

SERVICE MANUAL




DIGITAL MULTIFUNCTIONAL SYSTEM OPTION

PAPER FOLDING UNIT

MODEL MX-FD10

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

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



Explanation of Symbols

The following symbols are used throughout this Service Manual.

Symbols	Explanation	Symbols	Explanation
	Check.		Remove the claw.
	Check visually.		Insert the claw.
	Check the noise.		Use the bundled part.
	Disconnect the connector.		Push the part.
	Connect the connector.		Plug the power cable.
	Remove the cable/wire from the cable guide or wire saddle.		Turn on the power.
	Set the cable/wire to the cable guide or wire saddle.		
	Remove the screw.		
	Tighten the screw.		

The following rules apply throughout this Service Manual:

1. Each chapter contains sections explaining the purpose of specific functions and the relationship between electrical and mechanical systems with reference to the timing of operation.

In the diagrams,  represents the path of mechanical drive; where a signal name accompanies the symbol, the arrow  indicates the direction of the electric signal. The expression "turn on the power" means flipping on the power switch, closing the front door, and closing the delivery unit door, which results in supplying the machine with power.

2. In the digital circuits, '1' is used to indicate that the voltage level of a given signal is "High", while '0' is used to indicate "Low". (The voltage value, however, differs from circuit to circuit.) In addition, the asterisk (*) as in "DRMD*" indicates that the DRMD signal goes on when '0'.

In practically all cases, the internal mechanisms of a microprocessor cannot be checked in the field. Therefore, the operations of the microprocessors used in the machines are not discussed: they are explained in terms of from sensors to the input of the DC controller PCB and from the output of the DC controller PCB to the loads.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information bulletins and be able to identify and isolate faults in the machine.

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

Signal Name (Written in this manual)	Signal Name	Parts Name	Function / Operation
M5	FLM5	Motor	Entrance motor 1
M7	FLM7	Motor	Fold tray motor
M8	FLM8	Motor	Upper stopper motor
M9	FLM9	Motor	C-fold stopper motor
M10	FLM10	Motor	Leading edge press guide
M11	FLM11	Motor	Fold feed motor
M12	FLM12	Motor	Entrance motor 2
M13	FLM13	Motor	Exit motor 2
M14	FLM14	Motor	Exit motor 1
M15	FLM15	Motor	Fold position adjustment motor
SOL2	FLSOL2	Solenoid	Folding/straight branching flapper solenoid
SOL3	FLSOL3	Solenoid	Release timing solenoid
SOL4	FLSOL4	Solenoid	Flapper solenoid
SOL5	FLSOL5	Solenoid	C-fold stopper solenoid
CL3	FLCL3	Clutch	Fold adjustment feed clutch
CL4	FLCL4	Clutch	Fold adjustment back clutch
F1	F1	Fan	Cooling Fan
S20	FLS20	Sensor	Entrance sensor
S21	FLS21	Sensor	Delivery sensor 2
S22	FLS22	Sensor	Delivery sensor 1
S23	FLS23	Sensor	Upper stopper HP sensor
S24	FLS24	Sensor	C-fold stopper HP sensor
S25	FLS25	Sensor	Leading edge press guide HP sensor
S26	FLS26	Sensor	Fold tray paper full sensor
S27	FLS27	Sensor	Fold tray paper sensor
S28	FLS28	Sensor	Fold tray HP sensor
S29	FLS29	Sensor	Folding unit sensor
S30	FLS30	Sensor	Slowdown timing sensor
S31	FLS31	Sensor	Release timing sensor
S32	FLS32	Sensor	Fold position sensor
S33	FLS33	Sensor	Upper stopper paper sensor
SW1	FLSW1	Sensor	Front upper cover switch

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Safety Precautions

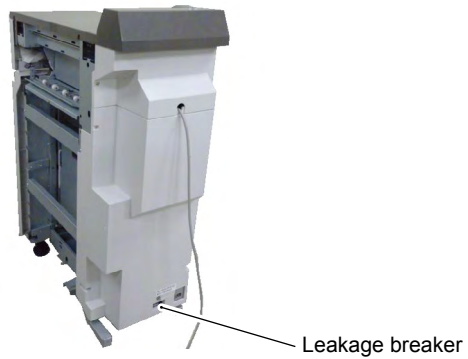
- Points to Note About Turning Off the Main Power
- Notes Before it Works Serving

Points to Note About Turning Off the Main Power Switch

This equipment does not have a main power switch, but it has only a leakage breaker.
This equipment is powered when the main power switch of the host machine is turned on.
The leakage breaker detects overcurrent and power leakage.

MEMO:

Explain to the customer that the leakage breaker must be checked once or twice a month and the result must be recorded.



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Notes Before it Works Serving

CAUTION:

At servicing, be sure to turn off the power source according to the specified steps and disconnect the power plug.

CAUTION:

Do not turn off the power switch (of the host machine or Finisher/Saddle Finisher) when downloading is under way.

Turning off the main power switch while downloading is under way can disable the machine.

1

Product Outline

- Features
- Specifications
- Names of Parts



Features

Features

- A product furnished with five kinds of folding features.
- Fold types [Z-fold,C-fold,outer threefold,fourfold,twofold]

Specification

Model name	MX-FD10	
Installing system	Mounting plate latching system (The caster height can be adjusted.)	
Door open detection	Yes (Front door)	
Paper kind	Refer to the related table.	
Paper size	Refer to the related table.	
Paper weight	Refer to the related table.	
External dimensions	336 mm x 770 mm x 1,050 mm	
Weight	66 Kg	
Power source	Yes (Universal, 100-240V)	
Max. power consumption	150W or less	
Folding method	Roller pressing method (Serial process during paper pass)	
Folding mode	Z-fold, internal 3-fold, external 3-fold, 4-fold, 2-fold	
Paper kind	Thin paper, plain paper, recycled paper, heavy paper/ coated paper	
Paper size	Z-fold	Refer to the related table.
	Internal 3-fold	Refer to the related table.
	External 3-fold	Refer to the related table.
	4-fold	Refer to the related table.
	2-fold	Refer to the related table.
Paper weight	Refer to the related table.	
Tray load capacity (Lower section of the paper folding unit)	Internal 3-fold	Load height: 60mm (corresponding to 40 sheets.)
	External 3-fold	Load height: 60mm (corresponding to 40 sheets.)
	4-fold	Load height: 60mm (corresponding to 25 sheets.)
	Z-fold	Discharged to the 100-sheet stapling finisher.
	2-fold	Discharged to the 100-sheet stapling finisher.

Table

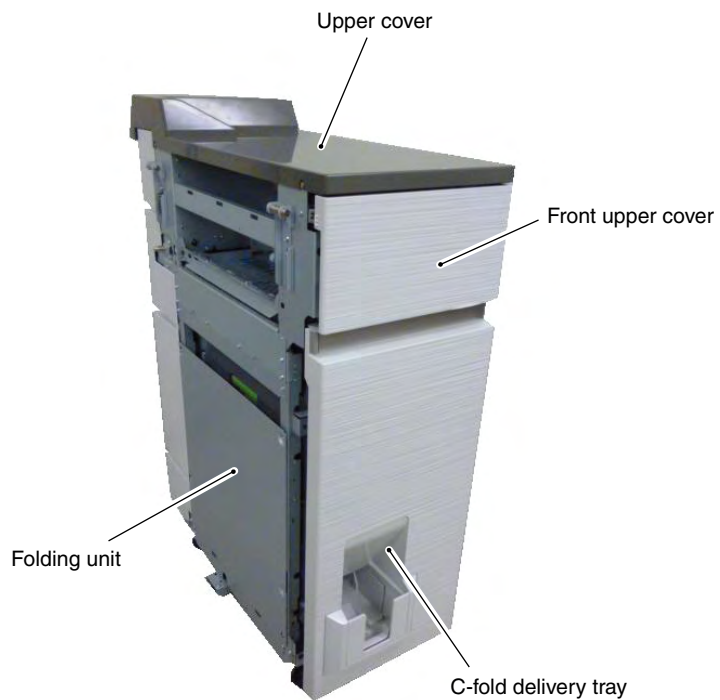
		Through	Z-fold tray	Z-fold	2-fold	Outer/ inner 3-fold	4-fold
Min. weight		55g/m ²	55g/m ²	55g/m ²	55g/m ²	55g/m ²	55g/m ²
Max. weight		300g/m ²	105g/m ²	105g/m ²	105g/m ²	105g/m ²	105g/m ²
Paper type	Thin paper	Yes	Yes	Yes	Yes	Yes	Yes
	Plain paper	Yes	Yes	Yes	Yes	Yes	Yes
	Recycled paper	Yes	Yes	Yes	Yes	Yes	Yes
	Color paper	Yes	Yes	Yes	Yes	Yes	Yes
	Letterhead	Yes	Yes	Yes	No	No	No
	Printed paper	Yes	Yes	Yes	No	No	No
	Punch sheet	Yes	Yes	Yes	No	No	No
	Heavy paper 1 106 – 176	Yes	No	No	No	No	No
	Heavy paper 2 177 – 220	Yes	No	No	No	No	No
	Heavy paper 3 221 – 256	Yes	No	No	No	No	No
	Heavy paper 4 257 – 300	Yes	No	No	No	No	No
	Embossed paper	Yes	No	No	No	No	No
	Tab paper	Yes	No	No	No	No	No
	OHP	Yes	No	No	No	No	No
	Label paper	Yes	No	No	No	No	No
	Gloss paper	Yes	No	No	No	No	No
	User type 1 – 9	Yes	Yes	Yes	Yes	Yes	Yes
Paper size	12"x18"(A3W)	305x457	No	No	No	No	No
	Ledger (11"x17")	279x432	Yes	No	Yes	No	No
	Ledger (11"x17") Z-fold	279x216	-	-	-	-	-
	Legal (8.5"x14")	216x356	Yes	No	Yes	No	No
	Legal (8.5"x14") Z-fold	216x178	-	-	-	-	-
	Asian legal (8.5"x13.5")	216x343	Yes	No	No	No	No
	Mexican legal (8.5"x13.4")	216x340	Yes	No	No	No	No
	Foolscap (8.5"x13")	216x330	Yes	No	No	No	No
	Letter (8.5"x11")	279x216	Yes	No	No	No	No
	Letter R (8.5"x11"R)	216x279	Yes	No	Yes	Yes	Yes
	Letter R (8.5"x11"R) Z-fold	216x140	-	-	-	-	-

			Through	Z-fold tray	Z-fold	2-fold	Outer/ inner 3-fold	4-fold
Paper size	Letter R (8.5"x11"R) 2-fold	216x140	-	-	-	-	-	-
	Letter R 3-fold/4-fold	216x93/70	-	Yes	-	-	-	-
	Invoice (5.5"x8.5")	216x140	No	No	No	No	No	No
	Invoice R (5.5"x8.5"R)	140x216	Yes	No	No	No	No	No
	Executive R (7.25"x10.5"R)	184x266	Yes	No	No	No	No	No
	9x12 (A4W)	305x229	Yes	No	No	No	No	No
	A3	297x420	Yes	No	Yes	No	No	No
	A3 Z-fold	297x210	-	-	-	-	-	-
	B4	257x364	Yes	No	Yes	No	No	No
	B4 Z-fold	257x182	-	-	-	-	-	-
	A4	297x210	Yes	No	No	No	No	No
	A4-R	210x297	Yes	No	Yes	Yes	Yes	Yes
	A4-R Z-fold	210x148	-	-	-	-	-	-
	A4-R 2-Z-fold	210x148	-	-	-	-	-	-
	A4-R 3-fold/4-fold	210x99/74	-	Yes	-	-	-	-
	B5	257x182	Yes	No	No	No	No	No
	B5-R	182x257	Yes	No	No	No	No	No
	A5	210x148	Yes	No	No	No	No	No
	A5-R	148x210	Yes	No	No	No	No	No
	SRA3	320x450	Yes	No	No	No	No	No
	SRA4	320x225	Yes	No	No	No	No	No
	Kiku 8	318x234.75	-	-	-	-	-	-
	A series 8	312.5x220	-	-	-	-	-	-
	Kiku 4	318x469.5	-	-	-	-	-	-
	A series 4	312.5x440	-	-	-	-	-	-
	8K	270x390	Yes	No	No	No	No	No
	16K	270x195	Yes	No	No	No	No	No
	16K-R	195x270	Yes	No	No	No	No	No
	Postcard	100x148	Yes	No	No	No	No	No
	Monarch	98x191	Yes	No	No	No	No	No
	COM10	105x241	Yes	No	No	No	No	No

			Through	Z-fold tray	Z-fold	2-fold	Outer/ inner 3-fold	4-fold	
Paper size	DL	110x220	Yes	No	No	No	No	No	
	C5	229x162	Yes	No	No	No	No	No	
	Long No. 3	120x235	Yes	No	No	No	No	No	
	Long No. 4	90x205	Yes	No	No	No	No	No	
	Western No. 2	114x162	Yes	No	No	No	No	No	
	Western No. 4	105x235	Yes	No	No	No	No	No	
	Square No. 2	240x332	Yes	No	No	No	No	No	
	Square No. 3	216x277	Yes	No	No	No	No	No	
	Special - custom size		Yes	No	No	No	No	No	
	Custom range	MinX (Sub scan)	148 (5.875)	No	No	No	No	No	No
		MaxX (Sub scan)	457 (18)	No	No	No	No	No	No
		MinY (Main scan)	90 (3.625)	No	No	No	No	No	No
		MaxY (Main scan)	320 (12.5)	No	No	No	No	No	No
	Special - size undetermined		Yes	No	No	No	No	No	
Long-scale paper	Width:	90 - 305	Yes	No	No	No	No	No	
	Length:	458 - 1200							

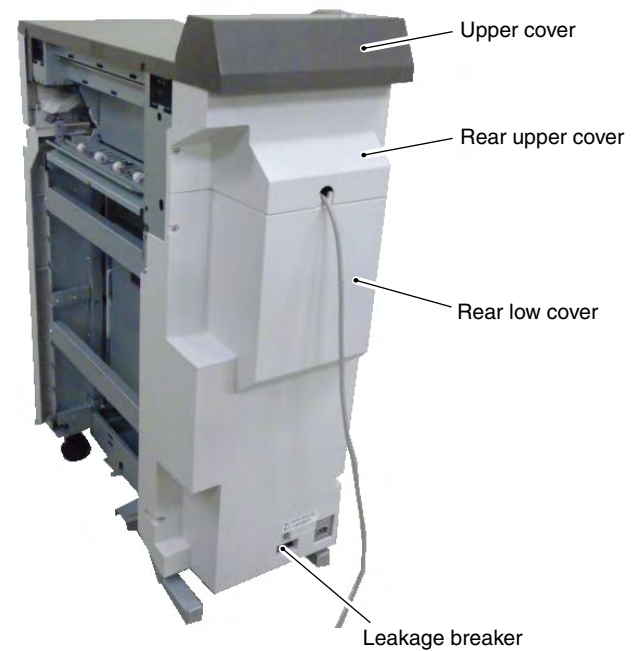
Names of Parts

External View(Front)



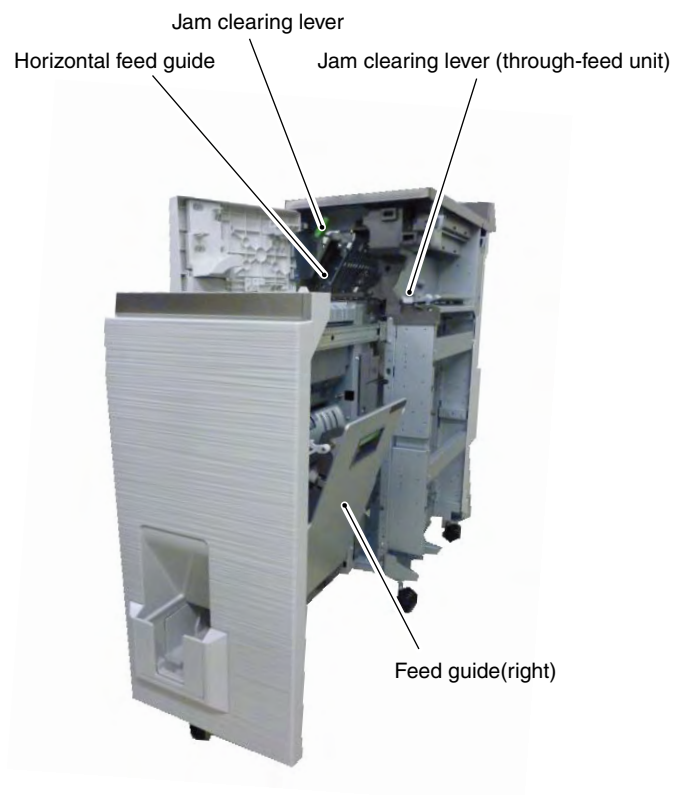
F-1-1

External View(Rear)

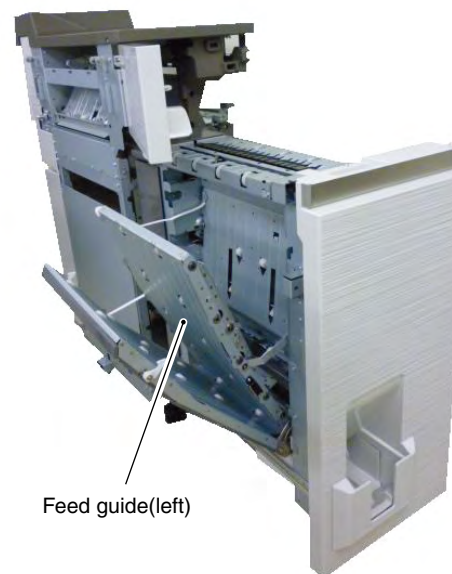


F-1-2

External View(Internal)



F-1-3



F-1-4

2

Technology

- Basic Configuration
- Controls
- Detecting jams
- Power Supply
- Work of service

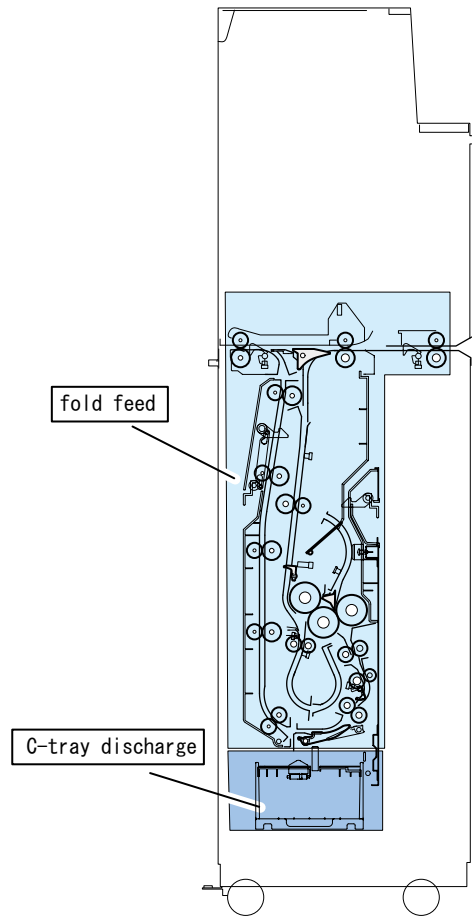


F-2-1

Basic Configuration

Functional Configuration

The components of this fold unit are organized into two major blocks: fold feed and C-tray discharge.



F-2-2

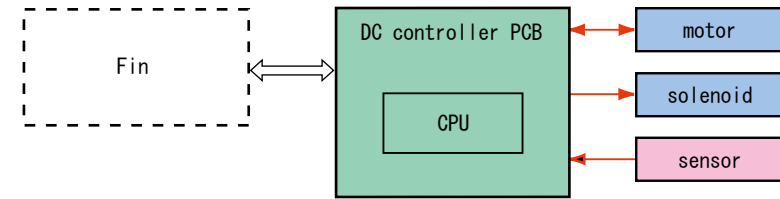
Electric Circuit Overview

The operation sequence of the folder is controlled by the dc controller PCB.

The dc controller PCB incorporates a CPU.

The CPU interprets the signals from the sensors and finisher to output the signals for driving DC loads such as motors and solenoids at the predetermined timings.

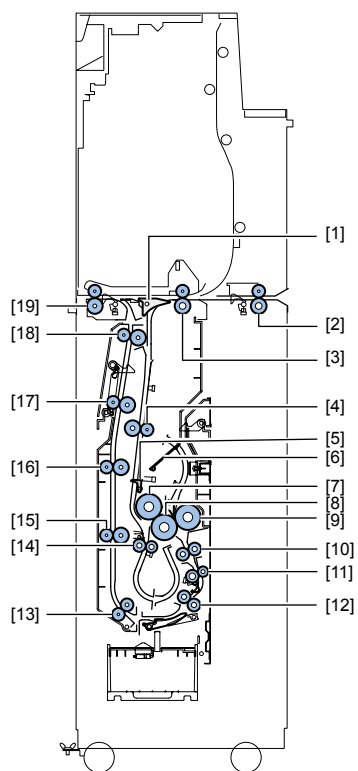
The dc controller PCB reports the information about various sensors to the finisher through serial communication.



F-2-3

Component Configuration

Roller Layout

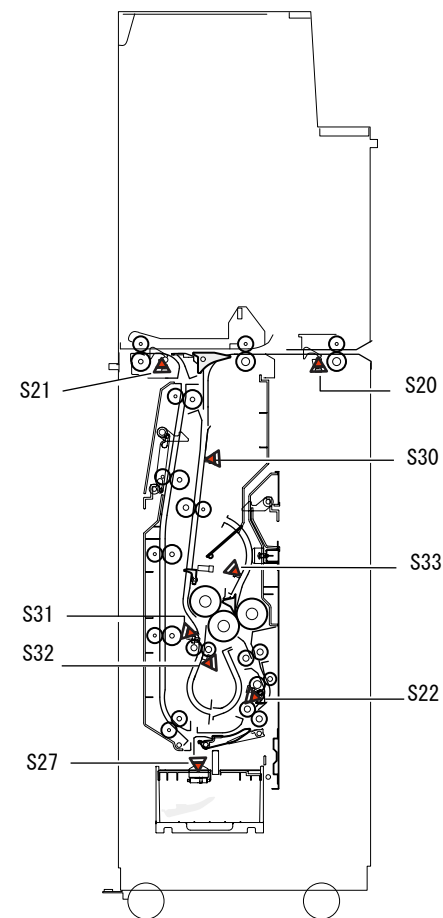


F-2-4

- | | |
|---------------------------------------|-----------------------------|
| [1]Folding/straight branching flapper | [11]Delivery roller2 |
| [2]Inlet 1 roller | [12]Delivery roller3 |
| [3]Inlet 2 roller | [13]Z-fold delivery roller1 |
| [4]Feed roller | [14]Registration roller |
| [5]C-fold stopper | [15]Z-fold delivery roller2 |
| [6]Second fold stopper | [16]Z-fold delivery roller3 |
| [7]Folding roller1 | [17]Z-fold delivery roller4 |
| [8]Folding roller2 | [18]Z-fold delivery roller5 |
| [9]Folding roller3 | [19]Delivery roller |
| [10]Delivery roller1 | |

Sensor Layout

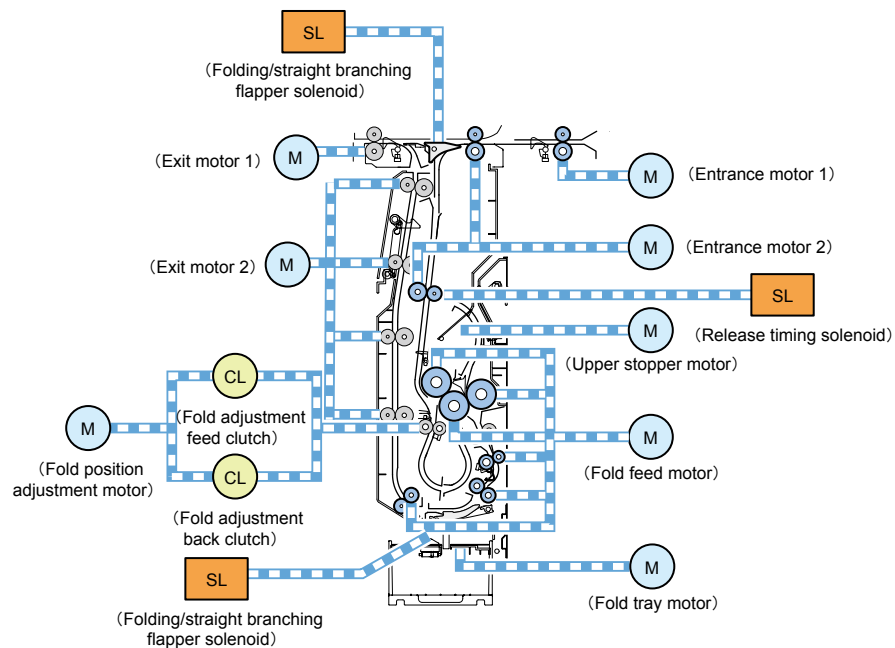
It describes only all optical sensors on the feed path.



F-2-5

- | | |
|-----|----------------------------|
| S20 | Entrance sensor |
| S21 | Delivery sensor 2 |
| S22 | Delivery sensor 1 |
| S27 | Fold tray paper sensor |
| S30 | Slowdown timing sensor |
| S31 | Release timing sensor |
| S32 | Fold position sensor |
| S33 | Upper stopper paper sensor |

Drive Configuration



F-2-6

Basic Operation Outline

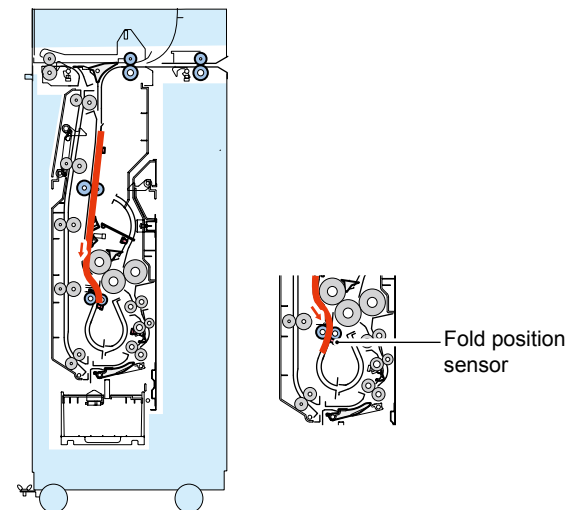
Z-fold operation

The Z-fold operation is carried out in the following order of steps:

- (1)Registration correction
- (2)Paper insertion
- (3)Folding
- (4)DeliveritionEjection

[Operation]

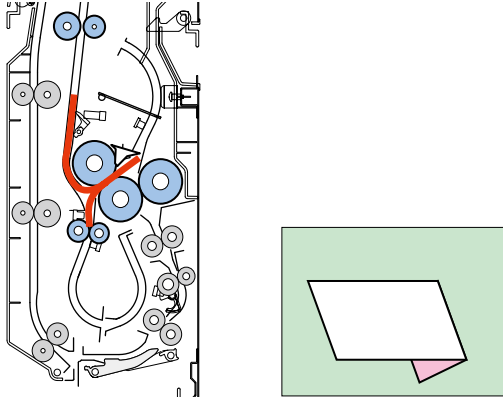
1. Registration correct
Stops the feeding of paper on the registration roller and forms a loop to correct the registration of the paper.
2. Paper insert operation
Inserts the paper until a specified length of time expires after it has passed the foldingposition accuracy sensor on leaving the registration roller.



F-2-7

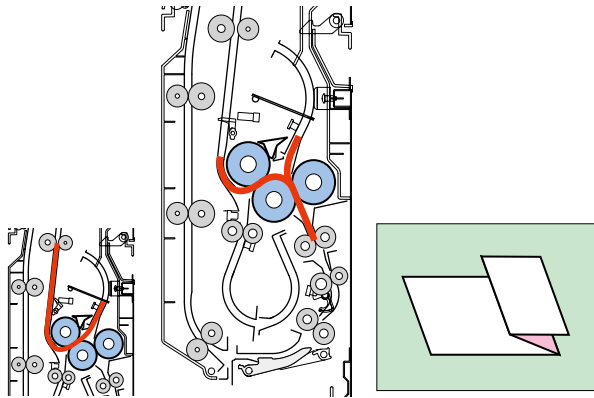
3. Folding operation

Gives the paper a first fold on folding rollers 1 and 2.



F-2-8

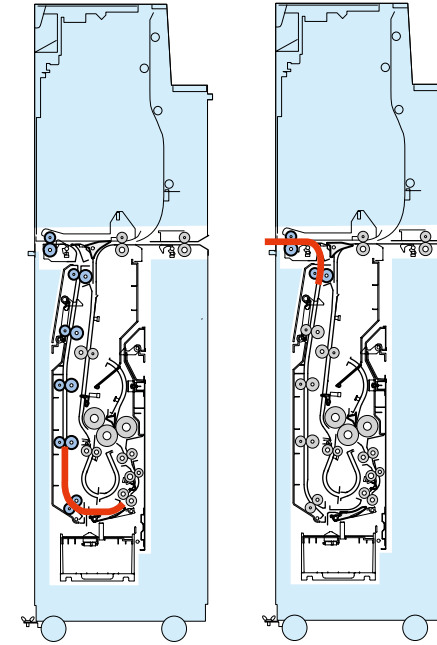
Gives the paper a second fold on folding rollers 2 and 3 as the paper hits the second fold stopper.



F-2-9

4. Delivery operation

Passes the paper on to the finisher through an delivery path.



F-2-10

Outer threefold operation

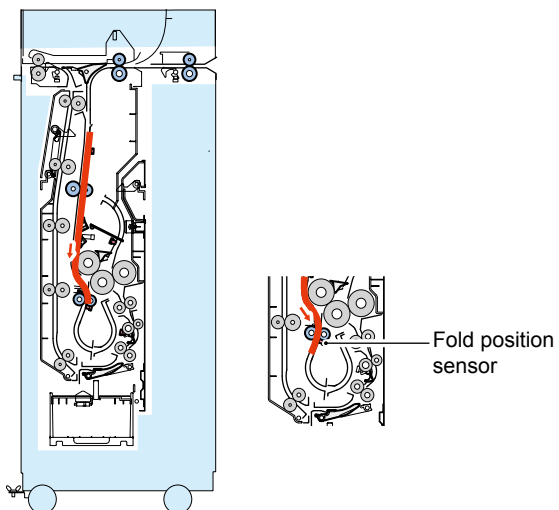
The outer threefold operation is carried out in the following order of steps:

- 1) Registration correction
- 2) Paper insertion
- 3) Folding
- 4) Delivery/Ejection

[Operation]

1. Registration correct operation
Similar to the Z-fold operation
2. Paper insert operation

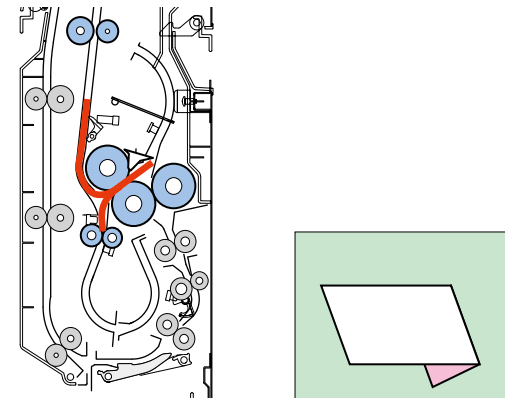
Inserts the paper until a specified length of time expires after it has passed the folding position accuracy detection sensor. (Allows the paper to be inserted for longer than in a Z-fold operation)



F-2-11

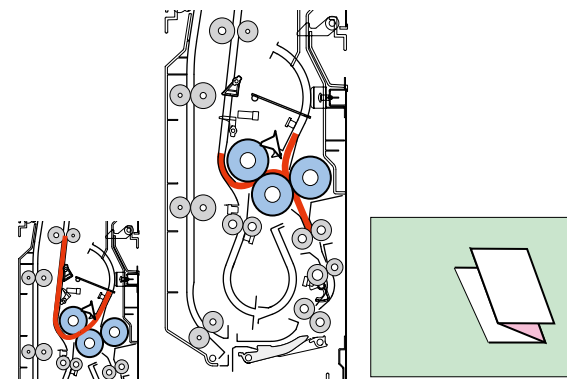
3. Folding operation

Gives the paper a first fold on folding rollers 1 and 2.



F-2-12

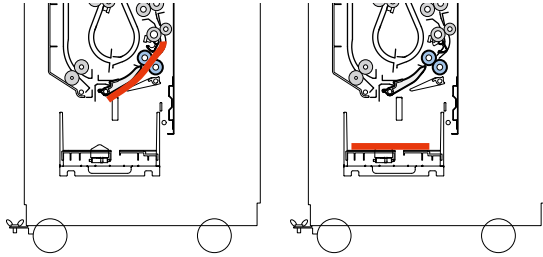
Gives the paper a second fold on folding rollers 2 and 3 as the paper hits the second fold stopper.



F-2-13

4. Delivery operation

Delivers the paper to the C-fold output tray.



F-2-14

C-fold operation

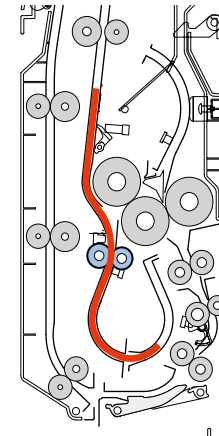
The C-fold operation is carried out in the following order of steps:

- 1) Registration correction
- 2) Paper insertion
- 3) Folding
- 4) DeliveritionEjection

[Operation]

1. Registration correct operation
Similar to the Z-fold operation
2. Paper insert operation

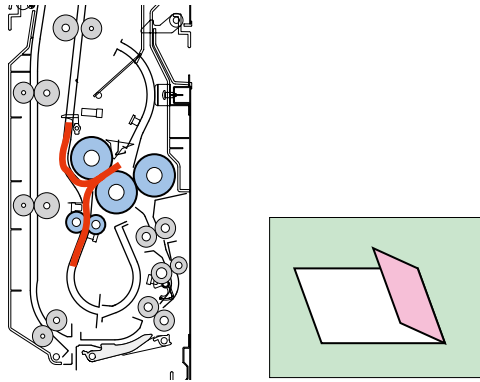
Inserts the paper until a specified length of time expires after it has passed the folding position accuracy detection sensor on leaving the registration roller.



F-2-15

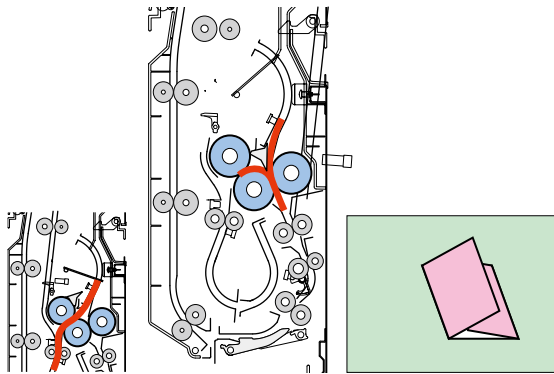
3. Folding operation

Gives the paper a first fold on folding rollers 1 and 2 as the paper hits the C-folding stopper.



F-2-16

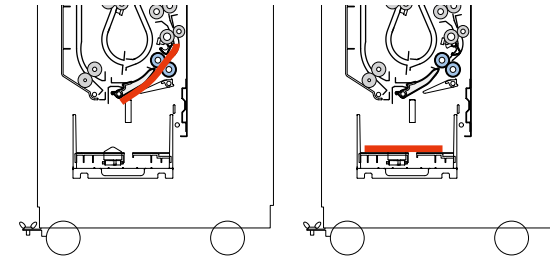
Gives the paper a second fold on folding rollers 2 and 3 as the paper hits the second fold stopper.



F-2-17

4. Delivery operation

Delivers the paper to the C-fold output tray.



F-2-18

Fourfold operation

The fourfold operation is carried out in the following order of steps:

- 1) Registration correction
- 2) Paper insertion
- 3) Folding
- 4) Delivery/Ejection

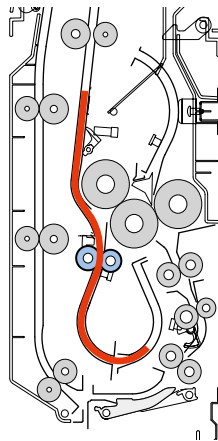
[Operation]

1. Registration correct operation

Similar to the Z-fold operation

2. Paper insert operation

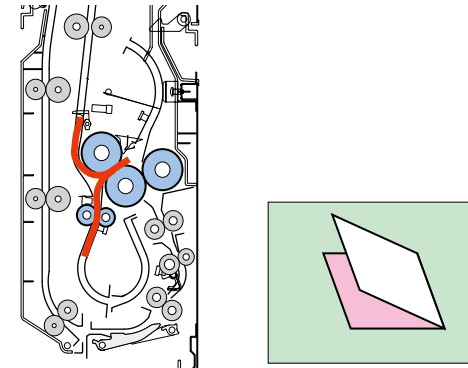
Inserts the paper until a specified length of time expires after it has passed the folding position accuracy detection sensor on leaving the registration roller.



F-2-19

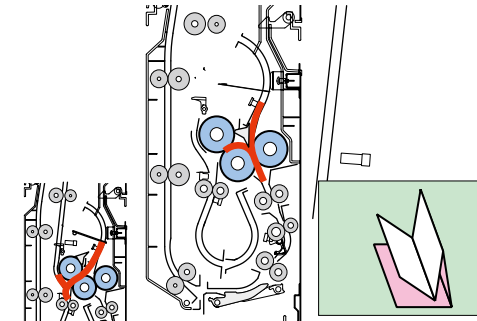
3. Folding operation

Gives the paper a first fold on folding rollers 1 and 2 as the paper hits the C-folding stopper.



F-2-20

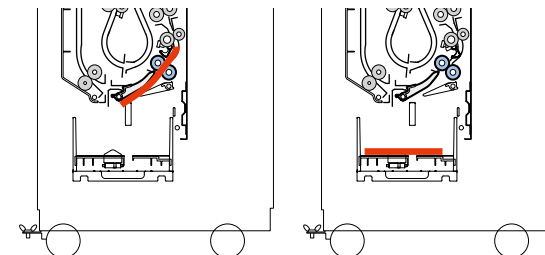
Gives the paper a second fold on folding rollers 2 and 3 with the leading edge retaining guides forcing the fold into the paper as the paper hits the second fold stopper.



F-2-21

4. Delivery operation

Delivers the paper to the C-fold output tray.



F-2-22

Twofold operation

The twofold operation is carried out in the following order of steps:

- 1) Registration correction
- 2) Paper insertion
- 3) Folding
- 4) Delivery/Ejection

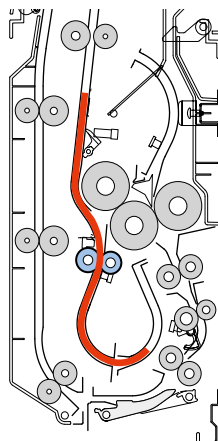
[Operation]

1. Registration

Similar to the Z-fold operation.

2. Paper insertion operation

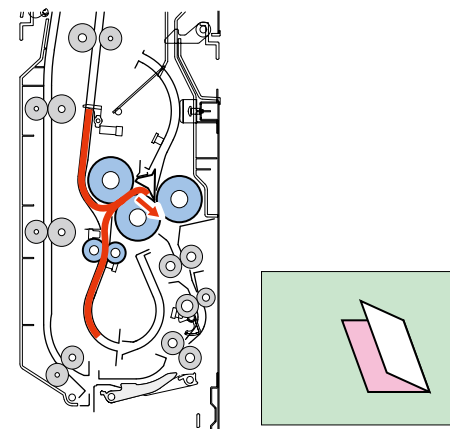
Inserts the paper until a specified length of time expires after it has passed the folding position accuracy detection sensor on leaving the registration roller. (The paper is inserted the same way as in a fourfold operation)



F-2-23

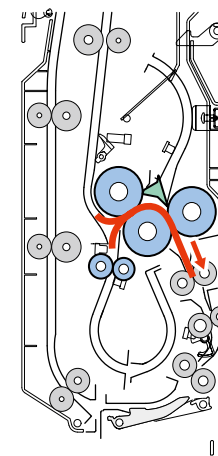
3. Folding operation

Gives the paper a first fold on folding rollers 1 and 2 as the paper hits the C-folding stopper.



F-2-24

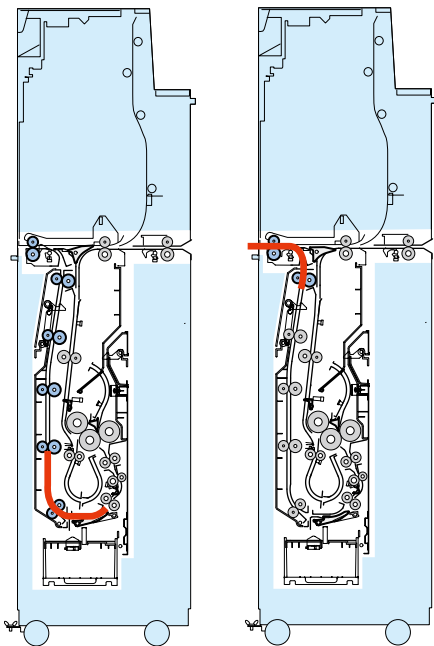
Paper is inserted to folding rollers 2 and 3 along the leading edge retaining guides moved beforehand.



F-2-25

4. Delivery operation

Passes the paper on to the finisher through an delivery path.

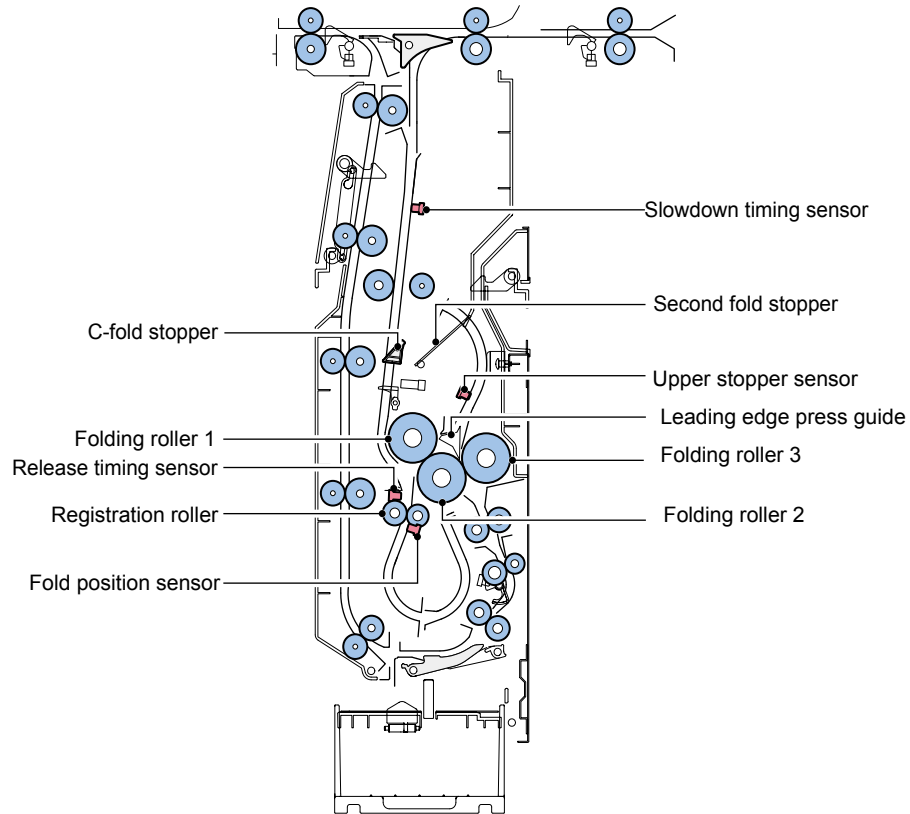


F-2-26

Controls

Outline of operations

Key parts involved in fold operations



[Registration roller]

Stops the feeding of paper on each fold operation to correct its registration.

[Folding roller1]

Gives the paper a first fold,in conjunction with folding roller 2,on each fold operation.

[Folding roller2]

Gives the paper a first fold,in conjunction with folding roller 1,on each fold operation and gives it a second fold in conjunction with folding roller3.

[Folding roller3]

Gives the paper a second fold,in conjunction with folding roller 2,on each fold operation.

[Second fold stopper]

Allows paper to feed to folding rollers 2 and 3 for a second fold as the folding side of the paper hits the stopper on each fold operation.

[C-fold stopper]

Allows paper to feed to folding rollers 1 and 2 for a first fold as the paper hits the stopper on each c-fold operation.

[Leading edge retaining guide]

The guide retains the first of the folds during a C-fold operation,forces a second fold into the paper during a fourfold operation and is moved beforehand to serve as a branch during a twofold operation.

[Spacing timing sensor]

Stops the feeding of paper on detecting the paper for registration correction.

[Upper stopper paper detection sensor]

Detects the presence of paper before it hits the second fold stopper.

[Folding position accuracy detection sensor]

Determines the length of paper insertion on detecting paper leaving the registration roller.

[Deceleration timing sensor]

Decelerates the feeding of paper on detecting the paper.

F-2-27

Fold Operation Sequence

1) Z-fold operation sequence

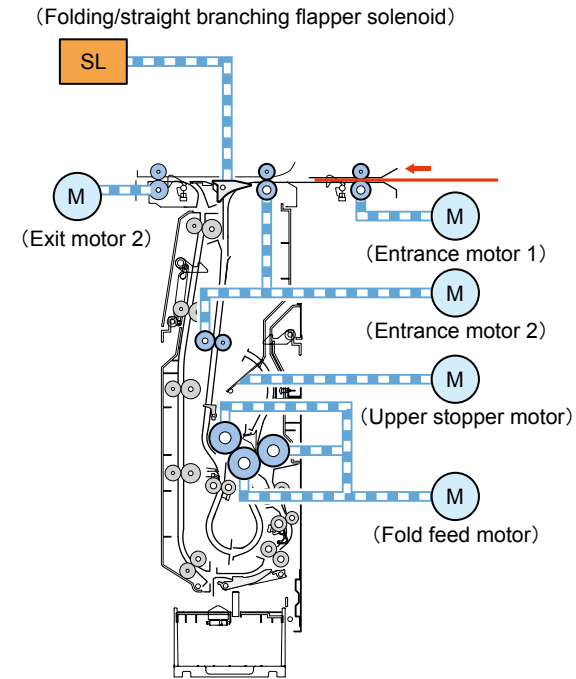
When a post handling specification signal "Z-fold Operation" is received during copying, Z-fold operation starts. The Z-fold operation procedure is as follows:

- 1) Registration correction
- 2) Paper pulling in
- 3) Folding
- 4) Delivery to fold tray

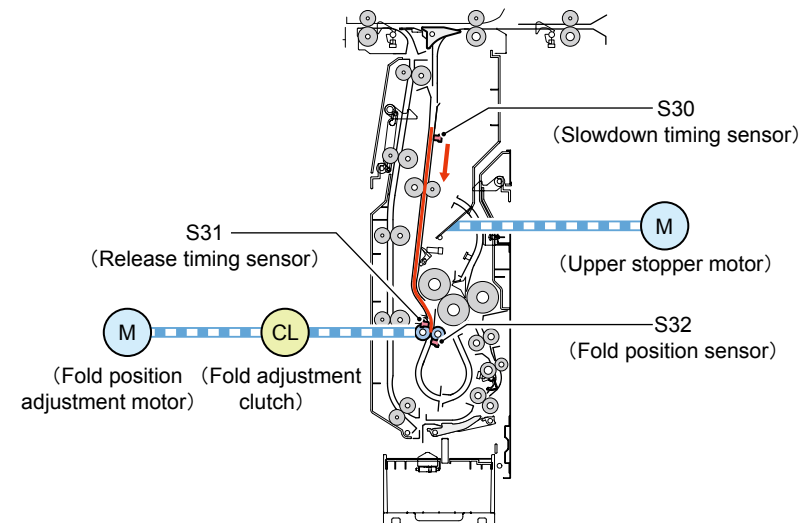
[Operation]

1. First paper registration correction

- The entrance motor 1, and entrance motor 2, and exit motor 2 turn at the linear speed of the host machine.
- The fold/straight branching flapper solenoid turns on.
- The fold feed motor turns at a speed of 400 mm/s.
- The upper stopper motor turns at a speed of 533 pps to move the stopper.
- When paper has been fed 233.0 mm since the slowdown timing sensor turned on, the entrance motor 1 and entrance motor 2 slow down to 650 mm/s. The clutch (CW) turns on.
- When paper has been fed 17.6 mm since the release timing sensor turned on, the entrance motor 1 and entrance motor 2 stop (registration loop size: 7 mm).



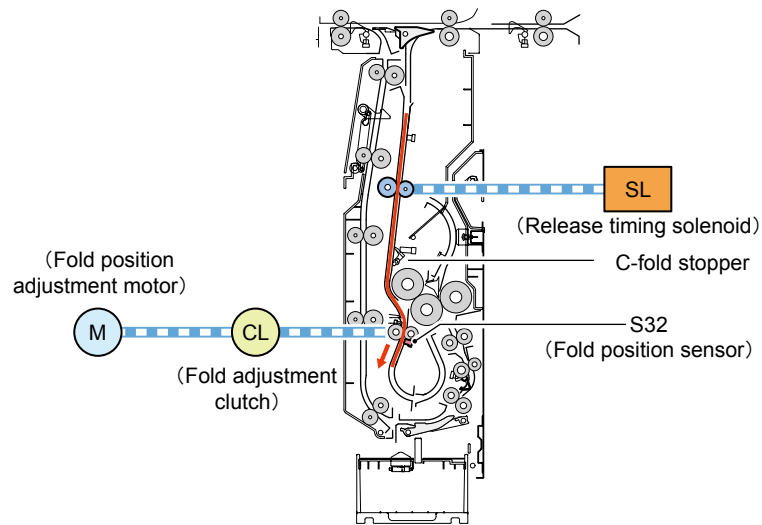
F-2-28



F-2-29

2. First paper pulling in

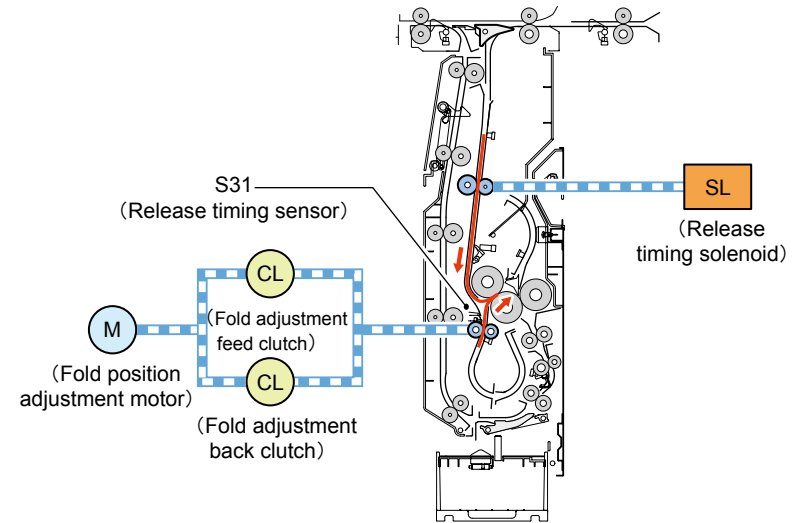
- The fold position adjustment motor turns in the reverse direction at a speed of 400 mm/s.
- The fold position accuracy sensor turns on to activate the release solenoid.
- When paper has been fed 15.4 mm since the fold position accuracy sensor turned on, the fold position adjustment motor stops.



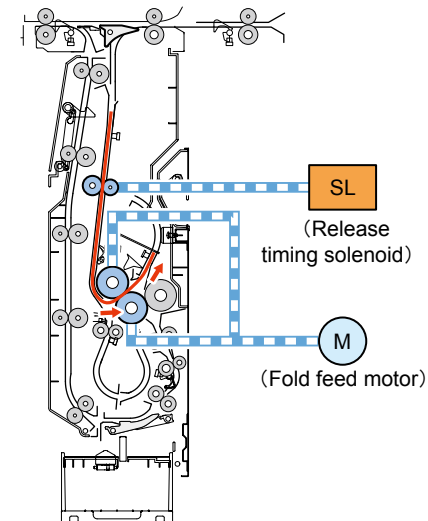
F-2-30

3. First paper fold operation

- The fold position adjustment clutch (CW) turns off and the fold position adjustment clutch (CCW) turns on.
- The release solenoid turns off 150 ms after the release solenoid turned on.
- The entrance motor 1 and entrance motor 2 start turning at a speed of 400 mm/s 150 ms after the release solenoid turned off.
- A loop is formed at the fold position adjustment roller, starting the first fold operation.
- The release timing sensor turns off to turn off the fold position adjustment clutch (CCW).
- The leading edge of the first fold stops against the upper stopper, starting the second fold operation.



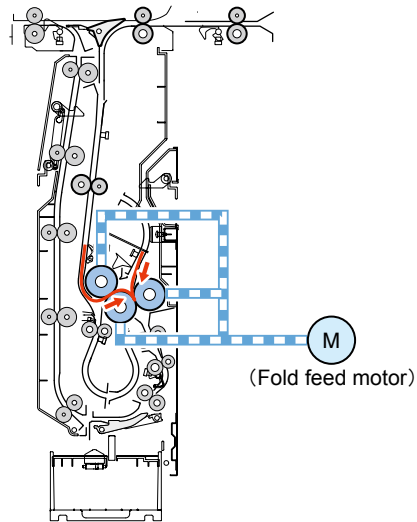
F-2-31



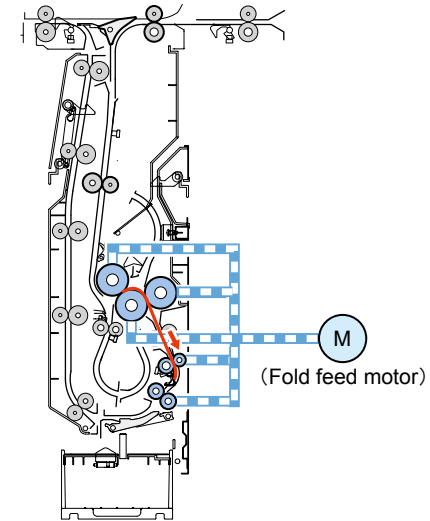
F-2-32

4. First paper delivery

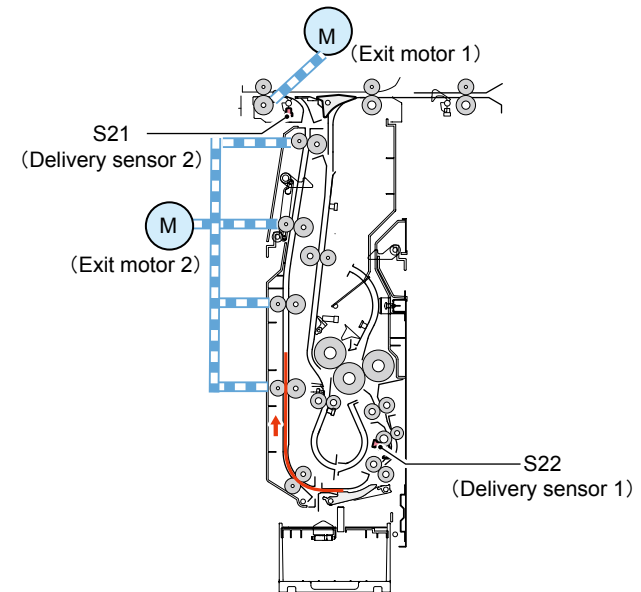
- The delivery sensor 1 turns on to turn the exit motor 1 at the folding speed (400 mm/s).
- When paper has been fed 150.8 mm (the trailing edge has passed through the brushless motor drive area) since the delivery sensor 2 turned on, the exit motor 1 and exit motor 2 slow down to the linear of the host machine.
- When paper has been fed 12.3 mm since the delivery sensor 2 turned on, a “Paper Delivery Start Request” signal is sent.
- The delivery 2 sensor turns off to change the speed of the exit motor 1 to 400 mm/s.



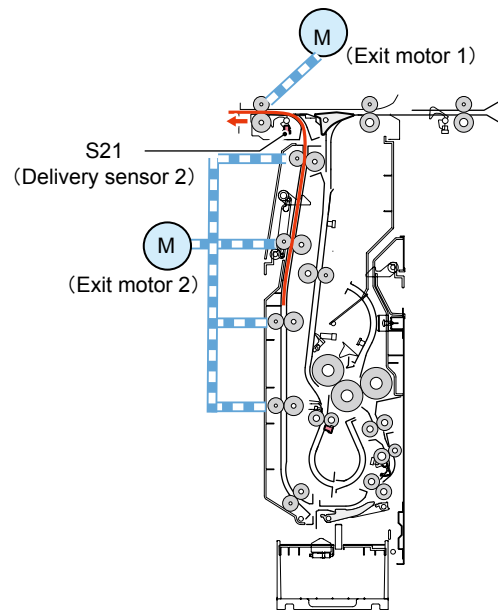
F-2-33



F-2-34



F-2-35



F-2-36

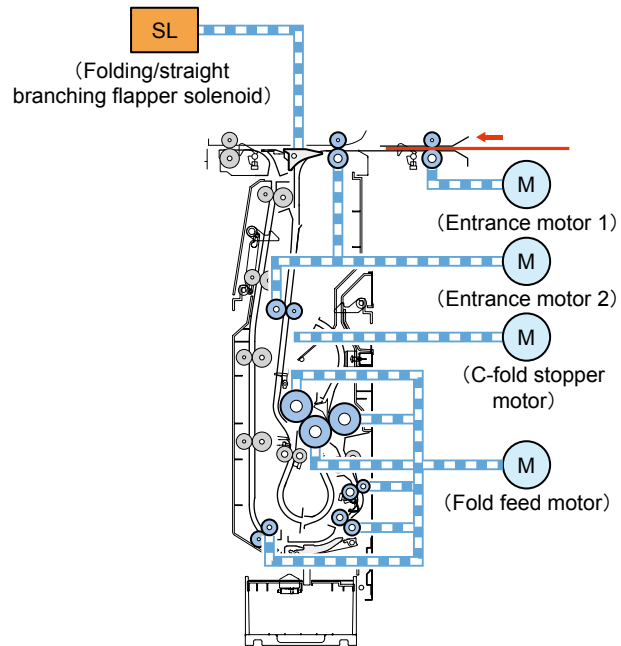
● 2) C-fold operation sequence

When a post handling specification signal “C-fold Operation” is received during copying, C-fold operation starts. The C-fold operation procedure is as follows:

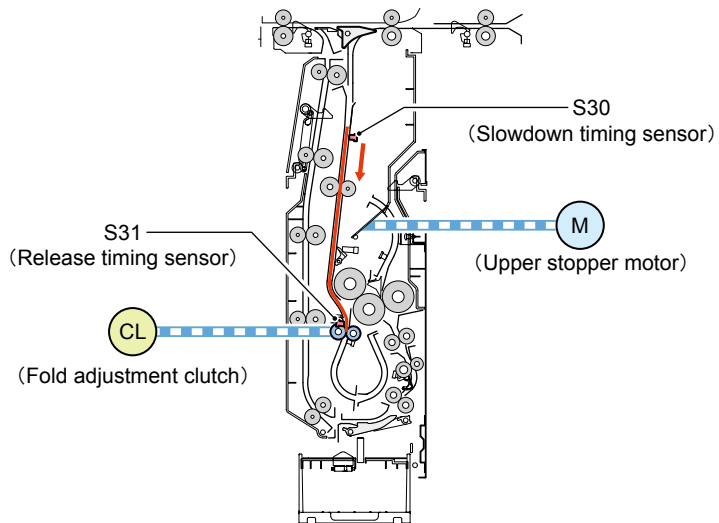
- 1) Registration correction
- 2) Paper pulling in
- 3) Folding
- 4) Delivery to fold tray

[Operation]

1. First paper registration correction
 - The entrance motor 1 and entrance motor 2 turn at the linear speed of the host machine.
 - The fold/straight branching flapper solenoid turns on.
 - The fold feed motor turns at a speed of 400 mm/s.
 - The upper stopper motor and C-fold stopper motor turn at a speed of 533 pps to move the stopper.
 - When paper has been fed 233.0 mm since the slowdown timing sensor turned on, the entrance motor 1 and entrance motor 2 slow down to 650 mm/s. The clutch (CW) turns on.
 - When paper has been fed 17.6 mm since the release timing sensor turned on, the entrance motor 1 and entrance motor 2 stop (registration loop size: 7 mm).



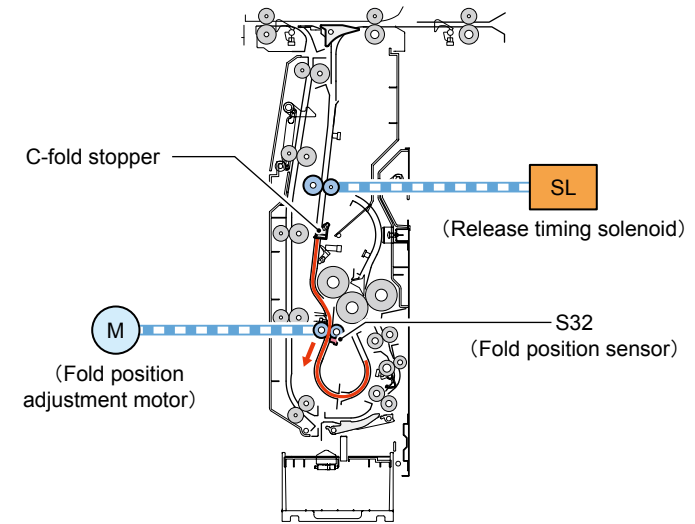
F-2-37



F-2-38

2. First paper pulling in

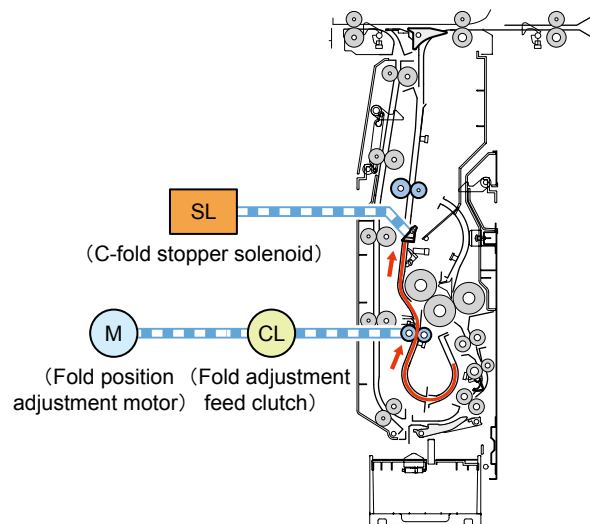
- The fold position adjustment motor turns in the reverse direction at a speed of 400 mm/s.
- The fold position accuracy sensor turns on to activate the release solenoid.
- When paper has been fed 10.0 mm since its trailing edge passed through the released rollers (and 150 ms have passed after the release solenoid turned on), the release solenoid turns off.
- When the paper has been fed 10.0 mm since its trailing edge passed by the inner threefold stopper, the fold position adjustment motor stops.



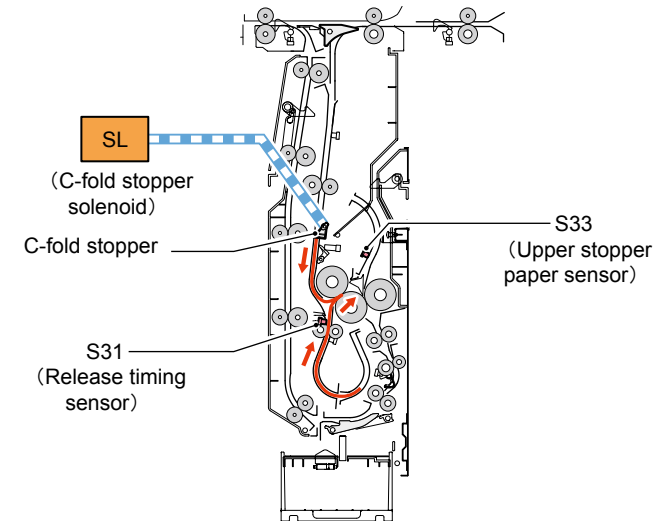
F-2-39

3. First paper fold operation

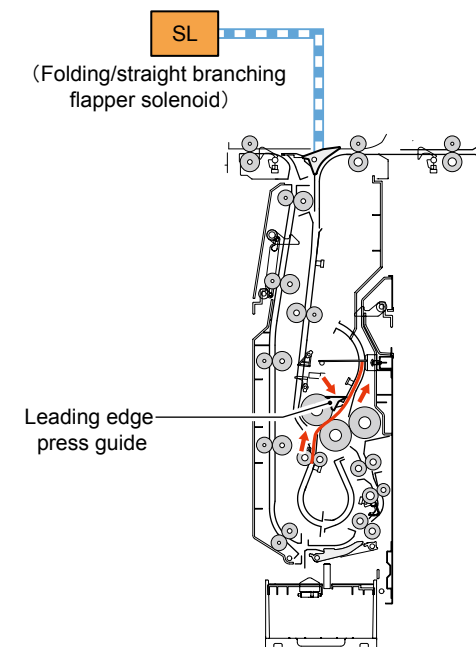
- The fold position adjustment clutch (CW) turns off, the fold position adjustment clutch (CCW) turns on, and the inner threefold stopper solenoid turns on.
- The fold position adjustment motor turns in the normal direction at a speed of 400 mm/s.
- The leading edge of the paper stops against the inner threefold stopper, starting the first fold operation.
- The release timing sensor turns off to stop the position adjustment motor and turns off the fold position adjustment clutch (CCW).
- The upper stopper paper sensor turns on and the inner three fold stopper solenoid turns off.
- The leading edge of the first fold stops against the upper stopper, starting the second fold operation.
- The leading edge press guide starts moving 133 ms after the upper stopper paper sensor turned on.
- The upper stopper paper sensor turns off to turn on the fold tray flapper solenoid.



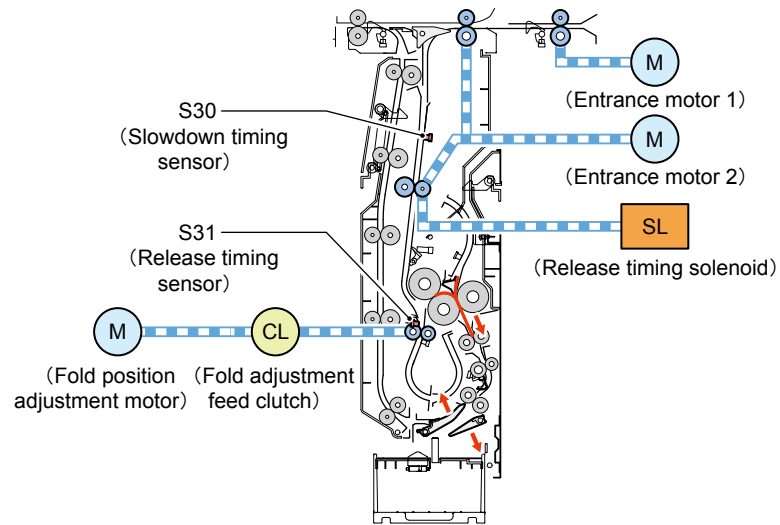
F-2-40



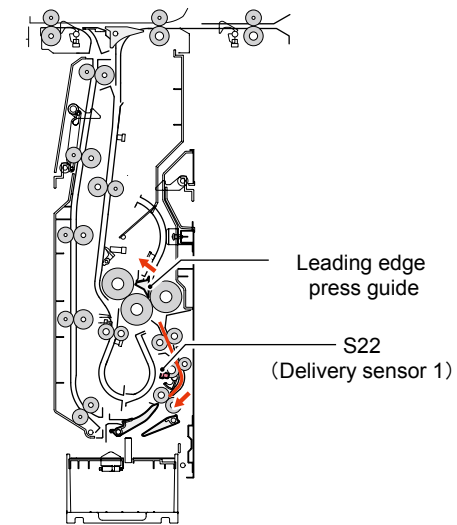
F-2-41



F-2-42



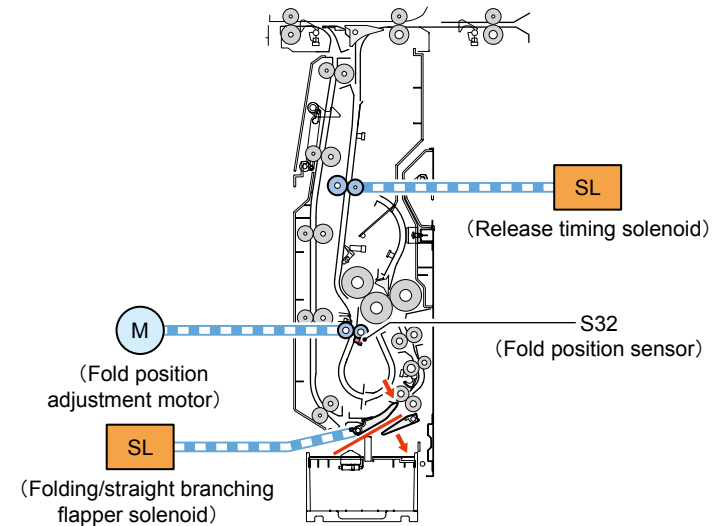
F-2-43



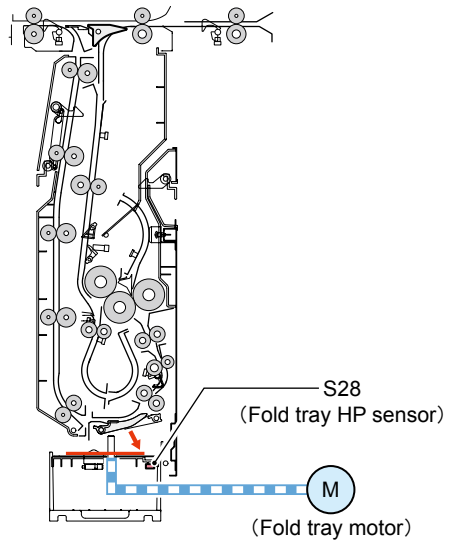
F-2-44

4. First paper delivery to C tray

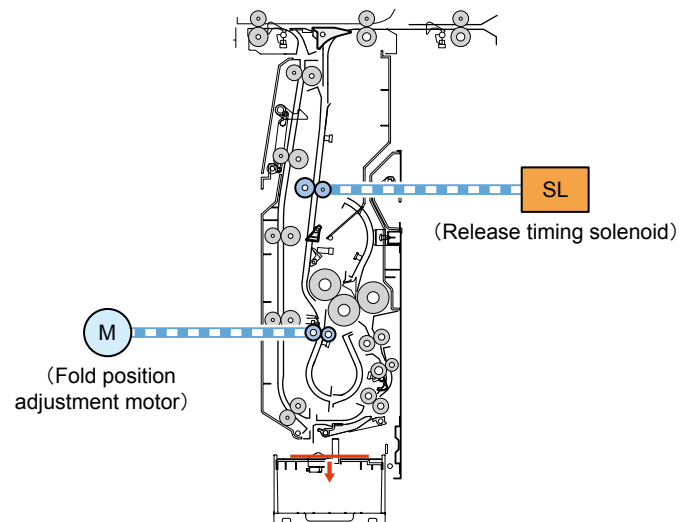
- The delivery sensor 1 turns on to move the leading edge guide to the standby position.
- The fold tray branching flapper solenoid turns off 100 ms after the delivery sensor 1.
- The fold tray delivery motor turns at a speed of 533 pps 100 ms after the fold tray branching flapper solenoid turned off.
- The fold tray HP sensor turns on to stop the fold tray delivery motor.
- A "Fold Tray Delivery Notification" signal is sent.



F-2-45



F-2-46



F-2-47

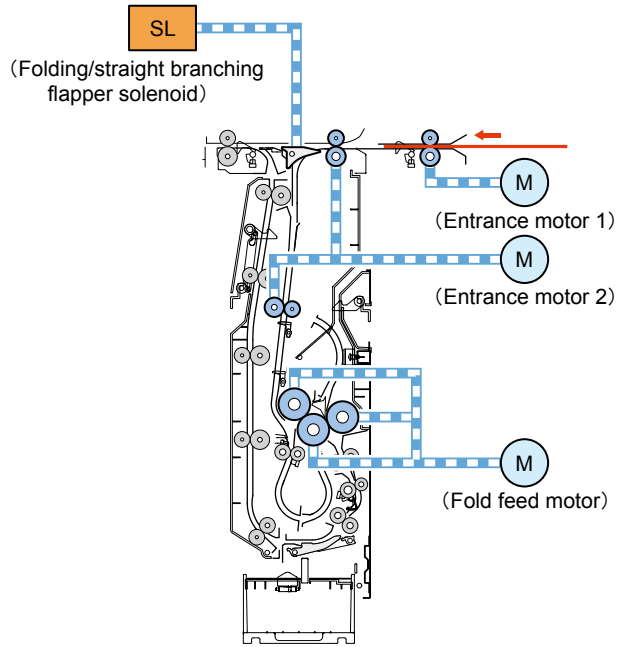
● 3) Outer threefold operation sequence

When a post handling specification signal "Z-fold Operation" is received during copying, outer threefold operation starts. The outer threefold operation procedure is as follows:

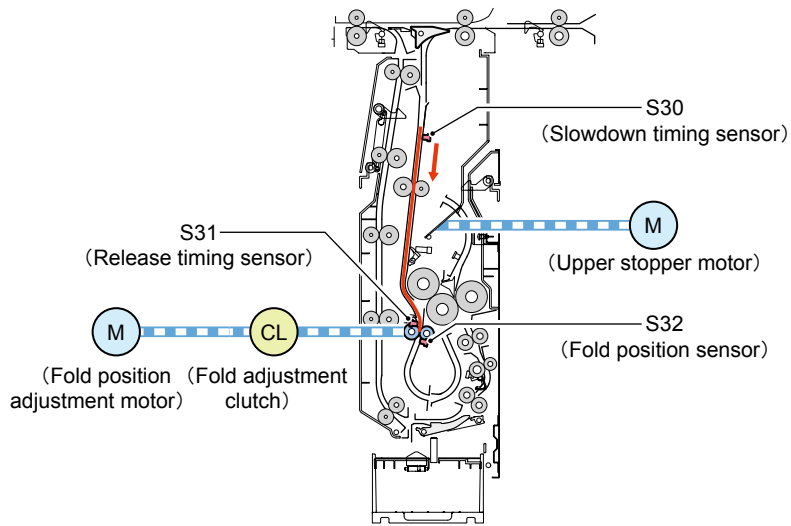
- 1) Registration correction
- 2) Paper pulling in
- 3) Folding
- 4) Delivery to fold tray

1. First paper registration correction

- The entrance motor 1 and entrance motor 2 turn at the linear speed of the host machine.
- The fold/straight branching flapper solenoid turns on.
- The fold feed motor turns at a speed of 400 mm/s.
- The upper stopper motor turns at a speed of 533 pps to move the stopper.
- When paper has been fed 233.0 mm since the slowdown timing sensor turned on, the entrance motor 1 and entrance motor 2 slow down to 650 mm/s. The clutch (CW) turns on.
- When paper has been fed 17.6 mm since the release timing sensor turned on, the entrance motor 1 and entrance motor 2 stop (registration loop size: 7 mm.)



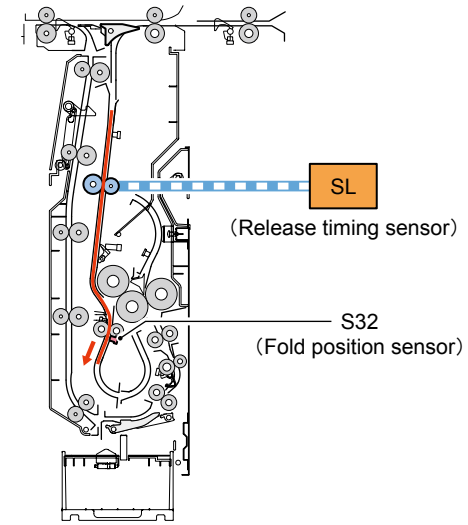
F-2-48



F-2-49

2. First paper pulling in

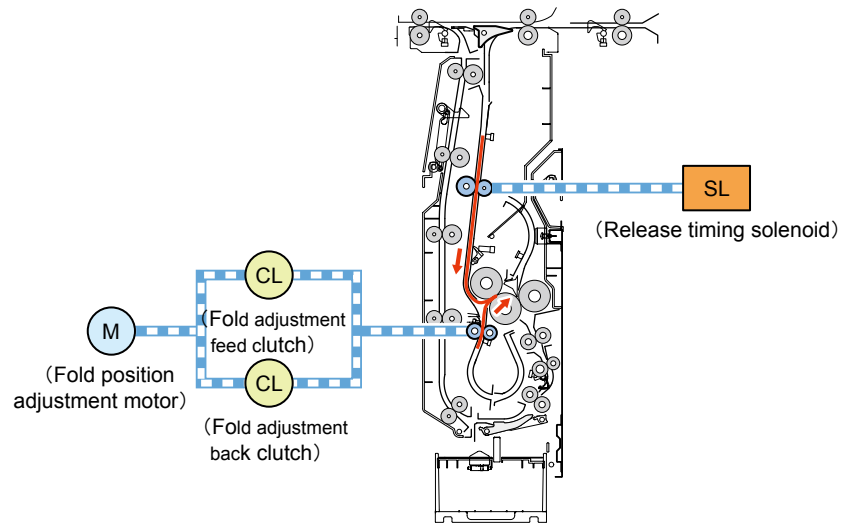
- The fold position adjustment motor turns in the reverse direction at a speed of 400 mm/s.
- The fold position accuracy sensor turns on to activate the release solenoid.
- When paper has been fed 40.5 mm since the fold position accuracy sensor turned on, the fold position adjustment motor stops.



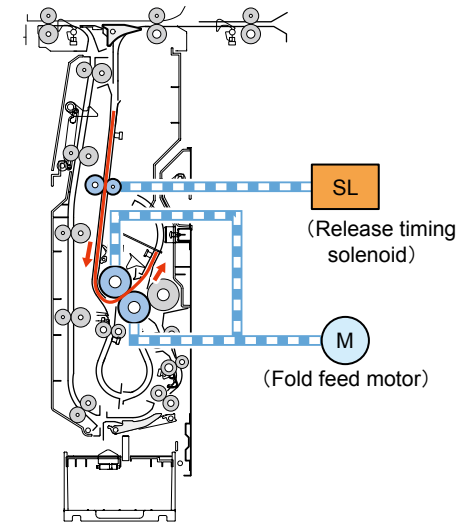
F-2-50

3. First paper fold operation

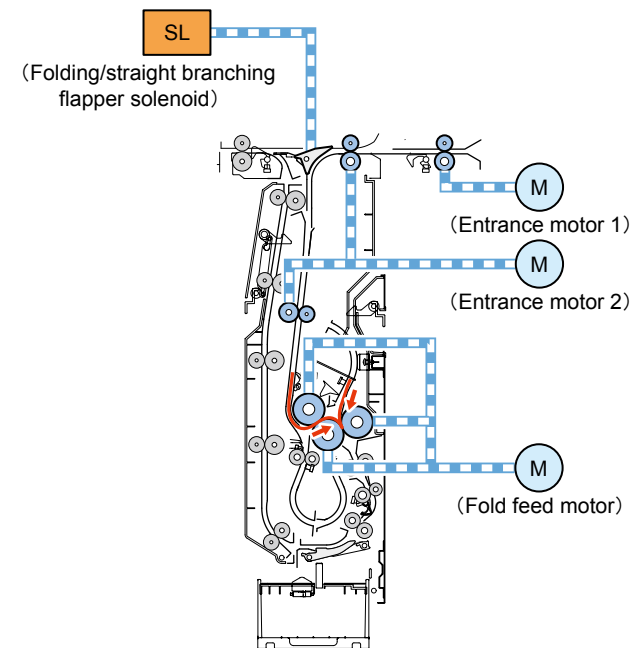
- The fold position adjustment clutch (CW) turns off and the fold position adjustment clutch (CCW) turns on.
- The release solenoid turns off 150 ms after it turned on.
- The entrance motor 1 and entrance motor 2 start turning at a speed of 400 mm 150 ms after the release solenoid turned off.
- A loop is formed at the fold position adjustment roller, starting the first fold operation.
- The release timing sensor turns off to deactivate the fold position adjustment clutch (CCW).
- The leading edge of the first fold stops against the stopper, starting the second fold operation.
- The upper stopper paper sensor turns off to activate the fold tray branching flapper solenoid.



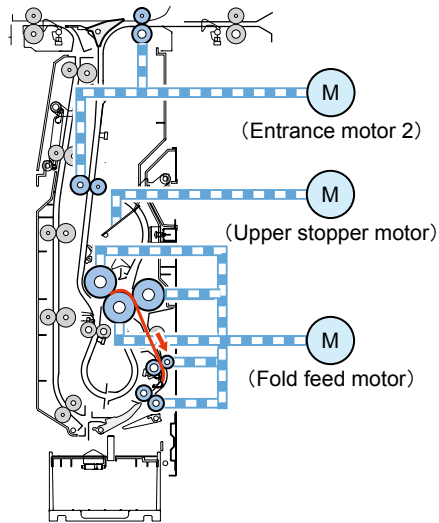
F-2-51



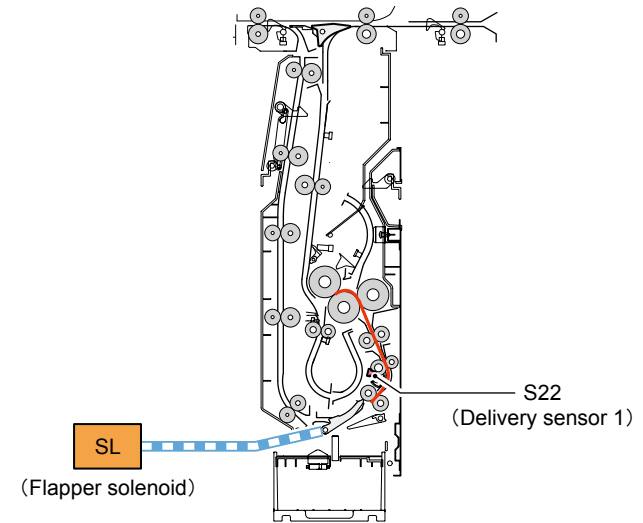
F-2-52



F-2-53



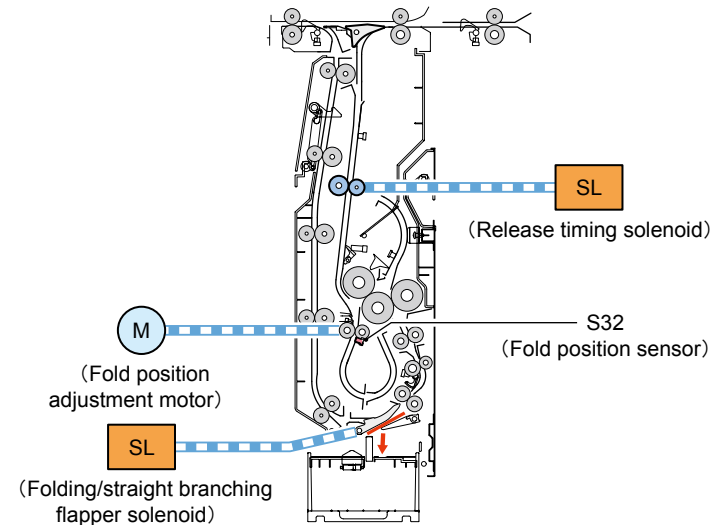
F-2-54



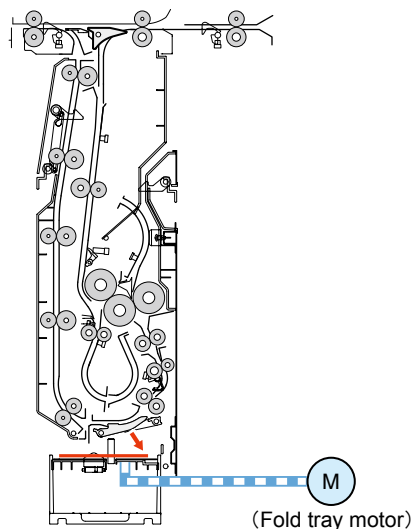
F-2-55

4. First paper delivery to small-size stack tray

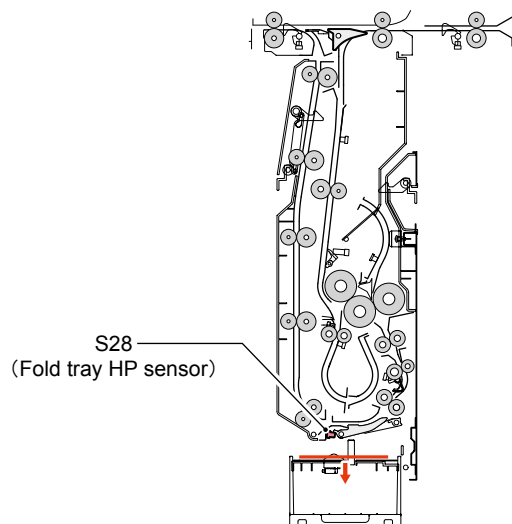
- The delivery sensor 1 turns on to move the leading edge guide to the standby position.
- The fold tray branching flapper solenoid turns off 100 ms after the delivery sensor 1 turned off.
- The fold tray delivery motor starts turning at a speed of 533 pps 100 ms after the fold tray branching flapper solenoid turned off.
- The fold tray HP sensor turns on to stop the fold tray delivery motor.
- A "Paper Tray Delivery Notification" signal is sent.



F-2-56



F-2-57



F-2-58

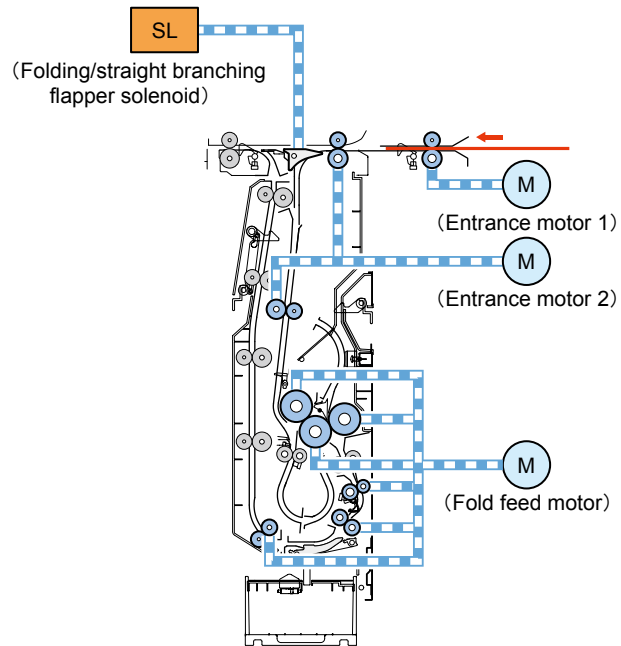
● 4) Fourfold operation sequence

When a post handling specification signal “fourfold Operation” is received during copying, fourfold operation starts. The fourfold operation procedure is as follows:

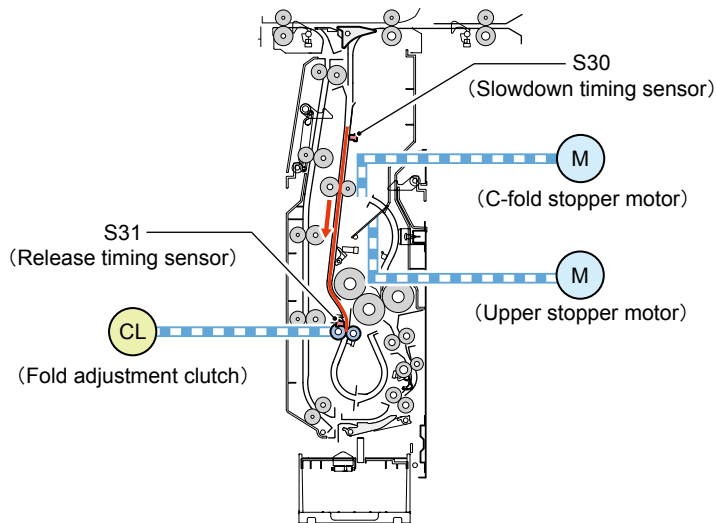
- 1) Registration correction
- 2) Paper pulling in
- 3) Folding
- 4) Delivery

[Operation]

1. First paper registration correction
 - The entrance motor 1 and entrance motor 2 turn at the linear speed of the host machine.
 - The fold/straight branching flapper solenoid turns on.
 - The fold feed motor turns at a speed of 400 mm/s.
 - The upper stopper motor and inner threefold stopper motor turns at a speed of 533 pps to move the stopper.
 - When paper has been fed 233.0 mm since the slowdown timing sensor turned on, the entrance motor 1 and entrance motor 2 slow down to 650 mm/s. The clutch (CW) turns on.
 - For plain paper, the entrance motor 1 and entrance motor 2 stop (registration loop size: 7 mm) when the paper has been fed 17.6 mm since the release timing sensor turned on. For thin paper, the entrance motor 1 and entrance motor 2 stop (registration loop size: 8.5 mm) when the paper has been fed 19.1 mm since the release timing sensor turned on.



F-2-59



F-2-60

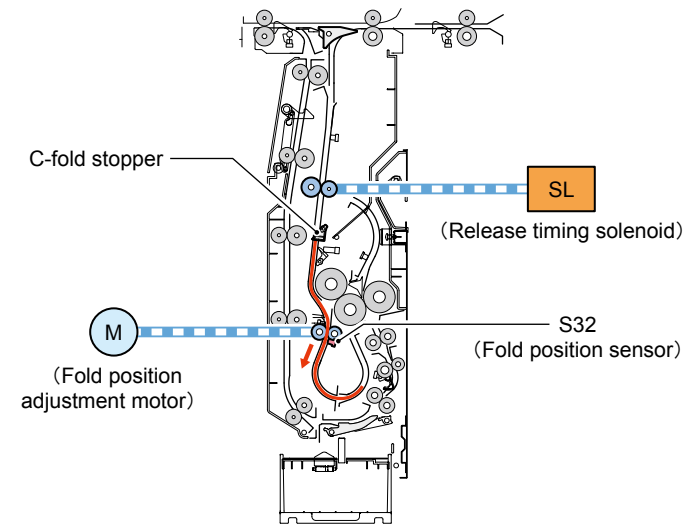
2. First paper pulling in

* For thin paper, the machine performs the following steps in advance:

- Turns the fold position adjustment motor in the reverse direction at a speed 50 mm/s, and stops the fold position adjustment motor after feeding paper by 5.0 mm.
- Turns on the release solenoid, and waits for 300 ms.

* The succeeding steps are the same for both plain paper and thin paper.

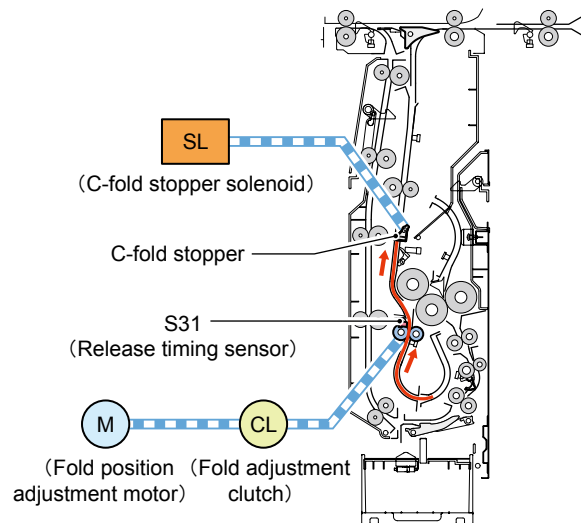
- The fold position adjustment motor turns at a speed of 400 mm/s.
- The fold position accuracy sensor turns on to activate the release solenoid.
- When paper has been fed 10.0 mm since its trailing edge passed through the released rollers (and 150 ms have passed after the release solenoid turned on), the release solenoid turns off.
- When the paper has been fed 10.0 mm since its trailing edge passed by the inner threefold stopper, the fold position adjustment motor stops.



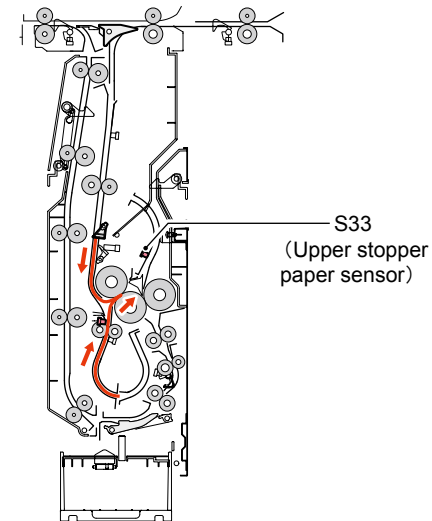
F-2-61

3. First paper fold operation

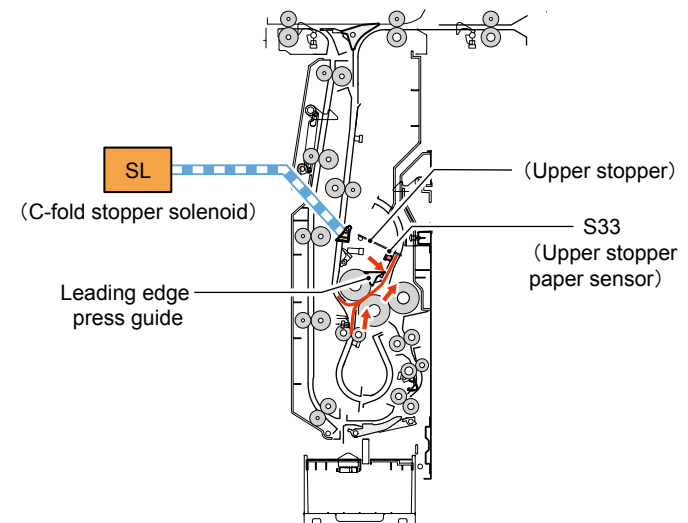
- The fold position adjustment clutch (CW) turns off, the fold position adjustment clutch (CCW) turns on, and the inner threefold stopper solenoid turns on.
- For plain paper, the fold position adjustment motor turns in the normal direction at a speed of 400 ms. For thin paper, the fold position adjustment motor turns in the normal direction at a speed of 200 mm/s.
- The leading edge of the paper stops at the inner threefold stopper, starting the first fold operation.
- The release timing sensor turns off to stop the fold position adjustment motor and turn off the fold position adjustment clutch (CCW).
- The upper stopper paper sensor turns on to turn off the inner threefold stopper solenoid.
- The leading edge of the first fold stops against the upper stopper, starting the second fold operation.
- The leading edge press guide starts moving 71 ms after the upper stopper paper sensor turned on.
- The upper stopper paper sensor turns off to turn on the fold tray branching flapper solenoid.



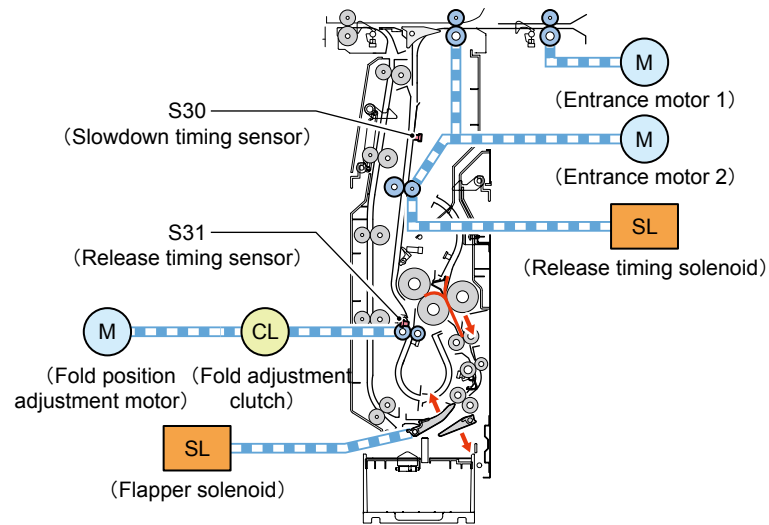
F-2-62



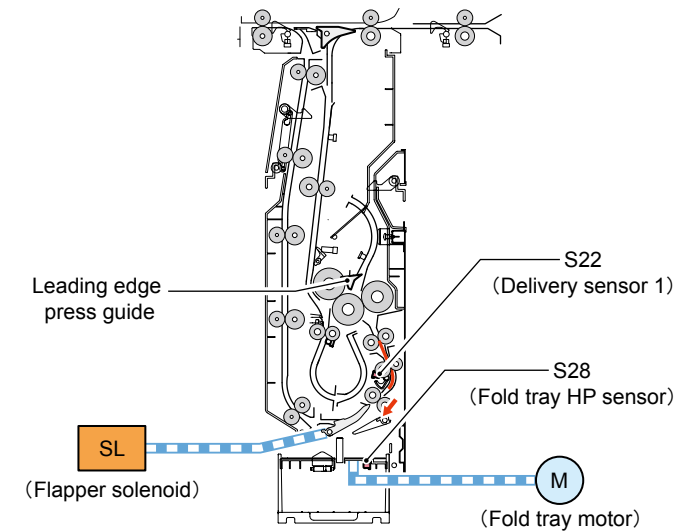
F-2-63



F-2-64



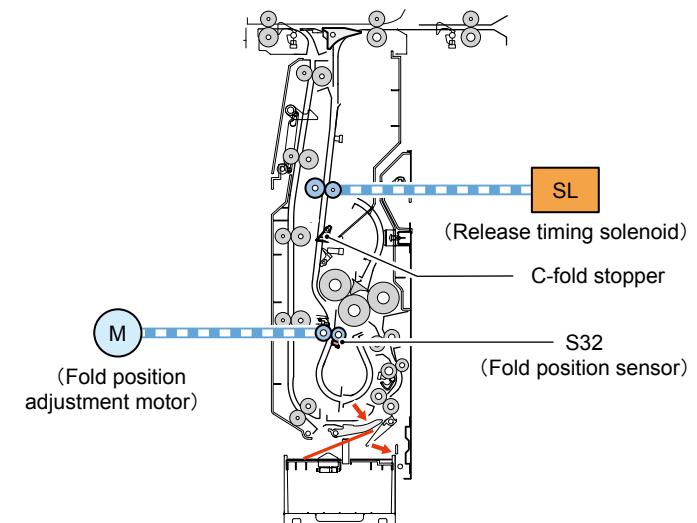
F-2-65



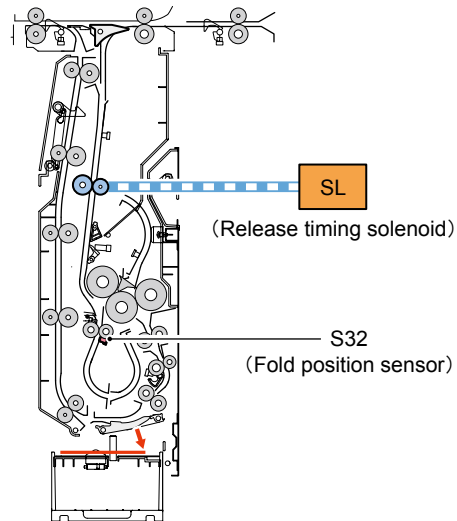
F-2-66

4. First paper delivery to small-size stack tray

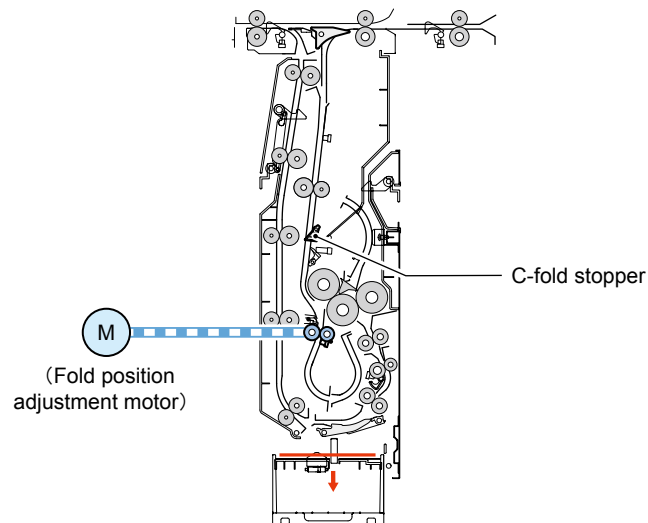
- The delivery sensor 1 turns on to move the leading edge guide to the standby position.
- The fold tray branching flapper solenoid turns off 100 ms after the delivery sensor 1 turned off.
- The fold tray delivery motor starts turning at a speed of 724 pps 100 ms after the fold tray branching flapper solenoid turned off.
- When the paper has been fed 366 pls (91.5 mm), the motor stops.
- 100 ms later, the motor starts at a speed of 300 pps.
- The fold tray HP sensor turns on to stop the fold tray delivery motor.
- A "Paper Tray Delivery Notification" signal is sent.



F-2-67



F-2-68



F-2-69

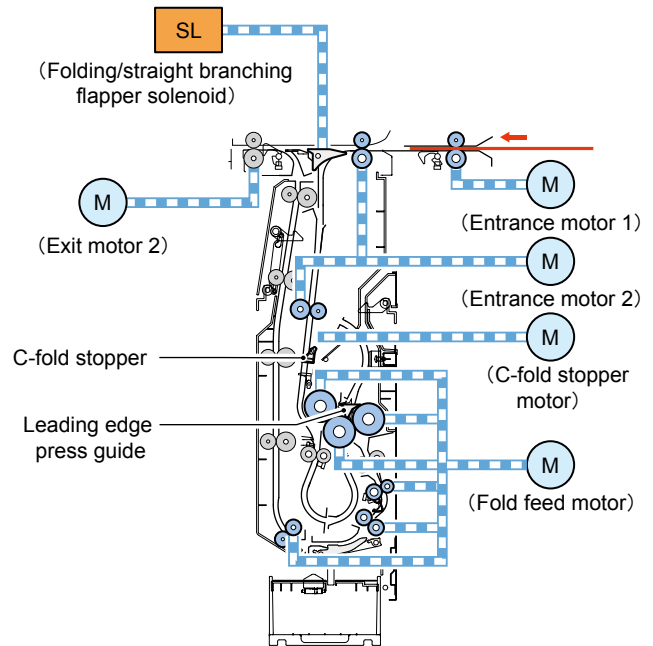
5) Twofold operation sequence

When a post handling specification signal “Twofold Operation” is received during copying, twofold operation starts. The twofold operation procedure is as follows:

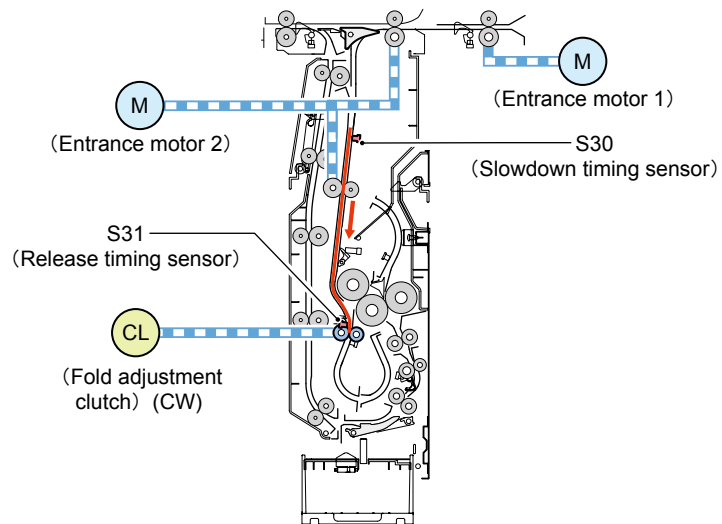
- 1) Registration correction
- 2) Paper pulling in
- 3) Folding
- 4) Delivery

1. First paper registration correction (Fig. Twofold 1-2)

- The entrance motor 1, entrance motor 2, and exit motor 2 turn at the linear speed of the host machine.
- The fold/straight branching flapper solenoid turns on.
- The fold feed motor turns at a speed of 400 mm/s.
- The inner threefold stopper motor turns at a speed of 533 pps and the leasing edge press guide motor turns at a speed of 67 pps to move the stopper.
- When paper has been fed 233.0 mm since the slowdown timing sensor turned on, the entrance motor 1 and entrance motor 2 slow down to 650 mm/s. The clutch (CW) turns on.
- For plain paper, the entrance motor 1 and entrance motor 2 stop (registration loop size: 7 mm) when the paper has been fed 17.6 mm since the release timing sensor turned on. For thin paper, the entrance motor 1 and entrance motor 2 stop (registration loop size: 8.5 mm) when the paper has been fed 19.1 mm since the release timing sensor turned on



F-2-70



F-2-71

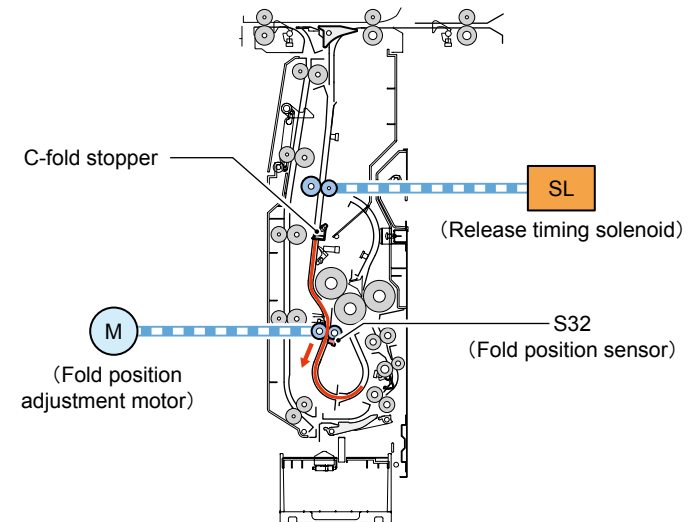
2. First paper pulling in

* For thin paper, the machine performs the following steps in advance:

- Turns the fold position adjustment motor in the reverse direction at a speed 50 mm/s, and stops the fold position adjustment motor after feeding paper by 5.0 mm.
- Turns on the release solenoid, and waits for 300 ms.

* The succeeding steps are the same for both plain paper and thin paper.

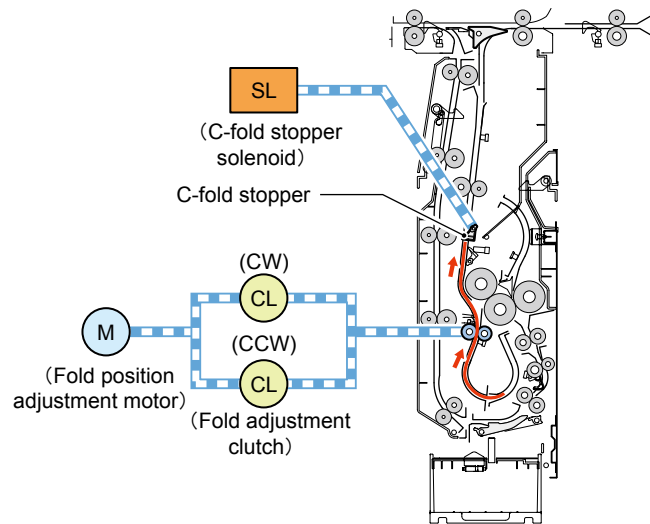
- The fold position adjustment motor turns at a speed of 400 mm/s.
- The fold position accuracy sensor turns on to activate the release solenoid.
- When paper has been fed 10.0 mm since its trailing edge passed through the released rollers (and 150 ms have passed after the release solenoid turned on), the release solenoid turns off.
- When the paper has been fed 10.0 mm since its trailing edge passed by the inner threefold stopper, the fold position adjustment motor stops.



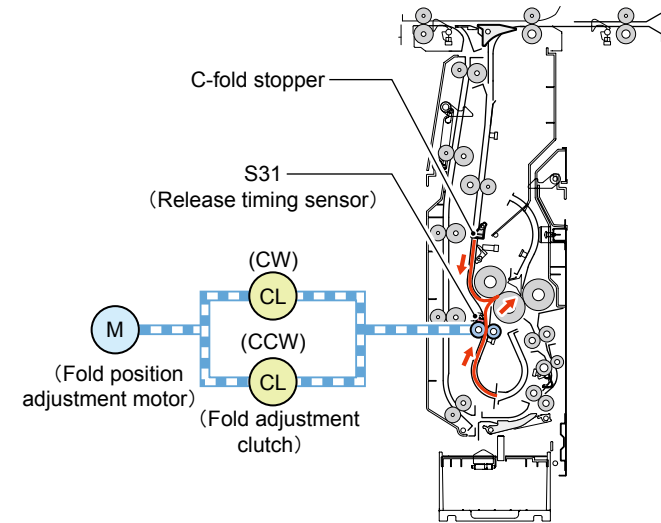
F-2-72

3. First paper fold operation

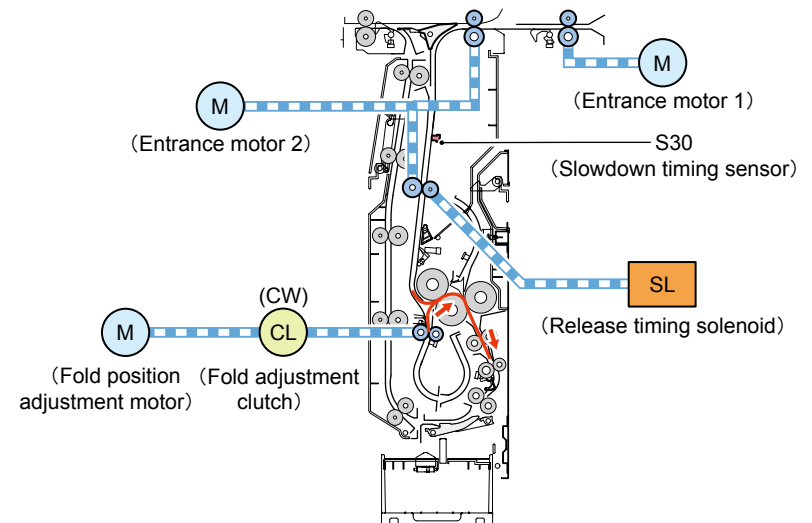
- The fold position adjustment clutch (CW) turns off, the fold position adjustment clutch (CCW) turns on, and the inner threefold stopper solenoid turns on.
- For plain paper, the fold position adjustment motor turns in the normal direction at a speed of 400 ms. For thin paper, the fold position adjustment motor turns in the normal direction at a speed of 200 mm/s.
- The leading edge of the paper stops at the inner threefold stopper, starting the first fold operation.
- The release timing sensor turns off to stop the fold position adjustment motor and turn off the fold position adjustment clutch (CCW).



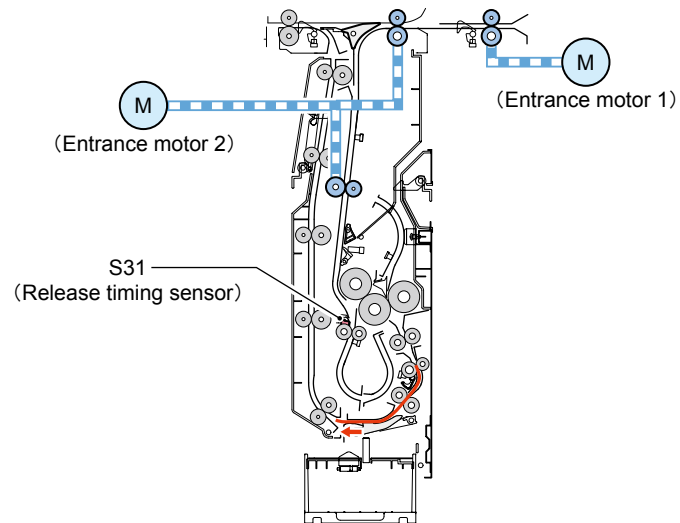
F-2-73



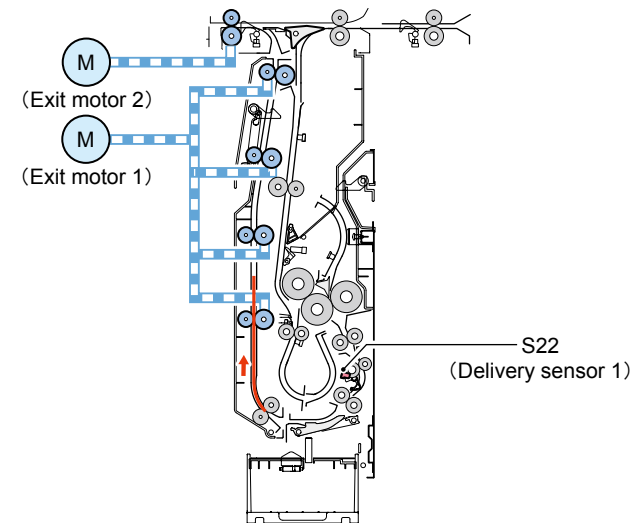
F-2-74



F-2-75



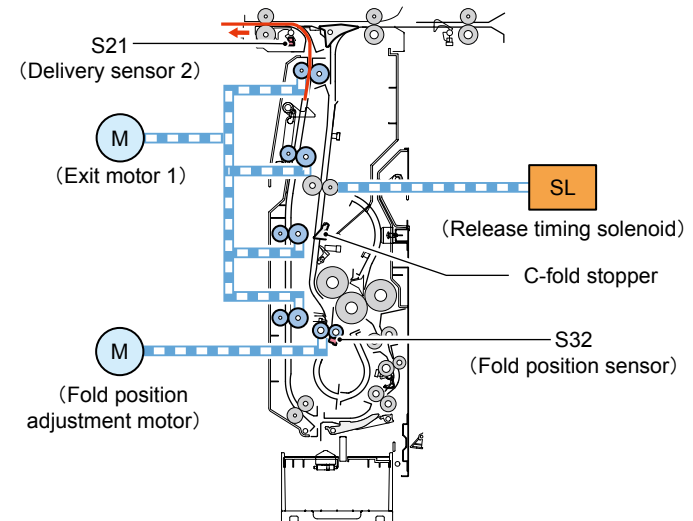
F-2-76



F-2-77

4. First paper delivery

- The delivery sensor 1 turns on to turn the exit motor 1 at the folding speed (400 mm/s).
- When paper has been fed 150.8 mm (the trailing edge has passed through the brushless motor drive area) since the delivery sensor 1 turned on, the exit motor 1 and exit motor 2 slow down to the linear speed of the host machine.
- When paper has been fed 12.3 mm since the delivery sensor 2 turned on, a "Paper Delivery Start Request" signal is sent.
- The delivery 2 sensor turns off to change the speed of the exit motor 1 to 400 mm/s.



F-2-78

Power Supply

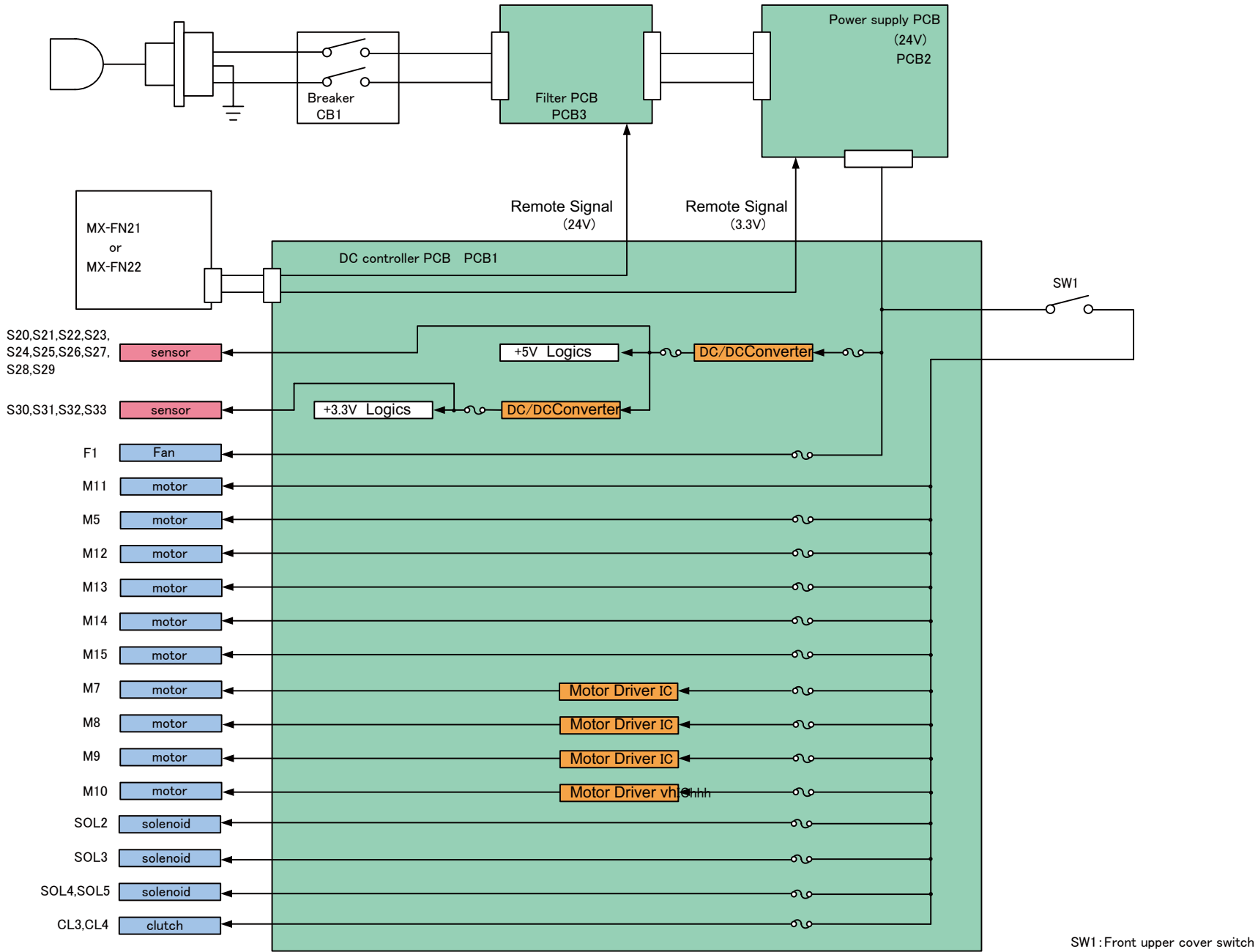
The Finisher AC power supplied to this machine passes through the filter PCB, and the filtered AC power is converted to 24 VDC. The 24 VDC is supplied to the DC control PCB from which it is supplied to the load-related parts (motors, solenoids, fans, and clutches) as it is or converted to 5 VDC or 3.3 VDC by the DC-DC to be supplied to logic-related parts (sensors)

Protection Function

The power supply PCB incorporates a primary-side, secondary-side overcurrent, and overvoltage protection circuits.

Each of load-related 24V lines has a fuse. If overcurrent or overvoltage occurs in a load (motor, etc.) due to a trouble such as a short circuit, the fuse blows to actuate the protection mechanism.

Each of logic-related 5V/3.3V lines also has a fuse to actuate the protection mechanism.



F-2-80

Work of service

Upgrading

Flash ROM is used for IC3 (CPU) on the master controller PCB. Rewrite this IC when upgrading.

There are two ways to upgrade.

-Upgrading from the host machine (using USB memory or service support tool)

3

Maintenance

- Maintenance list



Maintenance list

* When maintenance work is performed, this option must be separated from the main unit.

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

Part name	When calling	When machine maintenance	Cleaning method	Remarks
Through-feed inlet antistatic needle	×	×		
Through-feed outlet antistatic needle	×	×		
Folding front lower roller clutch 1	×	×		Replace at the reference of 1,000K.
Folding front lower roller clutch 2	×	×		Replace at the reference of 1,000K.
Folding/spacing solenoid	×	×		Replace at the reference of 1,000K.
Through/folding branching flapper solenoid	×	×		Replace at the reference of 2,000K.
C-fold stopper solenoid	×	×		
C-fold tray branching solenoid	×	×		
Reflection mirrors of Slowdown timing sensor	○	○	Clean with cloth immersed in water and squeezed tight.	
Reflection mirrors of Release timing sensor	○	○	Clean with cloth immersed in water and squeezed tight.	
Reflection mirrors of Upper stopper paper sensor	○	○	Clean with cloth immersed in water and squeezed tight.	
Reflection mirrors of Fold position sensor	○	○	Clean with cloth immersed in water and squeezed tight.	
Folding roller 1	×	×	Clean with alcohol.	Clean at the reference of 200K.
Folding roller 2	×	×	Clean with alcohol.	Clean at the reference of 200K.
Folding roller 3	×	×	Clean with alcohol.	Clean at the reference of 200K.
Transport rollers	○	○	Clean with alcohol.	
Transport paper guides	○	○	Clean with alcohol.	
Gears	×	×		
Belts	×	×		
Sensors	×	×		

4

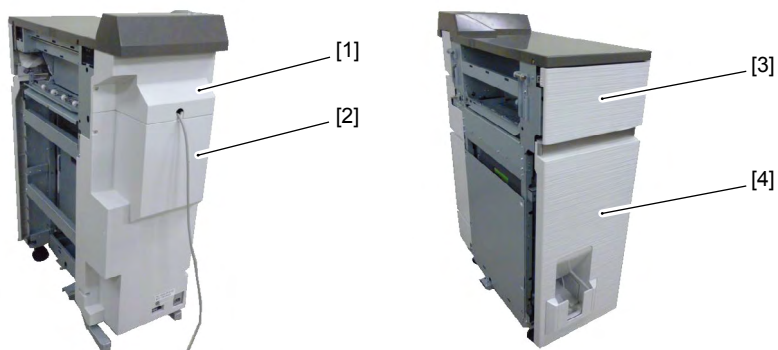
Disassembly and Assembly

- List of Parts
- External / Internal Covers
- Main units
- Consumable Parts Requiring Periodic Replacement and Cleaning Points
- Motors
- PCBs
- Feed Rollers



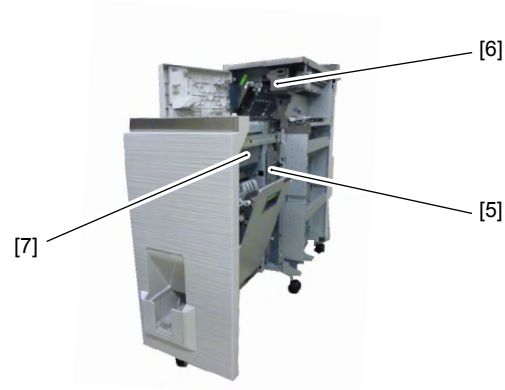
List of Parts

External / Internal Covers



F-4-1

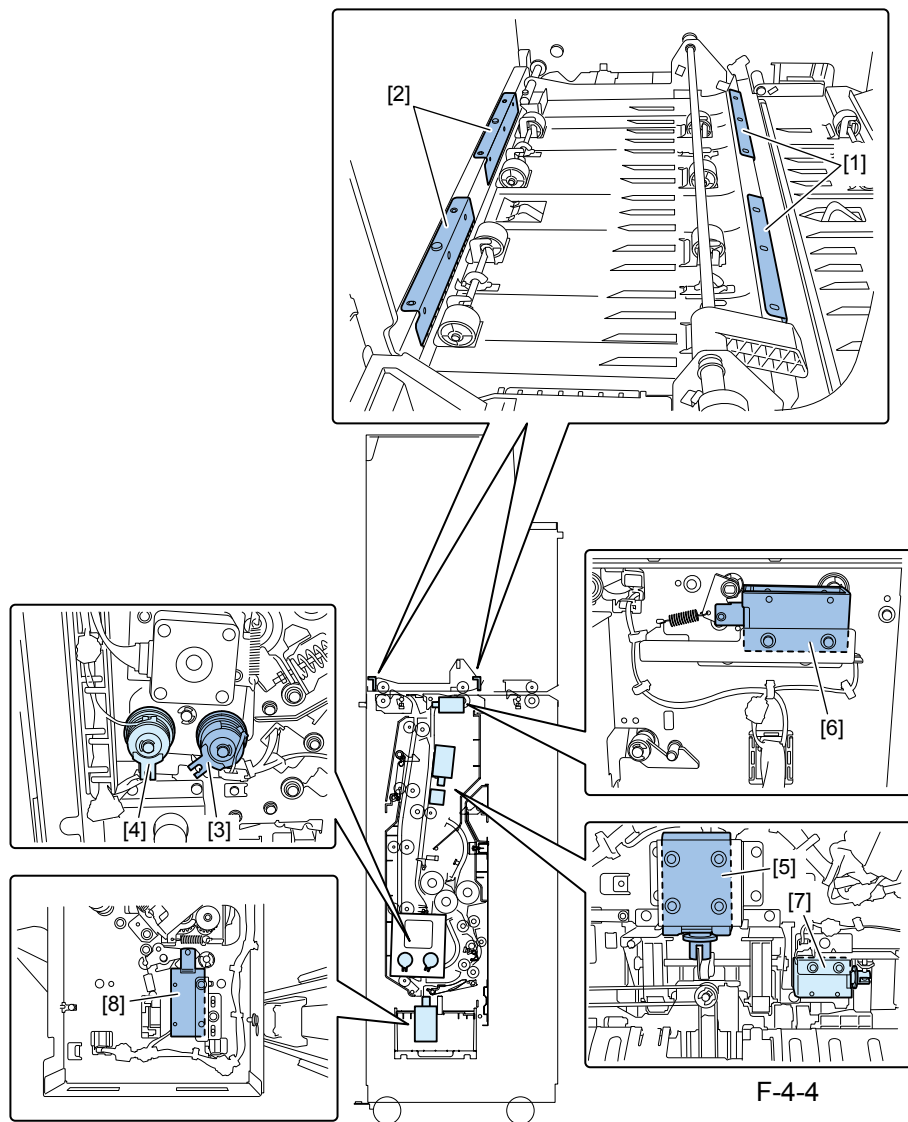
F-4-2



F-4-3

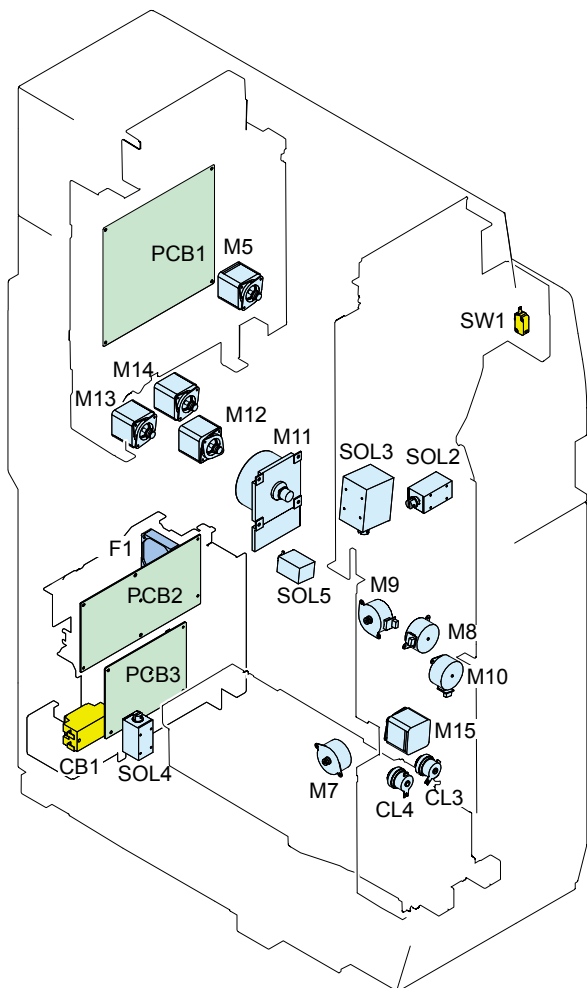
No	Name	Refer to
[1]	Rear Upper Cover	4-6
[2]	Rear Lower Cover	4-7
[3]	Front Upper Cover	4-7
[4]	Front Lower Cover	4-9
[5]	Rear Inner Cover	4-10
[6]	Front Inner Cover	4-11
[7]	Right Inner Cover	4-12

Consumable Parts Requiring Periodic Replacement and Cleaning Points



F-4-4

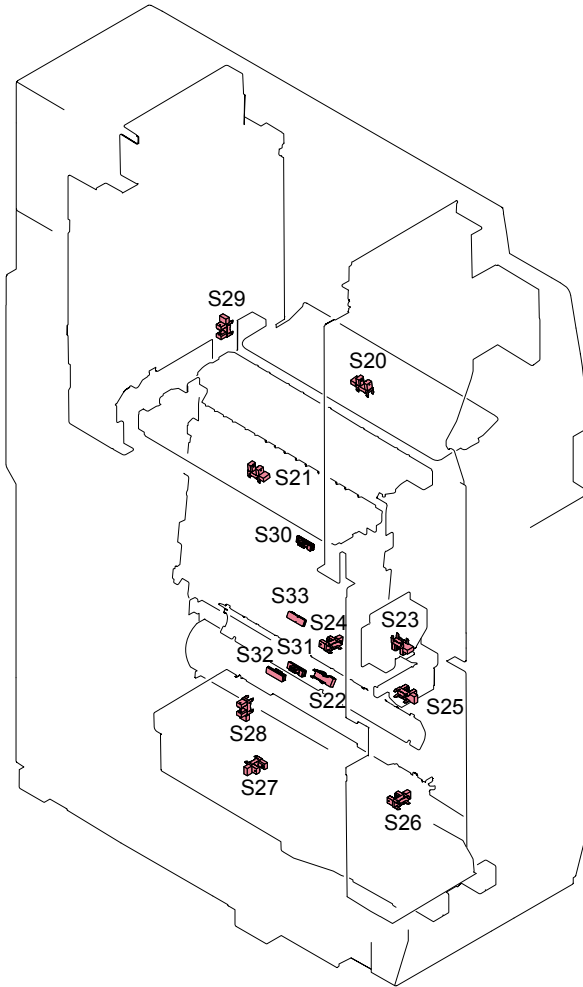
No	Name	Refer to
[1]	Through-feed inlet antistatic needle	-
[2]	Through-feed outlet antistatic needle	-
[3]	Fold adjustment feed clutch(CL3)	4-15
[4]	Fold adjustment back clutch(CL4)	4-16
[5]	Release timing solenoid(SOL3)	4-17
[6]	Folding/straight branching flapper solenoid(SOL2)	4-16
[7]	C-fold stopper solenoid(SOL5)	4-18
[8]	Flapper solenoid(SOL4)	4-17

 Motors / PCBs / Others


F-4-5

No	Name	Refer to
M5	Entrance motor 1	-
M7	Fold tray motor	4-19
M8	Upper stopper motor	4-20
M9	C-fold stopper motor	4-20
M10	Leading edge press guide	4-21
M11	Fold feed motor	-
M12	Entrance motor 2	4-21
M13	Exit motor 2	4-22
M14	Exit motor 1	4-22
M15	Fold position adjustment motor	4-23
SW1	Front upper cover switch	-
CL3	Fold adjustment feed clutch	4-15
CL4	Fold adjustment back clutch	4-16
SOL2	Folding/straight branching flapper solenoid	4-18
SOL3	Release timing solenoid	4-17
SOL4	Flapper solenoid	4-17
SOL5	C-fold stopper solenoid	4-18
F1	Fan	-
CB1	Breaker	-
PCB1	DC controller PCB	4-24
PCB2	Power supply PCB	-
PCB3	Filter PCB	-
	Z-folding Sheet Feed Roller	4-25

List of Sensors



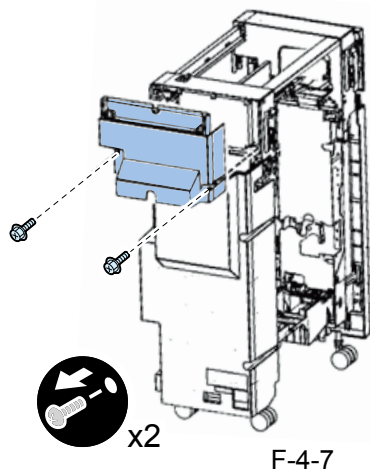
F-4-6

No	Name	Refer to
S20	Entrance sensor	-
S21	Delivery sensor 2	-
S22	Delivery sensor 1	-
S23	Upper stopper HP sensor	-
S24	C-fold stopper HP sensor	-
S25	Leading edge press guide HP sensor	-
S26	Fold tray paper full sensor	-
S27	Fold tray paper sensor	-
S28	Fold tray HP sensor	-
S29	Folding unit sensor	-
S30	Slowdown timing sensor	-
S31	Release timing sensor	-
S32	Fold position sensor	-
S33	Upper stopper paper sensor	-

External / Internal Covers

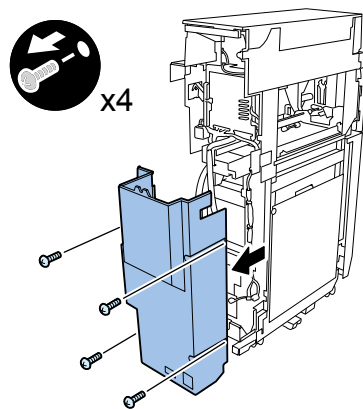
Removing the Rear Upper Cover

1) Remove two screws to remove the rear upper cover.



Removing the Rear Lower Cover

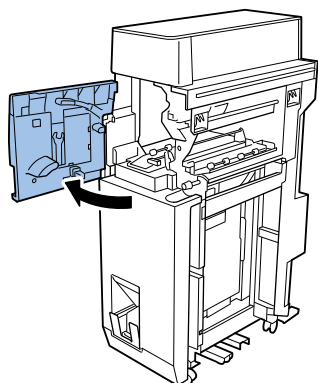
1) Remove four screws to remove the rear lower cover.



F-4-8

Open the Front Upper cover

1) Open the front upper cover.

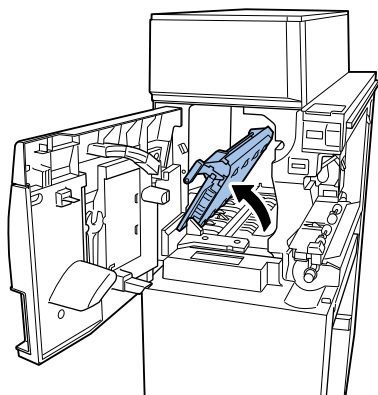


F-4-9

Open the Feed Guide

1) Open the front upper cover.
(Refer to:4-7)

2) Holding the jam removal lever, open the feed guide

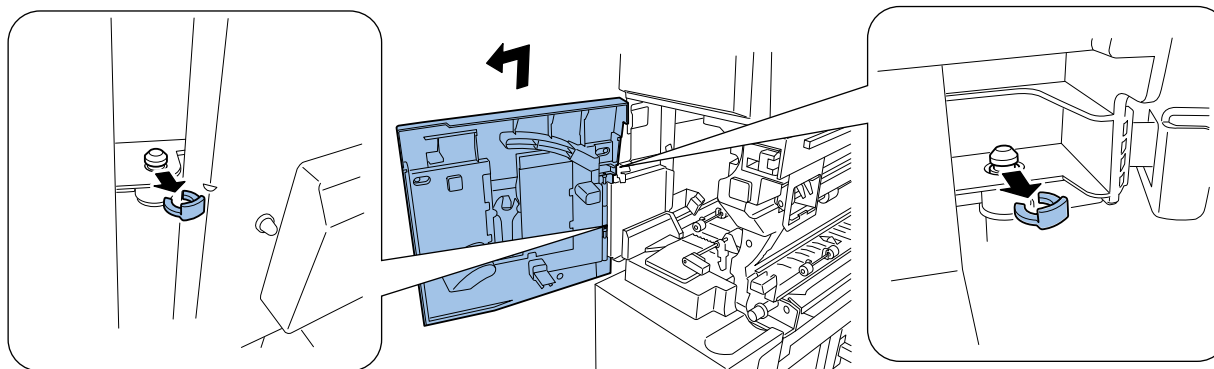


F-4-10

Removing the Front Upper Cover

1) Open the front upper cover.
(Refer to:4-7)

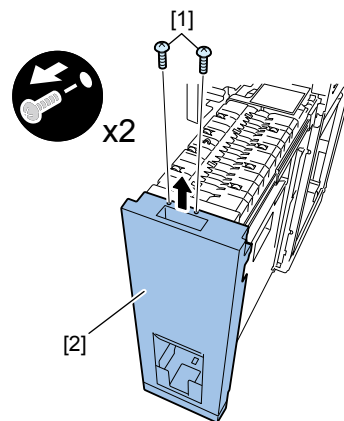
2) Remove two resin E-rings to remove the front upper cover.



F-4-11

Removing the Front Lower Cover

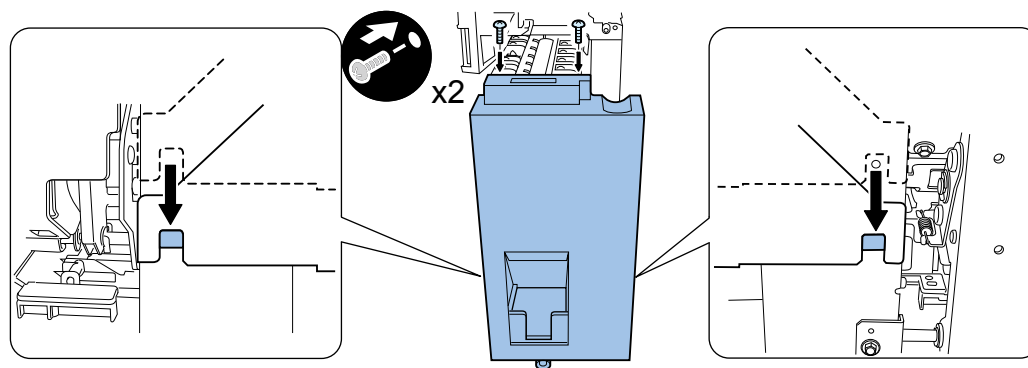
- 1) Open the front upper cover. (Refer to:4-7)
- 2) Draw out the folder block, and the remove two screws to remove the folder block front lower cover.



F-4-12

MEMO:

When installing the front lower cover, install the folder block front cover using two screws with its slits fitted on the hooks on both sides of the folder block. Next, push in the folder block.

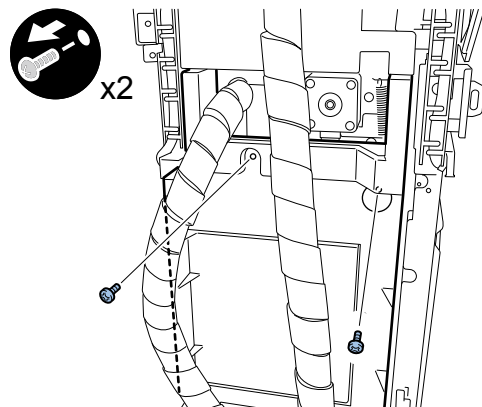


F-4-13

Removing the Rear Inner Cover

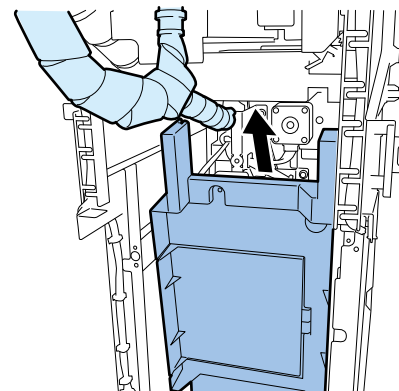
- 1) Open the front upper cover.
(Refer to:4-7)
- 2) Holding the jam removal lever, open the feed guide.
(Refer to:4-8)
- 3) Remove the rear upper cover.
(Refer to:4-6)
- 4) Remove the rear lower cover.
(Refer to:4-7)

- 5) Remove two screws.



F-4-14

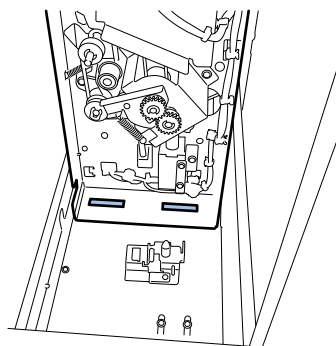
- 6) Push the folding unit about 20 cm forward, and then pull out the rear inner cover with the cables held out of the way.



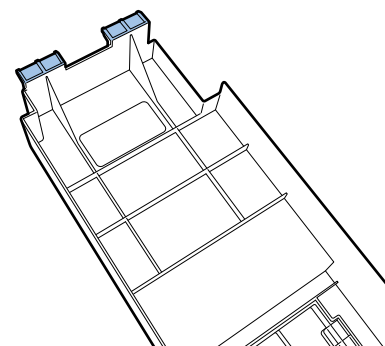
F-4-15

MEMO:

When installing the rear inner cover, insert the hook of the rear inner cover in the hole in the folding unit surface



F-4-16

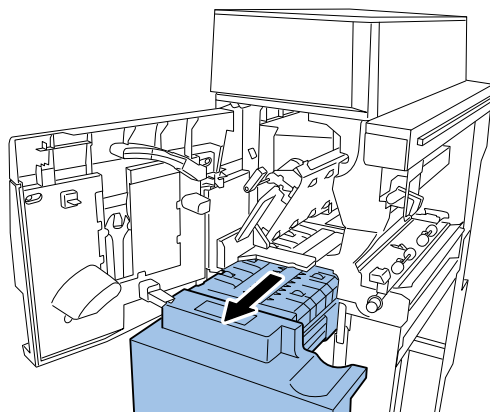


F-4-17

Removing the Front Inner Cover

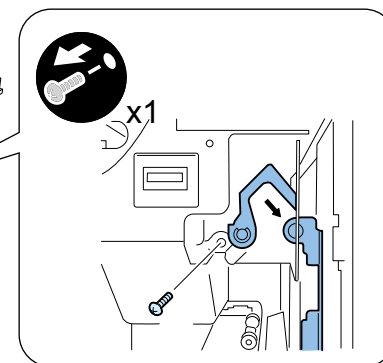
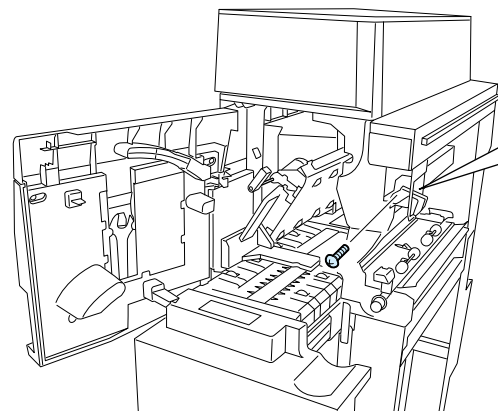
- 1) Open the front upper cover.
(Refer to:4-7)
- 2) Holding the jam removal lever, open the feed guide.
(Refer to:4-8)

- 3) Draw out the folding unit.



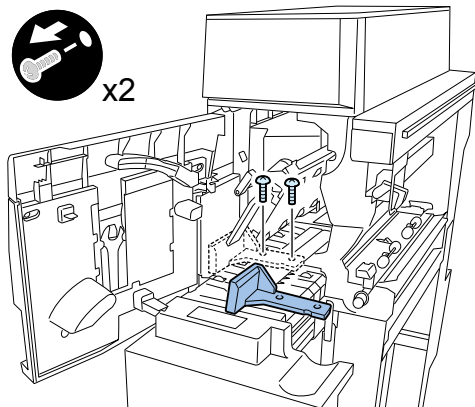
F-4-18

- 4) Remove one screw, and then lower the lock lever.



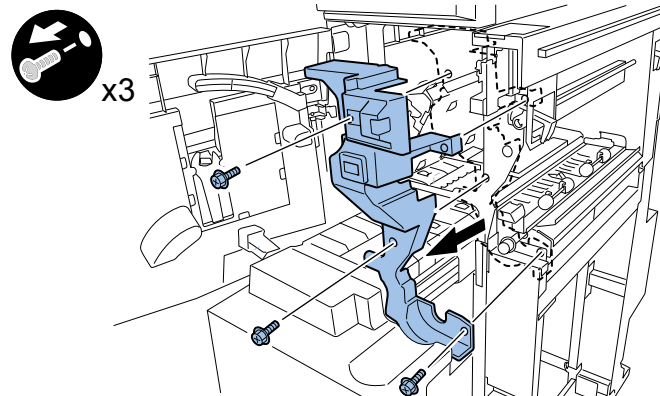
F-4-19

- 5) Remove two screws to remove the front inner cover (small).



F-4-20

- 6) Remove three screws to remove the front inner cover.

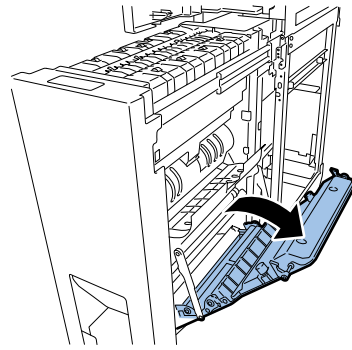


F-4-21

Removing the Right Inner Cover

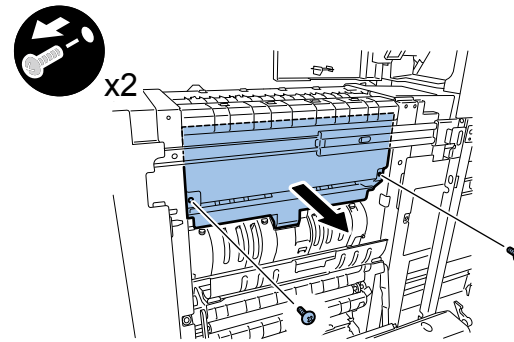
- 1) Open the front upper cover.
(Refer to:4-7)
- 2) Holding the jam removal lever, open the feed guide.
(Refer to:4-8)
- 3) Draw out the folding unit.
(Refer to:4-13)

- 4) Open the right freed guide unit fully.



F-4-22

- 5) Remove two screws to remove the right inner cover.

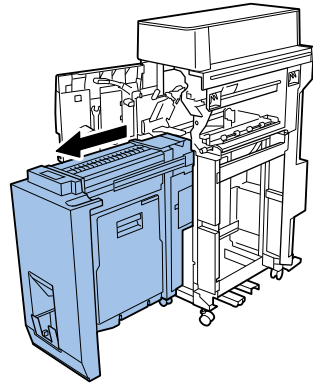


F-4-23

Main Units

Drawing out the Folding Unit

- 1) Open the front upper cover. [\(Refer to:4-7\)](#)
- 2) Holding the jam removal lever, open the feed guide. [\(Refer to:4-8\)](#)
- 3) Draw out the folding unit.

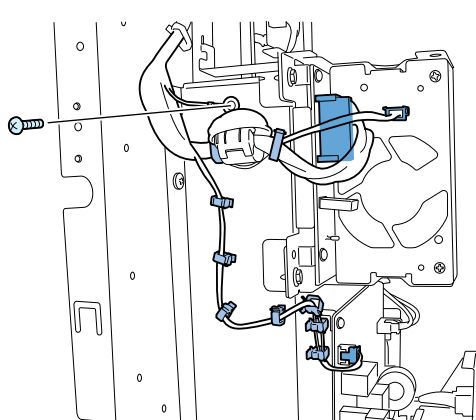


F-4-24

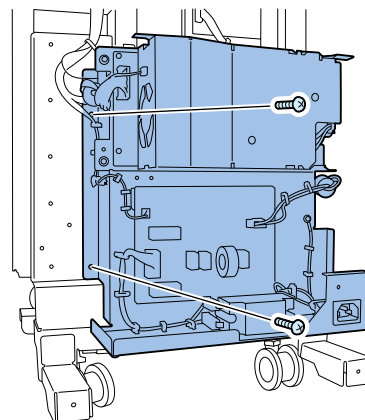
Removing the Power Supply Unit Base

1) Remove the rear lower cover.
(Refer to:4-7)

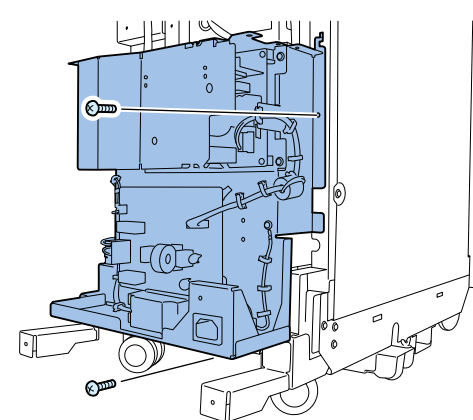
2) Remove four screws, three connectors, nine wire saddles, and one grounding wire (by removing one screw) to remove the power supply base.



F-4-25



F-4-26



F-4-27

Consumable Parts Requiring Periodic Replacement and Cleaning Points

● Removing the Fold Position Adjustment Feed Clutch (CL3)

1) Open the front upper cover.

[\(Refer to:4-7\)](#)

2) Holding the jam removal lever, open the feed guide.

[\(Refer to:4-8\)](#)

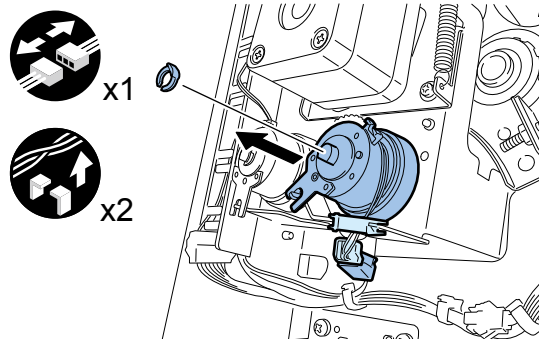
3) Draw out the folding unit.

[\(Refer to:4-13\)](#)

4) Remove the front lower cover.

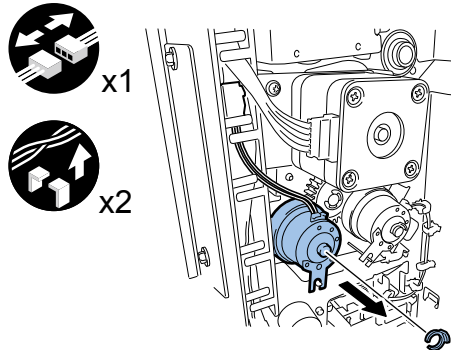
[\(Refer to:4-9\)](#)

5) Remove two wire saddles, one connector, and one resin E-ring to remove the fold position adjustment feed clutch.

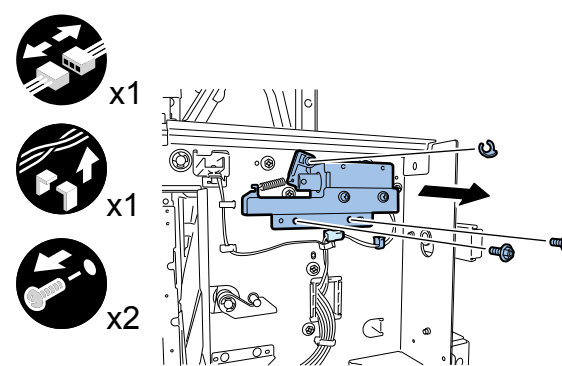
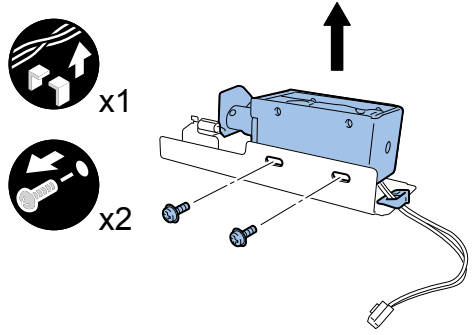


F-4-28

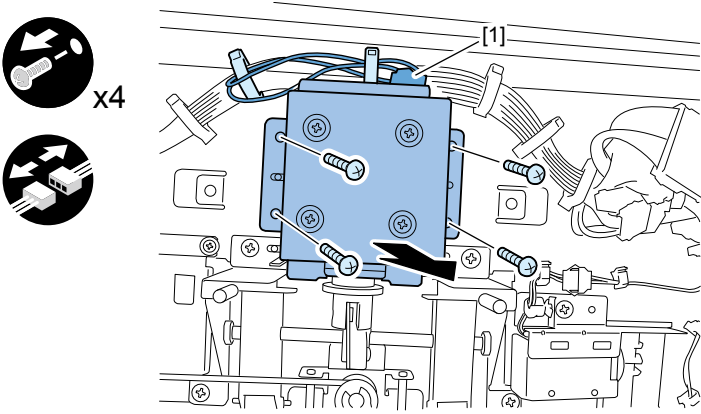
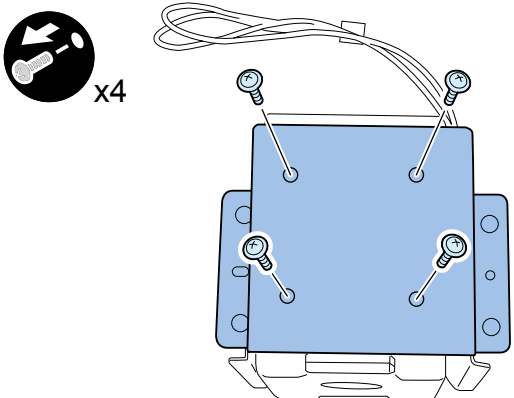
Removing the Fold Position Adjustment Return Clutch (CL4)

<ol style="list-style-type: none"> 1) Open the front upper cover. (Refer to:4-7) 2) Holding the jam removal lever, open the feed guide. (Refer to:4-8) 3) Draw out the folding unit. (Refer to:4-13) 4) Remove the front lower cover. (Refer to:4-9) 	<ol style="list-style-type: none"> 5) Remove two wire saddles, one connector, and one resin E-ring to remove the fold position adjustment return clutch. <div style="text-align: center;">  <p>F-4-29</p> </div>
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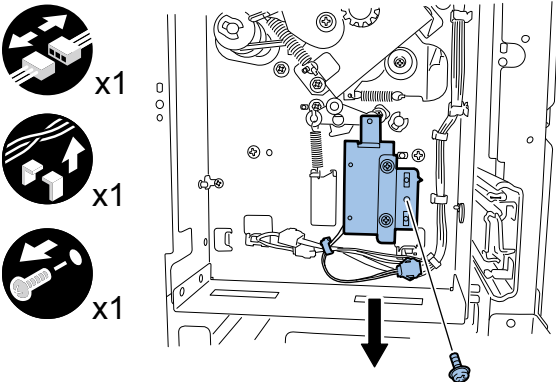
Removing the Fold Straight Branch Flapper Solenoid (SOL2)

<ol style="list-style-type: none"> 1) Open the front upper cover. (Refer to:4-7) 2) Holding the jam removal lever, open the feed guide. (Refer to:4-8) 3) Draw out the folding unit. (Refer to:4-13) 4) Remove the front lower cover. (Refer to:4-9) 	<ol style="list-style-type: none"> 5) Remove two screws, one connector, one wire saddle, and one E-ring to remove the fold straight branch flapper solenoid unit <div style="text-align: center;">  <p>F-4-30</p> </div>	<ol style="list-style-type: none"> 6) After drawing mark-off lines around the fold straight branch flapper solenoid, remove two screws and one wire saddle to remove the fold straight branch flapper solenoid. <div style="text-align: center;">  <p>F-4-31</p> </div>
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Removing the Release Solenoid (SOL3)

<ol style="list-style-type: none"> 1) Open the front upper cover. (Refer to:4-7) 2) Holding the jam removal lever, open the feed guide. (Refer to:4-8) 3) Draw out the folding unit. (Refer to:4-13) 4) Remove the right inner cover. (Refer to:4-12) 	<ol style="list-style-type: none"> 5) Remove four screws, one wire saddle, and one connector to remove the release solenoid unit.  <p style="text-align: center;">F-4-32</p>	<ol style="list-style-type: none"> 6) After drawing mark-off lines around the release solenoid, remove four screws to remove the release solenoid.  <p style="text-align: center;">F-4-33</p>
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Removing the Flapper Solenoid (SOL4)

<ol style="list-style-type: none"> 1) Remove the rear lower cover. (Refer to:4-7) 2) Remove the power supply unit base. (Refer to:4-14) 3) Remove the rear inner cover. (Refer to:4-10) 	<ol style="list-style-type: none"> 4) After drawing mark-off lines around the flapper solenoid, remove one screw, one connector, and one wire saddle to remove the flapper solenoid.  <p style="text-align: center;">F-4-34</p>
--	---

Removing the C-fold Stopper Solenoid (SOL5)

1) Open the front upper cover.

[\(Refer to:4-7\)](#)

2) Holding the jam removal lever, open the feed guide.

[\(Refer to:4-8\)](#)

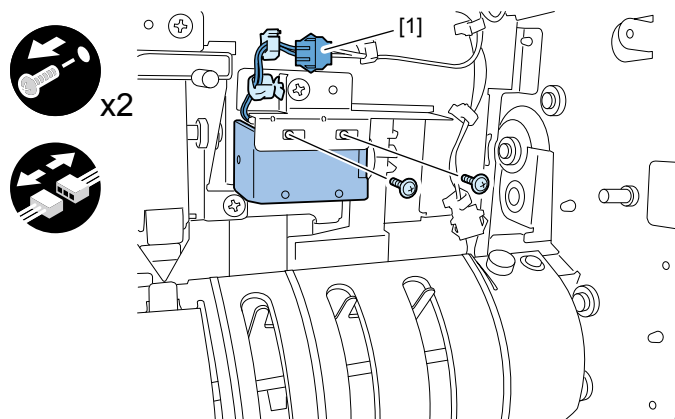
3) Draw out the folding unit.

[\(Refer to:4-13\)](#)

4) Remove the right inner cover.

[\(Refer to:4-12\)](#)

5) Remove two screws, one connector, and one wire saddle to remove the C-fold stopper solenoid unit.



F-4-35

Removing the Motor

Removing the Fold Tray Motor (M7)

1) Open the front upper cover.

[\(Refer to:4-7\)](#)

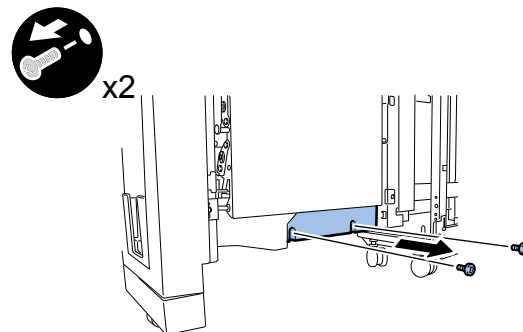
2) Holding the jam removal lever, open the feed guide.

[\(Refer to:4-8\)](#)

3) Draw out the folding unit.

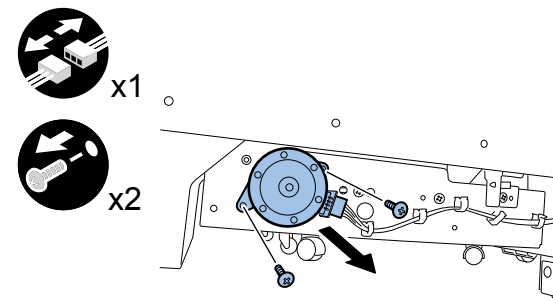
[\(Refer to:4-13\)](#)

4) Remove two screws to remove the lower cover.



F-4-36

5) Remove two screws and one connector to remove the fold tray motor.

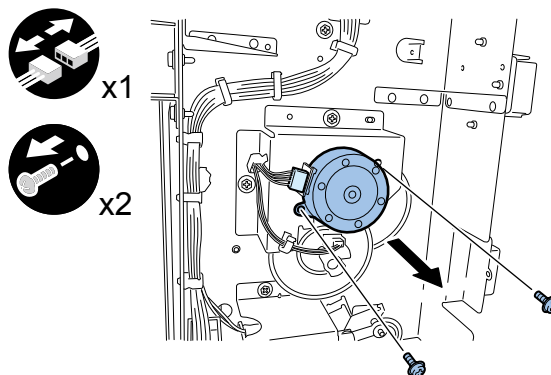


F-4-37

Removing the Upper Stopper Motor (M8)

- 1) Open the front upper cover.
(Refer to:4-7)
- 2) Holding the jam removal lever, open the feed guide.
(Refer to:4-8)
- 3) Draw out the folding unit.
(Refer to:4-13)
- 4) Remove the front lower cover.
(Refer to:4-9)

- 3) Remove two screws and one connector to remove the upper stopper motor.

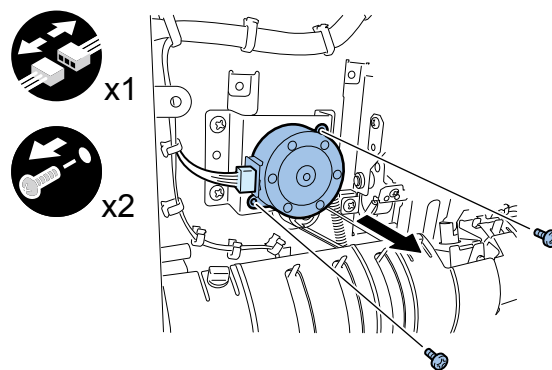


F-4-38

Removing the C-fold Stopper Motor (M9)

- 1) Open the front upper cover.
(Refer to:4-7)
- 2) Holding the jam removal lever, open the feed guide.
(Refer to:4-8)
- 3) Draw out the folding unit.
(Refer to:4-13)
- 4) Remove two screws to remove the right inner cover.
(Refer to:4-12)

- 5) Remove two screws and one connector to remove the C-fold stopper motor.



F-4-39

Removing the Leading End Retaining Guide Motor (M10)

1) Open the front upper cover.

(Refer to:4-7)

2) Holding the jam removal lever, open the feed guide.

(Refer to:4-8)

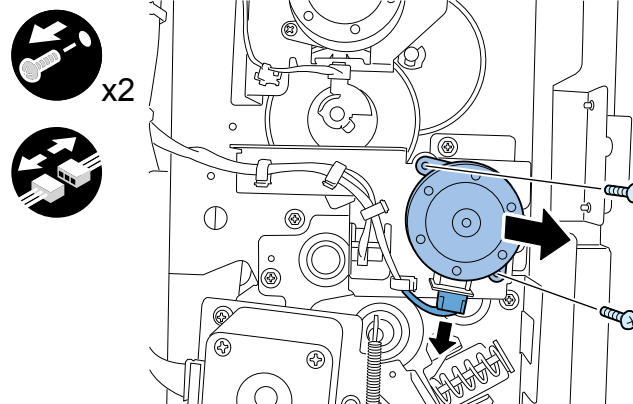
3) Draw out the folding unit.

(Refer to:4-13)

4) Remove the front lower cover.

(Refer to:4-9)

5) Remove two screws and one connector to remove the leading end retaining guide motor.



F-4-40

Removing the Inlet 2 Motor (M12).

1) Remove the rear upper cover.

(Refer to:4-6)

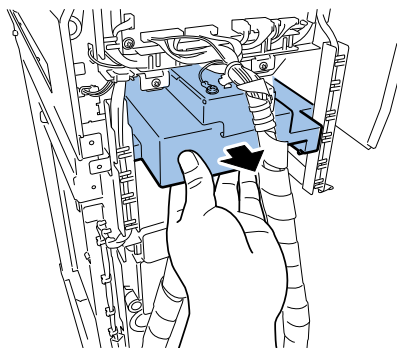
2) Remove the rear lower cover.

(Refer to:4-7)

3) Remove the rear inner cover

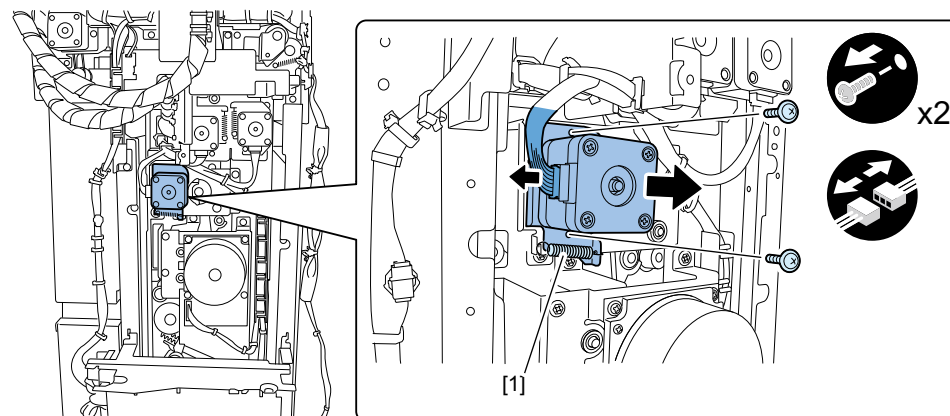
(Refer to:4-10)

4) Holding the upper portion of the folding unit, pull the folding unit backward.



F-4-41

5) Remove two screws, one spring, and one connector to remove the inlet 2 motor.

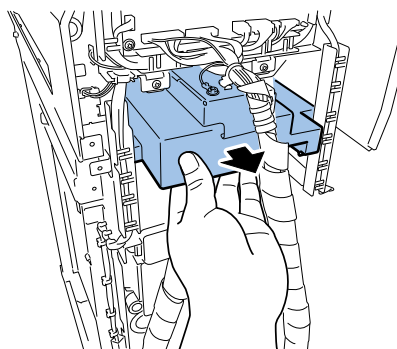


F-4-42

Removing the Outlet 2 Motor (M13)

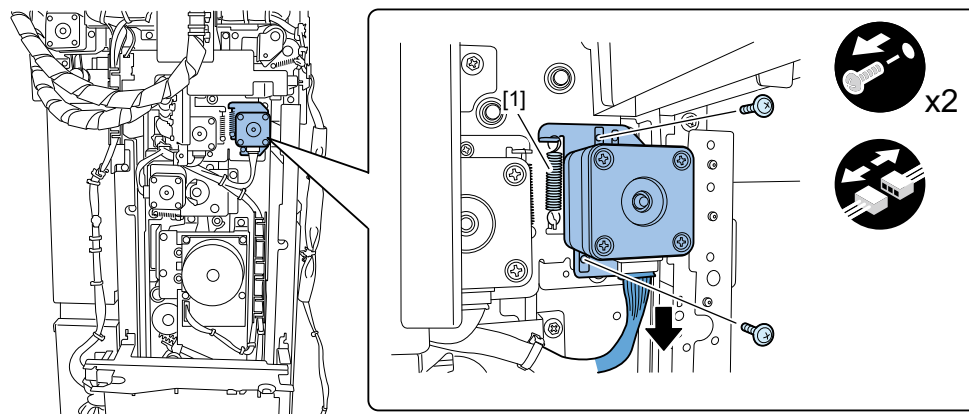
- 1) Remove the rear upper cover.
(Refer to:4-6)
- 2) Remove the rear lower cover.
(Refer to:4-7)
- 3) Remove the rear inner cover
(Refer to:4-10)

- 4) Holding the upper portion of the folding unit, pull the folding unit backward.



F-4-43

- 5) Remove two screws, one spring, and one connector to remove the outlet 2 motor.

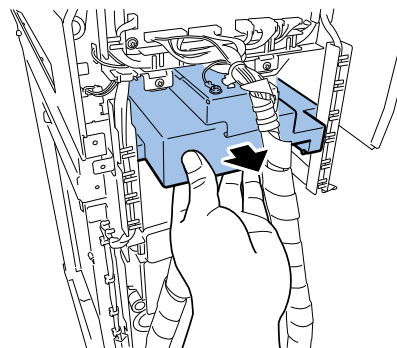


F-4-44

Removing the Outlet 1 Motor (M14)

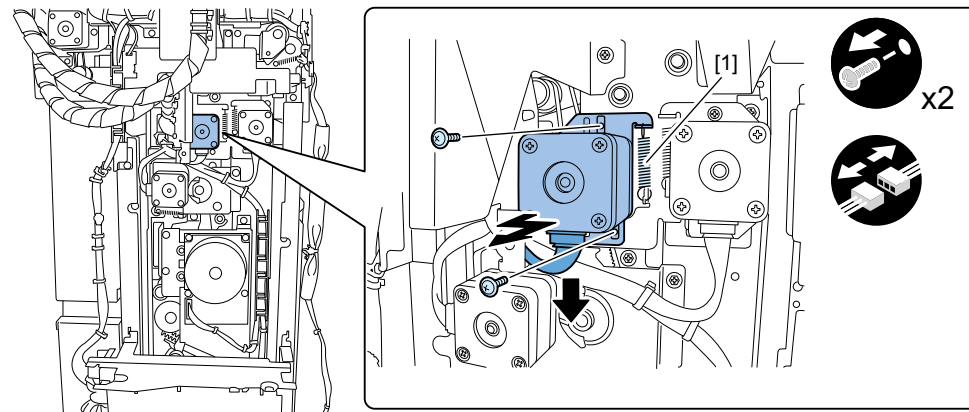
- 1) Remove the rear upper cover.
(Refer to:4-6)
- 2) Remove the rear lower cover.
(Refer to:4-7)
- 3) Remove the rear inner cover
(Refer to:4-10)

- 4) Holding the upper portion of the folding unit, pull the folding unit backward.



F-4-45

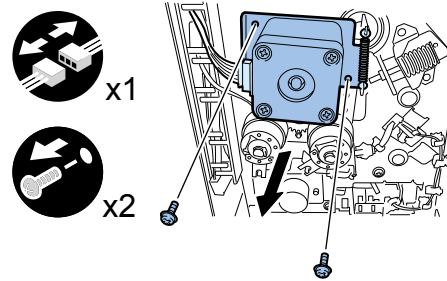
- 5) Remove two screws, one spring, and one connector to remove the outlet 1 motor.



F-4-46

Removing the Fold Position Adjustment Motor (M15)

- 1) Open the front upper cover.
(Refer to:4-7)
- 2) Holding the jam removal lever, open the feed guide.
(Refer to:4-8)
- 3) Draw out the folding unit.
(Refer to:4-13)
- 4) Remove the front lower cover.
(Refer to:4-9)
- 5) Remove two screws, one connector, and one spring to remove the fold position adjustment motor.



F-4-47

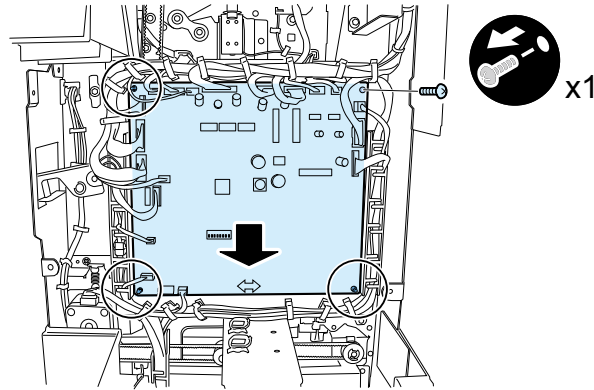
Removing a PCB

Removing the DC Controller PCB

1) Remove the rear upper cover.

[\(Refer to:4-6\)](#)

2) Remove all connectors, all screws, and three locking supports to remove the DC controller PCB.



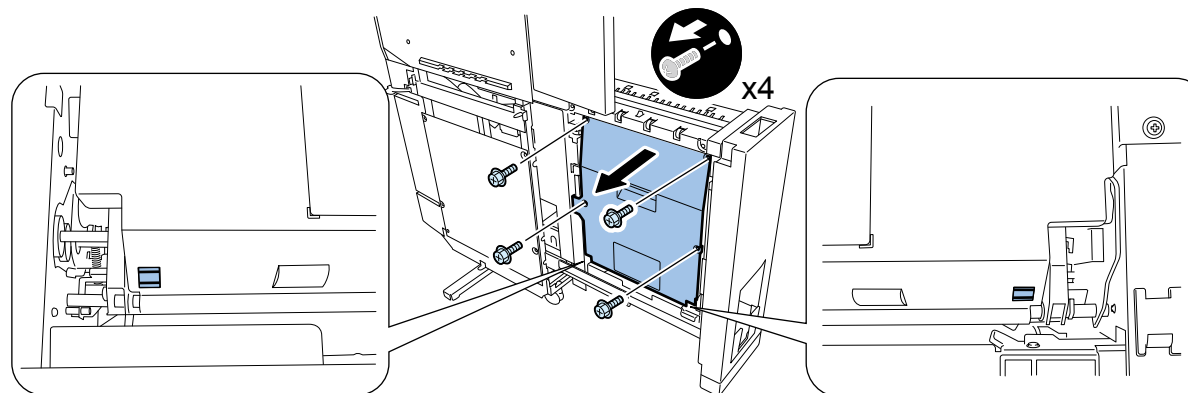
F-4-48

Removing the Feed Roller

Removing the Z-folding Sheet Feed Roller

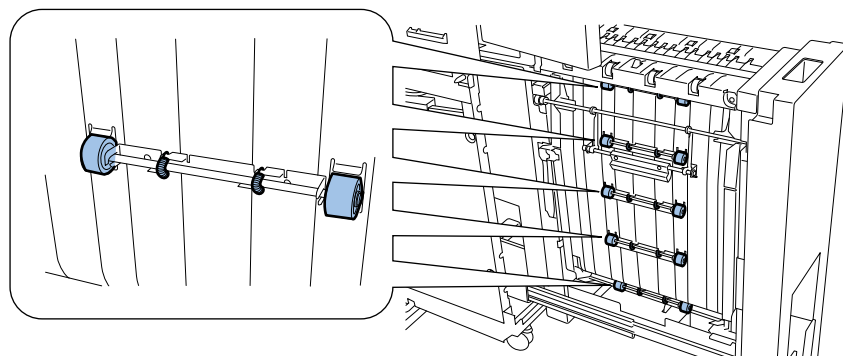
- 1) Open the front upper cover.
(Refer to:4-7)
- 2) Holding the jam removal lever, open the feed guide.
(Refer to:4-8)
- 3) Draw out the folding unit.
(Refer to:4-13)

- 4) Remove four screw, and then release two hooks (by pressing them using a screwdriver or the like) to remove the left guide bar.



F-4-49

- 5) Remove two springs to remove the Z-folding sheet feed roller.



F-4-50

5

Adjustment

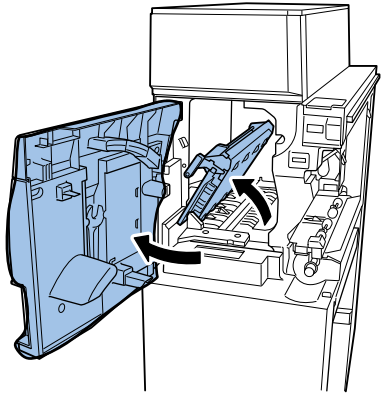
- Basic Adjustment
- Action on parts Replacement



Basic Adjustment

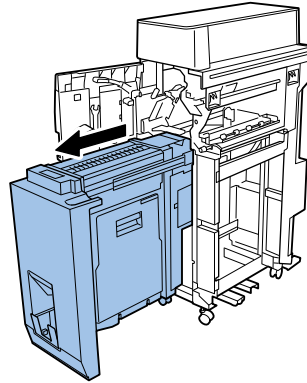
Z-fold/outer threefold(first fold)inclination adjustment (Registration roller inclination adjustment)

1) Open the front upper cover, and then raise the feed upper guide.



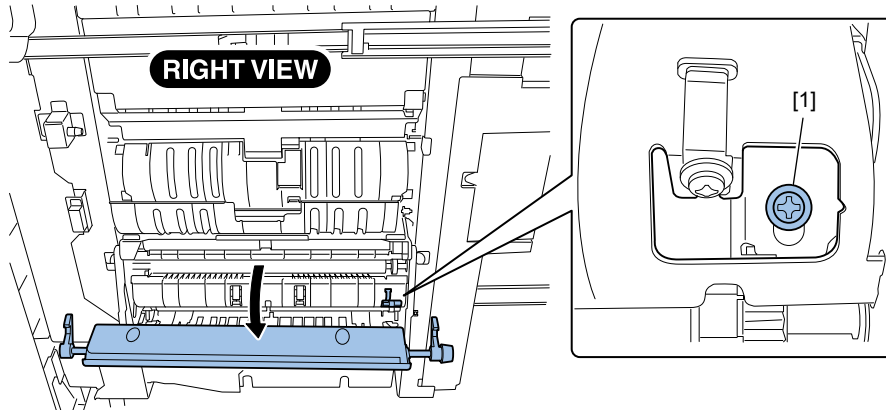
F-5-1

2) Draw out the folder unit.



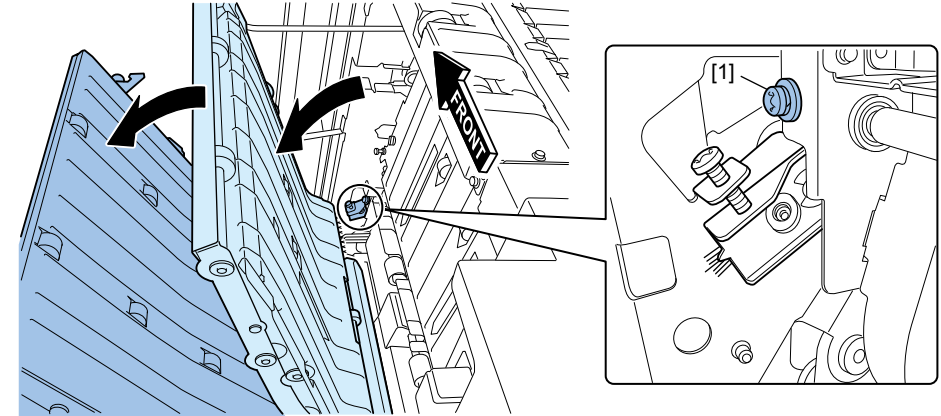
F-5-2

3) Open the feed guide (right) and loosen the screw.



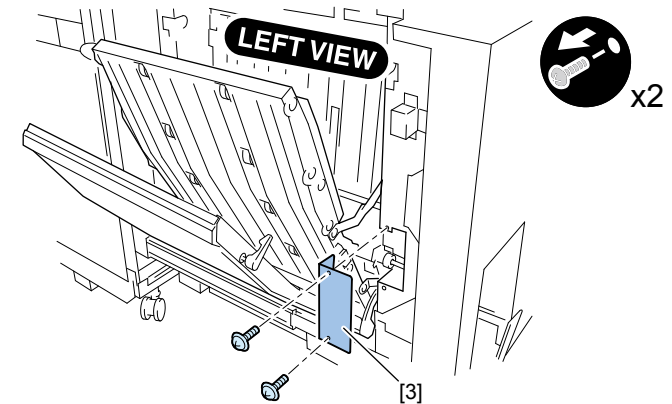
F-5-3

4) Open the feed guide (left) and loosen the screw.



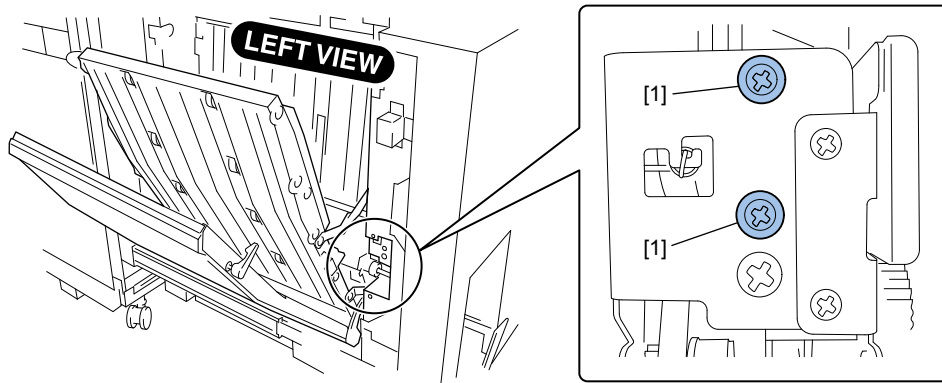
F-5-4

5) Remove the left lower small cover by removing two screws.



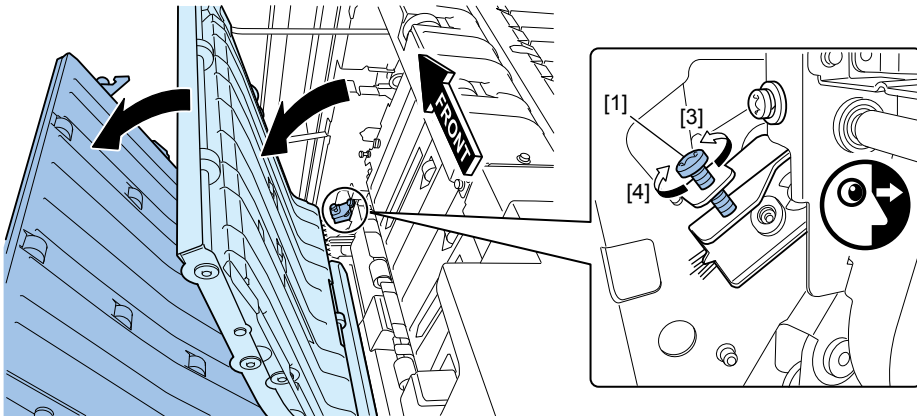
F-5-5

6) Loosen two screws.



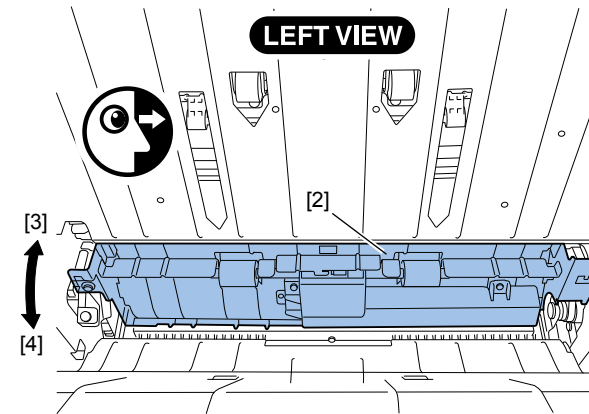
F-5-6

7) Turn the adjusting screw to adjust the inclination of the registration roller unit.
 -Turn the adjusting screw counterclockwise [3].: The rear side of the registration unit moves up.
 -Turn the adjusting screw clockwise [4].: The rear side of the registration unit moves down.



F-5-7

8) Tighten the previously loosened four screws to secure the feed guides (right and left)

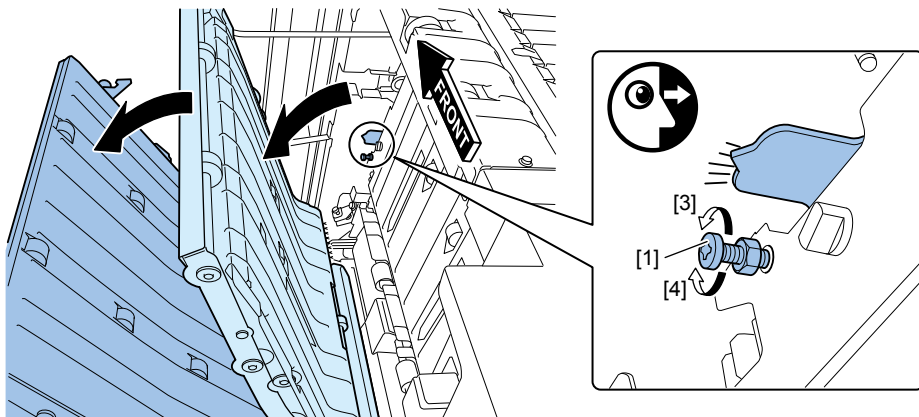


F-5-8

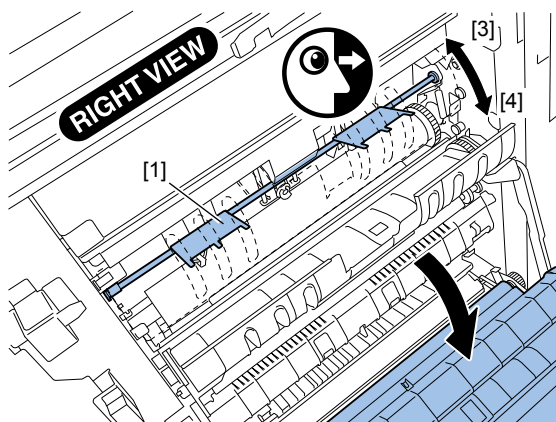
Z-fold/outer threefold/C-fold(second fold)inclination adjustment (Second fold stopper inclination adjustment)

Turn the adjusting screw [1] to adjust the inclination of the second fold stopper (located at the right of the folder unit).

- Turn the adjusting screw counterclockwise [3]: The rear side of the secondfold stopper moves up.
- Turn the adjusting screw clockwise [4]: The rear side of the secondfold stopper moves down.



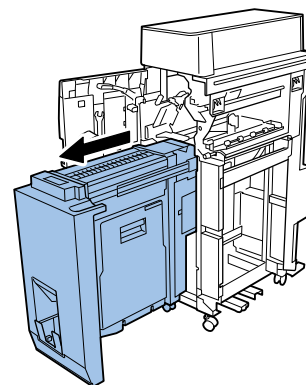
F-5-9



F-5-10

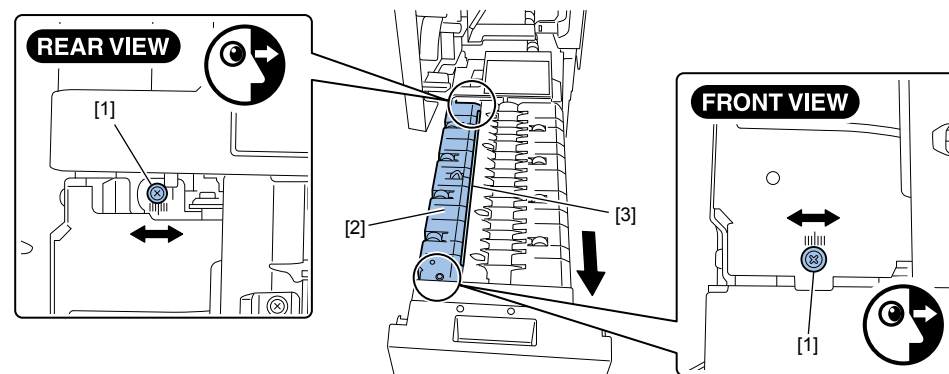
Z-fold/Two-fold paper skew adjustment (Eject guide protective sheet protrusion adjustment)

1) Draw out the folder unit.



F-5-11

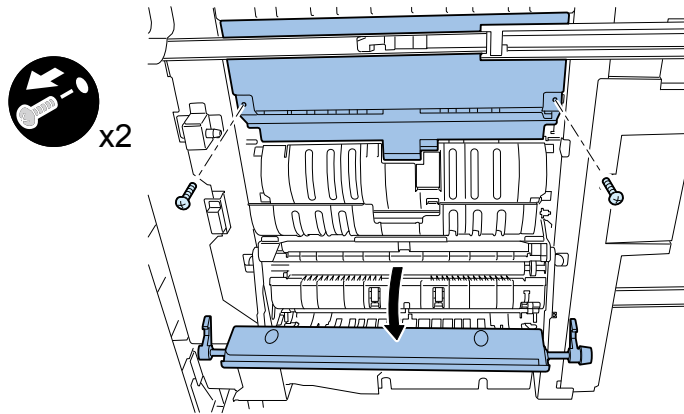
2) Loosen the adjusting screws (front/rear) [1], and then adjust the gap between the eject guide [2] and the protective sheet to adjust the Z-fold paper skew.



F-5-12

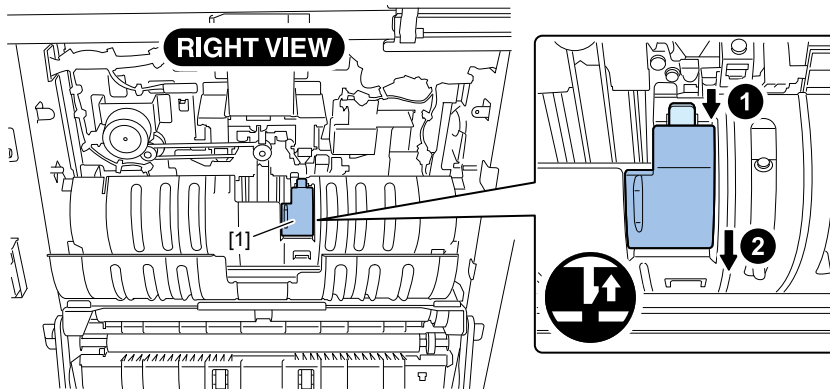
C-fold/Two-fold/Four-fold(first fold)inclination adjustment (C-fold stopper inclination)

1) Remove two screws to remove the right inner cover [2]



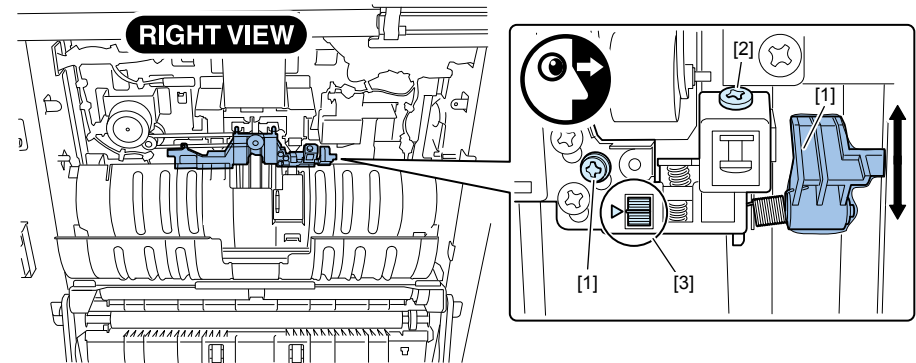
F-5-13

2) Release the hooks (1) and (2) to remove the small cover.



F-5-14

3) Loosen screw [1], and then turn the adjustment screw [2] to adjust the inclination of the C-fold stopper [3]



Action on parts replacement

Action to take after replacing the DC controller PCB

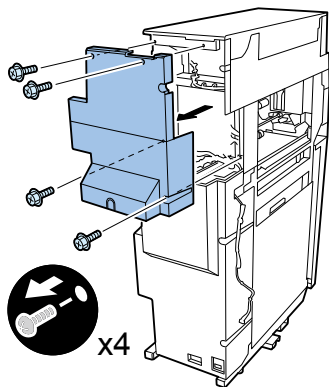
[Overview]

This section explains the action to take only for the paper folding unit E1.

After replacing the DC controller PCB, input the following adjustment values using the DIP switch on the PCB:

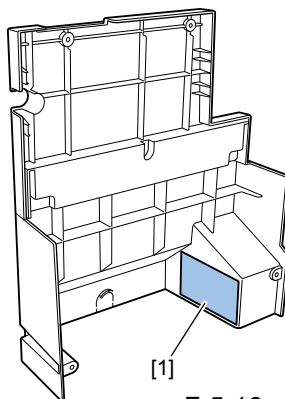
- Z-fold position adjustment value
- C-fold position adjustment value
- Outer threefold position adjustment value
- Fourfold position adjustment value
- Twofold position adjustment value.

1) Remove the rear upper cover.

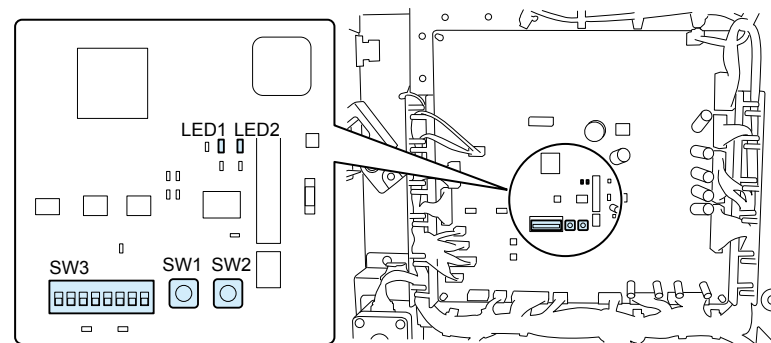


F-5-15

2) Using the DIP switch and push switches on the DC controller PCB, input the adjustment values indicated on the service label (1) affixed to the inside of the rear upper cover.



F-5-16



F-5-17

The input method is described below.

* Be sure to connect the paper folding unit E1 to the downstream finisher.

1) Set the SW3 (DIP switch) as shown below, turn on the SW1 (push switch), and then turn on the downstream finisher.

(Note: Keep pressing the SW1 for at least 2 seconds after turning on the power.)

SW3(■ON□OFF)								Test mode
1	2	3	4	5	6	7	8	
■	□	■	□	□	□	□	□	Folding position adjustment

2) Using the PSW2 (push switch), select a fold mode.

- Z-fold: Do not operate .
- C-fold: Press the SW2 twice (ON).
- Outer threefold: Press the SW2 four times (ON).
- Fourfold: Press the SW2 six times (ON).
- Twofold: Press the SW2 eight times (ON).

3) Input adjustment value 1 using the SW3 according to the following table, and then press the SW1 (ON).

4) Input adjustment value 2 using the SW3 according to the following table, and then press the SW1 (ON).

SW3(■ON□OFF)					Adjustment value[mm]
1	2	3	4	5	
□	□	□	□	□	0
■	□	□	□	□	+0.5
□	■	□	□	□	+1.0
■	■	□	□	□	+1.5
□	□	■	□	□	+2.0
■	□	■	□	□	+2.5
□	■	■	□	□	+3.0
■	■	■	□	□	+3.5
□	□	□	■	□	+4.0
■	□	□	■	□	+4.5
□	■	□	■	□	+5.0
■	□	□	□	■	-0.5
□	■	□	□	■	-1.0
■	■	□	□	■	-1.5
□	□	■	□	■	-2.0
■	□	■	□	■	-2.5
□	■	■	□	■	-3.0
■	■	■	□	■	-3.5
□	□	□	■	■	-4.0
■	□	□	■	■	-4.5
□	■	□	■	■	-5.0

SW3(■ON□OFF)			Paper size
6	7	8	
□	□	□	A4
■	□	□	B4
□	■	□	A3
□	□	■	LTR
■	□	■	LGL
□	■	■	LDR

5) To specify another paper size for the paper of the same fold type, return to step 3.

To specify another fold type, select it according to the table given below.

Pressing the SW2 once allows you to input the adjustment value indicated in the next row. The bottom row is looped to the top row.

The current position is represented by the “adjustment value 1” in the fold mode set in steps 3 and 4. After moving to the object of adjustment, return to step 3 or 4.

Example:

To input the outer fold adjustment value after inputting the Z-fold adjustment value in steps 3 and 4, press the SW2 four times (ON).

To input the Z-fold adjustment value after inputting the twofold adjustment value in steps 3 and 4, press the SW2 four times (ON).

Order	Object of adjustment
1	Z-fold adjustment value 1
2	Z-fold adjustment value 2
3	C-fold adjustment value 1
4	C-fold adjustment value 2
5	Outer threefold adjustment value 1
6	Outer threefold adjustment value 2
7	Fourfold adjustment value 1
8	Fourfold adjustment value 2
9	Two fold adjustment value 1
10	Two fold adjustment value 2

*The current object of adjustment and adjustment value are indicated by the flashing LEDs.

The flashing pattern changes with the paper size specified using the SW3. For more details, see the following tables:.

Object of adjustment	LED2 flashes at short intervals.
Z-fold	1
C-fold	2
Outer threefold	3
Fourfold	4
Two fold	5

Adjustment value 1 or 2	Adjustment value [mm]	LED1 flashes at long intervals	LED1 flashes at short intervals
Adjustment value1	0	1	1
	+0.5		2
	+1.0		3
	+1.5		4
	+2.0		5
	+2.5		6
	+3.0		7
	+3.5		8
	+4.0		9
	+4.5		10
	+5.0		11
	-0.5	2	2
	-1.0		3
	-1.5		4
	-2.0		5
	-2.5		6
	-3.0		7
	-3.5		8
	-4.0		9
	-4.5		10
	-5.0		11

Adjustment value2	0	3	1
	+0.5		2
	+1.0		3
	+1.5		4
	+2.0		5
	+2.5		6
	+3.0		7
	+3.5		8
	+4.0		9
	+4.5		10
	+5.0		11
	-0.5	4	2
	-1.0		3
	-1.5		4
	-2.0		5
	-2.5		6
	-3.0		7
	-3.5		8
	-4.0		9
	-4.5		10
	-5.0		11

6

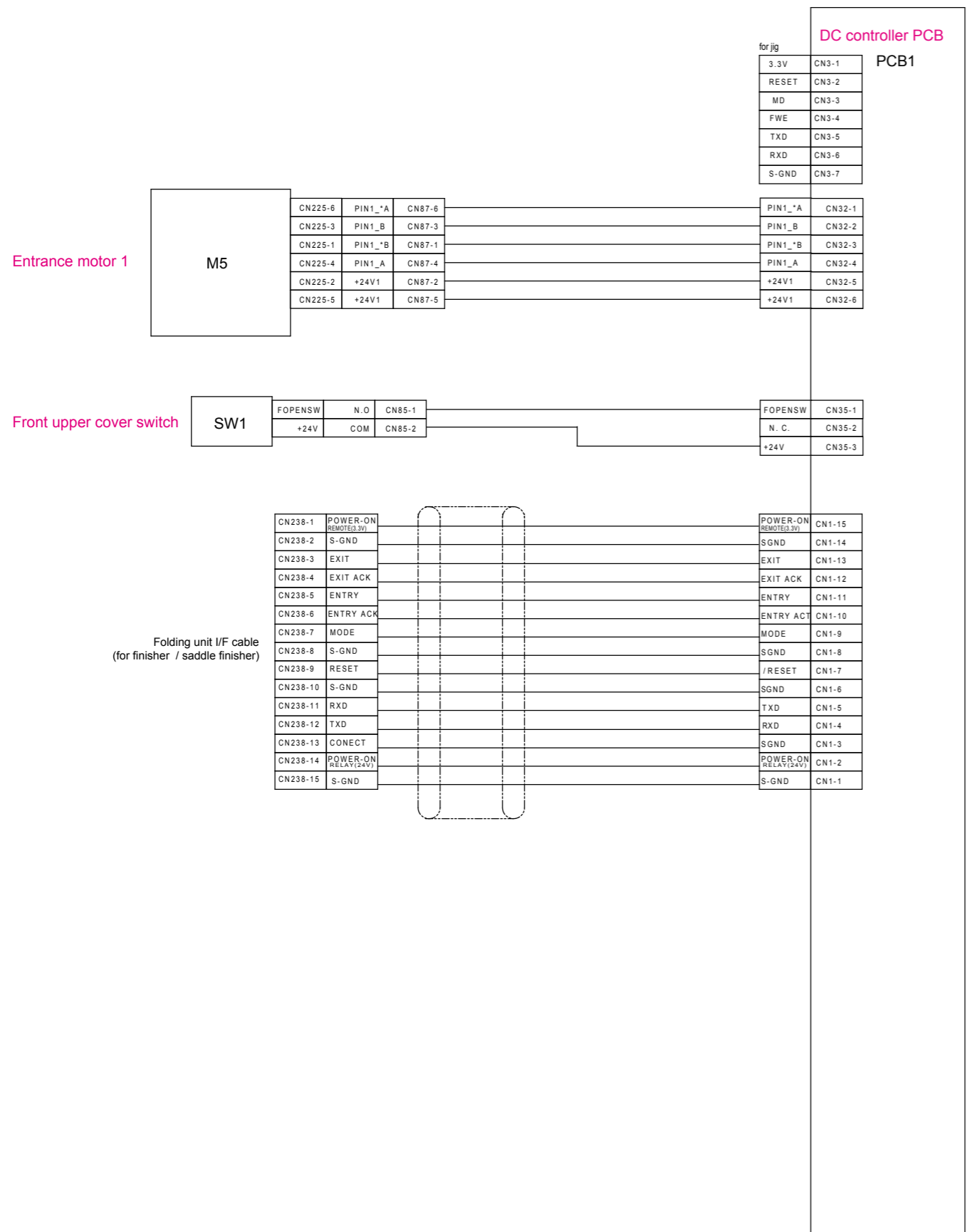
Actual wiring chart

■ Actual wiring chart



Actual wiring chart

General Circuit Diagram 1/5

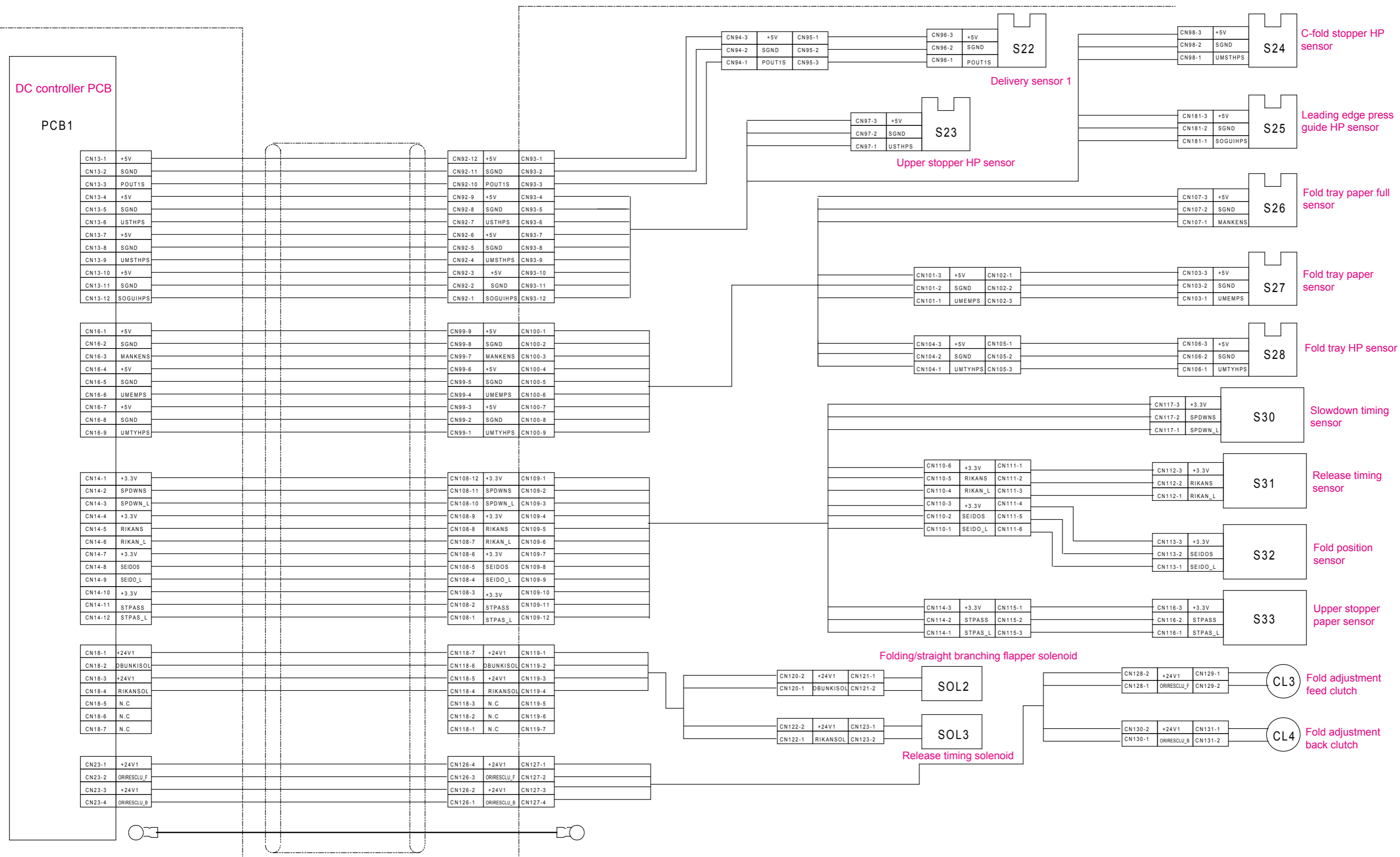


F-7-1

General Circuit Diagram 2/5

Actual wiring chart > Actual wiring chart

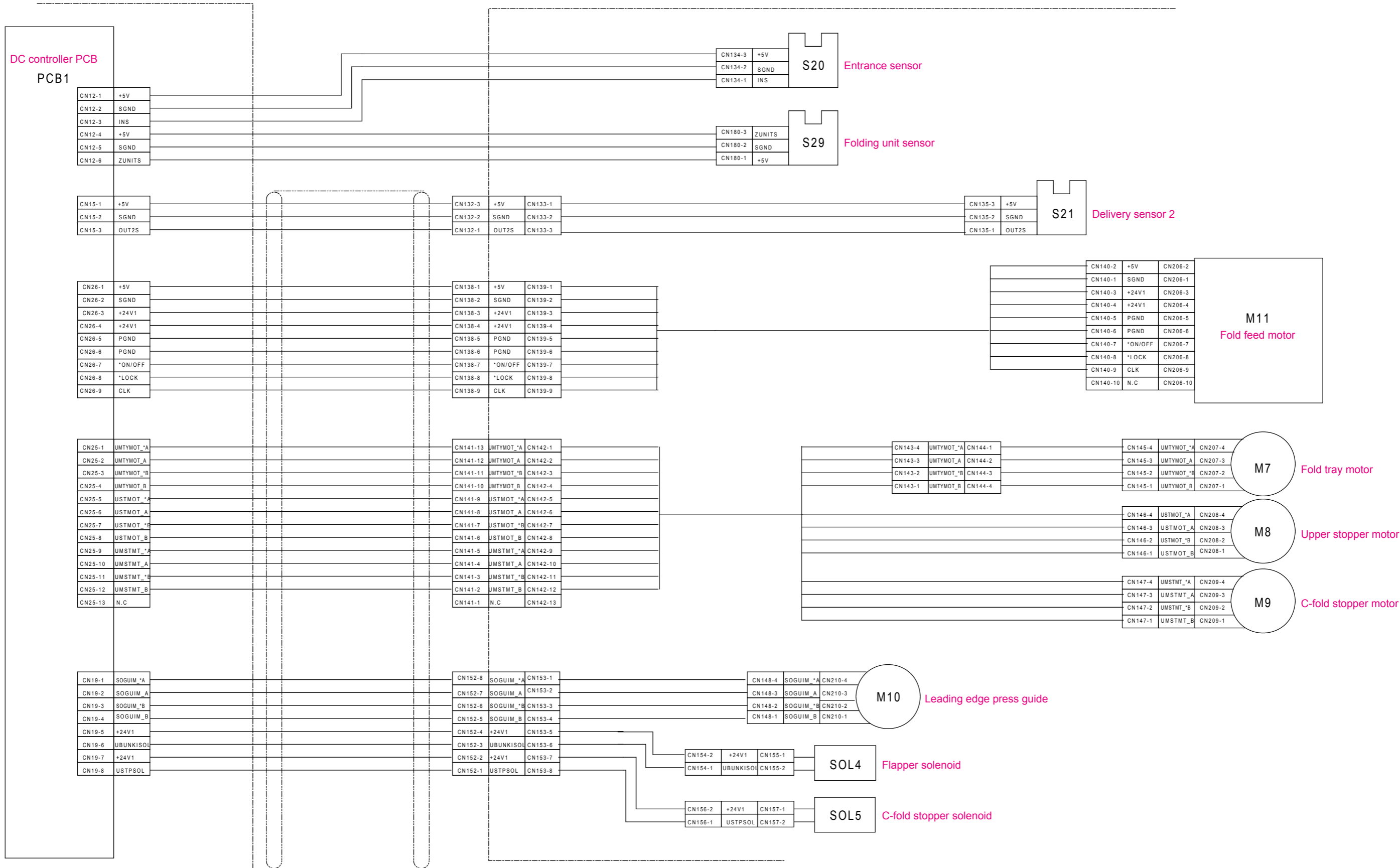
Actual wiring chart > Actual wiring chart



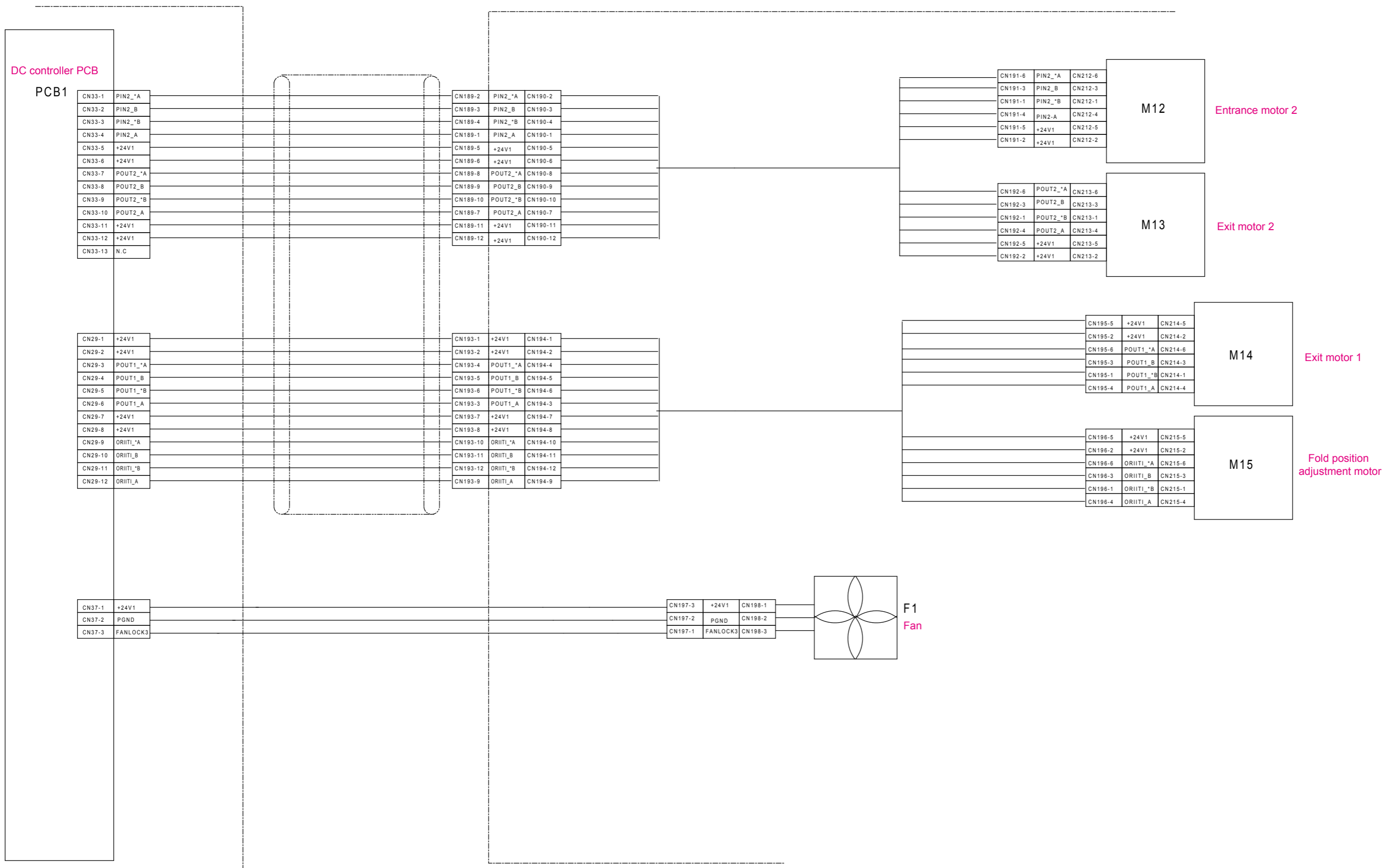
General Circuit Diagram 3/5

Actual wiring chart > Actual wiring chart

Actual wiring chart > Actual wiring chart

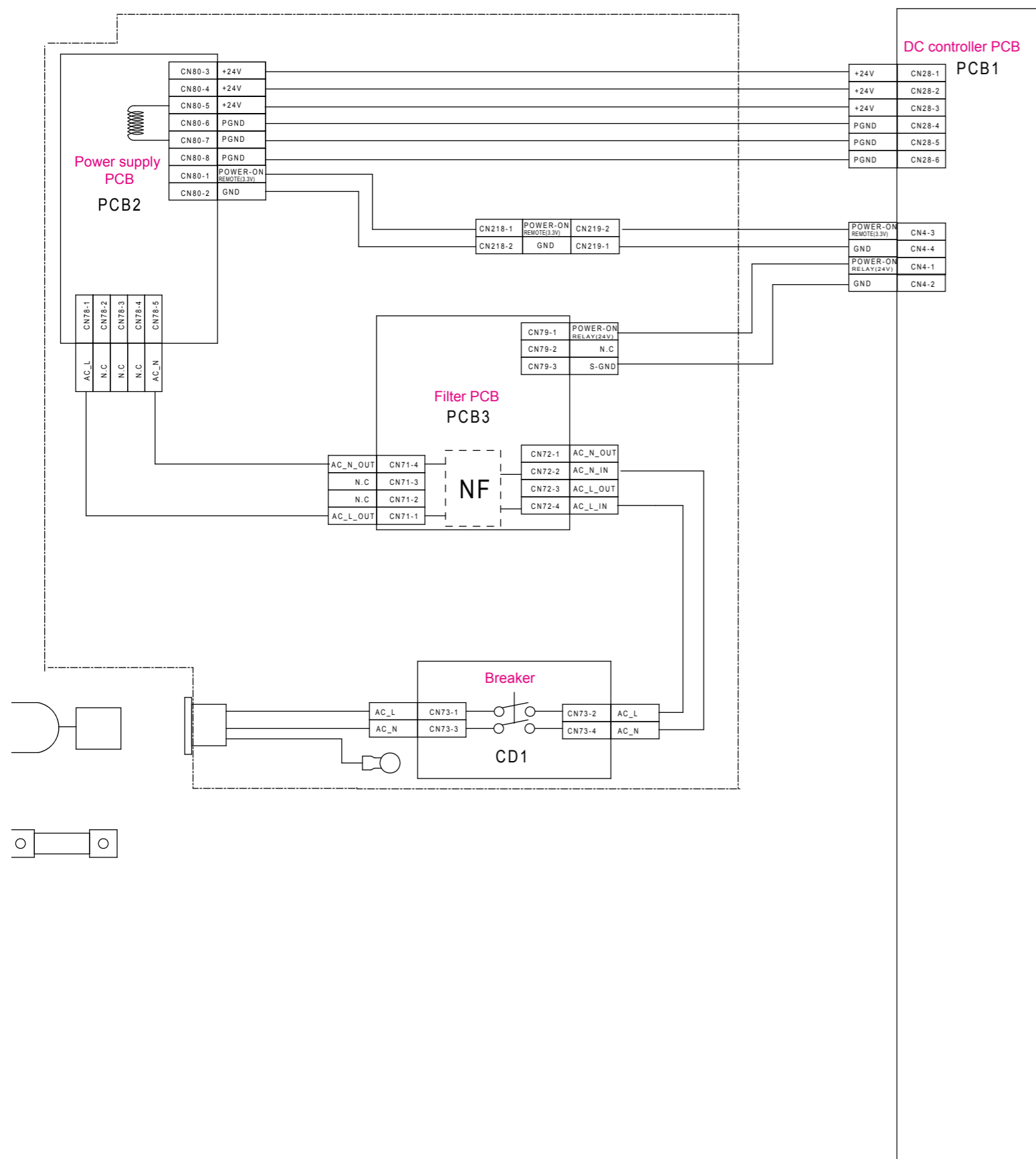


General Circuit Diagram 4/5



F-7-4

General Circuit Diagram 5/5

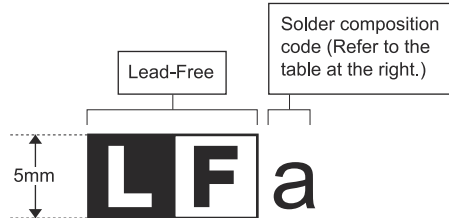


F-7-5

LEAD-FREE SOLDER

The PWB's of this model employs lead-free solder. The "LF" marks indicated on the PWB's and the Service Manual mean "Lead-Free" solder. The alphabet following the LF mark shows the kind of lead-free solder.

Example:



<Solder composition code of lead-free solder>

Solder composition	Solder composition code
Sn-Ag-Cu	a
Sn-Ag-Bi Sn-Ag-Bi-Cu	b
Sn-Zn-Bi	z
Sn-In-Ag-Bi	i
Sn-Cu-Ni	n
Sn-Ag-Sb	s
Bi-Sn-Ag-P Bi-Sn-Ag	p

(1) NOTE FOR THE USE OF LEAD-FREE SOLDER THREAD

When repairing a lead-free solder PWB, use lead-free solder thread.

Never use conventional lead solder thread, which may cause a breakdown or an accident.

Since the melting point of lead-free solder thread is about 40°C higher than that of conventional lead solder thread, the use of the exclusive-use soldering iron is recommendable.

(2) NOTE FOR SOLDERING WORK

Since the melting point of lead-free solder is about 220°C, which is about 40°C higher than that of conventional lead solder, and its soldering capacity is inferior to conventional one, it is apt to keep the soldering iron in contact with the PWB for longer time. This may cause land separation or may exceed the heat-resistive temperature of components. Use enough care to separate the soldering iron from the PWB when completion of soldering is confirmed.

Since lead-free solder includes a greater quantity of tin, the iron tip may corrode easily. Turn ON/OFF the soldering iron power frequently.

If different-kind solder remains on the soldering iron tip, it is melted together with lead-free solder. To avoid this, clean the soldering iron tip after completion of soldering work.

If the soldering iron tip is discolored black during soldering work, clean and file the tip with steel wool or a fine filer.

CAUTION FOR BATTERY REPLACEMENT

(Danish) ADVARSEL !
Lithiumbatteri – Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri
af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandoren.

(English) Caution !
Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type
recommended by the manufacturer.

Dispose of used batteries according to manufacturer's instructions.

(Finnish) VAROITUS
Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan
tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden
mukaisesti.

(French) ATTENTION
Il y a danger d'explosion si il y a remplacement incorrect
de la batterie. Remplacer uniquement avec une batterie du
même type ou d'un type équivalent recommandé par
le constructeur.

Mettre au rebut les batteries usagées conformément aux
instructions du fabricant.

(Swedish) VARNING
Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent
typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens
instruktion.

(German) Achtung
Explosionsgefahr bei Verwendung inkorrekt
er Batterien.
Als Ersatzbatterien dürfen nur Batterien vom gleichen Typ oder
vom Hersteller empfohlene Batterien verwendet werden.
Entsorgung der gebrauchten Batterien nur nach den vom
Hersteller angegebenen Anweisungen.

CAUTION FOR BATTERY DISPOSAL

(For USA, CANADA)

"BATTERY DISPOSAL"

THIS PRODUCT CONTAINS A LITHIUM PRIMARY
(MANGANESE DIOXIDE) MEMORY BACK-UP BATTERY
THAT MUST BE DISPOSED OF PROPERLY. REMOVE THE
BATTERY FROM THE PRODUCT AND CONTACT YOUR
LOCAL ENVIRONMENTAL AGENCIES FOR INFORMATION
ON RECYCLING AND DISPOSAL OPTIONS.

"TRAITEMENT DES PILES USAGÉES"

CE PRODUIT CONTIENT UNE PILE DE SAUVEGARDE DE
MÉMOIRE LITHIUM PRIMAIRE (DIOXYDE DE MANGANÈSE)
QUI DOIT ÊTRE TRAITÉE CORRECTEMENT. ENLEVEZ LA
PILE DU PRODUIT ET PRENEZ CONTACT AVEC VOTRE
AGENCE ENVIRONNEMENTALE LOCALE POUR DES
INFORMATIONS SUR LES MÉTHODES DE RECYCLAGE ET
DE TRAITEMENT.

