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# PF-650

# SERVICE MANUAL

Published in June 2005  
843JD111  
Version 2.0

## **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 the manufacturer's instructions.

## **CAUTION**

Double-pole/neutral fusing.

**Version history**

Version	Date	Replaced pages	Remarks
1.0	30 March 2005	-	-
2.0	24 June 2005	2-4-2, 2-4-3, 2-4-4	-

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# Safety precautions


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This booklet provides safety warnings and precautions for our service personnel to ensure the safety of their customers, their machines as well as themselves during maintenance activities. Service personnel are advised to read this booklet carefully to familiarize themselves with the warnings and precautions described here before engaging in maintenance activities.

## Safety warnings and precautions

Various symbols are used to protect our service personnel and customers from physical danger and to prevent damage to their property. These symbols are described below:

 **DANGER:** High risk of serious bodily injury or death may result from insufficient attention to or incorrect compliance with warning messages using this symbol.

 **WARNING:** Serious bodily injury or death may result from insufficient attention to or incorrect compliance with warning messages using this symbol.

 **CAUTION:** Bodily injury or damage to property may result from insufficient attention to or incorrect compliance with warning messages using this symbol.

### Symbols

The triangle (△) symbol indicates a warning including danger and caution. The specific point of attention is shown inside the symbol.



General warning.



Warning of risk of electric shock.



Warning of high temperature.

⊘ indicates a prohibited action. The specific prohibition is shown inside the symbol.



General prohibited action.



Disassembly prohibited.

● indicates that action is required. The specific action required is shown inside the symbol.



General action required.



Remove the power plug from the wall outlet.



Always ground the copier.

## 1. Installation Precautions

### WARNING

- Do not use a power supply with a voltage other than that specified. Avoid multiple connections to one outlet: they may cause fire or electric shock. When using an extension cable, always check that it is adequate for the rated current. ....
- Connect the ground wire to a suitable grounding point. Not grounding the copier may cause fire or electric shock. Connecting the earth wire to an object not approved for the purpose may cause explosion or electric shock. Never connect the ground cable to any of the following: gas pipes, lightning rods, ground cables for telephone lines and water pipes or faucets not approved by the proper authorities. ....



### CAUTION:

- Do not place the copier on an infirm or angled surface: the copier may tip over, causing injury. ....
- Do not install the copier in a humid or dusty place. This may cause fire or electric shock. ....
- Do not install the copier near a radiator, heater, other heat source or near flammable material.



This may cause fire. ....



- Allow sufficient space around the copier to allow the ventilation grills to keep the machine as cool as possible. Insufficient ventilation may cause heat buildup and poor copying performance. ....



- Always handle the machine by the correct locations when moving it. ....
- Always use anti-toppling and locking devices on copiers so equipped. Failure to do this may cause the copier to move unexpectedly or topple, leading to injury. ....
- Avoid inhaling toner or developer excessively. Protect the eyes. If toner or developer is accidentally ingested, drink a lot of water to dilute it in the stomach and obtain medical attention immediately. If it gets into the eyes, rinse immediately with copious amounts of water and obtain medical attention. ....













- Advise customers that they must always follow the safety warnings and precautions in the copier's instruction handbook. ....







## 2.Precautions for Maintenance

### WARNING

- Always remove the power plug from the wall outlet before starting machine disassembly. .... 
- Always follow the procedures for maintenance described in the service manual and other related brochures. .... 
- Under no circumstances attempt to bypass or disable safety features including safety mechanisms and protective circuits. .... 
- Always use parts having the correct specifications. .... 
- Always use the thermostat or thermal fuse specified in the service manual or other related brochure when replacing them. Using a piece of wire, for example, could lead to fire or other serious accident. .... 
- When the service manual or other serious brochure specifies a distance or gap for installation of a part, always use the correct scale and measure carefully. .... 
- Always check that the copier is correctly connected to an outlet with a ground connection. .... 
- Check that the power cable covering is free of damage. Check that the power plug is dust-free. If it is dirty, clean it to remove the risk of fire or electric shock. .... 
- Never attempt to disassemble the optical unit in machines using lasers. Leaking laser light may damage eyesight. .... 
- Handle the charger sections with care. They are charged to high potentials and may cause electric shock if handled improperly. .... 

### CAUTION

- Wear safe clothing. If wearing loose clothing or accessories such as ties, make sure they are safely secured so they will not be caught in rotating sections. .... 
- Use utmost caution when working on a powered machine. Keep away from chains and belts. .... 
- Handle the fixing section with care to avoid burns as it can be extremely hot. .... 
- Check that the fixing unit thermistor, heat and press rollers are clean. Dirt on them can cause abnormally high temperatures. .... 



• Do not remove the ozone filter, if any, from the copier except for routine replacement. ....



• Do not pull on the AC power cord or connector wires on high-voltage components when removing them; always hold the plug itself. ....



• Do not route the power cable where it may be stood on or trapped. If necessary, protect it with a cable cover or other appropriate item. ....



• Treat the ends of the wire carefully when installing a new charger wire to avoid electric leaks. ....



• Remove toner completely from electronic components. ....



• Run wire harnesses carefully so that wires will not be trapped or damaged. ....



• After maintenance, always check that all the parts, screws, connectors and wires that were removed, have been refitted correctly. Special attention should be paid to any forgotten connector, trapped wire and missing screws. ....



• Check that all the caution labels that should be present on the machine according to the instruction handbook are clean and not peeling. Replace with new ones if necessary. ....



• Handle greases and solvents with care by following the instructions below: ....



- Use only a small amount of solvent at a time, being careful not to spill. Wipe spills off completely.
- Ventilate the room well while using grease or solvents.
- Allow applied solvents to evaporate completely before refitting the covers or turning the power switch on.
- Always wash hands afterwards.

• Never dispose of toner or toner bottles in fire. Toner may cause sparks when exposed directly to fire in a furnace, etc. ....



• Should smoke be seen coming from the copier, remove the power plug from the wall outlet immediately. ....



### 3.Miscellaneous

#### WARNING

• Never attempt to heat the drum or expose it to any organic solvents such as alcohol, other than the specified refiner; it may generate toxic gas. ....





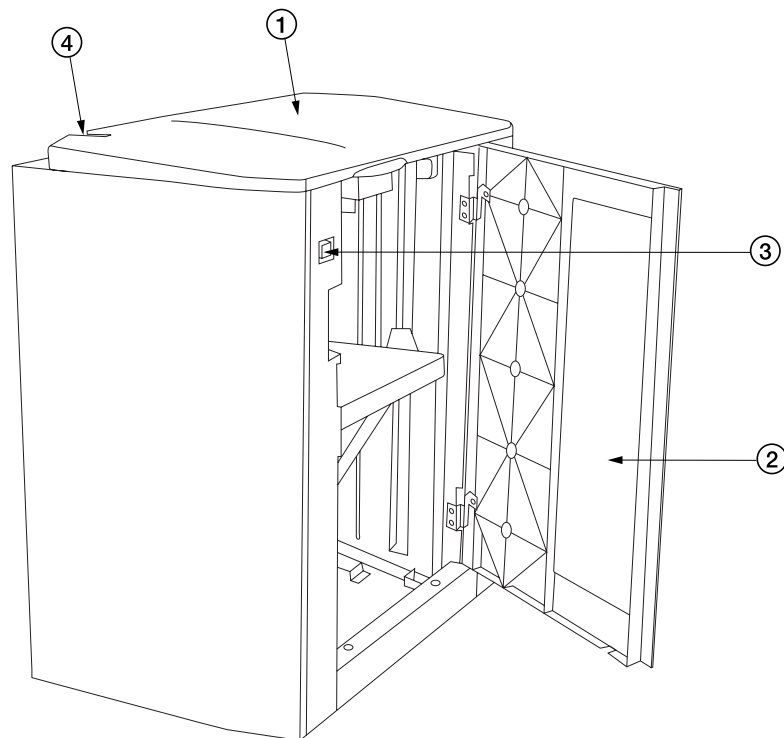
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**1-1-1 Specifications**

Type .....	Deck type
Supported paper .....	Weight: 60 - 160 g/m <sup>2</sup> Paper type: Plain paper, recycled paper and colored paper
Paper size .....	A4/11" × 8 1/2", B5
Capacity .....	4000 sheets (80 g/m <sup>2</sup> )
Power source .....	Electrically connected to the machine (5 V DC, 24 V DC)
Dimensions .....	371 (W) × 589 (D) × 693 (H) mm 14 5/8" (W) × 23 3/16" (D) × 27 5/16" (H)
Weight .....	Approximately 41 kg/90.2 lbs

## 1-1-2 Parts names



**Figure 1-1-1 Parts names**

1. Upper cover
2. Right cover
3. Right down switch
4. Side feeder release button

1-1-3 Machine cross section

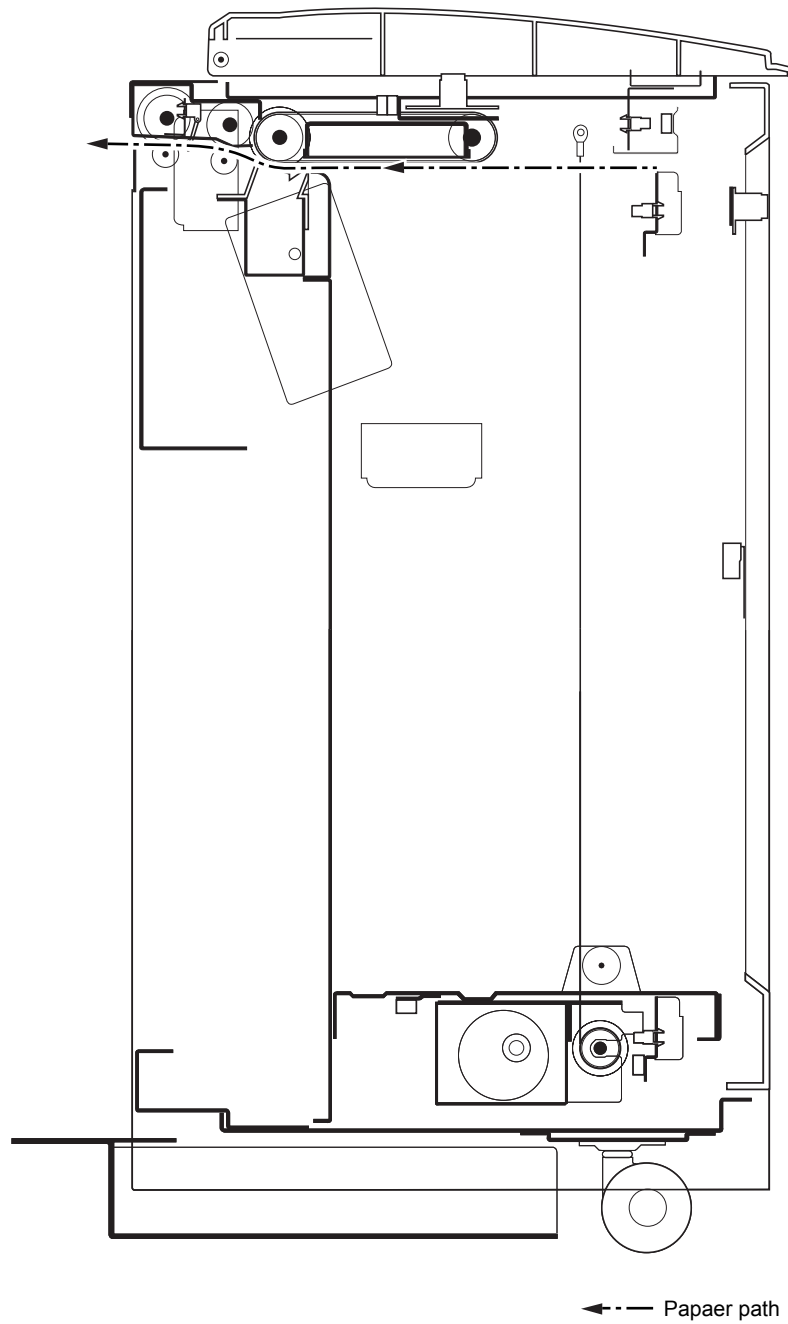
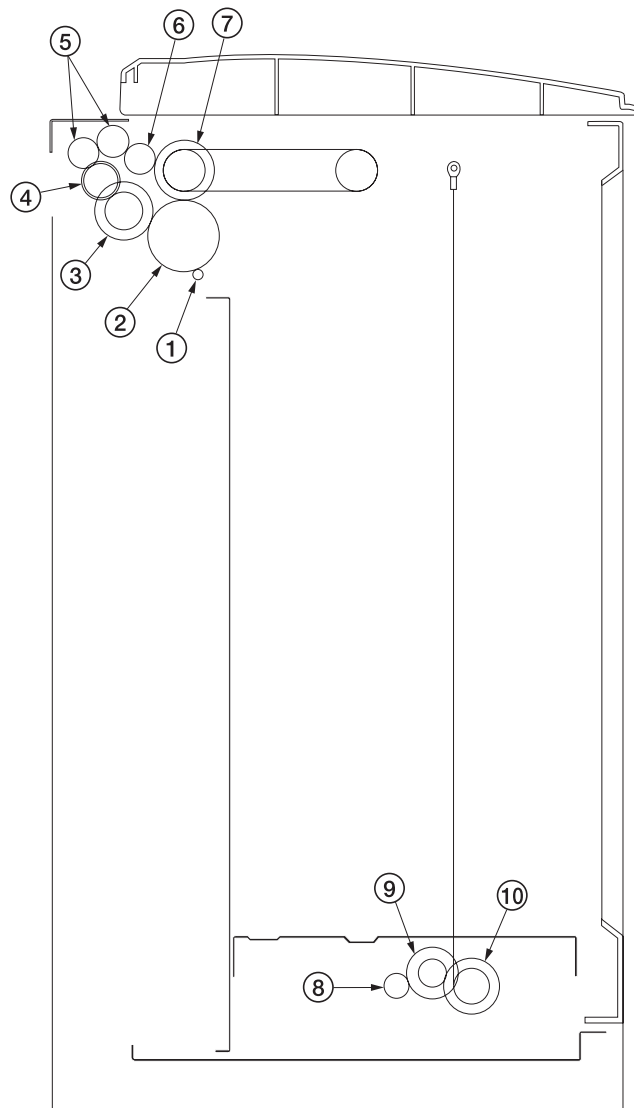


Figure 1-1-2 Cross section

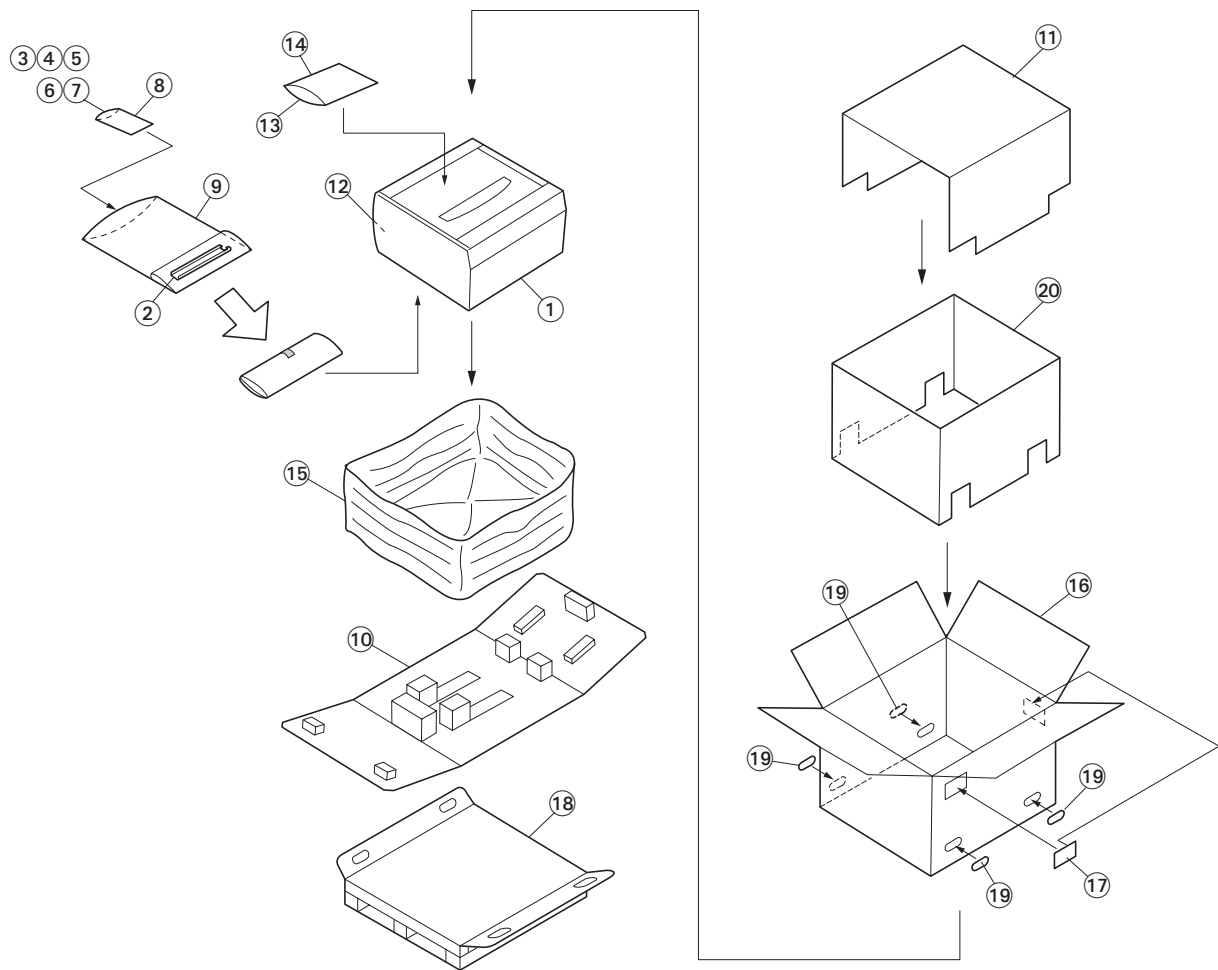


**Figure 1-1-3**

1. Paper feed motor gear
2. Feed gear 55/45
3. Duplex drive gear 24/36
4. Idle gear 20/24
5. Developing gear 20
6. Eject gear 20
7. Paper feed clutch gear
8. Lift gear 16
9. Gear 31/17
10. Oil roller gear

## 1-2-1 Unpacking

### (1) Unpacking



**Figure 1-2-1 Unpacking**

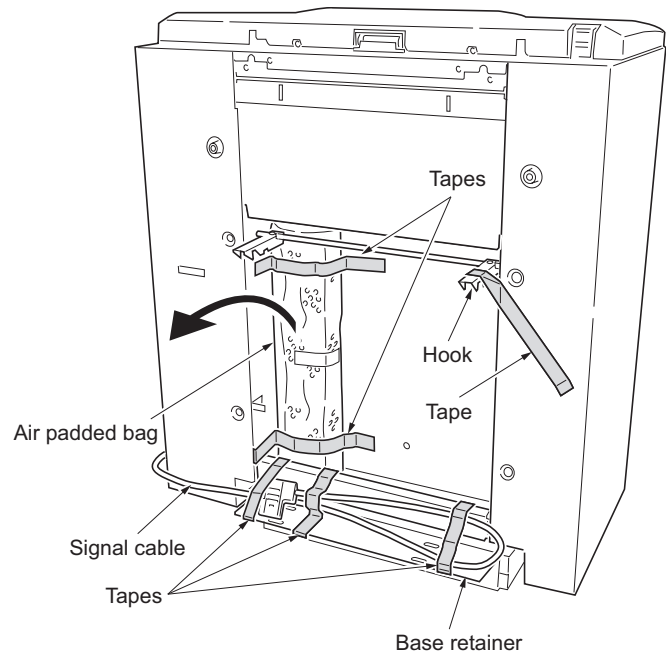
- |                                   |                         |
|-----------------------------------|-------------------------|
| (1) Side feeder                   | (11) Top pad            |
| (2) Guide plate                   | (12) Lift spacer        |
| (3) Switch contact plate          | (13) Installation guide |
| (4) M4 × 12 dish screw            | (14) Plastic bag        |
| (5) M3 × 6 Tap Tight S screw      | (15) Machine cover      |
| (6) M4 × 6 TP screws              | (16) Outer case         |
| (7) Clamp                         | (17) Bar code labels    |
| (8) Plastic bag (70 × 110 mm)     | (18) Skids              |
| (9) Air padded bag (400 × 500 mm) | (19) Joint hinges       |
| (10) Bottom pad                   | (20) Inner frame        |



**(2) Removing tapes and spacers**

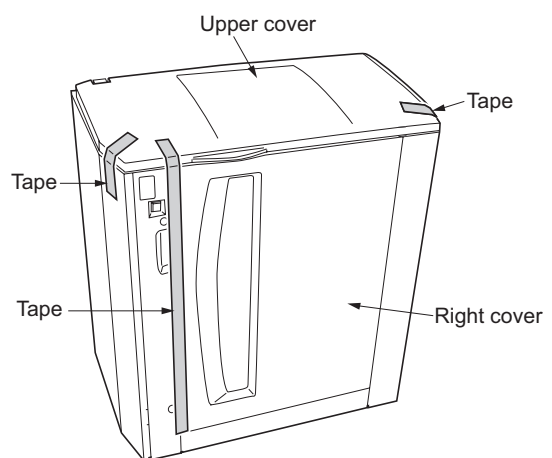
Remove the tapes and spacers as follows before machine installation.

1. Remove the tape securing the hook.
2. Remove the three tapes securing the signal cable and base retainer.
3. Remove the tapes and then remove the air padded bag.



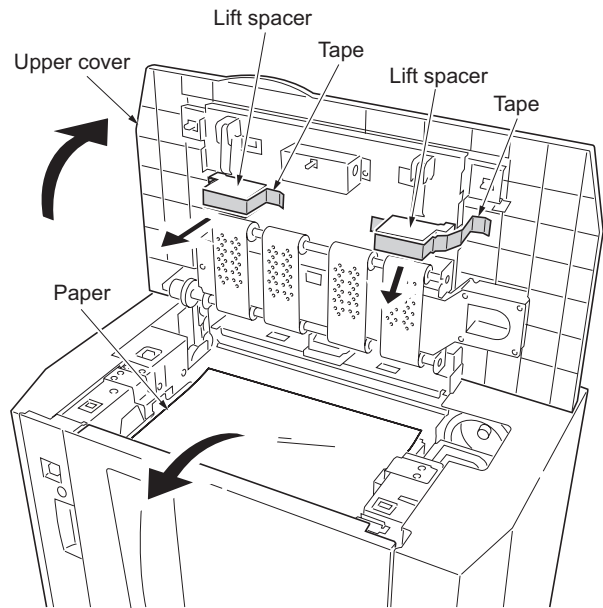
**Figure 1-2-2**

4. Remove the three tapes securing the upper and right covers.

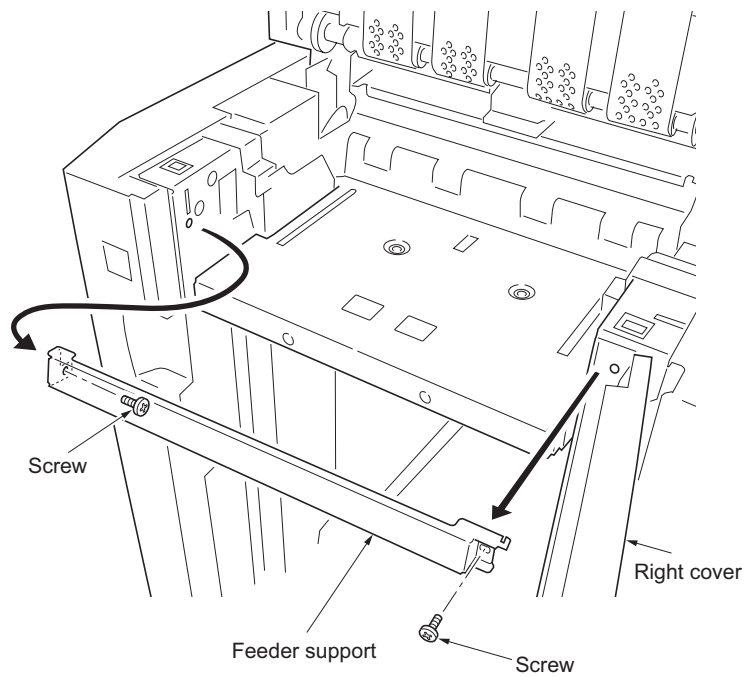


**Figure 1-2-3**

5. Open the upper cover.
6. Remove the tape securing each of the two lift spacers and then the spacers.
7. Remove the paper on the lift plate.

**Figure 1-2-4**

8. Open the right cover.
9. Remove the two screws and then remove the feeder support.

**Figure 1-2-5**

## 1-3-1 Maintenance mode

### (1) Contents of the maintenance mode items

Maintenance item No.	Description						
U019	<p><b>Displaying the ROM version</b></p> <p><b>Description</b> Displays the part number for the ROM fitted to each PWB.</p> <p><b>Purpose</b> To check the part number or to decide, based on the last digit of the number, if the newest version of ROM is installed.</p> <p><b>Method</b></p> <ol style="list-style-type: none"> <li>1. Press the start key. The ROM version (the last 6 digits of the part number) is displayed.</li> <li>2. Change the screen using the * or # keys.</li> </ol> <table border="1"> <thead> <tr> <th>Display</th><th>Description</th></tr> </thead> <tbody> <tr> <td>SIDE FEEDER</td><td>Side feeder main PWB ROM IC</td></tr> </tbody> </table> <p><b>Completion</b> Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.</p>	Display	Description	SIDE FEEDER	Side feeder main PWB ROM IC		
Display	Description						
SIDE FEEDER	Side feeder main PWB ROM IC						
U031	<p><b>Checking switches for paper conveying</b></p> <p><b>Description</b> Displays the ON/OFF status of each paper detection switch on the paper conveying path.</p> <p><b>Purpose</b> To check the operation of the switches for paper conveying.</p> <p><b>Method</b></p> <ol style="list-style-type: none"> <li>1. Press the start key. A list of switches, the on-off status of which can be checked, are displayed.</li> <li>2. Turn each switch on and off manually to check the status. When the on-status of a switch is detected, that switch is displayed in reverse.</li> </ol> <table border="1"> <thead> <tr> <th>Display</th><th>Sensor</th></tr> </thead> <tbody> <tr> <td>LDECK FD SW</td><td>Side feeder feed switch (SFFSW)</td></tr> <tr> <td>LDECK PE SW</td><td>Side feeder paper empty switch (SFPESW)</td></tr> </tbody> </table> <p><b>Completion</b> Press the stop/clear key. The screen for selecting a maintenance item No. is displayed.</p>	Display	Sensor	LDECK FD SW	Side feeder feed switch (SFFSW)	LDECK PE SW	Side feeder paper empty switch (SFPESW)
Display	Sensor						
LDECK FD SW	Side feeder feed switch (SFFSW)						
LDECK PE SW	Side feeder paper empty switch (SFPESW)						
U208	<p><b>Setting the paper size for the side feeder</b></p> <p><b>Description</b> Sets the paper size for the side feeder. This maintenance item is applied to only Japanese specification machines, so no setting is necessary.</p>						
U212	<p><b>Description</b> Sets the operation of the side feeder lift motor for when paper in the side feeder is exhausted.</p> <p><b>Purpose</b> To be set according to the paper loading method.</p> <p><b>Method</b> Press the start key. The screen for selecting an item is displayed.</p> <p><b>Setting the paper loading method</b></p> <ol style="list-style-type: none"> <li>1. Select the method to load paper at the screen for selecting an item.</li> </ol> <table border="1"> <thead> <tr> <th>Display</th><th>Description</th></tr> </thead> <tbody> <tr> <td>SIDE FEED</td><td>Load paper through the right cover.</td></tr> <tr> <td>UPPER FEED</td><td>Load paper through the upper cover.</td></tr> </tbody> </table> <p>Initial setting: SIDE FEED</p> <ol style="list-style-type: none"> <li>2. Press the start key. The setting is set. The screen for selecting a maintenance item No. is displayed.</li> </ol> <p><b>Completion</b> To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.</p>	Display	Description	SIDE FEED	Load paper through the right cover.	UPPER FEED	Load paper through the upper cover.
Display	Description						
SIDE FEED	Load paper through the right cover.						
UPPER FEED	Load paper through the upper cover.						

Maintenance item No.	Description												
<b>U247</b>	<p><b>Setting the paper feed device</b></p> <p><b>Description</b> Drives each motor of the optional side feeder.</p> <p><b>Purpose</b> To check the operation of the optional side feeder.</p> <p><b>Method</b></p> <ol style="list-style-type: none"> <li>1. Press the start key. The screen for selecting an item is displayed.</li> <li>2. Select the motor to be operated. When checking the side feeder lift motor (SFLM) operation, set the paper to the side feeder. The selected item is displayed in reverse and the operation starts.</li> </ol> <table border="1"> <thead> <tr> <th>Display</th><th>Operation</th></tr> </thead> <tbody> <tr> <td>SDECK MOT</td><td>Side feeder drive motor (SFDM)</td></tr> <tr> <td>SDECK FAN</td><td>Separation fan motor (SPFM) and suction fan motor (IFM)</td></tr> <tr> <td>SDECK LIFT</td><td>Side feeder lift motor (SFLM)</td></tr> <tr> <td>SDECK CVCL</td><td>Side feeder conveying clutch (SFCCL)</td></tr> <tr> <td>SDECK FDCL</td><td>Side feeder paper feed clutch (SFPFCL)</td></tr> </tbody> </table> <ol style="list-style-type: none"> <li>3. To stop operation, press the stop/clear key. If this maintenance item is executed with the upper cover of the side feeder open, detection of the upper limit is not possible and thus the side feeder lift motor overruns.</li> </ol> <p><b>Completion</b> Press the stop key after operation stops. The screen for selecting a maintenance item No. is displayed.</p>	Display	Operation	SDECK MOT	Side feeder drive motor (SFDM)	SDECK FAN	Separation fan motor (SPFM) and suction fan motor (IFM)	SDECK LIFT	Side feeder lift motor (SFLM)	SDECK CVCL	Side feeder conveying clutch (SFCCL)	SDECK FDCL	Side feeder paper feed clutch (SFPFCL)
Display	Operation												
SDECK MOT	Side feeder drive motor (SFDM)												
SDECK FAN	Separation fan motor (SPFM) and suction fan motor (IFM)												
SDECK LIFT	Side feeder lift motor (SFLM)												
SDECK CVCL	Side feeder conveying clutch (SFCCL)												
SDECK FDCL	Side feeder paper feed clutch (SFPFCL)												
<b>U327</b>	<p><b>Setting the drawer heater ON/OFF</b></p> <p><b>Description</b> Sets ON/OFF of the drawer heater and side feeder dehumidifier.</p> <p><b>Purpose</b> To change the setting when dew condensation on the drum is heavy.</p> <p><b>Method</b> Press the start key. The screen for selecting an item is displayed.</p> <p><b>Setting</b></p> <ol style="list-style-type: none"> <li>1. Select ON or OFF. The selected item is displayed in reverse.</li> </ol> <table border="1"> <thead> <tr> <th>Display</th><th>Description</th></tr> </thead> <tbody> <tr> <td>CASSETTE ON</td><td>Drawer heater ON</td></tr> <tr> <td>CASSETTE OFF</td><td>Drawer heater OFF</td></tr> <tr> <td>SIDE FEEDER ON</td><td>Side feeder dehumidifier heater ON</td></tr> <tr> <td>SIDE FEEDER OFF</td><td>Side feeder dehumidifier heater OFF</td></tr> </tbody> </table> <p>Initial setting: Drawer heater OFF, side feeder dehumidifier OFF</p> <ol style="list-style-type: none"> <li>2. Press the start key. The setting is set, and the screen for selecting a maintenance item No. is displayed.</li> </ol> <p><b>Completion</b> To exit this maintenance item without changing the current setting, press the stop/clear key. The screen for selecting a maintenance item No. is displayed.</p>	Display	Description	CASSETTE ON	Drawer heater ON	CASSETTE OFF	Drawer heater OFF	SIDE FEEDER ON	Side feeder dehumidifier heater ON	SIDE FEEDER OFF	Side feeder dehumidifier heater OFF		
Display	Description												
CASSETTE ON	Drawer heater ON												
CASSETTE OFF	Drawer heater OFF												
SIDE FEEDER ON	Side feeder dehumidifier heater ON												
SIDE FEEDER OFF	Side feeder dehumidifier heater OFF												

## 1-4-1 Paper misfeed detection

### (1) Paper misfeed detection

When a paper jam occurs, the machine stops operating immediately. The machine operation panel shows a jam message and the jam location. To remove the jammed paper, detach the side feeder from the machine.

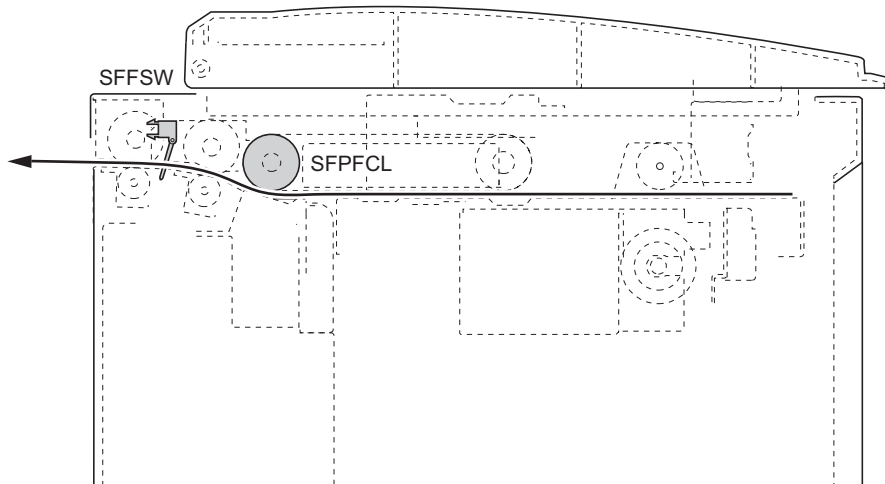


Figure 1-4-1

### (2) Paper misfeed detection condition

Section	Jam code	Description	Conditions
Side feeder	14	No paper feed from side feeder	Side feeder feed switch (SFFSW) does not turn on within 2000 ms of the side feeder paper feed clutch (SFPFCL) turning on; the clutch is then successively held off for 50 ms and turned back on twice, but the switch again fails to turn on within 848 ms.
	30	Multiple sheets in paper feed section	Side feeder feed switch (SFFSW) does not turn off within 700 ms of its turning on.
	32	Misfeed in registration	Feed switch 1 (FSW1) does not turn on within specified time <800 ms (586 ms) for 80 cpm/1029 ms (586 ms) for 60 cpm> of feed switch 2 (FSW2) turning on.

### (3) Paper misfeeds

Problem	Causes/check procedures	Corrective measures
A paper jam in the side feeder is indicated during copying.	Check if the side feeder paper feed clutch malfunctions.	Check and repair if necessary.
	Electrical problem with the side feeder paper feed clutch.	Check and repair if necessary. See page 1-4-4.
	Broken side feeder feed switch actuator.	Check visually and replace the side feeder feed switch if its actuator is broken.
	Defective side feeder feed switch.	Run maintenance item U031 and turn the side feeder feed switch on and off manually. Replace the side feeder feed switch if indication of the corresponding sensor on the touch panel is not displayed in reverse.

## 1-4-2 Self-diagnosis

### (1) Self-diagnostic function

When a problem is detected in the side feeder, copying is disabled and the machine operation section displays a code consisting of "C" followed by a number, indicating the nature of the problem.

After removing the problem, the self-diagnostic function can be reset by reattaching the side feeder.

### (2) Self diagnostic code

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
<b>C0420</b>	<b>Side feeder communication problem</b> <ul style="list-style-type: none"> <li>An error code from the side feeder is detected ten times in succession. No communication: there is no reply after 10 retries.</li> <li>Abnormal communication: a communication error (checksum error) is detected ten times in succession.</li> </ul>	Poor contact in the connector terminals.	Check the connection of connector YC15 on the machine's engine PWB and the connector YC3 on the side feeder main PWB, and the continuity across the connector terminals. Repair or replace if necessary.
		Defective machine's engine PWB.	Replace the machine's engine PWB and check for correct operation.
		Defective machine's main PWB.	Replace the machine's main PWB and check for correct operation.
		Defective side feeder main PWB.	Replace the side feeder main PWB and check for correct operation.
<b>C0700</b>	<b>Side feeder EEPROM problem</b> <ul style="list-style-type: none"> <li>An error occurs in EEPROM (U4) data read or write for the side feeder main PWB.</li> </ul>	Poor contact in the connector terminals.	Check the connection of connector YC15 on the machine's engine PWB and the connector YC3 on the side feeder main PWB, and the continuity across the connector terminals. Repair or replace if necessary.
		Defective side feeder main PWB.	Replace the side feeder main PWB and check for correct operation.
		Defective machine's engine PWB.	Replace the machine's engine PWB and check for correct operation.
		Defective machine's main PWB.	Replace the machine's main PWB and check for correct operation.
<b>C1140</b>	<b>Side feeder lift motor problem</b> <ul style="list-style-type: none"> <li>Upper limit detection switch does not turn off within 15 s of the side feeder lift motor starting (within 200 ms during paper feeding).</li> </ul>	Defective upper limit detection switch.	Replace the upper limit detection switch and check for correct operation.
		Defective side feeder main PWB.	Replace the side feeder main PWB and check for correct operation.
		Defective machine's engine PWB.	Replace the machine's engine PWB and check for correct operation.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C1150	<b>Side feeder lift motor problem</b> <ul style="list-style-type: none"> <li>Lower limit detection switch does not turn off within 15 s of the side feeder lift motor starting (within 200 ms during paper feeding).</li> </ul>	Defective lower limit detection switch.	Replace the lower limit detection switch and check for correct operation.
		Defective side feeder main PWB.	Replace the side feeder main PWB and check for correct operation.
		Defective machine's engine PWB.	Replace the machine's engine PWB and check for correct operation.
C2640	<b>Side feeder drive motor problem</b>	Defective side feeder drive motor.	Replace the side feeder drive motor and check for correct operation.
		Defective side feeder main PWB.	Replace the side feeder main PWB and check for correct operation.
		Defective machine's engine PWB.	Replace the machine's engine PWB and check for correct operation.

### 1-4-3 Electrical problem

Problem	Causes	Check procedures/corrective measures
(1) The side feeder paper feed clutch does not operate.	Poor contact of the side feeder paper feed clutch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Broken side feeder paper feed clutch coil.	Check for continuity across the coil. If none, replace the side feeder paper feed clutch.
	Defective side feeder paper feed clutch.	Run maintenance item U247 and check if the side feeder paper feed clutch does not operate when YC5-A10 on the side feeder main PWB goes low. If so, replace the side feeder paper feed clutch. (See page 1-3-2.)
	Defective side feeder main PWB.	Run maintenance item U247 and check if YC5-A10 on the side feeder main PWB goes low. If not, replace the side feeder main PWB. (See page 1-3-2.)
(2) The side feeder paper conveying clutch does not operate.	Poor contact of the side feeder paper conveying clutch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Broken side feeder paper conveying clutch coil.	Check for continuity across the coil. If none, replace the side feeder paper conveying clutch.
	Defective side feeder paper conveying clutch.	Run maintenance item U247 and check if the side feeder paper conveying clutch does not operate when YC6-B7 on the side feeder main PWB goes low. If so, replace the side feeder paper conveying clutch. (See page 1-3-2.)
	Defective side feeder main PWB.	Run maintenance item U247 and check if YC6-B7 on the side feeder main PWB goes low. If not, replace the side feeder main PWB. (See page 1-3-2.)
(3) The separation fan motor does not operate.	Poor contact of the separation fan motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective separation fan motor.	Run maintenance item U247 and check if the separation fan motor does not operate when YC6-A1 on the side feeder main PWB goes low. If so, replace the separation fan motor. (See page 1-3-2.)
	Defective side feeder main PWB.	Run maintenance item U247 and check if YC6-A1 on the side feeder main PWB goes low. If not, replace the side feeder main PWB. (See page 1-3-2.)
(4) The suction fan motor does not operate.	Poor contact of the suction fan motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective suction fan motor.	Run maintenance item U247 and check if the suction fan motor does not operate when YC6-A2 on the side feeder main PWB goes low. If so, replace the side feeder main PWB. (See page 1-3-2.)
	Defective side feeder main PWB.	Run maintenance item U247 and check if YC6-A2 on the side feeder main PWB goes low. If not, replace the side feeder main PWB. (See page 1-3-2.)



Problem	Causes	Check procedures/corrective measures
(5) The side feeder lift motor does not operate.	Poor contact of the side feeder lift motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Broken side feeder lift motor coil.	Check for continuity across the coil. If none, replace the feeder lift motor.
	Defective side feeder lift motor or side feeder main PWB.	<p>Run maintenance item U247 and measure the voltage between side feeder main PWB terminal YC5-A12 and YC6-B11. Each of LUSSW, UCSSW, LLSSW, and RCSSW should be turned off.</p> <p>Although 24 V DC or -24 V DC are measured, if a side feeder lift motor does not operate, replace the side feeder lift motor.</p> <p>When change of voltage is not measured, (0V), replace the side feeder main PWB.</p> <p style="text-align: right;"><u>SFLM Wiring Diagram</u></p>
(6) The side feeder drive motor does not operate.	Poor contact of the side feeder drive motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Broken side feeder drive motor coil.	Check for continuity across the coil. If none, replace the feeder lift motor.
	Defective side feeder drive motor.	Run maintenance item U247 and check if the side feeder drive motor does not operate when YC4-4 on the side feeder main PWB goes low. If so, replace the side feeder drive motor. (See page 1-3-2.)
	Defective side feeder main PWB.	Run maintenance item U247 and check if YC6-A1 on the side feeder main PWB goes low. If not, replace the side feeder main PWB. (See page 1-3-2.)

## **1-5-1 Precautions for assembly and disassembly**

### **(1) Precautions**

Be sure to turn the power switch off and disconnect the power plug before starting disassembly.

When handling PWBs (printed wiring boards), do not touch parts with bare hands. The PWBs are susceptible to static charge.

Do not touch any PWB containing ICs with bare hands or any object prone to static charge.

Use only the specified parts to replace the fuser thermostat. Never substitute electric wires, as the copier may be seriously damaged.

When replacing battery on a PWB, dispose properly according to laws and regulations.

## 1-5-2 Procedure for assembly and disassembly

### (1) Adjusting the center line

Make the following adjustment if there is a regular error between the center lines of the original and the copy image when paper is fed from the side feeder.

Note: Before performing this adjustment, be sure to perform the center line adjustment of the machine.

#### <Procedure>

1. Run maintenance item U034 and output a test pattern.
  2. Measure the discrepancy  $L$  (mm) between the center lines of the paper and test pattern.
  3. Open the lower vertical conveying cover of the machine. Loosen the two screws securing the feeder retainer and move the V-shaped groove on the feeder retainer by the measured amount  $L$  and retighten the screws.
- \* If the center line of the sample is shifted to the paper front, move the V-shaped groove of the feeder retainer toward the machine front (example 1).
  - \* If the center line of the sample is shifted to the paper rear, move the V-shaped groove of the feeder retainer toward the machine rear (example 2).

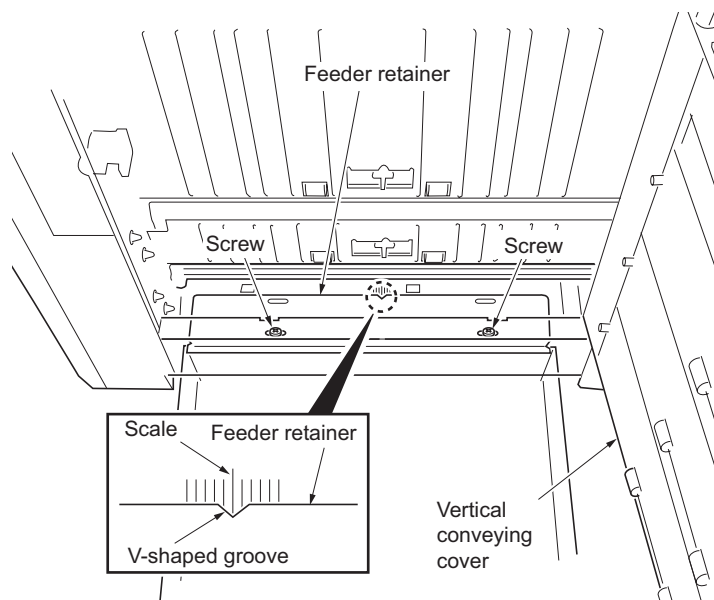


Figure 1-5-1

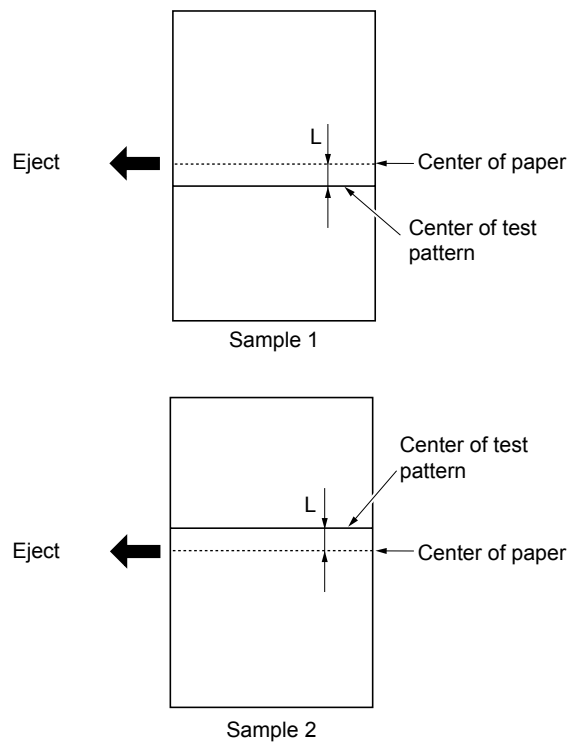


Figure 1-5-2

## 2-1-1 Mechanical construction

The side feeder consists of the paper lifting mechanism, which winds up paper with the wire of the side feeder lift motor (SFLM), and the paper feed and conveying mechanism, which conveys paper with the drive of the paper conveying belt, feed roller and left feed roller.

The side feeder lift motor (SFLM) raises the lift by winding up the wire engaged with the pulley. The lift is stopped at the upper and lower limit by the control of the upper limit detection switch (ULPSW) and lower limit detection switch (LLPSW). Paper is fed by controlling currents of air. The top sheet of the paper loaded on the lift is floated by the separation fan motor (SPFM) and then induced onto the paper conveying belt by the suction fan motor (IFM). The sheet thus attracted to the paper conveying belt is then conveyed to the feed roller and left feed roller by the drive of the side feeder drive motor (SFDM).

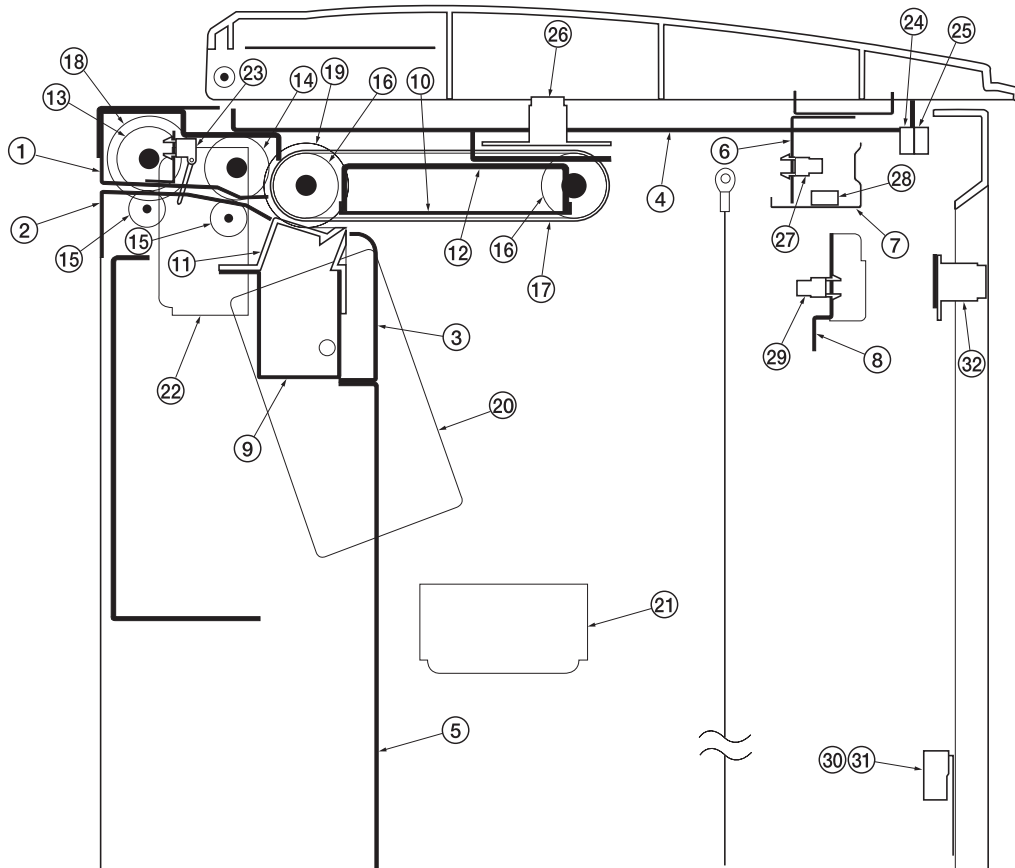
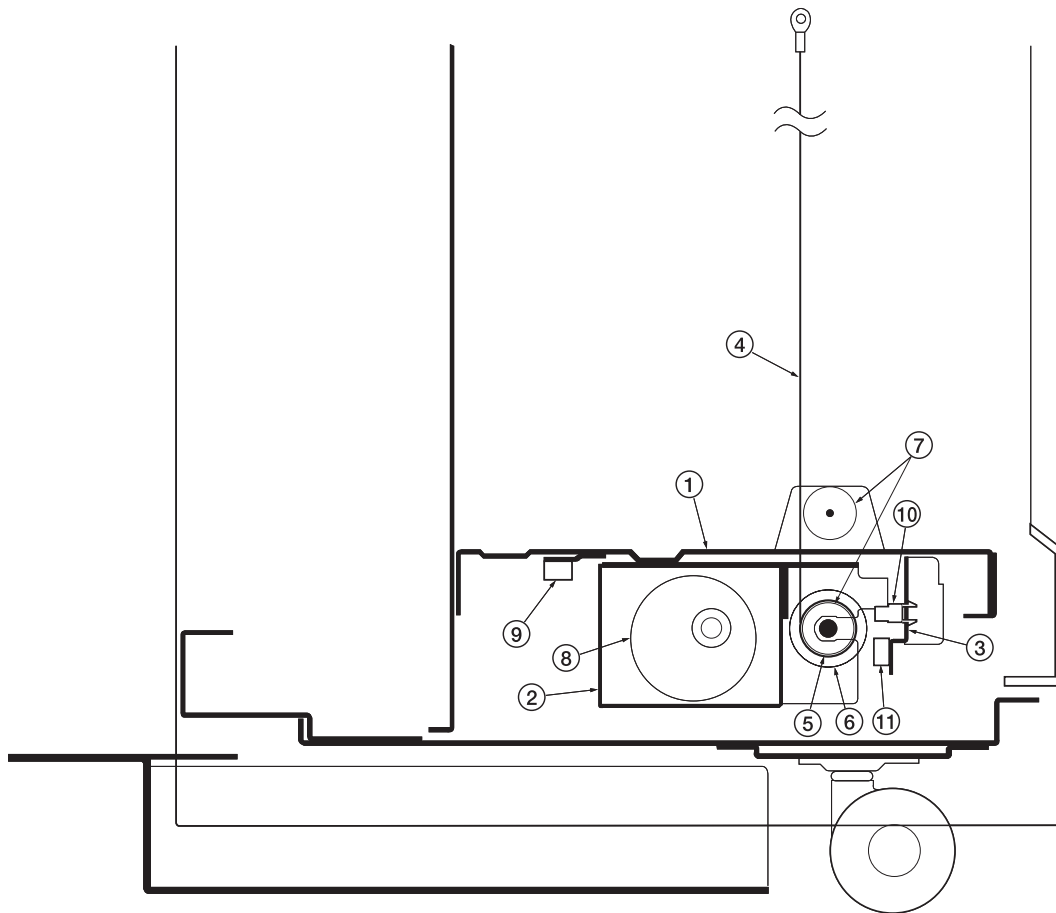


Figure 2-1-1 Side feeder (1)

- |  |   |
|--|---|
| (1) Upper paper conveying guide        | (18) Side feeder paper conveying clutch (SFCCL) |
| (2) Lower paper conveying guide        | (19) Side feeder paper feed clutch (SFPFCL)     |
| (3) Paper guide                        | (20) Side feeder drive motor (SFDM)             |
| (4) Paper conveying belt retainer      | (21) Suction fan motor (IFM)                    |
| (5) Left side feeder guide             | (22) Separation fan motor (SPFM)                |
| (6) Upper limit switch mount           | (23) Side feeder feed switch (SFFSW)            |
| (7) Switch cover                       | (24) Upper cover safety switch (UCSSW)          |
| (8) Paper level detection switch mount | (25) Upper cover open/close switch (UCOSW)      |
| (9) Lower separation duct mount        | (26) Upper down switch (UDSW)                   |
| (10) Lower suction duct                | (27) Upper limit detection switch (ULPSW)       |
| (11) Upper separation duct             | (28) Upper limit safety switch (ULSSW)          |
| (12) Upper suction duct                | (29) Paper level detection switch (PRDSW)       |
| (13) Left feed roller                  | (30) Right cover open/close switch (RCOSW)      |
| (14) Feed roller                       | (31) Right cover safety switch (RCSSW)          |
| (15) Paper conveying pulley            | (32) Right down switch (RDSW)                   |
| (16) Paper conveying belt pulley       |   |
| (17) Paper conveying belt              |   |



**Figure 2-1-2 Side feeder (2)**

- (1) Lift
- (2) Side feeder lift motor cover
- (3) Lower limit detection switch mount
- (4) Lift wire
- (5) Wire lift pulley
- (6) Wire holding plate
- (7) Mirror pulley
- (8) Side feeder lift motor (SFLM)
- (9) Side feeder paper empty switch (SFPESW)
- (10) Lower limit detection switch (LLPSW)
- (11) Lower limit safety switch (LLSSW)

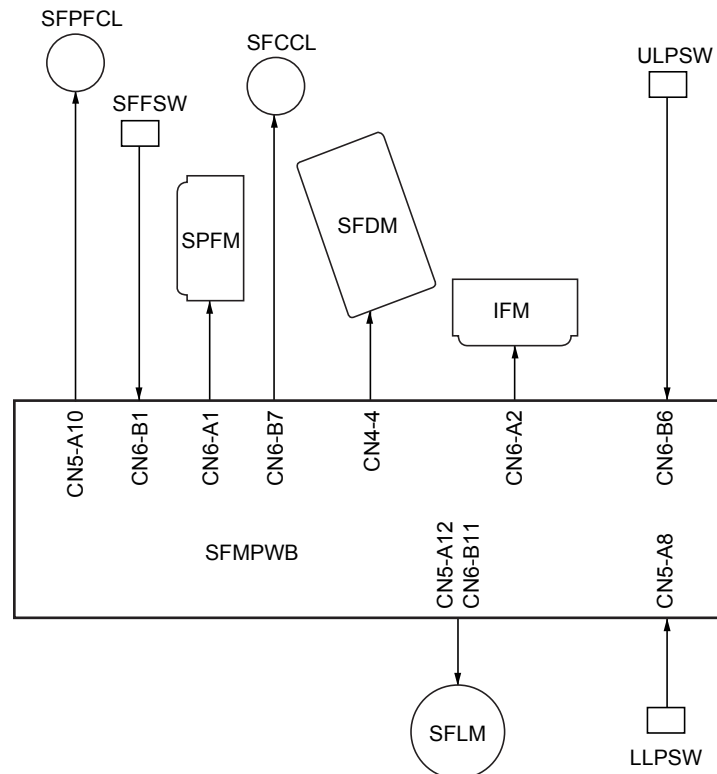


Figure 2-1-3 Side feeder block diagram

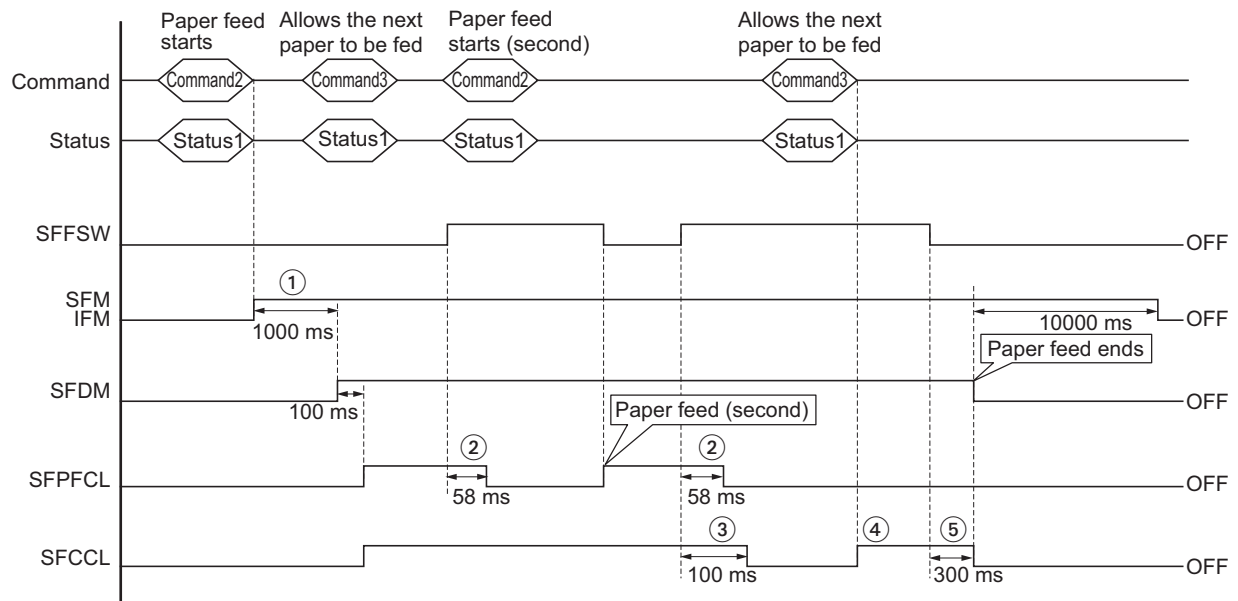
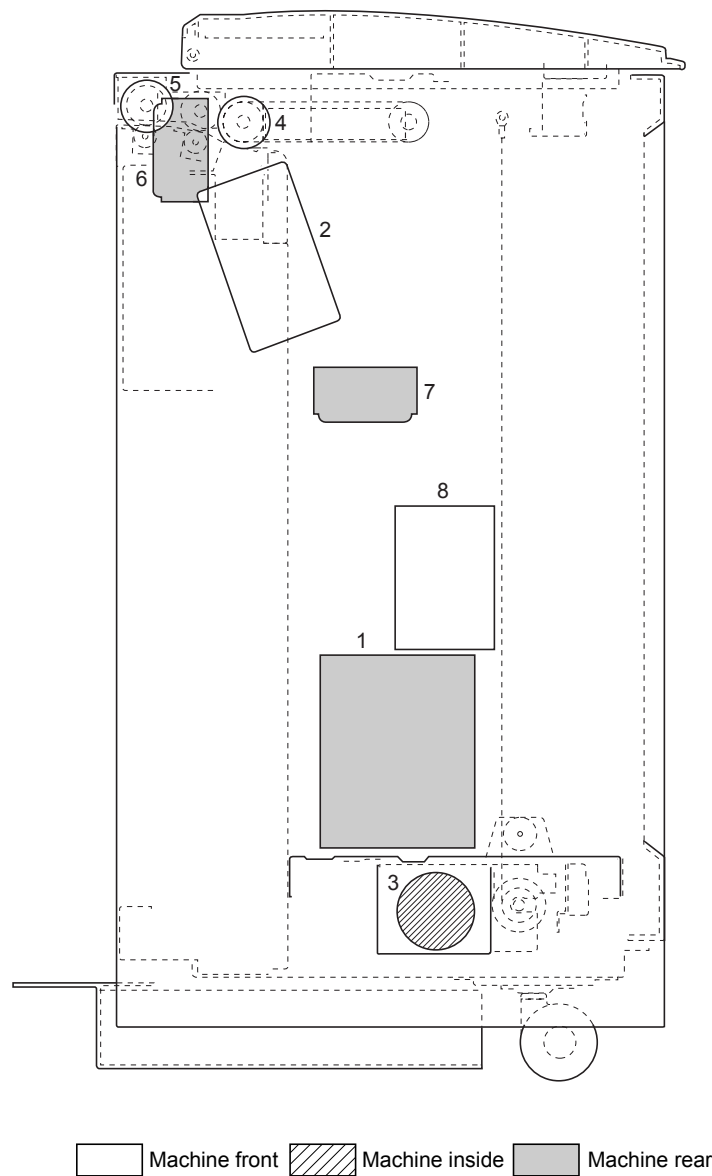


Figure 2-1-4 Timing chart

1. In case the separation fan motor (SPFM) and the suction fan motor (IFM) is not activated when receiving Command 2 (start feeding) from the machine, waits for 1000 ms until the fan rotation becomes stable.
2. After turning the side feeder feed switch (SFFSW) on, feeds the 35 mm paper and turns off the side feeder paper feed clutch (SFPFCL). The stop time varies along with the feeding speed  $600 \text{ mm/s} = 58 \text{ ms}$ .
3. When the side feeder feed switch (SFFSW) turns on, feeds the paper and turns the side feeder conveying clutch (SFCCL) off unless Command 3 (allows the next paper to be fed) is received. The stop time varies along with the feeding speed  $600 \text{ mm/s} = 58 \text{ ms}$ .
4. Restarts the feeding when receiving Command 3 (allows the next paper to be fed).
5. When the side feeder feed switch (SFFSW) is turned off, stops the feeding unless Command 3 (starts the feeding) is received.

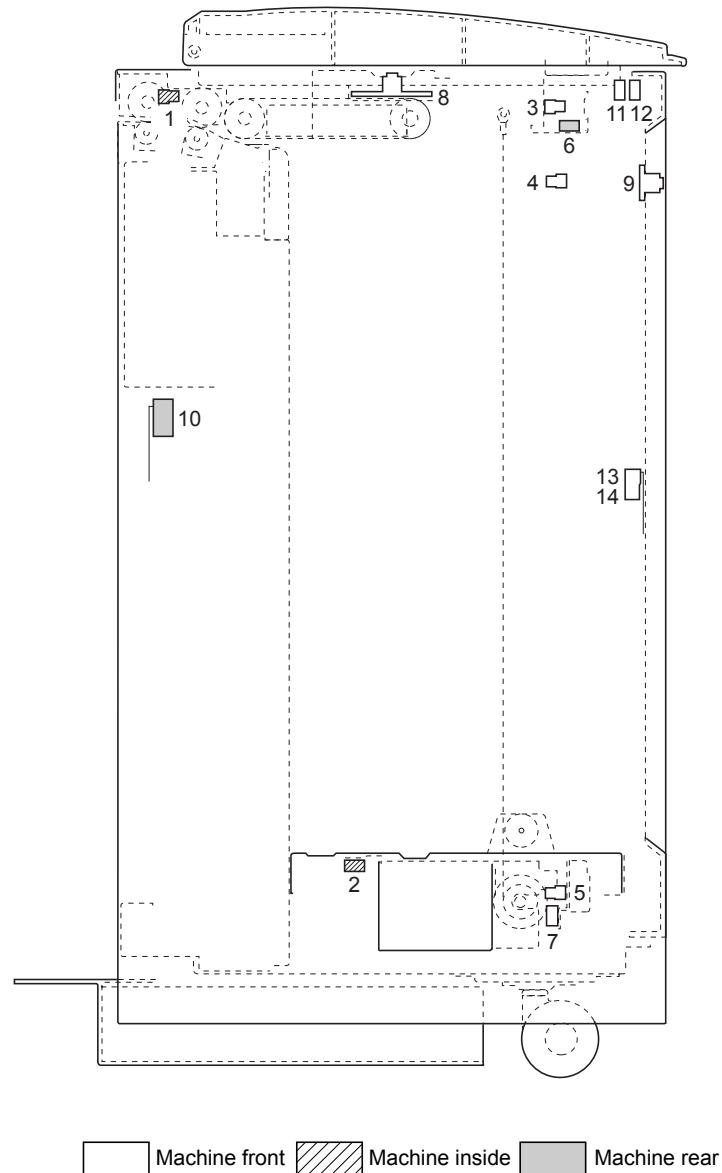
## 2-2-1 Electrical parts layout

### (1) PWBs, motors and clutches



**Figure 2-2-1 PWBs, motors and clutches**

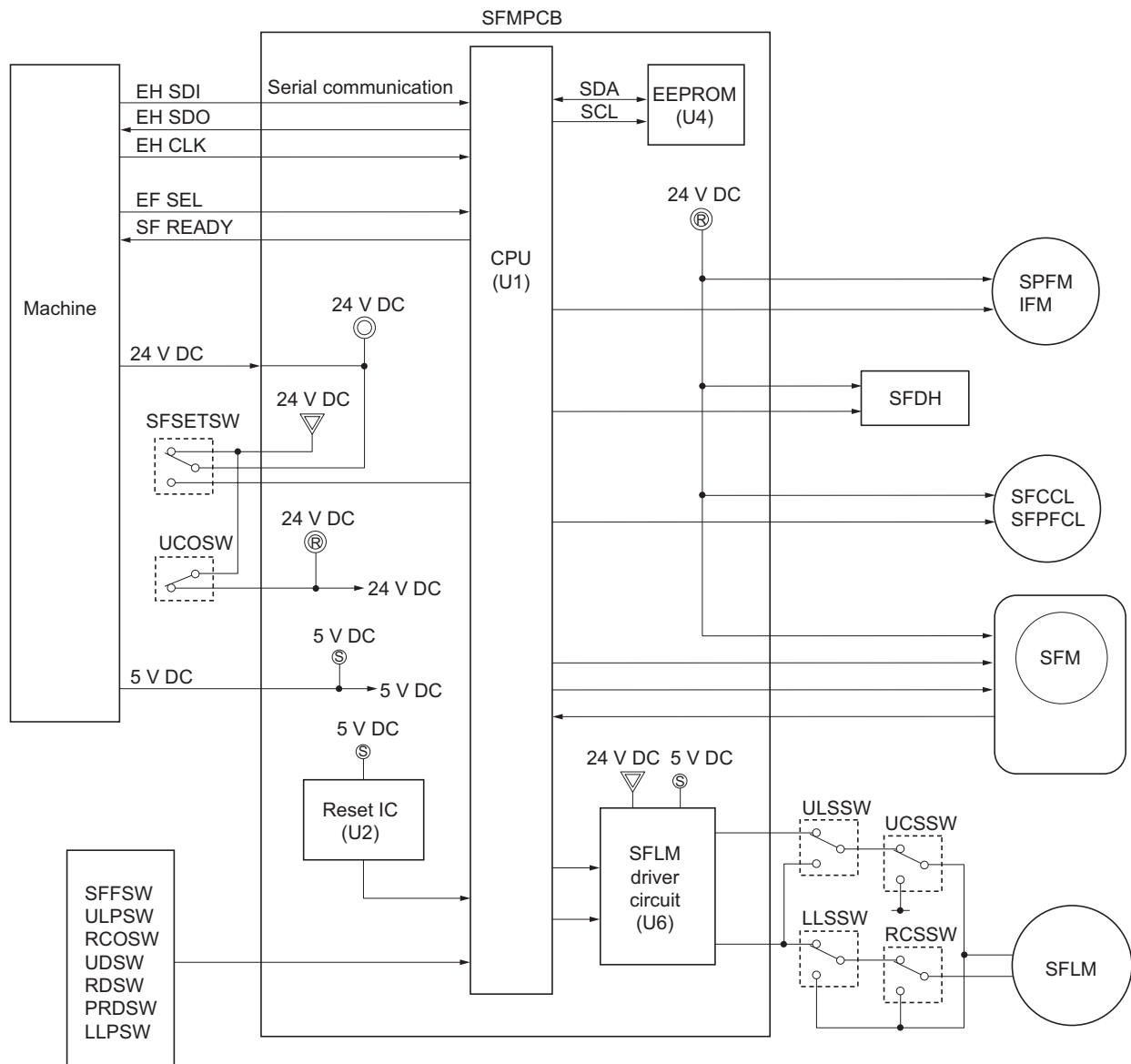
1. Side feeder main PWB (SFMPWB) ..... Controls electrical components in the side feeder and communications with the machine.
2. Side feeder drive motor (SFDM) ..... Drives the paper feed and conveying mechanism in the side feeder.
3. Side feeder lift motor (SFLM) ..... Drives the paper lift mechanism of the side feeder.
4. Side feeder paper feed clutch (SFPFCL) ..... Transfers drive from the paper conveying belt.
5. Side feeder paper conveying clutch (SFCCL) ..... Transfers drive from the left feed roller and feed roller.
6. Separation fan motor (SPFM) ..... Separates the uppermost sheet in the side feeder.
7. Suction fan motor (IFM) ..... Attracts paper to the paper conveying belt.
8. Side feeder dehumidifier heater (SFDH) ..... Dehumidifies paper in the side feeder.

**(2) Switches****Figure 2-2-2 Switches**

1. Side feeder feed switch (SFFSW)..... Detects a paper misfeed.
2. Side feeder paper empty switch (SFPESW) ..... Detects the presence of paper in the side feeder.
3. Upper limit detection switch (ULPSW) ..... Detects the lift reaching the upper limit.
4. Paper level detection switch (PRDSW)..... Detects the paper level in the side feeder.
5. Lower limit detection switch (LLPSW)..... Detects the lift reaching the lower limit.
6. Upper limit safety switch (ULSSW) ..... Breaks the safety circuit when the lift overruns the upper limit.
7. Lower limit safety switch (LLSSW)..... Breaks the safety circuit when the lift overruns the lower limit.
8. Upper down switch (UDSW) ..... For the controlling of the descending of the lift when the upper cover is opened.
9. Right down switch (RDSW)..... For the controlling of the descending of the lift when the right cover is opened.
10. Side feeder set switch (SFSETSW) ..... Detects the side feeder attached to the machine; breaks the safety circuit when the feeder is detached from the machine.
11. Upper cover safety switch (UCSSW) ..... Breaks the safety circuit when the upper cover is opened.
12. Upper cover open/close switch (UCOSW) ... Detects whether the upper cover is open or closed.
13. Right cover safety switch (RCSSW) ..... Breaks the safety circuit when the right cover is opened.
14. Right cover open/close switch (RCOSW) .... Detects whether the right cover is open or closed.



### 2-3-1 Side feeder main PWB



**Figure 2-3-1 Side feeder main PWB block diagram**

The main component of the side feeder main PWB (SFMPWB) is the CPU U1. It controls the overall operation of the side feeder by receiving detection signals from switches as inputs and outputting drive signals to motors and clutches.

Communication of control signals with the machine is performed by 3-line type serial communication method.

With the control signal received from the CPU U1, the SFLM driver circuit U6 drives the side feeder lift motor (SFLM). A safety circuit consisting of the side feeder set switch (SFSETSW), upper cover safety switch (UCSSW) and right cover safety switch (RCSSW) ensures the security by cutting 24 V DC supply for the SFLM driver circuit U6 and drive output for the side feeder lift motor (SFLM) when the side feeder is detached from the machine or when the upper or right cover is opened.

The reset IC U2 monitors the 5 V DC power supply. When the power is turned on and when the supply voltage becomes low, the reset IC U2 outputs a RESET signal to the CPU U1 to reset the system for the prevention of malfunctions.

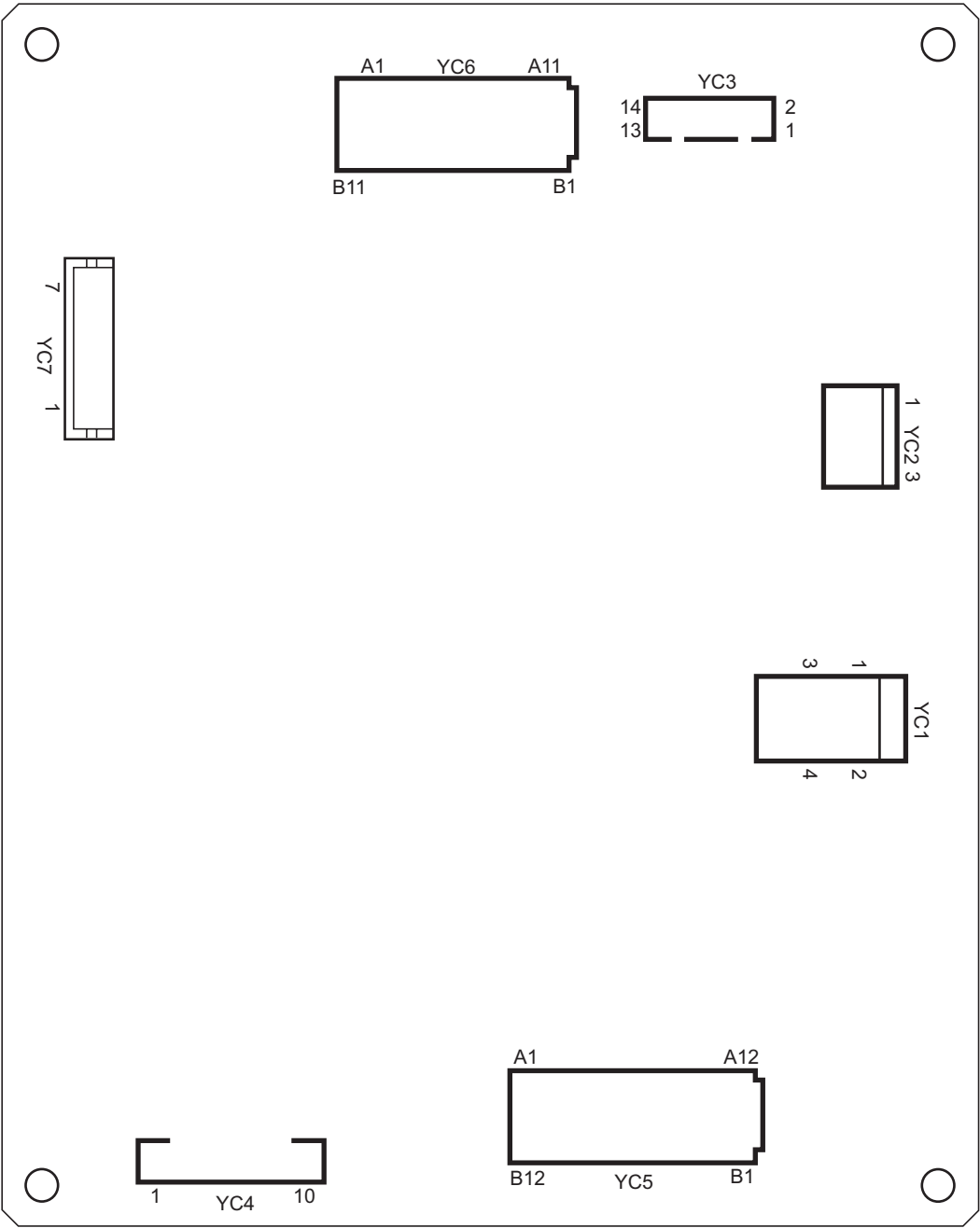
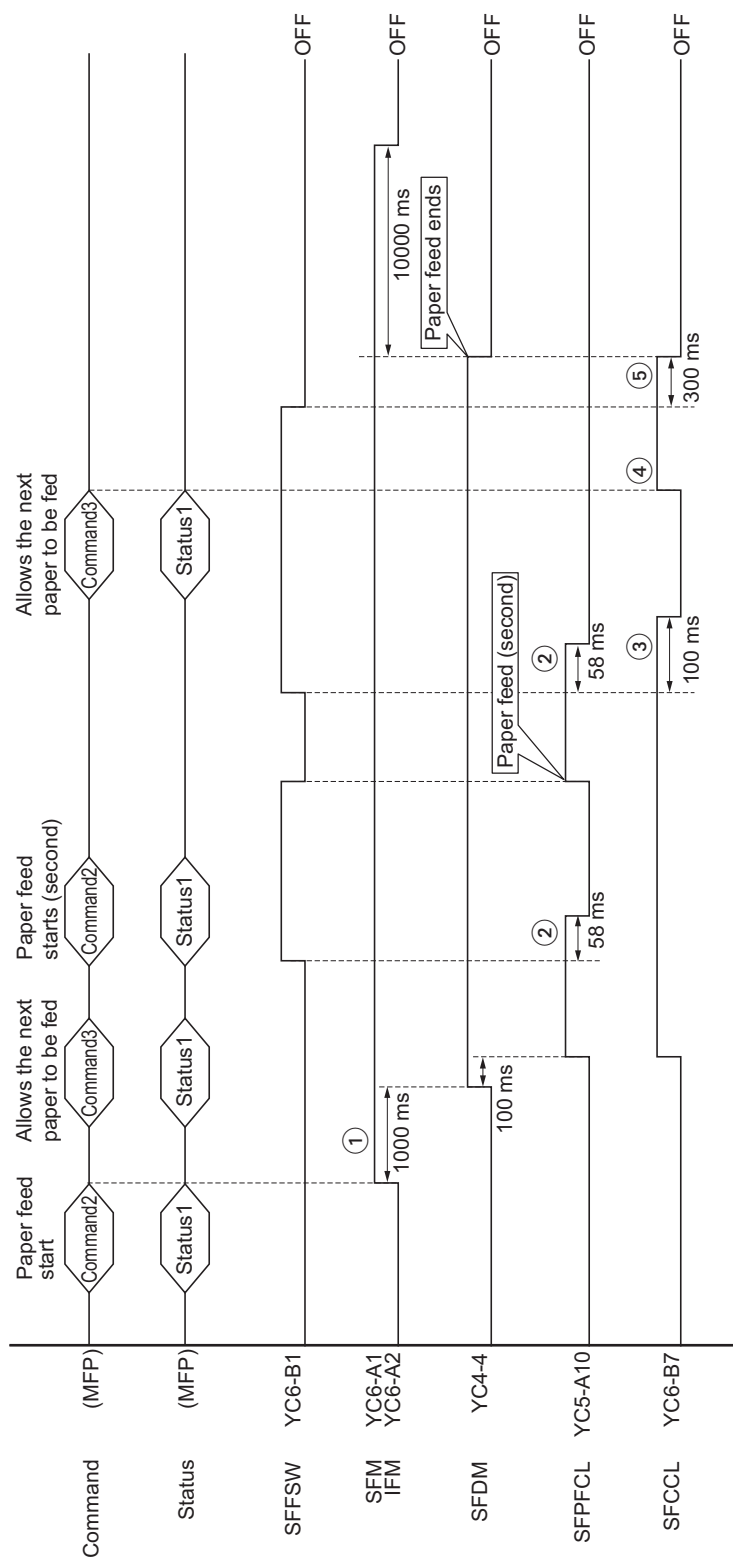


Figure 2-3-2 Side feeder main PWB silk-screen diagram

Connector	Pin No.	Signal	I/O	Voltage	Description
YC1 Connected to the side feeder set switch and upper cover open/close switch.	1	24V	O	24 V DC	24 V DC power
	2	SFSETSW	I	0/24 V DC	SFSETSW: On/Off
	3	SFLM 24V	I	24 V DC	24 V DC power (Via SFSETSW)
	4	R24V	I	24 V DC	24 V DC power (Via SFSETSW, UCOSW)
YC2 Connected to the machine.	1	5V	I	5 V DC	5 V DC power
	2	G(24V)	-	-	Ground
	3	24V	I	24 V DC	24 V DC power
YC3 Connected to the machine.	1	G(5V)	-	-	Ground
	2	G(5V)	-	-	Ground
	3	EH SDI	I	0/5 V DC (pulse)	Serial communication data signal
	4	G(5V)	-	-	Ground
	5	EH SDO	O	0/5 V DC (pulse)	Serial communication data signal
	6	G(5V)	-	-	Ground
	7	SF RDY	O	0/5 V DC	Ready signal
	8	G(5V)	-	-	Ground
	9	SF SEL	I	0/5 V DC	Select signal
	10	G(5V)	-	-	Ground
	11	EH CLK		0/5 V DC (pulse)	Clock signal for serial communication
	12	G(5V)	-	-	Ground
	13	EH STOP	-	-	Not used
	14	G(5V)	-	-	Ground
YC4 Connected to the side feeder drive motor.	1	N.C.	-	-	Not used
	2	SFDM CLK	O	0/5 V DC(pulse)	Clock signal for SFDM
	3	SFDM ALM	I	0/5 V DC	SFDM alarm signal
	4	SFDM REM	O	0/5 V DC	SFDM: On/Off
	5	5V	O	5 V DC	5 V DC power supply for SFDM
	6	G(5V)	-	-	Ground
	7	G(24V)	-	-	Ground
	8	G(24V)	-	-	Ground
	9	R24V	O	24 V DC	24 V DC power supply for SFDM
	10	R24V	O	24 V DC	24 V DC power supply for SFDM

Connector	Pin No.	Signal	I/O	Voltage	Description
YC5 Connect to the right down switch, upper down switch, paper level detection switch, lower limit detection switch, right cover safety switch, side feeder paper feed clutch and side feeder dehumidifier heater.	A1	LLSSW	-	-	LLSSW
	A2	LED REM	O	0/5 V DC	RDSW LED: On/Off
	A3	LED REM	O	0/5 V DC	UDSW LED: On/Off
	A4	RDSW	I	0/5 V DC	RDSW: On/Off
	A5	UDSW	I	0/5 V DC	UDSW: On/Off
	A6	5V	O	5 V DC	5 V DC power supply for PRDSW
	A7	PRDSW	I	0/5 V DC	PRDSW: On/Off
	A8	LLPSW	I	0/5 V DC	LLPSW: On/Off
	A9	RCOSW	I	0/5 V DC	RCOSW: On/Off
	A10	SFPFCL	O	0/24 V DC	SFPFCL: On/Off
	A11	SFDH REM	O	0/24 V DC	SFDH: On/Off
	A12	SFLM-	O	-24/0/+24 VDC	SFLM: Fwd/Stop/Rev
	B1	G(5V)	-	-	Ground
	B2	R24V	O	24 V DC	24 V DC power supply for SFDH
	B3	R24V	O	24 V DC	24 V DC power supply for SFPFCL
	B4	G(5V)	-	-	Ground
	B5	G(5V)	-	-	Ground
	B6	G(5V)	-	-	Ground
	B7	5V	O	5 V DC	5 V DC power supply for LLPSW
	B8	5V	O	5 V DC	5 V DC power supply for UDSW
	B9	5V	O	5 V DC	5 V DC power supply for RDSW
	B10	G(5V)	-	-	Ground
	B11	G(5V)	-	-	Ground
	B12	LLSSW	-	-	LLSSW
YC6 Connect to the separation fan motor, suction fan motor, side feeder paper empty switch, side feeder paper feed switch, upper limit safety switch and side feeder conveying clutch.	A1	SPFM REM	O	0/5 V DC	SPFM: On/Off
	A2	IFM REM	O	0/5 V DC	IFM: On/Off
	A3	R24V	O	24 V DC	24 V DC power supply for SPFM
	A4	R24V	O	24 V DC	24 V DC power supply for IFM
	A5	G(24V)	-	-	Ground
	A6	G(24V)	-	-	Ground
	A7	5V	O	5 V DC	5 V DC power supply for SPFM
	A8	5V	O	5 V DC	5 V DC power supply for IFM
	A9	5V	O	5 V DC	5 V DC power supply for SFPESW
	A10	G(5V)	-	-	Ground
	A11	SFPESW	I	0/5 V DC	SFPESW: On/Off
	B1	SFFSW	I	0/5 V DC	SFFSW: On/Off
	B2	5V	O	5 V DC	5 V DC power supply for SFFSW
	B3	G(5V)	-	-	Ground
	B4	G(5V)	-	-	Ground
	B5	5V	O	5 V DC	5 V DC power supply for ULPSW
	B6	ULPSW	I	0/5 V DC	ULPSW: On/Off
	B7	SFCCL	O	0/24 V DC	SFCCL: On/Off
	B8	R24V	O	24 V DC	24 V DC power supply for SFCCL
	B9	ULSSW	-	-	ULSSW
	B10	ULSSW	-	-	ULSSW
	B11	SFLM+	O	+24/0/-24 V DC	SFLM: Fwd/Stop/Rev

Timing chart No.1



- ①: In case the separation fan motor (SPFM) and the suction fan motor (IFM) is not activated when receiving Command 2 (start feeding) from the machine, waits for 1000 ms until the fan rotation becomes stable.
- ②: After turning the side feeder feed switch (SFFSW) on, feeds the 35 mm paper and turns off the side feeder paper feed clutch (SFPFCL). The stop time varies along with the feeding speed 600 mm/s = 58 ms.
- ③: When the side feeder feed switch (SFFSW) turns on, feeds the paper and turns the side feeder conveying clutch (SFCCL) off unless Command 3 (allows the next paper to be fed) is received. The stop time varies along with the feeding speed 600 mm/s = 58 ms.
- ④: Restarts the feeding when receiving Command 3 (allows the next paper to be fed).
- ⑤: When the side feeder feed switch (SFFSW) is turned off, stops the feeding unless Command 3 (starts the feeding) is received.

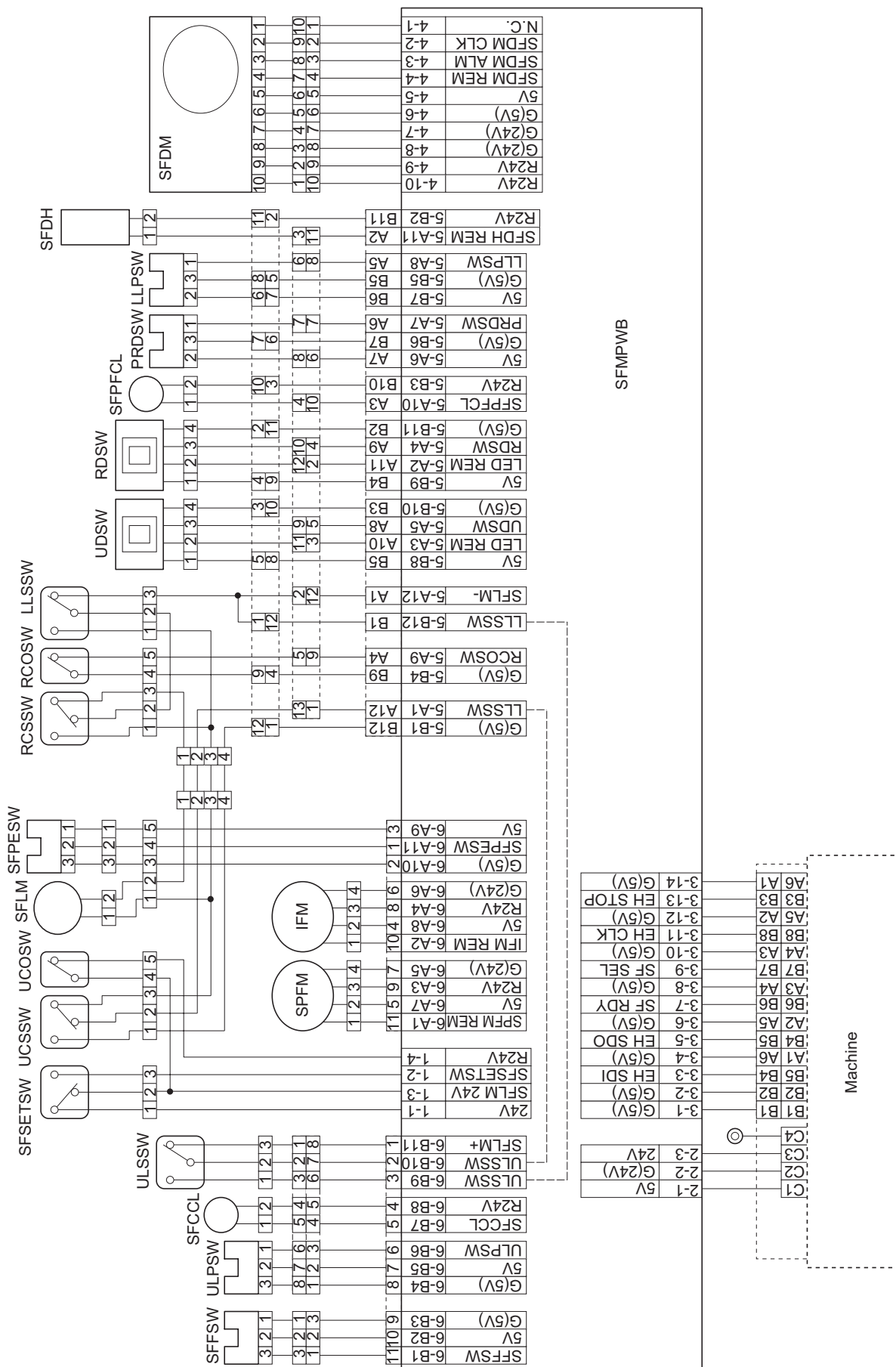
**Maintenance parts list**

<b>Maintenance part name</b>		<b>Part No.</b>	<b>Alternative part No.</b>	<b>Fig. No.</b>	<b>Ref. No.</b>
<b>Name used in service manual</b>	<b>Name used in parts list</b>				
Paper feed belts	BELT LCF,PAPER FEED	2A007990		3	7
Paper feed blades	BLADE PAPER FEED ASS'Y	303BF68010	3BF68010	3	70
Paper guide	GUIDE,PAPER	3BF19141		3	47
Upper paper conveying guide	UPPER GUIDE,CONVEYING	3BF19181		3	50
Lower paper conveying guide	LOWER GUIDE,CONVEYING	3BF19191		3	51
Feed left roller	LEFT ROLLER,FEED	3JD19210		3	48
Feed roller	ROLLER,FEED	3JD19330		3	49
Side feeder paper conveying clutch	CLUTCH 20,CONVEYING	3JD19200		3	67
Side feeder paper feed clutch	CLUTCH 36,PAPER FEED	3JD19230		3	25

## Periodic maintenance procedures

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Paper feed section	Paper feed belts	Clean Check	Every service	Clean with alcohol or a dry cloth. Replace if the belt is damaged.	
	Paper feed blades	Clean Check	Every service	Clean with alcohol or a dry cloth. Replace if the edge of blade is damaged.	
	Paper guide	Clean	Every service	Clean with alcohol or a dry cloth.	
	Upper paper conveying guide	Clean	Every service	Clean with alcohol or a dry cloth.	
	Lower paper conveying guide	Clean	Every service	Clean with alcohol or a dry cloth.	
	Feed left roller	Clean	Every service	Clean with alcohol or a dry cloth.	
	Feed roller	Clean	Every service	Clean with alcohol or a dry cloth.	
	Side feeder paper conveying clutch	Check	Every service	Clean with alcohol or a dry cloth.	
	Side feeder paper feed clutch	Check	Every service	Clean with alcohol or a dry cloth.	

2-4-4





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