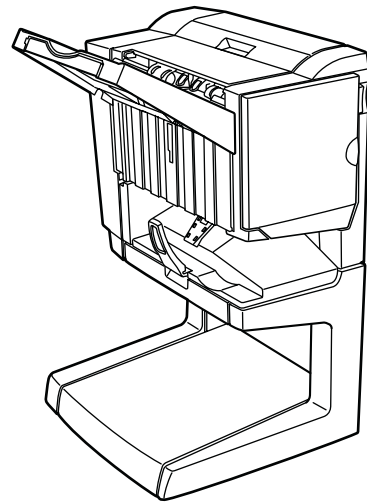


B83SS



LASER PRINTER OPTIONS

SADDLE STITCH FINISHER - B83SS

PUNCH UNIT - B83USP - optional

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[1] INTRODUCTION

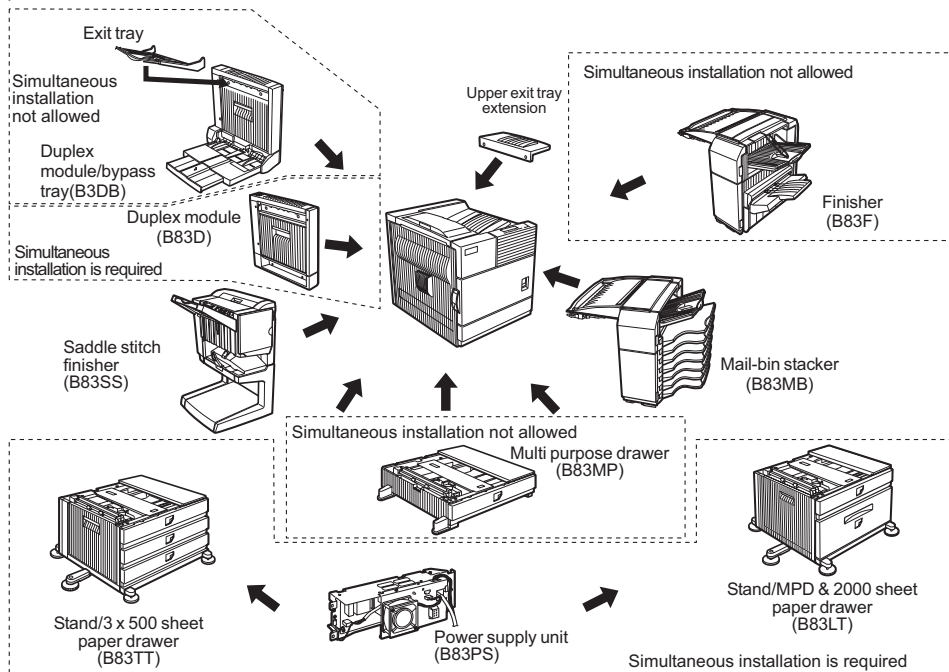
1. Product outline

This unit is installed to the following machines to perform the after-process of output paper from a printer, a copier, or a fax machine.

1. Employment of the through-type stapler. Employment of the through-type stapler allows to make saddle stitch by one stapler.
2. 3 kinds of auto staple functions. There are 3 staple positions available. (One position in the front, one position at the back, 2 positions at the center)
3. Saddle stitch function. Up to 10 sheets of paper can be stapled at the center and folded into two and discharged.
4. Punch function (Option). By installation of a puncher unit (B83UPS), paper can be punched to make holes for a binder. (Applicable for 64 - 128g/m² (17 - 34lbs). OHP films cannot be used.)

2. Configuration

1. Before installation of this unit, the large-capacity desk (B83LT) or the 3-stage desk (B83TT) must be installed in advance. (When installing the B83LT/TT, the optional power unit (B83PS) is required.)
2. When installing this unit, the duplex module (B83D) must be installed together.
3. This unit cannot be installed with the following units:
 - Duplex module (B83DB) with the manual paper feed tray
 - Paper exit tray
 - Multi-purpose tray (B83MP)
 - Finisher (B83F)



Output units		Multi purpose drawer	Stand/3 x 500 sheet paper drawer	Stand/MPD & 2000 sheet	Duplex module/bypass tray	Duplex module	Saddle stitch finisher	Finisher	Mail-bin stacker	Exit tray	Upper exit tray extension	Punch unit	Print server card	Power supply unit	Hard disk drive
Saddle stitch finisher	B83SS	X	O ^{*1}	X	O	-	X	X	X						
Punch unit	B83UPS	X	O ^{*1}	X	O	O	X	X						O	

O^{*1} = Any of the units must be installed together. O = Must be installed together
X

Specifications

A. B83SS

Basic specifications

Type	Console type finisher	
Transport speed	35/45 ppm	
Transport reference	Center reference	
Tray type (Number of trays)	Upper tray	Lift-up/down offset tray
	Lower tray	Book tray for saddle stitch
Paper exit direction	Face down	
Paper exit paper size	A3, B4, A4, A4R, B5, B5R, A5R, 11" x 17", 8.5" x 14", 8.5" x 13", 8.5" x 11", 8.5" x 11"R, 5.5" x 8.5"R Executive	
Power consumption	50W or below	
Power source	Supplied from the option power (DC24V, 2.7A)	
External dimensions (W x D x H)	24.45" x 23.74" x 39.37" (inches)	
	621 x 603 x 1000 (mm)	
Occupying dimensions (W x D)	28.27" x 23.74"	
	718 x 603 (mm)	
Weight	About 86lbs / 39kg	

Finishing section

Capacity of paper exit and load	Non-staple	1,000 sheets (Small size) 500 sheets (Large size)
	Staple sort Max	30 sheets 1,000 sheets (Small size) 500 sheets: (Large size)
		Large size Small size
	Offset function	Provided (Output paper size except for A5R, 5.5" x 8.5"R)
Paper size which can be stapled	A3, B4, A4, A4R, B5, 11" x 17", 8.5" x 14", 8.5" x 13", 8.5" x 11", 8.5" x 11"R	
Kinds and weights of paper to be discharged	Normal paper	60 - 128g/m ² (16 - 34lbs)
	Index paper	176g/m ² (47lbs)
	Cover paper OHP	200 - 205g/m ² (54 - 55lbs)
Quantity of paper to be stapled (Max.)	50 sheets (Small size, 128g/m ² (34lbs) x 2 + 80g/m ² (21lbs) x 48) 25 sheets (Large size, 80g/m ² (21lbs) x 25)	
	Large size	A3, B4, 11" x 17", 8.5" x 14", 8.5" x 13"
	Small size	A4, A4R, 8.5" x 11", 8.5" x 11"R, B5
Stapling	3 kinds (One in the front, one at the back: two positions)	
	two positions	A3, B4, 11" x 17", 8.5" x 14", 8.5" x 13", A4, 8.5" x 11", B5
	one at the back	A3, B4, A4, A4R, B5
	one in the front	11" x 17", 8.5" x 14", 8.5" x 13", 8.5" x 11", 8.5" x 11"R, Executive
Staple supply	Staple cartridge replacement	
Staple detection	Staple empty detection	Provided
	Cartridge empty detection	Provided
	Staple jam detection	Provided

Saddle stitch section

Stapling type	Center stapling: Center folding
Stapling position	1200mm pitch from the paper center
Weight of paper applicable for saddle stitch	A3, A4R, B4, 11" x 17", 8.5" x 11"R
Paper size	17 - 21lbs
	64 - 80g/m ² (Cover: 17 - 34lbs / 64 - 128g/m ²)
Book tray stacking type	Fixed
Quantity of paper to be stapled	10 sets (6 - 10 pages)
	20 sets (1 - 5 pages)

B. Punch Unit - (B83UPS)

Type	Punch unit
No. of punch holes	3 holes
Size of paper applicable for punching	Max. A3, Min. B5R

C. Consumable parts

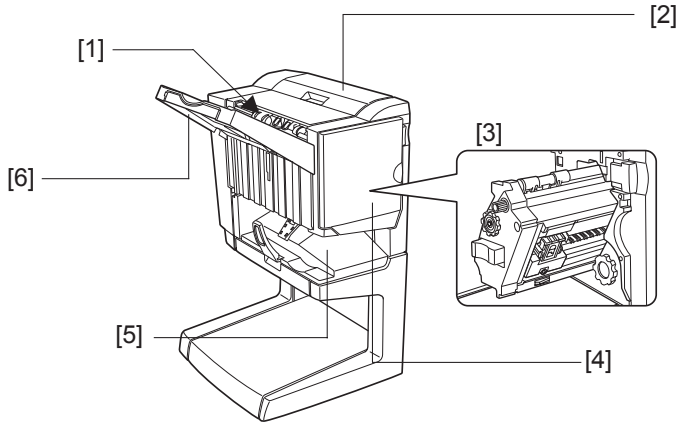
Name	Content	Life
Staple cartridge	Staple cartridge x 3	5000 x 3

Note: The meaning of "R" in paper size indications

- Some paper sizes can be placed in the printer so that it feeds either long edge first or short edge first.
- To differentiate between the two sizes in the various tables, the short edge first size indication will contain an "R". These are indicated as 8½ x 11R, 5½ x 8½R, A4R, B5R, etc.
- Sizes that can be placed only in the landscape orientation (11 x 17, 8½ x 14, 8½ x 13, A3, B4) do not contain the "R" in their size indication.

[2] EXTERNAL VIEWS AND INTERNAL STRUCTURES

1. External view



[1]	Stapler compiler
[2]	Top cover
[3]	Stapler section
[4]	Front cover
[5]	Saddle stitch tray
[6]	Offset tray

2. Internal structure

A. Finisher section

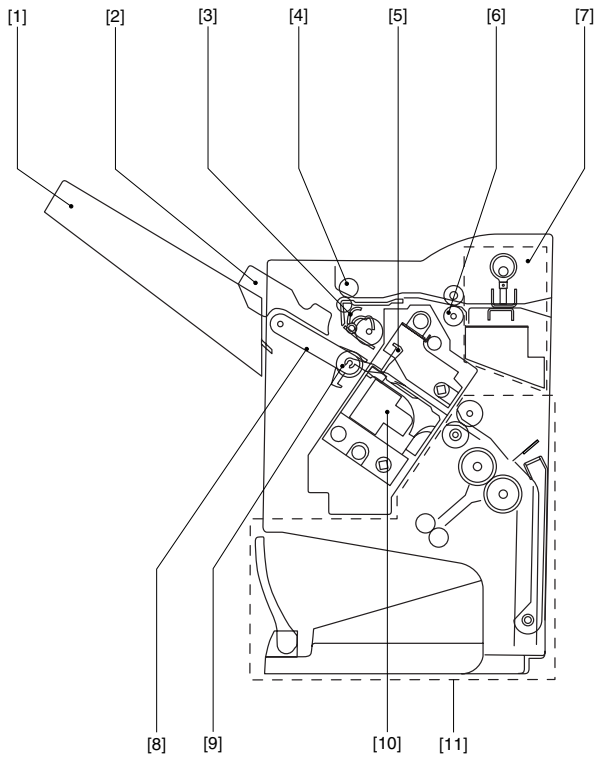


Fig. F01-301-01

[1]	Paper exit tray
[2]	Alignment plate (Front, back)
[3]	Paddle
[4]	Paper exit roller
[5]	Process tray stopper
[6]	Transport roller
[7]	Puncher section (Option)
[8]	Paper exit belt
[9]	Bundle exit roller
[10]	Stapler
[11]	Saddle section

B. Saddle section

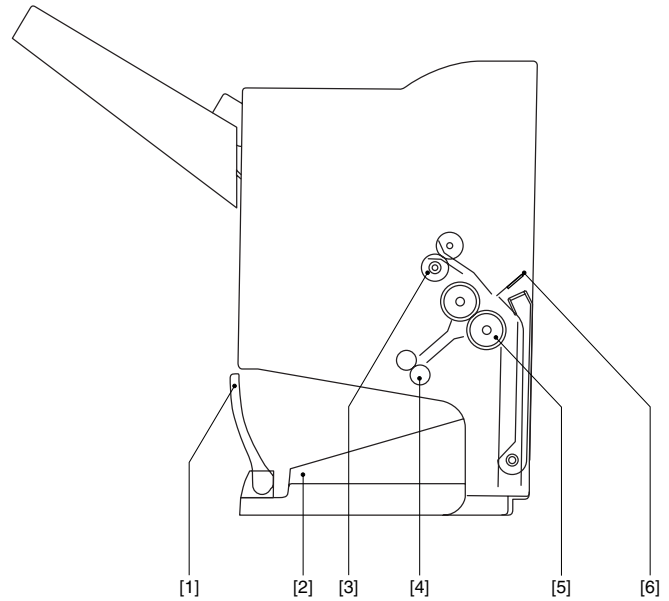


Fig. F01-301-02

[1]	Book making stopper
[2]	Book making tray
[3]	Bundle transport roller
[4]	Book making exit roller
[5]	Paper folding roller
[6]	Paper pushing plate

C. Puncher section (Option)

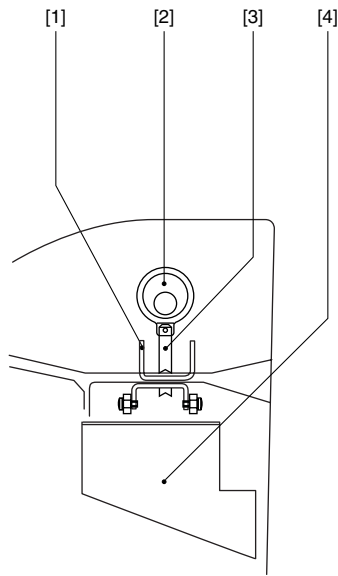


Fig. F01-301-03

[1]	Dice
[2]	Cam
[3]	Punch
[4]	Punch dust box

3. Finisher and saddle section

A. Sensor

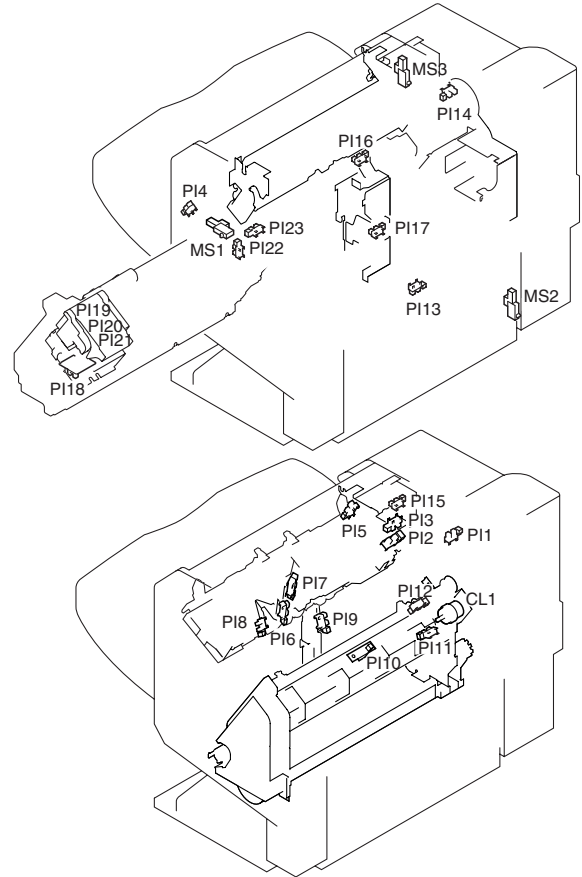


Fig. F05-201-01

Code	Name	Active condition
ES	Entry sensor	Paper detected: "H"
PHPS	Paddle home position sensor	Paddle HP: "H"
ARHPS	Bundle roller home position sensor	Oscillation guide HP: "H"
FJHPS	Alignment home position sensor (front)	Alignment tray (F) HP: "H"
RJHPS	Alignment home position sensor (rear)	Alignment tray (R) HP: "H"
AS	Alignment tray sensor	Paper detected: "H"
OBHPS	Exit belt home position sensor	Paper exit belt HP: "H"
BES	Tray paper sensor	Tray paper detected: "H"
SLS	Paper level sensor	Paper detected: "H"
FPS	Bookbinding position sensor	Paper detected: "L"
FHPS	Bookbinding home position sensor	Folding operation HP: "L"
FRHPS	Bookbinding roller HP sensor	Bundle transport roller HP: "H"
FES	Bookbinding paper sensor	Paper detected: "H"
FE	Bookbinding clock sensor	
ULS	Lift upper sensor	Tray upper limit detected: "H"
LLS	Lift lower sensor	Tray lower limit detected: "H"
LE	Lift lock sensor	
SHPS	Slide home position sensor	Stapler HP: "H"

Code	Name	Active condition
STHPS	Stapler home position sensor	Stapler stapling HP: "L"
SPS	Self prime sensor	Cartridge staple detected: "L"
SS	Staple sensor	Stapler cartridge detected: "L"
FDS	Front door sensor	Front cover open: "H"
TCS	Upper cover sensor	Upper cover open: "H"
FDSW	Front door switch	Front door closed: "H"
JS	Joint switch	Printer connected: "H"
SSS	Stapler safety switch	Oscillation guide closed: "H"

B. Motor and PWB

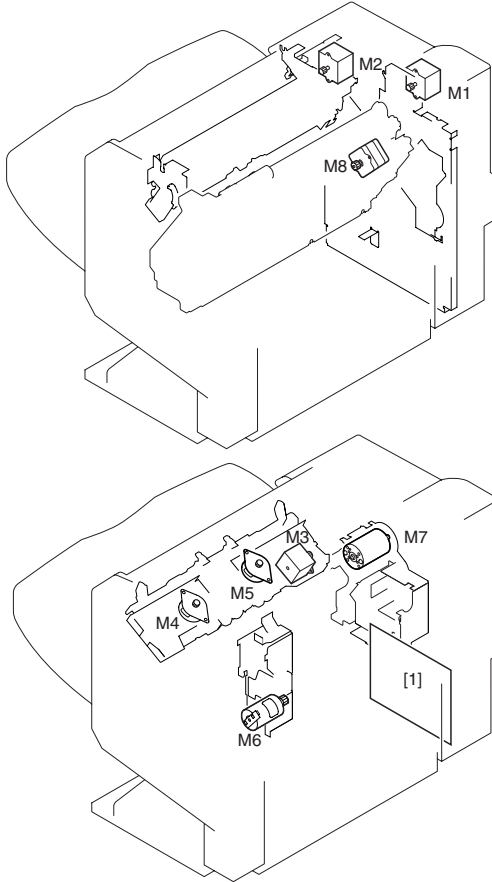


Fig. F05-201-02

Code	Name	Active condition	Remark
FFM	Transport motor	Paper transport	
FPM	Paddle motor	Oscillation guide drive, paper exit to offset tray	
FAM	Bundle exit motor	Paper exit operation	
FFJM	Alignment motor (front)	Alignment plate (F) drive	
FRJM	Alignment motor (rear)	Alignment plate (R) drive	
FLM	Shift motor	Paper exit tray up/down	
FFSM	Stapler/Fold motor	Stapling/paper folding	
FSM	Slide motor	Staple unit sliding	

4. Puncher section

A. Sensor

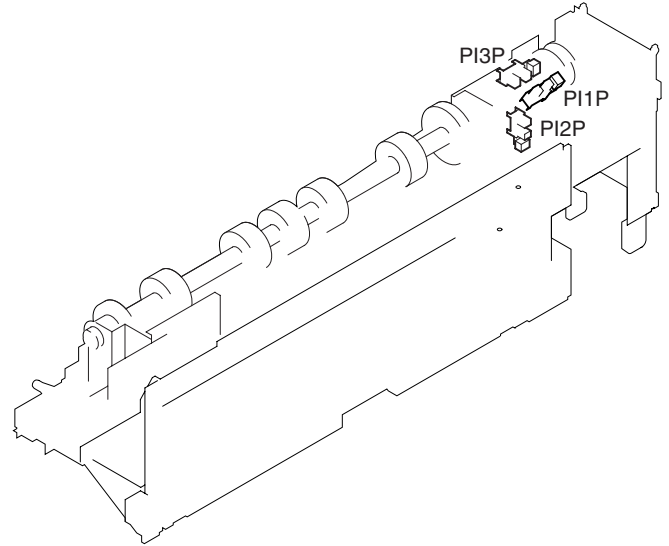


Fig. F05-202-01

Code	Name	Active condition	Remark
	Punch home position sensor	Punch HP detected: "L"	In the punch unit
PSHPS	Punch side home position	Punch slide unit HP detected: "H"	In the punch unit
PE	Punch dust sensor		In the punch unit

B. Motor

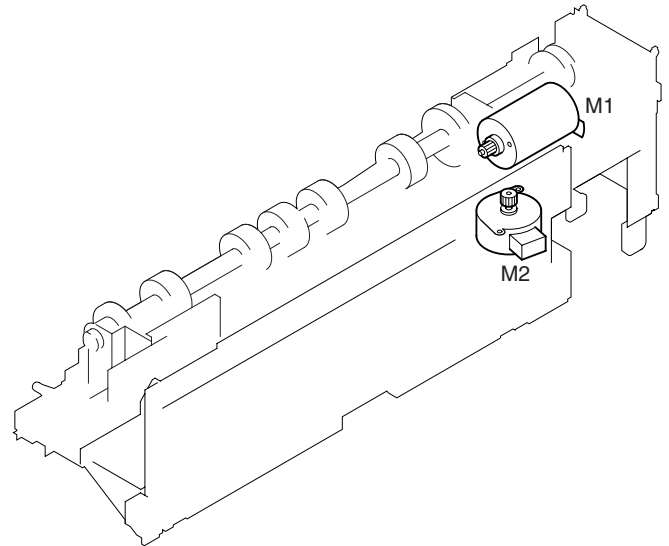


Fig. F05-202-02

Code	Name	Active condition	Remark
FPNM	Punch motor	Punch drive	
FPSM	Punch side motor	Punch slide unit transverse move	

C. PWB

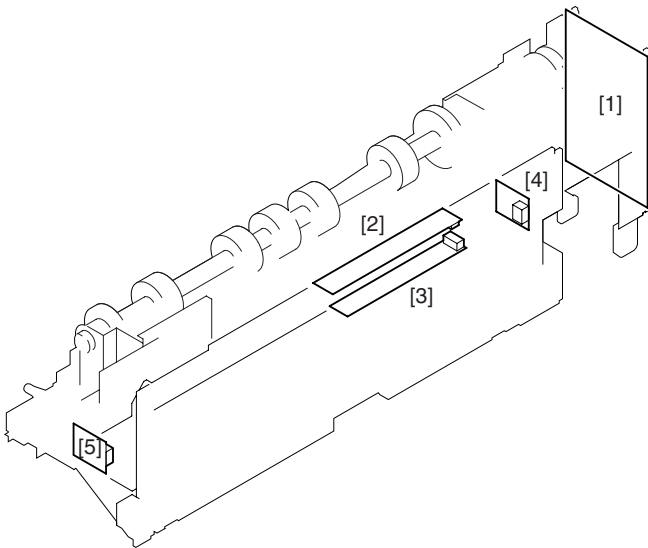


Fig. F05-202-03

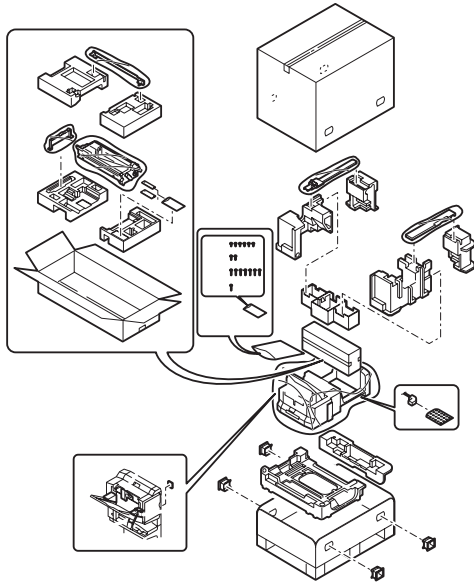
Code	Name
[1]	Punch driver PWB
[2]	Side resist photo sensor PWB
[3]	Side resist LED PWB
[4]	Dust full photo sensor PWB
[5]	Dust full LED PWB

[3] UNPACKING AND INSTALLATION

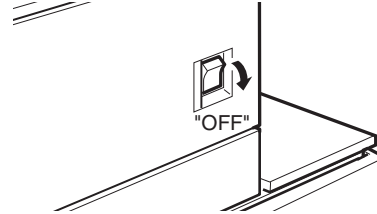
1. Saddle Stitch Finisher - B83SS

A. Before installation

For installation of B83SS, an optional stand/paper drawer (stand/MPD & 2000 sheet drawer or stand/3 x 500 sheet paper drawer) and a duplex module (B83D) must have been installed. Also a power supply unit (B83PS) is needed.

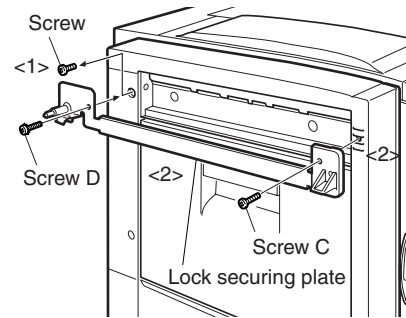


1. Turn the main switch located on the front side of the main unit to the "OFF" position. Then remove the power plug



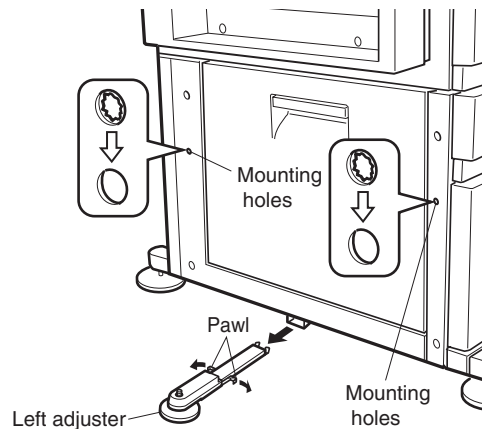
of the main unit from the outlet.

2. Attach the lock securing plate to the duplex module.
 - a. Remove the screw from the right side of the duplex module.
 - b. Attach the lock securing plate to the duplex module using the screws C and D (one for each).



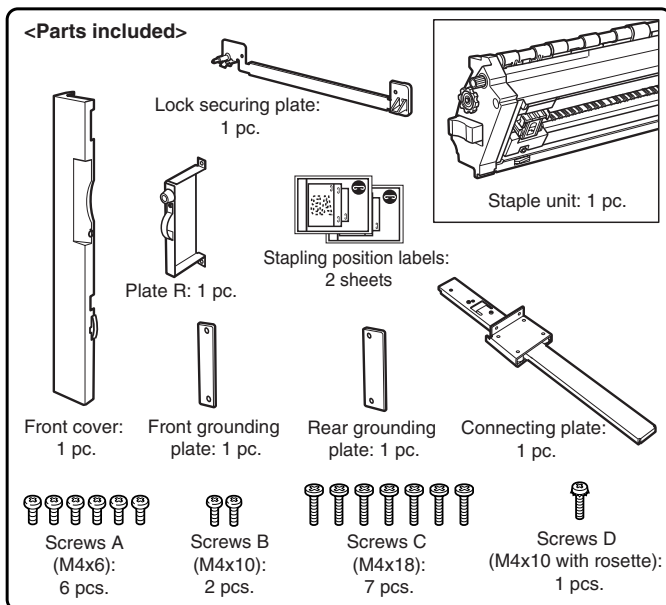
3. Process the stand/paper drawer.

- a. Open the pawl of the left adjuster on both sides to unlock it. It is located at the lower left of the stand/paper drawer. Remove the left adjuster.
- b. Punch out the two mounting holes of the stand/paper drawer using a screwdriver or something similar and remove burrs using a flat-blade screwdriver.

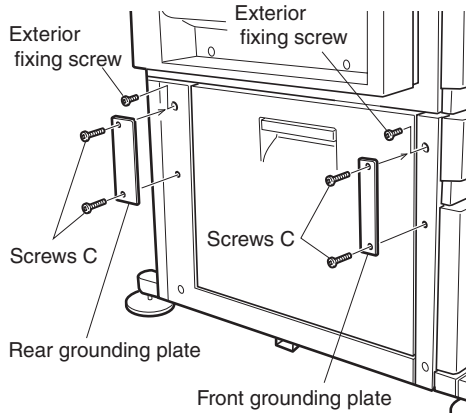


4. Attach the grounding plate to the stand/paper drawer.

- a. Remove the two screws that fix the exterior of the stand/paper drawer.

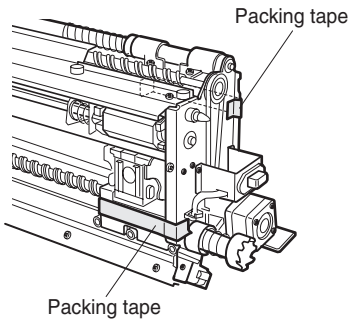


- b. Then, attach the front mounting plate and the rear mounting plate to the stand/paper drawer using screws C (two for each).

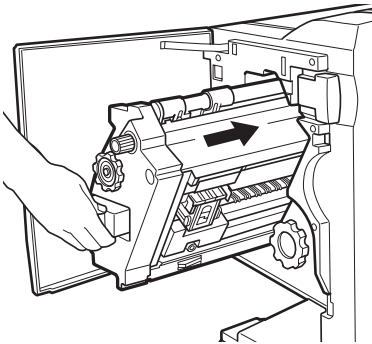


5. Install the staple unit to the finisher.

- a. Remove the two pieces of packing tape from the locations shown in the illustration.



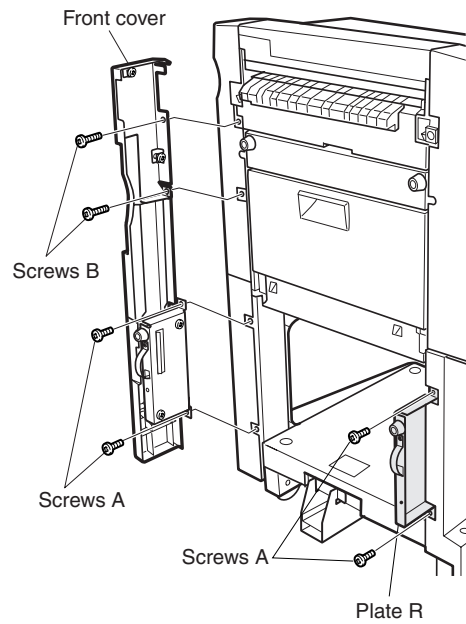
- b. Open the front cover of the finisher and insert the staple unit.



6. Attach the cover to the finisher.

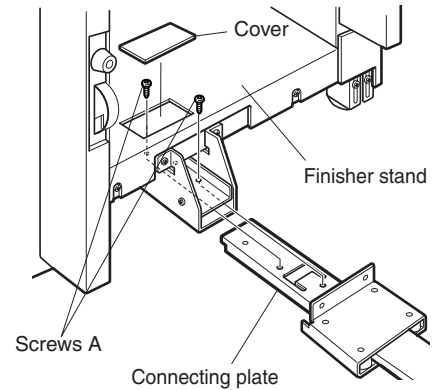
- a. Attach the plate R to the position shown in the illustration and secure it using two screws A.

- b. Attach the front cover to the finisher, and secure the upper part using two screws B and the lower part using two screws A.

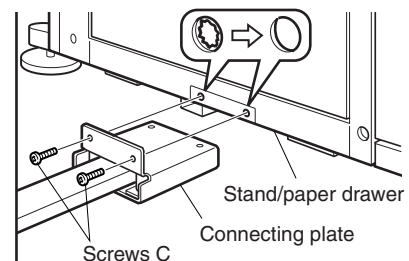


7. Connect the finisher to the stand/paper drawer.

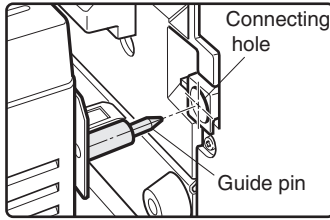
- a. Remove the cover from the finisher stand.
 b. Attach the connecting plate to the finisher using two screws A.
 c. Reattach the cover to its original position.



- d. Cut out the two mounting holes for the connecting plate at the lower part of the stand/paper drawer in a similar way to step 3).
 e. Attach the finisher connecting plate to the stand/paper drawer using two screws C.



8. Check and adjust the height of the finisher. Move the finisher toward the printer and check to see if the guide pin of the locking plate is inserted smoothly to the connecting hole of the finisher. If it is not inserted

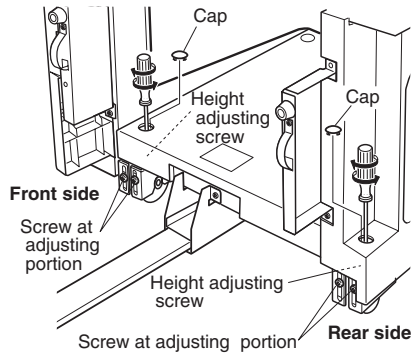


smoothly, use the following procedure to adjust the height.

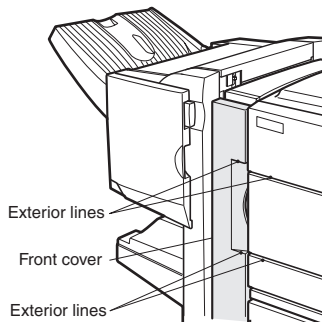
Height Adjustment Procedure

If the guide pin of the lock securing plate is not aligned with the connecting hole of the finisher:

- a. Loosen the screw at the rear adjusting portion.
- b. Remove the cap using a flat-blade screwdriver or something similar and adjust the height adjusting pin so that the guide pin is positioned to the center of the connecting hole of the finisher.
- c. Loosen the screw at the front adjusting portion.



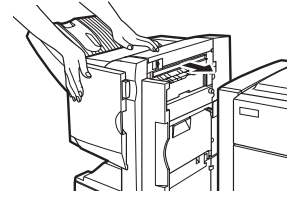
- d. Adjust the height adjusting pin so that the exterior lines are aligned, as shown in the illustration.



- e. If the guide pin can be inserted smoothly, tighten the screws at the front and rear adjusting portions and mount the caps.

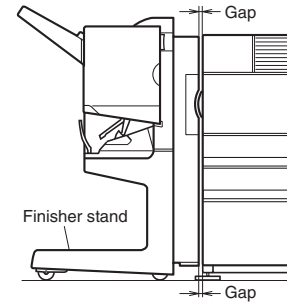
If the guide pin of the locking plate matches the connecting hole of the finisher:

- a. Push the finisher into the main unit.

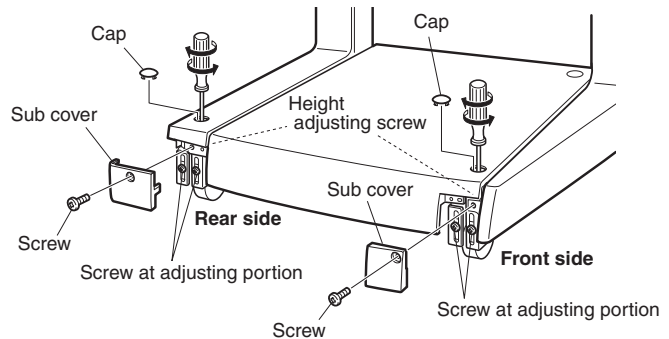


- b. If the gap between the main unit of the printer and the finisher is not uniform at the top and the bottom, remove the caps from the front side and the rear side of the finisher stand using a flat-blade screwdriver or something similar. Then, remove the screw of the sub covers on the front side and the rear side to remove the sub covers.

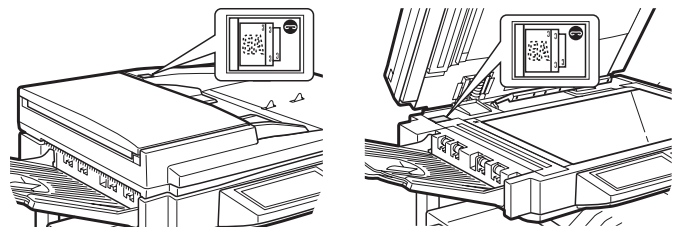
- c. Loosen the four screws at the adjusting areas indicated in the illustration and turn the height adjusting screws on the front side and the rear side so that the gap becomes uniform.



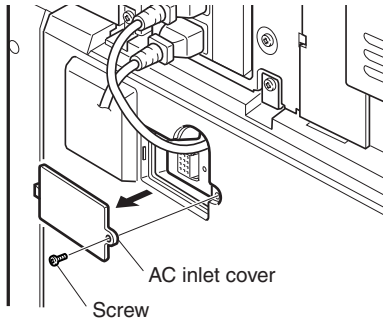
- d. When the gap is even, tighten the screws at the adjusting portions and reattach the caps and sub covers.



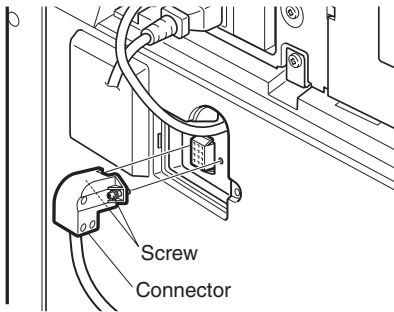
9. Paste the stapling position labels to the positions shown in the illustration.



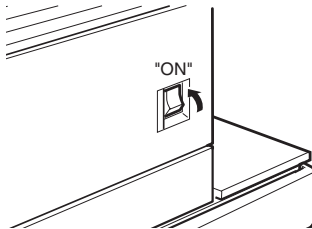
- Remove the AC inlet cover from the rear cabinet of the stand/paper drawer, by removing the screw that fixes the AC inlet cover and then removing the AC inlet cover.



- Connect the finisher connector to the stand/paper drawer. Tighten the screw of the connector.



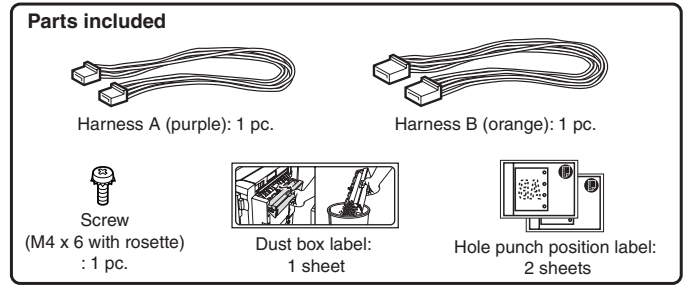
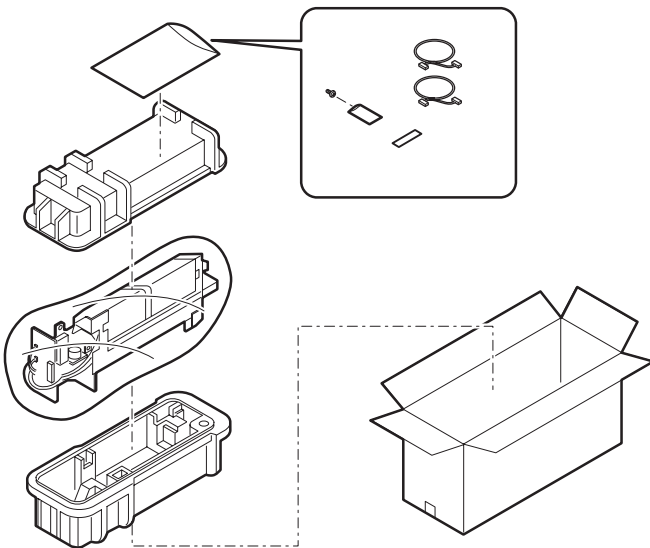
- Turn on the main switch of the main unit, by inserting the power plug of the main unit to the outlet.



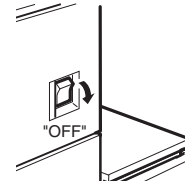
2. Punch Unit - B83UPS

A. Before installation

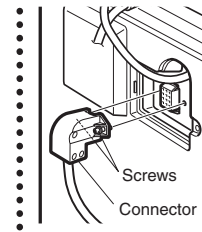
For installation of a punch unit, a saddle stitch finisher (B83SS) must have been installed.



- Turn off the main switch of the main unit of the printer to the "OFF" position.

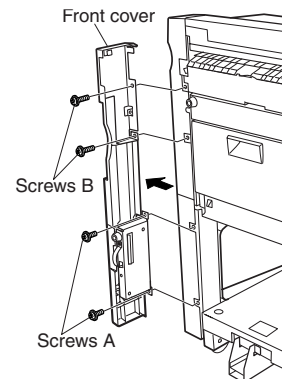


- Then remove the power plug of the main unit from the outlet.
- Loosen the screw and remove the connector of the finisher.



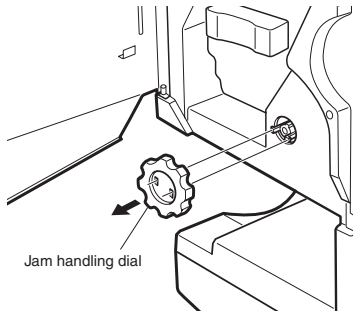
- Remove the front cover from the right front of the finisher.

- Remove the screws A and B (two for each) that secure the finisher front cover and remove the front cover.



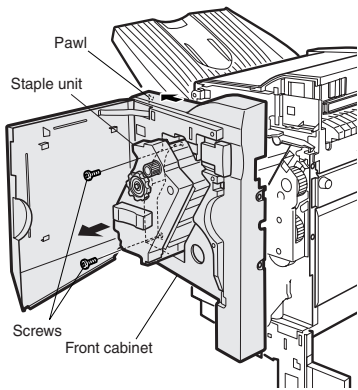
3. Remove the front cabinet and the rear cabinet from the finisher.

a. Open the front door of the finisher and remove the jam handling dial.

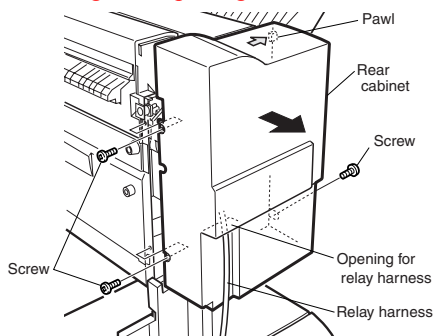


b. Remove the two front cabinet securing screws. Pull out the staple unit until it stops and then remove the pawl of the front cabinet in the direction indicated by the arrow and remove the front cabinet.

c. Remove the three screws that fix the rear cabinet and remove the rear cabinet. **At this time, remove the relay harness through the opening of the rear cabinet.**

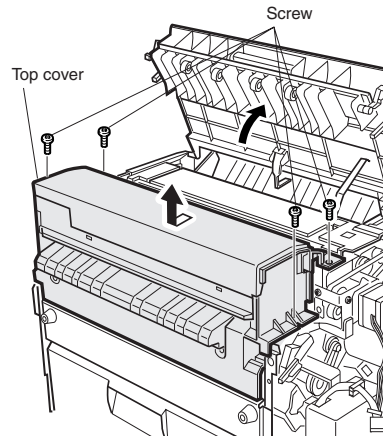


d. Remove the three rear cabinet securing screws, remove the pawl in the direction indicated by the arrow, and remove the rear cabinet. **At this time, remove the relay harness through the opening of the rear cabinet.**

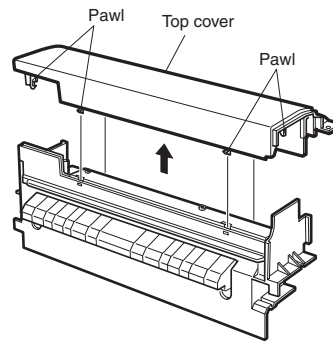


4. Remove the top cover.

a. Remove the four top cover securing screws and remove the top cover.



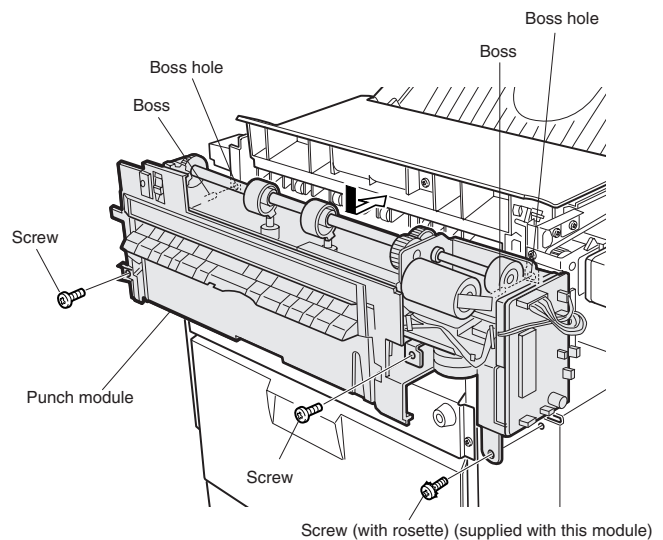
b. Remove the four pawls from the top cover and separate the cover into the upper and lower portions. Reuse the upper portion.



5. Attach the punch module.

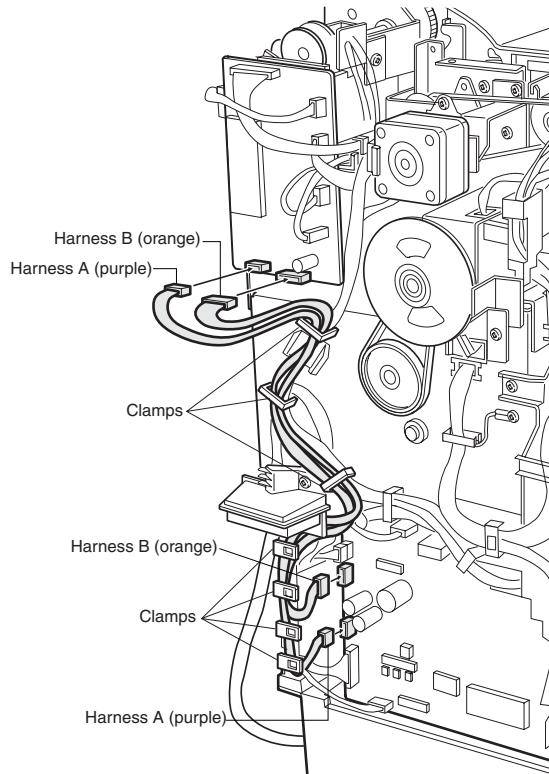
a. Insert the two bosses of the punch unit into the boss holes of the finisher and fix the punch module using three screws.

Note: For the screws, use a supplied screw and the two screws that have been removed in step 4.

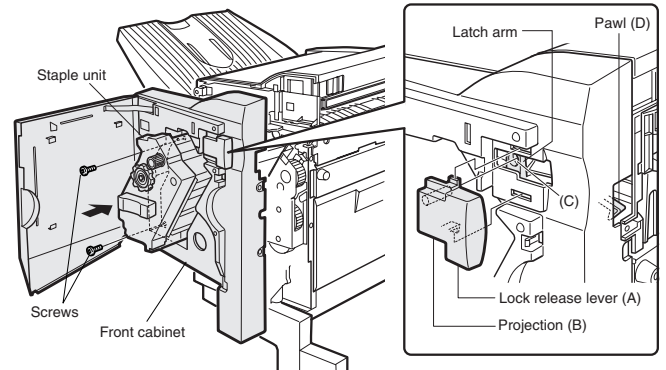


6. Connect the harness of the punch module to the PWB of the finisher.

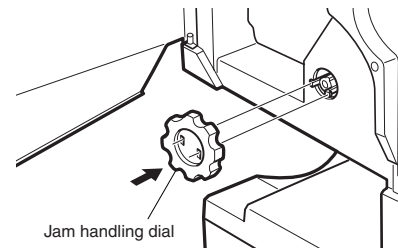
- a. Remove the clamps that fix the harness, handle the wiring of harness A (purple) and harness B (orange), and fix them with the clamps.



- c. Remove the lock release lever that has been attached to the front cabinet. Reattach the front cabinet to its original position, push in the staple unit, and attach it using the two screws.
- d. Insert the protrusion (B) of the lock release lever that has been removed before to the hole (C) of the latch arm. After attaching it, move the lever to check that it moves smoothly. If the lever does not move smoothly, remove the lock release lever by releasing the pawl at the lower part of the lock release lever using a flat-blade screwdriver and then insert it again.

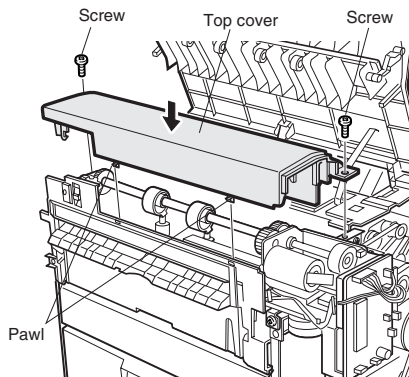


- e. Reattach the jam handling dial and close the front cover.

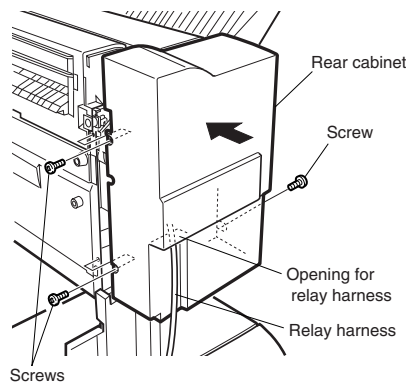


7. Reattach the covers that have been removed.

- a. Hang the two pawls of the top cover and secure them using the two screws.

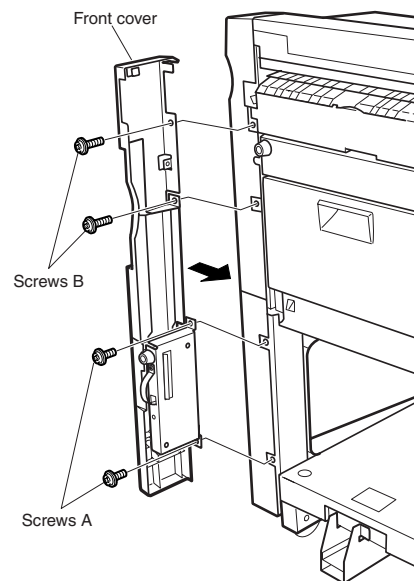


- b. Pass the relay harness to the rear cabinet and secure the rear cabinet using the three screws.

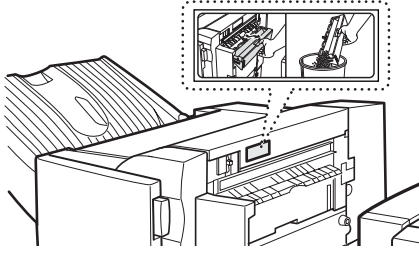


8. Reattach the front cover to the right front of the finisher.

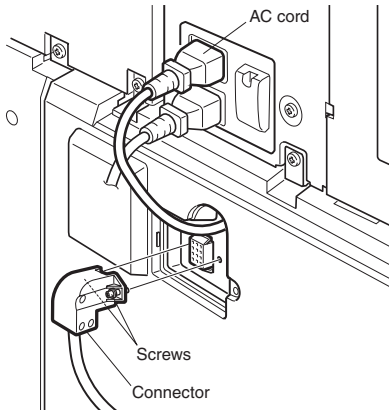
- a. Attach the front cover using the screws A and B (two for each).



9. Paste the supplied dust box label to the location indicated in the illustration.



10. Connect the connector to the stand/paper drawer and connect the AC cord of the power supply unit to the main unit of the printer.
- a. Connect the connector of the relay harness of the finisher to the stand/paper drawer and tighten the screws of the connector.



[4] OPERATIONAL DESCRIPTION

1. Basic Operation

A. Specifications

The finisher delivers sheets coming from the host machine. The mode of delivery may be non-sort stack, job offset*, or staple delivery.

The saddle unit built into the finisher folds a stack of sheets, from the finisher unit, in half for delivery.

All these operations are controlled by various commands sent by the host machine in addition to the commands from the finisher controller PCB.

The punch unit (option) is designed for installation to the pickup assembly of the finisher and is used to punch holes in sheets coming from the host machine.

The above operations are controlled with various commands from the finisher controller PCB as well as the commands from the punch controller PCB.

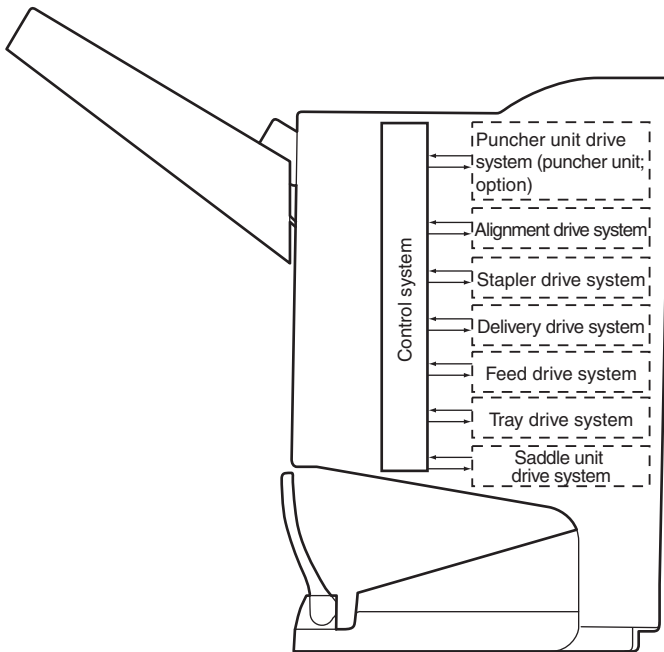


Fig. F02-101-01

Note: The position of delivery is shifted to the front/rear for each stack to assist sorting.

B. Outline of the Electrical Circuitry

The sequence of finisher operations is controlled by the finisher controller PCB. The finisher controller PCB is a 16-bit microprocessor (CPU), and is also used for combination with the host machine (serial).

The finisher controller PCB drive motors and other loads in response to the various commands from the host machine. It also communicates such data as on the states of various sensors and switches to the host machine by way of the serial communication line.

The ICs mounted to the finisher controller PCB have the following functions:

- IC13 (CPU)

Control sequence of operation.

- IC12 (EEP-ROM)

Backs up adjustment settings.

- IC6 (EP-ROM)

Stores sequence programs.

- IC11 (communication IC)

Communicates with the host machine.

- IC1 (regulator IC)

Generates 5 V.

F02-102-01 shows the flow of signals between finisher and options controller:

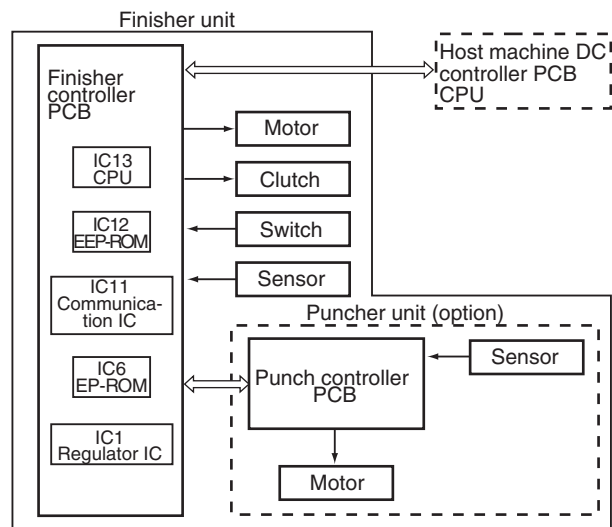


Fig. F02-102-01

2. Feed/Drive System

A. Outline

The machine performs the following in response to the commands coming from its host machine on the sheets arriving from the host machine for delivery: simple stacking, job offset, and stapling or folding (in two).

If a punch unit (option - B83UPS) is installed, the sheets are punched and delivered to the delivery tray.

Sheets may be delivered in one of five ways (including one for the punching unit):

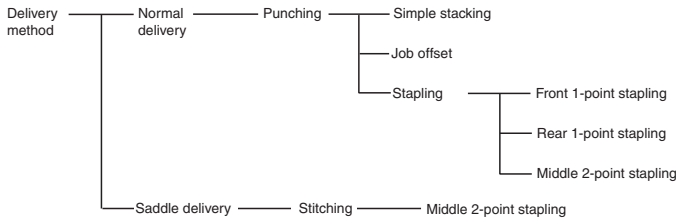


Fig. F02-201-01

Normal Delivery

Simple Stacking

The machine pulls in the sheet once to the processing tray and then delivers it to the delivery tray.

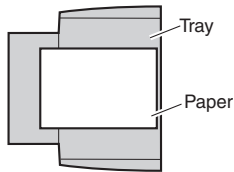
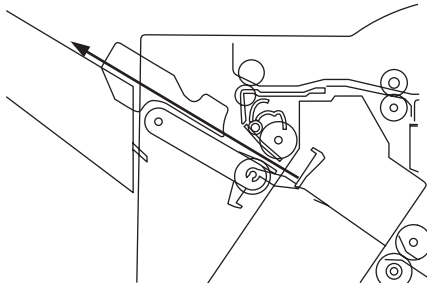
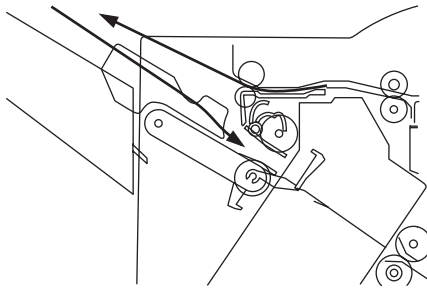
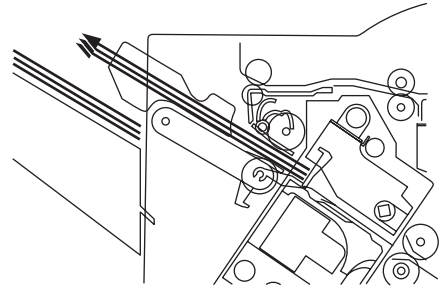
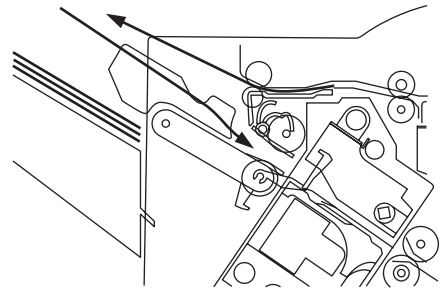


Fig. F02-201-02

Job Offset

The machine pulls the sheet once to the processing tray. It then moves the sheet to the front or the rear using the aligning plate. When it has deposited a specific number of sheets, it delivers them in the form of an aligning plane. When the number of sheets stacked on the processing tray reaches a specified value, the sheets are delivered as a stack. Even if the specified value is not reached, stacked sheets are temporarily delivered when 10 sheets of large-size paper (11.81"/300 mm or longer) or 30 sheets of small-size paper

(11.77"/299 mm or shorter) have been stacked. (5 1/2 x 8 1/2 or 5 and STMT sizes: 10 sheets)



Results of offset delivery (4 jobs)

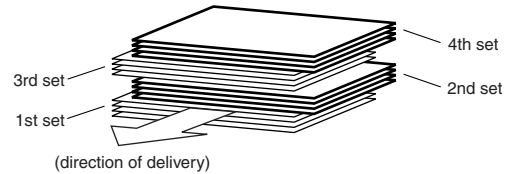


Fig. F02-201-03

Stapling

The machine stacks sheets coming from its host machine on the processing tray. When the number of sheets stacked on the processing tray reaches a specified value, the finisher staples them and delivers the stapled stack to the delivery tray.

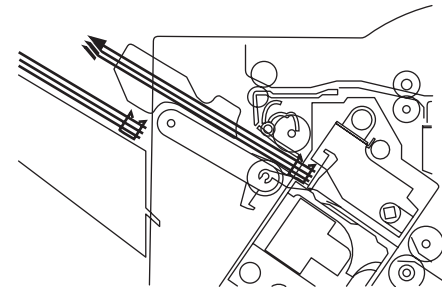
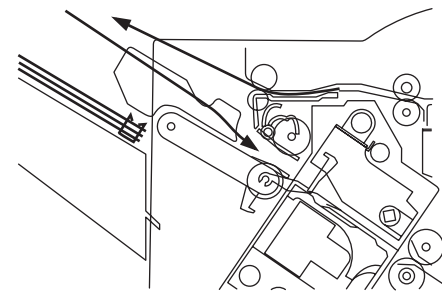


Fig. F02-201-04

Saddle Delivery

The machine deposits a stack of sheets on the processing tray, staples it (middle 2-point), and then moves it to the

saddle unit. The saddle unit folds the stack in two, and delivers it to the bind tray.

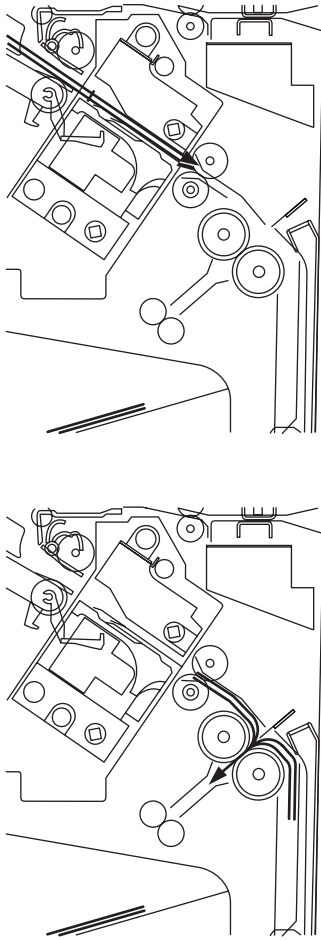


Fig. F02-201-05

Feed/Delivery

Outline

The machine forwards the sheets coming from its host machine to the delivery tray, processing tray, or saddle unit according to the type of delivery used. The sheets forwarded to the processing tray or the saddle unit are offset, stapled, or folded.

Table T02-202-01 shows the motors that are associated with moving and aligning sheets. These motors are controlled (rotated clockwise or counterclockwise) by the microprocessor (CPU) on the finisher controller PCB.

The paper path is equipped with the sensors (shown in Fig. F02-202-02) which are used to monitor the arrival or passage of sheets.

If a sheet fails to arrive at or move past a specific sensor within a specific period of time, the finisher controller will assume a jam, and stops the ongoing operation and, at the same time, communicates the presence of a jam to the host machine.

Notation	Name	Description	Connector on finisher controller PCB
FFM	Feed motor	Stepping motor	CN10
FPM	Paddle motor	Stepping motor	CN10
FAM	Delivery motor	Stepping motor	CN13
FFJM	Alignment plate motor (front)	Stepping motor	CN3
FRJM	Alignment plate motor (rear)	Stepping motor	CN3
FFSM	Staple/fold motor	Brush DC motor	CN6

Table. T02-202-01

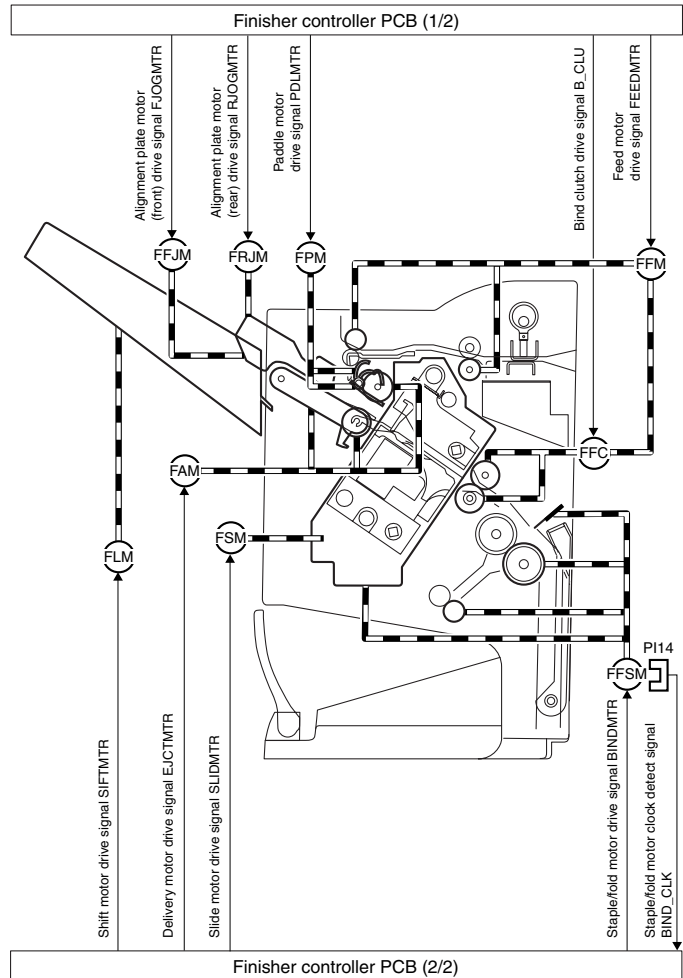


Fig. F02-202-01

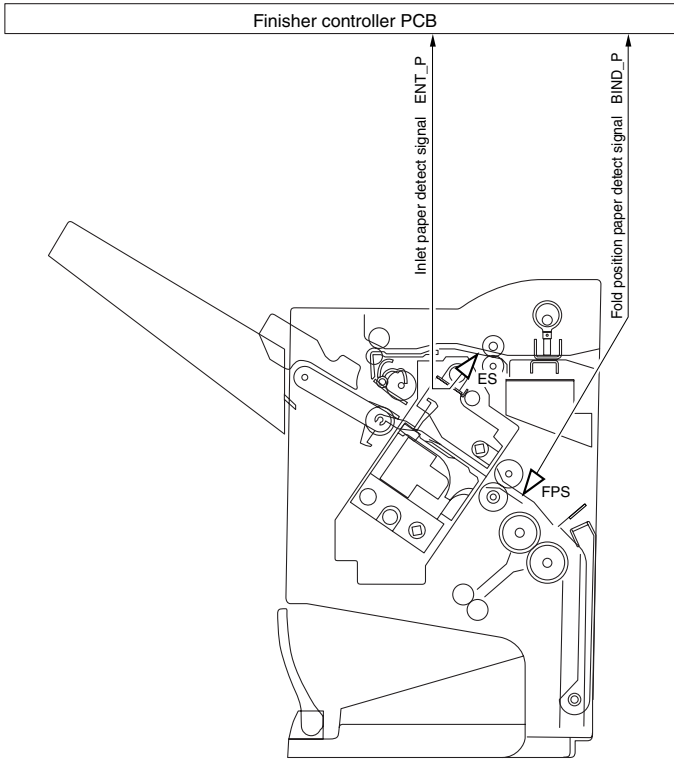


Fig. F02-202-02

Notation	Name	Description	Connector on finisher controller PCB
ES	Inlet sensor	Photointerrupter	CN16
FPS	Fold position sensor	Photointerrupter	CN16

Table. T02-202-02

Job Offset

Outline

- "Job Offset" refers to the operation when the machine delivers each set of sheets separated for sorting.
- The front and rear aligning plates create the offset position of the stacks.
- The sheet coming between the delivery rollers is fed onto the processing tray and then fed toward the stopper by the paddle.
- A swing guide is in the up position while a sheet is being pulled onto the processing tray or during alignment. It is in the down position during stack feeding, stack delivery, or stapling.
- At power-on, the finisher controller PCB drives the aligning plate (front) motor (FFJM) and the aligning

plate (rear) motor (FRJM) to return the two aligning plates to their home positions.

Sensor	Symbol	Connector	Function	Motor	Symbol
Aligning plate (front) home position sensor	FJHPS	CN4-3	Drives the aligning plate (front)	Aligning plate (front) motor	FFJM
Aligning plate (rear) home position sensor	RJHPS	CN5-15	Drives the aligning plate (rear)	Aligning plate (rear) motor	FRJM
Swing guide home position sensor	ARHPS	CN9-9	Drives the swing guide drive.	Paddle motor	FPM
Paddle home position sensor	PHPS	CN9-3	Drives the paddle (feeds paper).	Paddle motor	FPM

Table. T02-203-01

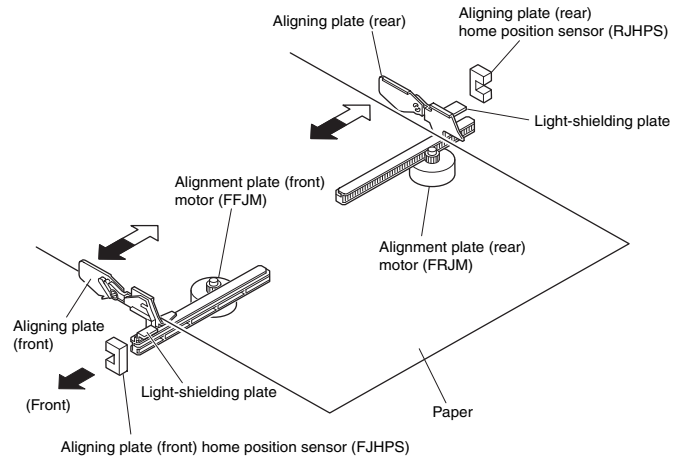


Fig. F02-203-01

Processing Tray Paper Stacking Operation

A sheet coming between the delivery rollers is fed onto the processing tray. Then, the paddle taps on the sheet surface twice (once for the second and subsequent sheets) to locate the sheet against the processing tray stopper.

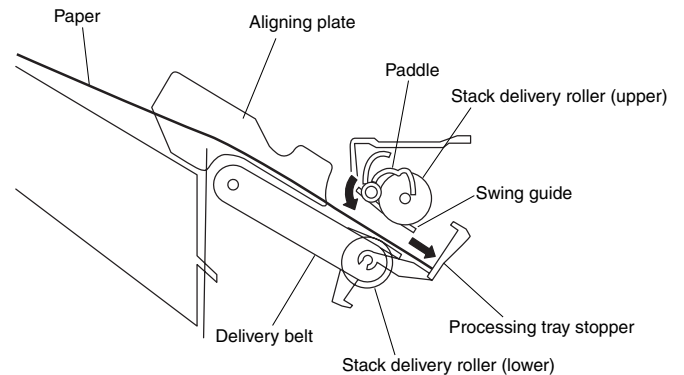


Fig. F02-203-02

Offset Operation

Each sheet is pulled forward or backward using the aligning plate (front) and the aligning plate (rear).

The offset operation is performed each time a sheet is pulled onto the processing tray.

Offsetting in the forward direction

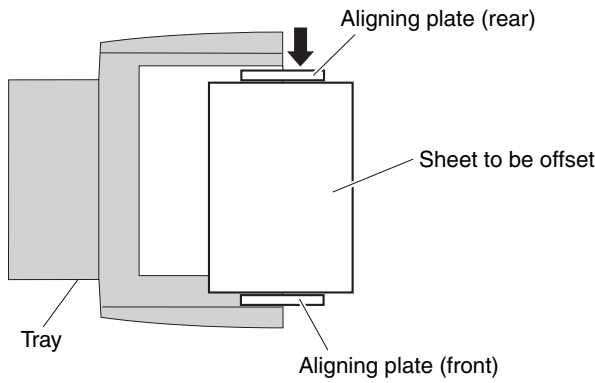


Fig. F02-203-03

Offsetting in the backward direction

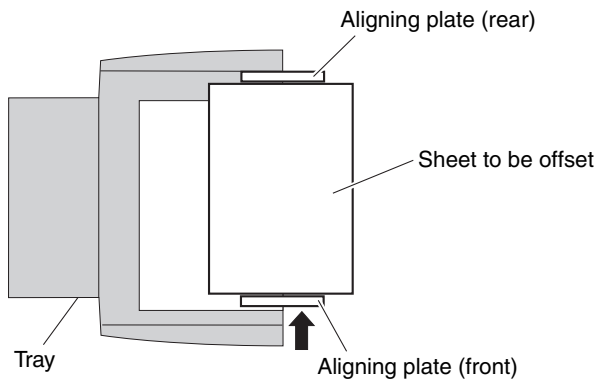


Fig. F02-203-04

Stack Delivery Operation

Stack delivery occurs when 10 sheets of large-size paper or 30 sheets of small-size paper (5½ x 8½ or A5 and STMT-sizes: 10 sheets) have been stacked on the processing tray with them offset in either direction.

The paddle motor rotates and the swing guide descends to hold the paper stack between the upper and lower stack delivery rollers. The delivery motor rotates in the forward direction to rotate the delivery rollers, feeding the paper stack in the delivery direction. The delivery belt home position sensor turns OFF. The delivery motor is driven a specified number of pulses, causing the swing guide to ascend. Next, the paper delivery motor is driven. Next, the delivery motor is driven to deliver the paper stack with the nails of the delivery belt that rotates in sync with the stack delivery rollers.

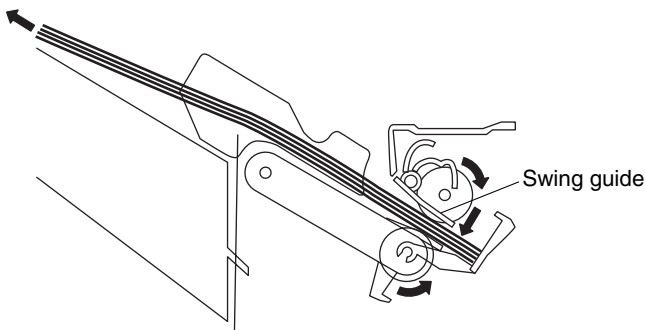


Fig. F02-203-05

Job offset sequence

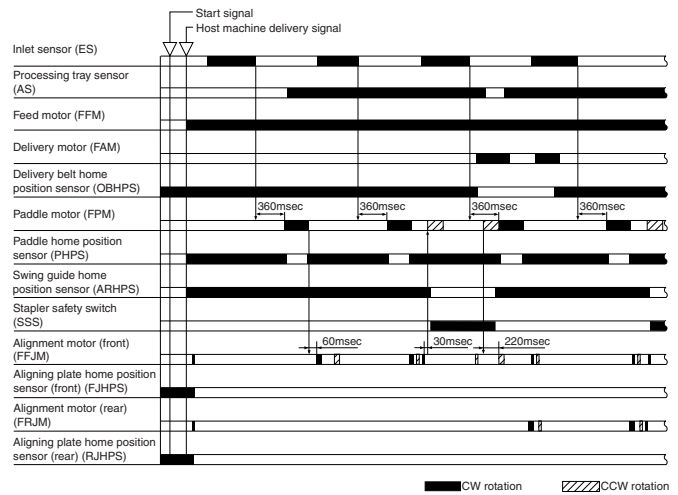


Fig. F02-203-06

3. Stapling Operation

A. Outline

Staple operation is performed to staple a specified sheets of paper using a stapler unit.

The stapling position depends on the staple mode and paper size. When the machine starts, the finisher controller PCB drives the slide motor (FSM) to return the stapler unit to the home position. The stapler unit starts moving toward the front of the stapler frame. It stops when the slide home position sensor (SHPS) on the slide PCB located under the stapler unit. Next, the slide motor is driven a specified number of pulses. The stapler unit moves to rear standby position at the back of the machine, entering the standby state.

Sensor	Symbol	Connector	Function	Remarks
Slide home position sensor	SHPS	CN11-3	Detects the home position for the stapler moving back and forth.	-
Staple home position sensor	STHPS	CN11-4	Detects the home position for the stapling operation	In the stapler
Staple empty sensor	SPS	CN11-5	Detects presence or absence of staples in the cartridge.	In the stapler
Staple top position sensor	SS	CN11-6	Detects the staple top position.	In the stapler

Function	Motor	Symbol	Remarks
Moves the stapler.	Slide motor	FSM	-
Performs stapling operation.	Staple/fold motor	FFSM	-

Table. T02-301-01

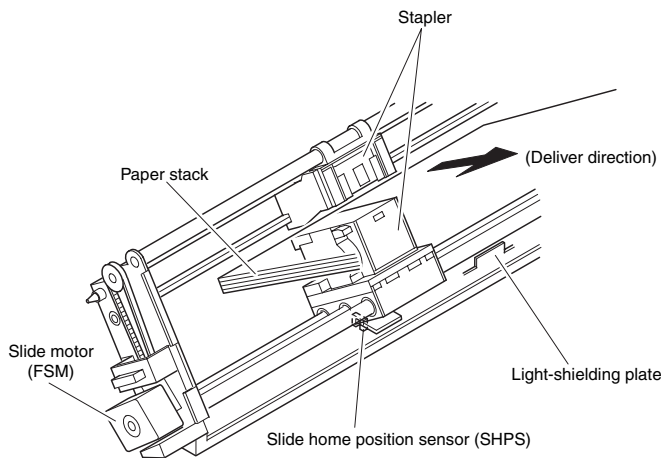


Fig. F02-301-01

B. Stapling Operation

When stacking and alignment of paper on the processing tray are complete, the finisher controller PCB drives the paddle motor (FPM) in the reverse direction and lowers the swing guide. When the swing guide descends, the paper stack is sandwiched between the upper and lower stack delivery rollers.

The finisher controller PCB moves the stapler for stapling according to the specified stapling position (when rear 1-point stapling is specified, the stapler does not move but it staples at the standby position). As the stapler moves forward, the processing tray stopper is folded forward.

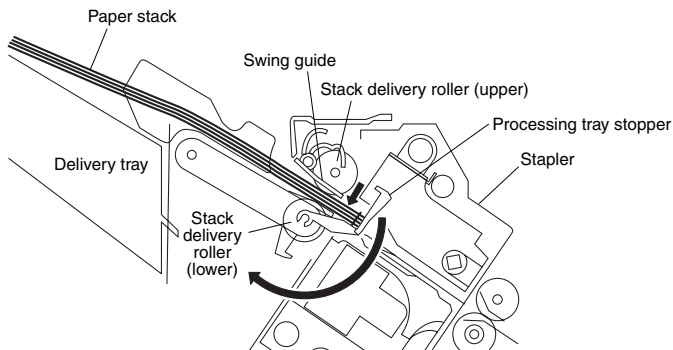


Fig. F02-302-01

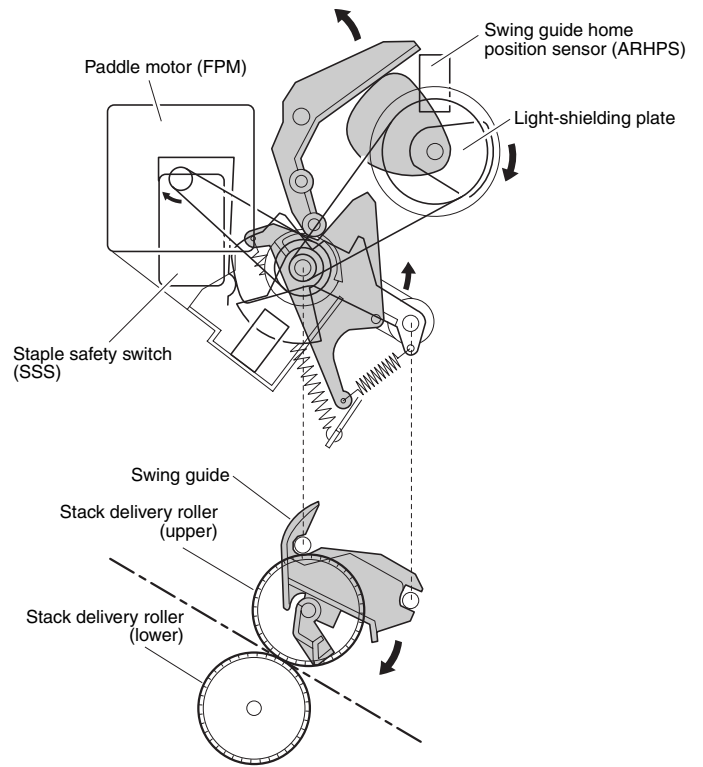


Fig. F02-302-02

C. Delivery Operation after Stapling

When stapling is complete, the finisher controller PCB drives the deliver motor in the forward direction to feed the paper stack (sandwiched between the stack delivery rollers) in the delivery direction. The delivery belt home position sensor is turned OFF. The delivery motor is driven a specified number of pulses, causing the swing guide to ascend. At the same time, the slide motor is driven to return the stapler back to the standby position, followed by driving of the delivery motor. Then, the paper stack is delivered with the nails of the delivery belt that rotates in sync with the stack delivery rollers.

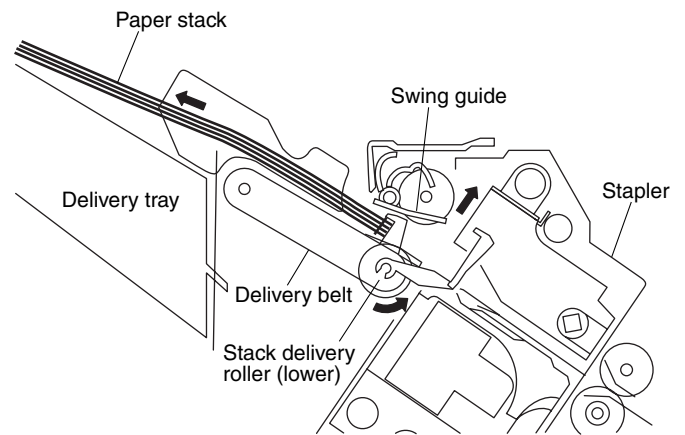


Fig. F02-303-01

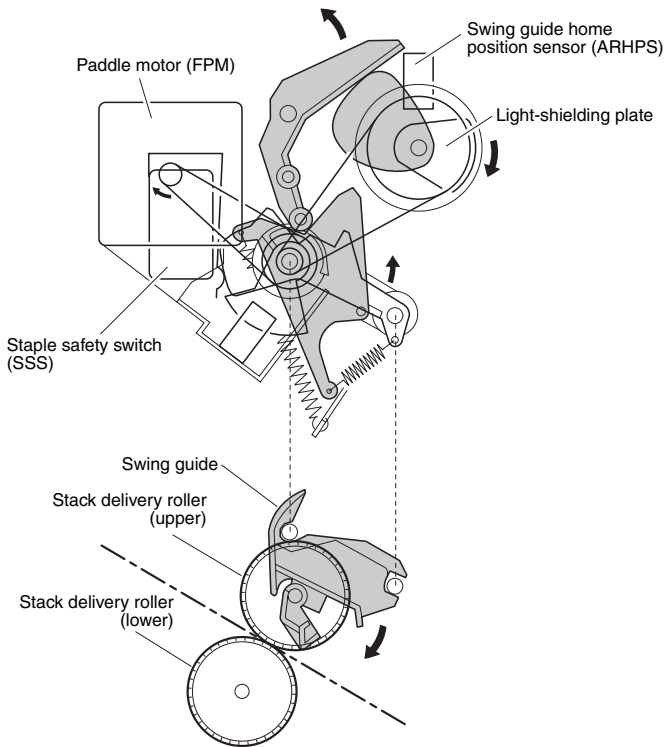


Fig. F02-303-02

D. Stapler Unit

- The staple/fold motor (FFSM) performs the stapling operation. This motor rotates the cam one turn for stapling. The home position of this cam is detected by the staple home position sensor (STHPS).
- The staple/fold motor rotates in the forward or reverse direction under the control of the macro computer (IC13) on the finisher controller PCB.
- When the staple home position sensor is OFF, the finisher controller PCB rotates the staple/fold motor in the forward direction until the sensor turns ON, allowing the staple cam to return to the original position.
- The staple empty sensor (SPS) detects the presence/absence of a staple cartridge in the machine and the presence/absence of staples in the cartridge.
- The staple top position sensor (SS) determines whether staples are pushed up to the top of the staple cartridge.
- The finisher controller circuit does not drive the staple/fold motor (FFSM) unless the staple safety switch (SSS) is ON (the swing guide is closed). This assures safety operation in case you happen to put your finger in the stapler.

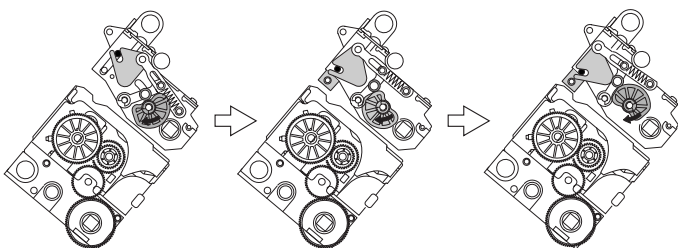


Fig. F02-304-01

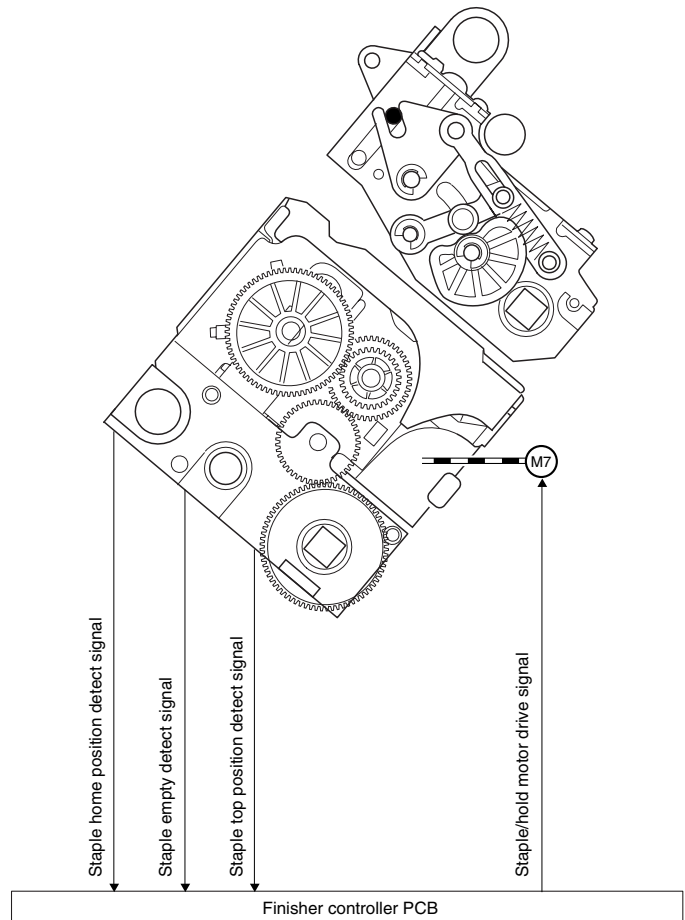


Fig. F02-304-02

Stapler Movement Controller

The slide motor (FSM) moves the stapler unit. Its home position is detected by the slide home position sensor (SHPS). The stapler waits at the back irrespective of the staple mode and paper size. After paper has been stacked on the processing tray, the stapler is moved to the specified stapling position in response to the stapling command from the host machine.

F02-304-03 shows the standby position of the stapler and the stapling position depending on the staple mode.

Front 1-point stapling

The stapler waits at the back. The stapler moves to and returns from the stapling position for each stapling operation.

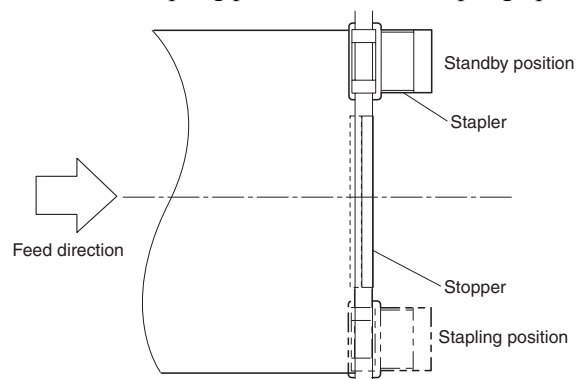


Fig. F02-304-03

Rear 1-point stapling

The stapler waits at the back. The stapling position is the same as the standby position.

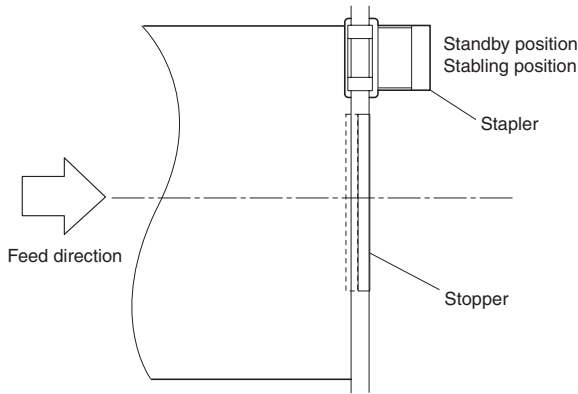


Fig. F02-304-04

Middle 2-point stapling

The stapler waits at the back. The stapler moves to and returns from the stapling position for each stapling operation. The stapler first staples a paper stack at the rear stapling position and then staples it at the front stapling position.

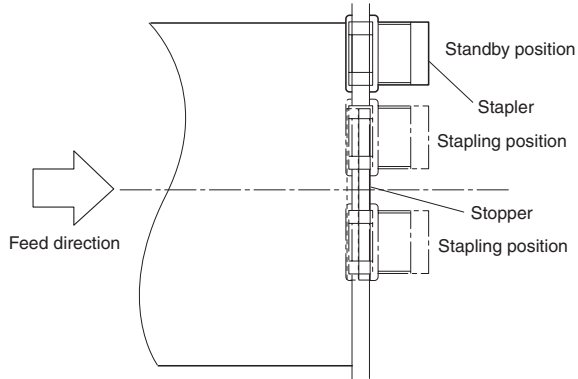


Fig. F02-304-05

Middle 2-point stapling (bind mode)

The stapler waits at the back. The stapler moves to and returns from the stapling position for each stapling operation. The stapler first staples a paper stack at the rear stapling position and then staples it at the front stapling position.

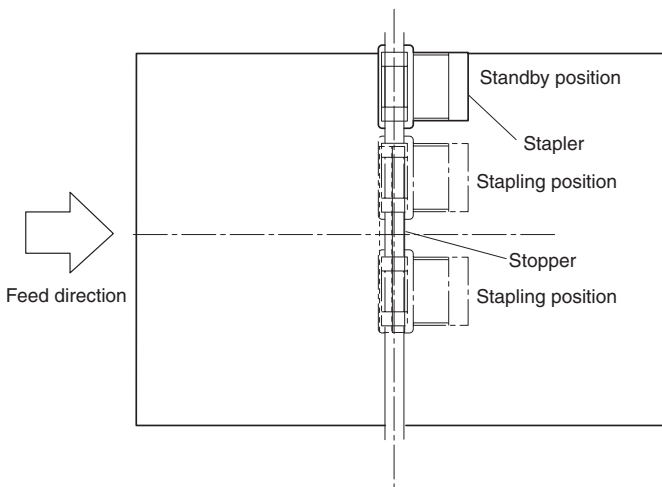


Fig. F02-304-06

Stapling Operation Sequence - Rear 1-point Stapling of Two Sheets

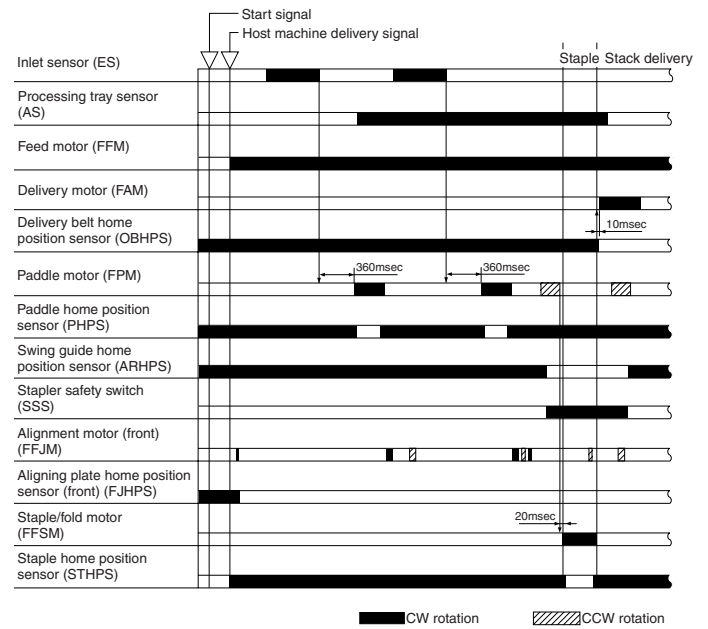


Fig. F02-304-07

4. Delivery Tray Operation

A. Outline

- The machine has a delivery tray in the finisher unit and a bind tray in the saddle unit.
- The bind tray in the saddle unit is of the fixed type and all the folded paper stacks are delivered to this tray. This tray has a bind tray sensor (FES) to detect the presence/absence of paper.
- The delivery tray in the finisher unit moves up and down using a shift motor (FLM).
- The finisher has a tray paper sensor (BES) to detect the presence/absence of paper on the stack tray.
- The home position sensor of the delivery tray detects the paper surface sensor (STHPS). When paper has already been stacked on the delivery tray, the home position is on the top surface of the stacked paper. When paper has not yet been stacked on the delivery tray, the home position is at the position where the edge of the delivery tray is detected. At power-on, the finisher controller PCB drives the shift motor (FLM) to return the delivery tray to the home position.
- When the paper coming from the processing tray is stacked on the delivery tray, the shift motor is driven a specified number of pulses, causing the delivery tray to descend. Clock pulses are detected by the shift motor clock sensor (LE). Then, the delivery tray returns to the home position for the next stacking operation.
- The upper limit of the delivery tray is detected by the shift upper limit sensor (ULS). When the shift upper limit sensor (ULS) is turned ON, the finisher controller PCB stops the shift motor (FLM) that is ascending.
- The lower limit of the delivery tray is detected by the shift lower limit sensor (LLS). When the shift lower

limit sensor (LLLS) is turned ON, the finisher controller PCB stops the shift motor (FLM) that is descending.

- The finisher unit has a full stack sensor (PI24) to detect overstacking of large-size or mixed paper according to the stack height.

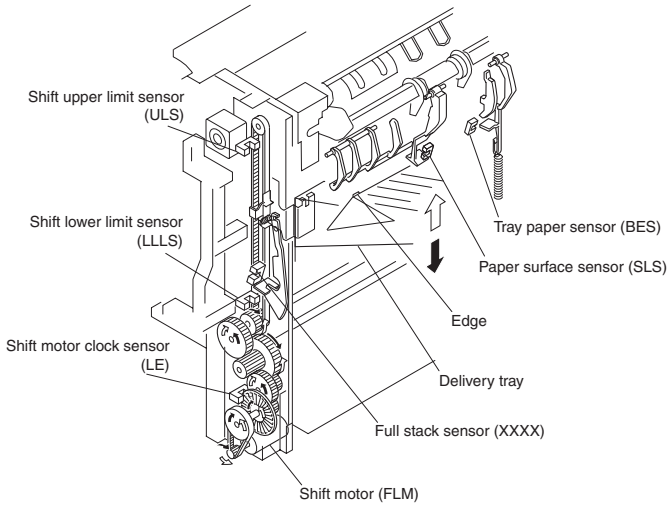


Fig. F02-401-01

5. Saddle Unit

A. Basic Operations

Outline

The machine stitches a stack of sheets (middle 2-point), then folds the stack in two in the finisher. These operations are controlled by the finisher controller PCB.

The finisher controller PCB is controlled by the commands from the host machine.

B. Feed/Drive System

Outline

This machine stitches the paper stack coming from the finisher, folds it, and delivers it to the bind tray in the saddle unit in response to the commands from the host machine.

The machine performs the following operations:

- Paper feed-in
- Stitching
- Stack feed
- Folding/delivery

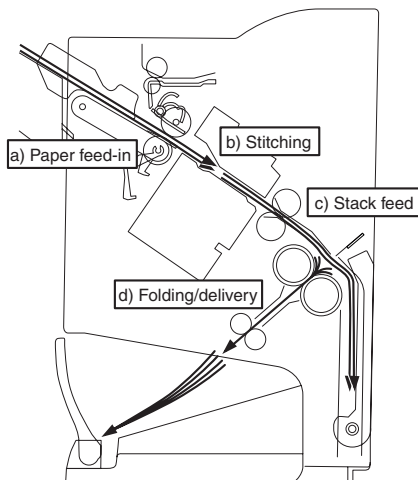


Fig. F02-502-01

Paper feed-in

After being aligned on the processing tray, a stack of sheets is sandwiched between the stack delivery rollers. As the stack delivery rollers rotate, the stack is fed toward the saddle unit.

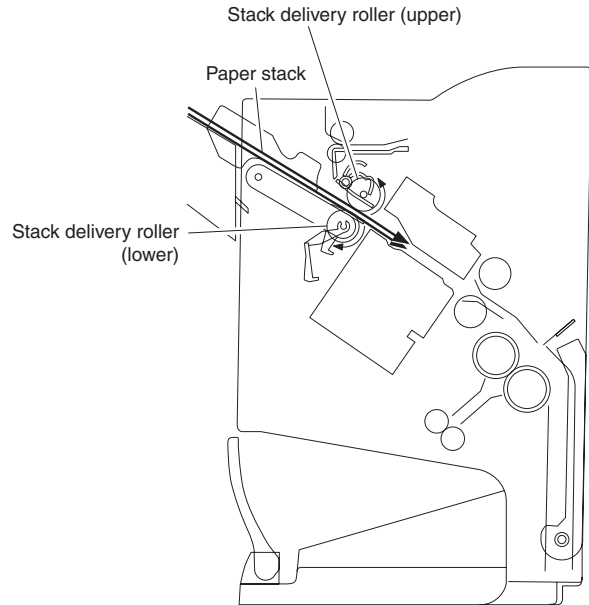


Fig. F02-502-02

Stitching

When the center of the paper stack (stitching position) reaches the stapler's staple position, the stapler stitches the paper stack.

When only one sheet is fed from the host machine, the next step (stack feed) is performed without performing the stitching operation.

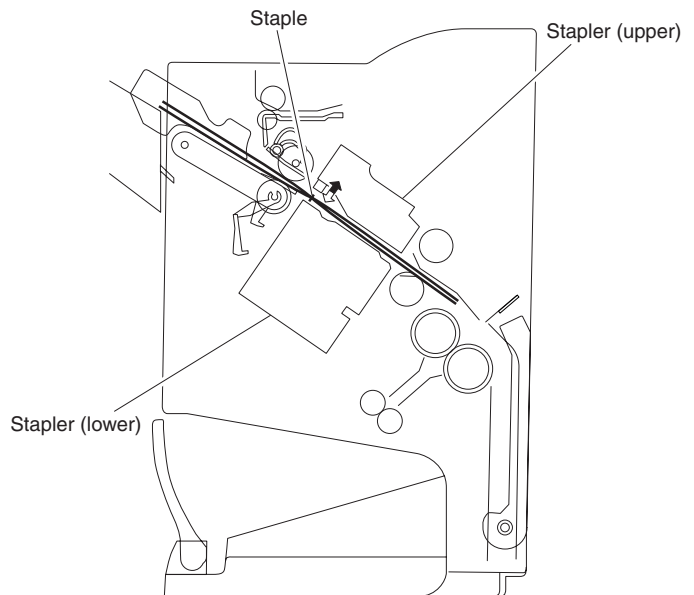


Fig. F02-502-03

Stack feed

The stack feed rollers feed the paper stack to the stack folding/delivery position where the center of the stack

(stitched position) is level with the paper pushing plate and paper folding roller's nip part.

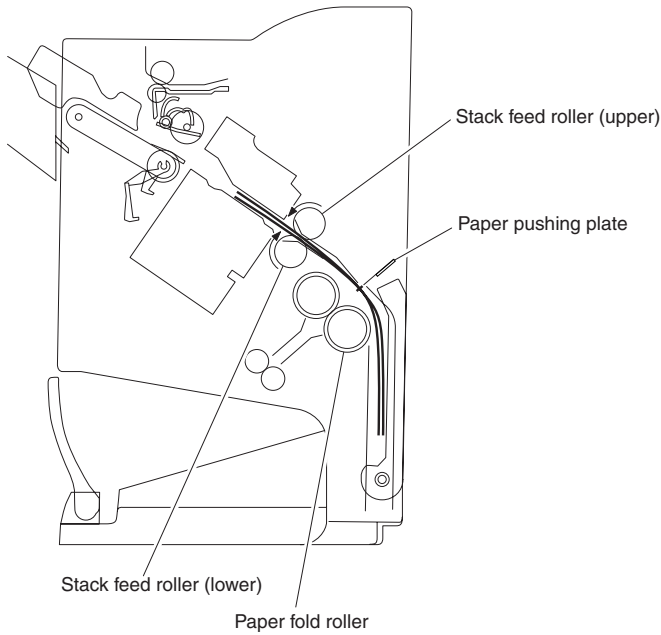


Fig. F02-502-04

Folding/delivery

The paper pushing plate pushes in the center of the paper stack to feed it toward the paper fold rollers. Then, the paper fold rollers and bind delivery rollers deliver the paper stack to the bind tray.

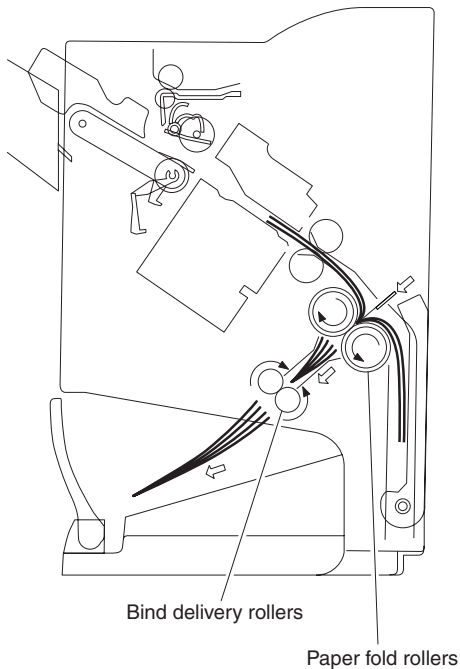


Fig. F02-502-05

C. Paper Feed System

Outline

The paper feed system feeds a stack of sheets (coming from the finisher) to the position where the center of the paper stack (stitching position) is aligned to the stapler's staple, allowing the next step (stitching and folding) to be performed.

When sheets of paper have been stacked and aligned on the processing tray, the paddle motor (FPM) rotates in the reverse direction, causing the swing guide to descend. As the swing guide descends, the paper stack is sandwiched between the upper and lower stack delivery rollers. The delivery motor (FAM) rotates in the reverse direction, feeding the paper stack toward the saddle unit. When the leading edge of the paper stack reaches the folding position sensor (FPS), the finisher controller PCB drives the delivery motor a specified number of motor pulses to stop the center of the paper stack (stitching position) at the stapler's staple position.

Before the paper stack passes through the stack feed rollers, the feed motor (FFM) is driven to rotate the stack feed roller (lower) so that the leading edge of the paper stack is not bent.

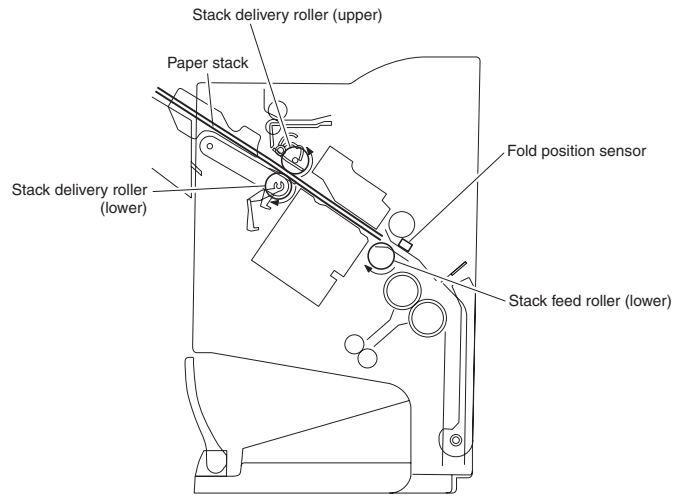


Fig. F02-503-01

D. Stack Feed System

Outline

The stack feed system feeds the stitched paper stack to the folding position.

When stitching is complete, the feed motor (FFM) rotates, causing the stack feed roller (upper) to descend. The paper stack is sandwiched between the stack feed rollers. Then, the bind clutch (FFC) is turned ON to rotate the feed motor (FFM) in the forward direction, thus feeding the paper stack to the folding position. The feed amount is equivalent to the

number of pulses used to drive the feed motor (FFM) until the paper stack reaches the folding position.

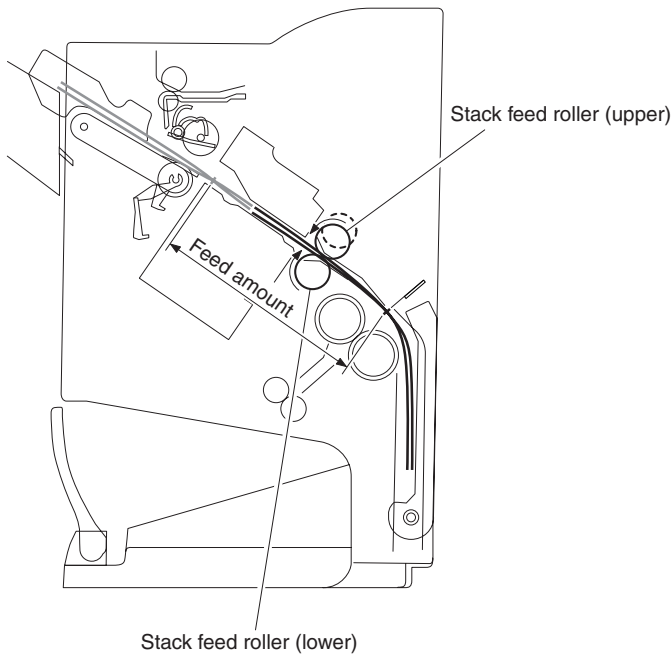


Fig. F02-504-01

E. Fold/Delivery System

Outline

The paper fold mechanism consists of a guide plate, paper fold rollers, and a paper pushing plate.

The guide plate, paper fold rollers, and paper pushing plate are driven by the staple/fold motor (FFSM). The drive force is transferred with a combination of gears and cams. Motor operation is monitored by the staple/fold motor lock sensor (FE).

Until the paper stack reaches the folding position, the guide plate covers the paper fold rollers to act as a paper path through which a paper stack is fed to the saddle unit and to prevent a paper stack from touching the rollers.

- A folding home position sensor (FHPS) is provided to detect the positions of the paper fold rollers and paper pushing plate.
- The paper stack folded in two by the paper fold rollers is delivered by bind delivery rollers.
- The bind delivery rollers are also driven by the staple/fold motor (FFSM).
- A bind tray sensor (FES) is provided on the bind tray to detect presence/absence of a paper stack; however, it is not used to detect a jam.

Paper Folding

Paper is folded using paper fold rollers and a paper pushing plate.

Almost concurrently with the start of roller rotation, the paper pushing plate starts operating to push the paper stack into the gap between the paper fold rollers. When the paper stack is fed about 10 mm with the rotation of the paper fold rollers, the paper pushing plate returns to the home position.

Then, the paper stack is delivered to the bind tray using the paper fold rollers and bind delivery rollers.

Half the entire surface of each paper fold roller is uncovered excluding the central area and the area at the left and right ends. The uncovered surface of the upper paper fold roller comes in touch with the uncovered surface of the lower paper fold roller only at the center and left and right ends, allowing a paper stack to be fed without causing creases.

The other half of the upper paper fold roller that is covered comes in touch with the other half of the lower paper fold roller that is also covered, allowing a paper stack to be folded while being fed.

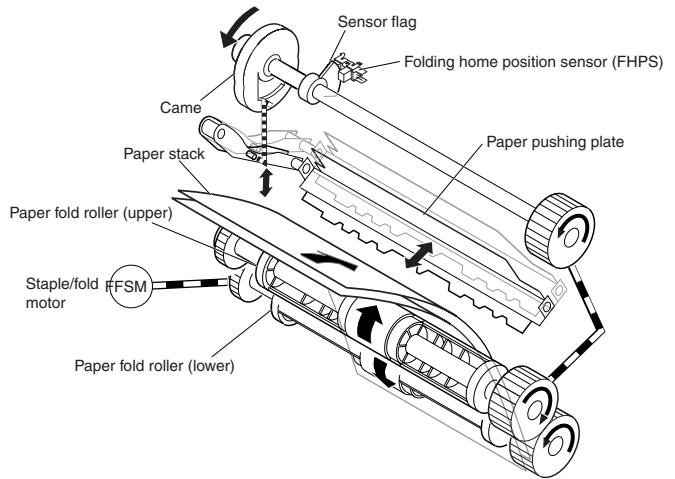


Fig. F02-505-01

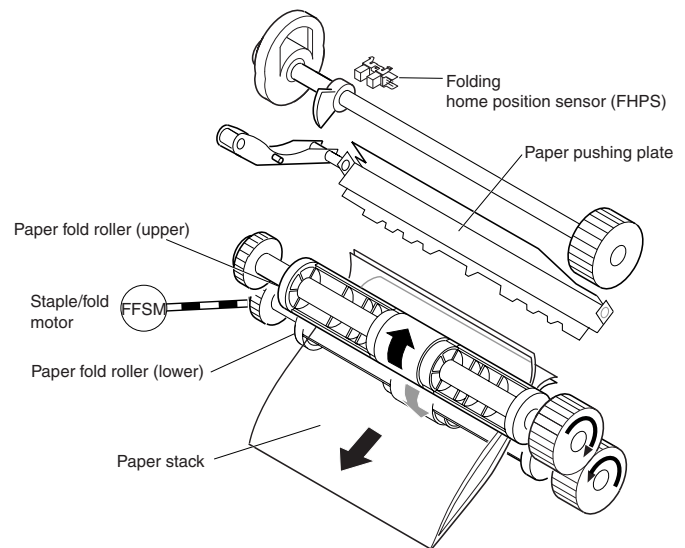


Fig. F02-505-02

[Paper folding start position]

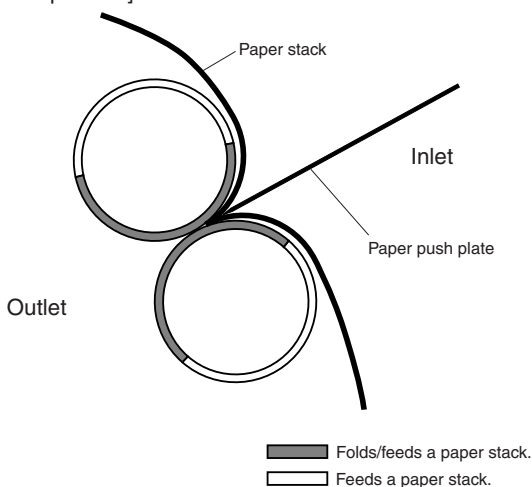


Fig. F02-505-03

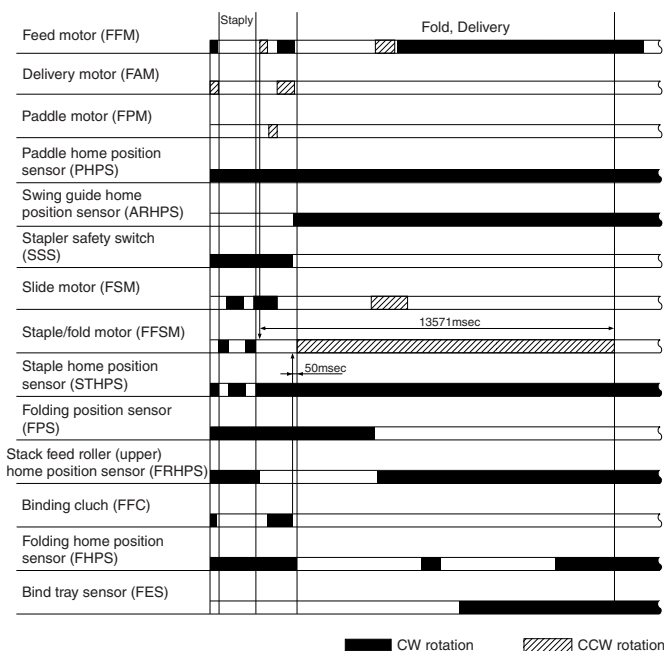


Fig. F02-505-04

6. Punching Unit (option)

A. Basic Operations

Outline

The punching unit is an option, and will install to the pickup assembly of the finisher. The punching unit is not equipped with a paper feeding mechanism, and the sheets from the host machine move through the punching unit and then the feed system of the finisher.

When the trailing edge of a sheet from the host machine reaches the punching unit, the sheet is stopped once, and the punch shaft is rotated to punch a hole along the trailing edge. These operations are controlled with various commands

from the finisher controller PCB as well as the commands from the punch controller PCB.

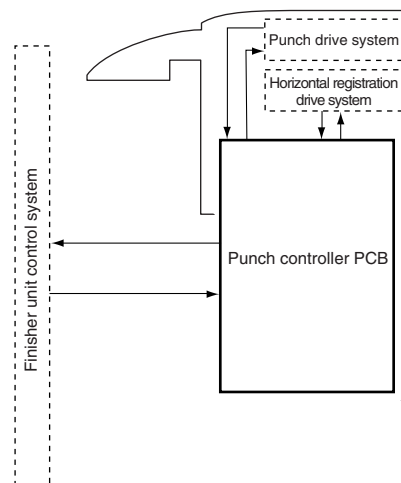


Fig. F02-601-01

B. Punching Operation

Outline

- The punching unit is located in the pickup assembly of the finisher, and is used to punch holes in sheets that have been sent from the host machine and stopped inside it. When the trailing edge of a sheet reaches the punching unit, the inlet roller of the finisher assembly stops the sheet to punch a hole along the trailing edge of the sheet.
- The punch unit consists of a die and hole puncher (punch blade).
- The hole puncher is driven by the punch motor (FPNM). It is attached to the eccentric cam of the punch shaft, and the rotation of the punch shaft is converted into reciprocating motion for punching operation.
- The punch motor (FPNM) is a DC motor. The home position of the punch shaft is detected by the punch home position sensor (PIIP). To make sure that the punch motor, which is a DC motor, stops exactly at its home position, the punch motor is stopped in relation to the count of the clock pulses kept by the punch motor clock sensor (PE).
- A single punching operation is executed by rotating the punch shaft 180 degrees from its home position.
- As many as five light-receiving transistors (photosensor PCB) are mounted over the inlet paper path of the punching unit; on the other hand, as many as five LEDs (LED PCB) are mounted under the path, together serving as five sensors. The frontmost sensor (LED5, PT5) is used to detect the training edge of sheets, and the remaining four (LED1 through LED4, PT1 through PT4) are used as horizontal registration sensors to detect the rear position of sheets when punching holes.
- The punch motor, punch unit, and sensors make up the punch slide unit, which moves to the front/rear to suit the selected paper size. The movement to the front/rear is driven by the horizontal registration motor (FPSM). The home position of the punch slide unit is detected by the horizontal registration home position sensor

(PSHPS), and the horizontal registration motor (FPSM) is a stepping motor.

- The punch motor and horizontal registration motor are controlled with various commands from the finisher controller PCB as well as the commands from the punch controller PCB.
- The waste paper occurring as the result of punching is collected in the waste paper case. The case is monitored by the LED121 on the waste full LED PCB and PT131 on the waste full photosensor PCB.

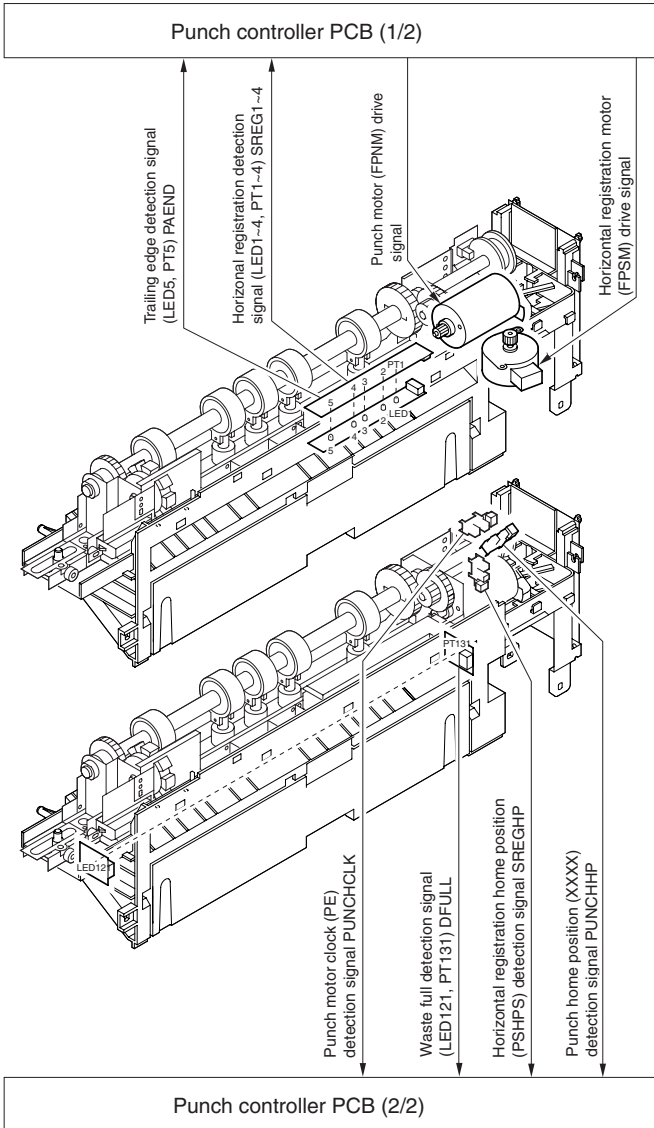


Fig. F02-602-01

Punching Operation

The hole puncher is driven by the punch motor (FPNM). The home position for the hole puncher is detected by the punch home position sensor (XXXX).

The 2-/3-hole type punches a hole, but the circumference of the punch shaft is divided into two (half for 2-hole and the other half for 3-hole).

3-Hole Type

The home position is identified when the punch home position sensor is ON. To make two holes, the punching operation for the first sheet ends when the punch shaft rotates

180° (half circumference) and the punch home position sensor goes ON. At this time, the 3-hole puncher makes a single round trip in escape direction (moving up the hole puncher) on a half circumference of the punch shaft.

The punching operation for the second sheet ends when the Punch shaft has rotated 180° counterclockwise and the punch home position sensor goes ON (half circumference). At this time, the 3-hole puncher makes a single round trip in escape direction (moving up the hole puncher) on the other half circumference of the punch shaft.

The punching operation takes place as follows when making two holes in two sheets of paper:

1. A hole is made along the trailing edge of the 1st sheet.

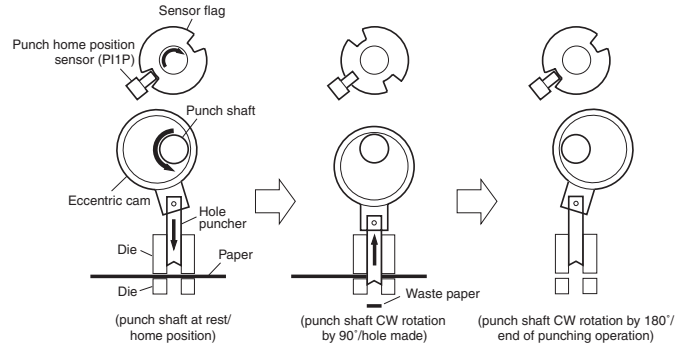


Fig. F02-602-04

While two holes are being made, the 3-hole puncher makes a single round trip in escape direction.

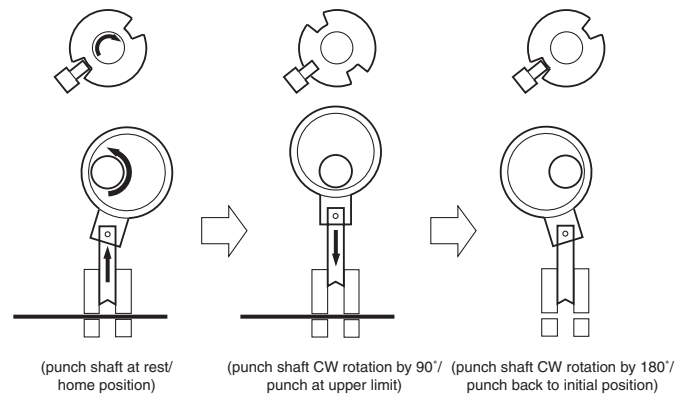


Fig. F02-602-05

2. Holes are made along the trailing edge of the 2nd sheet.

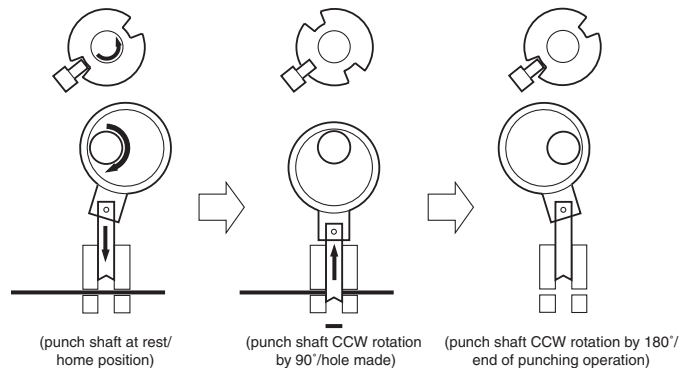


Fig. F02-602-06

While two hole are being made, the 3-hole puncher makes a single round trip in escape direction (moving up the hole puncher).

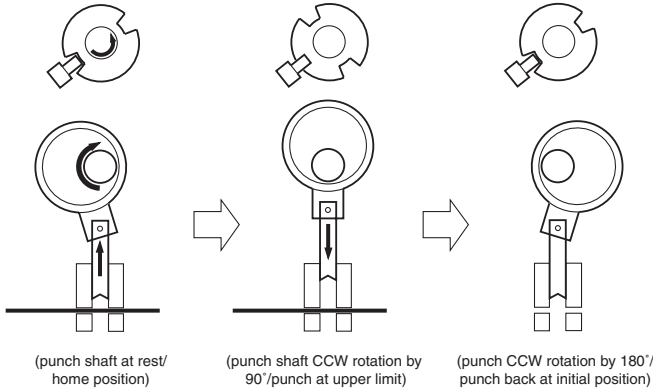


Fig. F02-602-07

Horizontal Registration Operation

The horizontal registration drive for the punch slide unit is provided by the horizontal registration motor (FPSM). The home position of the punch slide unit is detected by the horizontal registration home position sensor (PSHPS). The punch slide unit detects the trailing edge of sheets using the trailing edge sensor (LED5, PT5) and the horizontal registration sensors (LED1 through 4, SREG1 through 4), and causes a move to a specific position matching the trailing edge of each sheet (in relation to the size of the sheet).

The horizontal registration operation takes place as follows:

1. When the leading edge of a sheet from the host machine is detected by the trailing edge sensor (LED5, PT5), the horizontal registration motor (FPSM) starts to move the punch slide unit toward the front.

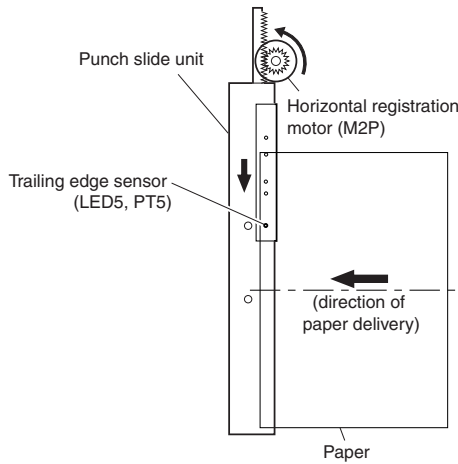


Fig. F02-602-08

2. When the horizontal registration sensor (LED1 through 4, PT1 through 4) suited to the paper size signal from the host machine detects the rear edge of the sheet, the horizontal

registration motor (FPSM) causes a farther move to a specific position, and stops the punch slide unit.

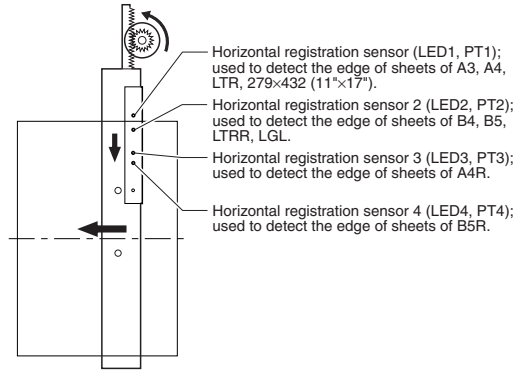


Fig. F02-602-09

3. When the trailing edge sensor (LED5, PT5) detects the trailing edge of the sheet, the drive of the feed motor (FFM) is stopped, thereby stopping the sheet. Then, the punch motor (FPNM) is driven to punch holes in the sheet.

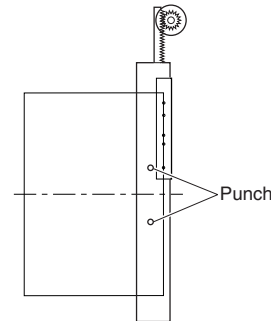


Fig. F02-602-10

4. When the punching operation ends, the feed motor (FFM) of the fisher unit is driven and, at the same time, the horizontal registration motor (FPSM) is rotated in reverse to return the punch slide unit to its home position.
5. For each sheet that arrives in succession, the punch slide unit is returned to its home position, and is caused to repeat steps 1 through 4.

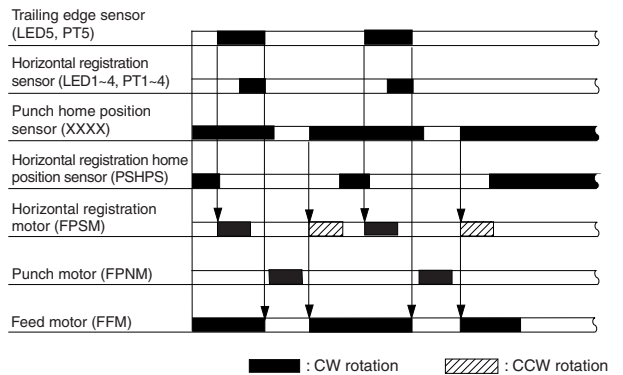


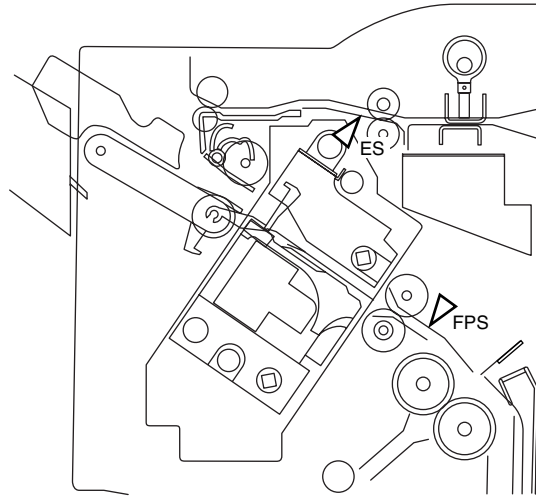
Fig. F02-602-11

7. Detecting Jams

A. Outline

The microprocessor (CPU) on the finisher controller PCB is programmed to check for jams in the finisher/saddle/puncher (option) at such times as set in advance. It identifies a jam in reference to the presence/absence of paper at a specific

sensor. If a jam is found, the finisher controller PCB communicates the nature of the jam to the host machine in the form of a code (which may be checked in service mode of the host machine).



ES: inlet sensor.
FPS Folding position sensor

Fig. F02-701-01

Inlet Sensor Delay Jam (Code: 1011)

The inlet sensor does not detect paper approximately 1.5 sec after the host machine generates the delivery signal.

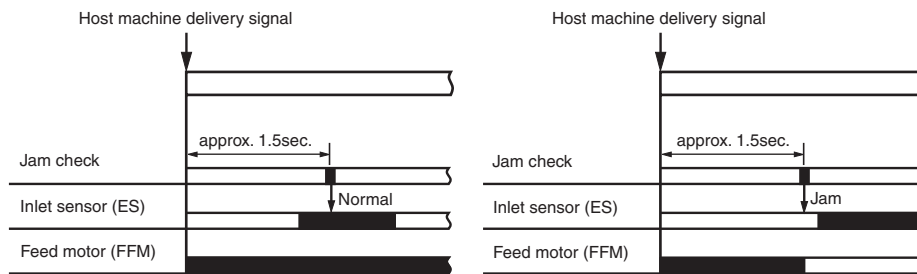


Fig. F02-701-02

Inlet Sensor Stationary Jam (Code: 1021)

The paper does not leave the inlet sensor approximately 2 sec after the inlet sensor has detected its leading edge.

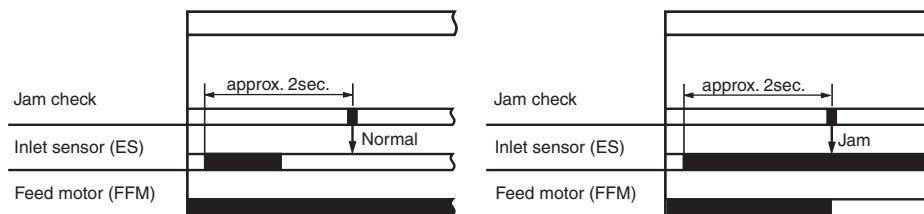


Fig. F02-701-03

Folding Position Sensor Delay Jam (Code: 1012)

In bind mode, the folding position sensor does not detect paper 1200 msec after the intermediate processing tray starts to send paper to the stapling position.

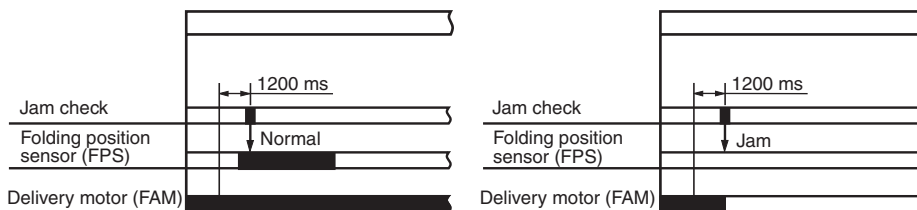


Fig. F02-701-04

Folding Position Sensor Stationary Jam (Code: 1022)

In bind mode, paper does not leave the holding position sensor approximately 10.5 sec after the staple/fold motor is driven.

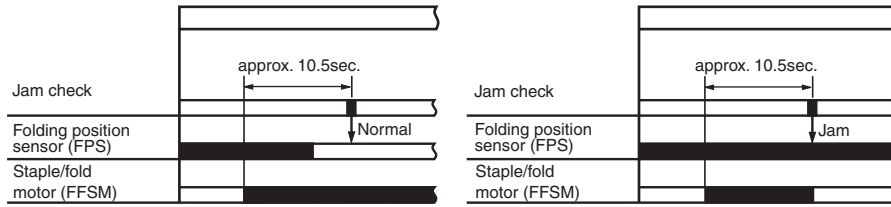


Fig. F02-701-05

Power-On Jam (Code: 1007)

Paper is detected inside the finisher at power-on or when the door is closed.

Door Open Jam (paper present) (Code: 1008)

The finisher is disconnected from its host machine or the front door, or the upper cover is opened while the system is in operation (paper on the move).

Staple Jam (Code: 1006)

The staple home position sensor (STHPS) does not go OFF 600 msec after the stapler is driven. Or, it does not return to its home position (where the sensor goes ON).

8. Power Supply System

A. Finisher/Saddle Assembly

Outline

When the host machine is turned on, it supplies the finisher controller PCB with two channels of 24 VDC; one is for the motors and clutches, and the other is turned into 5 VDC by the regulator IC (IC1) of the finisher controller PCB for use by the sensors and ICs on PCBs.

If a punch unit (option) is installed, power is also supplied to the punch controller PCB.

Some of 24 VDC used to drive motors is cut off when the joint switch (JS), front door switch (FDSW), or stapler safety switch (SSS) is open.

F02-801-01 is a block diagram of the power supply system:

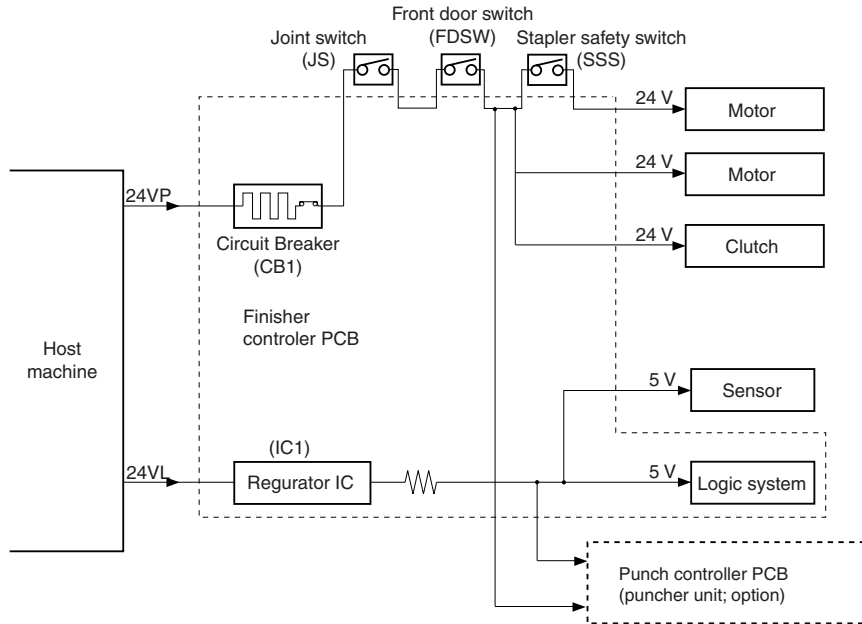


Fig. F02-801-01

Protective Mechanisms

A circuit breaker (CB1) is monitored to protect the 24 VDC system used to drive the motors against overcurrent. The 24-V system used to drive the feed motor (FFM), paddle motor (FPM), and delivery motor (FAM) is equipped with a fuse which melts in the presence of overcurrent.

A. Punching unit (option)

Outline

When the host machine is turned on, the punching unit is supplied by the finisher controller PCB with 24-V and 5-V power. The 24-V power is used to drive the motors, while the 5-V power is used by sensors and the ICs on the punch controller PCB. The 24-V power to the motors will be cut off when the joint switch (MS2) or the front door switch (MS1) of the finisher unit is open.

F02-802-01 is a block diagram for the power supply system:

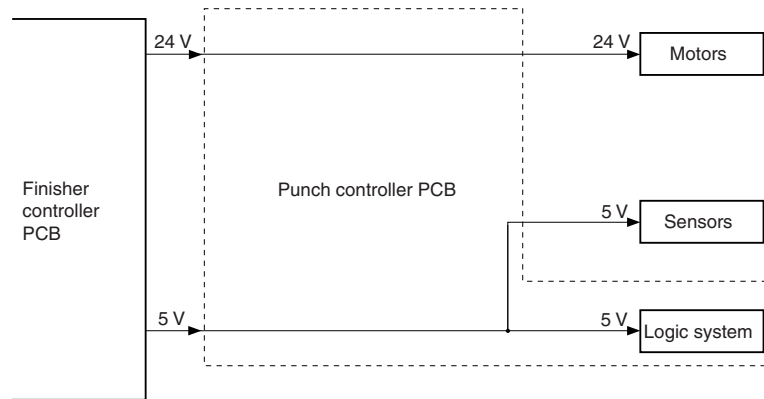


Fig. F02-802-01

Protective Mechanisms

The 24-V system used to drive the punch motor (FPNM) and the horizontal registration motor (FPSM) is equipped with a built-in fuse which melts in the presence of overcurrent.

[5] DISASSEMBLY AND ASSEMBLY

1. Finisher Saddle Unit

A. Externals and Controls

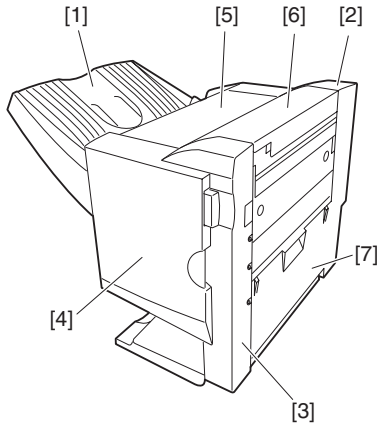


Fig. F03-101-01

Removing the Delivery Tray

1. Remove the four screws [1], and detach the delivery tray [2].

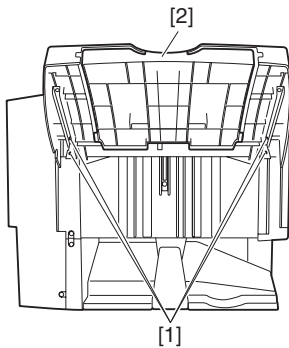


Fig. F03-101-02

Removing the Front Cover

1. Open the front door [1].
2. While picking the claw [2], detach the fold jam releasing dial [3].
3. Remove the two screws [4].

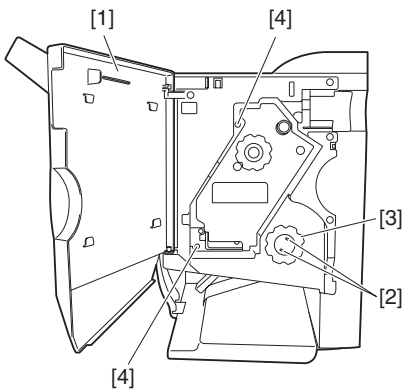


Fig. F03-101-03

4. Remove the three screws [5], and detach the front cover [6].

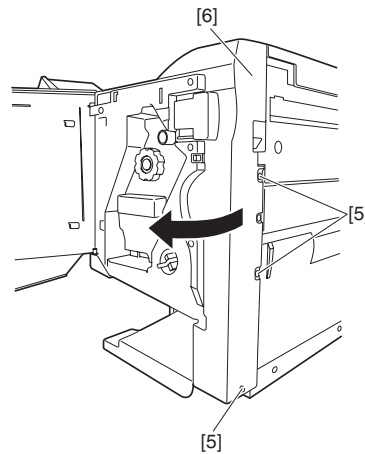


Fig. F03-101-04

Removing the Rear Cover

1. Remove the two screws [1] on the pickup side, and remove the screw [2] on the delivery side; then, detach the rear cover [3].

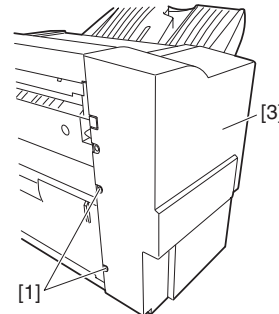


Fig. F03-101-05

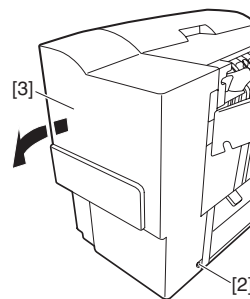


Fig. F03-101-06

Removing the Upper Cover

1. Open the upper cover [1], and turn the cover band retainer [2] to the left to remove it.

2. Remove the cover band [3].

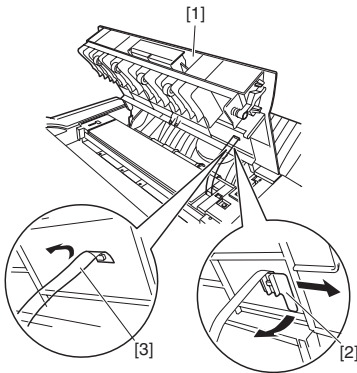


Fig. F03-101-07

3. Remove the screw [4], and detach the processing tray rear cover [5]; then, detach the upper.

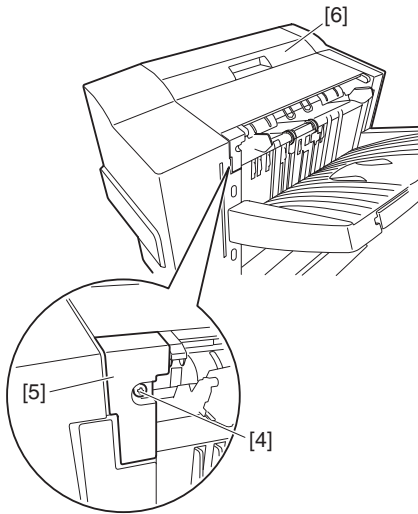


Fig. F03-101-08

Removing the Processing Tray Upper Cover

1. Remove the front cover. (See 1.A.(2).)
2. Remove the rear cover. (See 1.A.(3).)
3. Remove the upper cover. (See 1.A.(4).)
4. Disconnect the connector [1], and remove the screw [2].

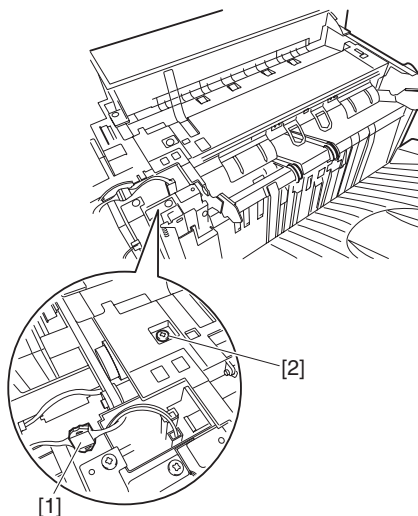


Fig. F03-101-09

5. While lifting the processing tray upper cover [3], disconnect the connector [4]; then, detach the processing tray upper cover [3].

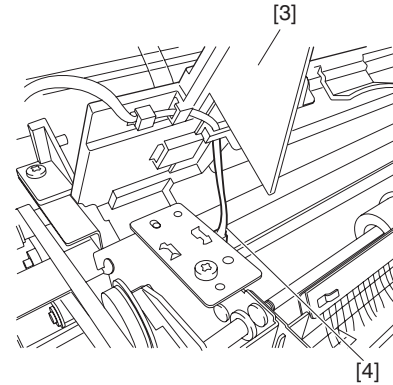


Fig. F03-101-10

Removing the Upper Right Cover Assembly

1. Remove the front cover. (See 1.A.(2).)
2. Remove the rear cover. (See 1.A.(3).)
3. Remove the two screws [1] at the front and the two screws [2] at the rear; then, detach the upper right cover assembly [3].

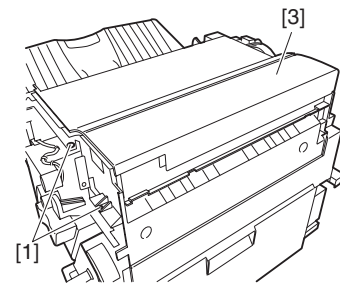


Fig. F03-101-11

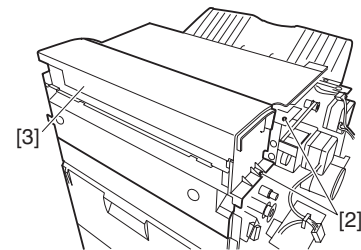


Fig. F03-101-12

Removing the Saddle Guide

1. Remove the delivery tray. (See 1.A.(1).)
2. Remove the front cover. (See 1.A.(2).)
3. Remove the rear cover. (See 1.A.(3).)
4. Free the delivery tray support plate (front) [1] and the delivery tray support plate (rear) [2] to the outside from the rail grooves.

5. Remove the four screws [3].

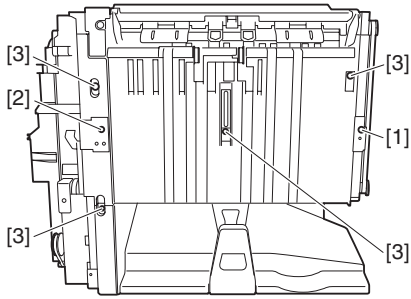


Fig. F03-101-13

6. Shift the side guide [4] lightly to the front, and free the engagement of the paper surface detecting lever (rear) [5]; then, detach the side guide [4].

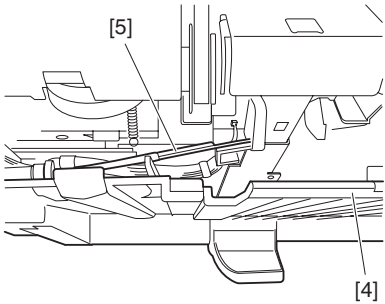


Fig. F03-101-14

NOTE: Be sure to mount the side guide after securely fitting the paper surface detecting lever (rear) [5] in the groove of the paper surface detecting lever (middle) [6].

After completion of mounting, push the paper surface detecting lever several times to make sure that side guide is mounted securely.

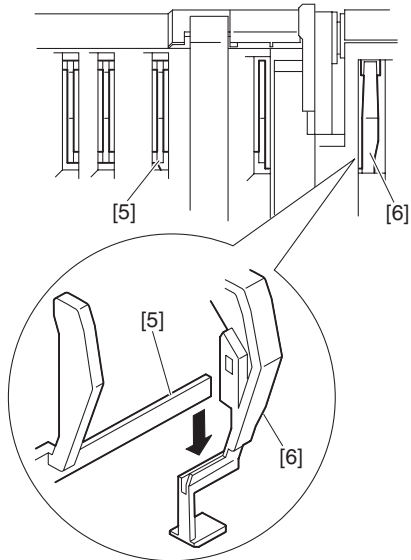


Fig. F03-101-15

B. Feeding System

Removing the Stapler Unit

1. Open the front door [1].

2. Slide out the stapler unit [3] while pressing the stopper [2].

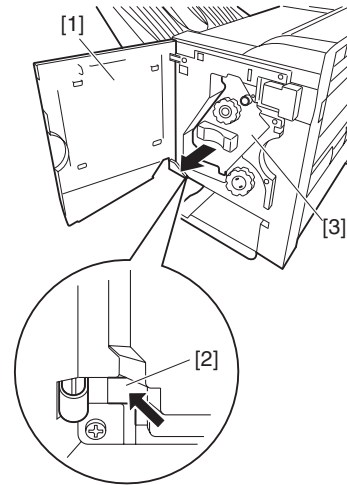


Fig. F03-102-01

NOTE: Do not remove the stapler frame shaft. If removed, the position where the staple driver (lower unit of the stapler) [4] shoots staples will shift from the position where the staple clincher (upper unit of the stapler) [5] receives staples.

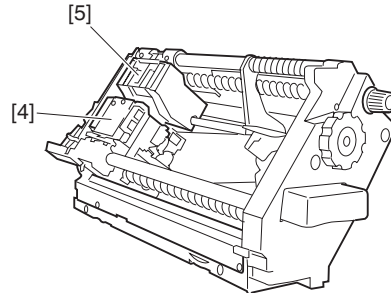


Fig. F03-102-02

Adjusting the Stapler Phase

When the gears or timing belt at the front of the stapler is replaced or removed for some reason, the staple shooting timing of the (lower unit of the stapler) does not match the staple bending timing of the staple clincher (upper unit of the stapler). Adjust the stapler phase following the procedure described below.

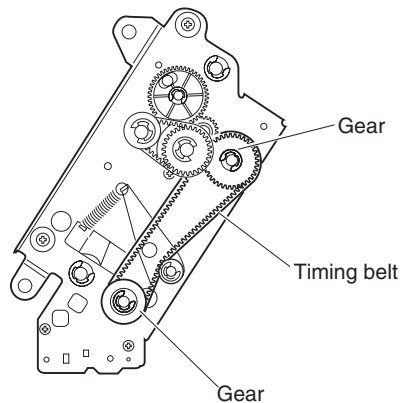


Fig. F03-102-03

1. Detach the gear cover [2] from the staple driver [1].

- Remove the E-ring [3] to detach the side cover [5] of the staple clincher [4].

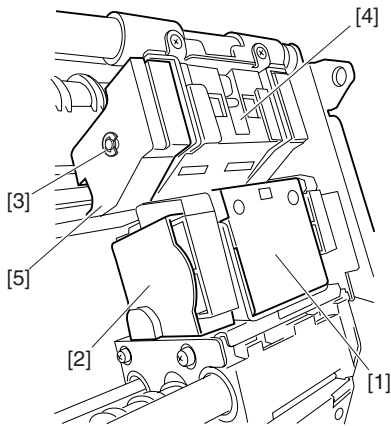


Fig. F03-102-04

- Remove the two E-rings [6] to remove the staple jam releasing gear [7], timing belt [8], and relay gear 1 [9]. Remove the spacer and spring at the back of the staple jam releasing gear.
- Remove the screw [10] and spring [11] to remove the belt tensioner [12].

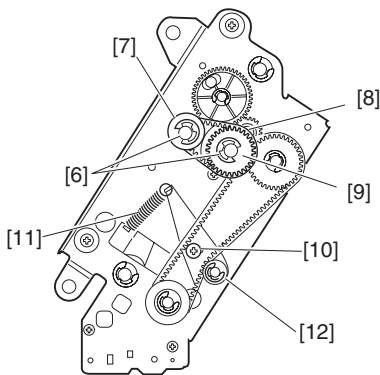


Fig. F03-102-05

- Remove the timing belt [13].
- Remove the E-ring [14] to remove the staple position check gear [15].

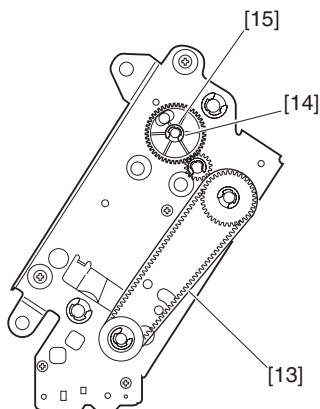


Fig. F03-102-06

- Turn the gear [16] to align the round hole in the staple driver gear with the round hole [17] at the back.

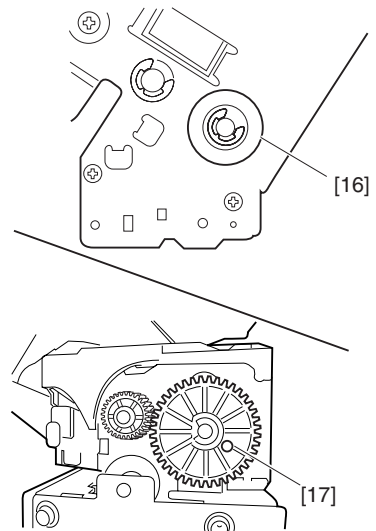


Fig. F03-102-07

- Insert a pin [18] with a diameter of approximately 2 mm (use recommended) in the round hole to secure the gear.

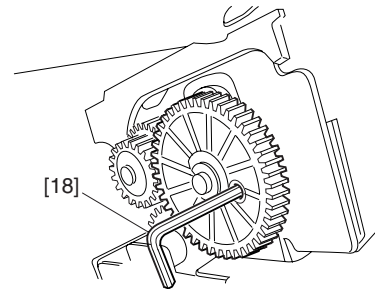


Fig. F03-102-08

- Turn the gear [19] to align the round hole in the staple clincher cam with the round hole [20] at the back.

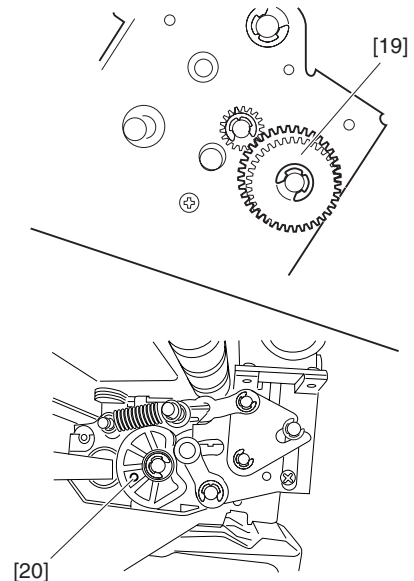


Fig. F03-102-09

10. Insert a pin [21] with a diameter of approximately 2 mm (use of a 2 mm Allen wrench is recommended) in the round hole to secure the gear.

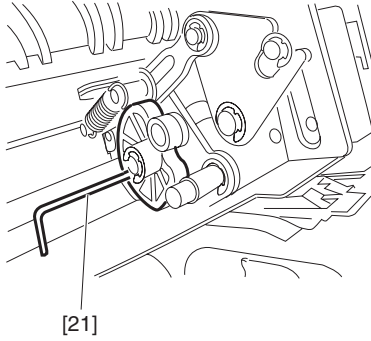


Fig. F03-102-10

11. With the gears and cam fixed, install the timing belt [22] on gears [23] and [24].

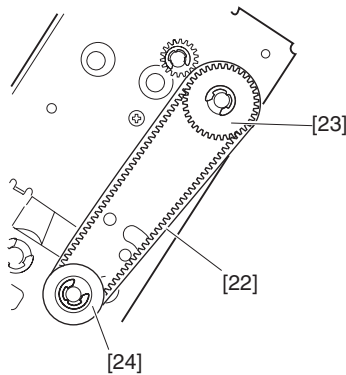


Fig. F03-102-11

12. Mount the staple position check gear [27] so that the blue mark [25] on the staple position check gear is aligned with the round hole [26] in the frame.

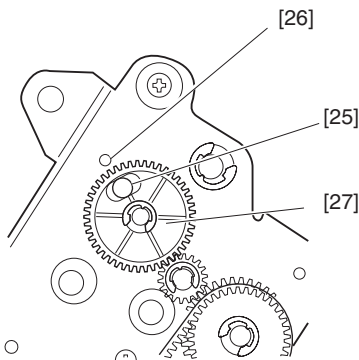


Fig. F03-102-12

NOTE: The position where the blue mark is aligned with the round hole is the home position for stapling. If the staple jam cancel dial is turned for some reason, the home position deviates, making it impossible to remove the stapler cartridge. If such a case, the gear can be returned to the home position by checking blue mark position. Therefore, it is necessary to mount the gear at the correct position.

13. Remove the pin securing the gear to the cam.

14. Assemble the spring [28], spacer [29], staple jam releasing gear [30], timing belt [31], and relay gear [32] and secure them with the E-ring [33].

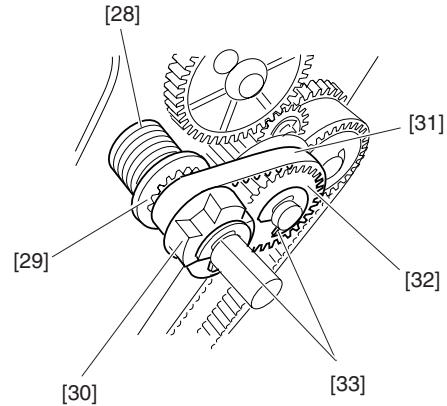


Fig. F03-102-13

Adjusting the Phase of the Gear in the Saddle Unit

If the gears at the front of the saddle unit or the paper fold rollers in the sale unit are replaced or removed for some reason, adjust the gear phase following the procedure described below.

1. The paper fold rollers [1] and saddle cam [2] must be positioned as shown below.

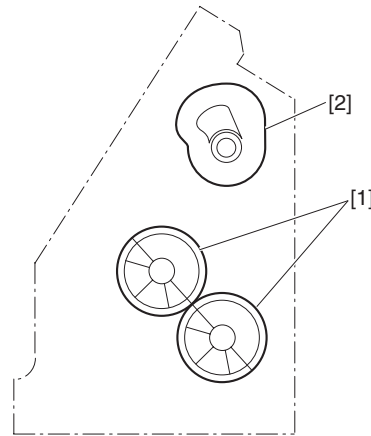


Fig. F03-102-14

2. With the paper fold rollers and saddle cam positioned as shown in Figure F03-102-14, mount gears as shown in figure F03-102-15.
 - Align the \triangle mark (either of two \triangle marks) on the saddle cam drive gear [3] with the \triangle mark on the relay gear [4] (on the half of the periphery where gears with a smaller face width are arranged).
 - With the \triangle mark on the saddle cam drive gear [3] aligned with the \triangle mark on the relay gear [4], align the

other Δ mark on the relay gear with the rib of the paper folding roller drive gear [5].

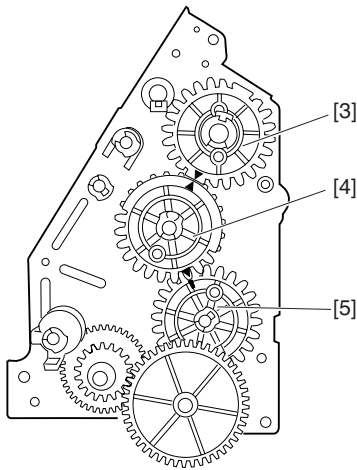


Fig. F03-102-15

Removing the Saddle Unit

1. Remove the front cover. (See 1.A.(2).)
2. Remove the rear cover. (See 1.A.(3).)
3. Open the jam removal cover [1]; then, remove the two screws [2] and the right stay [3].

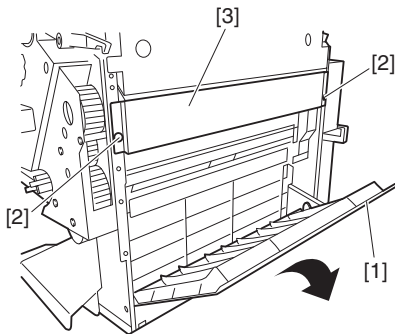


Fig. F03-102-16

4. Turn the fold jam releasing dial assembly [4] to move the paper retaining plate assembly [5] to the inside.

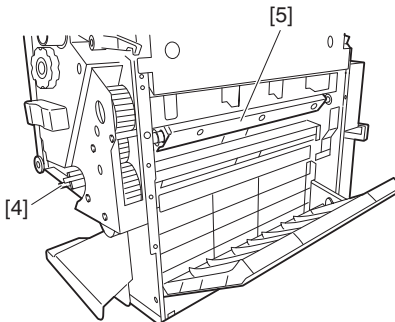


Fig. F03-102-17

5. Remove the stop ring [6], and detach the timing belt [7].

6. Disconnect the two connectors [8].

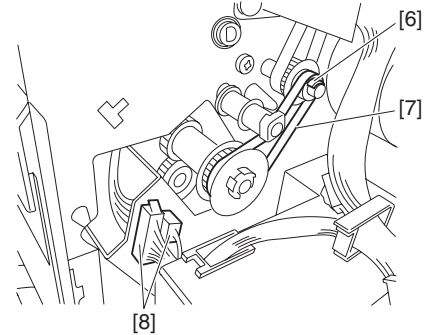


Fig. F03-102-18

7. Remove the three screws [9], and slide out the stapler unit [10] slightly to the front.
8. Slide out the saddle unit [11] to the front.

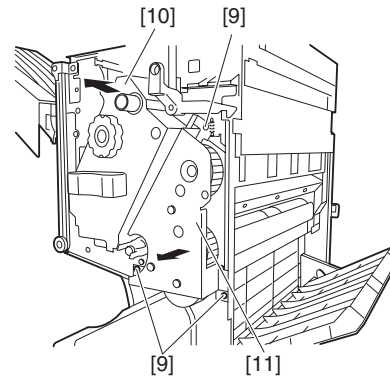


Fig. F03-102-19

(5) Removing the Processing Tray Assembly

1. Remove the processing tray upper cover. (See 1.A.(5).)
2. Remove the side guide. (See 1.A.(7).)
3. Remove the two screws [1], and disconnect the five connectors [2].

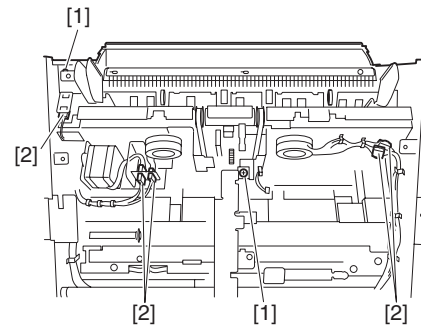


Fig. F03-102-20

4. Pull the processing stopper base [3] to the front, and free the claw [5] at the front and the claw [6] at the rear of the processing stopper [4].

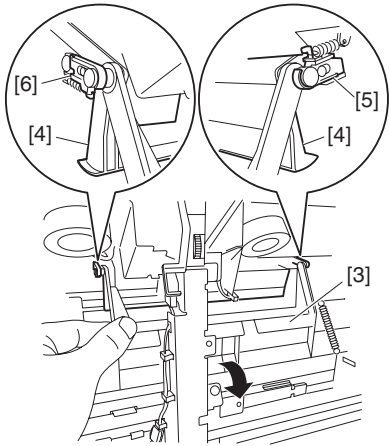


Fig. F03-102-21

5. Disconnect the three connectors [7].
6. Release the two claws [8] of the harness retainer, and detach the motor harness [9].

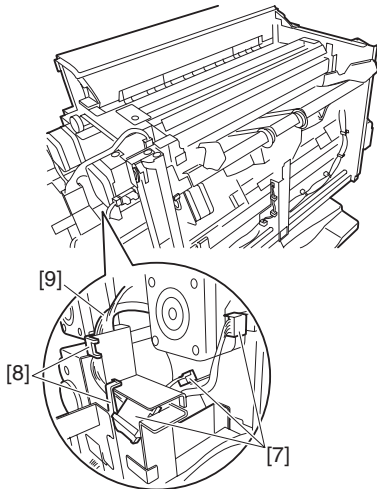


Fig. F03-102-22

7. Remove the stop ring [10], and detach the timing belt [11].

8. Disconnect the connector [12], and free the harness [14] from the edge saddle [13].

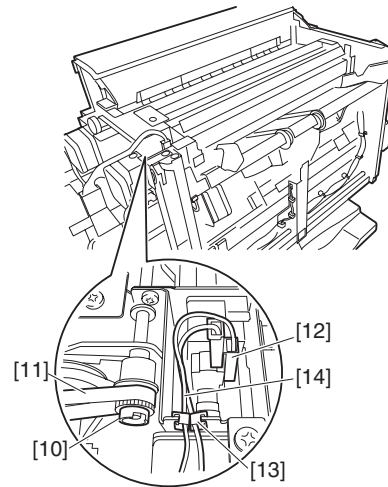


Fig. F03-102-23

9. Remove the two screws [15], and slide the processing tray assembly [16] to the rear; then, lift it to detach.

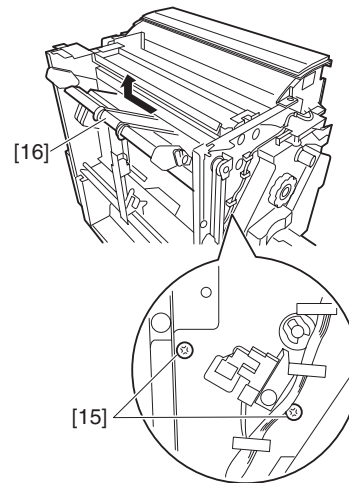


Fig. F03-102-24

Removing the Paddle Assembly

1. Remove the processing tray assembly. (See 1.B.(3).)
2. Place the processing tray assembly [1] as shown.
NOTE: Be sure to take care not to damage the aligning plate [2].

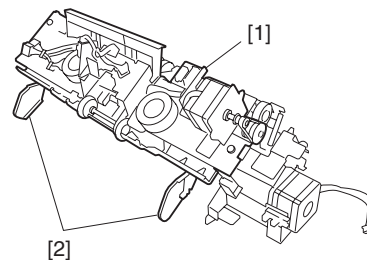


Fig. F03-102-25

- Detach the timing belt [3], and remove the two screws [4].

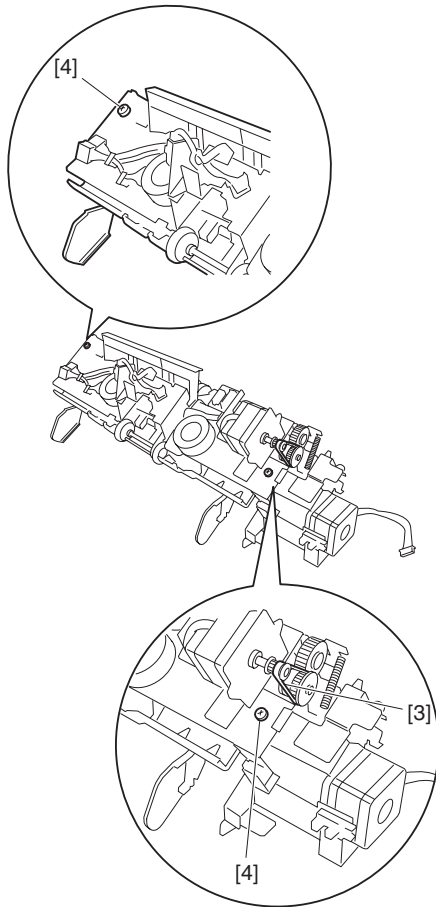


Fig. F03-102-26

- Separate the processing tray assembly [5] and the paddle assembly [6] as shown.

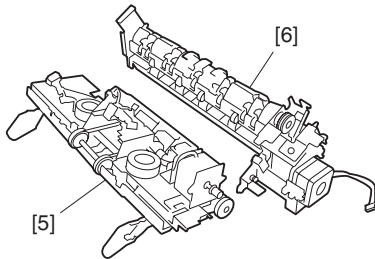


Fig. F03-102-27

Removing the Staple/Fold Drive Unit

- Open the front door [1], and slide out the stapler unit [2] slightly to the front.

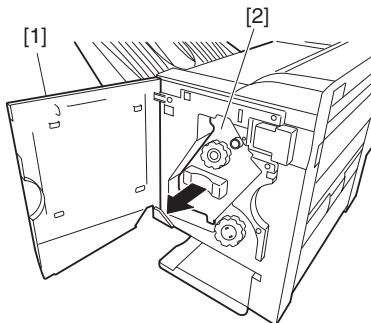


Fig. F03-102-28

- Remove the screw [3], and detach the interface retainer [4].
- Free the six harness retainers [5], and disconnect the connector [6].
- Free the harness [7] from the harness retainer [5].
- Free the harness [7] from the edge saddle [8]; then, disconnect the two connectors [9].

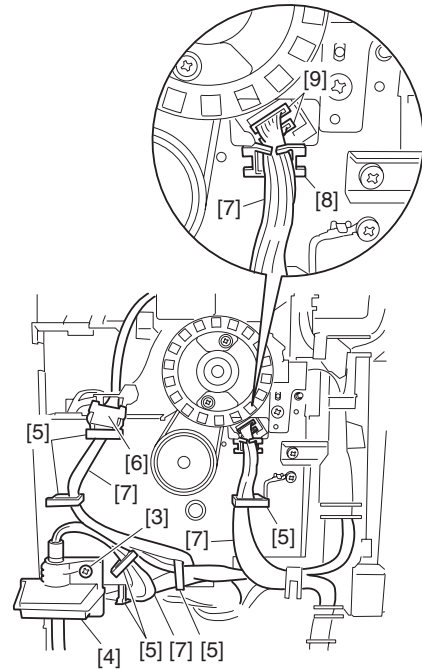


Fig. F03-102-29

- Release the harness retainer [10], and disconnect the connector [11].
- Free the harness [12] from the harness retainer [10].
- Free the harness [12] for the edge saddle [13]; and disconnect the two connectors [14].

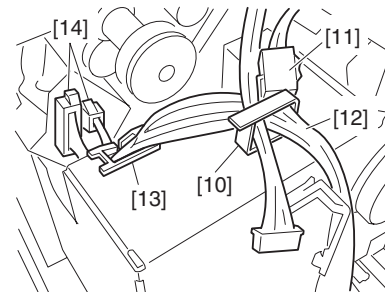


Fig. F03-102-30

- Remove the screw [15], and free the claw [17] of the harness guide from the long angle [16] of the base plate.

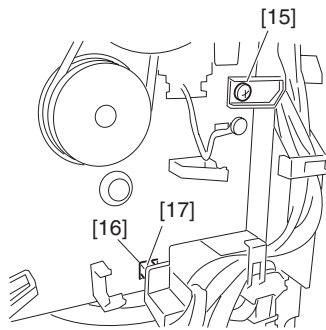


Fig. F03-102-31

- Disconnect the two connectors [18], and free the harness [20] from the edge saddle [19].

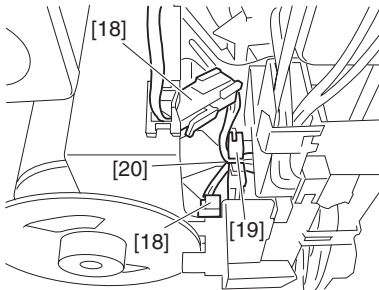


Fig. F03-102-32

- Remove the three screws [21].

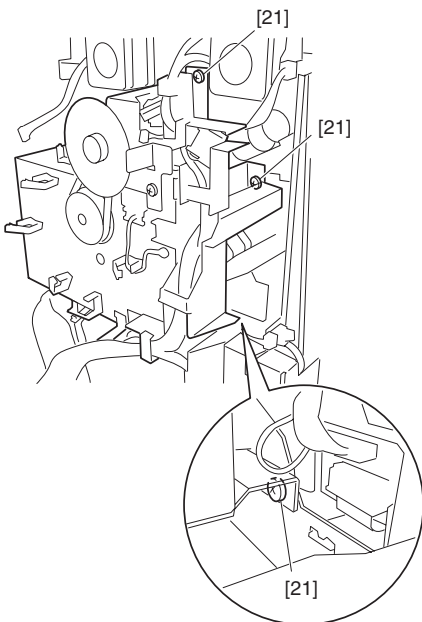


Fig. F03-102-33

- Remove the screw [22], and detach the staple/fold drive unit [23].

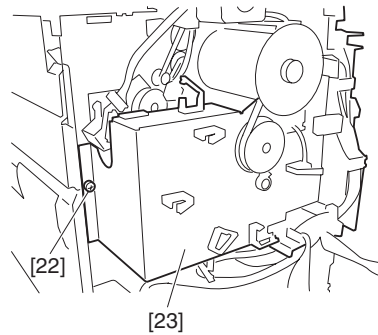


Fig. F03-102-34

Removing the Feed Motor Unit

- Remove the rear cover. (See 1.A.(3).)
- Open the harness retainer [1], and disconnect the two connectors [2].
- Remove the screw [3], and detach the harness guide [4].
- Remove the three screws [5], and detach the feed motor unit [6].

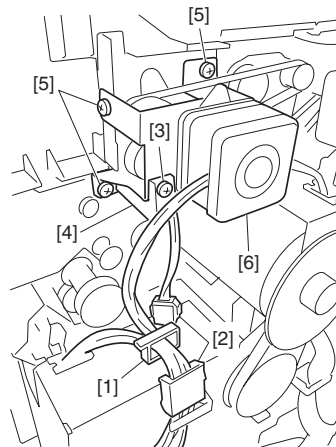


Fig. F03-102-35

Removing the Feed Roller

- Remove the upper cover. (See 1.A.(4).)
- Remove the upper right cover assembly. (See 1.A.(6).)
- Remove the feed motor unit. (See 1.B.(6).)
- Remove the screw [1].

5. Remove the stop ring [2], and detach the bushing [3].

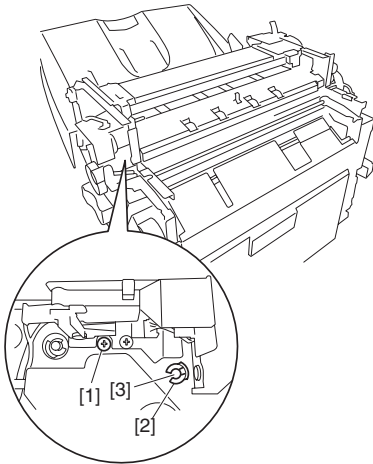


Fig. F03-102-36

6. Remove the two screws [4].

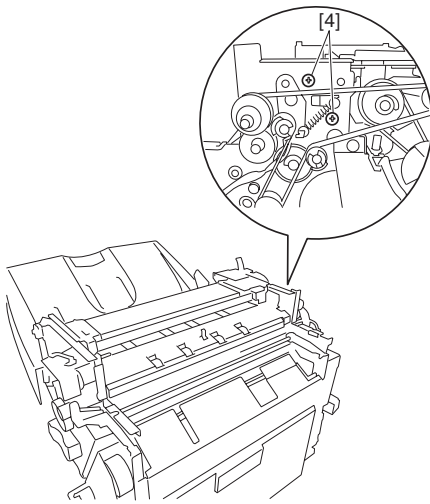


Fig. F03-102-37

7. Remove the gear [5], and detach the gear [6] while spreading the claw.

8. Remove the stop ring [7], and detach the bushing [8].

9. Remove the screw [9], and detach the inlet sensor [10].

10. Remove the lower paper guide [11].

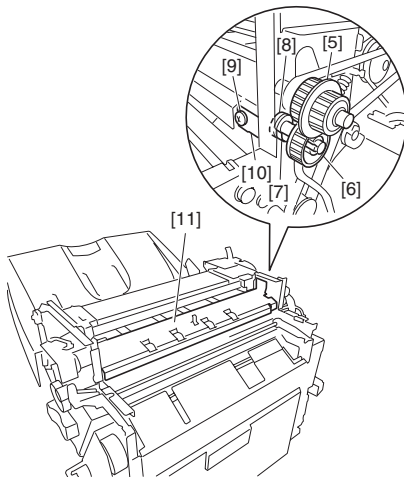


Fig. F03-102-38

11. Remove the feed roller [12].

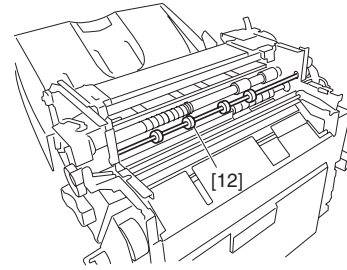


Fig. F03-102-39

Removing the Stack delivery roller (upper)

1. Remove the paddle assembly. (See 1.B.(4).)

2. Place the paddle assembly [1] as shown.

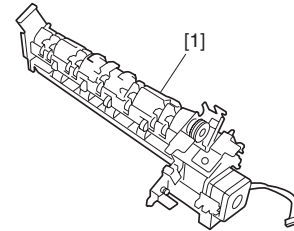


Fig. F03-102-40

3. Turn the gear [2] in the direction of the arrow to move up the stack delivery roller assembly (upper) [3].

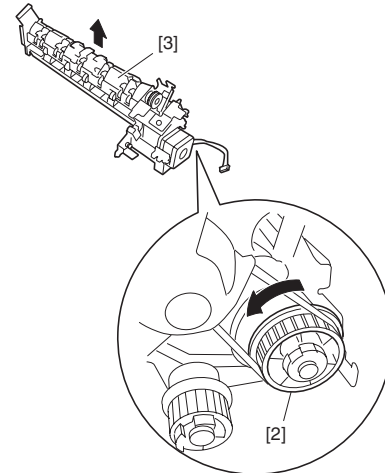


Fig. F03-102-41

4. Push up the stack delivery roller (upper) [4] from below to free the stack deliver roller (upper) [4] from the shaft [5].

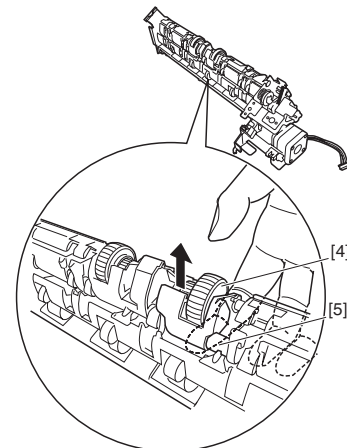


Fig. F03-102-42

- Shift up the stack delivery roller (upper) [4], and then push it down to detach the stack deliver roller (upper) [4].
- Likewise, remove the stack delivery roller (upper) [6] at the front.

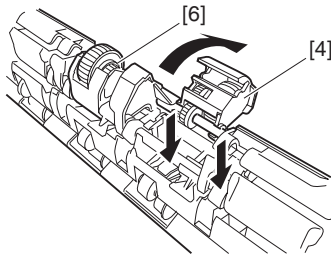


Fig. F03-102-43

Removing the Paddle

- Remove the paddle assembly. (See 1.B.(4).)
- Place the paddle assembly [1] as shown.

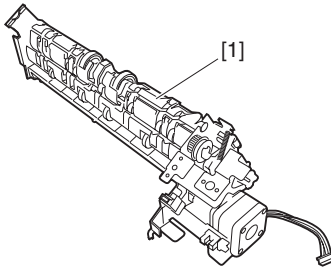


Fig. F03-102-44

- Turn the gear [2] in the direction of the arrow to move up the stack delivery roller assembly (upper) [3].

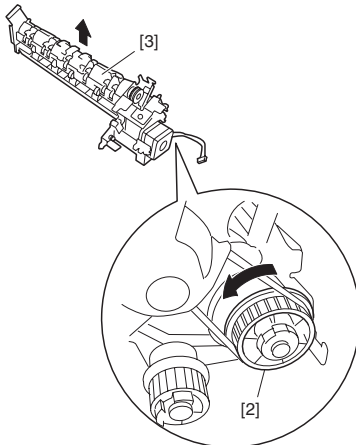


Fig. F03-102-45

- Push up the safety guide [4] from below to free one side of the safety guide [4] from the shaft [5].

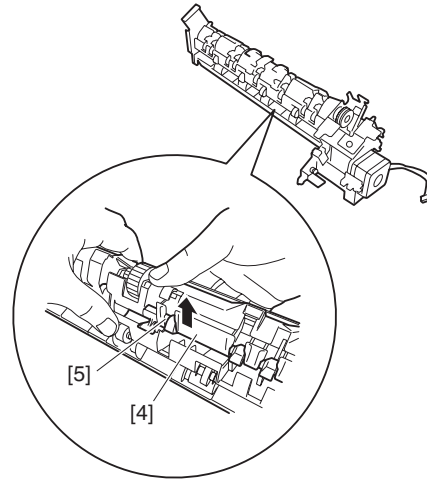


Fig. F03-102-46

- Push up the safety guide [4] from below to free the safety guide [4] from the shaft [5].

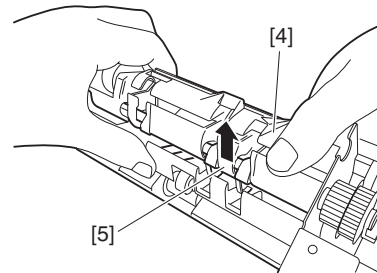


Fig. F03-102-47

- Remove the paddle [6] in the direction of the arrow.
- Likewise, remove the other paddle.

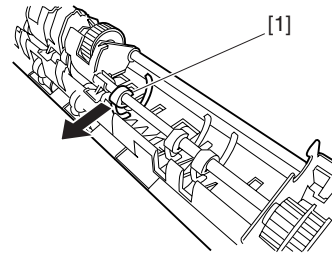


Fig. F03-102-48

Removing the Stack delivery roller (lower)/Delivery Belt

- Remove paddle assembly, and separate it from the processing tray assembly. (See 1.B.(4).)

- Slide the aligning plate (front) [2] and the aligning plate (rear) [3] of the processing tray assembly [1] by sliding them to the outside.

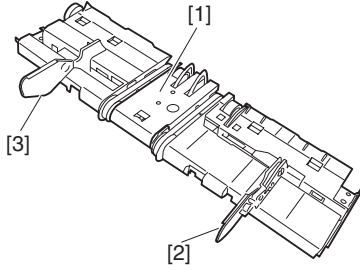


Fig. F03-102-49

- Remove the processing tray stopper [4].

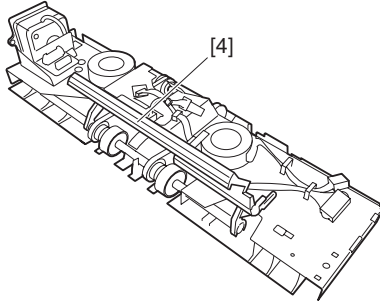


Fig. F03-102-50

- Remove the screw [5], and detach the paper guide (front) [7] while freeing the two claws [6].

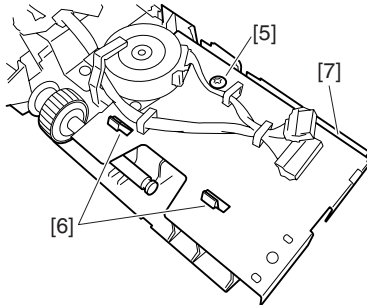


Fig. F03-102-51

- Remove the screw [8]; then, while freeing the claw [9], detach the paper guide (rear) [10].

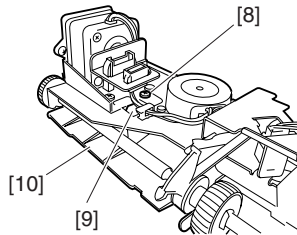


Fig. F03-102-52

- Remove the two stop rings [11]; then, move the two bushings [12] to the inside.

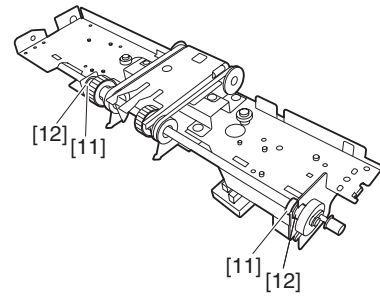


Fig. F03-102-53

- Remove the four screws [13]; then, lift the stack delivery roller assembly (lower) [14] to detach.

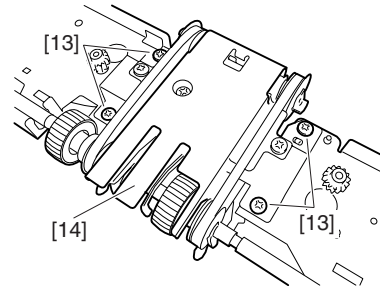


Fig. F03-102-54

- Remove the stack delivery roller (lower) [15] and the two delivery belts [16].

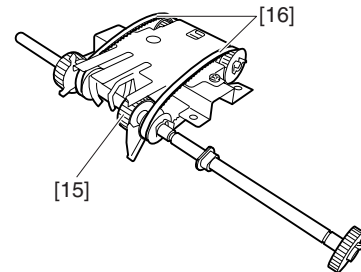


Fig. F03-102-55

NOTE: Be sure to mount them so that the edges [17] of the claws of the delivery belts are flush.

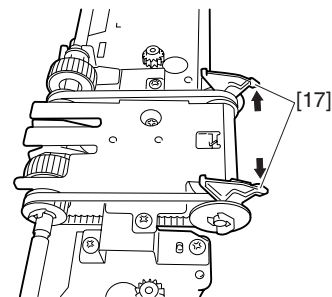


Fig. F03-102-56

C. PCBs

Removing the Finisher Controller PCB

- Remove the rear cover. (See 1.A.(3).)
- Disconnect the 17 connectors [1], and remove the screw [2].

- Free the PCB retainer [3], and detach the finisher controller PCB [4].

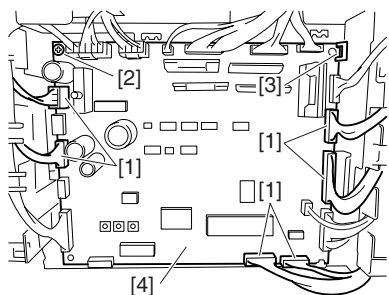


Fig. F03-103-01

Removing the Slide Home Position PCB

- Open the front door [1], and turn the tab [2] on the stapler slide in the direction of the arrow to slide the stapler to the frontmost point.
- Remove the stapler unit. (See 1.B.(1).)

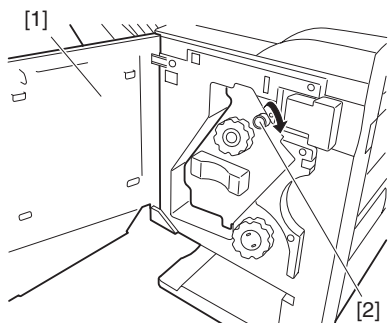


Fig. F03-103-02

- Place the stapler unit [3] as shown.
- Remove the two screws [4], and detach the guide [5].

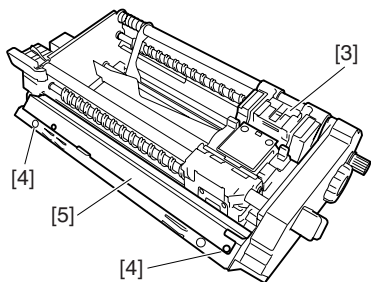


Fig. F03-103-03

- Turn the tab [2] on the stapler side in the direction of the arrow so that the fixing screw [7] of the slide home position PCB [6] is in view through the round hole.

- Remove the fixing screw [7].

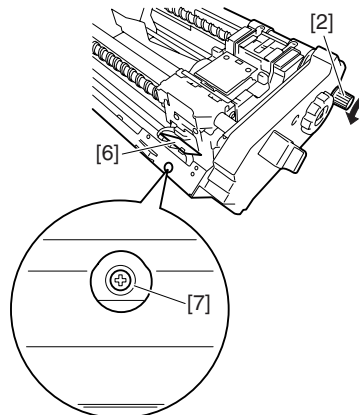


Fig. F03-103-04

- Disconnect the connector [8].
- Remove the flexible cable retainer [9].
- Free the lock [10] of the connector in the direction of the arrow; then, detach the flexible cable [11], and then detach the side home position PCB [12].

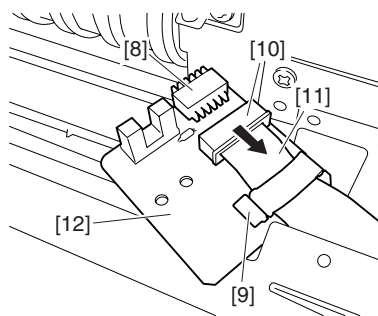


Fig. F03-103-05

2. Puncher Unit (option)

A. Puncher Driving System

Removing the Punch Motor

- Remove the two screws [1].
- Disconnect the connector [2] to remove the punch motor [3].

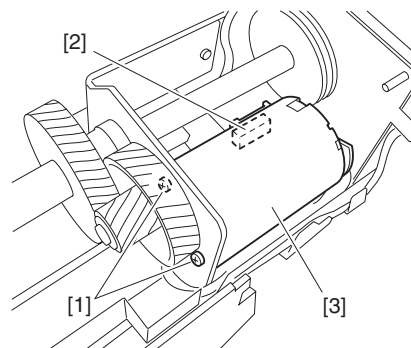


Fig. F03-201-01

Removing the Horizontal Registration Motor

- Disconnect connector [1].
- Remove the harness [3] from the harness guide [2].

- Remove the two screws [4] to remove the horizontal registration motor [5].

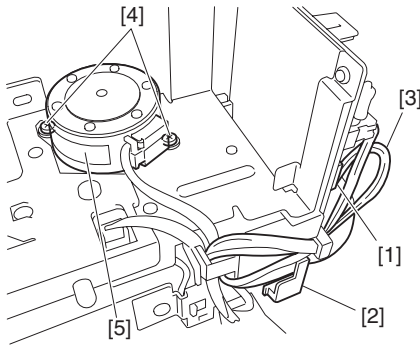


Fig. F03-201-02

Removing the Punch Unit

- Remove the waste case.
- Remove the screw [1] to detach the jam processing cover [2].

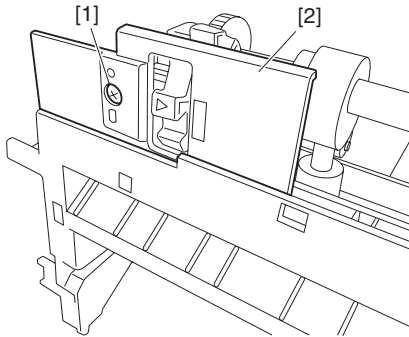


Fig. F03-201-03

- Disconnect the connector [3].
- Remove the harness [5] from the harness guide [4].

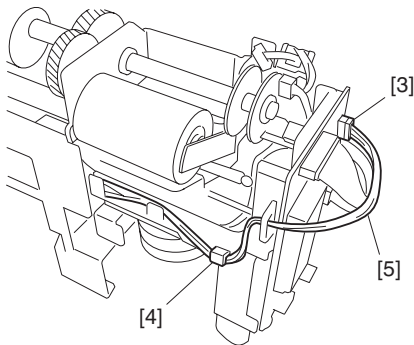


Fig. F03-201-04

- Disconnect the connector [6].
- Remove the screw [7] and sensor support plate [8].

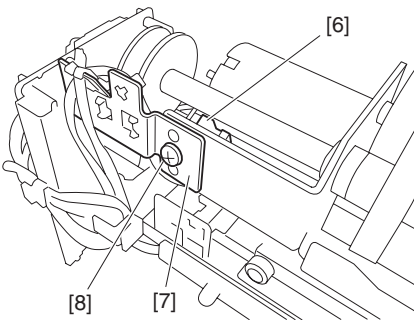


Fig. F03-201-05

- Remove the screw [9] and washer [10].
- Disconnect the connector [11].
- Remove the two screws [12] to detach the base cover [13].

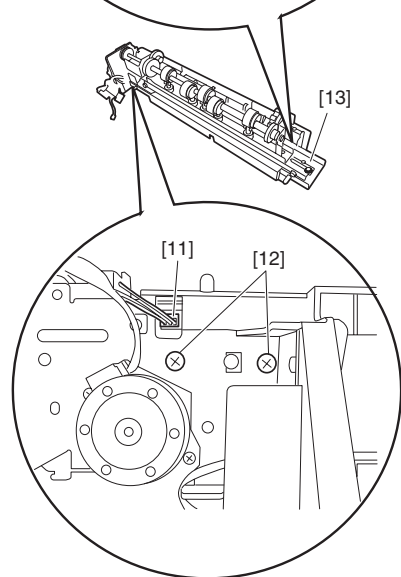
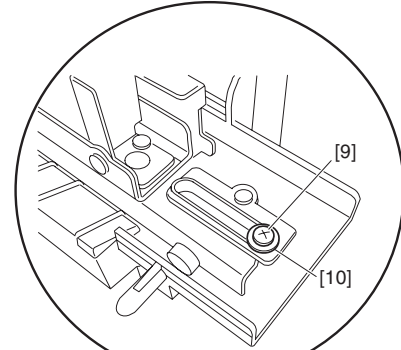


Fig. F03-201-06

- Remove the four screws [14] to remove the upper transmission sensor unit [15] and lower transmission sensor [16].

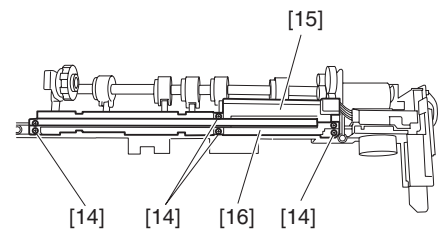


Fig. F03-201-07

- Remove the punch unit [18] from the horizontal registration motor assembly [17].

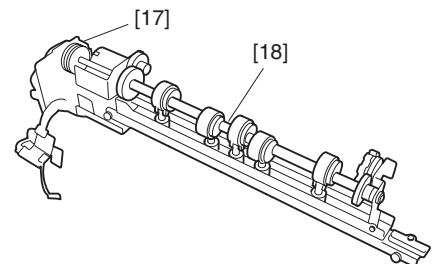


Fig. F03-201-08

B. PCBs

Removing the Punch Controller PCB

1. Remove the two screws [1].
2. Disconnect the five connectors [2] to remove the punch controller PCB [3].

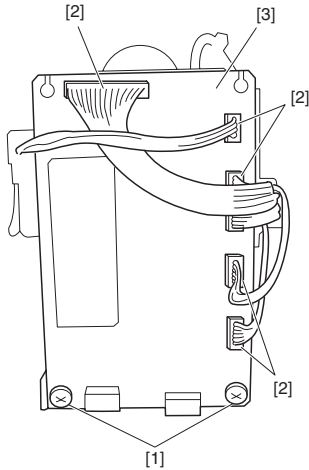


Fig. F03-202-01

Removing the Photosensor PCB

1. Remove the punch motor. (See 2.A.(1).)
2. Remove the screw [1].
3. Remove the harness [3] from the harness guide [2] on the PCB, then detach the PCB cover [4].

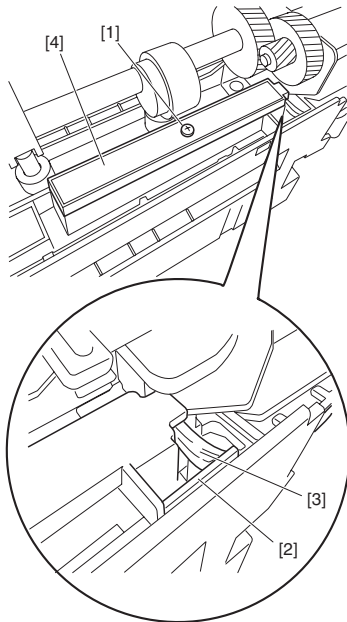


Fig. F03-202-02

4. Disconnect the connector [5] to remove the photosensor PCB [6].

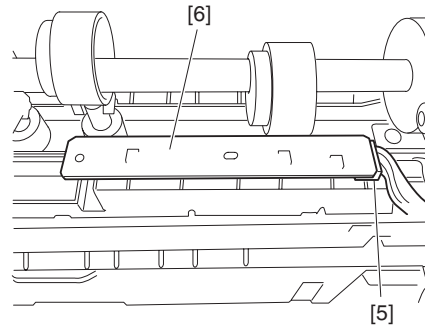


Fig. F03-202-03

Removing the LED PCB

1. Remove the waste case.
2. Disconnect connector [1].
3. Remove the harness [3] from the harness guide [2].

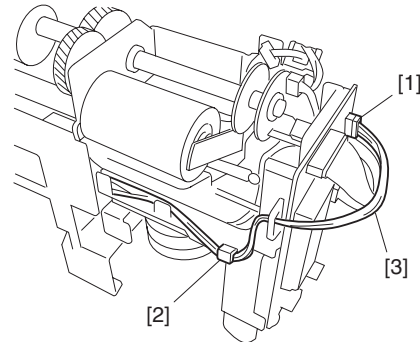


Fig. F03-202-04

4. Remove the screw [4] and washer [5].
5. Disconnect the connector [6].

6. Remove the screw [7] to detach the base cover [8].

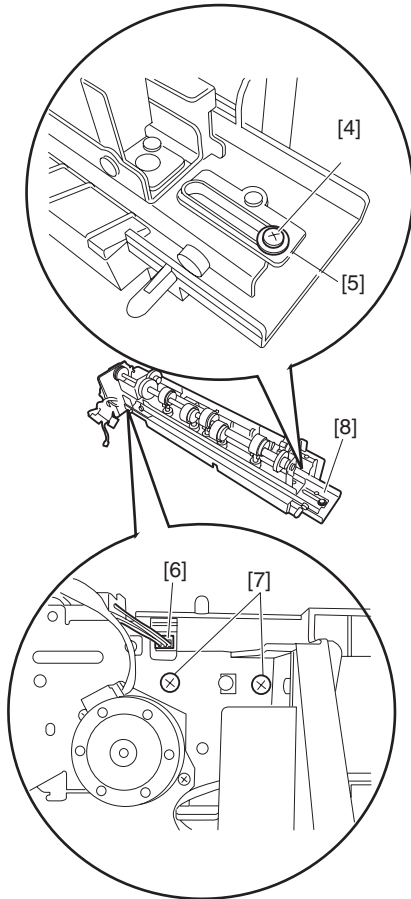


Fig. F03-202-05

7. Remove the screw [9].

8. Disconnect the connector [10] to remove the LED PCB [11].

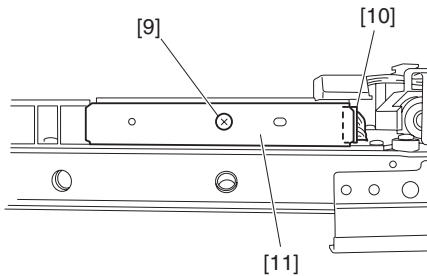


Fig. F03-202-06

Removing the Waste-Full Photosensor PCB

1. Remove the punch controller PCB. (See 2.B.(1).)
2. Remove the two screws [1] to remove the PCB film [2].

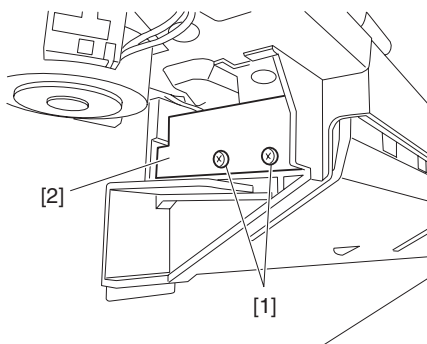


Fig. F03-202-07

3. Disconnect the connector [3] to remove the waste-full photosensor PCB [4].

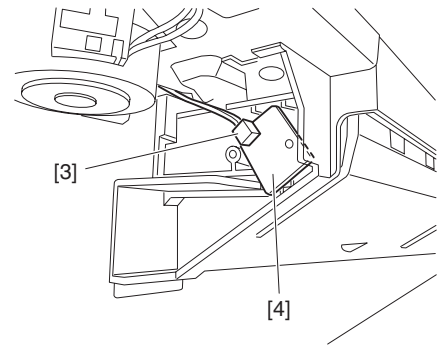


Fig. F03-202-08

Removing the Waste Full LED PCB

1. Remove the screw [1].
2. Disconnect the connector [2] to remove the waste-full LED PCB [3].

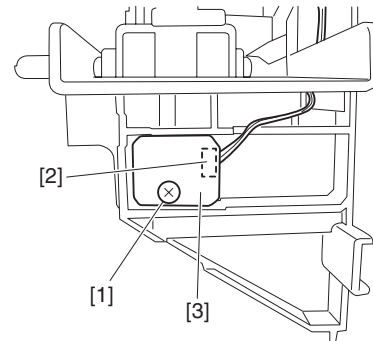


Fig. F03-202-09

[6] MAINTENANCE

1. Maintenance System Table

× Check (Clean, replace, or adjust as necessary.)

○ Clean

▲ Replace

△ Adjust

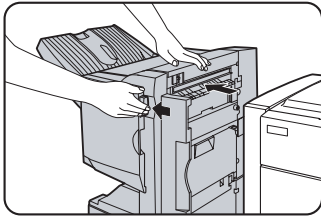
☆ Lubricate

□ Move position

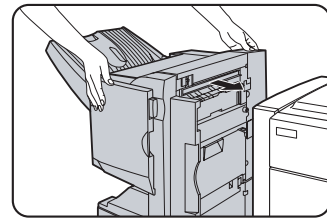
Unit name	Part name	When calling	50K	100K	150K	200K	250K	300K	350K	400K	Remark
Transport section	Transport rollers	○		○		○		○		○	
	Transport paper guides	○		○		○		○		○	
Drive section	Gears	☆		☆		☆		☆		☆	(Specified position)
	Belts	×						×			
Other	Sensors	×		×		×		×		×	
	Discharge brush	×		×		×		×		×	
Staple cartridge											User replacement for every 3000pcs.

2. Punch dust process (with the punch unit installed)

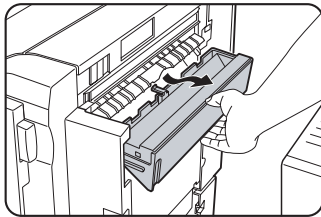
1. Pull the grip of the saddle finisher and move it to allow a space between the machine and the saddle finisher.



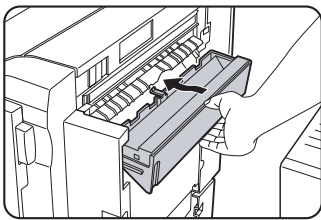
4. Move the saddle finisher back to the machine.



2. Slow pull down the punch dust box and remove punch dust. Use a polyethylene bag, etc. not to disperse punch dust.











3. Replace the punch dust box to the original position.



[7] MACHINE OPERATION

1. Staple sort mode

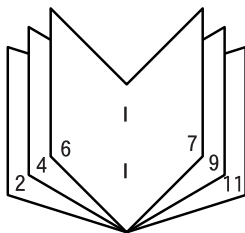
Collated sets of printouts are stapled and delivered to the offset tray (upper tray). Alternatively, printed paper is stapled at the center and delivered to the saddle stitch tray (lower tray). The relation among stapling positions, orientation, paper size for stapling, and stapling capacity is shown below.

Stapling positions	Portrait orientation		Landscape orientation	
Rear corner of printouts		Available paper sizes: 8-1/2" x 11", A4 and B5 Stapling capacity: Up to 50 sheets for any sizes		Available paper sizes: 11" x 17", 8-1/2" x 14", 8-1/2" x 13", 8-1/2" x 11" R, A3, B4, A4R, and B5R Stapling capacity: Up to 50 sheets for 8-1/2" x 11"R, A4R and B5R, and up to 25 sheets for other sizes
Center left two positions of printouts		Same as above		Same as above
Front corner of printouts		Same as above		Same as above
Saddle stitch		Saddle stitch stapling cannot be performed in the portrait orientation.		Available paper sizes: 11" x 17", 8-1/2" x 11"R, A3, B4, and A4R Stapling capacity: Up to 10 sheets for any sizes

A. Saddle stitch function

Printed paper is stapled at two positions at the center and is folded in two with the center down before delivery.

<Example>



to the offset tray. The saddle stitch function and the punch function cannot be used together.

<Example>

{Original 1}



{Punch positions}



{Original 2}



{Punch positions}



B. Punch function (only if a punch module (B83UPS) is installed)

If the saddle stitch finisher is equipped with a punch module, printed paper can be punched (two/three holes) and delivered

2. Print driver setup

A. Setup procedures using staple function

1. Select "PROPERTY" in the setup menu of the printer driver.
2. Click the "MAIN" tab.
3. In the "FINISH" item, select "Stapling position" and "Staple."

B. Setup procedures when using saddle stitch function

1. Select "PROPERTY" in the setup menu of the printer driver.
2. Click the "MAIN" tab.
3. In the "DUPLEX PRINT" items, put a check mark to the radio button of "Center binding."
4. Select between the normal-ratio center binding and 2-UP center binding.
5. In the "FINISH" item, select "2-position binding" of "STAPLE."

C. Setup procedures when using punch function

1. Select "PROPERTY" in the setup menu of the printer driver.
2. Click the "MAIN" tab.
3. In the "FINISH" items, put a check mark to the check box of "PUNCH."

[8] ADJUSTMENTS

1. Finisher/saddle unit

A. Adjusting the Folding Position

The folding position is adjusted by matching it with the stapling position.

If you have replaced the finisher controller PCB, you must transfer the existing settings to the new PCB. Perform the following if the folding position must be adjusted for some reason.

NOTE: Both the folding and stapling positions may deviate for some type of paper. In such a case, change the "middle stapling position" in the user mode of the host machine.

1. Set SW1 on the finisher controller PCB as follows:

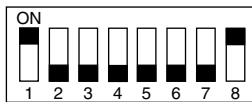


Fig. F05-101-01

2. Adjust the folding position by pressing the PSW1 or PSW2 on the finisher controller PCB a required number of times. Pressing the switch once moves the folding position about 0.16 mm.

- To move the folding position in the "-" direction, press the PSW1.
- To move the folding position in the "+" direction, press the PSW2.
- Pressing the PSW1 and PSW2 at the same time clears the adjustment value.

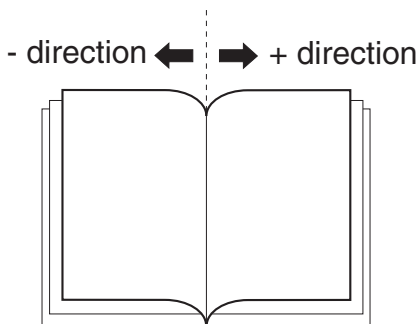


Fig. F05-101-02

3. When adjustment of the folding position is complete, set all bits of the SW1 on the finisher controller PCB to OFF.
4. Enter the bind mode of the host machine and check whether the folding position is adjusted properly. If adjusted improperly, adjust the folding position again.

B. Adjusting the Middle 2-Point Stapling Position

The stapling position is adjusted by matching it with the folding position.

If you have replaced the finisher controller PCB, you must transfer the existing settings to the new PCB. Perform the following if the stapling position must be adjusted for some reason.

NOTE: Both the folding and stapling positions may deviate for some type of paper. In such a case, change the "middle stapling position" in the user mode of the host machine.

1. Set SW1 on the finisher controller PCB as follows:

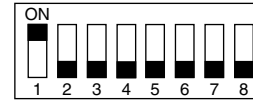


Fig. F05-101-03

2. Adjust the stapling position by pressing the PSW1 or PSW2 on the finisher controller PCB a required number of times. Pressing the switch once moves the stapling position about 0.14 mm.
 - To move the stapling position in the "-" direction, press the PSW1.
 - To move the stapling position in the "+" direction, press the PSW2.
 - Pressing the PSW1 and PSW2 at the same time clears the adjustment value.

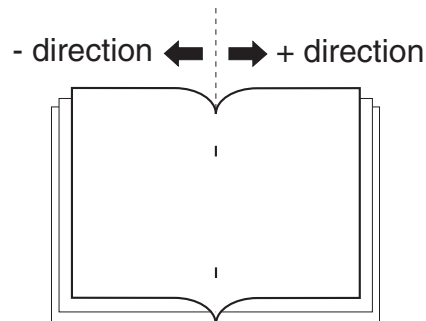


Fig.F05-101-04

3. When adjustment of the stapling position is complete, set all bits of the SW1 on the finisher controller PCB to OFF.
4. Enter the bind mode of the host machine and check whether the stapling position is adjusted properly. If adjusted improperly, adjust the stapling position again.

C. One-page exit mode

This mode is used to increase the accuracy of paper alignment in the simple load offset mode by discharging paper one by one to the offset tray.

1. Set the SW1 of the finisher control PWB as shown below.

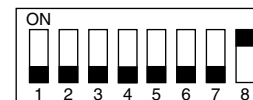


Fig. F05-101-05

2. Turn on the power.

2. Puncher unit (option - B83UPS)

A. Adjusting the Punch Hole Position

This mode requires operation in service mode. The range of hole displacement is between 3 and -3 in 1-mm increments. A higher setting will move the hole toward the leading edge of sheet.

(See the Service Manual of the host machine.)

B. Adjusting the Sensor Output

Perform the following when the punch controller PCB, horizontal registration sensor (photosensor PCB/LED PCB), or waste full sensor (waste full photosensor PCB/waste full LED PCB) has been replaced.

- Shift bits 1 through 4 on the punch controller PCB as follows:

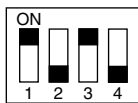


Fig. F05-102-01

- Press SW1002 or SW1003 on the punch controller PCB. A press will automatically adjust the sensor output.
 - The adjustment is over when all LEDs on the punch controller PCB are ON: LED1001, LED1002, LED1003.
- Shift all bits of DIPSW1001 to OFF.

C. Registering the Number of Punch Hole

Perform the following to register the type of puncher unit (number of holes) used to the IC on the punch controller PCB for identification by the finisher. Be sure to register the type whenever you have replaced the punch controller PCB.

- Set bits 1 through 4 on the DIPSW1001 on the punch controller PCB as follows:

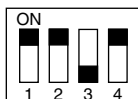


Fig. F05-102-02

- Press SW1002 on the punch controller PCB to select the appropriate number of punch holes.
 - Each press on SW1002 moves the selection through the following (repeatedly from top to bottom).

Number of punch holes	LED1001	LED1002	LED1003
2/3 holes (Puncher Unit-K1)	ON	ON	OFF

- Press SW1003 on the punch controller PCB twice. The presses will store the selected number of punch holes on the punch controller PCB.
 - A single press on SW1003 will cause the LED indication to flash; another press on SW1003 will cause the indication to remain ON to indicate the end of registration.
- Shift all bits of DIPSW1001 to OFF.

D. After Replacing the EEPROM (IC1002)

- Turn off the host machine.

- Set bits 1 through 4 on the punch controller PCB as follows:

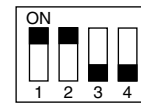


Fig. F05-102-03

- Press SW1002 and SW1003 on the punch controller PCB at the same time.
 - The presses will initialize the EEPROM. At the end, all LEDs (LED1001, LED1002, LED1003) will go ON.
- Adjust the sensor output, and store the number of punch holes.

E. Setup by the diag simulation of the printer

- Select "CONSOLE FIN. SET X" in the diag mode.

CONSOLE FIN. SET X

Fig. F05-102-04

- Select the setup value to be changed with [Δ] [∇] keys. The adjustable setup values are shown in the table below.

X:	Adjustment content	Default value	Setup range	Change/Setup value 1
A	Saddle binding position adjustment		0 - 400	0.0707mm
B	Saddle folding position adjustment		0 - 400	0.0525mm
C	Front alignment position adjustment		0 - 20	0.367mm
D	Rear alignment position adjustment		0 - 20	0.367mm
E	Staple front one-position binding position adjustment		0 - 200	0.04374mm
F	Staple rear one-position binding position adjustment		0 - 200	0.04374mm
G	Staple 2-position binding center adjustment		0 - 200	0.04374mm
H	Staple 2-position binding pitch		0 - 99	0.04374mm
I	Punch center position adjustment (FR direction)		0 - 99	
J	Punch hole position adjustment		0 - 99	0.105mm

[9] TROUBLESHOOTING

1. Outline

The CPU on the machine's finisher controller PCB is equipped with a mechanism to check the machine condition as needed; when it detects a fault, the machine communicates the fact to the host machine in the form of a code and a detail code.

The host machine indicates the code on its control panel. (The detail code may be checked in the host machine's service mode.)

2. Trouble code

F1	03	Content	Console finisher (B83SS) paddle motor trouble
		Detail	Paddle motor operation abnormality
		Cause	Motor lock Motor rpm abnormality Overcurrent to the motor Console finisher control PWB trouble
		Check and remedy	Use DIAG (SIM3-3) to check the motor operation.
	06	Content	Console finisher (B83SS) slide motor trouble
		Detail	Slide motor operation abnormality
		Cause	Motor lock Motor rpm abnormality Overcurrent to the motor Console finisher control PWB trouble
		Check and remedy	Use DIAG (SIM3-3) to check the motor operation.
	10	Content	Console finisher (B83SS) stapler motor trouble
		Detail	Stapler motor operation abnormality
		Cause	Motor lock Motor rpm abnormality Overcurrent to the motor Console finisher control PWB trouble
		Check and remedy	Use DIAG (SIM3-3) to check the motor operation.
	11	Content	Console finisher (B83SS) bundle exit motor trouble
		Detail	Bundle exit motor operation abnormality
		Cause	Motor lock Motor rpm abnormality Overcurrent to the motor Console finisher control PWB trouble
		Check and remedy	Use DIAG (SIM3-3) to check the motor operation.
	15	Content	Console finisher (B83SS) lift motor trouble
		Detail	Lift motor operation abnormality
		Cause	Motor lock Motor rpm abnormality Overcurrent to the motor Console finisher control PWB trouble
		Check and remedy	Use DIAG (SIM3-3) to check the motor operation.
19	Content	Console finisher (B83SS) front alignment motor trouble	
	Detail	Front alignment motor operation abnormality	
	Cause	Motor lock Motor rpm abnormality Overcurrent to the motor Console finisher control PWB trouble	
	Check and remedy	Use DIAG (SIM3-3) to check the motor operation.	

F1	20	Content	Console finisher (B83SS) rear alignment motor trouble
		Detail	Rear alignment motor operation abnormality
		Cause	Motor lock Motor rpm abnormality Overcurrent to the motor Console finisher control PWB trouble
		Check and remedy	Use DIAG (SIM3-3) to check the motor operation.
	30	Content	Console finisher (B83SS) communication trouble
		Detail	Communication cable test error after turning on the power or exiting from DIAG. Communication error with the console finisher
		Cause	Improper connection or disconnection of connector and harness between the machine and the console finisher. Console finisher control PWB trouble Control PWB (PCU) trouble Malfunction by noises
		Check and remedy	Canceled by turning OFF/ON the power. Check connectors and harness in the communication line. Replace the console finisher control PWB or PCU PWB.
	31	Content	Console finisher (B83SS) fold sensor trouble
		Detail	Sensor input value abnormality
		Cause	Sensor breakage harness breakage Console finisher control PWB trouble
		Check and remedy	Use DIAG (SIM3-2) to check the sensor operation.
32	Content	Communication trouble between the console finisher (B83SS) and the punch unit (B83UPS).	
	Detail	Communication err between the console finisher and the punch unit (B83UPS).	
	Cause	Improper connection or disconnection of connector and harness between the console finisher and the punch unit (B83UPS). Console finisher control PWB trouble Control PWB (PCU) trouble Malfunction by noise	
	Check and remedy	Canceled by turning OFF/ON the power. Check connectors and harness in the communication line. Replace the console finisher control PWB.	
33	Content	Console finisher (B83SS) punch side registration motor trouble	
	Detail	Punch side registration motor operation abnormality	
	Cause	Motor lock Motor rpm abnormality Overcurrent to the motor Console finisher control PWB trouble	
	Check and remedy	Use DIAG (SIM3-3) to check the motor operation.	

F1	34	Content	Console finisher (B83SS) punch motor trouble
		Detail	Punch motor operation abnormality
		Cause	Motor lock Motor rpm abnormality Overcurrent to the motor Console finisher control PWB trouble
		Check and remedy	Use DIAG (SIM3-3) to check the motor operation.
	35	Content	Console finisher (B83SS) punch side registration sensor trouble
		Detail	Sensor input value abnormality
		Cause	Sensor breakage Harness disconnection Console finisher control PWB trouble
		Check and remedy	Use DIAG (SIM3-2) to check the sensor operation.
	36	Content	Console finisher (B83SS) punch timing sensor trouble
		Detail	Sensor input value abnormality
		Cause	Sensor breakage Harness disconnection Console finisher control PWB trouble
		Check and remedy	Use DIAG (SIM3-2) to check the sensor operation.

F1	37	Content	Console finisher (B83SS) backup RAM trouble
		Detail	Backup RAM contents are disturbed.
		Cause	Console finisher control PWB trouble Malfunction by noise
		Check and remedy	Replace the console finisher control PWB.
	38	Content	Console finisher (B83SS) punch backup RAM trouble
		Detail	Punch unit (B83UPS) backup RAM contents are disturbed.
		Cause	Punch control PWB trouble Malfunction by noise
		Check and remedy	Replace the punch control PWB.
	81	Content	Console finisher transport motor abnormality
		Detail	Transport motor trouble
		Cause	Motor lock Motor rpm abnormality Overcurrent to the motor Console finisher control PWB trouble
		Check and remedy	Use DIAG (SIM3-3) to check the motor operation.

3. Troubleshooting

A. Finisher/saddle unit

F1-03, Paddle Motor Fault (detail code: 01/02/03/04)

Cause/Trouble section	Procedure	Check	Result	Remedy
Paddle home position sensor (PHPS)	1	Check the paddle home position sensor. Is the sensor normal?	NO	Replace the sensor
Swing guide home position sensor (ARHPS)	2	Check the swing guide home position sensor. Is the sensor normal?	NO	Replace the sensor.
Wiring	3	Is the wiring between the finisher controller PCB and the paddle motor normal?	NO	Correct the wiring.
Paddle, Swing guide assembly	4	Try turning the paddle motor clockwise and counterclockwise by hands. Is there mechanical tapping in the rotation of the paddle or the up/down movement of the swing guide?	YES	Correct the mechanical mechanism.
Paddle motor (FPM), finisher controller PCB	5	Try replacing the paddle motor. Is the problem corrected?	YES	End.
			NO	Replace the finisher controller PCB.

F1-10, Staple/fold Motor Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Wiring	1	Is the wiring between the finisher controller PCB and the staple/fold motor normal?	NO	Correct the wiring.
Stapler unit	2	Try turning the staple jam releasing dial. Is there mechanical trapping?	YES	Correct the mechanical system.
Staple/fold motor (FFSM), Finisher controller PCB	3	Try replacing the staple/fold motor. Is the problem corrected?	YES	End.
			NO	Replace the finisher controller PCB.

F1-10, Staple/Fold Motor Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Staple/fold clock sensor (FE)	1	Check the staple/fold clock sensor. Is the sensor normal?	NO	Replace the sensor.
Finisher controller PCB, Stapler unit	2	Does the staple/fold motor operate at the appropriate timing?	YES	Replace the finisher controller PCB.
			NO	Check the stapler unit drive mechanism: if faulty, correct it; if normal, go to step 3).
Staple/fold motor (FFSM), Finisher controller PCB	3	Try replacing the staple/fold motor. Is the problem corrected?	YES	End.
			NO	Try replacing the finisher controller PCB.

F1-10, Staple/Fold Motor Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Folding home position sensor (FHPS)	1	Check the folding home position sensor. Is the sensor normal?	NO	Replace the sensor.
Wiring	2	Is the wiring between the finisher controller PCB and the staple/fold motor normal?	NO	Correct the wiring.
Saddle unit	3	Try turning the fold jam releasing dial. Is there mechanical trapping?	YES	Correct the mechanical mechanism.
Staple/fold motor (FFSM), Finisher controller PCB	4	Try replacing the staple/fold motor. Is the problem corrected?	YES	End.
			NO	Replace the finisher controller PCB.

F1-10, Staple/Fold Motor Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Staple/fold clock sensor (FJHPS)	1	Check the staple/fold clock sensor. Is the sensor normal?	NO	Replace the sensor.

Cause/Trouble section	Procedure	Check	Result	Remedy
Finisher controller PCB, Saddle unit	2	Does the staple/fold motor operate at the appropriate timing?	YES	Replace the finisher controller PCB.
			NO	Check the saddle unit drive mechanism: if faulty, correct it; otherwise, go to step 3).
Staple/fold motor (FFSM), Finisher controller PCB	3	Try replacing the staple/fold motor. Is the problem corrected?	YES	End.
			NO	Replace the finisher controller PCB.

F1-10, Slide Motor Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Slide home position sensor (SHPS)	1	Check the slide home position sensor. Is the sensor normal?	NO	Replace the sensor PCB.
Wiring	2	Is the wiring between the finisher controller PCB and the slide motor normal?	NO	Correct the wiring.
Stapler unit	3	Is there mechanical trapping in the stapler path?	YES	Correct the mechanical system.
Slide motor (FSM), Finisher controller PCB	4	Try replacing the slide motor. Is the problem corrected?	YES	End.
			NO	Replace the finisher controller PCB.

F1-11, Delivery Motor Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Delivery belt home position sensor (OBHPS)	1	Check the delivery belt home position sensor. Is the sensor normal?	NO	Replace the sensor.
Wiring	2	Is the wiring between the finisher controller PCB and the delivery motor normal?	NO	Correct the wiring.
Stack delivery roller	3	Try turning the stack delivery roller by hand. Is the rotation smooth?	NO	Correct the mechanical system.
Delivery motor (FAM), Finisher controller PCB	4	Try replacing the delivery motor. Is the problem corrected?	YES	End.
			NO	Replace the finisher controller PCB.

F1-15, Shift Motor Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Paper surface sensor (SLS)	1	Check the paper surface sensor. Is the sensor normal?	NO	Replace the sensor.
Tray up/down mechanism	2	Check the tray up/down mechanism. Is the mechanism normal?	NO	Correct the mechanism.
Finisher controller PCB	3	Is 24 VDC supplied from the finisher controller PCB to the shift motor as soon as the tray is driven?	NO	Replace the finisher controller PCB.
Shift motor (FLM), Wiring	4	Is the wiring between the finisher controller PCB and the shift motor normal?	YES	Replace the shift motor.
			NO	Correct the wiring.

F1-15, Shift Motor Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Tray position	1	Is the tray as far as the shift upper limit sensor?	YES	Lower the position of the tray.
Shift upper limit sensor (ULS)	2	Check the shift upper limit sensor. Is the sensor normal?	NO	Replace the sensor.
Finisher controller PCB, Wiring	3	Check the wiring from the finisher controller PCB to the shift upper limit sensor; is it normal?	YES	Replace the finisher controller PCB.
			NO	Correct the wiring.

F1-15, Shift Motor Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
-	1	Is the tray in UP position?	YES	Go to step 4).
			NO	Go to step 2).
Finisher controller PCB	2	Is power supplied to the finisher controller PCB as soon as the tray is driven?	YES	Go to step 3).
			NO	Replace the finisher controller PCB.

Cause/Trouble section	Procedure	Check	Result	Remedy
Tray up/down mechanism, Shift motor (FLM)	3	Is there a fault in the tray up/down mechanism?	YES	Correct the tray up/down mechanism.
			NO	Replace the shift motor.
Shift motor clock (LE), Finisher controller PCB	4	Check the shift motor clock sensor.	YES	Replace the finisher controller PCB.
			NO	Replace the sensor.

F1-19, Alignment Motor (front) Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Aligning plate home position sensor (front; FJHPS)	1	Check the aligning plate home position sensor (front). Is the sensor normal?	NO	Replace the sensor.
Wiring	2	Is the wiring between the finisher controller PCB and the front alignment plate motor (front) normal?	NO	Correct the wiring.
Aligning plate (front)	3	Is there mechanical trapping in the aligning plate path?	YES	Correct the mechanical system.
Alignment motor (front; FFJM), Finisher controller PCB	4	Try replacing the Alignment motor (front). Is the problem corrected?	YES	End.
			NO	Replace the finisher controller PCB.

F1-20, Alignment Motor (Rear) Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Aligning plate home position sensor (rear; RJHPS)	1	Check the aligning plate home position sensor (rear). Is the sensor normal?	NO	Replace the sensor.
Wiring	2	Is the wiring between the finisher controller PCB and the rear alignment motor (rear) normal?	NO	Correct the wiring.
Aligning plate (rear)	3	Is there mechanical trapping in the path of the aligning plate?	YES	Correct the mechanical mechanism.
Alignment motor (rear; FRJM), Finisher controller PCB	4	Try replacing the alignment motor (rear). Is the problem corrected?	YES	End.
			NO	Replace the finisher controller PCB.

F1-30, Communication error

Cause/Trouble section	Procedure	Check	Result	Remedy
Finisher controller PCB, Host machine DC controller PCB	1	Turn off and then on the host machine. Is the problem corrected?	YES	End.
Wiring	2	Is the wiring between the finisher controller PCB and the DC controller PCB of the host machine normal?	NO	Correct the wiring.
Finisher controller PCB, Host machine DC controller PCB	3	Try replacing the finisher controller PCB and the host machine DC controller PCB. Is the problem corrected?	YES	End.

F1-37, Finisher Unit Back-Up Memory Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Finisher controller PCB	1	Turn off and then on the host machine. Is the problem corrected?	YES	End.
			NO	Replace the finisher controller PCB.

F1-80, Finisher Unit Power Supply Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Finisher controller PCB, Host machine DC controller PCB	1	Turn off and then on the host machine. Is the problem corrected?	YES	End.
Wiring	2	Is the wiring between the finisher controller PCB and the host machine DC controller PCB normal?	NO	Correct the wiring.
Power supply	3	Measure the voltage between CN1-1 (+) and CN1-3 (-)/CN2-1 (+) and CN2-3 (-) on the finisher controller PCB. Is it 24 VDC?	YES	Replace the finisher controller PCB.
			NO	Replace the host machine DC controller PCB.

F1-81, Feed Motor Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Stack feed roller (upper) home position sensor (FRHPS)	1	Check the stack feed roller (upper) home position sensor. Is it normal?	NO	Replace the sensor.
Wiring	2	Is the wiring between the finisher controller PCB and the feed motor normal?	NO	Correct the wiring.
Feed roller	3	Try turning the stack feed roller (upper) shaft by hand. Does the stack feed roller (upper) move up/down normally?	NO	Correct the mechanical system.
Feed motor (FFM), Finisher controller PCB	4	Try replacing the feed motor. Is the problem corrected?	YES	End.
			NO	Replace the finisher controller PCB.

B. Puncher unit B83UPS, option

F1-32, Communication Faulty

Cause/Trouble section	Procedure	Check	Result	Remedy
Finisher controller PCB, Punch controller PCB	1	Turn off and the on the host machine. Is the problem corrected?	YES	End.
Wiring	2	Is the wiring between the finisher controller PCB and the punch controller PCB normal?	NO	Correct the wiring.
Power supply	3	Measure the voltage between CN14-5 (+) and CN14-3 (-) on the finisher controller PCB. Is it 24 VDC?	NO	Replace the finisher controller PCB.
			YES	Replace the punch controller PCB.

F1-33, Horizontal Registration Motor Fault (detail code: 01/02)

Cause/Trouble section	Procedure	Check	Result	Remedy
Horizontal registration home position sensor (PSHPS)	1	Check the horizontal registration home position sensor. Is the sensor normal?	NO	Replace the sensor.
Wiring	2	Is the wiring between the finisher controller PCB and the horizontal registration home position sensor normal?	NO	Correct the wiring.
Horizontal registration mechanism, horizontal registration motor (FPSM)	3	Is there a fault in the horizontal registration mechanism?	YES	Correct the horizontal registration mechanism.
			NO	Replace the horizontal registration motor.
Punch controller PCB, Finisher controller PCB	4	Try replacing the punch controller PCB. Is the problem corrected?	YES	End.
			NO	Replace the finisher controller PCB.

F1-34, Punch Motor Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Punch motor home position sensor (XXXX)	1	Check the punch home position sensor. Is the sensor normal?	NO	Replace the sensor.
Punch motor clock sensor (PE)	2	Check the punch motor clock sensor. Is the sensor normal?	NO	Replace the sensor.
Wiring	3	Is the wiring between the finisher controller PCB and the sensor normal?	NO	Correct the wiring.
Punch mechanism, Punch motor (FPNM)	4	Is there a fault in the punch mechanism?	YES	Correct the punch mechanism.
			NO	Replace the punch motor.
Punch controller PCB, Finisher controller PCB	5	Try replacing the punch controller PCB. Is the problem corrected?	YES	End.
			NO	Replace the fisher controller PCB.

F1-35, Punch Sensor (horizontal registration) Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Horizontal registration sensor (photosensor PCB/LED PCB)	1	Check the horizontal registration sensor. Is the sensor normal?	NO	Replace the sensor.

Cause/Trouble section	Procedure	Check	Result	Remedy
Wiring	2	Is the wiring between the punch controller PCB and the horizontal registration sensor normal?	NO	Correct the wiring.
Punch controller PCB, Finisher controller PCB	3	Try replacing the punch controller PCB. Is the problem correct?	YES	End.
			NO	Replace the finisher controller PCB.

F1-38, Puncher Back-UP Memory Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
EEP-ROM (IC1002)	1	Is the problem corrected by initializing the EEP-ROM on the punch controller PCB?	YES	End.
Punch controller PCB	2	Turn off and the on the host machine. Is the problem corrected?	YES	End.
			NO	Replace the punch controller PCB.

F1-39, Punch sensor (waste full) Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Waste full Sensor (waste full photosensor PCB/ waste full LED PCB)	1	Check the waste full sensor. Is the sensor normal?	NO	Replace the sensor.
Wiring	2	Is the wiring between the punch controller PCB and the waste full sensor normal?	NO	Correct the wiring.
Punch controller PCB, Finisher controller PCB	3	Try replacing the punch controller PCB. Is the problem corrected?	YES	End.
			NO	Replace the finisher controller PCB.

F1-40, Puncher Unit Power Supply Fault

Cause/Trouble section	Procedure	Check	Result	Remedy
Finisher controller PCB, Host machine DC controller PCB	1	Turn off and then off the host machine. Is the problem corrected?	YES	End.
Wiring	2	Is the wiring between the finisher controller PCB and the punch controller PCB normal?	NO	Correct the wiring.
Power supply	3	Measure the voltage between CN14-5 (+) and CN4-3 (-) on the finisher controller PCB. Is it 24 VDC?	YES	Replace the punch controller PCB.
			NO	Replace the finisher controller PCB.

4. Simulations

A. Finisher/Saddle unit

Error	Condition	Timing of detection	Operation	Resetting
Staple absent	The stapler is not set.	Monitoring at all times	The staple/fold motor (FFSM) and the slide motor (FSM) will stop.	Set the stapler.
Staple absent	The staple cartridge has run out of staples.	Monitoring at all times	Normal operation will continue; however, operation is subject to instructions from the host machine.	Replace the staple cartridge; or, set it correctly.
Mixed sheets	Sheets of different sizes are deposited in the compartment.	When a sheet of a different size is placed.	The sheet will be aligned based on maximum size width and delivered as a stack.	-
Overstacking for stapling	The number of sheets in the compartment has exceeded the limit imposed on stapling.	When an extra sheet is placed.	The sheets will be delivered with stapling.	-
Stack tray overstacking	The number of sheets deposited on the delivery tray has exceeded the limit imposed on the tray (sheets, sets).	When an extra sheet is placed.	Normal operation will continue.	Remove the sheets from the delivery tray.
Saddle overstacking	Remove the stack from the bind tray. More than 10 stacks are deposited on the folded stack tray.	When an extra sheet is placed.	Normal operation will continue.	Remove the stack from the bind tray.

B. Puncher unit (option)

Error	Condition	Timing of detection	Operation	Resetting
Waste case full	The amount of waste paper in the waste case has reached the limit.	During punching.	Normal operation will continue.	Remove the waste paper from the waste case.
Excess water	The amount of waste paper in the waste case has exceeded the limit.	During punching.	Punching will be disabled.	Remove the waste paper from the water case.