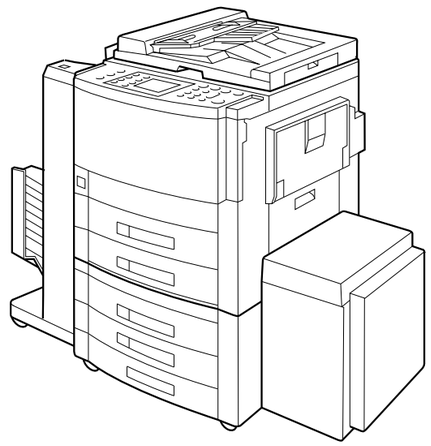
ORDER NO. OED9909380B8

FP-7818/7824/7830/7835/7845/7850 Service Manual

Service Manual
Parts Manual

Plain Paper Copier
FP-7818/7824/7830
FP-7835/7845/7850
Staple Sorter
FA-S620/660
System Console
FA-DS72/82



Panasonic

Panasonic

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result serious injury or death.

For U.S.A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment on a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

Any unauthorized changes or modifications to this equipment would void the users authority to operate this device.

For U.S.A

This manual dose not contain descriptions of PCB Connector and Signal Information and Sub Assemblies Operation which are discribed and unchanged in the FP-7718/7722/7728/7735/7742/7750 service manual. For those items not covered in this manual, please refer to the FP-7718/7722/7728/7735/7742/7750 service manual or PCB repaire manual.

Contents / Index

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 manufacture's instructions.

For Sweden, and Denmark

SPECIALSÄKRING: ENDAST AV APPARATFABRINKANTEN LEVERERAD SÄKRING FåR ANVÄNDAS.

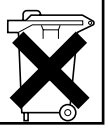
VARNING!
Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

ADVARSEL!
Lithiumbatteri—Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Lever det brugte batteri tilbage til leverrandoren.

CAUTION!
Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

For Holland

NL Batterij niet weggooien, maar inleveren als KCA.



For U.K.

FOR YOUR SAFETY PLEASE READ THE FOLLOWING TEXT CAREFULLY.
This appliance is supplied with a moulded three pin mains plug for your safety and convenience. A 13 amp fuse is fitted in this plug.
Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 13 amps and that it is approved by ASTA or BSI to BS1362.
Check for the ASTA mark or the BSI mark on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.
If you lose the fuse cover the plug must not be used until a replacement cover is obtained.
A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR OFFICE THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.
THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.
If a new plug is to be fitted please observe the wiring code as shown below.
If in any doubt please consult a qualified electrician.

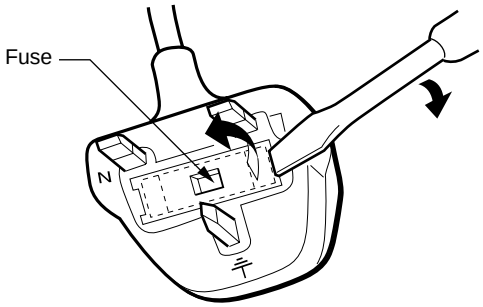
WARNING: THIS APPLIANCE MUST BE EARTHED.

IMPORTANT: The wires in this mains lead are coloured in accordance with the following code:

Green and Yellow	:Earth
Blue	:Neutral
Brown	:Live

As the colours of the wires in the main lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:
The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked by letter E or by the safety EARTH symbol "⏚" or coloured GREEN or GREEN-AND-YELLOW.
The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.
The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

How to replace the fuse.
Open the fuse compartment with a screwdriver and replace the fuse.



Section I

Introduction

1. 1 Specifications

1.Type		Desk Top									
2.Copy process		Electrostatic photographic method									
3.Development process		Two component magnetic brush									
4.Maximum original size		Ledger(11"x17") / A3(297 x 420mm)									
5.Copy speed (cpm)		FP-7818	FP-7824 <PU>	FP-7824 <PG>	FP-7830 <PU>	FP-7830 <PG>	FP-7835 <PU>	FP-7835 <PG>	FP-7845	FP-7850 <PU>	FP-7850 <PG>
	Ledger/A3 :	12.5	15.5/16.0		18.50/19.00		20/20.5				
	Legal/B4,FLS :	14	17.5/17.0		21.00/20.50		23.5/23				
	Letter-R/A4R :	15.5	19.5/19.0		24.00/23.50		28.5/27.5			43/41.5	
	Letter/A4 :	18	24.0		30.00		35		45	50	
	Invoice/A5 :	18	24.0		30.00		35		45	50	
6.First copy time		FP-7818	FP-7824		FP-7830		FP-7835		FP-7845	FP-7850	
(sec)	letter/A4 size without Auto mode	4.8	4.0		4.0		4.0		2.9	2.9	
	letter/A4 size with Auto mode	6.2	5.1		5.1		5.1		3.6	3.6	
7.Copy ratio		Enlargement(fixed) : 2.00, 1.73, 1.41, 1.22, 1.15									
		Reduction (fixed) : 0.87, 0.82, 0.71, 0.58, 0.50									
		Zoom : 50%-200% (1%step)									
8.Copy size		Ledger/A3–Invoice/A5									
9.Paper capacity		Cassette : 550 sheets x 2 (550 sheets:FP-7818)									
		Multi-feed bypass : 50 sheets									
10.Paper feed		Front loading universal paper cassette									
		Multi-feed bypass tray									
11.Paper exit tray capacity		250 sheets									
12.Paper weight		Cassette : 16–24 lbs (60–90g/m^2)									
		Bypass : 15–30 lbs (55–130g/m^2)									
13.Special paper		OHP,Label paper, Tracing paper									
		(Through multi-feed bypass)									
14.Continuous copying		1-999 reset to 1 (1-99 reset to 1 : FP-7818)									

15.Fusing system	Heat and Pressure	
16.Photoreceptor	Organic Photo Conductor(OPC)	
17.Exposure control	7 step digital+Photo/Auto button	
18.Warm up time	FP-7818	approx. 40 sec.
	FP-7824	approx. 50 sec.
	FP-7830	approx. 75 sec.
	FP-7835	approx. 75 sec.
	FP-7845	approx. 180 sec.
	FP-7850	approx. 270 sec.
19.Power consumption	Less than 1.45 kW/1.5 kW	
20.Power source	AC120V 60Hz / AC220 - 240V 50Hz	
21.Dimensions (W x D x H)	23.9" x 26.0" x 22.9" / 606 x 661 x 582 mm	
	(23.9" x 26.0" x 18.1" / 606 x 661 x 479 mm : FP-7818)	
22.Weight	(PU)	(PG)
	FP-7818	138.6 lbs / 64 kg
	FP-7824	149.6 lbs / 70 kg
	FP-7830	149.6 lbs / 70 kg
	FP-7835	149.6 lbs / 70 kg
	FP-7845	161 lbs / 73.5 kg
	FP-7850	161.5 lbs / 73.7 kg
23.Ambient conditions	Temperature : 50–86F/10–30 °C	
	Relative humidity : 30–80%	
24.Optional accessories	i-ADF	FA-A888
	ADF	FA-A505
	Sorter	FA-S280
		(10bin sorter: FP-7818/7824/7830)
		FA-S575/S660/S680
		(20bin sorter: except FP-7818)
	System console	FA-DS72: FP-7818/7824/7830/7835
		FA-DS82: FP-7845/7850
	LCC	FA-MA301

* Specifications are subject to change without notice.

1. 2 Features

- Introducing Qualitative Reasoning Based Adaptive Controller copy density control

  With Qualitative Reasoning Based Adaptive Controller used for copy density control, optimum copies are maintained for a long time in variable environmental conditions.

- User friendly operation

  The touch panel enables simple operation. (FP-7845/7850)

- Enhancements in serviceability

  If a problem should occur the self diagnosis system will indicate which area is responsible.

- Standard Automatic Duplexing (FP-7850)

  An Automatic Duplex Unit is provided as standard, in addition to front paper loading (550 sheets) + Multiple sheet bypass (50 sheets).

- Functional expansion through optional accessories

  Equipping with the system stand and LCC allows a high copy volume

  Maximum feed paper capacity

  FP-7818 2,250 sheets : four drawers + multiple sheert bypass

  FP-7824 2,800 sheets : five drawers + multipler sheet bypass

  FP-7830/7835/7845

  5,800 sheets : five drawers + LCC + multiple sheet bypass

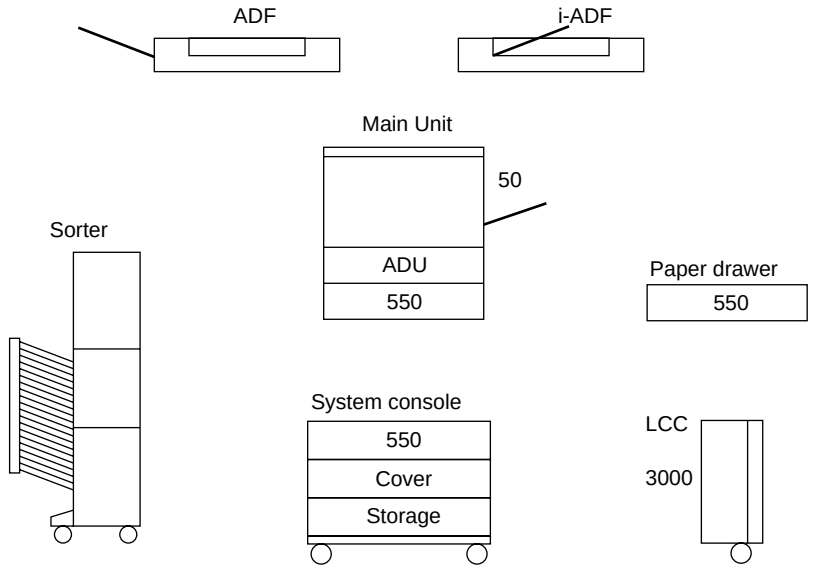
  FP-7850 5,250 sheets : four drawers + LCC + multiple sheet bypass

  ADF and sorter can be connected with the main system easily by using exterior connectors.

- Environmental considerations

  Quieter operation, lower power consumption, a higher content of recyleable plastic and our new Qualitative Reasoning Based Adaptive Controller. (FP-7830/7835/7845/7850)

1. 3 System Configuration



<Commonality of accessories>

	Accessories	FP-7818	FP-7824	FP-7830	FP-7835	FP-7845	FP-7850
System console	FA-DS72	○	○	○	○	×	×
	FA-DS82	×	×	×	×	○	○
	LCC (FA-MA301)	×	×	○	○	○	○
Copier paper feed	Number of drawer	1	2	2	2	1 + ADU	1 + ADU
	Auto Duplex unit (FA-MADM6)	×	Option	Option	Option	Standard	Standard
ADF	ADF FA-A505	○	○	○	○	○	○
	i-ADF FA-A888	×	×	○	○	○	○
Sorter	10bin sorter FA-S280	○	○	○	×	×	×
	20bin sorter FA-S575	×	○	○	○	○	○
	20bin staple sorter FA-S660/S680	×	○	○	○	○	○

Key: ○ = OK × = N/A

System Console FA-DS72: Storage tray,Cover x 1
(2 drawers drive mechanism)
FA-DS82: 550 sheets paper drawer, Storage tray, Cover
(3 drawers drive mechanism)

[Comparison of specifications]

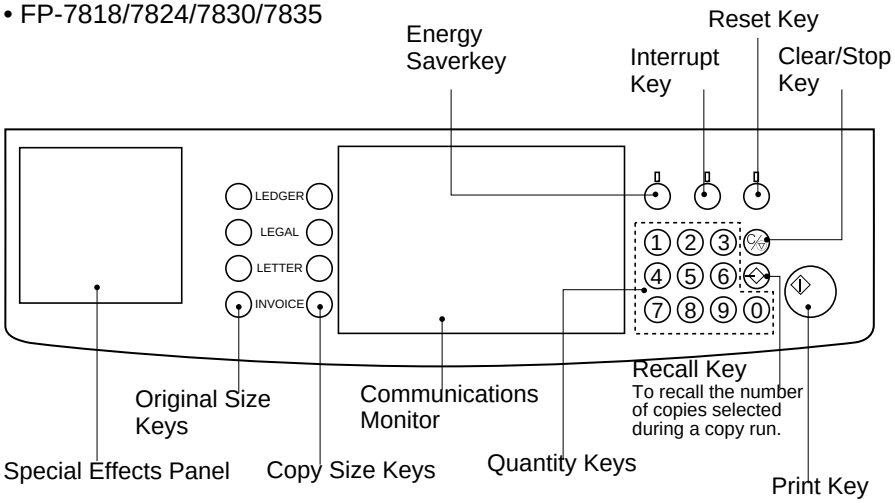
	FP-7818	FP-7824	FP-7830	FP-7835	FP-7845	FP-7850
Warm up time (sec.)	40	50	70	70	180	210
First copy time (sec.)	4.8	4.0	4.0	4.0	2.9	2.9
Paper feed cassette	1	2	2	2	1+ADU	1+ADU
System stand	DS72	DS72	DS72	DS72	DS82	DS82
Copy speed	18	22	28	35	42	50
Control panel design	LED	LED	LCD display	LCD display	LCD touch panel	LCD touch panel
Transfer corona cleaner	No	No	No	No	Yes	Yes
Drum separation finger	No	No	No	No	Yes	Yes
Fuser lamp	1	1	1	1	2	2
Process speed (mm/sec.)	170	210	210	210	340	340
Developer suction	No	No	No	No	Yes	Yes
Fresh toner recycling	No	No	Yes	Yes	Yes	Yes
Toner bottle life	10K	10K	20K	20K	20K	20K
Waste toner bottle capacity	10K	10K	120K	120K	120K	120K
PM cycle	80K	80K	120K	120K	120K	120K
Department counter	50	50	100	100	300	300
Cover, Interleaving, Presentation	No *	No *	No *	No *	Yes	Yes
Job memory	2	2	2	2	5	5

* Except OHP Interleaving

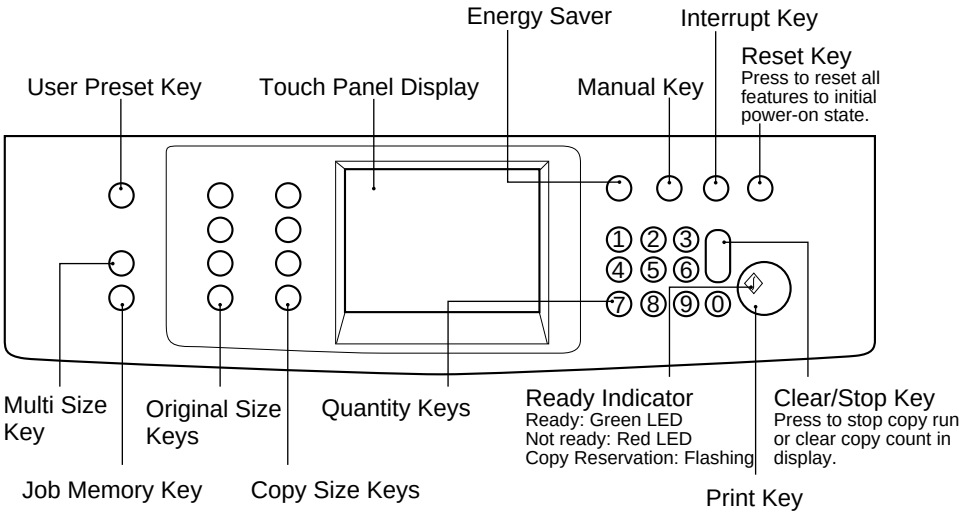
This Service Manual is based on the FP-7850.
To identify areas where the other models differ, please refer to this chart and the Field Service Manual for each model.

1. 4 Operation

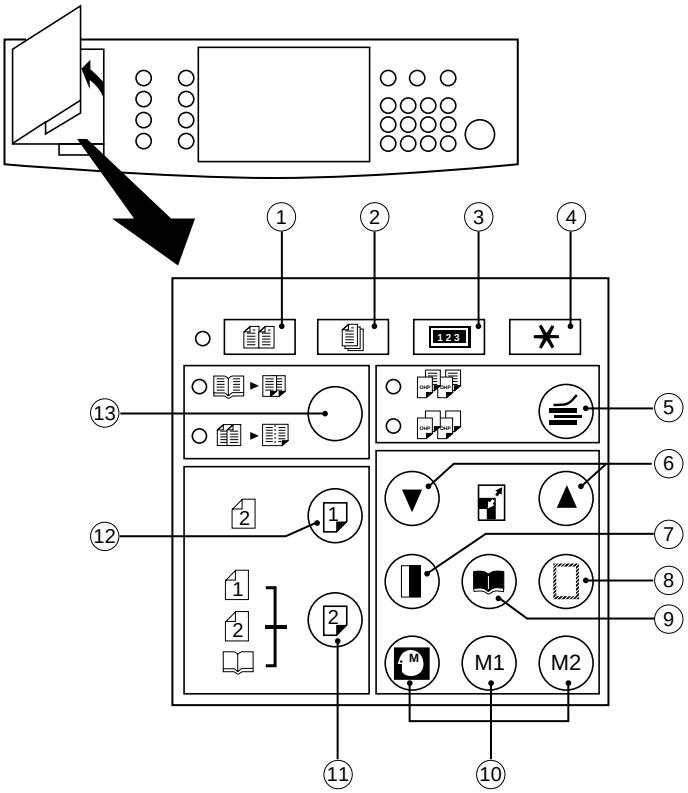
• FP-7818/7824/7830/7835



• FP-7845/7850



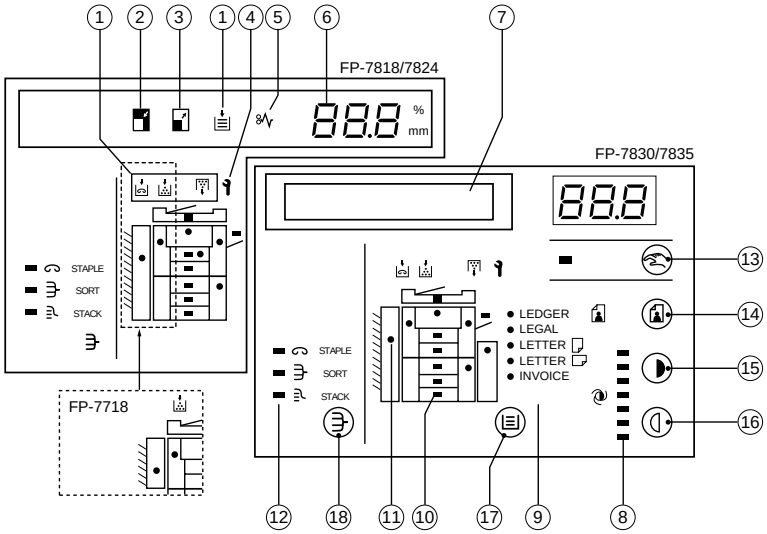
(1) Special Effects Panel (FP-7818/7824/7830/7835)



No.	Keys
①	Multi-Size Feeding (Except FP-7818/7824) • Using i-ADF
②	Original Count (Except FP-7818/7824) • Using i-ADF and ADU 2 in 1 mode
③	Access
④	User Preset
⑤	OHP interleaving mode
⑥	Zoom
⑦	Margin Shift Mode

No.	Keys
⑧	Edge Mode
⑨	Book Mode
⑩	Memory In/Job programs
⑪	Duplexing mode selection (Except FP-7818/7824) • Using ADU
⑫	2:1 Copy (Except FP-7818/7824) • Using i-ADF
⑬	2-Page copy/2 in 1 mode selection (2 in 1 : Except FP-7818/7824)

(2) Communications Monitor (FP-7818/7824/7830/7835)



No.	Indicator
①	Adding Paper Toner Staple (Except FP-7818) Replacing Waste Toner Bottle
②	Reduction
③	Enlargement
④	Service Call • Flashes for routine maintenance. • Lights steadily for duplex maintenance
⑤	Paper Misfeed
⑥	Copy Count Display Indicates number of copies, zoom ratio and error code.

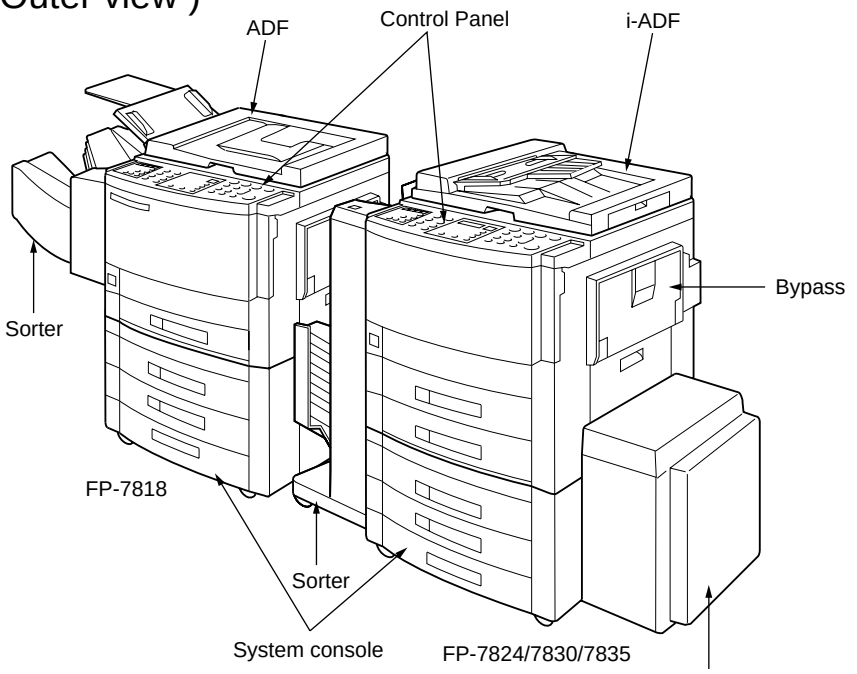
No.	Indicator
⑦	Message Display (FP-7830/7835) Indicates procedures, functions maintenance, etc.,
⑧	Exposure Indicator
⑨	Paper Size Indicator
⑩	Paper Drawer/Tray Indicator (–)
⑪	Paper misfeed location (•)
⑫	Mode Select Indicator Staple Sort (Except FP-7818) Sort Group

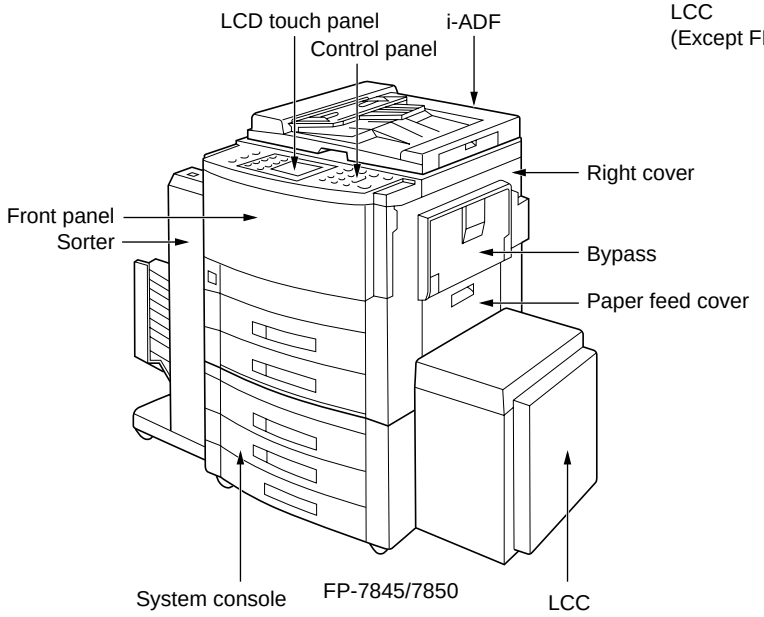
No.	Keys
⑬	Manual Key
⑭	PHOTO/AUTO
⑮	Exposure Control (DARK)

No.	Keys
⑯	Exposure Control (LIGHT)
⑰	Paper Drawer/Tray
⑱	Mode Select Key

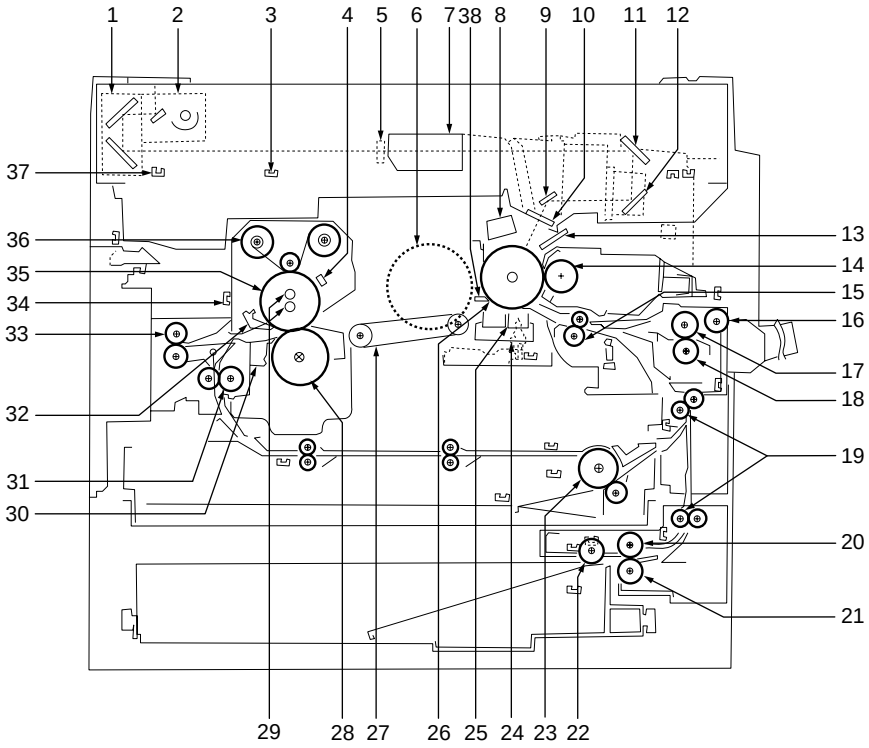
1. 5 Component Location

(Outer view)



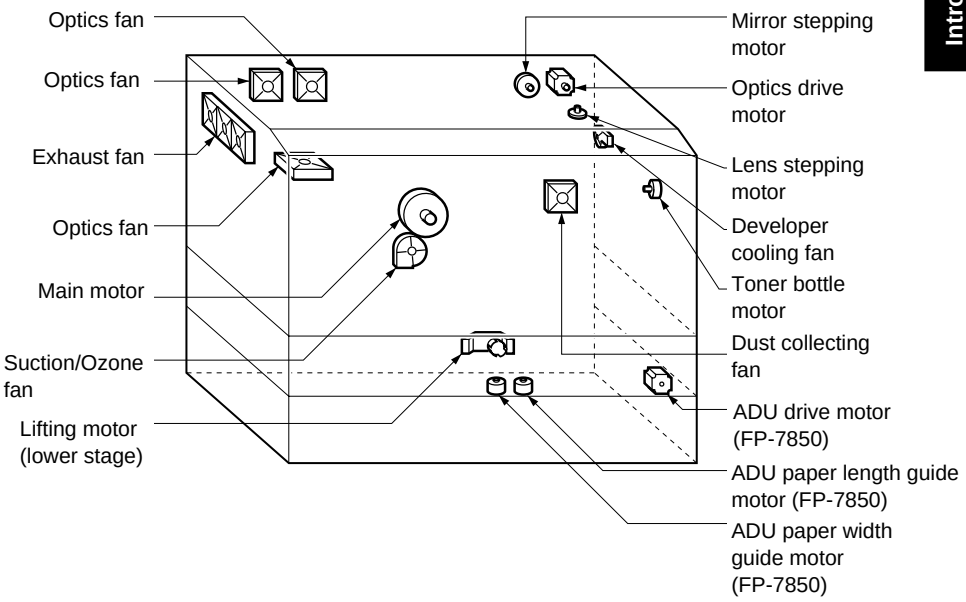


(1) Inner view

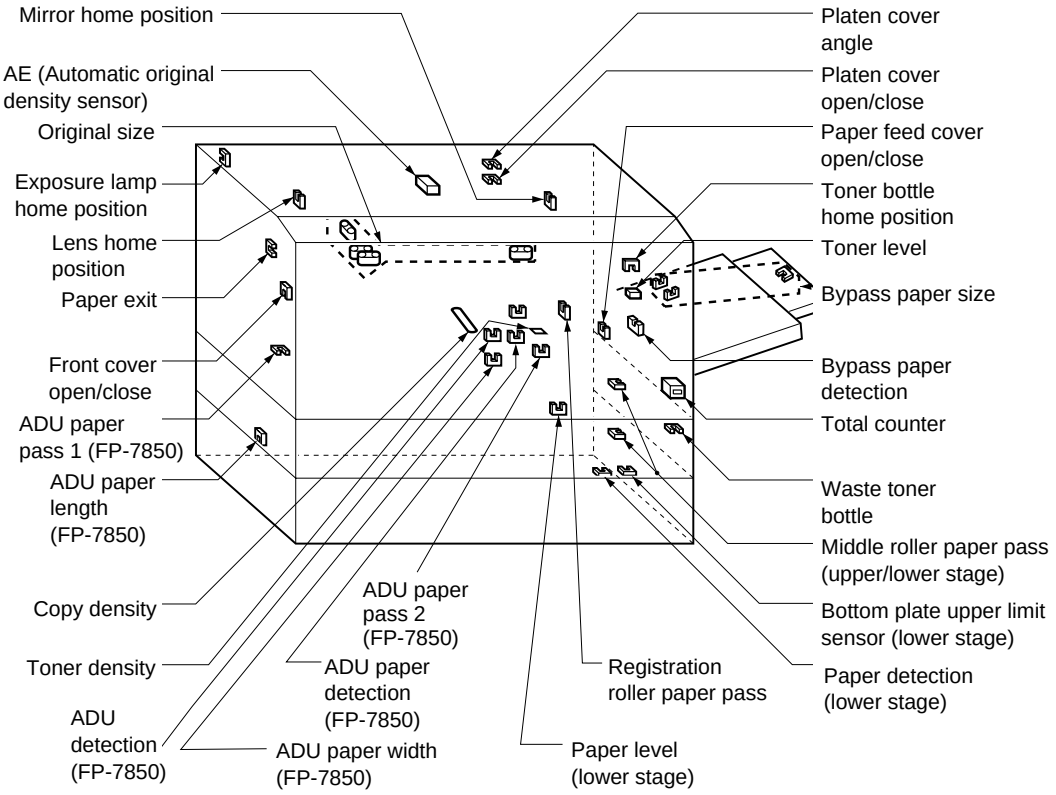


1	Half-speed unit	20	Paper feed roller
2	Full-speed unit	21	DFP roller
3	Lens Position sensor	22	Pick-up roller
4	Thermistor	23	ADU Paper feed roller
5	AE Sensor	24	Corona cleaner
6	Main motor	25	Transfer/Separation corona
7	Lens unit	26	Drum
8	Charge corona	27	Transfer belt
9	No.6 mirror	28	Pressure roller
10	Slit glass	29	Fuser lamps
11	No.4 mirror	30	Fuser separation finger (lower)
12	No.5 mirror	31	Reverse roller
13	LED array	32	Fuser separation finger (upper)
14	Magnetic roller	33	Paper exit roller
15	Registration roller	34	Paper exit sensor
16	Bypass pick-up roller	35	Heat roller
17	Bypass paper feed roller	36	Cleaning Web roller
18	Bypass DFP roller	37	Full-speed unit home postion sensor
19	Middle roller	38	Drum separation finger

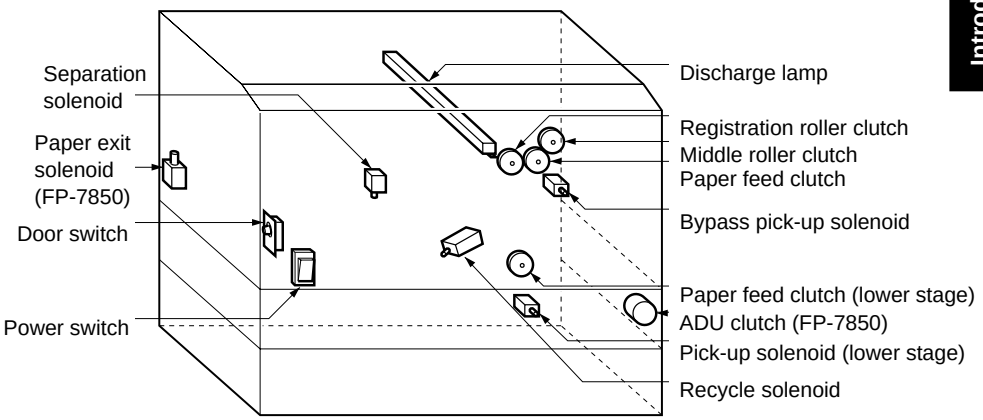
(2) Fan/Motor Location



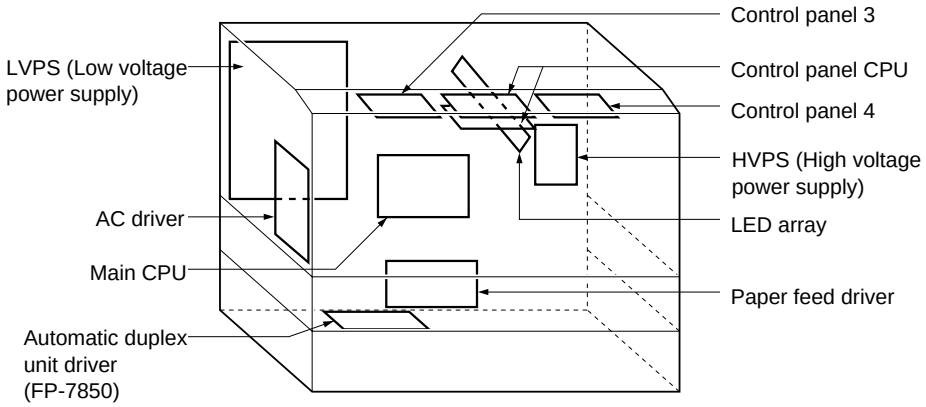
(3)Sensor Location



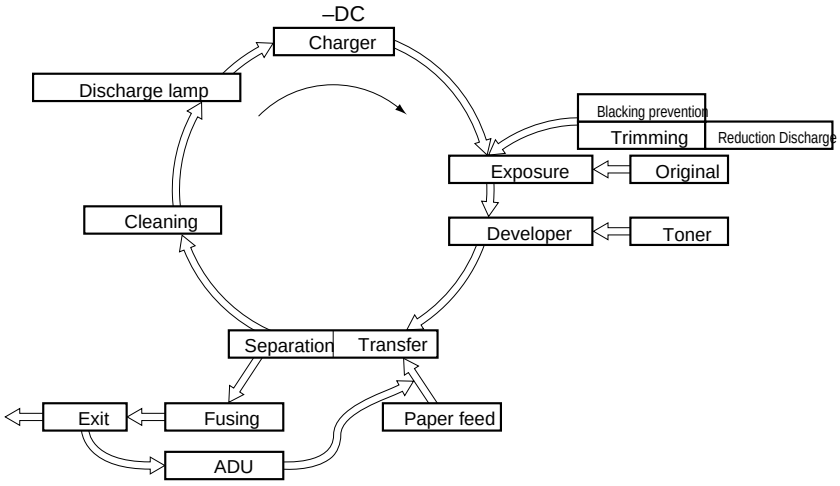
(4) Solenoid/Clutch/Discharge lamp Location

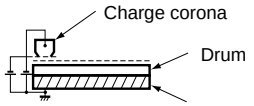
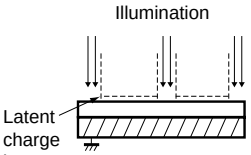
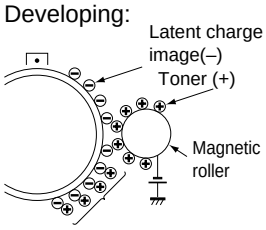
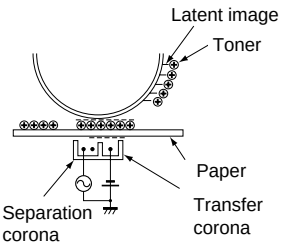
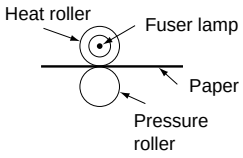
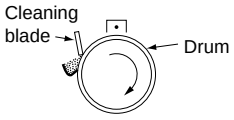
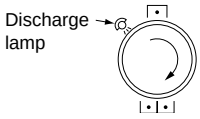


(5) PCB Location



1. 6 Copy Process



Primary Charge:  Drum surface approximately-800V DC	Image Exposure:  	Developing: 
Transfer/Separation  	Fusing:  	Cleaning: 
Discharge lamp:  		

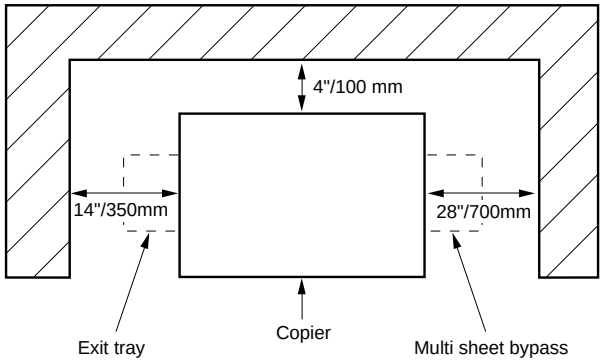
1. 7 Precautions on Set Up

Copy machine performance and the copy quality is subject to and dependant on environmental conditions. To maintain good performance, quality, and safe operation, observe the following precautions:

1) For safe operation and to avoid trouble do not install the system under the following conditions:

- High temperature, high humidity, low temperature or low humidity
- The temperature or humidity varies suddenly
- Being exposed to direct sunlight
- Dusty space
- Badly ventilated location
- Exposed to chemical gases (such as ammonia gas)
- Exposed to strong vibration
- Directly exposed to direct wind (ex. outlet of air conditioner)

2) The weight of machine is 220lb(100 kg) or more with options. It must be placed on a firm platform which is level.
3) The maximum power consumption is 1.45 kW. Use an independent power supply of 120 V and 15 A (220-240V and 7A)or higher. (Do not use a extension cord.)
4) Make sure the machine is properly grounded. (Do not ground to gas or water pipe.)
   - A ground terminal is provided on the back of the copier main body.
5) Install the machine with enough space around it.



1. 8 Precautions with Consumables

(1) Photoreceptor drum

- Do not touch the surface (with the hand or anything else).
- Stand the drum with the drum gear up for storage.
- Be careful not to smear with saliva, water, oil and so on.
- Do not place a where the temperature is high.
- Do not place it in strong light (such as direct sunshine or at window).
- Do not expose it to chemical gas or vapor.
- Do not store the developer unit with the photo receptor drum installed without covering it with clean paper.

(2) Toner Developer

1) Do not mix different types of toner and developer.
   - The machines are designed to use exclusive toner and developer for specific models. Do not mix with toner and developer for other models.
2) Do not mix foreign materials.
   Be careful not to include foreign materials in the toner and developer. If you spilled toner or developer on a table or floor when adding toner or developer in the developer unit, discard what was dropped. Such supplies may damage the drum as well as cause other trouble with the image.
3) Do not place into other containers.
   Toner and developer must not be placed into other containers, because some containers may change the characteristics of the supply. Vinyl chloride potentially changes the characteristics of supplies because of migrating plasticizers.
4) Precautions on storage and transport
   - Toner and developer additives are sensitive to temperature (high temperature in particular) and humidity (high humidity in particular). Pay attention to the following items for storage and transport.
   - Store them in a dark and cool location (lower than 95 F/35 C) and out of direct sunshine.
   - Be careful not to expose them to rain or direct sunshine during transportation. When delivered by truck the temperature inside must be not higher than 104 F/40 C. (Under the sun in summer, the inside temperature can typically be 140 F/60 deg.C or higher in a closed vehicle compartment.)

- There are normally no special problems with storage and transport in a cold climate but, store in a low humidity condition. Do not put supplies near heaters.

5) Safety and hygiene

Toner has the property of easily being wind blown. Toner on skin does not cause any damage to health but, inhaling it is undesirable even if a powder is simply dust. Therefore, be careful not to inhale toner .

- Handle the toner gently when changing cartridges, and developer when pouring in the developer unit. If you have breathed in a lot of toner by mistake, rinse out your mouth with water completely. Any toner on the skin should be washed off with soapy water.
- Toner stuck on clothing must be removed in a dry condition (by a vacuum cleaner, brush, or beating,) and then washed with soapy water. Wiping off with benzine, alcohol, or thinner is not recommended because it may partially melt the components of toner even more, resulting in a harder stain and spot.
- Toner spilled must be cleaned with a vacuum cleaner, and then wiped with a cloth dampened with a neutral detergent and wrung out.
- If exposed to flames toner and developer will burn. Keep these supplies away from open flames.
- Any wasted consumables (photo receptor, developer and toner) should be recycled.
- Wear rubber gloves, eye protection and so on before handling any solvents such as IPA.

Section II

Control Functions

2. 1 Image Control
Qualitative Reasoning Based Adaptive Controller

- Even if the toner density is at it's standard level, the copy image may vary with time depending on the characteristics of drum and the environmental variations.
  To prevent this change, the copy density sensor which is installed under the developer unit controls the image to stablize the copy image.

- Controlling the image
  During initialization after turning on the power, the copy density sensor reads the white density, medium density (line pattern density patch) and black density developed on the drum surface.These three values are compared with the ideal gamma curve stored in the copiers memory.
  The copier detects the amount offset from the standard gamma curve (such as "a little background" or "light image") and calculates the variables for copy density control in accordance with Qualitative Reasoning Based Adaptive Controller. In this way it finds the optimum compensation values to tighten the gamma curve for maintaining peak copy quality.
  By means of this process, copy quality is stabilized by the various compensations enabled by Qualitative Reasoning Based Adaptive Controller adjustment in image production.

- The control of the gamma curve stabilizes copy quality by monitoring three points of copy quality (white density, medium density and black density) and has a direct effect on background, solid area density and good reproduction of fine lines regardless of environmental changes and variation with time and copy volume.

- Qualitative Reasoning Based Adaptive Controller
  Qualitative Reasoning Based Adaptive Controller is adaptive control on the basis of quantative reasoning theory. While successively reasoning and learning the change of process characteristics regardless of environmental changes and the variations with time and the number of copies on the copier, the system reads the patch marks and determines the best values of exposure and surface potential to establish the best gamma curve for optimum copy quality.

- Qualitative Reasoning Based Adaptive Controller is applied at the following intervals.
  a) During initialization after turning on the power.
  b) After every 1,000 sheets following execution of Qualitative Reasoning Based Adaptive Controller
     (But, every 200 sheets following the execution of F8-09 for the next 500 sheets)
  c) After turning on the power (up to 200 copies)
  d) After replacing the toner bottle (up to 200 copies)

- Copy density detecting sensor
  Two sensors for detection of copy density are used, one for white density, and line pattern density and one for detection of black density. (Temperature and humidity sensors are not used.)

- To correct for toner build up on the sensor, clean the sensor at the same time as the replacement of the drum. The system provides a measured amount of light and detects the reflected light. The resultant value is used for sensor compensation. This becomes the reference value.

- As the reference value of the white density changes, various components are adjusted according to characteristics of the gamma curve.

Reference	F5-25: Qualitative Reasoning Based Adaptive Controller Operation ON/OFF
F mode	F6-80: Automatic compensation value (read only)
	F6-81: Automatic compensation value (read only)
	F6-82: Automatic compensation value (read only)
	F6-28: White density reference value (set by Qualitative Reasoning Based Adaptive Controller)
	F6-29: Black density reference value (set by Qualitative Reasoning Based Adaptive Controller)

2. 2 Toner Density Control

To keep toner density(toner carrier ratio) in the developer unit constant, the TDC sensor (toner density sensor) which is installed under the developer unit detects the amount of carrier in the developer unit to control the toner density.

<Fundamentals>

The change in magnetic flux density in accordance with the amount of carrier (magnetic power) in the developer (mixture of toner and carrier) is detected by the TDC sensor and is converted to a voltage to control the toner density.

<Change of toner density and change of TDC sensor output voltage>

Amount of carrier passing TDC sensor	Toner density condition	Sensor output voltage
Less	High	Lower than normal
Much	Low	Higher than normal

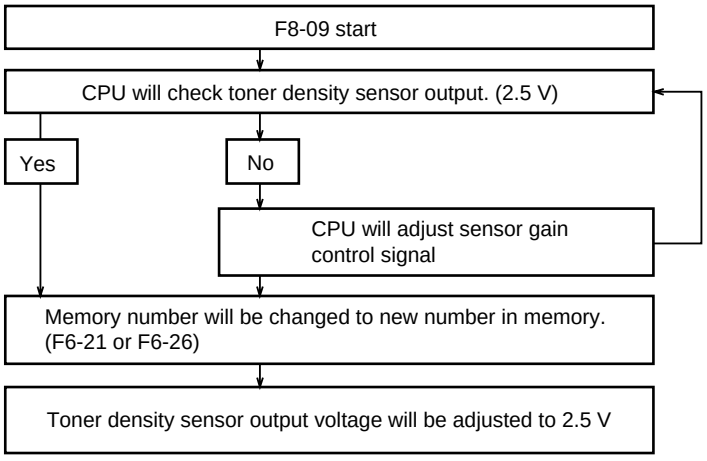
<Control>

The following controls are necessary for normal control of toner density

1) Automatic adjustment of TDC sensor gain (during execution of F8-C09) (to attain the standard reference level).
2) Maintain the standard level by control of toner density during use.

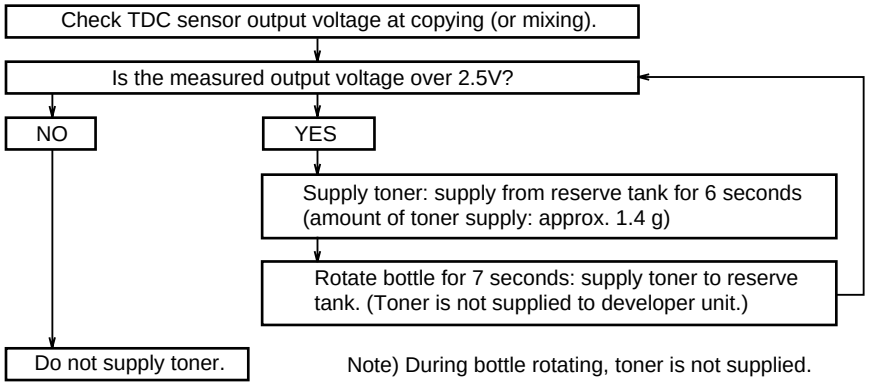
<Explanation of the control system>

1) Automatic adjustment of TDC sensor gain
   Automatically adjust the reference through the TDC sensor by executing service mode F8-09.
   The operation flow is as shown below.

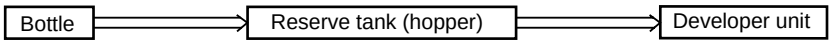


2) Maintain standard toner density

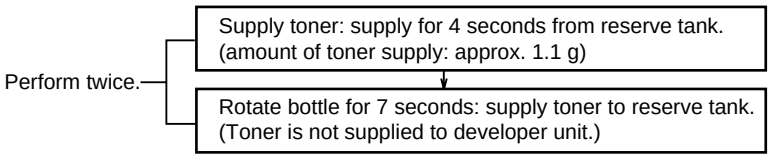
While checking the output voltage of the TDC sensor for every copy, control the timing of toner supply to the developer unit so that the output voltage is 2.5V at all times to keep the toner density constant.



(Reference 1) Toner supply route



(Reference 2) Forced toner supply



Note: Bottle rotation means toner is being added to the reserve tank, not the developer unit. This is not a final confirmation for proper TDC adjustment.

2. 3 Trouble Avoidance Mechanism

When some malfunction happens, this mechanism allows regular copy operation without error conditions (service man call) (providing the malfunction does not affect the basic copying operation and the appropriate function is not selected).

<Indication>

	Appropriate function selected	Appropriate function not selected
User mode	The selected function is unavailable, repair is necessary, select others. "(EX-XX)"	Normal indication of copying
Service mode	EX-XX (Error code)	XXXXXX (Electronic counter value at malfunction)

Note: Only 30 records can be stored. Earliest records are replaced by new ones as space is required.

<Self-recovery item>

	Item	Error code
Copier	Copier paper feed (upper)	E2-01
	Copier Paper feed (lower)	E2-02
	System stand paper feed (upper)	E2-03
	System stand paper feed (middle)	E2-04
	System stand paper feed (lower)	E2-05
	System stand paper feed timing	E2-10
	LCC Lift up	E2-06
	LCC Lift down	E2-07
	Duplex unit (length)	E6-03
	Duplex unit (width)	E6-04
	duplex unit (sensor)	E6-05
Accessories	Stapler	E7-06
	Sorter	E7-07
	ADF (motor)	E7-10
	ADF (sensor)	E7-11

2. 4 Toner Recycling System

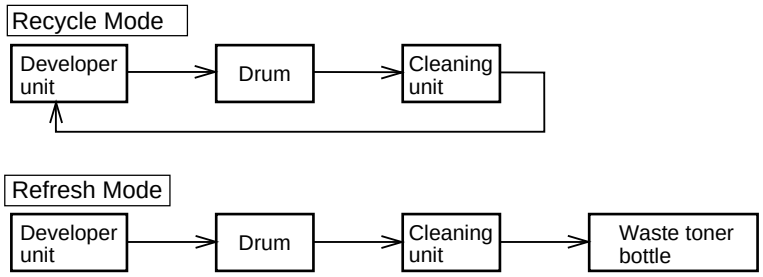
To maximize the number of copies which can be produced for each bottle, toner cleaned off of the drum needs to be returned to the developer for re-use. Under normal circumstances, the copy process can damage some toner. In addition, other undesireable materials may be cleared from the drum surface and mixed with re-useable toner (such as paper dust, etc.).
Toner Recycling System allows us to maximize toner yield, while avoiding the potential side effects of recycling used toner.

<Process>

There are two methods of handling the mixture of materials found in the cleaning unit following the drum cleaning.
This handling is normally in the "Recycle" mode, but on a regular basis is switched to the "Refresh" mode. During the "Refresh" mode, the undesireable particles are removed from the developer unit, and forwarded to the waste toner bottle to be discarded.

<Control>

Every programmed copies (500/1000/1500/2000 as set by F5-65), Toner Recycling System directs the recycle solenoid to switch from Recycle to Refresh Mode for the next 100 copies. During the refresh cycle, the cleaning unit is emptied into the waste toner bottle, there by removing all undesireable particles from the system. This process is completed unnoticed by the end user during regular operation.

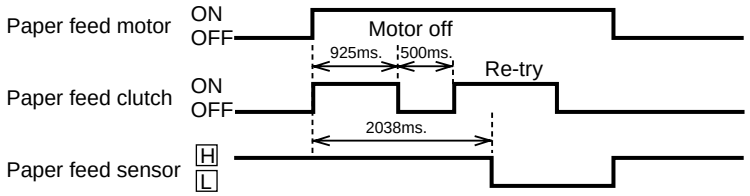


Note: Toner Recycling System also monitors TDC. If the ratio becomes too high, the system will initiate the Refresh Mode automatically.

2. 5 Re-try Control for Paper Misfeed

- Copy paper should pass the paper feed sensor within a specific time after the paper feed clutch turns on. To reduce paper misfeeds due to a slipping paper feed roller, the paper feed clutch turns on again (re-try operation).

- When the paper does not reach the paper feed sensor within a specific time after two re-try operations, "jam" is indicated.
  The re-try control for misfeeds is executed for each paper feed unit.

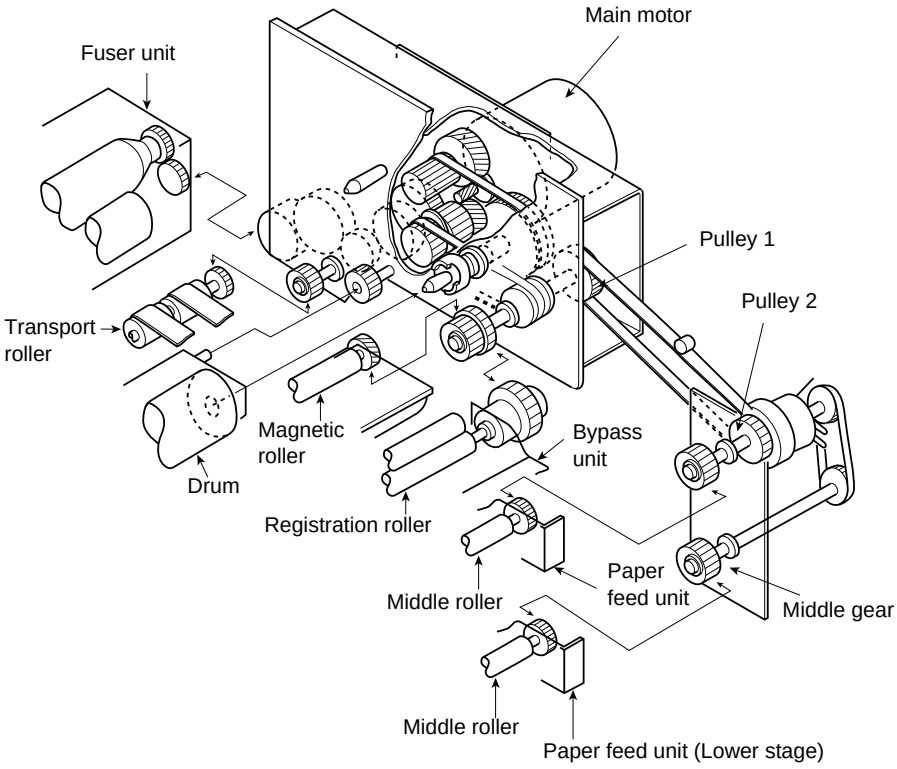


Section III

Sub Assemblies

3.1 Main Drive

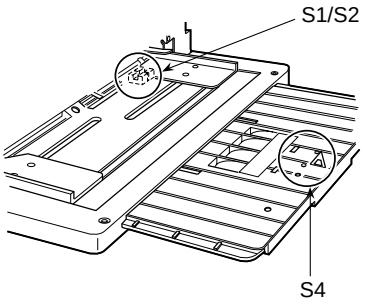
The driving mechanism of this machine is as follows.



Name of motor	Driving method	Driving unit
Main motor	DC24V driving	• Rotation of photo receptor drum • Developer unit, paper feed unit, paper transport, fuser unit and paper exit unit

(1) Detecting sheet bypass paper size

- The paper size for the sheet bypass is detected by a matrix of sheet bypass paper size sensors which are installed on the sheet bypass tray.
- When setting the paper in the sheet bypass tray and adjusting the paper guide, the matrix is as follows.

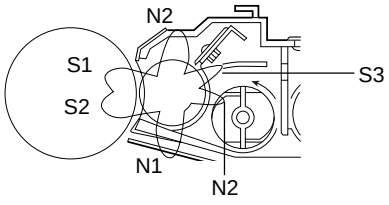


	Paper size detecting sensor		
	S1	S2	S4
Ledger/A3	ON	OFF	ON
Legal/B4	ON	ON	ON
Letter/A4	ON	OFF	OFF
Letter-R/A4R	OFF	ON	OFF
Invoice/A5	OFF	OFF	OFF

(2) Developing

- The developer mixing unit contains developer which is a mixture of fine powder (non-magnetic toner) and fine ferrite carrier.
- The developer is mixed by the transport screw and the mixing mill. The toner becomes charged (+) and the carrier becomes charged (–). The developer is magnetically stuck on the aluminum sleeve of the magnet roller, and the magnetic brush is formed.
  The developer is transfered counterclockwise in the rotating direction of the sleeve.
  The height of magnetic brush is controlled by the gap between the doctor blade and the sleeve surface.
- The drum with an electrostatic latent image (negative charge) is rotating clockwise and makes contact with the magnetic brush.
- The sleeve is charged opposite of the drum and an electric field is formed. The positive toner is stuck on the electrostatic latent image on the drum.
- The sleeve has applied (–) bias voltage, which prevents the drum from covering with toner. The distance between the drum and the sleeve is controlled with the spacer rings.

Amount of developer	Approx. 650 g
Initial toner density	4.0 %
DSD	0.8 mm
BSD	0.61 mm
Developing bias voltage	–250 V reference



Reference:

- The twin field magnet roller presents enhanced developing performance by a wider developing area which results from two pole peaks (S1 and S2 pole) facing the drum surface.
- N2 through S3: Attract the developer to the sleeve from the mixing mill.
- S3 pole: Raise the head of developer and control the head height with the doctor blade.
- N2 through S1: Transfer the developer to the developing position.
- N1 through N2: Separate the developer from the sleeve.

(3) Supplying toner

The Toner Hopper Unit supplies toner to the Developer Mixing Unit via the Reserve Tank, so toner addition is done in two stages, by turning the Toner Hopper Motor in either direction:

Forward Direction:

The bottle turns (via a spring clutch) to supply toner from the Toner Bottle to the Reserve Tank. This direction is controlled by the Toner Volume Sensor.

Reverse Direction:

The Toner Supply Roller turns (via a spring clutch) to supply toner from the Reserve Tank to the Developer Mixing Unit. This direction is controlled by the TDC Sensor.

TDC sensor output	Toner empty sensor	Hopper motor	Toner bottle	Toner supply roller	Add toner
High (Lower toner density)	Detect	Reverse rotation	—	Rotate	Supply toner to developer unit
High	Non detect	Forward rotation	Rotate	—	Supply toner to sub-hopper
Low (Higher toner density)	Detect	Stop	—	—	—
Low	Not detect	Stop	—	—	—

- A toner supply by the toner supply roller (approx. 16 seconds) can supply 1.4 g of toner of to the hopper.

- Separating the developer mixing unit from the toner supply unit of toner hopper, the toner supply shutter is closed to prevent toner drop.

(4) Toner level detection

- When the toner level sensor in the toner hopper detects no toner remaining, and does not detect toner after continuously turning the toner bottle "Add toner" is displayed. The copier is disabled.

  The machine can be used after the user's key input.
  After lighting the no toner indication, the machine stops after 300 copies.

  The "Add toner" indication is cleared by replacing the toner bottle.

Detecting the toner bottle position

- Insert the toner bottle in the hopper and turn to the specified position. Accordingly, the toner bottle shutter opens and is able to add toner to the hopper.

- The bottle home position sensor which is mounted in the toner hopper detects the position of the toner bottle and the toner bottle stops turning at the specified position.

(5) Temperature control

The heat roller is provided with two halogen lamps (main heater lamp and sub heater lamp). The main heater lamp turns ON during warming up and copying operation.

To control the maximum power consumption, the sub heater lamp turns ON during warming up and after release of pre-heat mode only in order to reduce the warming up time of fuser unit.

The temperature control in the copying operation and the standby is done by the main heater lamp.

- Sequence

a) When turning ON the power, the main heater lamp and the sub heater lamp turns ON, which heats the heat roller.

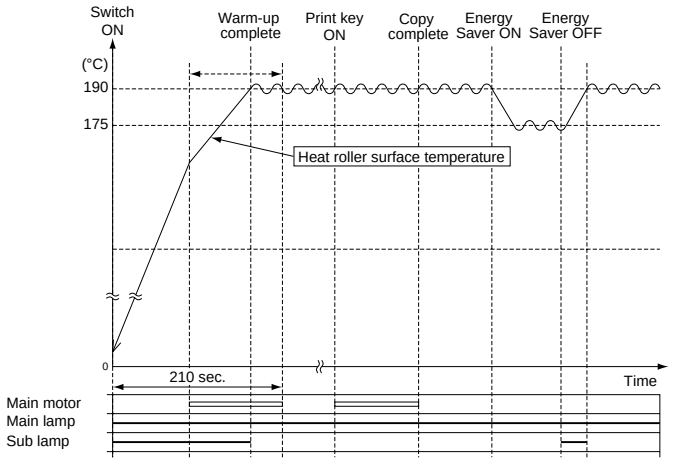
b) At a specified temperature, the main motor turns on and the heat roller and the pressure roller rotate. After all copy quality standards are set, the main motor turns off. When the heat roller temperature reaches the specified value, the machine is ready.

c) Afterwards, the thermister detects the temperature of heat roller. The heat roller keeps the temperature to the specified value by turning on/off the main heater lamp.

(Note)

- When the temperature of heat roller surface does not reach the specified value in the specified time from power ON, the error E4-01 is indicated.
- If when the power is turn ON in an absolutely frozen condition of fuser roller (a very cold morning) or copies are continuously made, the operation of main heater lamp is inadequate. In this case, the number of copies per min. will be reduced (no change for process rate)to increase fusing time.

  When the temperature of the heat roller surface rises enough, the machine speed will return to the regular number of copies per min.



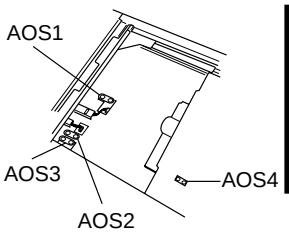
(6) Automatic detection of original paper size

- Opening the platen cover by approx. 30 degrees to insert the original, the platen cover angle sensor turns on and four original size detection sensors operate simultaneously.
- The original size detection sensors consists of light emission unit and light reception unit. The light from the light emission unit is thrown on the original and the reflected light is received by the light reception unit to check the existence of the original.
- The original size is read again by turning on the platen open/close detecting sensor when closing the platen cover.
- The automatic original size detecting operation is released when pressing "original size selector" key in the control panel, setting the original in ADF or selecting "0" for F5-52.

(Original size detection matrix)

○ — Detect
● — No detect

	Original size detect sensor(1) AOS1	Original size Detect sensor (2) AOS2	Original size detect semsor (3) AOS3	Original size detect semsor (4) AOS4
Ledger/A3	○	○	○	○
Legal/B4	○	○	●	○
Letter/A4	○	○	○	●
Letter-R/A4R	○	●	●	○
Invoice/A5	○	●	●	●
No original	●	●	●	●



(7) Adjusting quantity of light of AE sensor

- In pre-scan, the output of the AE sensor must be at a proper level. Therefore, when operating image density control (Quantam™ Technology), the exposure lamp voltage is adjusted to be approx. 2.7V of AE sensor output when reading the standard density mark, and the system memorizes the compensation value at that time.
- In pre-scan automatic exposure mode, the original reflects the light of the exposure lamp voltage adding the above compensation value, and the original density is read by the AE sensor. The result corrects the exposure before copying.

Reference: Service mode for adjustment (for details refer to the "Field Service Manual")

F6-01: Compensation of vertical copy ratio (compensating scanning speed of optics unit)
F6-02: Compensation of full size focus
F6-03: Compensation of horizontal copy ratio (compensating lens position)
F6-05: Compensation of paper registration position (Compensating timing roller clutch turning on timing)
F6-11: Compensation of quantity of exposure light for full size
F6-12: Compensation of quantity of exposure light for photo mode
F6-16: Compensation of quantity of light for AE sensor

Section IV Preventive Maintenance

The periodic maintenance service is performed by machine cleaning and parts replacements.
It is essential to perform these service activities properly for customer satisfacation. The purpose of this service is to maintain the machine performance and the copy quality.

4. 1 Precautions for Periodic Maintenance Service

- You should get the customer's agreement for when and where the maintenance service is performed.
- You should completely explain the philosophy maintenance service is not to repair problems, but to avoid them.
- You should prepare the necessary replacement parts and tools for cleaning beforehand.
- After finishing the maintenance service, you should discard the waste parts and papers, and clean the surrounding area.
- Let the customer know when you are finished.
- Before removing the equipment, pull out the plug.
- Before using solvents such as IPA (isopropyl alcohol), put on rubber gloves and eye protection.

(1) Timing

- Perform the periodic maintenance service in accordance with the chart of periodic maintenance areas.

(2) Cleaning of roller

- Rollers should be cleaned with water and cloth.
- Use IPA (isopropyl alcohol) if they are very dirty.

(3) Precautions for disassembly and adjustment

- Before disassembling the machine, disconnect the power plug.
- After taking apart, do not operate the machine.
  When operating the machine with the cover removed, be careful so that clothes are not caught by moving components.
- When electricity is applied, the connectors on any P.C.B. must not be connected or disconnected.
- Using a vacuum cleaner for the cleaning of the TDC sensor could cause electrostatic damage, therefore, use blower brush and cotton swab for the cleaning of these parts. And, before cleaning any units, remove the sensors beforehand.
- For the drum, comply with the precautions shown in 1.8 “Precautions with consumables”.
- Make sure to use the correct screw sizes.
- Use toothed lock washer for the installation of ground wires to secure electrical continuity.
- Reassemble parts in the reverse sequence of the disassembling unless otherwise noted.
- Replace blown fuses with the specified rated ones.
- Do not let the lithium battery on P.C.B short-circuit.

4.2 Maintenance chart

1) Replacement

Maintenance cycle

FP-7818/7824 : per 80,000 copies

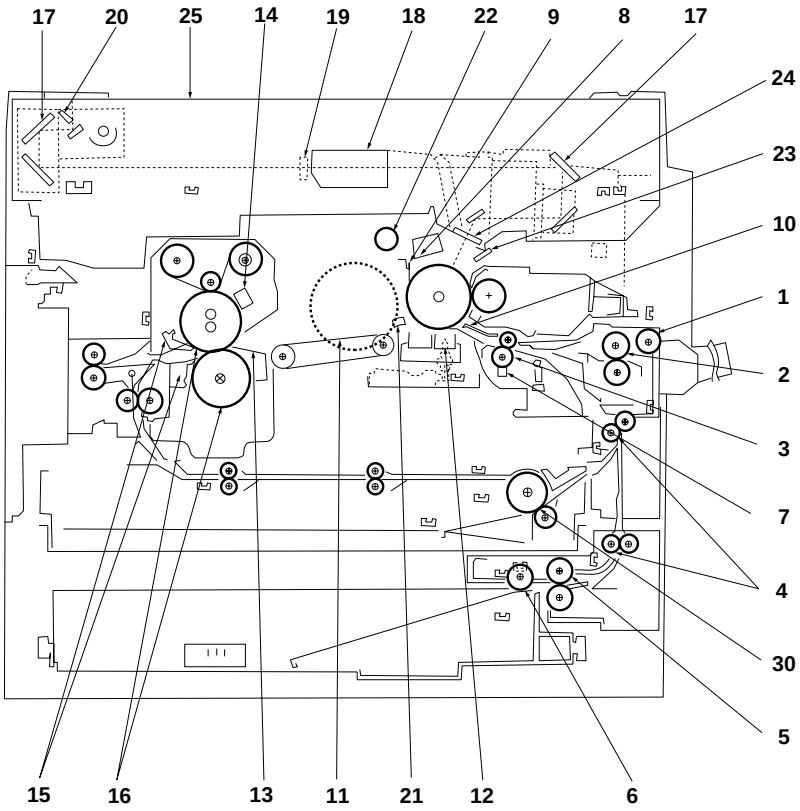
FP-7830/7835/7845/7850: per 240,000 copies

Item	Service	Part number	Q'ty per unit	Maintenance cycle (x 1000)				
				80/120	160/240	240/360	320/480	400/600
Paper	Paper feed roller	FFPMA05411	2	X				
feed	DFP Roller	FFPMA05411	2	X				
unit	Pick-up roller	FFPMA0542	2	X				
	Cleaning sheet (Except FP-7818/7824)	FFPHK0951	2					X
	Registration roller	FFPMA0539	1	Replace at 1,080,000 copies				
	Registration roller bearing	FFPMQ0559	2	Replace at 1,080,000 copies				
	Middle roller	FFPMA05451	1	Replace at 1,200,000 copies				
	Torque limiter (Bypass)	FFPXQ24H00	1	Replace at 1,200,000 copies				
	Torque limiter (Copier)	FFPXQ04H00	1	Replace at 1,200,000 copies				
Developer	Cleaning blade	FFPHK0942	1	X				
unit	Wire	FFPXL05H00	1	X				
	Developer (FP-7818/7824)	FQ-ZK10	1	X				
	Developer (FP-7830/7835/7845/7850)	FQ-ZK20	1	X				
	Drum (FP-7818/7824)	FQ-HK10	1	X				
	Drum (FP-7830/7835/7845/7850)	FQ-HK20	1	X				
	Side seal (Front)	FFPXG51H00	1	X				
	Side seal (Rear)	FFPXG50H00	1	X				
	Spacer ring (Front) (FP-7818/7824)	FFPHQ0057	1	X				
	Spacer ring (Front) (FP-7830/7835/7845/7850)	FFPHQ0061	1	X				
	Spacer ring (Rear) (FP-7818/7824)	FFPHQ0058	1	X				
	Spacer ring (Rear) (FP-7830/7835/7845/7850)	FFPHQ0062	1	X				
	Waste toner bottle (FP-7818/7824)	FFPQA0164	1	Replace at 10,000 copies				
	Waste toner bottle (FP-7830/7835/7845/7850)	FFPQA0165	1	X				
	Toner dispersion cover	FFPXG08H00	1					X
	Magnetic roller stopper (Front) (Except FP-7818/7824)	FFPXG06H00	1					X
	Magnetic roller stopper (Rear) (Except FP-7818/7824)	FFPXG07H00	1					X
	Drum separation finger	FFPLK0332	1			X		
	Corona	FFPXG60H00	1			X		

Item	Service	Part number	Q'ty per unit	Maintenance cycle (x 1000)				
				80/120	160/240	240/360	320/480	400/600
Fuser	Separation finger (Upper)	FFPLK0331	5				X	
unit	Separation finger (Lower)	FFPLK0231	4	X				
	Thermister	FFPBL0015	1		X			
	Fuser lamp (850W)	H12V085WN2A	1		X			
	Cleaning web (FP-7818/7824)	FFPKM0316	1	X				
	Cleaning web (FP-7830/7835/7845/7850)	FFPKM01343	1	X				
	Cleaning web pressure roller (Except FP-7818/7824)	FFPMA0470	1	Replace at 1,200,000 copies				
	Heat roller (FP-7850)	FFPMA0590	1			X		
	Heat roller (FP-7845)	FFPMA0566	1			X		
	Heat roller (FP-7830/7835)	FFPMA0577	1			X		
	Heat roller (FP-7818/7824)	FFPMA0574	1			X		
	Heat roller bearing	FFPMQ0572	2					X
	Heat roller gear	FFPMF1057	1					X
	Fuser entry guide (lower)	FFPKF1308	1	Replace at 1,200,000 copies				
	Pressure roller (FP-7818/7824)	FFPMA03582	1					X
	Pressure roller (FP-7830/7835)	FFPMA04181	1					X
	Pressure roller (FP-7845/7850)	FFPMA0565	1					X
	Pressure roller bearing	FFPMQ0573	2					X
	Heat-insulating bushing	FFPJF0034	2			X		
Optics	Exposure lamp	E08V025WN2A	1	X				
unit	Dust protection filter A	FFPJD00382	1	X				
	Dust protection filter B	FFPJD00421	1	X				
	Filter A	FFPGB0022	1	X				
	Filter B	FFPGB0023	1	X				
Main	Suction/Ozone filter	FFPHJ0039	1		X			
body	Ozone filter 1	FFPHJ0038	1		X			
	Ozone filter 5 (FP-7830/7835/7845/7850)	FFPHJ0042	1		X			
	Ozone filter 7 (FP-7818/7824)	FFPHJ00461	1		X			
	Dust protection filter	FFPHJ0049	1	X				
	Discharge lamp	PQ24V10WMG2	1		X			
	Transfer/Separation corona	FFPVL01H01	1			X		
	Wire 1	FFPXL04H00	1	X				
	Wire 2	FFPXL05H00	1	X				
	Wire cleaner	FFPXL01H00	1	X				
ADU	Paper feed roller	FFPMA0558	1	X				
	DFP roller	FFPMA0559	1	X				
	F/R Mylar	FFPXD07J00	1	X				
	Storage roller	FFPMA0557	2		X			
	Paper feed pad	FFPKP00821	1	X				

4.3 Cleaning Method

- Cleaning method for each PM service visit is shown below.



		Cleaning position	Tool/solvent	Work/precaution
Paper feed unit	1	Sheet bypass paper transfer roller	Cloth with water / IPA	- Use IPA, if toner is stuck on the rollers. (As little as possible.) - Do not use cleaning cotton.
	2	Sheet bypass paper feed roller		
	3	Timing roller		
	4	Middle roller		
	5	Paper feed roller		
	6	Paper transfer roller		
	7	Cleaning sheet	Brush / IPA	- Remove paper dust by brush deleted.
Developer unit	8	Corona wire	Cloth with water	- If not replaced at PM cycle, high voltage leak may occur. - Pay attention when replacing corona wire (No sagging or kinking) - Do not use cleaning cotton.
	9	Corona grid / Corona case		
	10	Lower developer frame Dust cover	Brush / Vacuum cleaner / Cloth with water	- Lift the developer unit (mag-roll side) up 45, and rotate mag-roller 4~5 times counterclockwise. Remove the toner dust on lower developer frame by brush or vacuum cleaner. - Clean the lower developer frame by cloth with water.
	11	Transport belt	Cloth with water	- Clean by cloth with water.
	12	Transfer corona wire / Corona case/ Transfer guide plate		
Fuser unit	13	Fuser guide plate	Cloth	
	14	Fuser thermister	Cloth	
	15	Fuser separation finger (upper/lower)	Cloth	- Remove toner dust on separation finger. - Don't damage separation finger edge.
	16	Fuser heat roller / pressure roller	Cloth	- Use IPA, if the roller is very dirty.

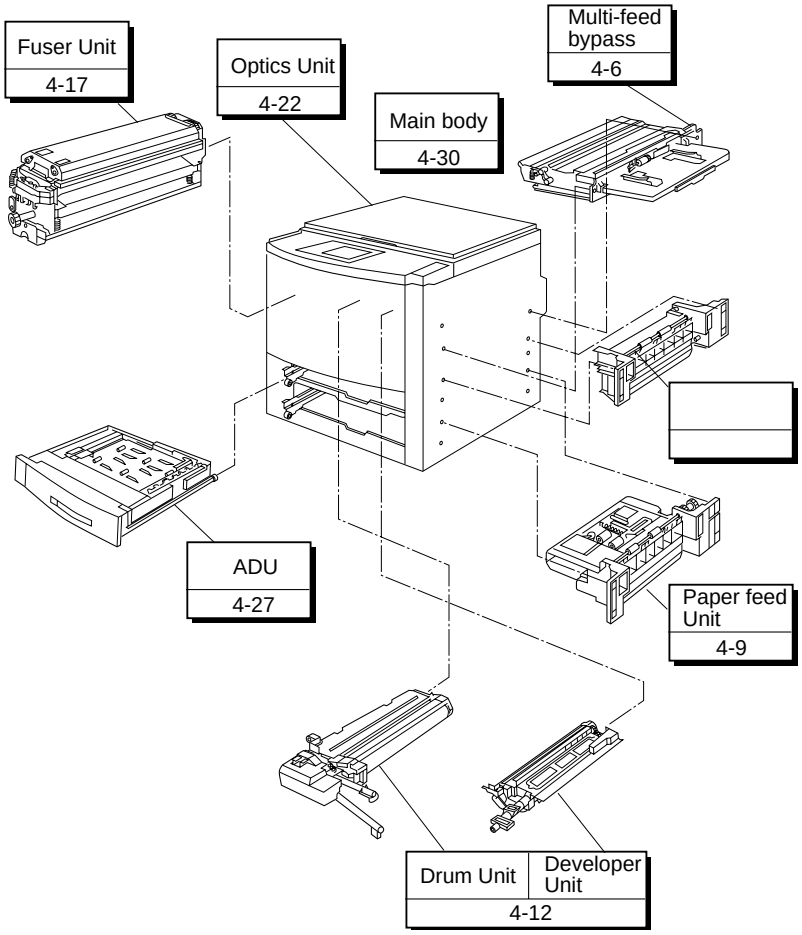
(to be continued)

		Cleaning position	Tool/solvent	Work/precaution
Optics unit	17	Mirror (No.1 ~ 6)	Blower brush / Glass cleaning paper with IPA	- Clean with soft touch, otherwise, the mirror surface may get damaged - Clean with soft paper and IPA as required.
	18	Lens		
	19	Original size detecting sensor	Blower brush Cloth with water	- Clean the dust on the sensor
	20	Reflector		
Main body	21	Copy density sensor	Cloth/Blower brush	
	22	Discharge lamp filter		
	23	LED array		
	24	Slit glass	IPA	
	25	Platen glass	IPA	
	26	Platen mat	Cloth	
	27	Ozone filter	Vacuum cleaner	
	28	Dust collection filter		
	29	Outer cover	Cloth with water / Neutral detergent	
Duplex unit	30	Paper feed roller	Cloth with water / IPA	- Same as paper feed unit

4. 4 Disassembly and Re-assembly

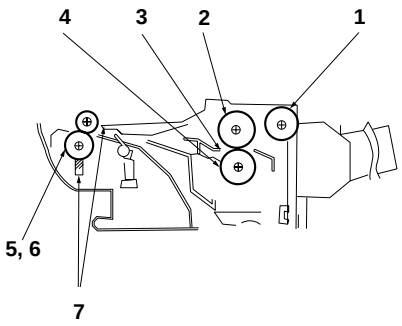
PM parts replacement procedure

- The replacement procedure of PM parts is as shown below.
  The replacement cycle of PM parts is shown for the FP-7750/7742.
  (For other models, refer to the correct Service Manual.)

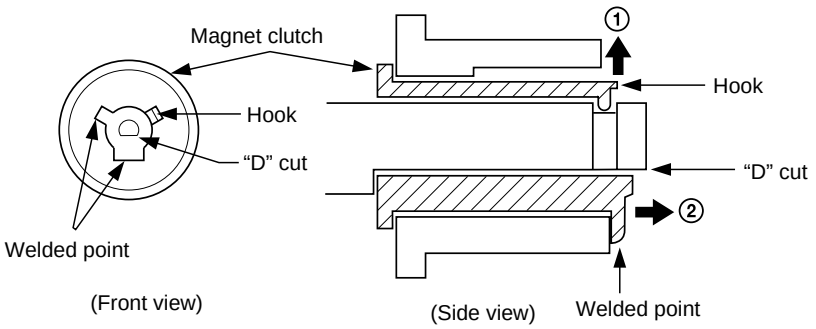


(1) Multi-feed bypass

Item		Part name	Cycle
	1	Pick up roller	120K
	2	Paper feed roller	120K
	3	DFP roller	120K
	4	Torque limiter	1200K
	5	Registration roller	1080K
	6	Registration roller bearing	1080K
	7	Cleaning sheet	600K

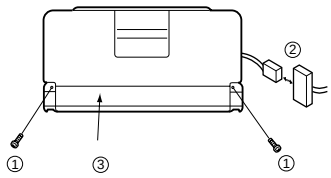
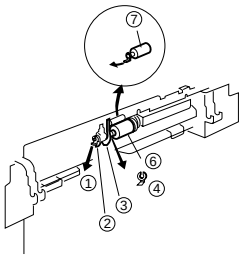


Caution

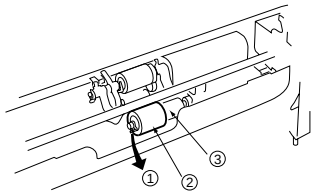


When removing the magnet clutch, push the hook ①, out of the slot and slide the magnet clutch in the arrow direction②, in order to avoid welded point damage.

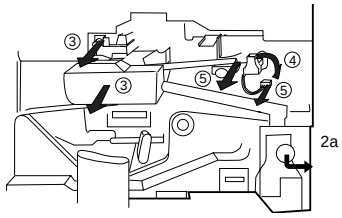
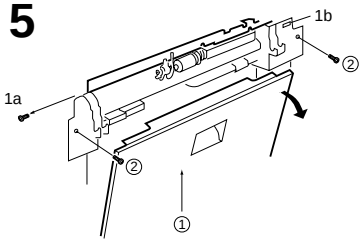
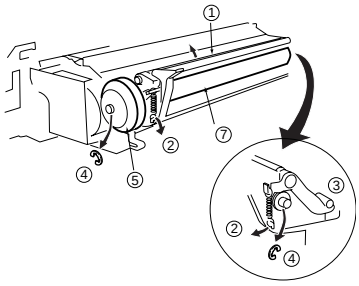
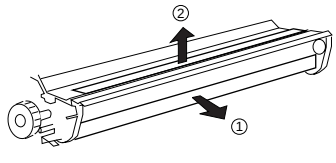
1) Replacement of the pick-up roller/paper feed roller

1  	(1)Remove the screws and covers. (x 2) (2)Disconnect the harness. (3)Remove the bypass tray. Note: Remove right cover (2 screws).
2  	(1)Remove the touch ring. (2)Remove the paper stopper. (3)Remove the sensor lever. (4)Remove the touch ring. (5)Remove the pick-up roller (6)Remove the touch ring. (7)remove the paper feed roller.

2) Replacement of the DFP roller and torque limiter

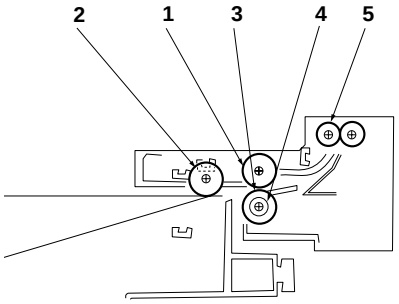
3  	*Conduct the procedure 1. *Open the copier paper feed cover. (1)Press the DFP roller lower side then remove touch ring. (2)Remove the DFP roller. (3)Remove the torque limiter. (4)Check the rotation of the torque limiter.

3) Replacement of the registration roller and cleaning sheet

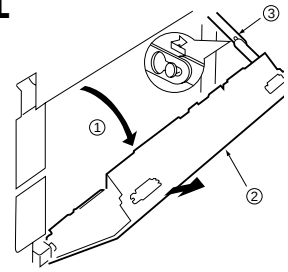
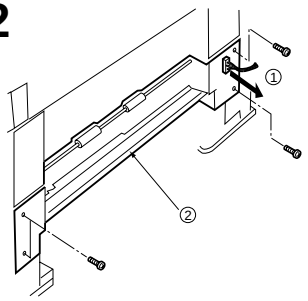
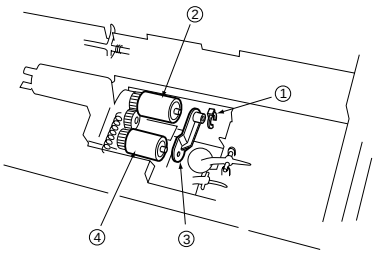
4 	1) Remove the right cover and rear cover. 2) Open the front cover. a) Open the waste toner bottle cover and remove the bottle. b) Turn the toner hopper 180°. 3) Pull and turn the developer release knob. 4) Remove the drum unit. 5) Remove the connector and developer unit.
5 	1) Open the copier paper feed cover and disconnect the cover link. a) Remove the knob (One screw), timing roller. b) Disconnect the harness. 2) Remove the bypass unit (Two screws).
6 	1) Remove the top cover (Two screws). 2) Remove the tension spring (X 2). 3) Remove the upper registration roller. Remove the paper guide plate (Two screws). 4) Remove the E rings (both sides). 5) Remove the drive gear, clutch, and E ring. 6) Remove the bushing support plate and bushing (1 screw). 7) Remove the Lower registration roller.
7 	1) Remove the cleaning sheet under the lower timing roller. 2) Remove the cleaning sheet on the top cover. 3) Clean the timing roller with IPA. 4) Re-install new cleaning sheets (x2).

(2) Paper feed unit

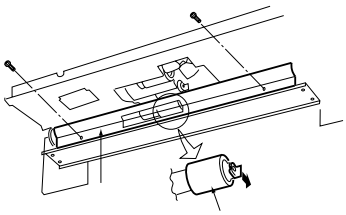
Item		Part name	Cycle
	1	Paper feed roller	120K
	2	Pick-up roller	120K
	3	DFP roller	120K
	4	Torque limiter	1200K
	5	Middle roller	1080K



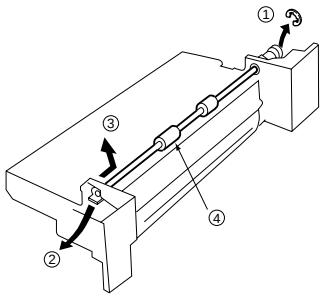
1) Replacement of the paper feed roller and the Pick-up roller

1  	1) Remove the right cover and rear cover. 2) Open the copier paper feed cover. 3) Remove the paper feed cover stopper. Note: Move the stopper to the larger hole and remove.
2  	1) Disconnect the harness of the paper feed unit. 2) Remove the paper feed unit (4 screws).
3  	1) Remove the touch ring. 2) Remove paper feed roller. 3) Remove the bracket guide. 4) Remove the the pick-up roller. Note: Confirm the direction of the rollers before the installation.

2) Replacement of the DFP roller and the torque limiter

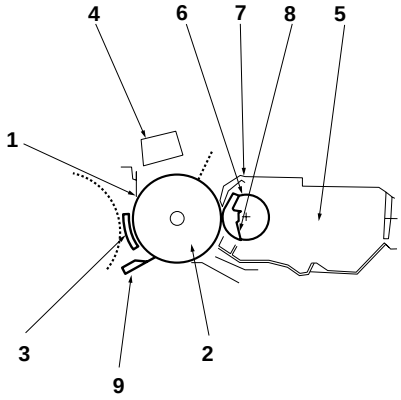
4 	1) Conduct the procedure 1 and 2. 2) Remove the lower roller cover (2 screws) 3) Remove the touch ring. 4) Remove the DFP roller. 5) Remove the torque limiter. Note: Confirm the direction of the torque limiter when re-installing it. [Fit the positioning pin (rear side)]

3) Replacement of the Middle roller

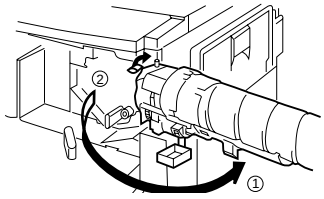
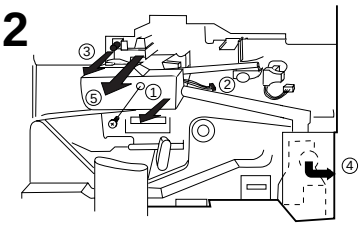
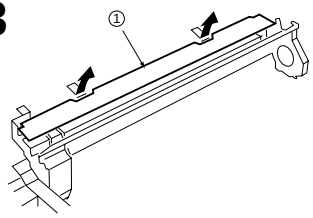
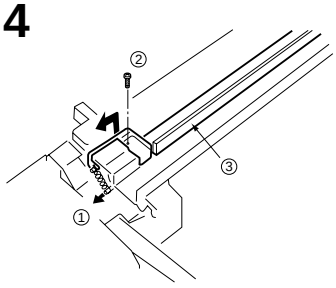
5  	1) Conduct the procedure 1 and 2. 2) Remove the E ring gear on middle roller. 3) Remove the touch ring and bushing. 4) Slide and remove the middle roller.

(3) Developer unit

Item		Part name	cycle
	1	Cleaning blade	120K
	2	Drum	120K
	3	Blade side seal (F)	120K
	3	Blade side seal (R)	120K
	4	Corona	360K
	5	Developer	120K
	6	Spacer ring (F)	120K
	6	Spacer ring (R)	120K
	7	Toner dispersion prevention cover	600K
	8	Mag-roll stopper (F)	600K
	8	Mag-roll stopper (R)	600K
	9	Drum separation finger	360K

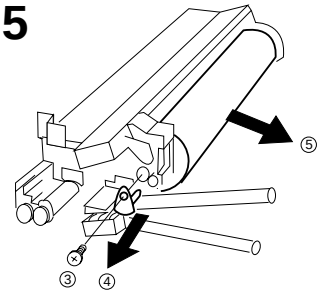


1) Replacement of the cleaning blade

1 	1) Open the front cover. 2) Move the toner hopper to front side. 3) Pull and turn the developer release lever and release the developer unit. (Refer to p. 4–8 step 4)
2 	1) Remove the drum unit solenoid cover (1 screw). 2) Disconnect the harness. 3) Remove the drum fixing screw. 4) Open the waste toner bottle cover and remove the bottle. 5) Remove the drum unit.
3 	1) Press the tabs of the drum unit lid toward arrow mark to remove the lid.
4 	1) Remove the cleaning blade tension spring. 2) Remove the blade case (1 screw). 3) Remove the cleaning blade. Note: - Before replacing the cleaning blade, put drum starting powder on the drum surface and cleaning blade. (lightly and evenly) - After replacing the cleaning blade, do not forget to reinstall the tension spring.

2) Replacement of the Drum / Side seal

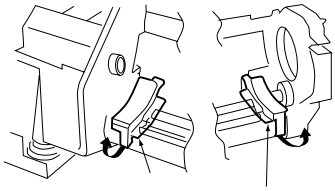
5



1) Conduct the procedure 1 and 2 and take the drum unit out.
2) Remove the drum cleaning blade tension spring (refer to P.4-13 step 4).
3) Remove the front side screw on the drum shaft.
4) Remove the drum shaft.
5) Remove the drum.

Note: Handle the case not the drum.

6



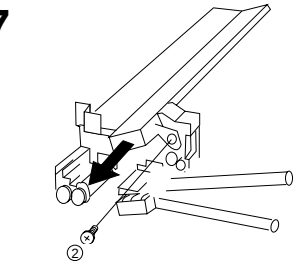
1) Remove the side seal (Front and Rear).
2) Clean the surface of drum unit frame then reinstall the side seal (Front and rear).
3) Replace the drum.

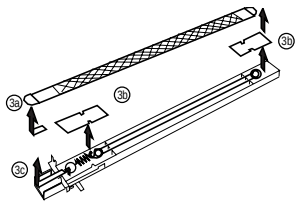
Adjustment after replacing new drum

a. Set F mode.
b. Clean the copy density sensor.
c. Adjust F8-14.
d. Adjust copy quality.
e. Go back to normal mode.

3) Replacement of the charge corona

7

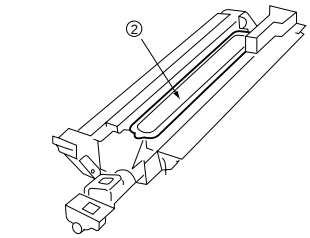


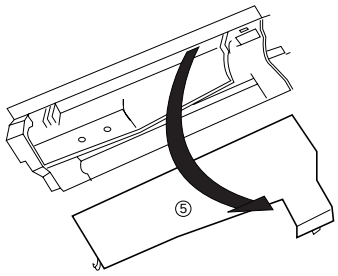


1) Conduct the same procedure 1 and 2 and take the drum unit out.
2) Remove the corona fixing screw and remove the charge corona assembly.
3) Remove the grid(3a), mylar(3b) and corona wire(3c).

4) Replacement of the developer

8





1) Conduct the procedure 1 and 2
2) Remove the developer unit and remove the mixer lid.
3) Dump the developer out of the unit.
4) Vacuum any developer on mag-roller and inside of the unit.
5) Remove the developer unit duct cover and clean inside of duct cover.
6) Pour in the new developer

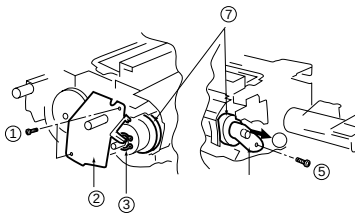
Note: - Shake the developer bottle and pour it into the developer unit evenly.
- Pay attention when cleaning the TDC sensor with vacuum cleaner , TDC sensor may be damaged by electro-statics.

Adjustment after relacing new developer

a. Set F mode.
b. Set and run F8-09.
c. Write the contents of F6-21 and 26 on the memory sheet.

5) Replacement of the spacer ring

9



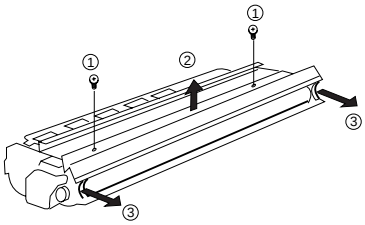
1) Conduct the procedure 1 and 2 then remove the developer unit.
2) Remove the bias terminal (2 screws).
3) Remove the C ring and gears on mag-roller.
4) Remove the spacer ring (Rear).
5) Remove the bushing support plate (1 screw).

Note: Take note of the position of the bushing support plate and reinstall it in the same position after replacing the spacer ring.

6) Remove the spacer ring (Front).
7) Replace the spacer ring (Front and rear).

6) Replacement of the toner dispersion prevention cover/magnetic roller stopper

10



- Conduct procedure 1 and 2 then pull out the developer unit.

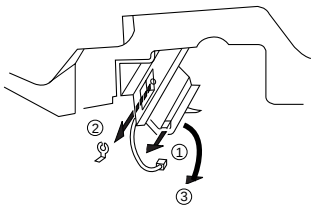
(1) Remove the screws (x 2).

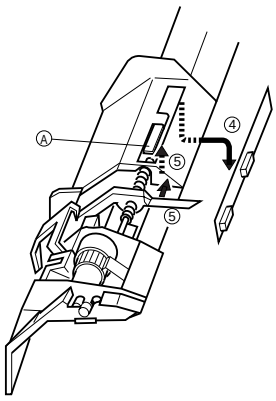
(2) Remove the toner dispersion prevention cover.

(3) Remove the magnetic roller stoppers (front/rear) and replace the magnetic roller.

7) Replacement of the dust collecting filter

11





- Conduct procedure 1 and 2 then pull out the drum unit

(1) Disconnect the sensor harness.

(2) Remove the touch ring.

(3) Slide the sensor base to rear side then put it down and pull out.

(4) Remove the sensor PCB from under side.

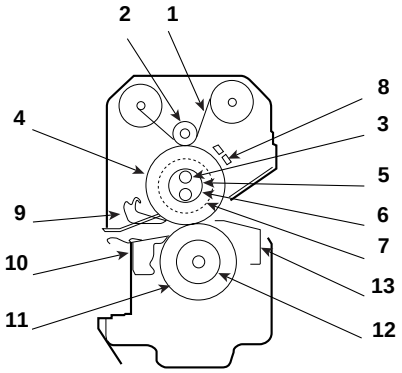
(5) Push the Ⓐ from under side and slide the separation finger then remove it.

Note: Be careful when removing and reinstalling the drum finger that the two springs are not lost or damaged.

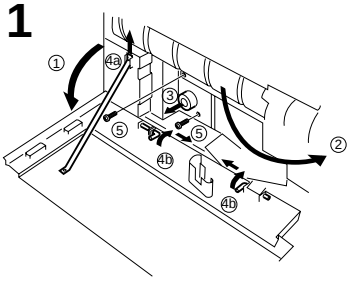
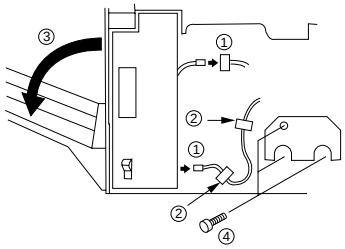
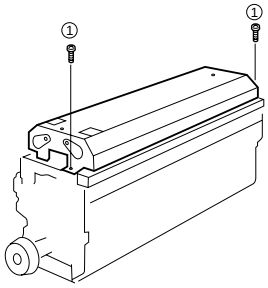
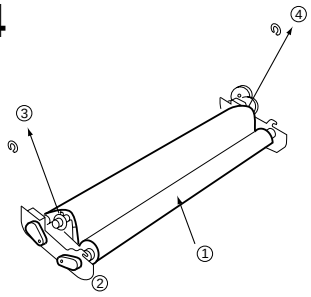
(6) Reassemble in reverse order.

(4) Fuser unit

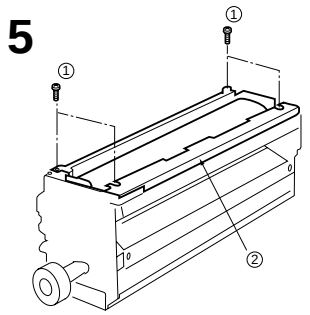
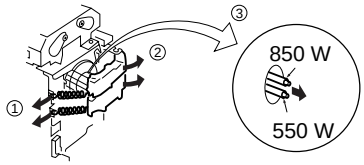
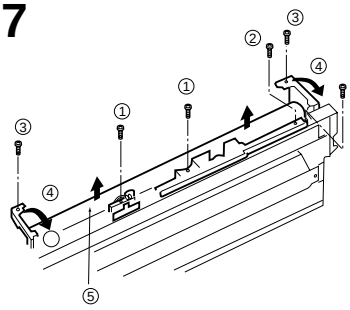
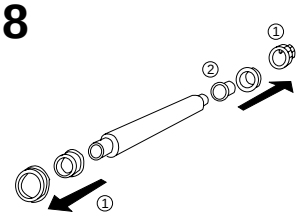
Item		Part name	Cycle
	1	Cleaning web roller	120K
	2	Web pressure roller	1200K
	3	Fuser lamp	240K
	4	Heat roller	360K
	5	Heat roller bearing	600K
	6	Insulating bushing	360K
	7	Heat roller gear	600K
	8	Thermistor	240K
	9	Separation finger (upper)	480K
	10	Separation finger (lower)	480K
	11	Pressure roller	480K
	12	Pressure roller bearing	600K
	13	Fuser entry guide	1200K



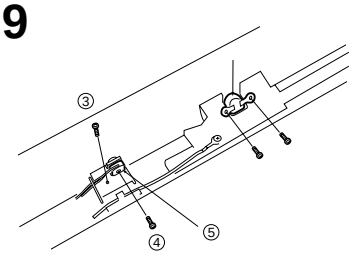
1) Replacement of cleaning web/web pressure roller

1 	(1) Open the front cover. (2) Swing the toner hopper to the right. (3) Remove the fuser unit manual paper feed knob. (1 screw reverse threaded) (4) Remove the front cover. a) Remove the band. b) Slide out the hinge pins. (5) Remove the fuser front cover (2 screws).
2 	(1) Disconnect the fuser unit connector (x 2). (2) Open the two LWS (x 2). (3)Open the paper exit unit. (4)Remove the fuser bracket (3 screws). (5) Carefully slide the fuser unit out of the front of the machine.
3 	(1) Remove the web ass'y bracket screw (x 2). (2) Slide the web ass'y to the right and remove.
4 	(1) Remove the bushings (2 screws) and rollers (x2). (2) Install the new web as shown. (3) Make sure to remove the slack in the supply roller. (4) Make sure the take-up drive is working normally.

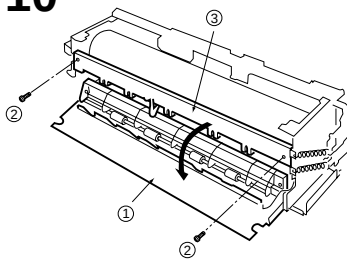
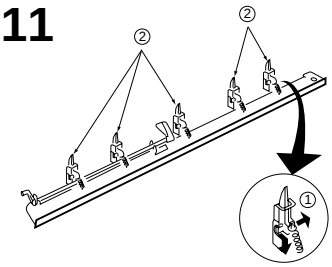
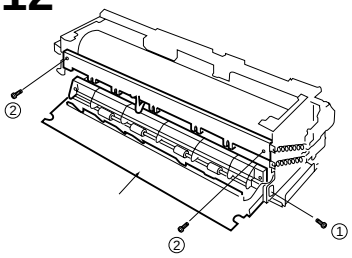
2) Replacement of the fuser lamp/heat roller/heat roller bearing/insulating bushing/ heat roller gear

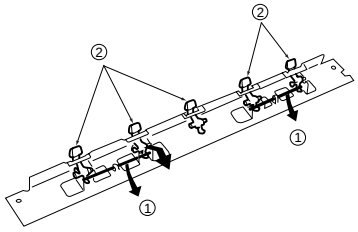
5 	• Conduct procedure 1and 2. (1)Remove the screws (x 4) (2)Remove the heat insulating cover. Note: Either loosen pressure screws (x 2) or install fuser shipping screws (x 2).
6 	(1)Remove the springs. ⑴ⓐ ⑴ⓑ (2)Turn the fuser lamp covers. ⑵ⓐ ⑵ⓑ (3)Remove the fuser lamps (x2). Note: The long one is the main fuser lamp. (850W) Reassemble the lamp with the rating indication in the rear.
7 	(1) (2) Remove the screws and take off the thermistor and thermostat blocks. (Lift the thermostat and slide to the front.) (3)Remove the screws (x 2). (4)Remove the roller pressure plates. (5)Remove the heat roller.
8 	• Remove the heat roller gear, bearing and insulating bushing. • Replace the heat roller. Note: After reassembling and tightening the screws of the pressure springs, check the pressure roller for fit.

3) Replacement of the thermistor

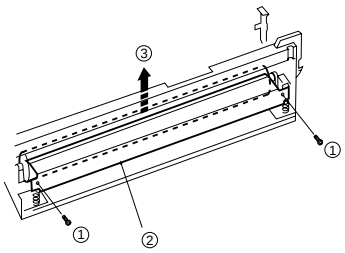
9 	• Conduct procedure 5. (3)(4) Remove the screw. (5)Remove the thermistor. • Replace the thermistor.

4) Replacement of the separation finger (upper/lower)

10 	(1)Open the fuser exit cover. (2)Remove the screws (x 2). (3)Remove the separation finger (upper) bracket.
11 	(1) Remove the separation finger (upper) spring. (2) Remove the separation finger (upper). • Replace the fingers (x 5).
12 	(1)Remove the screw (x1) and fuser exit cover pin then remove the exit cover. (2)Remove the screws (x 2). (3)Remove the duplex guide roller block and bracket together.

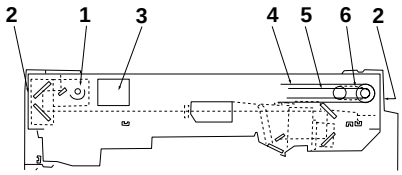
13  	(1) Remove the spring (x 2). (2) Turn the separation fingers and remove them (x 5).

5) Replacement of the pressure roller/roller bearing

14  	• Remove the heat roller (refer to step 5 to 7). • Remove the separation finger upper/lower brackets (refer to 10 and 12). Mark the current height adjustment to use as a reference during re-assembly. (1) Remove the screws (x 2). (2) Remove the entry guide. (3) Remove the pressure roller. • Remove the roller bearing.

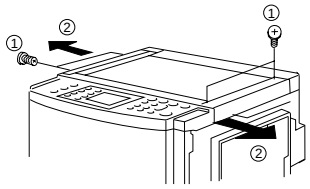
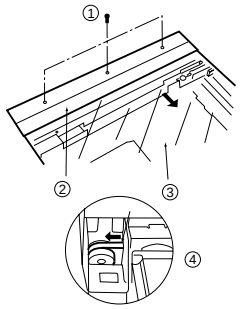
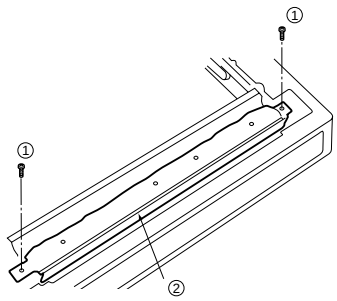
(5) Optics unit

Item		Part name	Cycle
	1	Exposure lamp	120K
	2	Filter A	120K
	2	Filter B	120K
	3	Optics filter	120K
	4	Full speed unit drive belt	✻
	5	Half speed unit drive belt	✻
	6	Optics drive belt	✻

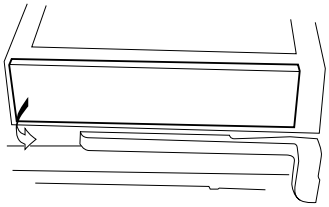


✻: As required

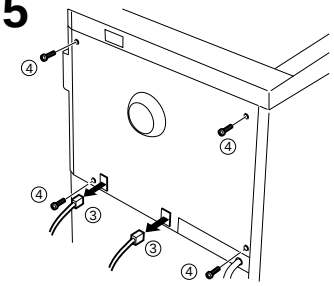
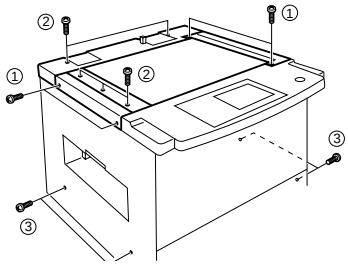
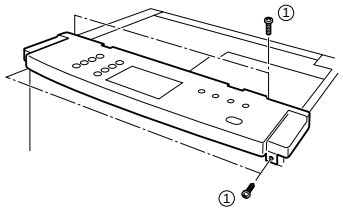
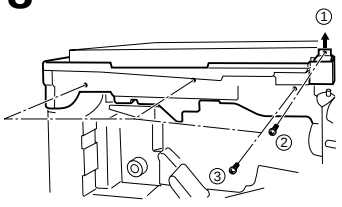
1) Replacement of the exposure lamp

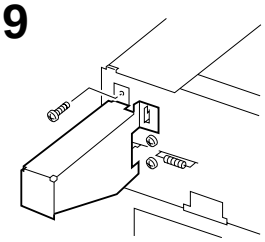
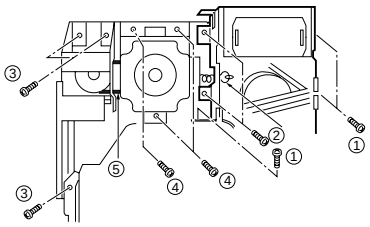
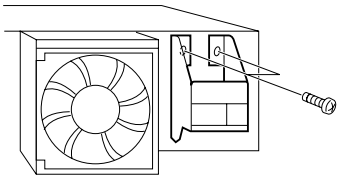
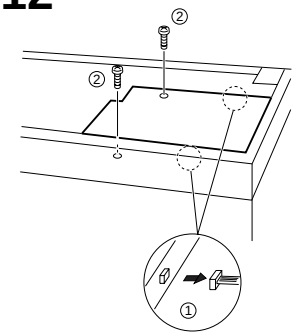
1 	Remove upper covers (left/right).
2 	(1) Remove the screws (x 3). (2) Remove the original guide. (3) Remove the platen glass. (4) Move the full speed unit to the right.
3 	(1) Remove the screws (x 2). (2) Remove the main reflector. Remove the exposure lamp and replace it.

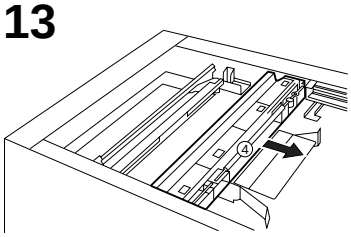
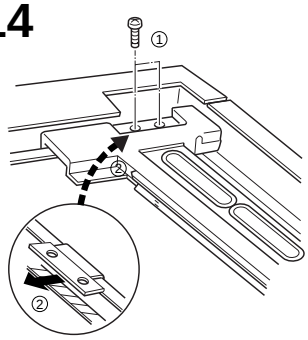
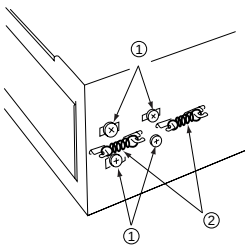
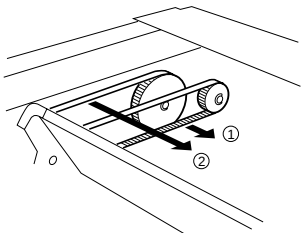
2) Replacement of filter A and B. Replacement of the optics fan filter

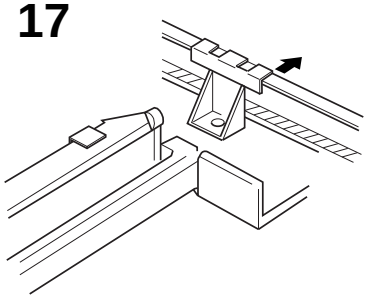
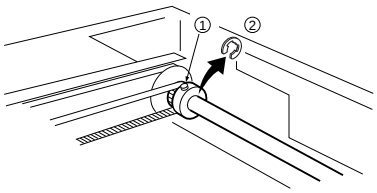
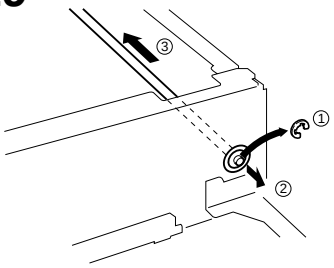
4 	• Conduct the procedure 1. Remove both left and right copier side covers. • Peel off the dust prevention filter and replace it with new one.

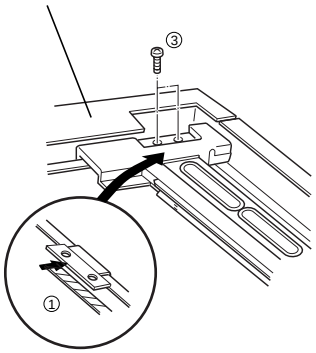
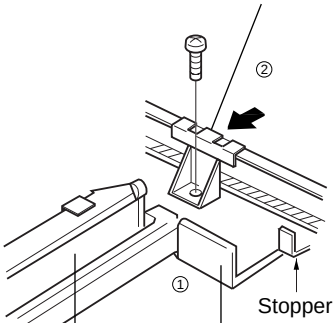
3) Replacement of the optics motor belt/full-speed unit drive belt/half speed unit drive belt

5 	(1) Remove the platen cover (or ADF/i-ADF if installed). (2) Remove the copier front cover (refer to page 4-18 step 1). (3) Disconnect the lattice connectors of any options (System Console and LCC). (4) Remove the rear cover (7 screws).
6 	(1) Remove the copier top left and right covers (4 screws). (2) Remove the original guide, platen glass and top rear cover (5 screws). (3) Remove the copier left and right covers (4 screws).
7 	Remove the control panel ass'y. (1) Remove the 4 screws. (2) Disconnect the 2 connectors. (3) Remove the ground wire (1 screw).
8 	(1) Swing the toner hopper ass'y 180 degrees to the right. (2) Remove the right side control panel ass'y bracket (1 screw). (3) Remove the inner front cover (3 screws).

9 	Remove the left side control panel ass'y bracket. (1 screw).
10 	(1) Remove the ADF lattice connector bracket (5 screws). (2) Remove the optics motor tension spring. (3) Remove the left ADF hinge receiving bracket/key counter receptacle bracket (3 screws). (4) Remove the optics drive motor (3 screws). (5) Remove the optics drive motor belt.
11 	Remove the right hinge receiving bracket (2 screws).
12 	Remove the optics cover. (1) Disconnect the 2 connectors. (2) Remove the 2 screws.

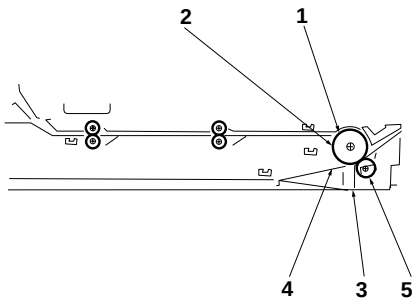
13 	Move the full-speed unit to right until it stops.
14 	(1) Remove the 2 screws on the full-speed unit support (each side). (2) Remove the full-speed unit belt fixing plate (each side).
15 	(1) Loosen the four idler pulley brackets (2 screws each). (2) Remove the four optics drive belt tension springs.
16 	Remove the optics drive belts from the idler pulleys (4 belts).

17 	Disconnect the drive belts from both sides of the half-speed unit.
18 	Loosen the hex screws and remove the E rings in the optics drive shaft pulleys (each side).
19 	(1)Remove the E rings (each side). (2)Remove the bearings (each side). (3)Slide the optics drive shaft to the rear, and remove it. (4)Replace the optics drive belts (when one requires replacement, we recommend replacement of complete set of four, due to the complexity of the process).

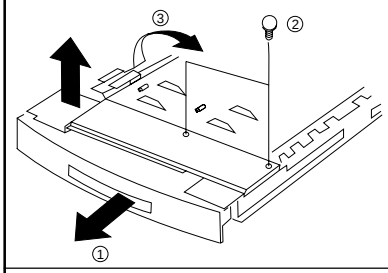
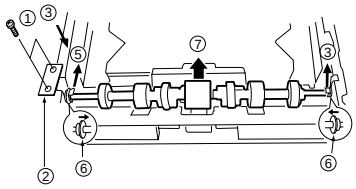
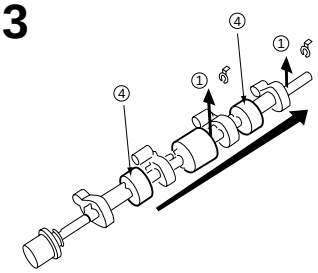
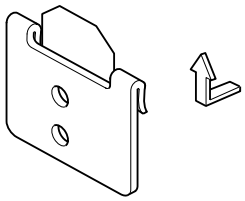
20  	Connect the full-speed unit drive belt (1) Install the belt fixing plate on the full-speed unit drive belt (each side). (2) Move the full-speed unit to right until it stops. (3) Tighten screws on the full-speed belt fixing plate. (each side)
21  	Connect the half-speed unit drive belt (1) Move the half-speed unit to right until it stops. (2) Connect the half speed drive belts (each side). Note: If the half-speed unit has not touched the stopper after the belt is connected, loosen screw on the half-speed unit support plate and adjust the half-speed unit position.

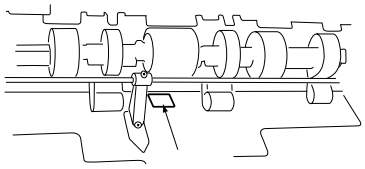
(6) Automatic duplex unit (ADU)

Item		Part name	Cycle
	1	Paper feed roller	24K
	2	Storage roller	48K
	3	F/R mylar	24K
	4	Paper feed pad	24K
	5	DFP roller	24K

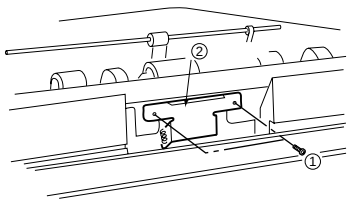
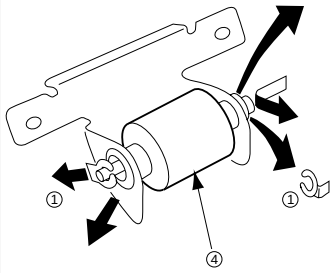


1) Replacement of the paper feed roller/storage roller/F/R mylar/feed roller pad

1 	(1) Pull out the ADU until it stops. (2) Remove the upper cover (2 screws). (3) Lift the transport guides (1 and 2).
2 	(1) Remove the screws (x 2). (2) Remove the stopper plate. (3) Remove the touch rings from the guide plates. (4) Disconnect the feed clutch connector. (5) Remove the touch rings (x2). (6) Move the bearing toward the feed rollers. (7) Remove the paper feed roller shaft.
3 	(1) Remove the touch ring. (2) Remove all rollers by pulling in the arrow direction. (3) Replace the paper feed roller. (4) Replace the storage rollers.
4 	• Take off the F/R mylar (kit) and replace it. Note: Perform step 7 first.

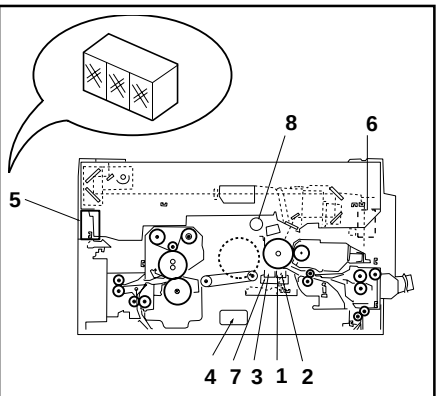
5 	• Conduct procedure 1 and 2. • Peel off the paper feed pad and replace it.

2) Replacement of the DFP roller

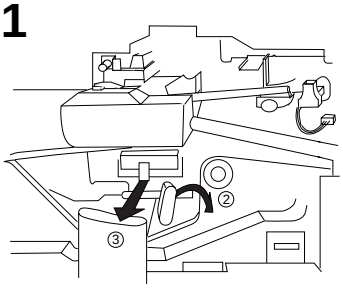
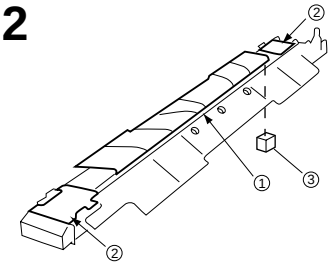
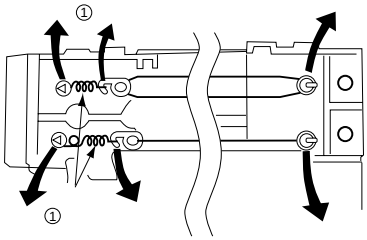
6  	• Conduct procedure 1. (1)Remove the screws (x 2). (2)Remove the DFP roller block.
7  	(1)Remove the touch rings (x 2). (2)Remove the bearing. (3)Remove the roller shaft. (4)Remove the DFP roller. Note: When re-installing the DFP roller, marked position is front side.

(7) Main body

Item		Part name	Cycle
	1	Corona cleaner	120K
	2	Transfer wire	120K
	3	Separation wire	120K
	4	Ozone filter	240K
	5	Ozone filters	240K
	6	Dust collecting filter (Main body)	240K
	7	Transfer chager	360K
	8	Discharge lamp	240K

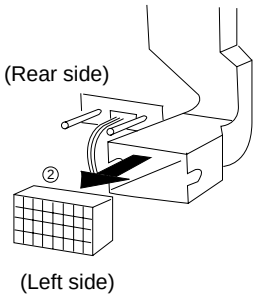


1) Replacement of the charger wire/wire cleaner felt

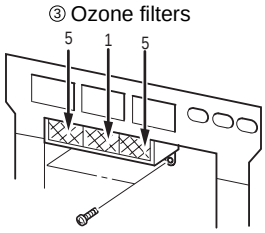
1 	(1)Open the front cover. (2)Turn the transport lever and lower the transport unit. (3)Press down the transfer charger and draw it toward you.
2 	• Remove the transfer corona. (1)Remove the paper guide. (2)Remove the charger cover. (3)Replace the transfer wire cleaner felt. Note: When the transfer charger is installing, slide the wire cleaner felt to rear side until it stops.
3 	• Replace the transfer corona wire and the separation corona wire with new one. (1)Remove the corona wire spring. (2)Unfasten the corona wire.

2) Remove the suction fan and the ozone filter to replace them with new ones.

4



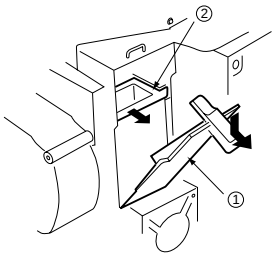
(1) Remove the rear cover.
(2) Replace the ozone filter.



(3) Replace the filters.
- Open the front cover.
- Remove the exit cover. (2 screws, more if sorter-equipped).
- Remove the filter holder (1 screw).
- Replace the filters.
- Re-assemble in the reverse.

3) Replacement of the dust collecting filter

5

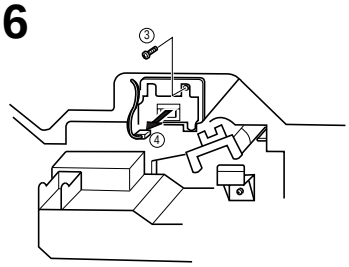


- Remove the copier rear cover.

(1) Remove the filter cover.
(2) Remove the dust collecting filter and replace it.

4) Replacement of the discharge lamp.

6



(1) Open the front cover.
(2) Turn the toner hopper 180°.
(3) Remove the 1 screw.
(4) Disconnect the harness.
(5) Remove the lamp holder.
(6) Replace the discharge lamp (Filter and 3 screws).

V. Troubleshooting

5.1 Service Mode

In Service mode, the technician can check for abnormalities in the copier so the copier can always operate normally. The input/output of major components in every section can be checked.

To select the service mode

The service mode is selected when USER PRESET, Multi-Copy key 3 and Original Size A3 keys are simultaneously pressed, then F1 will appear in the display.
(If copier is abnormal, then F4 will appear in the display.)

To reset the service mode

The service mode is reset when USER PRESET and CLEAR/STOP keys are pressed simultaneously.

NOTE: After servicing, if the copier is left in the F mode and shut off, when the copier is turned ON again, it will still be in the F mode.

The reset program must be used to reset the F mode.

(1) Service mode functions

Service mode	Item	Function
F1	Display check	Indicators and display check. NOTE: Message display is turned ON and OFF.
F2	Single sheet copying	For single copy operation.
F3	Continuous copying	For continuous copy operation.
F4	Input/Output check	The functioning of Input/Output items (selected item numbers) is checked.
F5	Copier function programming	Various function settings (selected by code numbers) can be changed.
F6	Adjustment and programming	same as above
F7	Electronic counter	Reads or Resets the electronic counter.
F8	Copier operating adjustment	Perform pseudo-operation of an item (selected by code numbers).
F9	Telephone number program	Input the telephone number.

(2) Service mode procedure

F1 appears in the display when the service mode is first turned ON.

Mode	Multi-Copy key	Item	Function	Remarks
F1	1	Display check	When the Print key is pressed, all displays light up.	It stops when the Clear/Stop key is pressed.
F2	2	Single sheet copying	1. One sheet is copied when the Print key is pressed. 2. Duplex mode (1 sided original, 2 sided copy or 2 sided original, 2 sided copy) a. Select the 1 sided original 2 sided copy or 2 sided original, 2 sided copy mode. b. One sheet is copied when the Print key is pressed. The first side is copied and fed into the duplex unit tray. c. When the Print key is pressed again, the second side is copied and fed to the copier exit tray. d. Repeat procedures b) and c). 3. Book original, 2 sided copy mode. a. Select the Book original, 2 sided copy mode. b. One sheet is copied normally when the Print key is pressed. c. When the Print key is pressed again, One sheet is copied and fed into the duplex unit tray. d. When the Print key is pressed again, the second side is copied and fed to the copier exit tray.	1. For both F2 and F3 the total and electronic counter are disabled. 2. When in F3, press the Clear/Stop key to stop the copy process. 3. In F2 and F3 with paper in the drawer the misfeed circuit is enabled. 4. If no paper is in drawer, the misfeed circuit is disabled. 5. In both F2 and F3, the ADF and Sorter can operate.

(To be continued)

Mode	Multi-Copy key	Item	Function	Remarks
		Single sheet copying	e. Repeat procedures b) and d). 4. 2 sided original, 1 sided copy mode. a. Select the 2 sided original, 1 sided copy mode. b. One sheet is copied normally when the Print key is pressed. c. Repeat item b).	
F3	3	Continuous copying	1. Multi copying is initiated by pressing the Print key. 2. Duplex mode (1 sided original, 2 sided copy or 2 sided original, 2 sided copy) a. Select the 1 sided original 2 sided copy or 2 sided original, 2 sided copy mode. b. 50 sheets are copied when the Print key is pressed, and fed into the duplex unit tray. c. When the Print key is pressed again, the second side is copied and fed to the copier exit tray. d. Repeat procedures b) and c). 3. Book original, 2 sided copy mode. a. Select the Book original, 2 sided copy mode. b. 50 sheets are copied normally when the Print key is pressed. c. When the Print key is pressed again, One sheet is copied and fed into the duplex unit tray. d. When the Print key is pressed again, the second side is copied and fed to the copier exit tray. 4. 2 sided original, 1 sided copy mode. a. Select the 2 sided original, 1 sided copy mode. b. 50 sheets are copied normally when the Print key is pressed. c. Repeat item b).	

(3) F4 mode

1) Input check.

Set the copier to service mode and press Multi-Copy key “4”.

↓

Press Print key.

↓

Select desired code number with Multi-Copy key.

↓

Press Print key.

↓

Check arrow mark on the touch panel display.

↓

Press Clear/Stop and User Preset key to escape service mode.

Code No.	Function	Condition	Message display							
			7	6	5	4	3	2	1	0
00	a) Duplex unit tray detecting sensor	Duplex unit tray is installed.					↑			
	b) Duplex unit detecting sensor	Duplex unit is detected.			↓					
01	a) Registration roller paper pass sensor	Paper is not detected.								↑
	b) Mirror home position sensor	Mirror unit in home position.					↑			
	c) Lens home position sensor	Lens unit in home position.				↑				
	d) Duplex unit paper width home position sensor	Paper guide (A) (for width) in home position.			↑					
	e) Duplex unit paper length home position sensor	Paper guide (B) (for length) in home position.		↑						
02	a) Copier front cover	Cover closed.					↓			
	b) Developer unit detecting sensor	Developer unit is detected.			↓					
	c) +5V line error signal	+5V line is defective.		↓						
03	Original size detection sensor	Ledger/A3		↑		↑		↑		↑
		Legal/B4-FLS		↑		↓		↑		↑
		Letter/A4		↓		↑		↑		↑
		Letter R/A4R		↑		↓		↓		↑
		Invoice/A5		↓		↓		↓		↑

Code No.	Function	Condition	Message display							
			7	6	5	4	3	2	1	0
04	a) Sheet bypass paper detecting sensor	Paper is not detected.								↑
	b) Sheet bypass paper size detection sensor	Ledger/A3					↑	↓	↑	
		Legal/B4-FLS					↑	↑	↑	
		Letter/A4					↑	↓	↓	
		Letter R/A4R					↓	↑	↓	
		Invoice/A5					↑	↑	↓	
	c) Platen open/close sensor	Platen is open.				↓				
	d) Platen angle sensor	Platen is open more than 30 degrees.			↓					
	e) Copier paper feed cover	Cover closed.	↑							
05	a) Developer cooling fan motor	Motor is locked.								↑
	b) +10V line error signal	+10V line is defective.							↓	
	c) Discharge lamp error signal 1	Lamp is not lit.						↓		
	d) Discharge lamp error signal 2	Lamp is not lit.					↓			
	e) Dust collecting fan motor	Motor is locked.				↑				
	f) Suction fan motor	Motor is locked.			↑					
	g) High voltage leak detection (Separation corona)	High voltage leak is not detected. (Normal)		↑						
	h) High voltage leak detection (Charge corona)	High voltage leak is not detected. (Normal)	↑							
06	a) Toner level detection	Toner is empty								↑
	b) Toner bottle position sensor	When the toner bottle is not in the proper position.							↓	
	c) Copier paper exit sensor	Paper is not detected.						↑		
	d) Total counter	Total counter is not connected.		↑						
	e) Key counter	Key counter is not installed.	↑							

Code No.	Function	Condition	Message display							
			7	6	5	4	3	2	1	0
07	a) Exhaust fan motor 1	Motor is locked.								↑
	b) Exhaust fan motor 2	Motor is locked.							↑	
	c) Optics fan motor 1	Motor is locked.						↑		
	d) Optics fan motor 2	Motor is locked.					↑			
	e) Optics fan motor 3	Motor is locked.				↑				
	f) Exhaust fan motor 3	Motor is locked.			↑					
08	a) Duplex unit paper pass sensor 1	Paper is not detected.								↑
	b) Duplex unit paper pass sensor 2	Paper is detected.							↑	
	c) Duplex unit paper detecting sensor	Paper is not detected.						↑		
09	a) Paper detection sensor (Copier lower paper tray)	Paper is not detected.								↑
	b) Paper limit sensor 2 (Copier lower paper tray)	Paper is full.							↑	
	c) Paper pass sensor (Copier lower paper tray)	Paper is not detected.						↑		
	d) Paper level sensor 1 (Copier upper paper tray)	Paper is empty or tray is pulled out.					↑			
	e) Paper level sensor 2 (Copier lower paper tray)	Paper is empty or tray is pulled out.	↑							
	f) Paper limit sensor 2 (Copier upper paper tray)	Paper is full.			↑					
	g) Paper detection sensor (Copier upper paper tray)	Paper is not detected.				↑				
	h) Paper pass sensor (Copier upper paper tray)	Paper is not detected.		↑						
10	Reserve									

Code No.	Function	Condition	Message display							
			7	6	5	4	3	2	1	0
11	a) System console motor signal	Motor is locked.						↑		
	b) System console paper feed cover sensor	Cover is closed.					↓			
	c) Paper detection sensor 3 (System console lower paper tray)	Paper is not detected.				↑				
	d) Paper limit sensor 3 (System console lower paper tray)	Paper is over stocked.			↑					
	e) Paper pass sensor 3 (System console lower paper tray)	Paper is not detected.		↑						
12	a) Paper detection sensor 2 (System console middle paper tray)	Paper is not detected.								↑
	b) Paper limit sensor 2 (System console middle paper tray)	Paper is over stocked.							↑	
	c) Paper pass sensor 2 (System console middle paper tray)	Paper is not detected.						↑		
	d) Paper detection sensor 1 (System console upper paper tray)	Paper is not detected.				↑				
	e) Paper limit sensor 1 (System console upper paper tray)	Paper is over stocked.			↑					
	f) Paper pass sensor 1 (System console upper paper tray)	Paper is not detected.		↑						
13	a) Paper level sensor 1 (System console upper paper tray)	Paper is empty or paper tray is pulled out.					↑			↑
	b) Paper level sensor 2 (System console middle paper tray)	Paper is empty or paper tray is pulled out.							↑	
	c) Paper level sensor 3 (System console lower paper tray)	Paper is empty or paper tray is pulled out.						↑		
	d) System console detecting sensor	System console is detected.		↓						

Code No.	Function	Condition	Message display							
			7	6	5	4	3	2	1	0
14	a) LCC detecting sensor 1	LCC is not installed.						↑		
	b) LCC door open/close sensor	Door closed.					↓			
	c) LCC detecting sensor 2	LCC is pulled out.				↑				
	d) LCC paper tray lower limit sensor	Paper tray is beyond the lower limit.			↑					
	e) LCC paper tray upper limit sensor	Paper tray is beyond the upper limit.		↑						
	f) LCC paper level sensor	Paper is full.	↑							
15	a) Corona cleaner home position sensor	Cleaner in home position.						↑		
	b) Waste toner bottle full sensor	Toner is full.					↑			
16,17		Not used								
18	For FA-A505									
	a) Encoder sensor	Signal is detected. (When driving the transport belt)				↑				
	b) Original detection sensor	Original is detected.								↑
	c) Original feed pass sensor	Original is detected.							↓	
	d) Original exit pass sensor	Original is detected.						↓		
	e) ADF open/close sensor	ADF is opened.					↓			
	For FA-A888									
	a) Registration roller pass sensor	Original is not detected.								↓
	b) Original reverse detection sensor	Original is not detected.							↓	
	c) Timing sensor	Original is not detected.						↓		
	d) ADF open/close sensor	ADF is opened.			↓					
	e) Entry cover open/close sensor	Cover is closed.		↑						
	f) Exit cover open/close sensor	Cover is closed.	↑							
19	For FA-A888									
	a) Original size detection sensor	Ledger/A3						↑	↓	↑
		Legal/B4-FLS						↑	↑	↑
		Letter/A4						↑	↓	↓
		Letter R/A4R						↑	↑	↓
		Invoice/A5						↑	↑	↑
	b) Original detection sensor	Original is detected.					↓			

Code No.	Function	Condition	Message display							
			7	6	5	4	3	2	1	0
20	For FA-S575									
	a) Motor clock sensor	Signal is detected.								↑
	b) Bin ass'y upper/lower limit switch	Bin is beyond the upper limit or beyond the lower limit.							↓	
	c) Cable safety switch	Cable is not loose.						↑		
	d) Bin ass'y position sensor 2	Bin ass'y position is not placed correctly.					↑			
	e) Bin ass'y position sensor 1	Bin ass'y position is top Bin ass'y. (#1 bin)				↓				
	f) Paper exit sensor	Paper is not detected.			↑					
	g) Paper feed sensor	Paper is not detected.		↑						
	For FA-S615									
	a) Bin lower limit switch	Bin is placed less than lower limit.					↑			
	b) Bin cam home position sensor	Cam in home position.				↑				
	c) Tamper home position sensor	Bar in home position.			↑					
	d) Transfer motor clock sensor	Clock signal is detected.		↑						
21	For FA-S575									
	a) Sorter detection switch	Sorter is pulled out.								↑
	For FA-S615									
	a) Bin paper detecting sensor	Paper is not detected.				↑				
	b) Paper detection sensor for JAM	Paper is not detected.			↑					
	c) Stapler detection sensor	Stapler is not installed.		↑						
22	For FA-S680									
	a) Sorter interlock switch	Sorter is installed.					↑			
	b) Paper transport cover open/close	Cover opened.				↑				
23	For FA-S680									
	a) Bin home position switch	Bin in home position					↑			
	b) Bin cam switch	Bin cam in home postion				↑				
	c) Tamper home position sensor	Tamper in home position			↑					

Code No.	Function	Condition	Message display							
			7	6	5	4	3	2	1	0
24	For FA-S680 a) Bin paper detecting sensor	Paper is detected.					↑			
	b) Paper pass sensor	Paper is detected.				↑				
	c) Staple detecting sensor	Staple is detected			↑					
25	For FA-S680 a) Stapler cam sensor	Cam in home position.					↑			
	b) Stapler swing home position sensor	Stapler swing in home position.				↑				
	c) Staple position sensor	Stapler in staple position.			↑					
	d) Stapler safety switch	Switch is not detected. (Switch turns on)		↑						

2) Output check*

Activate the door switch before executing output check.

Press the Print key to start and press the Clear/Stop key to reset.

Code	Item	Function
26	Timing roller clutch	When CN8-12 is +24V, clutch operates.
27	Sheet bypass paper feed solenoid	When CN5-6 is +24V, solenoid operates.
28	Sheet bypass paper feed clutch	When CN5-2 is +24V, clutch operates.
29	Main motor	When CN12-5 is +24V, motor rotates. (HVPS, developer unit, discharge lamp and eraser lamp turn ON.)
30	Registration roller clutch	When CN5-4 is +24V, clutch operates.
31	Main fuser lamp	When CN203-4 is AC line level, lamp lights up.
32	Sub fuser lamp	When CN203-6 is AC line level, lamp lights up.
33	Exposure lamp	When CN202-2 is AC line level, lamp lights up. Lamp turns off after 2 seconds.
34	Ozone/suction fan, developer unit cooling fan (Except FP-7818) and dust collecting fan	When CN8-1 is +24V, ozone/suction fan rotates. When CN8-2 is +24V, dust collecting fan rotates. When CN8-7 is +24V, developer cooling fan rotates.
35	Recycling solenoid (Except FP-7818)	When CN7-11 is +24V, solenoid operates.
36	Paper exit selection solenoid (Except FP-7818/7824)	When CN116-2 is +24V, solenoid operates.
37	Exhaust fan motor 1	When CN106-3 is +24V, fan motor 2 rotates.
38	Exhaust fan motor 2	When CN106-6 is +24V, fan motor 2 rotates.
39	Optics fan motor 1 and 4	When CN106-9 is +24V, fan motor 1 rotates. When CN106-12 is +24V, fan motor 4 rotates.
40	Optics fan motor 2 (Except FP-7818) Exhaust fan motor 3 (Except FP-7818) Lift motor (FP-7818)	When CN107-3 is +24V, fan motor 2 rotates. When CN107-6 is +24V, fan motor 3 rotates. When CN109-2 is +24V, lift motor rotates.
41	Drum separator solenoid (FP-7845/7850) Paper feed solenoid (FP-7818)	When CN102-2 is +24V, solenoid operates. When CN111-20 is +24V, solenoid operates.
42	Total counter	When CN112-2 is +24V, count up by one.

* Accessory checks require the selected accessory to be ready (Cover closed, etc.)

Code	Item	Function
43	Key counter	When CN119-6 is +24V, count up by one.
44	Not used	
45	+24V output control	When signal is sent from CPU CN1-6 to LVPS CN117-5, +24V is supplied to +24V line.
46	Lift motor 1 (When duplex unit is not installed.) (Except FP-7818)	When CN603-1 is +24V, motor rotates, lifting up (together with upper limit control.)
47	Paper feed clutch 1 (When duplex unit is not installed.) ADU clutch (When duplex unit is installed) (Except FP-7818)	When CN610-3 is +24V, clutch operates.
48	Paper feed solenoid 1 (When duplex unit is not installed.) ADU clutch (When duplex unit is installed) (Except FP-7818)	When CN610-4 is +24V, solenoid operates.
49	Lift motor 2 (Except FP-7818)	When CN604-2 is +24V, motor rotates, lifting up (together with upper limit control.)
50	Paper feed clutch 2 (Except FP-7818)	When CN609-3 is +24V, clutch operates.
51	Paper feed solenoid 2 (Except FP-7818)	When CN609-4 is +24V, solenoid operates.
52	Duplex unit drive motor (Storage)	When CN654-3 is +24V, motor rotates to storage direction.
53	Duplex unit drive motor (Paper feed)	When CN654-6 is +24V, motor rotates to second paper feed direction.
54	Lift motor 1 (System console upper)	When CN603-2 is +24V, motor rotates, lifting up (together with upper limit control.)
55	Paper feed clutch 1 (System console upper)	When CN610-3 is +24V, clutch operates.
56	Paper feed solenoid 1	When CN610-4 is +24V, solenoid operates.
57	Lift motor 2 (System console middle)	When CN604-2 is +24V, motor rotates, lifting up (together with upper limit control.)

Code	Item	Function
58	Paper feed clutch 2 (System console middle)	When CN609-3 is +24V, clutch operates.
59	Paper feed solenoid 2 (System console middle)	When CN609-4 is +24V, solenoid operates.
60	Lift motor 3 (System console lower)	When CN605-2 is +24V, motor rotates, lifting up (together with upper limit control.)
61	Paper feed clutch 3 (System console lower)	When CN608-3 is +24V, clutch operates.
62	Paper feed solenoid 3 (System console lower)	When CN608-4 is +24V, solenoid operates.
63	Option paper feed clutch	When CN602-1 is +24V, clutch operates.
64	Option paper feed drive motor	When CN602-7 is +24V, motor rotates.
65	LCC paper feed solenoid (Except FP-7818/7824)	When CN564-2 is +24V, solenoid operates.
66	LCC paper feed tray lift (up) (Except FP-7818/7824)	When CN563-1 is +24V, motor rotates, lifting up (together with upper limit control.)
67	LCC paper feed tray lift (down) (Except FP-7818/7824)	When CN563-2 is +24V, motor rotates, dropping down (together with upper limit control.)
68-72	Not used	
73	Transport belt motor forward rotation 1 (FA-A888/FA-A505)	The transport belt rotates forward. (High speed)
74	Transport belt motor forward rotation 2 (FA-A888)	The transport belt rotates forward. (Middle speed)
75	Transport belt motor forward rotation 3 (FA-A888)	The transport belt rotates forward. (Low speed)
76	Transport belt motor reverse rotation (FA-A888/FA-A505)	The transport belt rotates reverse.

Code	Item	Function
77	Paper feed motor forward rotation (FA-A888)	The motor rotates forward.
78	Paper feed motor reverse rotation (FA-A888)	The motor rotates reverse. (High speed)
79	Paper feed motor reverse rotation (FA-A888)	The motor rotates reverse. (Middle speed)
80	Paper feed motor reverse rotation (FA-A888)	The motor rotates reverse. (Low speed)
81	Paper reverse/exit motor forward rotation (FA-A888)	The motor rotates forward. (High speed)
82	Paper reverse/exit motor forward rotation (FA-A888)	The motor rotates forward. (Middle speed)
83	Paper reverse/exit motor forward rotation (FA-A888)	The motor rotates forward. (Low speed)
84	Wait plate and paper feed solenoid (FA-A888/FA-A505)	The solenoid operates.
85	Reverse solenoid (FA-A888)	The solenoid operates.
86	Not used	
87	Not used	
88	Transport/paper feed motor (Sorter)	The motor rotates.
89	Bin movement for down direction (Sorter)	The #20 bin position moves forward #1 bin position.
90	Bin movement for up direction (Sorter)	The #1 bin position moves forward #20 bin position.
91	Tamper drive motor (only Staple Sorter)	The tamper moves to staple minimum size and return to the original position
92	Staple motor (only Staple Sorter)	The stapler operates one time then resets.

Code	Item	Function
93	Staple ready indicator (LED) (only Staple Sorter)	The ready indicator lights up.
94	Stapler swing motor (only Staple Sorter)	The swing motor drives in and out.

(4) F5 mode Copier function programming

Set the copler to service mode and press Multi-Copy key “5”.

↓

Press Print key.

↓

Select desired code number with touch panel display and touch the OK key.

If you wish to select other code number, scroll the menu with arrow keys (← →).

↓

Select desired function with touch panel display and touch the OK key.

When the CANCEL key is touched, the desired code input will not be accepted.

↓

Press Clear/Stop and User Preset key to escape service mode.

Code	Item	Function	(Factory setting)
0	Country version	0: Japanese 1: North American 2: European/Others	 1 (for American) 2 (for European)
1	Frequency desired	0: 50 Hz 1: 60 Hz	0 (for European) 1 (for American)
2	Auto reset timer	0: None 1: 45 second 2: 1 minute 3: 2 minute	2
3	Energy saver timer	0: 15 m 1: 30 m 2: 60 m 3: 1.5 h 4: 2 h 5: 3 h 6: 4 h 7: No energy saver timer	0 (for American) 7 (for European)
4–6	Not used		
7	Message display language change (Except FP-7818/7824)	0: Japanese 5: Spanish 1: English 6: Swedish 2: German 7: Finnish 3: French 8: Dutch 4: Italian 9: Portuguese	1
8	Not used		
9	Fuser lamp phase control	0: Zero cross control 1: Phase control	0
10	Optics cooling fan control	0: Normal operation 1: Control mode (Fan operates when a predetermined amount of copies are made.)	1
11	Copy reservation function	0: Not detecting 1: Detecting	1
12	Not used		

Code	Item	Function	(Factory setting)
13	Auto off timer	0: No auto off timer 1: 30 m 2: 60 m 3: 1.5 hr 4: 3 hr 5: 4 hr	0 (for European) 1 (for American FP-7818) 2 (for American FP-7824/7830/7835) 3 (for American FP-7845/7850)
14	Copy paper size setting (copier paper tray upper)	0: None 1: Ledger/A3 2: Legal/B4 3: Letter/A4 4: Letter - R/A4R 5: Invoice/A5	1
15	Copy paper size setting (copier paper tray,lower)	same as F5-14	1
16	Copy paper size setting (System console, upper)	same as F5-14	0
17	Copy paper size setting (System console, middle)	same as F5-14	0
18	Copy paper size setting (System console, lower)	same as F5-14	0
19	Not used		
20	ADF (Automatic document feeder)	0: Cancellation of ADF 1: ADF installation automatically discriminated	1
21	Sorter	0: Cancellation of sorter 1: Sorter installation automatically discriminated	1
22	System console	0: Cancellation of system console 1: System console installation automatically discriminated	1
23	LCC (3000 sheet paper tray)	0: Cancellation of LCC 1: LCC installation automatically discriminated	0 (FP-7818/7824) 1 (FP-7830/7835/7845/7850)
24	Not used		
25	Copy density sensor read*	0: Not detecting 1: Detecting	1
26	Duplex unit	0: Cancellation of duplex unit 1: Duplex unit installation automatically discriminated	0 (FP-7818) 1 (FP-7824/7830/7835/7845/7850)
27	Total copy count (Except FP-7818) In case of mis-feed in second side copy for two side copy, copy number is/not counted.	0: Does not count up 1: Count up	0

* (for Qualitative Reasoning Based Adaptive Controller)

Code	Item	Function	(Factory setting)
28	Total copy count (Except FP-7818) Checking double feed by comparison between in/out copies.	0: Does not count up 1: Count up	0
29	Not used		
30	Skyshot mode (Using ADF)	0: not change registration void position 1: change registration void position	1
31	ADF switch back	0: No 1: Yes	0
32	SADF function	0: No 1: Yes	0
33	F_2, ADF operation (in case of no originals)	0: not operated 1: operated	0
34	Multi-feed default	0: off 1: on	0
35	Sorter initial mode setting	0: Non sort 2: Staple sort 1: Sort 3: Group	0
36	Paper alignment function (Except sort mode)	0: Yes 1: No	0
37	Countdown sorting function	0: No 1: Yes	1
38	Duplex unit initial mode setting (Except FP-7818)	0: Does not select 1: 1 sided to 2 sided 2: 2 sided to 2 sided 3: Book to 2 sided	0
39	Staple position default (FP-7845/7850)	0: Single front 1: double 2: Single rear	0
40	Double count (Total counter, Key counter, and Electronic counter)	0: Single 1: Ledger/A3 2: Ledger/Legal/A3/B4	1
41	Count up timing	0: At paper feed roller clutch (and sheet bypass solenoid) 1: At paper exit sensor	1
42	Key counter and Departmental counter	0: Not installed 1: Key counter installed 2: Departmental counter	0
43	Key counter count up timing	same as F5-41	0
44	Counter count up (Interleaving, cover mode)	0: Does not count up 1: Count up	0
45	Hole punch default	0: No 1: Yes	0
46	Hole punch indication change	0: 2 holes 1: 3 holes 2: 4 holes	1 (for American) 2 (for European)

Code	Item	Function	(Factory setting)
47-49	Not used		
50	Auto exposure default	0: Not detecting 1: Auto mode priority 2: Manual mode priority	2
51	2 in 1 mode copy ratio setting	0: Full size 1: Reduction	1
52	Auto original size detecting sensor	0: No detection - Priority (Manual key LED lit) 1: Detection - Priority (Manual key LED off) 2: Manual key status LED lit/off held in memory when power switch OFF	0 (FP-7818/7824) 1 (FP-7830/7835/7845/7850)
53	Auto shift (Duplexing)	0: No auto shift 1: Auto shift	0
54	Reduction ratio (Margin mode)	0: 100 % 1: 95 % 2: 93 % 3: 91 %	0
55	Margin value Initial setting	0: 5mm 1:10 mm 2:15 mm 3: 20 mm	1
56	Edge value Initial setting	0: 5mm 1:10 mm 2:15 mm 3: 20 mm	0
57	Book value Initial setting	0: 15mm 1: 20 mm 2: 25 mm 3:30 mm	1
58	Copier operation (After “U14” waste toner bottle is full)	0: Copier stops or copy cycle is inhibited. 1: Continuous copier operation	0
59	Copier operation (After “U13” Toner bottle empty detection)	0: Copier stops or copy cycle is inhibited. 1: Continuous copier operation	0
60	Auto paper tray selection	0: Manual 1: Auto	1
61–62	Not used		
63	U13 clear=After toner empty detection (Copier stops or copy cycle inhibited)	0: When clearing U13, press any key. 1: Press RESET key and AUTO EXPOSURE key.	0
64	Not used		
65	Toner recycling system operation cycle (Refresh cycle) (Except FP-7818/7824)	Number of copies for operating timing of Refresh mode. 0: 500/100 1: 1,000/100 2: 100/100 3: 300/100 4: No recycling	0
66	Interleave default	0: Blank 1: Copy	0
67	Page Insertion mode initial setting (FP-7845/7850)	0: Blank paper 1: Copied paper	0
68	Cover mode default (FP-7845/7850)	0: Front blank 1: Front copy 2: Front/back blank 3: Front/back copy	0
69	Not used		

Code	Item	Function	(Factory setting)
70	Preventive maintenance	0: No call 1: 1.5K 2: 2.5K 3: 5K 4: 10K 5: 15K 6: 20K 7: 30K 8: 40K 9:60K 10: 80K 11: 90K 12: 120K 13: 160K	10 (FP-7818/7824) 12 (FP-7830/7835/7845/7850)
71	Preventive maintenance (Duplex unit)	0: No indication 1: Indication	1
72	Copier operation (After cleaning web roller counter is reached to 0)	0: Continuous copier operation 1: Copier stops or copy cycle is inhibited.	1
73	Cleaning web roller counter selection	0: 120k 1: 80k	0 (FP-7830/7835/7845/7850) 1 (FP-7818/7824)
74–79	Not used		
80	Paper size selection priority	0: LETTER R/A4R 1: LEGAL/B4 2: LETTER/A4 3: LEDGER/A3 4: INVOICE/B5R 5: INVOICE/B5	0
81	B4/Foolscap size selection	0: B4 1: Foolscap 1 2: Foolscap 2 3: LD	0
82	Sky shot mode	0: OFF 1: M1 ON 2: M2 ON 3: M1, M2 ON	0
83	Auto edge default	0: OFF 1: ON	1
84	Paper tray selection priority (Left to Right)	0: LCC > System (lower to upper) > Copier (lower to upper) > Sheet bypass 1: Copier (upper to lower) > System (upper to lower) - LCC - Sheet bypass 2: LCC > Copier (upper to lower) > System (upper to lower) > Sheet bypass	0
85	Auto selection prohibition paper tray setting (1)	0: None 1: Copier (upper) 2: Copier (lower) 3: System console (upper) 4: System console (middle) 5: System console (lower) 6: LCC 7: Sheet bypass	0
86	Auto selection prohibition paper tray setting (2)	same as F5-85	0
87-89	Not used		
90	Beep sound (FP-7845/7850)	0: None 1: Yes	1
91*	Check size M1 Y	Width of paper parallel position to paper feed direction	160
92*	Check size M1 X	Length of paper vertical position to paper feed direction	70
93*	Check size M2 Y	Width of paper parallel position to paper feed direction	220

Code	Item	Function	(Factory setting)
94*	Check size M2 X	Length of paper vertical position to paper feed direction	95
95	Factory use size unit change	0: AB, Janpanese 1: inch 2: AB, European	1 (for American) 2 (for European)
96-97	Not used		
98	Factory use paper size sensor change	0: Yes 1: No	1
99	Not used		

* F6-91~94; check size = (input value x 5) mm.
* F6-91, 93; Even number only.

To Clear the Service Call indicator

Re-input the F5-70 and F5-73.

Set the copier to service mode and press Multi-Copy key “5”

↓

Press Print key.

↓

Scroll the display menu until code number 70 is indicated with arrow keys (← →), then touch “70” key.

↓

Touch desired PM cycle key and OK key.

When the CANCEL key is touched, the desired PM cycle will be not accepted.

↓

Scroll the display menu until code number 73 is indicated with arrow keys (← →), then touch “73” key.

↓

Touch desired PM cycle key and OK key.

When the CANCEL key is touched, the desired PM cycle will be not accepted.

↓

Press Clear/Stop and User Preset key to escape service mode.

(5) F6 mode Adjustment and programming

Set the copier to service mode and press Muiti-Copy key “6”.

↓

Press Print key.

↓

Select desired code number with touch panel display and touch the OK key.
If you wish to select other code number, scroll the menu with arrow keys (← →).

↓

The display will indicate memorized number.

↓

Input the new setting number with Multi-Copy key or Up/Down key.
Increase: Multi-Copy key or Up key of touch panel display
Decease: Reset and Multi-Copy key or Down key of touch panel display

↓

The OK key is touched on the touch panel display, the memory number changed is now in memory.
When the CANCEL key is touched, the desired code input will not be accepted.

↓

Press Clear/Stop and User Preset key to escape service mode.

Code	Item	Function		Remarks
00	100% selection (Ratio of vertical and parallel position to the paper feed direction) (standard = 100%)	Adjustment from 99.1% to 100.9%	0.10% (–9 to +9) (+): Enlargement (–): Reduction	
01	Just 100% (Ratio of parallel position to the paper feed direction)	Adjustment of ratio for parallel position. (L/T)	0.10% (–9 to +9)	
02	100% focus	Adjustment of focus.	(–50 to +50)	
03	Just 100% (Ratio of vertical position to the paper feed direction)	Adjustment of lens stop position by lens home position. (S/S)	(–50 to +50) (+): Enlargement (–): Reduction	
04	Original registration detecting timing (Reduction and Enlargement copying)	Adjustment of original registration detection timing .	0.2mm (–30 to +30) (+): Delayed (–): Advanced	*If you adjust the content of F8-02 mode, the content of F6-04mode is automatically changed from the factory setting.

Code	Item	Function		Remarks
05	Copy paper registration detecting timing	After 04 is adjusted, delay time is adjusted from timing roller clutch ON.	0.425mm (FP-7850/7818) 0.375mm (FP-7845) 0.525mm (FP-7824/7830/7835) (–30 to +20) (+): Delayed (–): Advanced	*same as F6-04
06	LED array synchronized timer for trimming function	After 04 is adjusted, synchronized timer is adjusted.	0.425mm (FP-7850/7818) 0.375mm (FP-7845) 0.525mm (FP-7824/7830/7835) (–20 to +20)	
07	Registration void of image (LED array synchronized timer)	After 05 and 06 are adjusted, registration void is adjusted.	0.425mm (FP-7850/7818) 0.375mm (FP-7845) 0.525mm (FP-7824/7830/7835) (0 to +99)	
08	Trail edge timing of original image (Reduction)	After 06 is adjusted, black line is adjusted. (–) Advanced (+) Delayed	0.425mm (FP-7850/7818) 0.375mm (FP-7845) 0.525mm (FP-7824/7830/7835) (–9 to +30)	
09	Trail edge timing of copy image (Enlargement)	same as F6-08	0.425mm (FP-7850/7818) 0.375mm (FP-7845) 0.525mm (FP-7824/7830/7835) (–9 to +9)	
10	Not used			
11	Exposure standard	Adjustment of overall exposure standard	0.18V (–99 to +99)	
12	Photo mode exposure voltage change	Adjustment of Photo mode exposure voltage	0.4V (–99 to +99)	
13	Zoom exposure (50% Reduction) (standard = 4.7V)	In reduction mode, the exposure voltage is adjusted in proportion to the difference between the reduction and 100% ratio.	0.4V (–9 to +9)	
14	Zoom exposure (200% Enlargement) (standard = 5.4V)	In enlargement mode, the exposure voltage is adjusted in proportion to the difference between the enlargement and 100% ratio.	0.4V (–9 to +9)	

Code	Item	Function		Remarks
15-16	Not used			
17	Grid standard voltage (standard = –810V)	Adjustment of grid standard voltage.	–2.28V (–99 to +99)	
18	Photo mode grid voltage (standard = –480V)	Adjustment of photo standard voltage.	–2.28V (–99 to +99)	
19	Bias standard voltage (standard = –250V)	Adjustment of bias standard voltage	–2.1V (–50 to +50)	
20	Not used			
21	Toner density sensor gain voltage (standard = 6.51V)	Adjustment of toner density sensor gain. voltage	0.033V (–49 to +54)	
22–23	Not used			
24	Copy density rank adjustment (D mode light side)	Adjust copy density rank change for document mode (Light side)	(–99 to +99)	
25	Copy density rank adjustment (D mode dark side)	Adjust copy density rank change for document mode (Dark side)	(–99 to +99)	
26	Toner density sensor judgment voltage level (standard = 2.5V)	Adjustment of toner supply starting judgment voltage level.	19.5mV (–26 to +26)	
27	Toner recycle switch judgment level	Adjustment of toner density sensor judgment level (Recycle or collection)	19.5mV (–10 to +10)	(Except FP-7818/7824)
28	White density adjustment*	Adjustment of standard white density level*	–30 to +40	
29	Black density adjustment*	Adjustment of standard black density level*	–99 to +99	
30	Not used			
31	Fuser temperature	Adjustment of fuser temperature.	0.7 C (–15 to +15) (+): Lower (–): Raise	
32	Original density light peak of auto original density level	The level is adjusted in proportion to the difference between the light peak and standard level.	1% (–99 to +99)	
33~35	Not used			
36	Registration of original for the automatic document feeder (1-side original feeding)	Adjustment of registration timing	0.4mm (A888) 0.65mm (A505) (–32 to +32)	

* (for Qualitative Reasoning Based Adaptive Controller)

Code	Item	Function		Remarks
37	Registration of original for the automatic document feeder (2-side original feeding)	Adjustment of registration timing	0.4mm (–32 to +32)	with A888
38	Image density (black level) judgment standard voltage	Adjustment of judgment standard voltage.	19.5mV (–99 to +99)	
39-40	Not used			
41	Paper loop (Sheet bypass)	Adjustment for length of the loop formed before the copier timing roller.	1.25ms. (–40 to +40)	0.8mm (FP-7850) 0.7mm (FP-7845) 0.5mm (FP-7835/ 7830/7824) 0.4mm (FP-7818)
42	Paper loop (ADU)	same as F6-41 *When installed duplex unit, second copy feeding.	1.25ms. (–50 to +50)	0.7mm (FP-7850/7845) 0.4mm (FP-7835/ 7830/7824/7818)
43	Paper loop (Except FP-7818) (Copier paper tray lower)	same as F6-41	1.25ms. (–50 to +50)	0.7mm (FP-7850/7845) 0.4mm (FP-7835/ 7830/7824)
44	Paper loop (System console)	Adjust the length of the loop formed before the registration roller of system console.	1.25ms. (–50 to +50)	0.7mm (FP-7850/7845) 0.4mm (FP-7835/ 7830/7824/7818)
45	Paper loop LCC (Except FP-7818/7824)	same as F6-41	1.25ms. (–50 to +50)	0.7mm (FP-7850/7845) 0.4mm (FP-7835/7830)
46	Paper feeding (ADU)	Adjustment of registration timing	10.0ms. (–50 to +50)	5.4mm (FP-7850/7845) 3.3mm (FP-7835/ 7830/7824/7818)
47	Paper feeding (Copier paper tray, lower)	same as F6-46	10.0ms. (–50 to +50)	same as F6-46
48	Paper feeding (System console, upper)	same as F6-46	10.0ms. (–50 to +50)	same as F6-46
49-50	Not used			
52	Reduction mode focus	This must be adjusted if this focus changes after adjustment of F6-02.	(–9 to +9)	
53	Enlargement mode focus	This must be adjusted if this focus changes after adjustment of F6-02.	(–9 to +9)	

Code	Item	Function		Remarks
54	Registration void of image (During use with ADF = NO swing back condition)	Adjustment of registration void.	0.425mm (FP-7850/7818) 0.375mm (FP-7845) 0.525mm (FP-7835/7830/7824) (0 to +99)	
55	Original stop position (2 in 1 mode) (FA-A888)	Adjustment of original stop position from original guide plate	0.4mm (–32 to +32)	with A888
56	Original interval (2 in 1 mode) (FA-A888)	Adjustment of original interval timing	0.7mm (–16 to +8)	with A888
57	Registration width guide standard position (Duplex)	Adjustment of registration width guide position	0.39mm (–10 to +10)	(Except FP-7818)
58	Registration length guide standard position (Duplex)	Adjustment of registration length guide position	0.31mm (–12 to +12)	(Except FP-7818)
59	Not used			
60-61	Not used			
62	Toner density sensor gain voltage	Adjustment of toner density sensor gain voltage	0.033V (–5 to +5)	
63	Limitation of maximum copy number	Selection of maximum copy number of continuous copy mode	0 to 99	
64	Not used			
65	Black density sensor reference voltage compensation	Reference voltage for black density sensor	–99 to +99	
66	Black density sensor output gain/compensation	Compensate value for black density sensor output	–99 to +99	
67	Copy density rank adjustment (P mode light side)	Adjust copy density rank change for photo mode (Light side)	–99 to +99	
68	Copy density rank adjustment (P mode dark side)	Adjust copy density rank change for photo mode (Dark side)	–99 to +99	
69	Not used			
70	LCD contrast adjustment	Reference voltage adjustment for LCD contrast	–46 to +18 60mV	(FP-7850/7845)
71	Coordinates compensation for touch panel (X1)	Coordinates compensation value (X1 point)	–50 to +50 0.5mm	(FP-7850/7845)
72	Coordinates compensation for touch panel (Y1)	Coordinates compensation value (Y1 point)	–99 to +99 0.5mm	(FP-7850/7845)
73	Coordinates compensation for touch panel (X2)	Coordinates compensation value (X2 point)	–50 to +50	(FP-7850/7845)
74	Coordinates compensation for touch panel (Y2)	Coordinates compensation value (Y2 point)	–99 to +99	(FP-7850/7845)

Code	Item	Function		Remarks
75-79	Not used			
80	Automatic compensation value (Read only) Exposure voltage	Set by Qualitative Reasoning Based Adaptive Controller	–81 to +92 0.18V	
81	Not used			
82	Automatic compensation value (Read only) Grid voltage	Set by Qualitative Reasoning Based Adaptive Controller	–92 to +55 2.28V	
83-98	Not used			
99	F5/F6 Initialization	Return to factory setup		Factory Use Only

(6) F7 mode electronic counter

Read procedure

Set the copier to service mode and press Multi-Copy key “7”.

↓

Press Print key.

↓

Select the desired code number with Multi-Copy key.

↓

Indicates memorized count in the electric counter.

↓

Press Clear/Stop and User Preset key to escape service mode.

Code	Item	Function
00	A code No. of specific department manager	Identification code number for access counter of user choice mode
01 - 20	Not used	
21	Total count	Total count of all copies
22	Preventive maintenance total count	PM count of all copies. NOTE: When the service call indicator turns ON, the PM count is cleared.
23	Developer count	Total elapsed copies since the last developer change.
24–25	Not used	
26	Fuser cleaning web count	Possible number of copies until replacement of web roller.
27 - 32	Not used	
33	ADF original feed total count	Total count of originals fed.
34	Duplex unit copy total count	Total count of duplex unit copies.
35	Sheet bypass count	Total count of sheet bypass paper fed.
36	Copier lower paper drawer count	Total count of copies from the lower drawer of the copier.
37	System console upper paper drawer count	Total count of upper stage of optional system console.
38	System console middle paper drawer count	Total count of upper stage of optional system console.

Code	Item	Function
39	System console lower paper drawer count	Total count of upper stage of optional system console.
40	LCC count (3000 sheet paper drawer)	Total count of optional LCC
41	Copier upper paper drawer count (When duplex unit is not installed.)	Total count of copies from upper paper drawer of the copier. NOTE: When the duplex unit is installed to/upper stage of copier, this code No. 05 does not count up.
42 - 50	Not used	

(7) F8 mode copier operation adjustment

Set the copier to service mode and press Multi-Copy key “8”.

↓

Press Print key.

↓

Select the desired code number with Multi-Copy key.

↓

Adjust the selected mode according with instructed procedure.

↓

Press Clear/Stop and User Preset key to escape service mode.

Code	Item	Function
00	Exposure lamp replacement	When replacing the exposure lamp. Procedure: a) Press the Print key then this function moves the lamp to the position (approx. 450mm from the optics home position) where it can be replaced. b) To return the optical system to the optics home position, press the Clear/Stop key.
01	Original registration adjustment copy	This function automatically makes six copies for checking the original registration, consisting of three 100% and 200% copies. Procedure: a) Position the Panasonic Test chart-53/54 on the platen glass. b) Press the Print key.
02	Measurement input for adjusting the original registration	This function measures the registration that was copied using "01". The original registration is corrected by input of the resulting measured value. Procedure: a) Press the Print key. b) Measure the registration on the three 200% copies that were made using "01". c) Multiply the average measured value obtained from these three copies by 10, then input the product using the Multi-Copy key. d) Press the Print key. e) Measure the registration on the three 100% copies that were made using "01". f) Same as c). g) Press the Print key. At this time, the registration is calculated so the registration of both the 200% and 100% copy matches, then the resulting registration is memorized.

Code	Item	Function
02		h) This adjustment may cause the factory setting of F6-04 to change, so check the F6-04 setting once more. If it has changed, transfer the revised value the memory sheet. i) After completing this adjustment, check F6-05 once more.
03-05	Not used	
06	Machine error and Paper jam read	a) Each time the Recall key is pressed, 30 machine error or paper jam codes stored in memory are displayed, beginning with the code stored first. b) Again, press the Reset key. 5 codes per minute are displayed on the LCD, beginning with the code stored first. NOTE: When stored codes more than 30, only the most recent 30 are displayed.
07	Machine error and Paper jam code read (06) clear	a) Press the Reset key. A Message "Error code can be cleared with the Print key" is displayed on the LCD. b) Press the Print key.
08	Lock operation of mirror and lens	a) Press the Print key then the mirror and lens unit move to locked position for transporting the copier. b) When the mirror and lens unit are locked, any digit key input won't be accepted. NOTE: The lock operation is automatically reset when the Power switch is turned ON again.
09	Automatic gain adjustment of toner density sensor This adjustment must always be performed when replacing new developer.	a) Press the Print key and the gain voltage and judgment level of the toner density sensor is automatically set in approx. 2 minutes. b) This adjustment may cause the factory setting of F6-21 and 26 to change, so check F6-21 and 26 settings once more. If they have changed, transfer the revised values to the memory sheet.
10	Drum charge voltage checking	This function automatically confirms the drum bias voltage without paper of F3 mode because the LED array always lights up. Procedure: a) Press the Print key to make copies. b) Press the Clear/Stop key to clear.
11	Original registration adjustment copy (2)	This function automatically makes 2 copies (both 100% and 200%) same as F8-01 mode.

Code	Item	Function
12	Not used	
13	Black density sensor reference level adjustment (Factory use only)	(Factory use only / Need special fixtures)
14	Black density sensor output gain adjustment	This adjustment should be performed when installing the copier, cleaning/replace black density sensor or replacing the drum. Procedure : a) Press the Print key b) Adjustment value is automatically stored at F6-65
15	Not used	
16	LCD touch panel key input position adjustment	This adjustment is to compensate the LCD touch panel detecting position corresponding key input.
17	ADU paper infeed positioning adjustment	This function automatically adjusts paper guide positioning. When “Print” is pressed, paper feeds into the ADU and stops. **NOTE**: Remove paper after this procedure.
18 - 20	Not used	

(8) F9 Telephone# input

Set the copier to service mode and press Multi-Copy key “9”.

↓

Press Print key.

↓

Touch INPUT key on the touch panel display.

↓

Input the telephone number.

Number: Multi-Copy key

Hyphen (–): Reset key

Space: Interrupt key

Carousal moving

to left side: A5 key of Original size

to right side: A5 key of Copy size

↓

The OK key is touched, the new telephone number is now in memory.

↓

Press Clear/Stop and User Preset key to escape service mode.

5.2 Self-diagnostics/Machine Malfunctions

The self-diagnostic functions detect troubles in important components of the copier. When any trouble occurs, the copier is stopped.

1. User error

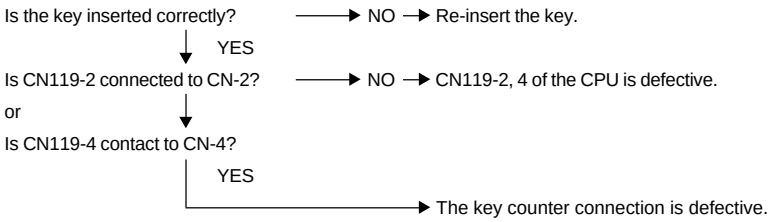
NOTE: XXXX will appear in message display.

Error code	Message	Item	See page
Uo	INSERT KEY or INPUT IDENTIFICATION CODE XXX	Key counter failure (option) or Access code number was not input	4-34
U1	CLOSE FRONT PANEL	Front cover failure	4-34
U4	CLOSE SORTER	Sorter failure (option) Sorter won't close securely.	4-34
U5	CLOSE DUPLEX UNIT	Duplex unit failure	4-34
U6	CLOSE RIGHT SIDE PANEL	Copier paper feed cover failure	4-35
U7	CLOSE RIGHT SIDE PANEL	System console (option) paper feed cover failure	4-35
U10	CLOSE ADF	ADF (option) failure	4-35
U11	CLEAR SORTER BINS	Sorter copy paper removal NOTE: When clearing U11, all paper is removed from bins.	4-35
U12	ADD STAPLES	Sorter with stapler	4-36
U13	ADD TONER	Toner level detection	4-36
U14	REPLACE WASTE TONER BOTTLE	Waste toner bottle full	4-36
U16	INSTALL DEVELOPER UNIT	Developer unit is not installed	4-36
U17	—	Sorter transport cover failure	4-36
U18	—	Copy usage is upper limited.	4-36

Error code	Message	Item	See page
oF	SORTER FULL-EMPTY PRESS MODE KEY	If too many copies in bin or too many bins selected. Remove copies and press the each sorter mode key on the touch panel.	4-37
	Not ready (Red LED flashes)	Power saving The ready indicator will light and the other displays are turned OFF. To clear the Stand-by mode, press the Print key.	----------
	Not ready (Red LED lights)	Auto off The ready indicator will flash and the other displays are turned OFF. To clear the Power saving mode, press the Print key.	----------

(1) U0: Key counter failure or Access code number was not input

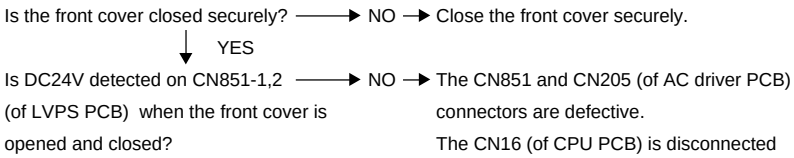
*The copier does not indicate READY TO COPY when the key is inserted.



*Access code number was not input.
Input access code number.

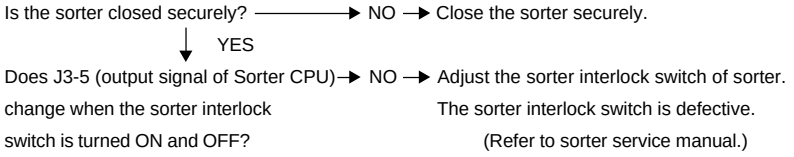
(2) U1: Front cover failure

*The copier does not indicate READY TO COPY when the front cover is closed.



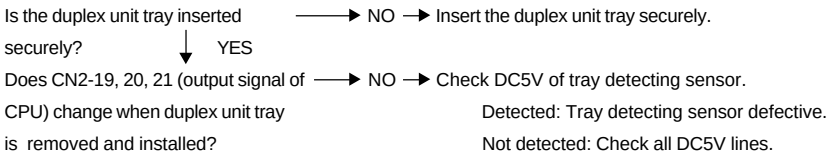
(3) U4: Sorter failure (option)

*The copier does not indicate READY TO COPY when the sorter is installed.



(4) U5: Duplex unit failure

*The copier does not indicate READY TO COPY when the duplex unit is installed.



(5) U6: Copier paper feed cover failure

*The copier does not indicate READY TO COPY when the copier paper feed cover is closed.

Is the paper feed cover closed securely? → NO → Close the paper feed cover securely.
↓ YES
Does CN5-7, 9, 11 (output signal of CPU) → NO → Check DC5V of the tray detecting sensor.
change when the paper feed cover is opened and closed?
Detected: Cover sensor is defective.
Not detected: Check DC5V line.

(6) U7: System console (option) paper feed cover failure

*The copier does not indicate READY TO COPY when the system console paper feed cover is closed.

Is the paper feed cover closed securely? → NO → Close the paper feed cover securely.
↓ YES
Does CN611 (output signal of system console driver) change when the paper feed cover is opened and closed? → NO → Check DC5V of the system console driver.
Detected: Cover sensor is defective.
Not detected: Check DC5V line.
↓ YES
System console drive PCB is defective.
(Refer to system console Service Manual)

(7) U10: ADF (option) failure

*The copier does not indicate READY TO COPY when the original is placed onto the original feed tray.

Is the ADF closed securely? → NO → Close the ADF securely.
↓ YES
Is the ADF entry cover closed securely? → NO Close the entry cover securely.
↓ YES
Is the ADF exit cover closed securely? → NO Close the exit cover securely.
↓ YES
Refer to the ADF Service Manual.

(8) U11: Sorter copy paper removal

*When the Staple Sort or Sort mode is selected:

Copies are already in at least one bin.
Any bin receives more than 25 copies as a result of the use of the ADF.
Any bin receives a copy which is an unsuitable size for stapler use.
Any bin receives a double feed from the duplex unit.

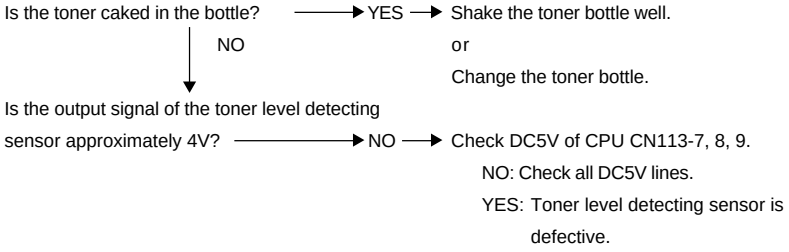
NOTE: To clear U11, all paper must be removed from all bins.

(9) U12: Sorter with stapler

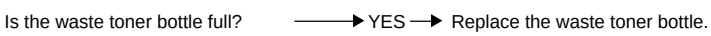
*When the stapler mode is selected, and a staple cartridge is not inserted.

(10) U13: Toner level detection

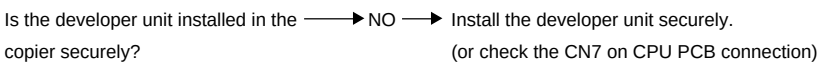
*"U13" does not reset after replacing the toner bottle.



(11) U14: Waste toner bottle full

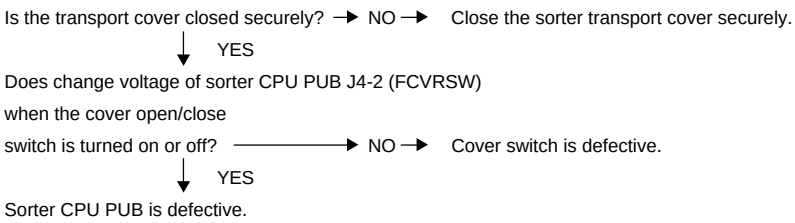


(12) U16: Developer unit failure



(13) U17: Sorter transport cover failure (FA-S680)

The copier does not indicated READY TO COPY when the transport cover is closed.



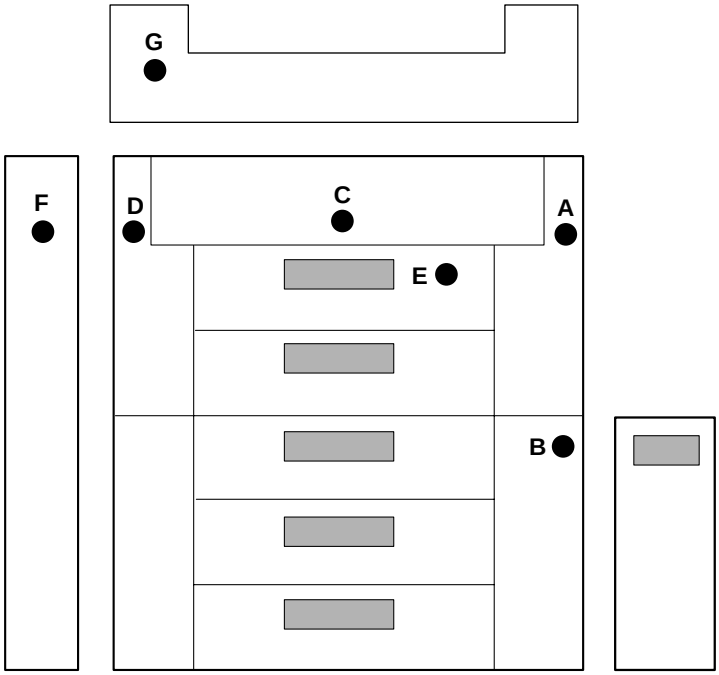
(14) U18: Copy usage is upper limited

Please consult department key operator.

(15) oF: Sorter bin capacity failure

*Too many copies in at least one bin or too many bins selected.

Did the number of copies exceed the bin capacity? → YES → Remove copies and press the Sorter mode select key.



2. Paper Jam

Jam read code	Condition	Jam position
J00	The registration roller paper pass sensor does not detect paper within a predetermined time after sheet bypass paper feed roller starts rotating.	A
J01	The copier upper paper feed unit paper pass sensor 1 does not detect paper within a predetermined time. When the duplex unit is not installed: After copier upper stage paper feed roller starts rotating. When the duplex unit is installed: After duplex unit paper feed roller starts rotating.	 A A, E
J02	The copier lower paper feed unit paper pass sensor 2 does not detect paper within a predetermined time after copier lower stage paper feed roller starts rotating.	A
J03	Optional system console upper paper feed unit paper pass sensor 1 does not detect paper within a predetermined time after upper stage paper feed roller starts rotating.	B
J04	Optional system console middle paper feed unit paper pass sensor 2 does not detect paper within a predetermined time after middle stage paper feed roller starts rotating.	B
J05	Optional system console lower paper feed unit paper pass sensor 3 does not detect paper within a predetermined time after lower stage paper feed roller starts rotating.	B
J06	When optional LCC is installed. The copier lower stage paper pass sensor 2 does not detect paper within a predetermined time after LCC pick-up roller starts rotating.	A
J07	Paper feeding from the copier lower paper tray or optional LCC or system console: The copier upper stage paper pass sensor 1 does not detect paper within a predetermined time after copier lower stage paper pass sensor detected paper.	A
J08	Paper feeding from the optional system console upper stage: The copier lower stage paper pass sensor 2 does not detect paper within a predetermined time after optional system console upper stage paper pass sensor 1 detected paper.	A, B
J09	a) Paper feeding from the optional system console middle stage: The copier lower stage paper pass sensor 2 does not detect paper within a predetermined time after optional system console middle stage paper pass sensor 2 detected paper. b) Paper feeding from the optional system console lower stage: The copier lower stage paper pass sensor 2 does not detect paper within a predetermined time after optional system console lower stage paper pass sensor 3 detected paper.	B
J10	Not used	
J11	The copier upper stage paper pass sensor 1 is detecting paper within a predetermined time. a) Paper feeding from copier upper stage: b) Paper feeding from duplex unit:	 A A, E

Jam read code	Condition	Jam position
J12	Paper feeding from copier lower stage: The copier lower stage paper pass sensor 2 is detecting paper within a predetermined time after first detecting paper.	A
J13	Paper feeding from optional system console upper stage: Upper stage paper pass sensor 1 is detecting paper within a predetermined time after first detecting paper.	B
J14	Paper feeding from optional system console middle stage: Middle stage paper pass sensor 2 is detecting paper within a predetermined time after first detecting paper.	B
J15	Paper feeding from optional system console lower stage: Lower stage paper pass sensor 3 is detecting paper within a predetermined time after first detecting paper.	B
J16	Paper feeding from optional LCC: The copier lower stage paper pass sensor 2 is detecting paper within a predetermined time after first detecting paper.	A
J17	When fixed quantity paper passed on the registration roller paper pass sensor. a) The copier paper pass sensor 1 or 2 is detecting paper. b) Optional paper pass sensor 1 or 2 or 3 is detecting paper.	 A B
J18	Paper feeding except from sheet bypass: The registration roller paper pass sensor does not detect paper within a predetermined time after copier upper stage paper pass sensor 1 detected paper.	A
J19-20	Not used	
J21	Copier upper stage paper pass sensor 1 is detecting paper.	A
J22	Copier lower stage paper pass sensor 2 is detecting paper.	A
J23	Optional system console upper paper pass sensor 1 is detecting paper.	B
J24	Optional system console middle paper pass sensor 2 is detecting paper.	B
J25	Optional system console lower paper pass sensor 3 is detecting paper.	B
J26-29	Not used	
J30	Paper feeding from sheet bypass: The registration roller paper pass sensor is detecting paper within a predetermined time after sensor detected paper.	C
J31	Paper feeding except from sheet bypass: The registration roller paper pass sensor is detecting paper within a predetermined time after registration roller starts rotating.	C
J32	Not used	
J33	The registration roller paper pass sensor is detecting paper.	C
J34-39	Not used	
J40	The paper exit sensor does not detect paper within a predetermined time after registration roller starts rotating.	C, D
J41	The paper exit sensor is detecting paper within a predetermined time after sensor detected paper.	D
J42	The paper exit sensor is detecting paper.	D
J43-49	Not used	

Jam read code	Condition	Jam position
J50	Transport operation for duplexing The duplex unit paper pass sensor 1 does not detect paper within a predetermined time after copier paper exit sensor detected paper.	D
J51	Transport operation for duplexing The duplex unit paper pass sensor 1 is detecting paper within a predetermined time after sensor detected paper.	D, E
J52	Transport operation for duplexing The duplex unit paper pass sensor 2 does not detect paper within a predetermined time after paper pass sensor 1 detected paper.	D, E
J53	Transport operation for duplexing The duplex unit paper pass sensor 2 is detecting paper within a predetermined time after sensor detected paper.	D, E
J54	The duplex unit paper pass sensor 1 is detecting paper.	D
J55	The duplex unit paper pass sensor 2 is detecting paper.	D
J56	The duplex unit paper detecting sensor does not detect paper after copies are fed into the duplex unit tray.	
J57-59	Not used	
J60	When the sorter is installed. a) The sorter entry paper pass sensor does not detect paper within a predetermined time after copier paper exit sensor detected paper. b) The sorter paper exit sensor does not detected paper within a predetermined time after sorter entry paper pass sensor detected paper. c) The sorter entry or exit paper pass sensor is detecting paper. d) For FA-S575 The sorter exit paper pass sensor does not detect paperwithin a predetermined time after sorter entry paper pass sensor detected paper. e) For FA-S575 The sorter exit paper pass sensor is detecting within a predetermined time after sensor detected paper.	 D, F F F F F
J70	When ADF is installed. a) The ADF entry paper pass sensor does not detect paper within a predetermined time after ADF paper feed roller starts rotating. b) The ADF entry paper pass sensor is detecting paper within a predetermined time after sensor detected paper. c) The ADF entry paper pass sensor is detecting paper before using ADF.	 G G
J71	a) The ADF exit paper pass sensor does not detect paper within a predetermined time after ADF starts paper exit. b) The ADF exit paper pass sensor is detecting paper within a predetermined time after sensor detected paper. c) The ADF exit paper pass sensor is detecting paper before using ADF.	G G G
J72	(FA-A888) a) The ADF exit paper pass sensor does not detect paper within a predetermined time after ADF starts reverse operation. b) The ADF exit paper pass sensor is detecting paper within a predetermined time after sensor detected paper.	

3. Machine error

The machine system will detect problems in important areas of the copier. When any problems occurs the copier stops.

Error codes indicate the mode number and code number which are alternately displayed in "Digit" display area of touch screen.

When there is trouble in any part of the copier, the "MACHINE ERROR TURN POWER SW OFF/ON" appears in the "Message" display.

(1) Error code display functions

E1: Optical unit error

Code	Function	Refer page
E1-01	Optical unit scan operating	5-46
E1-20	Lens ratio operating	5-46
E1-21	Mirror ratio operating	5-47
E1-23	F8-02 mis-input	5-47
E1-32	Auto original density detection	5-47
E1-40	Optics fan motor (1) rotation	5-48
E1-41	Optics fan motor (2) rotation	5-48
E1-43	Optics fan motor (4) rotation	5-48

E2: Paper feed unit error

Code	Function	Refer page
E2-01	Lift motor rotation 1 (Copier upper tray)	5-48
E2-02	Lift motor rotation 2 (Copier lower tray)	
E2-03	Lift motor rotation 3 (System console upper)	
E2-04	Lift motor rotation 4 (system console middle)	
E2-05	Lift motor rotation 5 (system console lower)	
E2-06	Optional LCC lift operation (UP)	5-49
E2-07	Optional LCC lift operation (DOWN)	
E2-10	System console motor rotation manual	

E3: Developer unit and Hopper unit error

Code	Function	Refer page
E3-01	Toner bottle motor rotation	5-50
E3-03	Toner density sensor gain	5-50
E3-10	High voltage power supply leak (1)	5-51
E3-11	High voltage power supply leak (2)	5-51
E3-20	Main motor rotation	5-51
E3-21	Dust collection fan motor rotation	5-52
E3-22	Exhaust fan motor rotation	5-52
E3-23	Suction fan motor rotation	5-52
E3-30	Discharge lamp	5-52
E3-40	Copy density sensor output detection	5-52
E3-50	Transfer cleaner operation	5-53

E4: Fuser unit error

Code	Function	Refer page
E4-01	Fuser warm-up	5-53
E4-10	Exhaust fan motor (1) rotation	5-54
E4-11	Exhaust fan motor (2) rotation	5-54
E4-12	Exhaust fan motor (3) rotation	5-54

E5: System (+24V/+10V) error

Code	Function	Refer page
E5-01	Vp (+24V) line	5-54
E5-04	Vo (+10V) line	5-55
E5-10	+5V (for EPA)	5-55
E5-21	ADF communication abnormal	5-55
E5-22	Sorter communication abnormal	5-55
E5-23	Control panel communication abnormal	5-55
E5-41	Registration timing control circuit abnormal	5-56
E5-42	Total counter connection	5-56
E5-50	Communication error	5-56

E6: Duplex unit error

Code	Function	Refer page
E6-03	Paper length home position detecting sensor	5-56
E6-04	Paper width home position detecting sensor	5-57
E6-05	Paper detecting sensor	5-57

E7: Optional unit error

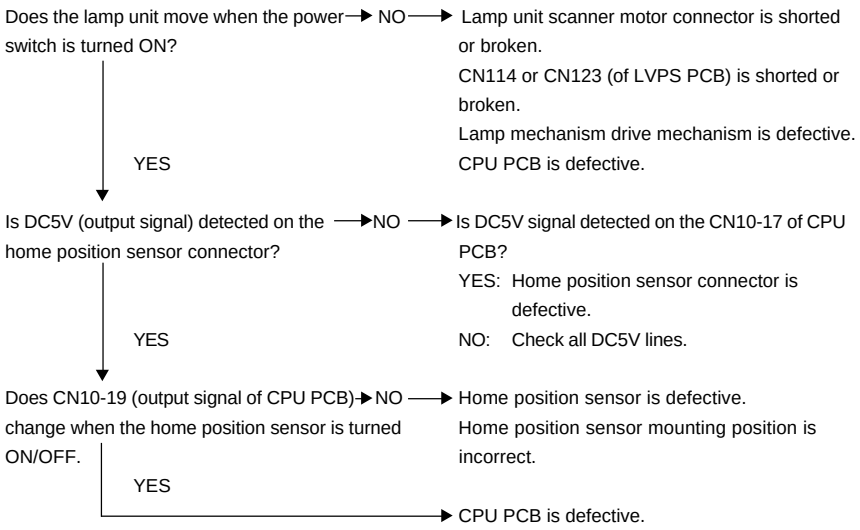
*These errors are indicated when options are installed.

Refer to Optional Unit Service Manual.

Code	Function	Refer page
E7-01	Sorter bin movement	Sorter Service Manual
E7-03	Transport belt motor failure	
E7-06	Stapler drive motor failure	
E7-07	Tamper drive motor failure	
E7-10	ADF main motor rotation	ADF Service Manual
E7-11	ADF sensors output abnormal (registration and original exit/reverse sensor)	

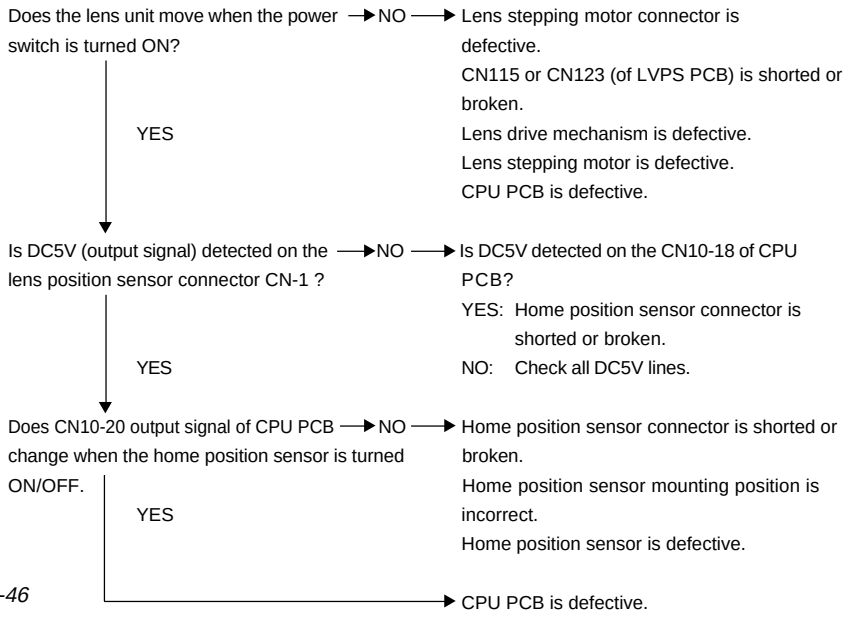
E1-01: Optical unit scan drive

When the lamp unit scanner motor drives to the optics home position sensor and is not detected within a predetermined time.



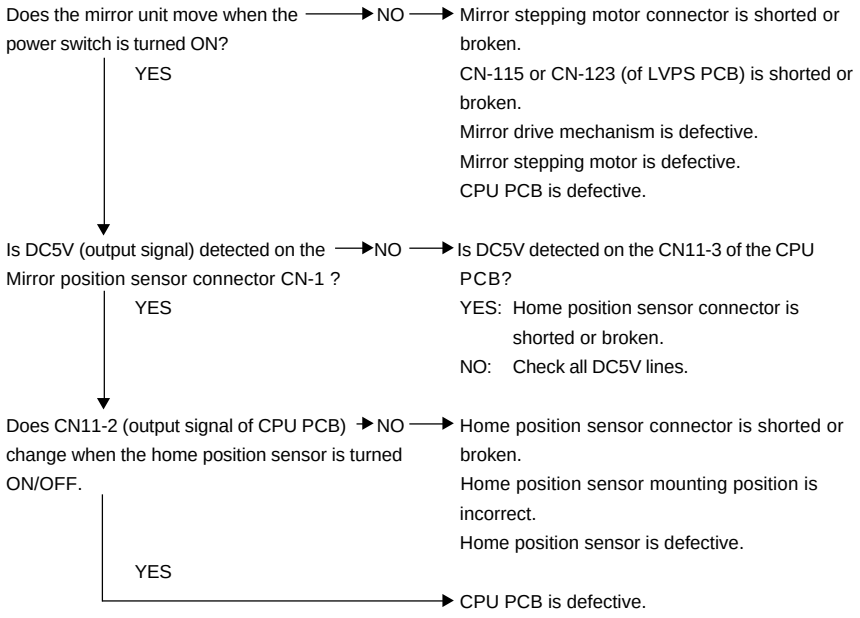
E1-20: Lens ratio drive

When the lens stepping motor drives to the lens home position sensor and is not detected within a predetermined time.



E1-21: Mirror ratio drive

When the mirror stepping motor drives to the mirror home position sensor and is not detected within a predetermined time.

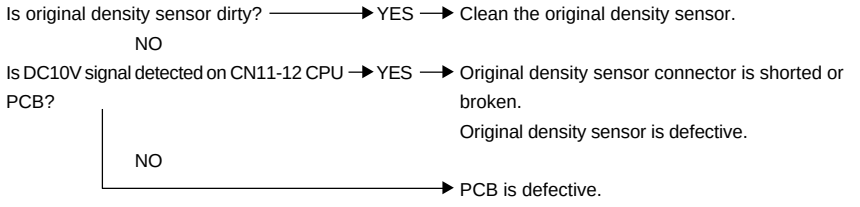


E1-23: F8-02 mis-input

Measurement input for adjusting the original registration	Input the average measurement correctly. Adjust F8-01 and F8-02 again.

E1-32: Auto original density detection

When the auto original density signal is not detected, or the auto original density can not be adjusted.



E1-40: Optics fan motor (1) rotation

E1-41: Optics fan motor (2) rotation

E1-43: Optics fan motor (4) rotation

A lock signal is detected when the fan motor is rotating.

Is DC24V, detected on CN 106-9, 12 or CN 107-3 (on LVPS PCB)? → NO → LVPS is defective.

↓ YES

Connector is shorted or broken, Harness is defective. Fan is defective.

A rotation signal is detected when the fan motor stops.

Is 0V CN106-9, 12 or CN107-3 (on LVPS PCB)? → NO → LVPS is defective.

↓ YES

Fan is defective.

E2-01: Lift motor rotation 1 (Copier upper tray)

E2-02: Lift motor rotation 1 (Copier lower tray)

E2-03: Lift motor rotation 1 (System console upper)

E2-04: Lift motor rotation 1 (System console middle)

E2-05: Lift motor rotation 1 (System console lower)

When the lift motor is turned on, the level sensor is not turned ON within a predetermined time.

Does the lift motor lift the plate? → YES → Check level sensor signal(CN-2) when the plate rises.
- Changed: CPU PCB defective.
- Not changed:
  - Check sensor lever.
  - Check DC5V of CN-1.
  - Level sensor is defective.

↓ NO

Does LUMX-2* changed "H" to "L" when the lift motor is turned ON? → YES → Lift motor drive mechanism is defective.
- Lift motor is defective.
- Driver PCB is defective.

↓ NO

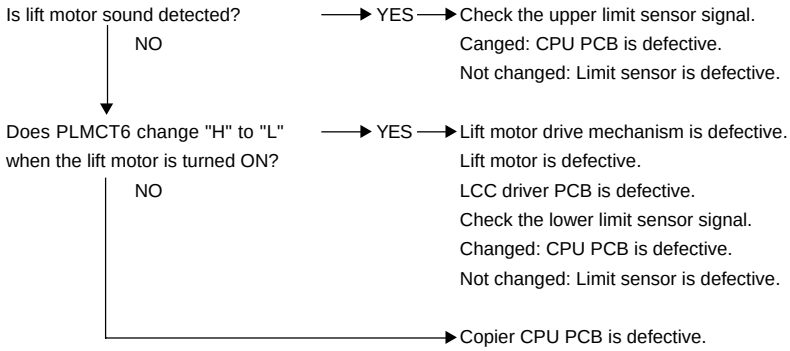
→ Copier CPU PCB is defective.

* NOTE: X=1: Lift motor signal (Copier upper tray)
X=2: Lift motor signal (Copier lower tray)
X=3: Lift motor signal (System console upper)
X=4: Lift motor signal (System console middle)
X=5: Lift motor signal (System console lower)

E2-06: Optional LCC lift operation (UP)

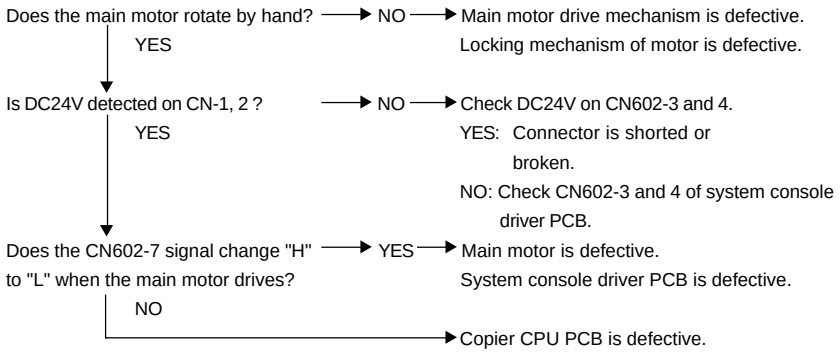
E2-07: Optional LCC lift operation (DOWN)

When the lift motor drives up and down, the upper and lower limit switch are not detected within a predetermined time.



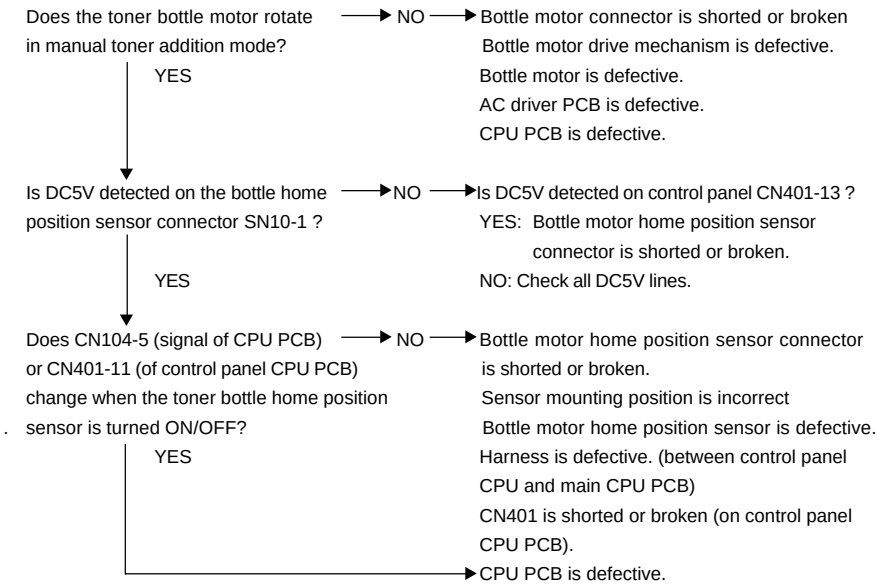
E2-10: System console motor rotation

When the system console main motor drives an abnormal signal is detected.



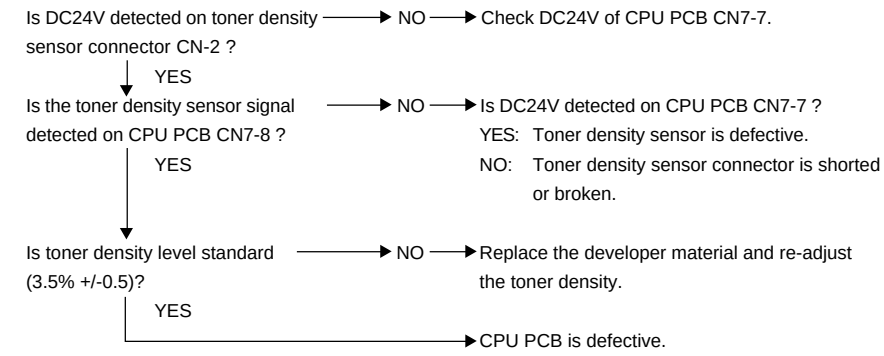
E3-01: Toner bottle motor rotation

When the toner bottle motor drives to the toner bottle position and the toner bottle home position sensor is not detected.



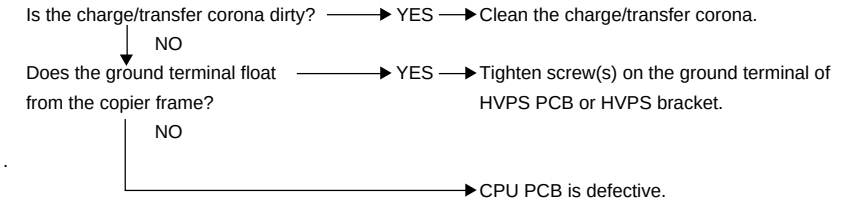
E3-03: Toner density sensor gain

When the toner density gain is adjusted, toner density sensor standard signal level is not detected.



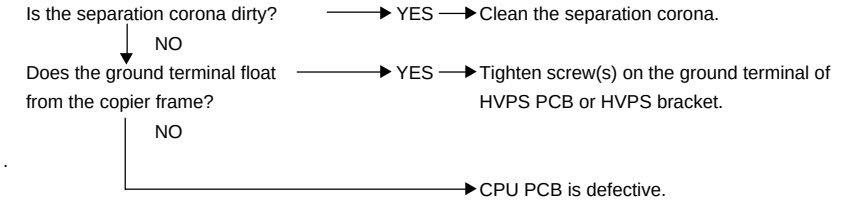
E3-10: High voltage power supply leak (1)

When a leak is detected from the high voltage power supply charge/transfer corona.



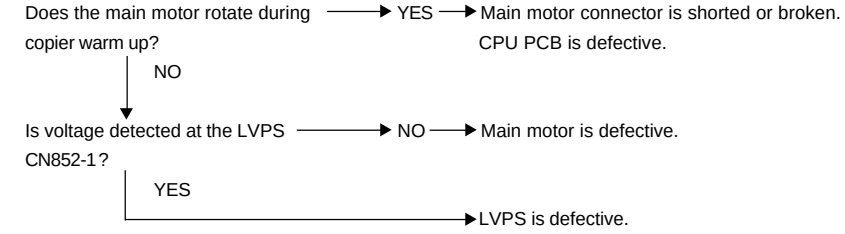
E3-11: High voltage power supply leak (2)

When a leak is detected from the high voltage power supply separation corona.



E3-20: Main motor rotation

When the main motor is turned ON/OFF, the signal is/not detected.



E3-21: Dust collection fan motor rotation

E3-22: Exhaust fan motor rotation

E3-23: Suction fan motor rotation

When the fan motor is rotated or stopped, fan motor rotation signal is/not detected.

Is DC24V detected on CN8-1, 2 or 7? → YES → Fan motor connector is shorted or broken.
fan motor is defective

E3-30: Discharge lamp

When the discharge lamp does not turn ON, or the fan motor fails to rotate when the power switch is turned ON.

Is the discharge lamp ON? → YES → CPU PCB CN14-1 and 2 are shorted.
↓ NO
Is DC24V detected on discharge lamp connector CN-2? → NO → Check DC24V on CPU PCB CN14-2.
↓ YES
→ Discharge lamp terminal position is incorrect.
CPU PCB is defective.

E3-40: Copy density sensor output adjustment

When the QRBAC* Function does operate, the white density output signal is not detected.

Is the copy density sensor dirty? → YES → Clean the copy density sensor.
↓ NO
Does the copy density sensor connector insert securely? → NO → Re-insert the sensor connector securely.
↓ YES
Is the drum installed securely? → NO → Install the drum securely.
↓ NO
Does the LED array light? → NO → Check the LED array connector is connected correctly
↓ YES
Is DC5V detected on CPU PCB CN7-3 ? (QRBAC* function) → NO → Check other DC5V line.
↓ YES
Is voltage detected on CPU PCB CN7-2 ? → NO → Copy density sensor is defective.
↓ YES
→ Check all DC5V lines.

* QRBAC = Qualitative Reasoning Based Adaptive Controller.

E3-50: Transfer cleaner operation

When the transfer cleaner motor drives, the transfer cleaner home position sensor is not ON/OFF within a predetermined time.

Is the wire cleaner felt at the home position sensor?
- NO → Does the wire cleaner felt connect to the corona rail slider?
  - NO
    a) Turn the transport lever and lower the transport unit
    b) Press down the transfer charger and draw it toward you.
    c) Slide the wire cleaner felt to rear side until it stops.
    d) Re-install the transfer charger.
    e) Turn the transport lever and raise the transport unit.
    f) Check the wire cleaner felt is connected to the corona rail slider.
    - YES
    Check operation
- YES

Is DC5V detected on sensor CN-1?
- NO → Sensor connector is shorted or broken.
- YES

Does CN4-5 (output signal of control panel CPU PCB) change when the sensor is turned ON/OFF?
- NO → Sensor is defective

E4-01: Fuser warm-up

When the fuser temperature does not reach the predetermined level within a predetermined time.

Does fuser lamp turned ON after the power switch is turned on?
- YES → Fuser thermistor is dirty.
  Sensor position is incorrect.
  Fuser temperature is low (re-adjust F6-31)
  Fuser thermistor is defective.
- NO

Is these continuity between CN-1 and 2 when the AC driver PCB CN203 is removed.
- NO → Fuser lamp connector is shorted or broken.
  Fuser thermostat is defective.
  Fuser lamp is defective.
- YES

Is there some registrance between CNTH-1 and 2 approximately few MΩ , whenCPU PCB CN7 is removed.
(approx. 1.4MΩ /77F, 25°C)
- NO → CNTH connector is shorted or broken.
  Fuser thermistor is defective.

E4-10: Exhaust fan motor (1) rotation
E4-11: Exhaust fan motor (2) rotation
E4-12: Exhaust fan motor (3) rotation

A lock signal is detected when the fanmotor is rotating.

Is DC24V detected on CN106-3, 6 or CN107-6 (on LVPS PCB)? → NO → LVPS is defective.

↓ YES

Connector is shorted or broken.
Harness is defective.
Fan is defective.

A rotation signal is detected when the fan motor stops.

Is 0V CN106-3, 6 or CN107-6 (on LVPS PCB)? → NO → LVPS is defective.

↓ YES

Fan is defective.

E5-01: Vp (+24V)

When the VCNT signal is "L", DC24V output is under approximately 18V or when the VCNT signal is "H", DC24V outputs over approximately 18V/approximately.

Is DC24V detected on CN851-3 and 4 of the LVPS PCB? → NO → VCNT signal connector is defective or broken. Low voltage power supply PCB is defective.

↓ YES

Is DC24V detected on CN205-1 and 2 of CPU PCB? → NO → Connector is shorted or broken. Harness is defective.

↓ YES

Is DC24V detected on CN205-3 and 4 of the AC driver PCB? → NO → The front cover open/close switch is defective. The front cover is not closed correctly.

↓ YES

→ Connector is shorted or broken. Harness is defective.

E5-04: Vo (+10V) line

When the power switch is turned on, DC10V is not detected.

Is DC24V detected on between CPU PCB CN1-8 and 9? → YES → (IC16, IC9 or IC13)

E5-10: +5V (for Power saving mode)

When the power saving mode is operated on and DC5V power supply is not 0V,
The E5-10 is indicated just moved power saving mode.

E5-21: ADF communication abnormal

When the communication signal between ADF and copier is abnormal.

Is ADF connector inserted securely? → NO → Re-insert ADF connector securely.

YES → ADF control PCB is defective.
(Refer to ADF Service Manual)
Copier CPU PCB is defective.

E5-22: Sorter communication abnormal

When the communication signal between the sorter and copier is abnormal.

Is Sorter connector inserted securely? → NO → Re-insert Sorter connector securely.

YES → Sorter control PCB is defective.
(Refer to Sorter Service Manual)
Copier CPU PCB is defective.

E5-23: Control panel communication abnormal

When the communication signal between the control panel and copier CPU become abnormal, after normal communication between the control panel and the copier has occurred.

Is CN103 connector of the CPU PCB inserted securely? → NO → Re-insert CN103 securely.

YES

Is CN104 connector of the LVPS PCB inserted securely? → NO → Re-insert CN104 securely.

YES

Is CN401 connector of the control panel CPU PCB inserted securely? → NO → Re-insert CN401 securely.

YES → Any PCB is defective.

E5-41: Registration timing control circuit abnormal

When the copier stops, the optics scan and registration drive start driving or when the copier is operated, the optics scan and registration operating are not driven within a predetermined time.

IC5 on CPU PCB is defective.

E5-42: Total counter connection

When the total counter is disconnected.

Is the total counter connector inserted securely? → NO → Insert the total counter securely.
YES → Total counter is defective.
Copier CPU PCB is defective.

E5-50: I/O Communication error

When an abnormal communication is detected.
Main CPU (IC5), paper feed driver, ADU driver or LCC driver is defective.

E6-03: Paper length home position detecting sensor

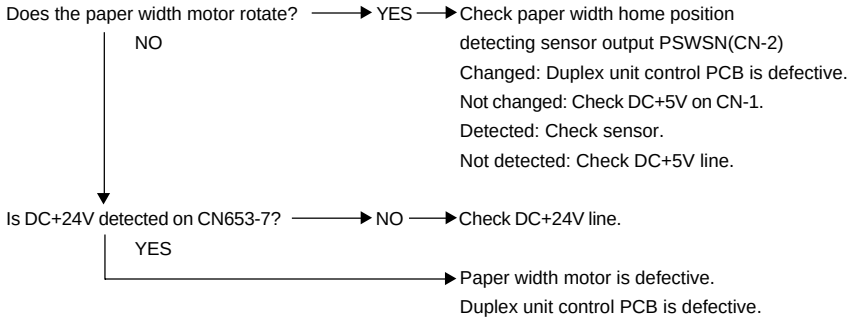
When the paper length motor drives to home position, paper length home position detecting sensor is not sensed within a predetermined time.

Does the paper length motor rotate? → YES → Check paper length home position detecting sensor output PSLSN(CN-2)
Changed: Duplex unit control PCB is defective.
Not changed: Check DC+5V on CN-1.
NO
Detected: Check sensor.
Not detected: Check DC+5V line.

Is DC+24V detected on CN653-4? → NO → Check DC+24V line.
YES → Paper length motor is defective.
Duplex unit control PCB is defective.

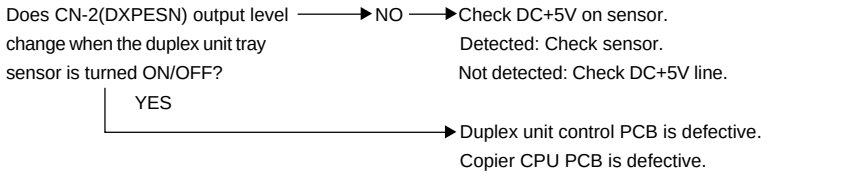
E6-04: Paper width home position detecting sensor

When the paper width motor drives to home position, paper width home position detecting sensor is not sensed within a predetermined time.



E6-05: Paper detecting sensor

When paper is in the duplex unit tray, but it is not detected.



5.3 User Preset Mode

Regarding the operation procedure, please refer to the operating guide.

Code	Item	Function	(Factory setting)
UP-00	Paper size (copier and System Console)	Refer to example	Copier: Ledger/A3 System: Not setting
UP-01	Paper size priority	0: A4R, LETTER R 1: B4, LEGAL 2: A4, LETTER 3: A3, LEDGER 4: INVOICE, A5	2
UP-02	Margin value default	0: 5mm 1: 10mm 2: 15mm 3: 20mm	1
UP-03	Edge value default	0: 5mm 1: 10mm 2: 15mm 3: 20mm	1
UP-04	Book value default	0: 15mm 1: 20mm 2: 25mm 3: 30mm	1
UP-05	Margin reduction default	0: None 1: 95% 2: 93% 3: 91%	0
UP-06	Sorter mode default	0: None sort 1: Staple sort 2: Sort 3: Group	0
UP-07	Duplex mode default	0: Does not select 1: 1 sided to 2 sided 2: 2 sided to 2 sided 3: Book to 2 sided	0
UP-08	2 in 1 copy ratio	0: Full size 1: Reduction	0
UP-09	Auto edge default	0: OFF 1: ON	0
UP-10	Check mode ON/OFF selection	0: OFF 1: M1 ON 2: M2 ON 3: M1, M2 ON	0
UP-11	Manual toner addition	(0) OFF (1) ON	
UP-12	Total copy usage of a specific department Changing the total copy usage of a specific department.	Press Print key and input the code number. Press Print key and input the code number. Then press Recall key and input the changed copy usage, and press Print key.	
UP-13 to 18		Not used	
UP-19	Set key operator code (3digits)		
UP-20 to 34	Before setting these modes, please input ID number.		
UP-20	Auto reset timer 2: 1 minute	0: None 1: 45 seconds 2: 1 minute 3: 2 minute	2
UP-21	Energy saver timer	0: 15 m 1: 30 m 2: 60 m 3: 1.5 h 4: 2 h 5: 3 h 6: 4 h 7: No energy saver timer	0

Code	Item	Function	(Factory setting)
UP-22	Auto off timer	0: No auto off timer 1: 30 m 2: 60 m 3: 1.5 hr 4: 3 hr 5: 4 hr	1
UP-23	Auto original density (When power ON)	0: Not detecting 1: Auto mode priority 2: Manual mode priority	1
UP-24	Message display language change	0: Japanese 1: English 2: German 3: French 4: Italian 5: Spanish 6: Swedish 7: Finnish 8: Dutch 9: Portuguese	1
UP-25	Auto selection prohibition paper tray (1)	0: None 1: Copier (upper) 2: Copier (lower) (Except FP-7818) 3: System console (upper) 4: System console (middle) 5: System console (lower) 6: LCC (Except FP-7818/7824) 7: Sheet bypass	0
UP-26	Auto selection prohibition paper tray (2)	same as UP-25	0
UP-27	Presentation/ OHP Interleaving mode initial setting	(0) Blank paper (1) Copied paper	0
UP-28	Page Insertion mode initial setting	(0) Blank paper (1) Copied paper	0
UP-29	Cover mode initial setting	(0) Cover page: Blank paper (1) Cover page: Copied paper (2) Cover page: Copied paper Back cover: Blank paper (3) Cover page: Copied paper Back cover: Copied paper	0
UP-30	Not used		
UP-31	Changing upper copy quantity (n = -99 to 0)	Quantity = 999 + n x 10 + 1	0
UP-32	Check width size in M1 memory (n = 1 to 60) Check length size in M1 memory (n = 1 to 41)	Width = n x 5mm Length = n x 5mm	28 43 (American) 42 (Others)
UP-33	Check width size in M2 memory (n = 1 to 60) Check length size in M2 memory (n = 1 to 41)	Width = n x 5mm Length = n x 5mm	28 43 (American) 42 (Others)

Code	Item	Function	(Factory setting)
UP-34	Indicate the access code number of a specific department. Changing the access code number of a specific department.	Press the Access key and input the code number. Press the Access key and input the code number. Then press Recall key and input the changed access number, and press Print key.	

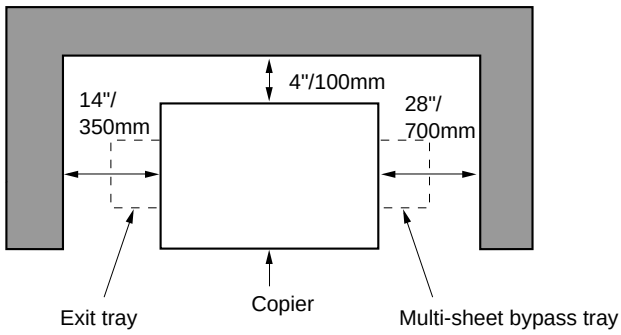
VI. Unpacking/Installation

6. 1 Installation Requirements

Make sure machine is properly leveled from left to right and from front to rear (use small carpenter level).

The mains plug on this equipment must be used to disconnect mains power. Please ensure that the socket outlet is installed near the equipment and shall be easily accessible.

The copier should be installed in a level and well-ventilated area, to minimize the ozone density in the air.



6.2 Contents Check

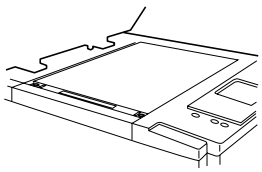
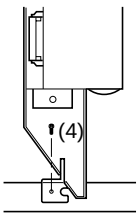
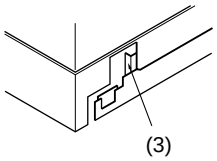
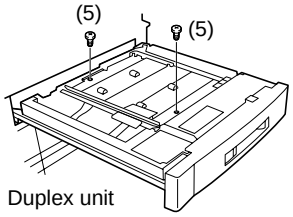
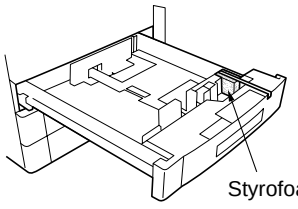
	Contents	Check
1	Copier	
2	Exit tray	
3	Document bag	

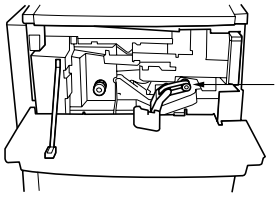
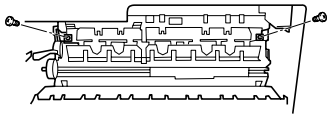
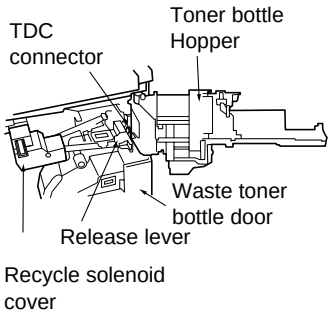
6.3 Unpacking

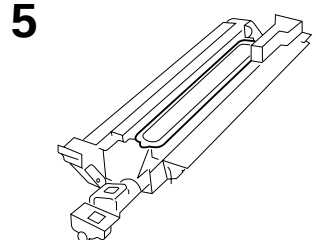
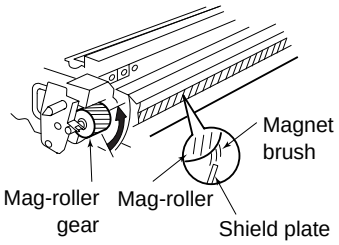
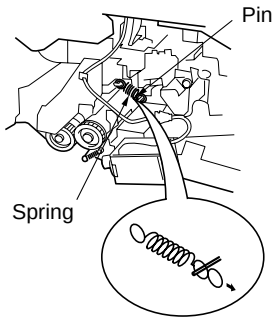
Check the condition and contents of the box for any shipping damage and completeness before installation. (Visual check)

6.4 Installation Procedure

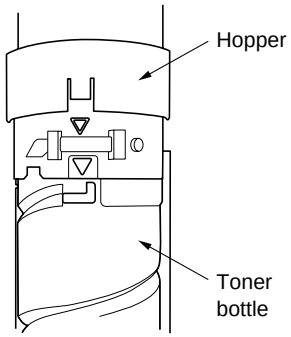
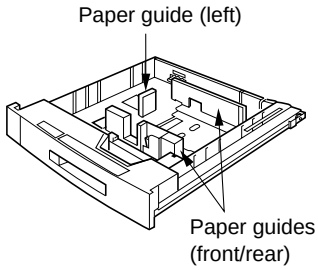
- Remove the external packing/protection materials.
- Remove the shipping tape from the copier.
- Save the shipping materials for future use (Transport of copier)

Location	Shipping material/Procedure	Check	
1   (4)  (3) (5) (5)  Duplex unit  Styrofoam	**1. Optical unit** (1) Remove the original guide plate. (3 screws) (2) Remove the optical unit shipping brackets (front/rear) (1 screw each). (3) Remove the platen glass. (4) Remove the lens unit fixing bracket B. (1 screw) (5) Reinstall the platen glass. (6) Reinstall the original guide plate. **2. Duplex unit** (1) Open the waste toner bottle cover. (2) Remove the waste toner bottle. (3) Remove the tape and duplex unit bracket. (4) Pull the duplex unit tray out fully. (5) Remove the paper guide shipping screws. (2 screws) (6) Raise the paper guide. (7) Remove the shipping styrofoam. (1 piece) (8) Slide back the duplex unit tray. **3. 550 sheet paper drawer** (1) Pull the 550 sheet paper drawer out fully. (2) Remove the shipping styrofoam. (1 piece) (3) Slide back the paper drawer.		

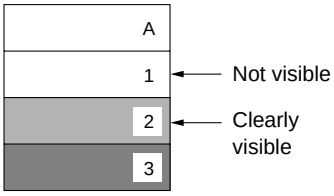
Location	Shipping material/Procedure	Check	
2  	**Paper transport unit** (1) Open the front cover. (2) Remove the shipping tape.		
3 	**Fuser unit** (1) Open the paper exit door. (2) Open the fuser exit guide plate. (3) Remove the fuser pressure release screws. (2 screws) (4) Close the fuser exit guide plate. (5) Close the paper exit door.		
4  	**Developer unit** (1) Swing open the toner bottle/ hopper. (180 degrees) (2) Turn the developer unit release lever clockwise. (3) Remove the recycle solenoid cover. (1 screw) (4) Open the waste toner bottle door. (5) Lower the paper transport. (6) Remove the drum unit. (1 screw, 1 connector) (7) Disconnect the TDC connector. (8) Remove the developer unit. (Pull out until it stops, then angle up to remove.) **Note:** Be careful to avoid damaging the recycle and toner addition sponge seals.		

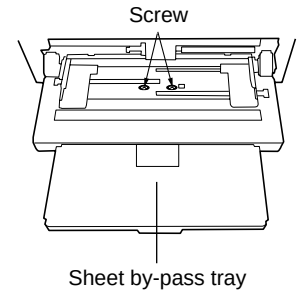
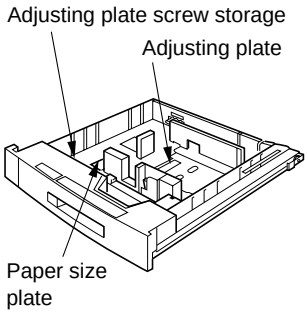
Location	Shipping material/Procedure	Check	
5   	**Pour the developer into the unit** (1) Remove the developer unit lid. (2) Pour the developer evenly into the unit. **Note:** Pour in the entire bottle of developer, after shaking it well. (3) Reinstall the developer unit lid. (4)-1. Rotate the mag-roller gear clockwise (down-ward) several turns in order to distribute developer evenly on the sleeve. (4)-2. Rotate the mag-roller gear counter-clockwise (up-ward) about 90 degrees in order to form magnet brush between shield plate and sleeve. (4)-3. Rotate the mag-roller gear clockwise (down-ward) several turns again to stabilize magnet brush. (5) Reinstall the developer unit. (6) Reconnect the TDC connector. (7) Reinstall the drum unit. (8) Pull the developer unit release lever out until it stops and rotate it 90 degrees counterclockwise. (9) Push the developer unit release lever back in until it stops.		
6  	**Cleaning blade pressure release** (1) Install the cleaning blade pressure spring to the pin. (2) Reconnect the solenoid connector. (3) Reinstall the solenoid cover. (1 screw) (4) Swing back the toner bottle/hopper. (5) Raise the paper transport. (6) Close the front cover. (7) Install the waste toner bottle. (8) Close the waste toner bottle cover. **Note:** Please take care for Tonerrecycle Solenoid Harness, if you push in the drum unit.		

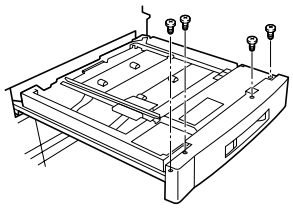
Location	Shipping material/Procedure	Check	
7	**Turn the power switch ON**		
8(a)	**TDC adjustment** (1) Press the “User Preset”, “Ledger/ A3 of Original Size” and “3” keys simultaneously to enter the F mode. (2) Press the “8” key to enter the F8 mode. (3) Press the “Print” key. (4) Press the “0”, “9” keys to enter the F8 mode code “09”. (5) Press the “Print” key for automatic TDC sensor gain adjustment. (Wait approximately 2 minutes until the adjustment cycle stops.) (6) Write the contents of F6-21 and 26 on the memory sheet.		
8(b)	**Black density sensor output gain adjustment** (1) Press the “1” and “4” to enter the F8 mode code “14”. (2) Press the “Print” key for automatic black density sensor output gain adjustment. (3) Write the content of F6-65 on the memory sheet. (4) Press the “User Preset” and “Clear/Stop” keys simultaneously to escape from the F mode.		

Location	Shipping material/Procedure	Check	
9 	**Toner bottle insertion** (1) Open the front cover. (2) Take a fresh bottle of toner and shake it 10 to 15 times. (3) Swing the toner bottle hopper open 90 degrees. (4) Remove the toner bottle cap. (5) Insert the toner bottle into the hopper unit and turn it clockwise. **Note:** Make sure the arrows on the bottle and the hopper are aligned. (6) Close the front cover.		
10 	**Paper size setting** (1) Pull the paper drawer out until it stops. (2) Position the paper guides (front/rear) to the paper size required. If the size will remain fixed, install the screws to lock down the paper guides. (3) Position the paper guide (left) to the paper size required and install the paper guide screw. (4) Push in the paper tray. (5) Select F5-15. (6) Select the desired paper size. (7) Press the “User Preset” and "Clear/Stop" key simultaneously to escape from the F mode. (8) Take out and reinsert the indicator so the selected paper size is shown.		

6.5 Adjustment

Location	Shipping material/Procedure	Check	
1  	**Exposure standard adjustment** (1) Enter the F6 mode. (2) Confirm F6-11, 12, 17, 18 and 19 to “0”, and change as necessary. (3) Enter the F2 mode and set the exposure to the center position in the Document mode. (4) Make a copy of Test Chart 53/54 with gray scale (P/N FQ-SJ101). a) Gray scale “1” should not be visible. b) Gray scale “2” should be clearly visible. **Note:** Skip to step 11 if the density is in target. (5) Enter the F6-28 mode. (6) Enter the new content. **Note:** The “Reset” key is used to enter the “–” content. (+): Lighter side (–): Darker side (7) Press the “OK” key, then press the "Print" key. (8) Press the “Clear/Stop” key twice. (9) Enter the F2 mode. (10) Make a copy to confirm the adjustment **Note:** Repeat step 3 to 10 until the proper density is attained. (11) Press the “User Preset” and “Clear/Stop” keys simultaneously to escape from the F mode. **Note:** Dependent on customer requirement. Perform the above adjustment upon customer request.		

Location	Shipping material/Procedure	Check	
2   	**Side to side adjustment** **1. Sheet bypass tray** (1) Loosen adjusting screws. (2 screws) (2) Move the adjusting plate to the front or rear accordingly. **Note:** After this adjustment is done, duplex side to side adjustment must be done. (Adjustment #3 below) **2. 550 sheet paper drawer** (1) Pull the paper drawer out until it stops. (2) Loosen the paper drawer adjusting plate (2 screws), and move it to the front or rear as required. (3) Install new paper then adjust the paper width. (4) Remove the paper. (5) Retighten the paper drawer adjusting plate mounting screws. (6) Loosen paper size plate mounting screw and move the plate as necessary, then tighten the screw.		

Location	Shipping material/Procedure	Check	
	**3. Side to side adjustment (Duplex)** (1) Pull the duplex unit tray out until it stops. (2) Loosen the four screws of the front cover. (3) Move the front cover as required, then tighten the screws. **Note:** Move the front cover evenly. (left and right sides) **4. Registration adjustment** (1) Press the “User Preset”, “Ledger/ A3 of Original Size” and “3” keys simultaneously to enter the mode. (2) Press the “6” key to enter the F6 mode. (3) Press the “Print” key. (4) Press the “0” and “5” keys to enter the F6 mode code “05”. (5) Press the “Print” key. (6) Enter the new content. **Note:** The “Reset” key is used to enter the “–” content. (+): Paper feed timing is delayed (–): Paper feed timing is advanced (7) Press the “Print” key. (8) Press the “User Preset” key and “Clear/Stop” keys simultaneously to escape from the F mode. (9) Make a copy confirm the adjustment.		

6.6 White Density Adjustment

(When replacing the original guide for FA-A505)

(1) Check the rank of sensor mark sheet back side of the original guide.
(2) Select the F6 mode.
(3) Press “2” and “8” keys to enter F6 mode code “28” then press “Print” key.
(4) Enter the new content according to the rank of sensor mark sheet.

Note:

Rank	F6-C28 content
–2	–20
–1	–10
0	0
1	10
2	20

FA-S620/S660 Service Manual

Contents

V. Troubleshooting

VI. Unpacking/Installation

Supplements

Section I Introduction

1.1 Specifications

Operating Conditions	Ambient conditions	59 - 86 F / 15-30 °C (standard: 68 F / 20°C)	
	Relative humidity	20-80% (standard: 60%)	
	Power source	DC+24V (supplied from copier)	
	Installation condition	Horizontal	
Specifications	Number of bins	20 bins	
	Bin Capacity (when recommended paper is used) • (Numbers in ( ) are for Ledger/A3, Legal/B4 paper)	Stack	30 (25) ✻
		Sort	50 (30, S620: 25/Legal-B4, 15/Ledger-A3)
		Staple	50 (30, S620: 25/Legal-B4, 15/Ledger-A3)
		Group	30 (25)
	Copy Size	Ledger/A3, Legal/B4, Letter/A4, Invoice/A5	
	Copy paper weight	16 - 24 lb / 64 - 80g/m^2	
	Manual staple capacity	2-50 copies (25 copies: A3/B4) (20lb / 80g/m^2)	
	Dimensions(W x D x H)	17.1" x 23.3" x 23.5" / 434 x 594 x 624 mm	
	Weight	Approximately 44 lb / 20kg	

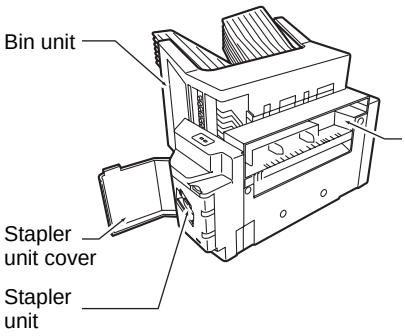
✻ Less than 100 copies: 100 per pin
More than 100 copies: 30 (25) per pin of 20
When more than 100 copies are selected, the balance of the copies requested are stacked into the sort bins, starting from bin 1, up to 30 (25) copies into each bin before shifting to the next bin.
(This means a maximum of 600 (A4, A5)/500 (A3, B4) copies can be made before "oF" appears---A4, A5: 30 X 20 A3, B4: 25 X 20

1.2 Features

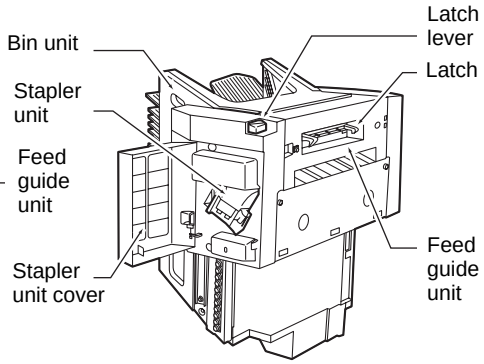
Following modes can be selected by pressing the key on the panel of the copier.

- Staple Mode: Copies discharged into bins will be stapled automatically (when using the ADF)
- Group Mode: Copies of the same page will be grouped and stacked separately from copies of other pages.
- Sort Mode: Copies of multiple page documents will be sorted.
- Stack Mode: Copies will be received by other 20 bins starting from bin No.1 (After 75 copies enter the stack tray in excess of 100).

1.3 External View

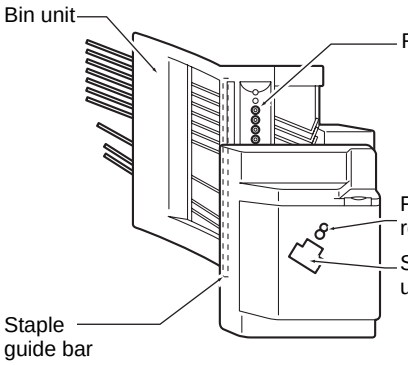


FA-S620

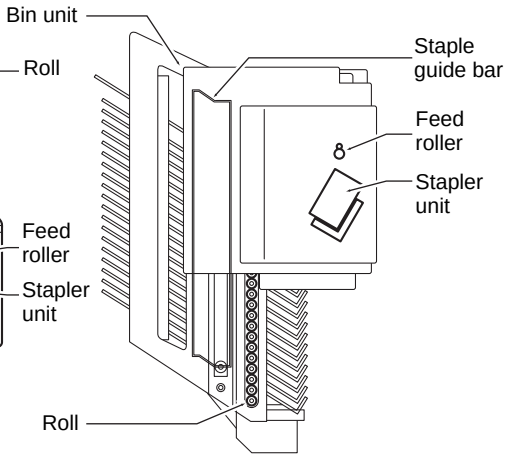


FA-S660

1.4 Inner View

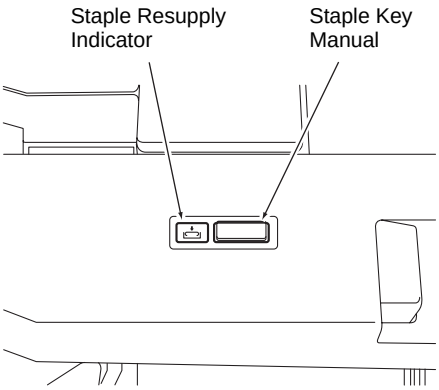


FA-S620



FA-S660

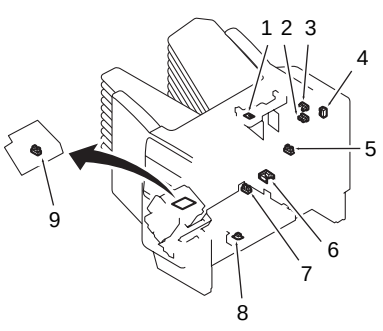
1.5 Operation Panel



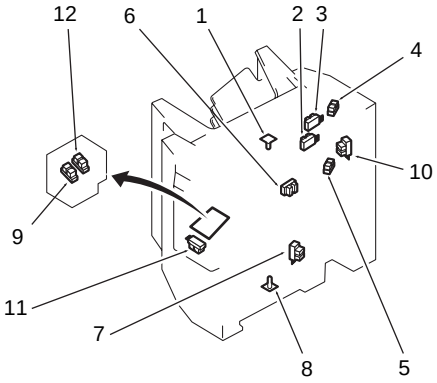
No.	Name of key	Function	Remarks
1	Manual staple key	Press “Manual Staple” at the start. (The indicator turns on when stapling is ready.) If the key is pressed during the stapling process, the process is discontinued. The lamp blinks when the staple jam occurs in the stapler.	
2	STAPLE RESUPPLY indicator	The lamp lights up when the staples in the stapler have exhausted. The indicator turns on in the absence of a staple cartridge.	When remaining staples after the stapling process are

1.6 Component Location

(1) Sensors



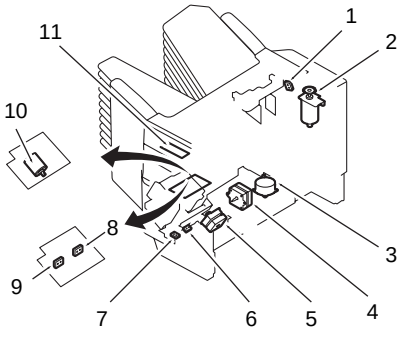
FA-S620



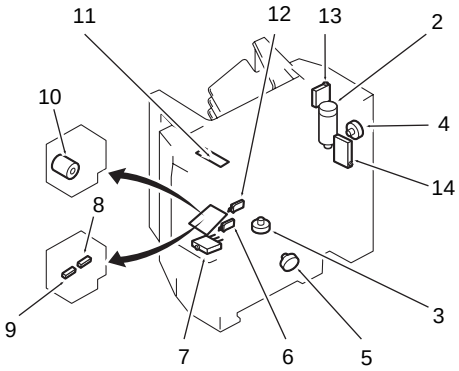
FA-S660

No.	Name
1	In-bin paper detecting sensor (TX) (S1)
2	Bin lower limit sensor (PI4)
3	Bin upper limit sonsor (PI5)
4	Bin shift motor clock sensor (PI1)
5	Reed cam sensor (PI2)
6	Paper exit sensor (PS1)
7	Staple guide bar home position sensor (PI3)
8	In-bin paper detecting sensor (RX) (S2)
9	Stapler home position sensor (PI8)
10	Sorter interlock sensor (PI6 for FA-S660)
11	Stapler unit cover sensor (PI7 for FA-S660)
12	Stapling position detecting sensor (PL9 for FA-S660)

(2) Motors, Swiches, Solenoids, PCBs



FA-S620



FA-S660

No.	Name
1	Reed cam rotation detecting switch (SW3 for FA-S620)
2	Bin shift motor (M1)
3	Staple guide bar drive motor (M3)
4	Feed motor (M2)
5	Stapler swing motor (M4)
6	Stapler swing home position detecting switch (MS4)
7	Stapler unit cover detecting switch (MS2)
8	Staple detecting switch (MS5)
9	Cartridge detecting switch (MS6)
10	Staple motor (M5)
11	Staple key switch (SW)
12	Stapler safety detecting switch (MS3 for FA-S660)
13	In-bin obstacles detecting switch (MS7 for FA-S660)
14	Sorter interlock switch (MS1 for FA-S660)

Section II Mechanism

2.1 Construction

•The staple sorter consists of the following four functional blocks, paper transport section, bin driving section, tamper driving section and stapler driving section.

2.2 Paper transport

✳ The paper transport roller in the staple sorter is driven by the paper transport motor (M2) (+24V).

(1) When the "Print" key is pressed, the copier begins feeding paper.

(2) When the paper is detected by the paper exit sensor on the copier,the paper transport motor starts to rotate and transmits drive to the paper exit roller.

(3) The transport motor controls transport speed via pulse. Transport speed is adjusted as follows:

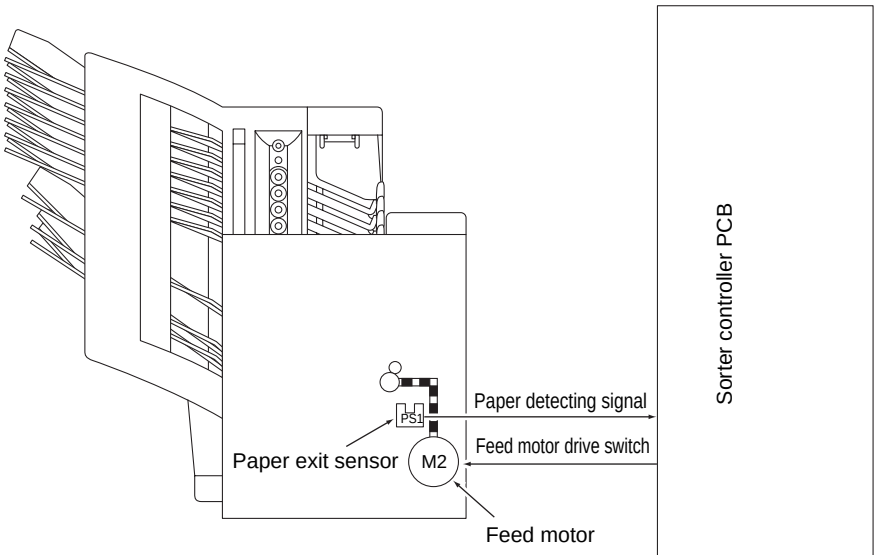
(a) Paper feed speed

Speed of the paper passing between the paper exit sensor in the copier and the paper exit sensor (PS1). (Constant speed in all paper sizes)

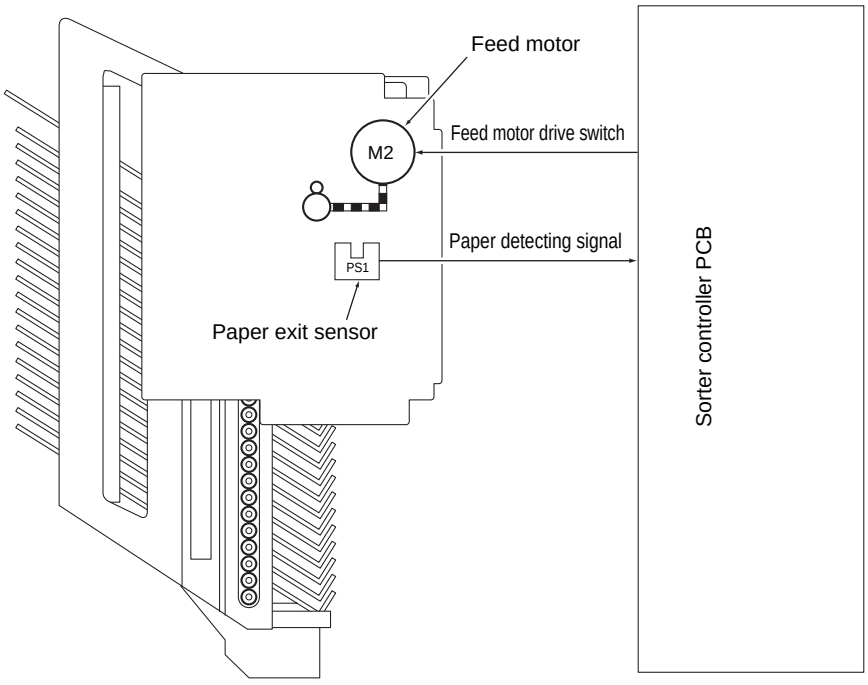
(b) Paper exit speed

Speed of the paper passing between the paper exit sensor and the sorter bin. (Paper exit speed depends on paper sizes. Paper exit speed of the first paper and the following papers may also be different.)

(4) "Paper jam" in the sorter is detected by the paper transport sensors. Jams are detected when the sensors are not turned ON/OFF within a predetermined time.



FA-S620



FA-S660

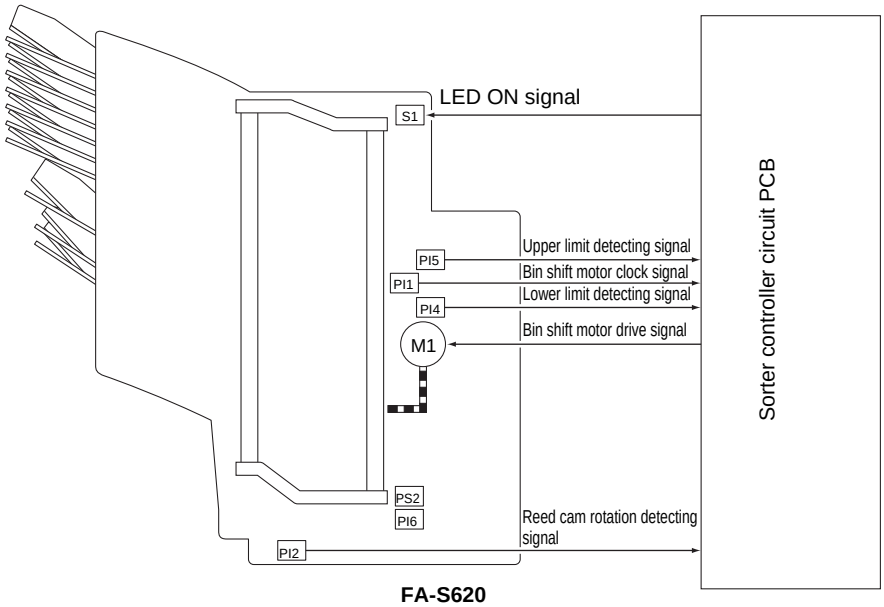
2.3 Bin drive

* Up and down movement of each bin in the sorter is achieved by the rotation of the bin motor (M1) located on the lower frame of the sorter. If any overdrive occurs,the upper and lower limit switches(PI4 and PI5) (micro-switch) detect the abnormality and protect the machine against damage.

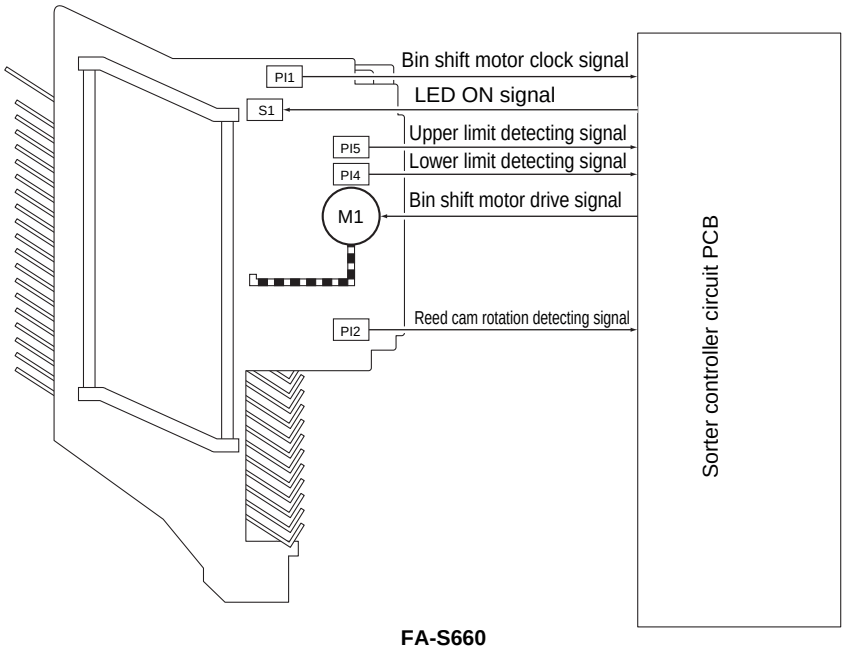
  (1) Rolls are fitted to both sides of each bin. The rolls are engaged in the groove of the reed cam,which firmly secures each bin.

  (2) The rotating motion of the bin motor is transmitted to the reed cam (front/rear) through the bin drive belt. Rolls (for each bin) engaged in the groove in the reed cam move up and down along the inclination provided in the reed cam, thereby causing each bin up and down.

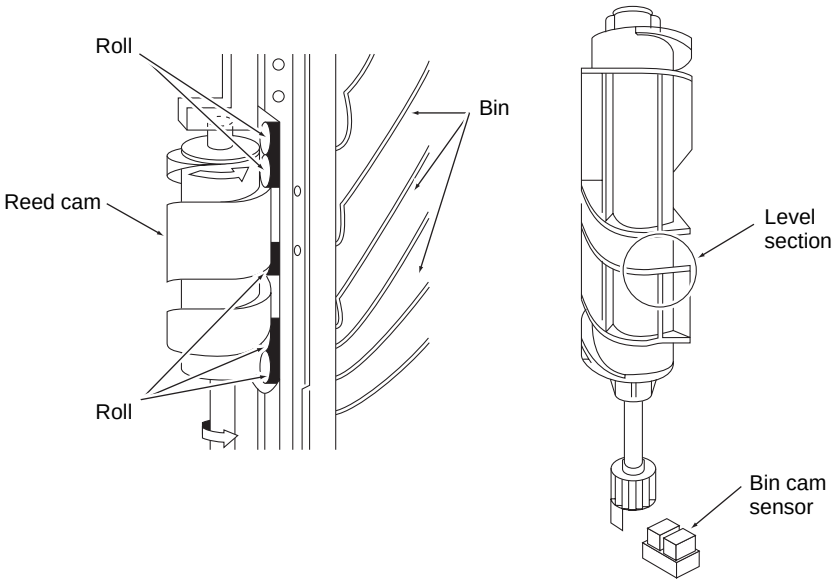
  (3) The position of the cam is detected by the reed cam home position sensor (PI2). This is achieved by turning the reed cam home position sensor (PI2) ON each time the actuator on the reed cam (rear) completes a rotation.

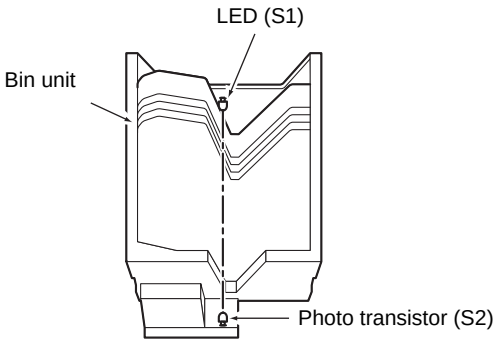


FA-S620


Bin shift motor clock signal
PI1
LED ON signal
S1
Upper limit detecting signal
PI5
Lower limit detecting signal
PI4
Bin shift motor drive signal
M1
Reed cam rotation detecting signal
PI2
Sorter controller circuit PCB

FA-S660


Roll
Bin
Reed cam
Roll
Level section
Bin cam sensor



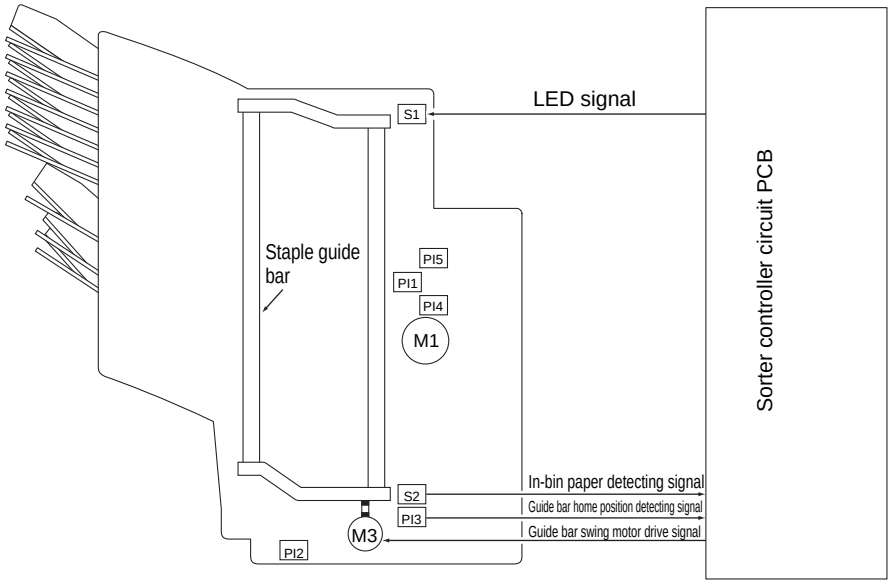
2.4 Tamper drive

* The tampers in the bin unit are driven by the tamper drive motor located on the lower frame of the sorter. The tampers jog each time a copy is fed into a bin and keeps the copies in each bin evenly stacked.

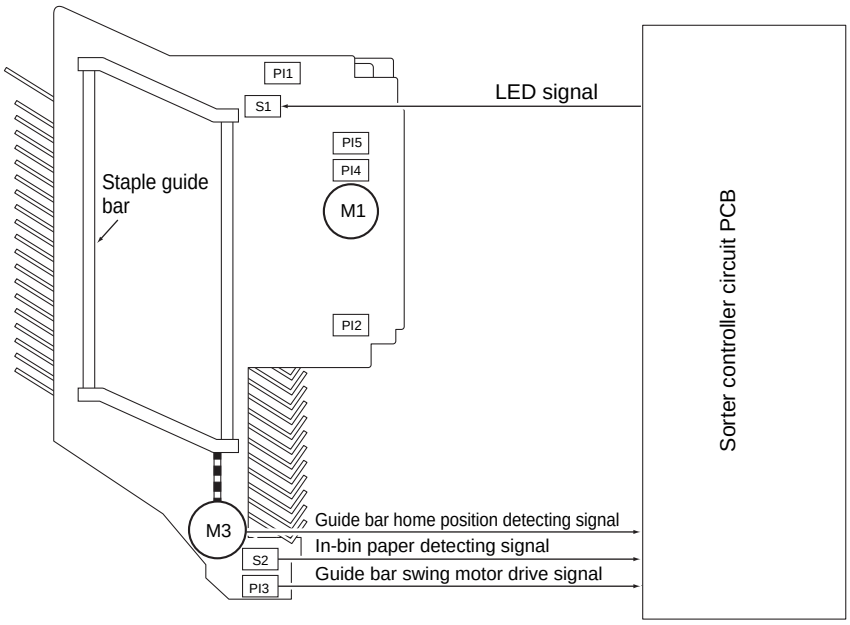
(1) The copier begins feeding paper when the "Print" key is pressed. Copies discharged into each bin are stacked evenly by the movement of the tampers in the bin unit.

(2) The tampers are driven by the tamper motor (M3). The amount of motion of tamper (front) is constant, regardless of paper size, while that of the tamper (rear) are determined by the paper size signal supplied from the copier.

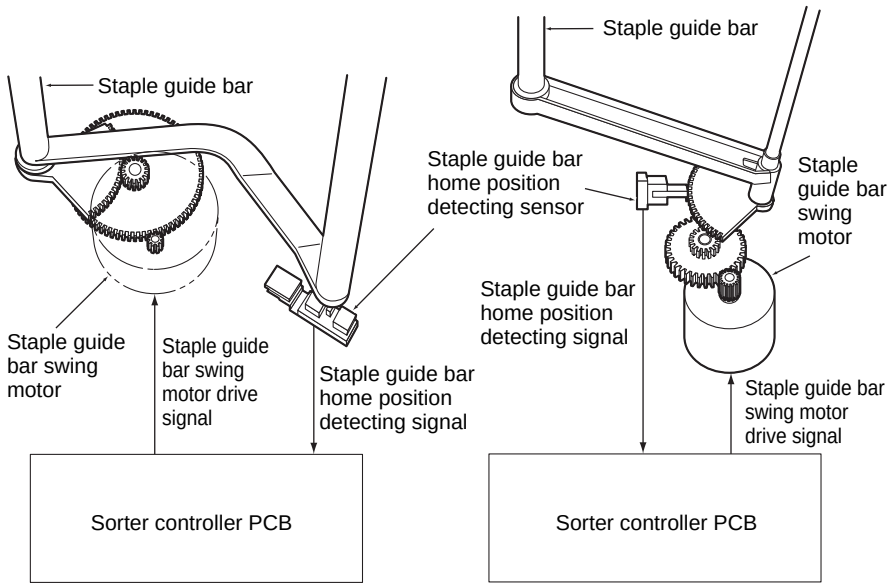
(3) The tamper home position is detected by tamper home position sensor.



FA-S620



FA-S660



(4) The tamper (rear) home position is detected when the sensor detecting plate attached to the tamper support blocks the light from the tamper home position sensor on the bottom frame of the sorter. A signal according to the copy size is output from the control panel and the tamper drive motor rotates appropriately to the start position for the selected copy size.

(5)When paper is detected by the paper exit sensor in the copier, the tamper motor rotates and positions the tamper at a prescribed distance (depending on paper size) from the selected copy size edge so the copy can be received easily into the bin. After receiving a copy, the tamper moves to the preset copy size position to tap it into place, then the tamper moves out to the start position and waits for the next copy.

2.5 Stapler drive

* Copies discharged into the bins in the "Staple mode" can be stapled by stapler assembly automatically. In addition, manual stapling can be performed on copies placed into the bin tray by pressing the the "Staple" key.

(1) The operational components in the stapler include the stapler swing motor, stapler drive motor, staple position sensor, stapler swing position sensor, stapler safety switch, cartridge detecting sensor, staple detecting sensor, stapling position detecting sensor, and stapler.

(2) For stapling to begin, the staple detecting sensor (PS1) must detect staples in the staple cartridge, and the sorters bin paper sensor (TX-1, RX-1) must detect paper in the bins. The stapling sequence is as follows:

a) The bin motor (M1) correctly positions the bin assembly, the tampers tap the paper.

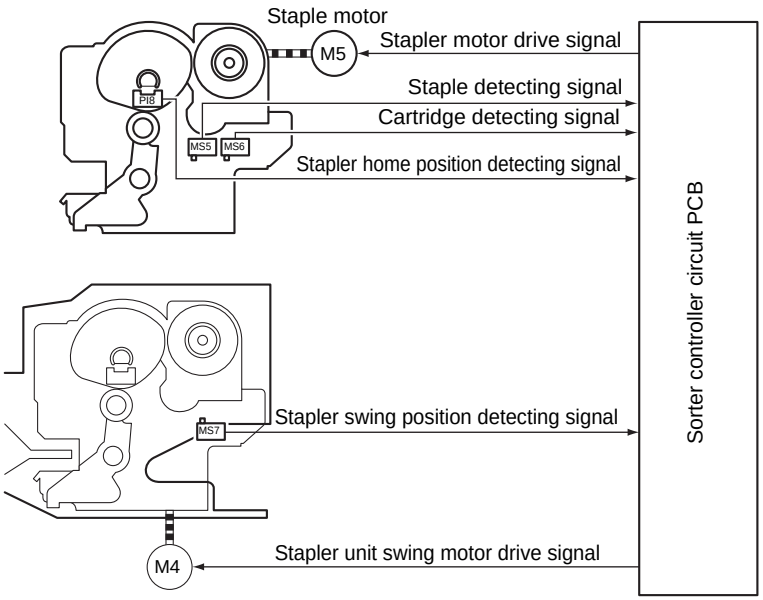
b) The stapler swing motor (M4) drives the stapler to the stapling position as detected by the stapler swing sensor (PS3).

c) The staple drive motor (M5) begins to drive. (If foreign objects are blocking the stapler or paper has been removed, the swing motor (M4) returns the stapler back to it's home position.)

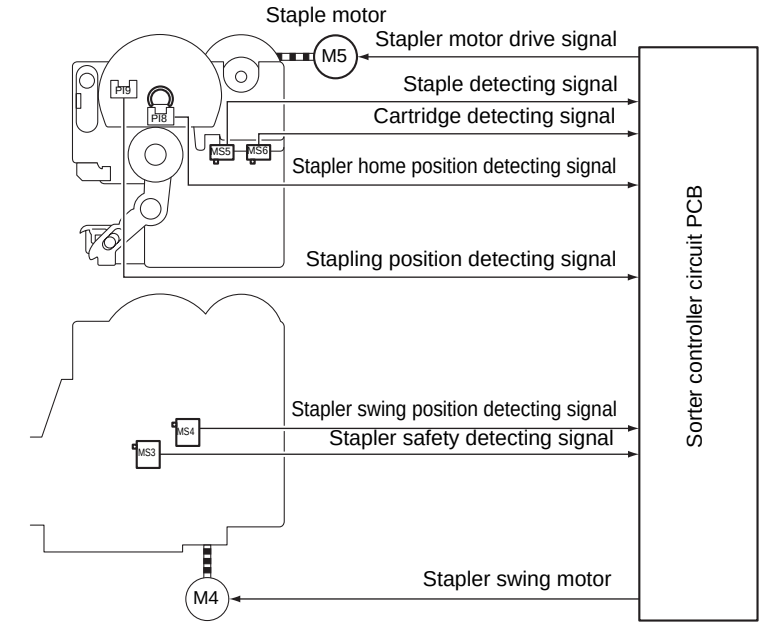
d) Once the cam sensor (PS4) detects that the stapler drive has returned home, the swing motor drives the stapler back to the stapler swing home sensor (PS2).

e) Step a - d are repeated until the sensor bin paper sensor no longer detects paper in the bin assembly.

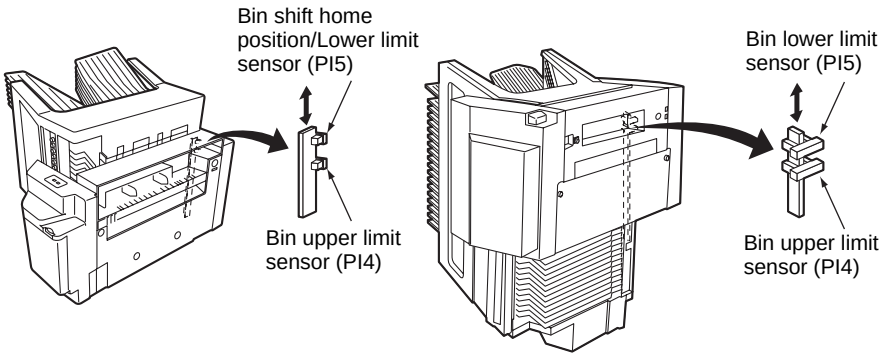
(3) Stapler motion is detected by stapler swing position switch. (The cam connected to stapler drive gear turns the switch on and off) When stapling fails by staple jam etc., stapler drive motor returns to the initial position, and sends signals to the main unit.



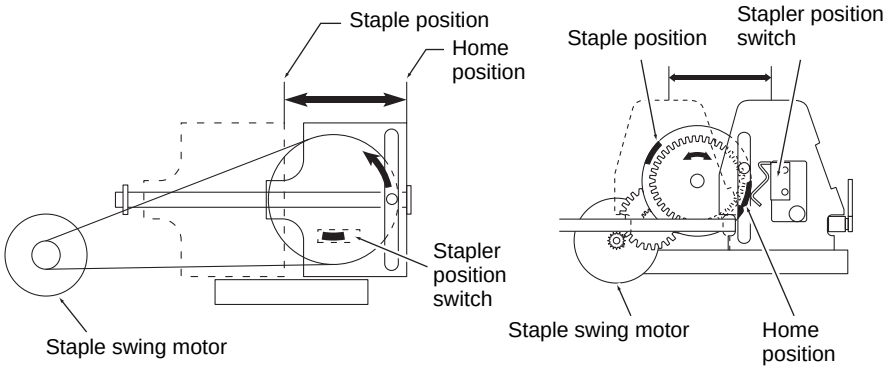
FA-S620



FA-S660

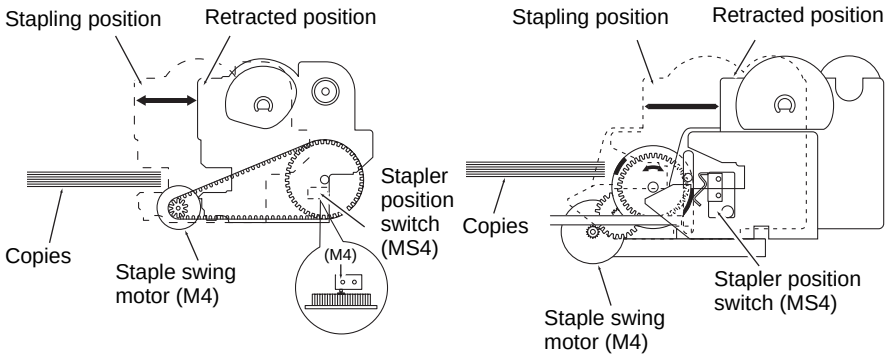


FA-S620 **FA-S660**



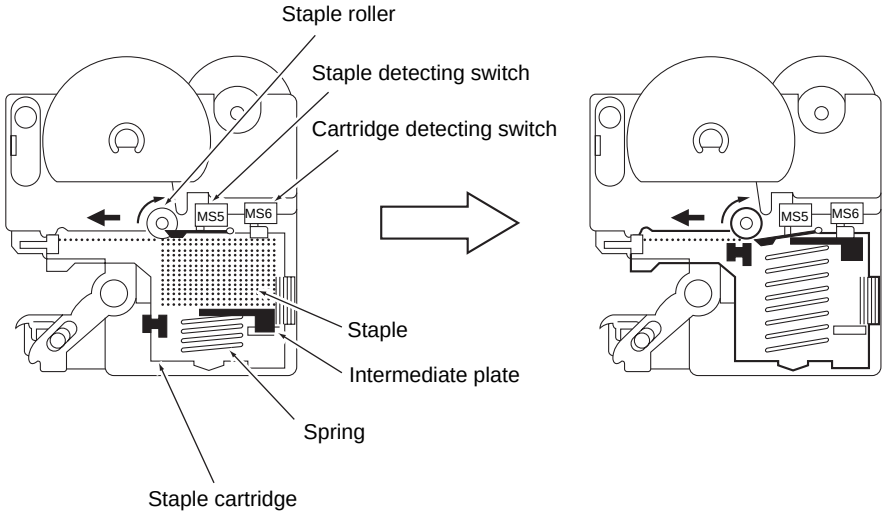
FA-S620 **FA-S660**

(4) Staple swing motor swings stapler. Staple position sensor and stapler swing position sensors detect the staple position and initial position. Stapler only swings when stapling, otherwise stays in the initial position.



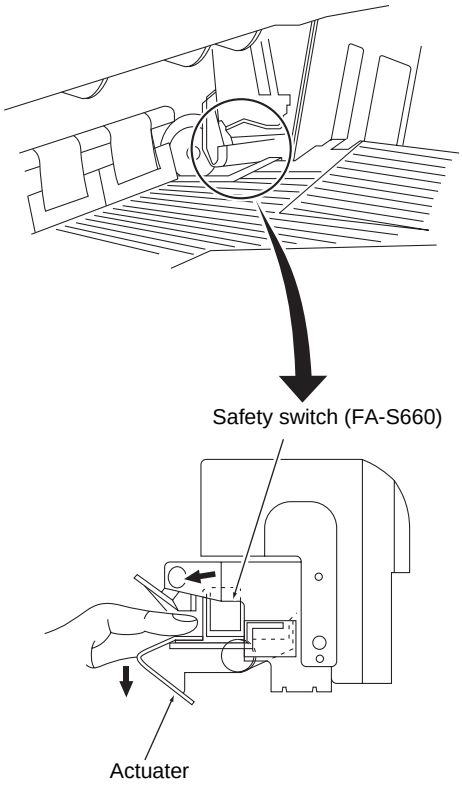
FA-S620 **FA-S660**

(5) Staple detecting sensor detects the presence of staples. In case of no staples, the sensor sends signals to the main unit.



(6) For FA-S660

If foreign objects like fingers are detected in the bin when stapling, actuater turns the stapler safety switch OFF and consequently stops stapling.



Section III Maintenance

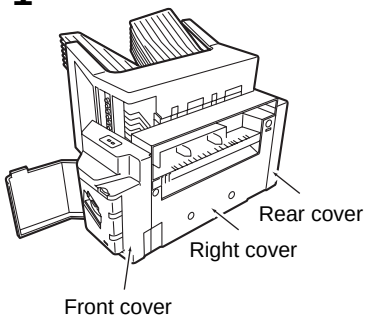
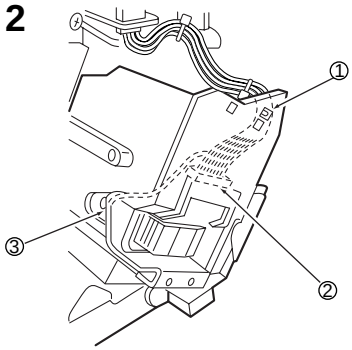
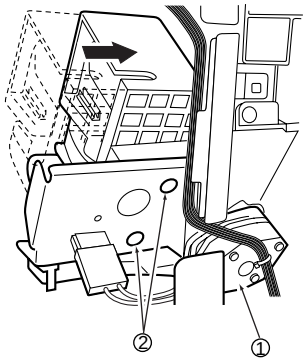
3.1 Maintenance areas

- The following areas should be cleaned at the prescribed interval.

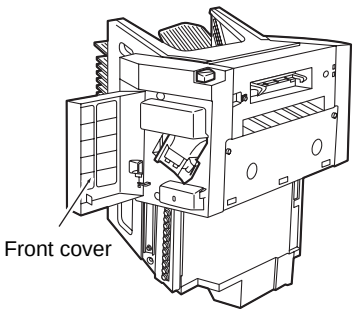
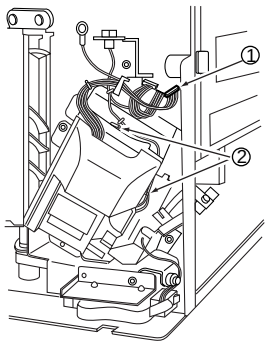
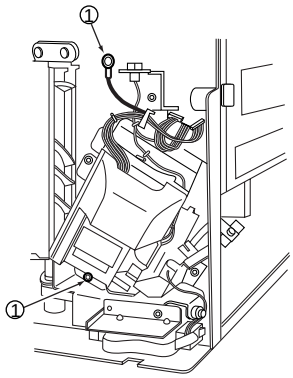
Part name	Maintenance cycle		
	Replacement	Cleaning	Lubrication
Stapler unit	Per 200,000 copies	—	—
Paper feed roller (upper/lower) Paper exit roller Bin/Roll Bin paper detecting sensor	—	Follow the cycle of main unit.	—

3.2 Disassembly/Assembly

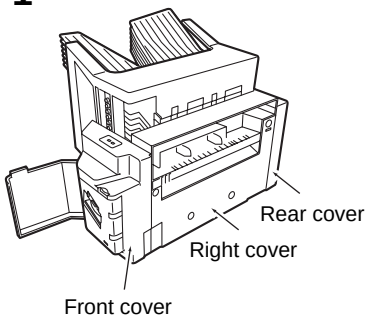
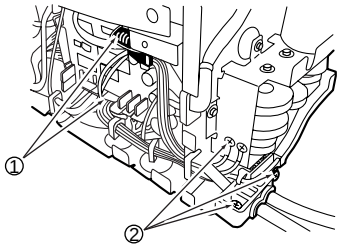
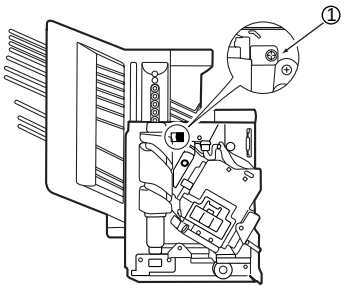
(1) Replacement of the stapler assembly (FA-S620)

1  	Remove the front cover, right cover, and rear cover.
2  	① Remove the tie-wrap. ② Disconnect the connector. ③ Remove the ground wire. (1 screw)
3  	① Rotate the stapler swing motor to move the stapler unit to the position indicated in the diagram. ② Remove the stapler unit. (2 screws)

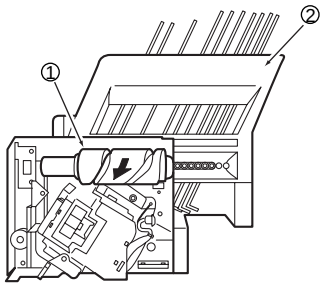
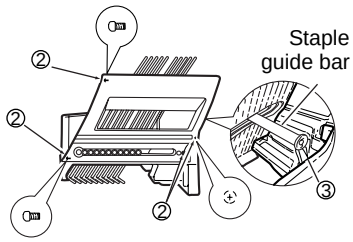
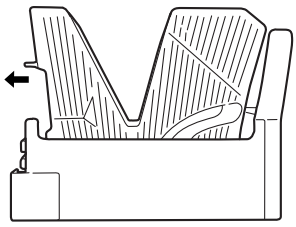
(2) Replacement of the stapler assembly (FA-S660)

1  	Remove the front cover.
2  	① Remove the connector. ② Remove the tie-wraps. (x2)
3  	① Remove the screws. (x2) ② Remove the stapler unit.

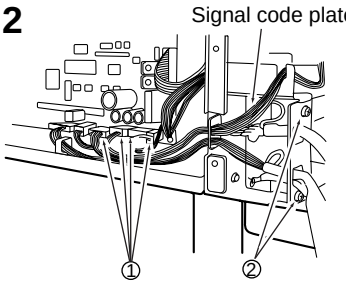
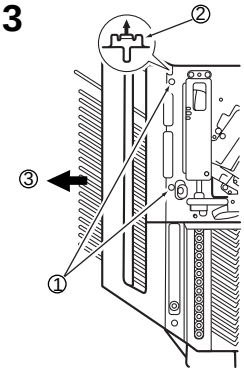
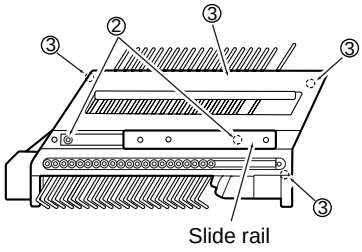
(3) Replacement of the bin unit (FA-S620)

1  	Remove the front cover, right cover, and rear cover.
2  	① Disconnect the connectors of the sorter controller PCB. (x 2) ② Remove the bin cable. (3 screws)
3  	① Remove bin stoppers (front/rear, each 1 screw).

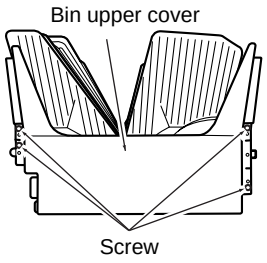
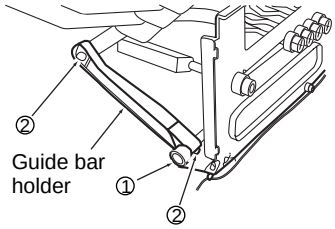
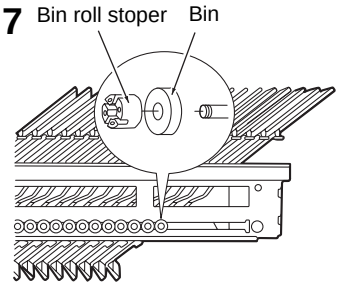
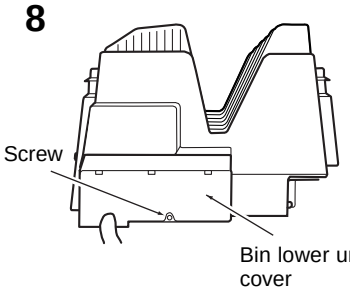
(3) Replacement of the bin unit (FA-S620) (continued)

4 	Remove the bin ① Place the sorter sideways on the work table. ② Turn the reed cam in the direction of the arrow to remove the bin unit. (both front and rear at the same time)
5 	① Remove the bin unit from the sorter and place it on the work table. ② Remove the bin front cover. (4 screw) ③ Remove the staple guide bar. (1 screw)
6 	Remove the bin.

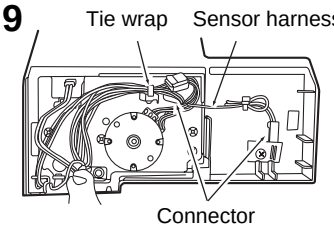
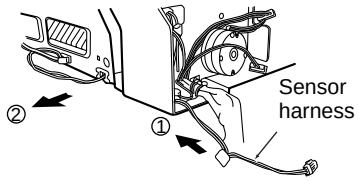
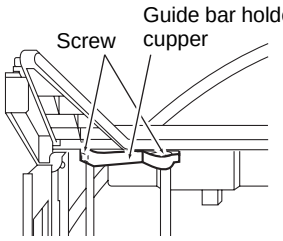
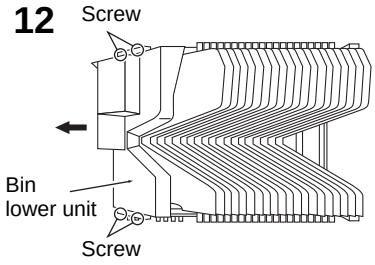
(4) Replacement of the bin unit (FA-S660)

1	Remove the front cover, right cover, and rear cover.
2 	① Disconnect the connector of the sorter controller PCB. (x 4) ② Detach the signal code plate. (2 screws)
3 	① Remove two screws (front/rear). ② Lift the guide rail hitch. ③ Place the detached bin unit as shown.
4 	Replacing the bin from the upper side (See 8 for replacing the bin from the lower side) ① Place the bin unit sideways on the work table. ② Remove the slide rails (front/rear). (2 screws) ③ Remove the bin front cover and bin rear cover. (front side: 3 screws, rear side: 4 screws)

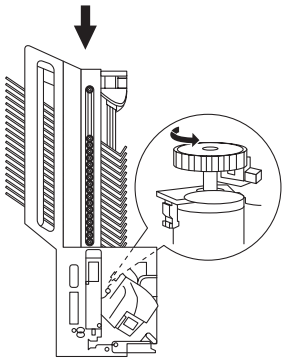
(4) Replacement of the bin unit (FA-S660) (continued)

5 	Remove the bin upper unit cover. (4 screws)
6 	① Remove the spring. ② Remove the guide bar holder. (screws x 2)
7 	Remove the bin roll stopper and bin roll then Remove the bins.
8 	Replacing the bin from the lower side Remove the bin lower unit cover. (1 screw)

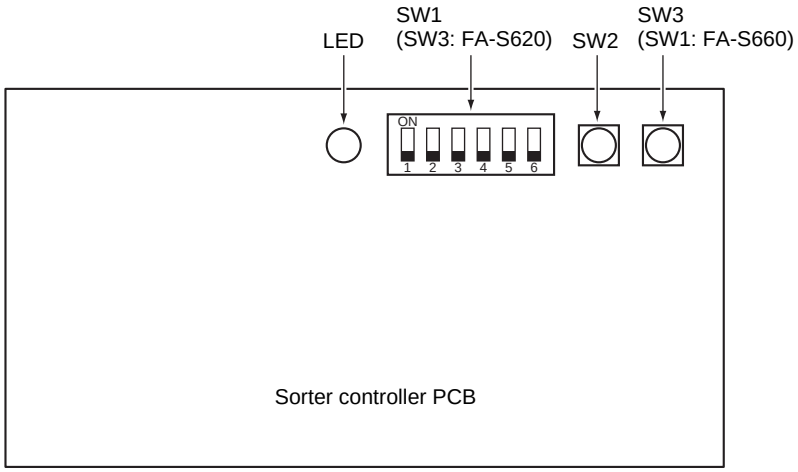
(4) Replacement of the bin unit (FA-S660) (continued)

9 	Disconnect the sensor harness. (2 Connectors, 1 Tie wrap)
10 	Remove the sensor harness as shown.
11 	Remove the guide bar holder (upper). (2 screws)
12 	Remove the bin lower unit. **Note:** Pull out the guide bar holder separating it from the guide bar.
13	Remove the bins removing the bin roll stoppers.

Caution when reassembling the bin unit. (FA-S660)

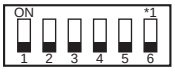
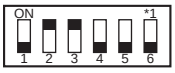
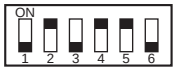
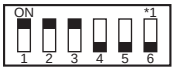
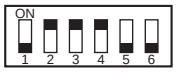
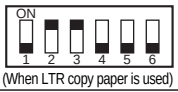
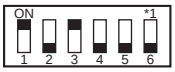
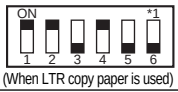
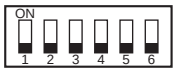
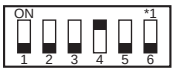
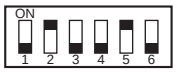
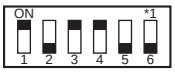
1 	Put the bin unit on the reed cam from the upper side, and fit the bin into the reed cam rotating the clock plate of the shift motor
2	① Make sure if the locking part of the bin roll stopper is not damaged. ② Make sure if the bin roll stopper is not omitted.

3.3 Adjustment



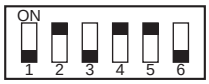
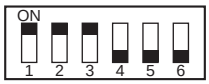
(1) Dip switch function list

Functions of the dip switch (SW1) on the sorter controller PCB are shown in the table below.

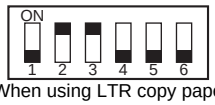
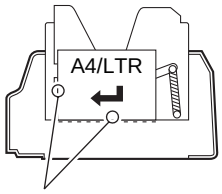
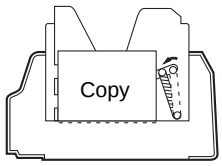
Setting		Function	Page No.
FA-S620	FA-S660		
		By turning OFF all the switches, normal copy condition is set up.	
		• By pressing the manual staple key, the feed motor (M2) rotates in the forward direction (paper feed direction). To stop, press the staple start/stop key again.	
		• By pressing the manual staple key ( ), the in-bin paper dtecting sensor (S1, S2) adjustment mode is executed. When replacing sorter controller PCB and in-bin paper detecting sensor (S1,S2).	
 (When A4 copy paper is used)  (When LTR copy paper is used)	 (When A4 copy paper is used)  (When LTR copy paper is used)	• To adjust the swing range of tamper bar. ✲ When replacing sorter controller PCB, tamper bar home position sensor and the bin unit.	
		By pressing the manual staple key, the guide bar operates. Each press causes the operation of A4-R B5 LT-R A4-R to be repeated. By pressing the manual staple key again, the guide bar returns to the home position and stops.	
		To adjust the staple position ✲ When disassembling sorter controller PCB, stapler home position sensor, and the stapler unit.	

*1: After adjustment, make sure to turn OFF all the swithces.

(2) Adjustment of in-bin paper detecting sensor

1	Remove all the paper from the bin unit.
2 **FA-S620**  **FA-S660**  	Remove the right cover and set the dip switch on the sorter controller PCB as shown. (SW3: FA-S620, SW1:FA-S660)
3	Press the manual staple key.
4	Check the lighting condition of the manual staple key. Kept ON: Adjustment completed. Blinking: Improper adjustment. • Turn OFF and ON the power switch of the copier. Check the installation condition of the sensor and repeat the procedure of step 3.
5	Turn OFF all the dip switch (SW3: FA-S620, SW1:FA-S660)

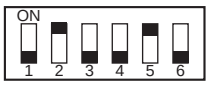
(3) Adjustment of the tamper bar swing range

1	Remove all the paper from the bin unit.
2 **FA-S620**  (When using A4 copy paper)  (When using LTR copy paper) **FA-S660**  (When using A4 copy paper)  (When using LTR copy paper)	Remove the right cover and set the dip switch on the sorter controller PCB as shown. (SW3: FA-S620, SW1:FA-S660)
3  Bring paper into contact	Place the A4 or LTR copy paper (1 sheet) in the bin unit as shown.
4  	Pressing the push switches (SW2 and SW1/ SW3) on the sorter controller PCB, move the guide bar to touch the copy paper slightly. • SW1 (FA-S620), SW3 (FA-S660): The guide bar approaches to the copy paper. • SW2: The guide paper goes away from the copy paper.

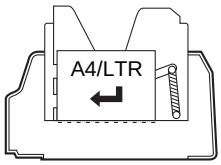
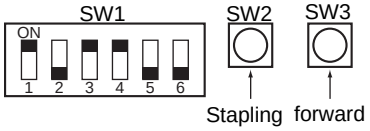
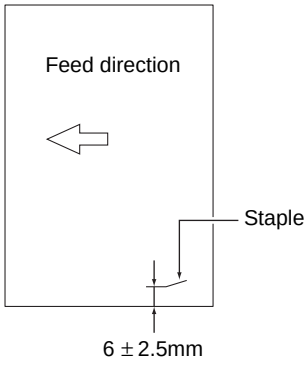
(3) Adjustment of the tamper bar swing range (continued)

5	RemoCheck the lighting condition of the manual staple key. Kept ON: Adjustment completed. Blinking: Improper adjustment. • Check the installation condition of the guide bar home position sensor, and repeat the procedure from the step 3. ve all the paper from the bin unit.
6	Turn OFF all the dip switch (SW3: FA-S620, SW1:FA-S660)

(4) Adjustment of the staple position

1	Remove all the paper from the bin unit.
2 **FA-S620**  **FA-S660** 	Detach the right cover and set the dip switch on the sorter controller PCB as shown. (SW3: FA-S620, SW1:FA-S660)

(4) Adjustment of the staple position (continued)

3 	Place about 5 sheets of copy paper (A4 or LTR) into the top bin.
4 **FA-S620**  **FA-S660** 	Pressing the push switch on the sorter controller PCB, move the stapler unit to the staple position. (SW1:FA-S620, SW3:FA-S660)
5 	Press the push switch to check the staple position. (SW1:FA-S620, SW3:FA-S660) • When the staple position is too outer, press the push switch (SW1/SW3) first then press the other (SW2) to adjust the staple position. • When the staple position is too inner, press the manual staple key to return the staple unit to the home position and readjust the staple position with the push switch. (SW1:FA-S620, SW3:FA-S660)
6	Press the manual staple key. • The value of the adjustment is memorized.
7	Turn OFF all the dip switch (SW3: FA-S620, SW1:FA-S660).

Section IV Electrical

4.1 Electrical parts Operation

(1) Bin motor control

The circuit shows the bin shift motor control circuit diagram.

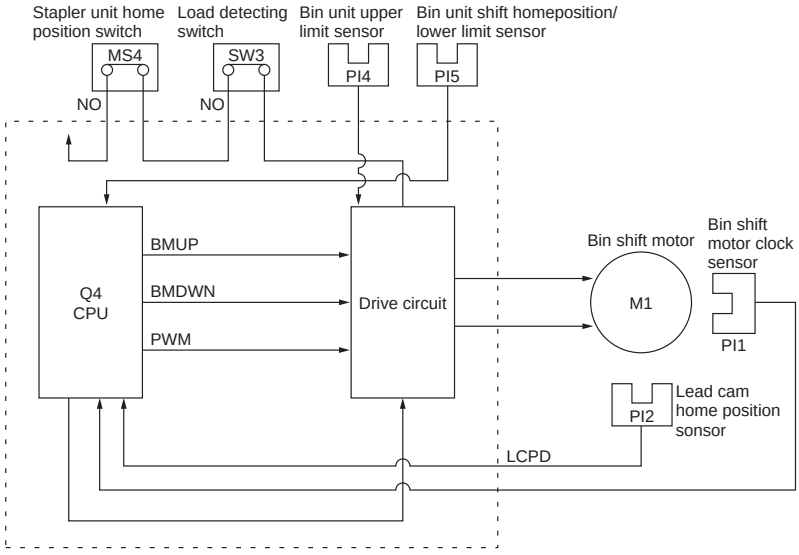
A DC motor is used for the bin shift motor (M1), which is controlled by the drive circuit so that the bin unit moves up and down.

The bin unit up/down speed is detected and controlled by the shift motor clock sensor.

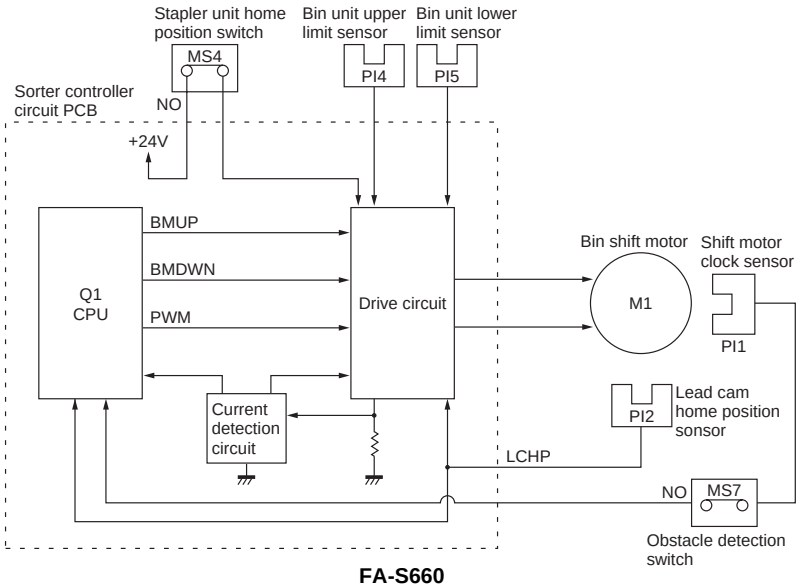
The bin unit stop position is detected by the lead cam home position sensor.

When the stapler unit is not at the home position, the 24V power supply is cut off by the stapler unit home position switch preventing the bin shift motor from rotating to avoid the bin unit and stapler from colliding with each other.

The bin unit upper and lower limit sensors prevent the overrun of the bin unit.



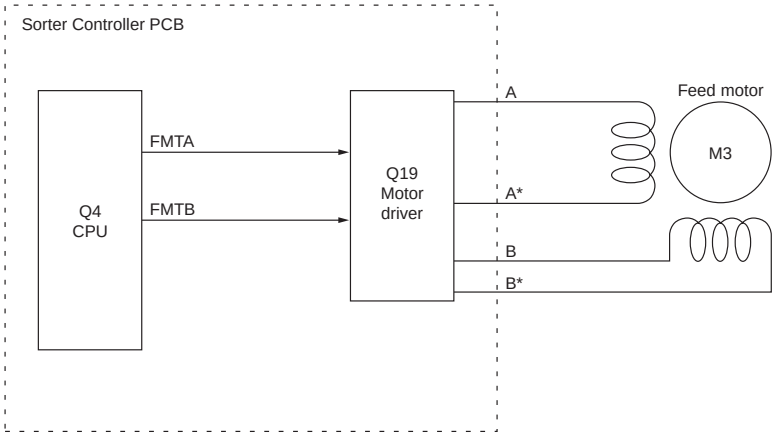
FA-S620


Stapler unit home position switch
Bin unit upper limit sensor
Bin unit lower limit sensor
MS4
PI4
PI5
Sorter controller circuit PCB
NO
+24V
BMUP
BMDWN
PWM
Q1
CPU
Drive circuit
Bin shift motor
Shift motor clock sensor
M1
PI1
PI2
Lead cam home position sonsor
Current detection circuit
LCHP
NO
MS7
Obstacle detection switch

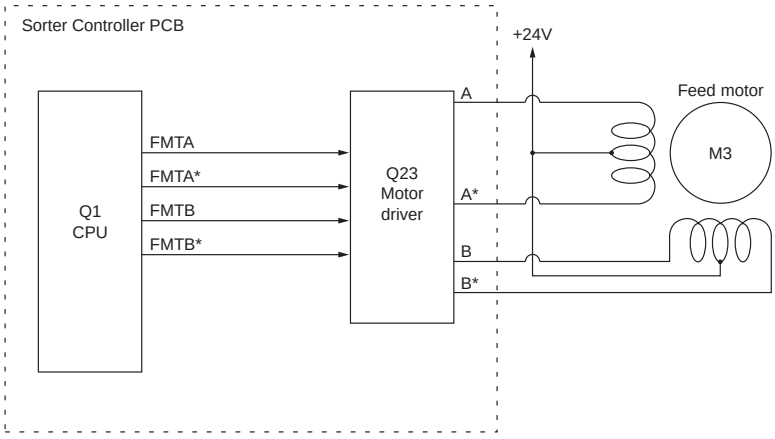
FA-S660

(2) Paper transport motor control

A4-phase (FA-S660)/2-phase (FA-S620) control stepping motor is used for the feed motor. The feed speed is controlled by the number of pulses ofthe pulse signal A, A*, B, and B* of the motor driver IC (Q19: FA-S620, Q23: FA-S660).



FA-S620



FA-S660

(3) Tamper drive motor control

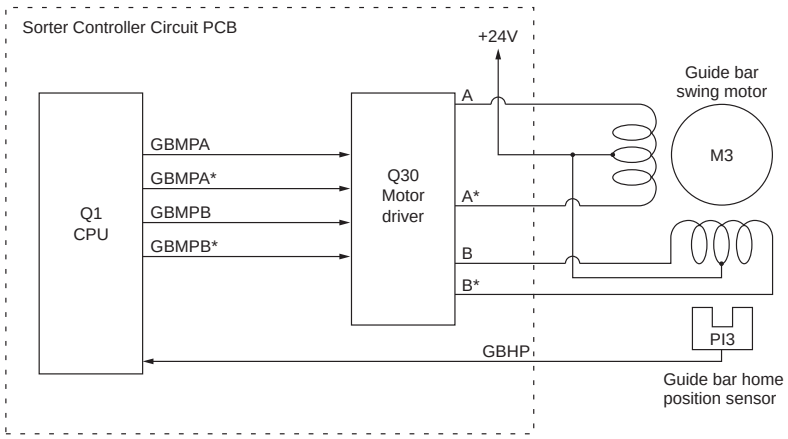
The guide bar swing motor is a 4-phase (FA-S660), 2-phase (FA-S620) control stepping motor.

The sorter controller PCB sends drive pulses (GBMA, GBMA*, GBMB, and GBMB*/ GBMPA, GBMPA*, GBMPB, GBMPB*) to the motor driver.

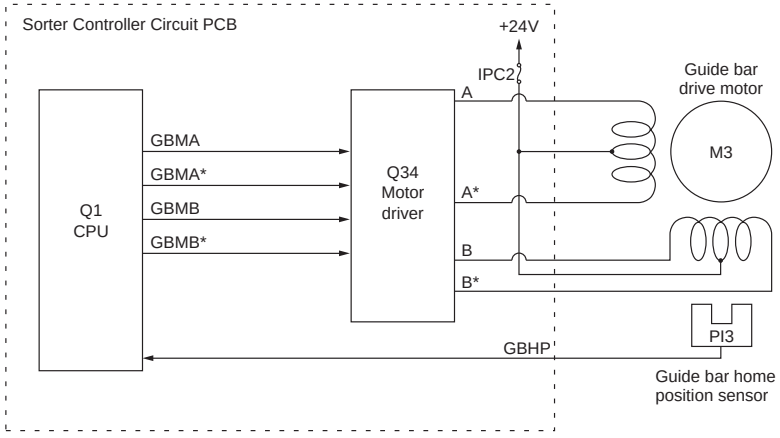
The motor driver controls the output timing of the pulse signal A, A*, B, and B* according to each signal, thereby switching ON and OFF the guide bar swing motor (M3) and its rotating direction.

While the guide bar swing motor (M3) is at the hold condition, the output timing of the pulse signal A, A*, B, and B* is fixed.

The fuse (ICP2/FA-S660) cuts off the power supply circuit to stop the guide bar swing motor (M3) when overcurrent flows to the circuit.



FA-S620

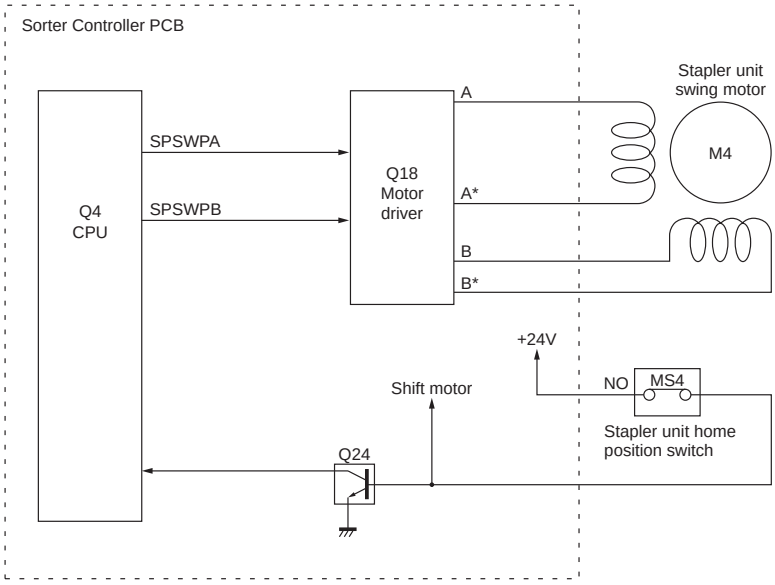


FA-S660

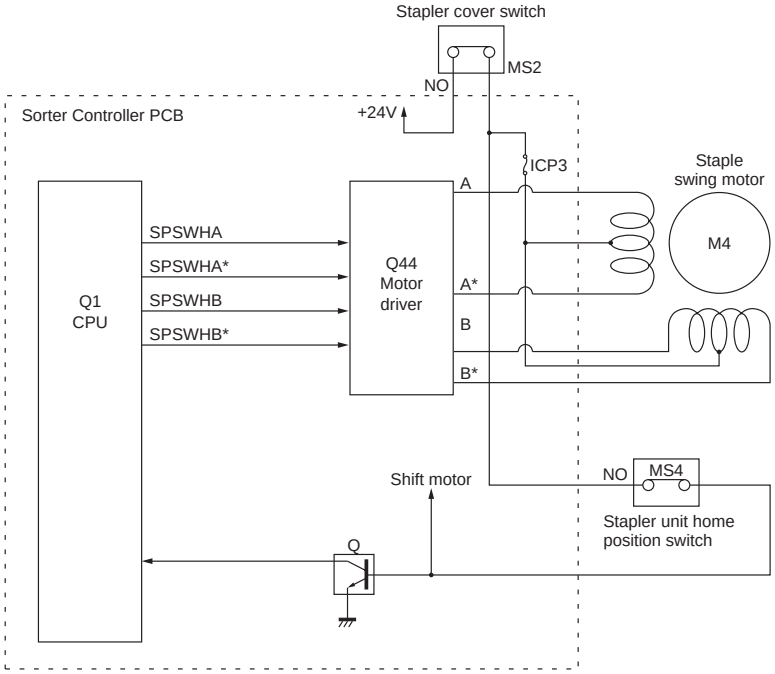
(4) Staple swing motor control

Staple swing motor is a 4-phase (FA-S660)/2-phase (FA-S620) control stepping motor. By controlling the output of pulse signal A, A*, B, and B*, ON/OFF and the rotating direction of staple swing motor (M4) are switched. The stapler cover switch (MS2) and fuse (ICP3/FA-S660) are provided in the power supply circuit to the stapler unit swing motor (M4). The power supply circuit is opened respectively by the stapler cover switch (MS2) when the stapler cover is opened or by the fuse (ICP3/FA-S660) when overcurrent flows to the circuit, to stop staple swing motor (M4).

The stapler home position switch (MS4) is provided in the power supply circuit to the bin shift motor. When the stapler unit is not at the home position, the switch cuts off the power supply to the bin shift motor to prevent the collision between bins and stapler.



FA-S620



FA-S660

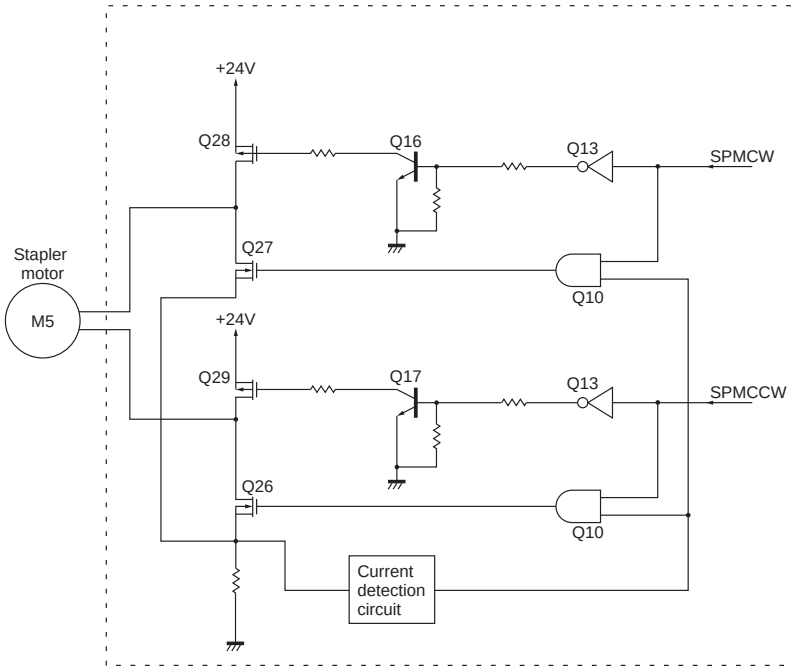
(5) Staple motor control

A DC motor is used for the staple motor (M5). This circuit has major functions as follows:

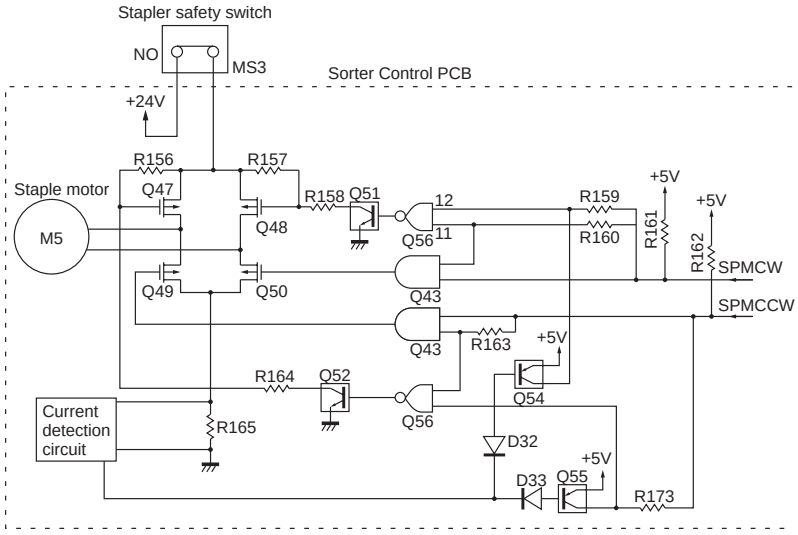
- Staple motor ON/OFF control
- Staple motor rotating direction control
- Staple motor overcurrent protection

Stapler safety switches are provided in the power supply path down to the staple motor (M5).

The stapler safety switch (MS3/FA-S660) cuts off the power supply to drive the staple motor (M5) when some object larger than about 5.5mm enters the stapler.



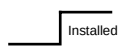
FA-S620



FA-S660

4.2 Connector signals

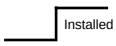
(1) FA-S620

Connector No.	Signal Name	Connection	Input/Output	Function
J1-2	DENDET	Lead cam rotation detecting switch (SW3)		Lead cam rotation detecting siginal
J2-1	SPSWPB	Stapler swing motor (M4)		Stapler swing motor drive signal
J2-2	SPSWPB*			
J2-4	SPSWPA			
J2-5	SPSWHA*			
J3-1	FMPA*	Feed motor (M2)		Feed motor drive signal
J3-2	FMPA			
J3-3	FMPB*			
J3-4	FMPB			
J4-1	GBMPA	Staple guide bar drive motor (M3)		Staple guide bar drive motor signal
J4-2	GBMPB			
J4-3	GBMPA*			
J4-4	GBMPB*			
J5-1	BMUP	Bin shift motor (M1)		Bin shift motor drive signal (Bin goes up)
J5-2	BMDWN	Bin shift motor (M1)		Bin shift motor drive signal (Bin goes down)
J7-1	JOI SW	Sorter interlock switch (MS1)		Sorter installation detecting signal
J8-2	SPUHP	Stapler unit home position switch (MS4)		Stapler unit home position detecting signal
J8-5	STPOPN	Stapler unit cover switch (MS2)		Stapler unit cover open/ close detecting signal

Connector No.	Signal Name	Connection	Input/Output	Function
J9-1	BUL	Bin unit upper limit sensor (PI4)	Upper limit	Bin unit upper limit detecting signal
J9-4	BINHP	Bin unit lower limit sensor (PI5)	Lower limit	Bin unit lower limit detecting signal
J9-8	BSMC	Bin unit drive motor clock sensor (MS-6)	Pulse	Bin unit drive motor clock signal
J11-1,2	STTPMCW	Staple motor (M5)	Pulse	Motor rotation signal 1
J11-4,5	STTPMCCW	Staple motor (M5)	Pulse	Motor rotation signal 2
J11-6	STPCRT	Staple cartridge detecting switch (MS5)	Staples / No staples	Staple cartridge detecting signal
J11-8	SPEMP	Staple detecting switch (MS6)	Staples / No staples	Staple detecting signal
J11-9	SPLHP	Stapler unit home position sensor (PI8)	Home position	Stapler unit home position detecting signal
J12-3	STPOK	Manual staple key	Stapling ready	Stapling ready indication signal
J12-4	STEMP	Manual staple key	No staples	No staples indication signal
J13-1	SEJCT	Paper exit sensor	Detects	Paper exit sensor signal
J15-1	LCPD	Lead cam home position sensor (PI2)	Home	Lead cam home position signal
J16-1	BINPA	In-bin paper detecting sensor	Light emitted	In-bin paper detecting sensor (light emitting unit) signal
J16-5	GBHP	Guide bar home position sensor (P13)	Home position	Guide bar home position detecting signal
J7-11	SELFP	Stapling position detecting sensor (PI9)	Stapling position	Stapling position detecting signal
J7-12	IBUTU	Stapler safety switch (MS3)	Safe	Stapler safety switch signal
J14-1	SPL COV	Stapler unit cover switch (PI7)	Close	Stapler unit cover open/ close detecting signal

(2) FA-S660

Connector No.	Signal Name	Connection	Input/Output	Function
J3-1	SP LED	Manual staple key	Stapling ready	Stapling ready indication signal
J3-2	HARI LED	Manual staple key	No staples	No staples indication signal
J4-2	BIN LED	In-bin paper detecting sensor (light emitting unit)(S1)	Light emitted	In-bin paper detecting sensor (light emitting unit) signal
J4-3	PA CHE	In-bin paper detecting sensor (light receiving unit)(S2)	Light received	In-bin paper detecting sensor (light receiving unit) signal
J4-6	STYGHP	Guide bar home position sensor (P13)	Home position	Guide bar home position detecting signal
J5-3	SHIFT CLK	Bin unit drive motor clock sensor (PI1)	Pulse	Bin unit drive motor clock signal
J5-5	CUMH	Lead cam home position sensor (PI2)	Home	Lead cam home position signal
J6-2	SPLOPN	Stapler unit cover switch (MS2)	Close	Stapler unit cover open/ close detecting signal
J6-4	SPUHP	Stapler unit home position switch (MS4)	Home	Stapler unit home position detecting signal
J7-1	SPMCW	Staple motor (M5)	Pluse	Motor rotation signal 1
J7-2	SPMCCW	Staple motor (M5)	Pluse	Motor rotation signal 2
J7-7	SPEMP	Staple detecting switch (MS5)	Staples / No staples	Staple detecting signal
J7-8	SP CART	Staple cartridge detecting switch (MS6)	Staples / No staples	Staple cartridge detecting signal
J7-9	SPLHP	Stapler unit home position sensor (PI8)	Home position	Stapler unit home position detecting signal
J7-11	SELFP	Stapling position detecting sensor (PI9)	Stapling position	Stapling position detecting signal
J7-12	IBUTU	Stapler safety switch (MS3)	Safe	Stapler safety switch signal
J8-1	BMUP	Bin shift motor (M1)	Up	Bin shift motor drive signal (Bin goes up)
J8-2	BMDWN	Bin shift motor (M1)	Down	Bin shift motor drive signal (Bin goes down)

Connector No.	Signal Name	Connection	Input/Output	Function
J8-3	FMHA	Feed motor (M2)	 Pulse	Feed motor drive signal
J8-5	FMHB			
J8-6	FMH$\overline{A}$			
J8-8	FMH$\overline{B}$			
J9-1	GBMA	Tamper bar drive motor (M3)	 Pulse	Tamper bar drive motor signal
J9-3	GBMB			
J9-4	GBM$\overline{A}$			
J9-6	GBM$\overline{B}$			
J10-2	JOI SW	Sorter interlock switch (MS1)	 Installed	Sorter installation detecting signal
J11-3	BUL	Bin unit upper limit sensor (PI4)	 Upper limit	Bin unit upper limit detecting signal
J11-6	BLL	Bin unit lower limit sensor (PI5)	 Lower limit	Bin unit lower limit detecting signal
J12-2	SPSWHB	Stapler swing motor (M4)	 Pulse	Stapler swing motor drive signal
J12-3	SPSWHA			
J12-4	SPSWHB			
J12-5	SPSWHA			
J13-3	SOP	Sorter interlock sensor (PI6)	 Installed	Sorter installation detecting signal
J14-1	SPL COV	Stapler unit cover switch (PI7)	 Close	Stapler unit cover open/ close detecting signal

Section V Troubleshooting

Remember that failure indications can be caused by defects in harnesses and/or connections.

5.1 Self-diagnosis/Machine malfunction

The self-diagnostic function detects machine malfunctions and indicates messages on the display depending on the trouble area.
When malfunctions occur, the +24V power supply is interrupted and the machine is stopped. At the same time the message appears in the display. Take necessary measures depending on the message.

(1) Use error: Message appears on the copy number display

Message	Code	Cause	Page
"Close sorter"	U4	Sorter is not installed correctly	P5-2
"Clear sorter bins"	U11	Paper condition in the sorter is abnormal	P5-2
"Close staple cover of sorter"	U12	Stapler cover is not closed	P5-2
"Replace staple cartridge"	–	Staple cartridge is not detected	P5-2
"Sorter-full-Empty/Press mode key"	oF	Paper overflow in the sorter	P5-3

(a) U4:Sorter failure

* When the sorter is not installed correctly.

Is the sorter installed correctly? —NO→ • Install the sorter correctly

↓ YES

Does the input of the connector (J7-1:S620/J3-1:S660) change when the door switch is turned ON/OFF? —NO→ • Door switch improper fitting or failure

(b) U11:Sorter paper trouble

* Paper is in the sort bin when the staple sort mode or sort mode is selected.
  - More than 50(30/Ledger, A3) copies are received by the sort bin.
  - Sheets of paper of different width or sizes unsuitable for stapling(invoice,etc.) are received.

"U11" is cleared when all the copies in the sort bin are removed.

(c) U12:Stapler unit cover trouble

* When the staple unit cover is not closed completely.

Is the cover opened? —NO→ • Close the cover.

↓ YES

Does the output from YJ6-2 (SPLOPN) change when opening and closing the cover? —NO→ • Stapler unit cover switch failure.

(d) Staple cartridge is not detected

* Under the following conditions, copies won't be stapled:
  - Pressing the manual staple key
  - Selecting the staple sort mode

Note: The "Add staple" indication is an alarm. All functions other than stapling are normal.

Does the output from (J11-6, 8: S620/J7-7, 8: S660) change when the staple cartridge is in and out?

NO

- Staple detecting switch (MS5) failure---replace the sensor.

(e) oF: Paper detection trouble

* When the number of sorted copies received by a sorter bin exceeds the specified number of copies.

To clear "oF", remove all the copied sheets.

(2) Paper Jam

* Detection of Paper Jam

- FA-S620/S660 copy paper transport condition is monitored by the sensors shown below. When paper is jammed, the jam position indicator ( ) blinks. at the same time, "paper jam" is memorized by code number (J60). (Maximum 10 occurrences including options.)
- To recall paper jam codes, refer to the copier service manual "F8-06".

(a) Jam conditions

- When the sorter paper feed sensor does not detect paper within a predetermined time after the paper exit sensor in the copier detects paper.
- When the sorter paper exit sensor does not detect paper within a predetermined time after the paper feed sensor in the sorter detects paper.
- When the sorter paper feed sensor and the sorter paper exit sensor detect paper when the power switch is turned on.

* To clear "paper jam" indication, remove the paper, reset the sorter mode and select the sorter mode again.

(3) Machine malfunctions

- When the CPU P.C.B. can not control the machine or any trouble occurs, the error code(Exx) appears in the message display of the copier and the machine will stop.
- To clear Exx, release the sort mode and select the sort mode again.

(a) Sorter failure

Error code	Item	Cause
E5-22	Communication failure	• Communication between the copier and the sorter is faulty.
E7-01	Bin motor failure	• The reed cam switch is not re-turned ON within a predetermined time after motor drive signal is output. • The bin home position detecting switch is not turned OFF within a predetermined time after the bins are lifted up from the bin home position. • The motor clock signal is not detected within a predetermined time after the motor drive signal is output.
E7-07	Stapler swing motor failure	• The stapler position detecting sensor is not turned ON within a predetermined time after motor drive signal is output. • The stapler swing home position detecting sensor is not turned ON within a predetermined time after motor drive signal is output.
E7-07	Stapler drive motor failure	• The stapler unit home position sensor is not turned ON within a predetermined time after output of the motor drive signal. Next, The staple unit home position sensor is not turned ON within a predetermined time after output of motor reverse drive signal.
E7-07	Staple guide bar drive motor failure	• Staple guide bar home position detecting sensor is not turned ON within a predetermined time after output of the motor drive signal.

✻ E5-22:Communication failure

Is the sorter cord connected securely?

NO

- Check connector CNT3 of the copier.
- Check connector (J6, 10: S620/J1, 2: S660) of the sorter controller P.C.B.

YES

Is the voltage between connector (J6-1, 2: S620/J1-1, 2: S660) of the sorter controller CPU P.C.B. approximately 24V?
(J6/J1-2 0n the (+) side)

NO

- Check the sorter controller P.C.B. failure.

* E7-01Bin motor failure

Does the output of (J1-2: S620/J5-5: S660) change when the reed cam home position sensor is turned ON/OFF?

NO → • Sensor is not mounted correctly or sensor failure.

YES

Is DC+24V generated between (J5-1 and 2: S620/J8-1 and 2: S660) with the rotation of bin motor?

Lifting up: J5-1/J8-1: +24V

Lifting down: J5-2/J8-2: +24V

NO → • Check DC+24V of the sorter controller CPU.

YES

Bin motor failure.

* E7-07 Stapler swing motor failure

Does the output of connector (J8-2: S620/J7-1: S660) change when the stapler unit home position sensor is turned ON/OFF?

NO → • Sensor is not mounted correctly or sensor failure.

YES

Is DC+24V generated connector J12-1 (S660) with the rotation of stapler swing motor?

NO → • Check DC+24V of the sorter controller CPU.

YES

Bin motor failure.

* E7-07: Stapler drive motor failure

Does the output of connector (J8-2:S620/J6-4:S660) change when the switch is turned ON/OFF?

NO → • The switch is defective.

YES ↓

Is +5V generated connector (J11-4, 5: S620/J7-3, 4: S660) with the stapler drive motor?

NO → • Check DC +5V of the sorter controller P.C.B..

YES ↓

• Stapler drive motor failure.

* E7-07: Staple guide bar drive motor failure

Does the output of connector (J16-5:S620/J4-6:S660) change when the guide bar home position sensor is turned ON/OFF?

NO → • The guide bar home position sensor is defective.

YES ↓

Is pulse input generated to J9-1,3,4,6 with the tamper drive motor and DC+24V generated on J9-2,5 (S660)?

NO → • Check DC +24V of the sorter controller P.C.B..

5.2 Service mode

(1) F4 mode

1) Input check

Code No.	Function	Condition	Message display							
			7	6	5	4	3	2	1	0
22	For FA-S620/S660 a) Sorter interlock switch	Sorter is installed.					↑			
23	For FA-S620/S660 a) Bin unit drive motor clock sensor b) Reed cam home position sensor c) Staple guide bar home position sensor	Bin in home position. Reed cam in home position. Staple guide bar in home position.			↑	↑	↑			
24	For FA-S620/S660 a) Bin paper detecting sensor b) Staple detecting sensor	Paper is detected. Staple is detected.			↑		↑			
25	For FA-S620/S660 a) Stapler unit home position sensor b) Stapler safety switch	Unit in home position. Obstacles are not detected. (Switch turns ON)		↑			↑			

2) Output check

Started by "Copy start" key operation.

Released by "Clear/Stop" key operation or at the end of operation.

Code		Item	Function
88		Transport motor	The motor is energized.
89		Bin movement (down direction)	The #10/20 bin or other bin position moves to #1 bin position.
90		Bin movement (Up direction)	The #1 bin or other bin position moves to #10/20 bin position.
91		Tamper drive motor	The tamper moves to the smallest size position.
92		Staple motor	The motor is energized once.
93		Staple ready indicator	The indicator lights up once.
94		Staple action	The motor is energized once.

Section VI
Unpacking/Installation

6.1 Installation requirements

- The same as the copier, FA-S620/S660 is a precision machine. The performance of the sorter can be affected by the surrounding conditions.

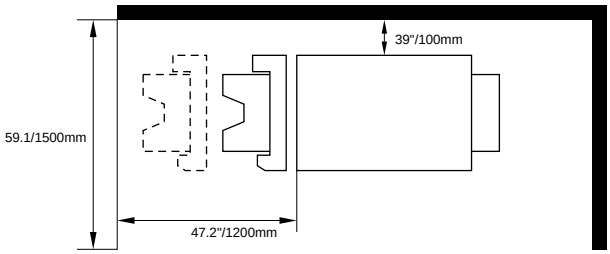
(1) The sorter should not be installed under the following conditions:

(1) Extremely high temperature/humidity.
(2) In areas exposed to direct sunlight.
(3) In areas of high dust concentration.
(4) In areas with poor ventilation.
(5) In areas of chemical fume concentration.
(6) In areas with excessive vibrations.
(7) Directly in air conditioning flow.

Note: If the copier is installed under the above conditions, suggest that the customer move it to an appropriate place.

(2) Check the following requirements before installing FA-S620/S660.

(1) The space shown below is needed for installation.



(2) Make sure that only accessories made by Panasonic are used.
- System consoles: FA-DS72
  FA-DS82

(3) Make sure the copier is operating normally before installing FA-S620/S660.

6.2 Installation Procedure (FA-S620)

(1) Unpacking

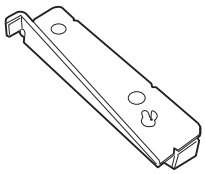
Check the condition and contents of each box for any shipping damage and completeness before installation. (Visual check)

* Check the contents of the box.

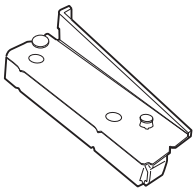
Sorter receiving bracket (rear) (X1)

Sorter receiving bracket (front) (X1)

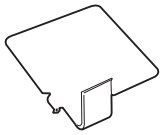
System console support bracket (X2)



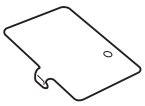
Rail mounting bracket (rear) (X1)



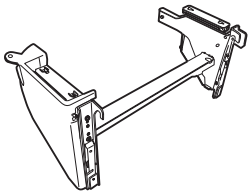
Rail mounting bracket (front) (X1)



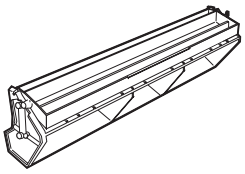
Magnet catch (rear) (X1)



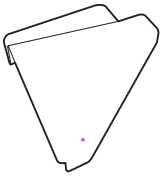
Magnet catch (front) (X1)



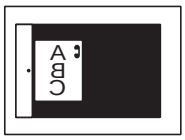
Rail assembly (X1)



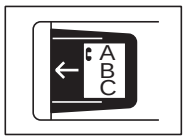
Paper guide (X1)



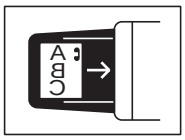
Rail cover (X1)



"Staple" label (A)
(X1)



"Staple" label (B)
(X1)



"Staple" label (C)
(X1)

<Screws>

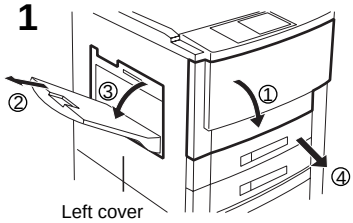
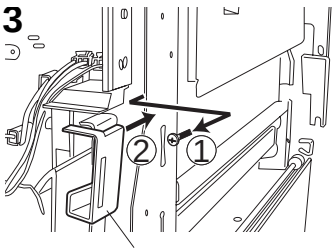
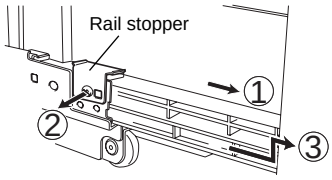
Rail assembly fixing (M4 X 25)(X2)	Rail cover fixing (M4 X 8)(X3)
(For FP-7824/7830)	System console support
Rail assembly fixing (M4 X 16)(X2)	bracket fixing (M4 X 8)(X 4)
(For FP-7818)	Magnet catch fixing (M4 X 10)(X2)
Sorter fixing (M4 X 8)(X 2)	Paper guide fixing (M4 X 12)(X 2)
Sorter receiving bracket fixing (M4 X 8)(X 1)	Rail mounting bracket fixing (M4 X 8)(X4)

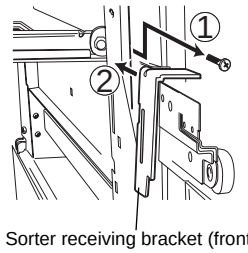
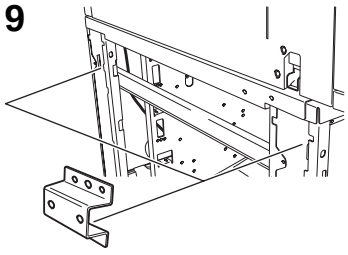
(2) Installation

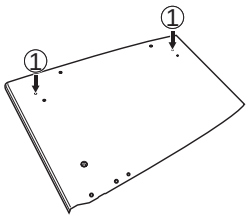
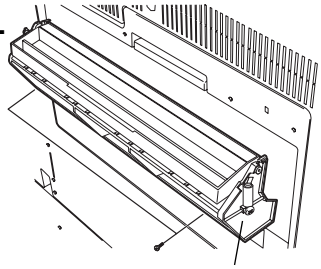
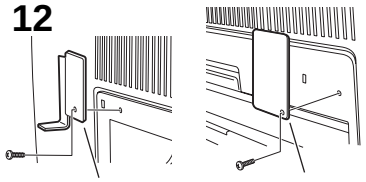
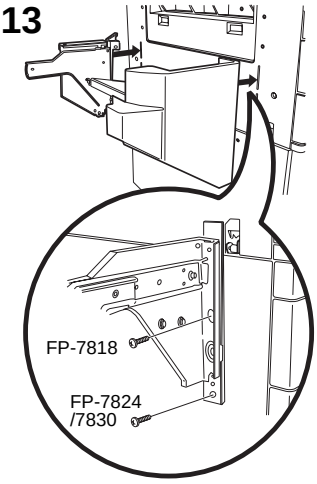
Remove all shipping materials before installation.

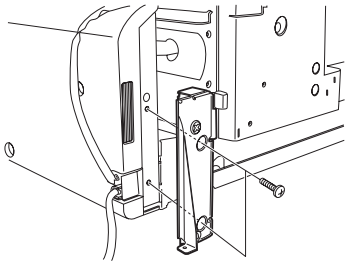
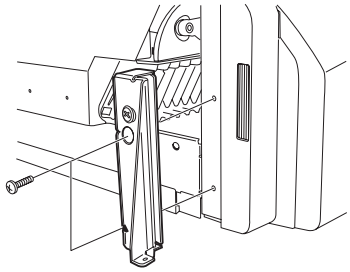
Caution: Make sure the copier is unplugged before the installation.

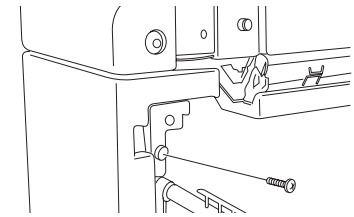
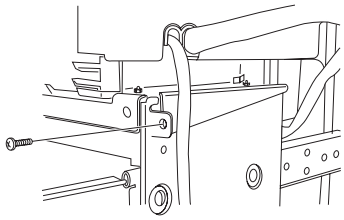
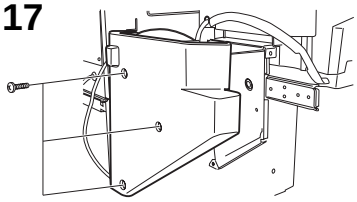
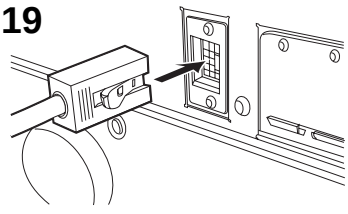
Procedures 1 to 7: for FP-7824/7830/7835
except FP-7818

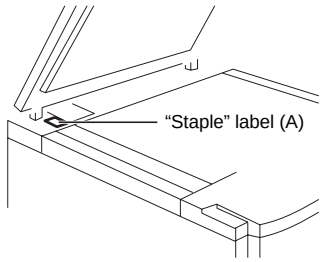
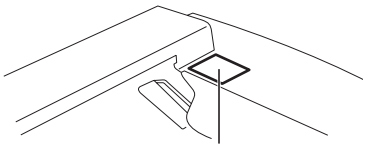
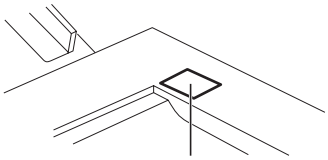
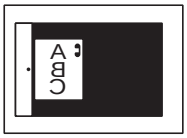
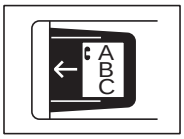
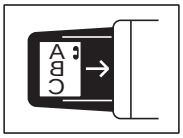
Location	Procedure	Check	
1 	(1) Open the front door. (2) When using the exit tray, remove the exit tray. (3) Open the exit cover. (4) Open the upper cassette/ADU.		
2	(1) Remove the left cover. (3 screws) (2) Remove the rear cover. (7 screws) (3) When the ADU is installed: Remove the waste toner bottle then remove the right cover. (2 screws)		
3 	(1) Remove the upper cassette rail fixing screw. (rear side X 1) (2) Install the sorter receiving bracket (rear), together with the upper cassette rail. (1 screw: just removed, 1 screw: included)		
4 	(1) Pull out the upper cassette/ADU. (2) Remove the rail stopper. (1 screw) When the ADU is installed: Remove the both side rail stoppers (2 screws) (3) Remove the upper cassette/ADU. FP-7818: Remove the cassette.		

Location	Procedure	Check	
5  Sorter receiving bracket (front)	(1) Remove the upper cassette rail fixing screw. (front side X 1) (2) Install the sorter receiving bracket (front), together with the upper cassette rail. (1 screw just removed)		
6	Re-install the upper cassette/ADU and rail stopper.		
7	(1) Re-install the left cover and rear cover. (2) Close the exit door and front door. (3) When the ADU is installed: Re-install the waste toner bottle then re-install the right cover.		
8	Remove the system console left cover. (2 screws)		
9 	Install the system console support brackets. (front and rear, 4 screws, M4 X 8)		

Location	Procedure	Check	
10 	(1) Remove the pre-stamped holes (2 positions). (2) Re-install the system console left cover.		
11 	Install the paper guide. (2 screws, M4 X 12)		
12 	Install the magnet catches (front and rear sides). (2 positions, 2 screws, M4 X 10)		
13 	Insert the rail assembly into the upper slits of copier left cover, then fix the rail assembly. (For FP-7824/7830: 2 screws, M4 X 25) (For FP-7818: 2 screws, M4 X 16)		

Location	Procedure	Check	
14 Rail mounting bracket (rear)  Rail mounting bracket (front) 	Install the rail mounting bracket to underside of the sorter (front and rear side). (4 screws, M4 X 8)		
15	Pull out the rail assembly fully, and install the sorter. **Note:** Holding the set the sorter with both hands as shown as the figure. If hold the other parts, sorter will be damaged.		

Location	Procedure	Check	
16  	Fix the rail assembly to the sorter body (front and rear side). (2 screws, M4 X 8)		
17 	Install the rail cover. (3 screws, M4 X 8)		
18	For FP-7818: Install the sorter mounting kit (FA-SH01). Refer to the installation procedure of FA-SH01.		
19 	Connect the lattice connector of the sorter to the copier.		

Location	Procedure	Check	
20 **<Copier upper cover, rear>**  **<FA-A888>**  **<FA-A505>**  	Attach the "Staple" label (1) Open the platen cover (or ADF) (2) Attach "Staple" label (A) provided on the upper cover (rear).  **(When the ADF is installed)** <FA-A888> Attach "Staple" label (B) provided on the main cover.  <FA-A505> Attach "Staple" label (C) provided on the main cover. 		
21	Operation check (1) Place some paper in the stapler position on the top bin and press the manual staple key. (2) Remove the paper from the bin and check staple. (3) When sheets of paper are not stapled, repeat steps (1) and (2).		

6.2 Installation Procedure (FA-S660)

(1) Unpacking

Check the condition and contents of each box for any shipping damage and completeness before installation. (Visual check)

* Check the contents of the box.

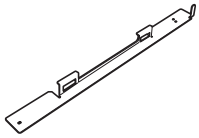
Sorter receiving bracket (rear) (X1)

Sorter receiving bracket (front) (X1)

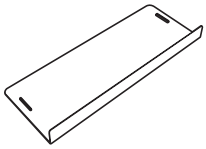
System console support bracket (X2)

Spacer (X2)

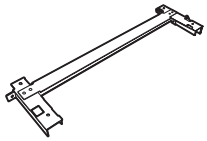
Connecting plate (X1)



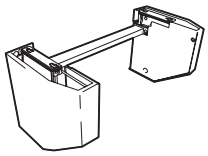
Latch receiving bracket (X1)



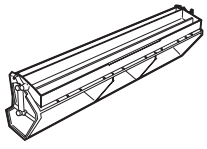
Stabilizer (X1)



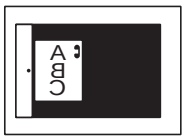
Sorter mounting bracket (X1)



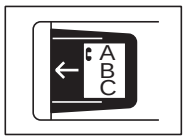
Rail assembly (X1)



Paper guide (X1)



"Staple" label (A)
(X1)



"Staple" label (B)
(X1)

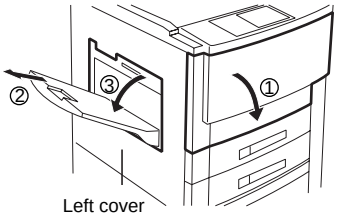
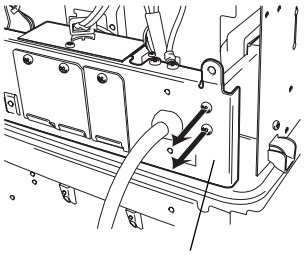
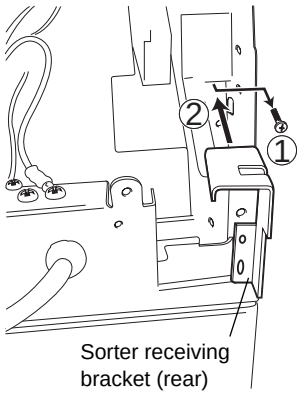
<Screws>

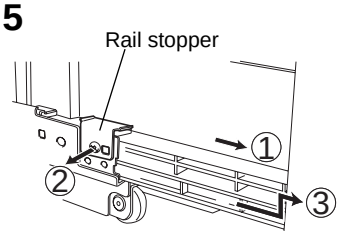
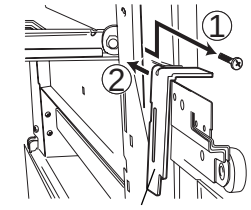
Rail assembly fixing (M4 x 33)(x 2)	Latch receiving bracket fixing
Sorter fixing (M4 x 8)(x 2)	(M4 x 12)(x 2)
Sorter receiving bracket fixing (M4 x 8)(x 1)	Paper guide fixing (M4 x 12)(x 2)
System console support bracket fixing	Upset prevention plate fixing (M4 x 14)(x 2)
(M4 x 8)(x 4)	Sorter mounting bracket fixing (M4 x 12)(x 4)

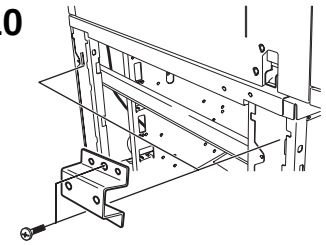
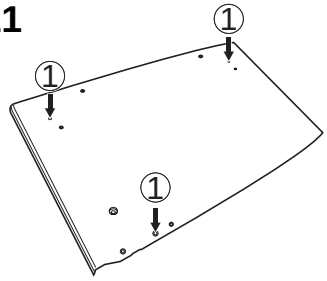
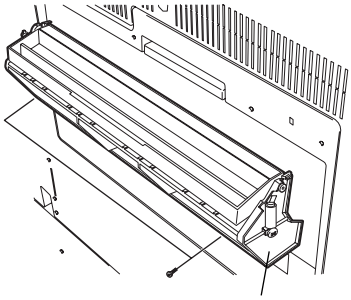
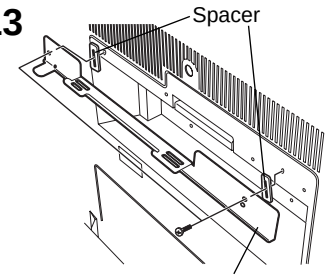
(2) Installation

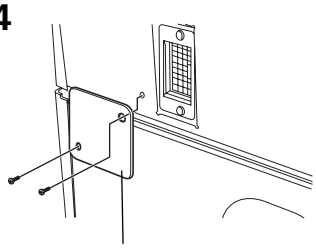
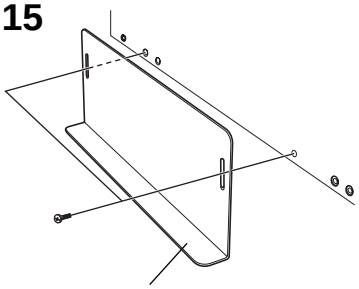
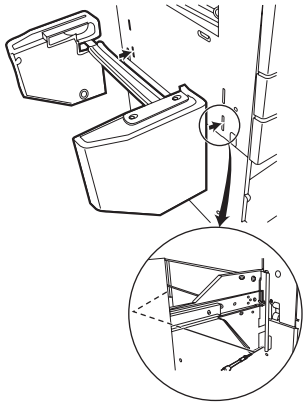
Remove all shipping materials before installation.

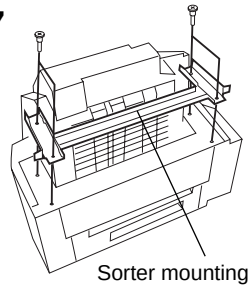
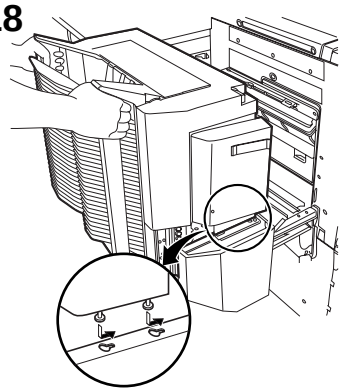
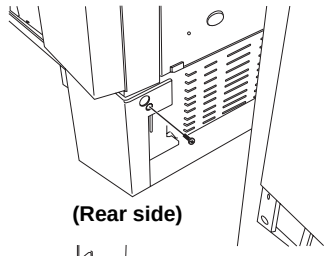
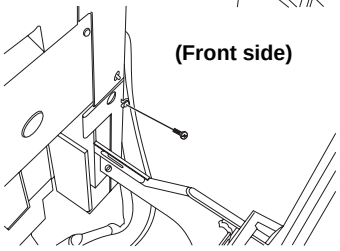
Caution: Make sure the copier is unplugged before the installation.

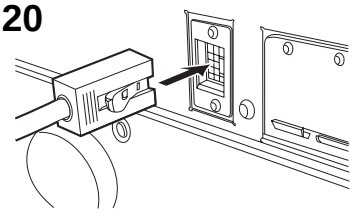
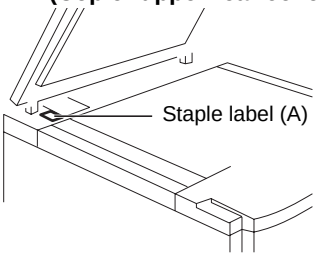
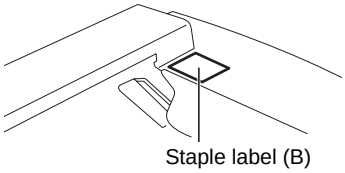
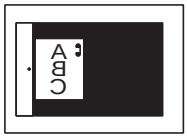
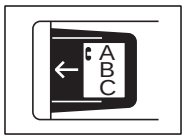
Location	Procedure	Check	
1 	(1) Open the front door. (2) When using the exit tray, remove the exit tray. (3) Open the exit cover.		
2	(1) Remove the left cover. (3 screws) (2) Remove the rear cover. (7 screws)		
3 	Remove the power cord mounting bracket. (2 screws)		
4 	(1) Remove the lower cassette rail fixing screw. (rear side X 1) (2) Install the sorter receiving bracket (rear). (1 screw: just removed, 1 screw: included) (3) Reinstall the power cord mounting bracket. (2 screws removed)		

Location	Procedure	Check	
5 	(1) Pull out the lower cassette. (2) Remove the rail stopper. (1 screw) (3) Remove the lower cassette.		
6  Sorter receiving bracket (front)	(1) Remove the lower cassette rail fixing screw. (front side X 1) (2) Install the sorter receiving bracket (front), together with the lower cassette rail. (2 screws just removed)		
7	Re-install the lower cassette and rail stopper.		
8	(1) Re-install the left cover and rear cover. (2) Close the exit door and front door.		
9	Remove the system console left cover. (2 screws)		

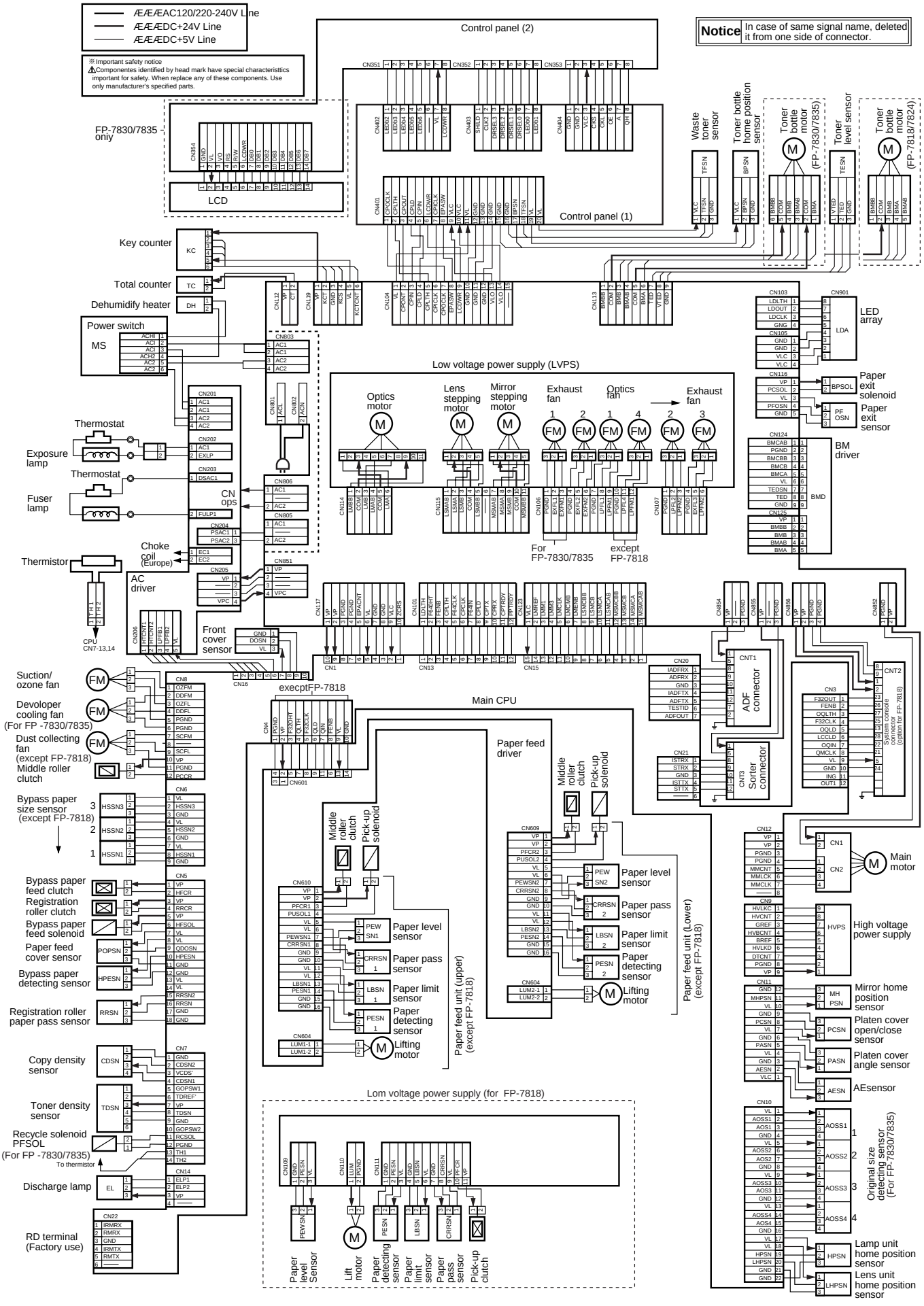
Location	Procedure	Check	
10 	Install the system console support brackets. (front and rear, 4 screws, M4 X 8)		
11 	(1) Remove the pre-stamped holes (3 positions). (2) Re-install the system console left cover.		
12  Paper guide	Install the paper guide. (2 screws, M4 X 12)		
13  Latch receiving bracket	Install the latch receiving bracket together with the spacer. (2 screws, M4 X 12)		

Location	Procedure	Check	
14  Connecting plate	(1) Remove 2screws of the rear cover (copier and system console). (2) Install the connecting plate to the rear cover (copier and system console). (2 screws, just removed)		
15  fall stabilizer	Install the floor stabilizer to the system console. (2 screws, M4 X 14) **Note:** Put the floor stabilizer completely on the flower.		
16 	Insert the rail assembly into the lower slits of copier left cover, then fix the rail assembly. (2 screws, M4 X 33)		

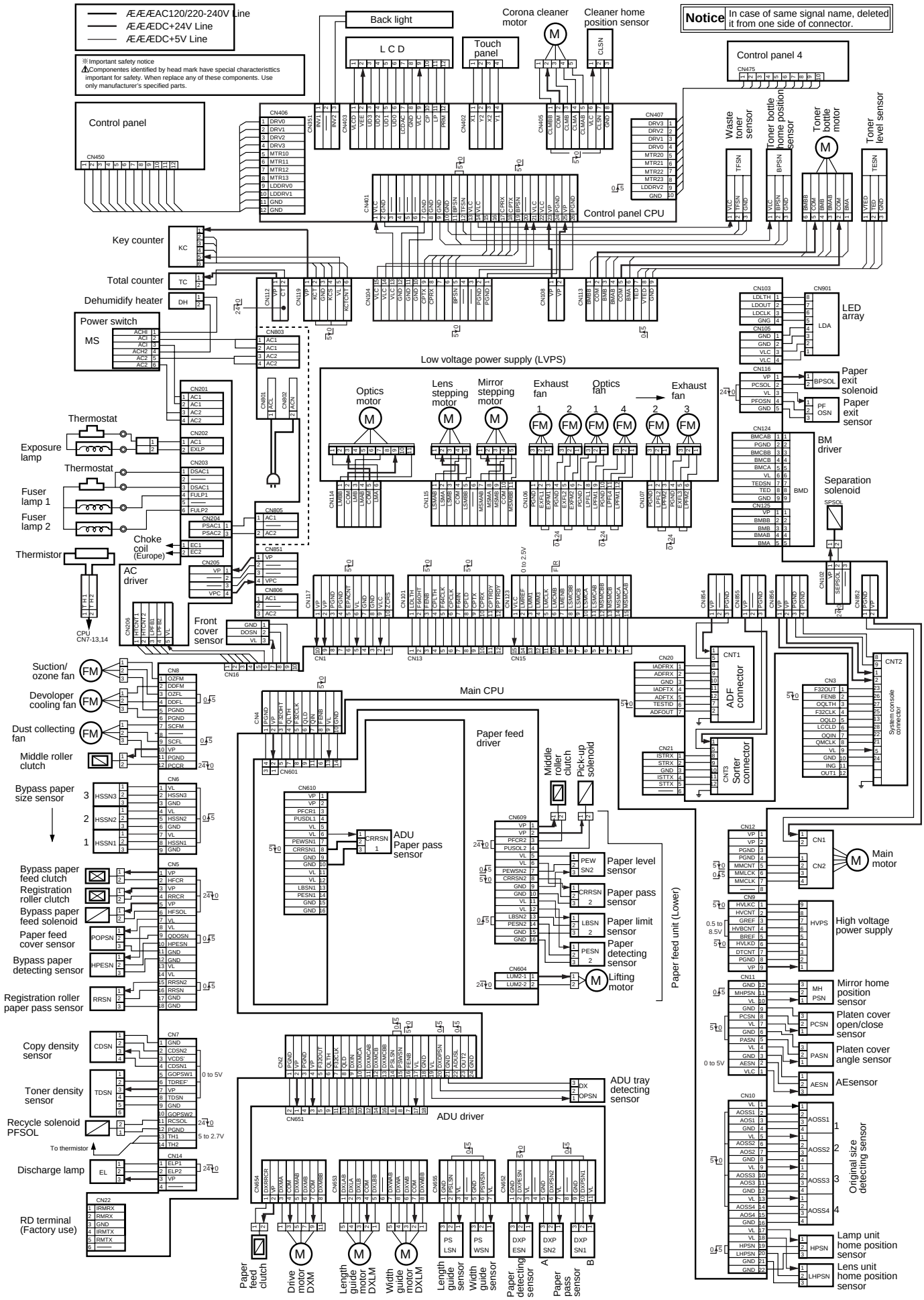
Location	Procedure	Check	
17 	Install the sorter mounting bracket to the sorter. (4 shoulder screws, M4 X 12)		
18 	Pull out the rail assembly fully, and install the sorter. **Note:** Hold the sorter with both hands as shown in the figure. If holding the other parts, sorter will be damaged.		
19  	Fix the rail assembly (front/rear side). (2 screws, M4 X 8)		

Location	Procedure	Check	
20 	Connect the lattice connector of the sorter to the copier.		
21 **(Copier upper rear cover)**  **<FA-A888>** 	Attach the "Staple" label. (1) Open the platen cover (or ADF). (2) Attach "Staple" label (A) provided on the upper cover (rear).  **(When the ADF is installed)** <FA-A888> Attach "Staple" label (B) provided on the main cover. 		
22	**Operation check** (1) Place some paper in the stapler position on the top bin and press the manual staple key. (2) Remove the paper from the bin and check staple. (3) When sheets of paper are not stapled, repeat steps (1) - (2).		

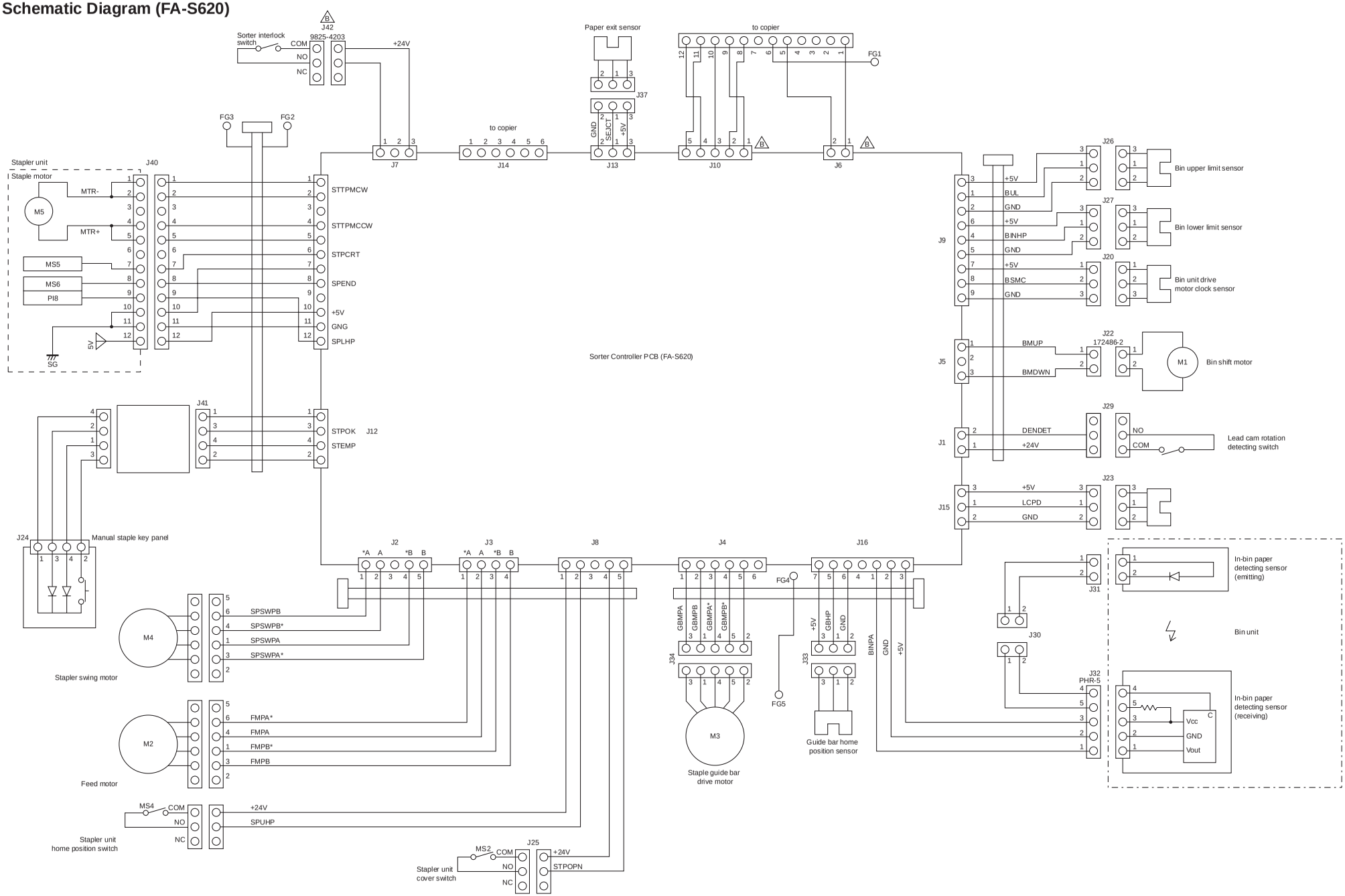
Schematic Diagram (FP-7818/7824/7830/7835)



Schematic Diagram (FP-7845/7850)



Schematic Diagram (FA-S620)



Schematic Diagram (FA-S660)