F-2205/AD-62

CONTENTS

1-1-1 Specifications

Finisher

Type .... Built-in
Number of trays .... 1 (intermediate tray)
Stapling limit .... A4/11" $\times$ 8^1/$_2$" or smaller: 30 sheets
Other sizes than above: 20 sheets
Power source .... Electrically connected to the copier
Dimensions .... 696 (W) $\times$ 618 (D) $\times$ 281 (H) mm
27^3/$_8$" (W) $\times$ 24^5/$_{16}$" (D) $\times$ 11^1/$_{16}$" (H)
Weight .... Approximately 11 kg/24.2 lbs

Duplex unit

Type .... Outboard
Paper .... Plain paper: 75 – 80 g/m^2
Special paper: colored paper
Paper sizes .... A3 – A5R, folio/11" $\times$ 17" – 5^1/$_2$" $\times$ 8^1/$_2$"
Power source .... Electrically connected to the copier
Dimensions .... 48 (W) $\times$ 450 (D) $\times$ 397 (H) mm
1^1/$_8$" (W) $\times$ 17^{11}/$_{16}$" (D) $\times$ 15^5/$_8$" (H)
Weight .... Approximately 3.3 kg/7.26 lbs

1-1-2 Part names and their functions

(1) Finisher
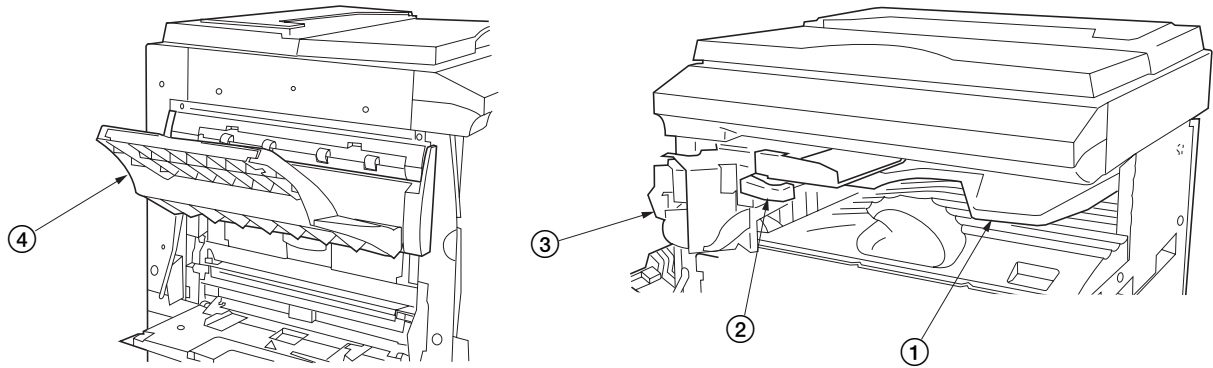
Figure 1-1-1

① Intermediate tray
② JAM release lever
③ Stapler
④ Eject tray

(2) Duplex unit
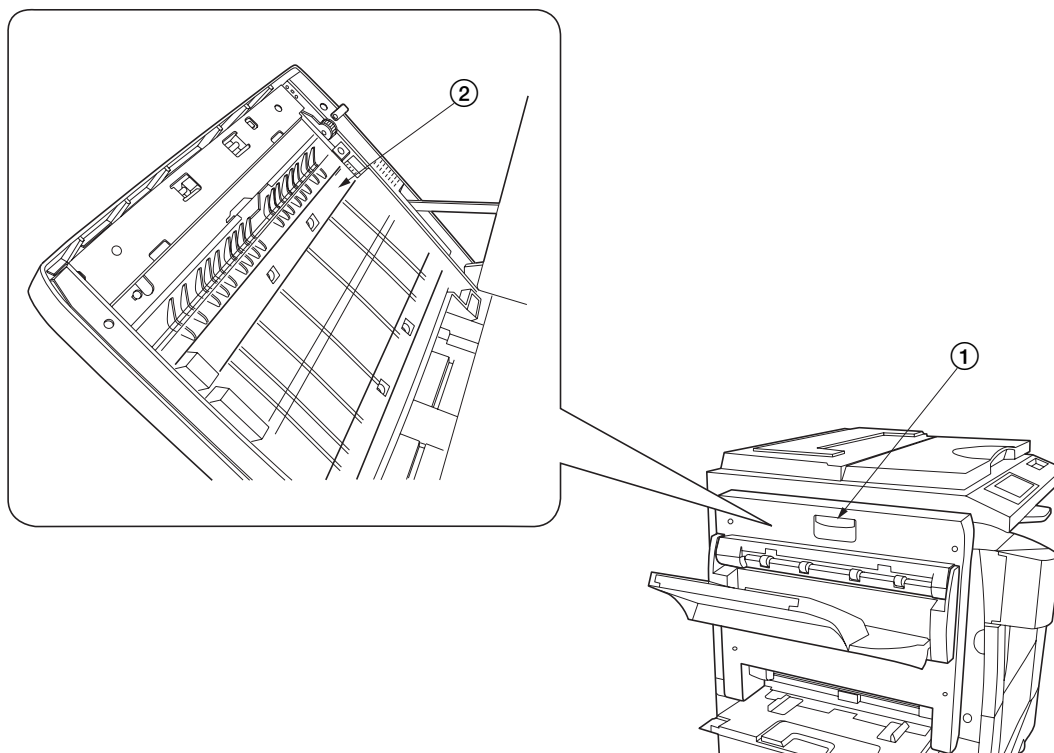
Figure 1-1-2

① Duplex lever
② Open/close guide

1-1-3   Machine cross section

(1) Finisher
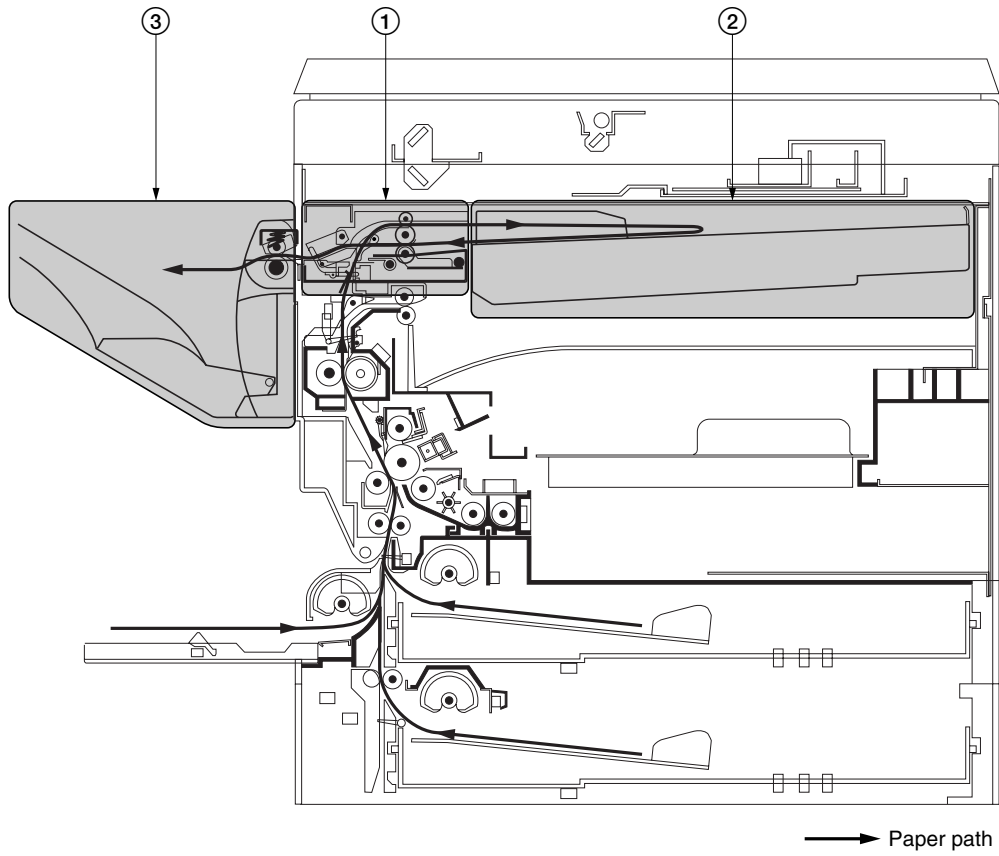
Figure 1-1-3   Machine cross section (finisher)

① Feedshift section
② Intermediate tray section
③ Eject section

(2) Duplex unit

Paper path
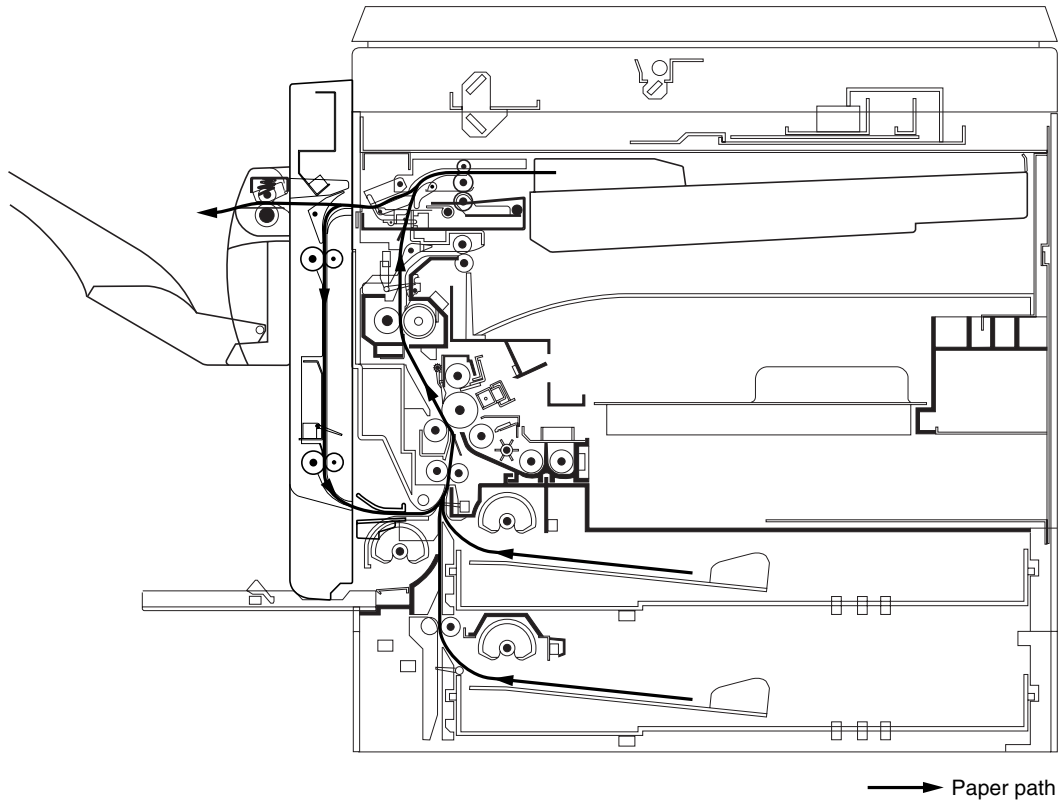
Figure 1-1-4   Machine cross section (duplex unit)

1-1-4 Drive system

(1) Finisher

Figure 1-1-5

① Paper conveying motor gear   ⑪ Gear 32
② Gear 18/38   ⑫ Stopper gear 26
③ Gear 18   ⑬ One-way gear 18 (rear)
④ Central gear   ⑭ Gear 21 (front)
⑤ Gear 15   ⑮ Central gear (middle)
⑥ Central gear (front)   ⑯ Gear 25
⑦ Gear 21 (rear)   ⑰ Gear 18
⑧ Lift clutch gear   ⑱ Gear 16
⑨ Clutch cam   ⑲ Gear 25
⑩ Stopper gear

(2) Duplex unit
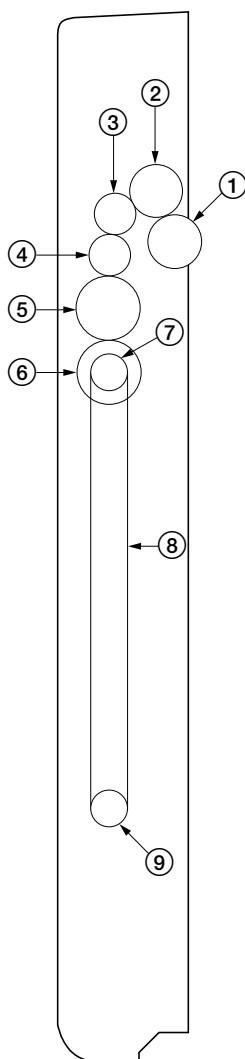
Figure 1-1-5

① Gear 20   ⑥ Gear 25
② Gear 20   ⑦ Pulley 20
③ Gear 16   ⑧ Duplex belt
④ Gear 16   ⑨ Pulley 20
⑤ Gear 25

1-2-1 Unpacking
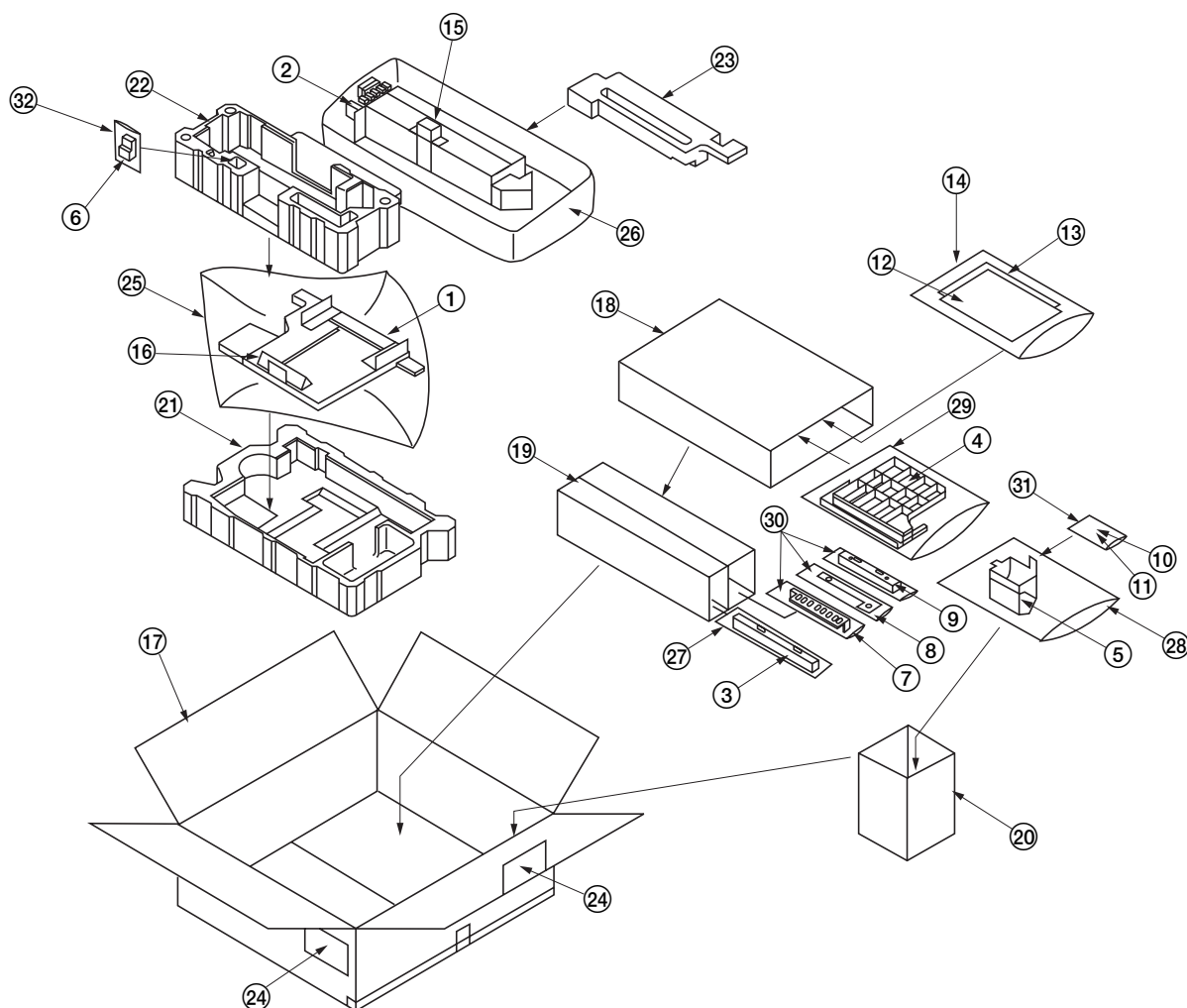
Figure 1-2-1   Unpacking (finisher)

① Intermediate tray unit
② Feedshift unit
③ Eject unit
④ Eject tray unit
⑤ Stapler cover
⑥ Staple cartridge
⑦ Upper paper conveying cover F
⑧ Upper eject cover F
⑨ Upper eject cover D
⑩ Two (2) cross-head bronze binding screws BVM3 × 05
⑪ Two (2) cross-head chrome TP-A screws M3 × 05
⑫ Installation manual
⑬ Instruction handbook
⑭ Plastic bag
⑮ Unit spacer
⑯ Cursor spacer

⑰ Outer case
⑱ Eject tray spacer
⑲ Spacer B
⑳ Spacer C
㉑ Intermediate tray pad
㉒ Stapler pad
㉓ Cover pad
㉔ Bar-code labels
㉕ Plastic sheet
㉖ Product cover
㉗ Air-padded bag
㉘ Plastic bag
㉙ Air-padded bag
㉚ Plastic bag
㉛ Plastic bag
㉜ Plastic bag
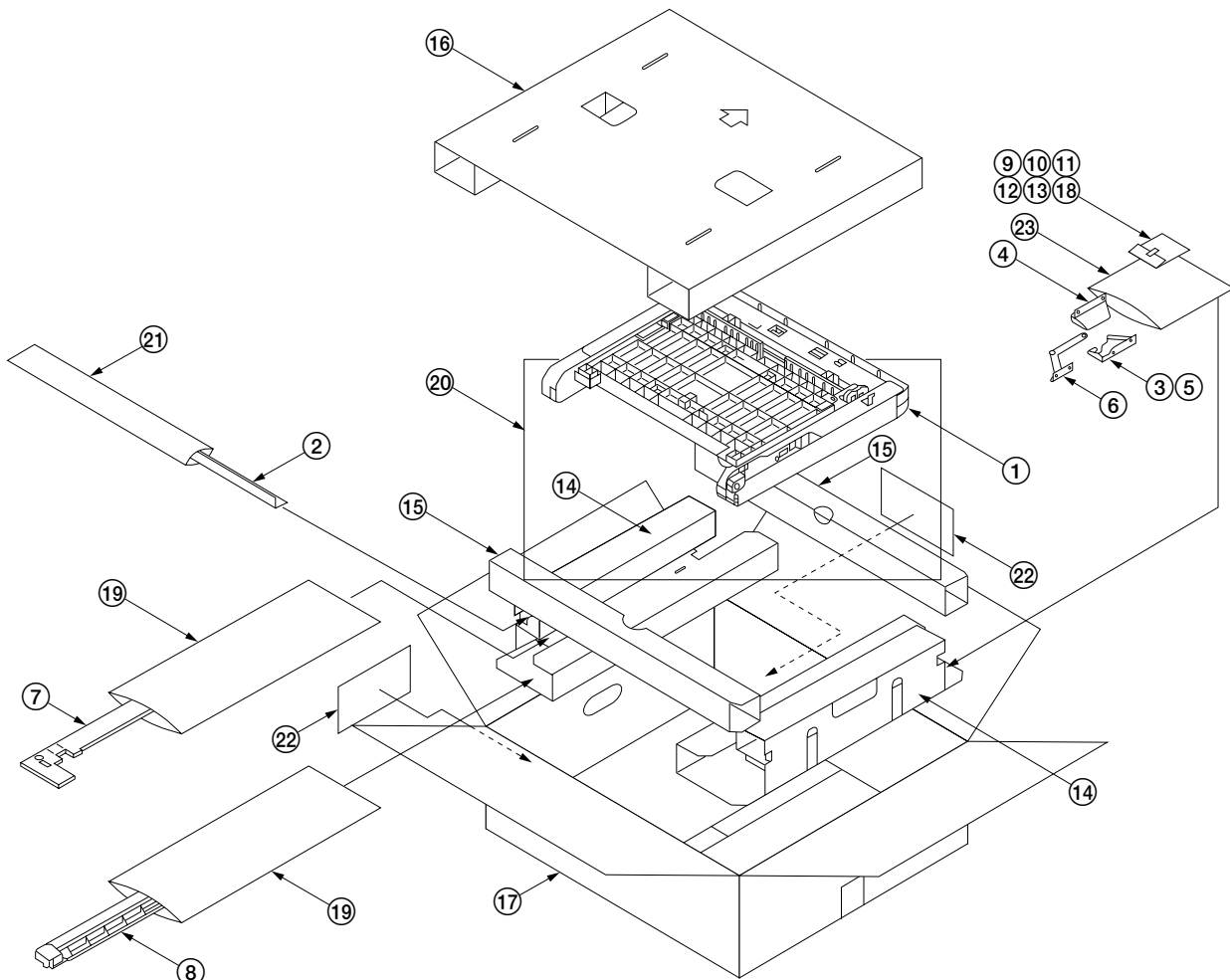
Figure 1-2-2　Unpacking (duplex unit)

1. Duplex unit
2. Duplex joint
3. Front duplex fulcrum plate
4. Rear duplex fulcrum plate
5. Front fulcrum hook
6. Duplex stopper
7. Left cover
8. Entry guide
9. Two (2) stoppers 5
10. Seven (7) cross-head chrome binding screws M3 × 14
11. One (1) cross-head chrome TP-A screw M3 × 05
12. One (1) cross-head tap-tight P chrome TP-A screw M3 × 08

13. One (1) cross-head tap-tight P chrome TP-A screw M4 × 12
14. Bottom pads
15. Spacers
16. Upper pad
17. Outer case
18. Plastic bag
19. Plastic bag
20. Product cover
21. Air-padded bag
22. Bar-code label
23. Air-padded bag

1-3-1 Paper misfeed detection

(1) Paper misfeed indication
When paper jams, the machine immediately stops operation and the occurrence of a paper jam is indicated on the copier operation panel.
To remove the jammed paper, lower the intermediate tray or open the duplex unit.
To reset the paper misfeed detection, detach and refit the intermediate tray to turn the tray open/close switch off and on or open and close the duplex unit to turn the duplex open/close switch off and on.

1-3
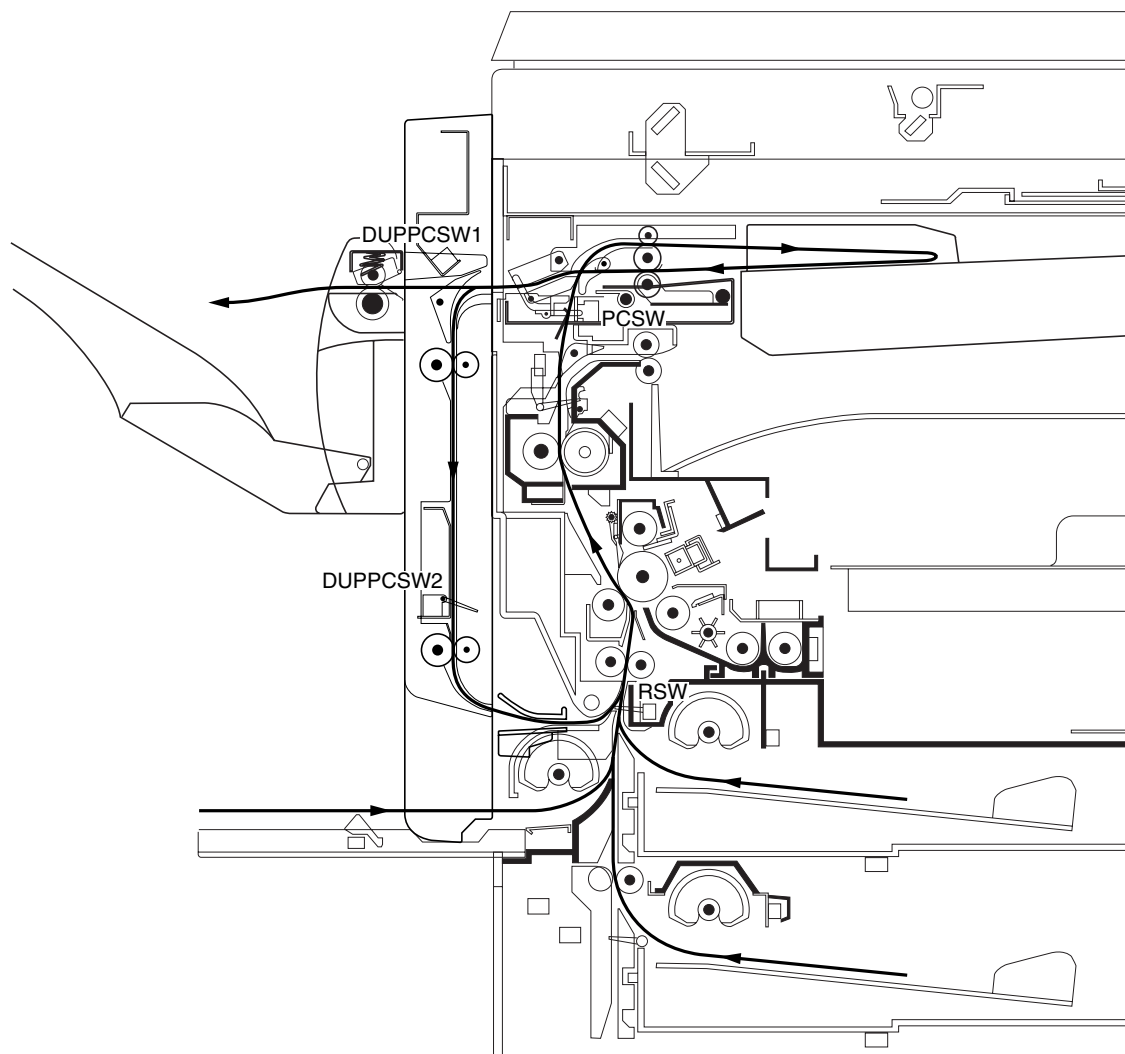
Figure 1-3-1 Paper misfeed detection

(2) Paper misfeed detection condition

(2-1) Finisher
• Jam between the finisher and copier (jam code 80)
  No signal indicating the completion of paper ejection is output from the finisher within 15 s of the paper conveying switch (PCSW) turning off.

• Jam during batch ejection standby (jam code 81)
  No signal requesting batch ejection is output from the finisher within 15 s of the ejection of the last sheet to the intermediate tray.

• Jam during paper conveying for batch ejection 1 (jam code 82)
  When ejecting a stack of paper, the paper conveying switch (PCSW) does not turn on within 1250 ms of the start of forward rotation of the paper conveying motor (PCM).

PCM		Off
PCM	Fwd. rotation	On
PCSW		Off
PCSW	1250 ms	On
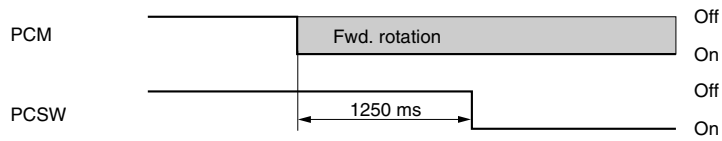
Timing chart 1-3-1

When ejecting a stack of paper, the paper conveying switch (PCSW) does not turn off within 6320 ms of turning on.

| PCSW | 6320 ms | Off |
| PCSW | | On |
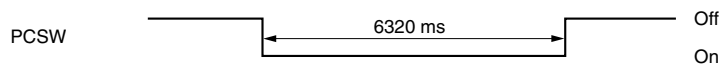
Timing chart 1-3-2

• Jam during paper conveying for batch ejection 2 (jam code 83)
  When ejecting a stack of paper, duplex paper conveying switch 1 (DUPPCSW1) does not turn on within 1250 ms of the paper conveying switch (PCSW) turning on.

PCSW		Off
PCSW		On
DUPPCSW1	1250 ms	Off
DUPPCSW1		On
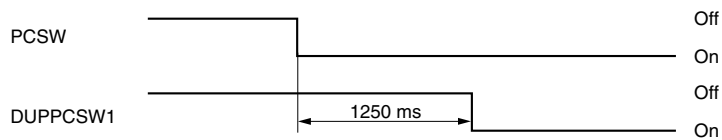
Timing chart 1-3-3

When ejecting a stack of paper, duplex paper conveying switch 1 (DUPPCSW1) does not turn off within 1640 ms of turning on.

| DUPPCSW1 | 1640 ms | Off |
| DUPPCSW1 | | On |
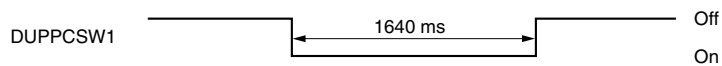
Timing chart 1-3-4

(2-2) Duplex unit

• Jam in feedshift section (jam code 51)

Duplex paper conveying switch 1 (DUPPCSW1) does not turn on within 1640 ms of the start of reverse rotation of the paper conveying motor (PCM).

		Off
PCM	Rev. rotation	
		On
		Off
DUPPCSW1	←— 1640 ms —→	
		On
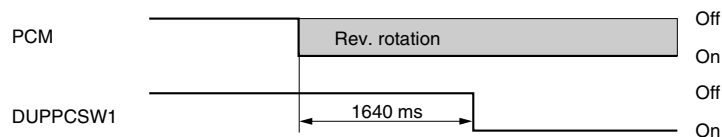
Timing chart 1-3-5

• Jam in duplex paper conveying section 1 (jam code 60)

Duplex paper conveying switch 2 (DUPPCSW2) does not turn on within 3360 ms of duplex paper conveying switch 1 (DUPPCSW1) turning on.

		Off
DUPPCSW1		
		On
		Off
DUPPCSW2	←— 3360 ms —→	
		On
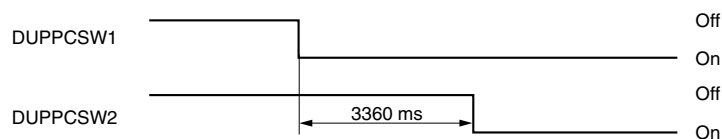
Timing chart 1-3-6

• Jam in duplex paper conveying section 2 (jam code 61)

Duplex paper conveying switch 2 (DUPPCSW2) does not turn off within 3360 ms of duplex paper conveying switch 1 (DUPPCSW1) turning off.

		Off
DUPPCSW1		
		On
		Off
DUPPCSW2	←— 3360 ms —→	
		On
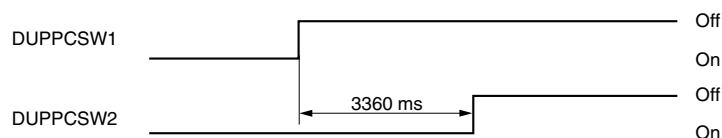
Timing chart 1-3-7

The registration switch (RSW) of the copier does not turn on within 3300 ms of duplex paper conveying switch 2 (DUPPCSW2) turning on.

		Off
DUPPCSW2		
		On
		Off
RSW (copier)	←— 3300 ms —→	
		On
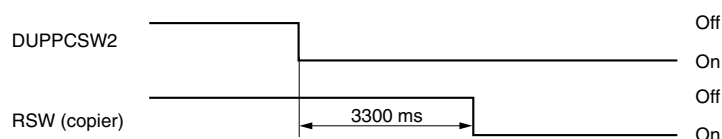
Timing chart 1-3-8

(3) Paper misfeeds

(3-1) Finisher

Problem	Causes	Check procedures/corrective measures
(1) Paper jams in the finisher when the main switch is turned on.	A piece of paper torn from copy paper is caught around the paper conveying switch.	Remove any found.
	Defective paper conveying switch.	With 5 V DC present at CN4-9 on the main PCB, check if CN4-10 on the main PCB remains low when the paper conveying switch is turned on and off. If it does, replace the paper conveying switch.
(2) Paper jams in the finisher during copying (jam during paper conveying for batch ejection 1).	Defective paper conveying switch.	With 5 V DC present at CN4-9 on the main PCB, check if CN4-10 on the main PCB remains high or low when the paper conveying switch is turned on and off. If it does, replace the paper conveying switch.
	Check if the feedshift roller or press roller is deformed.	Check visually and replace the pulley or roller if deformed.
(3) Paper jams in the finisher during copying (jam during paper conveying for batch ejection 2).	Defective duplex paper conveying switch 1 in the duplex unit.	With 5 V DC present at CN5-11 on the copier main PCB, check if CN5-10 on the copier main PCB remains high or low when duplex paper conveying switch 1 is turned on and off. If it does, replace duplex paper conveying switch 1.
	Check if the eject pulley or eject roller is deformed.	Check visually and replace the pulley or roller if deformed.

(3-2) Duplex unit

Problem	Causes	Check procedures/corrective measures
(1) Paper jams in the duplex unit when the main switch is turned on.	A piece of paper torn from copy paper is caught around duplex paper conveying switch 1 or 2.	Remove any found.
	Defective duplex paper conveying switch 1.	With 5 V DC present at CN5-11 on the copier main PCB, check if CN5-10 on the main PCB remains low when duplex paper conveying switch 1 is turned on and off. If it does, replace duplex paper conveying switch 1.
	Defective duplex paper conveying switch 2.	With 5 V DC present at CN5-8 on the copier main PCB, check if CN5-7 on the main PCB remains low when duplex paper conveying switch 2 is turned on and off. If it does, replace duplex paper conveying switch 2.
(2) Paper jams in the feedshift section during copying (jam in feedshift section).	Defective duplex paper conveying switch 1.	With 5 V DC present at CN5-11 on the copier main PCB, check if CN5-10 on the main PCB remains high when duplex paper conveying switch 1 is turned on and off. If it does, replace duplex paper conveying switch 1.
	Check if the feedshift pulley or feedshift roller is deformed.	Check visually and replace the pulley or roller if deformed.
(3) Paper jams in the duplex unit during copying (jam in duplex paper conveying section 1).	Defective duplex paper conveying switch 2.	With 5 V DC present at CN5-8 on the copier main PCB, check if CN5-7 on the main PCB remains high when duplex paper conveying switch 2 is turned on and off. If it does, replace duplex paper conveying switch 2.
	Check if the duplex roller or upper duplex roller is deformed.	Check visually and replace the pulley or roller if deformed.
(4) Paper jams in the duplex unit during copying (jam in duplex paper conveying section 2).	Defective duplex paper conveying switch 2.	With 5 V DC present at CN5-8 on the copier main PCB, check if CN5-7 on the main PCB remains low when duplex paper conveying switch 2 is turned on and off. If it does, replace duplex paper conveying switch 2.
	Defective copier registration switch.	With 5 V DC present at CN3-6 on the copier main PCB, check if CN3-7 on the main PCB remains high when the registration switch is turned on and off. If it does, replace the registration switch.
	Check if the duplex pulley or lower duplex roller is deformed.	Check visually and replace the pulley or roller if deformed.

1-3

1-3-2 Self-diagnosis

(1) Self-diagnostic function
This unit is equipped with a self-diagnostic function. When a problem is detected, copying is disabled and the problem displayed as a code consisting of "C" followed by a number between 034 and 821, indicating the nature of the problem. A message is also displayed requesting the user to call for service.
After removing the problem, the self-diagnostic function can be reset by turning the tray open/close switch or copier safety switch 1, 2 or 3 off and back on.

1-3

1-3-2 Self-diagnosis

(2) Self-diagnostic codes

Code	Contents	Remarks	
		Causes	**Check procedure/corrective measures**
C034	**Finisher communication problem** During the serial communication between the copier and finisher, when there is no reply to the command from the copier from the finisher, serial communication does not recover after 5 retries.	The connector makes poor contact.	Check the connection of connector CN27 on the copier main PCB and CN1 on the finisher main PCB, and the continuity across the connector terminals. Remedy or replace if necessary.
		Defective copier main PCB.	Replace the copier main PCB and check for correct operation.
		Defective finisher main PCB.	Replace the finisher main PCB and check for correct operation.
C817	**Front side registration motor problem** When the side registration front home position sensor is on during initialization, the sensor does not turn off within 570 ms of the start of initialization. When the side registration front home position sensor is off during initialization, the sensor does not turn on within 3180 ms of the start of initialization.	The front side registration motor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		Defective front side registration motor.	Replace the front side registration motor and check for correct operation.
		The side registra-tion front home position sensor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		Defective side registration front home position sensor.	Replace the side registration front home position sensor and check for correct operation.
		Defective finisher main PCB.	Replace the finisher main PCB and check for correct operation.
C818	**Rear side registration motor problem** When the side registration rear home position sensor is on during initialization, the sensor does not turn off within 570 ms of the start of initialization. When the side registration rear home position sensor is off during initialization, the sensor does not turn on within 2880 ms of the start of initialization.	The rear side registration motor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		Defective rear side registration motor.	Replace the rear side registration motor and check for correct operation.
		The side registra-tion rear home position sensor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		Defective side registration rear home position sensor.	Replace the side registration rear home position sensor and check for correct operation.
		Defective finisher main PCB.	Replace the finisher main PCB and check for correct operation.

1-3

1-3

Code	Contents	Remarks	
		Causes	**Check procedure/corrective measures**
C819	**Trailing edge registration motor problem** When the trailing edge registration home position sensor is on during initialization, the sensor does not turn off within 570 ms of the start of initialization. When the trailing edge registration home position sensor is off during initialization, the sensor does not turn on within 4550 ms of the start of initialization.	The trailing edge registration motor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		Defective trailing edge registration motor.	Replace the trailing edge registration motor and check for correct operation.
		The trailing edge registration home position sensor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		Defective trailing edge registration home position sensor.	Replace the trailing edge registration home position sensor and check for correct operation.
		Defective finisher main PCB.	Replace the finisher main PCB and check for correct operation.
C821	**Stapler motor problem** When the stapler home position sensor is off during stapler initialization, the sensor does not turn on within 600 ms of the start of the stapler motor forward rotation and then it fails to turn on again within 600 ms of the start of the stapler motor reverse rotation. The stapler home position sensor does not turn off within 200 ms of the start of stapling. During stapling, the stapler home position sensor does not turn on within 600 ms of turning off. The stapler home position sensor does not turn off within 200 ms of the start of self-priming. During self-priming, the stapler home position sensor does not turn on within 600 ms of turning off.	The stapler motor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, repair or replace the cable.
		The stapler malfunctions. a) The stapler is blocked with a staple. b) The stapler is broken.	a) Remove the staple cartridge and check the cartridge and the stapling section of the stapler. b) Replace the stapler and check for correct operation.
		Defective finisher main PCB.	Replace the finisher main PCB and check for correct operation.

1-3-3 Electrical problems

(1) Finisher

Problem	Causes	Check procedures/corrective measures
(1) The paper conveying motor does not operate.	Broken paper conveying motor coil.	Check for continuity across the coil. If none, replace the paper conveying motor.
	Poor contact of the paper conveying motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective finisher main PCB.	Check if a motor drive coil energization signal is output at CN9-9, CN9-10, CN9-11 and CN9-12 on the finisher main PCB. If not, replace the finisher main PCB.
(2) The feedshift solenoid does not operate.	Broken feedshift solenoid coil.	Check for continuity across the coil. If none, replace the feedshift solenoid.
	Poor contact of the feedshift solenoid connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective finisher main PCB.	Check if CN4-2 and CN4-4 on the finisher main PCB go low. If not, replace the finisher main PCB.
(3) The switchback solenoid does not operate.	Broken switchback solenoid coil.	Check for continuity across the coil. If none, replace the switchback solenoid.
	Poor contact of the switchback solenoid connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective finisher main PCB.	Check if CN4-6 and CN4-8 on the finisher main PCB go low. If not, replace the finisher main PCB.
(4) The pickup solenoid does not operate.	Broken pickup solenoid coil.	Check for continuity across the coil. If none, replace the pickup solenoid.
	Poor contact of the pickup solenoid connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective finisher main PCB.	Check if CN4-7 on the finisher main PCB goes low. If not, replace the finisher main PCB.
(5) The front side registration motor does not operate.	Broken front side registration motor coil.	Check for continuity across the coil. If none, replace the front side registration motor.
	Poor contact of the front side registration motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective finisher main PCB.	Check if a motor drive coil energization signal is output at CN5-1, CN5-3, CN5-4 and CN5-5 on the finisher main PCB. If not, replace the finisher main PCB.
(6) Rear side registration motor does not operate.	Broken rear side registration motor coil.	Check for continuity across the coil. If none, replace the rear side registration motor.
	Poor contact of the rear side registration motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective finisher main PCB.	Check if a motor drive coil energization signal is output at CN5-6, CN5-8, CN5-9 and CN5-10 on the finisher main PCB. If not, replace the finisher main PCB.

1-3

Problem	Causes	Check procedures/corrective measures
(7) Trailing edge registration motor does not operate.	Broken trailing edge registration motor coil.	Check for continuity across the coil. If none, replace the trailing edge registration motor.
	Poor contact of the trailing edge registration motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective finisher main PCB.	Check if a motor drive coil energization signal is output at CN6-1, CN6-2, CN6-3 and CN6-4 on the finisher main PCB. If not, replace the finisher main PCB.

1-3

(2) Duplex unit

Problem	Causes	Check procedures/corrective measures
(1) The duplex feedshift solenoid does not operate.	Broken duplex feedshift solenoid coil.	Check for continuity across the coil. If none, replace the duplex feedshift solenoid.
	Poor contact of the duplex feedshift solenoid connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective copier main PCB.	Run maintenance item U033 and check if CN5-3 and CN5-4 on the copier main PCB go low. If not, replace the main PCB.

1-3-4 Mechanical problems

(1) Finisher

Problem	Causes/check procedures	Corrective measures
(1) Paper jams.	Check if the contact between the feedshift pulley and feedshift roller is correct.	Check and remedy.
	Check if the contact between the feedshift roller and press roller is correct.	Check and remedy.
(2) Abnormal noise is heard.	Check if the rollers and gears operate smoothly.	Grease the bushings and gears.

1-3

(2) Duplex unit

Problem	Causes/check procedures	Corrective measures
(1) Paper jams.	Check if the duplex pulley, upper duplex roller or lower duplex roller is deformed.	Check visually and replace the pulley or roller if deformed.
(2) Abnormal noise is heard.	Check if rollers and gears operate smoothly.	Apply grease to the bushings and gears.

1-3

1-4-1 Precautions for assembly and disassembly

(1) Precautions
• Be sure to turn the main switch off and disconnect the power plug before starting disassembly.
• When handling PCBs, do not touch connectors with bare hands or damage the board.
• Do not touch any PCB containing ICs with bare hands or any object prone to static charge.
• Use the following testers when measuring voltages:
  Hioki 3200
  Sanwa MD-180C
  Sanwa YX-360TR
  Beckman TECH300
  Beckman DM45
  Beckman 330*
  Beckman 3030*
  Beckman DM850*
  Fluke 8060A*
  Arlec DMM1050
  Arlec YF1030C
  * Capable of measuring RMS values.
• Prepare the following as test originals:
  1. NTC (new test chart)
  2. NPTC (newspaper test chart)

1-4

1-4-2 Finisher

(1) Adjusting the positions of the front side registration cursor, rear side registration cursor and trailing edge registration cursor (reference)

Perform the following adjustment if paper registration is poor or stapling is made outside the specified area.

Procedure

1-4

Start

Make a test copy in staple-sort mode.

Is the paper registration good? — No

Yes

Is the stapling position correct? See Figure 1-4-1. — No

Yes

End

Enter maintenance mode.

Enter 246 using the numeric keys.

Press the start key.

Select the item to be adjusted using the cursor up/down keys.

Change the setting using the cursor left/right keys.

Press the start key.

The new setting is stored.

Press the stop/clear key.

Exit maintenance mode.

Stapler

5 ± 2.5 mm

5 ± 2.5 mm

Figure 1-4-1 Stapling position

ADJUST FRONT JOGGER: Stop position of the front side registration cursor
ADJUST REAR JOGGER: Stop position of the rear side registration cursor
ADJUST END JOGGER: Stop position of the trailing edge registration cursor

Setting range: 0 to 8
Reference: 4
Increasing the value moves the front or rear side registration cursor or trailing edge registration cursor outward (a); decreasing the value moves each cursor inward (e). See Figure 1-4-2.

Rear side registration cursor

Trailing edge registration cursor

Front side registration cursor
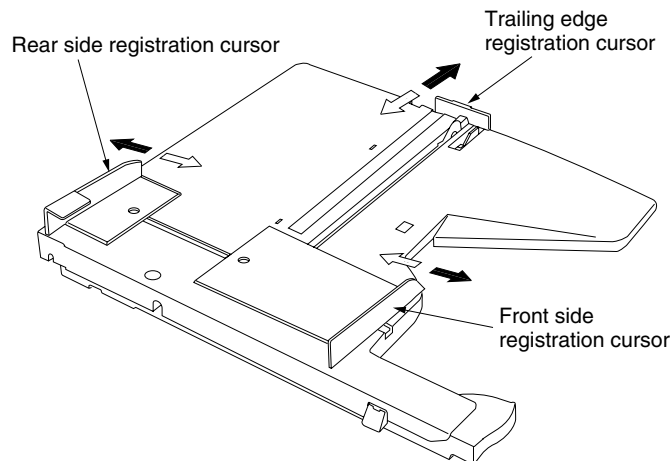
Figure 1-4-2

(2) Cleaning the stapler

During periodic maintenance, remove all the staples remaining inside the machine due to failure of stapling.

Procedure

1. Open the front cover of the copier.
2. Remove the staple cartridge.
3. Remove the screw securing the stapler cover and then the cover.
4. Remove the staples attracted to the magnet on the inside of the stapler cover.
5. Refit all the removed parts.
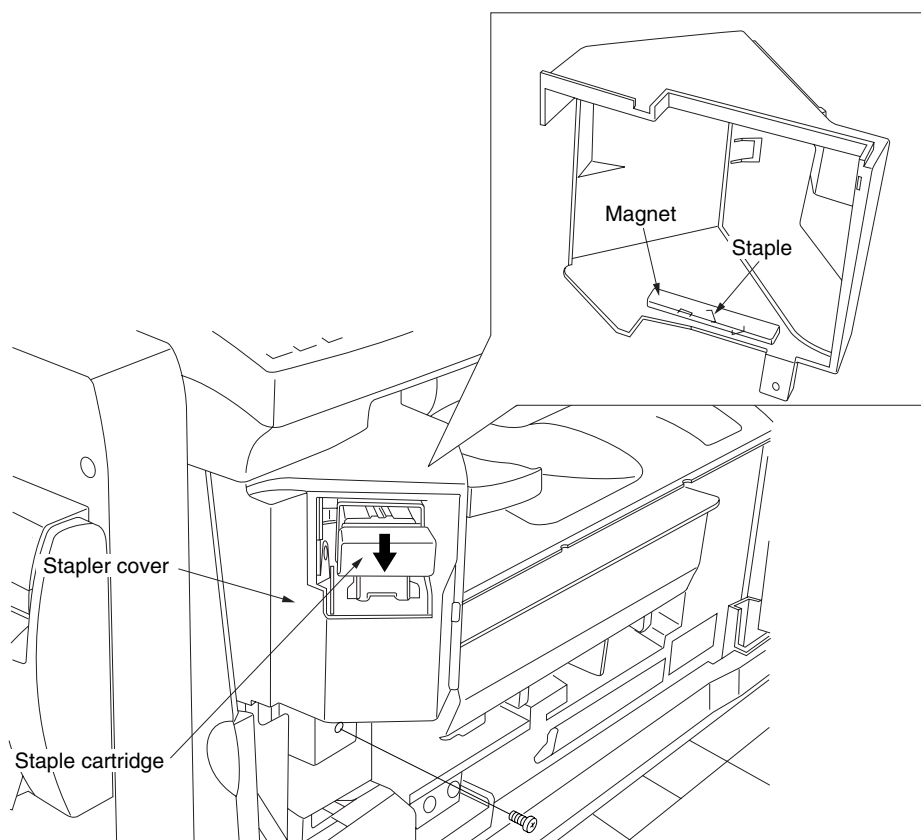
Figure 1-4-3

(3) Adjusting the tension of the front and rear side registration belts
Adjust the tension of each belt during periodic maintenance.

Procedure
1. Remove the intermediate tray unit from the copier.
2. Loosen the tension adjustment screws for the front and rear side registration belts. The tension of the tension spring will be applied to the belts.
3. Retighten the screws. Each belt will be secured with the tension applied.

Intermediate tray unit

For adjusting the tension of the front side registration belt

For adjusting the tension of the rear side registration belt
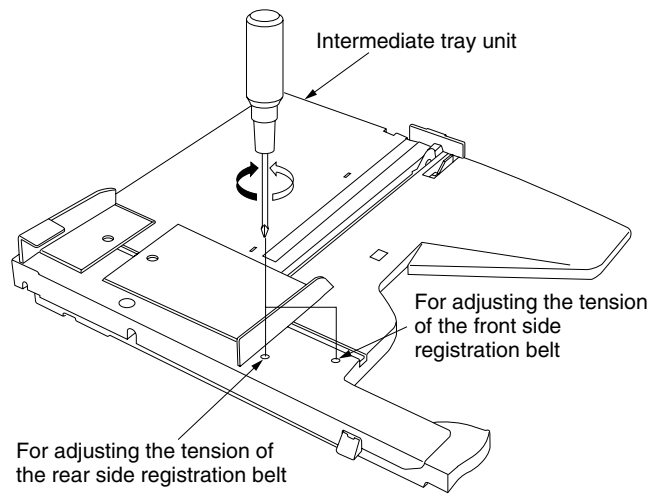
Figure 1-4-4

1-4

1-4-3 Duplex unit

(1) Adjusting the margin for printing
Perform the following adjustment if the printer leading edge margin for duplex copying (second face) is not correct.

Procedure
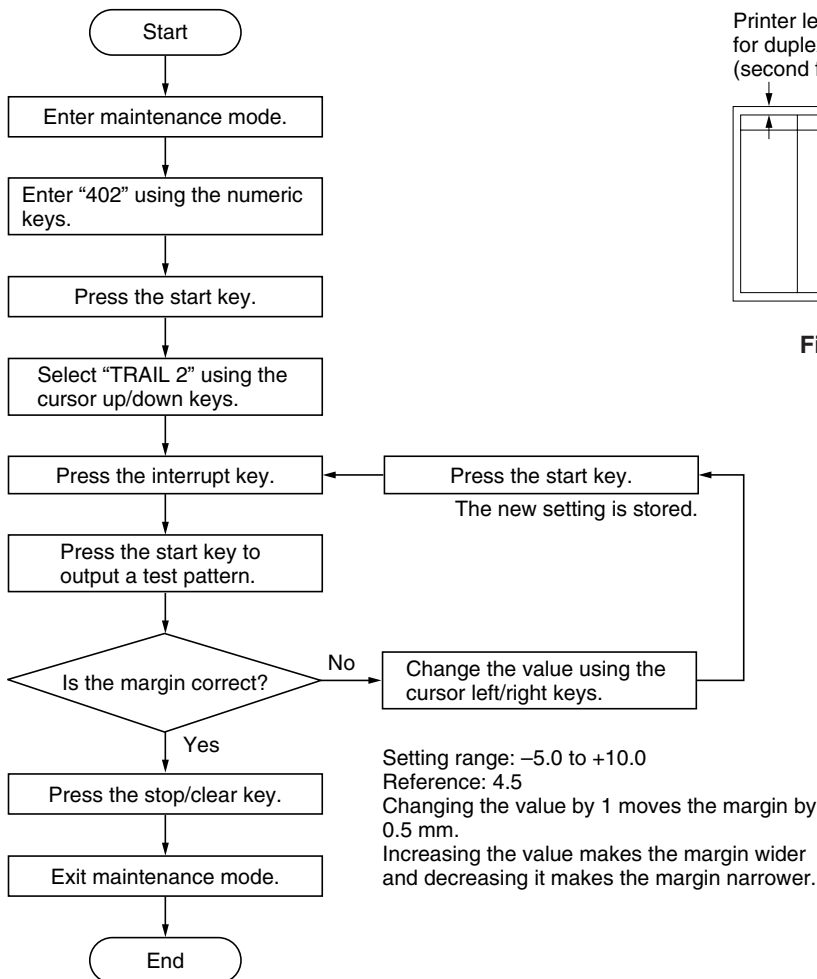
Printer leading edge margin
for duplex copying
(second face, 3 ± 2.5 mm)

Figure 1-4-5

```
        Start

Enter maintenance mode.

Enter "402" using the numeric
keys.

Press the start key.

Select "TRAIL 2" using the
cursor up/down keys.

Press the interrupt key.  ◄──  Press the start key.
                               The new setting is stored.

Press the start key to
output a test pattern.

Is the margin correct?  ──No──►  Change the value using the
                                  cursor left/right keys.

        Yes

Press the stop/clear key.

Exit maintenance mode.

        End
```

Setting range: –5.0 to +10.0
Reference: 4.5
Changing the value by 1 moves the margin by
0.5 mm.
Increasing the value makes the margin wider
and decreasing it makes the margin narrower.

(2) Adjusting the amount of slack at the registration roller
Perform the following adjustment if the leading edge of the copy image is missing or varies randomly, or if the copy paper is Z-folded during duplex copying.

Procedure

Original Copy example 1 Copy example 2

Figure 1-4-6

```
        ( Start )
           │
  Enter maintenance mode.
           │
  Enter "051" using the numeric
  keys.
           │
  Press the start key.
           │
  Select "DUPLEX" using the
  cursor up/down keys.
           │
  Press the interrupt key. ◄──────── Press the start key. ◄──┐
           │                          The new setting is stored. │
  Make a test copy in duplex mode.                             │
           │                                                    │
      Is the leading                                           │
   edge of the image missing ── Yes ──► Increase the value using the ──┤
   or varying randomly                  cursor right key.          │
   (copy example 1)?                                              │
           │ No                                                   │
      Is the copy paper                                          │
   Z-folded (copy example 2)? ── Yes ──► Decrease the value using the ──┘
           │                              cursor left key.
           │ No
  Press the stop/clear key.
           │
  Exit maintenance mode.
           │
        ( End )
```
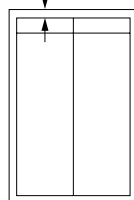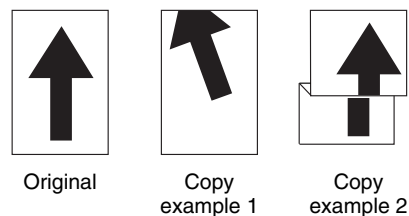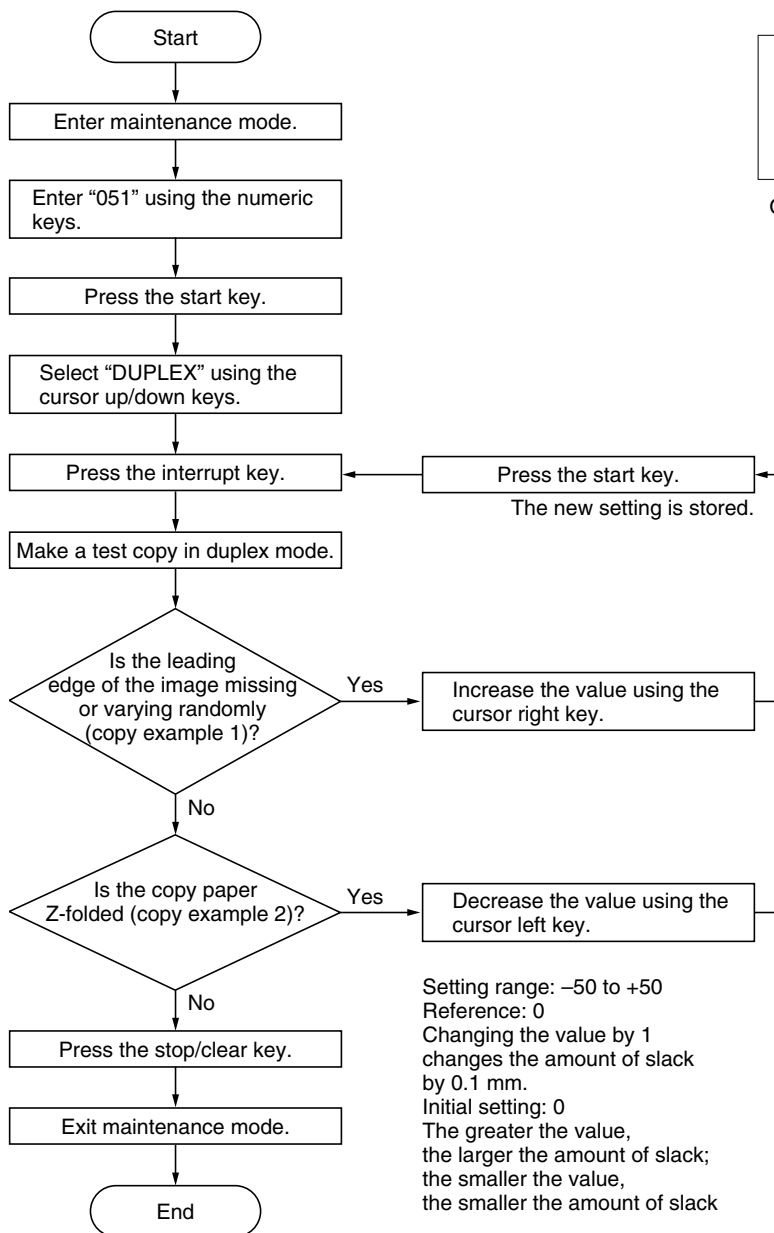
Setting range: –50 to +50
Reference: 0
Changing the value by 1 changes the amount of slack by 0.1 mm.
Initial setting: 0
The greater the value, the larger the amount of slack; the smaller the value, the smaller the amount of slack

1-4

(3) Adjusting the center line of image printing
Make the following adjustment if there is a regular error between the center lines of the copy image and original when copying using the duplex unit.

Procedure

Start

Enter maintenance mode.

Enter "034" using
the numeric keys.

Press the start key.

Select "ADJ. LSU OUT TIMING"
using the cursor up/down keys
and press the start key.

Select "LSU DUP" using
the cursor up/down keys.

Press the interrupt key. ← Press the start key.
The new setting is stored.

Press the start key to
output a test pattern.

Is the image correct? —No→ For output example 1, decrease
the value using the cursor left key.
For output example 2, increase
the value using the cursor right
key.

Yes

Press the stop/clear key
to exit maintenance mode.

Setting range: –5.0 to +5.0
Changing the value by 1 moves the
center line by 0.1 mm.
Initial setting: 0

End

Center line of printing

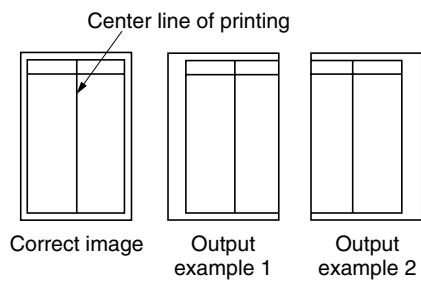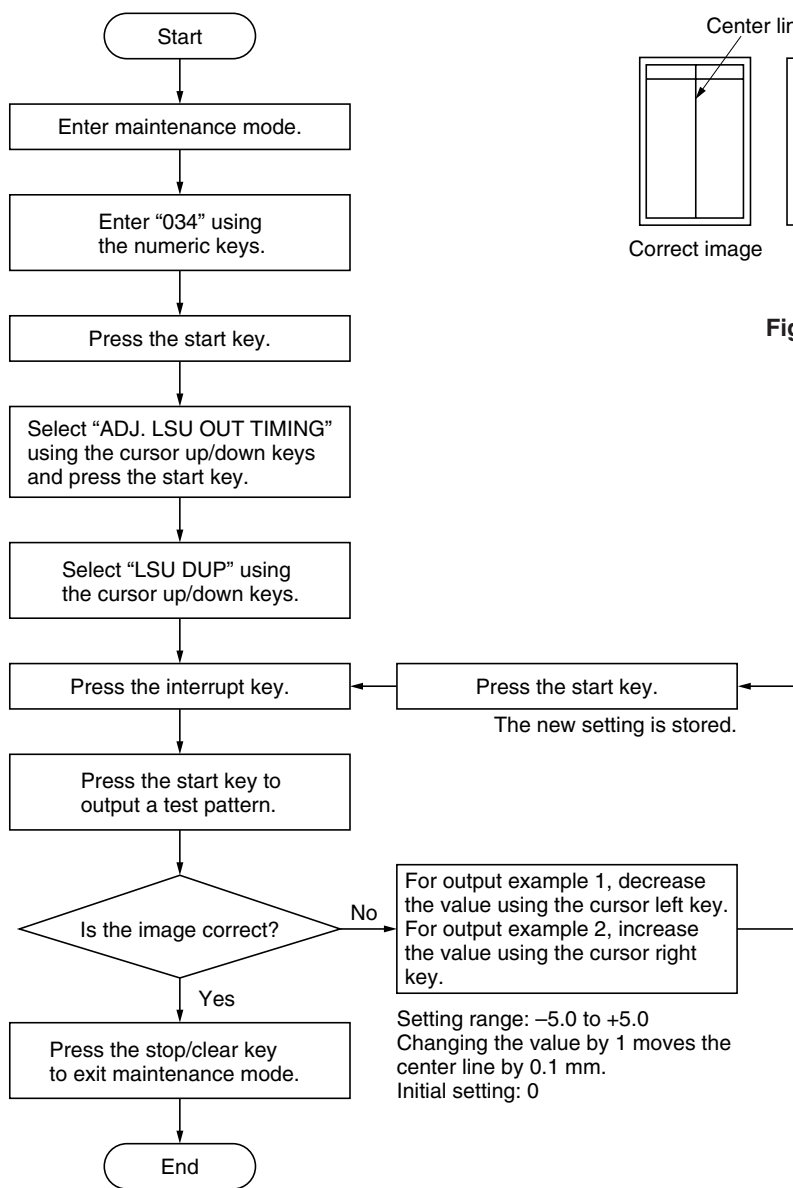Correct image   Output
example 1   Output
example 2

Figure 1-4-7

1-4

2-1-1 Feedshift section

The feedshift section consists of the components shown in Figure 2-1-1. It switches the path for the paper conveyed from the copier in sort and duplex modes.
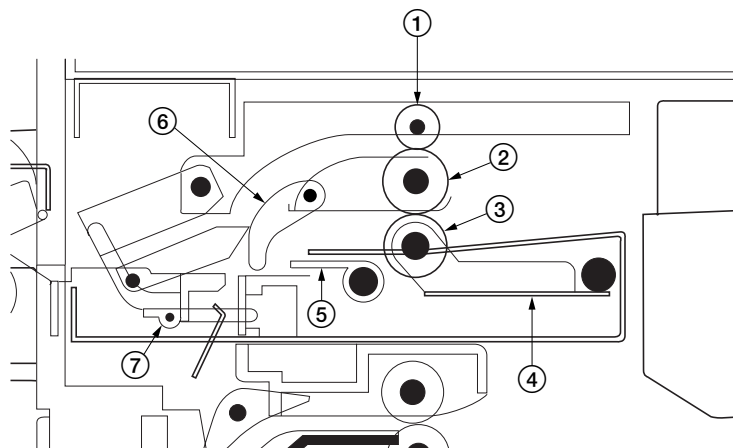

Figure 2-1-1 Feedshift section

① Feedshift pulley   ⑤ Stopper
② Feedshift roller   ⑥ Feedshift claw
③ Press roller   ⑦ Paper conveying switch (PCSW)
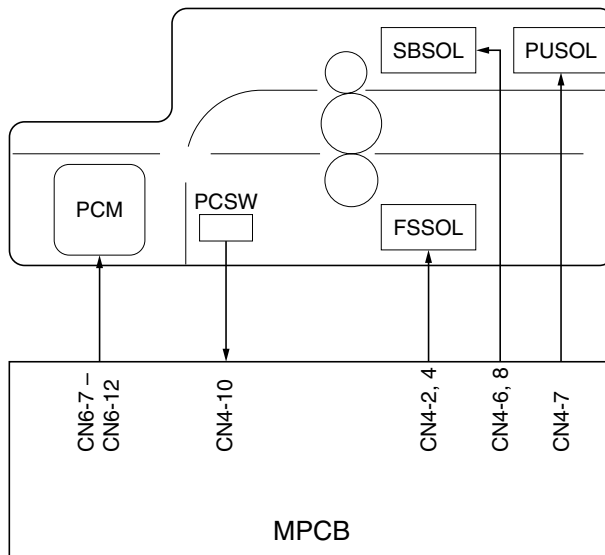④ Press roller lift

2-1

Figure 2-1-2 Feedshift section block diagram

(1) Paper conveying operation in sort mode

When a copy is made in the sort mode, the feedshift solenoid (FSSOL) turns on and the feedshift guide of the copier operates to switch the paper path to the feedshift section. The switchback solenoid (SBSOL) then turns on to lower the separation claw and the paper is conveyed to the intermediate tray by the feedshift roller. When the trailing edge registration cursor of the intermediate tray shifts the paper stocked in the intermediate tray to the stopper, the pickup solenoid (PUSOL) turns on to lift the press roller and release the stopper, and the switchback solenoid (SBSOL) turns off to lift the feedshift claw. The stack of paper on the intermediate tray is then ejected to the eject tray by the feedshift roller.

2-1
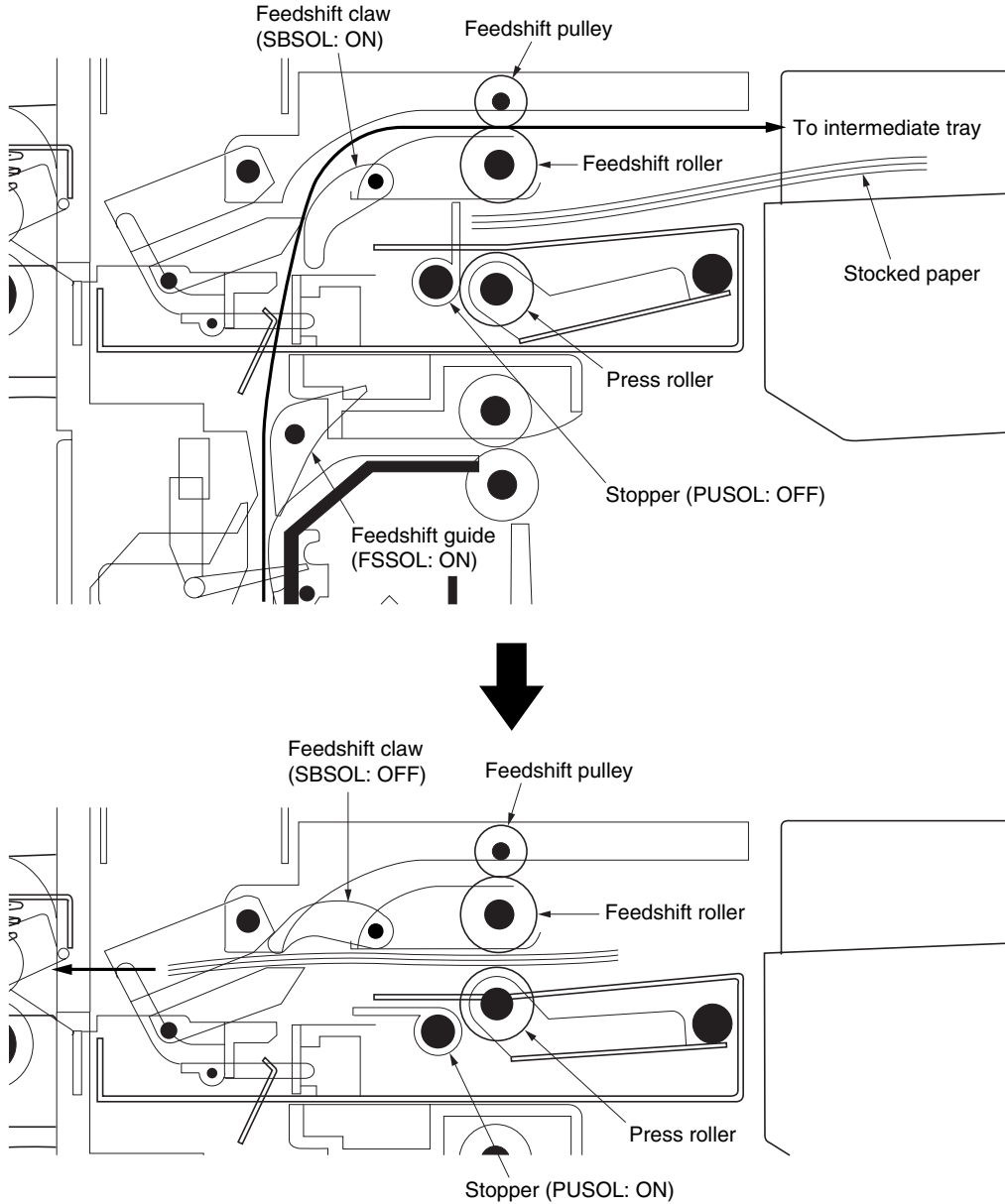
Figure 2-1-3

(2) Switchback operation in duplex mode

In duplex mode, when the rear face of the paper is copied, the paper is conveyed to the feedshift section in the same manner as in sort mode. When the trailing edge of the paper passes the paper conveying switch (PCSW), the paper conveying motor (PCM) reverses, rotating the feedshift roller in the reverse direction to switch back the paper into the duplex unit.
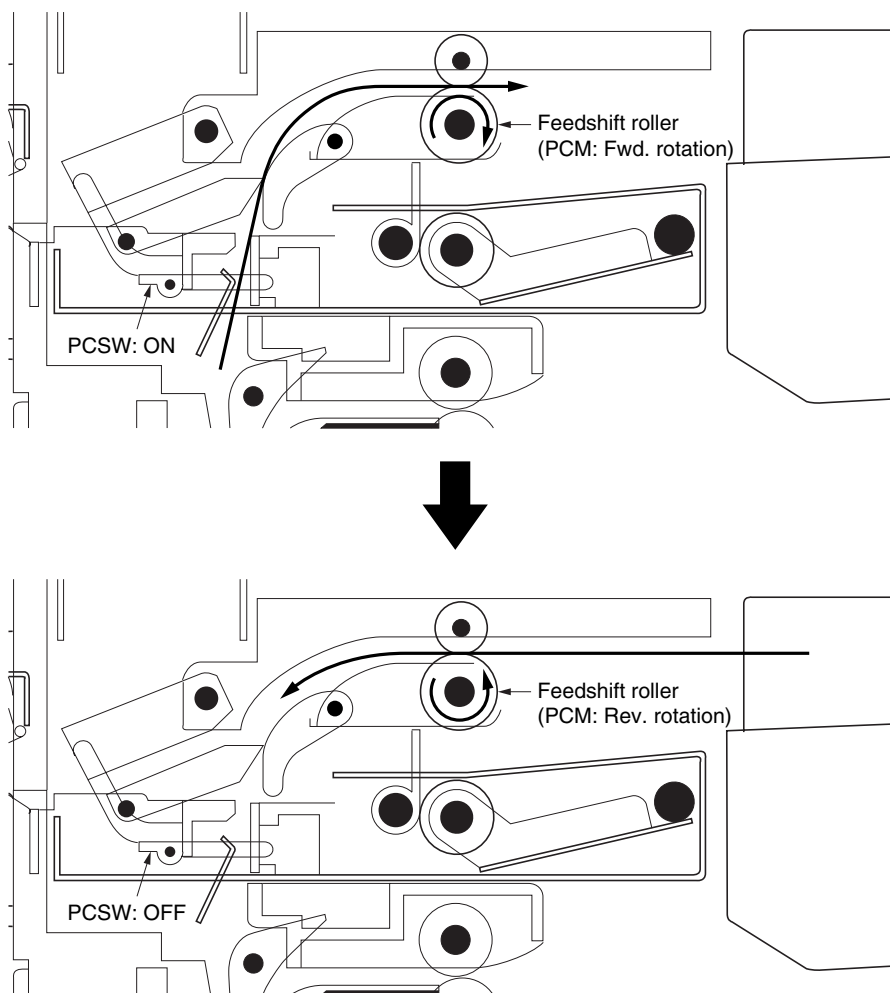
Figure 2-1-4

2-1-2 Intermediate tray section

The intermediate tray section consists of the components shown in Figure 2-1-5. It stores and evens up the paper conveyed from the feedshift section and returns the stack of paper to the feedshift section.
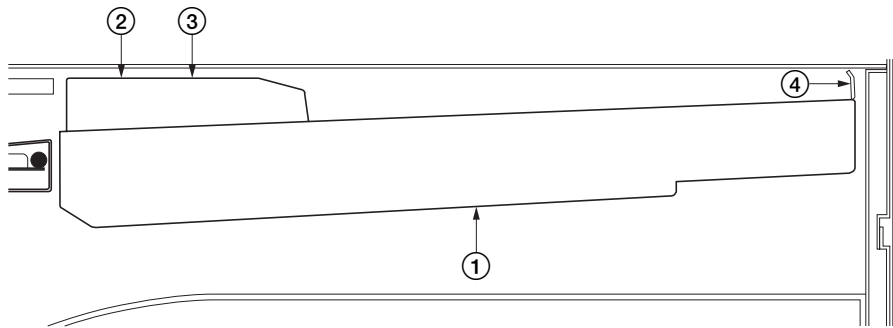
Figure 2-1-5 Intermediate tray section

1 Intermediate tray
2 Front side registration cursor

3 Rear side registration cursor
4 Trailing edge registration cursor

2-1
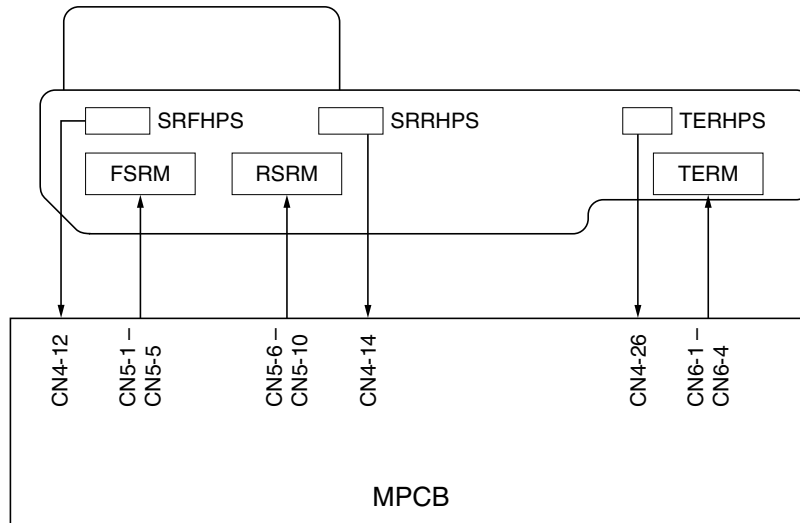
Figure 2-1-6 Intermediate tray section block diagram

(1) Paper registration on the intermediate tray

In sort mode, the front and rear side registration cursors move to the size of the paper used to even up the sides of the stack of paper and the trailing edge registration cursor shifts the paper to the feedshift section.

In staple-sort mode, the front and rear side registration cursors even up the sides of the stack of paper and shift the stack toward the machine front, and then the trailing edge registration cursor shifts the stack to the stapling position.

Home positions

Rear side registration cursor

Trailing edge registration cursor

Front side registration cursor

Paper registration

Shifting the paper to the stapling position

Figure 2-1-7

2-1
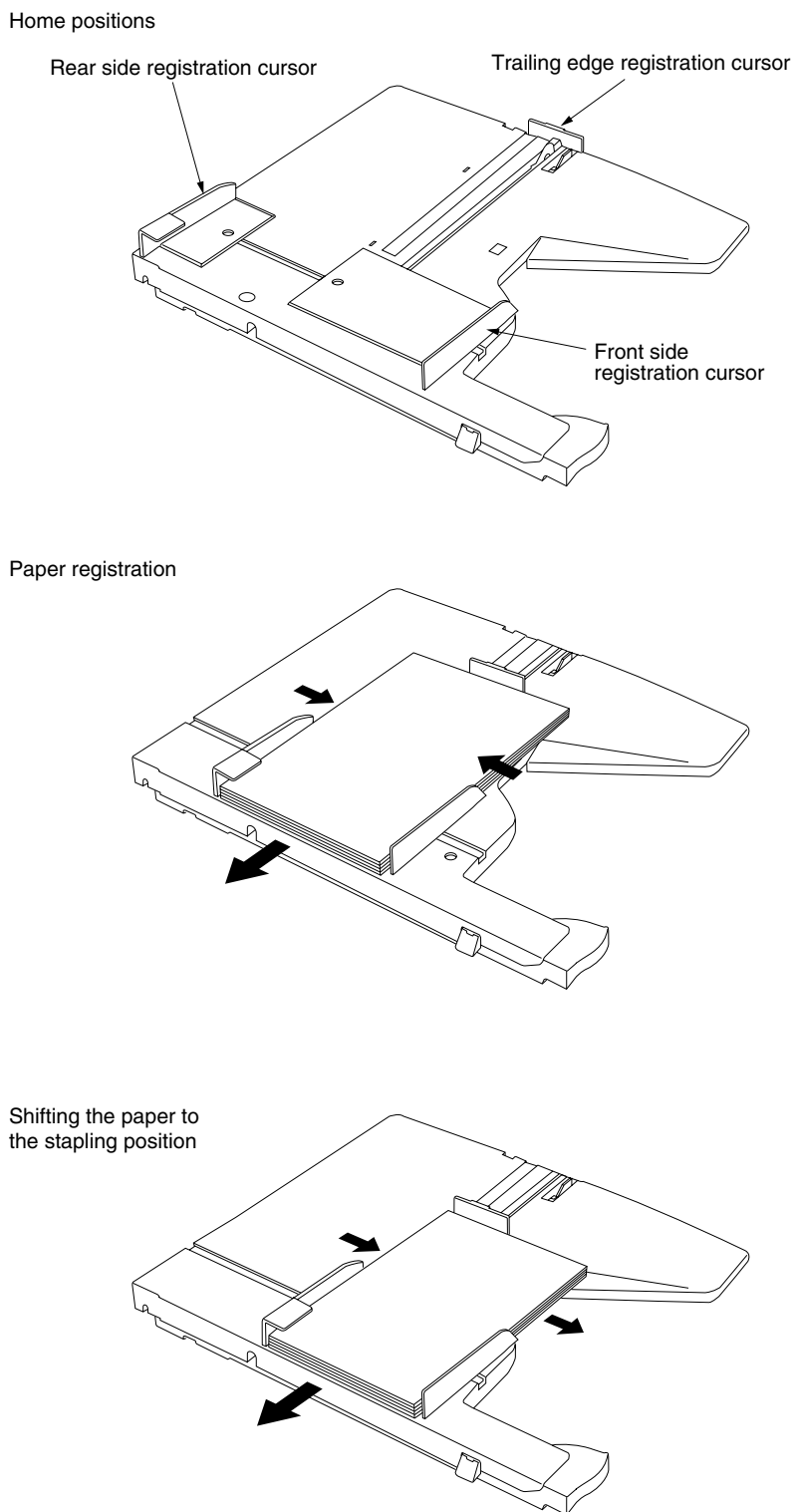
2-1-3 Eject section

The eject section consists of the components shown in Figure 2-1-8. It ejects paper to the eject tray.
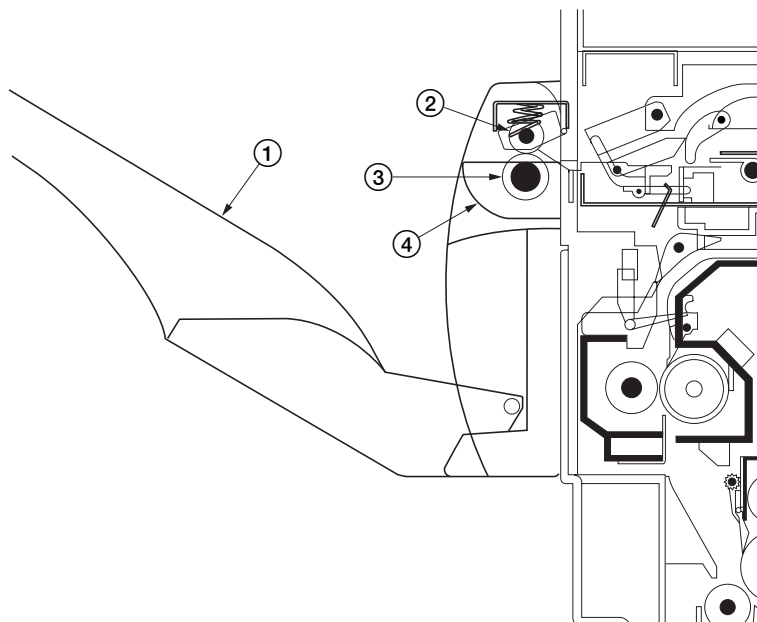
Figure 2-1-8   Eject section

① Eject tray   ③ Eject roller
② Eject pulley   ④ Lower eject guide

2-1-4 Stapler section

In staple-sort mode, paper stocked on the intermediate tray is stapled by the stapler.
The stapler motor (STM) drives the stapler cam via the stapler drive gear to staple paper.
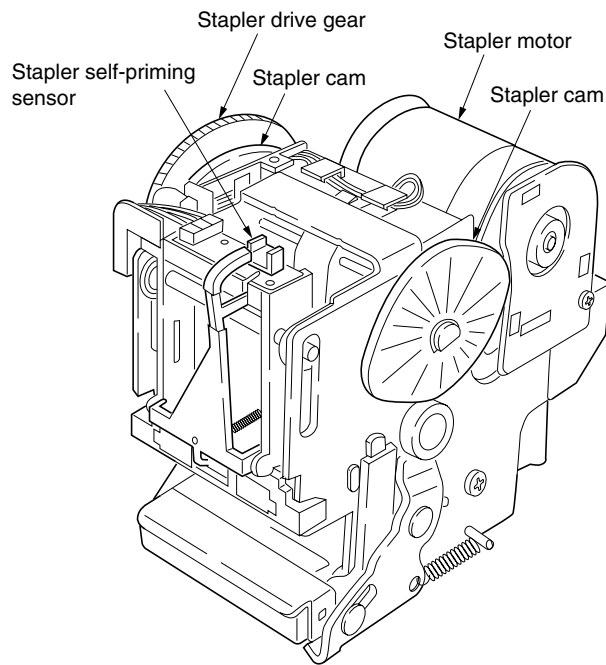
Figure 2-1-9 Stapler section
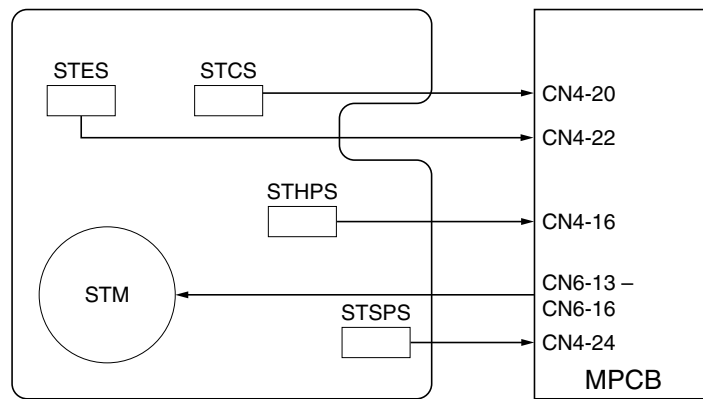
Figure 2-1-10 Stapler section block diagram

2-1-5 Duplex unit

The duplex unit consists of the components shown in Figure 2-1-11. In duplex mode, it refeeds paper switched back in the feedshift section to the copier paper feed section.
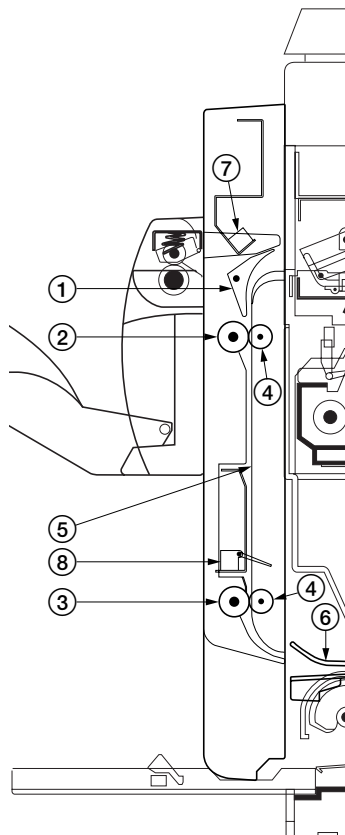
Figure 2-1-11   Duplex unit

① Duplex feedshift guide   ⑤ Open/close guide
② Upper duplex roller   ⑥ Entry guide
③ Lower duplex roller   ⑦ Duplex paper conveying switch 1 (DUPPCSW1)
④ Duplex pulley   ⑧ Duplex paper conveying switch 2 (DUPPCSW2)
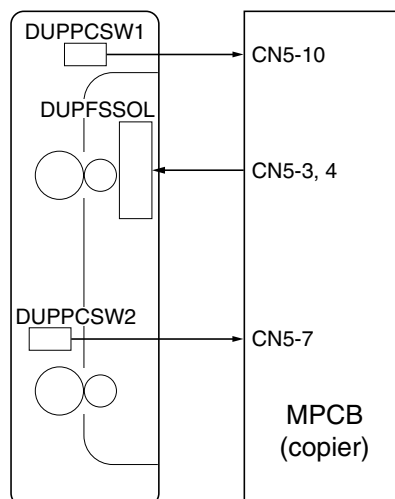
Figure 2-1-12   Duplex unit block diagram

(1) Switching the paper path in the duplex unit

In duplex mode, when the reverse face of the paper is copied, the paper is switched back in the feedshift section and conveyed to the duplex unit. The paper is then conveyed to the paper conveying section of the copier by the upper and lower duplex rollers.

When ejecting paper to the eject tray, the duplex feedshift solenoid (DUPFSSOL) turns on to operate the duplex feedshift guide to switch the paper path to the eject tray.

Duplex feedshift guide

Eject tray

2-1

Figure 2-1-13

3BN/3A4
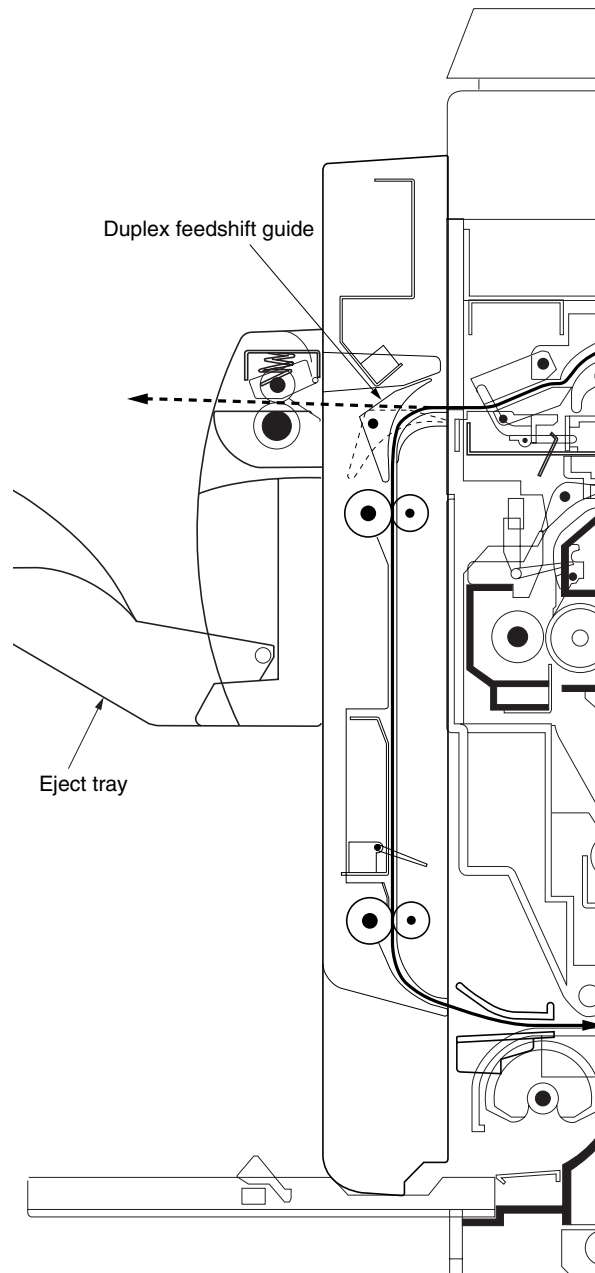
2-2-1 Electrical parts layout

2-2-1

(1) Finisher

Machine front ▢ Machine inside ▨ Machine rear ▨
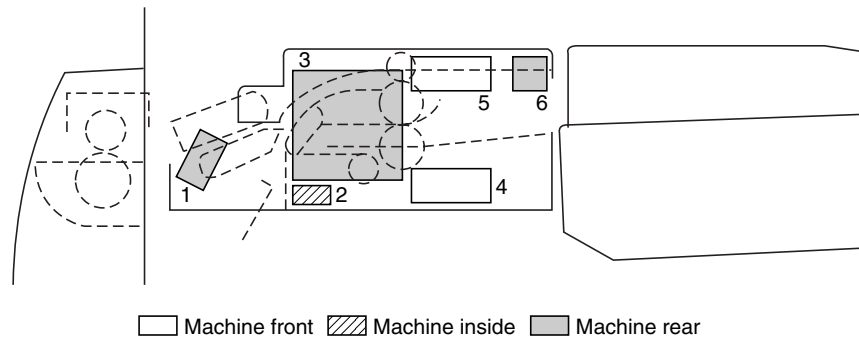
Figure 2-2-1   Feedshift section

1. Left cover switch (LCSW) .... Detects if the copier left cover is opened or closed.
2. Paper conveying switch (PCSW) .... Detects a paper jam in the finisher.
3. Paper conveying motor (PCM) .... Drives the feedshift section.
4. Feedshift solenoid (FSSOL) .... Operates the feedshift guide of the copier.
5. Switchback solenoid (SBSOL) .... Operates the feedshift claw.
6. Pickup solenoid (PUSOL) .... Operates the press roller.

2-2

2-2-1

Machine front ▭ Machine inside ▨ Machine rear ▨
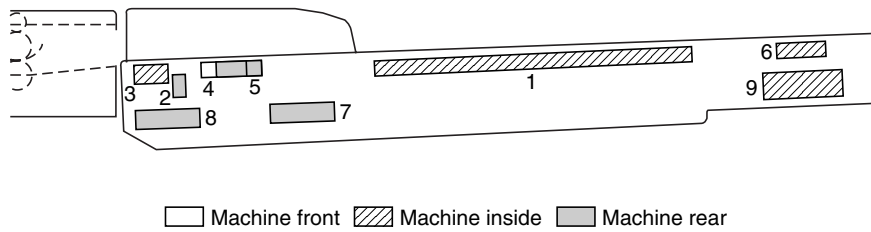
Figure 2-2-2 Intermediate tray section

1. Main PCB (MPCB) .... Controls electrical components.
2. Tray open/close switch (TOCSW) .... Detects if the intermediate tray is opened or closed.
3. Intermediate tray sensor (ITS) .... Detects the presence of paper on the intermediate tray.
4. Side registration front home position
   sensor (SRFHPS) .... Detects the front side registration cursor in the home position.
5. Side registration rear home position
   sensor (SRRHPS) .... Detects the rear side registration cursor in the home position.
6. Trailing edge registration home position
   sensor (TERHPS) .... Detects the trailing edge registration cursor in the home position.
7. Front side registration motor (FSRM) .... Drives the front side registration cursor.
8. Rear side registration motor (RSRM) .... Drives the rear side registration cursor.
9. Trailing edge registration motor (TERM) ...... Drives the trailing edge registration cursor.

2-2

Machine front ☐ Machine inside ▨ Machine rear ☐
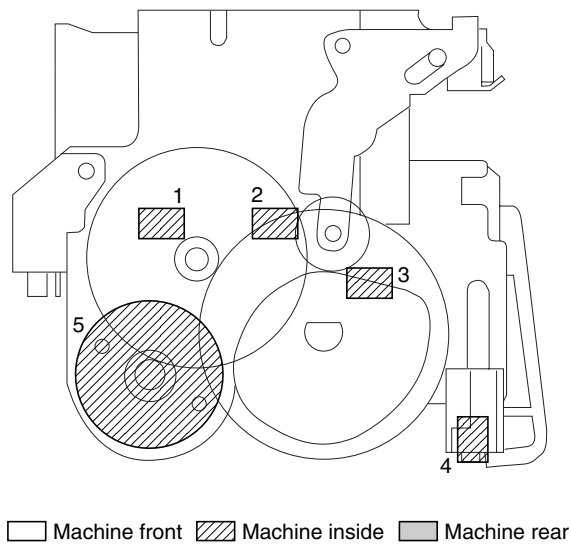
Figure 2-2-3　Stapler section

1. Stapler empty sensor (STES) .... Detects the presence of staples.
2. Staple cartridge sensor (STCS) .... Detects the presence of the staple cartridge.
3. Stapler home position sensor (STHPS) .... Detects the stapler in the home position.
4. Stapler self-priming sensor (STSPS) .... Detects the pre-stapling state of the stapler.
5. Stapler motor (STM) .... Drives the stapler.

2-2
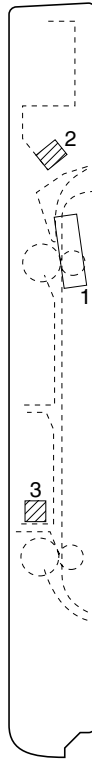
(2) Duplex unit

Machine front ▭ Machine inside ▨ Machine rear ▭

Figure 2-2-4   Duplex unit

1. Duplex feedshift solenoid (DUPFSSOL) ...... Operates the duplex feedshift guide.
2. Duplex paper conveying switch 1
   (DUPPCSW1) .... Detects a paper jam in the duplex unit.
3. Duplex paper conveying switch 2
   (DUPPCSW2) .... Detects a paper jam in the duplex unit.

2-3-1 Main PCB
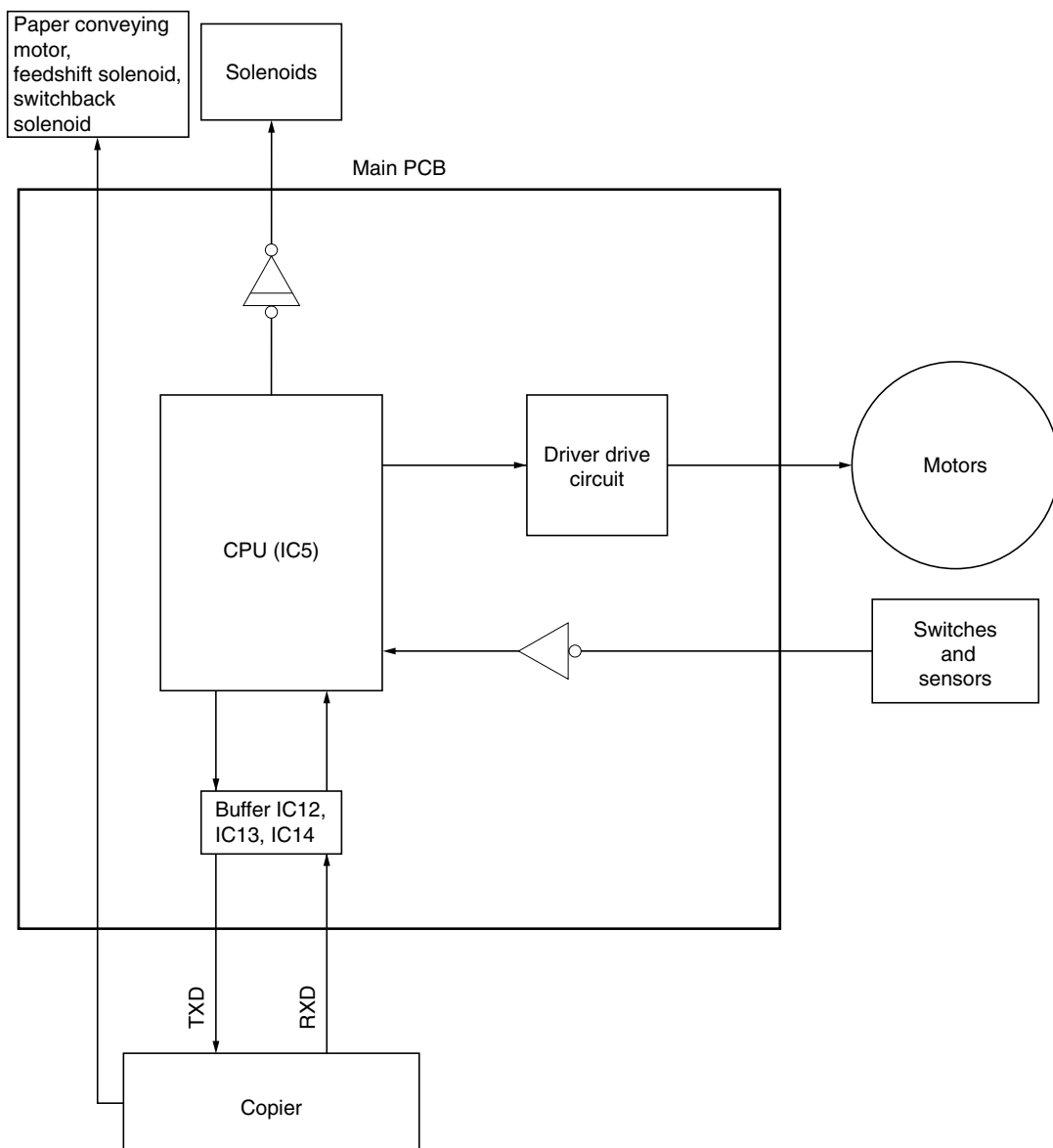
Figure 2-3-1   Main PCB block diagram

The main PCB (MPCB) consists mainly of the CPU IC5 and driver drive circuit.
The CPU IC5 detects the condition of the switches and sensors and controls the motors and solenoids by serially communicating with the copier. The paper conveying motor (PCM), switchback solenoid (SBSOL) and feedshift solenoid (FSSOL) operate with the control signals from the copier.

Figure 2-3-2   Main PCB silk-screen diagram

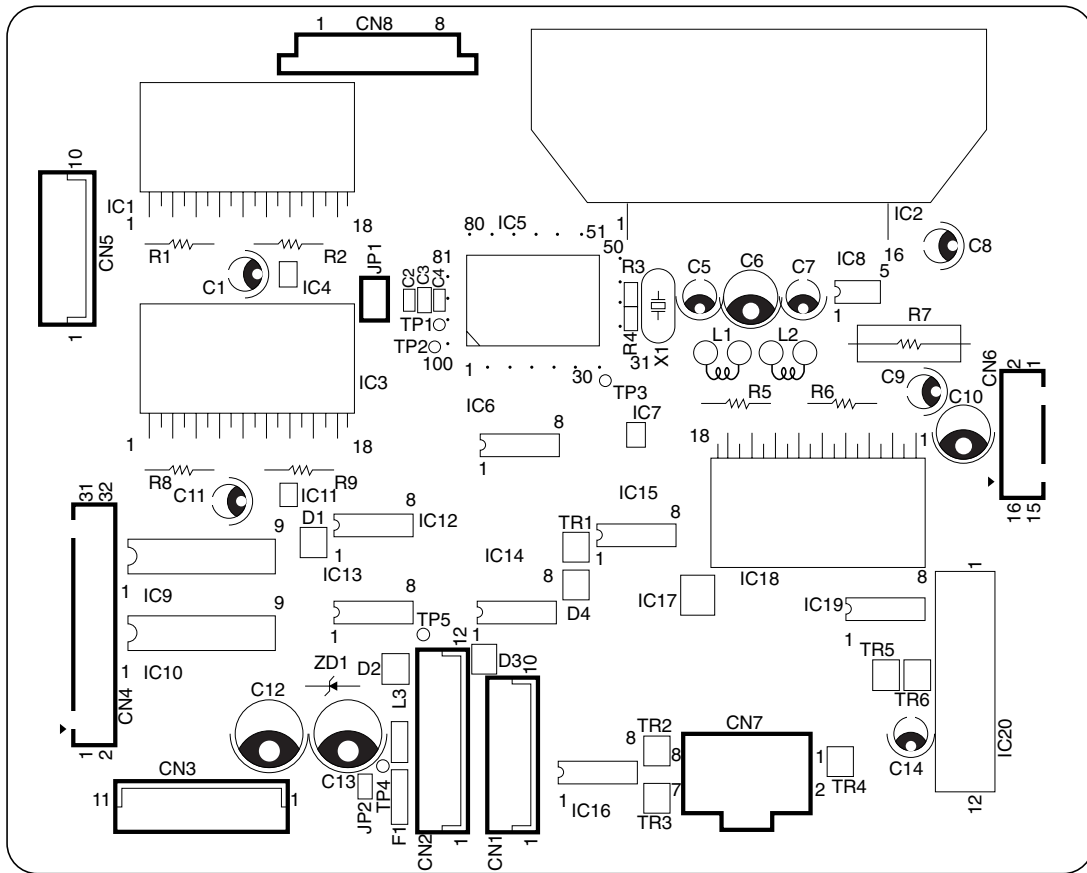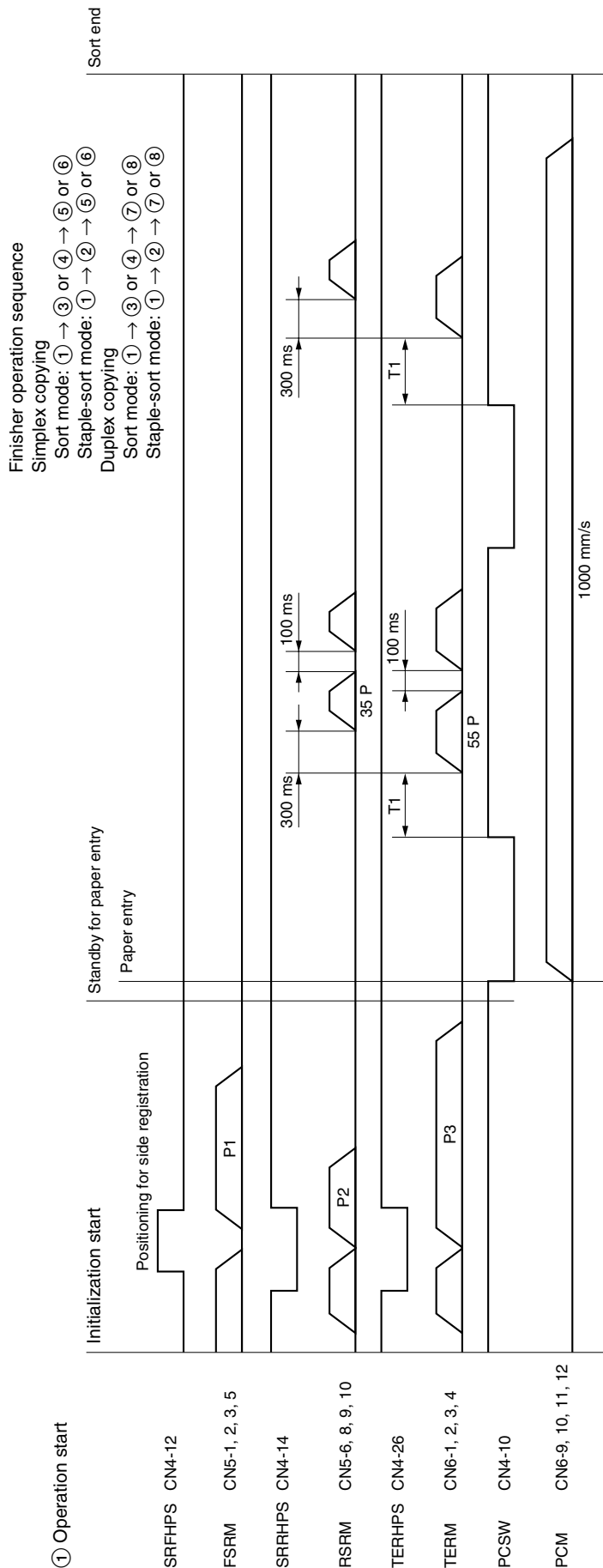| Terminals (CN)		Voltage	Remarks
1-2	1-7	0/5 V DC	PCM control signal (MODE), input
1-3	1-9	5/0 V DC	TOCSW on/off, output
1-4	1-7	0/5 V DC	PCM on/off, input
1-5	1-7	0/5 V DC	PCM control signal CWB, input
1-6	1-7	0/5 V DC (pulse)	PCM clock signal, input
1-8	1-7	5 V DC	5 V DC supply, input
2-1	2-3	0/5 V DC	RESET signal, input
2-4	2-5	0/5 V DC (pulse)	Serial signal TXD, input
2-6	2-7	0/5 V DC (pulse)	Serial signal RXD, output
2-8	2-7	5 V DC	5 V DC supply, input
2-11	2-9	24 V DC	24 V DC supply, input
2-12	2-10	24 V DC	24 V DC supply, input
3-1	3-4	0/24 V DC	SBSOL release signal, input
3-2	3-4	0/24 V DC	SBSOL latch-on signal, input
3-3	3-4	24 V DC	24 V DC supply for SBSOL, input
3-5	3-4	0/5 V DC	PCSW on/off, output
3-6	3-4	5 V DC	5 V DC supply for PCSW, input
3-7	3-4	0/24 V DC	FSSOL release signal, input
3-8	3-4	0/24 V DC	FSSOL latch-on signal, input
3-9	3-4	24 V DC	24 V DC supply for FSSOL, input
4-1	4-29	24 V DC	24 V DC supply for FSSOL, output
4-2	4-29	0/24 V DC	FSSOL latch-on signal, output
4-3	4-29	24 V DC	24 V DC supply for SBSOL, output
4-4	4-29	0/24 V DC	FSSOL release signal, output
4-5	4-29	24 V DC	24 V DC supply for PUSOL, output
4-6	4-29	0/24 V DC	SBSOL latch-on signal, output
4-7	4-29	0/24 V DC	PUSOL on/off, output
4-8	4-29	0/24 V DC	SBSOL release signal, output
4-9	4-29	5 V DC	5 V DC supply for PCSW, output
4-10	4-29	0/5 V DC	PCSW on/off, input
4-11	4-23	5 V DC	5 V DC supply for SRFHPS, output
4-12	4-23	0/5 V DC	SRFHPS on/off, input
4-13	4-25	5 V DC	5 V DC supply for SRRHPS, output
4-14	4-25	0/5 V DC	SRRHPS on/off, input
4-15	4-27	5 V DC	5 V DC supply for stapler, output
4-16	4-27	0/5 V DC	STHPS on/off, input
4-17	4-21	5 V DC	5 V DC supply for ITS, output
4-18	4-21	0/5 V DC	ITS on/off, input
4-19	4-28	5 V DC	5 V DC supply for TERHPS, output
4-20	4-27	0/5 V DC	STCS on/off, input
4-22	4-27	0/5 V DC	STES on/off, input
4-24	4-27	0/5 V DC	STSPS on/off, input
4-26	4-28	0/5 V DC	TERHPS on/off, input
5-1	3-4	0/24 V DC (pulse)	FSRM motor coil energization pulse, output (A)
5-2	3-4	24 V DC	24 V DC supply for FSRM, output
5-3	3-4	0/24 V DC (pulse)	FSRM motor coil energization pulse, output ($\overline{\text{B}}$)
5-4	3-4	0/24 V DC (pulse)	FSRM motor coil energization pulse, output (B)
5-5	3-4	0/24 V DC (pulse)	FSRM motor coil energization pulse, output ($\overline{\text{A}}$)
5-6	3-4	0/24 V DC (pulse)	RSRM motor coil energization pulse, output (A)
5-7	3-4	24 V DC	24 V DC supply for RSRM, output
5-8	3-4	0/24 V DC (pulse)	RSRM motor coil energization pulse, output ($\overline{\text{B}}$)
5-9	3-4	0/24 V DC (pulse)	RSRM motor coil energization pulse, output (B)
5-10	3-4	0/24 V DC (pulse)	RSRM motor coil energization pulse, output ($\overline{\text{A}}$)
6-1	3-4	0/24 V DC (pulse)	TERM motor coil energization pulse, output (A)
6-2	3-4	0/24 V DC (pulse)	TERM motor coil energization pulse, output ($\overline{\text{B}}$)
6-3	3-4	0/24 V DC (pulse)	TERM motor coil energization pulse, output (B)

2-3

Terminals (CN)		Voltage	Remarks
6-4	3-4	0/24 V DC (pulse)	TERM motor coil energization pulse, output ($\overline{A}$)
6-5	3-4	24 V DC	24 V DC supply for TERM, output
6-7	3-4	24 V DC	24 V DC supply for PCM, output
6-8	3-4	24 V DC	24 V DC supply for PCM, output
6-9	3-4	0/24 V DC (pulse)	PCM motor coil energization pulse, output (A)
6-10	3-4	0/24 V DC (pulse)	PCM motor coil energization pulse, output ($\overline{A}$)
6-11	3-4	0/24 V DC (pulse)	PCM motor coil energization pulse, output (B)
6-12	3-4	0/24 V DC (pulse)	PCM motor coil energization pulse, output ($\overline{B}$)
6-13	3-4	0/24 V DC	STM forward rotation drive signal (F), output
6-14	3-4	0/24 V DC	STM forward rotation drive signal (F), output
6-15	3-4	0/24 V DC	STM reverse rotation drive signal (R), output
6-16	3-4	0/24 V DC	STM reverse rotation drive signal (R), output
7-3	3-4	24/0 V DC	TOCSW on/off, input
7-6	3-4	24/0 V DC	LCSW on/off, output
7-7	3-4	24 V DC	24 V DC supply for LCSW, output
7-8	3-4	24/0 V DC	LCSW on/off, input

2-3

Timing chart No. 1

① Operation start

Timing chart No. 1 — Operation start / Finisher operation sequence

Finisher operation sequence
Simplex copying
Sort mode: ① → ③ or ④ → ⑤ or ⑥
Staple-sort mode: ① → ② → ⑤ or ⑥
Duplex copying
Sort mode: ① → ③ or ④ → ⑦ or ⑧
Staple-sort mode: ① → ② → ⑦ or ⑧

Signals:
- SRFHPS CN4-12
- FSRM CN5-1, 2, 3, 5
- SRRHPS CN4-14
- RSRM CN5-6, 8, 9, 10
- TERHPS CN4-26
- TERM CN6-1, 2, 3, 4
- PCSW CN4-10
- PCM CN6-9, 10, 11, 12

Pulse	Paper sizes	No. of pulses
P1	A3, A4	367
	B4, B5	438
	A4R	521
	11"×17", 11"×8 1/2"	398
	8 1/2"×14", 8 1/2"×11"	510

Pulse	Paper sizes	No. of pulses
P2	A3, A4	0
	B4, B5	71
	A4R	154
	11"×17", 11"×8 1/2"	31
	8 1/2"×14", 8 1/2"×11"	143

Pulse	Paper sizes	No. of pulses
P3	A3	42
	B4	240
	A4R	476
	A4	784
	B5	883
	11"×17"	0
	8 1/2"×14"	269
	8 1/2"×11"	539
	11"×8 1/2"	763

Timer	Paper sizes	Timer value
T1	A4, B5, 11"×8 1/2"	850 ms
	B4, A4R, 8 1/2"×11", 8 1/2"×14"	950 ms
	A3, 11"×17"	1050 ms
	Other sizes	550 ms

1000 mm/s · 300 ms · 100 ms · 35 P · 55 P · T1

Timing chart No. 2

② Stapling operation

Signals:
- SRFHPS CN4-12
- FSRM CN5-1, 2, 3, 5
- SRRHPS CN4-14
- RSRM CN5-6, 8, 9, 10
- TERHPS CN4-26
- TERM CN6-1, 2, 3, 4
- STM CN6-13, 14, 15, 16
- STHPS CN4-16

(Sort end / Moving to stapling position / Stapling / Moving to shift-eject position / To batch ejection; P4, P5; 150 ms, 300 ms)

③ Non-stapling operation (for front-shift ejection)

Signals:
- SRFHPS CN4-12
- FSRM CN5-1, 2, 3, 5
- SRRHPS CN4-14
- RSRM CN5-6, 8, 9, 10
- TERHPS CN4-26
- TERM CN6-1, 2, 3, 4

(Sort end / Moving to shift-eject position / To batch ejection; P6; 150 ms)

④ Non-stapling operation (for rear-shift ejection)

Signals:
- SRFHPS CN4-12
- FSRM CN5-1, 2, 3, 5
- SRRHPS CN4-14
- RSRM CN5-6, 8, 9, 10
- TERHPS CN4-26
- TERM CN6-1, 2, 3, 4

(Sort end / Moving to shift-eject position / To batch ejection; P7; 150 ms)

Pulse	Paper sizes	No. of pulses
P4	A3, A4	367
	B4, B5	438
	A4R	521
	11" × 17", 11" × 8 1/2"	398
	8 1/2" × 14", 8 1/2" × 11"	510

	Front-shift ejection		Rear-shift ejection	
Pulse	Paper sizes	No. of pulses	Paper sizes	No. of pulses
P5	A3, A4	292	A3, A4	380
	B4, B5	415	B4, B5	521
	A4R	498	A4R	604
	11" × 17", 11" × 8 1/2"	323	11" × 17", 11" × 8 1/2"	411
	8 1/2" × 14", 8 1/2" × 11"	488	8 1/2" × 14", 8 1/2" × 11"	594

Pulse	Paper sizes	No. of pulses
P6	A3, A4	53
	B4, B5	18
	A4R	18
	11" × 17", 11" × 8 1/2"	53
	8 1/2" × 14", 8 1/2" × 11"	18

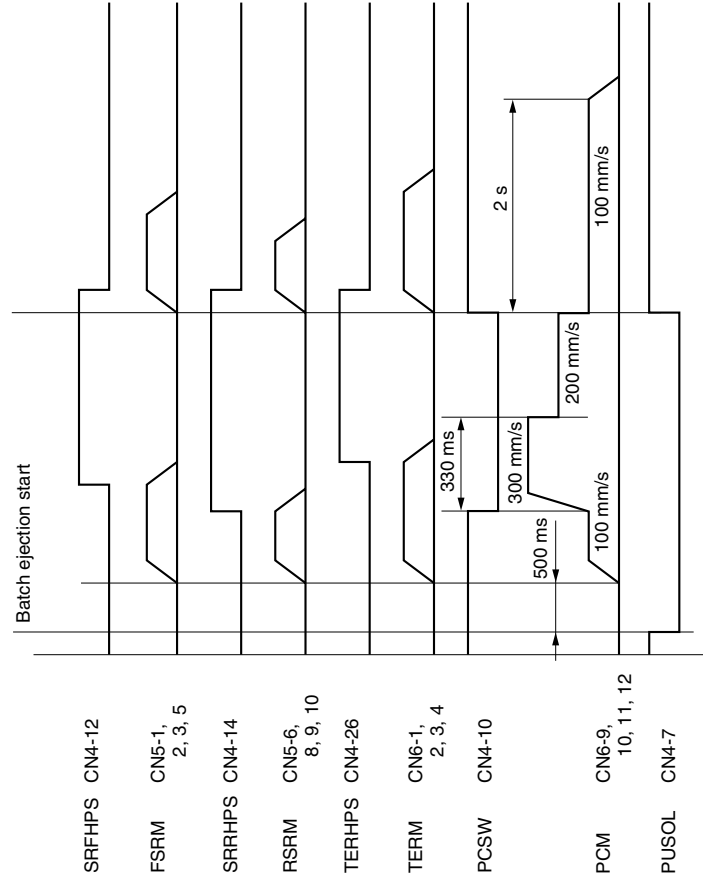| Pulse	Paper sizes	No. of pulses
P7	A3, A4	18
	B4, B5	88
	A4R	88
	11" × 17", 11" × 8 1/2"	18
	8 1/2" × 14", 8 1/2" × 11"	88

2-4

Timing chart No. 3

Small paper: A4, B5, 11" × 8¹/₂"   Large paper: others

⑤ Batch ejection 1 (simplex copying onto large paper)
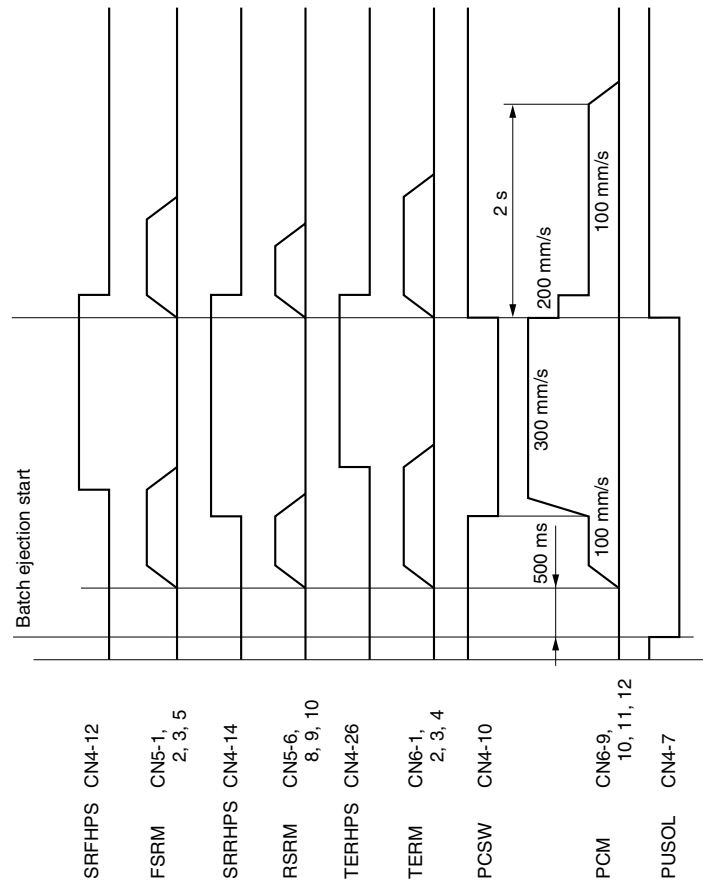
⑥ Batch ejection 2 (simplex copying onto small paper)
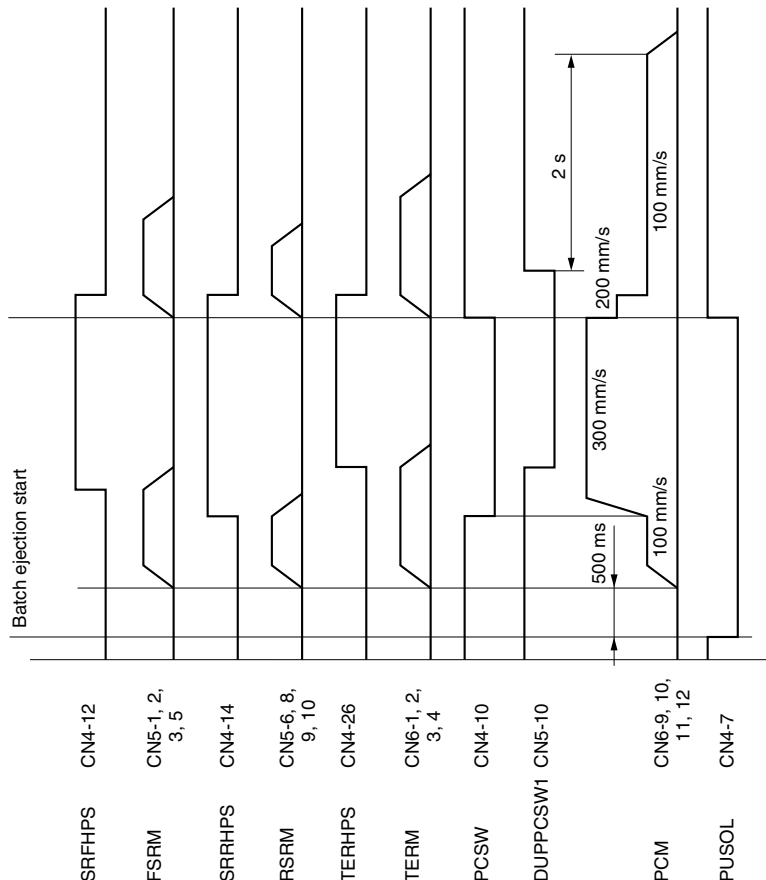

SRFHPS	CN4-12
FSRM	CN5-1, 2, 3, 5
SRRHPS	CN4-14
RSRM	CN5-6, 8, 9, 10
TERHPS	CN4-26
TERM	CN6-1, 2, 3, 4
PCSW	CN4-10
PCM	CN6-9, 10, 11, 12
PUSOL	CN4-7

Timing chart No. 4
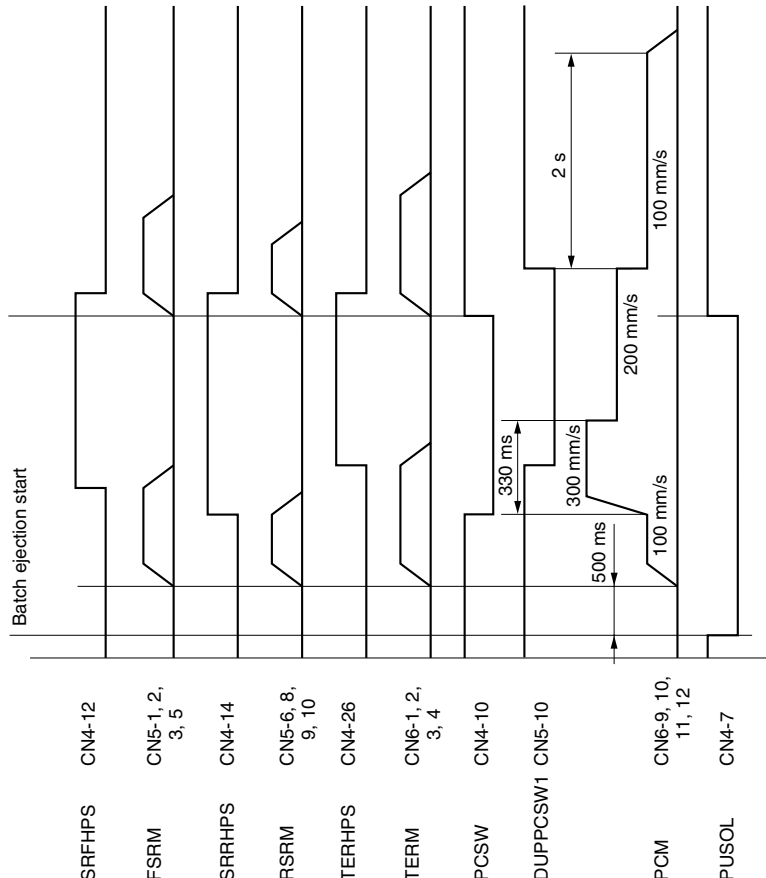
Small paper: A4, B5, 11" × 8¹/₂"   Large paper: others

⑦ Batch ejection 3 (duplex copying onto large paper)

⑧ Batch ejection 4 (duplex copying onto small paper)

SRFHPS	CN4-12
FSRM	CN5-1, 2, 3, 5
SRRHPS	CN4-14
RSRM	CN5-6, 8, 9, 10
TERHPS	CN4-26
TERM	CN6-1, 2, 3, 4
PCSW	CN4-10
DUPPCSW1	CN5-10
PCM	CN6-9, 10, 11, 12
PUSOL	CN4-7

Periodic maintenance procedures

• Finisher

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Stapler section	Magnet	Clean	Every service	Remove the staples attracted to the magnet inside the stapler cover.	1-4-3

• Duplex unit

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Paper conveying section	Upper duplex roller	Clean	Every service	Clean with alcohol or a dry cloth.	
	Lower duplex roller	Clean	Every service	Clean with alcohol or a dry cloth.	

2-4

Wiring diagram