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# DF-720

## SERVICE MANUAL

Published in June 2006  
843J3110  
First Edition

## **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.

**Revision history**

Revision	Date	Replaced pages	Remarks

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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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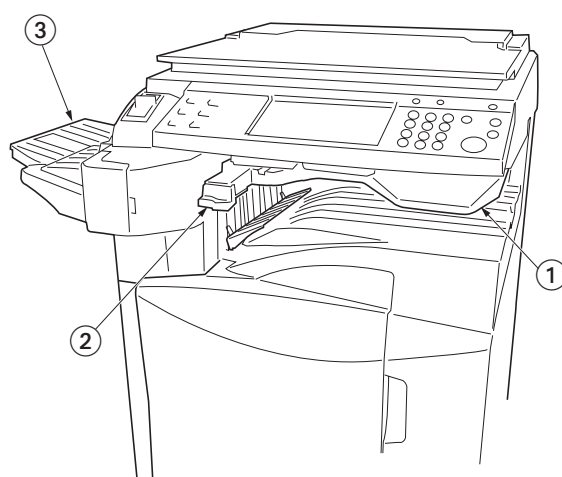
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### 1-1-1 Specifications

Type .....	Built-in
Number of trays .....	1 (finisher tray)
Tray capacity.....	When NOT stapling
	A3, B4, Ledger, Legal, Folio, OfficioII: 250 sheets
	A4, A4R, B5, Letter, LetterR: 500 sheets
	When stapling 2 to 4 pages: 130 sheets
	When stapling 5 pages or more: 250 sheets
Stapling capacity .....	A4/Letter or smaller: 30 sheets
	Other sizes than above: 20 sheets
Paper size .....	A3 to B5, Folio, Ledger, Letter, Legal and OfficioII
Power source .....	Electrically connected to the machine
Dimension (W) x (D) x (H) .....	310 (W) x 410 (D) x 160 (H) mm
	12 3/16" (W) x 16 1/8" (D) x 6 1/4" (H)
Weight.....	Approximately less than 9 kg/19.84 lbs

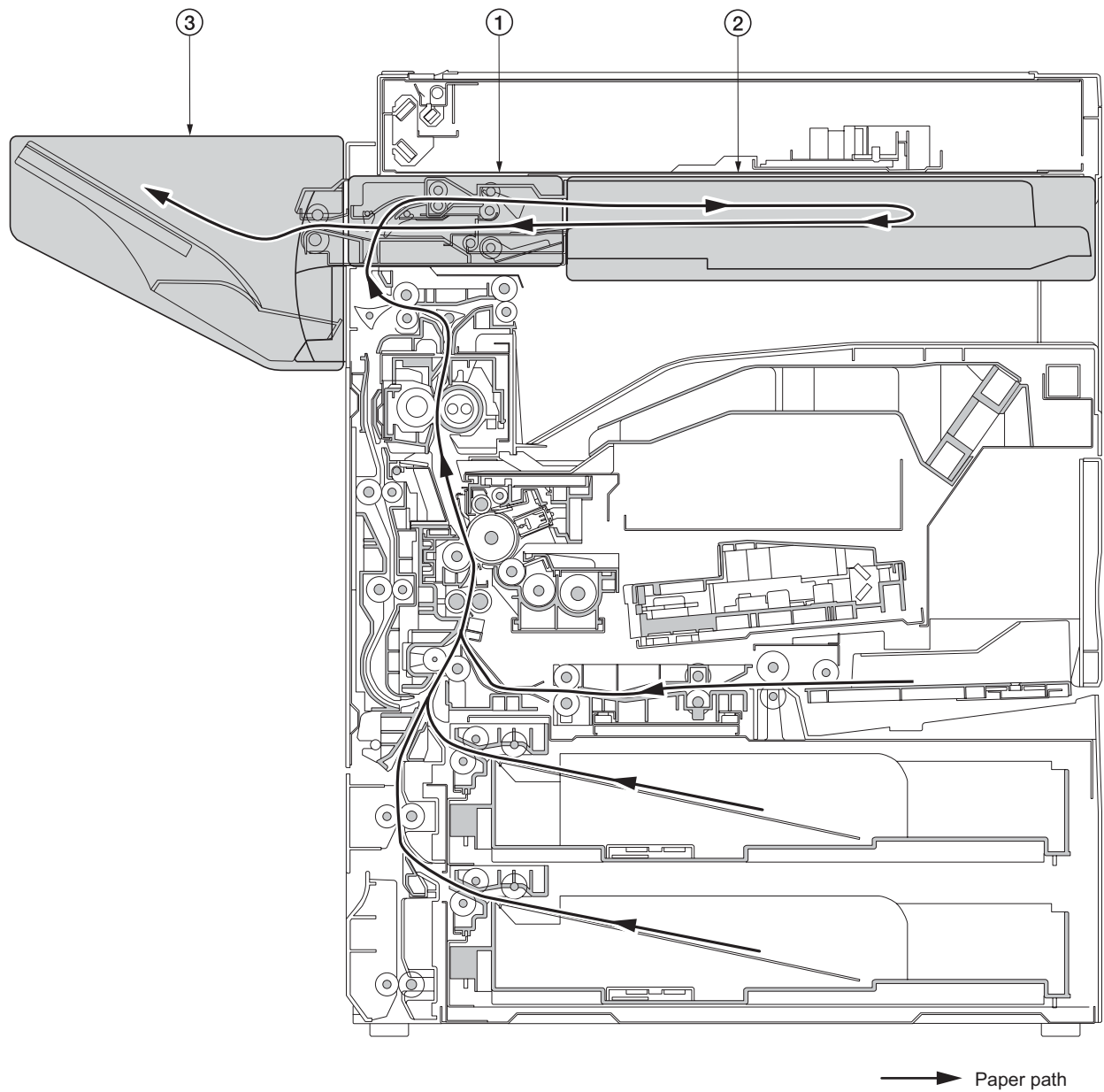
NOTE: These specifications are subject to change without notice.

## 1-1-2 Parts names



**Figure 1-1-1**

1. Intermediate tray
2. JAM release lever
3. Finisher tray

**1-1-3 Machine cross section****Figure 1-1-2 Machine cross section**

1. Paper conveying section
2. Intermediate tray section
3. Eject section

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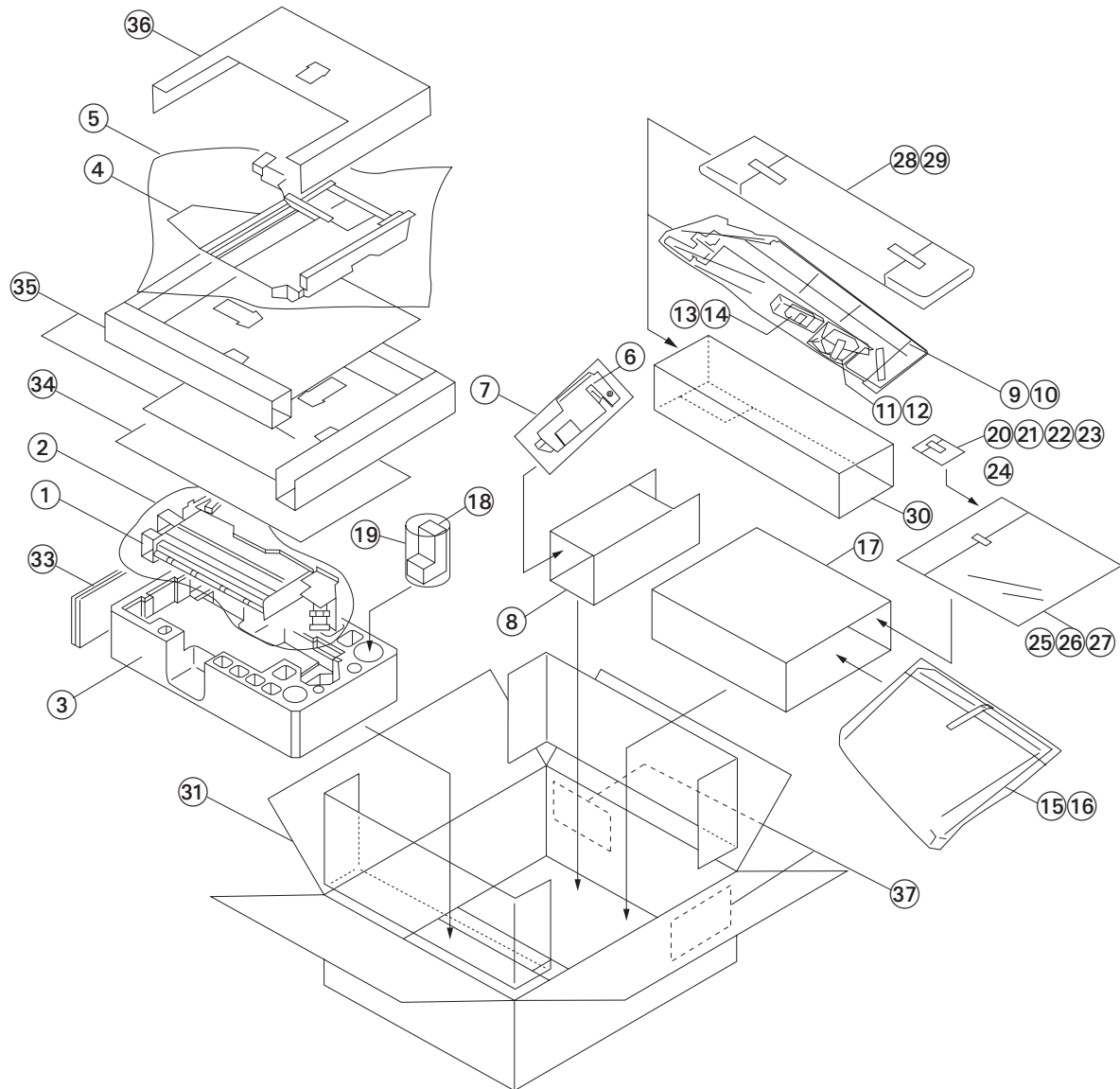


### 1-2-1 Installation environment

1. Installation location (Be based on the machine establishment place.)  
Avoid direct sunlight or bright lighting. Ensure that the photo-conductor will not be exposed to direct sunlight or other strong light when removing paper jams.  
Avoid extremes of temperature and humidity, abrupt ambient temperature changes, and hot or cold air directed onto the machine.  
Avoid dust and vibration.  
Choose a surface capable of supporting the weight of the machine.  
Place the machine on a level surface (maximum allowance inclination: 1°).  
Avoid air-borne substances that may adversely affect the machine or degrade the photo-conductor, such as mercury, acidic or alkaline vapors, inorganic gasses, NOx, SOx gases and chlorine-based organic solvents.  
Select a room with good ventilation.

## 1-2-2 Unpacking

### (1) Unpacking



**Figure 1-2-1 Unpacking**

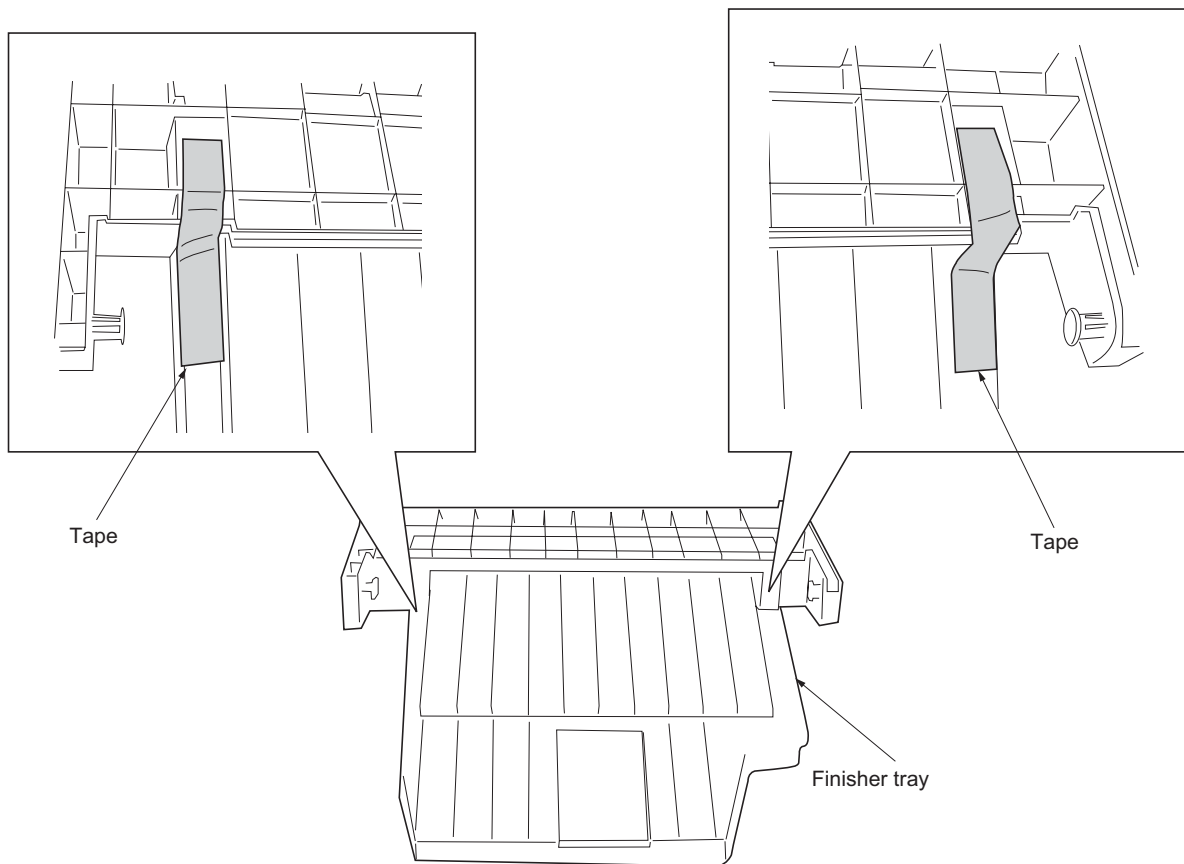
- |                             |                                    |                                       |
|-----------------------------|------------------------------------|---------------------------------------|
| 1. Paper conveying unit     | 15. Finisher tray                  | 29. Air-padded bag                    |
| 2. Plastic bag              | 16. Air-padded bag                 | 30. Cover spacer                      |
| 3. Paper conveying unit pad | 17. Finisher tray spacer           | 31. Outer case                        |
| 4. Intermediate tray        | 18. Staple cartridge               | 32. Stays                             |
| 5. Plastic sheet            | 19. Air-padded bag                 | 33. Paper conveying unit side spacer  |
| 6. Stapler cover            | 20. Flat spring ejection           | 34. Paper conveying unit upper spacer |
| 7. Plastic bag              | 21. Ground plate                   | 35. Intermediate tray lower spacer    |
| 8. Stapler cover spacer     | 22. TP screws M3 x 05              | 36. Intermediate tray upper spacer    |
| 9. Large eject cover        | 23. Operation section securing pin | 37. Barcode labels                    |
| 10. Plastic bag             | 24. Plastic bag                    |                                       |
| 11. Front eject cover       | 25. Installation guide             |                                       |
| 12. Plastic bag             | 26. PULL label                     |                                       |
| 13. Rear eject cover        | 27. Plastic bag                    |                                       |
| 14. Plastic bag             | 28. Sub tray                       |                                       |

Caution: Place the machine on a level surface.

**(2) Remove the tapes**

When installing the finisher to the machine, be sure to remove the following tapes.

1. Remove two tapes holding the finisher tray.



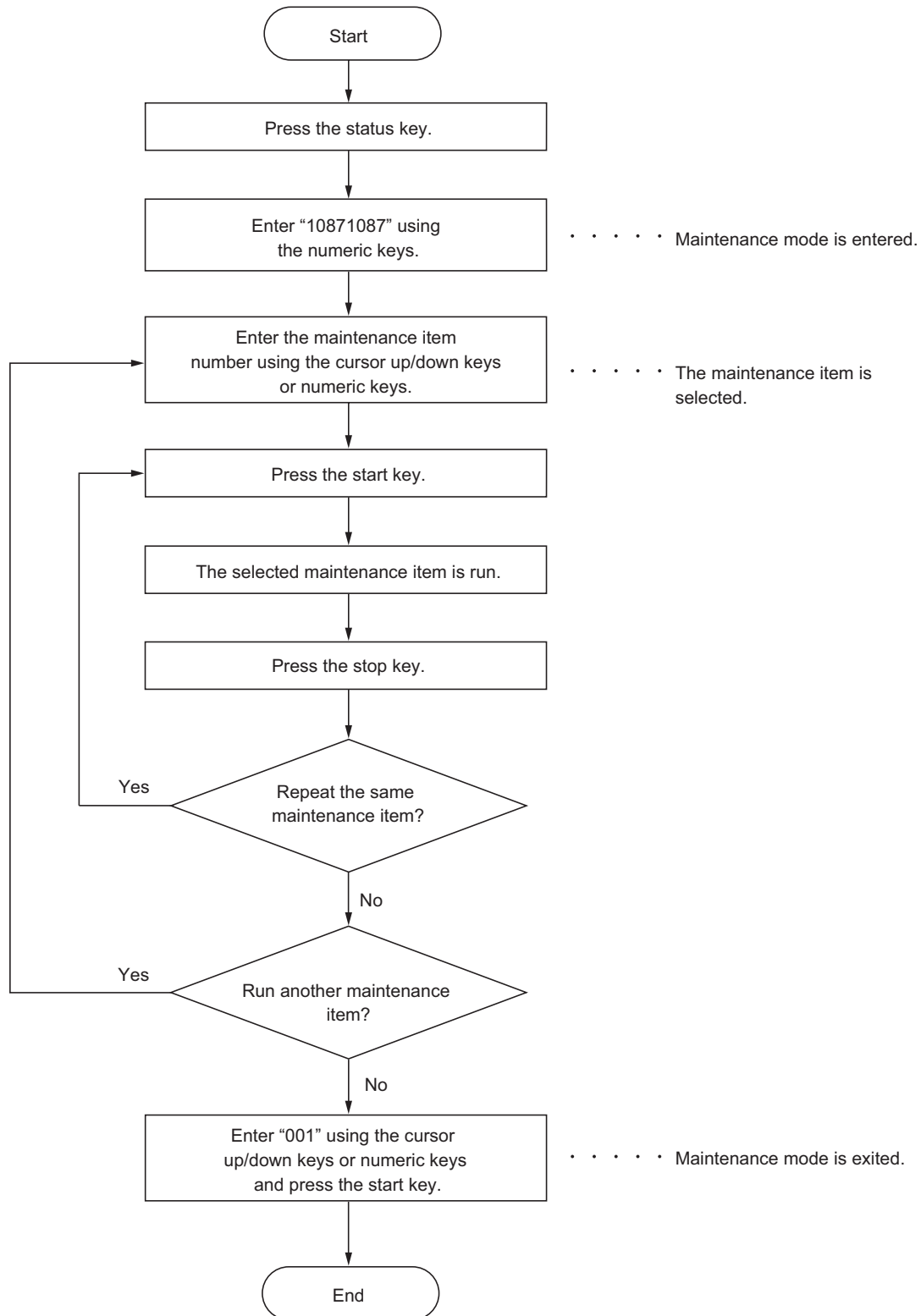
**Figure 1-2-2**

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### 1-3-1 Maintenance mode

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

#### (1) Executing a maintenance item



## (2) Contents of the maintenance mode items

Maintenance item No.	Description																																														
<b>U019</b>	<p><b>Displaying the ROM version</b></p> <p><b>Description</b> Displays the part number of the ROM fitted to each PWB.</p> <p><b>Purpose</b> To check the part number or to decide, 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 are displayed.</li> <li>2. Change the screen using the cursor up/down keys</li> </ol> <table border="1"> <thead> <tr> <th>Display</th><th>Description</th></tr> </thead> <tbody> <tr><td>MAIN</td><td>Main PWB ROM IC</td></tr> <tr><td>MMI</td><td>Operation PWB ROM IC</td></tr> <tr><td>ENGINE</td><td>Engine PWB ROM IC</td></tr> <tr><td>ENGINE BOOT</td><td>Engine PWB booting</td></tr> <tr><td>SCANNER</td><td>Scanner PWB ROM IC</td></tr> <tr><td>OPTION LANGUAGE</td><td>Optional language ROM IC</td></tr> <tr><td>DICTIONARY</td><td>-</td></tr> <tr><td>DP</td><td>Optional DP main PWB ROM IC</td></tr> <tr><td>LCF</td><td>Optional 3000-sheet paper feeder main PWB ROM IC</td></tr> <tr><td>OPTION CASSETTE</td><td>Optional paper feeder main PWB ROM IC</td></tr> <tr><td>DF MAIN</td><td>Optional 3000-sheet document finisher main PWB ROM IC</td></tr> <tr><td>DF MTRAY</td><td>Optional 3000-sheet document finisher internal tray PWB ROM IC</td></tr> <tr><td>DF SADDLE</td><td>Optional centerfold main PWB ROM IC</td></tr> <tr><td>DF MAILBOX</td><td>Optional mail box main PWB ROM IC</td></tr> <tr><td>INNER DF</td><td>Built-in finisher control PWB ROM IC</td></tr> <tr><td>SIMPLE DF MAIN</td><td>Optional document finisher main PWB ROM IC</td></tr> <tr><td>FAX BOOT1</td><td>Optional fax control PWB booting</td></tr> <tr><td>FAX APL1</td><td>Optional fax control PWB application</td></tr> <tr><td>FAX IPL1</td><td>Optional fax control PWB IPL</td></tr> <tr><td>FAX BOOT2</td><td>-</td></tr> <tr><td>FAX APL2</td><td>-</td></tr> <tr><td>FAX IPL2</td><td>-</td></tr> </tbody> </table> <p><b>Completion</b> Press the stop key. The screen for selecting a maintenance item No. is displayed.</p>	Display	Description	MAIN	Main PWB ROM IC	MMI	Operation PWB ROM IC	ENGINE	Engine PWB ROM IC	ENGINE BOOT	Engine PWB booting	SCANNER	Scanner PWB ROM IC	OPTION LANGUAGE	Optional language ROM IC	DICTIONARY	-	DP	Optional DP main PWB ROM IC	LCF	Optional 3000-sheet paper feeder main PWB ROM IC	OPTION CASSETTE	Optional paper feeder main PWB ROM IC	DF MAIN	Optional 3000-sheet document finisher main PWB ROM IC	DF MTRAY	Optional 3000-sheet document finisher internal tray PWB ROM IC	DF SADDLE	Optional centerfold main PWB ROM IC	DF MAILBOX	Optional mail box main PWB ROM IC	INNER DF	Built-in finisher control PWB ROM IC	SIMPLE DF MAIN	Optional document finisher main PWB ROM IC	FAX BOOT1	Optional fax control PWB booting	FAX APL1	Optional fax control PWB application	FAX IPL1	Optional fax control PWB IPL	FAX BOOT2	-	FAX APL2	-	FAX IPL2	-
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FAX IPL2	-																																														

Maintenance item No.	Description										
U033	<p><b>Checking solenoid operation</b></p> <p><b>Description</b> Applies current to each solenoid in order to check its ON status.</p> <p><b>Purpose</b> To check the operation of each solenoid.</p> <p><b>Method</b></p> <ol style="list-style-type: none"> <li>1. Press the start key.</li> <li>2. Select the solenoid to be operated.</li> <li>3. Press the start key. The solenoid turns on for 1 s.</li> </ol> <table border="1"> <thead> <tr> <th>Display</th><th>Solenoids</th></tr> </thead> <tbody> <tr> <td>TONER</td><td>Toner feed solenoid (TNFSOL)</td></tr> <tr> <td>BRANCH1</td><td>Feedshift solenoid (FSSOL)*</td></tr> <tr> <td>BRANCH2</td><td>Feedshift solenoid (FSSOL)</td></tr> <tr> <td>MOTOR ON</td><td>The drive motor (DM) and the paper feed motor (PFM) are turned on.</td></tr> </tbody> </table> <p>*Solenoid of machine. To stop motor driving, press [MOTOR ON] again.</p> <p><b>Completion</b> Press the stop key. The screen for selecting a maintenance item No. is displayed.</p>	Display	Solenoids	TONER	Toner feed solenoid (TNFSOL)	BRANCH1	Feedshift solenoid (FSSOL)*	BRANCH2	Feedshift solenoid (FSSOL)	MOTOR ON	The drive motor (DM) and the paper feed motor (PFM) are turned on.
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BRANCH2	Feedshift solenoid (FSSOL)										
MOTOR ON	The drive motor (DM) and the paper feed motor (PFM) are turned on.										
U236	<p><b>Setting the limit for the ejection section of the built-in finisher</b></p> <p><b>Description</b> Sets whether A5R/B5R/statement size paper is output to the machine eject tray or not.</p> <p><b>Purpose</b> If paper jams occur due to curling of paper in the built-in ejection section when duplex copying onto A5R/B5R/statement size paper is performed, this mode is used to change the setting to ON to disable ejection to the machine eject tray.</p> <p><b>Method</b> Press the start key. The screen for executing is displayed.</p> <p><b>Setting</b></p> <ol style="list-style-type: none"> <li>1. Press the start key.</li> <li>2. Select ON or OFF.</li> </ol> <table border="1"> <thead> <tr> <th>Display</th><th>Description</th></tr> </thead> <tbody> <tr> <td>ON</td><td>Does not eject to the machine eject tray.</td></tr> <tr> <td>OFF</td><td>Eject to the machine eject tray.</td></tr> </tbody> </table> <p>Initial setting: OFF</p> <ol style="list-style-type: none"> <li>3. Press the start key. The setting is set.</li> </ol> <p><b>Completion</b> Press the stop key. The screen for selecting a maintenance item No. is displayed.</p>	Display	Description	ON	Does not eject to the machine eject tray.	OFF	Eject to the machine eject tray.				
Display	Description										
ON	Does not eject to the machine eject tray.										
OFF	Eject to the machine eject tray.										

Maintenance item No.	Description																		
U246	<b>Setting the finisher</b>																		
	<b>Description</b>																		
	Provides various settings for the built-in finisher, if furnished.																		
	<b>Purpose</b>																		
	Adjusts the side registration cursor stop position if paper registration is poor or stapling is made outside the specified area.																		
	<b>Start</b>																		
	1. Press the start key.																		
	2. Select the item to be set. The screen for setting each item is displayed.																		
	<table><tr><th>Display</th><th>Description</th></tr><tr><td>FINISHER 3000</td><td>Adjustment of the 3000-sheet document finisher</td></tr><tr><td>BOOKLET FOLDER</td><td>Adjustment of the centerfold unit</td></tr><tr><td>FINISHER B-IN</td><td>Adjustment of the built-in finisher</td></tr></table>				Display	Description	FINISHER 3000	Adjustment of the 3000-sheet document finisher	BOOKLET FOLDER	Adjustment of the centerfold unit	FINISHER B-IN	Adjustment of the built-in finisher							
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FINISHER 3000	Adjustment of the 3000-sheet document finisher																		
BOOKLET FOLDER	Adjustment of the centerfold unit																		
FINISHER B-IN	Adjustment of the built-in finisher																		
<b>Setting the side registration cursor stop position</b>																			
1. Select the desired cursor position.																			
2. Change the setting using the +/- or numeric keys.																			
<table><tr><th>Display</th><th>Description</th><th>Setting range</th><th>Initial setting</th></tr><tr><td>FRONT</td><td>Front side registration cursor stop position</td><td>-4 to +4</td><td>0</td></tr><tr><td>REAR</td><td>Rear side registration cursor stop position</td><td>-4 to +4</td><td>0</td></tr><tr><td>END</td><td>Trailing edge registration cursor stop position</td><td>-4 to +4</td><td>0</td></tr></table>				Display	Description	Setting range	Initial setting	FRONT	Front side registration cursor stop position	-4 to +4	0	REAR	Rear side registration cursor stop position	-4 to +4	0	END	Trailing edge registration cursor stop position	-4 to +4	0
Display	Description	Setting range	Initial setting																
FRONT	Front side registration cursor stop position	-4 to +4	0																
REAR	Rear side registration cursor stop position	-4 to +4	0																
END	Trailing edge registration cursor stop position	-4 to +4	0																
3. Press the start key. The value is set.																			
4. To return to the screen for selecting an item, press the stop key.																			
<b>Completion</b>																			
Press the stop key. The screen for selecting a maintenance item No. is displayed.																			
U342	<b>Setting the ejection restriction</b>																		
	<b>Description</b>																		
	Sets or cancels the restriction on the number of sheets to be ejected continuously when the internal eject tray is selected as the eject location.																		
	<b>Purpose</b>																		
	According to user request, sets or cancels restriction on the number of sheets.																		
	<b>Setting</b>																		
	1. Press the start key.																		
	2. Select ON or OFF.																		
	<table><tr><th>Display</th><th>Description</th></tr><tr><td>ON</td><td>Sets restriction on the number of sheets</td></tr><tr><td>OFF</td><td>Cancels restriction on the number of sheets</td></tr></table>				Display	Description	ON	Sets restriction on the number of sheets	OFF	Cancels restriction on the number of sheets									
	Display	Description																	
ON	Sets restriction on the number of sheets																		
OFF	Cancels restriction on the number of sheets																		
Initial setting: ON																			
Details of restriction (number of sheets to be ejected continuously after the start key is pressed)																			
<table><tr><th>Condition</th><th>Number of sheets</th></tr><tr><td>When no optional ejection device is installed</td><td>250</td></tr><tr><td>When the job separator is installed</td><td>150</td></tr><tr><td>When the finisher is installed</td><td>100</td></tr></table>				Condition	Number of sheets	When no optional ejection device is installed	250	When the job separator is installed	150	When the finisher is installed	100								
Condition	Number of sheets																		
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When the finisher is installed	100																		
3. Press the start key. The setting is set.																			
<b>Completion</b>																			
Press the stop key. The screen for selecting a maintenance item No. is displayed.																			



## 1-4-1 Paper misfeed detection

### (1) Paper misfeed indication

When paper jams, the machine immediately stops operation and the occurrence of a paper jam is indicated on the operation panel.

To remove the jammed paper, lower the intermediate tray.

To reset the paper misfeed detection, detach and refit the intermediate tray to turn the tray open/close switch off and on.

### (2) Paper misfeed detection conditions

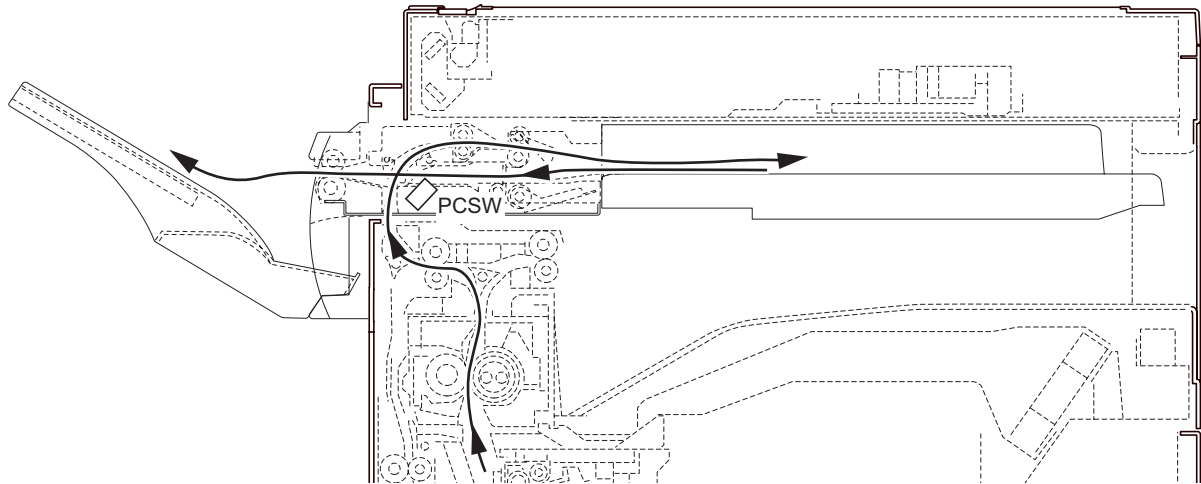


Figure 1-4-1

Section	Description	Conditions	Specified time
Built-in finisher	81 Paper conveying sensor nonarrival jam	The paper conveying switch (PCSW) is not turned on even if a specified time has elapsed after the machine eject signal was received.	1573 ms (30 ppm) 1217 ms (40/50 ppm)
		The paper conveying switch (PCSW) does not turn off within specified time of its turning on when paper is conveyed to the intermediate tray from the paper conveying unit.	Paper length + 1123 ms (30 ppm) Paper length + 869 ms (40/50 ppm)
	82 Jam in stapler	The staple home position sensor (STHPS) is not turned on within the specified time when driving the staple motor (STM).	600 ms
	83 Eject jam	The paper conveying switch (PCSW) does not turn off within specified time of its turning on when paper is ejected to the finisher tray from the intermediate tray.	Paper length + 1123 ms (30 ppm) Paper length + 869 ms (40/50 ppm)
	96 Jam between the built-in finisher and machine	Paper ejection is not output from the machine to the document finisher within specified time of the intermediate tray sensor (ITS) turning on.	1573 ms (30 ppm) 1217 ms (40/50 ppm)

**(3) Paper misfeeds**

<b>Problem</b>	<b>Causes/check procedures</b>	<b>Corrective measures</b>
(1) A paper jam in built-in finisher is indicated as soon as the main power switch is turned on.	A piece of paper torn from copy paper is caught around the paper conveying switch.	Check visually and remove it, if any.
	Defective paper conveying switch.	With 5 V DC present at YC2-23 on the finisher control PWB, check if YC2-21 on the finisher control PWB remains low when the paper conveying switch is turned on and off. If it does, replace the paper conveying switch.
(2) A paper jam in built-in finisher is indicated during copying (paper jam during paper insertion to the finisher). Jam code 81	Extremely curled paper.	Change the paper.
	Defective paper conveying switch.	With 5 V DC present at YC2-23 on the finisher control PWB, check if YC2-21 on the finisher control PWB remains low or high when the paper conveying switch is turned on and off. If it does, replace the paper conveying switch.
	Check if the feedshift roller or feedshift pulley is deformed.	Check and remedy.
(3) A paper jam in built-in finisher is indicated during copying (finisher stapler jam). Jam code 82	The stapler is blocked with a staple.	Remove the stapler cartridge, and check the cartridge and the stapling section of the stapler. Remove the staple if any.
	Defective stapler section.	With 5 V DC present at YC2-24 on the finisher control PWB, check if YC2-19 on the finisher control PWB remains low or high. If it does, replace the stapler section.
(4) A paper jam in built-in finisher is indicated during copying (eject jam). Jam code 83	Defective paper conveying switch.	With 5 V DC present at YC2-23 on the finisher control PWB, check if YC2-21 on the finisher control PWB remains low when the paper conveying switch is turned on and off. If it does, replace the paper conveying switch.
	Check if the feedshift roller or feedshift pulley is deformed.	Check and remedy.
(5) A paper jam in built-in finisher is indicated during copying (jam between finisher and machine). Jam code 96	Defective intermediate tray sensor.	With 5 V DC present at YC3-1 on the finisher control PWB, check if YC3-2 on the finisher control PWB remains low or high when the intermediate tray sensor is turned on and off. If it does, replace the intermediate tray sensor.

## 1-4-2 Self-diagnosis

### (1) Self-diagnostic function

This unit is equipped with a self-diagnostic function. When a problem is detected, copying is disabled and the problem displayed as a code consisting of C followed by a number, indicating the nature of the problem.

A message is also displayed requesting the user to call for service.

After removing the problem, the self-diagnostic function can be reset by turning the tray open/close switch or machine safety switch 1 or 2 off and back on.

### (2) Self diagnostic codes

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
<b>C8170</b>	<b>Finisher front side registration motor problem</b> When the front-side registration home-position sensor is turned on during initialization, the sensor did not turn on while it has moved by 106 pulses. When the front-side registration home-position sensor is turned off during initialization, the sensor did not turn on in three seconds.	The front side registration motor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
		Defective front side registration motor.	Replace front side registration motor.
		The front side registration home position sensor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
		Defective front side registration home position sensor.	Replace the front side registration home position sensor.
		Defective finisher control PWB.	Replace the finisher control PWB and check for correct operation.
<b>C8180</b>	<b>Finisher rear side registration motor problem</b> When the rear-side registration home-position sensor is turned on during initialization, the sensor did not turn on while it has moved by 106 pulses. When the rear-side registration home-position sensor is turned off during initialization, the sensor did not turn on in three seconds.	The rear side registration motor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
		Defective rear side registration motor.	Replace rear side registration motor.
		The rear side registration home position sensor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
		Defective rear side registration home position sensor.	Replace the rear side registration home position sensor.
		Defective finisher control PWB.	Replace the finisher control PWB and check for correct operation.

Code	Contents	Remarks	
		Causes	Check procedures/corrective measures
<b>C8190</b>	<b>Finisher trailing edge registration motor problem</b> When the trailing edge registration home-position sensor is turned on during initialization, the sensor did not turn on while it has moved by 106 pulses. When the trailing edge registration home-position sensor is turned off during initialization, the sensor did not turn on in three seconds.	The trailing edge registration motor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
		Defective trailing edge registration motor.	Replace trailing edge registration motor.
		The trailing edge registration home position sensor connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
		Defective trailing edge registration home position sensor.	Replace the trailing edge registration home position sensor.
		Defective finisher control PWB.	Replace the finisher control PWB and check for correct operation.
<b>C8210</b>	<b>Finisher stapler problem</b> The stapler home position sensor does not change state from nondetection to detection within 200 ms of the start of stapler motor counterclockwise (forward) rotation. During initialization, the stapler home position sensor does not change state from non-detection to detection within 600 ms of the start of stapler motor clockwise (reverse) rotation.	The stapler connector makes poor contact.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
		The stapler is blocked with a staple.	Remove the stapler cartridge, and check the cartridge and the stapling section of the stapler.
		The stapler is broken.	Replace the front stapler and check for correct operation.
		Defective finisher control PWB.	Replace the finisher control PWB and check for correct operation.

### 1-4-3 Electric problems

Troubleshooting to each failure must be in the order of the numbered symptoms.

Problem	Causes	Check procedures/corrective measures
(1) The paper conveying motor does not operate.	1. Poor contact in the connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	2. Broken motor coil.	Check for continuity across the coil. If none, replace the motor.
	3. Defective drive transmission system.	Check if the rollers and gears rotate smoothly. If not, grease the bushings and gears. Check for broken gears and replace if any.
(2) The feedshift solenoid does not operate.	1. Broken solenoid coil.	Check for continuity across the coil. If none, replace the solenoid.
	2. Poor contact in the connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	3. Defective engine PWB.	Run maintenance item U033 and check if the solenoid operates. If not, replace the engine PWB.
(3) The pickup solenoid does not operate.	1. Broken solenoid coil.	Check for continuity across the coil. If none, replace the solenoid.
	2. Poor contact in the connector terminals.	Reinsert the connector. Also check for continuity within the connector cable. If none, remedy or replace the cable.
	3. Defective finisher control PWB.	Check if YC2-2 on the finisher control PWB goes low. If not, replace the finisher control PWB.

**1-4-4 Mechanical problems**

<b>Problem</b>	<b>Causes/check procedures</b>	<b>Corrective measures</b>
(1) Paper jams.	Check if the contact between the feedshift roller and feedshift pulleys is correct.	Check and remedy.
	Check if the contact between the feedshift roller and press roller is correct.	Check and remedy.
	Check if the contact between the eject roller and eject pulleys is correct.	Check and remedy.
(2) Abnormal noise is heard.	Check if the rollers and gears operate smoothly.	Clean with isopropyl alcohol.

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

### **(1) Precautions**

Before starting disassembly the finisher, press the Power key on the operation panel to off. Make sure that the Power indicator and the Memory indicator are off before turning off the main power switch. And then unplug the power cable from the wall outlet.

Turning off the main power switch before pressing the Power key to off may cause damage to the equipped hard disk.

When optional fax kit is installed, be sure to disconnect the modular code 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 unit thermostat. Never substitute electric wires, as the machine may be seriously damaged.

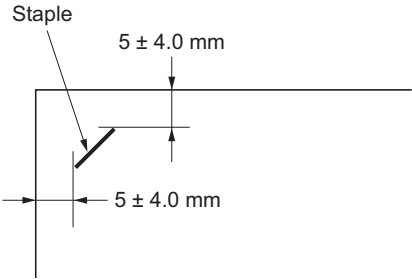
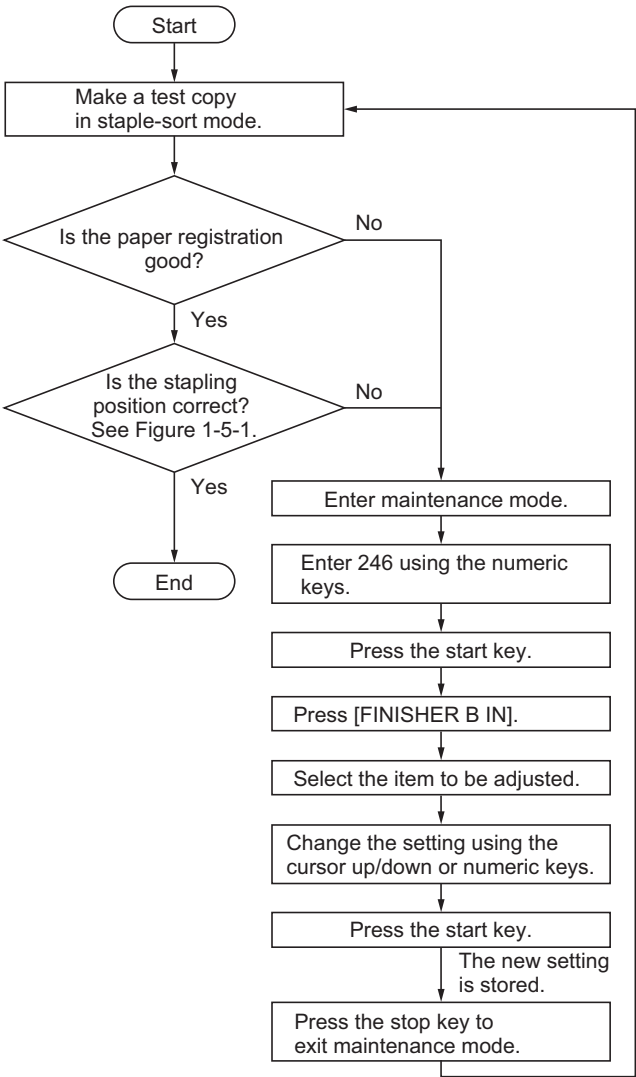
When replacing battery on a PWB, dispose properly according to laws and regulations.

When removing the hook of the connector, be sure to release the hook.

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

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

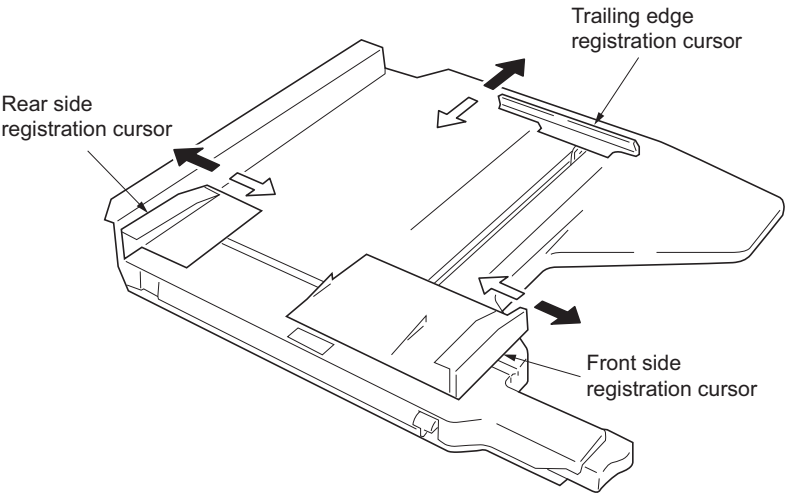
**Procedure**



**Figure 1-5-1 Stapling position**

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

Setting range: -4 to 4  
Reference: 0  
Changing the value by 1 changes the position by 0.556 mm.  
Increasing the value moves the front or rear side registration cursor or trailing edge registration cursor outward ( $\Rightarrow$ ); decreasing the value moves each cursor inward ( $\Leftarrow$ ). See Figure 1-5-2.



**Figure 1-5-2**

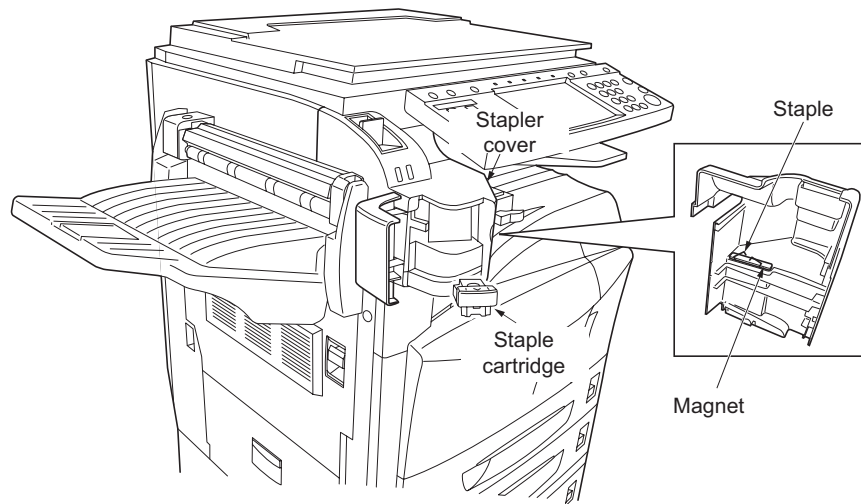


### (3) Cleaning the staple

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

#### Procedure

1. Open the front and conveying covers of the machine.
2. Open the stapler cover and then remove the staple cartridge.
3. Remove the stapler holder.
4. Remove five screws securing the stapler cover and then the cover.
5. Remove the staples attracted to the magnet on the inside of the stapler cover.



**Figure 1-5-3**

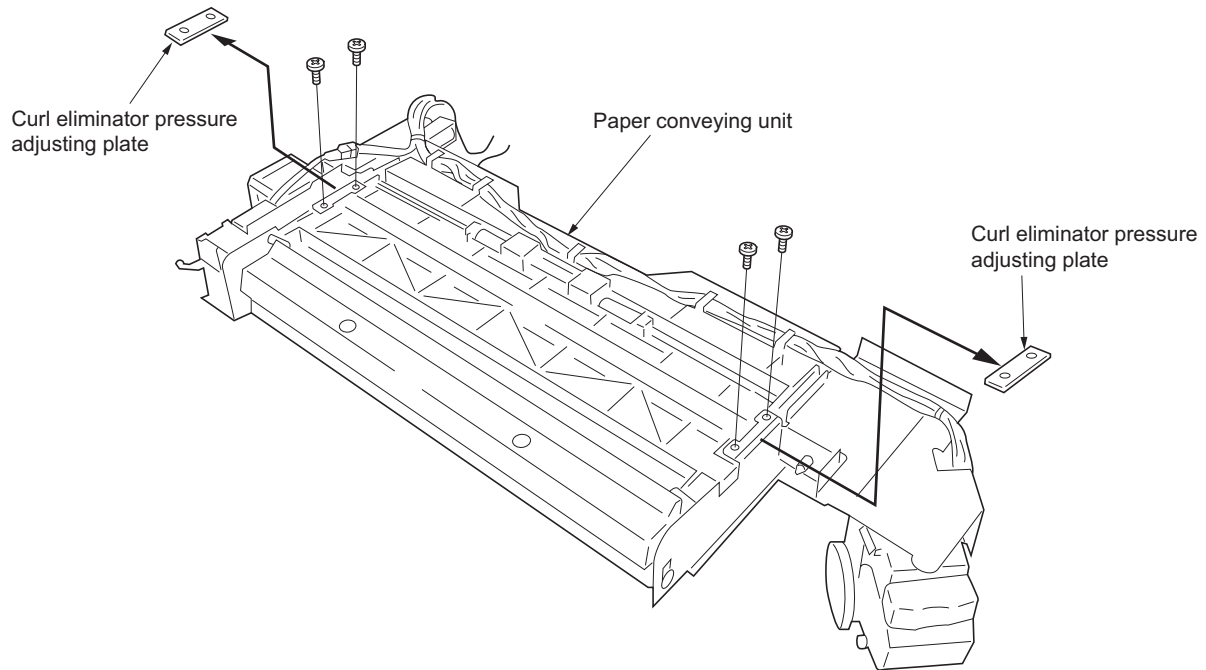
6. Refit the stapler cover.
7. Refit the staple cartridge and close the stapler cover.
8. Refit the stapler holder.
9. Close the conveying front and covers.

**(4) Adjusting the pressure of curl eliminator mechanism**

Increase the pressure of the curl eliminator mechanism to reduce upward curling of paper stacked on the intermediate tray if a paper jam occurs when batch ejection is performed because of strong upward curling.

**Procedure**

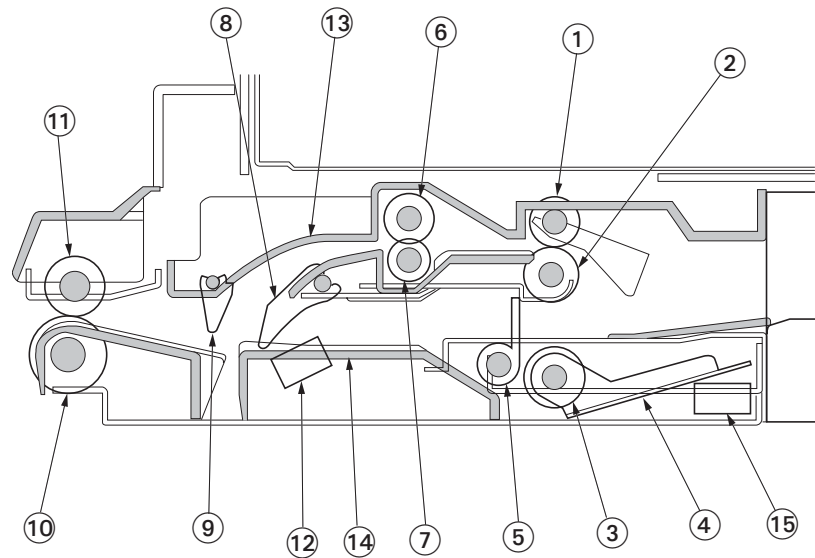
1. Remove the paper conveying unit from the machine.
2. Loosen each two screws from the front and rear curl eliminator pressure adjusting plates respectively and then remove the plates.
3. Refit the all removed parts.



**Figure 1-5-4**

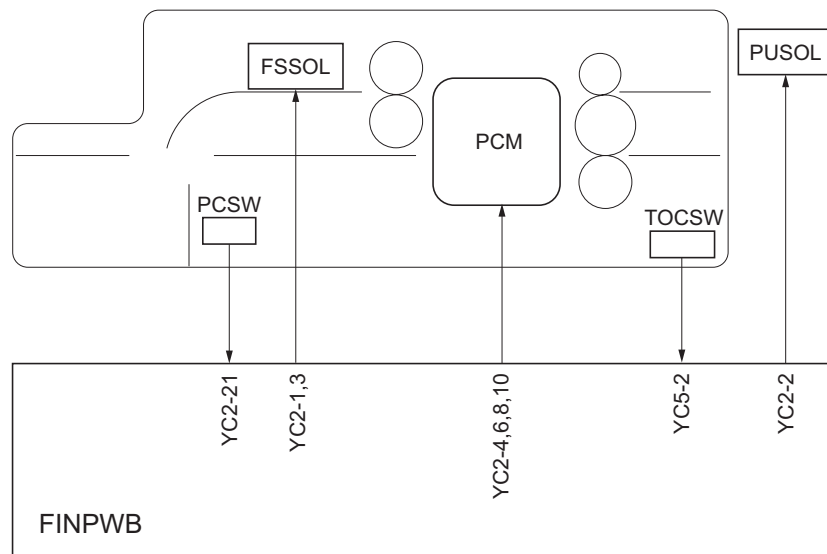
### 2-1-1 Construction of each section

The paper conveying section consists of the components shown in Figure 2-1-1. It switches the path for the paper conveyed from the machine in sort mode. Also the paper conveying section contains a curl eliminator mechanism, which reduces curling of paper with curl eliminator rollers.



**Figure 2-1-1 Paper conveying section**

- |                                  |                                     |
|----------------------------------|-------------------------------------|
| (1) Feedshift pulleys            | (9) Small feedshift claw            |
| (2) Feedshift roller             | (10) Eject roller                   |
| (3) Press roller                 | (11) Eject pulleys                  |
| (4) Press roller lift            | (12) Paper conveying switch (PCSW)  |
| (5) Stopper                      | (13) Upper guide plate              |
| (6) Upper curl eliminator roller | (14) Lower guide plate              |
| (7) Lower curl eliminator roller | (15) Tray open/close switch (TOCSW) |
| (8) Feedshift claw               |                                     |



**Figure 2-1-2 Paper conveying section block diagram**

### (1) Paper conveying operation in sort mode

In the sort mode, the feedshift solenoid (FSSOL) turns on and the feedshift guide of the machine operates to switch the paper path to the paper conveying unit. After curling of the conveyed paper is eliminated by the curl eliminator rollers, the paper is conveyed to the intermediate tray by the feedshift roller. When the trailing edge registration cursor of the intermediate tray shifts the paper stocked in the intermediate tray to the stopper, the pickup solenoid (PUSOL) turns on to lift the press roller and release the stopper. The stack of paper on the intermediate tray is ejected to the finisher tray by the feedshift roller and eject roller.

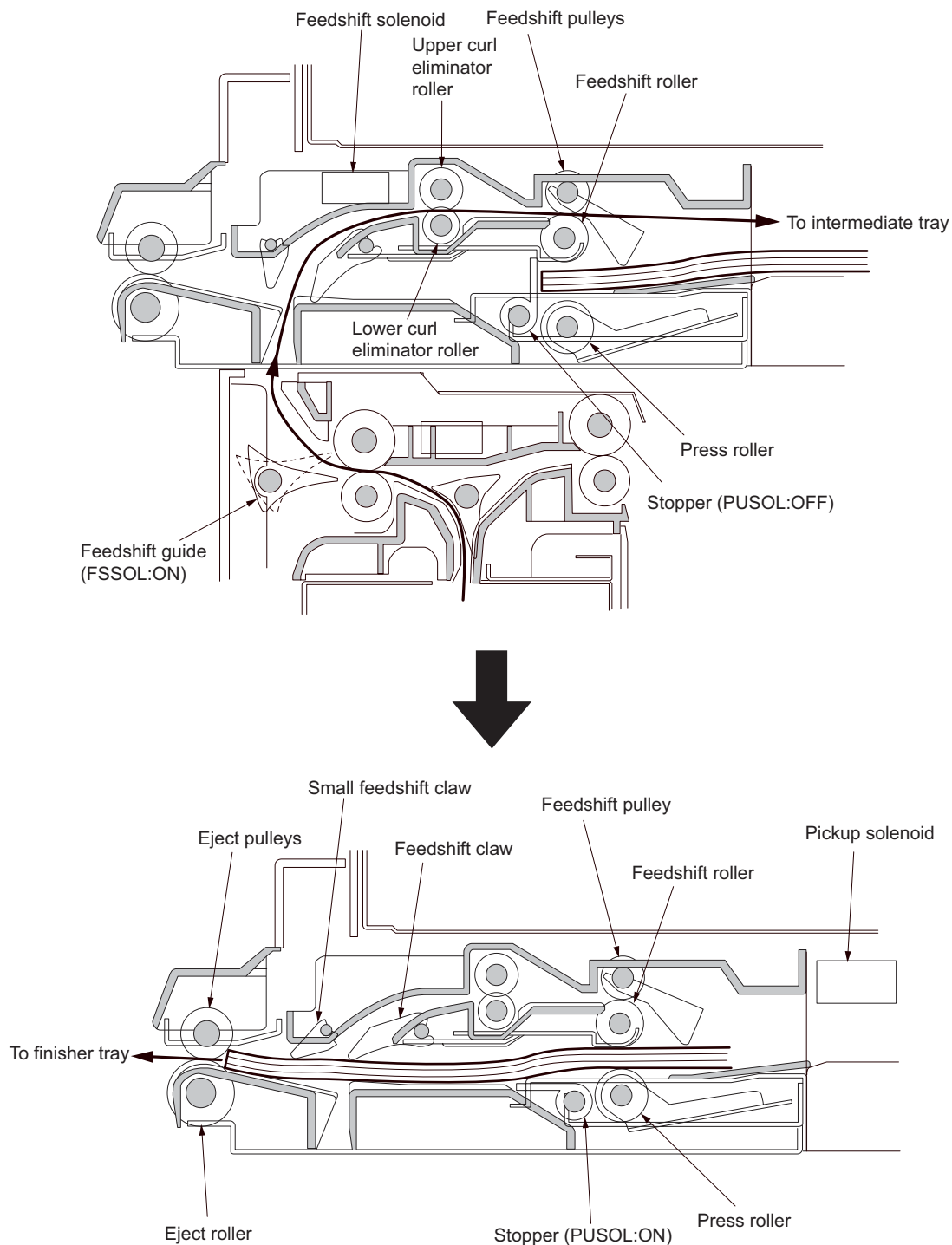


Figure 2-1-3

2-1-2 Intermediate tray section

The intermediate tray section consists of the components shown in Figure 2-1-4. It stores and evens up the paper conveyed from the paper conveying section and returns the stack of paper to the paper conveying section.

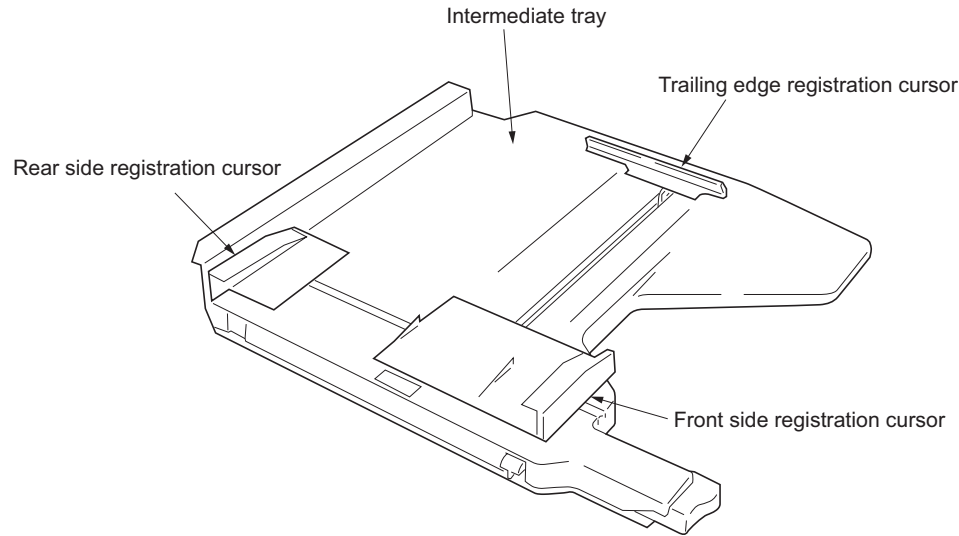


Figure 2-1-4 Intermediate tray section

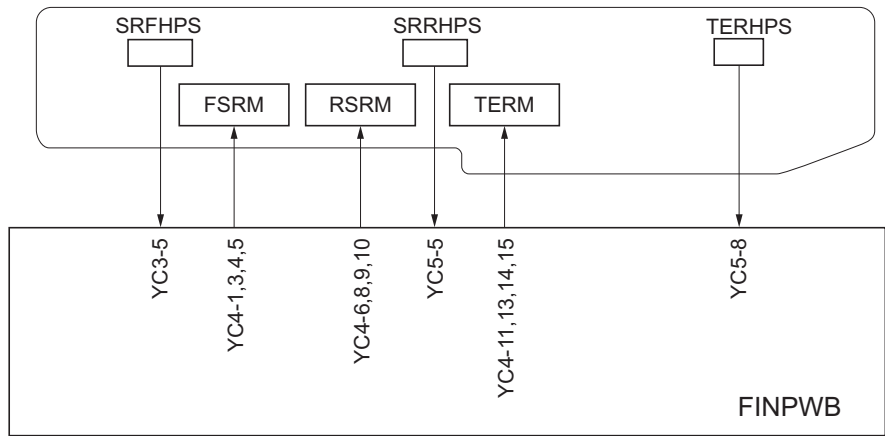


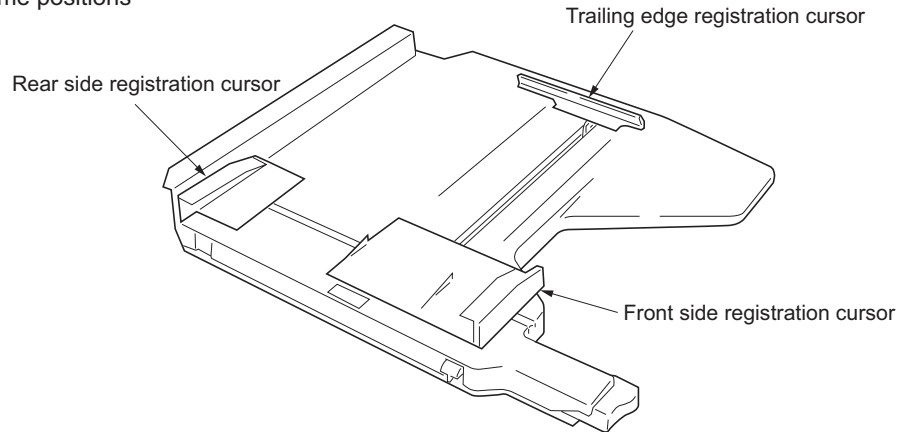
Figure 2-1-5 Intermediate tray section block diagram

### (1) Paper registration on the intermediate tray

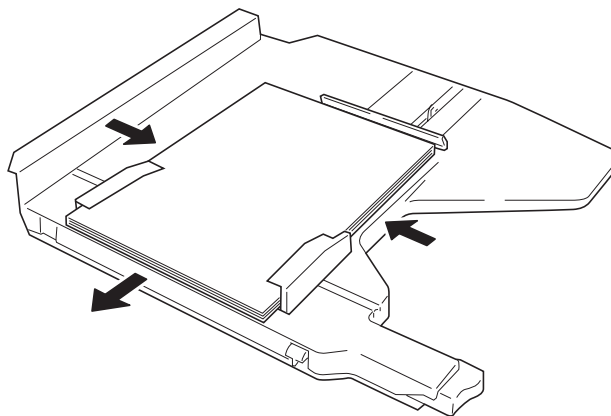
In sort mode, the front and rear side registration cursors move to the size of the paper used to even up the sides of the stack of paper and the trailing edge registration cursor shifts the paper to the paper conveying section.

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

Home positions



Paper registration



Shifting the paper to the stapling position

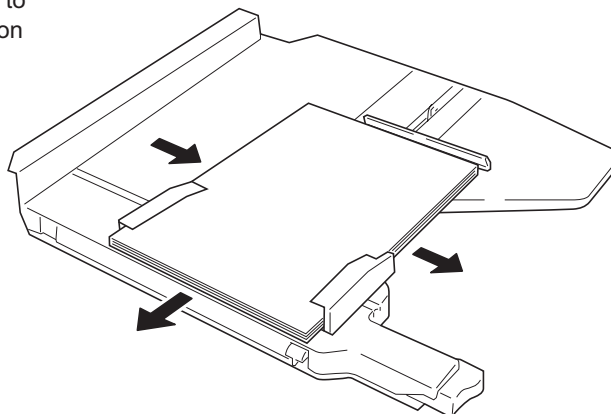
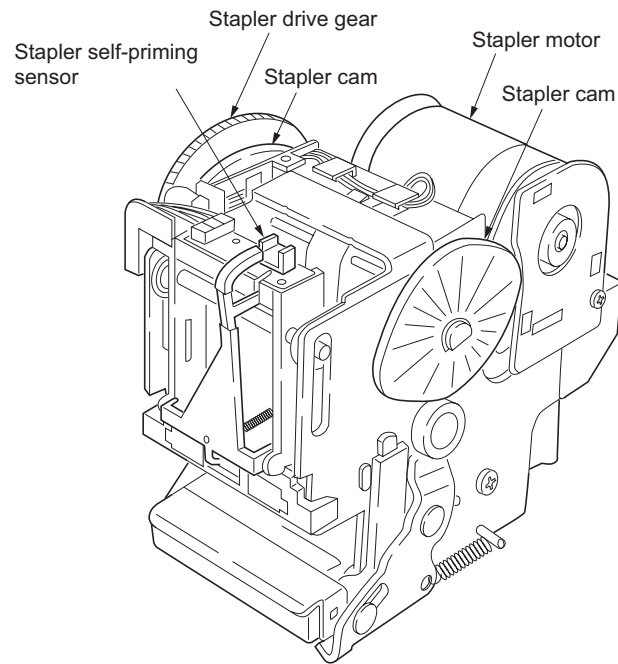


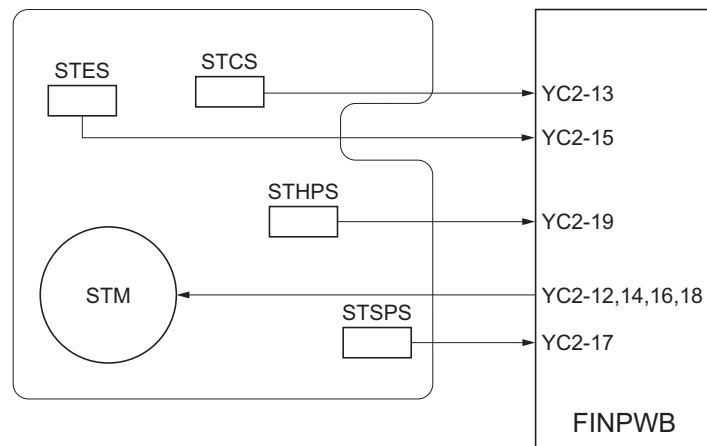
Figure 2-1-6

### 2-1-3 Stapler section

In staple-sort mode, paper stocked on the intermediate tray is stapled by the stapler. The stapler motor (STM) drives the stapler cam via the stapler drive gear to staple paper.



**Figure 2-1-7 Stapler section**



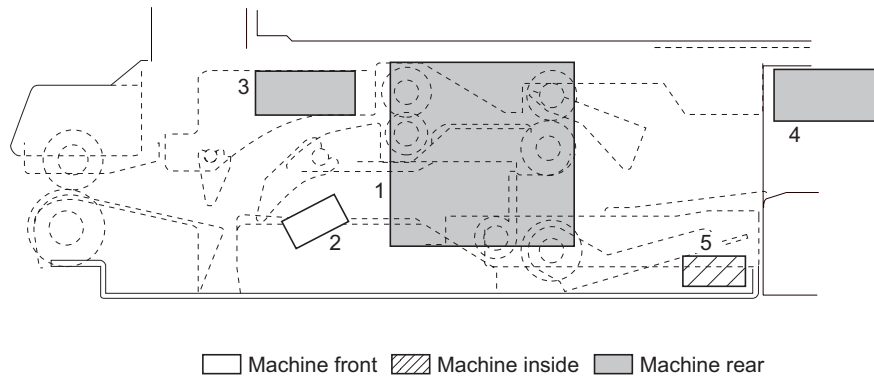
**Figure 2-1-8 Stapler section block diagram**

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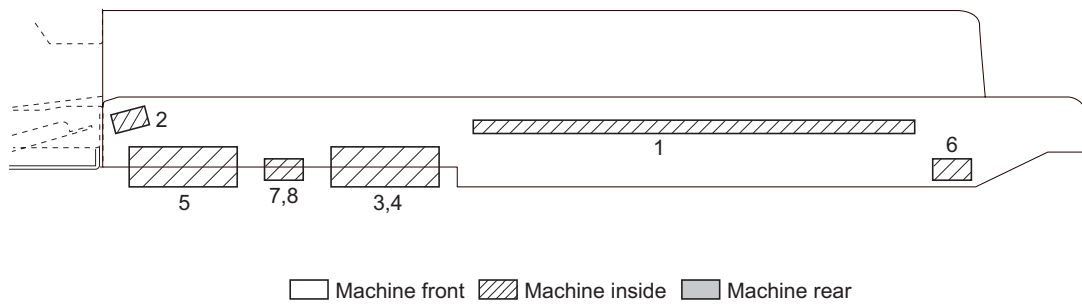
## 2-2-1 Electrical parts layout

### (1) Paper conveying section

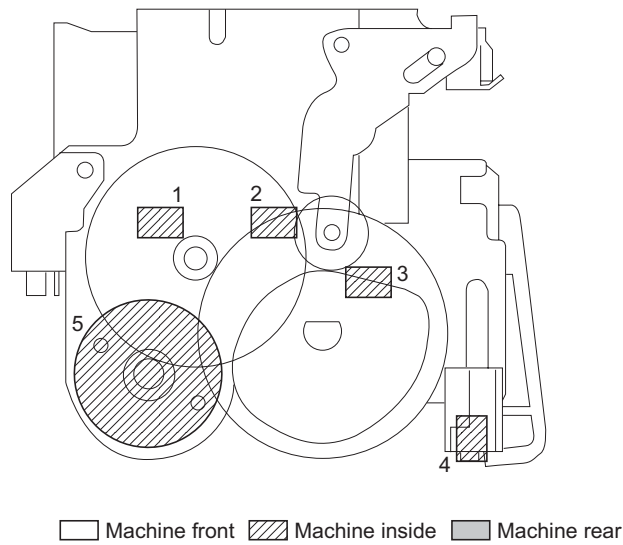


**Figure 2-2-1 Paper conveying section**

1. Paper conveying motor (PCM)..... Drives the paper conveying section.
2. Paper conveying switch (PCSW) ..... Detects a paper jam in the finisher.
3. Feedshift solenoid (FSSOL)..... Operates the feedshift guide of the machine.
4. Pickup solenoid (PUSOL) ..... Operates the press roller.
5. Tray open/close switch (TOCSW) ..... Detects if the intermediate tray is opened or closed.

**(2) Intermediate tray section****Figure 2-2-2 Intermediate tray section**

- |   |  |
|---|--|
| 1. Finisher control PWB (FINPWB).....<br>2. Intermediate tray sensor (ITS) .....<br>3. Trailing edge registration motor (TERM).....<br>4. Front side registration motor (FSRM) .....<br>5. Rear side registration motor (RSRM).....<br>6. Trailing edge registration home position<br>sensor (TERHPS) .....<br>7. Side registration front home position<br>sensor (SRFHPS) .....<br>8. Side registration rear home position<br>sensor (SRRHPS)..... | Controls electrical components.<br>Detects the presence of paper on the intermediate tray.<br>Drives the trailing edge registration cursor.<br>Drives the front side registration cursor.<br>Drives the rear side registration cursor.<br>Detects the trailing edge registration cursor in the home position.<br>Detects the front side registration cursor in the home position.<br>Detects the rear side registration cursor in the home position. |
|---|--|

**(3) Stapler section****Figure 2-2-3 Stapler section**

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

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### 2-3-1 Finisher control PWB

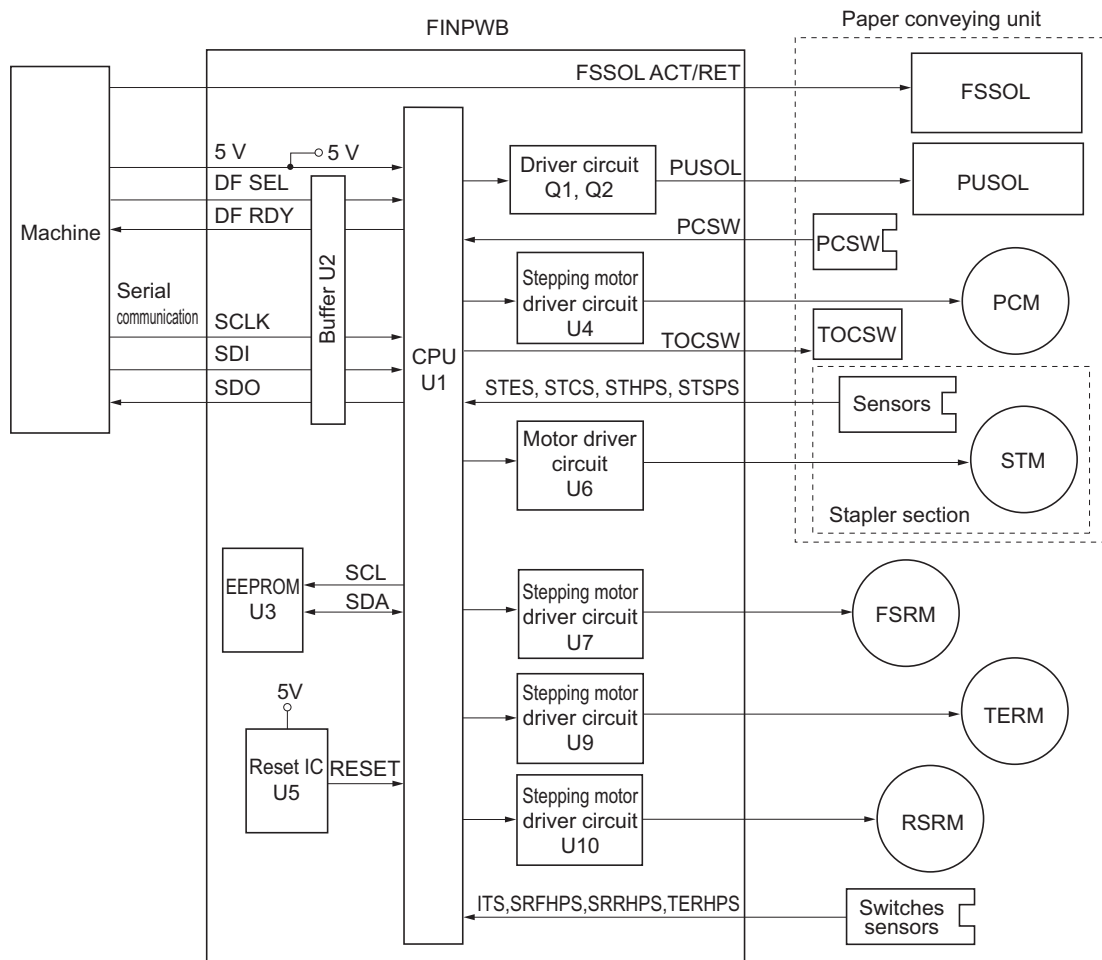


Figure 2-3-1 Finisher control PWB diagram

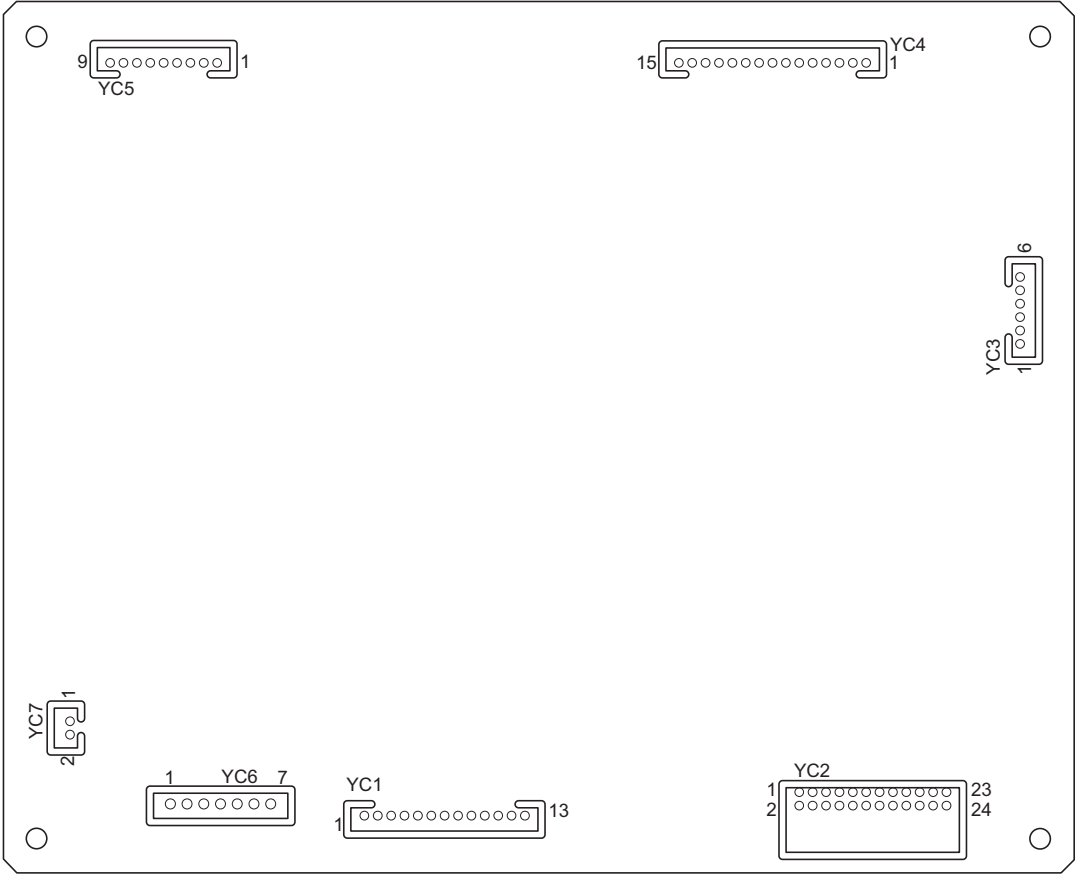


Figure 2-3-2 Finisher control PWB silk-screen diagram

Connector	Pin No.	Signal	I/O	Voltage	Description
<b>YC1</b> Connected to the machine	1	24V	I	24 V DC	24 V DC supply
	2	24V	I	24 V DC	24 V DC supply
	3	PG	-	-	Ground
	4	PG	-	-	Ground
	5	5V	I	5 V DC	5 V DC supply
	6	SG	-	-	Ground
	7	DF SEL	I	0/5 V DC	Finisher select signal
	8	DF RDY	O	0/5 V DC	Finisher ready signal
	9	SDI	I	0/5 V DC (pulse)	Serial communication data signal
	10	SDO	O	0/5 V DC (pulse)	Serial communication data signal
	11	SCLK	I	0/5 V DC (pulse)	Clock signal for serial communication
	12	JCT SOL(ACT)	I	0/24 V DC	FSSOL (active): On/Off
	13	JCT SOL(RET)	I	0/24 V DC	FSSOL (return): On/Off
<b>YC2</b> Connected to PUSOL, FSSOL, PCM, stapler section and PCSW	1	JCT SOL(RET)	O	0/24 V DC	FSSOL drive signal (return)
	2	PU SOL	O	0/24 V DC	PUSOL: On/Off
	3	JCT SOL(ACT)	O	0/24 V DC	FSSOL drive signal (active)
	4	CMOT A	O	0/24 V DC (pulse)	PCM drive pulse (A)
	5	JCT SOL 24V	O	24 V DC	24 V DC supply for FSSOL
	6	CMOT B	O	0/24 V DC (pulse)	PCM drive pulse (B)
	7	PU SOL 24V	O	24 V DC	24 V DC supply for PUSOL
	8	CMOT _A	O	0/24 V DC (pulse)	PCM drive pulse (_A)
	9	CMOT A 24V	O	24 V DC	24 V DC supply for PCM A
	10	CMOT _B	O	0/24 V DC (pulse)	PCM drive pulse (_B)
	11	CMOT B 24V	O	24 V DC	24 V DC supply for PCM B
	12	ST MOT R	O	0/24 V DC	STM reverse rotation drive signal
	13	ST CART	I	0/5 V DC	STCS detection signal
	14	ST MOT R	O	0/24 V DC	STM reverse rotation drive signal
	15	ST LOW	I	0/5 V DC	STES detection signal
	16	ST MOT F	O	0/24 V DC	STM forward rotation drive signal
	17	ST SP	O	0/5 V DC	STSPS detection signal
	18	ST MOT F	O	0/24 V DC	STM forward rotation drive signal
	19	ST HP	I	0/5 V DC	STHS detection signal
	20	ST GND	-	-	Ground
	21	FEED	I	0/5 V DC	PCSW detection signal
	22	FEED GND	-	-	Ground
	23	FEED 5V	O	5 V DC	5 V DC supply for PCSW
	24	ST 5V	O	5 V DC	5 V DC supply for ST

Connector	Pin No.	Signal	I/O	Voltage	Description
<b>YC3</b> Connected to ITS and SRFHPS	1	5V	O	5 V DC	5 V DC supply for ITS
	2	TRAY	I	0/5 V DC	ITS detection signal
	3	SG	-	-	Ground
	4	5V	O	5 V DC	5 V DC supply for SRFHPS
	5	FJ HP	I	0/5 V DC	SRFHPS detection signal
	6	SG	-	-	Ground
<b>YC4</b> Connected to FSRM, RSRM and TERM	1	FJ A	O	0/24 V DC (pulse)	FSRM drive pulse (A)
	2	COM	O	24 V DC	24 V DC supply for FSRM
	3	FJ _B	O	0/24 V DC (pulse)	FSRM drive pulse (_B)
	4	FJ B	O	0/24 V DC (pulse)	FSRM drive pulse (B)
	5	FJ _A	O	0/24 V DC (pulse)	FSRM drive pulse (_A)
	6	RJ A	O	0/24 V DC (pulse)	RSRM drive pulse (A)
	7	COM	O	24 V DC	24 V DC supply for RSRM
	8	RJ _B	O	0/24 V DC (pulse)	RSRM drive pulse (_B)
	9	RJ B	O	0/24 V DC (pulse)	RSRM drive pulse (B)
	10	RJ _A	O	0/24 V DC (pulse)	RSRM drive pulse (_A)
	11	RE A	O	0/24 V DC (pulse)	TERM drive pulse (A)
	12	COM	O	24 V DC	24 V DC supply for TERM
	13	RE _B	O	0/24 V DC (pulse)	24 V DC supply for TERM
	14	RE B	O	0/24 V DC (pulse)	TERM drive pulse (B)
	15	RE _A	O	0/24 V DC (pulse)	TERM drive pulse (_A)
<b>YC5</b> Connected to TOCSW, SRRHPS and TERHPS	1	5V	-	-	Not used
	2	TOPN	I	0/5 V DC	TOCSW detection signal
	3	SG	-	-	Ground
	4	5V	O	5 V DC	5 V DC supply for SRRHPS
	5	RJ HP	I	0/5 V DC	SRRHPS detection signal
	6	SG	-	-	Ground
	7	5V	O	5 V DC	5 V DC supply for TERHPS
	8	RE HP	I	0/5 V DC	TERHPS detection signal
	9	SG	-	-	Ground



**Maintenance parts list**

Maintenance part name		Part No.	Alternative part No.	Fig. No.	Ref. No.
Name used in service manual	Name used in parts list				
Intermediate tray	TRAY MIDDLE	303J336060	3J336060	3	1
Upper curl eliminator roller	UPPER ROLLER,DECURLER	303B508131	3B508131	2	52
Lower curl eliminator roller	ROLLER SUS,DECURLER	3B508430		2	49
Eject roller	ROLLER,EJECT	303B508181	3B508181	2	21
Eject pulleys	PULLEY,LOOP FEED	63210170		1	46
Feedshift roller	ROLLER,FEED SHIFT	3BN08090		2	33
Feedshift pulleys	PULLEY,BRANCH	3BN08100		1	34
Press roller	ROLLER,PRESSURE	303BN08571	3BN08571	2	12
Switches and sensors	SENSORS	-	-	-	-

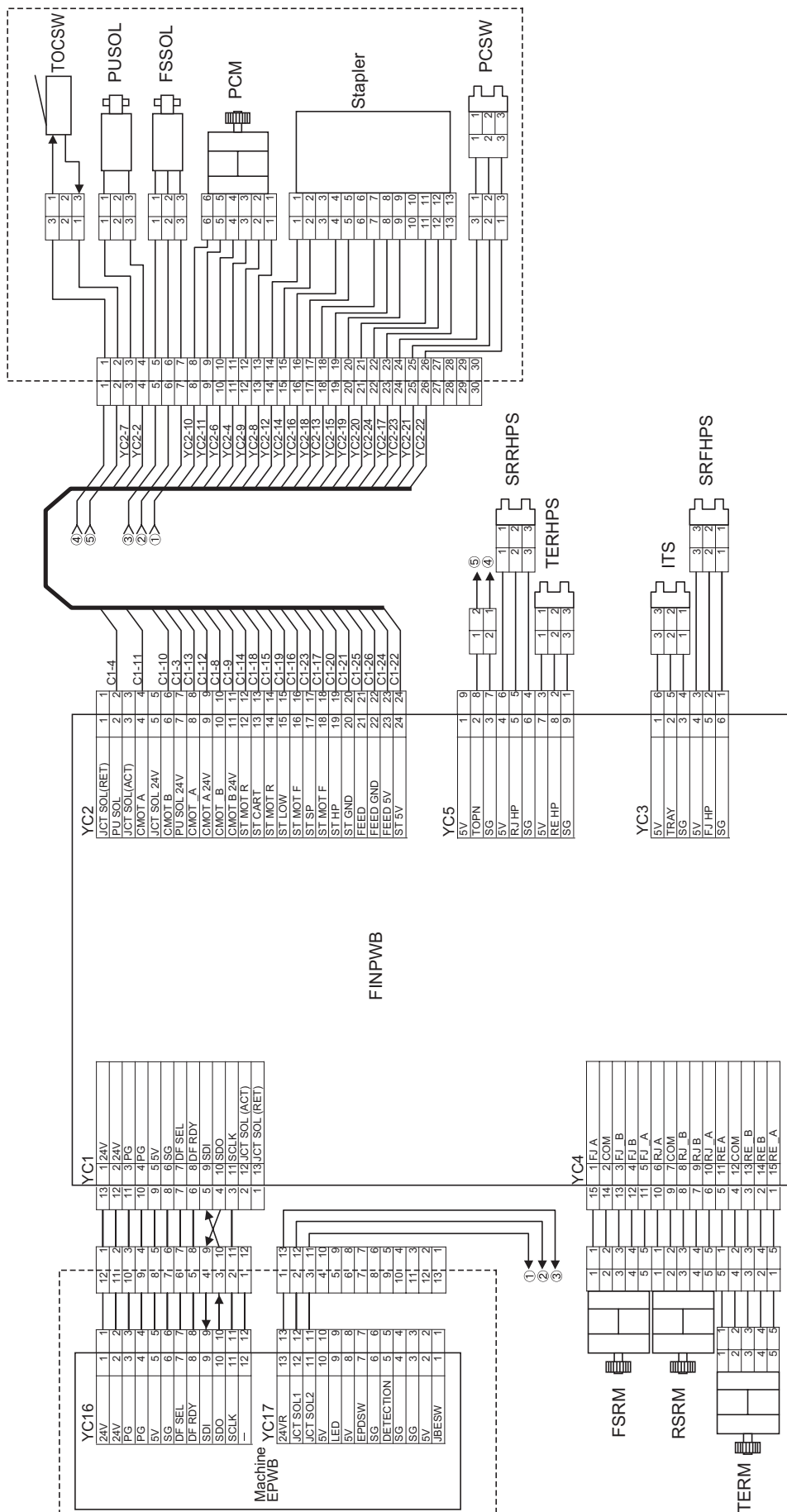
**Periodic maintenance procedures**

Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Paper conveying and intermediate tray section	Intermediate tray	Clean and grease Check and grease	Every service User call	Clean the rail section and apply molycote grease EM-50L 50G (P/N: M014000080).	
	Upper curl eliminator roller	Clean Check and clean	Every service User call	Clean with alcohol.	
	Lower curl eliminator roller	Clean Check and clean	Every service User call	Clean with alcohol.	
	Eject roller	Clean Check and clean	Every service User call	Clean with alcohol.	
	Eject pulleys	Clean Check and clean	Every service User call	Clean with alcohol.	
	Feedshift roller	Clean Check and clean	Every service User call	Clean with alcohol.	
	Feedshift pulleys	Clean Check and clean	Every service User call	Clean with alcohol.	
	Press roller	Clean Check and clean	Every service User call	Clean with alcohol.	
	Switches and sensors	Clean Check and clean	Every service User call	Airbrush.	



Section	Maintenance part/location	Method	Maintenance cycle	Points and cautions	Page
Stapler section	Magnet	Clean	Every service	Remove the staples attracted to the magnet inside the stapler cover.	P.1-5-3

## Wiring diagram



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