TOSHIBA

SERVICE MANUAL

LARGE CAPACITY FEEDER

MP-4003

File No.31100203
2002-06

GENERAL PRECAUTIONS FOR INSTALLATION/SERVICE/ MAINTENANCE FOR LARGE CAPACITY FEEDER MP-4003

1. When installing the Large Capacity Feeder MP-4003 to the Copier, be sure to follow the instructions described in the “Unpacking/Set-Up Procedure for the MP-4003” booklet which comes with each unit of the MP-4003.
2. Installed only by an authorized/qualified person.
3. When transporting/installing the MP-4003, employ two persons. The MP-4003 is fairly heavy and weights approximately 40 kg (89 lb), therefore pay full attention when handling it.
4. Before starting installation, servicing or maintenance work, be sure to turn off and unplug the copier first.
5. Supplied with power from the copier, requiring no additional power source.
6. Grounded to the specified positions on the machine frame.
7. When serving or maintaining, be careful about the rotating or operating sections such as gears, pulleys, sprockets, cams, belts, etc.
8. When parts are disassembled, reassembly is basically the reverse of disassembly unless otherwise noted in this manual or other related documents. Be careful not to reassemble small parts such as screws, washers, pins, E-rings, toothed washers to the wrong places.
9. Basically, the machine should not be operated with any parts removed or disassembled.
10. Delicate parts for preventing safety hazard problems (such as thermofuses, door switches sensors, etc. if any) should be handled/installed/adjusted correctly.
11. During servicing or maintenance work, be sure to check the nameplate and other cautionary labels (if any) to see if they are clean and firmly stuck. If not, take appropriate actions.
12. Use suitable measuring instruments and tools.
13. The PC board must be stored in an anti-electrostatic bag and handled carefully using a wristband, because the ICs on it may be damaged due to static electricity.
    Caution: Before using the wrist band, pull out the power cord plug of the copier and make sure that there is no uninsulated objects in the vicinity.
14. For the recovery and disposal of used the large capacity feeder, consumable parts, packing materials, used batteries, and RAM-ICs including litium batteries, it is recommended that the relevant local regulations/rules.

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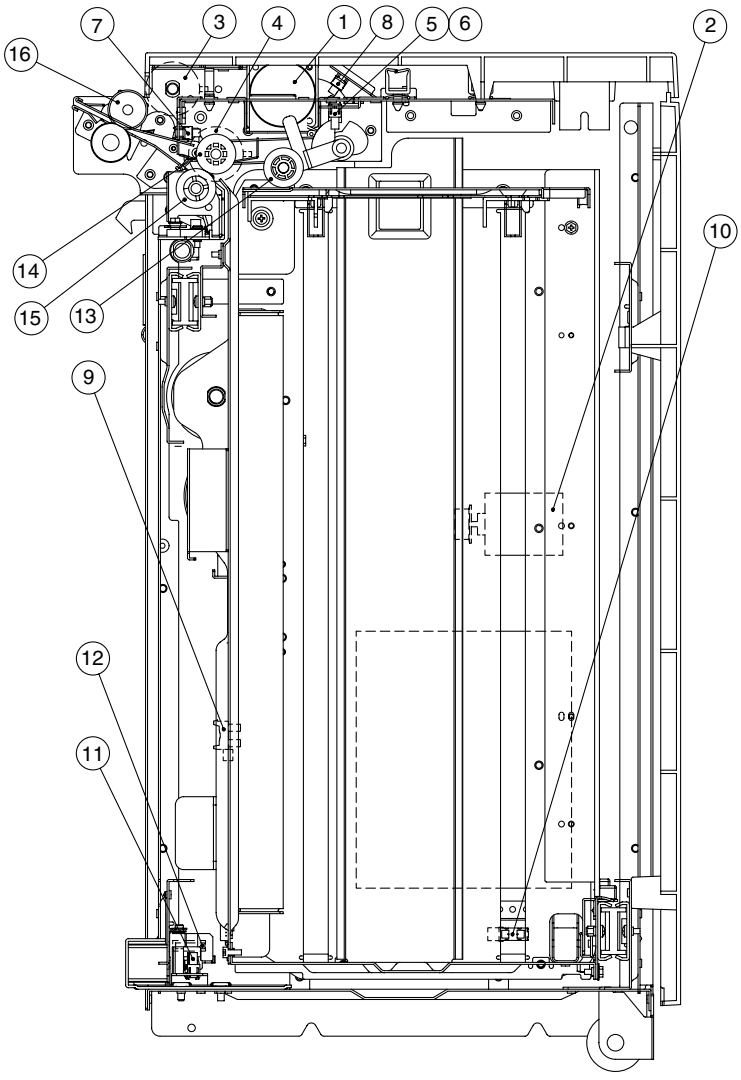
1. SPECIFICATIONS

Function

Replenishing method	Front loading method
Paper	Size: A4, B5, LT Thickness: 64~209g/m^2 (17~110lbs. Index)
Capacity of tray	4,000 papers (Stack height: within 428mm)
Dimensions	326 (W) X 599 (D) X 617 (H) mm (when connected to the copier)
Weight	Approx. 40kg (89lbs)
Power supply	DC5V, 24V (supplied from the copier)

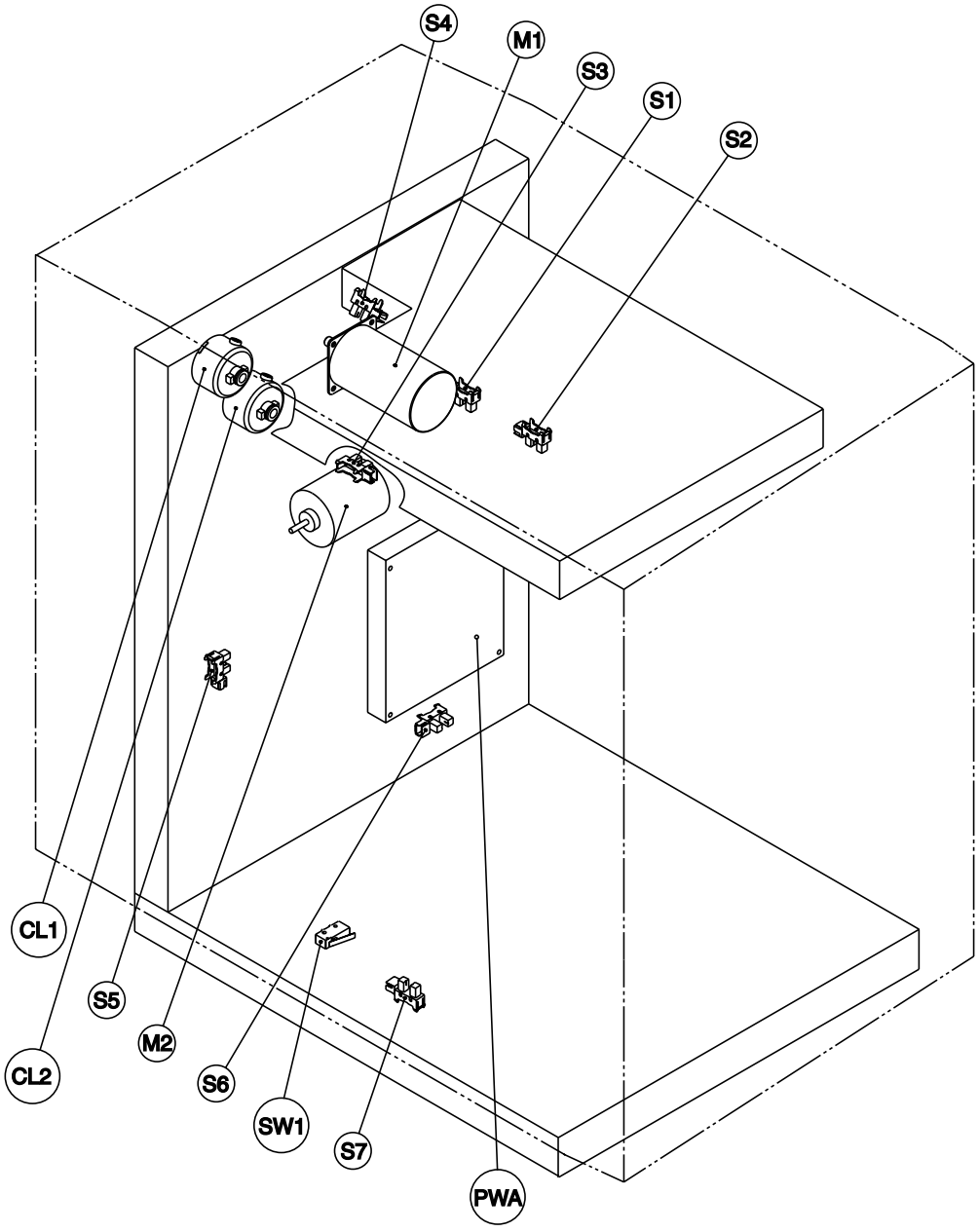
2. OUTLINE OF THE MACHINE

2. 1 Front Sectional View



NO.	NAME	NO.	NAME
1	Transport motor (M1)	9	Tray sensor (S5)
2	Tray motor (M2)	10	Tray bottom sensor (S6)
3	Transport clutch (CL1)	11	LCF set sensor (S7)
4	Feed clutch (CL2)	12	Door switch (SW1)
5	Empty sensor (S1)	13	Pickup roller
6	Tray-up sensor (S2)	14	Feed roller
7	Feed sensor (S3)	15	Separation roller
8	FG-pulse sensor (S4)	16	Transport roller

2. 2 Electrical Parts Layout



2. 3 Electrical Parts

(1) Motors

SYMBOL	NAME	FUNCTION	REMARKS
M1	TR-MTR Transport motor	Driving of the feeding and transportation	Brush motor
M2	TRY-MTR Tray motor	Lifting/Lowering of the tray	Brush motor

(2) Electromagnetic clutches

SYMBOL	NAME	FUNCTION	REMARKS
CL1	TR-CLT Transport clutch	Driving of the transportation	
CL2	FED-CLT Feed clutch	Driving of the feeding	

(3) Switches/Sensors

SYMBOL	NAME	FUNCTION	REMARKS
S1	EMP-SNR Empty sensor	Detection of the presence or absence of paper	Photo interrupter
S2	TRY-UP-SNR Tray-up sensor	Detection of the tray upper limit position	Photo interrupter
S3	FED-SNR Feed sensor	Detection of the paper transportation	Photo interrupter
S4	FG-PULS-SNR FG-pulse sensor	Detection of the transport motor rotation number	Photo interrupter
S5	TRY-SNR Tray sensor	Detection of the drawer installed	Photo interrupter
S6	TRY-BTM-SNR Tray bottom sensor	Detection of the tray lower limit position	Photo interrupter
S7	LCF-SET-SNR LCF-set sensor	Detection of the LCF installed to the copier	Photo interrupter
SW1	DOOR-SW Door switch	Safety switch	Pushing switch

(4) PC Board

SYMBOL	NAME	FUNCTION	REMARKS
PWA	PWA-F-LCF-555 PC board	Driving of the feeding Control of the tray driving	

3. GENERAL OPERATION

3. 1 Description of Operation

[A] From power ON to standby

(1) When the copier is turned ON, power is also supplied to the feed unit from the copier to start the pre-running operation. The tray motor (M2) starts to rotate forward to lift the tray.
The tray motor (M2) stopped rotating and lifting the tray when the tray has been lifted and the tray-up sensor (S2) has been turned ON (H: Sensor light path blocked by the actuator sensor). Papers are assessed to be present when the empty sensor (S1) is turned ON (L:Passing the sensor light path) while they are assessed to be absent when the empty sensor (S1) is turned OFF (H: Sensor light path blocked).

(2) When the LCF is not being installed to the copier (LCF set sensor (S7): OFF) or when the drawer is being pulled out (Tray sensor (S5): OFF), the tray lifting operation is not carried out. In this case, the tray starts to be lifted and the same operation which is until the detection of the paper presense or absense is carried out when it is installed to the copier and the drawer is inserted.

(3) When the feed sensor (S3) is turned ON (L: Passing the sensor light path), that is, when the paper is remaining at the transport path, the LCF detects it as a paper jam and cannot operate.

[B] Standby state

(1) When a paper is detected to be present by the above-described operation, the LCF gets into a standby state.

(2) When the tray unit is pulled out, the tray is automatically lowered because of its structure, and when it is inserted once again, it is lifted.

[C] Feeding/Transporting operation from the start to the finish of the printing

(1) The [START] key is pressed when the copier decides that the feeding from the the LCF. Then, the transport motor (M1) starts to drive after the feed motor of the copier has been turned ON.

(2) The feed clutch (CL2) is turned ON and pickup and feed rollers start to drive to feed a paper from the tray.

(3) After the feeding starts, the transport clutch (CL1) is turned ON and the transport roller starts to drive to transport the paper.

(4) When the leading edge of the paper has turned ON the feed sensor (S3), the feed clutch (CL2) is turned OFF and stops the feeding operation. The paper transported by the transport roller is sent to the copier side, where it is transported by the feed unit.

(5) When a specified time has passed after the trailing edge of the paper turned OFF the feed sensor (S3), next paper can be fed.

(6) When carrying out a continuous printing, the above steps from (2) to (5) are repeated as many papers as printed.

(7) When the printing has been finished, the feed motor of the copier stops rotating and the transport motor (M1) is turned OFF to finish the feeding/transporting operation.

[D] Tray operation during printing

(1) When 10~20 sheet of paper have been fed from the tray, the pickup roller is lowered down to a specified height. The tay-up sensor (S2) detects this and the tray motor (M2) rotates forward to lift the tray.

3. 2 Error Detection

[A] Jam detection

In the following cases, the feed jam takes place.

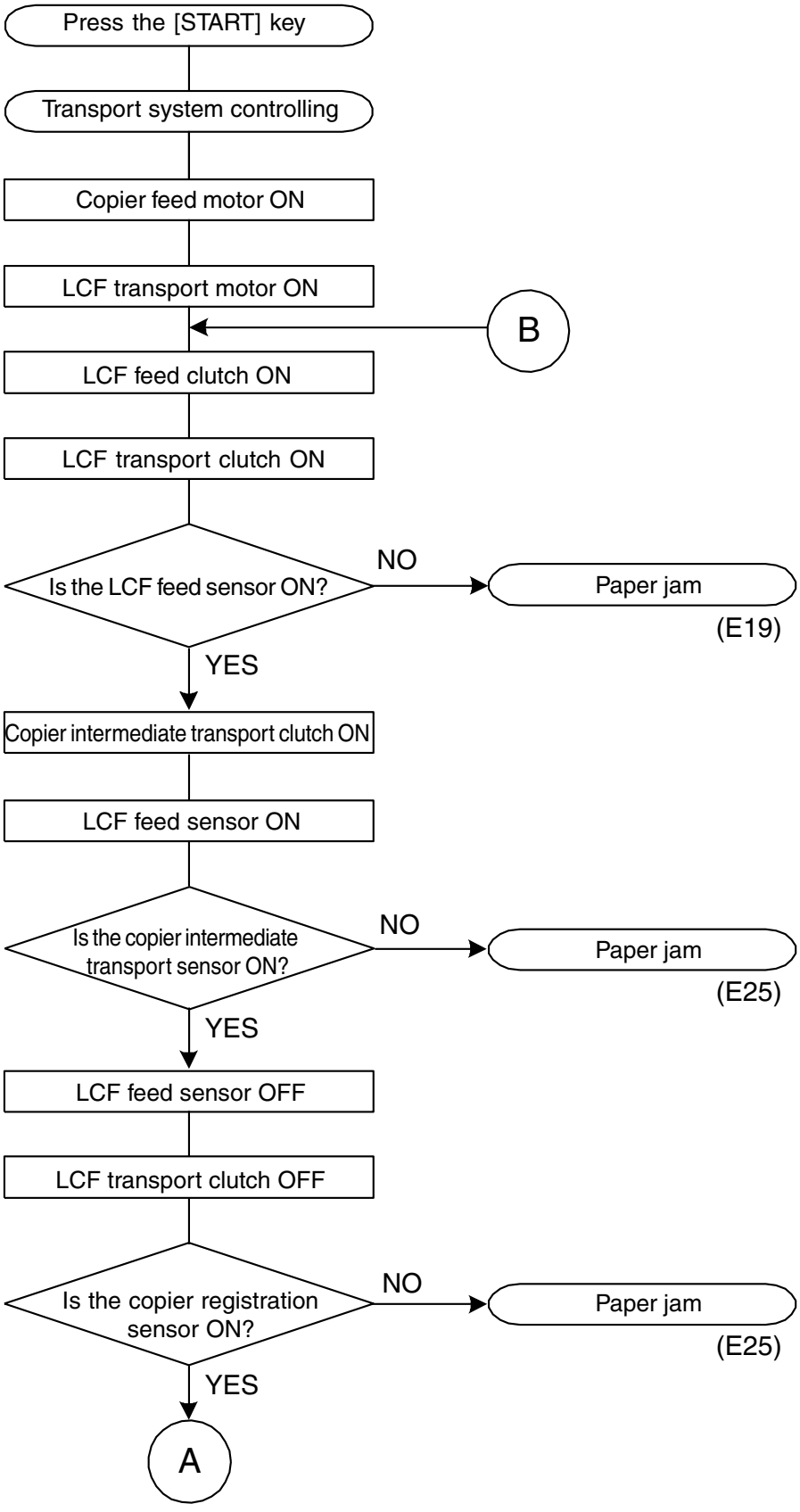
(1) When the feed sensor (S3) is not turned ON in a specified time after the feeding has started.

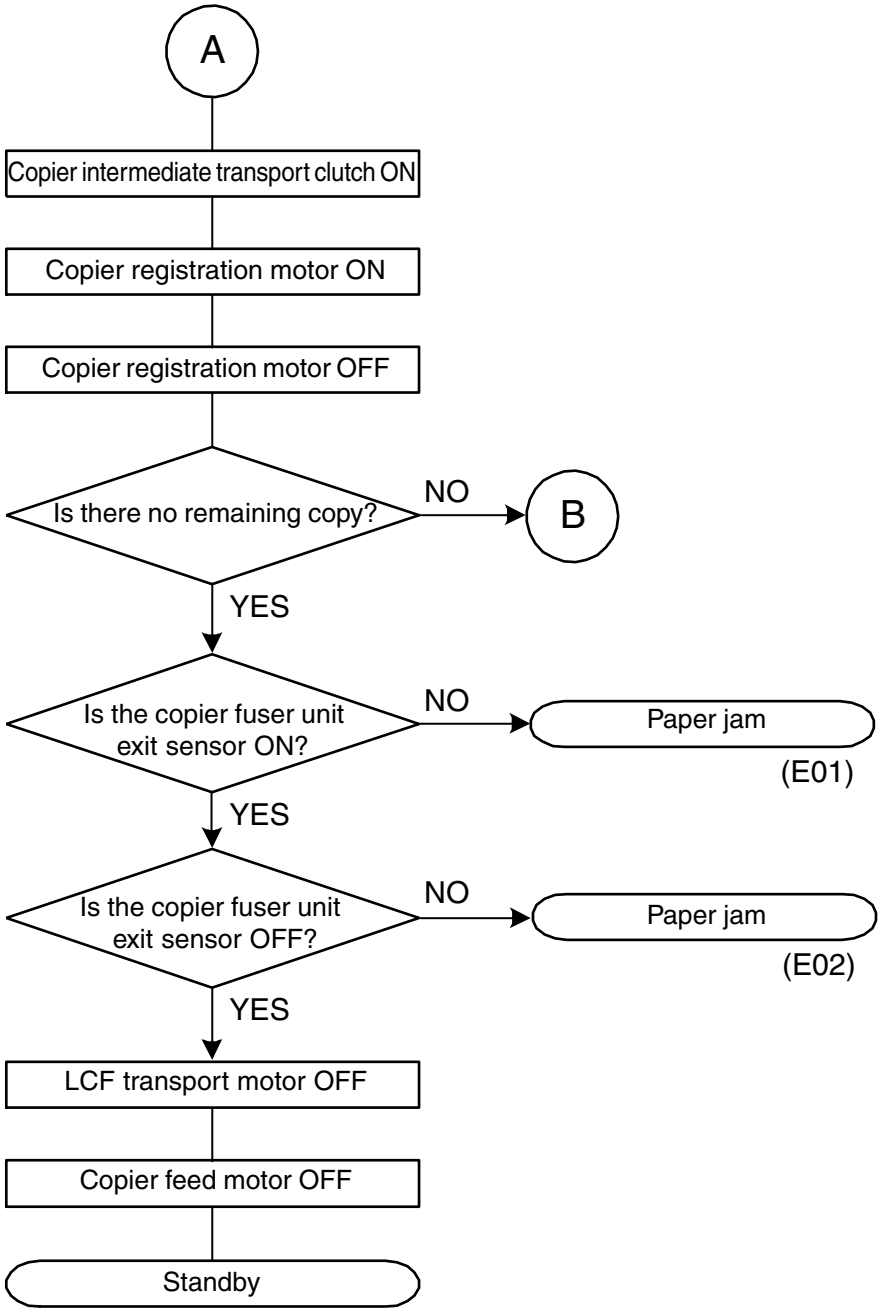
(2) When each transport sensor of the copier does not operate (ON/OFF) in a specified time after the feeding has started at the copier side.

[B] Call for service

(1) When the tray-up sensor (S2) is not turned ON in a specified time after the tray has started to be lifted.

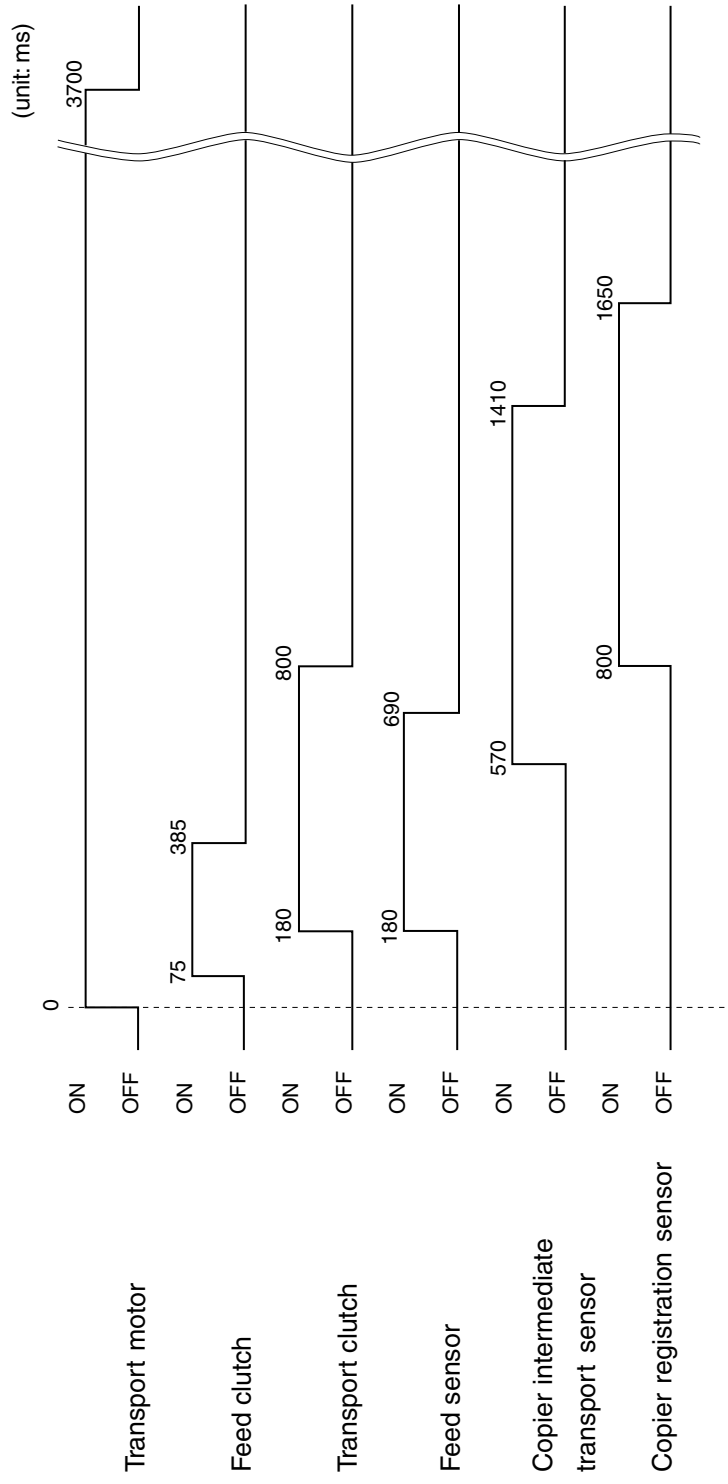
3. 3 Flow Chart



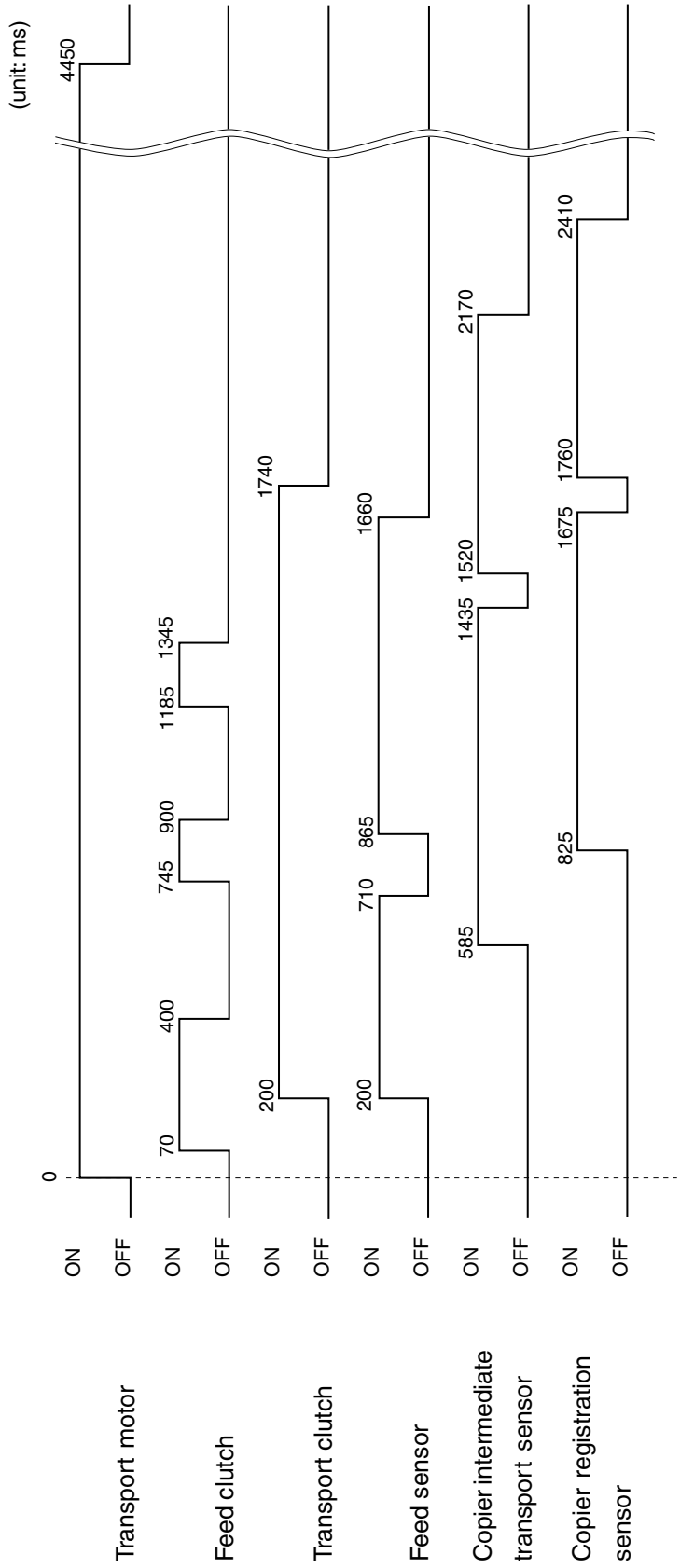

A
Copier intermediate transport clutch ON
Copier registration motor ON
Copier registration motor OFF
Is there no remaining copy?
NO
B
YES
Is the copier fuser unit exit sensor ON?
NO
Paper jam
(E01)
YES
Is the copier fuser unit exit sensor OFF?
NO
Paper jam
(E02)
YES
LCF transport motor OFF
Copier feed motor OFF
Standby

3. 4 Timing Chart

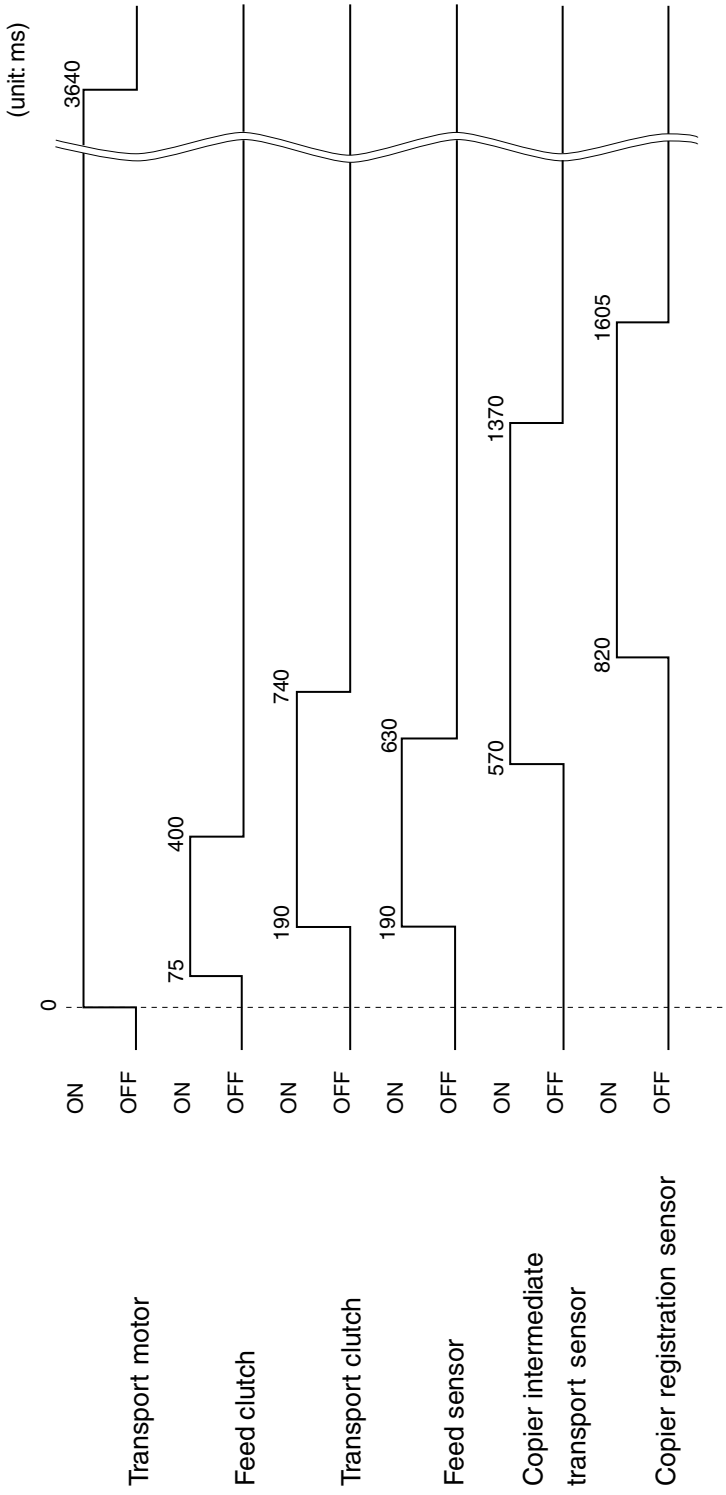
(1) Timing at the LCF feeding: A4, 1 copy



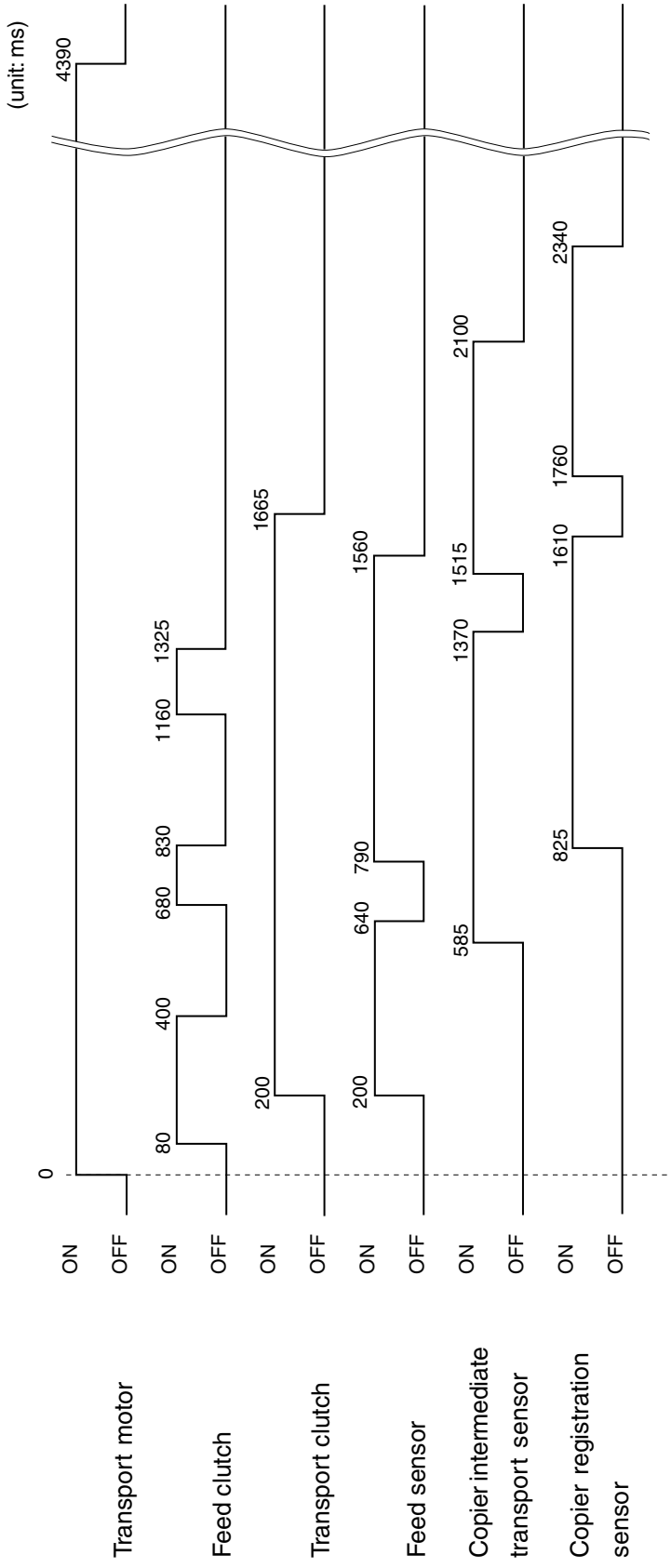
(2) Timing at the LCF feeding: A4, 2 copies



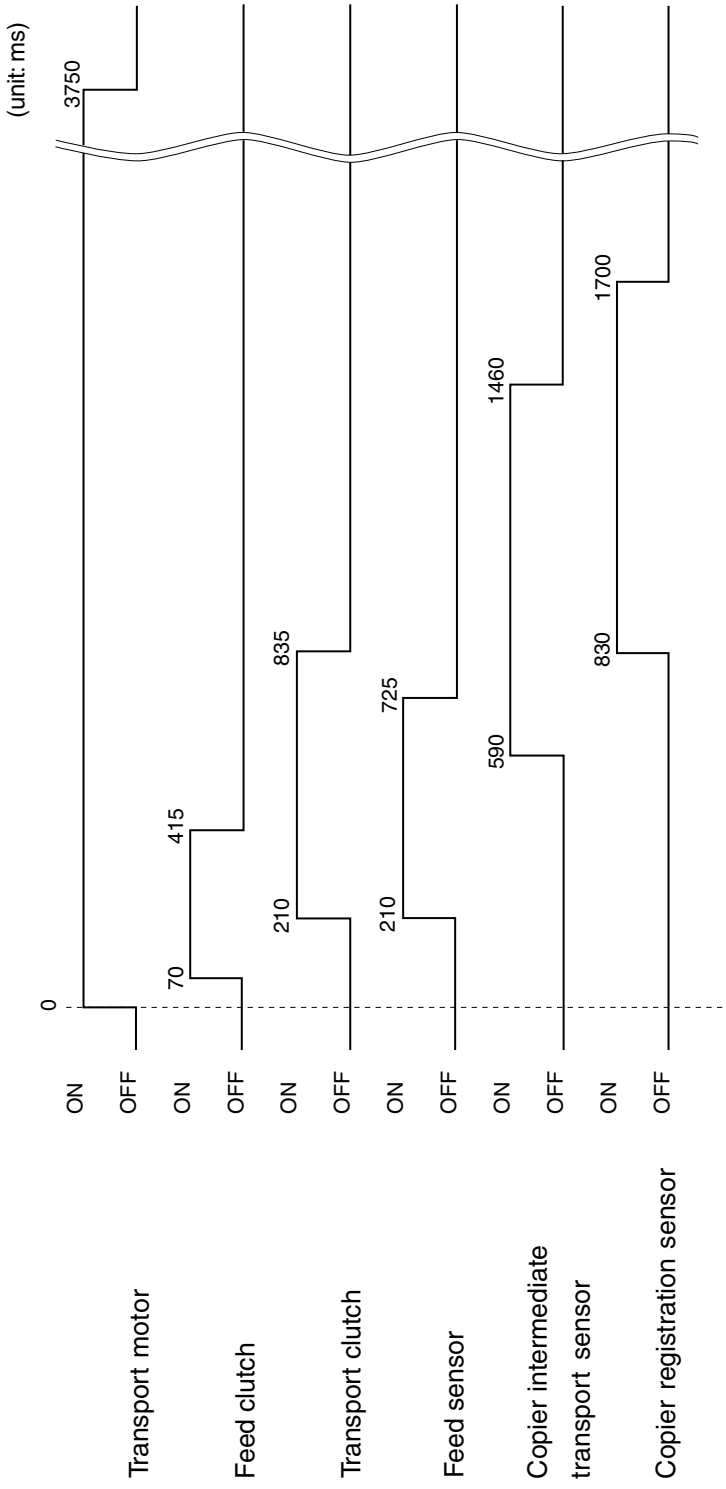
(3) Timing at the LCF feeding: B5, 1 copy



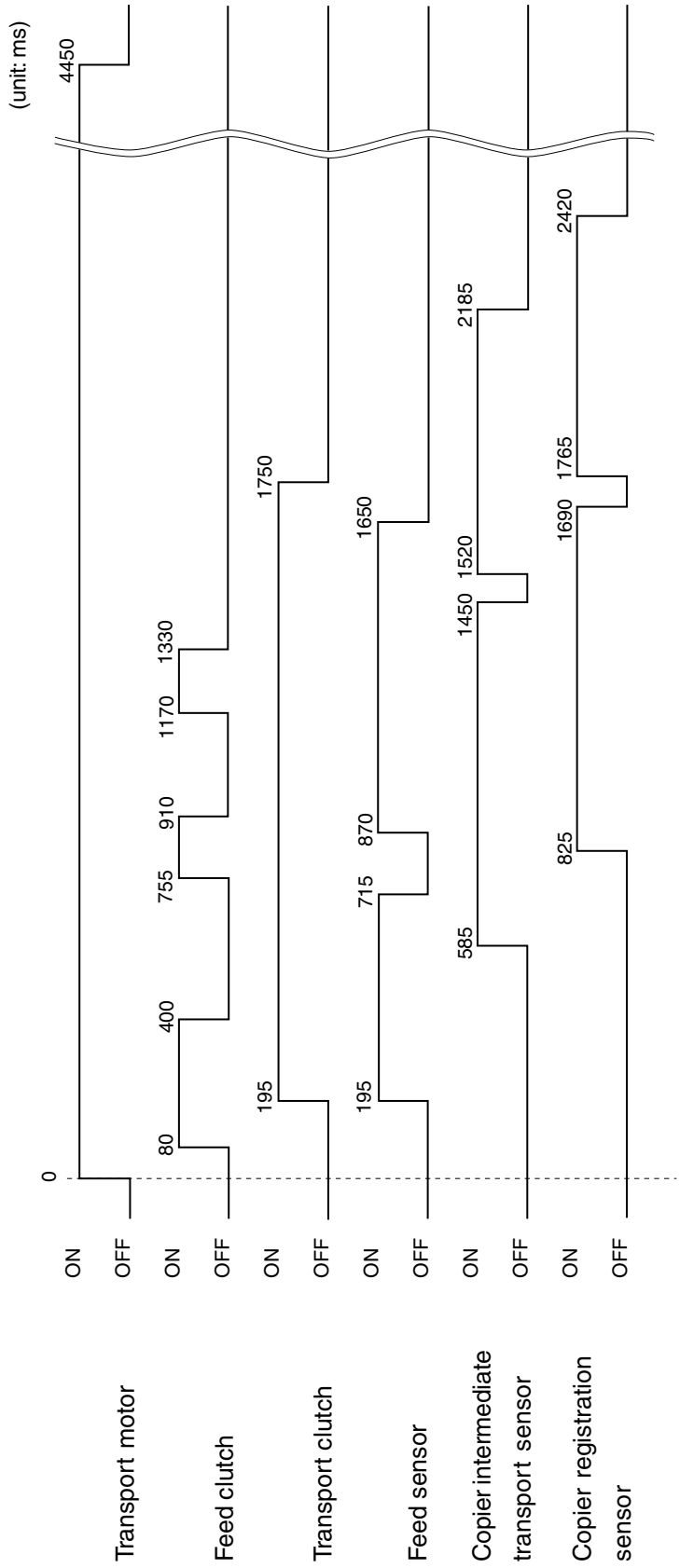
(4) Timing at the LCF feeding: B5, 2 copies



(5) Timing at the LCF feeding: LT, 1 copy



(6) Timing at the LCF feeding: LT, 2 copies



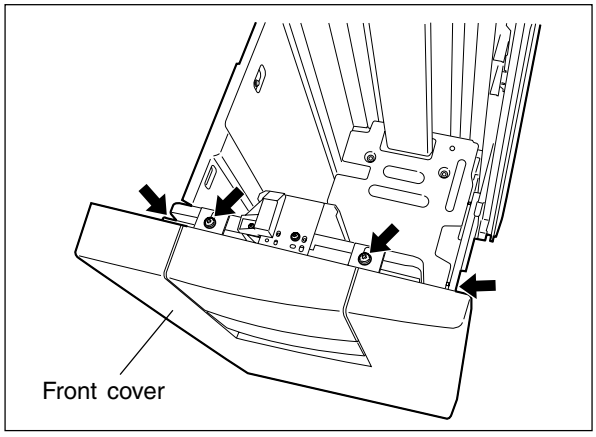
4. DISASSEMBLY AND REPLACEMENT /ADJUSTMENT

4. 1 Covers

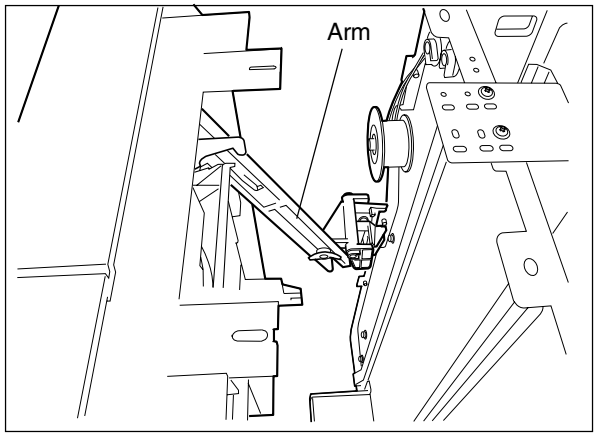
[A] Front cover

(1) Pull out the drawer.

(2) Remove 4 screws and take off the front cover.

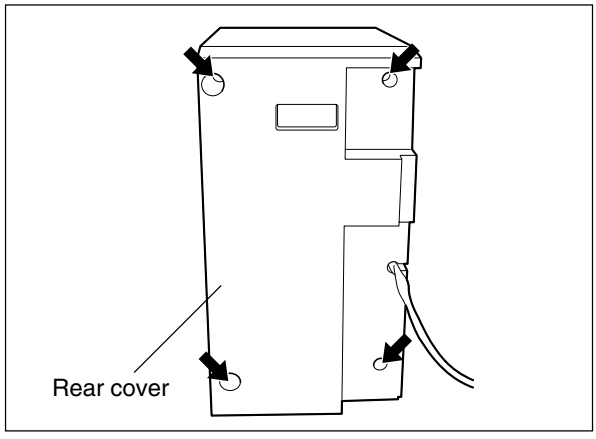


Note: When installing the front cover, fit the arm on the latch lever.



[B] Rear cover

(1) Remove 4 screws and take off the rear cover.

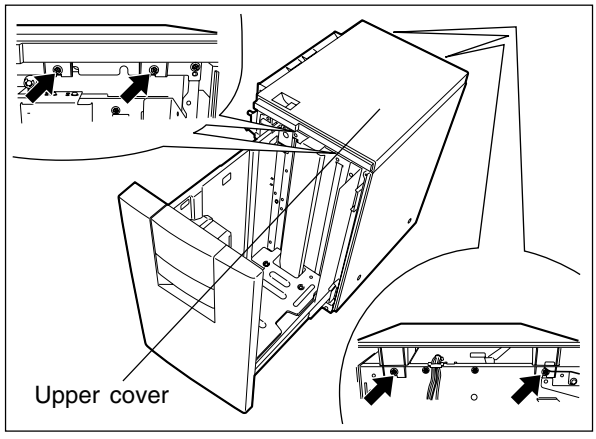


[C] Upper cover

(1) Pull out the drawer.

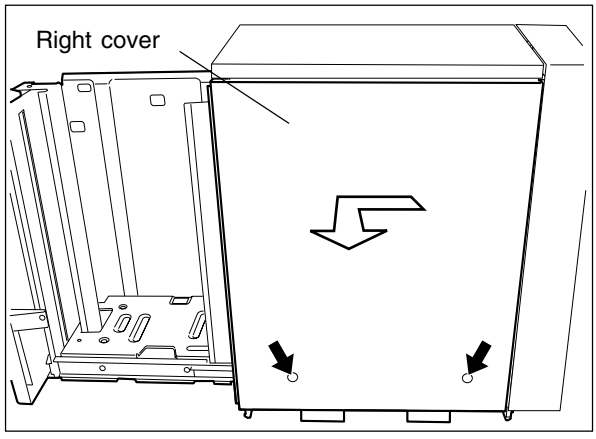
(2) Remove the rear cover.

(3) Loosen 4 screws and take off the upper cover.



[D] Right cover

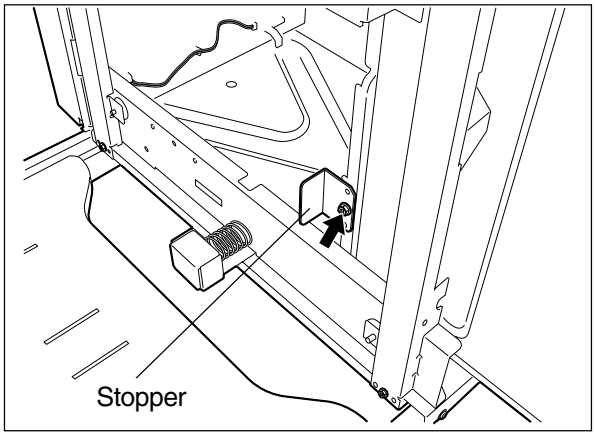
(1) Remove 2 screws and take off the right cover sliding it toward the front side.



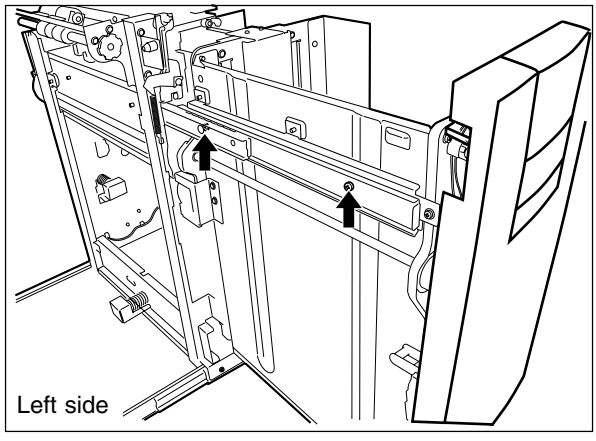
4. 2 Tray Unit

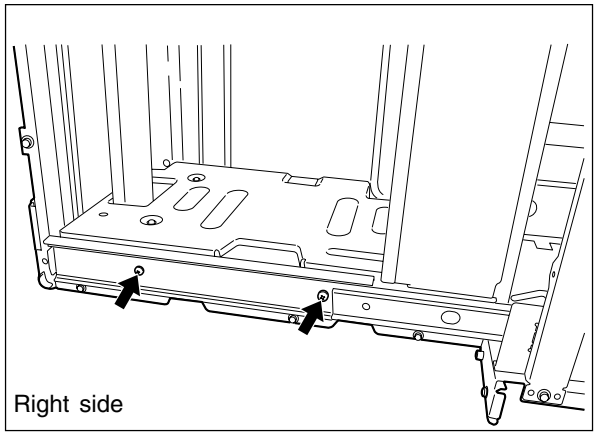
(1) Pull out the drawer.

(2) Remove 1 screw and take off the stopper.



(3) Remove 4 screws (2 for the left side and 2 for the right side) and take off the tray unit pulling it upward.

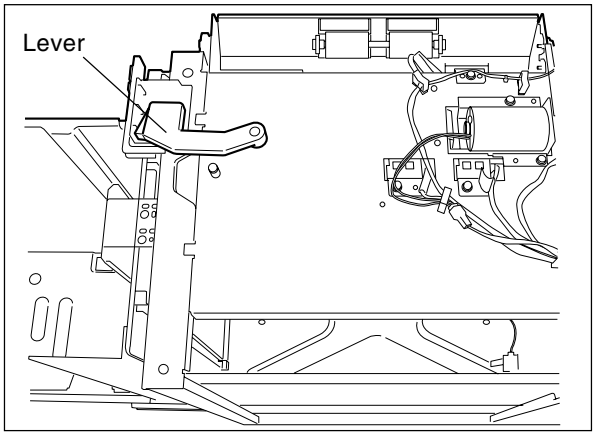




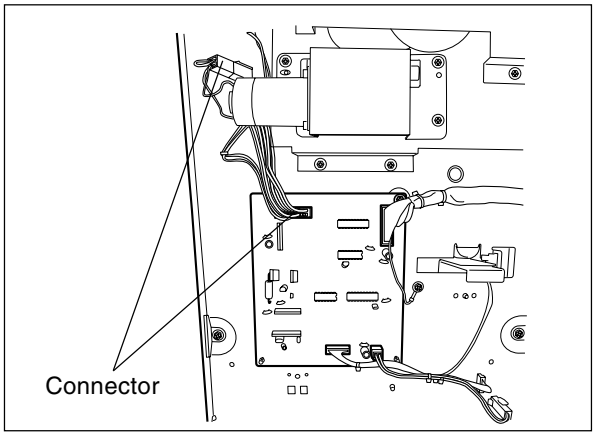
4. 3 Feed Unit

(1) Remove the upper cover.

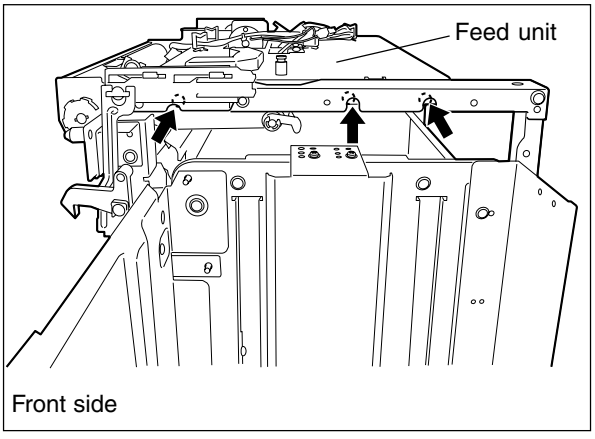
(2) Remove the lever.

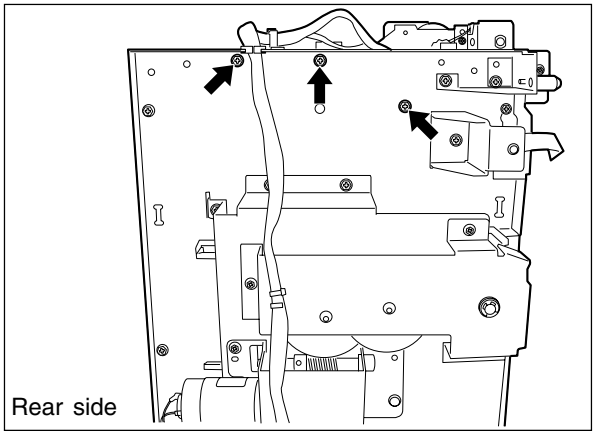


(3) Disconnect 2 connectors (for tray motor, PC boad).



(4) Remove 3 screws for each at the front and rear sides and take off the feed unit upward.



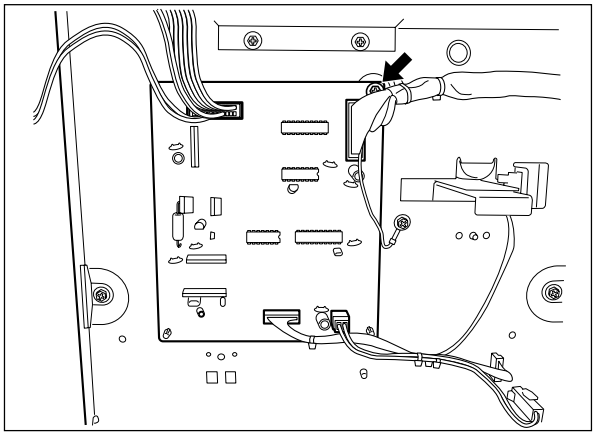


4. 4 Electric Parts

[A] PC board

(1) Remove the rear cover.

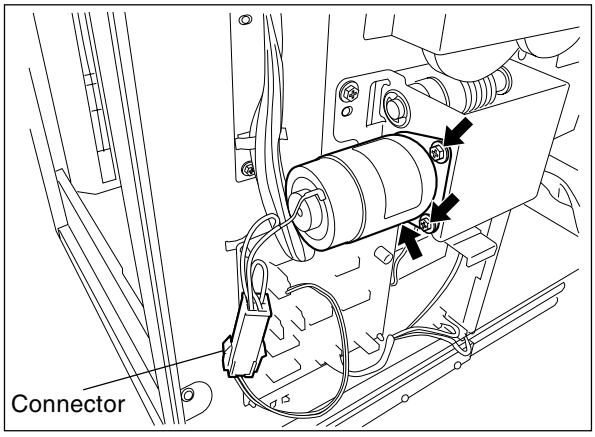
(2) Disconnect 4 connectors and remove 1 screw to take off the PC board.



[B] Tray motor

(1) Remove the rear cover.

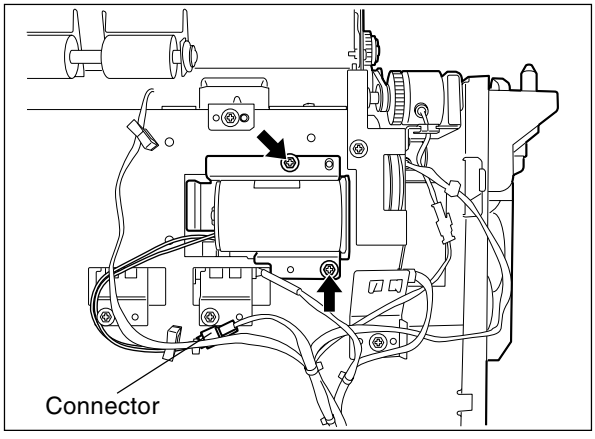
(2) Disconnect 1 connector and remove 3 screws to take off the tray motor.



[C] Transport motor

(1) Remove the upper cover.

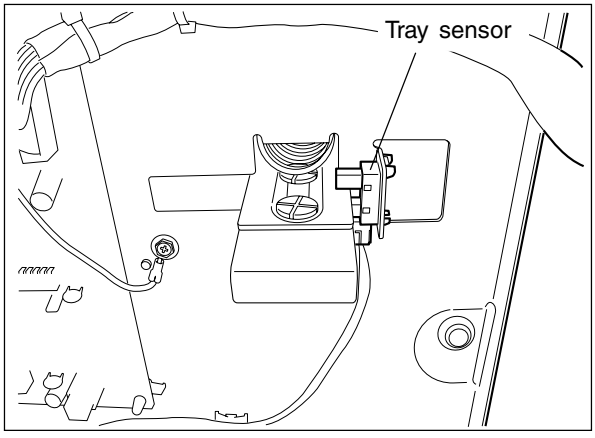
(2) Disconnect 1 connector and remove 2 screws to take off the transport motor.



[D] Tray sensor

(1) Remove the rear cover.

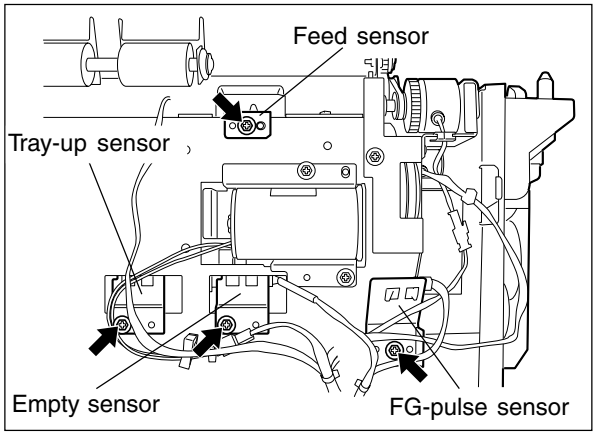
(2) Disconnect 1 connector and take off the tray sensor.



[E] FG-pulse sensor, Tray-up sensor, Empty sensor, Feed sensor

(1) Remove the upper cover.

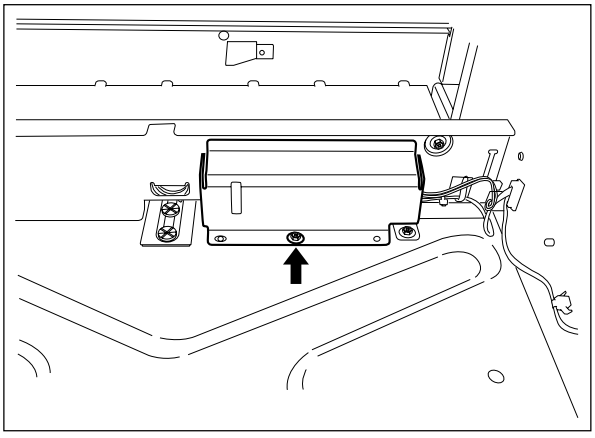
(2) Remove 1 screw and disconnect 1 connector for each sensor and take off the sensor with the bracket. (FG-pulse sensor, tray-up sensor, empty sensor, feed sensor)



[F] LCF set sensor, Door switch

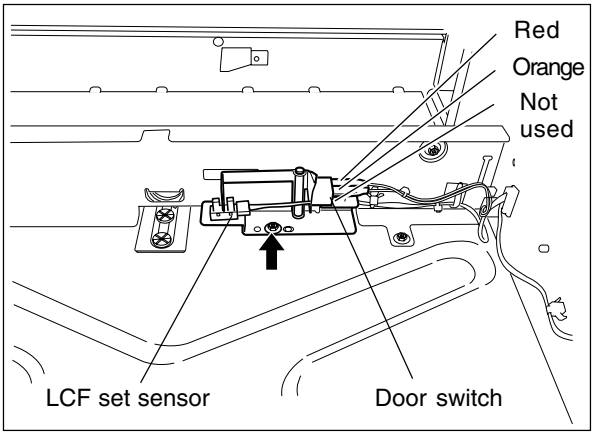
(1) Remove the right cover and pull out the tray unit.

(2) Remove 1 screw and take off the cover.



(3) Remove 1 screw and dissconnect 3 connectors, and take off the LCF set sensor and door switch with the bracket.

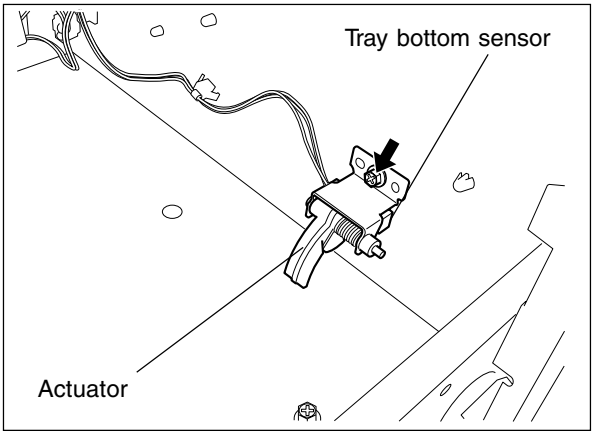
Note: Be careful not to connect the connector of the door switch to the wrong place.



[G] Tray bottom sensor

(1) Remove 1 screw and take off the actuator.

(2) Disconnect 1 connector and unhook the hook of the sensor from the rear side to take off the tray bottom sensor.

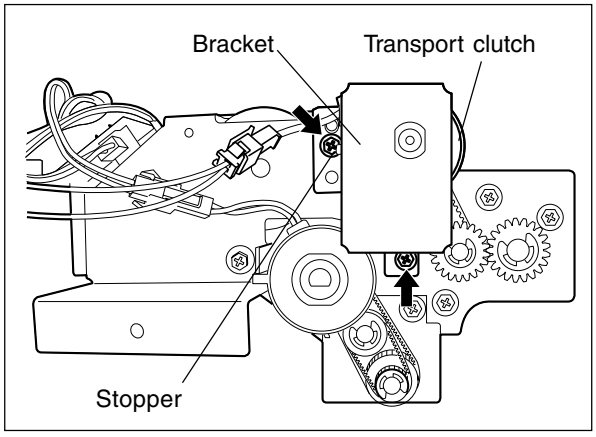


[H] Transport clutch

(1) Remove the feed unit.

(2) Remove 2 screws and take off the bracket. Then disconnect 1 connector and take off the transport clutch.

Note: When installing the clutch, put the stopper of clutch in the boss of flame conmpetely.

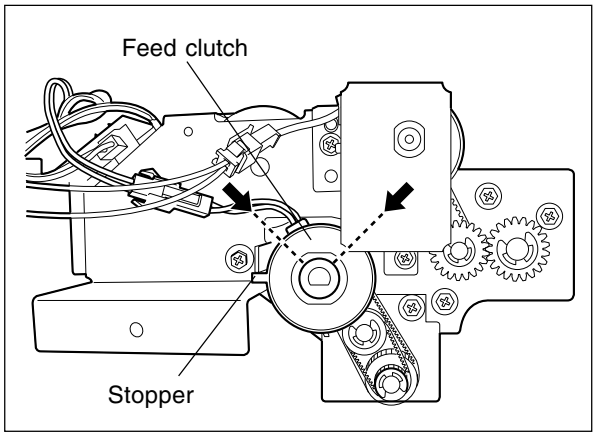


[I] Feed clutch

(1) Remove the transport clutch.

(2) Disconnect 1 connector and remove 2 setscrews to take off the feed clutch.

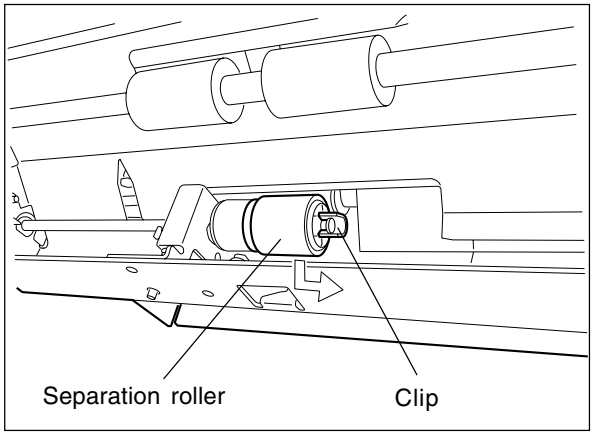
Note: When installing the clutch, put the stopper of clutch in the boss of flame conmpetely.



4. 5 Rollers

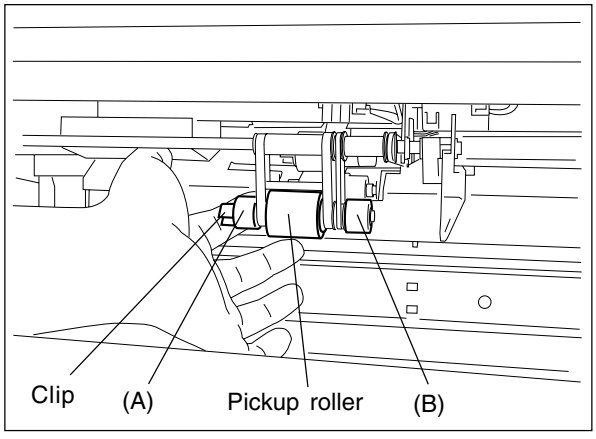
(1) Pull out the LCF away from the copier.

(2) Remove 1 clip and take off the separation roller while pushing it down.

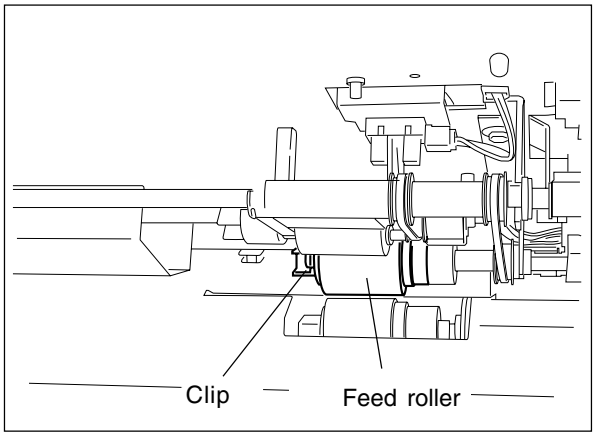


(3) Remove 2 screws and take off the right cover sliding it toward the front side.

(4) Remove 1 clip and take off the weight (A). Then Pull out the weight (B) with the shaft and take off the pickup roller.



(5) Remove 1 clip and take off the feed roller.

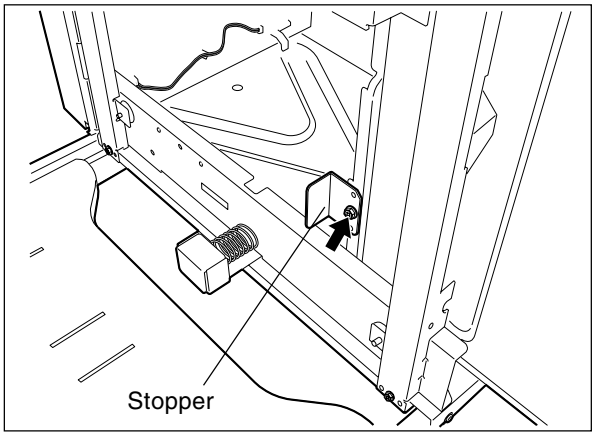


4. 6 Side Guides / End Guide

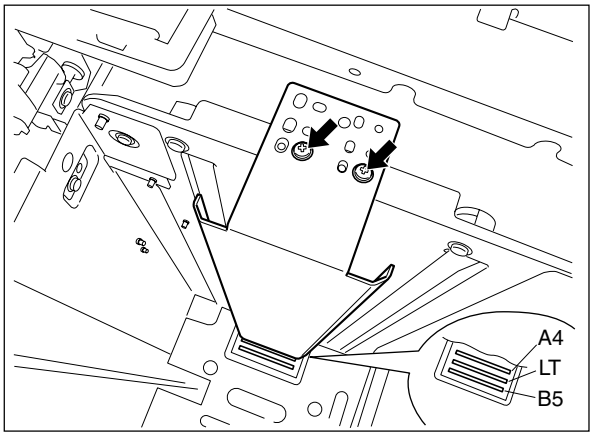
[A] Rear side guide

(1) Pull out the drawer.

(2) Remove 1 screw and take off the stopper.



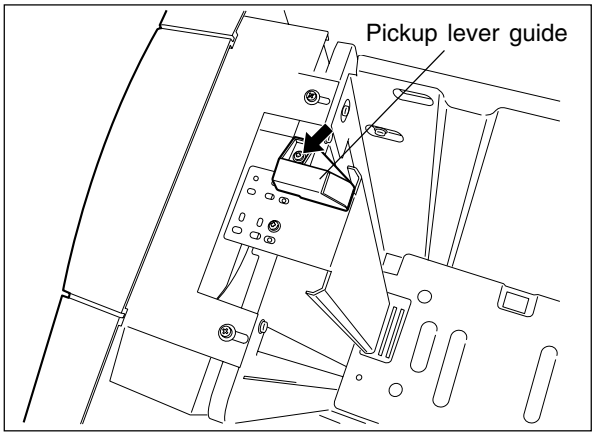
(3) Remove 2 screws and adapt the groove and screw hole to the paper size. Then screw it shut.



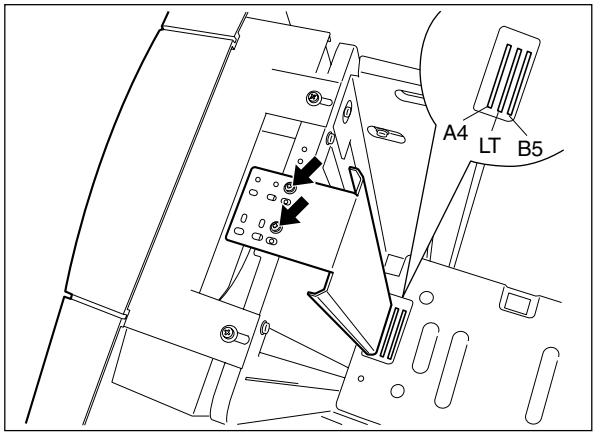
[B] Front side guide

(1) Pull out the drawer.

(2) Remove 1 screw and take off the pickup lever guide.



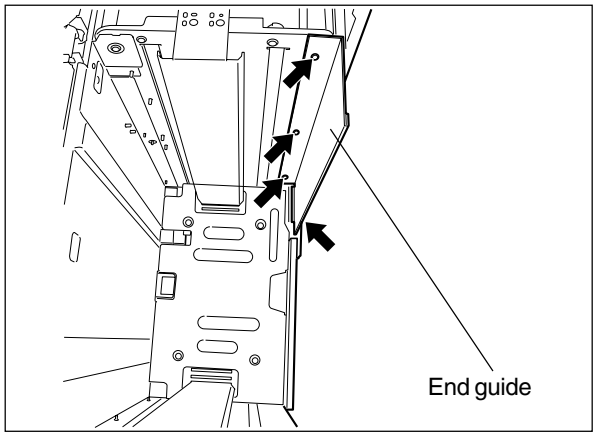
(3) Remove 2 screws and adapt the groove and screw hole to the paper size. Then screw it shut.



[C] End guide guide

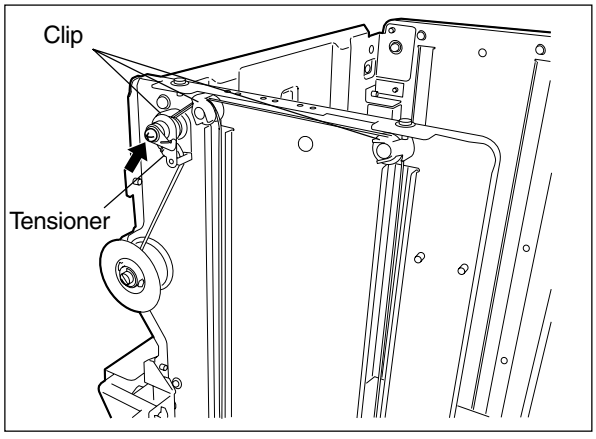
(1) Remove 4 screws and take off the tray unit.
(2) Remove 4 screws and adapt the groove and screw hole to the paper size. Then screw it shut.

Note: For a B5 size paper, an exclusive end guide is needed.

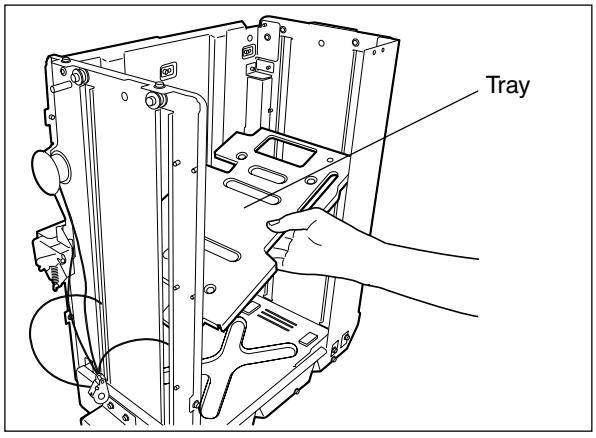


4. 7 Tray Wire

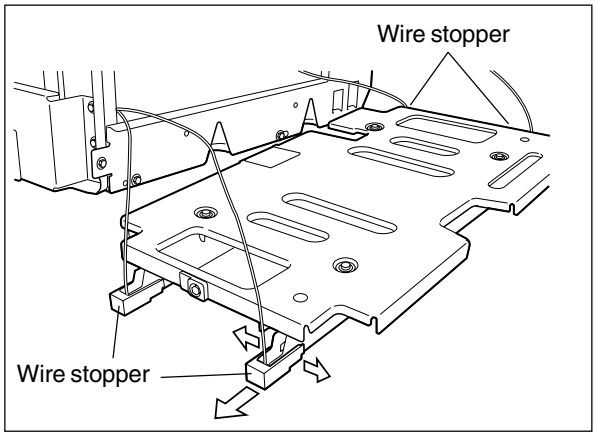
(1) Remove the tray unit.
(2) Remove the front cover.
(3) Remove both the rear and front side guides.
(4) Remove 1 screw and 3 clips and take off the front side wire tensioner (same for the rear side).



(5) Remove the tray.

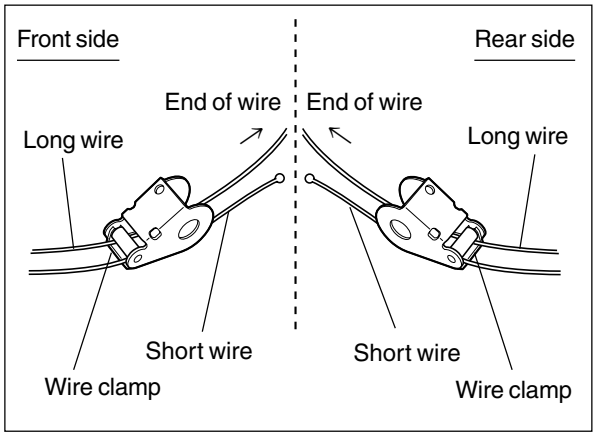


(6) Release the latches and take off 4 wire stoppers and tray wires.

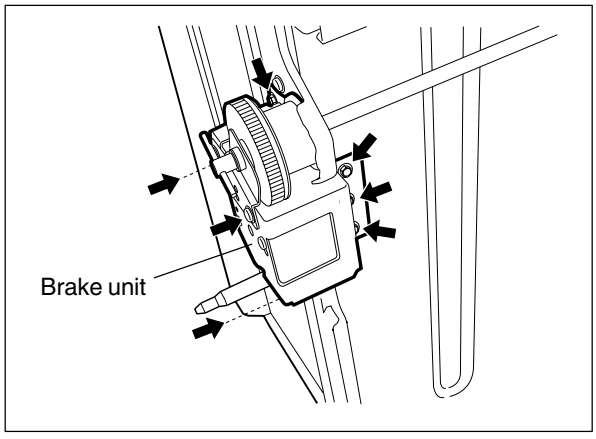


(7) Release the latches and take off the wire clamps.

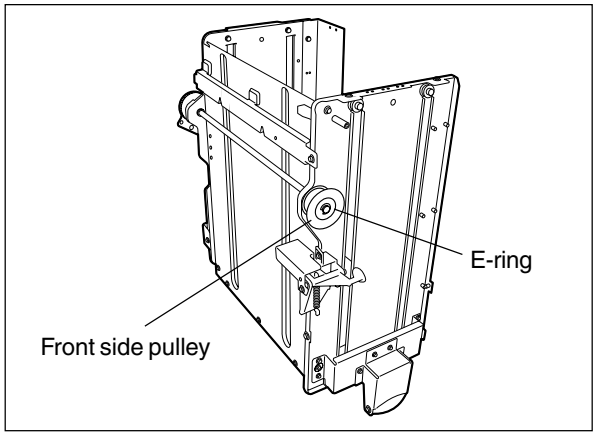
Note: Pay attention to the length and direction of the wires when installing the wire clamps.



(8) Remove 7 screws and take off the brake unit.

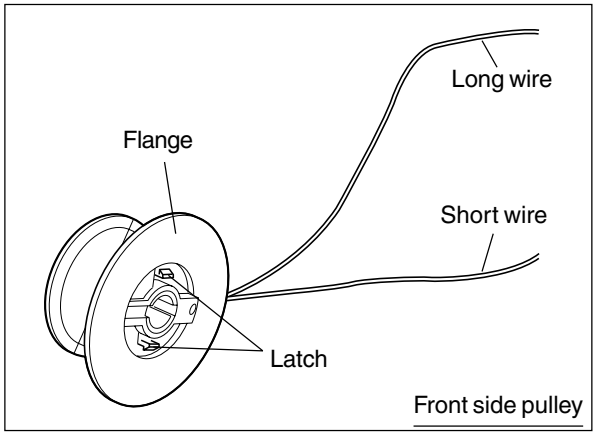


(9) Remove 1 E-ring and take off the front side pully.



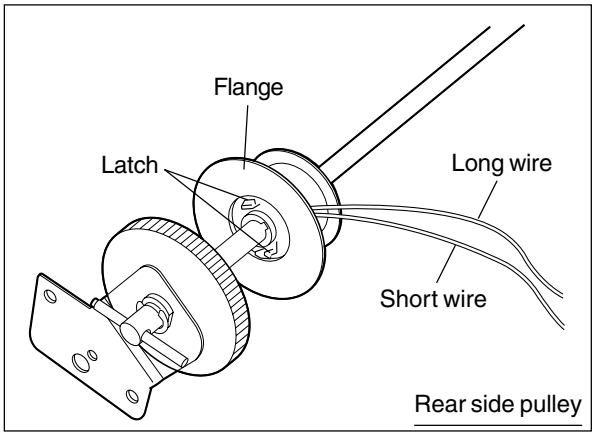
(10) Release the latches and take off the flange of the front side pulley.

Note: Pay attention to the length of the wires when installing the flange.

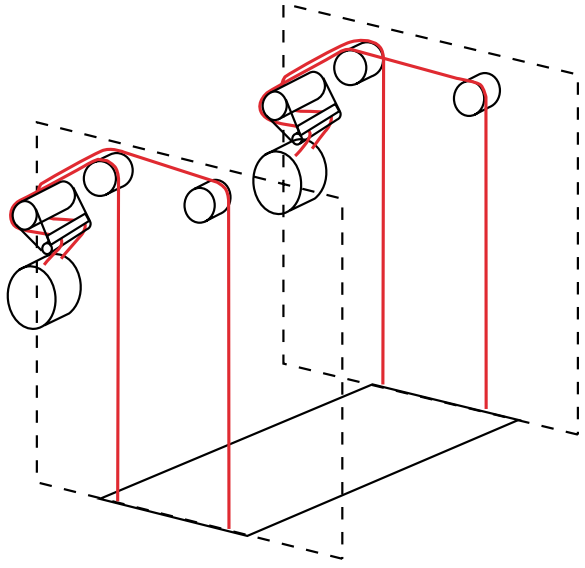


(11) Pull out the rear side pulley with shaft. Release the latches and take off the flange of rear side pulley.

Note: Pay attention to the length of the wires when installing the flange.



Wire layout

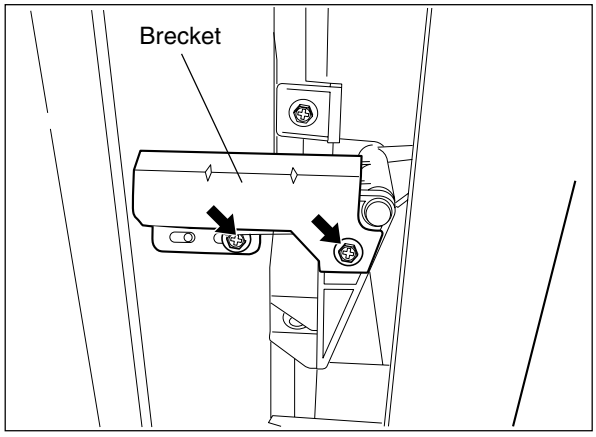


4. 8 Sidewise Deviation Adjustment

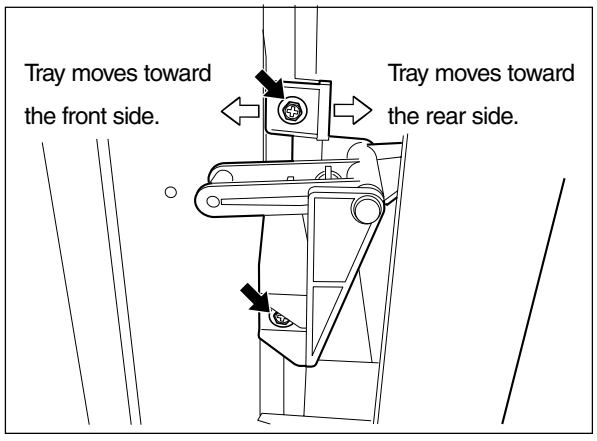
When the tray position is out of alignment, adjust it taking the following procedure.

(1) Pull out the tray unit.

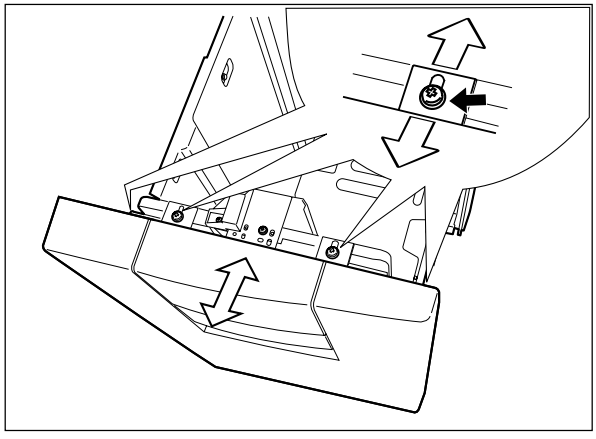
(2) Remove 2 screws and take off the bracket.



(3) Loosen 2 screws and move the adjustment board to the right position. Then screw it shut.



Note: After the tray position adjustment, re-adjust the front cover position. Adjustment; loose 4 screws and slide the front cover front or rear side.



4. 9 Stopper Adjustment

Compensate the slant of LCF by the adjusting the stoppers.

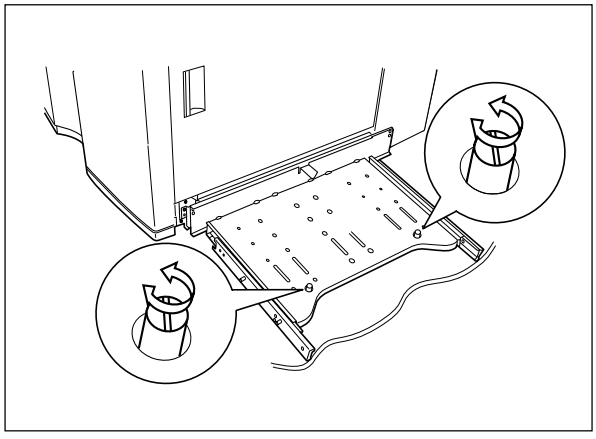
(1) Pull out the LCF from the copier.

(2) Turn 2 screws and adjust the stoppers.

Turn left: Stopper moves upward.

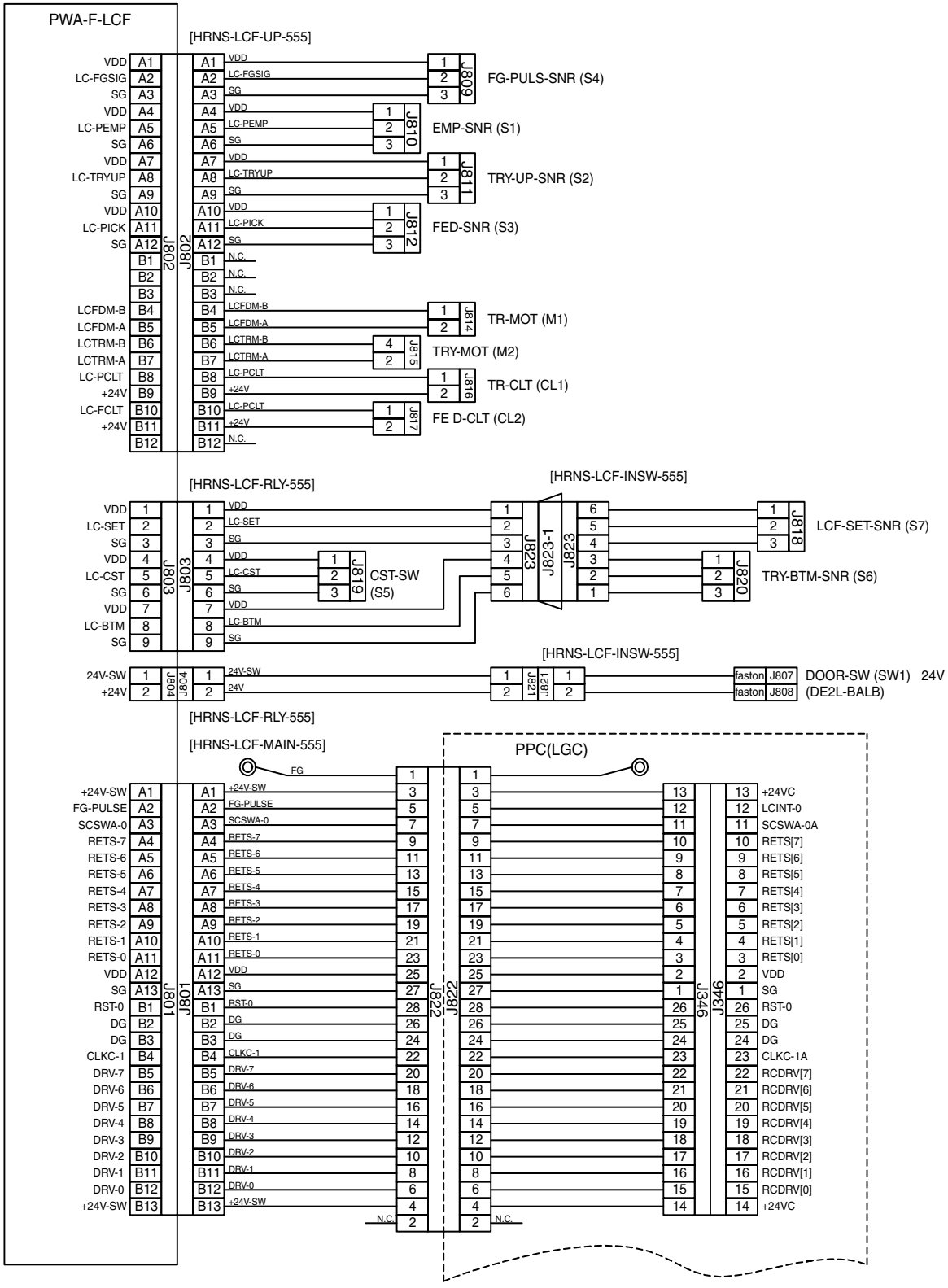
Turn right: Stopper moves downward.

Note: When moving the copier, need to move the stoppers upward.

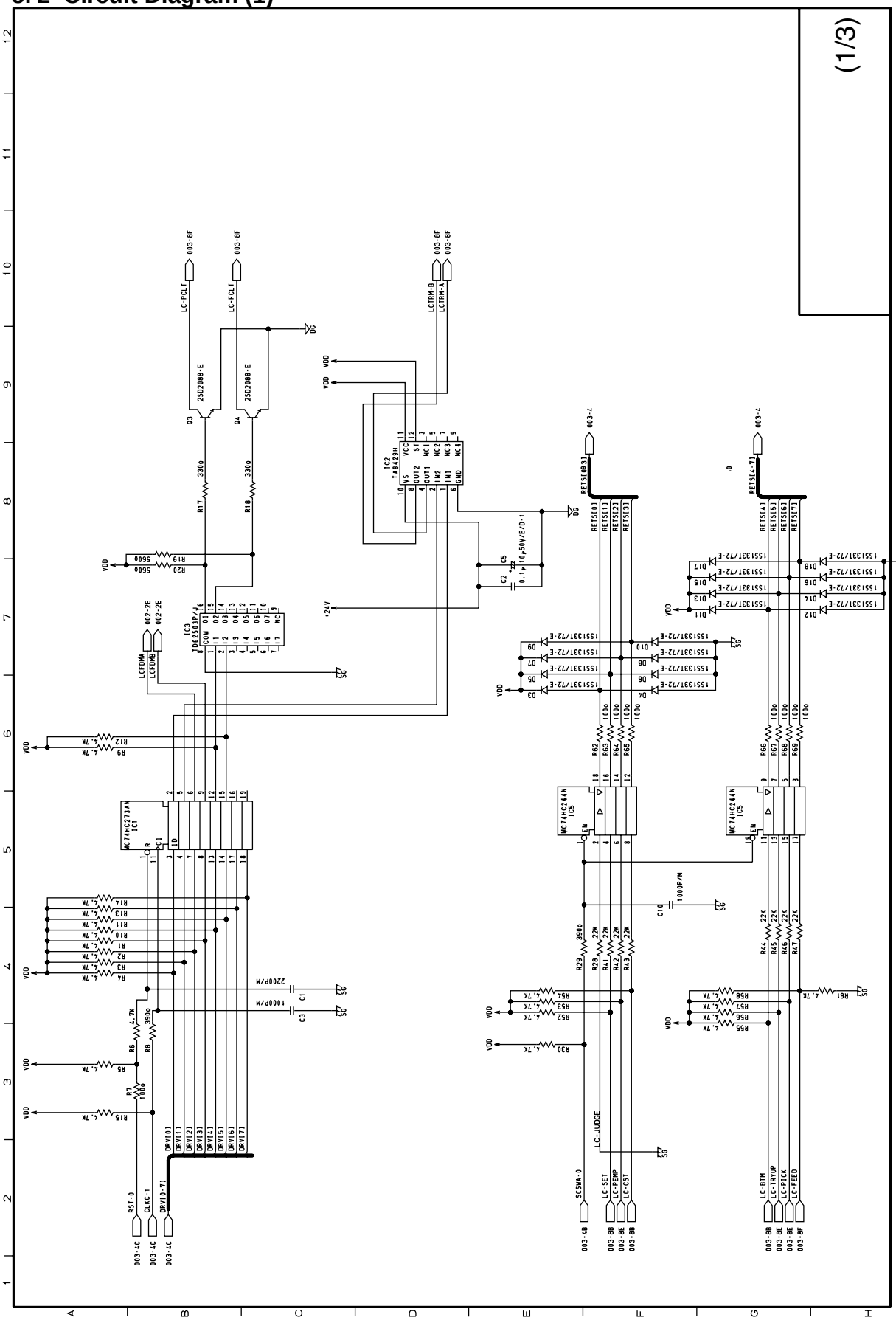


5. ELECTRIC CIRCUIT

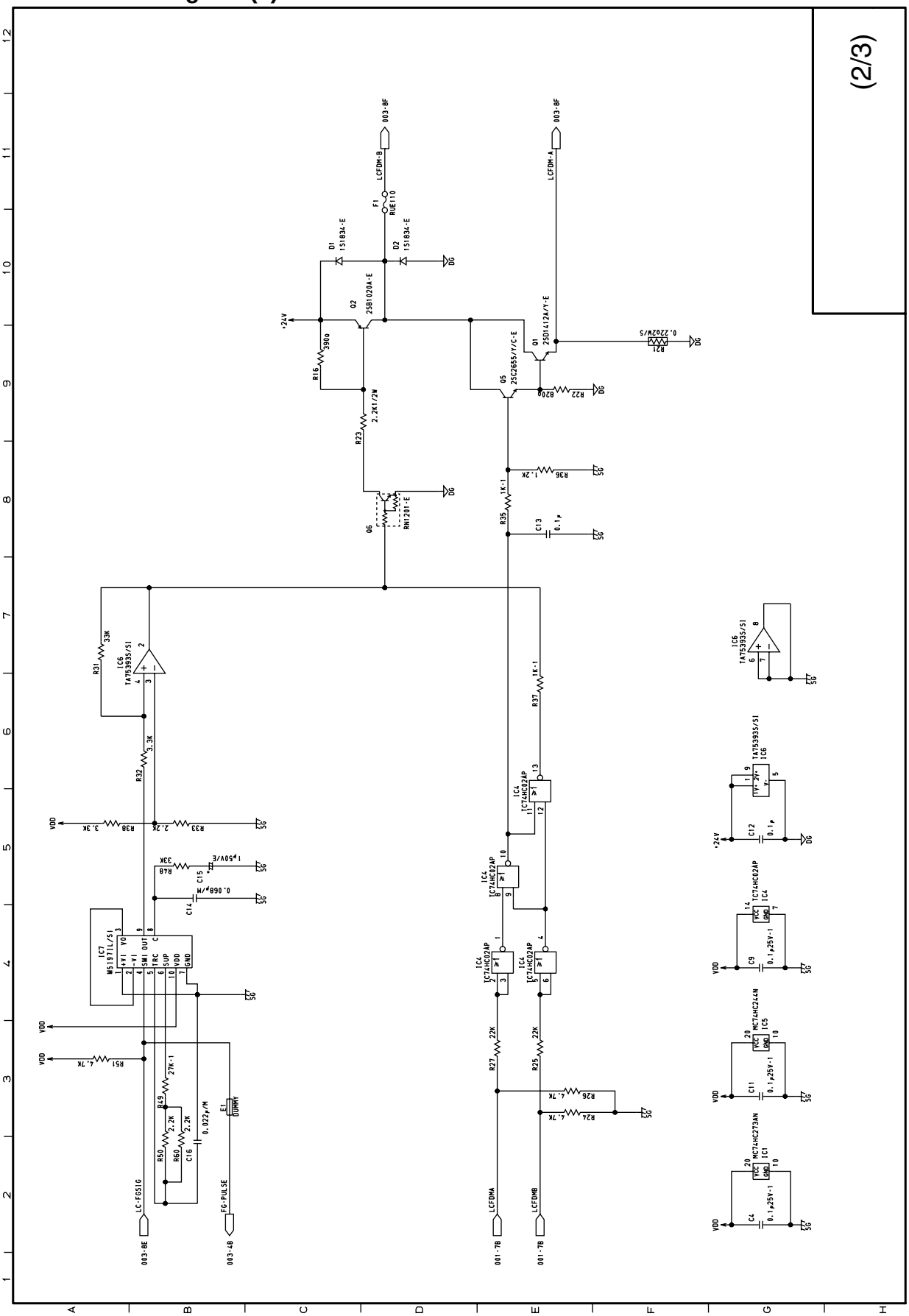
5. 1 Harness Diagram



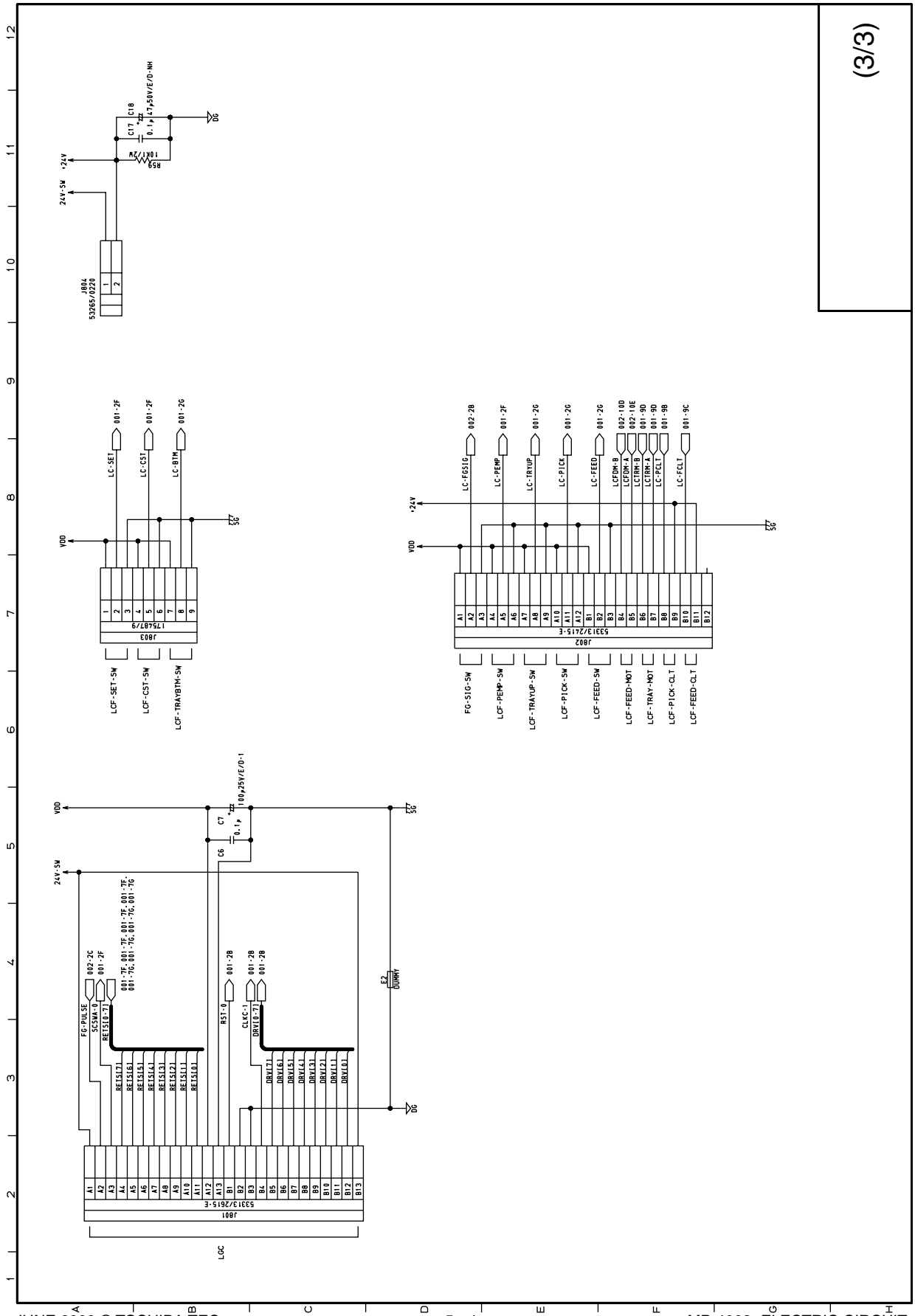
5. 2 Circuit Diagram (1)



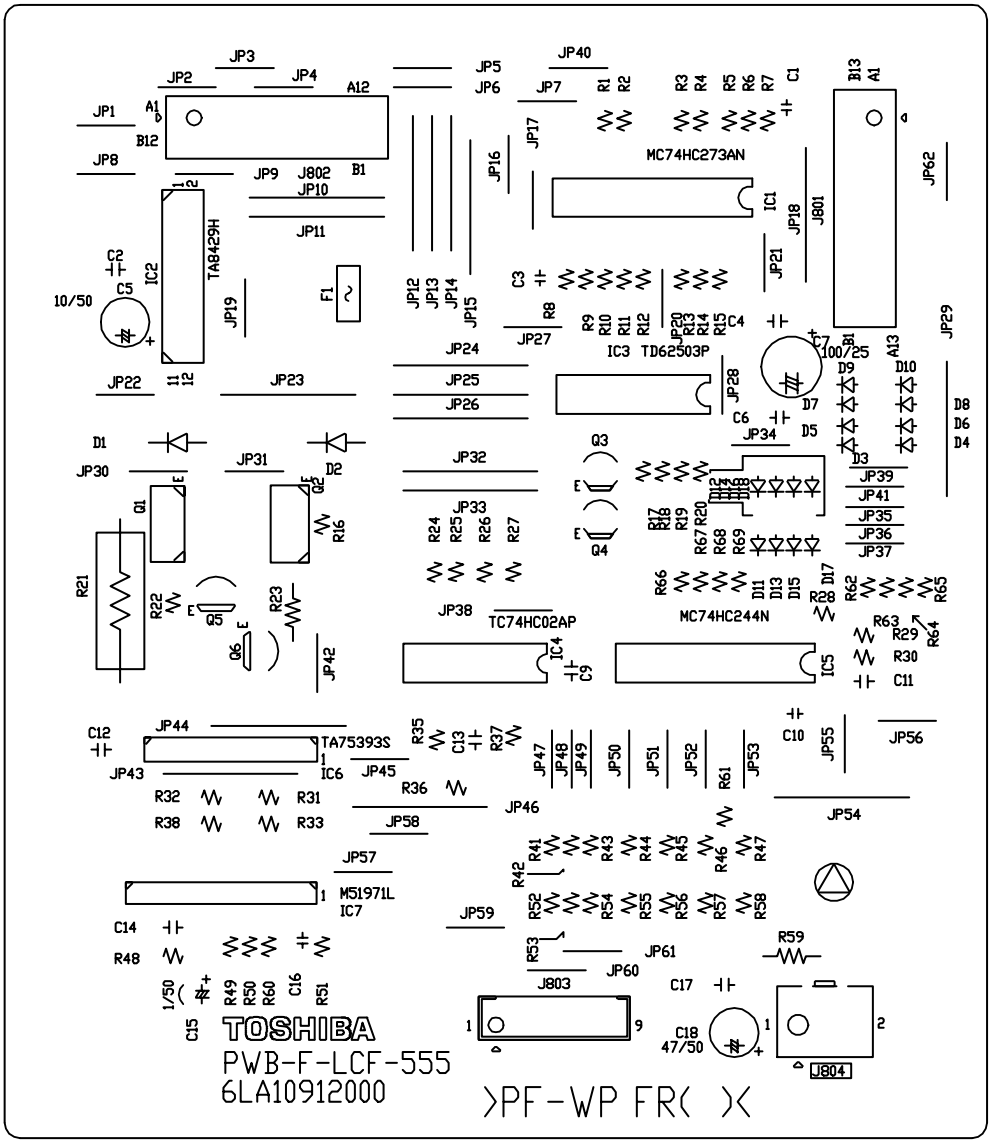
5. 2 Circuit Diagram (2)



5. 2 Circuit Diagram (3)



5. 3 PC Board


TOSHIBA
PWB-F-LCF-555
6LA10912000
MC74HC273AN
TA8429H
TD62503P
MC74HC244N
TC74HC02AP
TA75393S
M51971L

6. PERIODIC MAINTENANCE

Symbols used in the checklist

Cleaning	Coating	Replacing	Date
A: Cleaning with alcohol	W: White grease (Molycoat)	500: every 500K copies △: Replace if deformed or damaged.	User's name Serial No. Inspector's name Remarks

General Maintenance Checklist

Item to check	Cleaning	Coating	Replacing x 1000	Remarks
Pickup roller	A		500△	
Feed roller	A		500△	
Separation roller	A		500△	
Drive gears (tooth face)		W		

* Operational interval of the periodic maintenance (PM) is different among the copiers.

e-STUDIO 550: every 400K copies

e-STUDIO 650: every 460K copies

e-STUDIO 810: every 500K copies

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