fan1	-
FNFAN104	Paper Delivery Unit Cooling Fan2	-

T-4-8

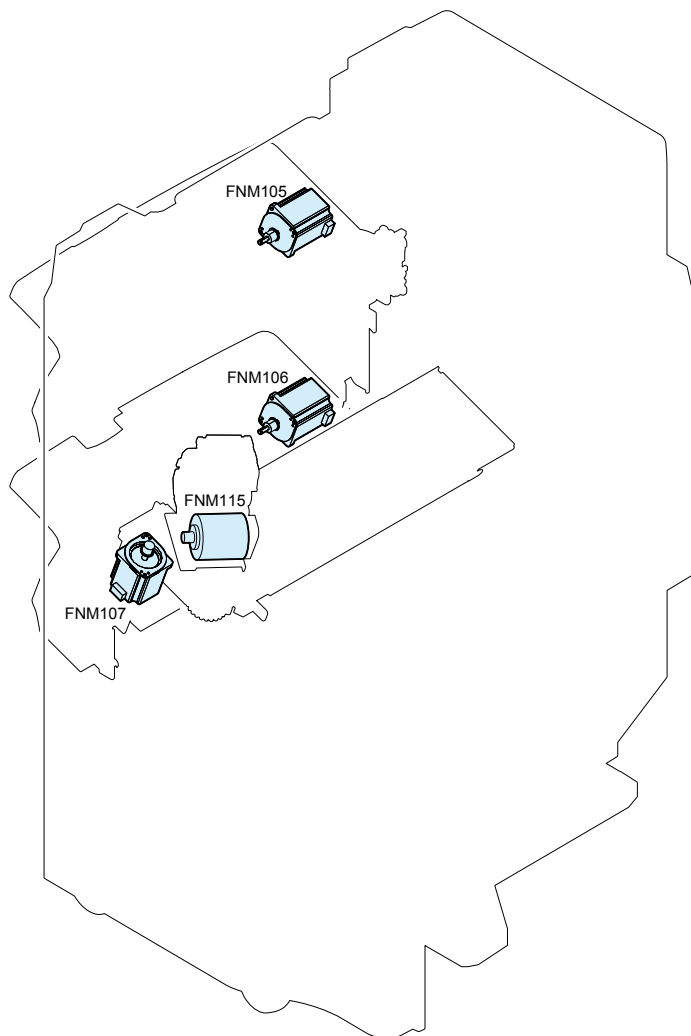
Motors view



F-4-9

Code	Name	Reference
FSM200	Finisher Paper Transport Motor1	Refer to page 4-54.
FSM102	Finisher Paper Transport Motor2	Refer to page 4-53.
FNM104	Finisher Paper Delivery Motor1	Refer to page 4-55.
FNM108	Finisher Paper Alignment Motor F	Refer to page 4-47.
FNM109	Finisher Paper Alignment Motor R	Refer to page 4-46.
FNM110	Finisher Delivery Roller Lift Motor	Refer to page 4-56.
FNM112	Finisher Paper Alignment Roller Lift Motor	-
FNM113	Finisher Paper Tail Holding Motor	Refer to page 4-53.
FNM114	Finisher Delivery Paper Holding Motor	Refer to page 4-45.
FNM116	Finisher Gripper Arm Motor	Refer to page 4-44.
FNM117	Finisher Gripper Motor	Refer to page 4-44.
FNM118	Finisher Paper Tail Push Down Motor	Refer to page 4-52.
FNM119	Finisher Paper Transport Roller Lift Motor	Refer to page 4-57.
FNM120	Finisher Paper Guide Motor	Refer to page 4-45.
FNM121	Finisher Paper Transport Alignment Motor	Refer to page 4-43.
FNM122	Finisher Paper Delivery Motor2	Refer to page 4-55.

T-4-9

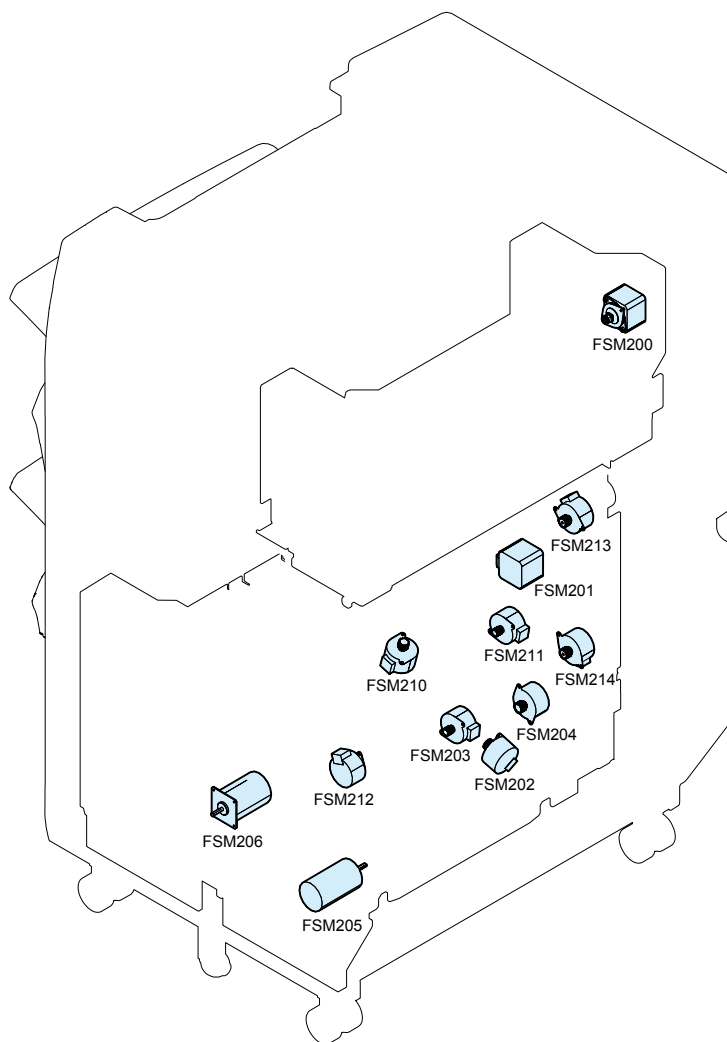


F-4-10

Code	Name	Reference
FNM105	Finisher Upper Tray Lift Motor	Refer to page 4-49.
FNM106	Finisher Lower Tray Lift Motor	Refer to page 4-50.
FNM107	Finisher Stapler Shift Motor	Refer to page 4-51.
FNM115	Finisher Staple Motor	-

T-4-10

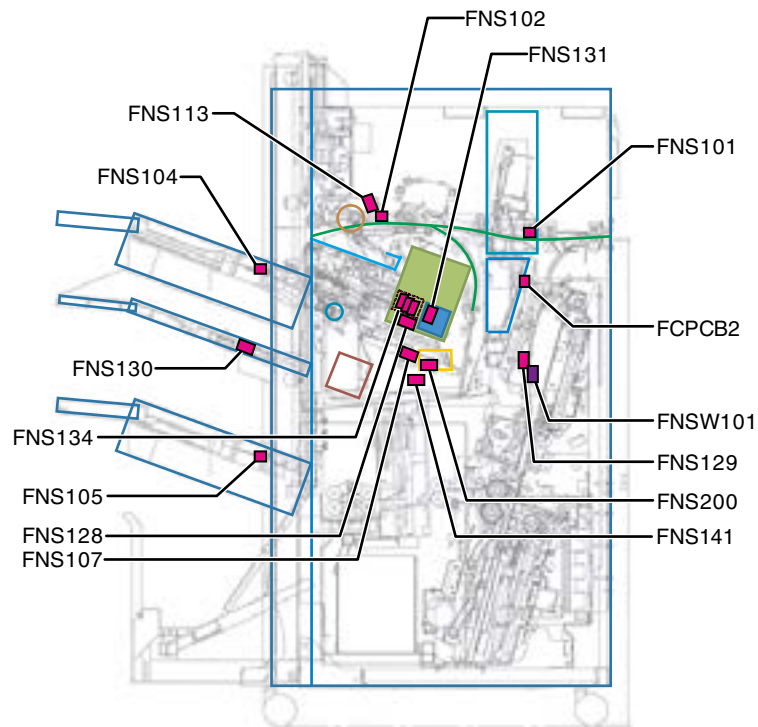
↳ Saddle finisher



Code	Name	Reference
FSM200	Saddle Paper Transport Motor	Refer to page 4-52
FSM201	Saddle paper feed motor	-
FSM202	Saddle alignment motor	-
FSM203	Saddle front edge stopper motor	-
FSM204	Saddle roller guide motor	-
FSM205	Saddle pushing motor	-
FSM206	Saddle folding transport motor	-
FSM210	Saddle Paper Tail Holding Motor	-
FSM211	Saddle rear edge moving motor	-
FSM212	Saddle alignment roller motor	-
FSM213	Saddle rear edge sorting motor	-
FSM214	Saddle Gaining over estrangement motor	-

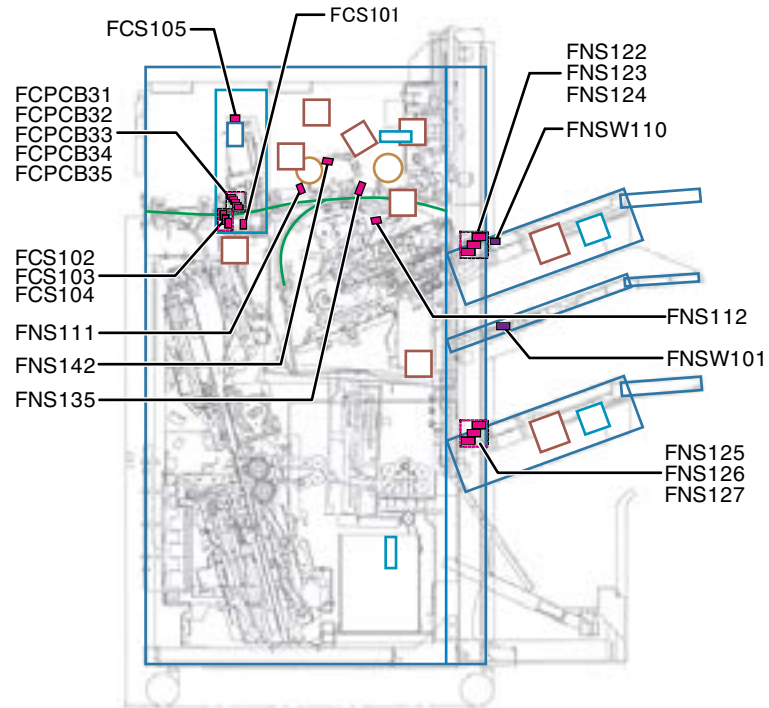
T-4-11

Sensors View



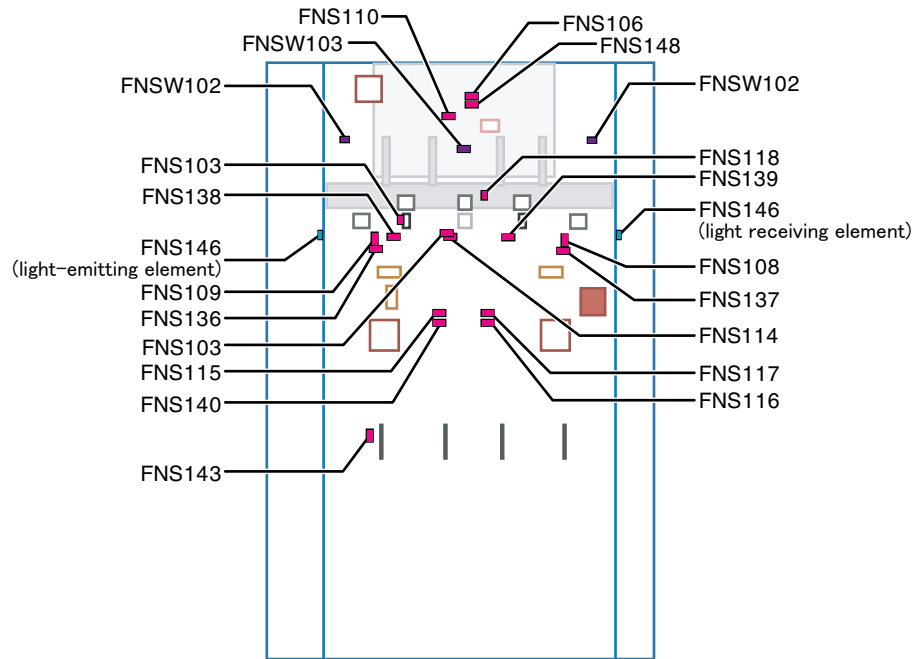
F-4-13

No	Name	Reference
FCPCB2	Finisher Punch Dust Full Sensor	-
FNS102	Finisher paper JAM detector	-
FNS104	Finisher Paper Delivery Tray1 Paper Detector	-
FNS105	Finisher Paper Delivery Tray2 Paper Detector	-
FNS107	Finisher Stapler Shift Home Position Sensor	-
FNS113	Finisher Paper Tail Push Down Homeposition Sensor	-
FNS128	Finisher Staple Area Detector	-
FNS129	Finisher Cover Detector1	-
FNS130	Finisher Paper Delivery Tray3 Paper Detector	-
FNS131	Finisher Staple Homeposition Sensor	-
FNS134	Finisher Staple cartridge sensor	-
FNS141	Staple dust box sensor	-
FNS200	Finisher staple dust sensor	-
FNSW101	Finisher Cover Detector1	-



F-4-14

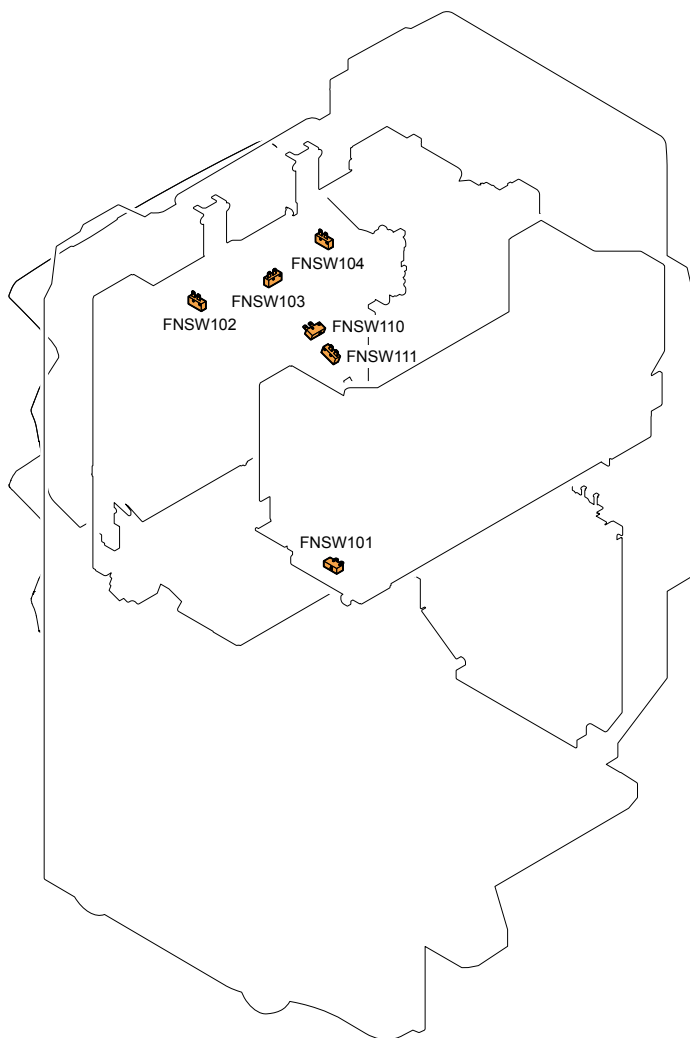
No	Name	Reference
FCPCB31	Finisher Punch Paper Edge Sensor1	-
FCPCB32	Finisher Punch Paper Edge Sensor2	-
FCPCB33	Finisher Punch Paper Edge Sensor3	-
FCPCB34	Finisher Punch Paper Edge Sensor4	-
FCPCB35	Finisher Punch Paper Edge Sensor5	-
FCS101	Finisher Puncher Home Position Sensor	-
FCS102	Finisher Punch Position Sensor1	-
FCS103	Finisher Punch Position Sensor2	-
FCS104	Finisher Puncher Cam Home Position Sensor	-
FCS105	Finisher Punch Motor Rotation Sensor	-
FNS111	Finisher Paper Transport Roller Lift Homeposition Sensor	-
FNS112	Finisher Paper Alignment Roller Lift Homeposition Sensor	-
FNS122	Finisher Tray1 Position Sensor1	-
FNS123	Finisher Tray1 Position Sensor2	-
FNS124	Finisher Tray1 Position Sensor3	-
FNS125	Finisher Tray2 Position Sensor1	-
FNS126	Finisher Tray2 Position Sensor2	-
FNS127	Finisher Tray2 Position Sensor3	-
FNS135	Finisher Paper Tail Hold Homeposition Sensor	-
FNS142	Finisher Buffer Flapper Home Position Sensor	-
FNSW110	Finisher Tray Proximity Switch	-



F-4-15

No	Name	Reference
FNS103	Finisher Paper Alignment Tray Paper Sensor	-
FNS106	Finisher Shutter Open Sensor	-
FNS108	Finisher Paper Alignment Plate Homeposition Sensor F	-
FNS109	Finisher Paper Alignment Plate Homeposition Sensor R	-
FNS110	Finisher Delivery Roller Lift Homeposition Sensor	-
FNS114	Finisher Delivery Paper Hold Homeposition Sensor C	-
FNS115	Finisher Gripper Home Position Sensor	-
FNS116	Finisher Gripper Arm Position Sensor1	-
FNS117	Finisher Gripper Arm Position Sensor2	-
FNS118	Finisher Paper Alignment Tray Paper Level Detector	-
FNS136	Finisher Paper Guide Homeposition Sensor R	-
FNS137	Finisher Paper Guide Homeposition Sensor F	-
FNS138	Finisher Delivery Paper Hold Homeposition Sensor R	-
FNS139	Finisher Delivery Paper Hold Homeposition Sensor F	-
FNS140	Finisher Gripper Position Sensor	-
FNS143	Finisher Tray2 Paper Level Detector	-
FNS146	Finisher Paper Level Sensor	-
FNS148	Finisher Shutter Close Sensor	-
FNS149	Finisher Paper Level Detector	-
FNSW102	Finisher Safety Switch3	-
FNSW103	Finisher Safety Switch2	-

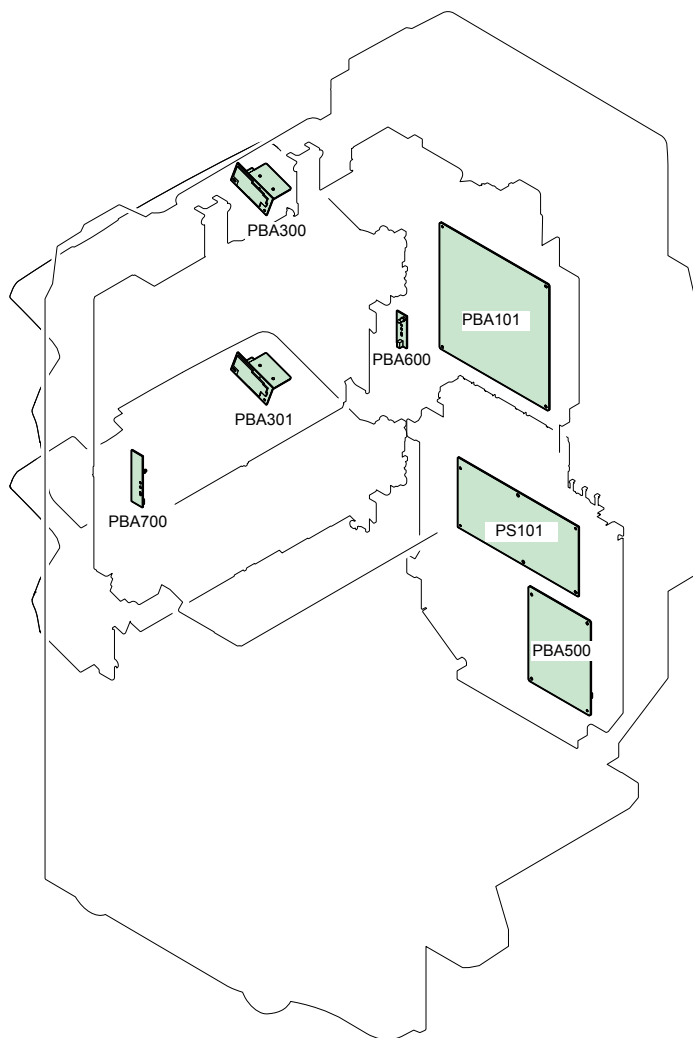
Switches view



F-4-16

Code	Name	Reference
FNSW101	Finisher Safety Switch1 (Front cover switch)	-
FNSW102	Finisher Safety Switch3 (Lift guide switch(Front) (Rear))	-
FNSW103	Finisher Safety Switch2 (Stapler safety switch)	-
FNSW104	Finisher Safety Switch3 R	-
FNSW110	Finisher Tray Proximity Switch (Upper tray/Middle tray)	-
FNSW111	Finisher fax Tray Proximity Switch	-

T-4-15

 PWB's view


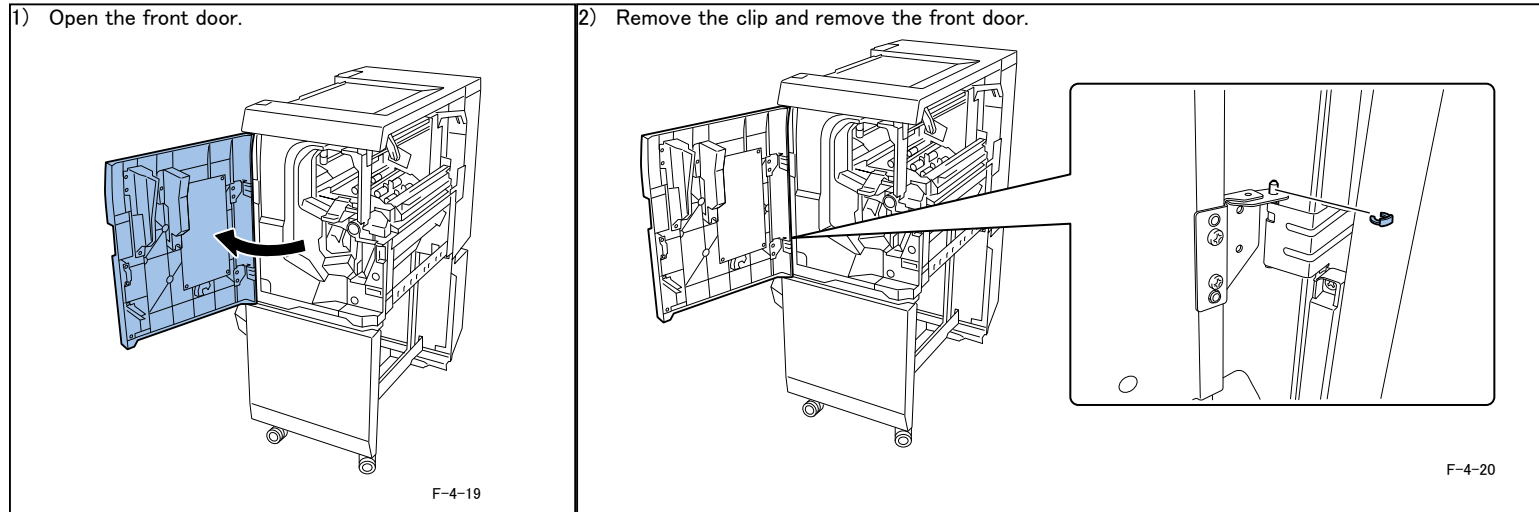
F-4-17

Code	Name	Reference
PBA101	Finisher controller PWB	Refer to page 4-60.
PBA300	Upper tray motor driver PWB	Refer to page 4-61.
PBA301	Lower tray motor driver PWB	Refer to page 4-62.
PBA500	AC noise filter PWB	Refer to page 4-63.
PBA600	Finisher Paper Level Sensor (Light emitting side)	-
PBA700	Finisher Paper Level Detector (Light receiving side)	-
PS101	Power unit	Refer to page 4-63.

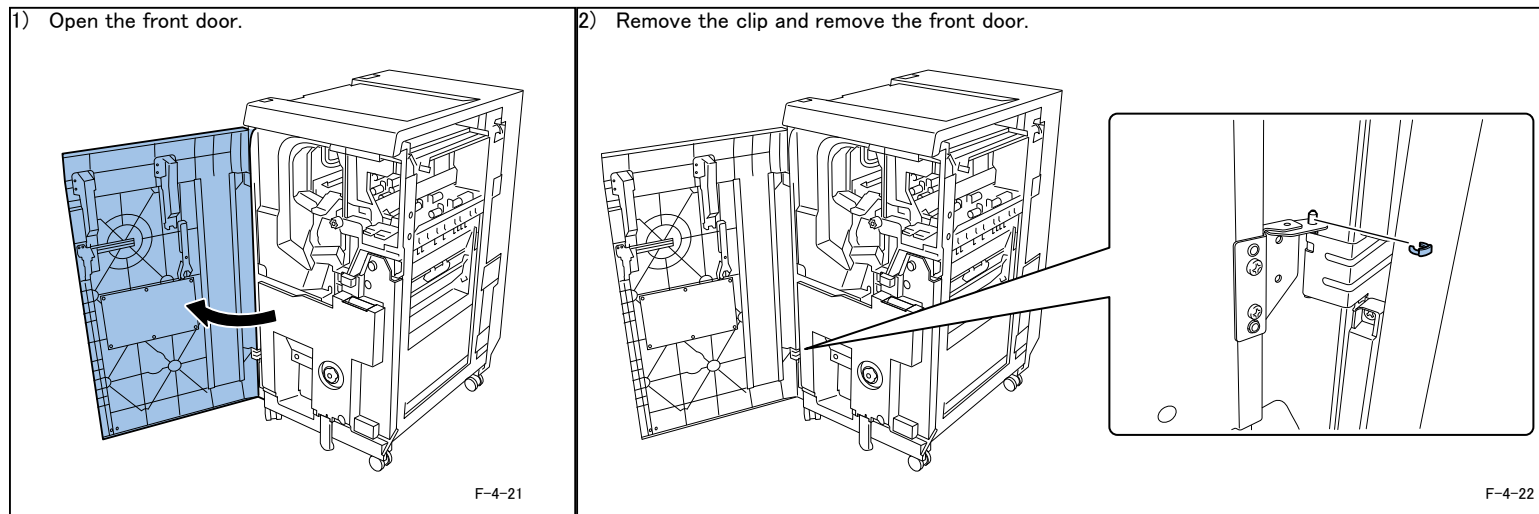
T-4-16

External/Internal Cover

Front door disassembly (Finisher)

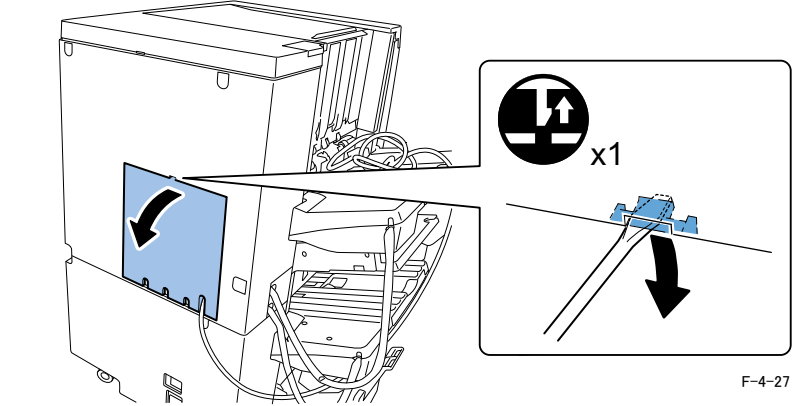


Front door disassembly (Saddle finisher)



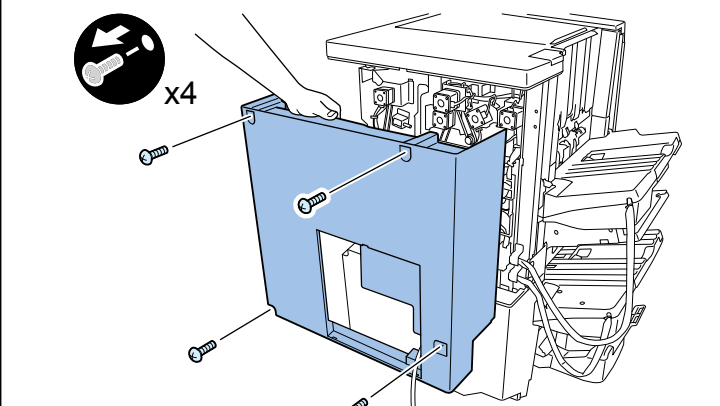
Rear upper cover disassembly

1) Use a screwdriver (-) to disengage the hook, and remove the PWB cover.



F-4-27

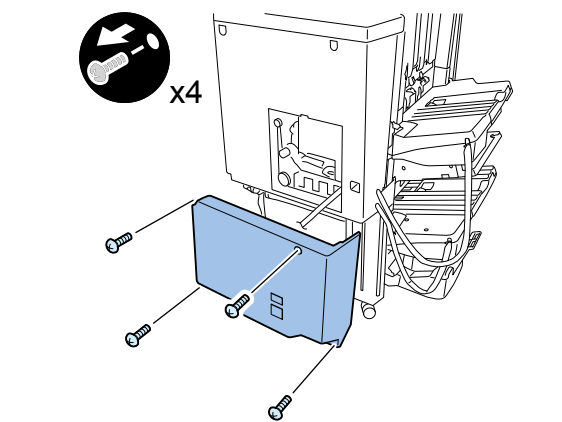
2) Remove the four screws, and remove the rear upper cover.



F-4-28

Rear lower cover disassembly

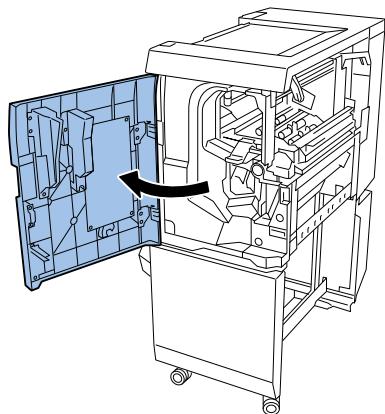
1) Remove the four screws, and remove the rear lower cover.



F-4-29

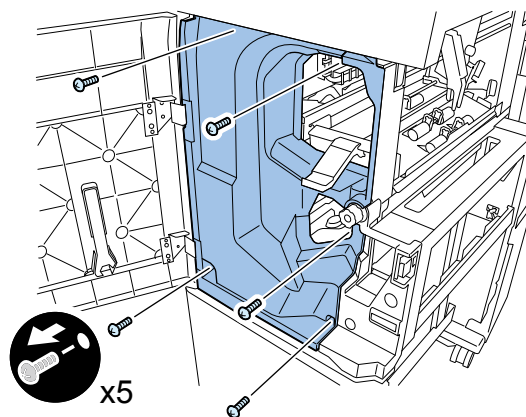
Left inside cover disassembly

1) Open the front door.



F-4-30

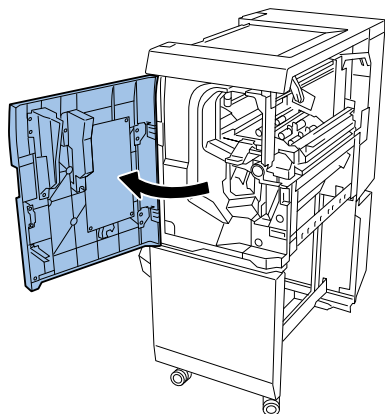
2) Remove the five screws, and remove the left inside cover.



F-4-31

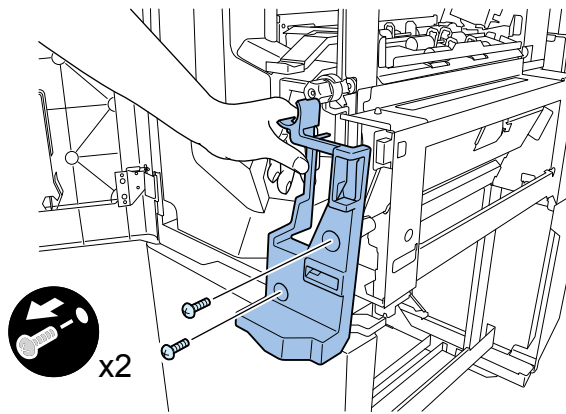
Right inside cover disassembly

1) Open the front door.



F-4-34

2) Remove the two screws, and remove the right inside cover.

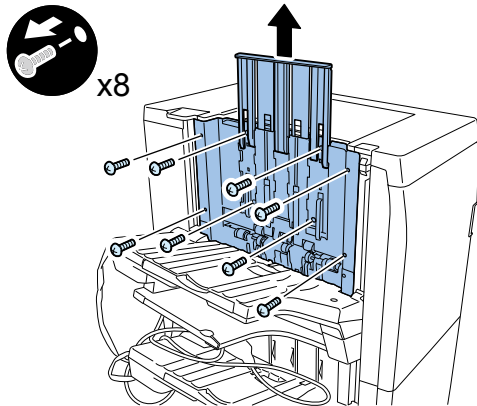


F-4-35

Major Units

Grid upper guide disassembly

- 1) Lift the paper holder guide, remove the eight screws, and remove the grid upper guide.

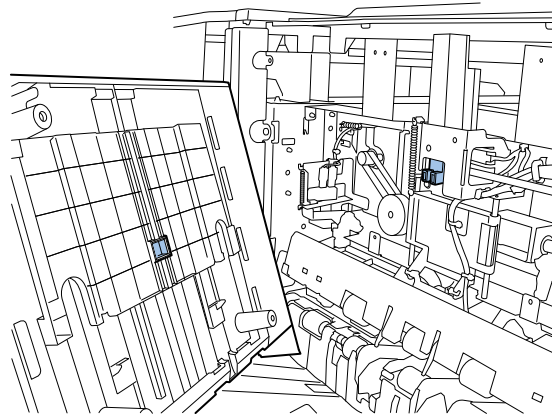


F-4-42

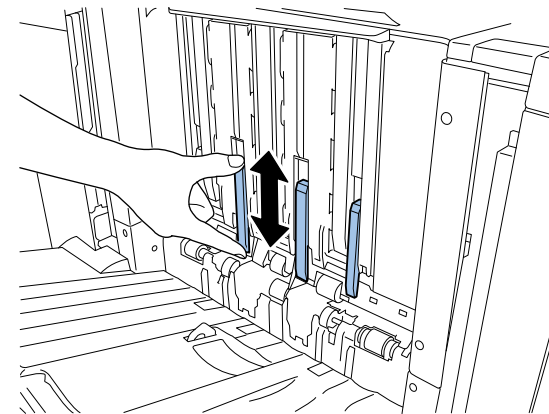
NOTE:

When assembling, put the projection in the shutter connection section into the shutter groove.

The shutter connection section and the shutter must be lifted to the top for assembling. After assembling, manually move the shutter up and down to check that some load is applied to the movement.



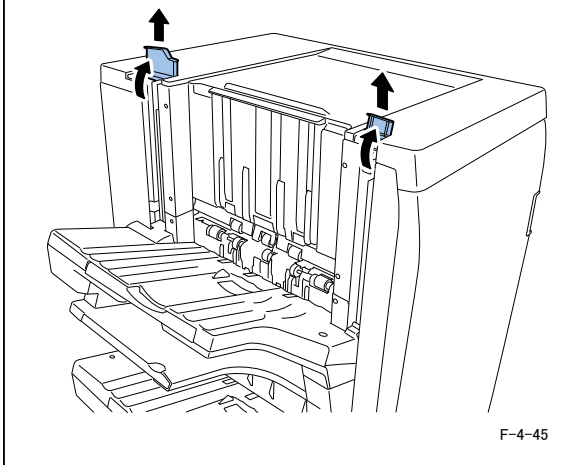
F-4-43



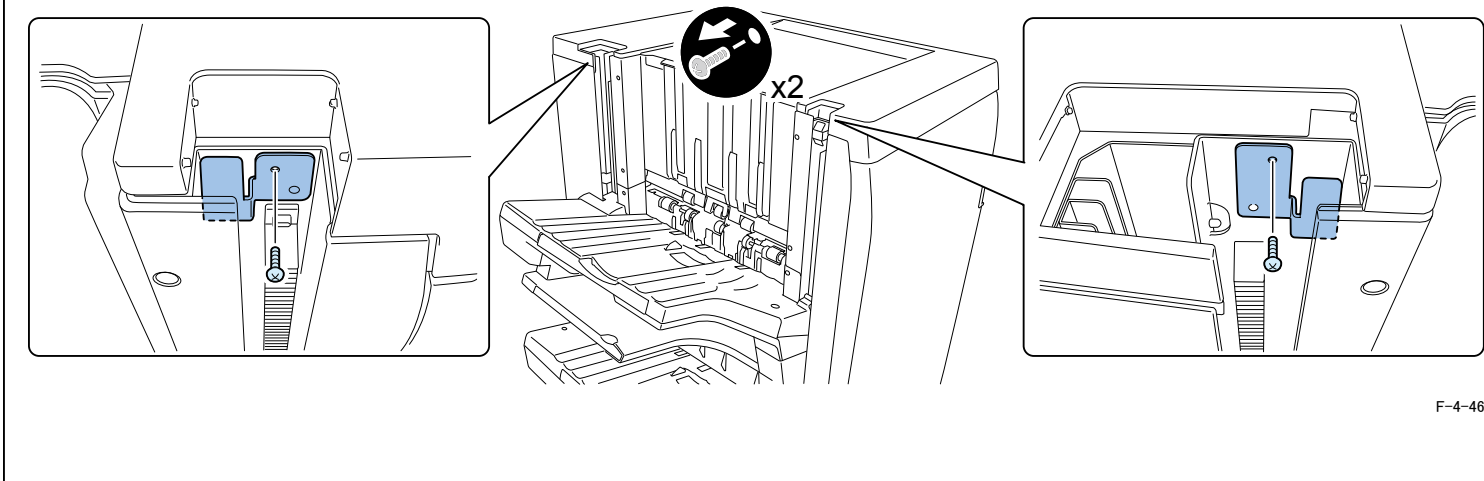
F-4-44

Upper Tray / Lower Tray disassembly

- 1) Remove the finger pinch protection cover (Front) and the finger pinch protection cover (Rear).

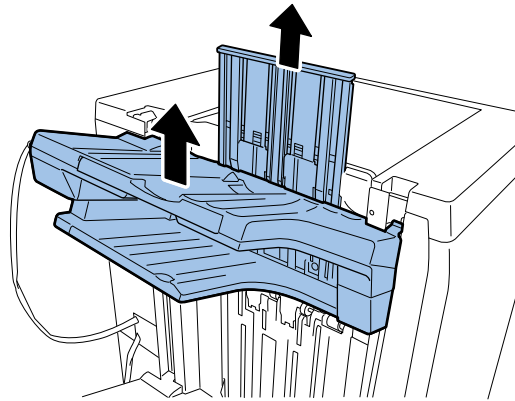


- 2) Remove the two screws, and remove the tray stopper plate (Front) and the tray stopper plate (Rear).



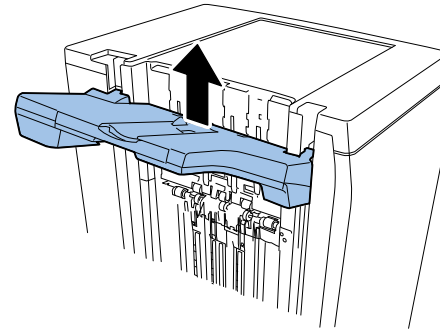
3) Remove the grid upper guide.
(Refer to page 4-16.)

4) Pull out the paper holder guide upward, and remove the upper tray.



F-4-47

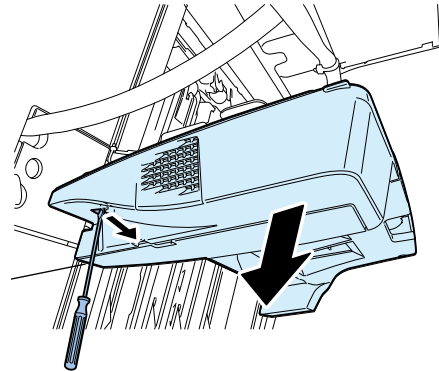
5) Remove the lower tray.



F-4-48

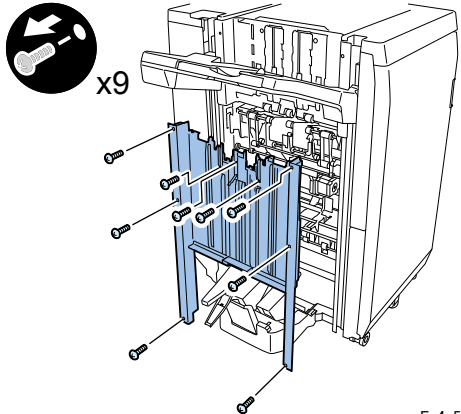
NOTE:

When assembling or lowering the tray, insert a screwdriver into the hole in lower rear side of the tray, and release the engagement. Then lower the tray while releasing the engagement.

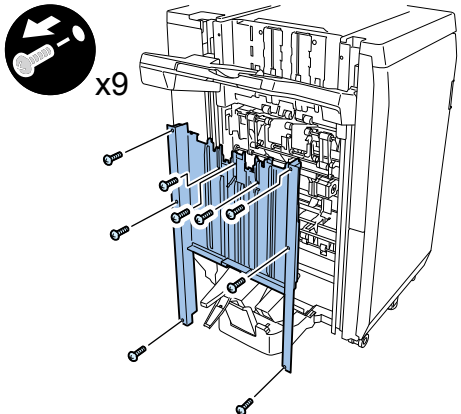


F-4-49

Grid lower guide disassembly

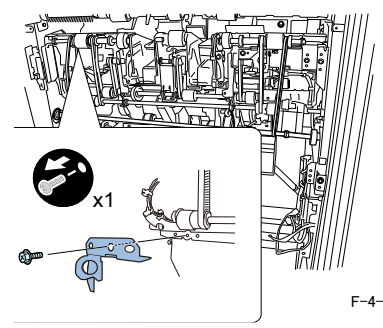
<p>1) Remove the upper tray. (Refer to page 4-17.)</p>	<p>2) Move up the lower tray to the utmost top, remove the 9 screws, and remove the grid lower guide.</p>  <p>F-4-50</p>
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Grid lower guide disassembly (for saddle finisher)

<p>1) Remove the upper tray. (Refer to page 4-17.)</p>	<p>2) Move up the lower tray to the utmost top, remove the 9 screws, and remove the grid lower guide.</p>  <p>F-4-50</p>
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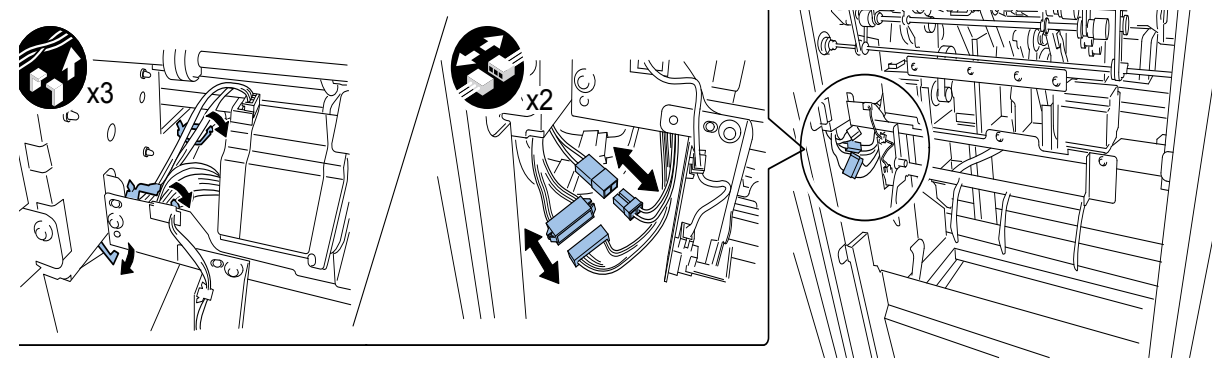
Staple drive unit disassembly

- 1) Remove the staple unit.
[\(Refer to page 4-28\)](#)
- 2) Remove the grid lower guide.
[\(Refer to page 4-19\)](#)
- 3) Remove the rear cover (upper).
[\(Refer to page 4-14\)](#)
- 4) Remove the one screw to remove the support plate.



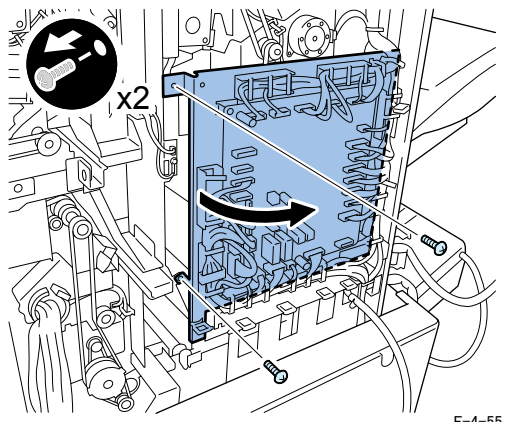
F-4-55

- 4) Release the stapler drive unit binding wire from the three wire saddles, and disconnect the two connectors (10P and 2P).



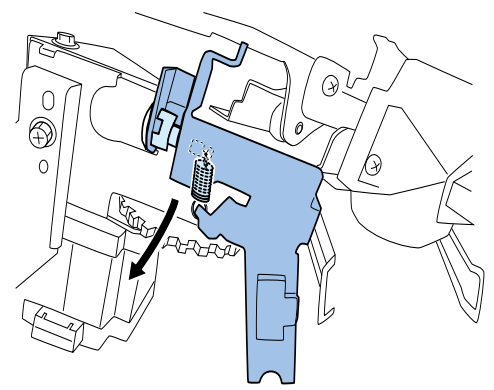
F-4-56

- 4) Disconnect the connector in the interface section. Remove the two screws, and open the finisher controller PWB base.



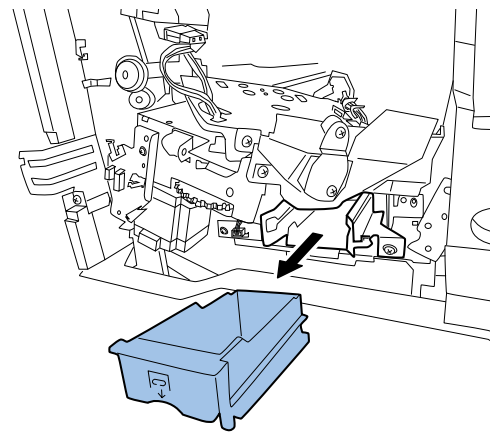
F-4-55

- 5) Remove the crip, shaft and spring to remove the stapler stopper.



F-4-58

- 6) Remove the waste staple case.



F-4-70

7) Remove the one connector and two screws to remove the staple collect unit.

F-4-71

8) Release the harness from the harness guide and disconnect the 3 connectors.

F-4-72

9) Remove the 3 screws to remove the stapler drive unit.

F-4-73

NOTE:

When the stapler drive unit is installed, fit the projection of the stapler drive unit to the groove of side plate.

F-4-63

NOTE:

When the harness for stapler drive unit is installed, fix the two reuse bands after shifting the stapler to the marked line. At this time, be sure the harness is not crossed as shown in the figure A.

Figure A
F-4-64

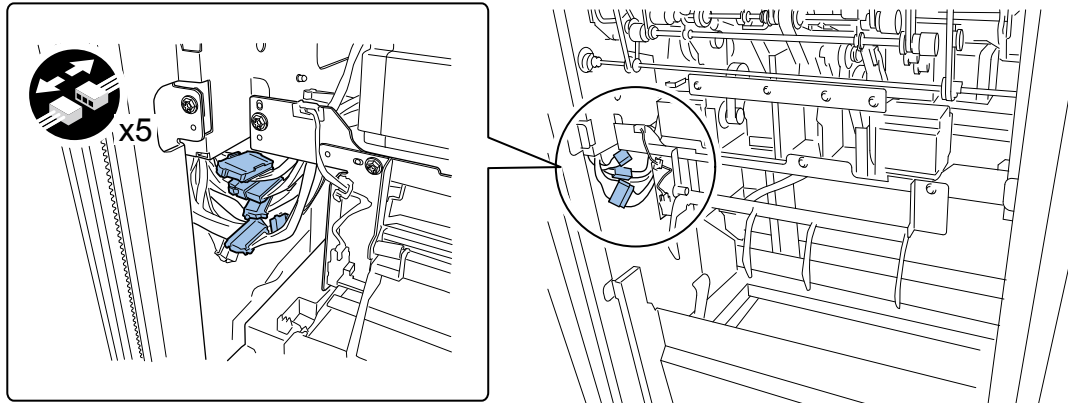
NOTE:

If the harness is crossed as shown in the figure B, the harness may be cut during the staple operation.

Figure B
F-4-65

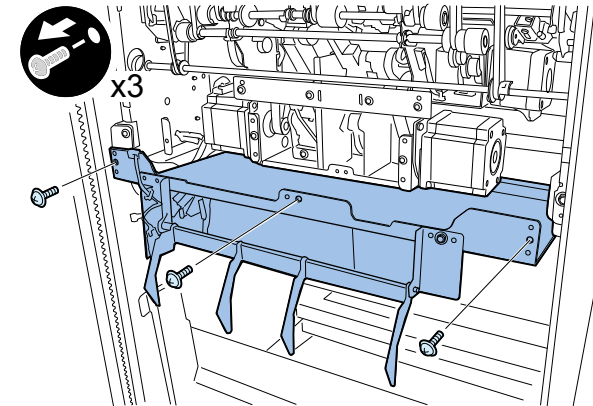
Process tray unit disassembly

1) Disconnect the five connectors.



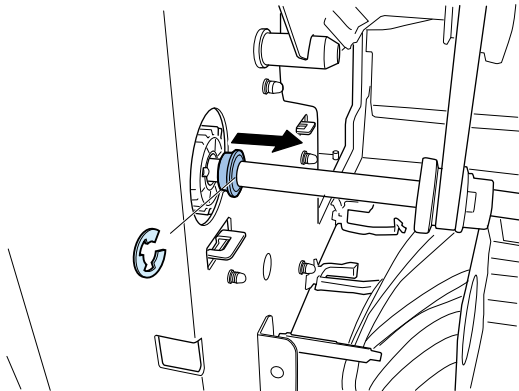
F-4-59

2) Remove the three screws, and remove the bottom plate of the process tray unit.



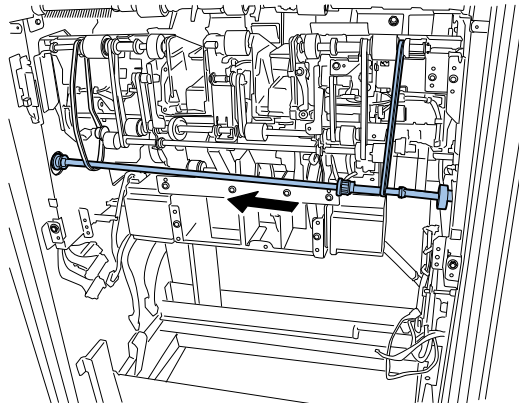
F-4-60

3) Remove the E-ring on the rear side, and shift the bearing into the machine.



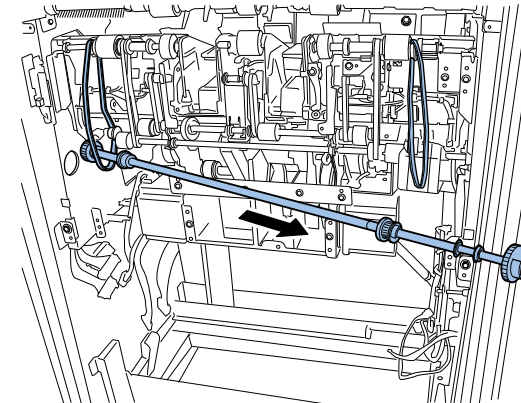
F-4-61

4) Shift the drive shaft to the rear side, and pull it out from the belt on the front side.

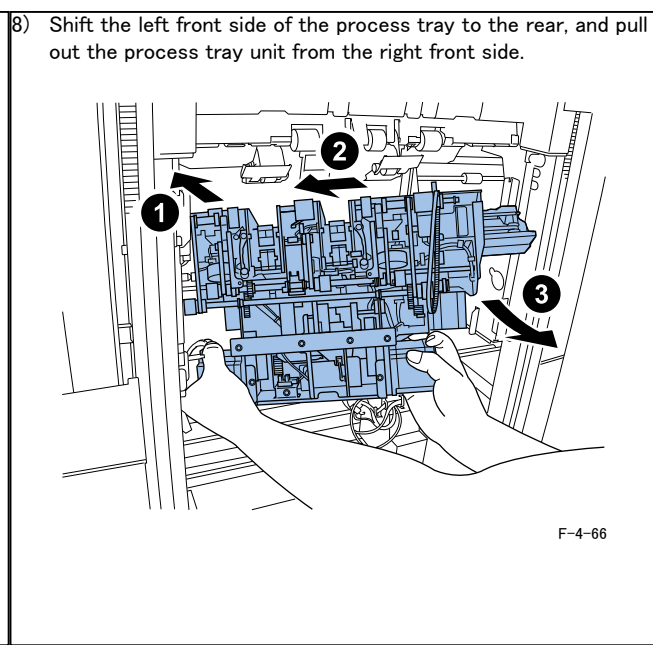
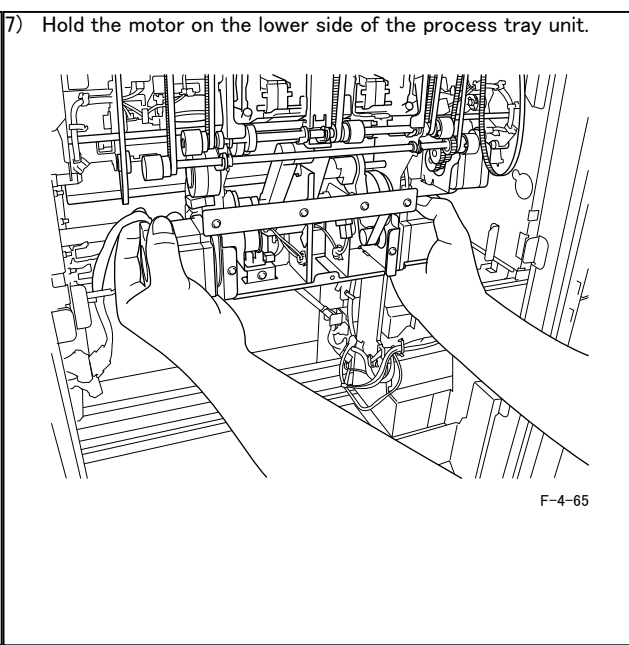
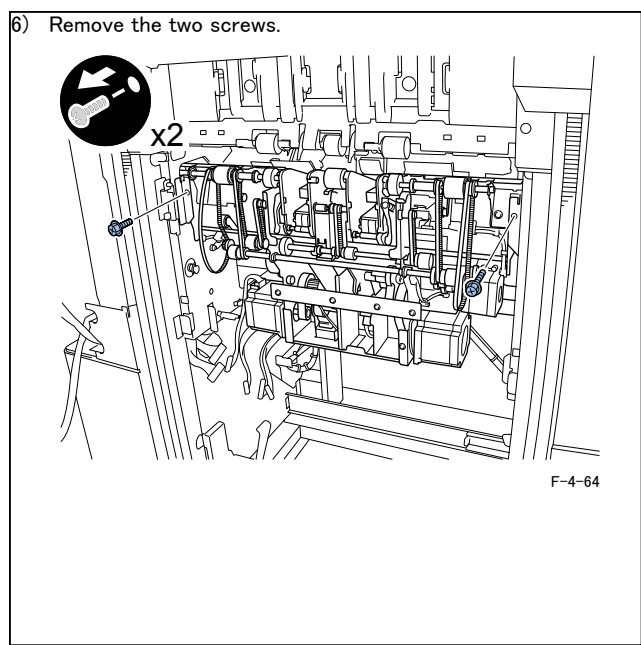


F-4-62

5) Shift the drive shaft to the front side, and pull it out from the belt on the rear side, and remove the drive shaft.

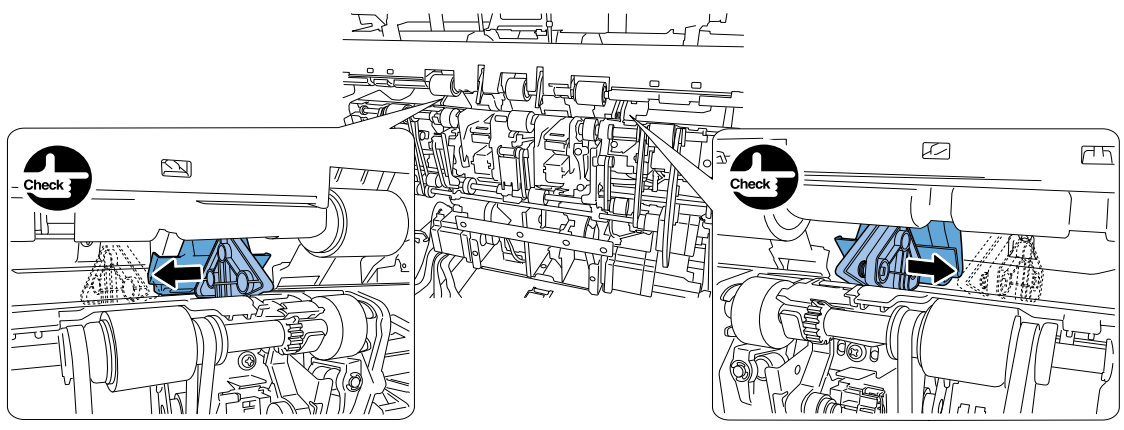


F-4-63



NOTE:

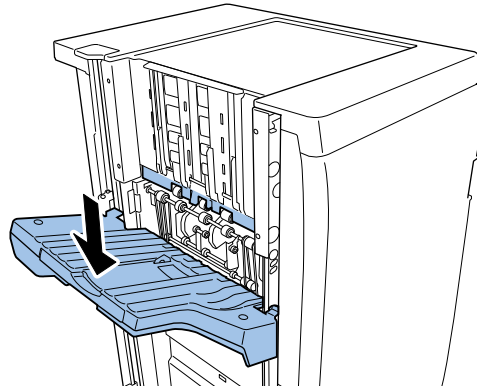
If the paper return guide interferes the alignment plate, sift the alignment plate so that the paper return guide won't interfere it.



Oscillation guide disassembly

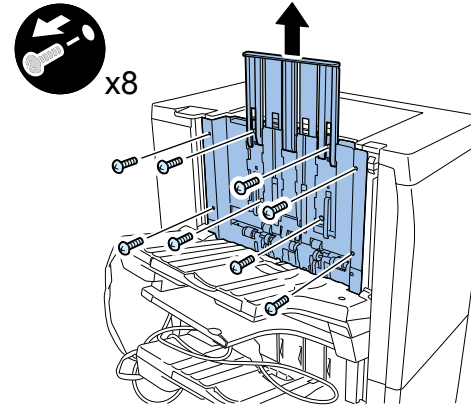
1) Remove the process tray unit.
(Refer to page 4-22.)

2) Lower the tray to the lower position than the oscillation guide.



F-2-39

3) While lifting the guide, remove the eight screws, and remove the grid upper guide.

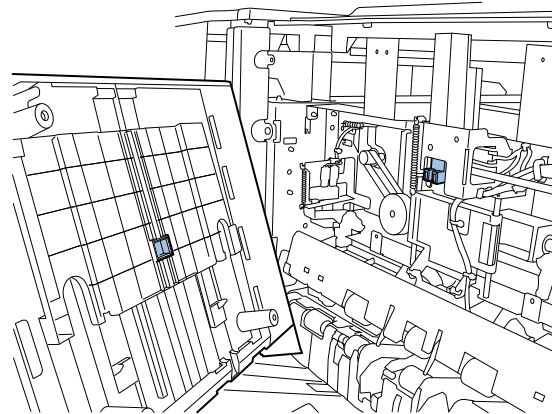


F-2-40

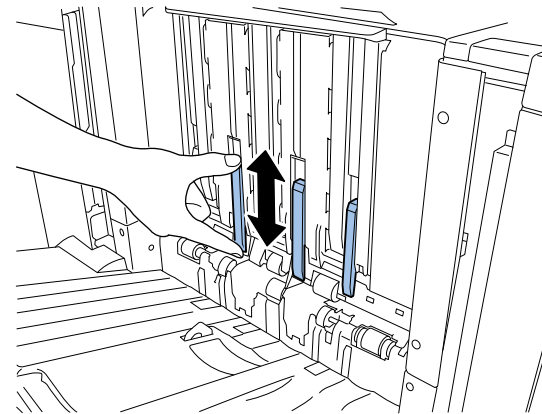
NOTE:

When assembling the grid upper guide, put the projection in the shutter connection section into the shutter groove.

The shutter connection section and the shutter must be lifted to the top for assembling. After assembling, manually move the shutter up and down to check that some load is applied to the movement.

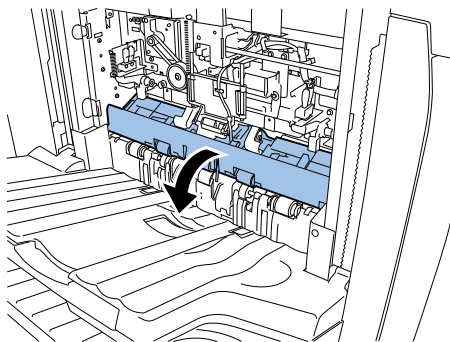


F-2-41



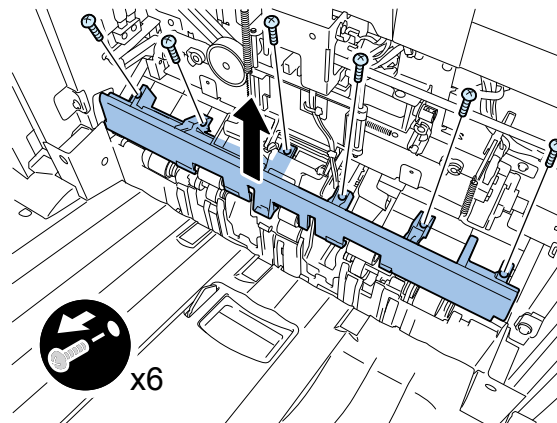
F-2-42

4) Lower the oscillation guide.



F-2-43

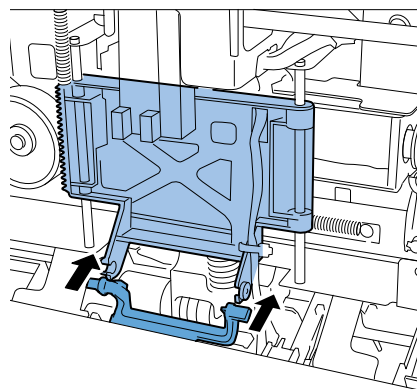
5) Remove the six screws, and remove the oscillation guide upper cover.



F-2-44

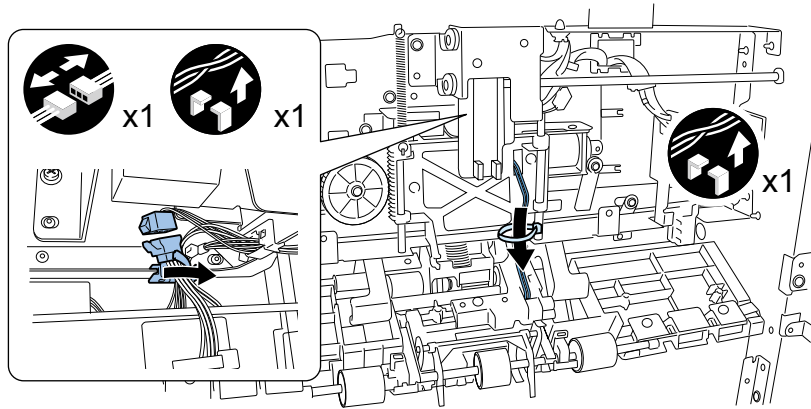
NOTE:

When assembling the oscillation guide upper cover, put the oscillation guide arm in the connection holder.



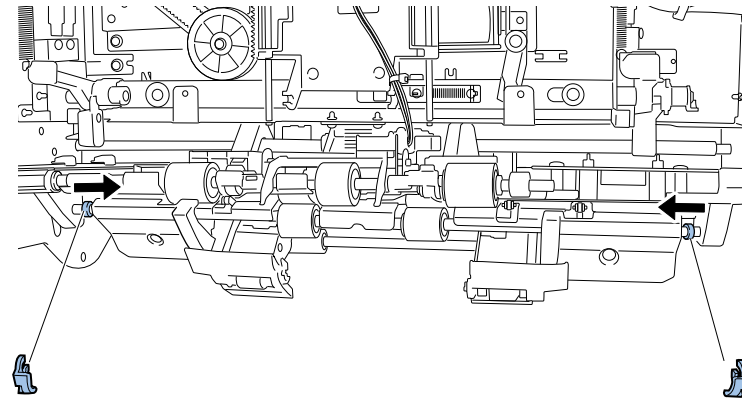
F-2-45

- 6) Remove the binding wire from the binding wire guide, and disconnect the connector. Then, pull out the binding wire from the clearance of the reuse band.



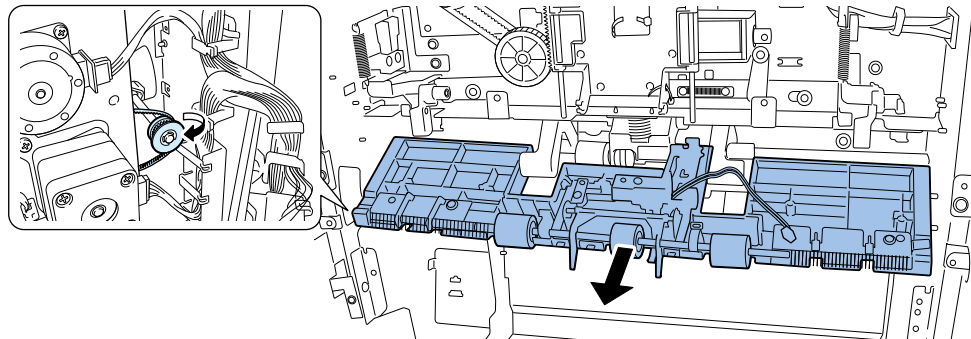
F-2-46

- 7) Remove the two clips, and slide the two bushings inside.



F-2-47

- 8) While removing the belt from the pulley, remove the oscillation guide.

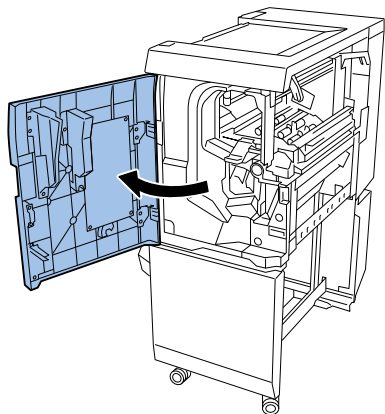


F-2-48

Periodic/Consumable Parts, Cleaning Positions

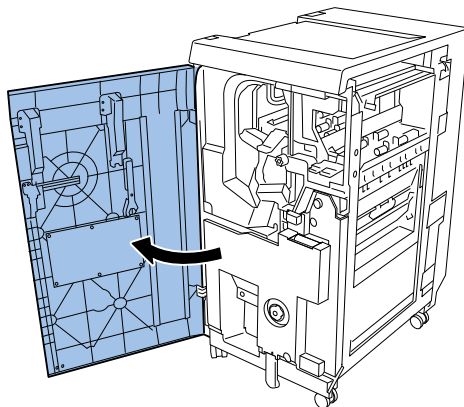
● Discharge needle (Transport guide section) disassembly

- 1) Open the front door.
- Staple finisher

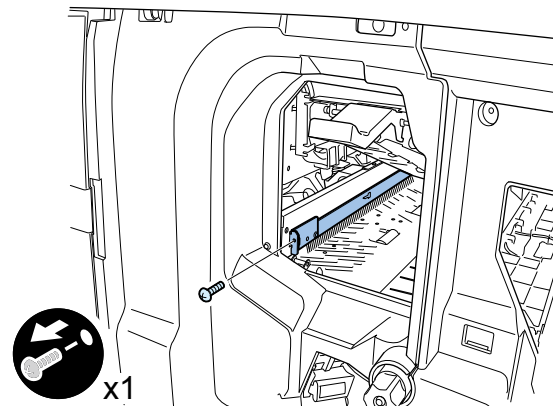


F-4-83

- Saddle finisher

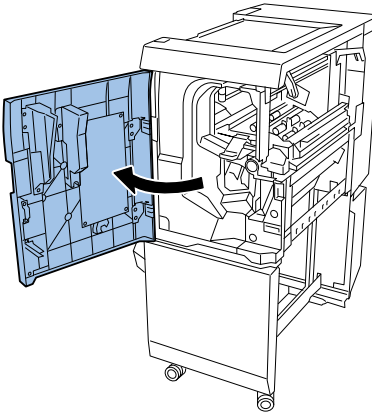
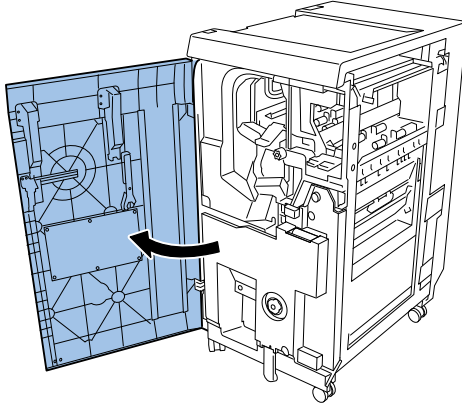
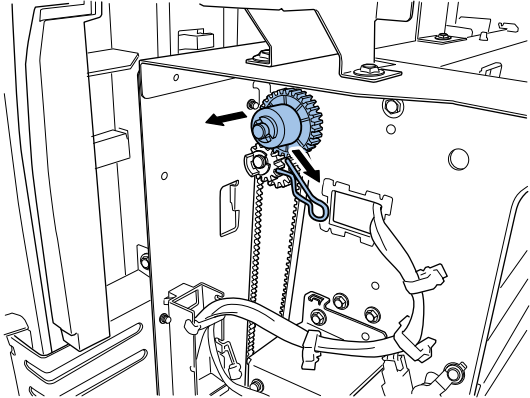


- 2) Lift the transport guide, remove the screw, and remove the discharge needle.

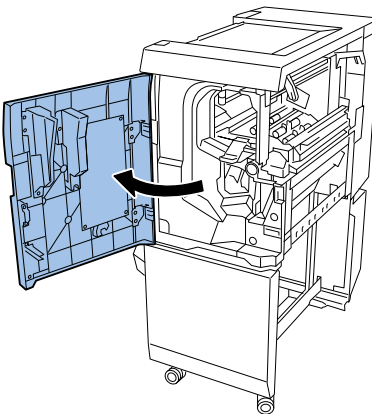
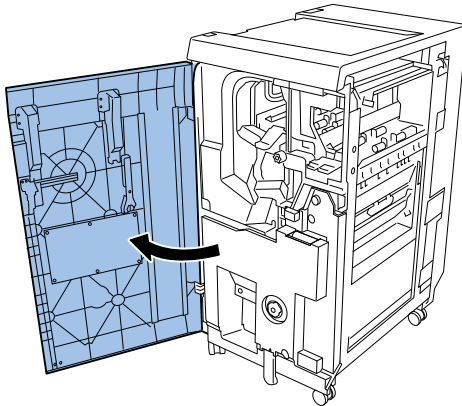
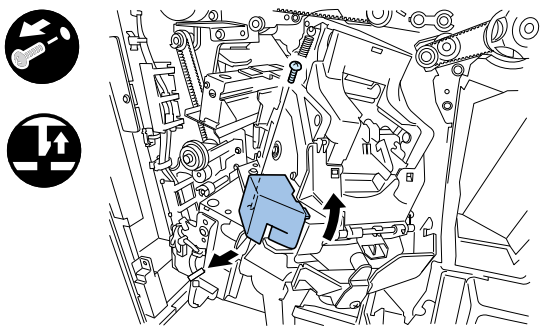


F-4-84

Shutter torque limiter disassembly

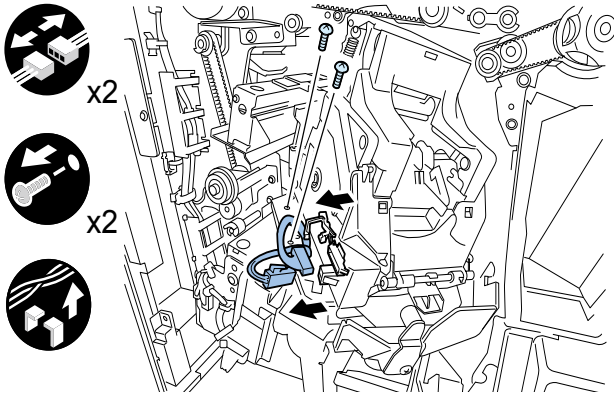
<p>1) Open the front door.</p> <ul style="list-style-type: none"> • Staple finisher  <p>F-4-83</p>	<ul style="list-style-type: none"> • Saddle finisher 	<p>2) Remove the left inside cover. (Refer to page 4-15.)</p>	<p>3) Remove the pin, and remove the shutter torque limiter.</p>  <p>F-4-87</p>
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Staple unit disassembly

<p>1) Open the front cover.</p> <ul style="list-style-type: none"> • Staple finisher  <p>F-4-83</p>	<ul style="list-style-type: none"> • Saddle finisher 	<p>2) Remove the left inside cover. (Refer to page 4-15.)</p>	<p>3) Remove the one screw and release the one hook to remove the connector cover.</p>  <p>F-4-120</p>
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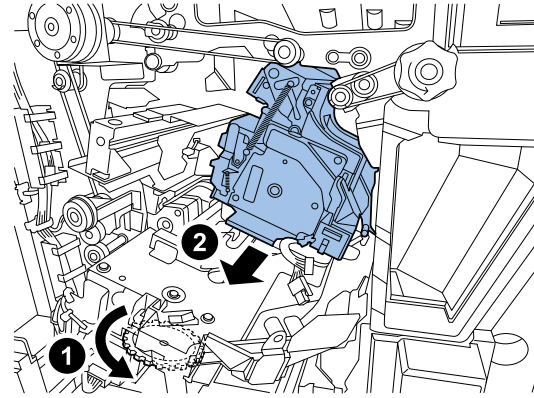


4) Remove the two screws and two connectors and then free the harness from the harness guide.



F-4-121

5) Turn the dial to shift the staple unit to the rear side and then remove the staple unit.

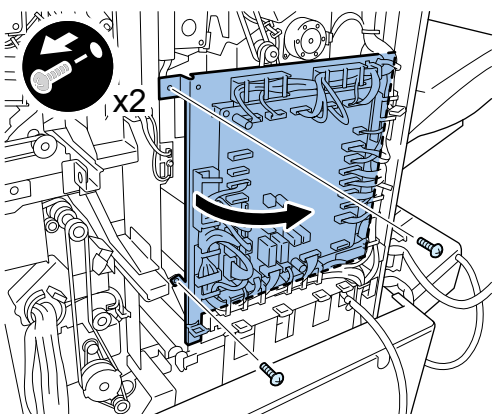


F-4-122

Paper holder torque limiter disassembly

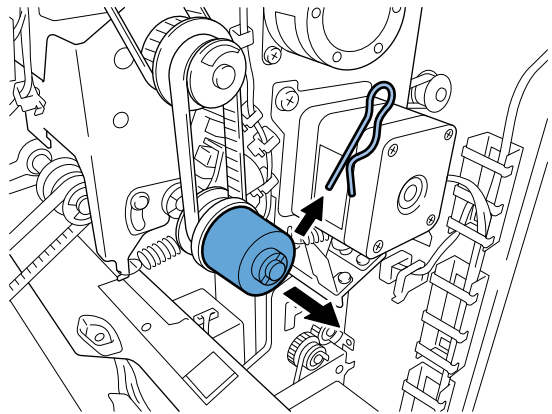
1) Remove the rear upper cover. [\(Refer to page 4-14.\)](#)

2) Remove the two screws, and remove the finisher controller PWB base.



F-4-92

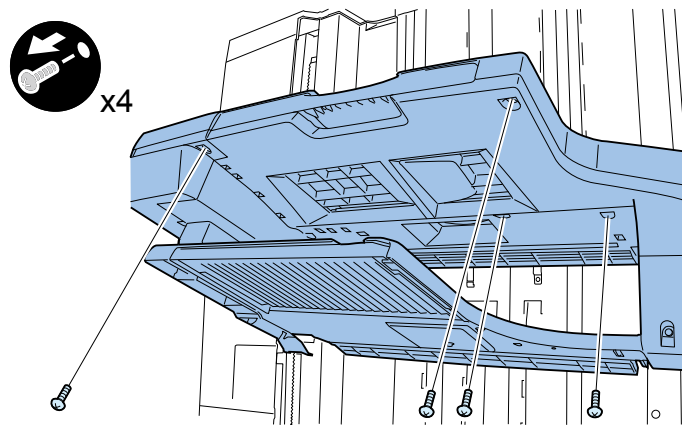
3) Remove the pin, and remove the paper holder torque limiter.



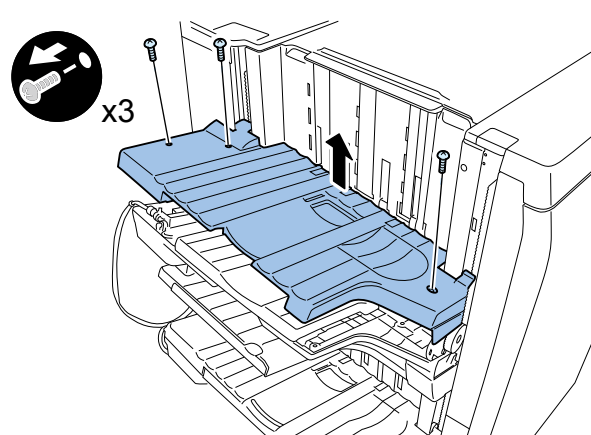
F-4-93

Upper Tray torque limiter disassembly

1) Remove the seven screws, and remove the upper tray upper cover and the auxiliary tray.

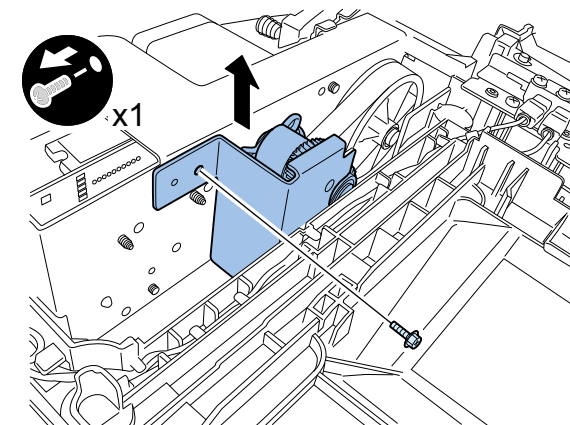


F-4-94



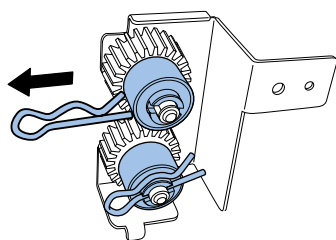
F-4-95

2) Remove the screw, and remove the torque limiter unit.



F-4-96

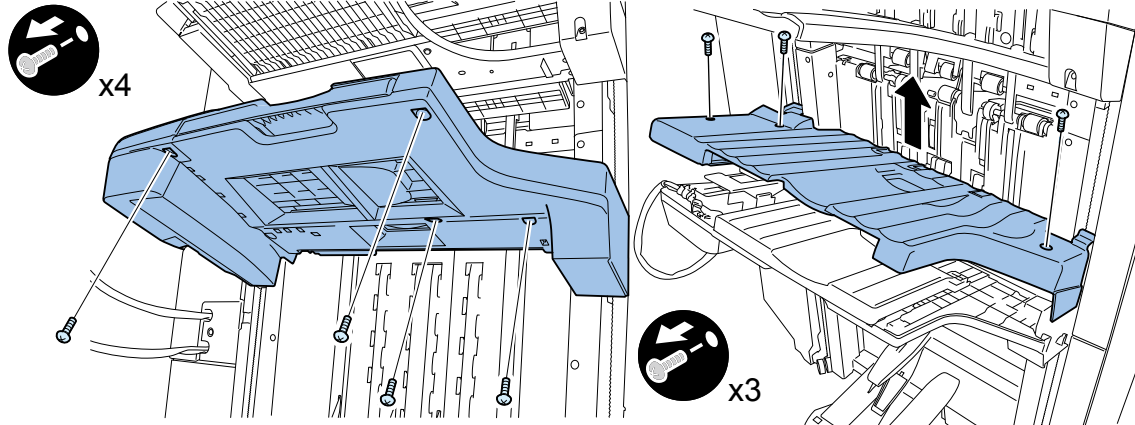
3) Remove the pin, and remove the two torque limiters.



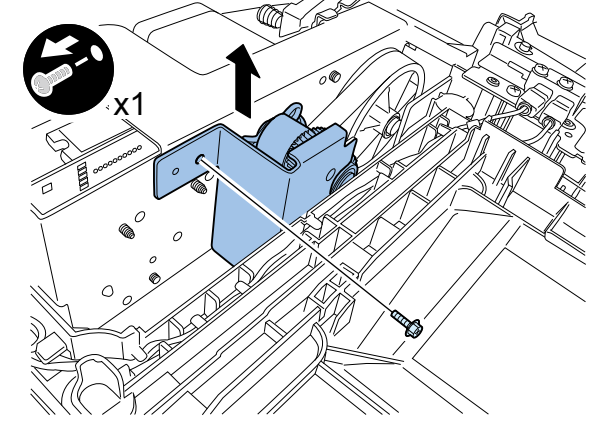
F-4-97

Lower Tray torque limiter disassembly

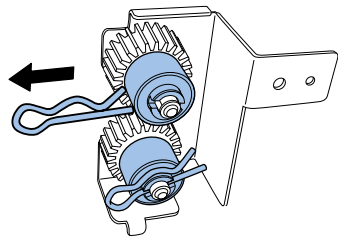
1) Remove the seven screws, and remove the lower tray upper cover and the auxiliary tray.



2) Remove the screw, and remove the torque limiter unit.



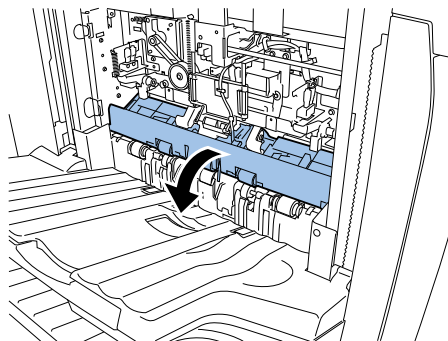
3) Remove the pin, and remove the two torque limiters.



Discharge needle (oscillation guide section) disassembly

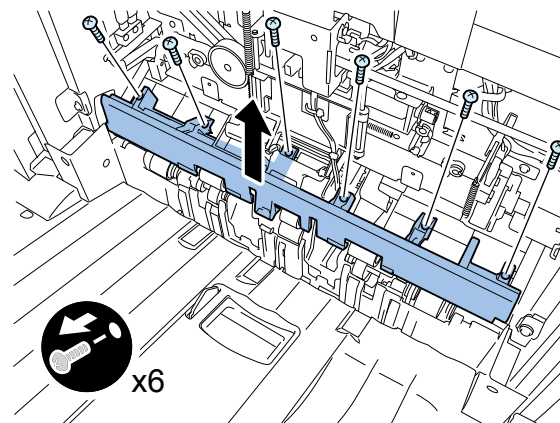
1) Remove the grid upper guide.
(Refer to page 4-16.)

2) Lower the oscillation guide.



F-4-102

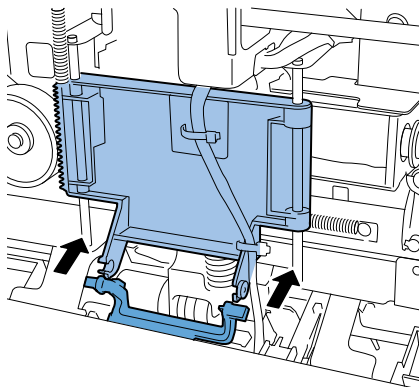
3) Remove the six screws, and remove the oscillation guide upper cover.



F-4-103

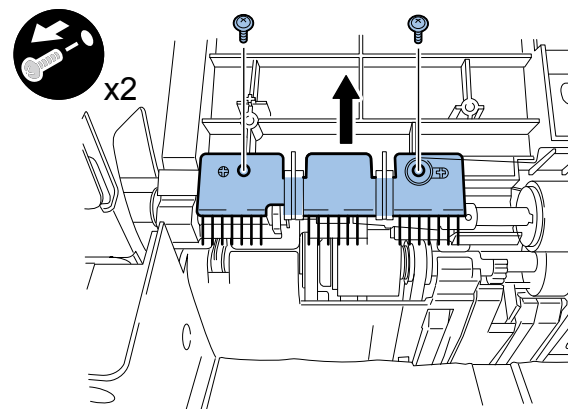
NOTE:

When assembling the oscillation guide upper cover, put the oscillation guide arm in the connection holder.



F-4-104

4) Remove the two screws, and remove the discharge needle.



F-4-105

NOTE:

When the oscillation guide upper cover is disassembled or assembled, check the installing position of the oscillation unit.

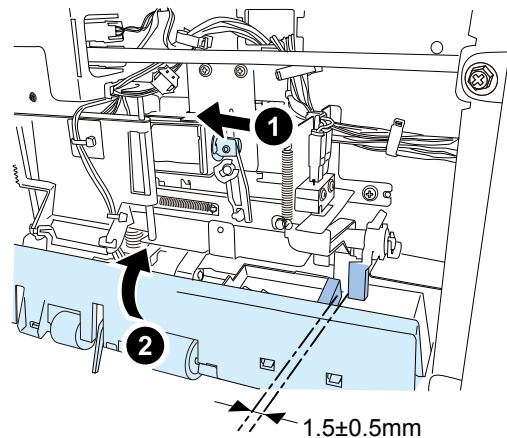
(Refer to page 4-33.)

Oscillation unit installing position adjustment

NOTE:

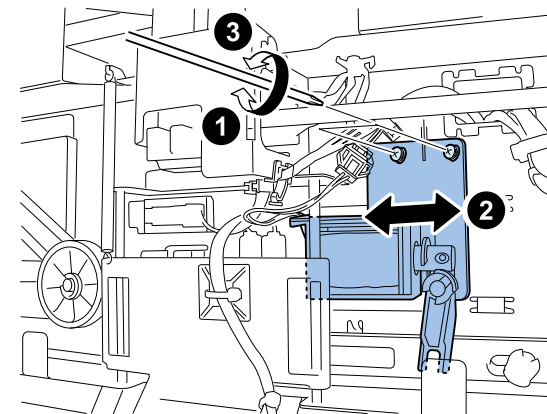
When the oscillation unit, the oscillation guide upper cover, or the Finisher Safety Switch2 Solenoid (FNSL101) is disassembled or assembled, check the clearance between the oscillation guide upper cover and the arm section of the Finisher Safety Switch2.

- 1) Check to confirm that the clearance between the oscillation guide upper cover and the arm section of the Finisher Safety Switch2 is $1.5 \pm 0.5\text{mm}$ when the oscillation guide is lifted with the Finisher Safety Switch2 solenoid plunger pressed. If the clearance is not in the specified range, adjust according to the procedures 2) and 3).



F-4-106

- 2) Loosen the two screws, shift the installing position of the Finisher Safety Switch2 Solenoid, and adjust the position of the arm section of the Finisher Safety Switch2. Then tighten the two screws which were loosened.



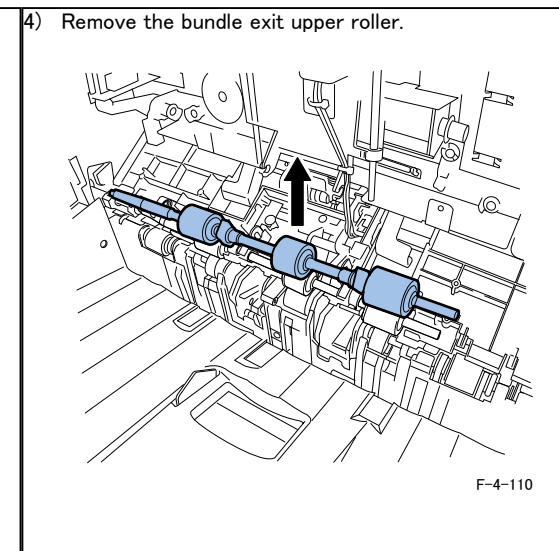
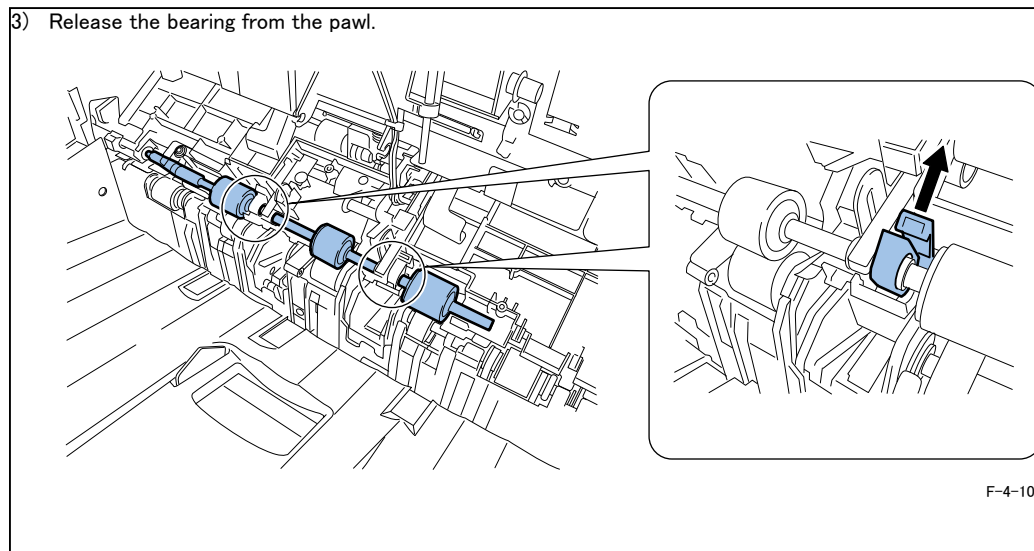
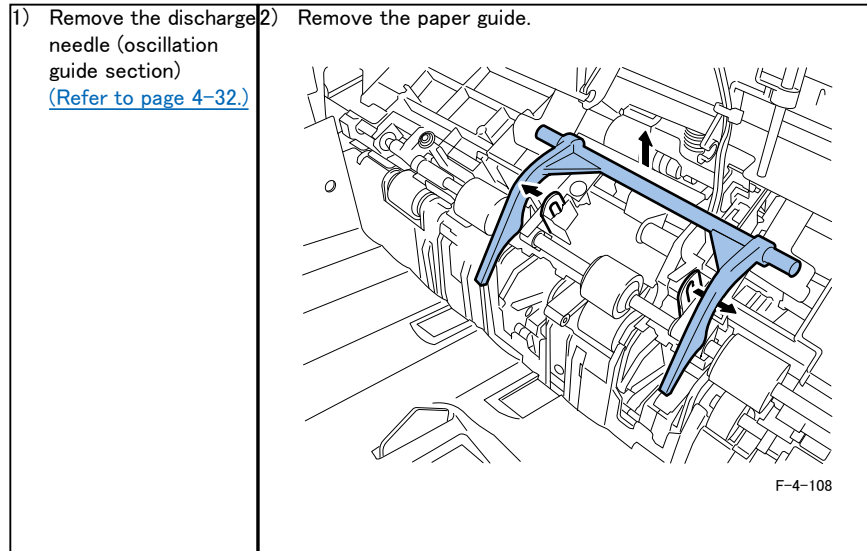
F-4-107

- 3) Check to confirm that the clearance between the oscillation guide upper cover and the arm section of the Finisher Safety Switch2 is within the specified range. If it is not in the specified range, adjust according to the procedure 2).

NOTE:

If the clearance between the oscillation guide upper cover and the arm section of the Finisher Safety Switch2 is not within the specified range, it may cause a malfunction.

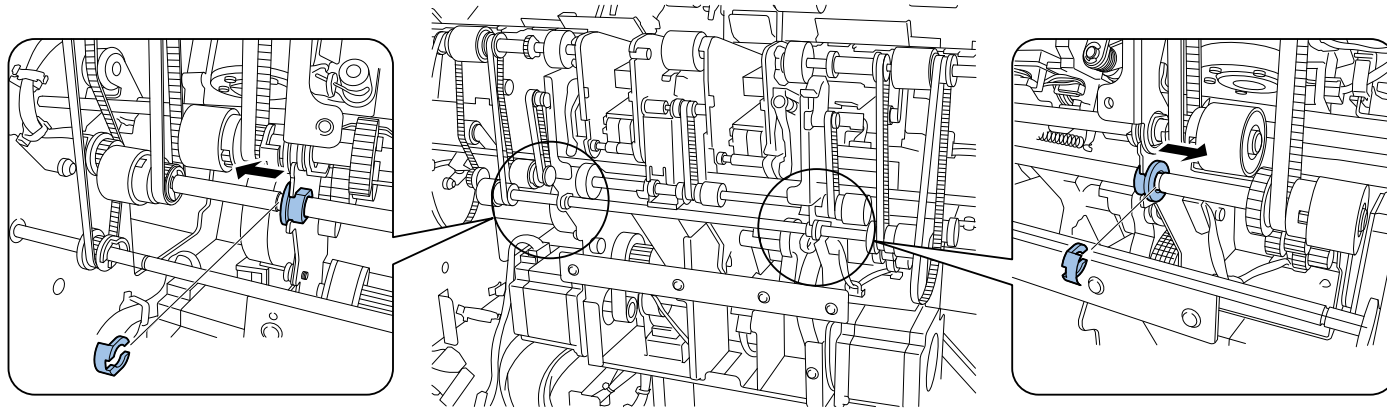
Bundle exit upper roller disassembly



Sub guide torque limiter disassembly

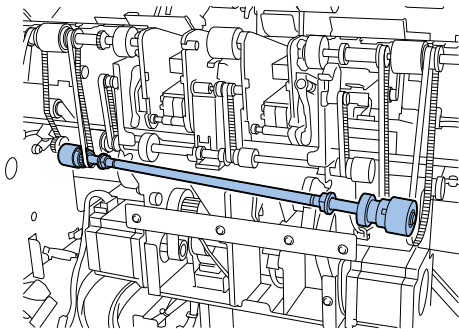
1) Remove the grid lower guide.
(Refer to page 4-19.)

2) Remove the two clips, and shift the bearing outside.



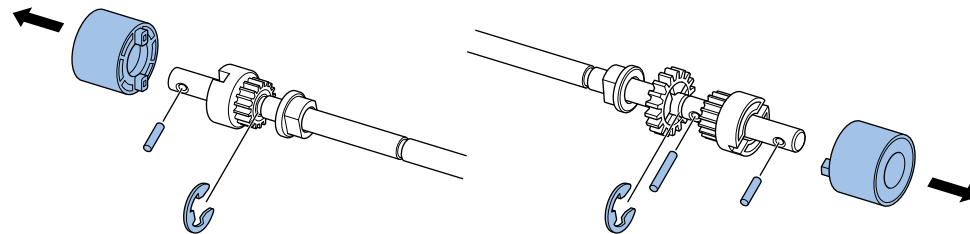
F-4-111

3) Release the drive shaft from the belt, and remove it.



F-4-112

4) Remove the E-ring and the parallel pin, and remove the torque limiter.

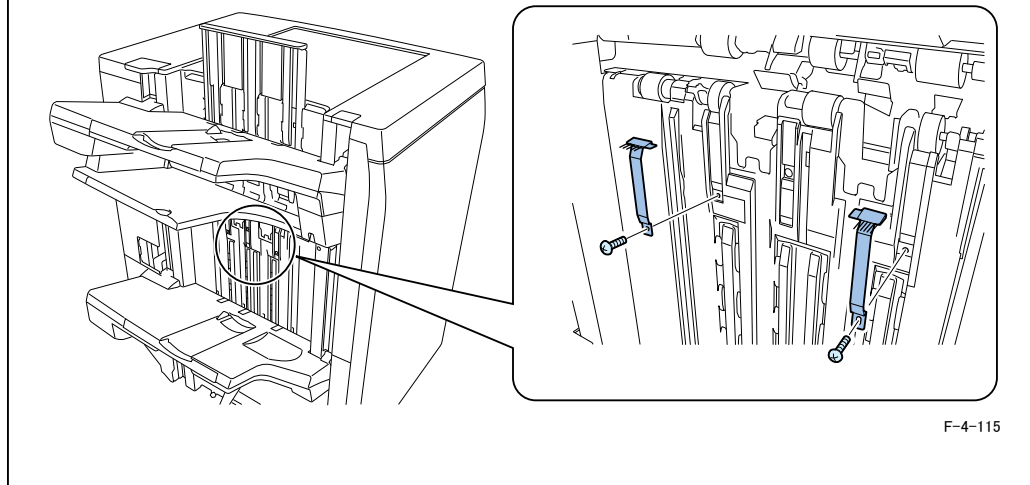


F-4-113

F-4-114

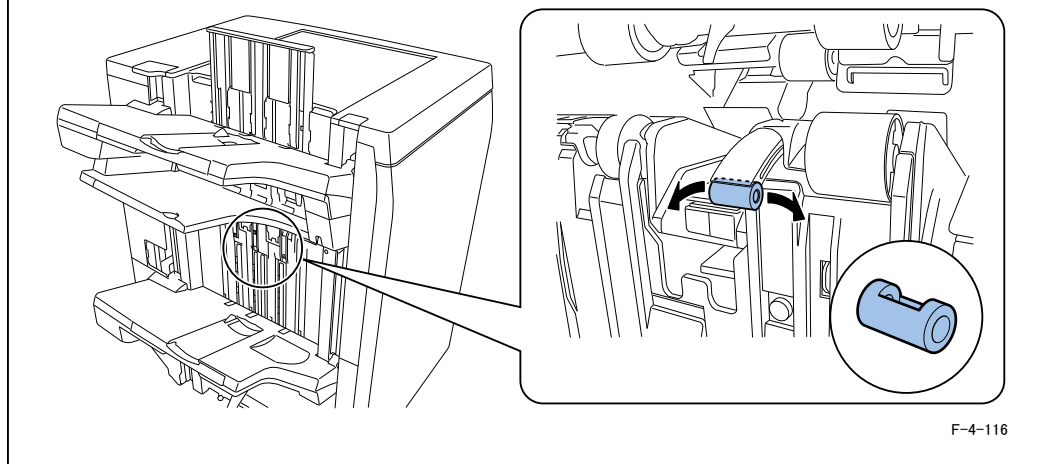
Discharge needle (grid lower guide section) disassembly

- 1) Lift the upper tray to the utmost top. Remove the screw, and remove the discharge needle.



Paper holder rubber disassembly

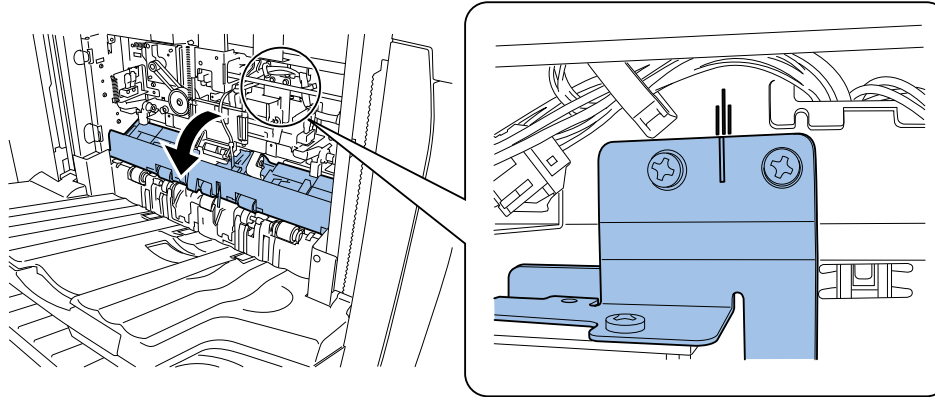
- 1) Lift the upper tray to the utmost top. Pull out the paper holder lever, and remove the paper holder rubber.



Finisher Safety Switch2 Solenoid (FNSL101) disassembly

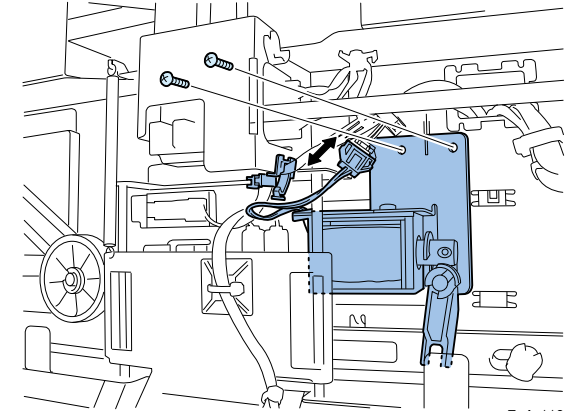
- 1) Remove the grid upper guide.
(Refer to page 4-16.)

- 2) Lower the oscillation guide, and mark the installing position of the Finisher Safety Switch2 solenoid.



F-4-117

- 3) Release the solenoid binding wire from the two edge saddles, remove the two screws, and remove the Finisher Safety Switch2 Solenoid unit.



F-4-118

NOTE:

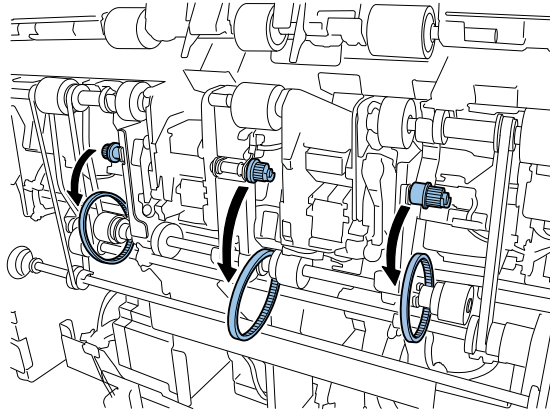
When the Finisher Safety Switch2 Solenoid (FNSL101) is disassembled or assembled, check the clearance between the oscillation guide upper cover and the arm section of the Finisher Safety Switch2.

(Refer to page 4-33.)

Torque limiter (upper / lower tray paper holder) disassembly

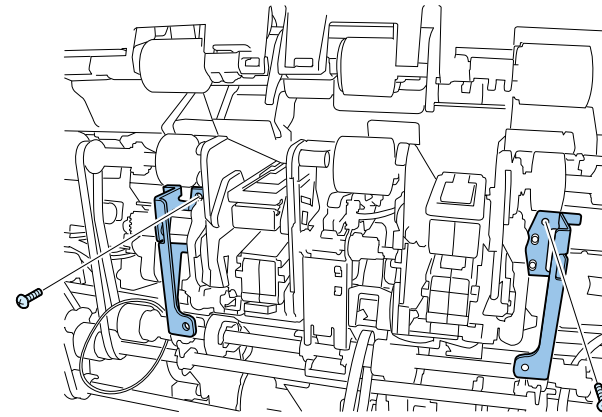
1) Remove the grid lower guide.
(Refer to page 4-19.)

2) Remove the three belts from the pulley.



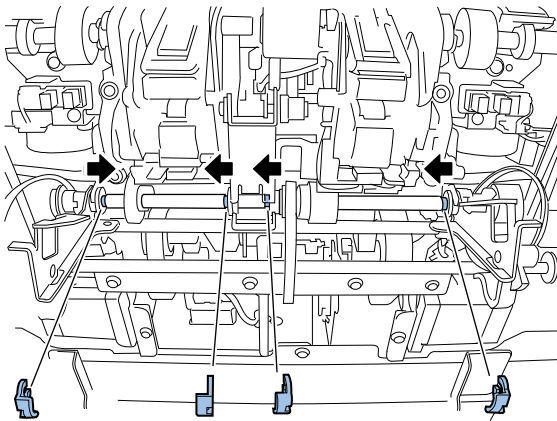
F-4-119

3) Remove the two screws, and remove the paper holder shaft side plate (Front) and (Rear).



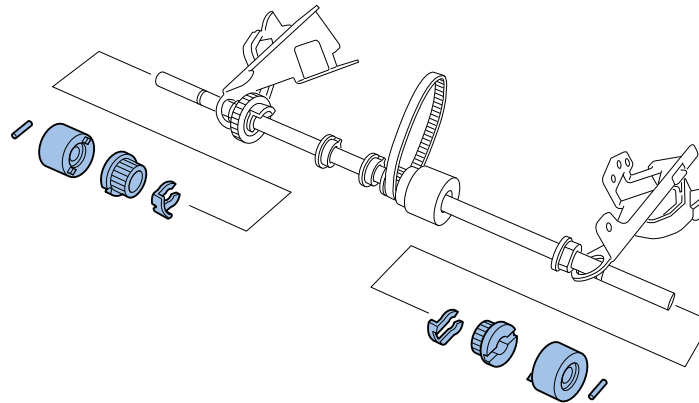
F-4-120

4) Remove the four clips, slide the four bearings, and remove the paper holder shaft.



F-4-121

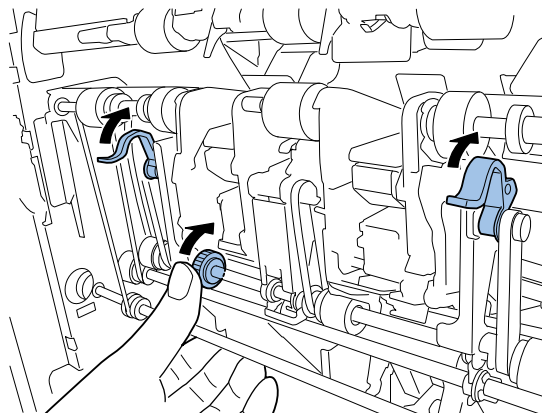
5) Remove the two torque limiters (upper /lower tray paper holder).



F-4-122

NOTE:

When the torque limiter (upper / lower tray paper holder) is assembled, turn the drive shaft in the arrow direction to store the tray paper holder lever in the process tray unit.

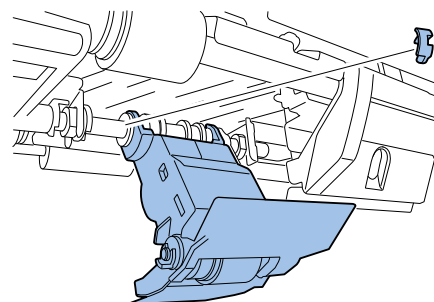
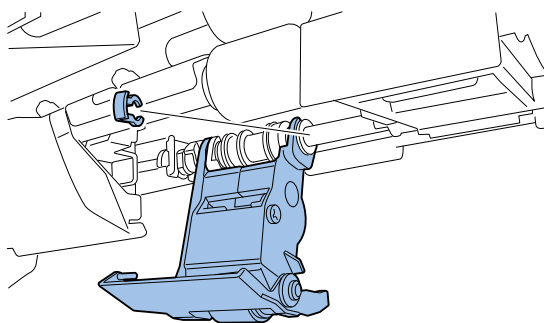


F-4-123

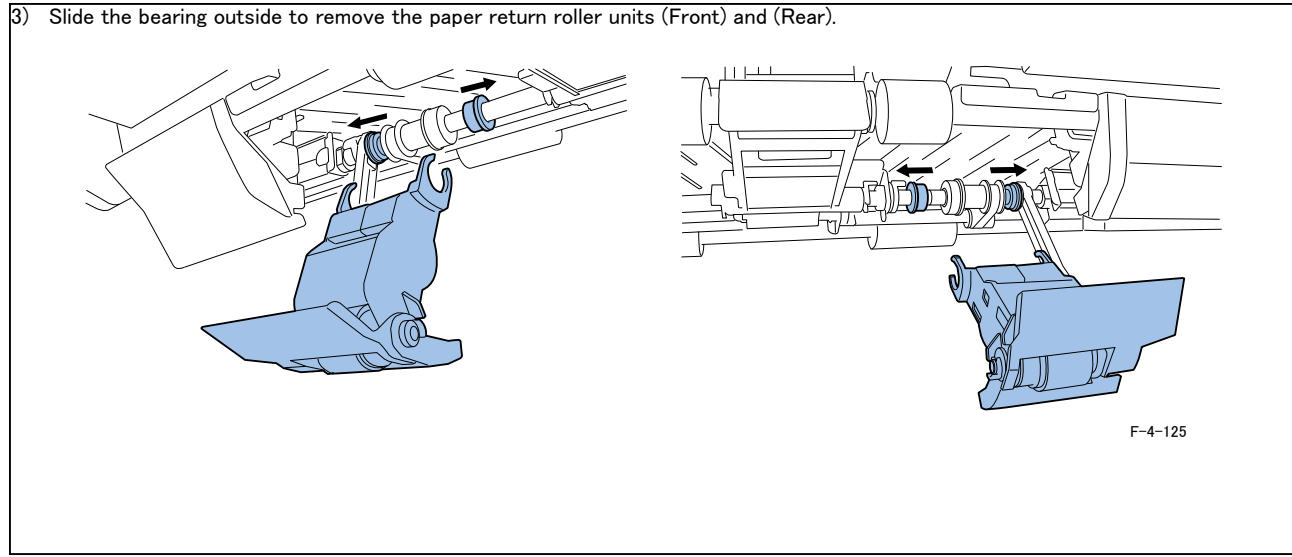
Paper return rollers (Front)/(Rear) disassembly

1) Remove the process tray unit.
[\(Refer to page 4-22.\)](#)

2) Remove the clip.



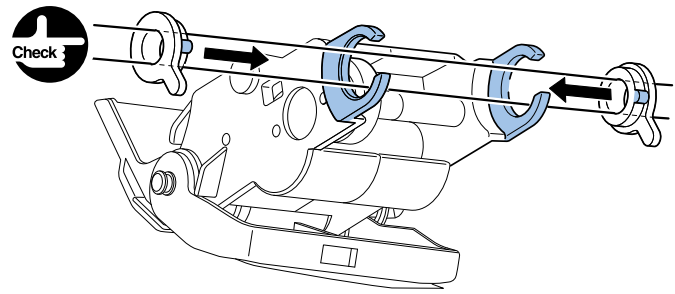
F-4-124



NOTE:

When installing the paper return guide roller units, be careful about the followings.

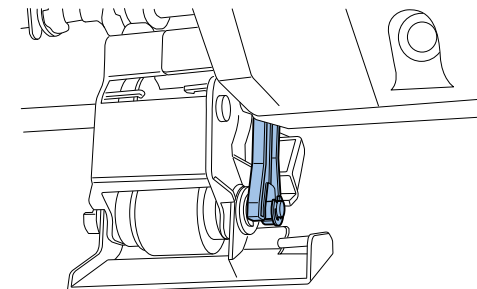
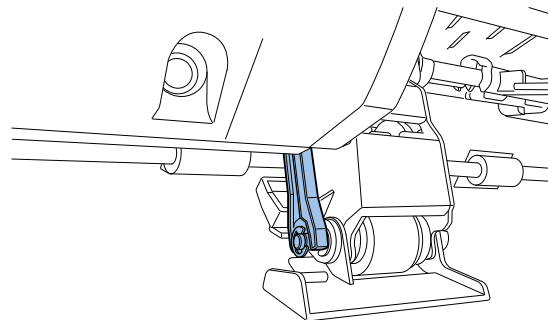
Fit the projection of the bushings into the opening of the paper return guide holders.



F-4-158

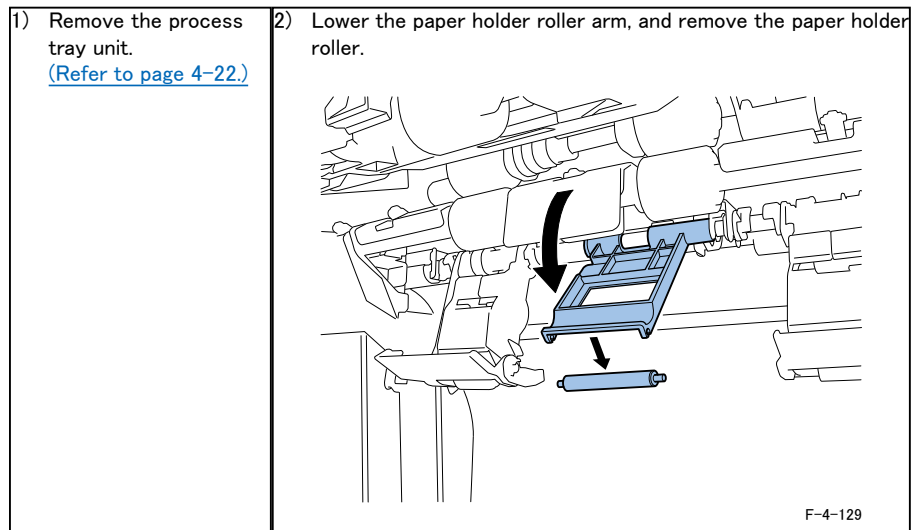
NOTE:

Install so that the drive shaft arm grips the roller shaft.

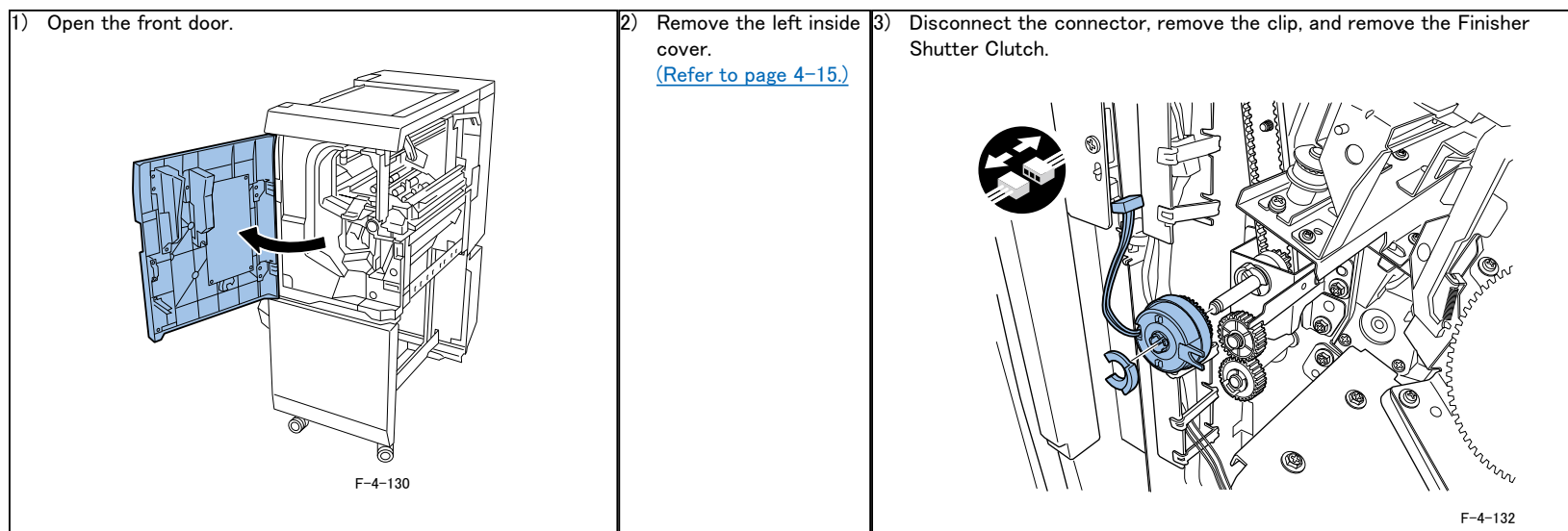


F-4-128

Paper holder roller disassembly



Finisher Shutter Clutch (FNCL102) disassembly

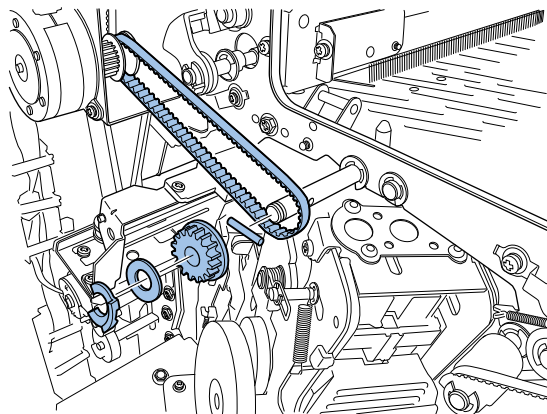


Motors

Finisher Paper Transport Alignment Motor (FNM121) disassembly

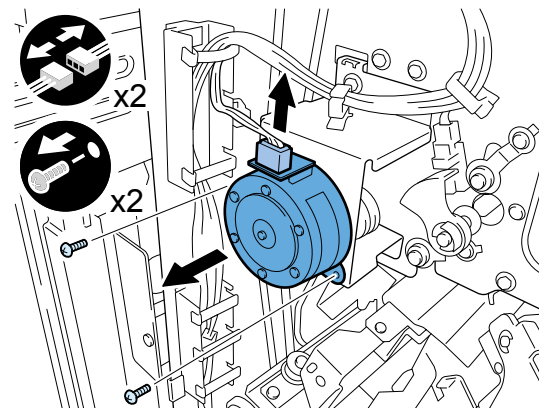
1) Remove the left inside cover.
(Refer to page 4-15.)

2) Remove the clip, the flange, the pulley, the parallel pin, and the belt.



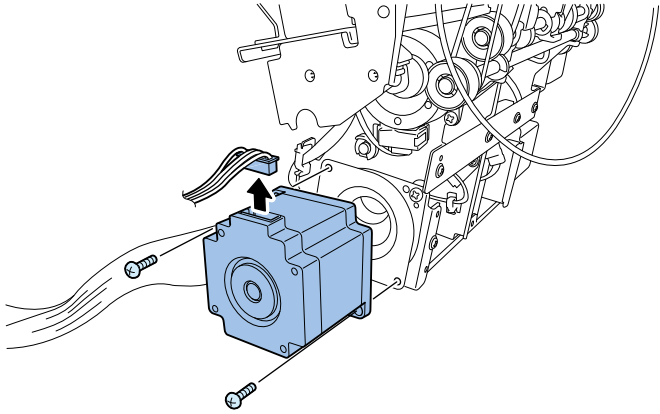
F-4-135

3) Disconnect the connector and remove the two screws, and remove the Finisher Paper Transport Alignment Motor.

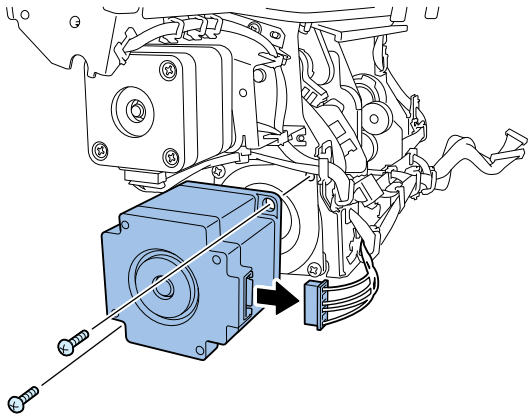


F-4-136

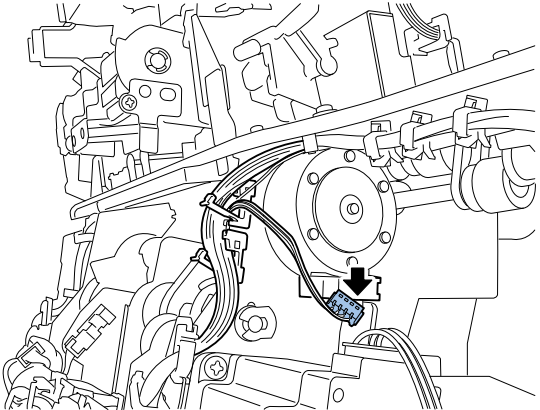
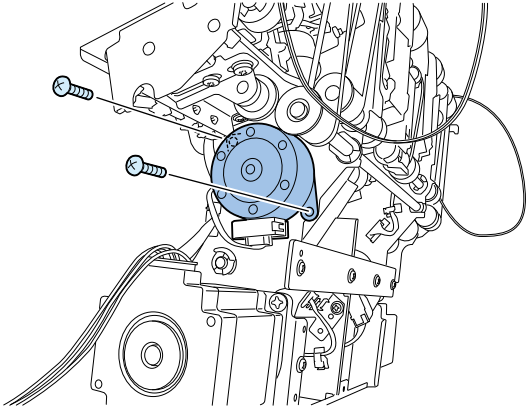
Finisher Gripper Motor (FNM117) disassembly

<p>1) Remove the process tray unit. (Refer to page 4-22.)</p>	<p>2) Disconnect the connector, remove the two screws, and remove the Finisher Gripper Motor.</p>  <p>The diagram shows a blue motor unit (FNM117) being removed from a mechanical assembly. An arrow points upwards from the top of the motor, indicating the direction of removal. Two screws are shown being removed from the top of the motor. A connector is also shown being disconnected from the motor's wiring.</p> <p>F-4-137</p>
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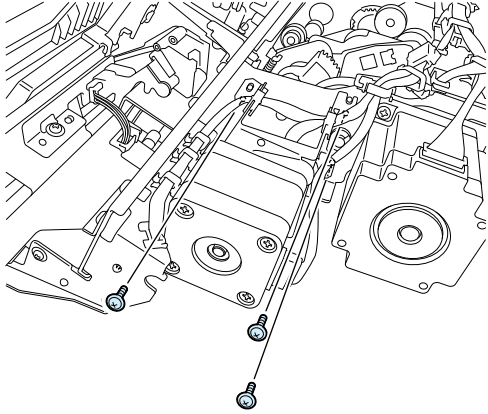
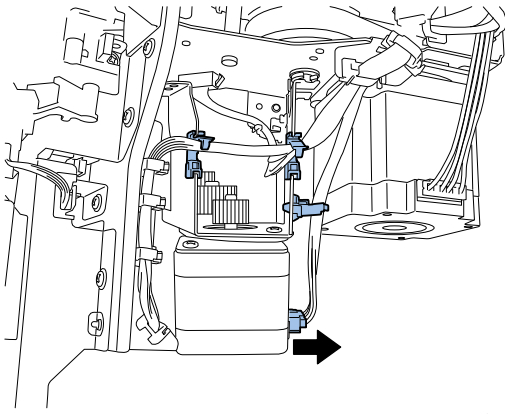
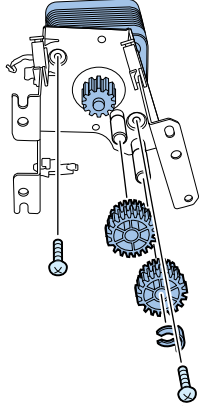
Finisher Gripper Arm Motor (FNM116) disassembly

<p>1) Remove the process tray unit. (Refer to page 4-22.)</p>	<p>2) Disconnect the connector, remove the two screws, and remove the Finisher Gripper Arm Motor.</p>  <p>The diagram shows a blue motor unit (FNM116) being removed from a mechanical assembly. An arrow points to the right from the side of the motor, indicating the direction of removal. Two screws are shown being removed from the side of the motor. A connector is also shown being disconnected from the motor's wiring.</p> <p>F-4-138</p>
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Finisher Delivery Paper Holding Motor (FNM114) disassembly

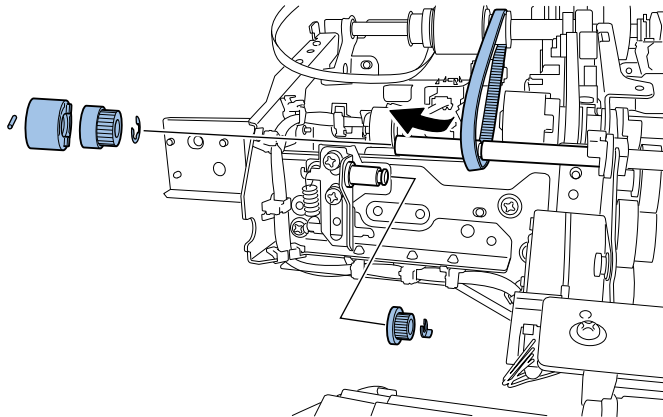
<p>1) Remove the process tray unit. (Refer to page 4-22.)</p>	<p>2) Disconnect the motor connector, and release the binding wire from the edge saddle.</p>  <p>F-4-139</p>	<p>3) Remove the two screws, and remove the Finisher Delivery Paper Holding Motor.</p>  <p>F-4-140</p>
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Finisher Paper Guide Motor (FNM120) disassembly

<p>1) Remove the process tray unit. (Refer to page 4-22.)</p>	<p>2) Remove the three screws.</p>  <p>F-4-141</p>	<p>3) Release the binding wire from the four wire saddles, and disconnect the motor connector and remove the motor base.</p>  <p>F-4-142</p>	<p>4) Remove the clip, the two gears, and the two screws, and remove the Finisher Paper Guide Motor.</p>  <p>F-4-143</p>
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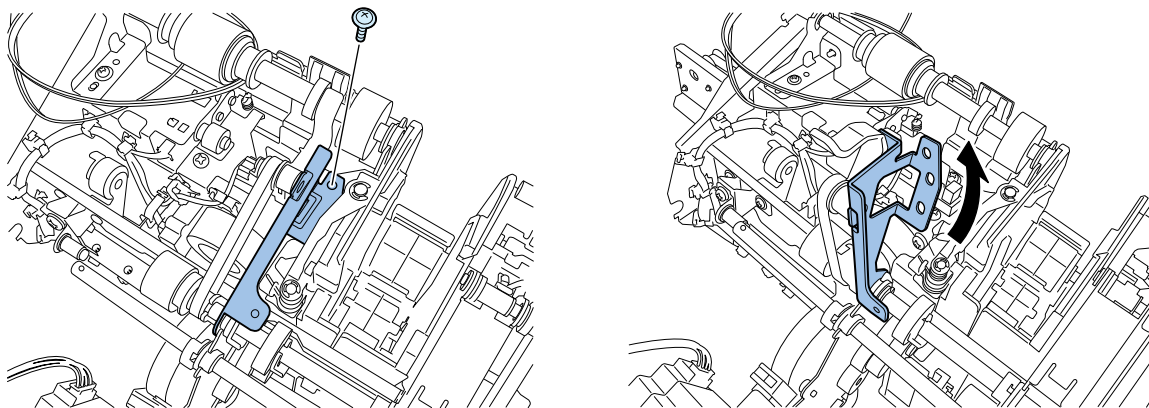
Finisher Paper Alignment Motor R (FNM109) disassembly

- 1) Remove the process tray unit.
(Refer to page 4-22.)
- 2) Remove the clip, and remove the pulley. Remove the E-ring, the pulley, the torque limiter, and the parallel pin, and release the belt from the shaft.



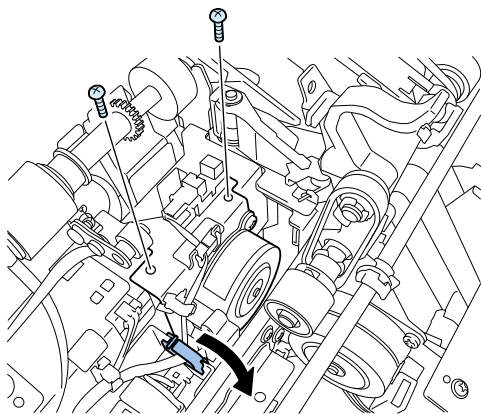
F-4-144

- 3) Remove the screw, and turn the paper holder lever base to the front.



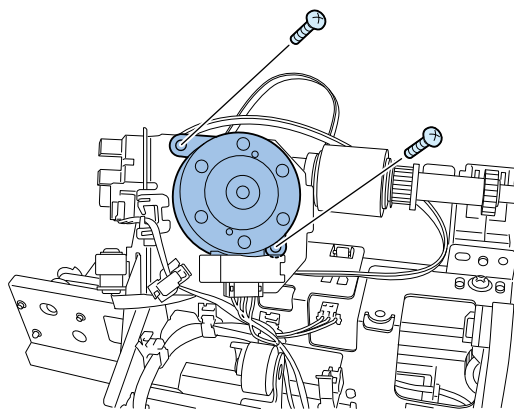
F-4-145

- 4) Open the edge saddle, remove the two screws, and pull out the motor base.



F-4-146

- 5) Disconnect the connector, remove the two screws, and remove the Finisher Paper Alignment Motor R.

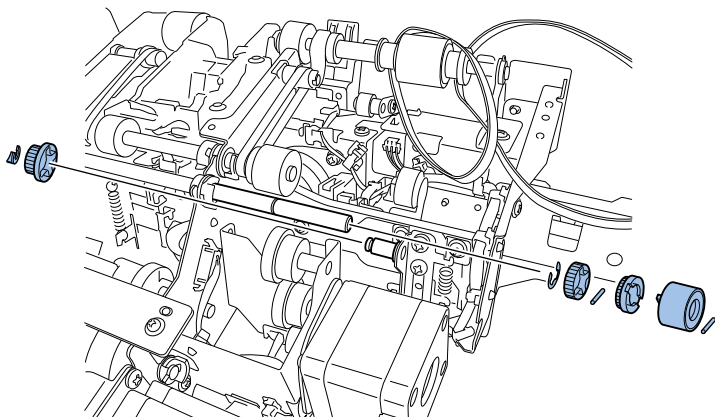


F-4-147

Finisher Paper Alignment Motor F (FNM108) disassembly

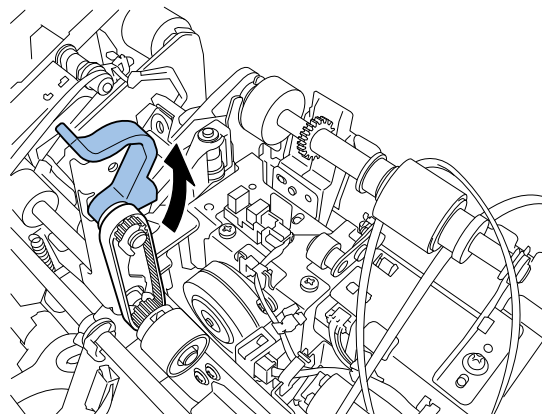
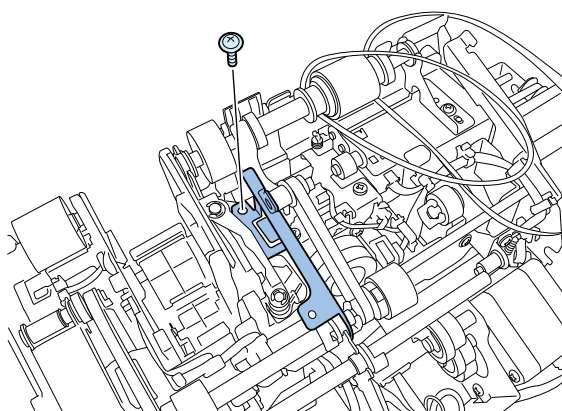
- 1) Remove the process tray unit.
(Refer to page 4-22.)

- 2) Remove the clip and the pulley. Remove the E-ring, the gear, the pulley, the torque limiter, and the two parallel pins, and release the belt from the shaft.



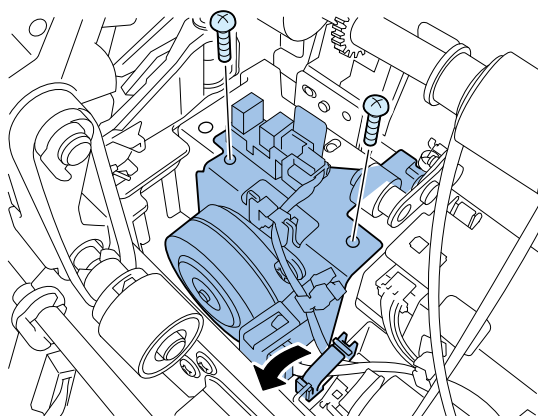
F-4-148

- 3) Remove the screw, and turn the paper holder lever base to the front.



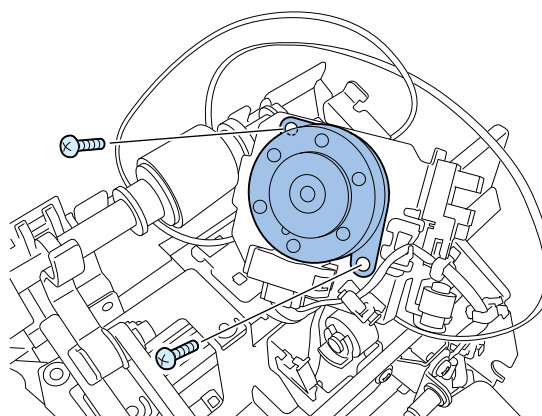
F-4-149

- 4) Open the edge saddle, remove the two screws, and pull out the motor base.



F-4-150

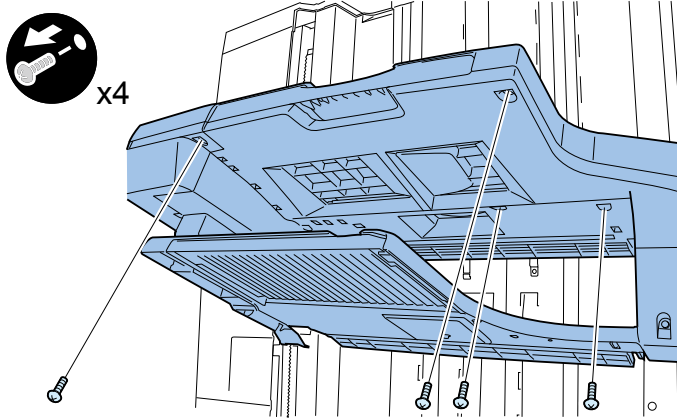
- 5) Disconnect the connector, remove the two screws, and remove the Finisher Paper Alignment Motor F.



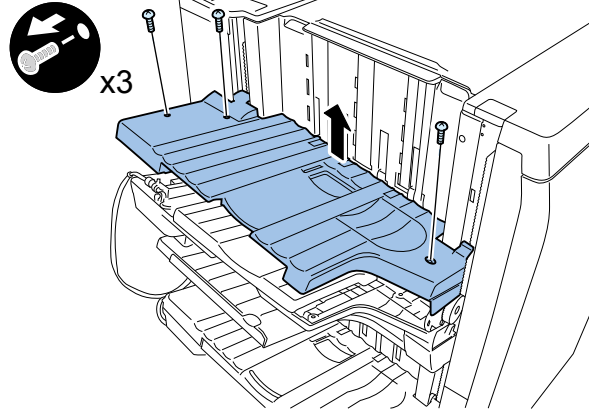
F-4-151

Finisher Upper Tray Lift Motor (FNM105) disassembly

1) Remove the seven screws, and remove the upper tray upper cover.

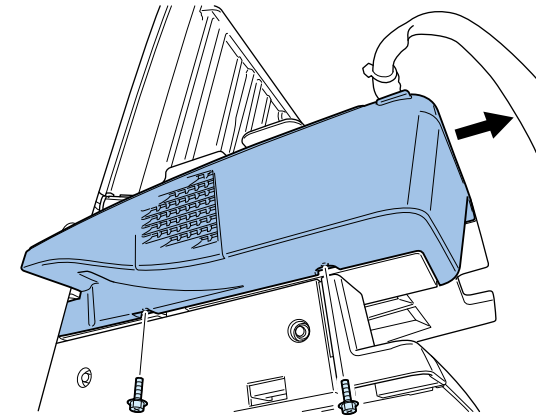


F-4-152



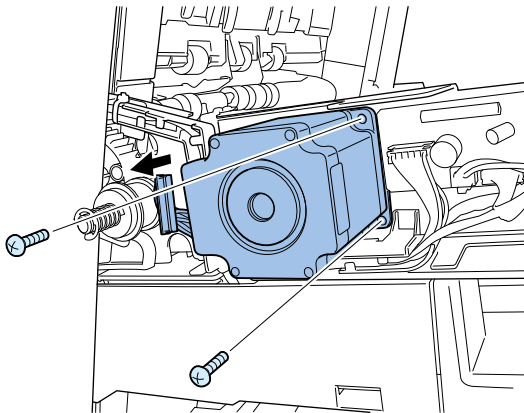
F-4-153

2) Remove the two screws, and remove the tray motor cover.



F-4-154

3) Disconnect the connector, and remove the two screws, and remove the Finisher Upper Tray Lift Motor.

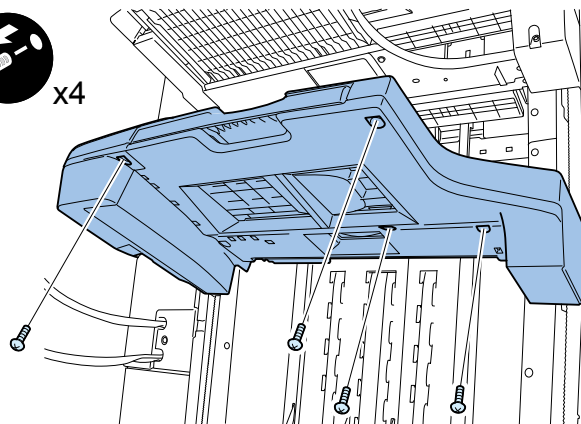


NOTE:

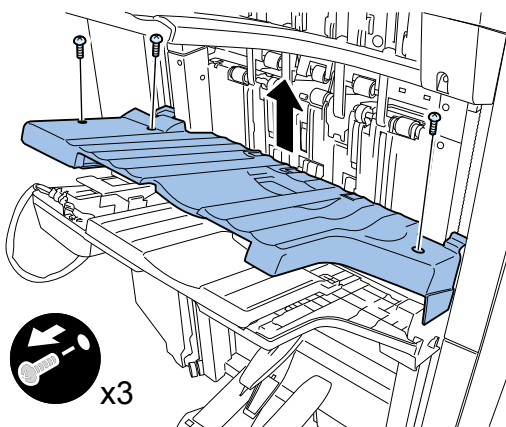
When the Finisher Upper Tray Lift Motor is disassembled, the tray will fall by its own weight. Be careful of that.

Finisher Lower Tray Lift Motor (FNM106)

1) Remove the seven screws, and remove the lower tray upper cover.

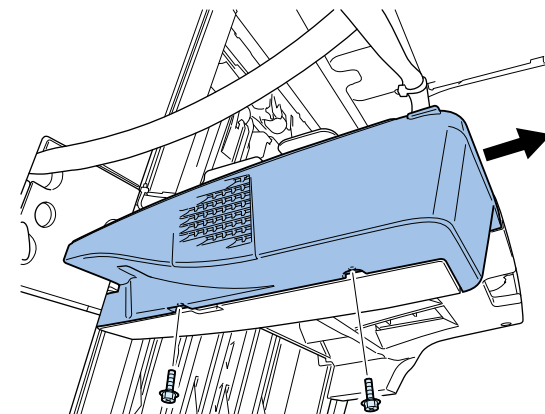


F-4-155



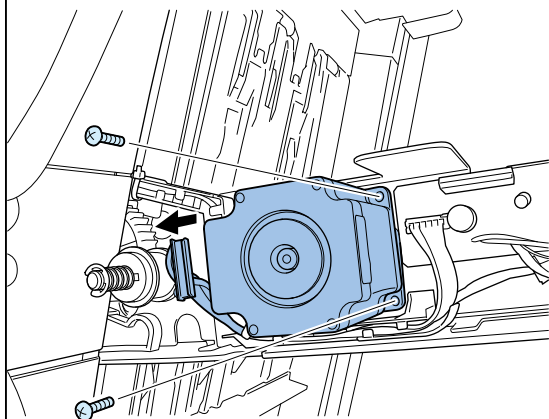
F-4-156

2) Remove the two screws, and remove the tray motor cover.



F-4-157

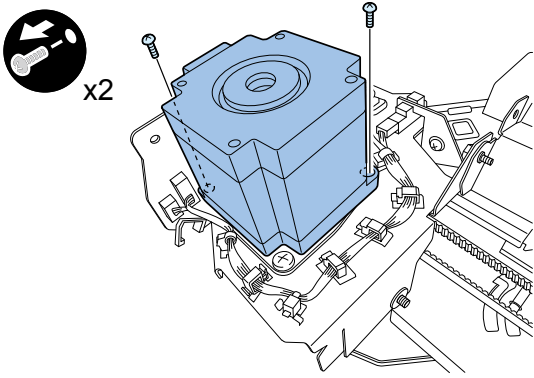
3) Disconnect the connector, remove the two screws, and remove the Finisher Lower Tray Lift Motor.



NOTE:

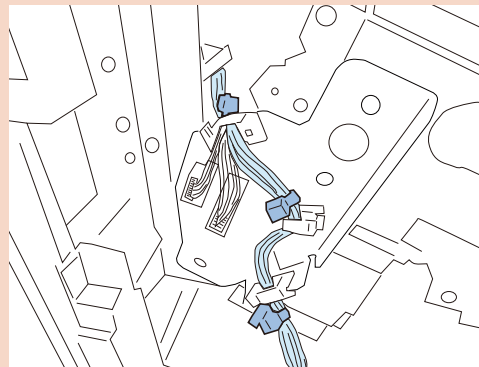
When the Finisher Lower Tray Lift Motor is disassembled, the tray will fall by its own weight. Be careful of that.

Finisher Stapler Shift Motor (FNM107) disassembly

<p>1) Remove the left inside cover. (Refer to page 4-15.)</p> <p>2) Remove the staple unit. (Refer to page 4-28.)</p>	<p>2) Remove the two screws to remove the staple motor.</p>  <p>F-4-206</p>
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NOTE:

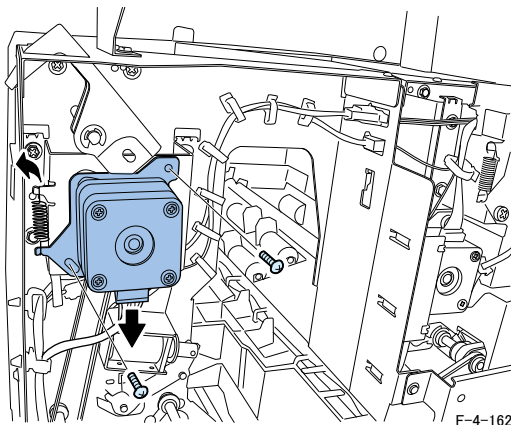
When the staple shift motor is installed, set the motor cable to the wire saddles so the harness bands of motor cable are located as shown in the figure.



F-4-207

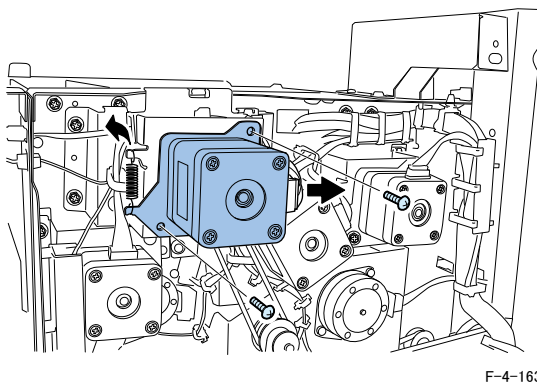
Finisher Paper Transport Motor1 (FSM200) disassembly

- 1) Remove the rear upper cover.
(Refer to page 4-14.)
- 2) Disconnect the motor connector, and remove the tension spring. Remove the two screws, and remove the Finisher Paper Transport Motor1.



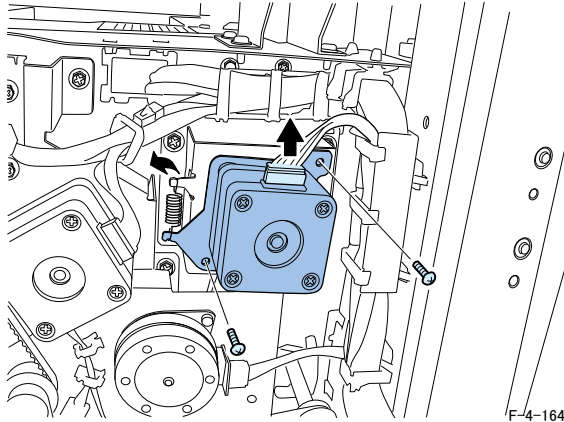
Finisher Paper Tail Push Down Motor (FNM118) disassembly

- 1) Remove the rear upper cover.
(Refer to page 4-14.)
- 2) Disconnect the motor connector, and remove the tension spring. Remove the two screws, and remove the Finisher Paper Tail Push Down Motor.



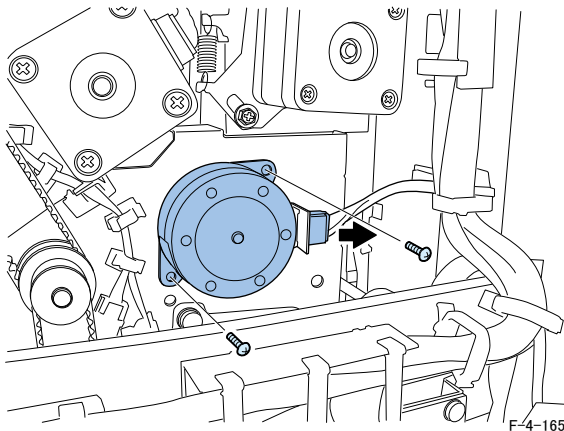
Finisher Paper Transport Motor2 (FSM102) disassembly

- 1) Remove the rear upper cover.
(Refer to page 4-14.)
- 2) Disconnect the motor connector, and remove the tension spring. Remove the two screws, and remove the Finisher Paper Transport Motor2.



Finisher Paper Tail Holding Motor (FNM113) disassembly

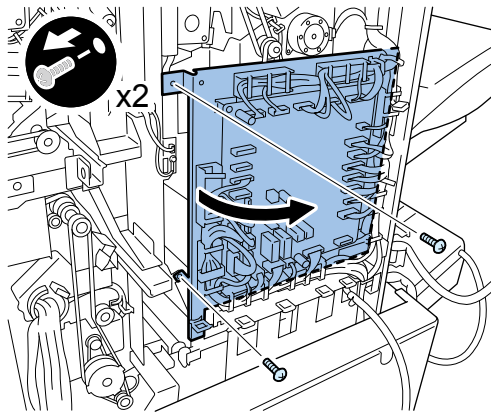
- 1) Remove the rear upper cover.
(Refer to page 4-14.)
- 2) Disconnect the motor connector, and remove the two screws, and remove the Finisher Paper Tail Holding Motor.



Finisher Paper Transport Motor1 (FSM200) disassembly

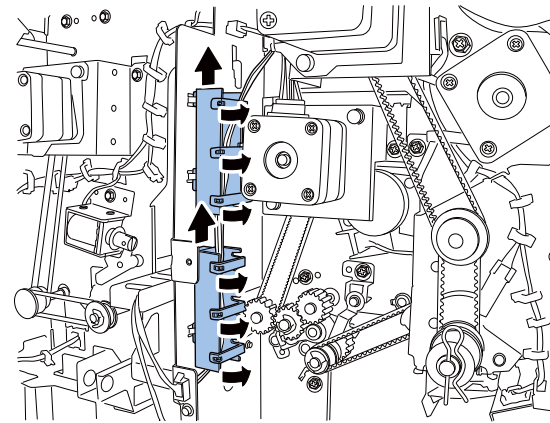
1) Remove the rear upper cover.
(Refer to page 4-14.)

2) Remove the two screws, and open the finisher controller PWB base.



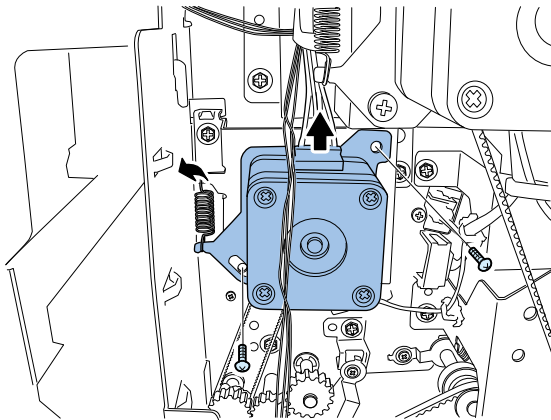
F-4-166

3) Release the binding wire from the binding wire guide, and remove the two binding wire guides.



F-4-167

4) Disconnect the motor connector, and remove the tension spring. Remove the two screws, and remove the Finisher Paper Transport Motor1.

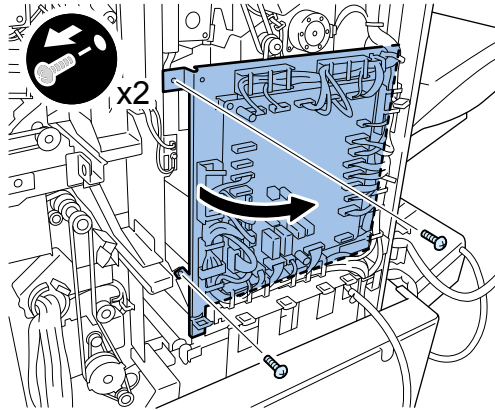


F-4-168

Finisher Paper Delivery Motor1 (FUM104) disassembly

1) Remove the rear upper cover.
(Refer to page 4-14.)

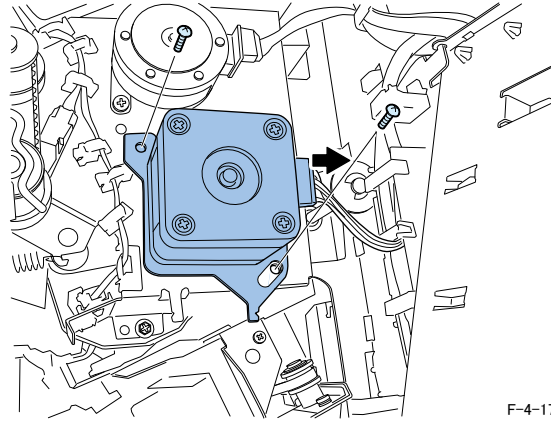
2) Remove the two screws, and open the finisher controller PWB base.



F-4-169

3) Disconnect the motor connector, remove the two screws, and remove the Finisher Paper Delivery Motor1.

Note for assembling the motor:
When installing, adjust the position of the motor along the reference line of the motor mounting plate.

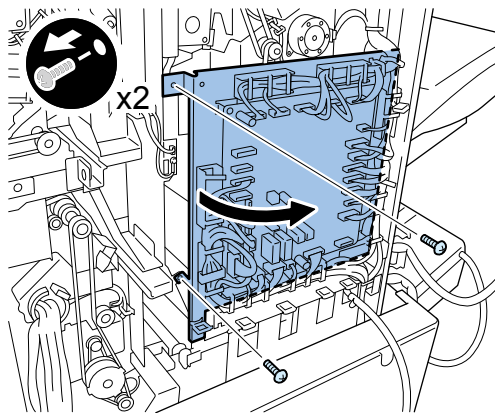


F-4-170

Finisher Paper Delivery Motor2 (FNM122) disassembly

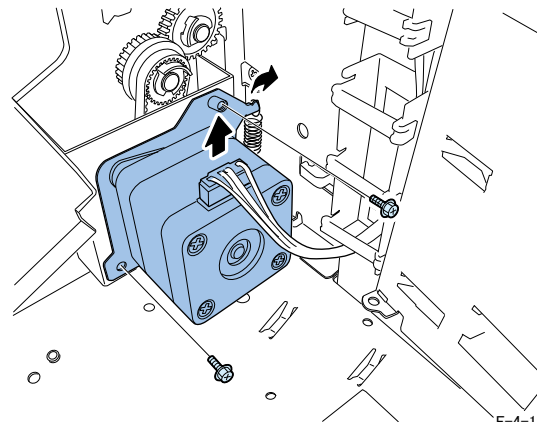
1) Remove the rear upper cover.
(Refer to page 4-14.)

2) Remove the two screws, and open the finisher controller PWB base.



F-4-171

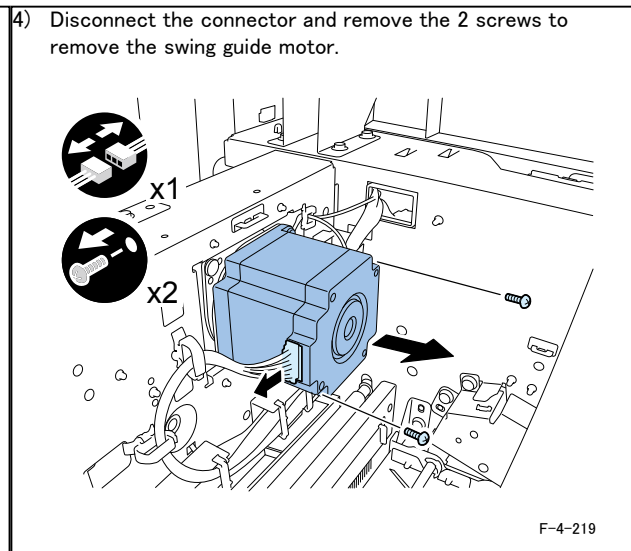
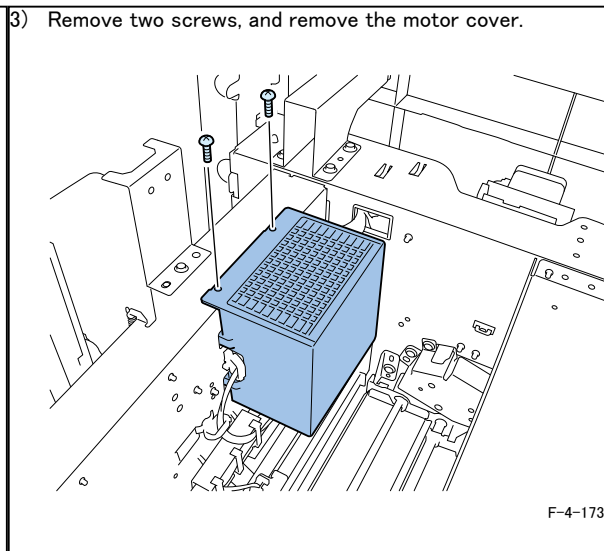
3) Disconnect the motor connector, and remove the tension spring. Remove the two screws, and remove the Finisher Paper Delivery Motor2.



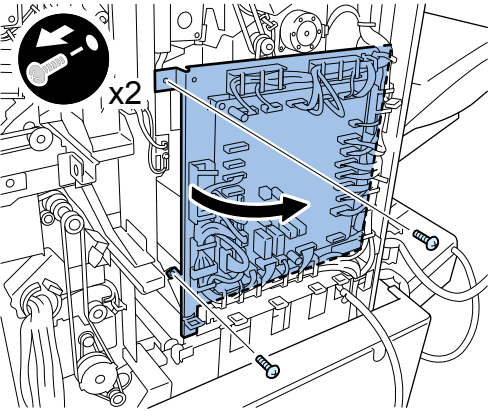
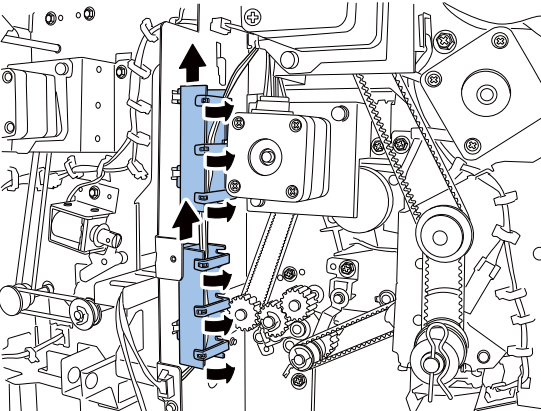
F-4-172

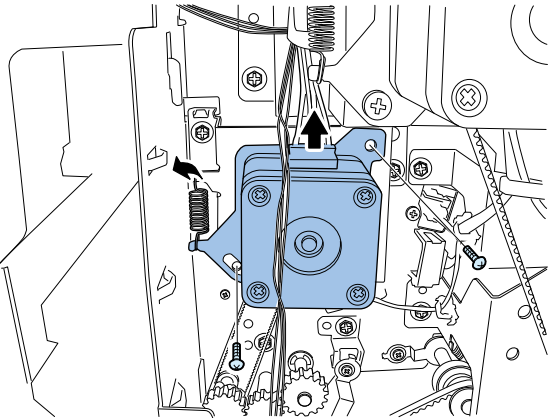
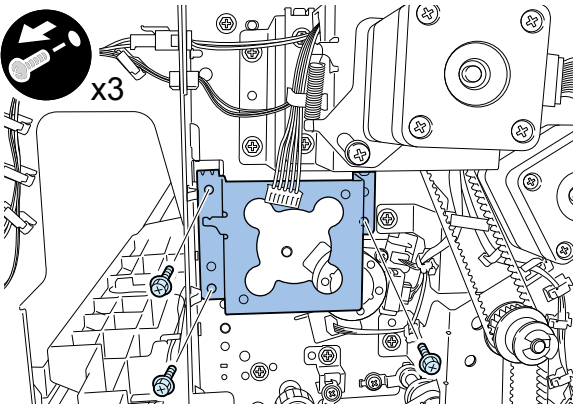
Finisher Delivery Roller Lift Motor (FNM110) disassembly

- 1) Remove the grid upper guide.
[\(Refer to 4-16\)](#)
- 2) Remove the upper cover.
[\(Refer to 4-73\)](#)

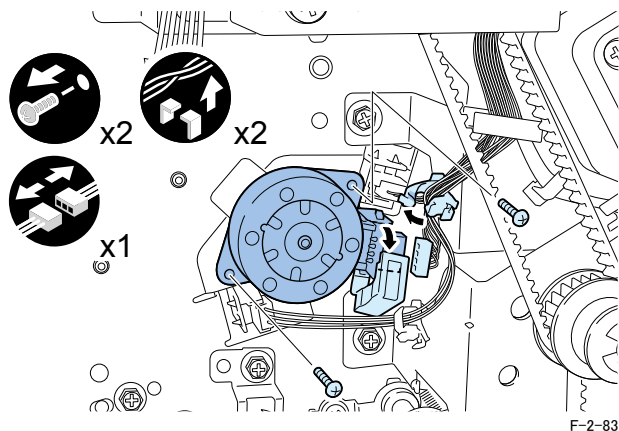


Finisher Paper Transport Roller Lift Motor (FNM119) disassembly

<p>1) Remove the rear upper cover. (Refer to page 4-14.)</p>	<p>2) Remove the two screws, and open the finisher controller PWB base.</p>  <p style="text-align: right;">F-2-79</p>	<p>3) Remove the binding wire from the binding wire guide, and remove the two binding wire guides.</p>  <p style="text-align: right;">F-2-80</p>
------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>4) Disconnect the connector, remove the spring and the two screws, and remove the transport motor.</p>  <p style="text-align: right;">F-2-81</p>	<p>5) Remove the three screws, and remove the motor support base.</p>  <p style="text-align: right;">F-2-82</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

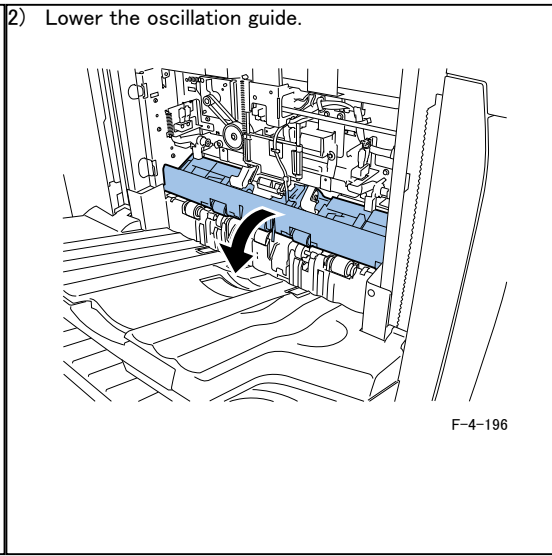
- 6) Remove the binding wire from the binding wire guide. Disconnect the connector, remove the two screws, and remove the Finisher Paper Transport Roller Lift Motor.



Switches

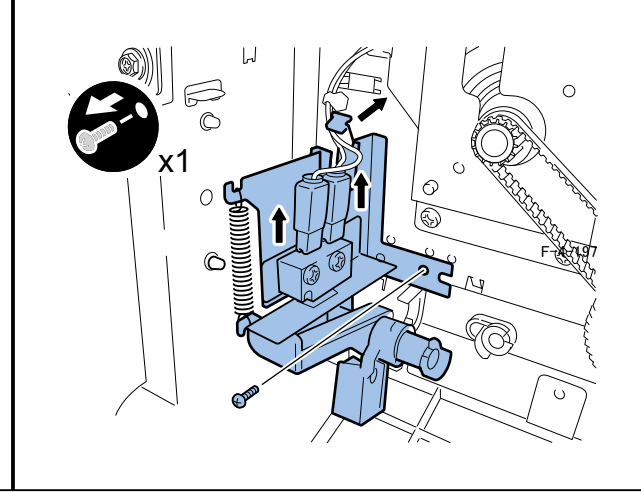
Staple safety switches (Front) (Rear) (FNSW102/FNSW104)

1) Remove the grid upper guide.
(Refer to page 4-16)

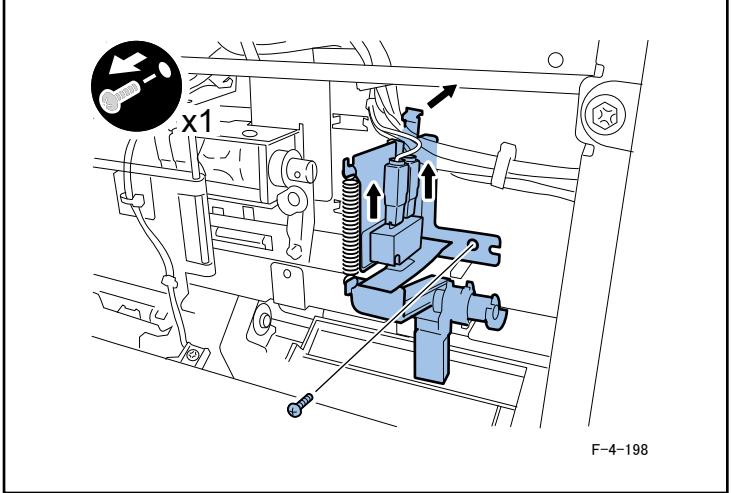


2) Lower the oscillation guide.

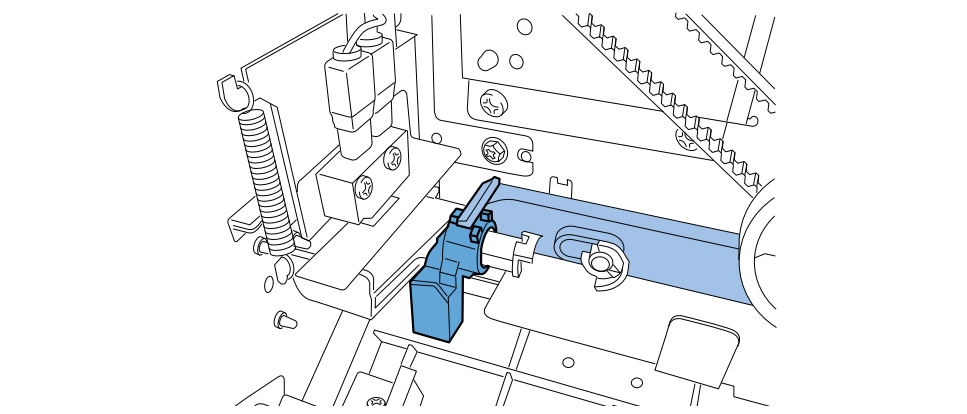
3) Open the wire saddle, release the bundle wire, remove the switch base, and remove the staple safety switch (Rear).



4) Open the wire saddle, release the bundle wire, remove the switch base, and remove the staple safety switch (Front).



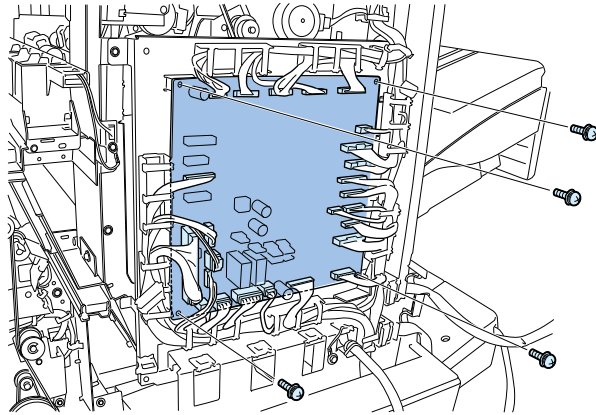
NOTE:
When reassembling, attach the switch so that the projection will put between the lever.



PWB's

 Finisher controller PWB disassembly

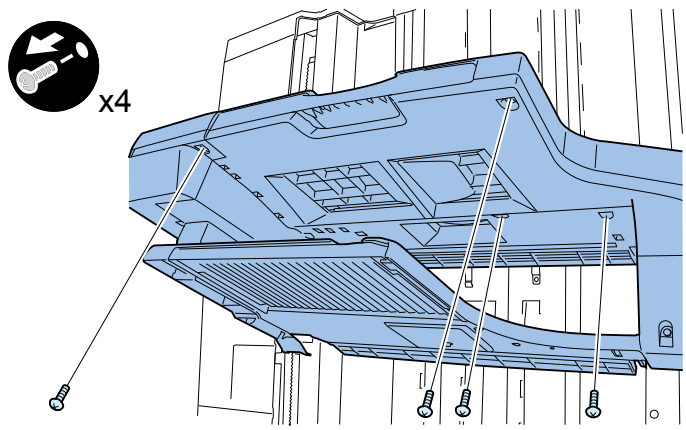
- 1) Remove the rear upper cover.
[\(Refer to page 4-14.\)](#)
- 2) Disconnect the connector, remove the four screws and remove the finisher controller PWB.



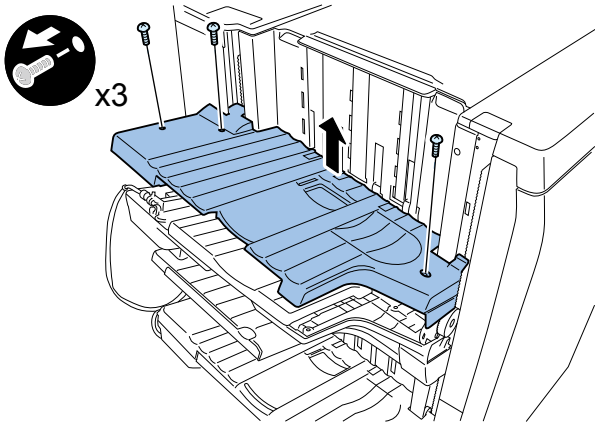
F-4-199

Upper Tray motor driver PWB disassembly

1) Remove the seven screws, and remove the upper tray upper cover.

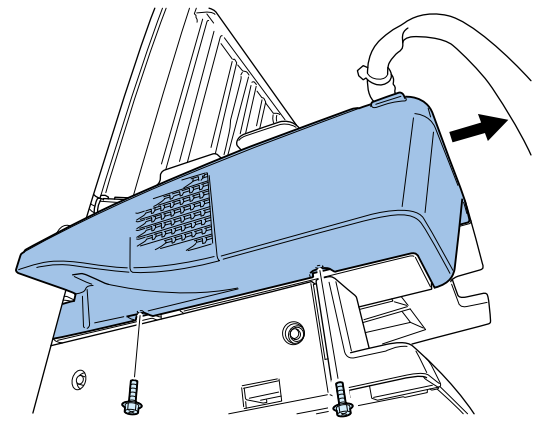


F-4-200



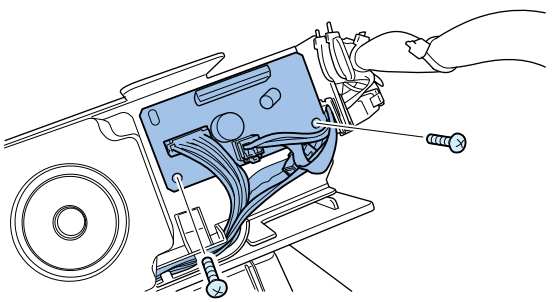
F-4-201

2) Remove the two screws, and remove the tray motor cover.



F-4-202

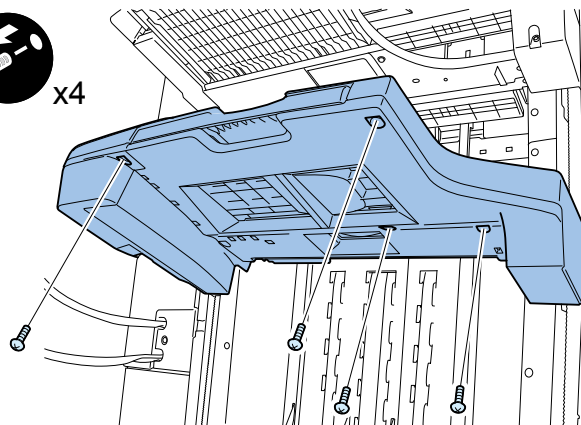
3) Disconnect the three connectors, and remove the two screws and remove the upper tray motor driver PWB.



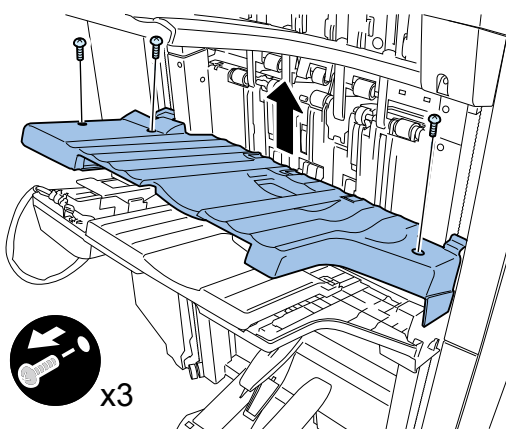
F-4-203

Lower Tray motor driver PWB disassembly

1) Remove the seven screws, and remove the lower tray upper cover.

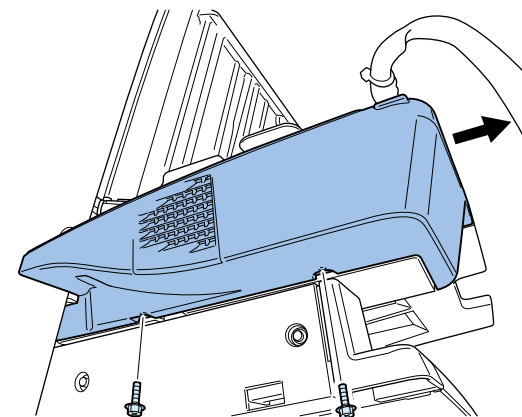


F-4-204



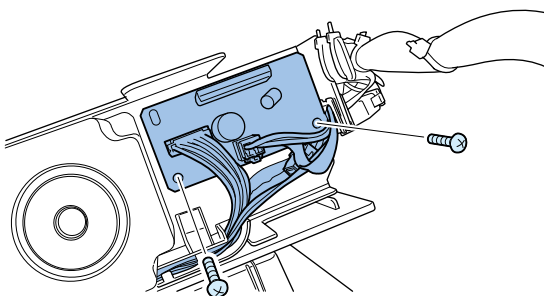
F-4-205

2) Remove the two screws, and remove the tray motor cover.



F-4-206

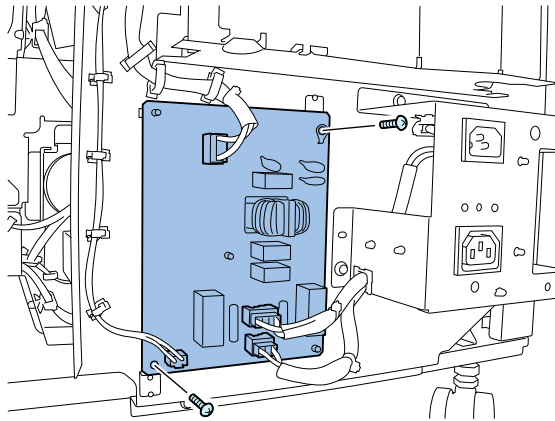
3) Disconnect the three connectors, remove the two screws, and remove the lower tray motor driver PWB.



F-4-207

AC noise filter PWB disassembly

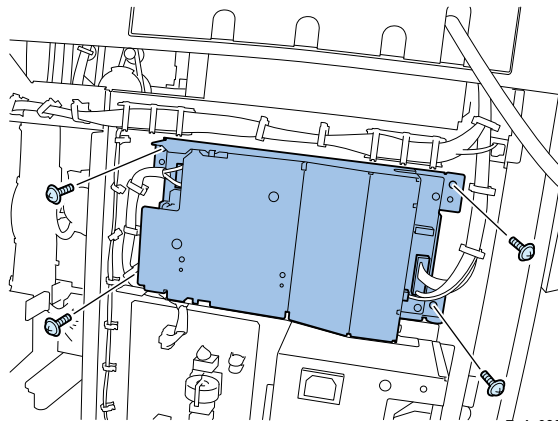
- 1) Remove the rear lower cover.
(Refer to page 4-14.)
- 2) Disconnect the four connectors, remove the two screws, and remove the AC noise filter PWB.



F-4-208

Power unit disassembly

- 1) Remove the rear lower cover.
(Refer to page 4-14.)
- 2) Disconnect the three connectors, remove the four screws and remove the power unit.

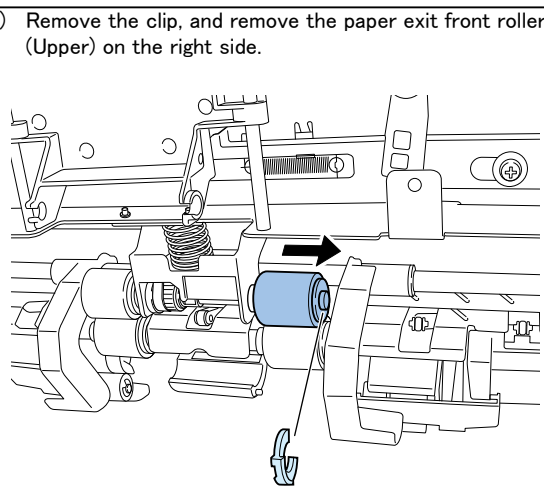


F-4-209

Rollers

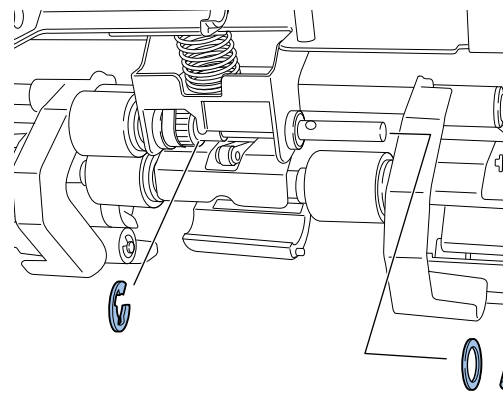
Paper exit front roller (Upper) disassembly

1) Remove the oscillation guide unit.
(Refer to page 4-24.)



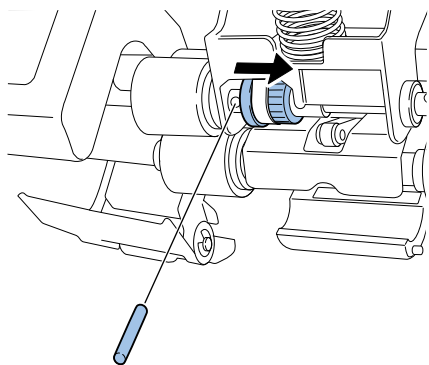
F-2-51

2) Remove the clip, and remove the paper exit front roller (Upper) on the right side.



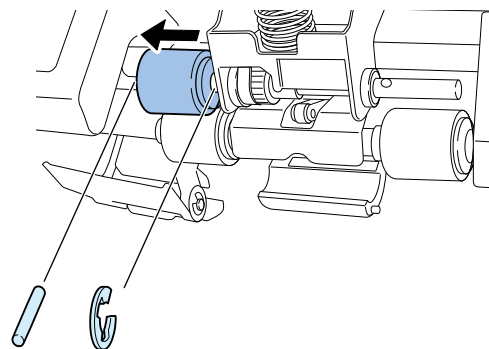
F-2-52

4) Slide the pulley to the right side, and remove the parallel pin.



F-2-53

5) Remove the E-ring and the parallel pin, and remove the paper exit front roller (Upper) on the left side.

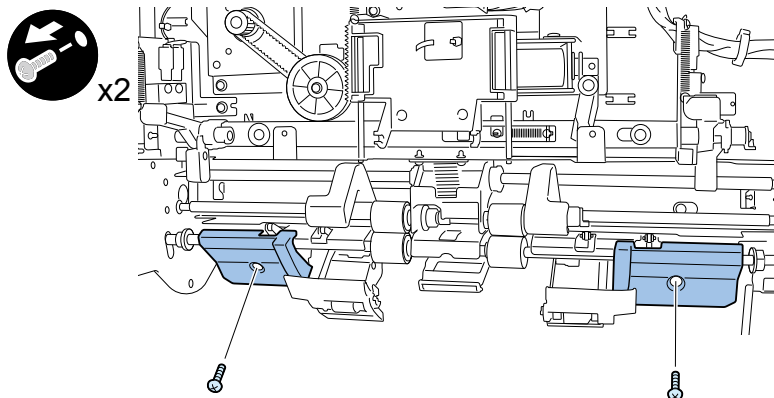


F-2-54

Paper exit front roller (Lower) disassembly

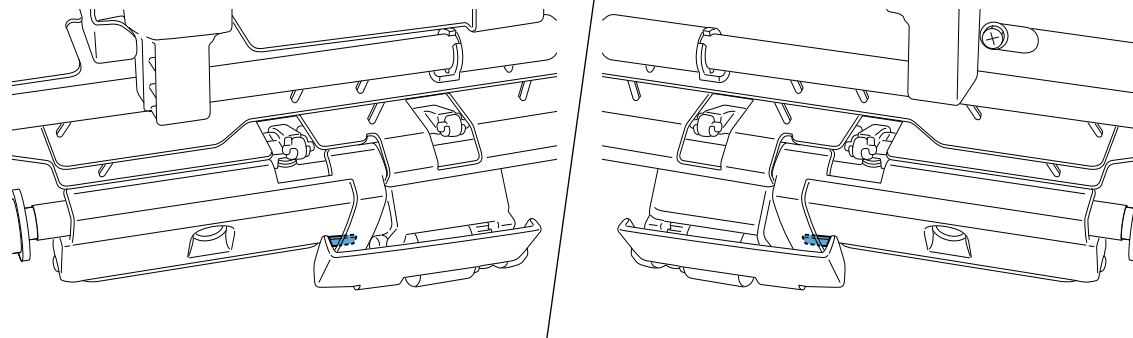
1) Remove the oscillation guide unit. (Refer to page 4-24.)

2) Remove the two screws, and remove the guides (Left) and (Right).

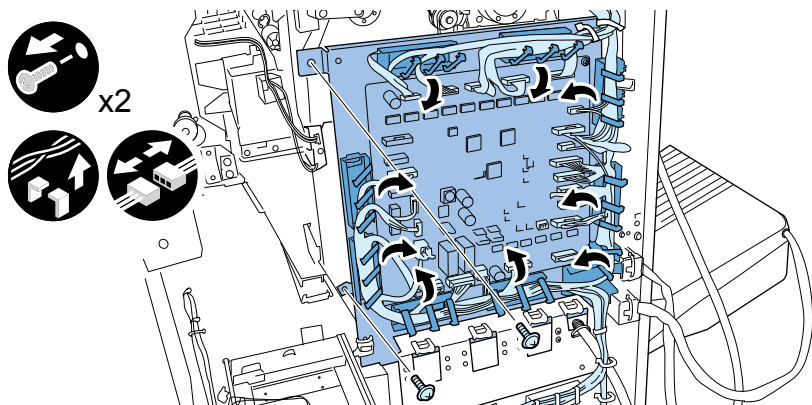


NOTE:

When assembling the guide, put the projection of the paper return in the guide groove.

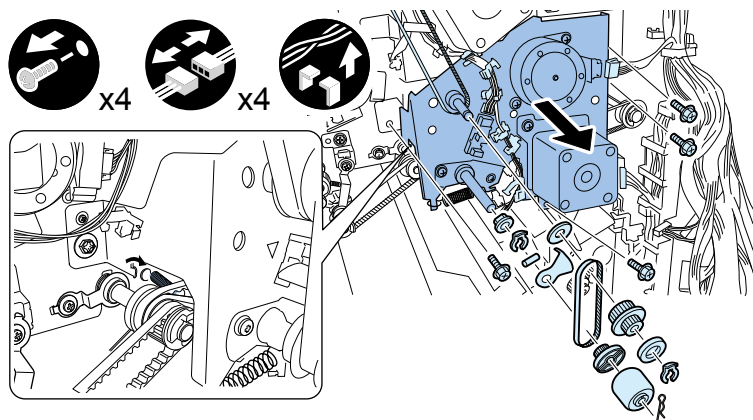


- 3) Disconnect all the connectors on the finisher controller PWB, and remove all the binding wires from the binding wire guides. Remove the two screws, and remove the finisher controller PWB with the mounting base.



F-2-57

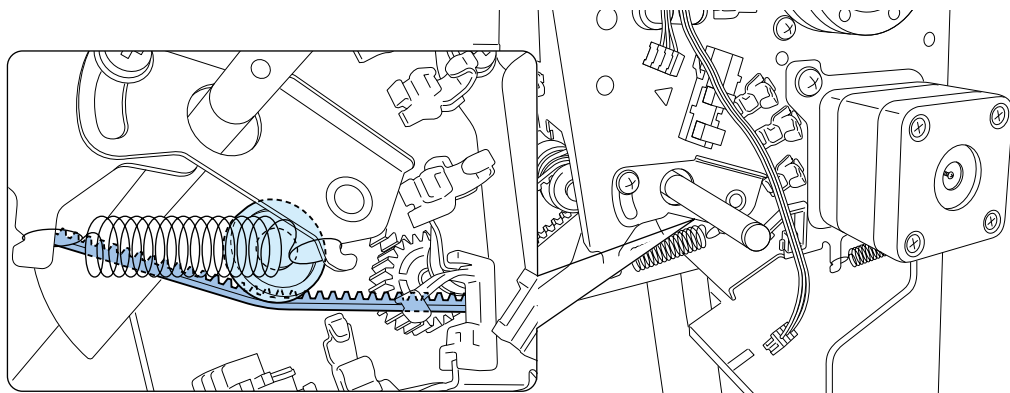
- 4) Remove the pin, the torque limiter, the three washers, the two timing belts, the two pulleys, the sensor lever, the parallel pin, the two clips, and the bushing. Then remove the spring, the four screws, and the four connectors. Remove the binding wire from the binding wire guide, and remove the drive unit.



F-2-58

NOTE:

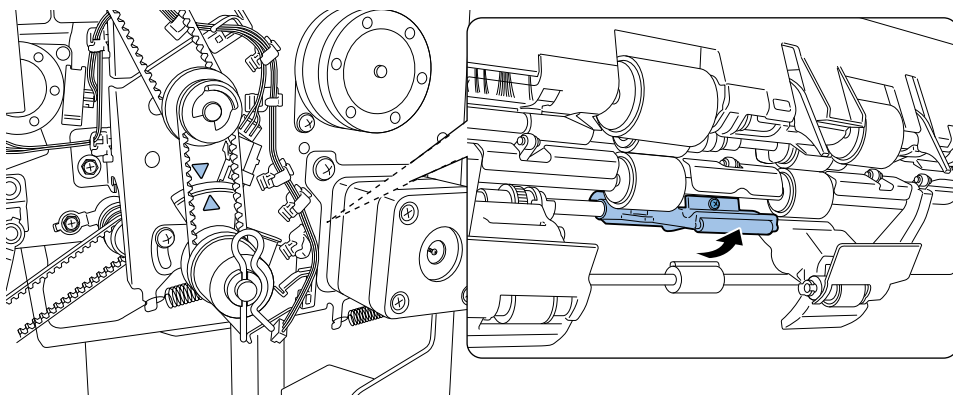
When installing the drive unit, install it so that the tension pulley is inside the belt.



F-2-59

NOTE:

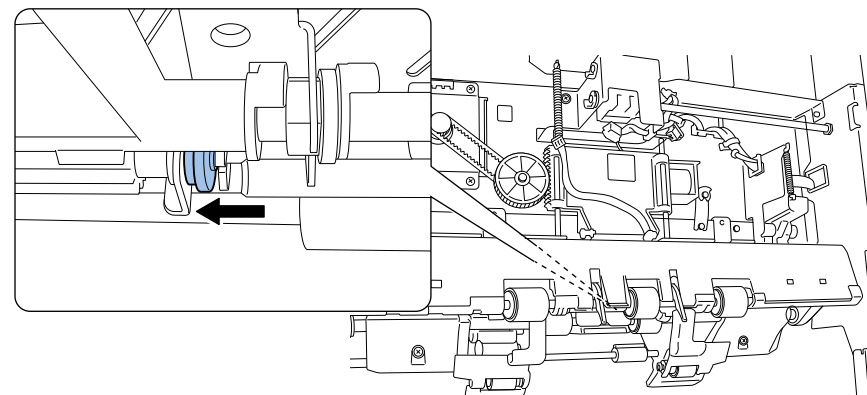
When installing the sensor lever, adjust so that the paper holder comes at the utmost top when mark " Δ " on the lever and mark " Δ " on the drive unit are aligned.



F-2-60

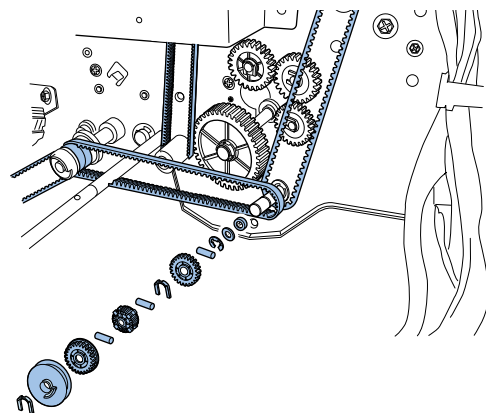
NOTE:

When installing the drive unit, check to confirm that the bushing in the paper holder section is in the support plate.



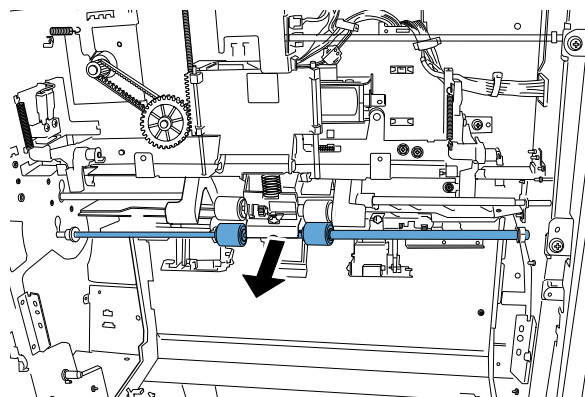
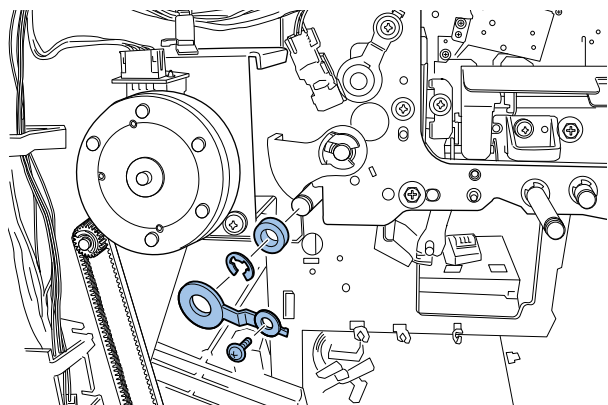
F-2-61

- 5) Remove the two clips, two washers, two pulleys, two parallel pins, three timing belts, one gear, one E-ring, and one bearing.

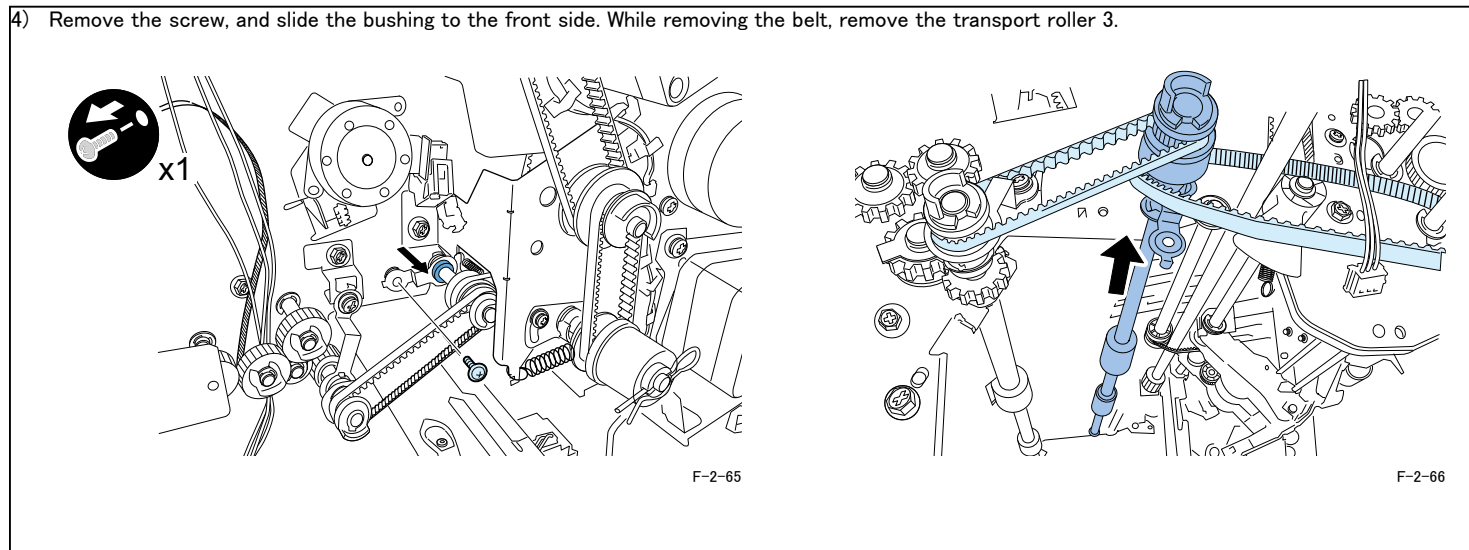
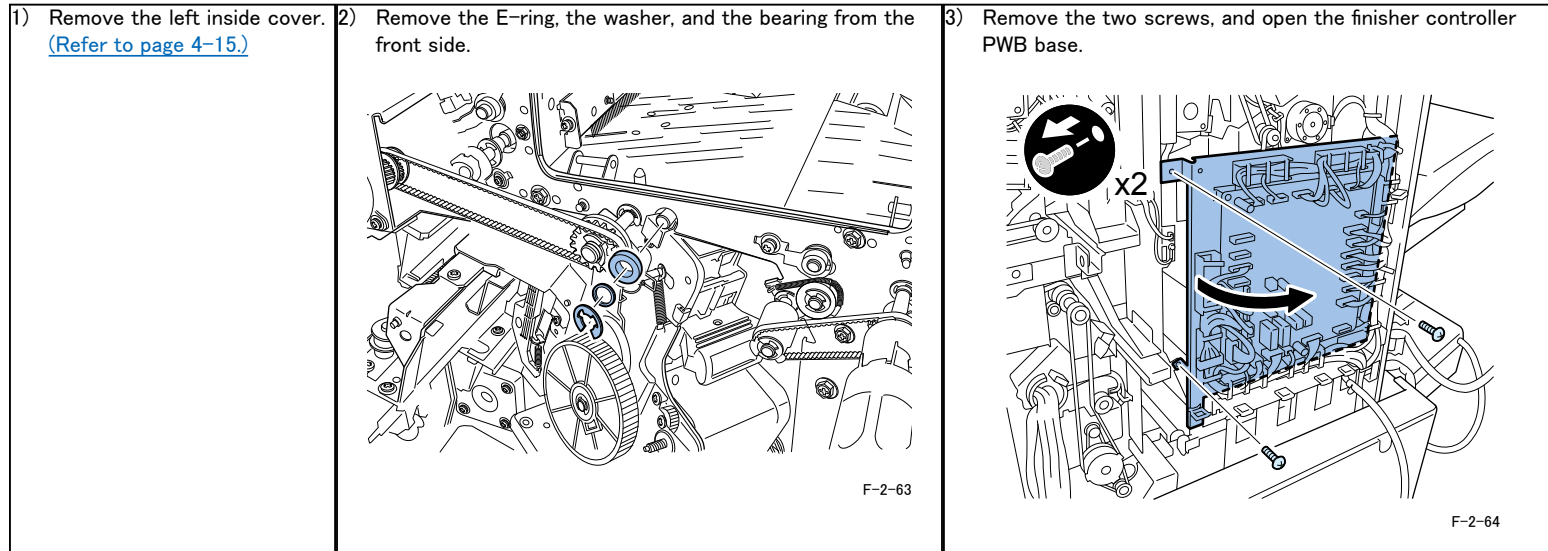


F-2-62

- 6) Remove the screw, the bushing, the E-ring, and the bearing from the front side, and remove the paper exit front roller (Lower).



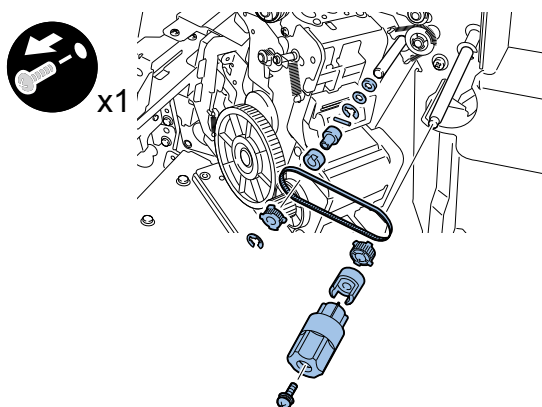
Transport roller 3 disassembly



Buffer roller (Lower) disassembly

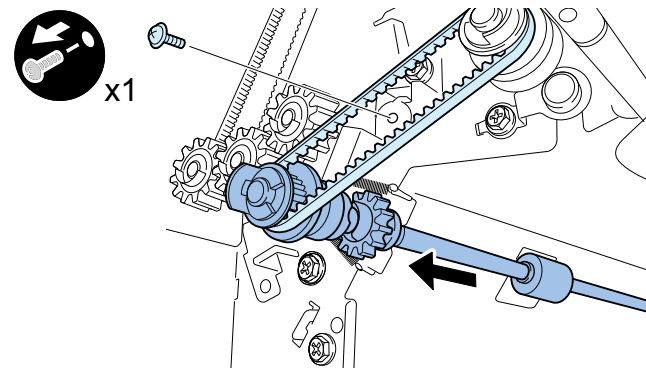
1) Remove the left inside cover.
(Refer to page 4-15.)

2) Remove the screw, the knob, the joint, the two E-rings, the two pulleys, the two latches, the parallel pin, the washer, and the bearing.



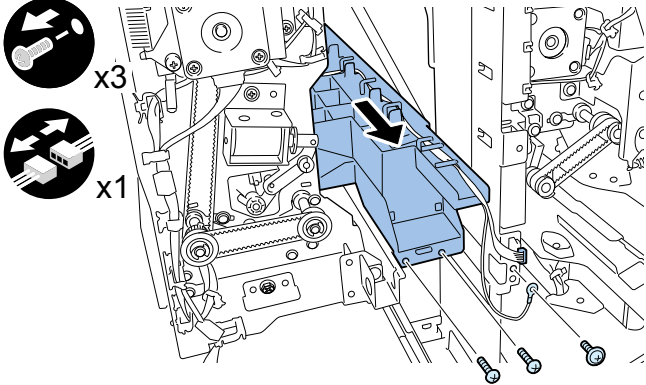
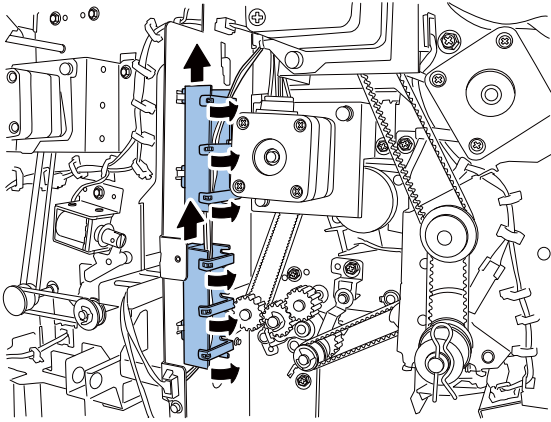
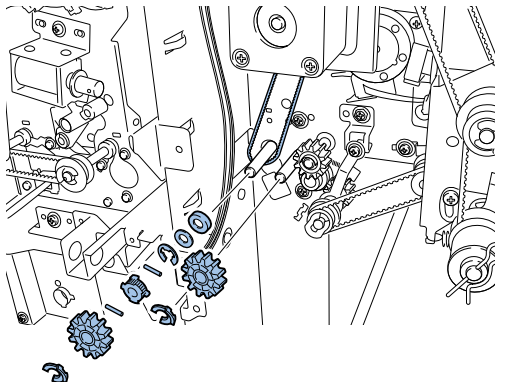
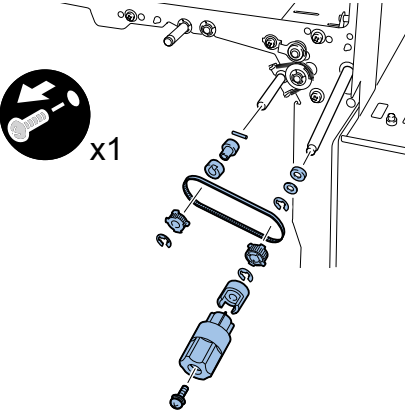
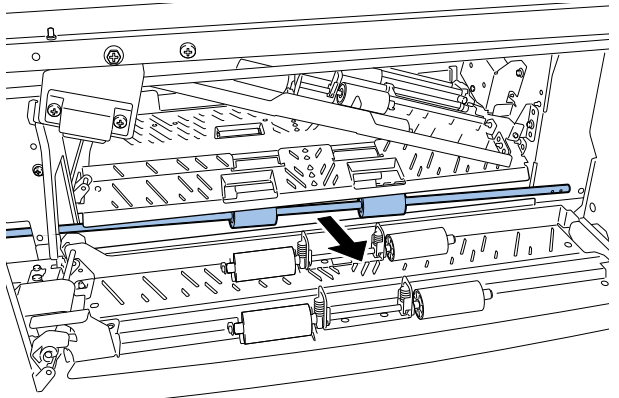
F-2-67

3) Remove the screw from the rear side. While removing the belt, remove the buffer roller (Lower).



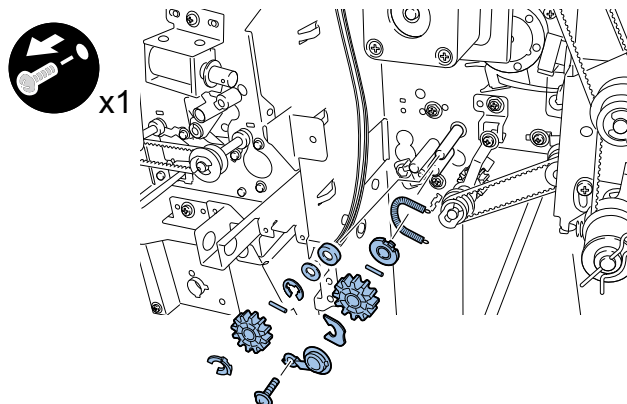
F-2-68

Transport roller 1 disassembly

<p>1) Remove the left inside cover. (Refer to page 4-15.)</p> <p>2) Remove the right inside cover. (Refer to page 4-15.)</p>	<p>3) Remove the three screws and the connector, and remove the inlet guide. If the puncher unit is installed, remove the puncher unit.</p>  <p>F-2-69</p>	<p>4) Remove the binding wire from the binding wire guide, and remove the two binding wire guides.</p>  <p>F-2-70</p>
<p>5) Remove the two clips, the two gears, the two parallel pins, the coupling, the timing belt, the E-ring, the washer, and the bearing from the rear side.</p>  <p>F-2-71</p>	<p>6) Remove the screw, the knob, the three E-rings, the joint, the two couplings, the two latches, the parallel pin, the washer, and the bearing from the front side, and remove the transport roller 1.</p>  <p>F-2-72</p>	 <p>F-2-73</p>

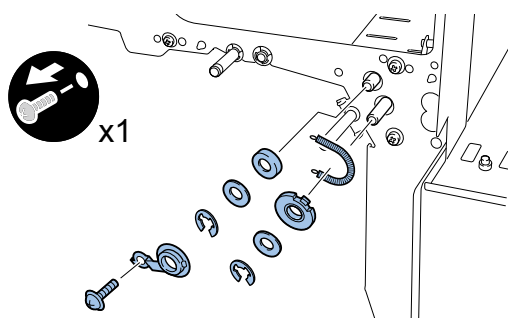
Transport roller 2/buffer roller (Upper) disassembly

- 1) Remove the transport roller 1. [\(Refer to page 4-71.\)](#)
- 2) Remove the two clips, the two gears, the parallel pin, the E-ring, the washer, the two bearings, the screw, the bushing, and the spring from the rear side.

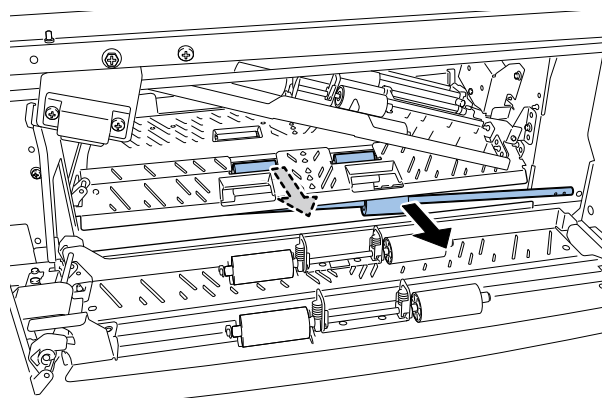


F-2-74

- 3) Remove the screw, the bushing, the two E-rings, the two washers, the two bearings, and the spring from the front side, and remove the transport roller 2. Then remove the buffer roller (Upper).



F-2-75

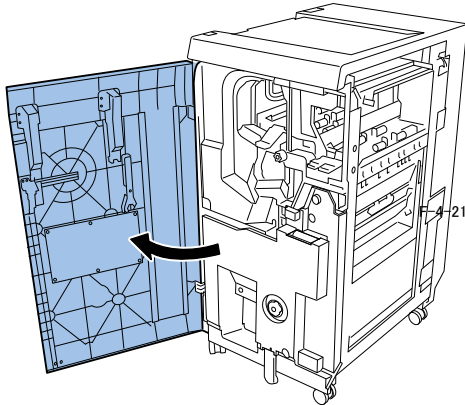


F-2-76

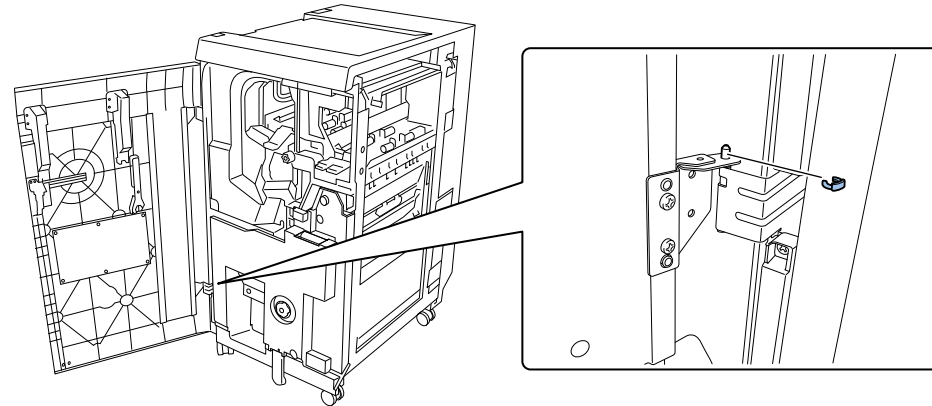
Saddle stitcher section

Front door disassembly (Saddle finisher)

1) Open the front door.



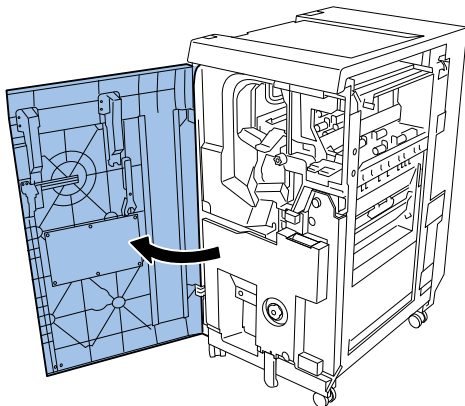
2) Disengage the clip, and remove the front door.



F-4-22

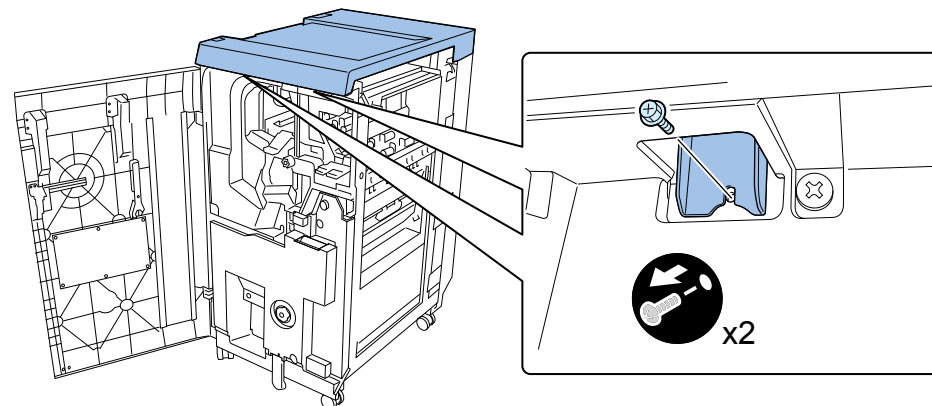
Upper cover disassembly (Saddle finisher)

1) Open the front door.



F-4-25

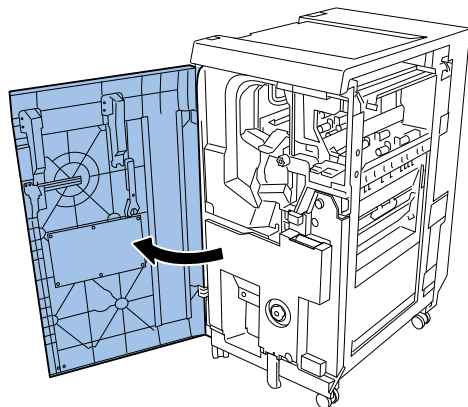
2) Remove two screws, and remove the upper cover.



F-4-26

Left inside cover disassembly (Saddle finisher)

1) Open the front door.

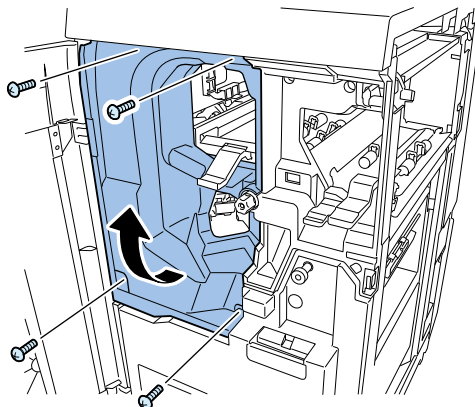


F-4-32

2) Remove four screws, and remove the left inside cover.



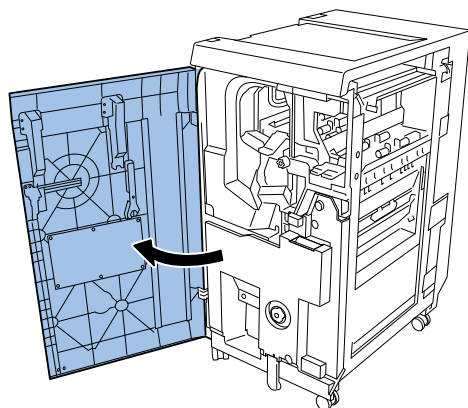
x4



F-4-33

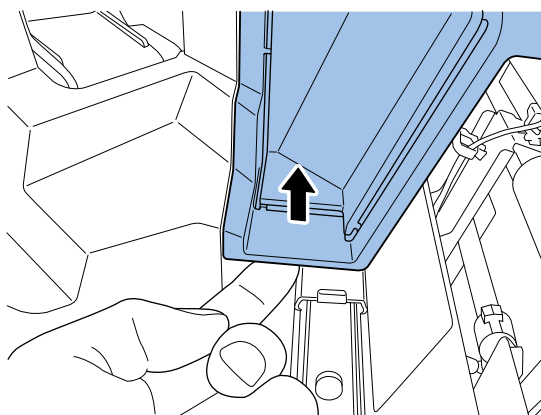
Right inside cover disassembly (Saddle finisher)

1) Open the front door.



F-4-36

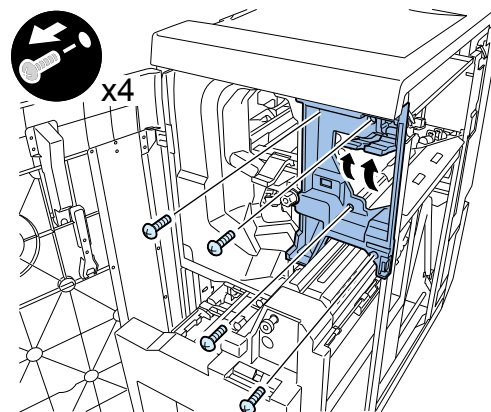
2) Lift the two jam process levers, and pull out the saddle unit a little. Remove four screws. Push the lower section of the right inside cover to disengage the pawl, and remove the right inside cover.



F-4-37



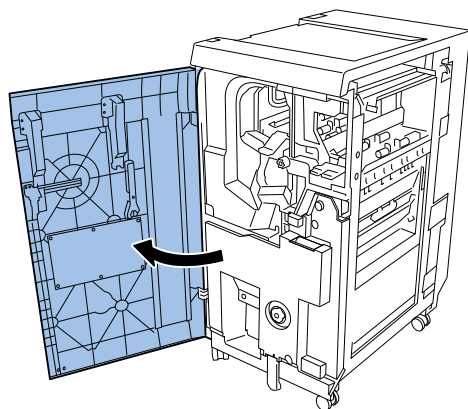
x4



F-4-38

Saddle cover disassembly

1) Open the front cover.

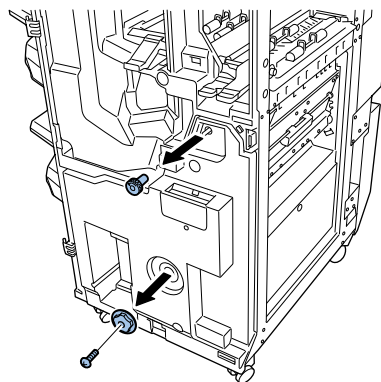


F-4-39

2) Remove the jam dial (upper). Remove one screw, and remove the jam dial (lower).



x1

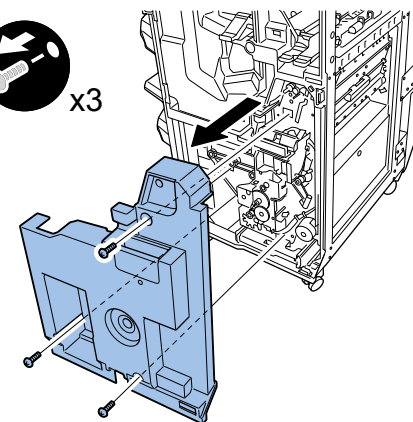


F-4-40

3) Remove three screws, and remove the saddle cover.



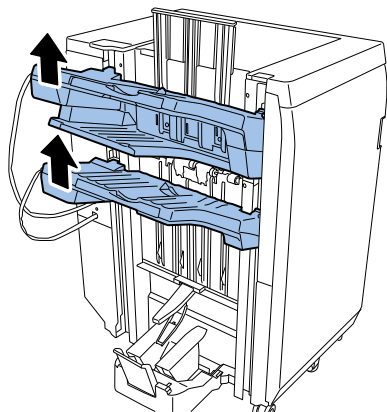
x3



F-4-41

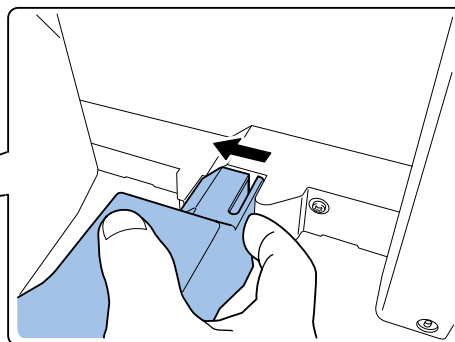
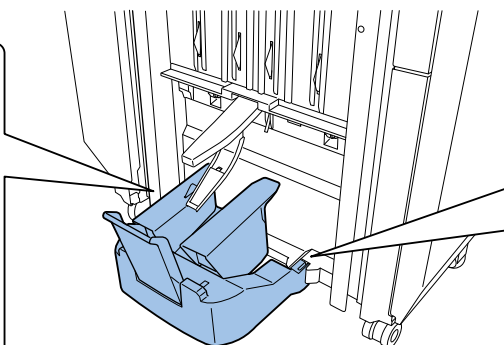
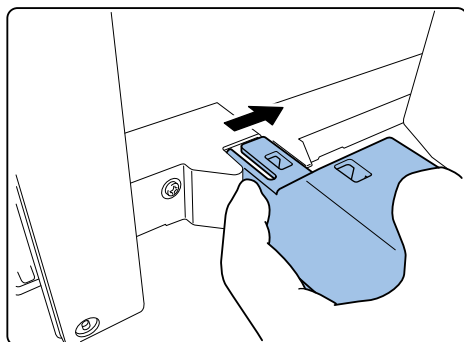
Saddle paper exit tray disassembly

1) Lift the tray 1 and the tray 2.



F-4-51

2) Press the hold with your finger to release it. Remove the saddle paper exit tray, and disconnect the connector.



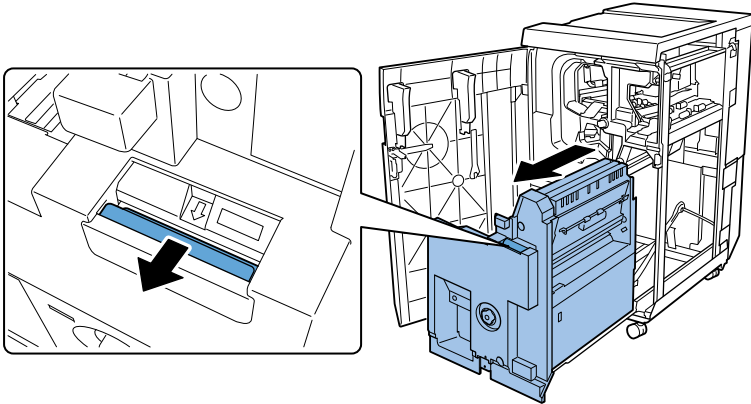
F-4-52

F-4-53

Process tray unit disassembly

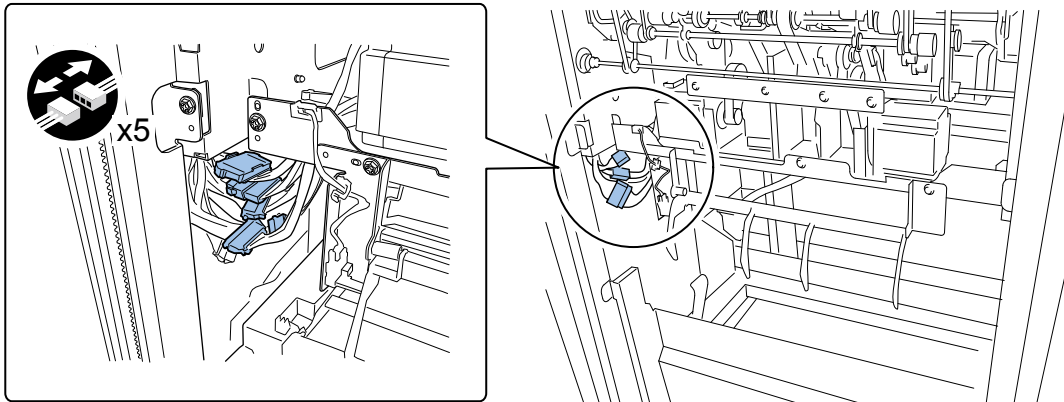
1) Remove the staple drive unit.
(Refer to Page 4-20)

2) Pull out the saddle unit.



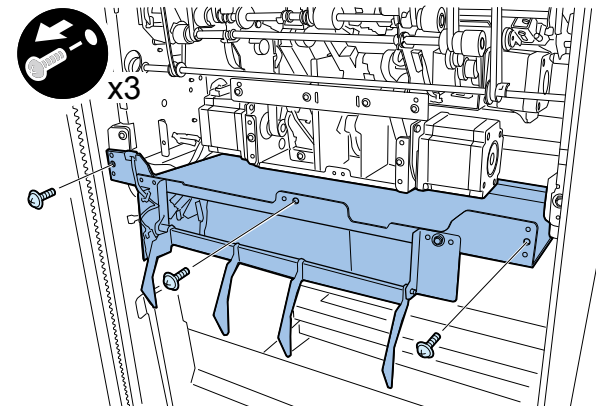
F-4-58

3) Disconnect five connectors.



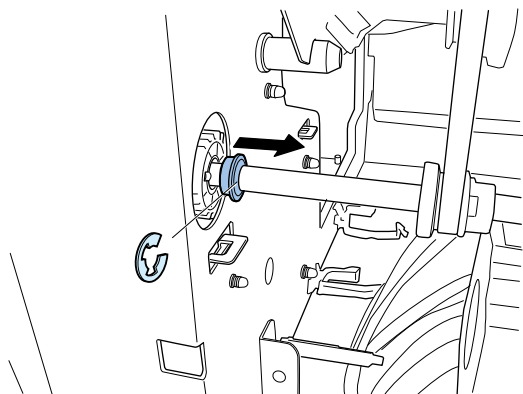
F-4-59

4) Remove three screws, and remove the process tray unit bottom plate.



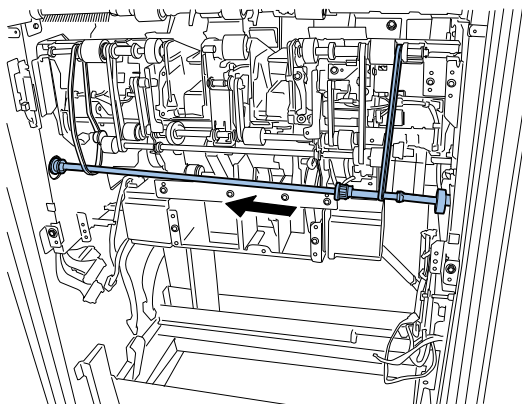
F-4-60

- 5) Remove the E-ring in the rear side, and shift the bearing to the inside of the machine.



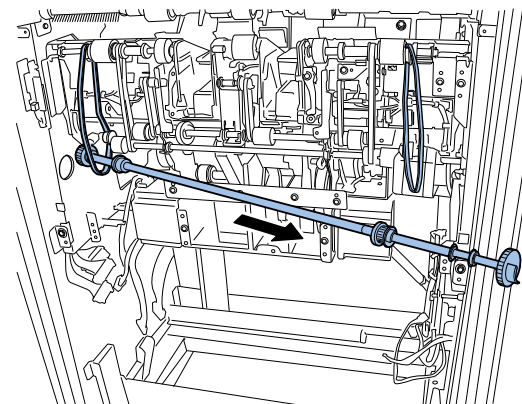
F-4-61

- 6) Shift the drive shaft to the rear side, and pull out the shaft from the belt in the front side.



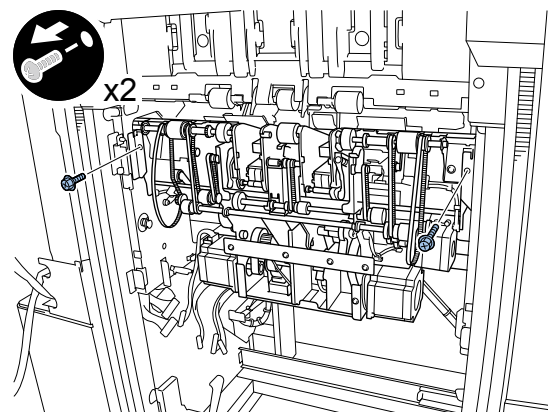
F-4-62

- 7) Shift the drive shaft to the front side, pull out the shaft from the belt in the rear side, and remove the drive shaft.



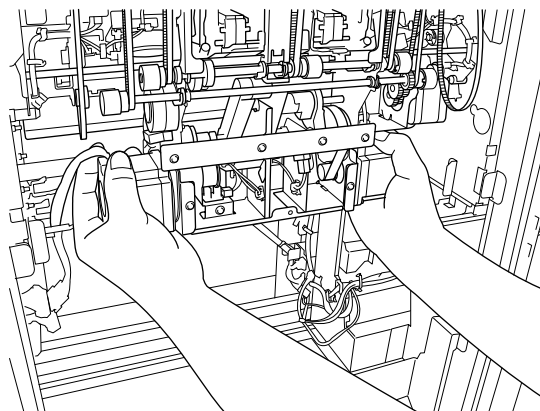
F-4-63

- 8) Remove two screws.



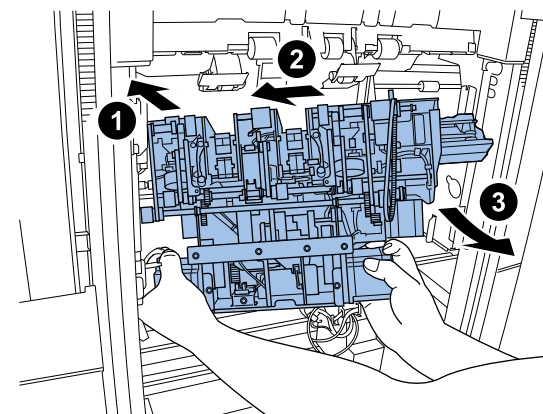
F-4-64

- 9) Hold the motor below the process tray unit.



F-4-65

- 10) Move the left side of the process tray unit to the rear side and remove the process tray unit from the right side.

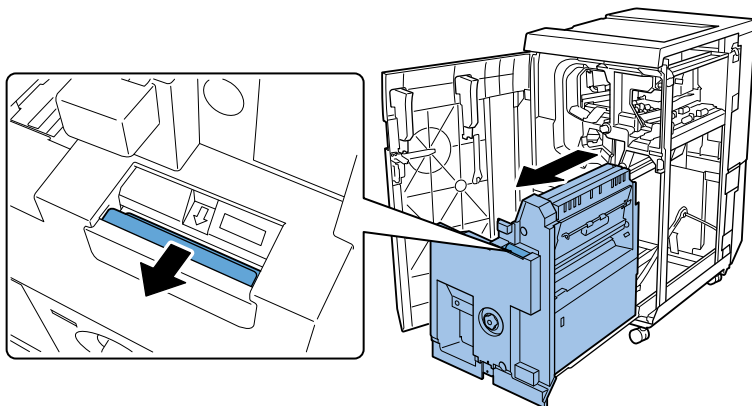


F-4-66

Saddle unit pull-out (Service position)

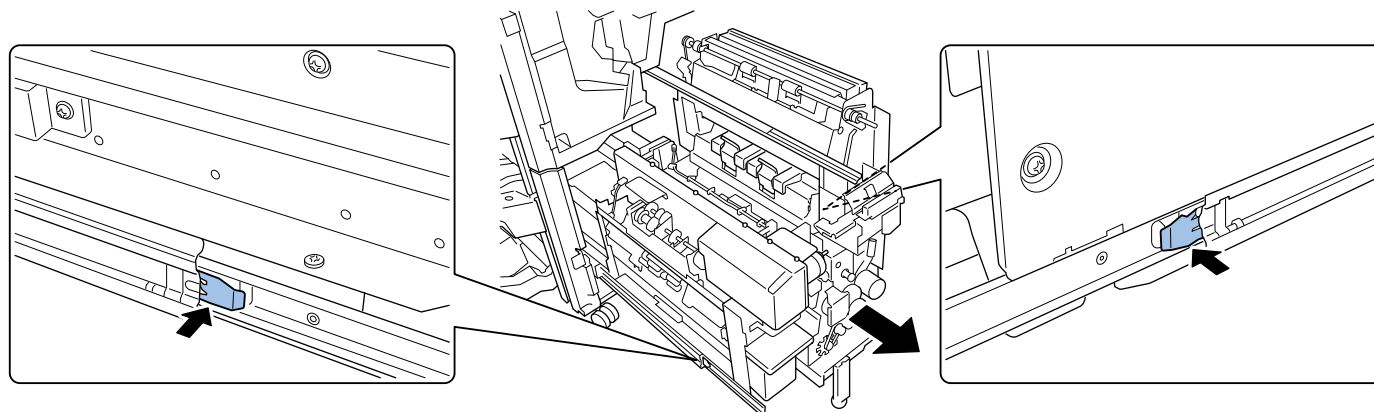
- 1) Open the front door.
(Refer to page [4-13](#))

- 2) Pull out the saddle unit until it stops.



F-4-67

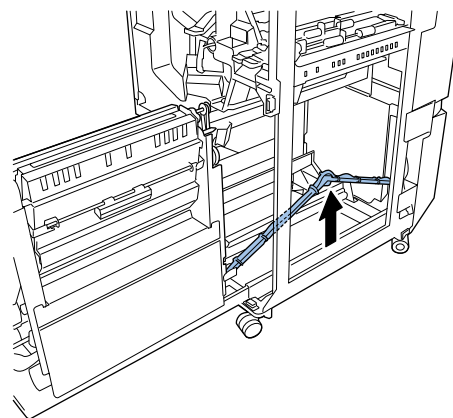
- 3) Release the stopper of the rail, and pull it out about 5cm furthermore.



F-4-68

Note:

- Pull out the saddle unit carefully and gradually. If it is pulled out too much, the saddle communication cable and the cable guide may be broken.
- When returning the saddle unit from the service position to the machine, lift the center portion of the cable guide. If the saddle unit is pushed abruptly, the center of the cable guide falls, resulting in damages in the saddle communication cable and the cable guide.

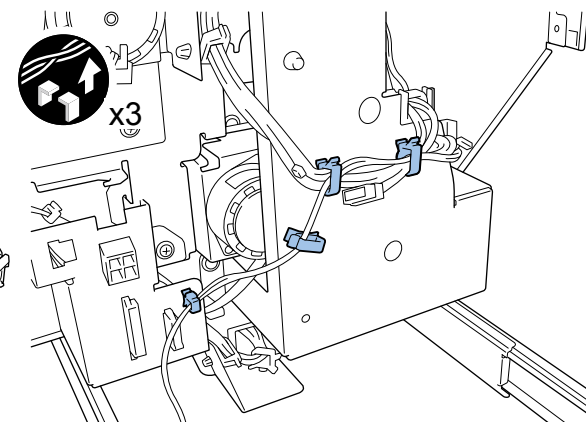
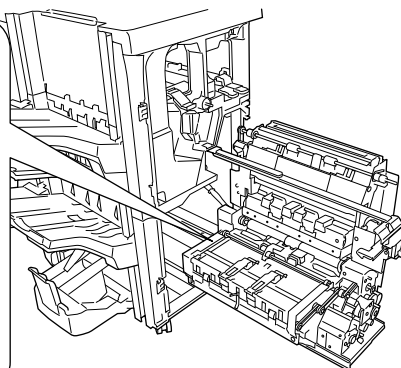
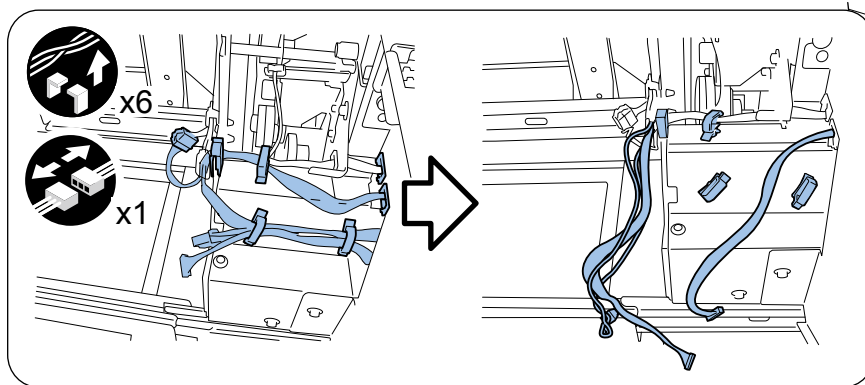


F-4-69

Saddle unit disassembly

- 1) Pull out the saddle unit to the service position.
(Refer to [Page 4-79](#))

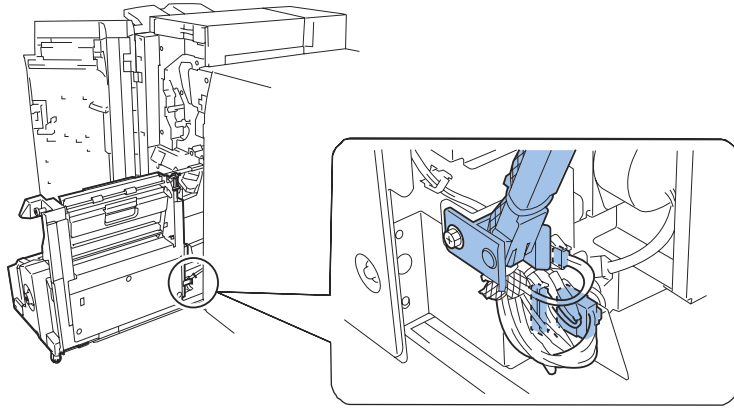
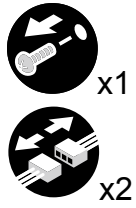
- 2) Disconnect one connector in the rear section of the saddle unit, and remove the bundle line from the wire saddle.



F-4-70

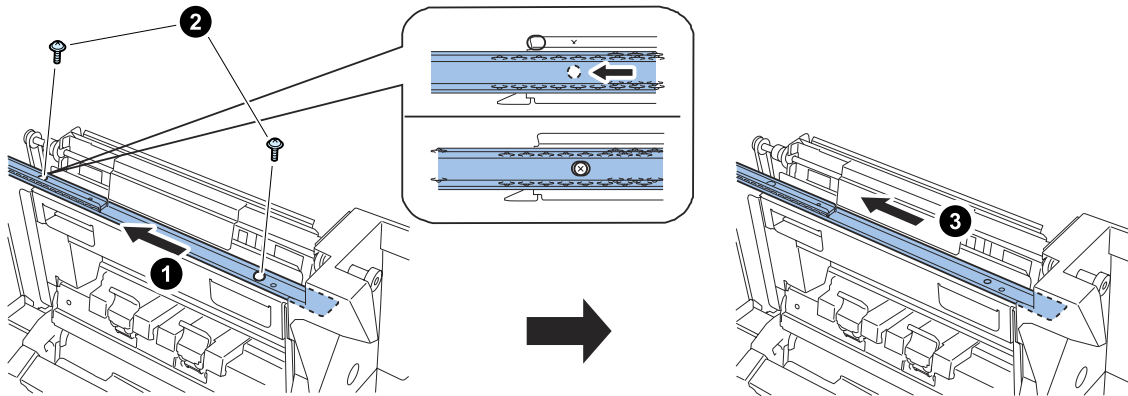
F-4-71

3) Remove one screw, disconnect three connectors, and remove the cable guide.



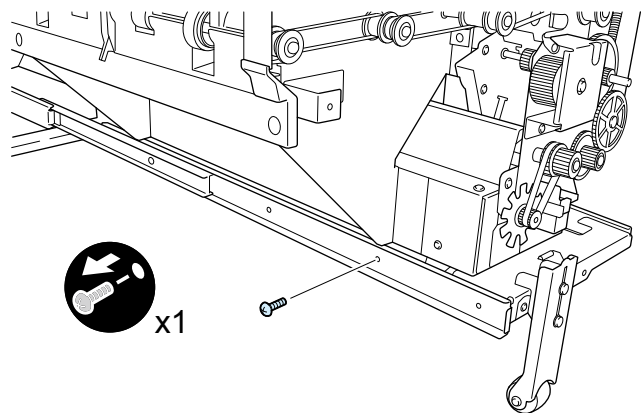
F-4-72

4) Shift the saddle unit to the finisher side until the screw can be seen from the rail hole. Remove two screws.

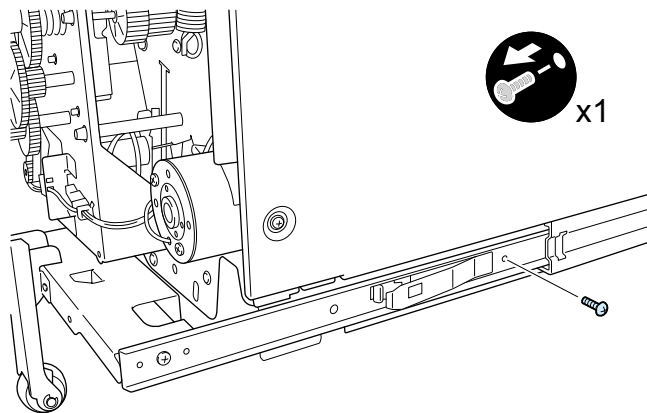


F-4-73

5) Remove two screws from the rail (Left) and the rail (Right)

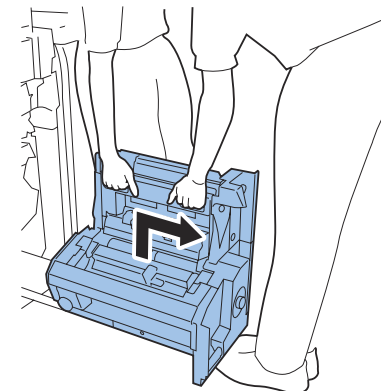


F-4-74



F-4-75

6) Hold the saddle unit as shown in the figure below, and lift it in the arrow direction. Check to confirm that the unit is disengaged from the rail, and carry it.



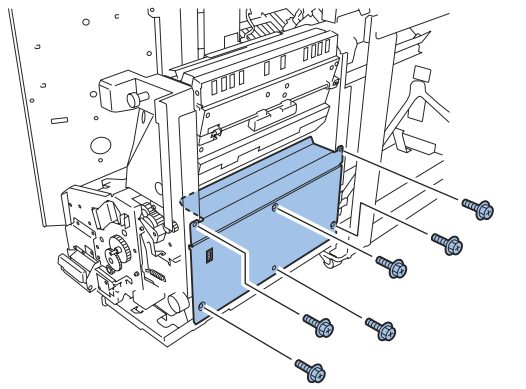
F-4-76

Push unit disassembly

1) Remove the saddle cover.
(Refer to Page 4-75)

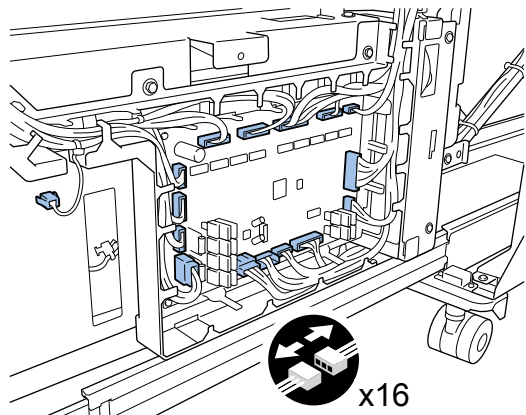
2) Pull out the saddle unit to the service position.
(Refer to Page 4-79)

3) Remove six screws, and remove the PWB cover.



F-4-77

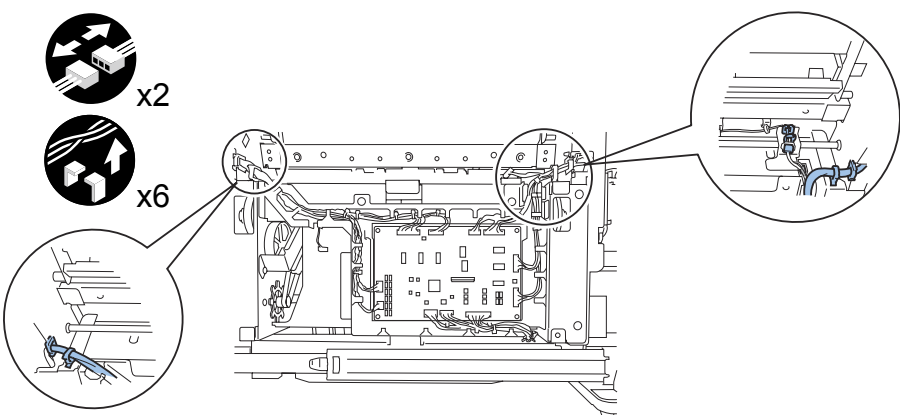
4) Disconnect sixteen connectors, and remove the bundle line from the cable guide.



x16

F-4-78

5) Remove the cable from the wire saddle, and disconnect two connectors.

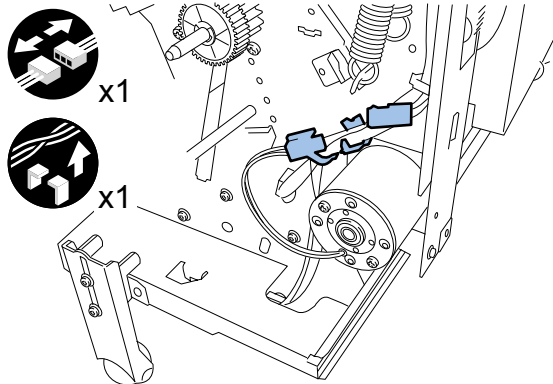


x2

x6

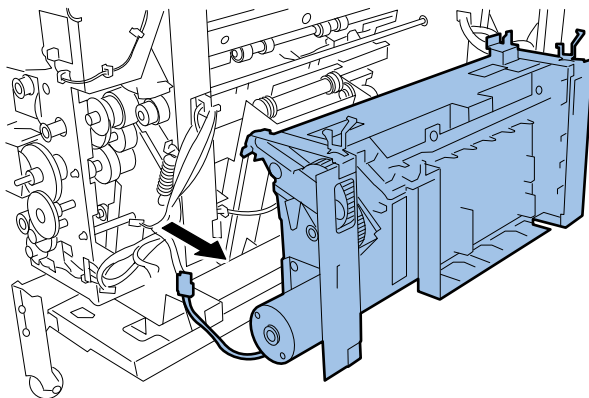
F-4-79

6) Remove the cable from the wire saddle, and disconnect one connector.



F-4-80

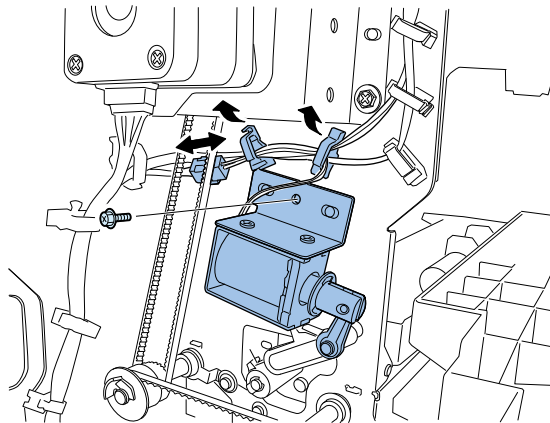
7) Remove four screws and remove the push unit.



F-4-81

Saddle inlet port flapper solenoid (FSSL206) disassembly

- 1) Remove the rear upper cover.
(Refer to Page 4-14)
- 2) Mark the fixing position of the solenoid. Release the solenoid bundle line from the wire saddle, disconnect the connector, remove one screw, and remove the saddle inlet port flapper solenoid.



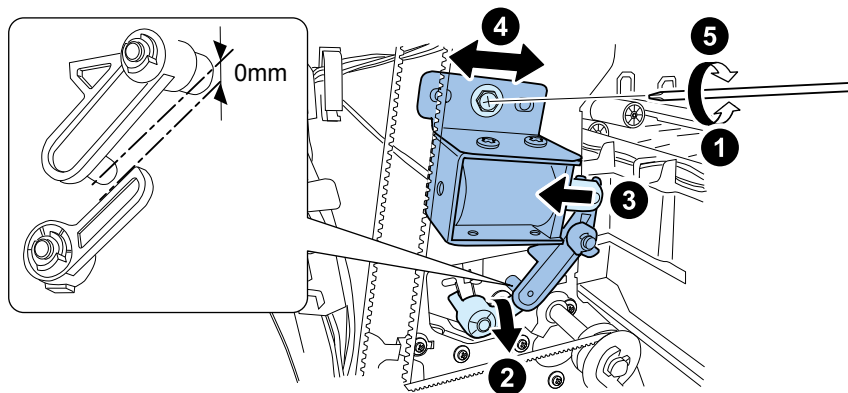
F-4-133

Saddle inlet port flapper solenoid (FSSL206) mounting position adjustment

Note:

When disassembling or assembling the saddle inlet port flapper solenoid, be sure to execute the solenoid mounting position adjustment.

- 1) Loosen the screw.
- 2) Shift and adjust the position of the saddle inlet port flapper solenoid so that the arm section is brought into contact with the link when the solenoid plunger is pressed with the arm section of the saddle inlet port flapper unit lowered until it stops.
- 3) Tighten the screw.

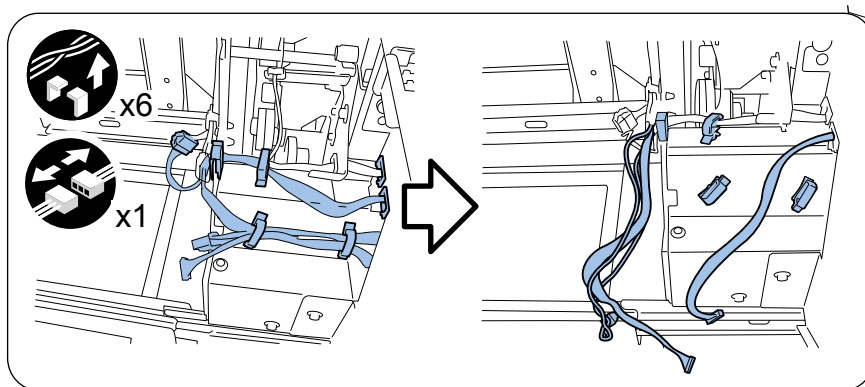


F-4-134

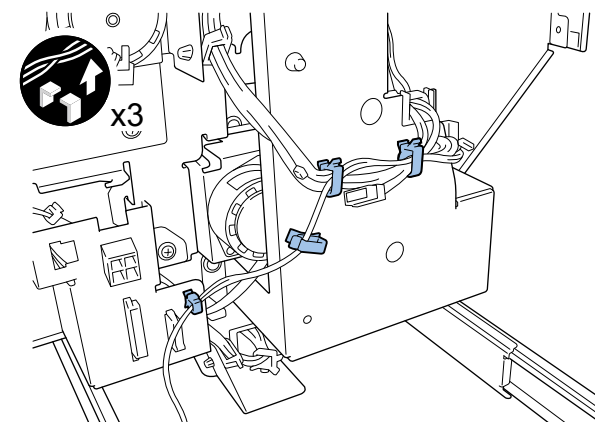
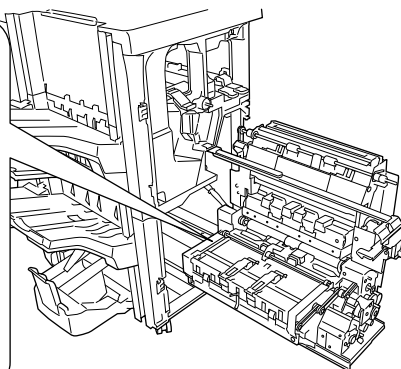
Alignment roller disassembly

- 1) Remove the saddle cover.
(Refer to Page 4-75)
- 2) Pull out the saddle unit to the service position.
(Refer to Page 4-79)

- 3) Disconnect one connector in the rear section of the saddle unit, and remove the bundle line from the wire saddle.

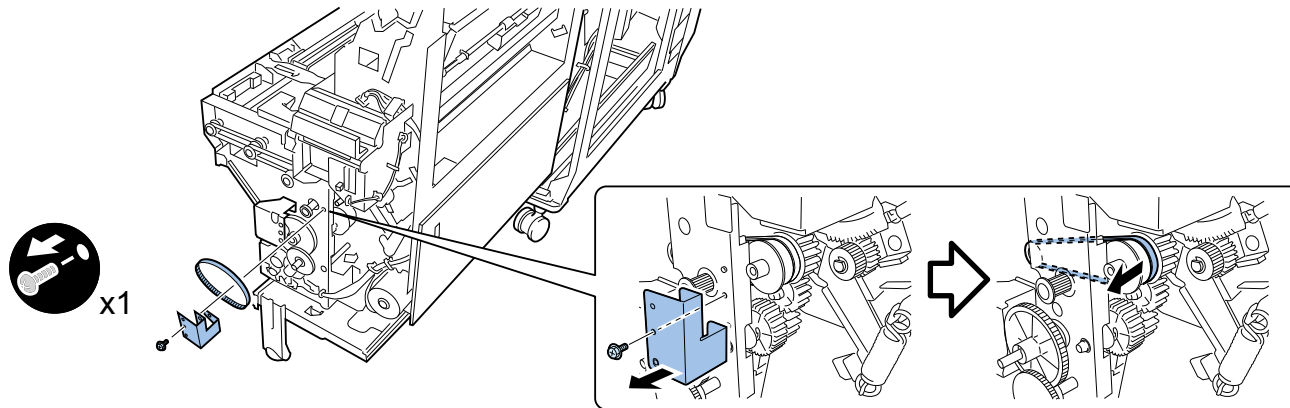


F-4-176



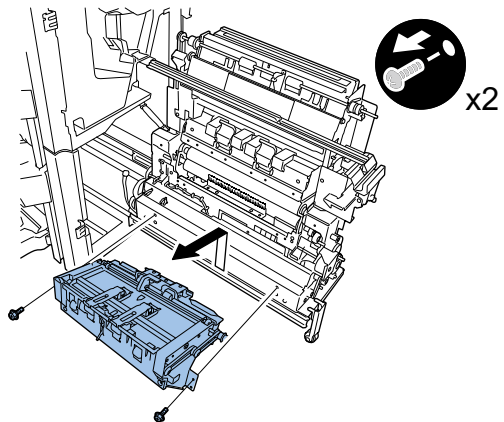
F-4-177

4) Remove one screw and remove the support plate. Shift the pulley toward you and remove the belt.



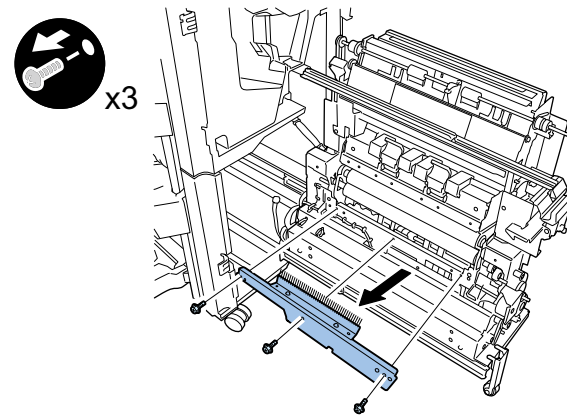
F-4-178

5) Remove two screws, and remove the transport unit.



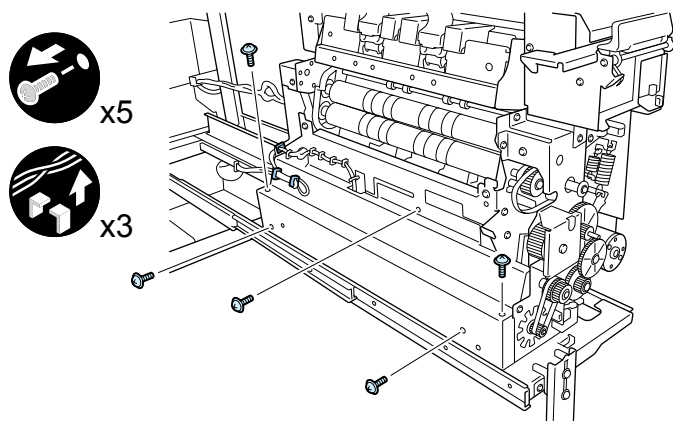
F-4-179

6) Remove three screws and remove the discharge needle unit.



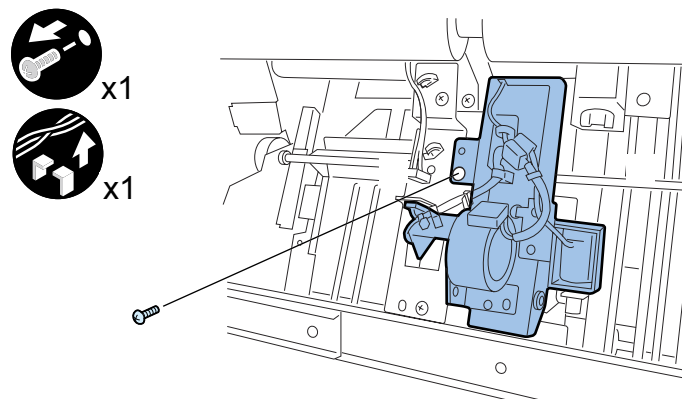
F-4-180

7) Remove the bundle line from the wire saddle. Remove five screws, and remove the transport cover.



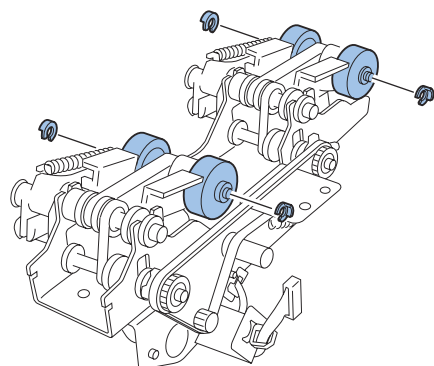
F-4-181

8) Remove one screw, disconnect one connector and remove the alignment roller unit.



F-4-182

9) Remove the clip, and remove the alignment roller.

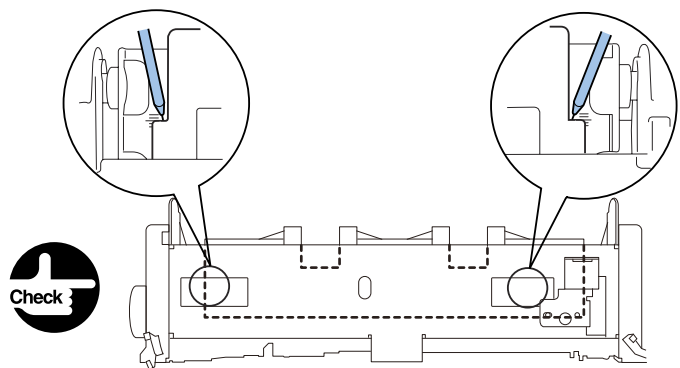


F-4-183

Push plate disassembly

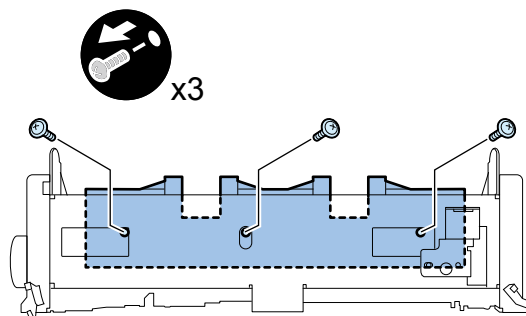
1) Remove the push unit.
(Refer to Page 4-84)

2) Mark the mounting position of the push plate.



F-4-184

3) Remove the three screws, and remove the push plate..

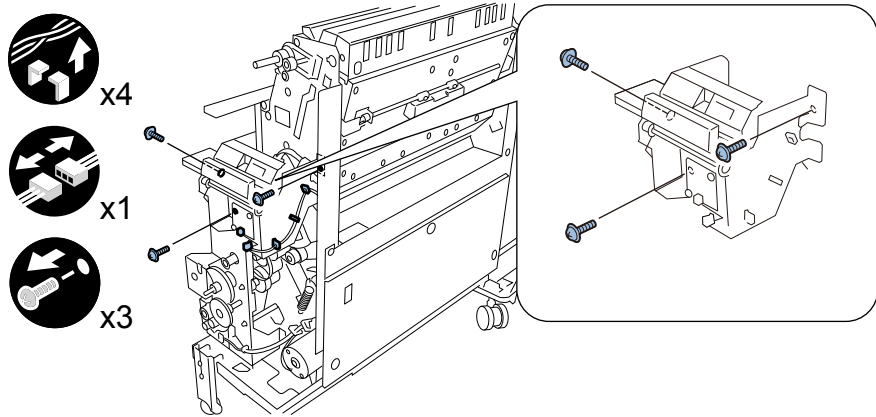
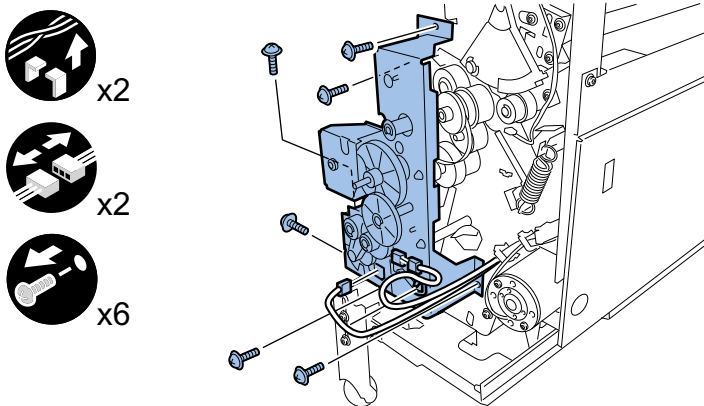


F-4-185

Note: :

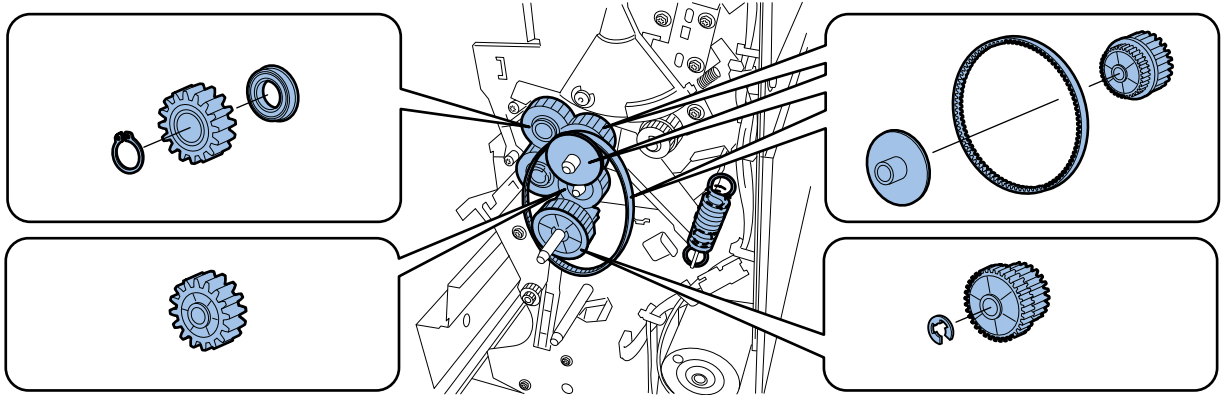
When assembling the push plate,
fit it to the position marked in
procedure 2) and fix it.

Folding rollers (Upper)/(Lower) disassembly

<p>1) Remove the saddle cover. (Refer to Page 4-75)</p> <p>2) Remove the alignment roller. (Refer to Page 4-88)</p>	<p>3) Remove the bundle line from the wire saddle, and disconnect one connector. Remove three screws and remove the saddle handle unit.</p>  <p style="text-align: right;">F-4-186</p>	<p>4) Remove the bundle line from the wire saddle, and disconnect two connectors. Remove six screws and remove the unit fixing base (Front).</p>  <p style="text-align: right;">F-4-187</p>
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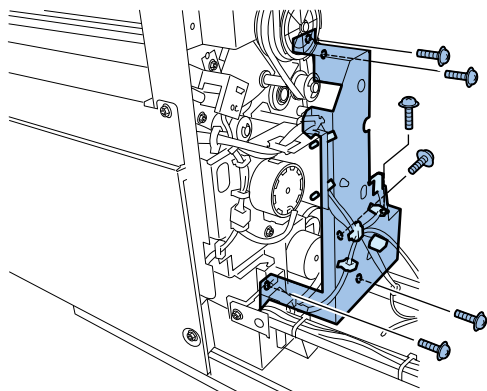
5) Remove the pulley, the belt, the gear, the E-ring, and the stretch spring.

6) Remove the C-ring, the gear, and the bearing in the front side, and remove the pressure plate (Upper).



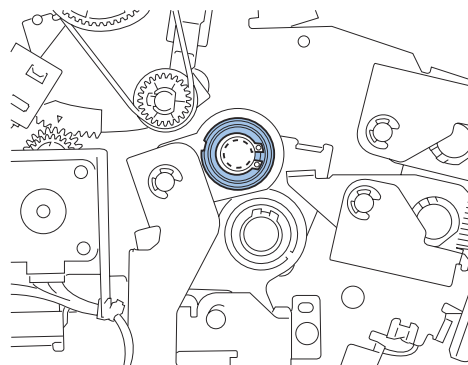
F-4-188

7) Remove the bundle line from the wire saddle and the edge saddle in the rear section of the saddle unit. Remove six screws, and remove the unit fixing base (Rear).



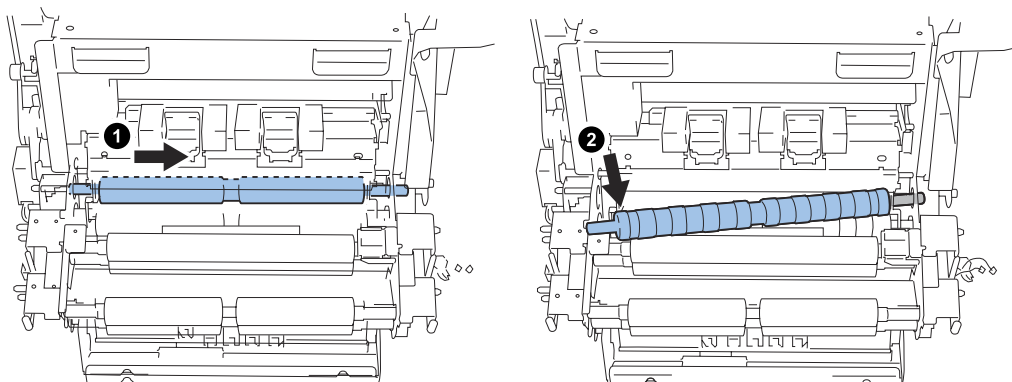
F-4-189

8) Remove the C-ring, the spacer, and the bearing in the rear side.



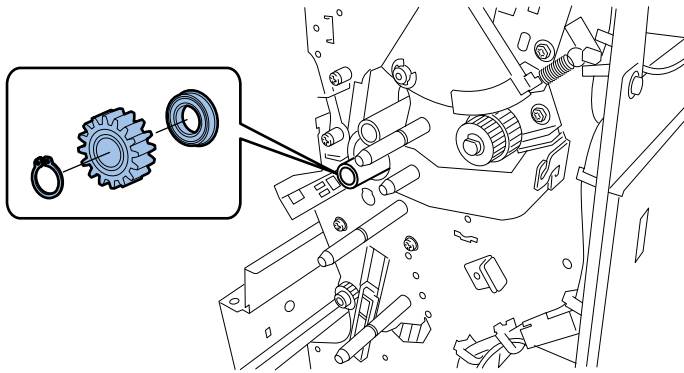
F-4-190

9) Slide the folding roller (Upper) in the arrow direction to remove.



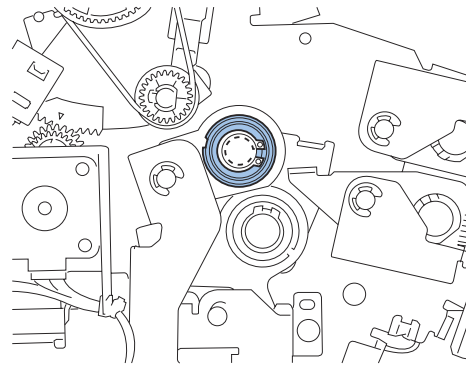
F-4-191

10) Remove the C-ring, the gear, and the bearing in the front side, and remove the pressure plate (Lower).



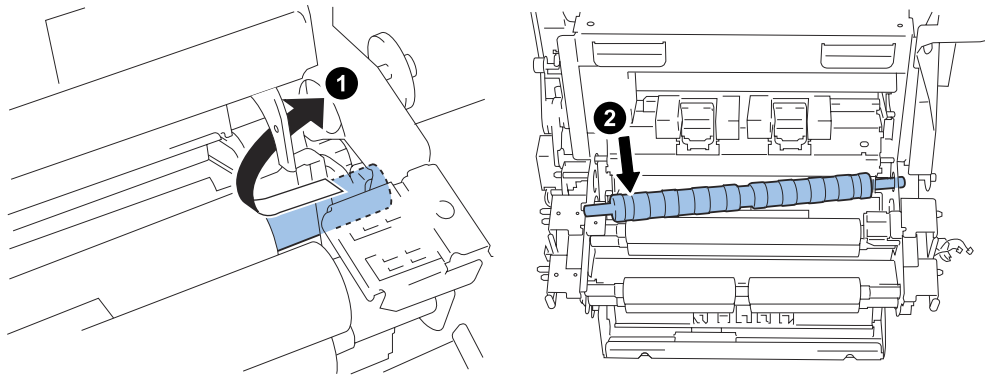
F-4-192

11) Remove the C-ring, the sensor flag, and the bearing in the rear side.



F-4-193

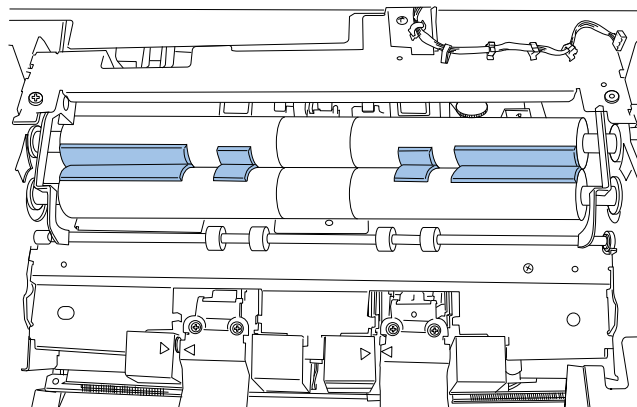
12) Slide the folding roller (Lower) in the arrow direction to remove.



F-4-194

Note:

When assembling the folding rollers, fit the extended portions of the folding roller (Upper) and the folding roller (Lower) together.



F-4-195

5

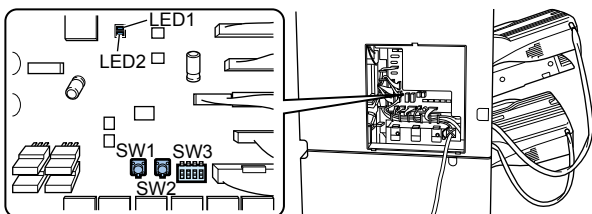
ADJUSTMENTS

- + Outline
- + Operational Descriptions of Service Mode
- + Basic adjustment
- + Set value display
- + Adjustments When Replacing Parts

Outline

Outline

The service mode adjustments are performed with SW1 (Push SW), SW2 (Push SW), SW3 (DIP SW), LED1, and LED2.



F-5-1

Details

Supply the power with SW3 on the finisher PWB all OFF, and set SW3 for a service mode adjustment. Then press SW1 for 2 sec, and the service mode adjustment is started.

When a service mode adjustment is not performed, LED1 repeats 0.5sec ON and 0.5sec OFF.

Operational Descriptions of Service Mode

Outline

The operations by the DIPSW and the push SW on the finisher PWB in the service mode are described below.

Details

(1) The operations of the service mode are divided into the following contents depending on the status of SW3.

SW3	1	2	3	4	Contents of Service Mode Operations
ON ■ / OFF □	□	□	□	□	Disable
ON ■ / OFF □	■	□	□	□	Punch horizontal registration sensor adjustment
ON ■ / OFF □	□	■	□	□	Punch dust sensor adjustment
ON ■ / OFF □	■	■	□	□	Trimmer dust sensor adjustment
ON ■ / OFF □	□	□	■	□	Not used.
ON ■ / OFF □	■	□	■	□	Bleedthrough prevention mode setting (Buffering is performed from the first bundle.)
ON ■ / OFF □	□	■	■	□	Not used.
ON ■ / OFF □	■	■	■	□	Not used.
ON ■ / OFF □	□	□	□	■	Not used.
ON ■ / OFF □	■	□	□	■	Not used.
ON ■ / OFF □	■	■	□	■	Not used.
ON ■ / OFF □	□	□	■	■	Not used.
ON ■ / OFF □	■	□	■	■	Not used.
ON ■ / OFF □	□	■	■	■	Not used.
ON ■ / OFF □	■	■	■	■	Disable

Basic adjustment

Punch horizontal registration sensor adjustment

Outline

The punch horizontal registration sensor adjustment is performed.

Details

Operation start conditions

- (1) With SW3 all OFF, turn ON the power.
- (2) Set SW3 as shown below, and press and hold SW1 for 2 sec.

SW3	1	2	3	4
ON ■ / OFF □	■	□	□	□

Operation end conditions

- (1) With SW3 all OFF, turn OFF the power.

Adjustment procedures

- (1) Press and hold SW1 for 2 sec or more. When SW1 is released, the sensor adjustment is started.
If the punch unit is not provided, LED1 flashes at a very high speed.
※ (100ms ON) → (100ms OFF) → (100ms ON) → (100ms OFF) → ... The operations are repeated.
When SW2 is pressed, LED1 returns to the normal flashing. (LED1 repeats 0.5 sec ON → 0.5 sec OFF.)
- (2) During the adjustment, LED1 and LED2 light up.
- (3) When the adjustment is completed successfully, LED returns to the normal flashing. (LED1 repeats 0.5 sec ON → 0.5 sec OFF.) When the adjustment is completed successfully, the new adjustment value is written into the EEPROM.
- (4) If the adjustment is failed, LED1 flashes to indicate the failed sensor by the number of times of flashing.

Number of times of LED1 flashing	Adjustment-failed sensor
Once	A3 sensor
Twice	LD sensor
3 times	B4 sensor
4 times	A4R sensor
5 times	B5R sensor

※ (Flashes 250ms ON → 250ms OFF by the above number of times.) → (1000ms OFF) → (Flashes 250ms ON → 250ms OFF by the above number of times.) → (1000ms OFF) → ... The operations are repeated.

To cancel the display of adjustment failure, press SW2, and LED1 returns to the normal flashing. (LED1 repeats 0.5 sec ON → 0.5 sec OFF.)

Punch dust sensor adjustment

Outline

The punch dust sensor adjustment is performed.

Details

Operation start conditions

- (1) With SW3 all OFF, turn ON the power.
- (2) Set SW3 as shown below, and press and hold SW1 for 2 sec.

SW3	1	2	3	4
ON ■ / OFF □	□	■	□	□

Operation end conditions

- (1) With SW3 all OFF, turn OFF the power.

Adjustment procedures

- (1) Press and hold SW1 for 2 sec or more. When SW1 is released, the sensor adjustment is started.
If the punch unit is not provided, LED1 flashes at a very high speed.
※ (100ms ON) → (100ms OFF) → (100ms ON) → (100ms OFF) → ... The operations are repeated.
When SW2 is pressed, LED1 returns to the normal flashing. (LED1 repeats 0.5 sec ON → 0.5 sec OFF.)
- (2) During the adjustment, LED1 and LED2 light up.
- (3) When the adjustment is completed successfully, LED returns to the normal flashing. (LED1 repeats 0.5 sec ON → 0.5 sec OFF.) When the adjustment is completed successfully, the new adjustment value is written into the EEPROM.
- (4) If the adjustment is failed, LED1 flashes at a very high speed.
※ (250ms ON) → (250ms OFF) → (250ms ON) → (250ms OFF) → ... The operations are repeated.
To cancel the display of adjustment failure, press SW2, and LED1 returns to the normal flashing. (LED1 repeats 0.5 sec ON → 0.5 sec OFF.)

Trimmer dust sensor adjustment

Outline

The trimmer dust sensor adjustment is performed.

Details

Operation start conditions

- (1) With SW3 all OFF, turn ON the power.
- (2) Set SW3 as shown below, and press SW1 for 2 sec.

SW3	1	2	3	4
ON ■ / OFF □	■	■	□	□

Operation end condition

- (1) With SW3 all OFF, turn OFF the power.

Adjustment procedures

- (1) Press and hold SW1 for 2 sec or more. When SW1 is released, the sensor adjustment is started.
If the trimmer unit is not provided, LED1 flashes at a very high speed.
※ (100ms ON) → (100ms OFF) → (100ms ON) → (100ms OFF) → ... The operations are repeated.
When SW2 is pressed, LED1 returns to the normal flashing. (LED1 repeats 0.5 sec ON → 0.5 sec OFF.)
- (2) During the adjustment, LED1 and LED2 light up.
- (3) When the adjustment is completed successfully, LED returns to the normal flashing. (LED1 repeats 0.5 sec ON → 0.5 sec OFF.) When the adjustment is completed successfully, the new adjustment value is written into the EEPROM.
- (4) If the adjustment is failed, LED1 flashes at a very high speed.
※ (250ms ON) → (250ms OFF) → (250ms ON) → (250ms OFF) → ... The operations are repeated.
To cancel the display of adjustment failure, press SW2, and LED1 returns to the normal flashing. (LED1 repeats 0.5 sec ON → 0.5 sec OFF.)

Bleedthrough prevention mode setting

Outline

By this setting, the finisher operates in the Bleedthrough prevention mode.

[Bleedthrough prevention content]

Buffer operation is performed for all buffer enable paper (plain paper of A4, LT, B5, 16K) in the offset mode, disabling take-up of paper to the process tray when there is any paper in the process tray.

Details

Operation start conditions

- (1) With SW3 all OFF, turn ON the power.
- (2) Set SW3 as shown below, and press SW1 for 2 sec.

SW3	1	2	3	4
ON ■ / OFF □	■	□	■	□

Operation end conditions

- (1) With SW3 all OFF, turn OFF the power.

Setting procedures

- (1) The current set value is indicated by LED1 and LED2.
- (2) To set to the normal mode, press SW1.
To set to the bleedthrough prevention mode, press SW2.
- (3) LED1 and LED2 turns ON for 500 ms.
- (4) The new set value is indicated by LED1 and LED2.
- (5) Press SW1 for 2 sec to write the new set value into the EEPROM.
Press SW2 for 2 sec to cancel the setting.
- (6) LED2 turns OFF, and LED1 repeats 0.5 sec ON → 0.5 sec OFF.

Setting range

1 [Normal mode] or 2 [Bleedthrough prevention mode]
(Default value: 1 [Normal mode])

Set value display

Outline

The value on the tens digit is indicated by the number of flashing of LED1, and the value on the ones digit by the number of flashing of LED2.


The flashing speed is 300 [ms].

To indicate "0," LED turns ON for 2 sec.

Details

Example 1) To indicate the set value of 1:


(When the number of flashing on the tens digit is 0 and that on the ones digit is 1, the set value is $10 \times 0 + 1 \times 1 = 1$.)

	LED1	LED2	Remark
Repeats 	Tens digit	● (ON for 2 sec)	LED1 ON (2 sec)
		○	LED1/LED2 OFF (1sec)
	Ones digit	◎ (Flashes once.)	Flashes every 300 [ms].
		○	LED1/LED2 OFF (1 sec)

○ = OFF, ● = ON, ◎ = Flash

Example 2) To indicate the set value of 2:

(When the number of flashing on the tens digit is 0 and that on the ones digit is 2, the set value is $10 \times 0 + 1 \times 2 = 2$.)

	LED1	LED2	Remark
Repeats 	Tens digit	● (ON for 2 sec)	LED1 ON (2sec)
		○	LED1/LED2 OFF (1sec)
	Ones digit	◎ (Flashes twice.)	Flashes every 300 [ms].
		○	LED1/LED2 OFF (1sec)

○ = OFF, ● = ON, ◎ = Flash

Adjustments When Replacing Parts

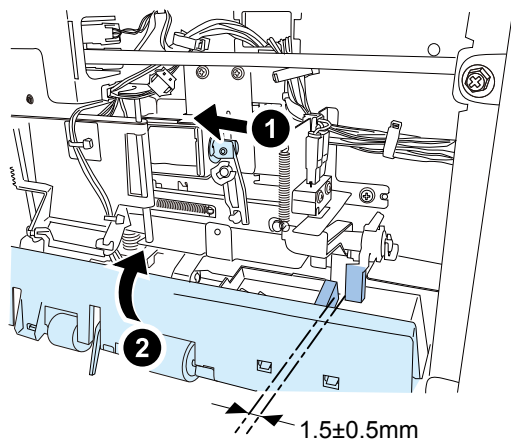
Oscillation unit installing position adjustment

Note:

When the oscillation unit, the oscillation guide upper cover, or the Finisher Safety Switch2 Solenoid (FNSL101) is disassembled or assembled, be sure to check the clearance between the oscillation guide upper cover and the arm section of the Finisher Safety Switch2.

- 1) Check to conform that the clearance between the oscillation guide upper cover and the arm section of the Finisher Safety Switch2 is $1.5 \pm 0.5\text{mm}$ when the oscillation guide is lifted with the Finisher Safety Switch2 Solenoid plunger pushed.

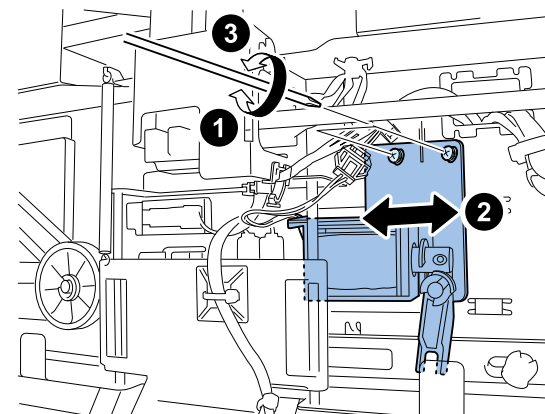
If the clearance is not in the specified range, adjust according to the procedures 2) and 3).



F-5-17

- 2) Loosen the two screws, and shift the installing position of the Finisher Safety Switch2 Solenoid to adjust the arm section position of the Finisher Safety Switch2.

After that, tighten the two screws which were loosened previously.



F-5-18

- 3) Check to confirm that the clearance between the oscillation guide upper cover and the arm section of the Finisher Safety Switch2 is within the specified range. If it is not within the specified range, adjust according to the procedure of 2) again.

Note:

If the clearance between the oscillation guide upper cover and the arm section of the Finisher Safety Switch2 is not within the specified range, it may cause a malfunction.

Note for replacing the finisher controller PWB

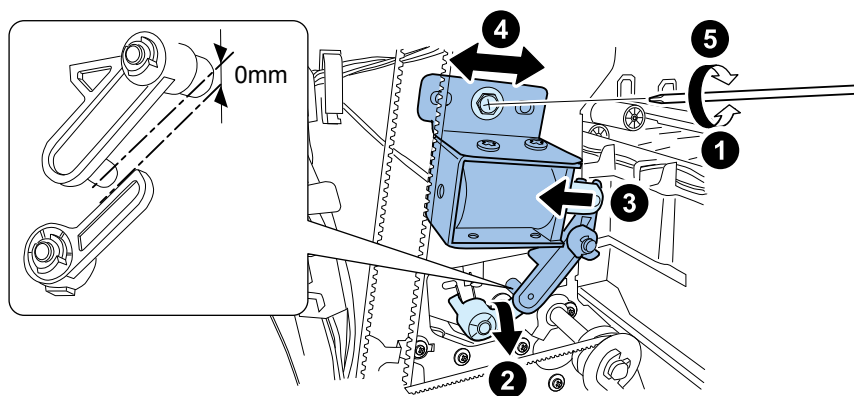
When replacing the finisher controller PCB, the setting information is held by insertion of the EEPROM of the old PCB into a new PCB, eliminating the need for various adjustments. If, however, there is any trouble found in the operation check after replacement, perform necessary adjustments.

Saddle inlet port flapper solenoid (FSSL206) mounting position adjustment

Note:

When the saddle inlet port flapper solenoid is disassembled and assembled, perform the solenoid mounting position adjustment.

- 1) Loosen the screw.
- 2) With the arm section of the saddle inlet port flapper lowered until it stops, adjust the position of the saddle inlet port flapper solenoid so that the arm section makes contact with the link when the solenoid plunger is pushed.
- 3) Tighten the screw.



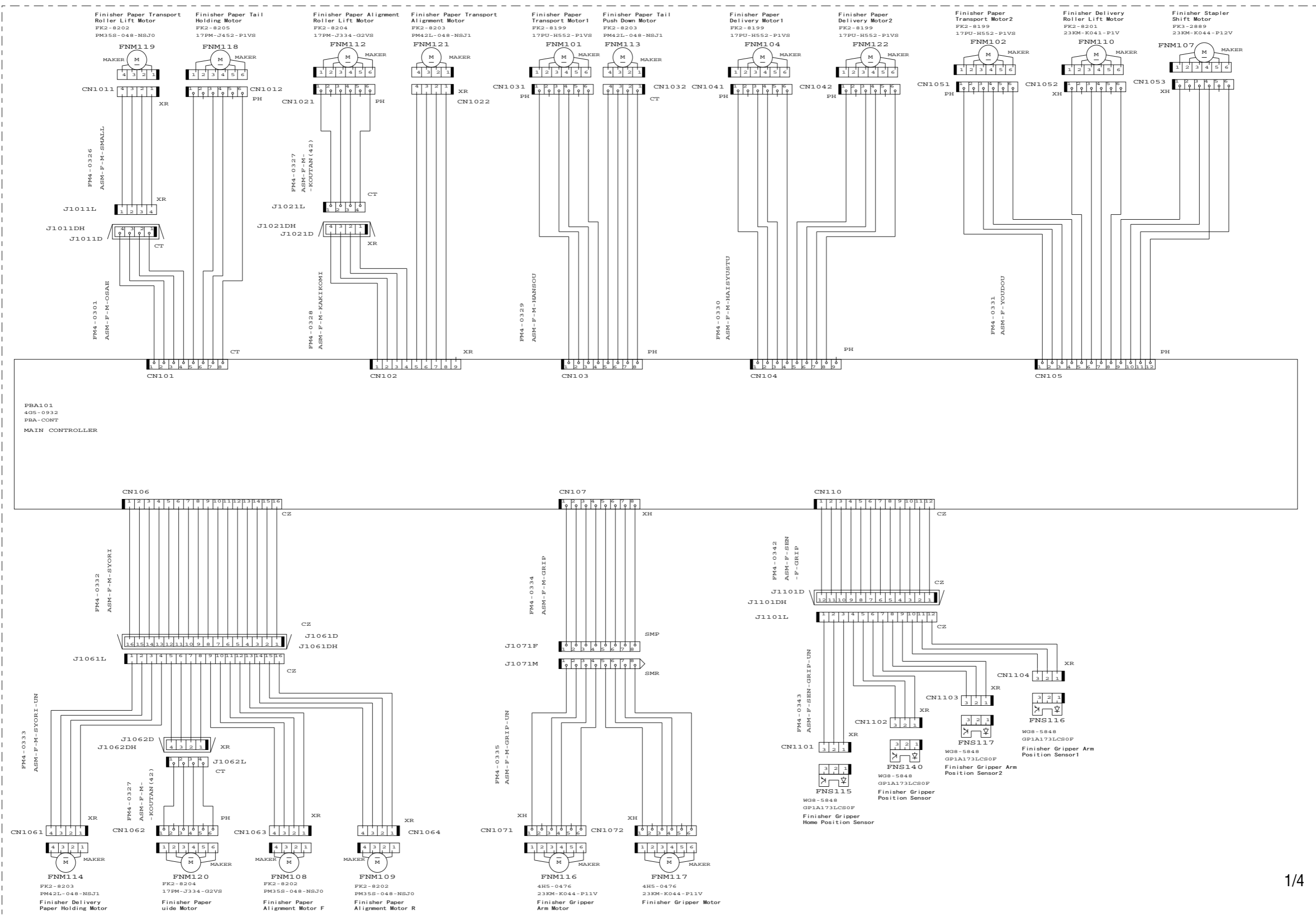
F-5-19

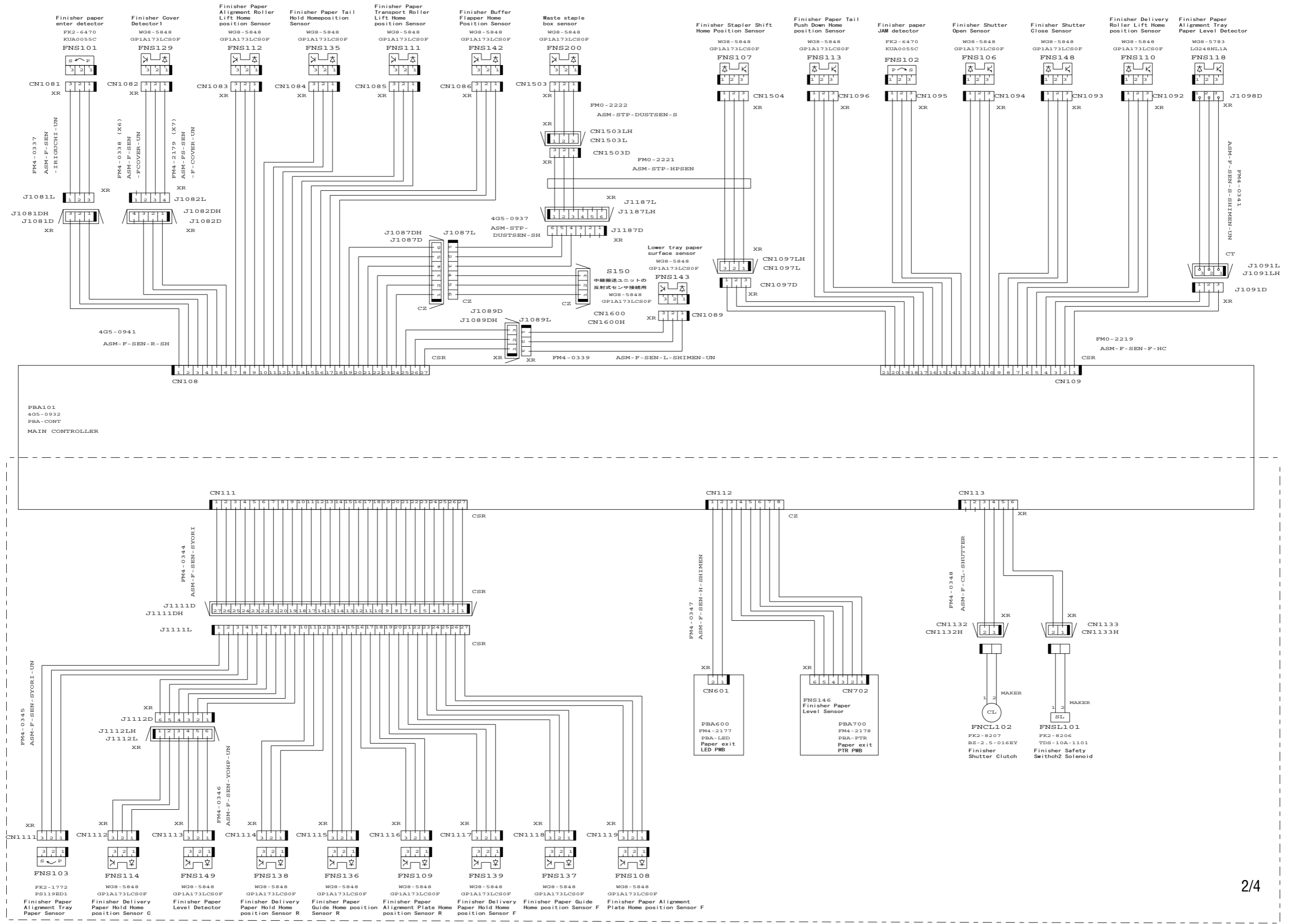
6

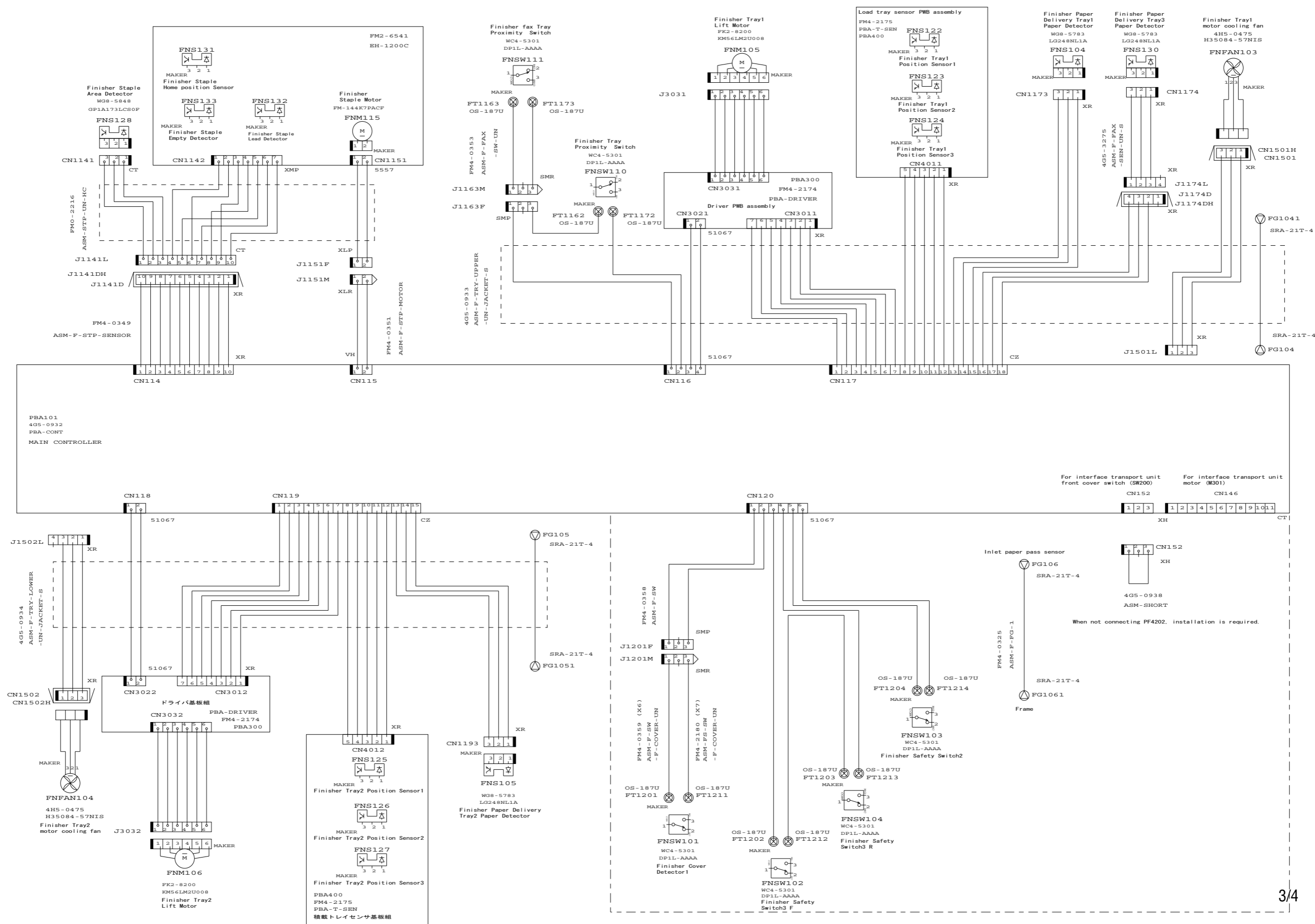
ACTUAL WIRING DIAGRAM

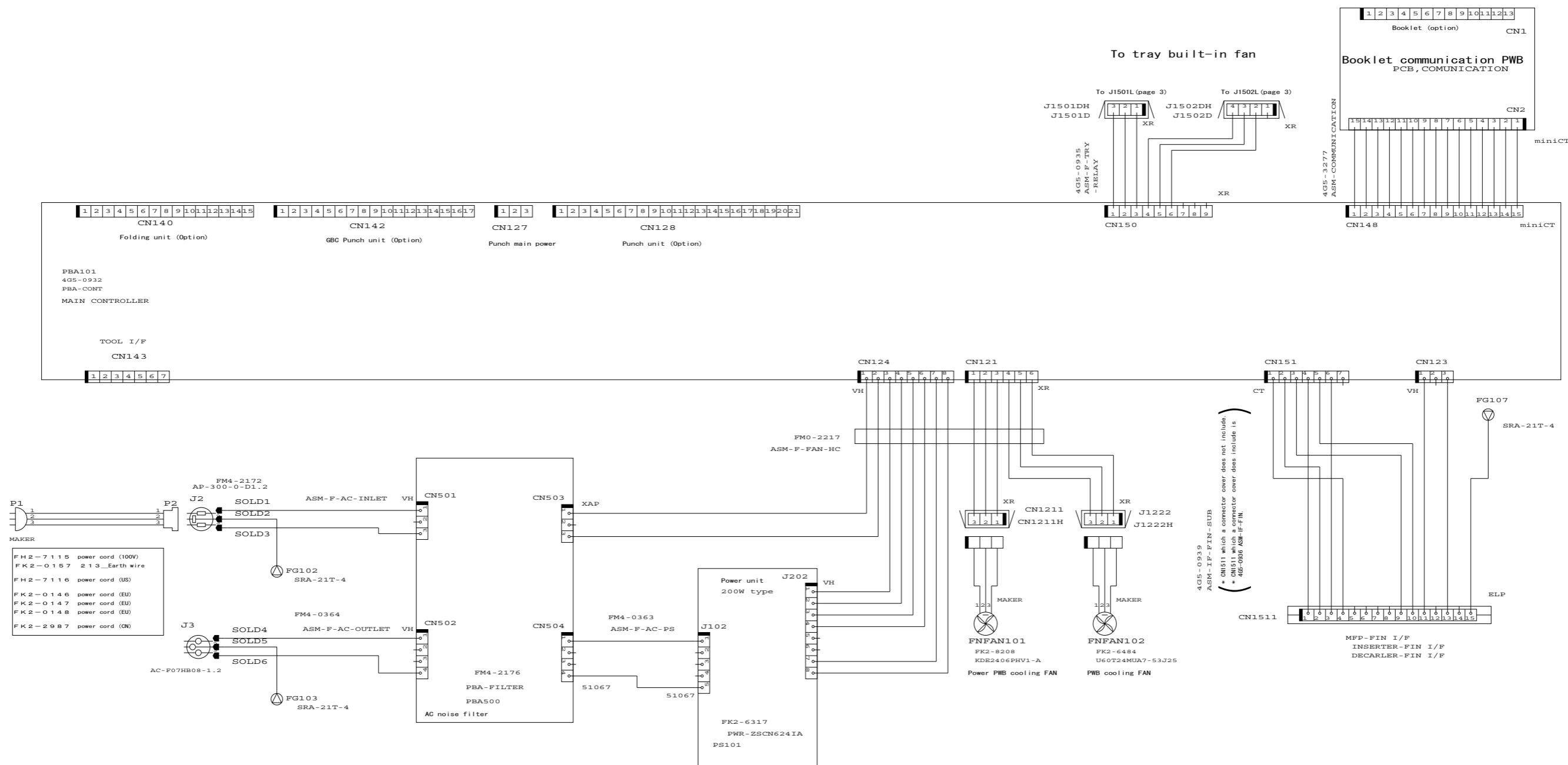
Actual Wiring Diagram

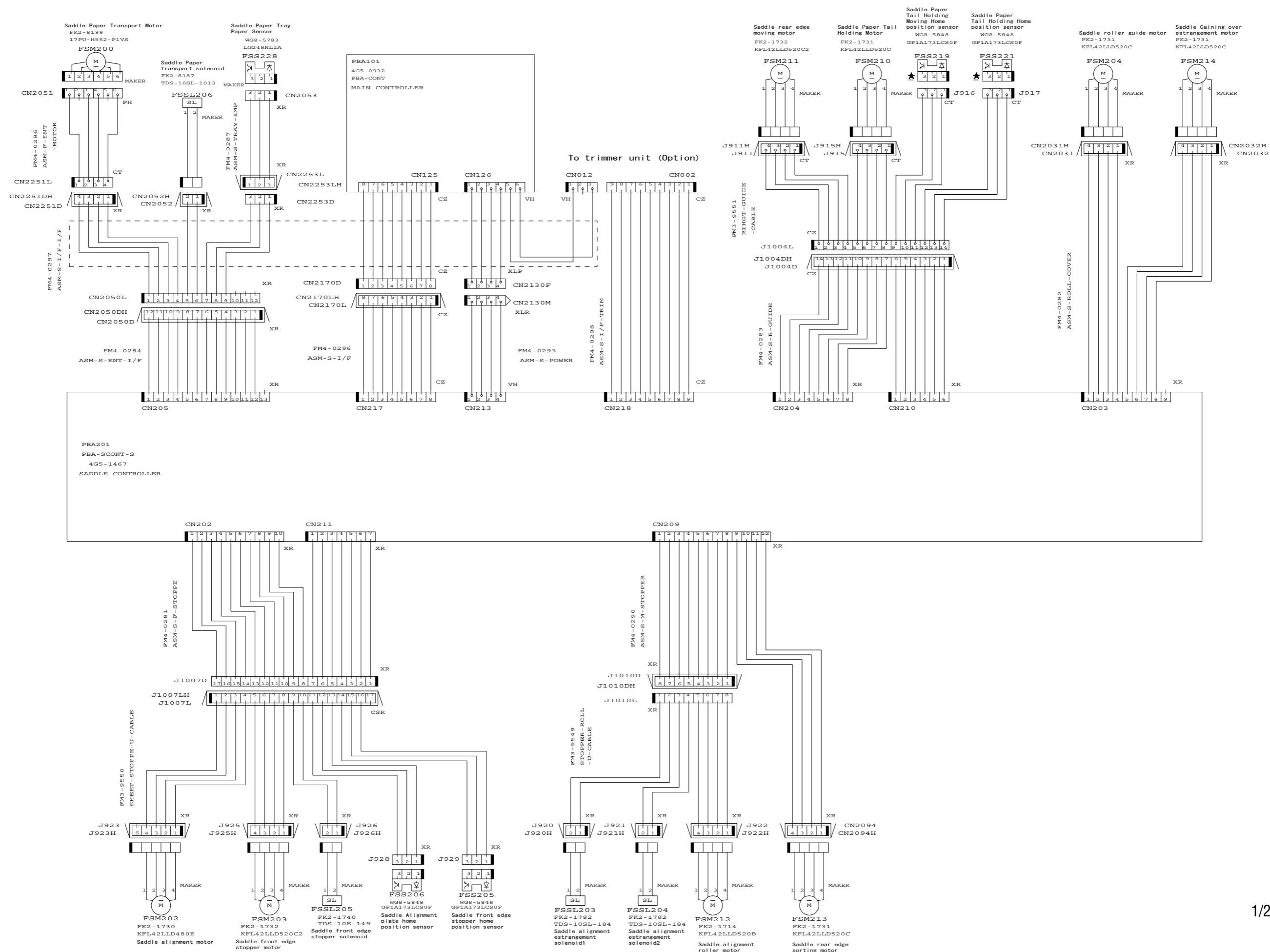
For MX-FN21/MX-FN22

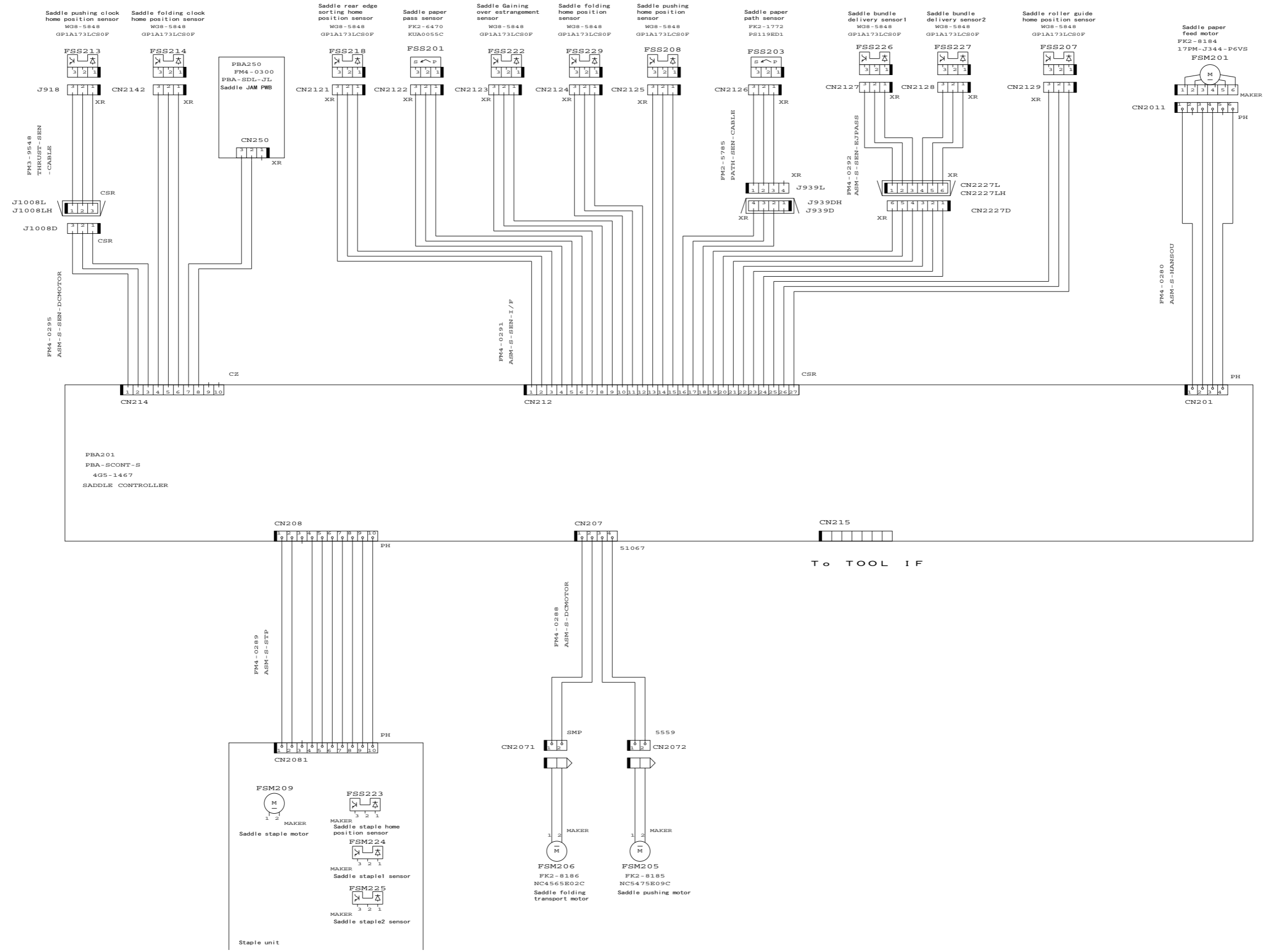














PUNCH SECTION

- † Product Outline
- † Technical Descriptions
- † Disassembly and Assembly
- † Actual Wiring Diagram

Product Outline

Features

† High accuracy punch mode

The accuracy (normal mode/high accuracy mode) of the punch hole position on paper can be set.

† Space-saving design

The space-saving design allows to be built in the finisher.

Specifications

Model name	MX-PN13		
Finisher enable to install	MX-FN21 / MX-FN22		
Punch kinds	2-hole / 3-hole / 4-hole / 4-hole (Wide) One of the above four kinds of the punch unit can be installed.		
Punchable paper size	2-hole 3-hole 4-hole/2-hole 4-hole (Wide) (Refer to table 1)		
Paper weight	(Refer to table 1)		
Lifetime	1 million sheets (80g/m ²)		
Bundled items	Punch position label		
Power source	Supplied from the finisher.		
External dimensions (WxDxH)	95 x 715 x 392mm 3-48/64" x 28-9/64 x 15-28/64"		
Weight	Approx. 3.7kg, 8.6lbs		

Table 1

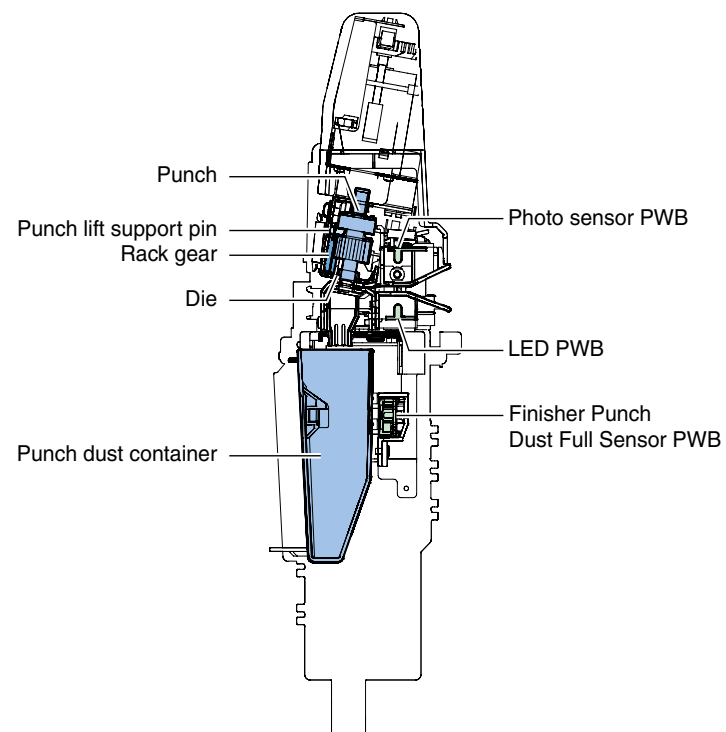
		Punch (2-hole)	Punch (2-hole /3-hole)	Punch (2-hole /4-hole)	Punch (4-hole wide)
Min. weight		55g/m ²	55g/m ²	55g/m ²	55g/m ²
Max. weight		256g/m ²	256g/m ²	256g/m ²	256g/m ²
Paper type	Thin paper	Yes	Yes	Yes	Yes
	Plain paper	Yes	Yes	Yes	Yes
	Recycled paper	Yes	Yes	Yes	Yes
	Color paper	Yes	Yes	Yes	Yes
	Letterhead	Yes	Yes	Yes	Yes
	Printed paper	Yes	Yes	Yes	Yes
	Punch sheet	No	No	No	No
	Heavy paper 1 106 - 176	Yes	Yes	Yes	Yes
	Heavy paper 2 177 - 220	Yes	Yes	Yes	Yes
	Heavy paper 3 221 - 256	Yes	Yes	Yes	Yes
	Heavy paper 4 257 - 300	No	No	No	No
	Embossed paper	Yes	Yes	Yes	Yes
	Tab paper	No	No	No	No
OHP	No	No	No	No	
Label paper	No	No	No	No	
Gloss paper	Yes	Yes	Yes	Yes	
User type (1 - 9)	Yes	Yes	Yes	Yes	
Paper size	12" x 18" (A3W)	305 x 457	No	No	No
	Ledger (11" x 17")	279 x 432	Yes	Yes (3 hole)	Yes (2/4 hole)

			Punch (2-hole)	Punch (2-hole /3-hole)	Punch (2-hole /4-hole)	Punch (4-hole wide)
Paper size	Ledger (11" x 17") Z-fold	279 x 216	Yes	Yes (3 hole)	Yes (2/4 hole)	Yes
	Legal (8.5" x 14")	216 x 356	Yes	Yes (2 hole)	Yes (2 hole)	Yes
	Legal (8.5" x 14") Z-fold	216 x 178	No	No	No	No
	Asian legal (8.5" x 13.5")	216 x 343	Yes	Yes (2 hole)	Yes (2 hole)	Yes
	Mexican legal (8.5" x 13.4")	216 x 340	Yes	Yes (2 hole)	Yes (2 hole)	Yes
	Foolscap (8.5" x 13")	216 x 330	Yes	Yes (2 hole)	Yes (2 hole)	Yes
	Letter (8.5" x 11")	279 x 216	Yes	Yes (3 hole)	Yes (2/4 hole)	Yes
	Letter R (8.5" x 11"R)	216 x 279	Yes	Yes (2 hole)	Yes (2 hole)	Yes
	Letter R (8.5" x 11"R) Z-fold	216 x 140	No	No	No	No
	Letter R (8.5" x 11"R) 2-fold	216 x 140	No	No	No	No
	Invoice (5.5" x 8.5")*1	216 x 140	No	No	No	No
	Invoice R (5.5" x 8.5"R)	140 x 216	No	No	No	No
	Executive R (7.25" x 10.5"R)	184 x 266	Yes	No	Yes (2 hole)	Yes
	9x12 (A4W)	305 x 229	No	No	No	No
	A3	297 x 420	Yes	Yes (3 hole)	Yes (2/4 hole)	Yes
	A3 Z-fold	297 x 210	Yes	Yes (3 hole)	Yes (2/4 hole)	Yes
	B4	257 x 364	Yes	No	Yes (2 hole)	Yes
	B4 Z-fold	257 x 182	Yes	No	Yes (2 hole)	Yes
	A4	297 x 210	Yes	Yes (3 hole)	Yes (2/4 hole)	Yes
	A4-R	210 x 297	Yes	Yes (2 hole)	Yes (2 hole)	Yes
	A4-R Z-fold	210 x 148	No	No	No	No
	A4-R 2-fold	210 x 148	No	No	No	No
	B5	257 x 182	Yes	No	Yes (2 hole)	Yes
	B5-R	182 x 257	Yes	No	Yes (2 hole)	Yes
	A5 *1	210 x 148	-	-	-	-
	A5-R	148 x 210	No	No	No	No
	SRA3	320 x 450	No	No	No	No
	SRA4	320 x 225	No	No	No	No
	Kiku 8	318 x 234.75	-	-	-	-

			Punch (2-hole)	Punch (2-hole /3-hole)	Punch (2-hole /4-hole)	Punch (4-hole wide)	
Paper size	A series 8	312.5 x 220	-	-	-	-	
	Kiku 4	318 x 469.5	-	-	-	-	
	A series 4	312.5 x 440	-	-	-	-	
	8K	270x390	Yes	No	Yes (2 hole)	No	
	16K	270x195	Yes	No	Yes (2 hole)	No	
	16K-R	195x270	Yes	No	Yes (2 hole)	No	
	Postcard	100x148	No	No	No	No	
	Monarch	98x191	No	No	No	No	
	COM10	105x241	No	No	No	No	
	DL	110x220	No	No	No	No	
	C5	229x162	No	No	No	No	
	Long No. 3	120x235	No	No	No	No	
	Long No. 4	90x205	No	No	No	No	
	Western No. 2	114x162	No	No	No	No	
	Western No. 4	105x235	No	No	No	No	
	Square No. 2	240x332	No	No	No	No	
	Square No. 3	216x277	No	No	No	No	
	Special - custom size		No	No	No	No	
	Custom range	Min X (Sub scan)		-	-	-	-
		Max X (Sub scan)		-	-	-	-
		Min Y (Main scan)		-	-	-	-
		Max Y (Main scan)		-	-	-	-
	Special - size undetermined		No	No	No	No	
	Long-scale paper	Width: 90 - 305, Length: 457 - 1200	No	No	No	No	

Signal Name (Written in this manual)	Signal Name	Parts Name	Function / Operation
M101	FSM101	Motor	Finisher Punch Motor
M102	FSM102	Motor	Finisher Punch Shift Motor
S101	FCS101	Sensor	Finisher Puncher Home Position Sensor
S102	FCS102	Sensor	Finisher Punch Position Sensor1
S103	FCS103	Sensor	Finisher Punch Position Sensor2
S104	FCS104	Sensor	Finisher Puncher Cam Home Position Sensor
S105	FCS105	Sensor	Finisher Punch Motor Rotation Sensor
S106	FCS106	Sensor	Finisher paper enter detector
PCB2	FCPCB2		Finisher Punch Dust Full Sensor
PCB3 PT1	FCPCB31		Finisher Punch Paper Edge Sensor1 (A3)
PCB3 PT2	FCPCB32		Finisher Punch Paper Edge Sensor2 (LD)
PCB3 PT3	FCPCB33		Finisher Punch Paper Edge Sensor3 (B4)
PCB3 PT4	FCPCB34		Finisher Punch Paper Edge Sensor4 (A4R)
PCB3 PT5	FCPCB35		Finisher Punch Paper Edge Sensor5 (B5R)

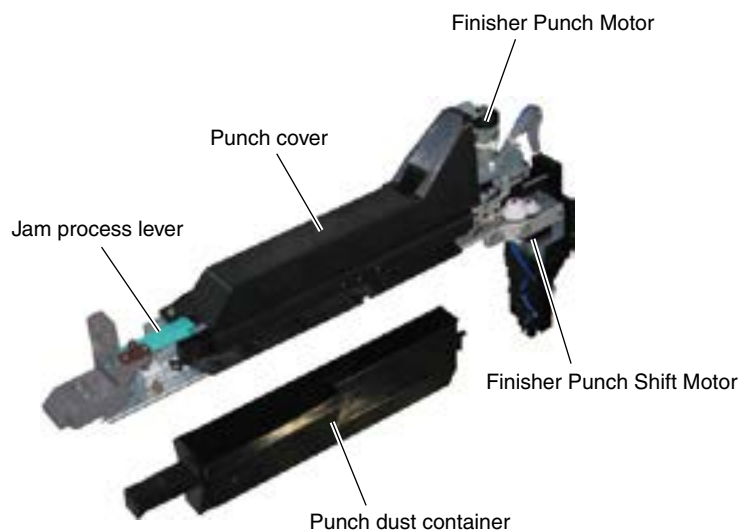
† Cross section view



F-1-2

● Part Names

† External view



F-1-1

Technical Descriptions

Basic composition

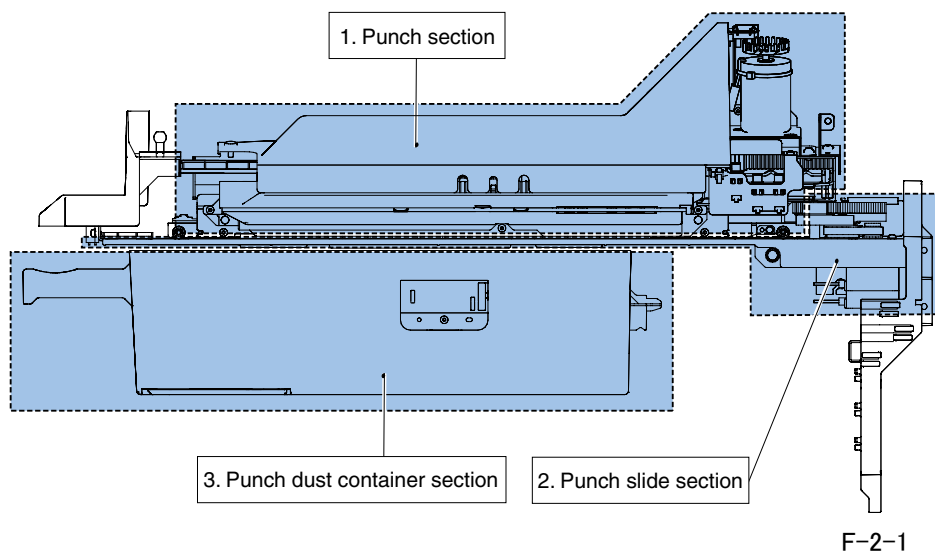
Basic composition

This unit is mainly composed of the punch section, the punch slide section, and the punch dust container section.

Punch section [1]	Punches holes in the rear edge of paper.
Punch slide section [2]	Shifts the punch section to the punch position (rear edge of paper) according to the paper size.
Punch dust container section [3]	Accumulates punch dust generated by punching in the rear edge of paper.

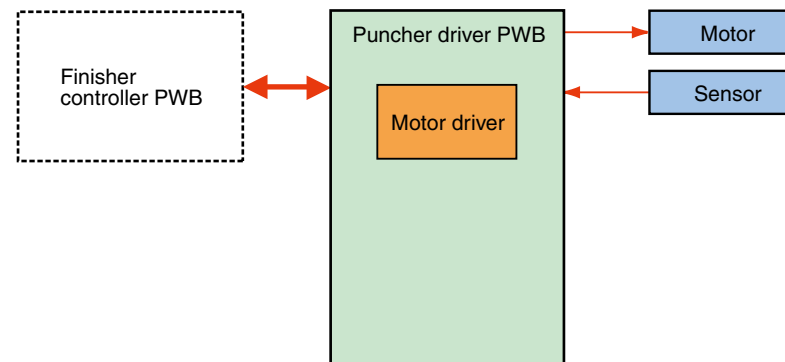
MEMO:

This unit is not provided with a microprocessor (CPU), but controlled by the finisher controller PWB.



Electrical circuit outline

This unit is electrically controlled by the finisher controller PWB and the puncher driver PWB.

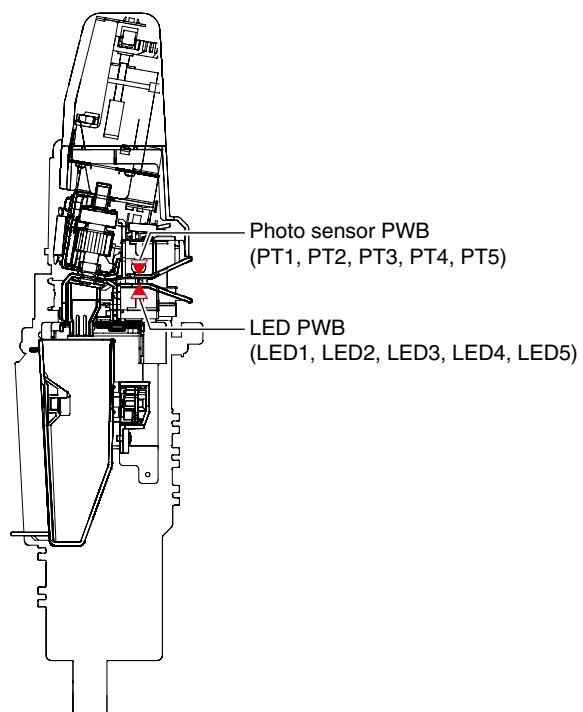


F-2-2

† Part composition

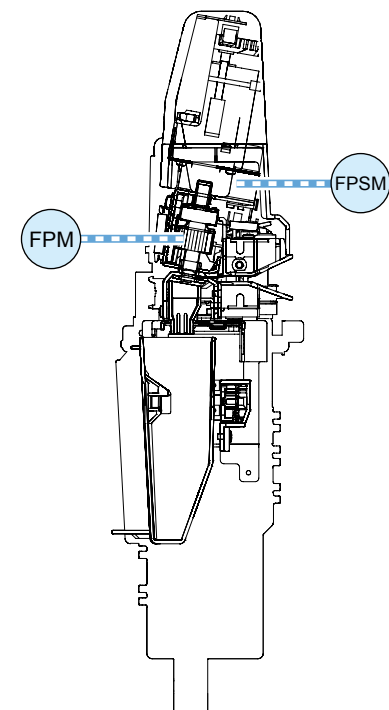
Sensor arrangement plan

Only the optical sensors on the transport path are indicated.



F-2-3

† Drive composition



F-2-4

FPSM: Finisher Punch Shift Motor

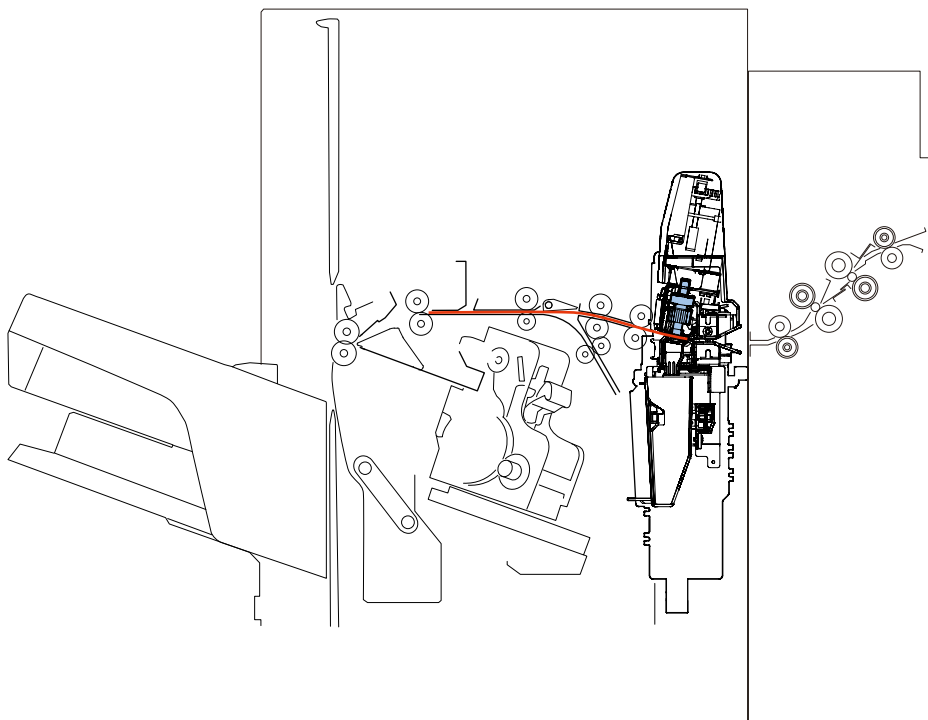
FPM: Finisher Punch Motor

Outline of basic operations

This unit punches holes in the rear edge of paper.

This unit is an option of the main machine, and is attached to the transport path inside the finisher.

Paper is transported to the punch section, and stops at the punch position. Then the rack gear is driven back and forth to lift the punch and make punching in the rear edge of the paper. These operations are controlled by the finisher controller PWB, and each puncher section is driven by the puncher driver PWB.



F-2-5

Control operations

Outline

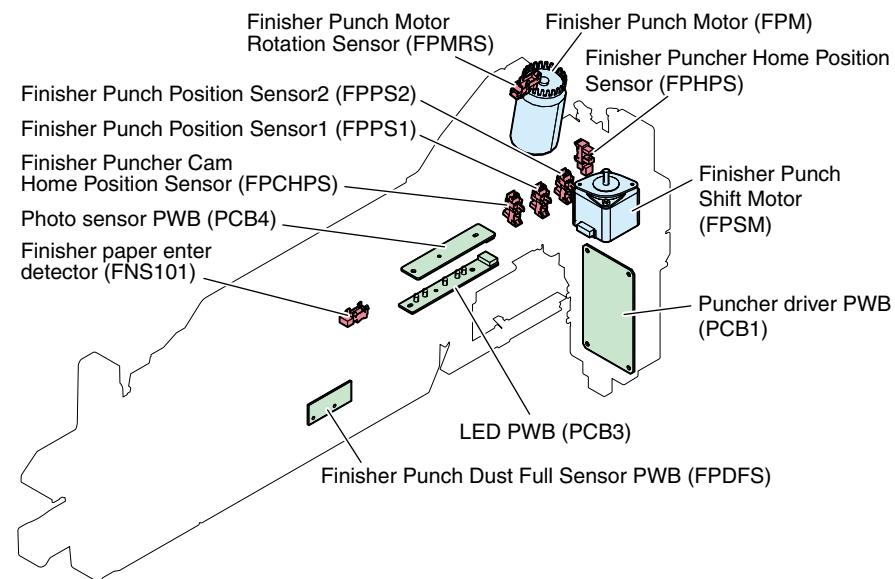
This unit punches holes in paper which is stopped at the punch position in the transport path inside the finisher.

The paper is transported from the main body by the inlet roller and the transport roller in the finisher. When the paper rear edge reaches the specified position, it is stopped and punching is made in the paper rear edge.

The motors and the sensors used in punching are shown below.

Motor	Function	Reference
Finisher Punch Shift Motor (FPSM)	Drives the punch slide unit.	-
Finisher Punch Motor (FPM)	Drives the punch section.	-

Sensor	Function	Reference
Finisher Puncher Home Position Sensor (FPHPS)	Detects the home position of the punch slide unit.	-
Finisher Punch Position Sensor1 (FPPS1)	Detects the punch position.	-
Finisher Punch Position Sensor2 (FPPS2)	Detects switching of punch holes.	-
Finisher Puncher Cam Home Position Sensor (FPCHPS)	Detects the home position of the punch.	-
Finisher Punch Motor Rotation Sensor (FPMRS)	Detects the punch motor clock.	-
Finisher paper enter detector (FNS101)	Detects the lead edge and the rear edge of paper.	-
Finisher Punch Dust Full Sensor (FPDFS)	Detects punch dust full.	-
Finisher Punch Paper Edge Sensor1 - 5 (FPES1 - 5)	Detects the rear edge of paper.	-



F-2-6

Control composition

The punch section is composed of the die section and the punch blades.

The punch blades are driven by the Finisher Punch Motor (FPM). The rack gear is driven back and forth by the Finisher Punch Motor (FPM) to lift the punch blades through the punch lift indication pin to make punching.

The home positions of the punch blades are detected by the Finisher Punch Position Sensor2 (FPPS2) and the Finisher Puncher Cam Home Position Sensor (FPCHPS), and the lowering positions of the punch blades are detected by the Finisher Punch Position Sensor1 (FPPS1).

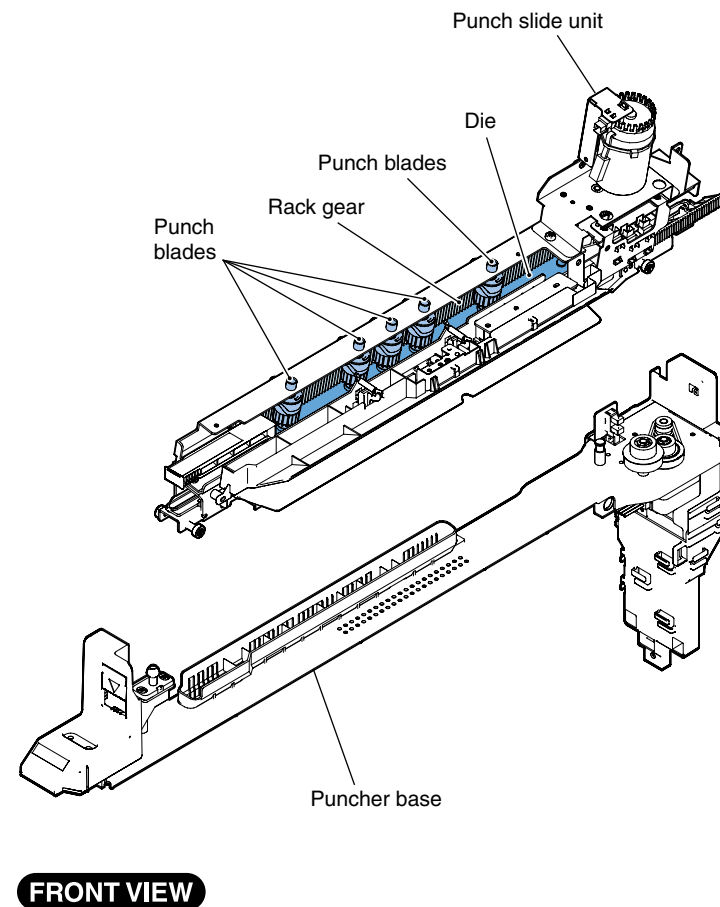
The Finisher Punch Motor (FPM) is a DC motor. To stop the Finisher Punch Motor (FPM) correctly at the home position, the specified number of clocks is counted by the Finisher Punch Motor Rotation Sensor (FPMRS) to stop the punch motor.

The Finisher paper enter detector (FNS101) is provided at the inlet section of the punch unit to detect the lead edge and the rear edge of paper. In addition, five light-receiving transistors (photo sensor PWB) are provided on the upper side of the inlet paper transport path of the punch unit, and five light emitting LED (LED PWB) are provided on the lower side, which act as five sensors. These sensors are horizontal resist sensors, and used to detect the positions in the rear edge of paper for punching.

The punch motor, the punch section, and the above sensors compose the punch slide unit, and they are moved back and forth according to the paper size by the Finisher Punch Shift Motor (FPSM). The home position of the punch slide unit is detected by the Finisher Puncher Home Position Sensor (FPHPS). The Finisher Punch Shift Motor (FPSM) is a 2-phase stepping motor.

The punch motor and the punch shift motor are driven by the control signals from the finisher controller PWB and the punch driver PWB.

Punch dust generated by punching is accumulated in the punch dust container. Punch dust full is detected by the reflection-type sensor (LED1/PT1 on the Finisher Punch Dust Full Sensor PWB).



F-2-7

† Punch operation

The punch blade is driven by the Finisher Punch Motor (FPM). The home position of the punch blade is detected by the Finisher Punch Position Sensor1 (FPPS1) and the Finisher Puncher Cam Home Position Sensor (FPCHPS). The two sensors detect the sensor flag when the punch blade is at the home position.

The rack gear is driven back and forth by the Finisher Punch Motor (FPM) to lift the punch blade through the punch lift indication pin to make punching. The sensor flag is attached to the rack gear. The operation of the punch blade is detected by the combination of the sensor flag and the three sensors (the Finisher Punch Position Sensor1 (FPPS1), the Finisher Punch Position Sensor2 (FPPS2), and the Finisher Puncher Cam Home Position Sensor (FPCHPS)). Control items by the combination of the sensor flag and the sensors are shown below.

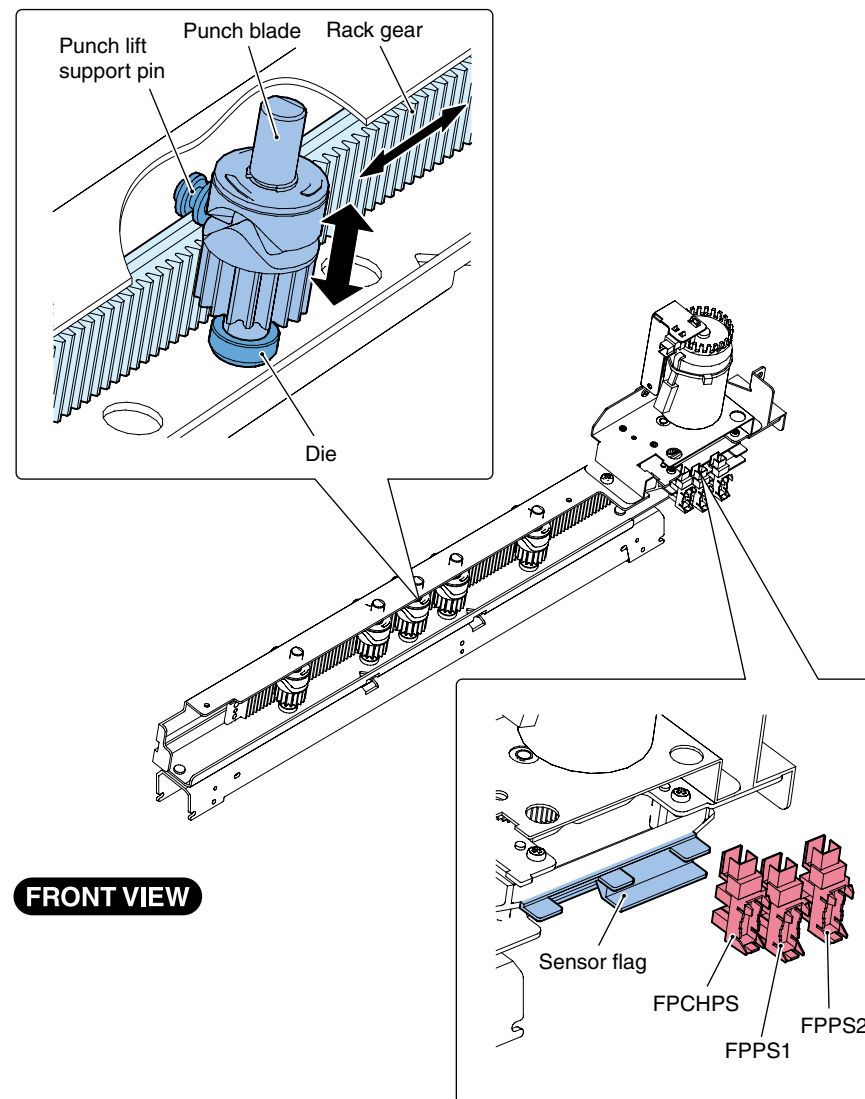
• In the case of 2-hole type (BG1)

Punch blade status		Finisher Puncher Cam Home Position Sensor (FPCHPS)	Finisher Punch Position Sensor1 (FPPS1)	Finisher Punch Position Sensor2 (FPPS2)
Home position (Lifting position)	Punching operation: 1 cycle	ON	ON	OFF
Descending position		OFF	OFF	OFF
Lifting position		ON	OFF	OFF

• In the case of 3-hole type / 4-hole type

For the punch unit which can punch two kinds of holes, the rack gear is driven back and forth in the opposite range to the above operation.

Punch blade state		Finisher Puncher Cam Home Position Sensor (FPCHPS)	Finisher Punch Position Sensor1 (FPPS1)	Finisher Punch Position Sensor2 (FPPS2)
Home position (Lifting position)	Punching operation: 1 cycle	ON	ON	OFF
Descending position		OFF	ON	ON
Lifting position		ON	OFF	ON



F-2-8

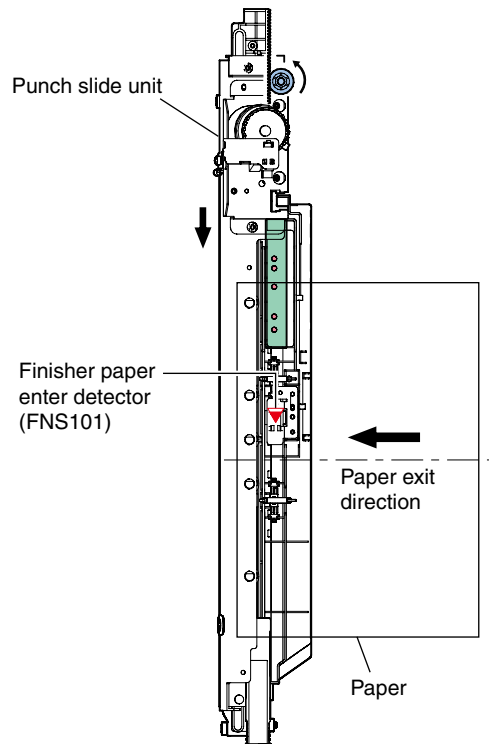
Horizontal resist operation

Horizontal resist operation of the punch slide unit is made by the Finisher Punch Shift Motor (FPSM).

The home position of the punch slide unit is detected by the Finisher Puncher Home Position Sensor (FPHPS). The punch slide unit detects the rear edge of paper with the Finisher paper enter detector (FNS101) and the Finisher Punch Paper Edge Sensors (LED1 – 5 on the LED PWB and PT1 – 5 on the photo sensor PWB).

The horizontal resist operation is described below:

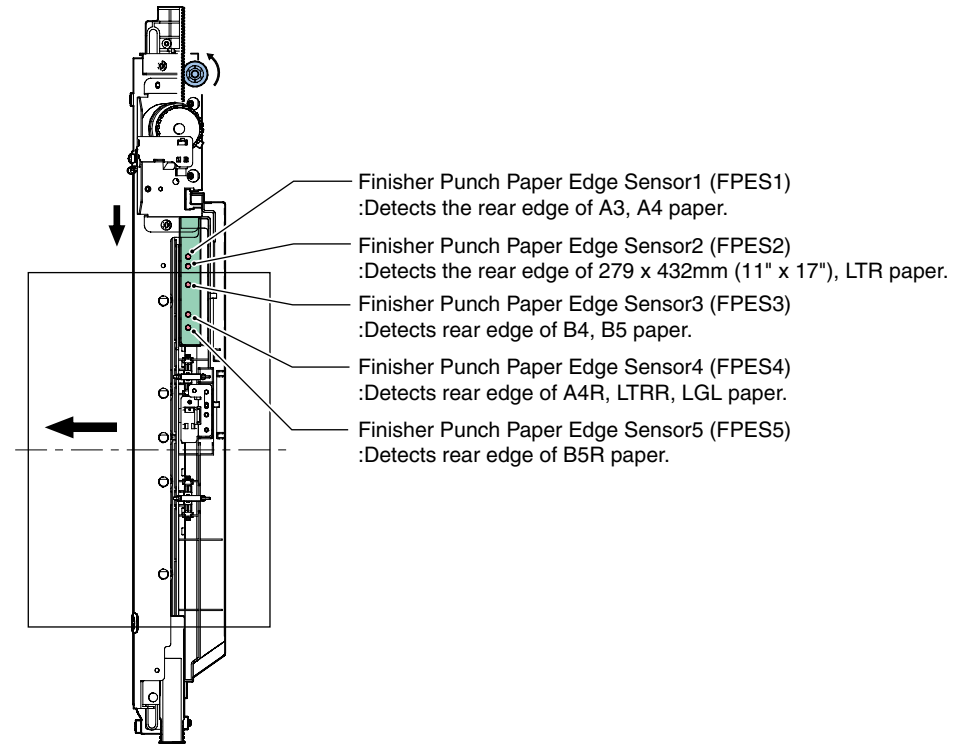
- 1) When the lead edge of paper is detected by the Finisher paper enter detector (FNS101), the Finisher Punch Shift Motor (FPSM) shifts the punch slide unit to the front side.



FRONT VIEW

F-2-9

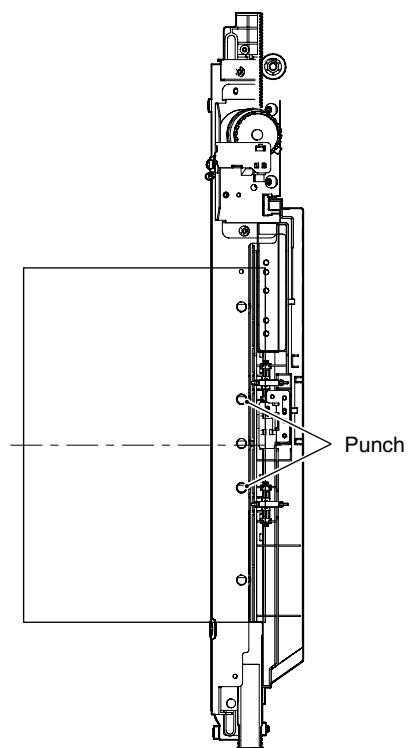
- 2) Finisher Punch Paper Edge Sensors (FPES1 – 5) detect the rear edge of paper according to the paper size signal sent from the main body, then the Finisher Punch Shift Motor (FPSM) drives the punch slide unit further to the front up to the specified position, where it is stopped.



FRONT VIEW

F-2-10

- 3) When the rear edge of paper is detected by the Finisher paper enter detector (FNS101), the paper is stopped. Then it is switched back to make contact with the stopper for alignment. Then the Finisher Punch Motor (FPM) is driven to punch the paper.



FRONT VIEW

F-2-11

- 4) After completion of punching, the Finisher Punch Shift Motor (FPSM) is reversed to return the punch slide unit to the home position, where it is stopped.
- 5) When two or more sheets of paper are fed for punching, the punch slide unit returns to the home position for every sheet and repeats the above operations.

⊣ Servicing work

Periodic servicing

Item	Part name	Lifetime	Q'ty	Process	Reference
Periodic replacement part	None				
Consumable part	None				
Periodic servicing part	None				

Version upgrade

Since this unit is not equipped with a CPU, there is no need to upgrade the version.

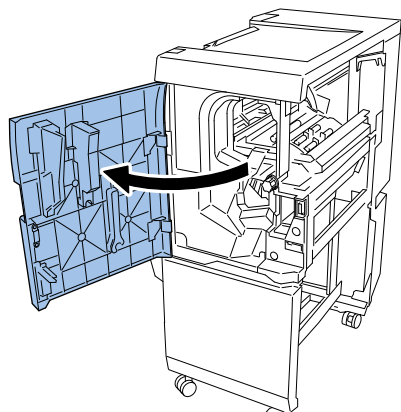
Version upgrade is made on the finisher side.

Disassembly and Assembly

Disassembly of the main unit

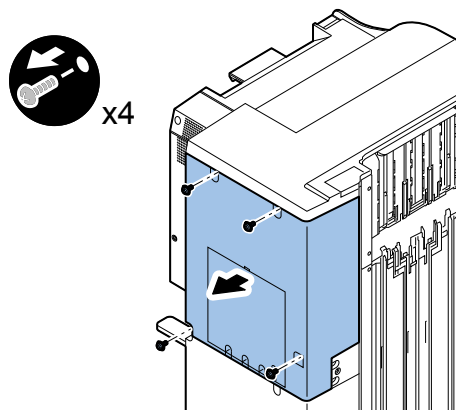
Disassembly from the finisher

1) Open the front cover of the finisher.



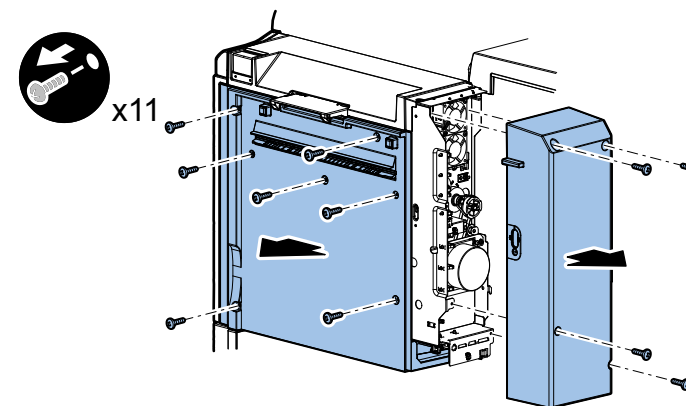
F-3-1

2) Remove the four screws, and remove the finisher rear cover.

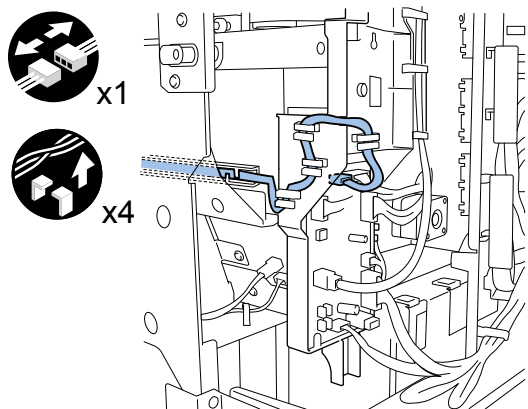


F-3-3

3) Remove the eleven screws, and remove the interface rear cover and the right cover.

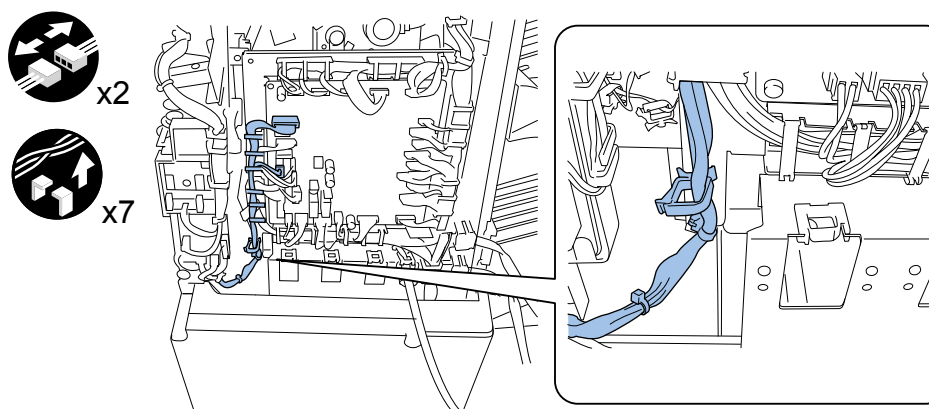


- 4) Disconnect the connector (CN4) of the punch controller PWB, and remove the punch dust full sensor binding wire from the binding wire guide.



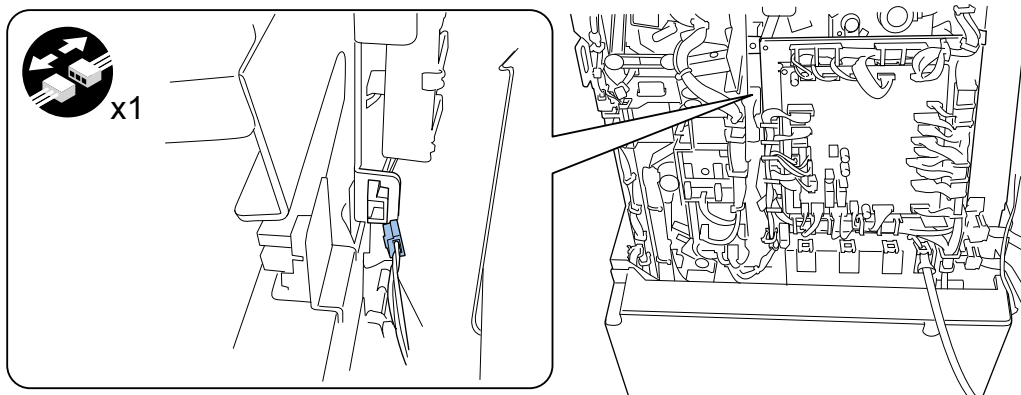
F-3-4

- 5) Disconnect two connectors (CN127, CN128) of the finisher controller PWB. Remove the punch unit binding wire from the seven cable guides, and remove the reuse band.



F-3-5

- 6) Disconnect the connector of the punch unit binding wire.

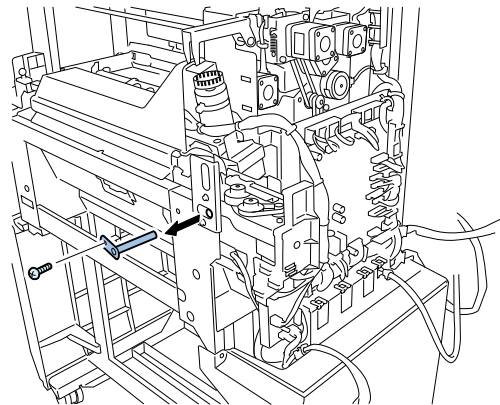


F-3-6

7) Remove the screw, and remove the punch unit fixing pin.



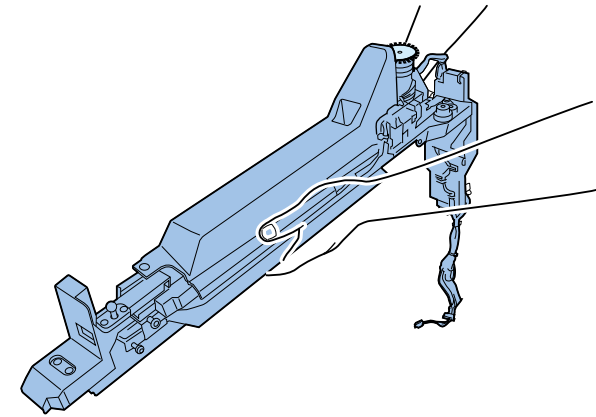
x1



F-3-7

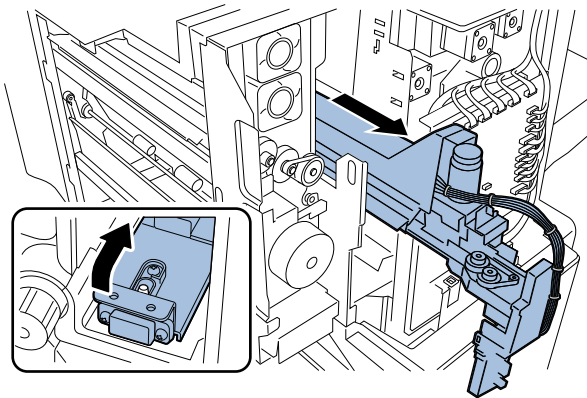
Note:

- Hold the punch unit as shown in the figure on the right.
- Do not hold the motor gear section.



F-3-8

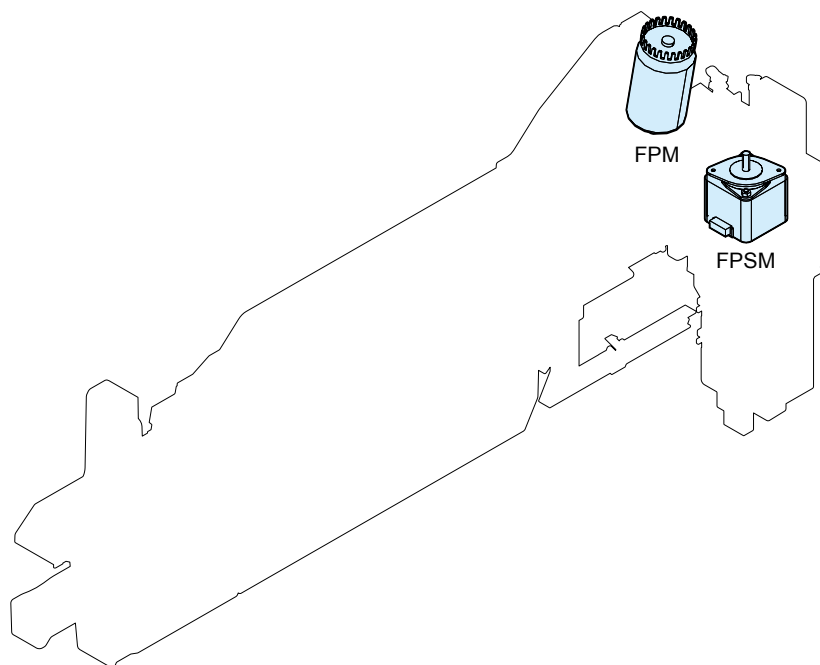
8) Remove the punch unit from the finisher.



F-3-9

List of parts

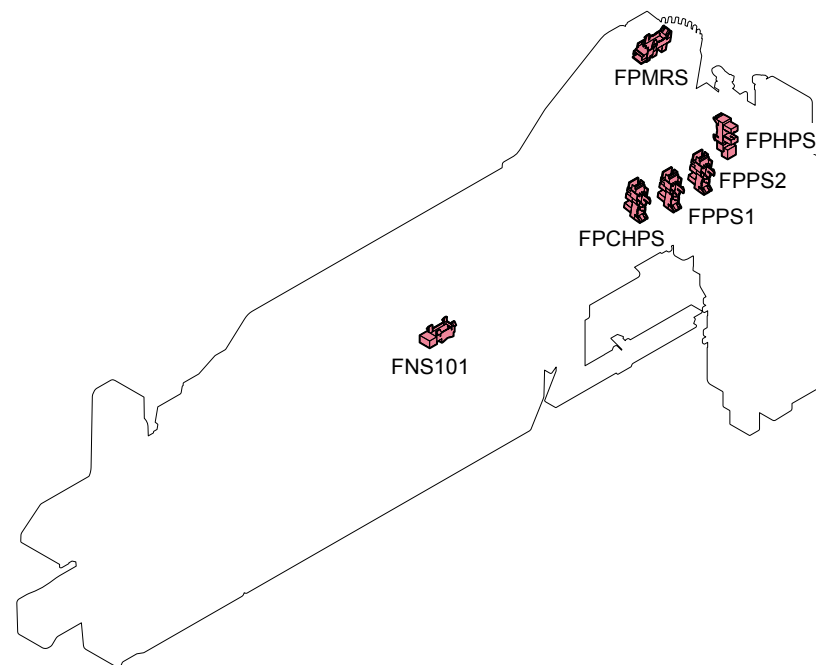
List of motors



F-3-19

Code	Name	Reference
FPSM	Finisher Punch Shift Motor	-
FPM	Finisher Punch Motor	-

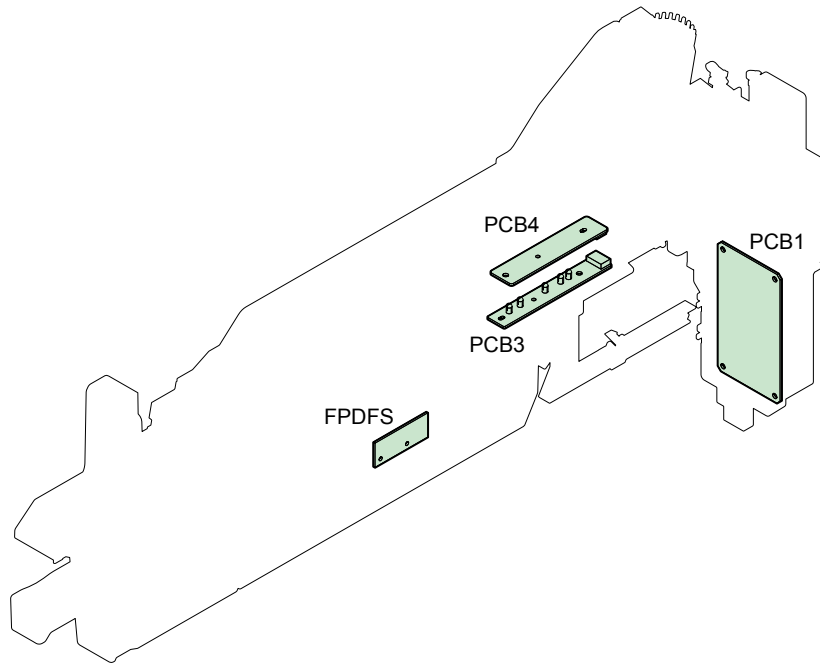
List of sensors



F-3-20

Code	Name	Reference
FPHPS	Finisher Puncher Home Position Sensor	-
FPPS1	Finisher Punch Position Sensor1	-
FPPS2	Finisher Punch Position Sensor2	-
FPCHPS	Finisher Puncher Cam Home Position Sensor	-
FPMRS	Finisher Punch Motor Rotation Sensor	-
FNS101	Finisher paper enter detector	-

List of PWB's



F-3-21

Code	Name	Reference
PCB1	Punch driver PWB	-
FPDFS	Finisher Punch Dust Full Sensor PWB	-
PCB3	LED PWB	-
PCB4	Photo sensor PWB	-

Actual Wiring Diagram

