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# PF-410

## SERVICE MANUAL

Published in May '03  
843HW110

## **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.



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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 main 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

Paper feed system .....	Automatic feed
Paper sizes .....	A3 – A5R/11" × 17" – 5 <sup>1</sup> / <sub>2</sub> " × 8 <sup>1</sup> / <sub>2</sub> "
Copy paper .....	Plain paper, recycled paper and colored paper (64 – 105 g/m <sup>2</sup> )
Paper capacity .....	300 sheets (80 g/m <sup>2</sup> )
Power source .....	Electrically connected to the copier
Dimensions .....	570 (W) × 538 (D) × 135 (H) mm 22 <sup>7</sup> / <sub>16</sub> " (W) × 21 <sup>3</sup> / <sub>16</sub> " (D) × 5 <sup>5</sup> / <sub>16</sub> " (H)
Weight .....	Approx. 7.0 kg/15.4 lbs

## 1-1-2 Parts names and their functions

### (1) Parts names

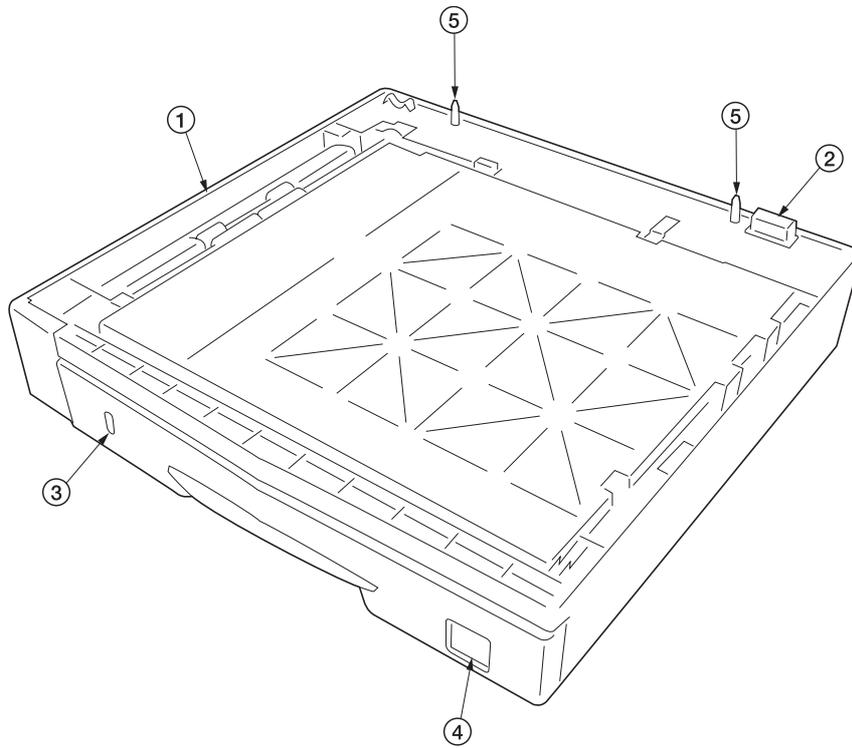
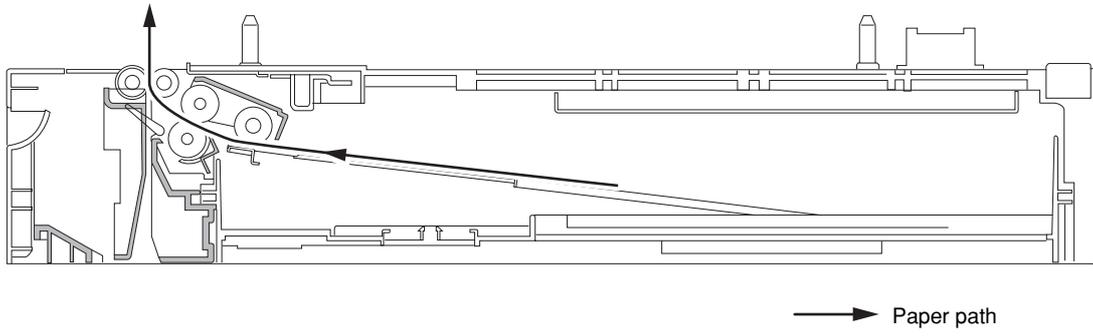


Figure 1-1-1

- ① Drawer left cover
- ② Interface connector
- ③ Paper gauge
- ④ Paper size indication
- ⑤ Positioning pins

**1-1-3 Machine cross section**



**Figure 1-1-2 Machine cross section**

1-1-4 Drive system

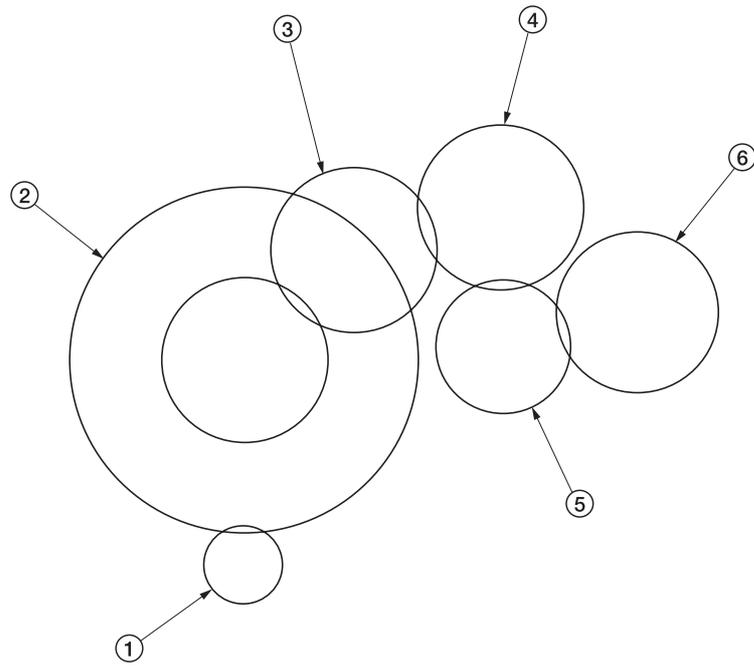


Figure 1-1-3 Drive system

- ① Drawer drive motor gear
- ② Gear 26/90
- ③ Gear 25
- ④ Gear 25
- ⑤ Paper feed gear 20
- ⑥ Drawer paper feed clutch gear

## 1-2-1 Unpacking and installation

### (1) Unpacking

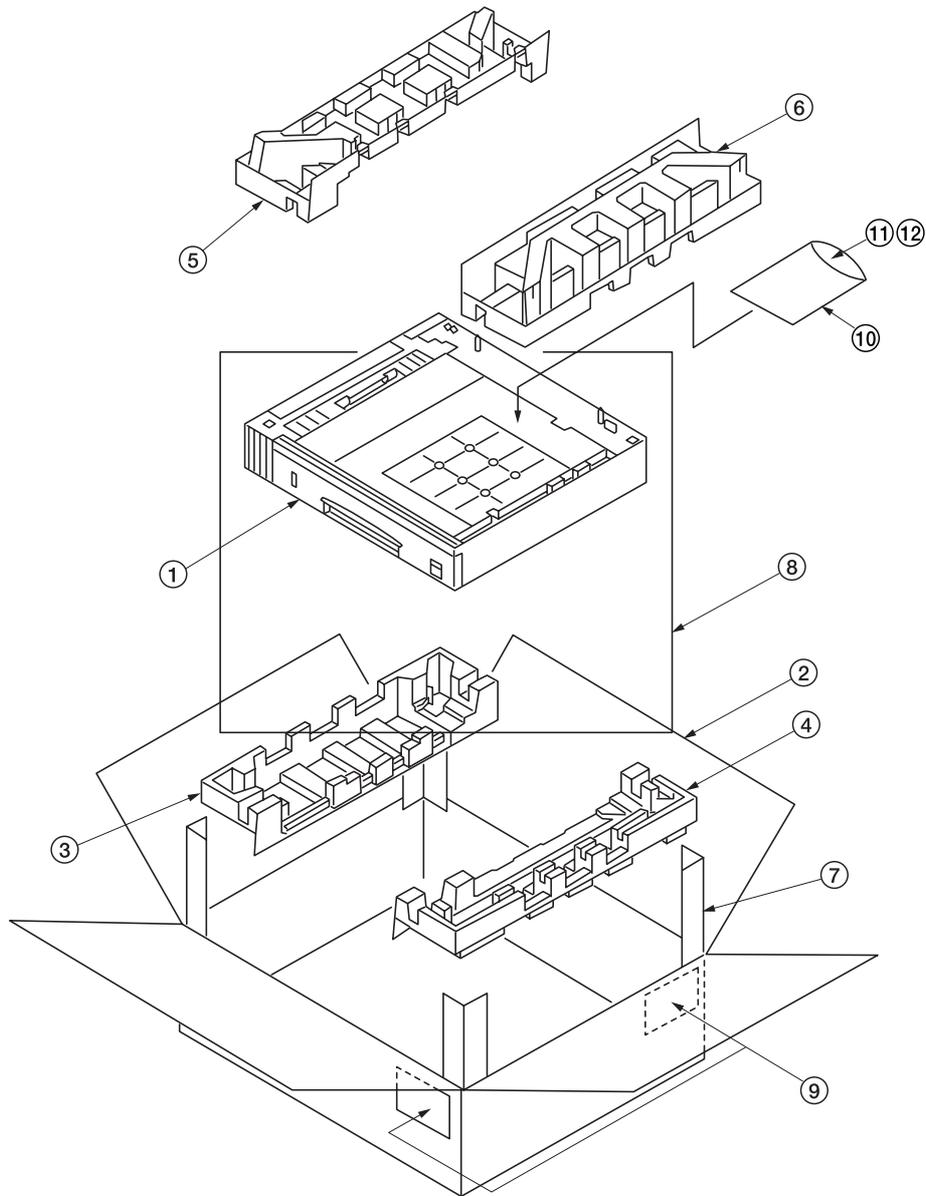


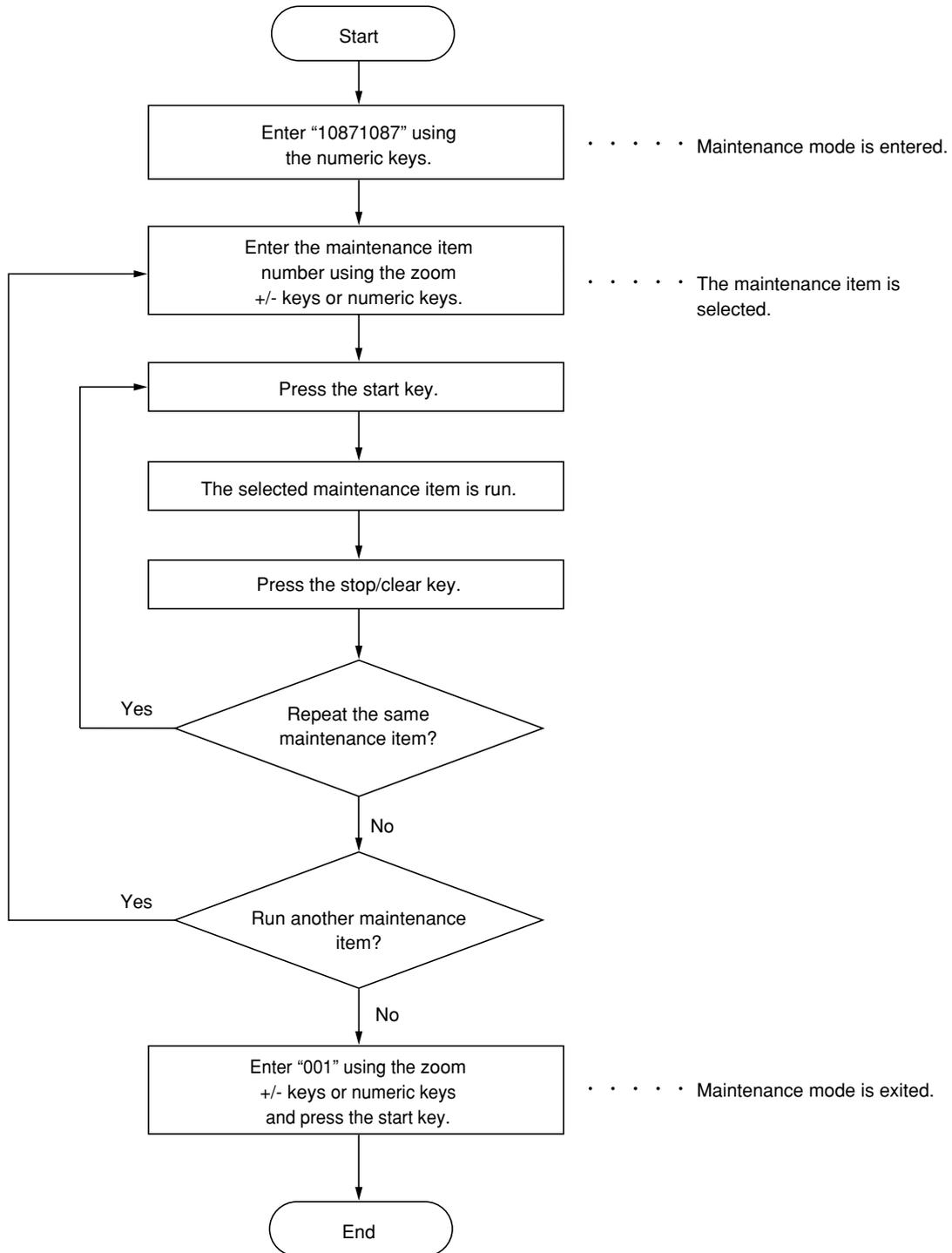
Figure 1-2-1 Unpacking

- |                    |                               |
|--------------------|-------------------------------|
| ① Paper feeder     | ⑦ Stay                        |
| ② Outer case       | ⑧ Plastic sheet (1300 × 1300) |
| ③ Left bottom pad  | ⑨ Bar code labels             |
| ④ Right bottom pad | ⑩ Plastic bag (240 × 350)     |
| ⑤ Left upper pad   | ⑪ Installation guide          |
| ⑥ Right upper pad  | ⑫ Cassette size sheet         |

### 1-3-1 Maintenance mode

The copier is equipped with a maintenance function which can be used to maintain and service the machine.

#### (1) Executing a maintenance item



## (2) Maintenance mode item list

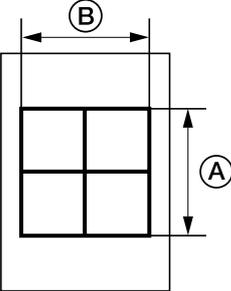
Section	Item No.	Maintenance item contents	Initial setting*
Paper feeder	U019	Displaying the ROM version	—
	U030	Checking motor operation	—
	U031	Checking switches for paper conveying	—
	U032	Checking clutch operation	—
	U034	Setting paper timing • Adjusting the leading edge registration • Adjusting the center line	0 0
	U051	Adjusting the amount of slack in the paper	0
	U053	Performing fine adjustment of the motor speed	0
	U901	Checking/clearing copy counts by paper feed locations	—

\* Initial setting for executing maintenance item U020

## (3) Contents of maintenance mode items

Maintenance item No.	Description																
U019	<p><b>Displaying the ROM version</b></p> <p><b>Description</b> Displays the part number of the ROM fitted to each board.</p> <p><b>Purpose</b> To check the part number or to decide if the ROM version is new from the last digit of the number.</p> <p><b>Method</b></p> <ol style="list-style-type: none"> <li>1. Press the start key. A selection item appears.</li> <li>2. Select the item to be displayed using the image mode selection key and copy exposure adjustment keys.</li> </ol> <table border="1" data-bbox="320 577 1382 1126"> <thead> <tr> <th data-bbox="320 577 639 645">Image mode LEDs</th> <th data-bbox="639 577 874 645">Copy exposure indicator</th> <th data-bbox="874 577 1382 645">Copy quantity display</th> </tr> </thead> <tbody> <tr> <td data-bbox="320 645 639 757"> <input type="radio"/>  Text &amp; Photo  <input type="radio"/>  Photo  <input checked="" type="radio"/>  Text         </td> <td data-bbox="639 645 874 757">Exp. 1 Exp. 2</td> <td data-bbox="874 645 1382 757">number of the main ROM number of the main ROM sub</td> </tr> <tr> <td data-bbox="320 757 639 875"> <input type="radio"/>  Text &amp; Photo  <input checked="" type="radio"/>  Photo  <input checked="" type="radio"/>  Text         </td> <td data-bbox="639 757 874 875">Exp. 1 Exp. 2</td> <td data-bbox="874 757 1382 875">number of the engine ROM number of the engine ROM sub</td> </tr> <tr> <td data-bbox="320 875 639 1010"> <input checked="" type="radio"/>  Text &amp; Photo  <input checked="" type="radio"/>  Photo  <input checked="" type="radio"/>  Text         </td> <td data-bbox="639 875 874 1010">Exp. 1 Exp. 2 Exp. 3</td> <td data-bbox="874 875 1382 1010">number of the first paper feeder ROM number of the second paper feeder ROM number of the third paper feeder ROM</td> </tr> <tr> <td data-bbox="320 1010 639 1126"> <input checked="" type="radio"/>  Text &amp; Photo  <input checked="" type="radio"/>  Photo  <input checked="" type="radio"/>  Text         </td> <td data-bbox="639 1010 874 1126">Exp. 1</td> <td data-bbox="874 1010 1382 1126">number of the DP ROM</td> </tr> </tbody> </table> <p data-bbox="320 1137 632 1167">○ : Off, ● : On,  : Flashing</p> <p><b>Completion</b> Press the stop/clear key. The indication for selecting a maintenance item No. appears.</p>	Image mode LEDs	Copy exposure indicator	Copy quantity display	<input type="radio"/> Text & Photo <input type="radio"/> Photo <input checked="" type="radio"/> Text	Exp. 1 Exp. 2	number of the main ROM number of the main ROM sub	<input type="radio"/> Text & Photo <input checked="" type="radio"/> Photo <input checked="" type="radio"/> Text	Exp. 1 Exp. 2	number of the engine ROM number of the engine ROM sub	<input checked="" type="radio"/> Text & Photo <input checked="" type="radio"/> Photo <input checked="" type="radio"/> Text	Exp. 1 Exp. 2 Exp. 3	number of the first paper feeder ROM number of the second paper feeder ROM number of the third paper feeder ROM	<input checked="" type="radio"/> Text & Photo <input checked="" type="radio"/> Photo <input checked="" type="radio"/> Text	Exp. 1	number of the DP ROM	
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<input checked="" type="radio"/> Text & Photo <input checked="" type="radio"/> Photo <input checked="" type="radio"/> Text	Exp. 1	number of the DP ROM															
U030	<p><b>Checking motor operation</b></p> <p><b>Description</b> Drives each motor.</p> <p><b>Purpose</b> To check the operation of each motor.</p> <p><b>Method</b></p> <ol style="list-style-type: none"> <li>1. Press the start key. A selection item appears.</li> <li>2. Select the motor to be operated using the copy exposure adjustment keys.</li> </ol> <table border="1" data-bbox="320 1503 1382 1760"> <thead> <tr> <th data-bbox="320 1503 699 1547">Display</th> <th data-bbox="699 1503 1382 1547">Motor</th> </tr> </thead> <tbody> <tr> <td data-bbox="320 1547 699 1581">A</td> <td data-bbox="699 1547 1382 1581">Drive motor (DM)</td> </tr> <tr> <td data-bbox="320 1581 699 1615">2F</td> <td data-bbox="699 1581 1382 1615">Registration motor (RM)</td> </tr> <tr> <td data-bbox="320 1615 699 1648">F1</td> <td data-bbox="699 1615 1382 1648">Drawer drive motor 1 (DDM1)</td> </tr> <tr> <td data-bbox="320 1648 699 1682">F2</td> <td data-bbox="699 1648 1382 1682">Drawer drive motor 2 (DDM2)</td> </tr> <tr> <td data-bbox="320 1682 699 1715">F3</td> <td data-bbox="699 1682 1382 1715">Drawer drive motor 3 (DDM3)</td> </tr> <tr> <td data-bbox="320 1715 699 1749">EJ1</td> <td data-bbox="699 1715 1382 1749">Exit motor (EM) forward rotation</td> </tr> <tr> <td data-bbox="320 1749 699 1760">EJ2</td> <td data-bbox="699 1749 1382 1760">Exit motor (EM) reverse rotation</td> </tr> </tbody> </table> <ol style="list-style-type: none"> <li>3. Press the start key. The selected motor operates.</li> <li>4. To stop operation, press the stop/reset key.</li> </ol> <p><b>Completion</b> Press the stop/clear key after operation stops. The indication for selecting a maintenance item No. appears.</p>	Display	Motor	A	Drive motor (DM)	2F	Registration motor (RM)	F1	Drawer drive motor 1 (DDM1)	F2	Drawer drive motor 2 (DDM2)	F3	Drawer drive motor 3 (DDM3)	EJ1	Exit motor (EM) forward rotation	EJ2	Exit motor (EM) reverse rotation
Display	Motor																
A	Drive motor (DM)																
2F	Registration motor (RM)																
F1	Drawer drive motor 1 (DDM1)																
F2	Drawer drive motor 2 (DDM2)																
F3	Drawer drive motor 3 (DDM3)																
EJ1	Exit motor (EM) forward rotation																
EJ2	Exit motor (EM) reverse rotation																

Maintenance item No.	Description														
<p><b>U031</b></p>	<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 path.</p> <p><b>Purpose</b> To check if the switches for paper conveying operate correctly.</p> <p><b>Method</b></p> <ol style="list-style-type: none"> <li>1. Press the start key.</li> <li>2. Turn each switch on and off manually to check the status. When the on-status of a switch is detected, the original size indicator corresponding to the operated switch lights.</li> </ol> <table border="1" data-bbox="304 544 1366 772"> <thead> <tr> <th>Original size indicator</th> <th>Switch</th> </tr> </thead> <tbody> <tr> <td>A3R/Ledger</td> <td>Exit switch (ESW)</td> </tr> <tr> <td>A5R/Legal</td> <td>Registration switch (RSW)</td> </tr> <tr> <td>A4/Letter-R</td> <td>Drawer feed switch 1 (DFSW1)</td> </tr> <tr> <td>B4R/Letter</td> <td>Drawer feed switch 2 (DFSW2)</td> </tr> <tr> <td>B5R/Statement</td> <td>Feedshift switch (FSSW)</td> </tr> <tr> <td>Folio/U</td> <td>Duplex paper conveying switch (DUPPCSW)</td> </tr> </tbody> </table> <p><b>Completion</b> Press the stop/clear key. The indication for selecting a maintenance item No. appears.</p>	Original size indicator	Switch	A3R/Ledger	Exit switch (ESW)	A5R/Legal	Registration switch (RSW)	A4/Letter-R	Drawer feed switch 1 (DFSW1)	B4R/Letter	Drawer feed switch 2 (DFSW2)	B5R/Statement	Feedshift switch (FSSW)	Folio/U	Duplex paper conveying switch (DUPPCSW)
Original size indicator	Switch														
A3R/Ledger	Exit switch (ESW)														
A5R/Legal	Registration switch (RSW)														
A4/Letter-R	Drawer feed switch 1 (DFSW1)														
B4R/Letter	Drawer feed switch 2 (DFSW2)														
B5R/Statement	Feedshift switch (FSSW)														
Folio/U	Duplex paper conveying switch (DUPPCSW)														
<p><b>U032</b></p>	<p><b>Checking clutch operation</b></p> <p><b>Description</b> Turns each clutch on.</p> <p><b>Purpose</b> To check the operation of each clutch.</p> <p><b>Method</b></p> <ol style="list-style-type: none"> <li>1. Press the start key. A selection item appears.</li> <li>2. Select the clutch to be operated using the copy exposure adjustment keys.</li> <li>3. Press the start key. The selected clutch turns on for 1 s.</li> </ol> <table border="1" data-bbox="304 1144 1366 1344"> <thead> <tr> <th>Display</th> <th>Clutch</th> </tr> </thead> <tbody> <tr> <td>P1</td> <td>Paper feed clutch (PFCL)</td> </tr> <tr> <td>Pb</td> <td>Bypass paper feed clutch (BYPPFCL)</td> </tr> <tr> <td>F1</td> <td>Drawer paper feed clutch 1 (DPFCL1)</td> </tr> <tr> <td>F2</td> <td>Drawer paper feed clutch 2 (DPFCL2)</td> </tr> <tr> <td>F3</td> <td>Drawer paper feed clutch 3 (DPFCL3)</td> </tr> </tbody> </table> <p><b>Completion</b> Press the stop/clear key. The indication for selecting a maintenance item No. appears.</p>	Display	Clutch	P1	Paper feed clutch (PFCL)	Pb	Bypass paper feed clutch (BYPPFCL)	F1	Drawer paper feed clutch 1 (DPFCL1)	F2	Drawer paper feed clutch 2 (DPFCL2)	F3	Drawer paper feed clutch 3 (DPFCL3)		
Display	Clutch														
P1	Paper feed clutch (PFCL)														
Pb	Bypass paper feed clutch (BYPPFCL)														
F1	Drawer paper feed clutch 1 (DPFCL1)														
F2	Drawer paper feed clutch 2 (DPFCL2)														
F3	Drawer paper feed clutch 3 (DPFCL3)														
<p><b>U034</b></p>	<p><b>Adjusting the print start timing</b></p> <p><b>Adjustment</b> See pages 1-5-7 and 8.</p>														
<p><b>U051</b></p>	<p><b>Adjusting the amount of slack in the paper</b></p> <p><b>Adjustment</b> See page 1-5-9.</p>														

Maintenance item No.	Description																																			
<p><b>U053</b></p> <p><b>Performing fine adjustment of the motor speed</b></p> <p><b>Description</b> Performs fine adjustment of the speeds of the motors.</p> <p><b>Purpose</b> Used to adjust the speed of the respective motors when the magnification is not correct. Also speed adjustment for each paper source can be performed in group 2.</p> <p><b>Method</b> Press the start key.</p> <p><b>Setting</b></p> <ol style="list-style-type: none"> <li>1. Select the group to be set or checked by lighting image mode LEDs using the image mode selection key.</li> <li>2. Select the item by lighting a copy exposure indicator using the copy exposure adjustment keys.</li> <li>3. Change the setting using the zoom +/- keys.</li> </ol> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Image mode LED</th> <th style="text-align: center;">Copy exposure indicator</th> <th style="text-align: center;">Description</th> <th style="text-align: center;">Setting range</th> <th style="text-align: center;">Initial setting</th> </tr> </thead> <tbody> <tr> <td rowspan="4"> <input type="radio"/>  Text &amp; Photo  <input type="radio"/>  Photo  <input checked="" type="radio"/>  Text                 </td> <td>Exp. 1</td> <td>Drive motor speed adjustment</td> <td>-5.0 to +5.0</td> <td>0</td> </tr> <tr> <td>Exp. 2</td> <td>Polygon motor speed adjustment</td> <td>-5.0 to +5.0</td> <td>0</td> </tr> <tr> <td>Exp. 3</td> <td>Exit motor speed adjustment</td> <td>-5.0 to +5.0</td> <td>0</td> </tr> <tr> <td>Exp. 4</td> <td>Registration motor speed adjustment</td> <td>-5.0 to +5.0</td> <td>0</td> </tr> <tr> <td rowspan="3"> <input type="radio"/>  Text &amp; Photo  <input checked="" type="radio"/>  Photo  <input checked="" type="radio"/>  Text                 </td> <td>Exp. 1</td> <td>Motor speed adjustment (for paper feed from bypass tray)</td> <td>-5.0 to +5.0</td> <td>0</td> </tr> <tr> <td>Exp. 2</td> <td>Motor speed adjustment (for paper feed from optional paper feeder)</td> <td>-5.0 to +5.0</td> <td>0</td> </tr> <tr> <td>Exp. 3</td> <td>Motor speed adjustment (in duplex mode)</td> <td>-5.0 to +5.0</td> <td>0</td> </tr> </tbody> </table> <p>Drive motor speed adjustment (unit: %) Increasing the setting makes the image longer in the auxiliary scanning direction, and decreasing it makes the image shorter in the auxiliary scanning direction.</p> <p>Polygon motor speed adjustment (unit: %) Increasing the setting makes the image longer in the main scanning direction and shorter in the auxiliary scanning direction; decreasing the setting makes the image shorter in the main scanning direction and longer in the auxiliary scanning direction.</p> <ol style="list-style-type: none"> <li>4. Press the start key. The value is set.</li> </ol> <p><b>Interrupt copy mode</b> While this maintenance item is being performed, a VTC pattern shown below is output in interrupt copy mode. Correct values for an A3/11" × 17" output are:                  (A) = 300 ± 1.5 mm                  (B) = 270 ± 1.35 mm</p> <div style="text-align: center;">  </div> <p><b>Figure 1-4-1</b></p> <p><b>Adjustment</b></p> <ol style="list-style-type: none"> <li>1. Output an A3/11" × 17" VTC pattern in interrupt mode.</li> <li>2. Measure (A) and (B) on the VTC pattern (Figure 1-4-1), and perform the following adjustments if they are different from the correct sizes:                     <ul style="list-style-type: none"> <li>(A): Drive motor speed adjustment</li> <li>(B): Polygon motor speed adjustment</li> </ul> </li> </ol> <p><b>Completion</b> Press the stop/clear key while a selection item is displayed. The indication for selecting a maintenance item No. appears.</p>	Image mode LED	Copy exposure indicator	Description	Setting range	Initial setting	<input type="radio"/> Text & Photo <input type="radio"/> Photo <input checked="" type="radio"/> Text	Exp. 1	Drive motor speed adjustment	-5.0 to +5.0	0	Exp. 2	Polygon motor speed adjustment	-5.0 to +5.0	0	Exp. 3	Exit motor speed adjustment	-5.0 to +5.0	0	Exp. 4	Registration motor speed adjustment	-5.0 to +5.0	0	<input type="radio"/> Text & Photo <input checked="" type="radio"/> Photo <input checked="" type="radio"/> Text	Exp. 1	Motor speed adjustment (for paper feed from bypass tray)	-5.0 to +5.0	0	Exp. 2	Motor speed adjustment (for paper feed from optional paper feeder)	-5.0 to +5.0	0	Exp. 3	Motor speed adjustment (in duplex mode)	-5.0 to +5.0	0	
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	Exp. 3	Motor speed adjustment (in duplex mode)	-5.0 to +5.0	0																																

Maintenance item No.	Description																								
<p><b>U901</b></p>	<p><b>Checking/clearing copy counts by paper feed locations</b></p> <p><b>Description</b> Displays or clears copy counts by paper feed locations.</p> <p><b>Purpose</b> To check the time to replace consumable parts. Also to clear the counts after replacing the consumable parts.</p> <p><b>Method</b></p> <ol style="list-style-type: none"> <li>1. Press the start key.</li> <li>2. Select the paper feed location (group No.) for which the count is to be checked or cleared by lighting image mode LEDs using the image mode selection key.</li> <li>3. Select the item by lighting a copy exposure indicator using the copy exposure adjustment keys.</li> </ol> <table border="1" data-bbox="304 573 1366 1402"> <thead> <tr> <th data-bbox="304 573 587 645">Image mode LED (group No.)</th> <th data-bbox="587 573 788 645">Copy exposure indicator</th> <th data-bbox="788 573 1366 645">Copy quantity display (count value)</th> </tr> </thead> <tbody> <tr> <td data-bbox="304 645 587 757">                     1  <input type="radio"/> + Text &amp; Photo  <input type="radio"/>  Photo  <input checked="" type="radio"/>  Text                 </td> <td data-bbox="587 645 788 757">                     Exp. 1                      Exp. 2                      Exp. 3                 </td> <td data-bbox="788 645 1366 757">                     First 3 digits of bypass copy count                      Last 3 digits of bypass copy count                      Clearing the count (CLE)                 </td> </tr> <tr> <td data-bbox="304 757 587 869">                     2  <input type="radio"/> + Text &amp; Photo  <input checked="" type="radio"/>  Photo  <input checked="" type="radio"/>  Text                 </td> <td data-bbox="587 757 788 869">                     Exp. 1                      Exp. 2                      Exp. 3                 </td> <td data-bbox="788 757 1366 869">                     First 3 digits of the drawer copy count                      Last 3 digits of the drawer copy count                      Clearing the count (CLE)                 </td> </tr> <tr> <td data-bbox="304 869 587 981">                     3  <input checked="" type="radio"/> + Text &amp; Photo  <input checked="" type="radio"/>  Photo  <input checked="" type="radio"/>  Text                 </td> <td data-bbox="587 869 788 981">                     Exp. 1                      Exp. 2                      Exp. 3                 </td> <td data-bbox="788 869 1366 981">                     First 3 digits of the first paper feeder copy count                      Last 3 digits of the first paper feeder copy count                      Clearing the count (CLE)                 </td> </tr> <tr> <td data-bbox="304 981 587 1093">                     4  <input checked="" type="radio"/> + Text &amp; Photo  <input checked="" type="radio"/>  Photo  <input type="radio"/>  Text                 </td> <td data-bbox="587 981 788 1093">                     Exp. 1                      Exp. 2                      Exp. 3                 </td> <td data-bbox="788 981 1366 1093">                     First 3 digits of the second paper feeder copy count                      Last 3 digits of the second paper feeder copy count                      Clearing the count (CLE)                 </td> </tr> <tr> <td data-bbox="304 1093 587 1205">                     5  <input checked="" type="radio"/> + Text &amp; Photo  <input type="radio"/>  Photo  <input type="radio"/>  Text                 </td> <td data-bbox="587 1093 788 1205">                     Exp. 1                      Exp. 2                      Exp. 3                 </td> <td data-bbox="788 1093 1366 1205">                     First 3 digits of the third paper feeder copy count                      Last 3 digits of the third paper feeder copy count                      Clearing the count (CLE)                 </td> </tr> <tr> <td data-bbox="304 1205 587 1317">                     6  <input type="radio"/> + Text &amp; Photo  <input type="radio"/>  Photo  <input type="radio"/>  Text                 </td> <td data-bbox="587 1205 788 1317">                     Exp. 1                      Exp. 2                      Exp. 3                 </td> <td data-bbox="788 1205 1366 1317">                     First 3 digits of the duplex unit copy count                      Last 3 digits of the duplex unit copy count                      Clearing the count (CLE)                 </td> </tr> <tr> <td data-bbox="304 1317 587 1402">                     7  <input checked="" type="radio"/> + Text &amp; Photo  <input checked="" type="radio"/>  Photo  <input type="radio"/>  Text                 </td> <td data-bbox="587 1317 788 1402">                     Exp. 1                 </td> <td data-bbox="788 1317 1366 1402">                     Clearing all counts (CLE)                 </td> </tr> </tbody> </table> <p>○ : Off, ● : On, ⚡ : Flashing</p> <p>Note: When no optional paper feed device is installed, the counts corresponding to optional paper feed devices will not appear.</p> <p><b>Clearing copy counts by paper feed locations</b></p> <ol style="list-style-type: none"> <li>1. Select the paper feed location to clear the count.</li> <li>2. Light exp. 3 using the copy exposure adjustment key.</li> <li>3. Press the start key. The count is cleared.</li> </ol> <p><b>Clearing copy counts for all paper feed locations</b></p> <ol style="list-style-type: none"> <li>1. Select group 7.</li> <li>2. Press the start key. The counts are cleared.</li> </ol> <p><b>Completion</b> Press the stop/clear key. The indication for selecting a maintenance item No. appears.</p>	Image mode LED (group No.)	Copy exposure indicator	Copy quantity display (count value)	1 <input type="radio"/> + Text & Photo <input type="radio"/> Photo <input checked="" type="radio"/> Text	Exp. 1 Exp. 2 Exp. 3	First 3 digits of bypass copy count Last 3 digits of bypass copy count Clearing the count (CLE)	2 <input type="radio"/> + Text & Photo <input checked="" type="radio"/> Photo <input checked="" type="radio"/> Text	Exp. 1 Exp. 2 Exp. 3	First 3 digits of the drawer copy count Last 3 digits of the drawer copy count Clearing the count (CLE)	3 <input checked="" type="radio"/> + Text & Photo <input checked="" type="radio"/> Photo <input checked="" type="radio"/> Text	Exp. 1 Exp. 2 Exp. 3	First 3 digits of the first paper feeder copy count Last 3 digits of the first paper feeder copy count Clearing the count (CLE)	4 <input checked="" type="radio"/> + Text & Photo <input checked="" type="radio"/> Photo <input type="radio"/> Text	Exp. 1 Exp. 2 Exp. 3	First 3 digits of the second paper feeder copy count Last 3 digits of the second paper feeder copy count Clearing the count (CLE)	5 <input checked="" type="radio"/> + Text & Photo <input type="radio"/> Photo <input type="radio"/> Text	Exp. 1 Exp. 2 Exp. 3	First 3 digits of the third paper feeder copy count Last 3 digits of the third paper feeder copy count Clearing the count (CLE)	6 <input type="radio"/> + Text & Photo <input type="radio"/> Photo <input type="radio"/> Text	Exp. 1 Exp. 2 Exp. 3	First 3 digits of the duplex unit copy count Last 3 digits of the duplex unit copy count Clearing the count (CLE)	7 <input checked="" type="radio"/> + Text & Photo <input checked="" type="radio"/> Photo <input type="radio"/> Text	Exp. 1	Clearing all counts (CLE)
Image mode LED (group No.)	Copy exposure indicator	Copy quantity display (count value)																							
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3 <input checked="" type="radio"/> + Text & Photo <input checked="" type="radio"/> Photo <input checked="" type="radio"/> Text	Exp. 1 Exp. 2 Exp. 3	First 3 digits of the first paper feeder copy count Last 3 digits of the first paper feeder copy count Clearing the count (CLE)																							
4 <input checked="" type="radio"/> + Text & Photo <input checked="" type="radio"/> Photo <input type="radio"/> Text	Exp. 1 Exp. 2 Exp. 3	First 3 digits of the second paper feeder copy count Last 3 digits of the second paper feeder copy count Clearing the count (CLE)																							
5 <input checked="" type="radio"/> + Text & Photo <input type="radio"/> Photo <input type="radio"/> Text	Exp. 1 Exp. 2 Exp. 3	First 3 digits of the third paper feeder copy count Last 3 digits of the third paper feeder copy count Clearing the count (CLE)																							
6 <input type="radio"/> + Text & Photo <input type="radio"/> Photo <input type="radio"/> Text	Exp. 1 Exp. 2 Exp. 3	First 3 digits of the duplex unit copy count Last 3 digits of the duplex unit copy count Clearing the count (CLE)																							
7 <input checked="" type="radio"/> + Text & Photo <input checked="" type="radio"/> Photo <input type="radio"/> Text	Exp. 1	Clearing all counts (CLE)																							

## 1-4-1 Paper misfeed detection

### (1) Paper misfeed indication

When a paper misfeed occurs, the copier immediately stops copying and displays the jam location on the copier operation panel.

Paper misfeed detection can be reset by opening and closing the drawer left cover to turn safety switch off and on.

### (2) Paper misfeed detection conditions

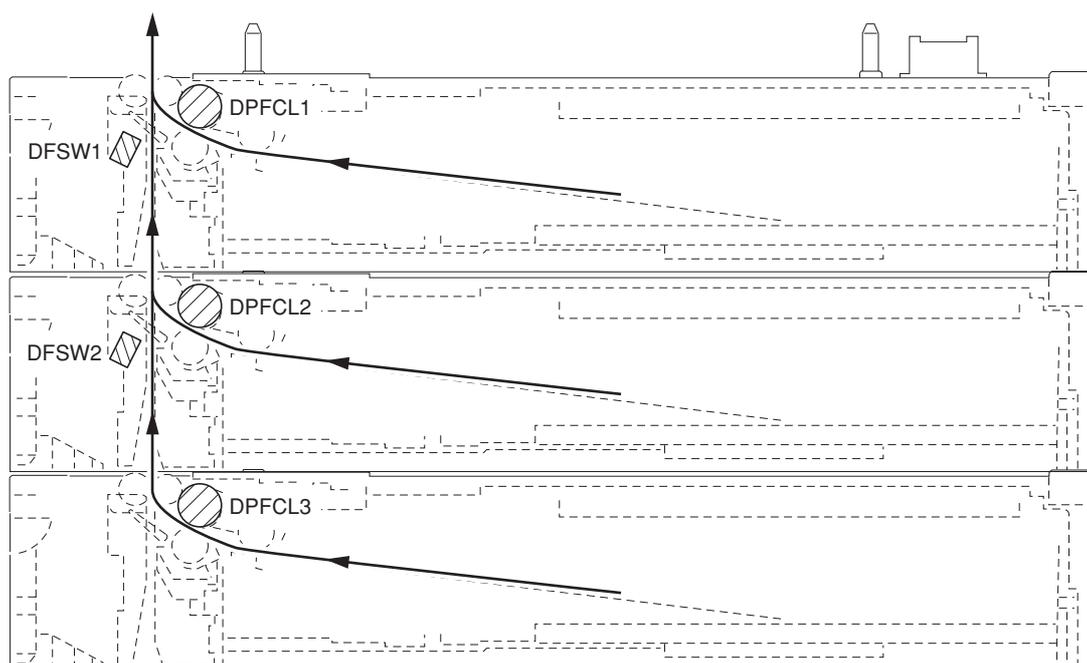


Figure 1-4-1

Section	Jam code	Description	Conditions
Paper feed section	12	No paper feed from the drawer 2 (first paper feeder)	The registration switch (RSW)* does not turn on within 2780 ms of the drawer paper feed clutch 1 (DPFCL1) turning on; the clutch is then successively held off for 1 s and turned back on once, but the switch again fails to turn on within 2780 ms.
	13	No paper feed from the drawer 3 (second paper feeder)	The drawer feed switch 1 (DFSW1) does not turn on within 2490 ms of the drawer paper feed clutch 2 (DPFCL2) turning on; the clutch is then successively held off for 1 s and turned back on once, but the switch again fails to turn on within 2490 ms.
	14	No paper feed from the drawer 4 (third paper feeder)	The drawer feed switch 2 (DFSW2) does not turn on within 2490 ms of the drawer paper feed clutch 3 (DPFCL3) turning on; the clutch is then successively held off for 1 s and turned back on once, but the switch again fails to turn on within 2490 ms.
Paper conveying section	22	Multiple sheets in the drawer 2 (first paper feeder)	The registration switch (RSW)* does not turn off within 4320 ms of registration switch (RSW)* turning on.
			The registration switch (RSW)* does not turn off within 2482 ms of drawer paper feed clutch 1 (DPFCL1) turning on.
	23	Multiple sheets in the drawer 3 (second paper feeder)	The drawer feed switch 1 (DFSW1) does not turn off within 5267 ms of drawer feed switch 1 (DFSW1) turning on.
			The drawer feed switch 1 (DFSW1) does not turn off within 2223 ms of drawer paper feed clutch 2 (DPFCL2) turning on.
	24	Multiple sheets in the drawer 4 (third paper feeder)	The drawer feed switch 2 (DFSW2) does not turn off within 5267 ms of drawer feed switch 2 (DFSW2) turning on.
			The drawer feed switch 2 (DFSW2) does not turn off within 2223 ms of drawer paper feed clutch 3 (DPFCL3) turning on.

**(3) Paper misfeeds**

<b>Problem</b>	<b>Causes/check procedures</b>	<b>Corrective measures</b>
(1) A paper jam in the paper feed section is indicated during copying (no paper feed from the drawer 2). Jam code 12	Paper in the first paper feeder is extremely curled.	Change the paper.
	Check if the paper feed pulley, separation pulley or forwarding pulley in the first paper feeder is deformed.	Check visually and replace any deformed pulley.
	Broken registration switch* actuator.	Check visually and replace registration switch if its actuator is broken.
	Defective registration switch*.	Run maintenance item U031 and turn registration switch on and off manually. Replace registration switch if indication of the corresponding switch is not light.
	Check if the drawer paper feed clutch 1 malfunctions.	Run maintenance item U032 and select the drawer paper feed clutch 1 to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the drawer paper feed clutch 1.	Check (see page 1-4-9).
(2) A paper jam in the paper feed section is indicated during copying (no paper feed from the drawer 3). Jam code 13	Paper in the second paper feeder is extremely curled.	Change the paper.
	Check if the paper feed pulley, separation pulley or forwarding pulley in the second paper feeder is deformed.	Check visually and replace any deformed pulley.
	Broken drawer feed switch 1 actuator.	Check visually and replace drawer feed switch 1 if its actuator is broken.
	Defective drawer feed switch 1.	Run maintenance item U031 and turn drawer feed switch 1 on and off manually. Replace drawer feed switch 1 if indication of the corresponding switch is not light.
	Check if the drawer paper feed clutch 2 malfunctions.	Run maintenance item U032 and select the drawer paper feed clutch 2 to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the drawer paper feed clutch 2.	Check (see page 1-4-9).
(3) A paper jam in the paper feed section is indicated during copying (no paper feed from the drawer 4). Jam code 14	Paper in the third paper feeder is extremely curled.	Change the paper.
	Check if the paper feed pulley, separation pulley or forwarding pulley in the third paper feeder is deformed.	Check visually and replace any deformed pulley.
	Broken drawer feed switch 2 actuator.	Check visually and replace drawer feed switch 2 if its actuator is broken.
	Defective drawer feed switch 2.	Run maintenance item U031 and turn drawer feed switch 2 on and off manually. Replace drawer feed switch 2 if indication of the corresponding switch is not light.

\*: Copier

Problem	Causes/check procedures	Corrective measures
(3) A paper jam in the paper feed section is indicated during copying (no paper feed from the drawer 4). Jam code 14	Check if the drawer paper feed clutch 3 malfunctions.	Run maintenance item U032 and select the drawer paper feed clutch 3 to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the drawer paper feed clutch 3.	Check (see page 1-4-9).
(4) A paper jam in the paper conveying section is indicated during copying (multiple sheets in the drawer 2). Jam code 22	Deformed guides along the paper conveying path.	Repair or replace if necessary.
	Broken registration switch* actuator.	Check visually and replace registration switch if its actuator is broken.
	Defective registration switch*.	Run maintenance item U031 and turn registration switch on and off manually. Replace registration switch if indication of the corresponding switch is not light.
	Check if the drawer paper feed clutch 1 malfunctions.	Run maintenance item U032 and select the drawer paper feed clutch 1 to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the drawer paper feed clutch 1.	Check (see page 1-4-9).
	Check if the feed roller and feed pulley contact each other.	Check visually and remedy if necessary.
(5) A paper jam in the paper conveying section is indicated during copying (multiple sheets in the drawer 3). Jam code 23	Deformed guides along the paper conveying path.	Repair or replace if necessary.
	Broken drawer feed switch 1 actuator.	Check visually and replace drawer feed switch 1 if its actuator is broken.
	Defective drawer feed switch 1.	Run maintenance item U031 and turn drawer feed switch 1 on and off manually. Replace drawer feed switch 1 if indication of the corresponding switch is not light.
	Check if the drawer paper feed clutch 2 malfunctions.	Run maintenance item U032 and select the drawer paper feed clutch 2 to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the drawer paper feed clutch 2.	Check (see page 1-4-9).
	Check if the feed roller and feed pulley contact each other.	Check visually and remedy if necessary.
(6) A paper jam in the paper conveying section is indicated during copying (multiple sheets in the drawer 4). Jam code 24	Deformed guides along the paper conveying path.	Repair or replace if necessary.
	Broken drawer feed switch 2 actuator.	Check visually and replace drawer feed switch 2 if its actuator is broken.
	Defective drawer feed switch 2.	Run maintenance item U031 and turn drawer feed switch 2 on and off manually. Replace drawer feed switch 2 if indication of the corresponding switch is not light.

Problem	Causes/check procedures	Corrective measures
(6) A paper jam in the paper conveying section is indicated during copying (multiple sheets in the drawer 4). Jam code 24	Check if the drawer paper feed clutch 3 malfunctions.	Run maintenance item U032 and select the drawer paper feed clutch 3 to be turned on and off. Check the status and remedy if necessary.
	Electrical problem with the drawer paper feed clutch 3.	Check (see page 1-4-9).
	Check if the feed roller and feed pulley contact each other.	Check visually and remedy if necessary.

## 1-4-2 Self-diagnosis

### (1) Self-diagnostic function

When a problem is detected, copying is disabled. "C" and a number between 042 and 051.

After removing the problem, the self-diagnostic function can be reset by turning safety switch off and back on.

### (2) Self diagnostic codes

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
C042 (A042*)	<b>Optional first paper feeder communication problem</b> <ul style="list-style-type: none"> <li>Communication fails five times successively.</li> </ul>	Paper feeder installed incorrectly.	Check the installation state of the paper feeder and adjust it if it is not properly installed.
		Defective main PCB or drawer main PCB.	Replace the main PCB or drawer main PCB and check for correct operation.
C050 (A050*)	<b>Optional second paper feeder communication problem</b> <ul style="list-style-type: none"> <li>Communication fails five times successively.</li> </ul>	Paper feeder installed incorrectly.	Check the installation state of the paper feeder and adjust it if it is not properly installed.
		Defective main PCB or drawer main PCB.	Replace the main PCB or drawer main PCB and check for correct operation.
C051 (A051*)	<b>Optional third paper feeder communication problem</b> <ul style="list-style-type: none"> <li>Communication fails five times successively.</li> </ul>	Paper feeder installed incorrectly.	Check the installation state of the paper feeder and adjust it if it is not properly installed.
		Defective main PCB or drawer main PCB.	Replace the main PCB or drawer main PCB and check for correct operation.

"A" is displayed on the operation panel.

### 1-4-3 Image formation problems

(1) The leading edge of the image is consistently misaligned with the original.



See page 1-4-8

(2) The leading edge of the image is sporadically misaligned with the original.



See page 1-4-8

3HW

(1) The leading edge of the image is consistently misaligned with the original.

**Causes**

1. Misadjusted leading edge registration.



<b>Causes</b>	<b>Check procedures/corrective measures</b>
1. Misadjusted leading edge registration.	Readjust the leading edge registration (see pages 1-5-7).

(2) The leading edge of the image is sporadically misaligned with the original.

**Causes**

1. Drawer paper feed clutch installed or operating incorrectly.



<b>Causes</b>	<b>Check procedures/corrective measures</b>
1. Drawer paper feed clutch installed or operating incorrectly.	Check the installation position and operation of the drawer paper feed clutch. If any of them operates incorrectly, replace it.

### 1-4-4 Electrical problems

Problem	Causes	Check procedures/corrective measures
(1) The machine does not operate when the power switch is turned on.	The drawer left cover is not closed completely.	Check the drawer left cover.
	Defective drawer left cover safety switch.	Check for continuity across the contacts of switch. If none, replace the switch.
(2) The drawer drive motor does not operate.	Poor contact in the drawer drive motor connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Broken drawer drive motor gear.	Check visually and replace the drawer drive motor if necessary.
	Defective drawer drive motor.	Run maintenance item U030 and check if the drawer drive motor operates when YC9-2,3,4,5 on the drawer main PCB goes low. If not, replace the drawer drive motor.
	Defective drawer main PCB.	Run maintenance item U030 and check if YC9-2,3,4,5 on the drawer main PCB goes low. If not, replace the drawer main PCB.
(3) The drawer paper feed clutch does not operate.	Broken drawer paper feed clutch coil.	Check for continuity across the coil. If none, replace the drawer paper feed clutch.
	Poor contact in the drawer paper feed clutch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective drawer main PCB.	Run maintenance item U032 and check if YC8-2 on the drawer main PCB goes low. If not, replace the drawer main PCB.
(4) The message requesting paper to be loaded is shown when paper is present in the drawer.	Poor contact in the drawer paper switch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective drawer paper switch.	If the level of YC5-2 on the drawer main PCB does not change when the drawer paper switch is turned on and off, replace the drawer paper switch.
(5) The size of paper in the drawer is not displayed correctly.	Poor contact in the drawer paper size length switch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective drawer paper size length switch.	Check if YC4-5,6,8 on the drawer main PCB goes low when the drawer paper size length switch is turned on. If not, replace the drawer paper size length switch.
	Poor contact in the drawer paper size width switch connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	Defective drawer paper size width switch.	Check if YC4-4 on the drawer main PCB goes low when the drawer paper size width switch is turned on. If not, replace the drawer paper size width switch.
(6) A paper jam in the paper feeder is indicated when the power switch is turned on.	A piece of paper torn from copy paper is caught around drawer feed switch.	Check and remove if any.
	Defective drawer feed switch.	Run maintenance item U031 and turn drawer feed switch on and off manually. Replace drawer feed switch if indication of the corresponding sensor is not light.

<b>Problem</b>	<b>Causes</b>	<b>Check procedures/corrective measures</b>
(7) The message re- questing cover to be closed is displayed when the drawer left cover is closed.	Poor contact in the drawer left cover safety switch connector terminals.	Reinsert the connector. Also check for continuity within the con- nector cable. If none, remedy or replace the cable.
	Defective drawer left cover safety switch.	Check for continuity across switch. If there is no continuity when the switch is on, replace it.
(8) Others.	Wiring is broken, shorted or makes poor contact.	Check for continuity. If none, repair.
	Noise.	Locate the source of noise and remove.

### 1-4-5 Mechanical problems

Problem	Causes/check procedures	Corrective measures
(1) No primary paper feed.	Check if the surfaces of the following roller or pulleys are dirty with paper powder: drawer forwarding pulley, drawer paper feed pulley, drawer separation pulley and feed roller.	Clean with isopropyl alcohol.
	Check if the drawer forwarding pulley, drawer paper feed pulley or drawer separation pulley is deformed.	Check visually and replace any deformed pulleys (see page 1-5-4 and 5).
	Electrical problem with the following electromagnetic clutche: drawer paper feed clutche.	See pages 1-4-9.
(2) Skewed paper feed.	Width guide in a drawer installed incorrectly.	Check the width guide visually and correct or replace if necessary.
	Deformed width guide in a drawer.	Repair or replace if necessary .
(3) Multiple sheets of paper are fed at one time.	Check if the drawer separation pulley is worn.	Replace the drawer separation pulley if it is worn (see page 1-5-4).
	Check if the paper is curled.	Change the paper.
(4) Paper jams.	Check if the paper is excessively curled.	Change the paper.
	Deformed guides along the paper conveying path.	Repair or replace if necessary.
	Check if the contact between the feed roller and feed pulley is correct.	Check visually and remedy if necessary.
(5) Abnormal noise is heard.	Check if the pulleys, roller and gears operate smoothly.	Grease the bearings and gears.
	Check if the following electromagnetic clutche are installed correctly: drawer paper feed clutche.	Correct.

## 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 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\*

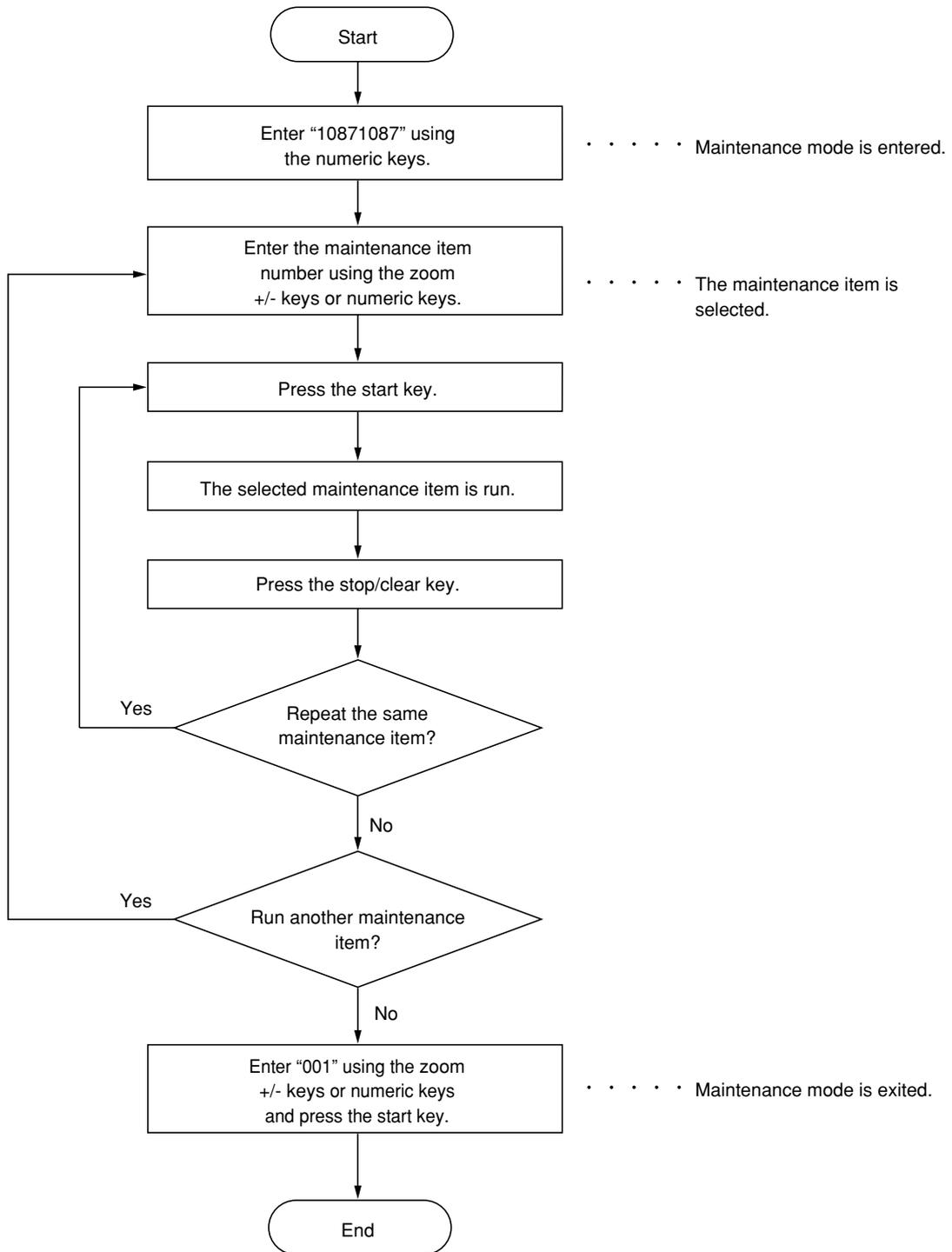
Fluke 8060A\*

Arlec DMM1050

Arlec YF1030C

\* Capable of measuring RMS values.

(2) Running a maintenance item



## 1-5-2 Paper feeder

### (1) Detaching and refitting the feed roller

Follow the procedure below to replace the feed roller.

#### Procedure

1. Open the drawer left cover.
2. Remove the two stop ring, gear and spring pin from rear side of the feed roller.
  - \* When removing the gear, take care not to lose the spring pin.
3. Slide the bearings in the front and rear of the feed roller toward the inside, push the feed roller once into the rear side of the machine, and then remove it from the paper feeder.
4. Remove the two bushing from front and rear side of the feed roller.
5. Replace the feed roller and refit all the removed parts.

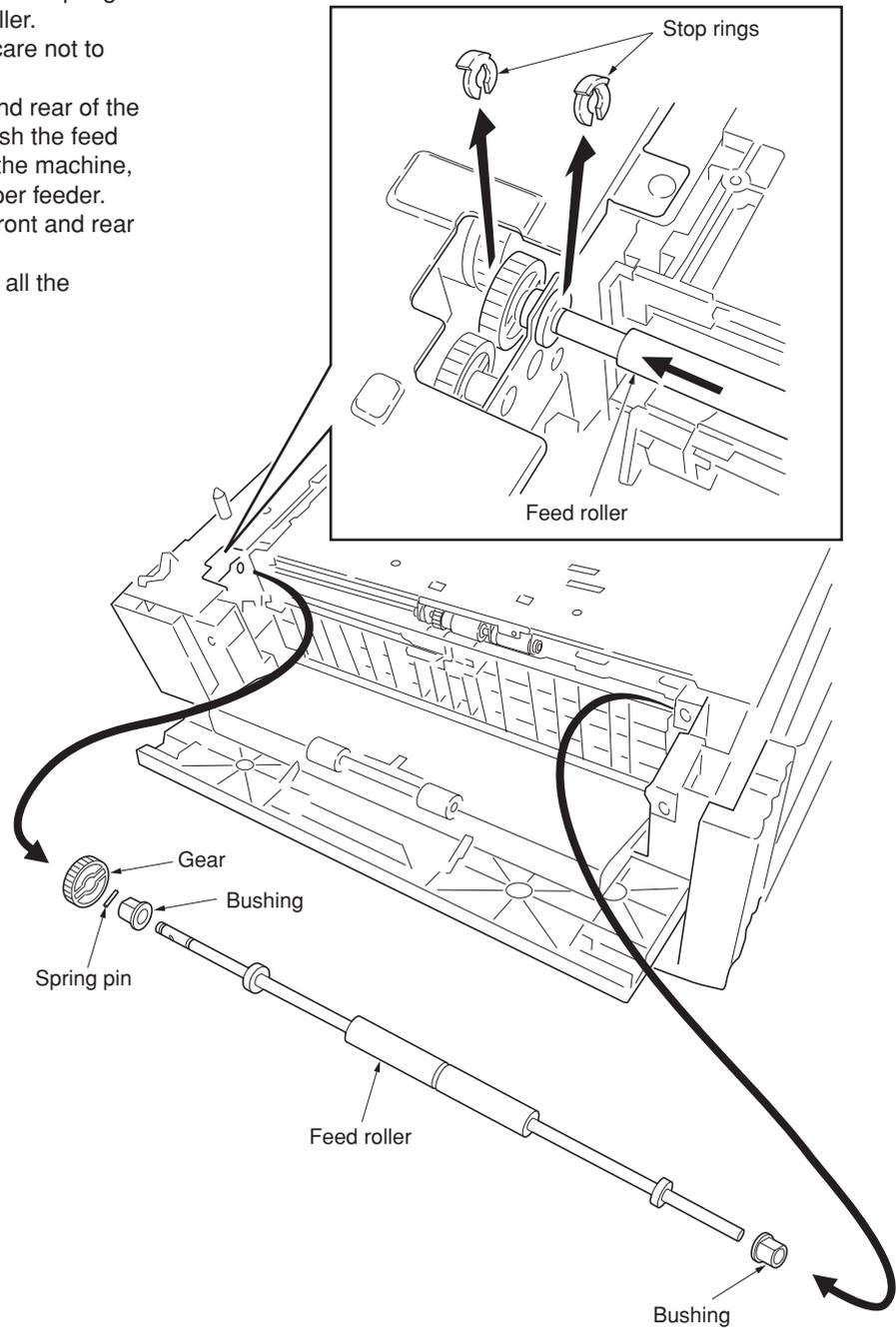


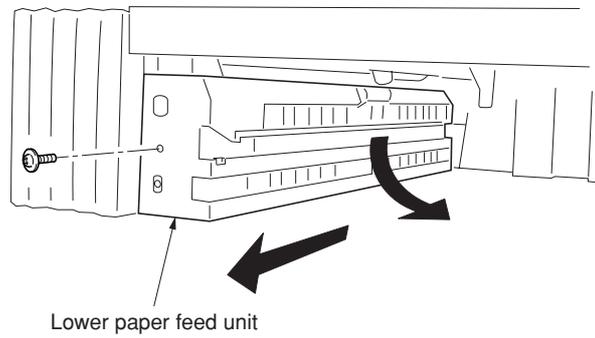
Figure 1-5-1

**(2) Detaching and refitting the drawer separation pulley**

Follow the procedure below to replace the drawer separation pulley.

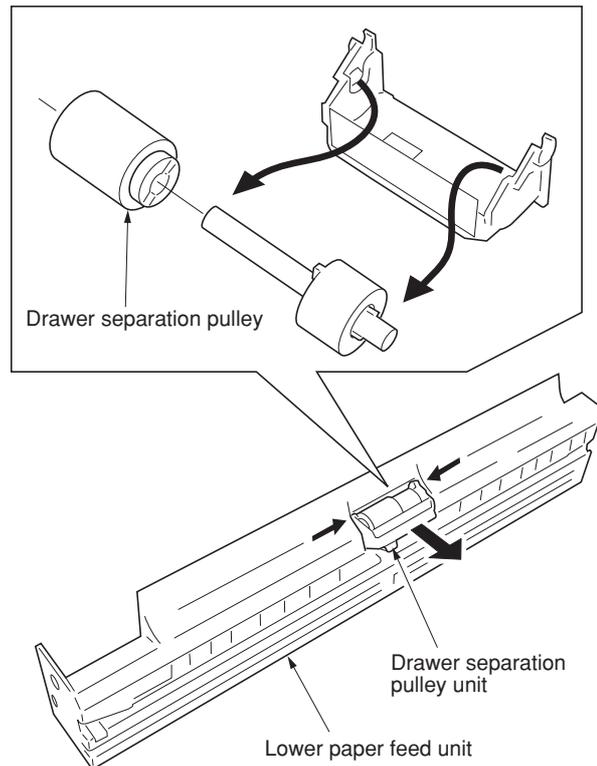
**Procedure**

1. Pull out the drawer. Open the drawer left cover.
2. Remove the screw and then the lower paper feed unit.



**Figure 1-5-2**

3. Remove the drawer separation pulley unit from the lower paper feed unit.
4. Remove the drawer separation pulley from the drawer separation pulley unit.
5. Replace the drawer separation pulley and refit all the removed parts.



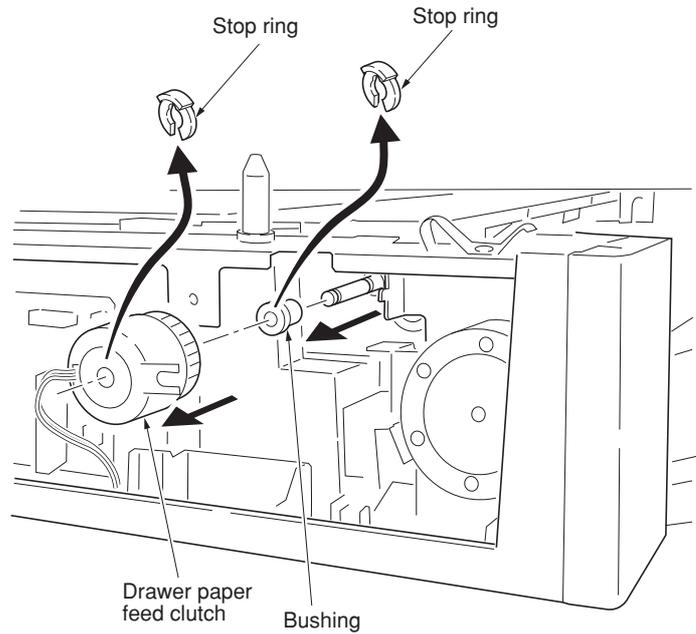
**Figure 1-5-3**

**(3) Detaching and refitting the drawer forwarding pulley and drawer paper feed pulley**

Follow the procedure below to replace the drawer forwarding pulley and drawer paper feed pulley.

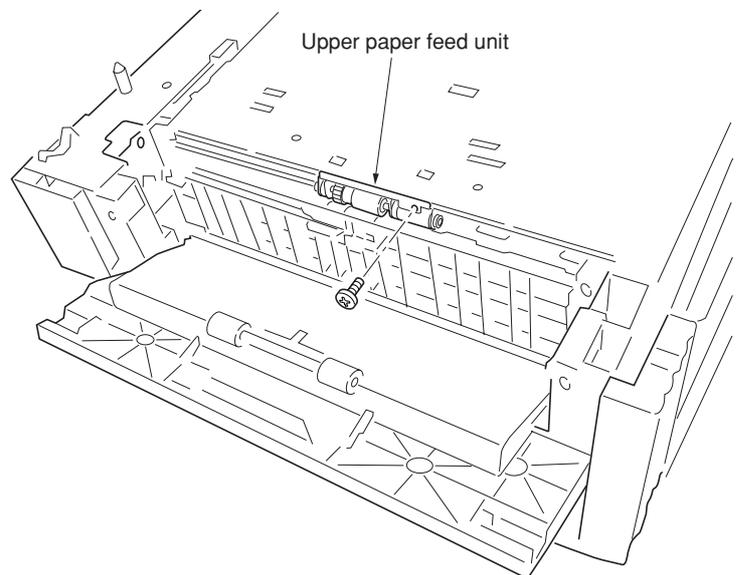
**Procedure**

1. Remove the lower paper feed unit (see page 1-5-4).
2. Remove the drawer rear cover.
3. Remove the stop ring and drawer paper feed clutch from the machine rear side. Remove the stop ring and bushing.



**Figure 1-5-4**

4. Remove the screw and then the upper paper feed unit.



**Figure 1-5-5**

3HW

5. Remove the springs, stop ring and bushing and then the shaft holder from the upper paper feed unit.

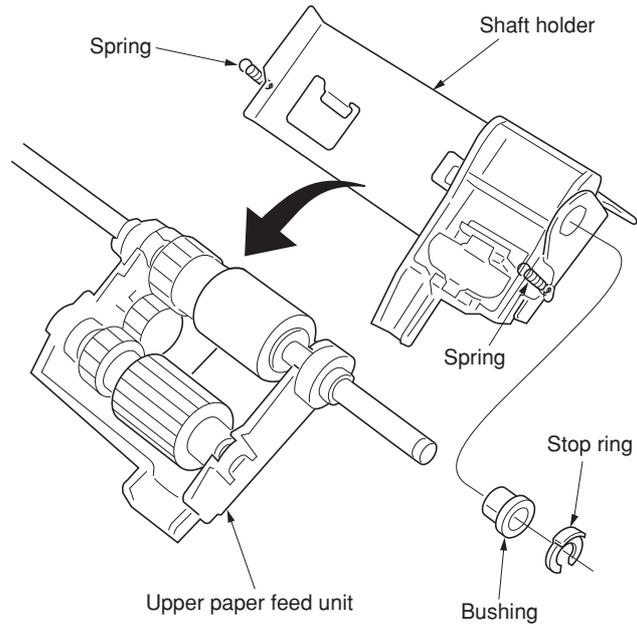


Figure 1-5-6

6. Remove the drawer forwarding pulley from the upper paper feed unit.
7. Remove the drawer paper feed pulley from the upper paper feed unit.
8. Replace the drawer forwarding pulley and drawer paper feed pulley and refit all the removed parts.

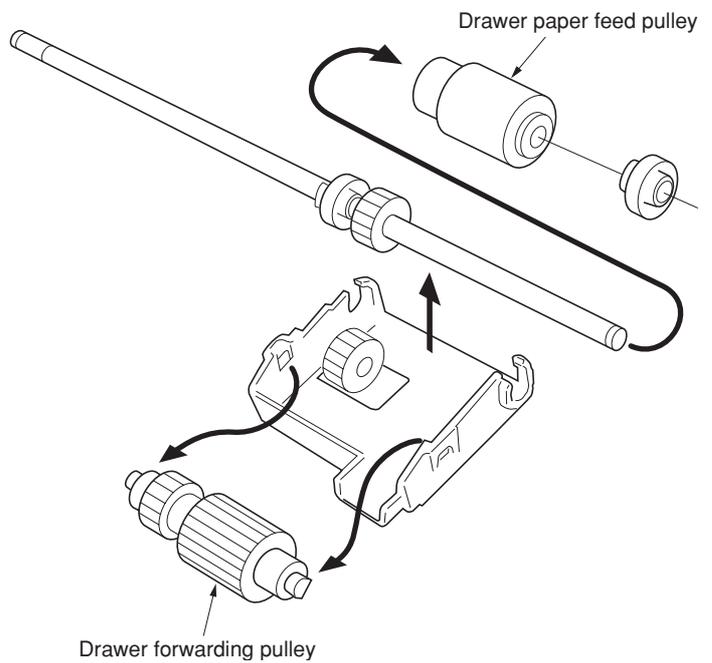
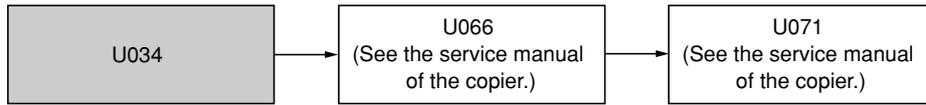


Figure 1-5-7

**(4) Adjusting the leading edge registration of image printing**

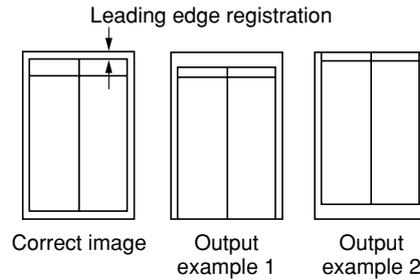
Make the following adjustment if there is a regular error between the leading edges of the copy image and original.



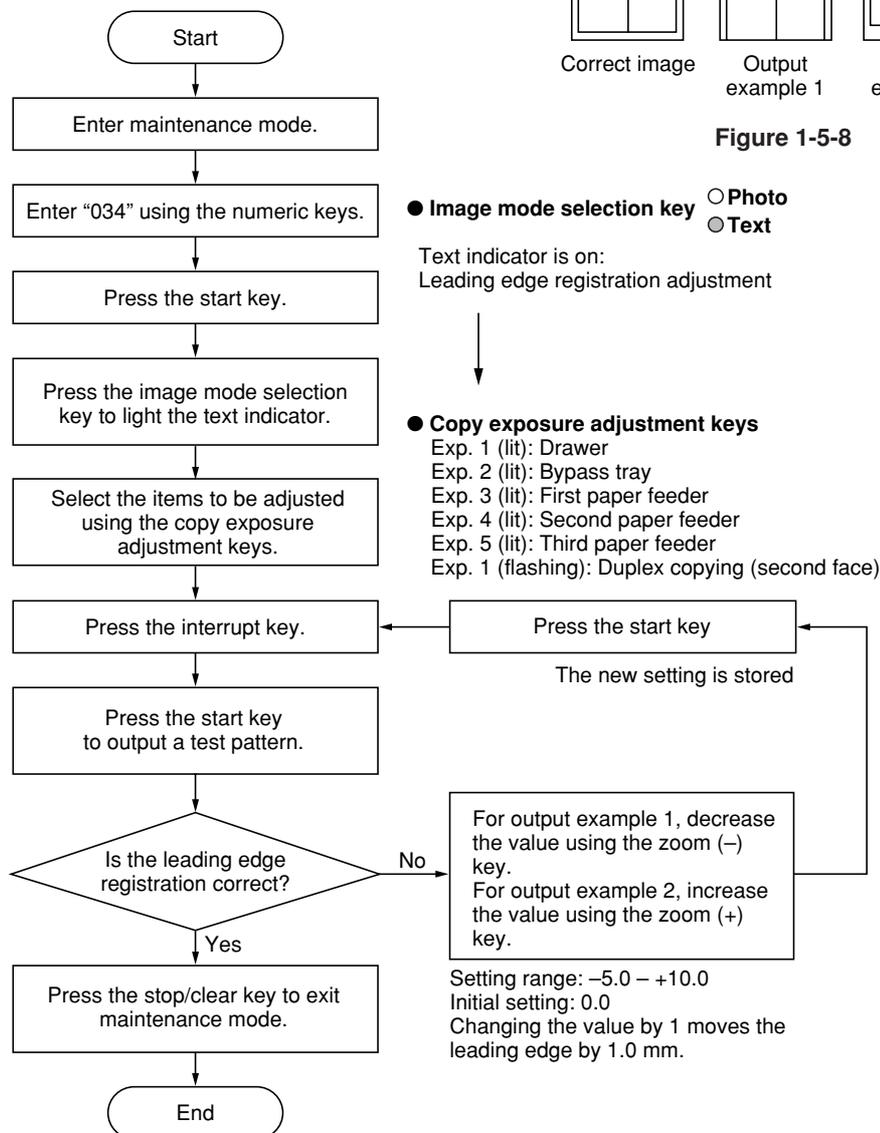
**Caution:**

Check the copy image after the adjustment. If the image is still incorrect, perform the above adjustments in maintenance mode.

**Procedure**

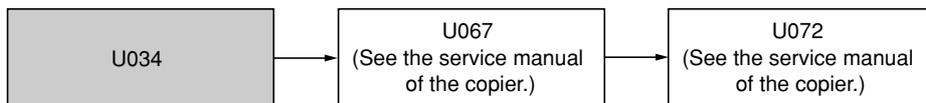


**Figure 1-5-8**



**(5) 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 paper is fed from the drawer.



**Caution**

Check the copy image after the adjustment. If the image is still incorrect, perform the above adjustments in maintenance mode.

**Procedure**

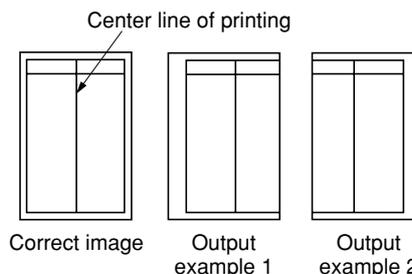
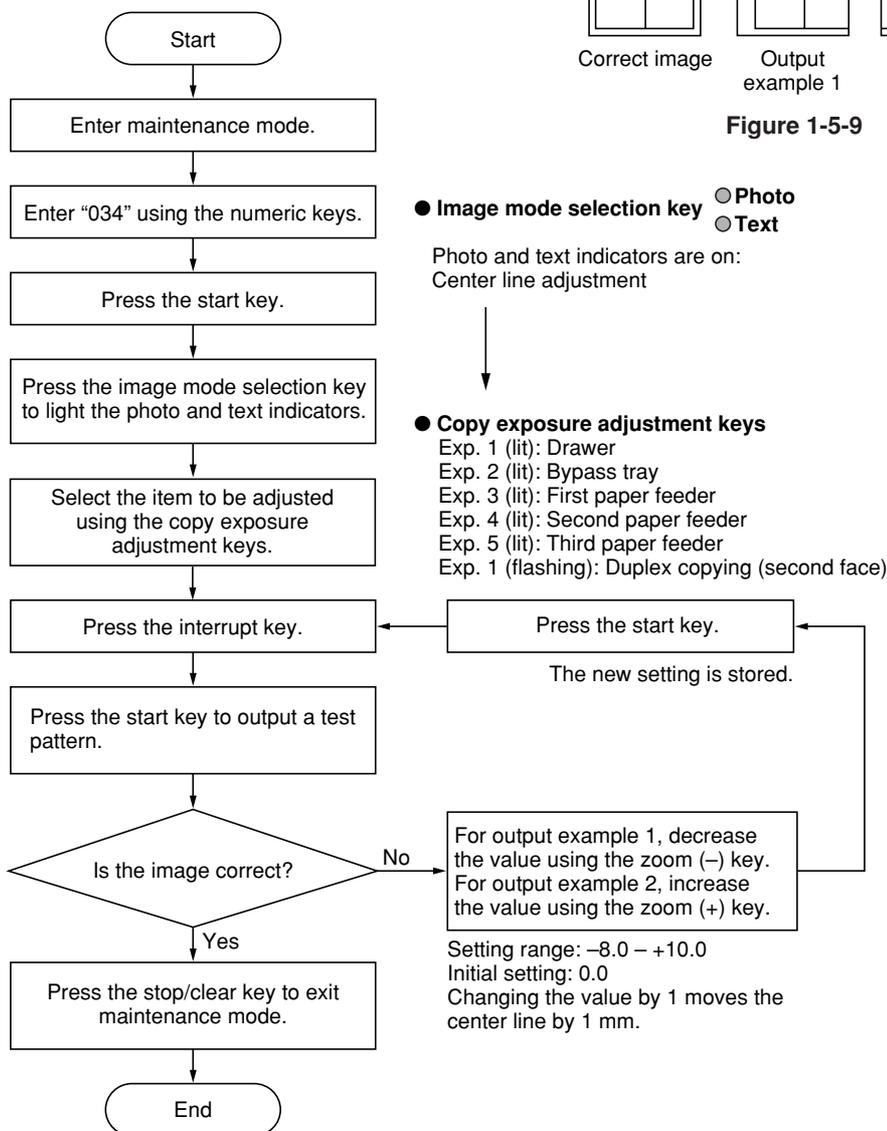


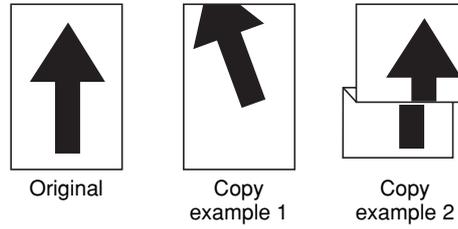
Figure 1-5-9



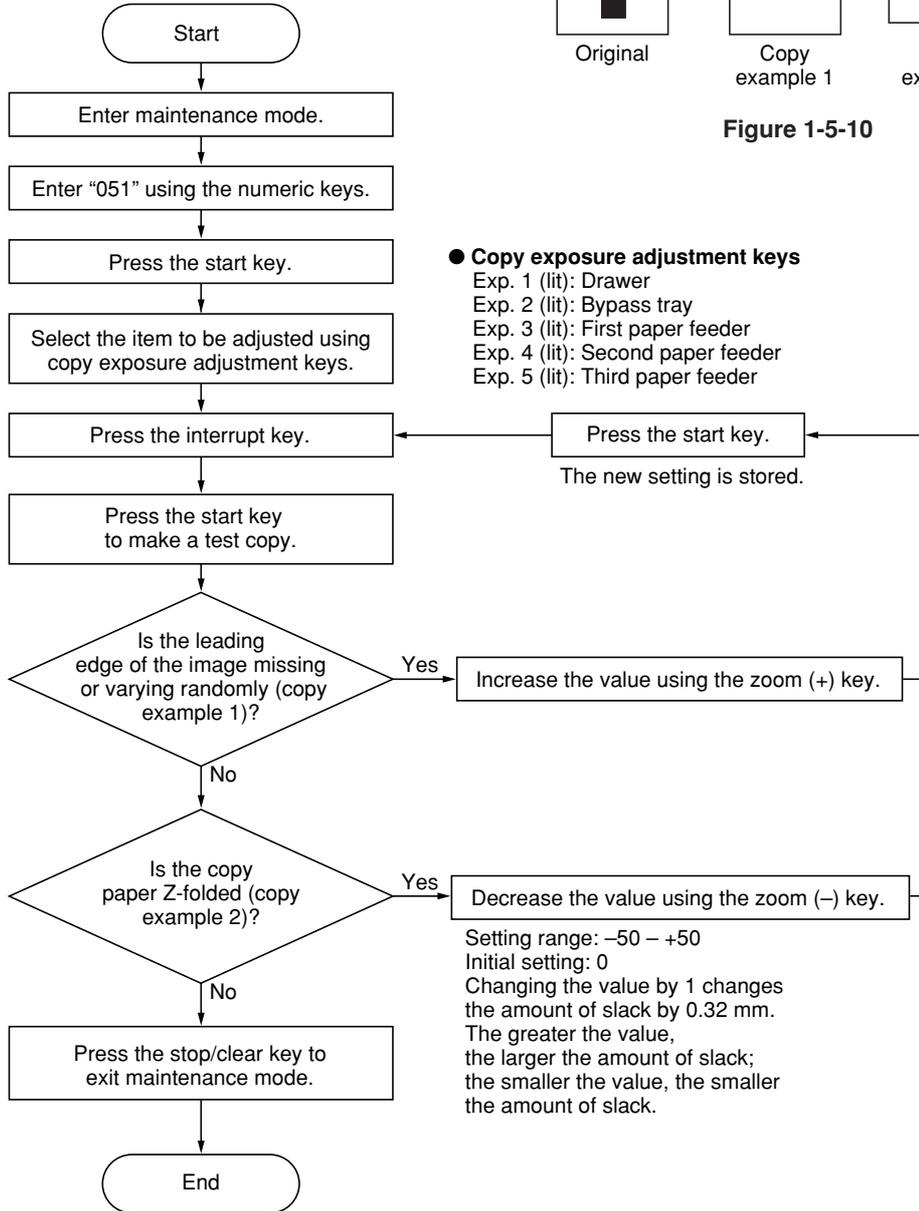
**(6) Adjusting the amount of slack in the paper**

Make the following adjustment if the leading edge of the copy image is missing or varies randomly, or if the copy paper is Z-folded.

**Procedure**



**Figure 1-5-10**



### 2-1-1 Mechanical construction

The paper feeder conveys paper from the drawer to the copier. Drawer can hold up to 300 sheets of paper. Paper is fed from the paper feeder by the rotation of the drawer forwarding pulley and drawer paper feed pulley. The drawer separation pulley prevents multiple sheets from being fed at one time, via the torque limiter.

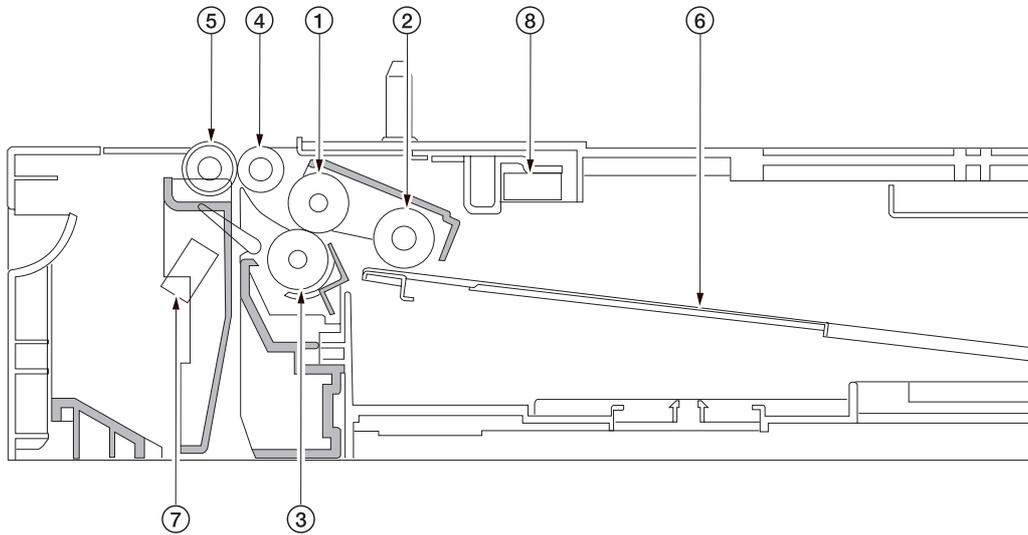


Figure 2-1-1

- |                            |                              |
|----------------------------|------------------------------|
| ① Drawer paper feed pulley | ⑤ Feed pulley                |
| ② Drawer forwarding pulley | ⑥ Drawer lift                |
| ③ Drawer separation pulley | ⑦ Drawer feed switch (DFSW)  |
| ④ Feed roller              | ⑧ Drawer paper switch (DPSW) |

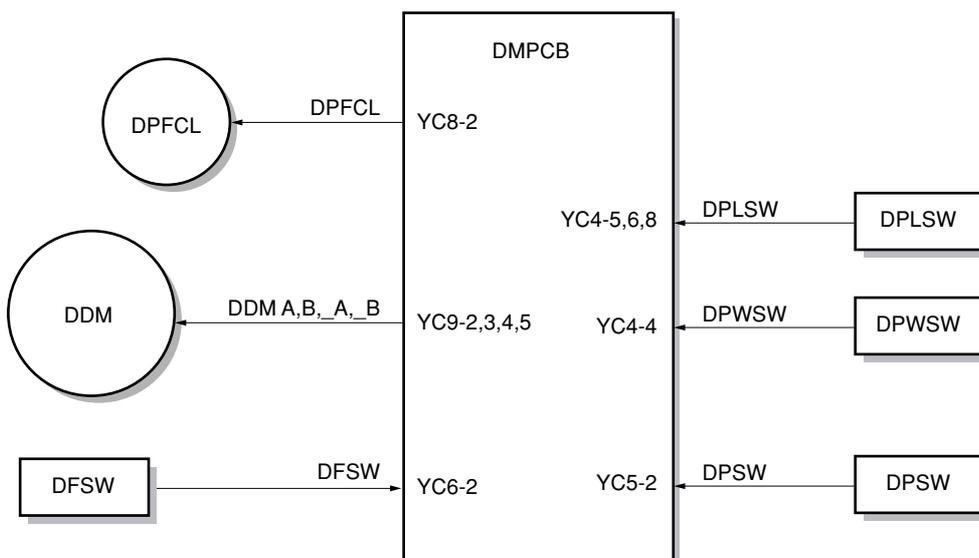
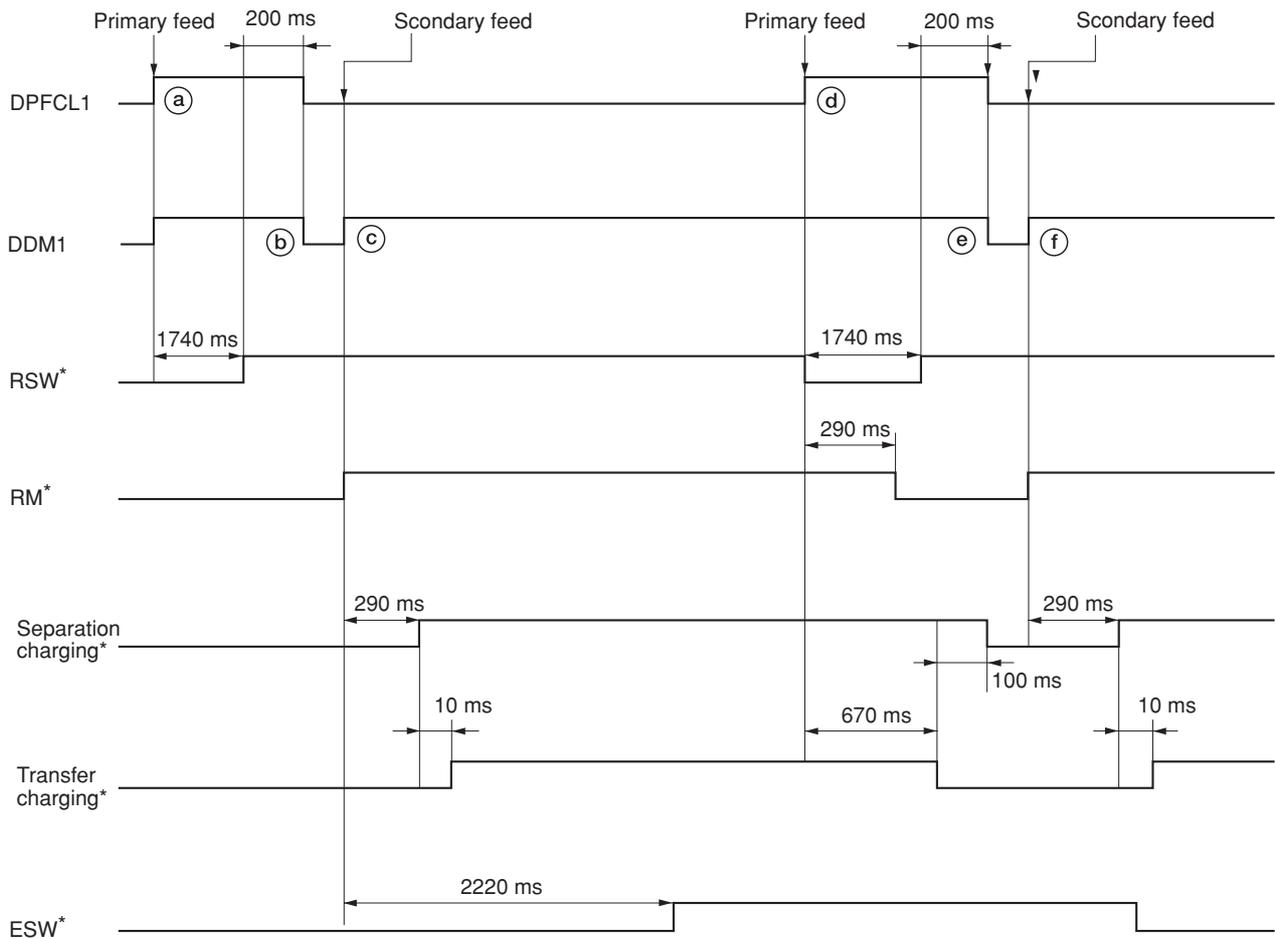


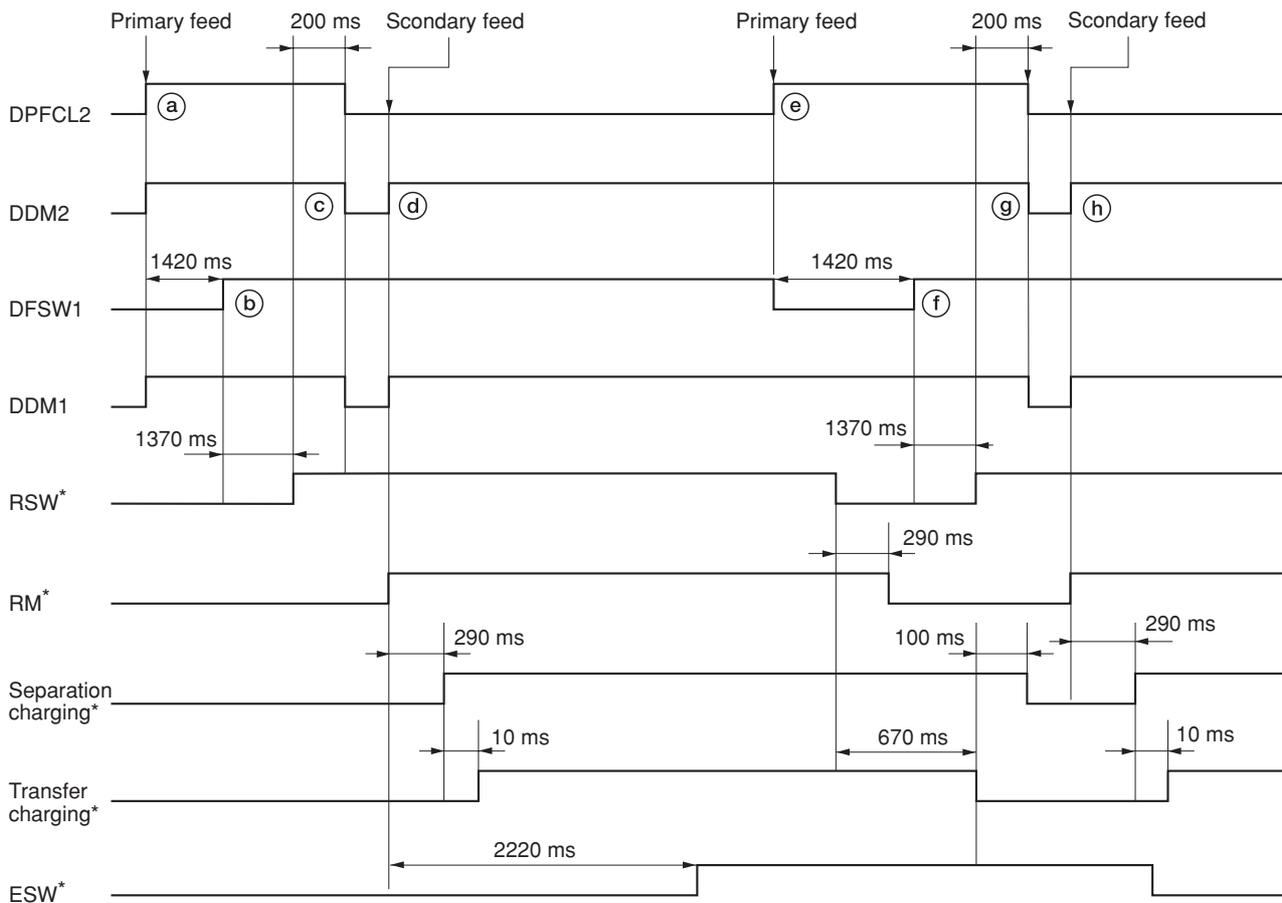
Figure 2-1-2 Block diagram



\*: Copier

**Timing chart 2-1-1 Paper feed from the first paper feeder (A4, two sheets, single-sided mode)**

- Ⓐ: The drawer paper feed clutch 1 (DPFC1) and drawer drive motor 1 (DDM1) turns on to start primary paper feed.
- Ⓑ: 200 ms after the registration switch (RSW) turns on, the drawer paper feed clutch 1 (DPFC1) and drawer drive motor 1 (DDM1) turns off.
- Ⓒ: The drawer drive motor 1 (DDM1) and the registration motor (RM) turns on to start secondary paper feed.
- Ⓓ: The drawer paper feed clutch 1 (DPFC1) turns on to start primary paper feed of the second sheet.
- Ⓔ: 200 ms after the registration switch (RSW) turns on, the drawer paper feed clutch 1 (DPFC1) and drawer drive motor 1 (DDM1) turns off.
- Ⓕ: The drawer drive motor 1 (DDM1) and the registration motor (RM) turns on to start secondary paper feed.



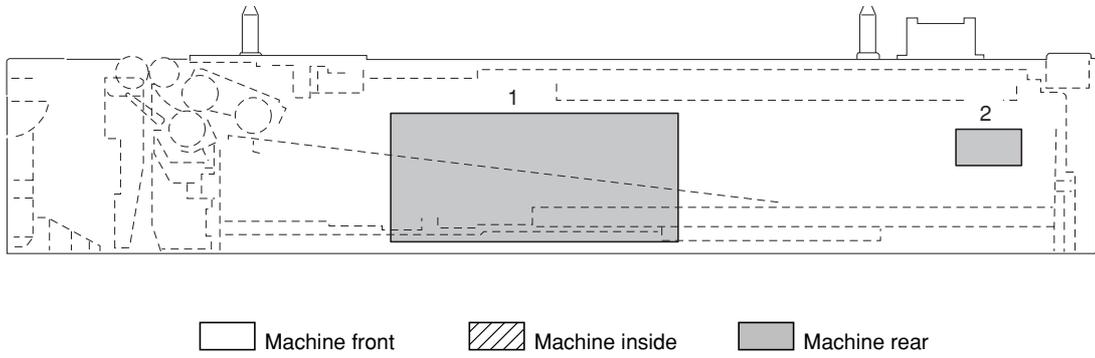
\*: Copier

**Timing chart 2-1-2 Paper feed from the second paper feeder (A4, two sheets, single-sided mode)**

- (a): The drawer paper feed clutch 2 (DPFCL2), drawer drive motor 2 (DDM2) and drawer drive motor 1 (DDM1) turns on to start primary paper feed.
- (b): 1420 ms after the drawer paper feed clutch 2 (DPFCL2) turns on, the drawer feed switch 1 (DFSW1) turns on.
- (c): 200 ms after the registration switch (RSW) turns on, the drawer paper feed clutch 2 (DPFCL2), drawer drive motor 2 (DDM2) and drawer drive motor 1 (DDM1) turns off.
- (d): The drawer drive motor 2 (DDM2), drawer drive motor 1 (DDM1) and the registration motor (RM) turns on to start secondary paper feed.
- (e): The drawer paper feed clutch 2 (DPFCL2) turns on to start primary paper feed of the second sheet.
- (f): 1420 ms after the drawer paper feed clutch 2 (DPFCL2) turns on, the drawer feed switch 1 (DFSW1) turns on.
- (g): 200 ms after the registration switch (RSW) turns on, the drawer paper feed clutch 2 (DPFCL2), drawer drive motor 2 (DDM2) and drawer drive motor 1 (DDM1) turns off.
- (h): The drawer drive motor 2 (DDM2), drawer drive motor 1 (DDM1) and the registration motor (RM) turns on to start secondary paper feed.

### 2-2-1 Electrical parts layout

#### (1) PCBs



**Figure 2-2-1 PCBs**

- 1. Drawer main PCB (DMPCB) ..... Controls electrical components of the drawer.
- 2. Drawer heater PCB (DHPCB) ..... Drawer heater power relay.

(2) Switches and sensors

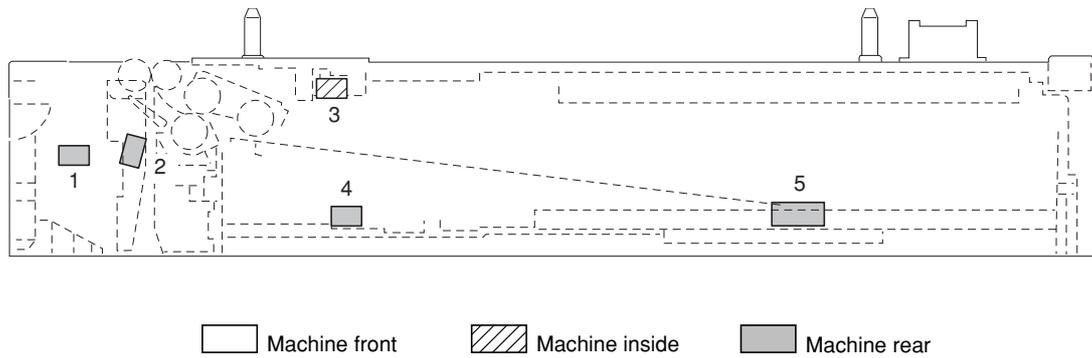


Figure 2-2-2 Switches and sensors

1. Drawer left cover safety switch (DLCSSW) ..... Breaks the safety circuit when the Drawer left cover is opened.
2. Drawer feed switch (DFSW) ..... Detects a paper misfeed.
3. Drawer paper switch (DPSW) ..... Detects the presence of paper in the drawer.
4. Drawer paper size width switch (DPWSW) ..... Detects the width of paper in the drawer.
5. Drawer paper size length switch (DPLSW) ..... Detects the length of paper in the drawer.

(3) Others

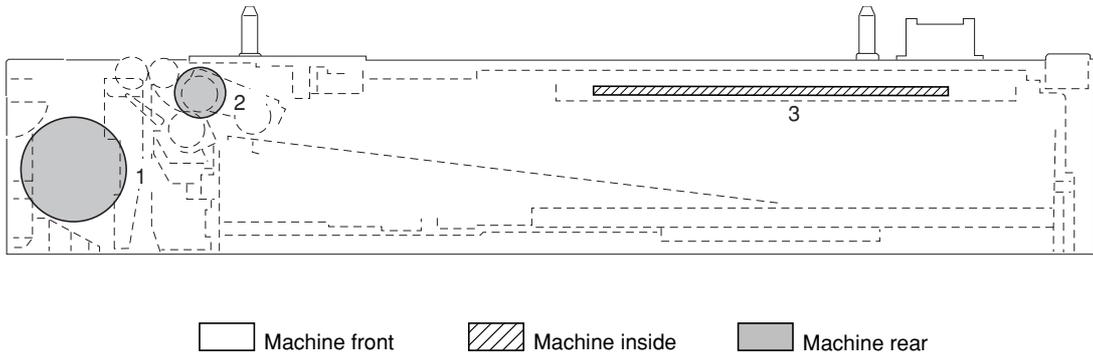
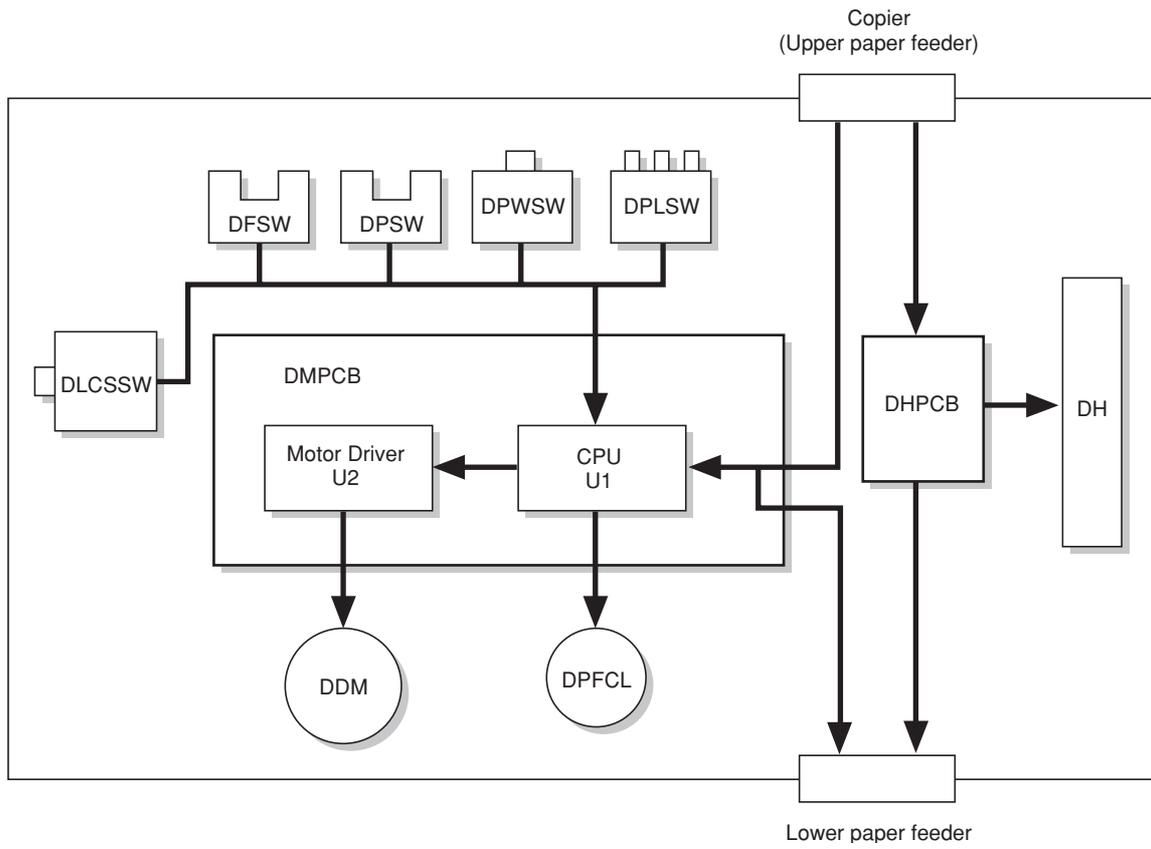


Figure 2-2-3 Others

- 1. Drawer drive motor (DDM) ..... Drives the machine.
- 2. Drawer paper feed clutch (DPFCL) ..... Primary paper feed from the drawer.
- 3. Drawer heater (DH) ..... Dehumidifies the drawer section.

### 2-3-1 Drawer main PCB



**Figure 2-3-1 Drawer main PCB block diagram**

The drawer main PCB (DMPCB) is controlled by the engine PCB (EPCB) in the copier, and the engine PCB (EPCB) uses serial communication to control input and output of each motor, clutch, and switch of the DP through the CPU (U1) equipped with a function of bidirectional serial/parallel conversion of 8-bit data.

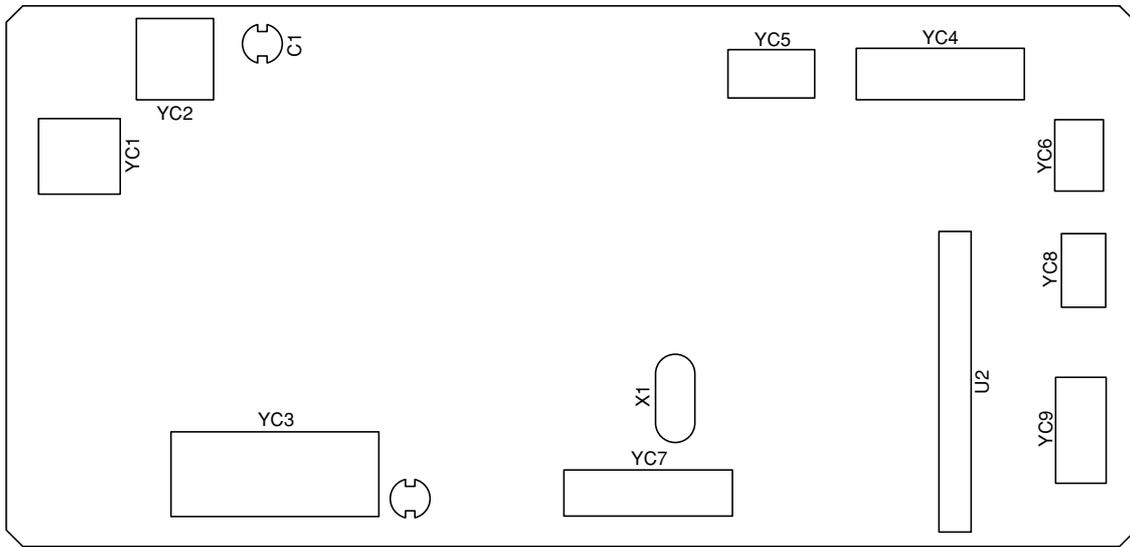
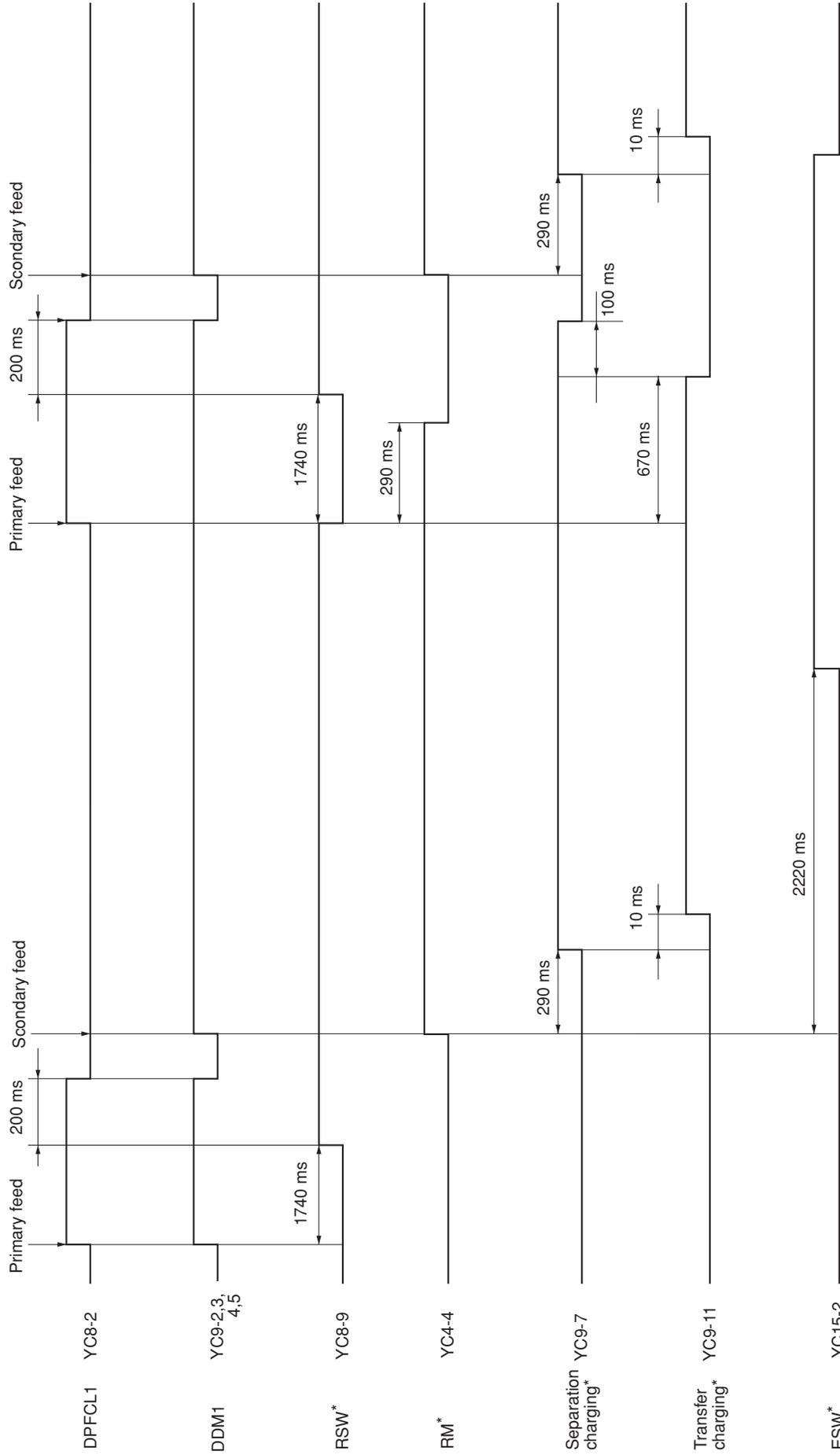


Figure 2-3-2 Drawer main PCB silk-screen diagram

Connector	Pin No.	Signal	I/O	Description
YC1 Connected to the copier	1	24 V	I	24 V DC power supply from copier
	2	P.GND	-	Ground
YC2 Connected to the lower paper feeder	1	24 V	O	24 V DC power supply for lower paper feeder
	2	P.GND	-	Ground
YC3 Connected to the copier and lower paper feeder	A1	5 V	I	5 V DC power supply from copier
	A2	S.GND	-	Ground
	A3	5 V	I	5 V DC power supply from copier
	A4	S.GND	-	Ground
	A5	5 V	I	5 V DC power supply from copier
	A6	S.GND	-	Ground
	A7	SDI	I	Serial communication reception
	A8	SDO	O	Serial communication transmission
	A9	SCLK	I	Clock signal from copier
	A10	SEL0	I	SEL0 signal from copier
	A11	SEL1	I	SEL1 signal from copier
	A12	SEL2	I	SEL2 signal from copier
	A13	RDY	O	READY signal to copier
B1	RDY	I	READY signal to lower paper feeder	
B2	SEL2	O	SEL2 signal to lower paper feeder	
B3	SEL1	O	SEL1 signal to lower paper feeder	

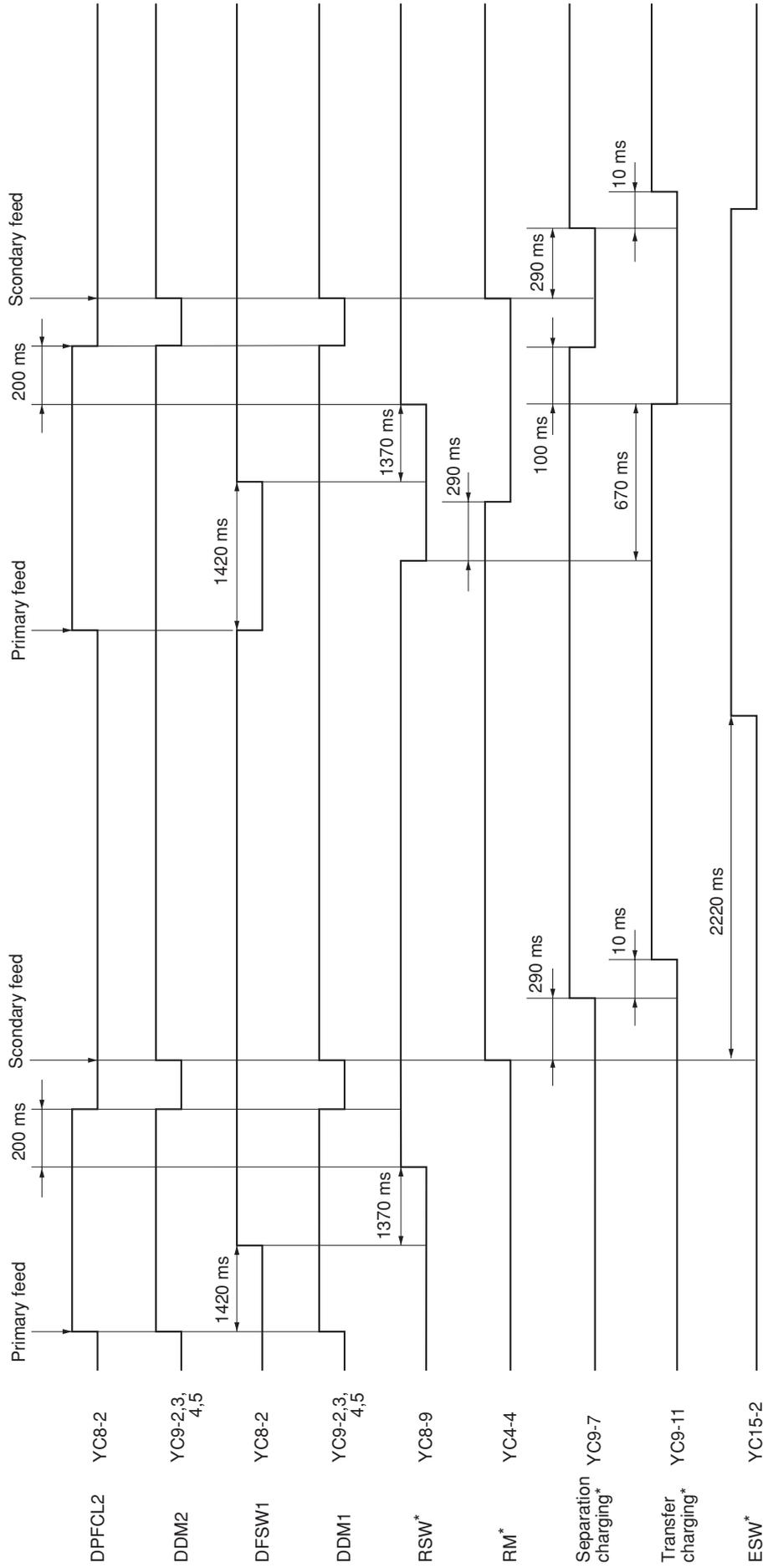
Connector	Pin No.	Signal	I/O	Description
YC3 Connected to the copier and lower paper feeder	B4	SEL0	O	SEL0 signal to lower paper feeder
	B5	SCLK	O	Clock signal to lower paper feeder
	B6	SDI	I	Serial communication reception
	B7	SDO	O	Serial communication transmission
	B8	S.GND	-	Ground
	B9	5 V	O	5 V DC power supply for lower paper feeder
	B10	S.GND	-	Ground
	B11	5 V	O	5 V DC power supply for lower paper feeder
	B12	S.GND	-	Ground
B13	5 V	O	5 V DC power supply for lower paper feeder	
YC4 Connected to the drawer paper size width switch and drawer paper size length switch	1	S.GND	-	Ground
	2	DLCSSW	I	DLCSSW on/off
	3	S.GND	-	Ground
	4	SIZE A	I	DPWSW (SIZE A) on/off
	5	SIZE B	I	DPLSW (SIZE B) on/off
	6	SIZE C	I	DPLSW (SIZE C) on/off
	7	S.GND	-	Ground
	8	SIZE D	I	DPLSW (SIZE D) on/off
YC5 Connected to the drawer paper switch	1	S.GND	-	Ground
	2	DPSW	I	DPSW on/off
	3	5 V	O	5 V DC power supply for DPSW
YC6 Connected to the drawer feed switch	1	S.GND	-	Ground
	2	DFSW	I	DFSW on/off
	3	5 V	O	5 V DC power supply for DFSW
YC8 Connected to the drawer paper feed clutch	1	24 V	O	24 V DC power supply for DPFCL
	2	DPFCL	O	DPFCL on/off
YC9 Connected to the drawer drive motor	1	24 V	O	24 V DC power supply for DDM
	2	A	O	DDM control signal (A)
	3	B	O	DDM control signal (B)
	4	_A	O	DDM control signal (_A)
	5	_B	O	DDM control signal (_B)

**Timing chart No. 1 Paper feed from optional first paper feeder, single-side mode, original size A4/1" x 8 1/2", two sheets**



\*: Copier

**Timing chart No. 2 Paper feed from optional second paper feeder, single-side mode, original size A4/11" x 8 1/2", two sheets**



\*: Copier

**Maintenance parts list**

<b>Maintenance part name</b>		<b>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>			
Drawer paper feed pulley	PULLEY, PAPER FEED	2AR07220	2	16
Drawer separation pulley	PULLEY, SEPARATION	2AR07230	2	17
Drawer forwarding pulley	PULLEY, LEADING FEED	2AR07240	2	18
Feed roller	ROLLER FEED	3HW06020	2	3
Feed pulley	PULLEY FEED	2BL16080	1	24

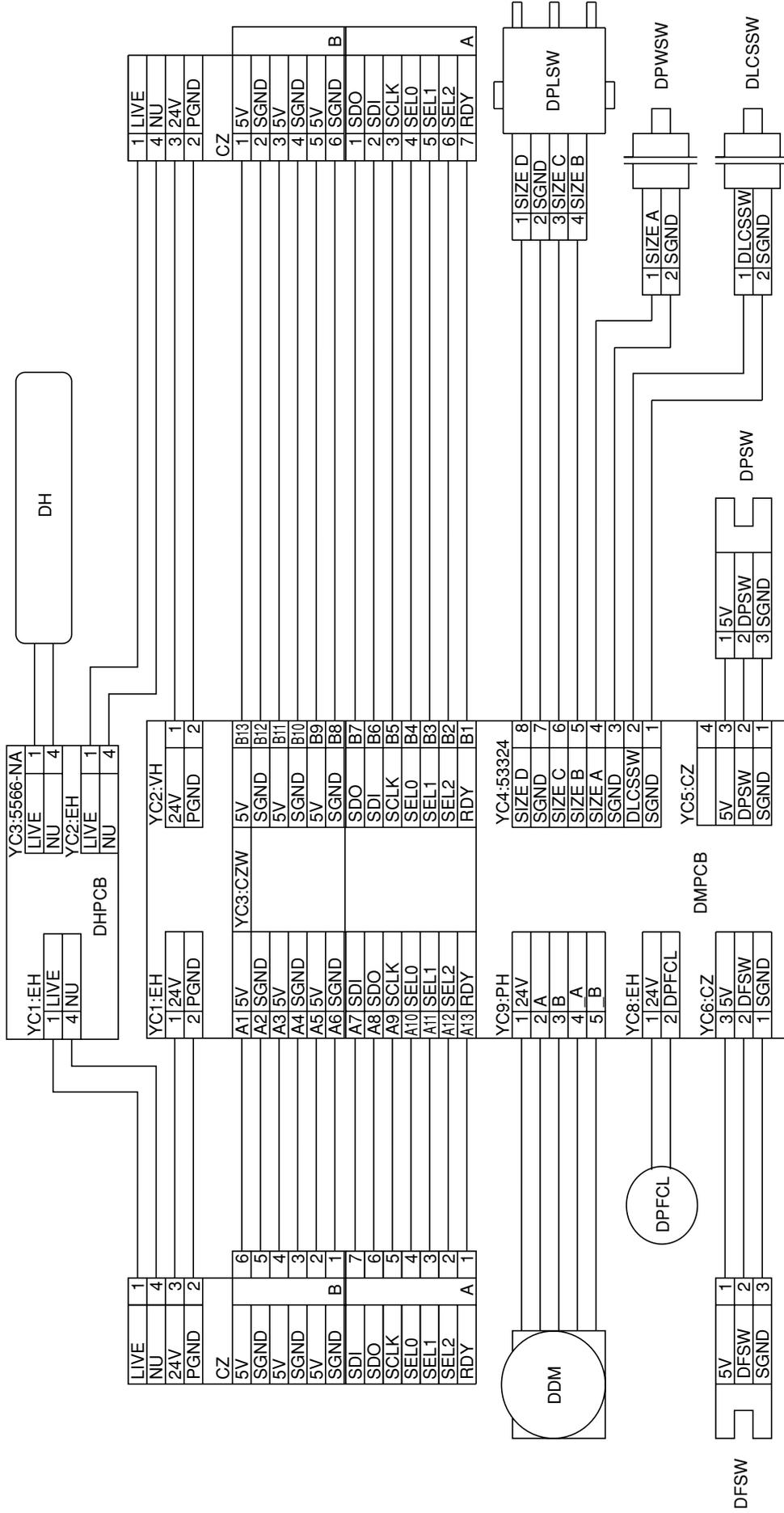
**Periodic maintenance procedures**

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Test copy and test print	Perform at the maximum copy size	Test copy	Every service		



Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Paper feed section	Drawer paper feed pulley	Clean or replace	-	Clean with the rubber roller cleanliness.	1-5-5
	Drawer separation pulley	Clean or replace	-	Clean with the rubber roller cleanliness.	1-5-4
	Drawer forwarding pulley	Clean or replace	-	Clean with the rubber roller cleanliness.	1-5-5
	Feed roller	Clean or replace	-	Clean with the rubber roller cleanliness.	1-5-3
	Feed pulley	Check or clean	-	Clean with alcohol or a dry cloth if it is dirty.	

Wiring diagram



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