

2000 SHEET PAPER DECK-N1 SERVICE MANUAL

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Canon

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INTRODUCTION

This service manual provides basic information required in performing field service to maintain the product quality and functions of 2000 Sheet Paper Deck-N1.

Each chapter consists of the following sections:

Chapter 1, "Introduction," Specifications, Names of Parts.

Chapter 2, "Operation Overview," Description of the mechanical and electrical operating principles and timing by function.

Chapter 3, "Mechanical System," Description of mechanical structure, and disassembly, assembly and adjustment methods.

Chapter 4, "Maintenance and Inspection," Table of periodic replacement parts and consumables replacement targets, periodic service list and parts to be cleaned during a customer service call.

Chapter 5, "Troubleshooting," Standards/ adjustments, operation failure countermeasures and paper feed failure countermeasures.

"Appendices," Signal name list, general circuit diagram, special tools, solvent and oil list.

Note that since installation procedure instructions are packed with the 2000 Sheet Paper Deck-N1, no installation procedures are provided in this manual.

Changes of the contents made for the sake of product improvements will be notified in Service Information (Technical Information) whenever such changes are made.

Gaining a sound and thorough understanding of the copier through careful reading of this service manual and the subsequently issued Service Information (Technical Information) bulletins is the only way to develop the technical skill necessary to prolong product quality and functionality and the practical ability to be able to determine the cause of breakdowns.

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CHAPTER 1

INTRODUCTION

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I. FEATURES

1. Large capacity

Ability to store a maximum of approximately 2,000 sheets of paper (64 g/m²), enabling continuous large volume copying / printing.

2. Status LED

The customer is easily able to check the equipments operating condition using the LED on the front of the unit.

3. Stand alone mode switch

When the stand alone mode switch is ON, it is possible to operate the unit independently, and easily enter the service mode.

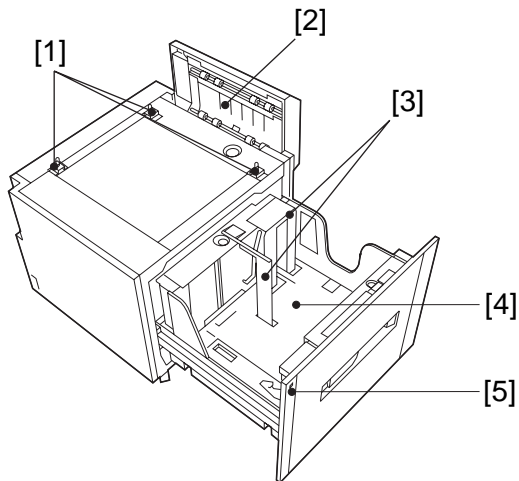
II. SPECIFICATIONS

Item	Specifications
Paper type	Plain paper: A3, B4, A4, Ledger, Legal, Letter sizes. (64 g/m ² to 105 g/m ² recommended paper)
Capacity	Depth 200 mm (Able to store 2,000 sheets of 64 g/m ² paper.)
Maximum power usage	Approximately 26 W or less (Room temperature 26°C, rated supply voltage input)
Noise (Official noise pollution value, as per ISO 9296) (note)	Sound power level (1 dB=10 dB) Under 7.1 dB (When copying / printing) Under 6.4 dB (On standby) Sound pressure level Under 53 dB (When copying / printing) (Bystander position) Under 48 dB (On standby)
Dimensions	629 (width) × 520 (depth) × 651 (height) mm
Mass	Approximately 30 kg
Power supply	100 - 120 V (50 / 60 Hz) 220 - 240 V (50 Hz) (Allowable voltage deviation : within ± 10 %)

Specifications are subject to change for the sake of product improvements.

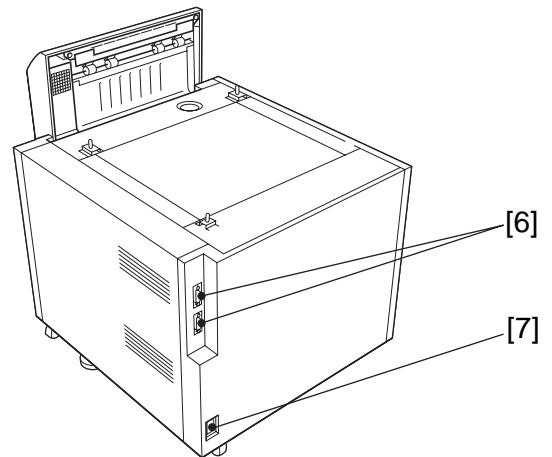
III. NAMES OF PARTS

A. External view



- [1] Positioning pin
- [2] Feeder assembly
- [3] Paper size regulating plate
- [4] Lifter
- [5] User LED

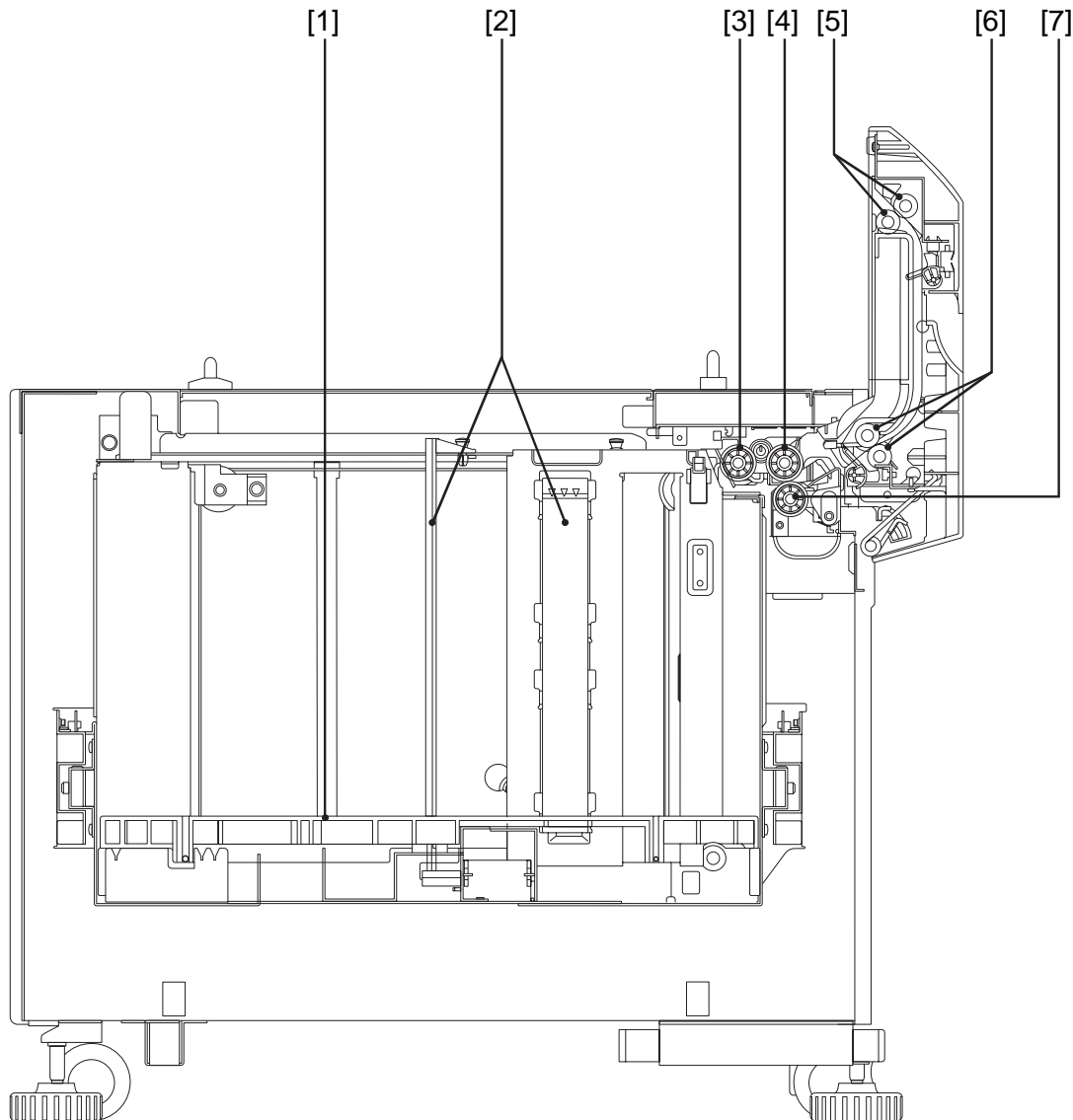
Figure 1-301



- [6] Interface connector
- [7] Power supply receptacle

Figure 1-302

B. Cross section diagram





- | | |
|---------------------------------|-------------------------|
| [1] Lifter | [5] Feed roller 2 |
| [2] Paper size regulating plate | [6] Registration roller |
| [3] Pick up roller | [7] Separation roller |
| [4] Pick up / Feeding roller | |

Figure 1-303

CHAPTER 2

OPERATION OVERVIEW

1. This chapter describes the objective and role of each function, the relationship between the electrical and mechanical systems and also gives an overview of the operation timing of each part by function.

The  symbol in the overview diagram indicates the transmission of mechanical drive, and the  symbol together with a signal name indicates the flow of electric signals.

2. In the descriptions of the digital circuits of the cassette feeding unit, "1" indicates a high electric signal level and "0" indicates a low electric signal level.

The cassette feeding unit incorporates microprocessors, but as their internal operation cannot be checked, a description of microprocessor operation has been omitted.

Since it is assumed that service engineers will not repair PCBs on the customers' premises, descriptions of PCBs are limited to overviews illustrated with block diagrams. Consequently, circuit descriptions cover from sensors to the input sections of the major PCBs and from the output sections of the major PCBs to the loads, as well as block diagrams of each function.

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I. BASIC CONSTRUCTION

A. Overview

This unit feeds the paper to the printer assembly's main unit.

This unit's operating sequences are regulated by the paper deck driver PCB. An 8-bit microprocessor (IC201) is used in the paper deck circuit driver PCB. This performs operating sequence control and serial communications control with the option controller PCB.

The paper deck driver PCB drives solenoids, motors, etc. in response to commands transmitted from the option controller PCB, via serial communication lines. The paper deck driver PCB also notifies the option controller PCB of sensor and switch information, via the serial communication lines.

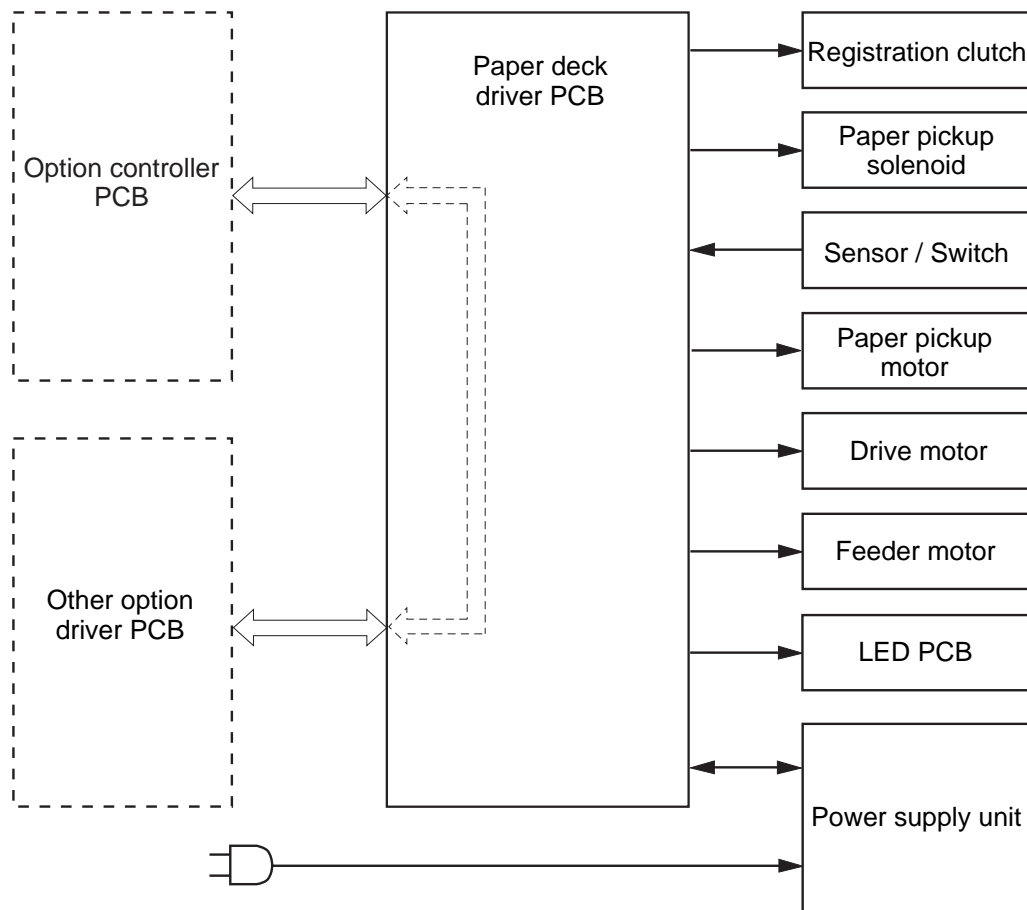


Figure 2-101

B. Paper deck driver PCB input / output

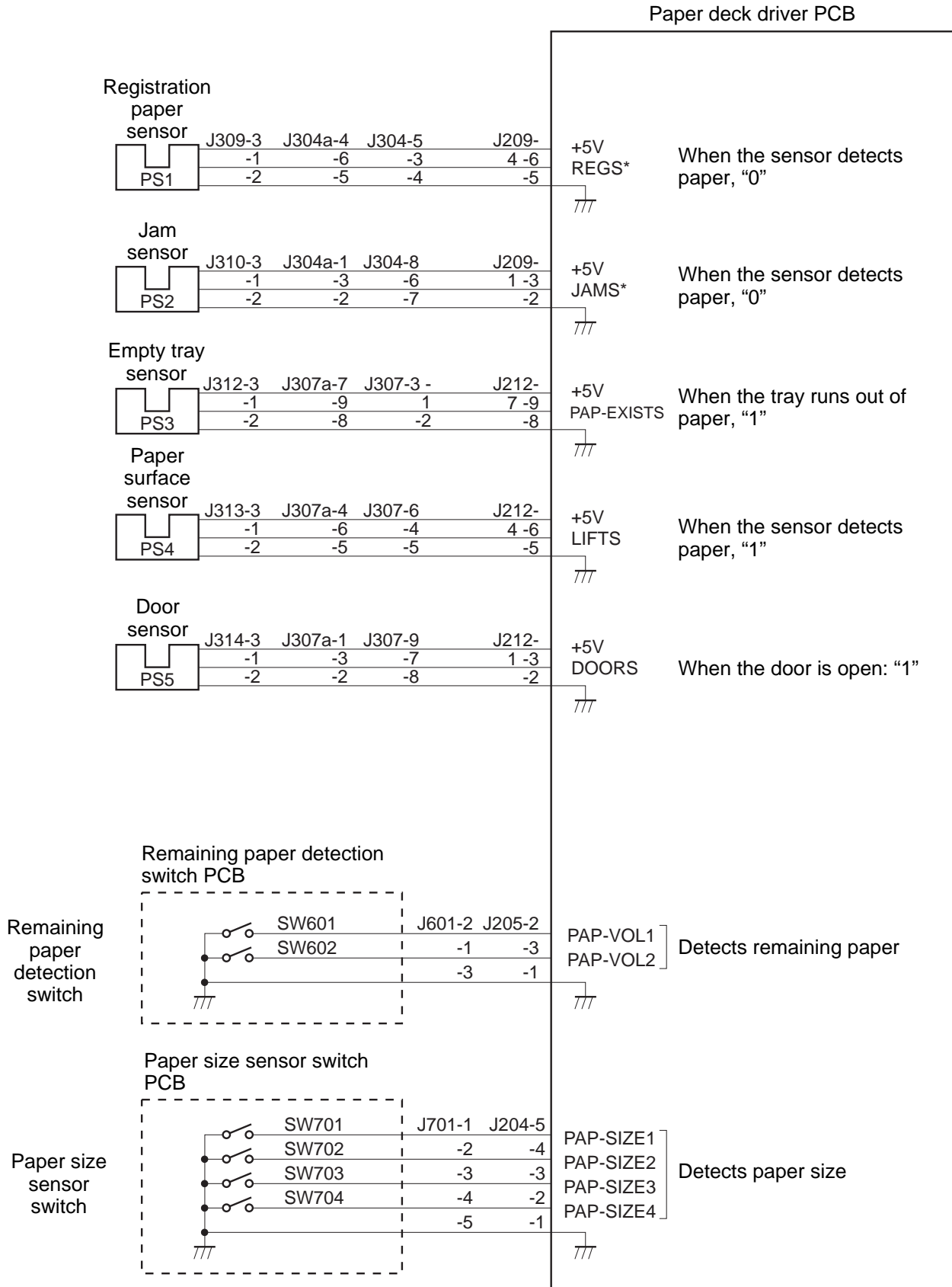


Figure 2-102

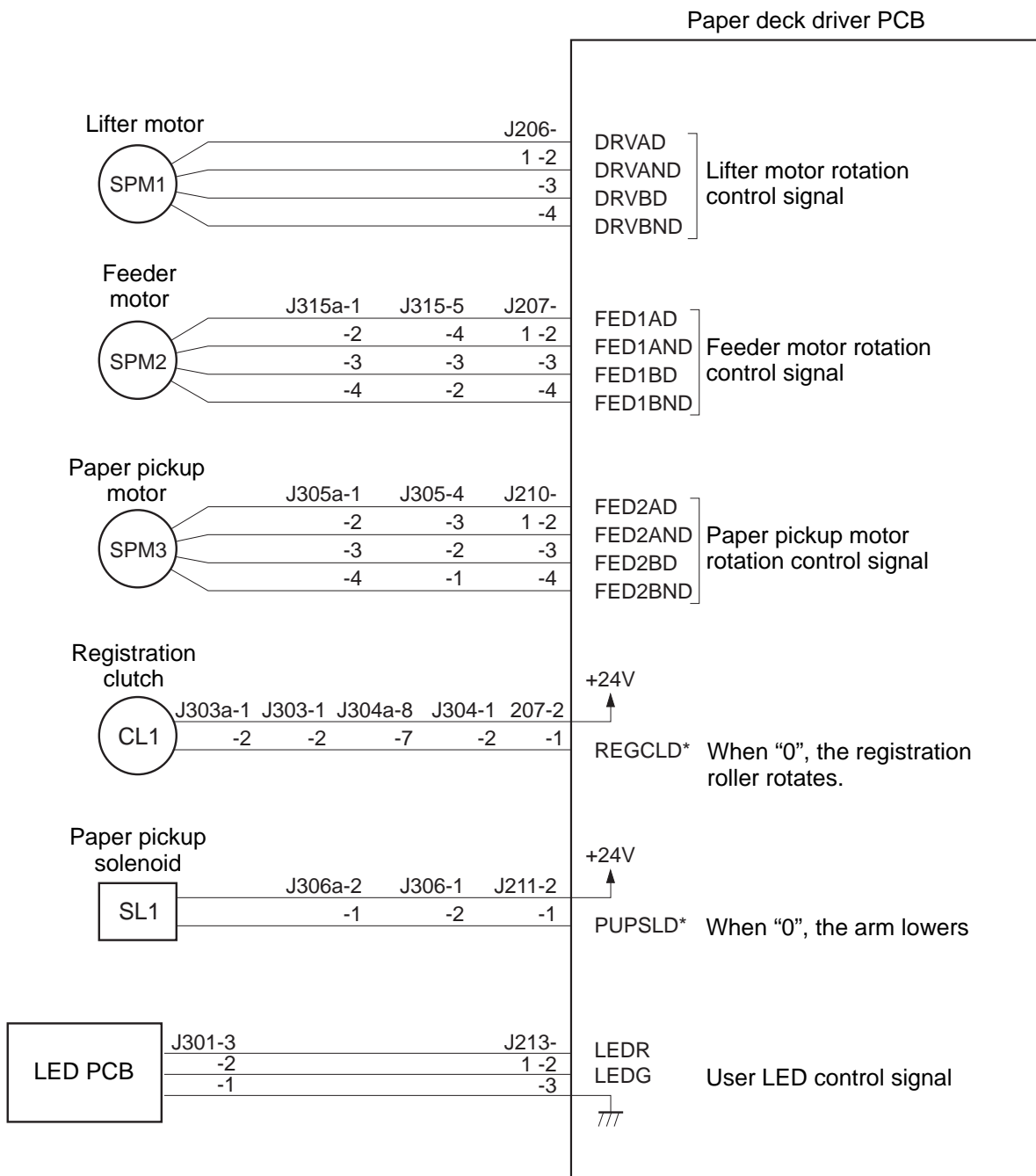


Figure 2-103

II. PAPER PICKUP AND FEEDING SYSTEM

A. Overview

The empty tray sensor (PS3) detects whether or not there is paper in the unit. The paper level in the tray is detected by a combination of paper level sensor switch 1 (SW601) and paper level sensor switch 2 (SW602). Also, the paper size is detected by a combination of paper size sensor switches (SW701 704). The paper level sensor switch combination and the paper size switch combination are shown in Tables 2-201, 202.

When a paper pickup command is sent from the option controller PCB to the unit, the paper deck driver PCB causes the paper pickup motor (SPM3) to rotate. Subsequently, the pick up roller, pick up / feeding roller and separation roller also rotate.

At the same time, the paper deck driver PCB turns the paper pickup solenoid (SL1) ON. This causes the pick up roller to lower to the paper surface. As a result, the paper is picked by the revolving pick up roller to the feeder assembly.

After the paper, which has been picked to the feeder assembly, has passed through the registration paper sensor (PS1), it stops momentarily. After that, the registration clutch (CL1) comes ON, and the paper is fed into the printer section.

There are 2 photo-interrupters (PS1, PS2) in the paper feeding path, and they detect whether the paper has arrived or passed though.

If the paper has not arrived at or passed though each sensor within a designated time period, the paper deck driver PCB judges there is a paper jam, and, in addition to stopping further operation, it will notify the option controller PCB that a jam has occurred.

Remaining paper detection switch		Paper level (%)
SW601	SW602	
OFF	OFF	100
ON	OFF	75
ON	ON	50
OFF	ON	25

Table 2-201

Paper size	Paper size sensor switch			
	SW701	SW702	SW703	SW704
Ledger	OFF	ON	OFF	OFF
A3	ON	ON	OFF	OFF
B4	OFF	OFF	ON	OFF
Legal	OFF	ON	ON	OFF
Letter horizontal	OFF	ON	OFF	ON
A4 horizontal	ON	ON	OFF	ON
Tray open	OFF	OFF	OFF	OFF

Table 2-202

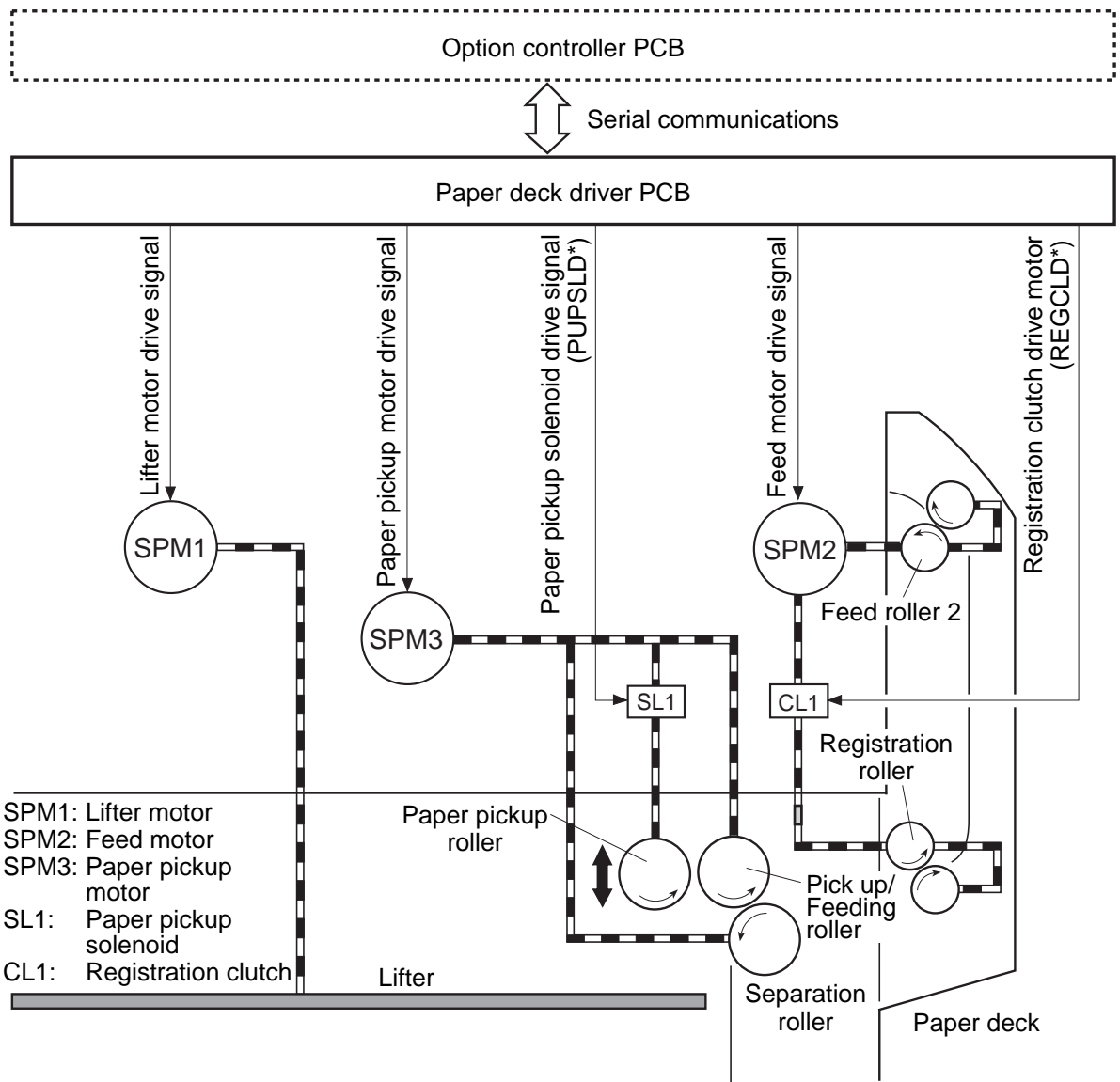


Figure 2-201

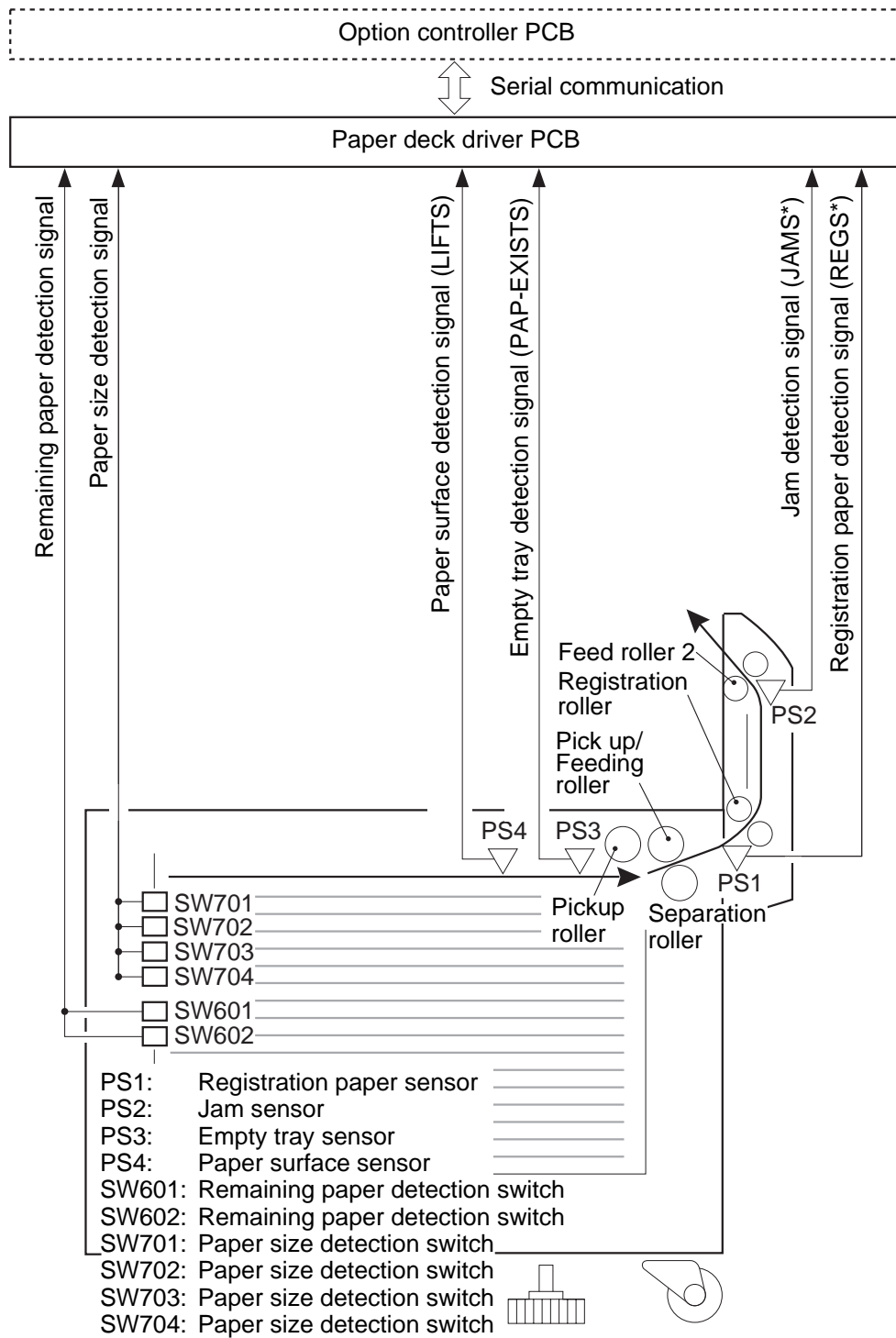


Figure 2-202

B. Paper Pickup and Feeding

When the paper deck driver PCB receives the paper pickup command from the option controller PCB, the feed motor (SPM2) and the Paper pickup motor (SPM3) start. SPM2 drives feed roller 2 and the registration roller. At the same time, the paper deck driver PCB turns the paper pickup solenoid ON. When this solenoid is ON, the paper feed cam rotates and the pickup arm moves. As a result of this, the revolving paper pickup roller lowers to the paper surface and feeds the paper. Then, the separation roller prevents multi-feeding, and only one piece of paper is fed to the feeder assembly by the Pick up / Feeding roller.

After the paper has passes through the registration sensor (PS1), it arrives at the registration roller. At this time the registration roller is not revolving, therefore the paper stops moving and a loop formed at the leading edge, and any correction necessary is made to ensure the paper is not fed at a skew angle. After this, the registration clutch (CL1) comes ON, and then the SPM2 drive is transmitted to the registration roller which begins to rotate. Once the registration roller is revolving, the paper again is fed into the printer assembly.

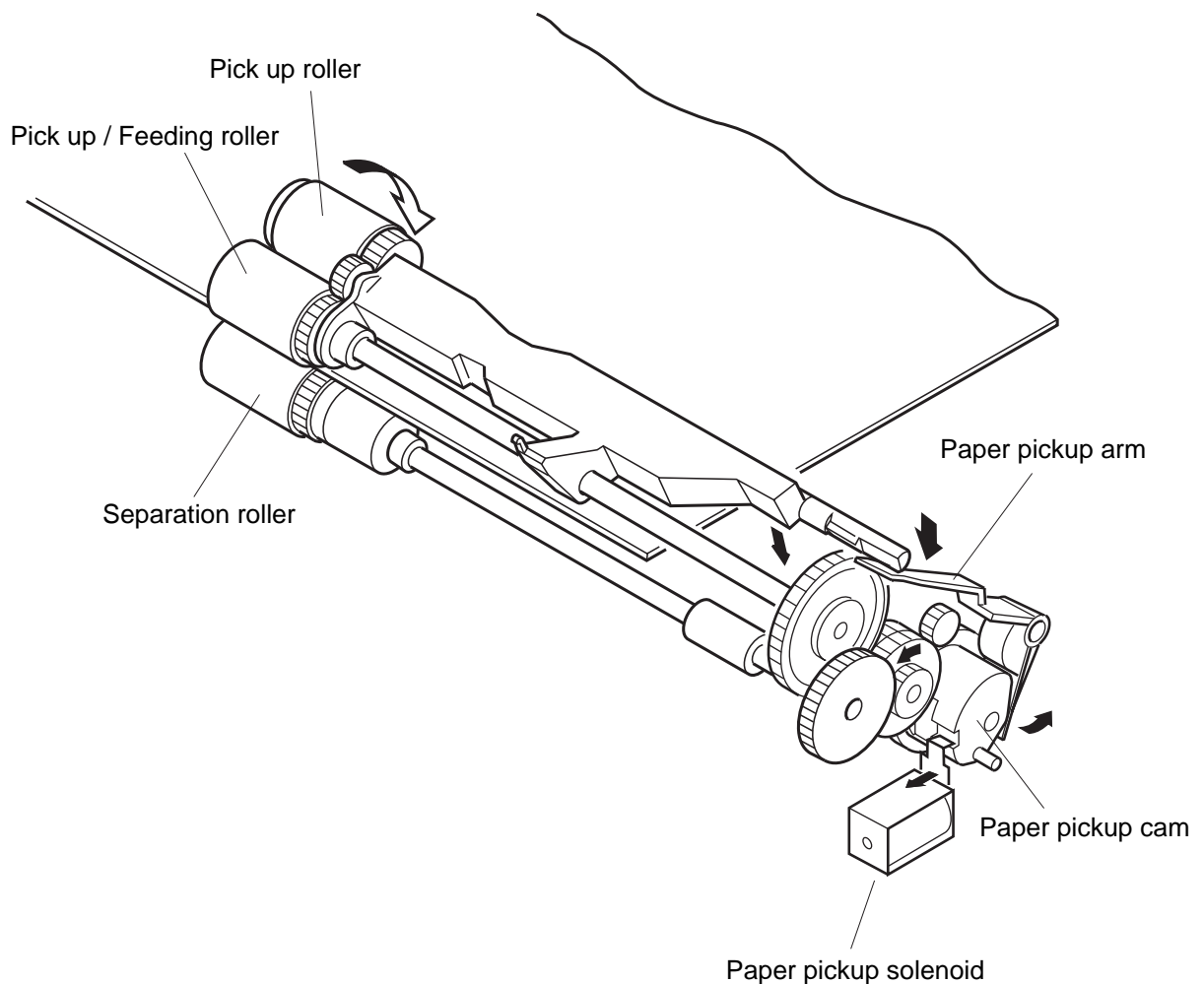


Figure 2-203

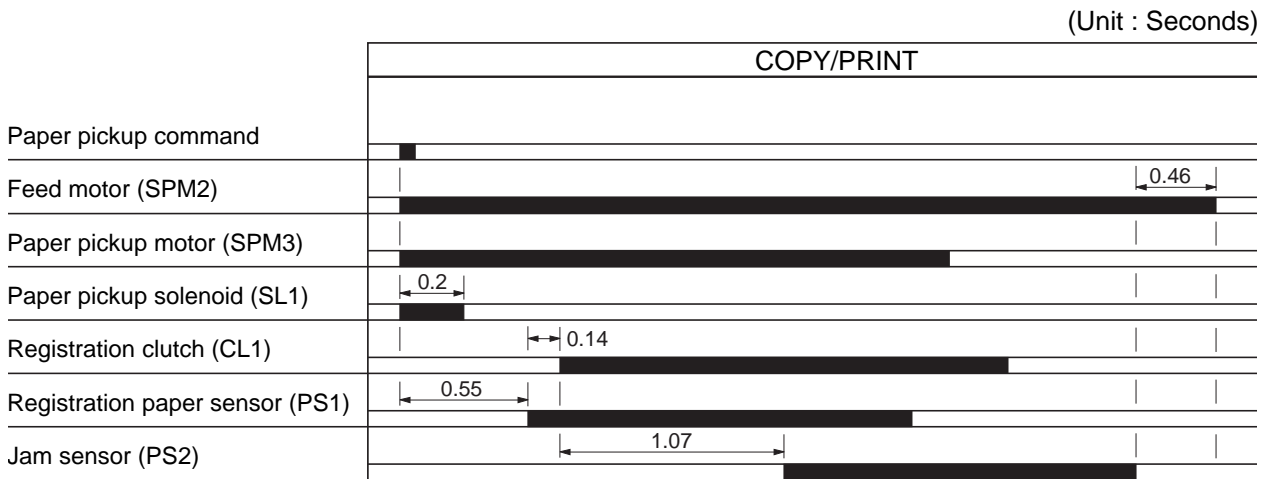


Figure 2-204

C. Lifter operation

The lifter in the tray is suspended by 2 wires. When the wires receive driving power from lifter motor (SPM1: stepping motor), they are wound around 4 pulleys, and the lift is actuated. Also, when the tray is pulled out, the pulley gear and motor gear are removed causing the lifter to lower under its own weight.

The paper size sensor switches (SW701 - 704) detect whether the tray is set correctly, or not.

When the paper size sensor switches have detected that the tray has been set correctly, the paper deck driver PCB turns the SPM1 ON. This causes the lifter to rise until it reaches the position where the paper surface sensor (PS4) changes to "1". After this, the paper volume in the tray decreases as the paper is used, and when the PS4 changes to "0", the paper deck driver PCB again turns SPM1 ON, and the raises the lifter until PS4 reaches the "1" position.

If PS4 does not reach "1" within a designated time after the lifter has begun to rise, the paper deck driver PCB will notify the option controller PCB that the lifter is faulty.

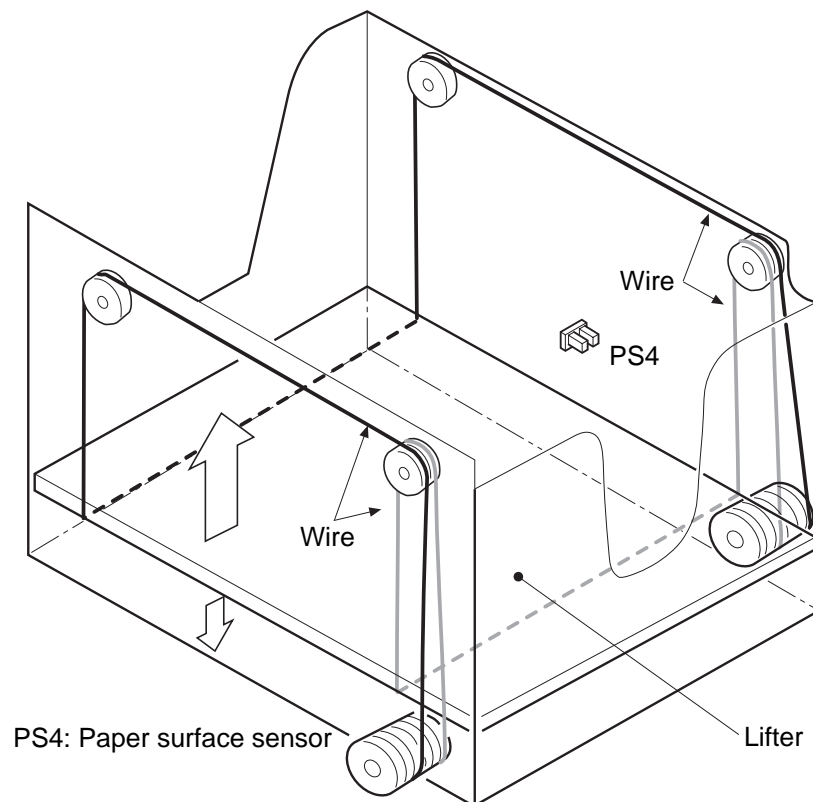


Figure 2-205

D. Jam detection

The machine is equipped with the following sensors to detect whether there is paper, or not, and whether the paper is being feded correctly, or not.

- Registration paper sensor (PS1)
- Jam sensor (PS2)

The preset check timing in the paper deck driver PCB microprocessor is used to determine whether a jam has occurred, depending on whether paper is present or not at the sensor.

When the CPU judges that there has been a jam, feeding to the printer assembly is stopped, and the option controller PCB is notified a jam has occurred.

1. Paper feed delay jam

If the paper has not arrived at the registration paper sensor (PS1) after the designated time has passed, the CPU judges there is a paper feed delay jam.

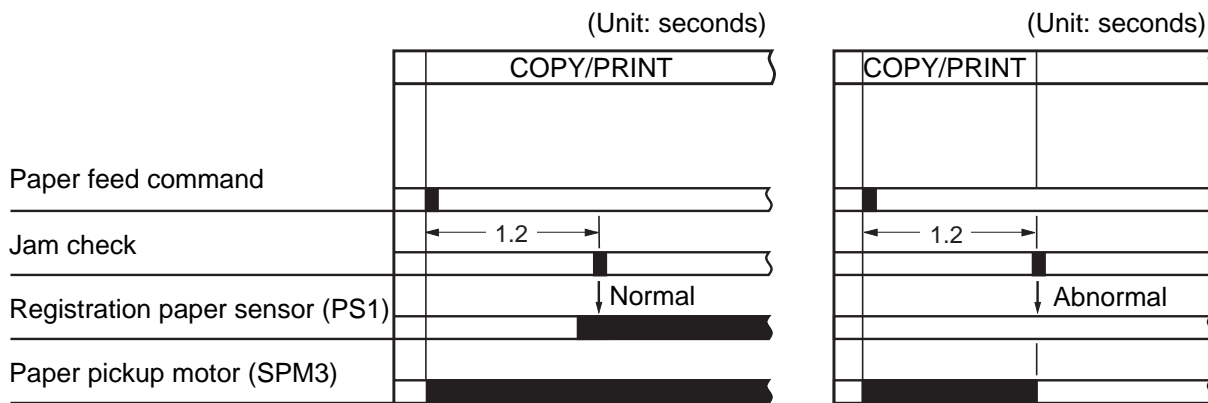


Figure 2-206

Paper feed retry function: If paper is not detected when the first jam check is carried out, the paper feed operation is repeated. If paper is still not detected after the second jam check, the CPU judges there is a paper feed delay jam.

2. Feed section delay jam

If, after a designated time from the registration clutch (CL1) being driven, paper has not arrived at the jam sensor (PS2), the CPU judges there is a feed section delay jam.

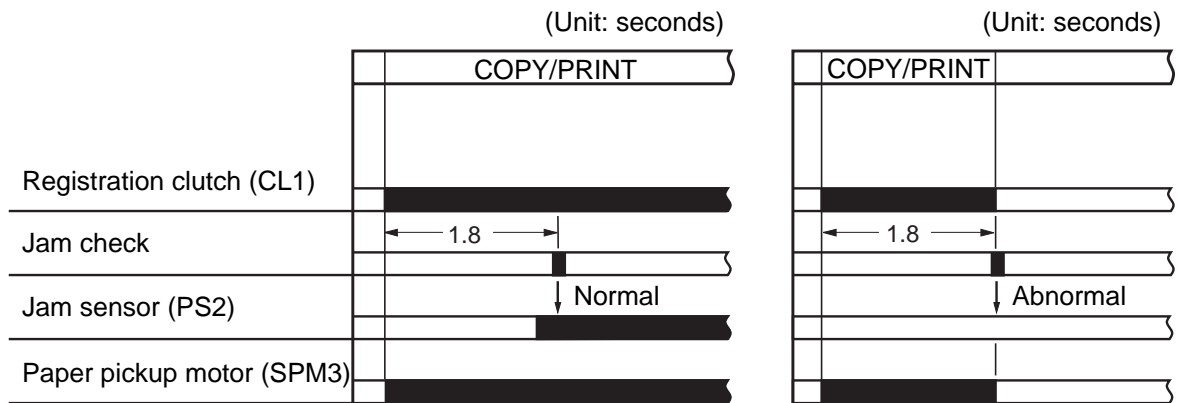
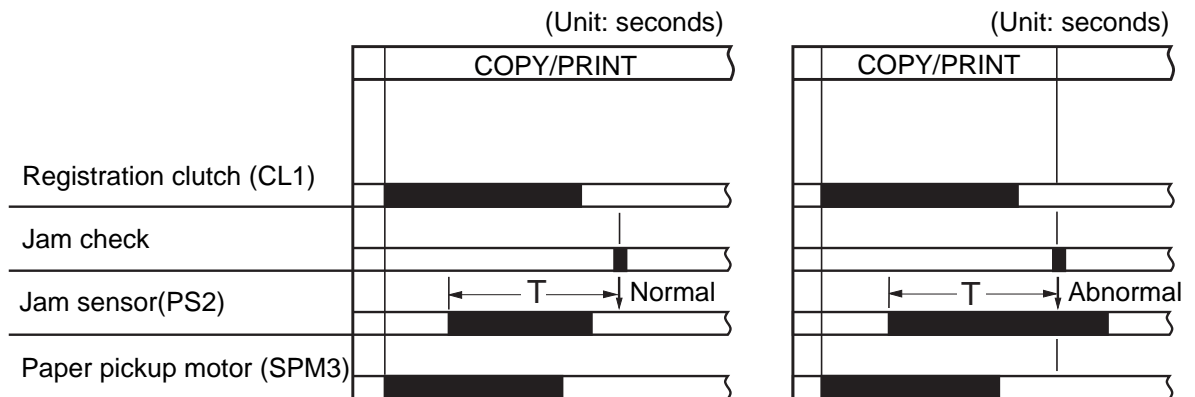


Figure 2-207

3. Feed section stationary jam

If, a designated time after the jam sensor (PS2) has come ON, paper has not passed the jam sensor (PS2), the CPU will judge there is a feed section stationary jam.



T=approx. 2.5(A4), approx. 4.4(ledger)

Figure 2-208

III. POWER SUPPLY

A. Overview

The power supply of the unit is equipped with a remote switch system.

When the power switch of the printer assembly is turned on, the option controller PCB outputs a power on signal (PWRON-IN) to the power supply unit, via the paper deck driver PCB. When the PWRON-IN signal is "1", the power supply provides +24 V and +5 V to the paper deck driver PCB.

The lifter motor, delivery motor, paper pickup motor, registration roller clutch and the paper pickup solenoid use +24 V, while the sensors and the paper deck driver PCB ICs, etc., use +5 V.

The unit is also provided with a power switch (SW1). This makes it possible to turn on the paper deck independently without having to also turn on the printer assembly.

A block diagram of the power supply is shown below.

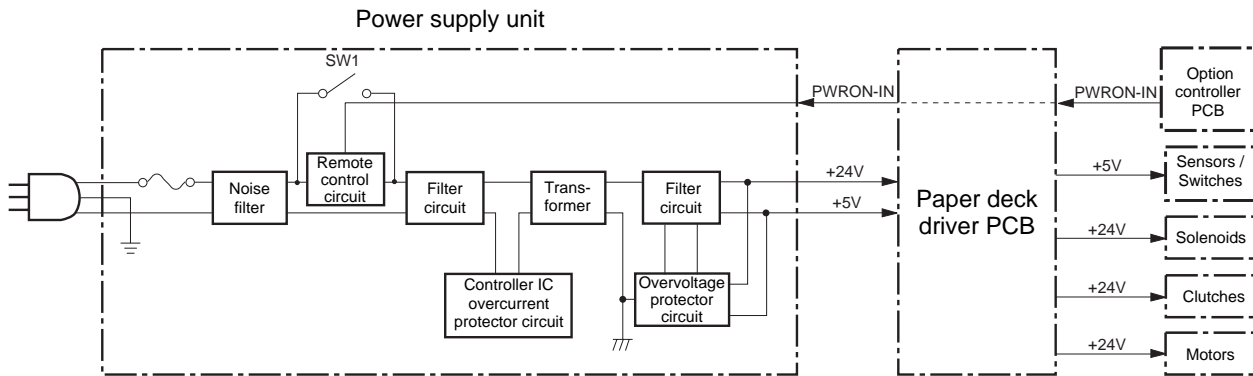


Figure 2-301

B. Protective functions

The +24 V and +5 V power circuits are equipped with an overvoltage and overcurrent protective functions that automatically turn off the output voltage to prevent the breakdown of power supply circuits in the event overcurrent or overvoltage caused by electrical shorts or other problems on the load side.

When the overvoltage and overcurrent protection functions have been triggered, and DC voltage is no longer being supplied from the power supply circuit, turn off the power switch on the printer assembly, correct the problem on the load side before turning on the printer assembly power switch.

CHAPTER 3

MECHANICAL SYSTEM

This chapter describes mechanical features and operations as well as disassembly and assembly procedures.

The following precautions must be observed during disassembly and assembly work.

1. ⚠ For the sake of safety, disconnect the power plug before performing any disassembly or assembly work.
2. Unless otherwise specified, assembly work is performed in the reverse order of the disassembly operations.
3. Be sure to use the right type (diameter and length) or screws in the right places.
4. An inner-clip washer is used with one securing screw in the metal cover to prevent buildup of static electricity. Make sure to use this washer during assembly work.
5. In principal, the copier must not be operated when parts have been removed.

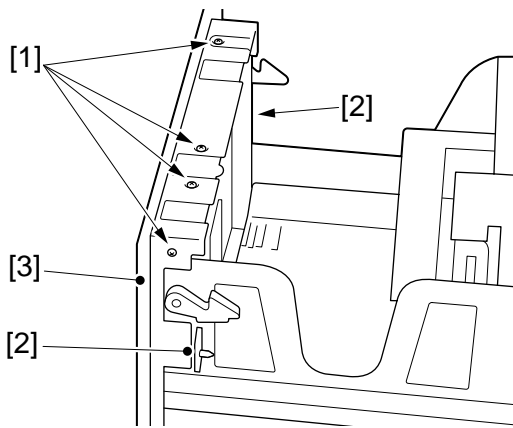
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I. EXTERNAL CONTROL SYSTEM

A. External cover

1. Front cover

- 1) Pull out the tray.
- 2) Remove the paper size regulating plate.
- 3) After removing the 4 screws, remove the left and right tabs, then remove the front cover.

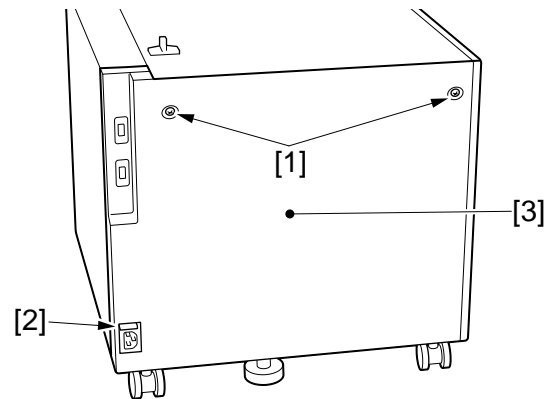


- [1] Screw
- [2] Tab
- [3] Front cover

Figure 3-101

2. Left cover

- 1) Remove the 2 screws.
- 2) Remove the tab, then remove the left cover.

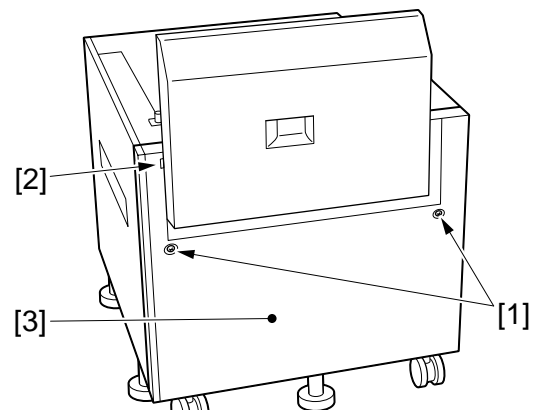


- [1] Screw
- [2] Tab
- [3] Left cover

Figure 3-102

3. Right cover

- 1) Remove the 2 screws.
- 2) Remove the tab, then remove the right cover.

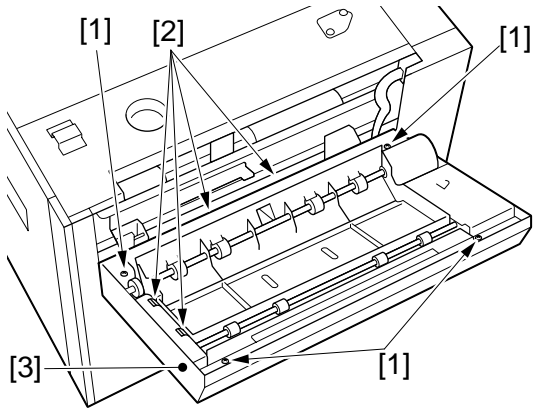


- [1] Screw
- [2] Tab
- [3] Right cover

Figure 3-103

4. Feed cover

- 1) Remove the 4 screws.
- 2) Remove the 4 tabs, then remove the feed cover.

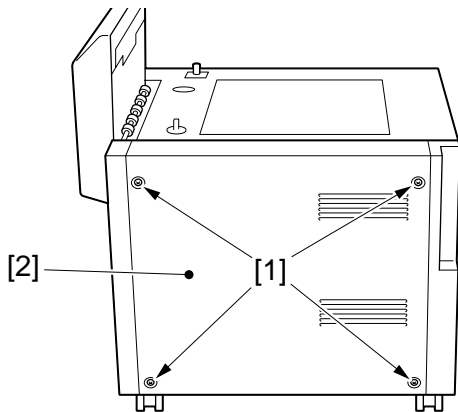


- [1] Screw
- [2] Tab
- [3] Feed cover

Figure 3-104

5. Back cover

- 1) Remove the 4 screws, then remove the back cover.



- [1] Screw
- [2] Back cover

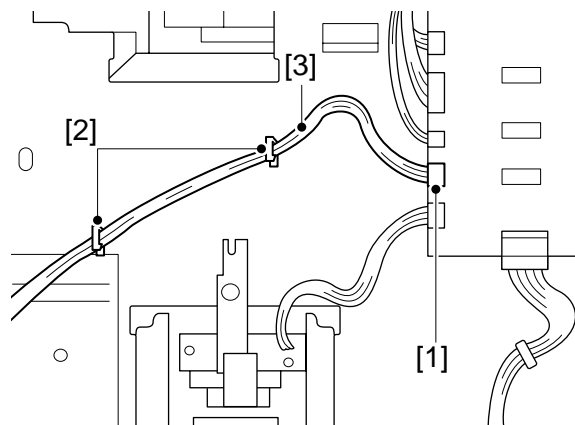
Figure 3-105

II. DRIVE SYSTEM

A. Drive assembly

1. To remove from the main unit.

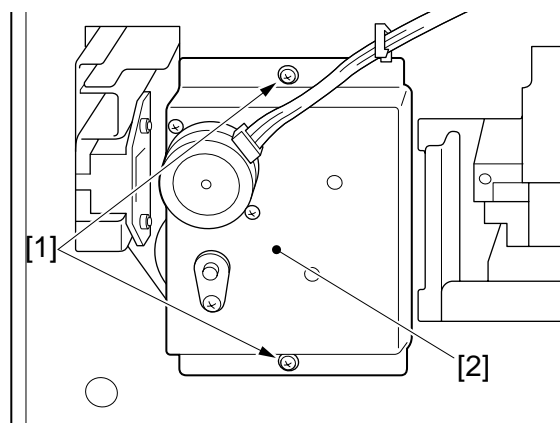
- 1) Remove the back cover.
- 2) Remove the connector, then remove the wire cable from the harness band.



- [1] Connector
- [2] Harness band
- [3] Wire cable

Figure 3-201

- 3) Remove the 2 screws, then remove the drive assembly.



- [1] Screw
- [2] Drive assembly

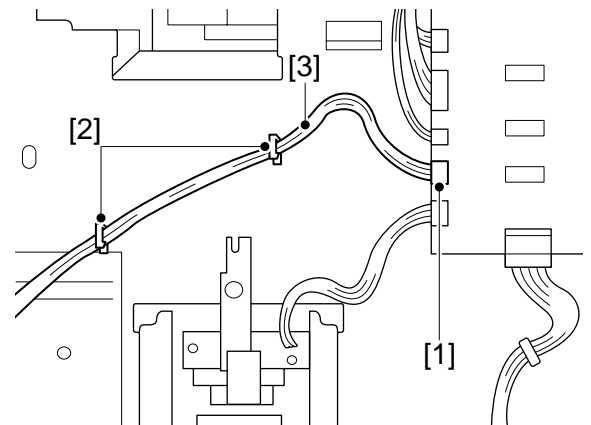
Figure 3-202

2. Disassembling / assembling

a. Lifter motor

1. To remove from the main unit.

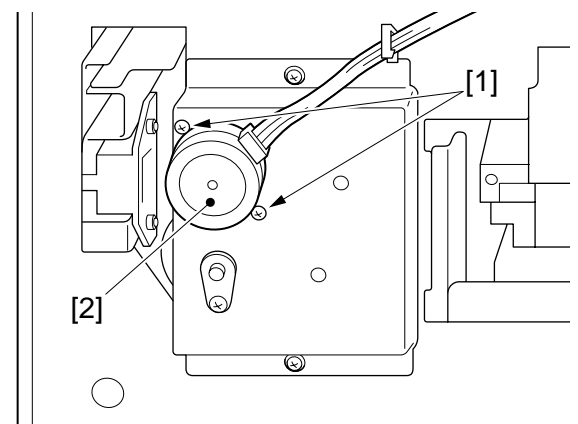
- 1) Remove the connector, then remove the wire cable from the harness band.



- [1] Connector
- [2] Harness band
- [3] Wire cable

Figure 3-203

- 2) Remove the 2 screws, then remove the lifter motor.



- [1] Screw
- [2] Lifter motor

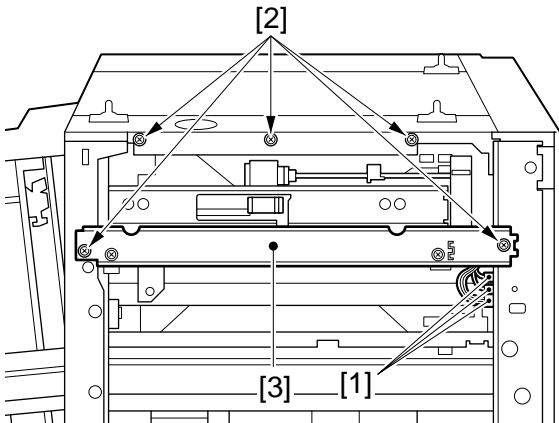
Figure 3-204

III. FEEDER SYSTEM

A. Paper pickup assembly

1. To remove from the main unit

- 1) Remove the Feeder assembly following steps 1-1) to 1-3) on page 3-5.
- 2) Pull out the tray.
- 3) Remove the right cover.
- 4) Remove the 3 connectors and 5 screws, then remove the paper pickup assembly.



- [1] Connector
- [2] Screw
- [3] Paper pickup assembly

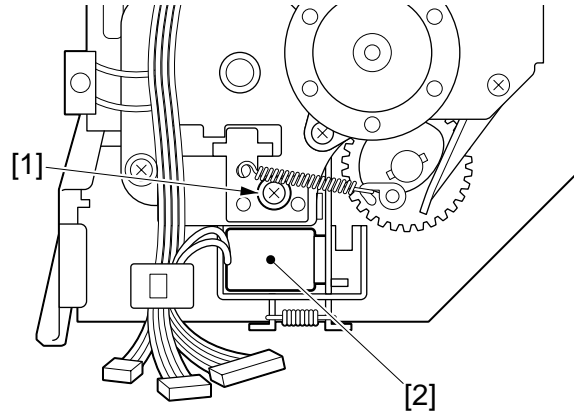
Figure 3-301

Caution:

When exchanging any part of the paper pickup assembly, before doing anything, completely remove the paper pickup roller, feed roller and separation roller to prevent getting grease on them. Furthermore, take care not to get grease on the paper feed guides.

2. Disassembling / Assembling

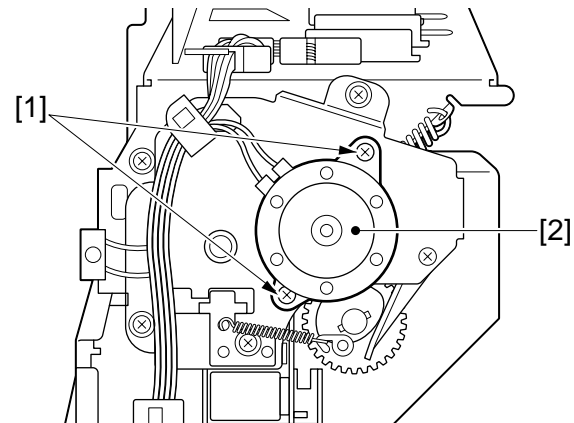
- a. Paper pickup solenoid
 - 1) Remove the screw, then remove the paper pickup solenoid.



- [1] Screw
- [2] Paper pickup solenoid

Figure 3-302

- b. Paper pickup motor
 - 1) Remove the 2 screws, then remove the paper pickup motor.



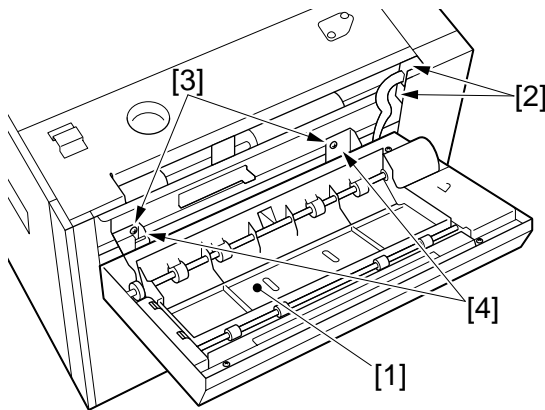
- [1] Screw
- [2] Paper pickup motor

Figure 3-303

B. Feeder assembly

1. To remove from the main unit

- 1) Open the feeder assembly out towards you.
- 2) Remove the 2 connectors.
- 3) Turn the feed spacer.
- 4) Remove the 2 screws, then remove the feeder assembly.



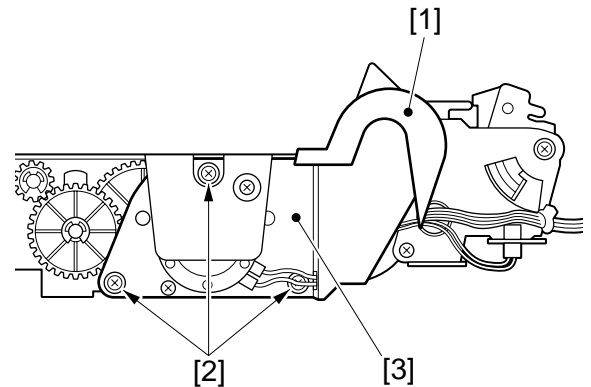
- [1] Feeder assembly
- [2] Connector
- [3] Screw
- [4] Feed spacer

Figure 3-304

2. Disassembling / Assembling

a. Registration clutch

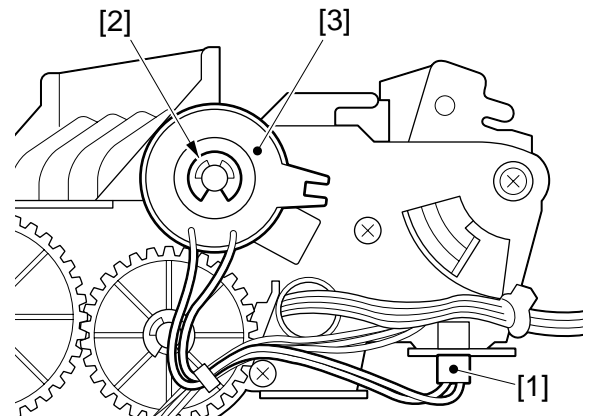
- 1) Remove the feed cover.
- 2) Remove the clutch cover.
- 3) Remove the 3 screws, then remove the feed motor adapter plate.



- [1] Clutch cover
- [2] Screw
- [3] Feed motor adapter plate

Figure 3-305

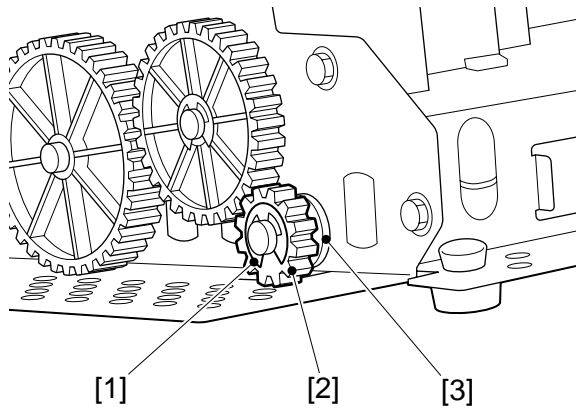
- 4) Remove the connector and the E ring, then remove the registration clutch.



- [1] Connector
- [2] E ring
- [3] Registration clutch

Figure 3-306

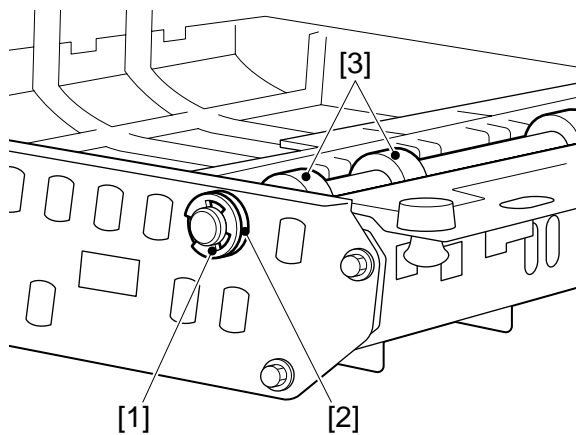
- b. Feed roller
 1) Remove the feed cover.
 2) Remove the E ring, the gear, the pin and the bushing.



- [1] E ring
 [2] Gear
 [3] Bushing

Figure 3-307

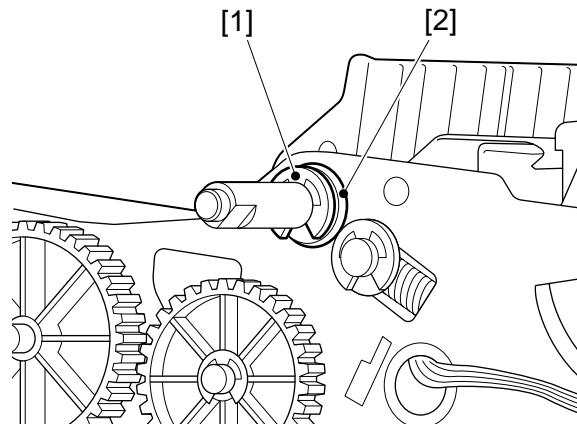
- 3) Remove the E ring and the bushing, then remove the feed roller.



- [1] E ring
 [2] Bushing
 [3] Feed roller

Figure 3-308

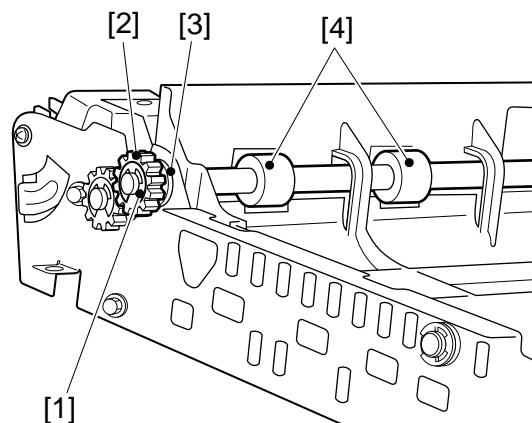
- c. Registration roller
 1) Remove the registration clutch following steps 1) to 4) of the Page 3-5 a.
 2) Remove the E ring and the bushing.



- [1] E ring
 [2] Bushing

Figure 3-309

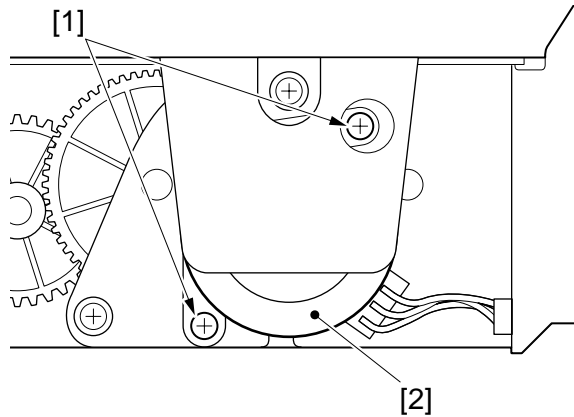
- 3) Remove the E ring, the gear, the pin and the bushing, then remove the registration roller.



- [1] E ring
 [2] Gear
 [3] Bushing
 [4] Registration roller

Figure 3-310

- d. Feed motor
 - 1) Remove the feed cover.
 - 2) Remove the clutch cover.
 - 3) Remove the connector.
 - 4) Remove the 3 screws, then remove the feed motor fixing plate.
 - 5) Remove the 2 screws, then remove the feed motor.



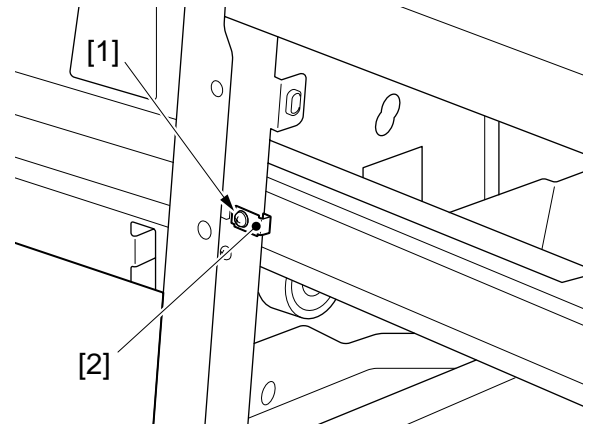
- [1] Screw
- [2] Feed motor

Figure 3-311

C. Trays

1. To remove from the main unit

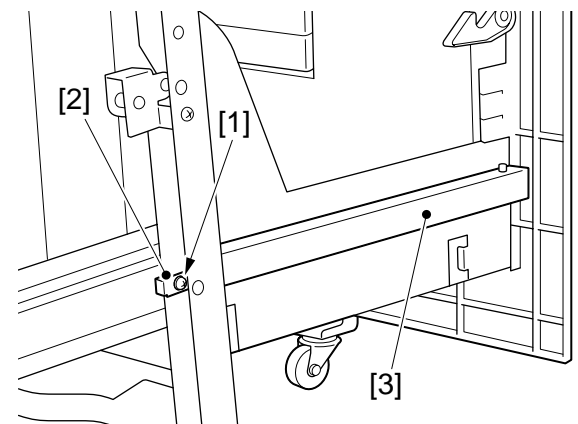
- 1) Remove the front cover.
- 2) Remove the left and right covers.
- 3) Remove the screw, then remove the stopper.



- [1] Screw
- [2] Stopper

Figure 3-312

- 4) Remove the screw, then after removing the stopper, pull out the tray.



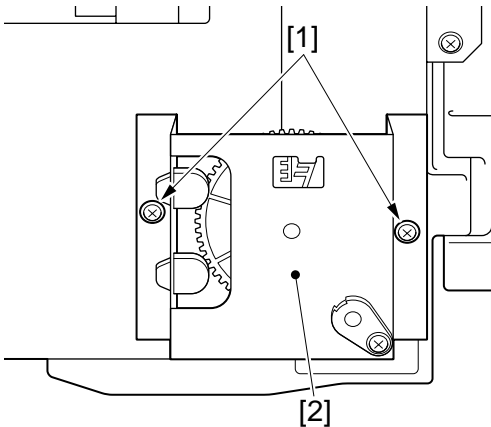
- [1] Screw
- [2] Stopper
- [3] Tray

Figure 3-313

2. Disassembly

a. Lifter

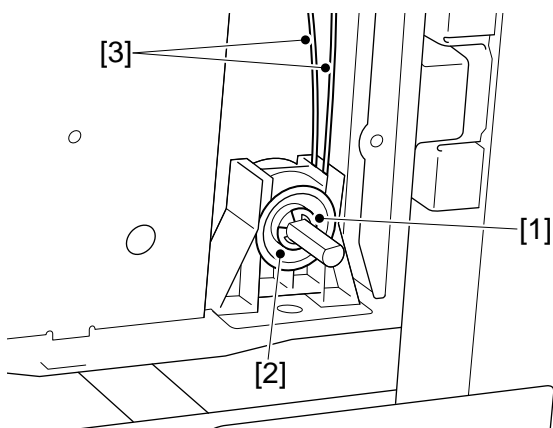
- 1) Remove the 2 screws, and after removing the damper unit, remove the gear.



- [1] Screw
- [2] Damper unit

Figure 3-314

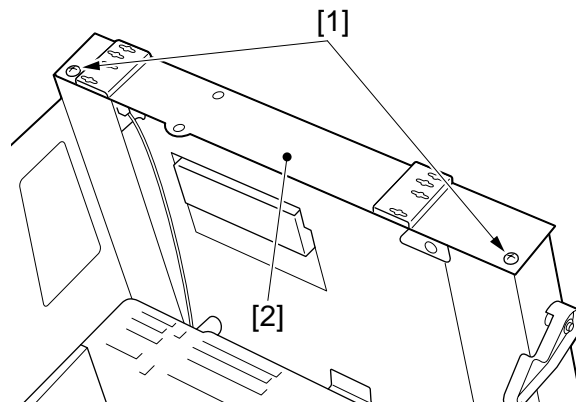
- 2) Remove the E ring, then remove the 2 pulleys.
- 3) Remove the wire from the pulleys.



- [1] E ring
- [2] Pulley
- [3] Wire

Figure 3-315

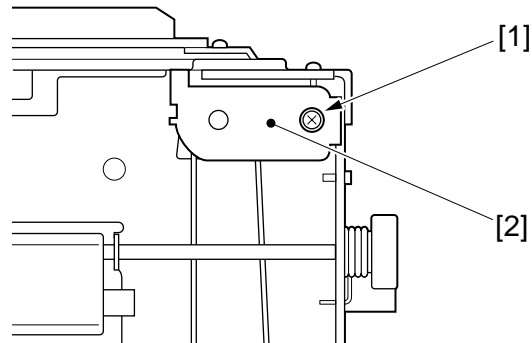
- 4) Remove the 2 screws, then remove the reference adapter plate.



- [1] Screw
- [2] Reference adapter plate

Figure 3-316

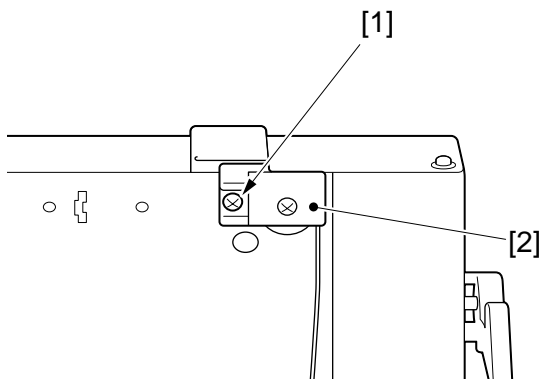
- 5) Remove the screw, then remove the wire cover.



- [1] Screw
- [2] Wire cover

Figure 3-317

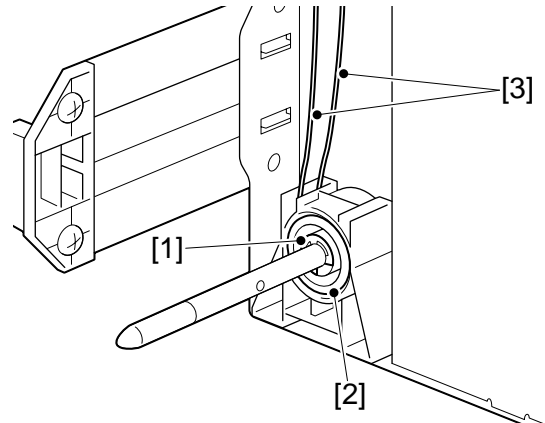
- 6) Remove the screw, then remove the wire cover.



- [1] Screw
[2] Wire cover

Figure 3-318

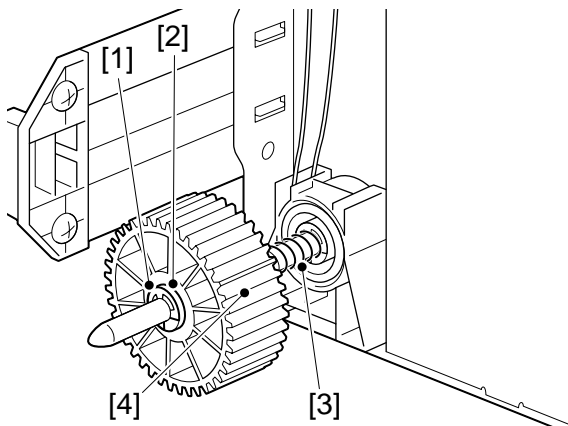
- 9) Remove the E ring, then remove the 2 pulleys.
10) Remove the wire from the pulleys.



- [1] E ring
[2] Pulley
[3] Wire

Figure 3-320

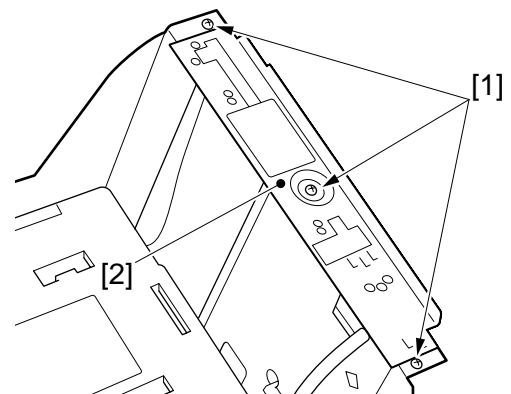
- 7) Remove the E ring, the rubber ring and the gear.
8) Remove the spring and pin.



- [1] E ring
[2] Rubber ring
[3] Spring
[4] Gear

Figure 3-319

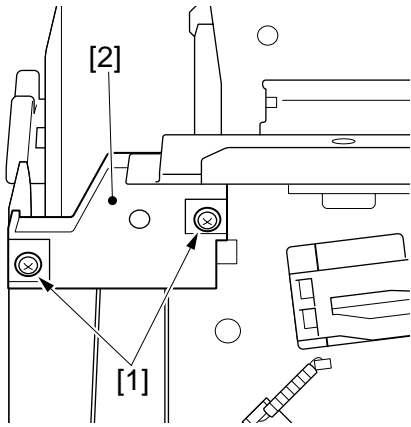
- 11) Remove the 3 screws, then remove the regulating adapter plate.



- [1] Screw
[2] Regulating adapter plate.

Figure 3-321

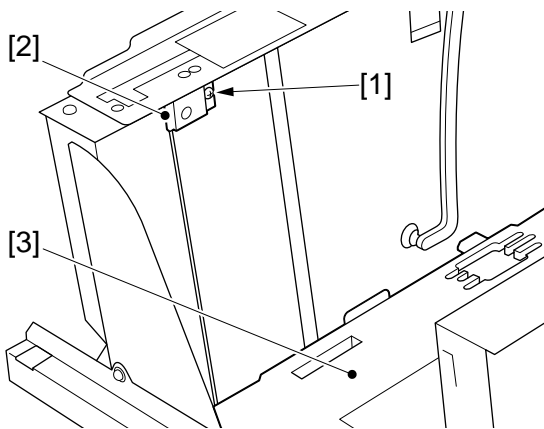
12) Remove the 2 screws, then remove the wire cover.



- [1] Screw
- [2] Wire cover

Figure 3-322

13) Remove the screw, then after removing the wire cover, remove the lifter.



- [1] Screw
- [2] Wire cover
- [3] Lifter

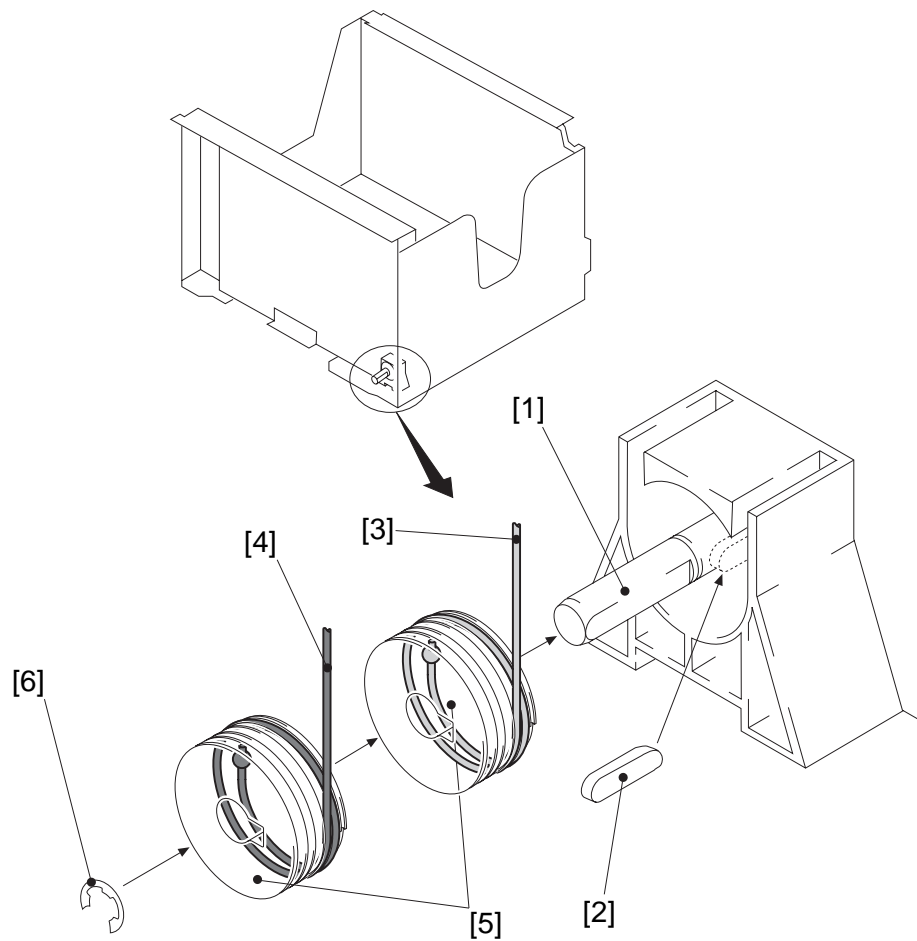
Figure 3-323

14) Remove the wire from the lifter.

3. Assembly

a. Front wire

- 1) Set the pulley positioning pin so that, when looking from the front, the pin is to right of the shaft.
- 2) Insert wire 1 into the second groove from the back and wrap around the pulley one and a half times. Then fit onto the shaft.
- 3) Insert wire 2 into the second groove from the back and wrap around the pulley one and a half times. Then fit onto the shaft.
- 4) Fix the pulley and shaft in place using the E stop ring.



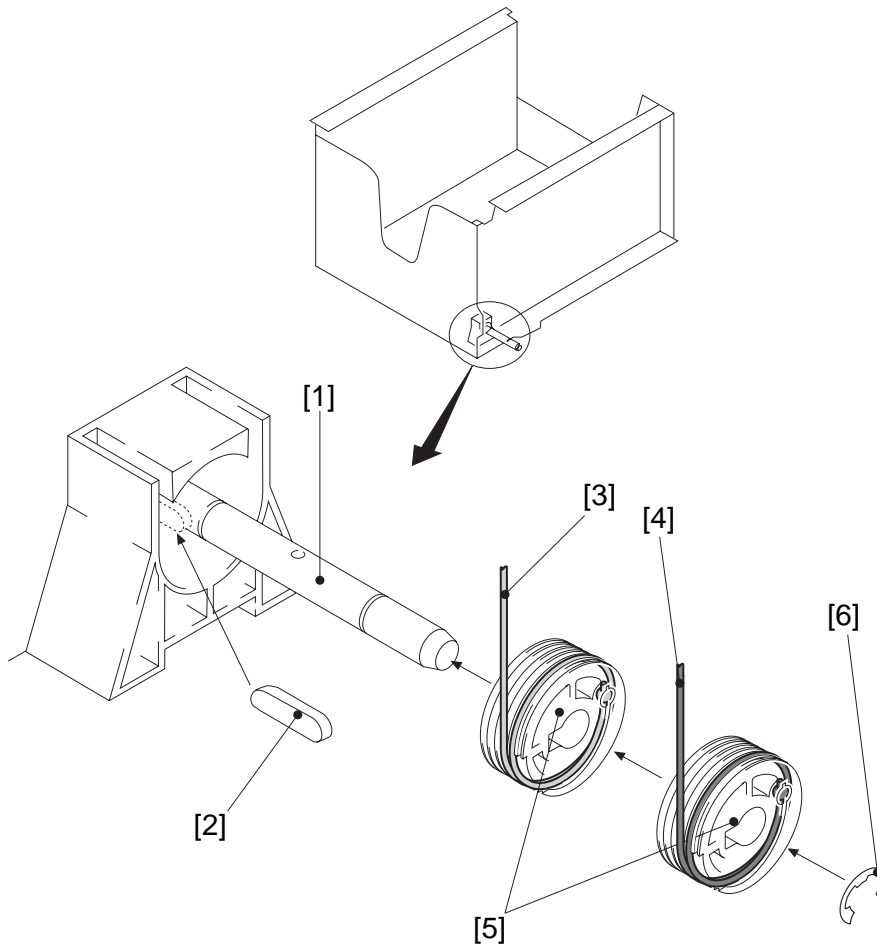
- [1] Axis
 [2] Pulley positioning pin
 [3] Wire 1

- [4] Wire 2
 [5] Pulley
 [6] E stop ring

Figure 3-324

b. Back wire

- 1) Set the pulley positioning pin so that, when looking from the front, the pin is to left of the shaft.
- 2) Insert wire 1 into the second groove from the front and wrap around the pulley one and a half times. Then insert onto the shaft.
- 3) Insert wire 2 into the second groove from the front and wrap around the pulley one and a half times. Then insert onto the shaft.
- 4) Fix the pulley and shaft in place using the E stop ring.



- | | |
|----------------------------|-----------------|
| [1] Axis | [4] Wire 2 |
| [2] Pulley positioning pin | [5] Pulley |
| [3] Wire 1 | [6] E stop ring |

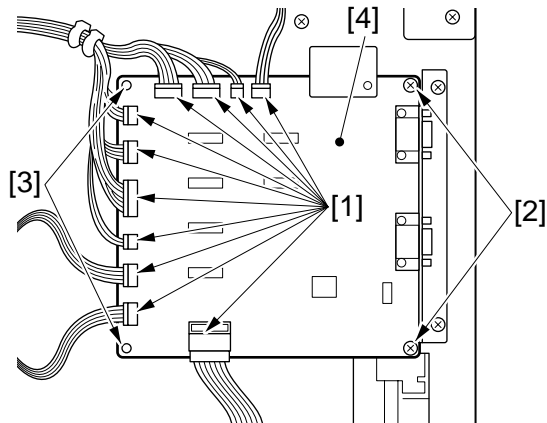
Figure 3-325

IV. PCBs

A. Paper deck driver PCB

1. To remove from the main unit

- 1) Remove the left cover.
- 2) Remove the back cover
- 3) Remove the 11 connectors.
- 4) Remove the 2 screws, next remove the 2 board retaining pins. Then, remove the paper deck driver PCB.



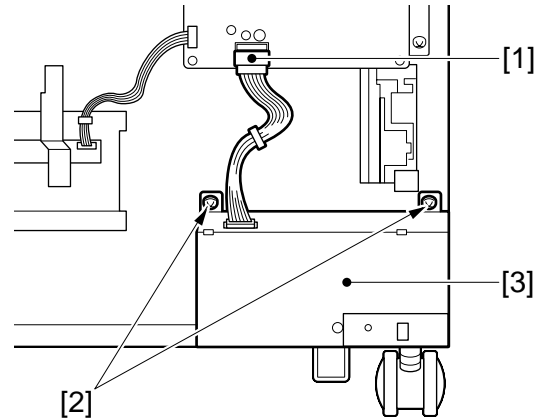
- [1] Connector
- [2] Screw
- [3] Board retaining pin
- [4] Paper deck driver PCB

Figure 3-401

B. Power supply unit

1. To remove from the main unit

- 1) Remove the back cover.
- 2) Remove the connector and 2 screws, then lifting the left side of the power supply unit up a little, remove it.



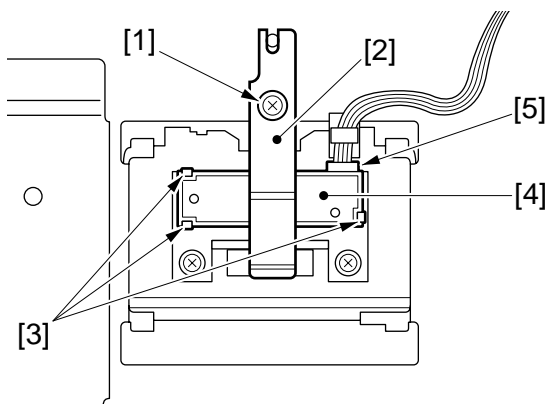
- [1] Connector
- [2] Screw
- [3] Power supply unit

Figure 3-402

C. Paper size detection switch PCB

1. To remove from the main unit

- 1) Remove the back cover.
- 2) Pull the tray out.
- 3) Remove the screw, then remove the board fixing plate.
- 4) Remove the 3 tabs, and after removing the paper size detection switch PCB, remove the connector.



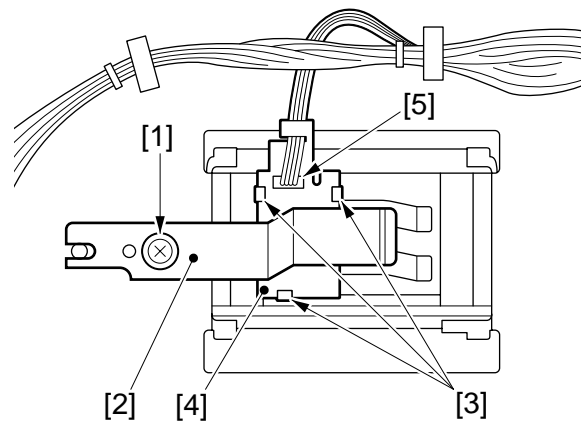
- [1] Screw
- [2] Board fixing plate
- [3] Tab
- [4] Paper size detection switch PCB
- [5] Connector

Figure 3-403

D. Remaining paper detection switch PCB

2. To remove from the main unit

- 1) Remove the back cover.
- 2) Pull the tray out.
- 3) Remove the screw, then remove the board fixing plate.
- 4) Remove the 3 tabs, and after removing the remaining paper detection switch PCB, remove the connector.



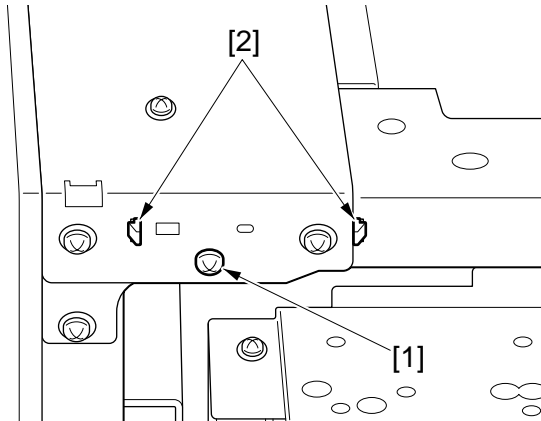
- [1] Screw
- [2] Board fixing plate
- [3] Tab
- [4] Remaining paper detection switch PCB
- [5] Connector

Figure 3-404

E. LED PCB

1. To remove from the main unit

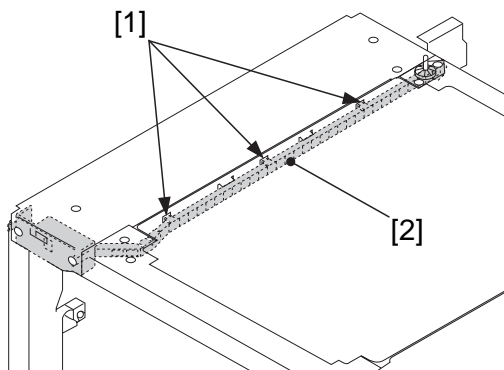
- 1) Remove the back cover and the left cover.
- 2) Pull the tray out.
- 3) Remove the screw and the 2 tabs.



- [1] Screw
- [2] Tab

Figure 3-405

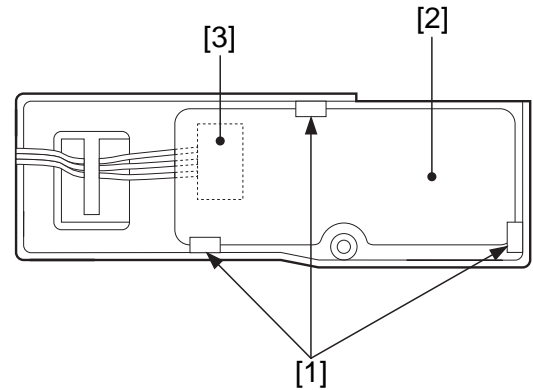
- 4) Remove the 3 tabs, then remove the cable guide assembly.



- [1] Tab
- [2] Cable guide assembly

Figure 3-406

- 5) Remove the 3 tabs, then after removing the LED PCB, remove the connector.



- [1] Tab
- [2] LED PCB
- [3] Connector

Figure 3-407

CHAPTER 4

MAINTENANCE AND INSPECTION

I.	PERIODIC REPLACEMENT PARTS	4-1	III.	PERIODIC SERVICE	4-1
II.	CONSUMABLES REPLACEMENT TARGETS.....	4-1	IV.	PARTS TO BE CLEANED DURING A CUSTOMER SERVICE CALL	4-2

I. PERIODIC REPLACEMENT PARTS

There are no parts in the unit that need to be periodically replaced.

Caution:

Periodic replacement parts are parts that must be replaced periodically to maintain product function to a certain level (even though there is no visible external damage, the loss of function of such parts has a serious effect on overall product performance). Such parts should be replaced at the periodic service closest to when the specified number of sheets has been printed.

II. CONSUMABLES REPLACEMENT TARGETS

These parts may require replacement once or more during the warranty period due to deterioration or damage. The expected life (number of pages) of parts that do not need to be replaced until they fail is indicated below.

As of December, 1998

No.	Name	Part No.	Quantity	Expected life span	Remarks
1	Pick up / Feeding roller, Separation roller	RF5-1834-000	2	350,000 sheets	The feed roller and separation roller must be replaced at the same time.

Table 4-201

Caution:

The information in the table above is only an estimate, and may be revised in the light of empirical data.

III. PERIODIC SERVICE

There are no parts that require periodic service.

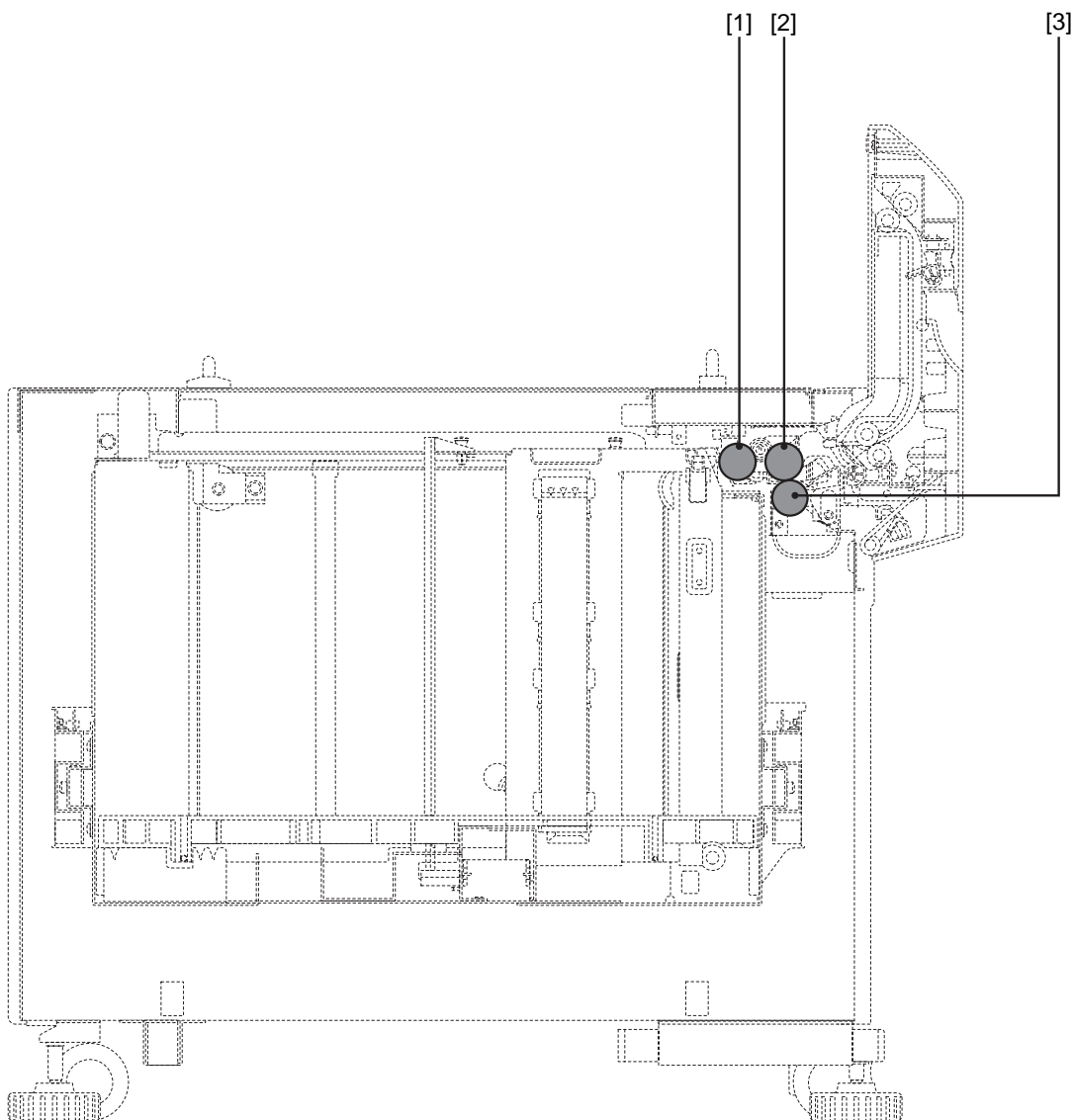
IV. PARTS TO BE CLEANED DURING A CUSTOMER SERVICE CALL

1. Pick up Roller, Separation Roller, Pick up / Feeding Roller

Use lint-free paper or a cloth moistened in alcohol to clean these parts.

Caution:

If you have used alcohol, be sure to let the part dry completely. Otherwise, the part may catch fire when the power is turned on.



- [1] Pick up roller
- [2] Pick up / Feeding roller 1
- [3] Separation roller

Figure 4-401

CHAPTER 5

TROUBLESHOOTING

I.	STANDARDS AND ADJUSTMENTS	5-1	B.	Print PCBs	5-14
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	Solenoids / Motors	5-12			

I. STANDARDS AND ADJUSTMENTS

1. Overview

When the unit malfunctions or a jam occurs, it is possible to check the units status using; [1] the Status LED (LED 301: green and orange display LED) on the LED PCB, and [2] the Service LED (LED 202: red display) on the paper deck driver PCB. Also [3], in combination with the DIP switches (SW201: four DIP switches) on the paper deck driver PCB, you can check the details of breakdowns and errors.

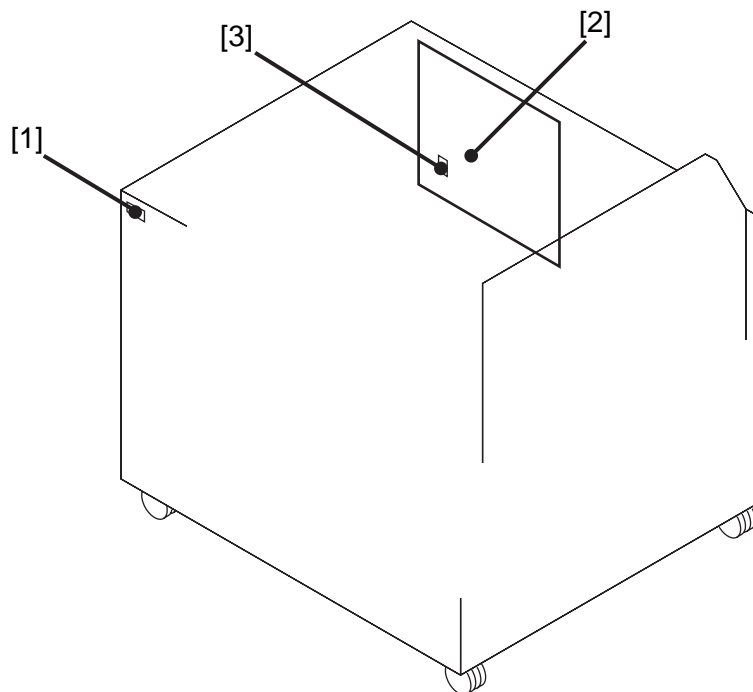


Figure 5-101

2. Operation check by the user

It is possible to check the mechanical condition of the unit by the Status LED (LED 301) display shown below.

- 1) Green light: The copier and printer assembly are communicating normally.
- 2) Orange flashing light: There is a paper jam, the door is open, etc. , it is necessary for the operator to take some action.
- 3) Orange light: There is a malfunction.

Furthermore, the Status LED is only effective when the test switches are in the following conditions (factory settings)

SW201-1 --- OFF, SW201-2 --- OFF, SW201-3 --- OFF, SW201-4 --- OFF

3. Operation check by the service engineer

It is possible to check the mechanical condition of the unit by the test switch combinations and Service LED (LED202) displays.

a. Normal operation

During normal operation the test switches are set as follows:

SW201-1 --- OFF, SW201-2 --- OFF, SW201-3 --- OFF, SW201-4 --- OFF

When the equipment is operating correctly, the Service LED flashes repeatedly ON for 0.5 seconds, then OFF for 0.3 seconds.

When an error occurs, the service LED flashes in the cycle shown below: header (1.0 sec on, 0.2 sec off), detected error details (0.3 sec on, 0.2 sec off) and pause (2.0 sec off).

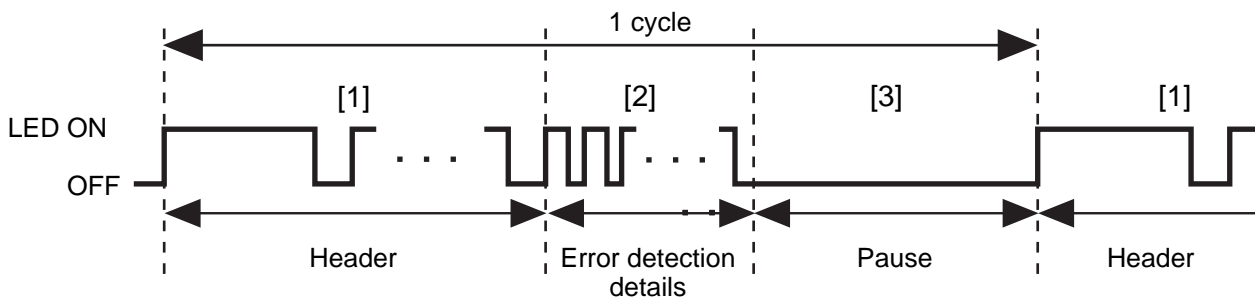


Figure 5-102

Use the information in Table 5-101 to identify errors based on service LED lighting status. For example, [1] when the service LED flashes three times in the header section, and [2] once in the error detection section, a lifter malfunction has occurred.

Header	Detection details	Error description
3	1	Lifter malfunction
2	1	Registration sensor delay jam
2	2	Registration sensor initial jam
2	3	Jam sensor delay jam
2	4	Jam sensor stationary jam, or initial jam
1	1	Feeder assembly open
1	2	Tray open, indefinite paper size
1	3	No paper

Table 5-101

b. Sensor check

To enter the sensor check mode, set the DIP switches to the following settings: SW201-1 --- OFF, SW201-2 --- OFF, SW201-3 --- ON, SW201-4 --- ON; then turn on the power.

When in sensor check mode, it is possible to check the status of the sensors and switches (11 in total) listed below:

Registration paper sensor (PS1)

Jam sensor (PS2)

Empty tray sensor (PS3)

Paper surface sensor (PS4)

Door sensor (PS5)

Remaining paper detection switch 1 and 2 (SW601, SW602)

Paper size detection switch 1, 2, 3 and 4 (SW701, SW702, SW703, SW704)

The checking procedure is explained below.

- 1) Turn the printer power supply OFF.
 - 2) Set DIP SW201 as follows.
SW201-1 --- OFF, SW201-2 --- OFF, SW201-3 --- ON, SW201-4 --- ON
 - 3) Select one of the 3 following methods, depending on the sensor to be checked.
 - a. To check the registration paper sensor (PS1), jam sensor (PS2), door sensor (PS5) ...open the feed cover and turn the power supply ON.
 - b. To check the empty tray sensor (PS3) and paper surface sensor (PS4) ... remove the right cover and turn the power supply ON.
 - c. To check remaining paper detection switches 1 and 2 (SW601, SW602) and paper size sensor switches 1, 2, 3 and 4 (SW701, SW702, SW703, SW704) ... remove the back cover, and after removing the print circuit boards fixing plate, turn the power supply ON.
 - 4) Move the sensor lever, or switch, of the sensor to be checked, and check if the LED lights up, or not.
At this time, if 2 or more sensor levers are moved at the same time, it is not possible to determine which is faulty, therefore move one at a time. Also, do not touch the switches with your hands.
 - 5) If the LED does not light up, the sensor or switch of that LED is faulty.
- c. Motor test
- When the test switches are set as below, and the power is turned ON, the motor test begins.
SW201-1 --- ON, SW201-2 --- ON, SW201-3 --- ON, SW201-4 --- OFF
- Once the motor test starts, all motors, clutches and solenoids are forced ON. When the power is turned OFF the motor test finishes.
- Before carrying out a motor test, open the feed assembly, and be sure to pull the tray out.
- By listening to the sound of the motor and checking whether the rollers are rotating, it is possible to judge whether the motors are operating normally, or not. To judge if the clutches are operating normally, check if feed roller 2 is rotating. And lastly, to judge if the solenoids are operating normally, push the Pick up roller paper feed arm and check if the Pick up roller moves up and down.

d. Test paper feed

When the test switches are set as below, and the power is turned ON, the test paper feed begins.

SW201-1 --- ON, SW201-2 --- OFF, SW201-3 --- ON, SW201-4 --- OFF

Once the paper feed begins, the test will continue as long as there is paper available.

When SW201-1 is turned OFF, the paper feed mode is cancelled and the test paper feed is discontinued. However, if SW201-1 is turned ON again while the equipment remains in this state, the test paper feed will resume.

Caution:

1. Even if the unit is in the test paper pickup mode, and the paper pickup operation takes place, because the printer assembly's main unit is not in operation, a jam will occur if paper is picked-up/fed into the printer assembly. Therefore, when putting in the test mode while the unit is installed in the printer assembly, put only one sheet of paper in the tray because when multiple sheets of paper are inserted, the paper will be continuously picked-up inside the printer until the paper runs out, and cause one jam after another.
2. After each of the tests has been completed, be certain to turn all the switches OFF.
3. Basically, the motor tests cannot take place unless the tray is pulled out. However, even if the tray is not pulled out, when the paper size sensor PCB connector is loose, or the PCB itself gets damaged, etc., it is judged there is no tray, and a motor test begins. At this time, if the tray is still in, there is a danger of broken wires, etc., Therefore be certain to pull the tray out before carrying out a motor test.

II. TROUBLESHOOTING

1 No power

Cause/Location of error	Procedure	Check item	Result	Measure
Poor interface connector contact	1	Is the power on signal input?	NO	Reconnect the interface connector correctly.
Blown power assembly fuse	2	Turn off the power switch and wait two minutes before turning it on again. Does the unit operate normally now?	NO	Remove the power supply unit, and replace the fuse which has blown.
Triggered over-current / over-voltage detection circuit			YES	Disconnect the power supply connector and connect it again. If this does not help, correct the cause that triggered the overcurrent / over-voltage detection circuits in the power supply assembly and turn on the power again.
Defective power assembly	3	Turn the printer assembly power OFF and remove connector J901 from the paper deck driver driver PCB. Then, turn ON the printer assembly power supply switch and check whether the prescribed DC power supply value is output.	NO	Replace the power supply unit
Wiring, DC load, paper deck driver PCB			YES	Check the wiring and DC load ahead of the paper deck driver PCB. If the wiring and the DC load are OK, replace the paper deck driver PCB.

2 Feed motor malfunction

Cause/Location of error	Procedure	Check item	Result	Measure
Faulty contact of the feed motor drive signal line connector	1	Are the feed motor connector J315 and the paper deck driver PCB connector J207 properly connected?	NO	Reconnect the connectors correctly.
Defective feed motor	2	Is the problem solved if the feed motor is replaced?	YES	Replace the feed motor.
Paper deck driver PCB	3	Is the problem solved if the paper deck driver PCB is replaced?	YES	Replace the paper deck driver PCB.

3 Lifter malfunction

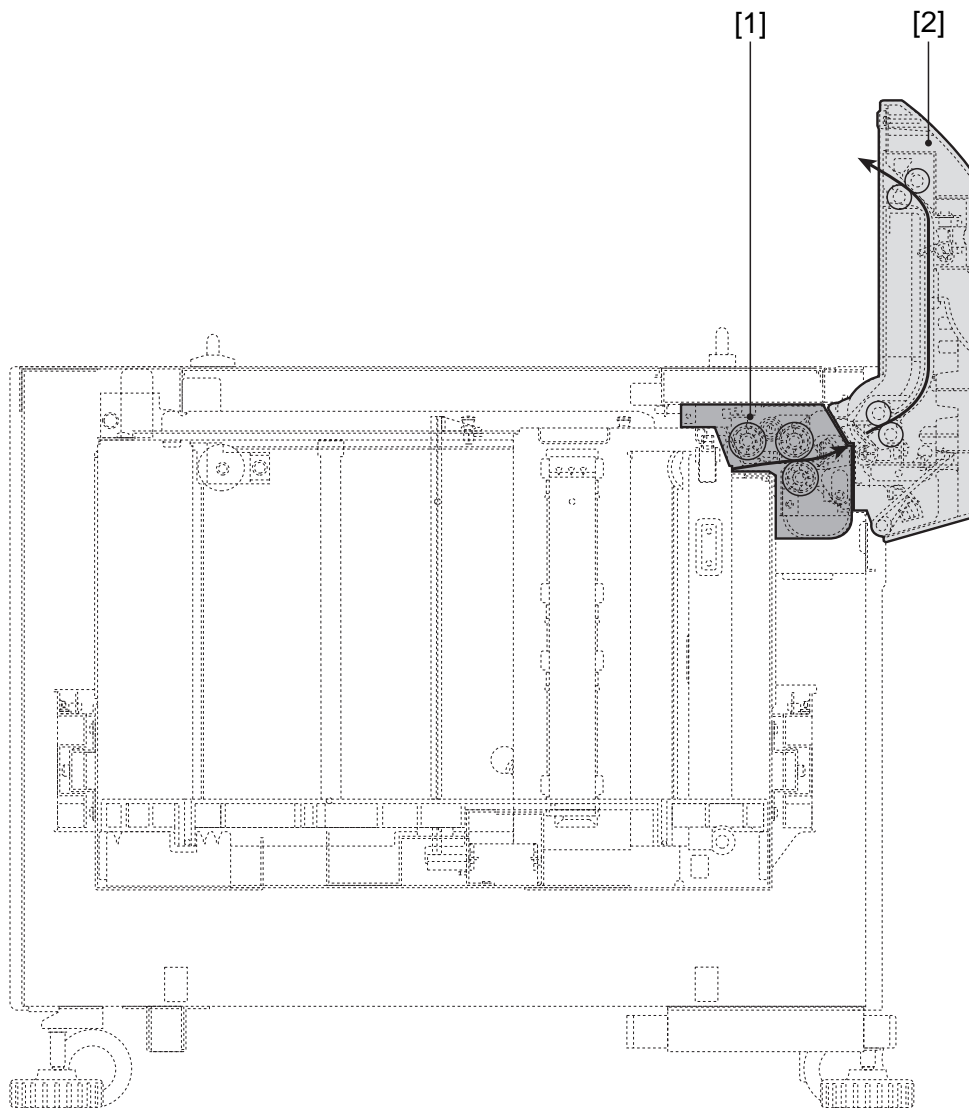
Cause/Location of error	Procedure	Check item	Result	Measure
Broken wire	1	Is the wire strung correctly?	NO	Restrung the wire.
Paper surface sensor lever damage	2	Is the paper surface sensor damaged?	YES	Replace the paper surface sensor.
Gear	3	Is part of the gear damaged?	YES	Replace the damaged part.
Faulty contact of the paper surface jam sensor signal line connector	4	Are the paper surface sensor connector J313, relay connectors J311, J307 and the paper deck driver PCB connector J212 all properly connected?	NO	Reconnect correctly.
Faulty contact of the lifter motor drive signal line connector	5	Is the paper deck driver PCB connector J206 properly connected?	NO	Reconnect correctly.
Faulty paper surface sensor	6	Perform the sensor check described on P. 5-3. Does the sensor work normally?	NO	Replace the paper surface sensor.
Faulty lifter motor	7	Is the problem solved if the lifter motor is replaced?	YES	Replace the lifter motor.
Faulty paper deck driver PCB	8	Is the problem solved if the paper deck driver PCB is replaced?	YES	Replace the paper deck driver PCB.

III. TROUBLESHOOTING FOR DEFECTIVE FEED

A. Paper jam

When a paper jam occurs inside the unit, the following measures should be carried out.

The feed path can roughly be divided into [1] the paper pickup assembly and [2] the feeder assembly. By looking at the block where the paper is jammed, it is possible to pinpoint the location of the fault.



- [1] Paper pickup assembly
- [2] Feeder assembly

Figure 5-301

1	Paper pickup assembly
----------	------------------------------

Cause/Location of error	Procedure	Check item	Result	Measure
Spring	1	Is the spring which pulls the roller normal?	NO	If the spring is not attached correctly, reattach correctly. If the spring is misshapen or damaged, replace it.
Pick up roller, Pick up / feeding roller, separation roller	2	Is the Pick up roller, Pick up / feeding roller, or separation roller worn down, misshapen or dirty?	YES	In the case of the roller being worn down or misshapen, replace it. Note that Pick up / feeding roller and the separation roller are replaced at the same time. If dirty, clean the roller.
Faulty contact of the paper pickup motor drive signal line connector	3	Are the paper pickup motor connector J305 and connector J211 on the paper deck driver PCB properly connected?	NO	Reconnect correctly.
Faulty contact of the paper pickup solenoid drive signal line connector	4	Are the paper pickup solenoid connector J306 and connector J211 on the paper deck driver PCB properly connected?	NO	Reconnect correctly.
Faulty paper pickup motor	5	Is the problem solved if the paper pickup motor is replaced?	YES	Replace the paper pickup motor.
Faulty paper pickup solenoid	6	Remove the paper pickup solenoid connector J306. Measure the resistance between connectors J306-1 and J306-2 on the cable side. Is it roughly 190 ?	NO	Replace the paper pickup solenoid.
Paper deck driver PCB	7	Is the problem solved if the paper deck driver PCB is replaced?	YES	Replace the paper deck driver PCB.

2 Feeder assembly

Cause/Location of error	Procedure	Check item	Result	Measure
Feed guide	1	Is the feed guide dirty, damaged or misshapen?	YES	If the feed guide is misshapen or damaged, replace it. If dirty, clean it.
Registration roller, feed roller 2	2	Is the registration roller or feed roller 2 worn down, misshapen or dirty?	YES	If the rollers are worn down or misshapen replace them. If dirty, clean them.
Registration paper sensor lever	3	Is the registration paper sensor lever damaged?	YES	If damaged, replace it.
Jam sensor lever	4	Is the jam sensor lever damaged?	YES	If damaged, replace it.
Faulty contact of the registration clutch drive signal line connector	5	Are the registration clutch connector J303 and connector J208 on the paper deck driver PCB properly connected?	NO	Reconnect correctly.
Faulty contact of the registration paper sensor signal line connector	6	Are the registration paper sensor connector J309, the relay connectors J308, J304, and the paper deck driver PCB connector J209 all properly connected?	NO	Reconnect correctly.
Faulty contact of the jam sensor signal line connector	7	Are the jam sensor connector J310, the relay connectors J308, J304, and the paper deck driver PCB connector J209 properly connected?	NO	Reconnect correctly.
Registration paper sensor	8	Carry out the sensor check explained on P.5-3. Is the sensor operating normally?	NO	Replace the registration paper sensor.
Jam sensor	9	Carry out the sensor check explained on P.5-3. Is the sensor operating normally?	NO	Replace the jam sensor.
Faulty registration clutch	10	Remove the registration clutch connector J303. Measure the resistance between connectors J303-1 and J306-2 on the cable side. Is it roughly 210 ?	NO	Replace the registration clutch.
Paper deck driver PCB	11	Is the problem solved if the paper deck driver PCB is replaced?	YES	Replace the paper deck driver PCB.

B. Incomplete feeding

1 Double feeding

Cause/Location of error	Procedure	Check item	Result	Measure
Separation roller	1	Is the separation roller worn down / misshapen?	YES	Replace the separation roller.
Spring	2	Is the spring which pulls the separation roller normal?	NO	If the spring is misshapen replace it. If it has moved out of position, position it correctly.

2 Wrinkling

Cause/Location of error	Procedure	Check item	Result	Measure
Roller	1	Check each roller in the paper pick-up assembly and feeder assembly. Are the rollers worn down or misshapen?	YES	If the rollers are misshapen or worn down, replace them.

3 Leading edge folded back

Cause/Location of error	Procedure	Check item	Result	Measure
Feed guide	1	Check the paper feed path. Are the feed guides damaged / misshapen?	YES	Replace the feed guide which are damaged or misshapen.

4 Skew feeding

Cause/Location of error	Procedure	Check item	Result	Measure
Feed path	1	Have any dirt or paper particles collected along the feed path?	YES	Clean the dirty area.
Rollers	2	Are the paper pickup assembly or feed assembly rollers damaged or misshapen?	YES	If damaged or misshapen, replace the rollers.

IV. LAYOUT OF ELECTRICAL PARTS

A. Switches / Sensors / Clutches / Solenoids / Motors

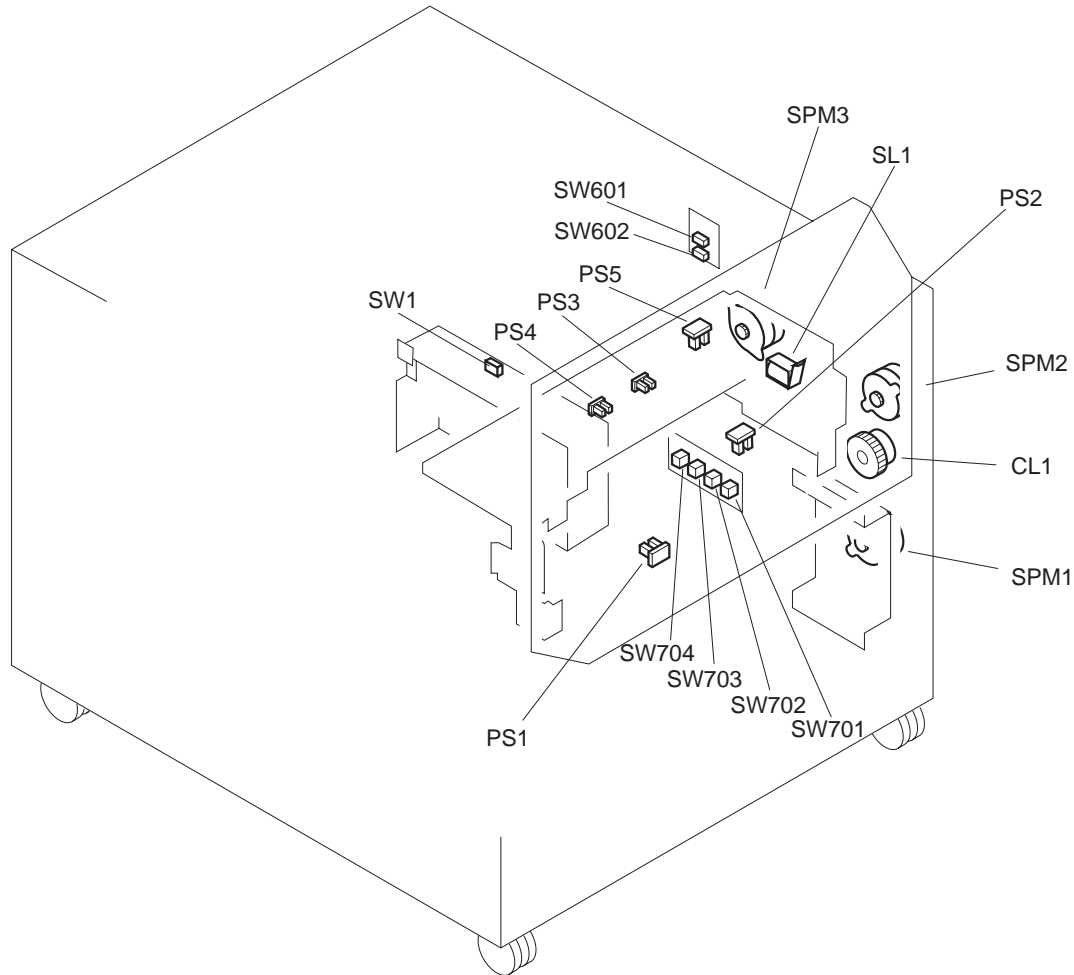


Figure 5-401






Symbol	Symbol name	Designation	Name
	Switches	SW601	Remaining paper detection switch
		SW602	Remaining paper detection switch
		SW701	Paper size detection switch
		SW702	Paper size detection switch
		SW703	Paper size detection switch
		SW704	Paper size detection switch
		SW1	Stand alone mode switch
	Photo-interrupters	PS1	Registration paper sensor
		PS2	Jam sensor
		PS3	Empty tray sensor
		PS4	Paper surface sensor
		PS5	Door sensor
	Clutch	CL1	Registration clutch
	Solenoid	SL1	Paper pickup solenoid
	Motors	SPM1	Lifter motor
		SPM2	Feed motor
		SPM3	Paper pickup motor

Table 5-401

B. Print PCBs

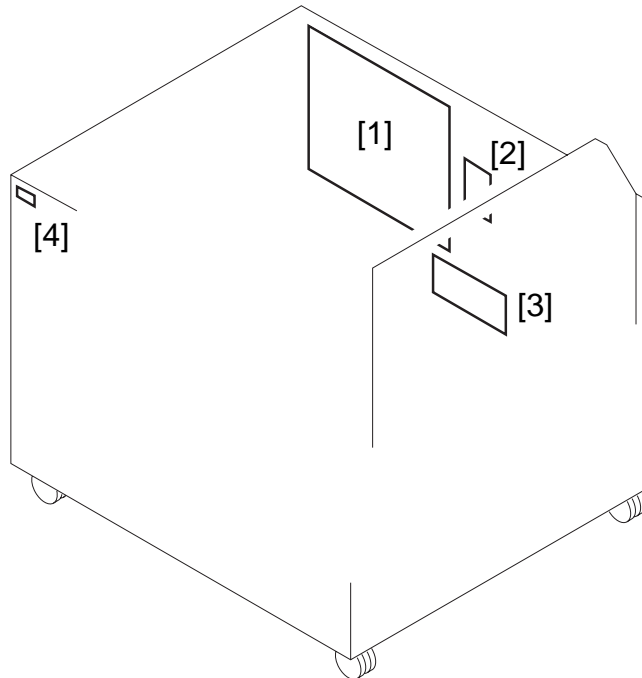


Figure 5-402

Number	Name	Function
[1]	Paper deck driver PCB	Load control and detection.
[2]	Remaining paper switch PCB	Detects the remaining paper.
[3]	Paper size sensor switch PCB	Detects the paper size.
[4]	LED PCB	Displays the mechanical status.

Table: 5-402

C. Connectors

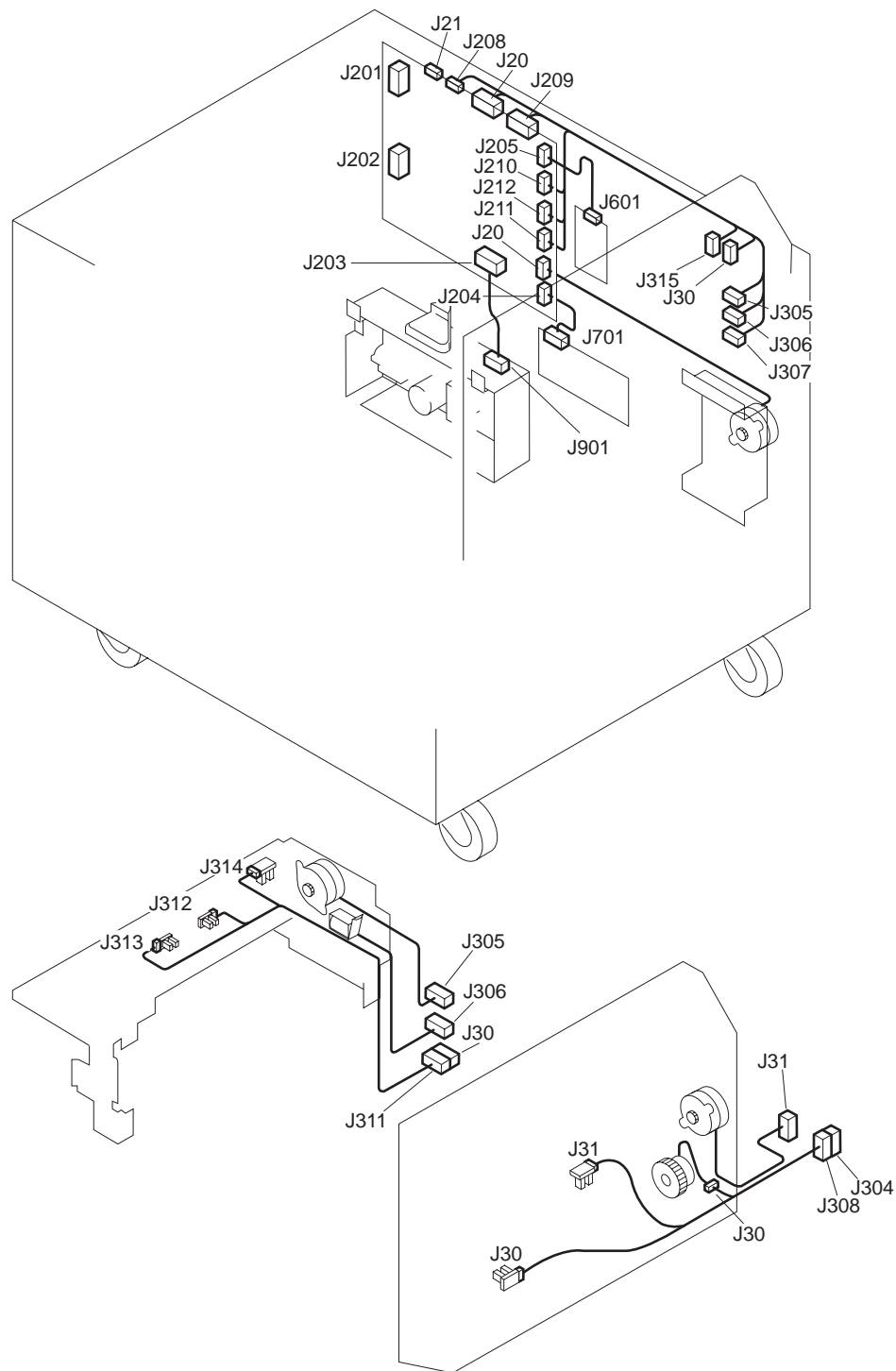


Figure 5-403

V. VARIABLE RESISTORS, LED, CHECK PIN TABLES

Only the LED and check pins which are necessary when servicing the equipment in the field are listed in this section.

Caution:

The check pins which do not appear in the table are specialized factory pins and are used for adjusting and checking the equipment. In order to use these pins, specialized tools and measuring equipment are required, as well as an extremely high degree of adjustment accuracy. Therefore, do not touch these when the servicing the machine in the field.

Caution:

Even when operating normally, there is some degree of leak current from some LEDs. This causes a faint light to be emitted even when the lights have been turned off. Take care not to misidentify this phenomenon.

A. Paper deck driver PCB

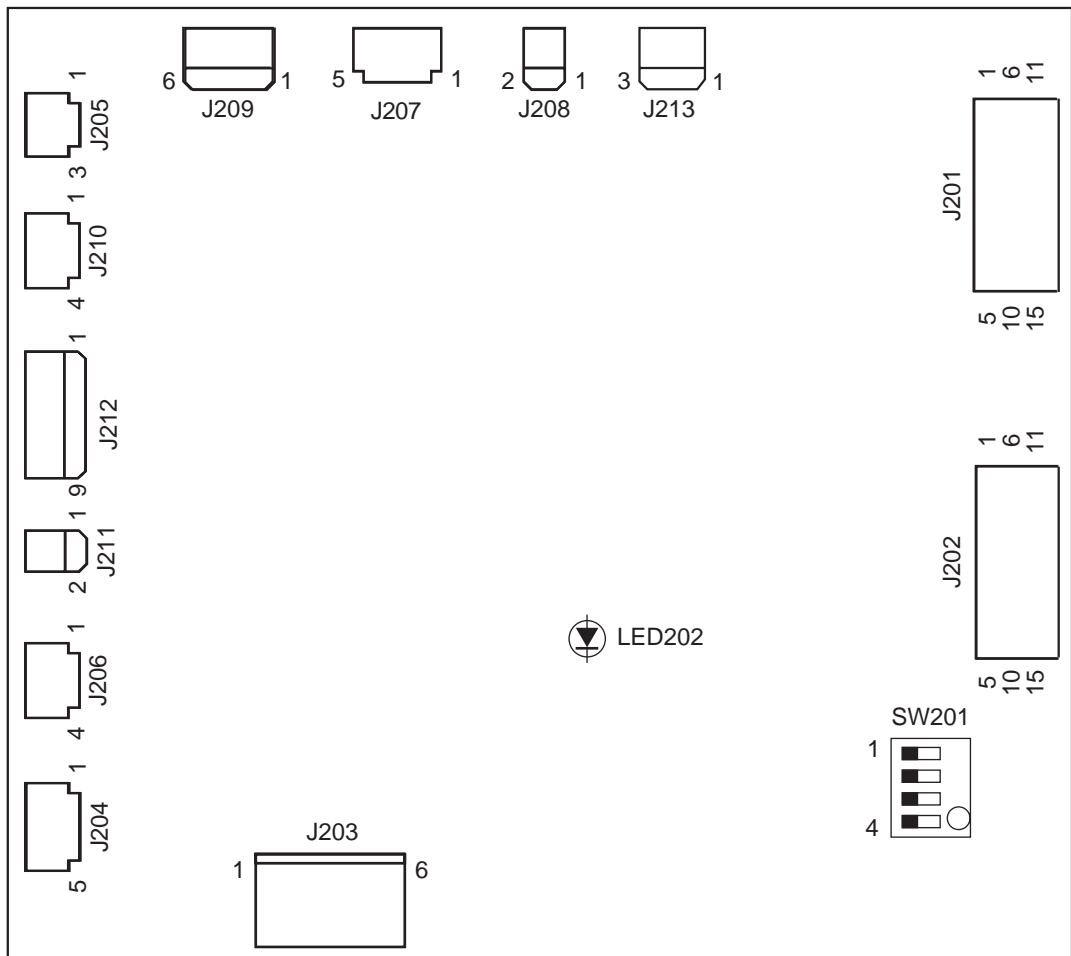


Figure 5-501

Name	Function
SW 201	Switches for checking operation (Refer to page 5-1 and after)
LED202	Inspection LED for service engineers use.

Table 5-501

B. Paper supply sensor switch PCB

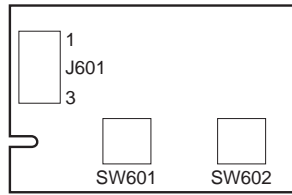


Figure 5-502

SW No.	Function
SW601	Remaining paper detection switch (Refer to the tables 2-201, 202 on page 2-4)
SW602	

Table 5-502

C. Paper size sensor switch PCB

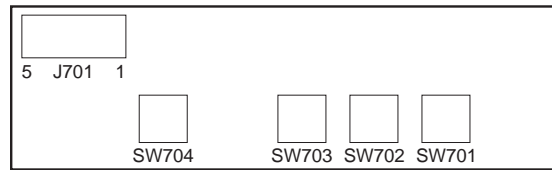


Figure 5-503

SW No.	Function
SW701	Paper size sensor switch (Refer to the tables 2-201, 202 on page 2-4)
SW702	
SW703	
SW704	

Table 5-503

D. User LED PCB

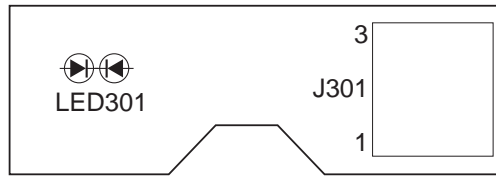


Figure 5-504

LED No.	Function
LED301	Status display LED

Table 5-504

APPENDIX

A.	SIGNAL NAMES AND CODE TABLE.....A-1	C.	SPECIAL TOOLS.....A-5
B.	GENERAL CIRCUIT DIAGRAMA-3	D.	TABLE OF SOLVENTS AND OILS.....A-5

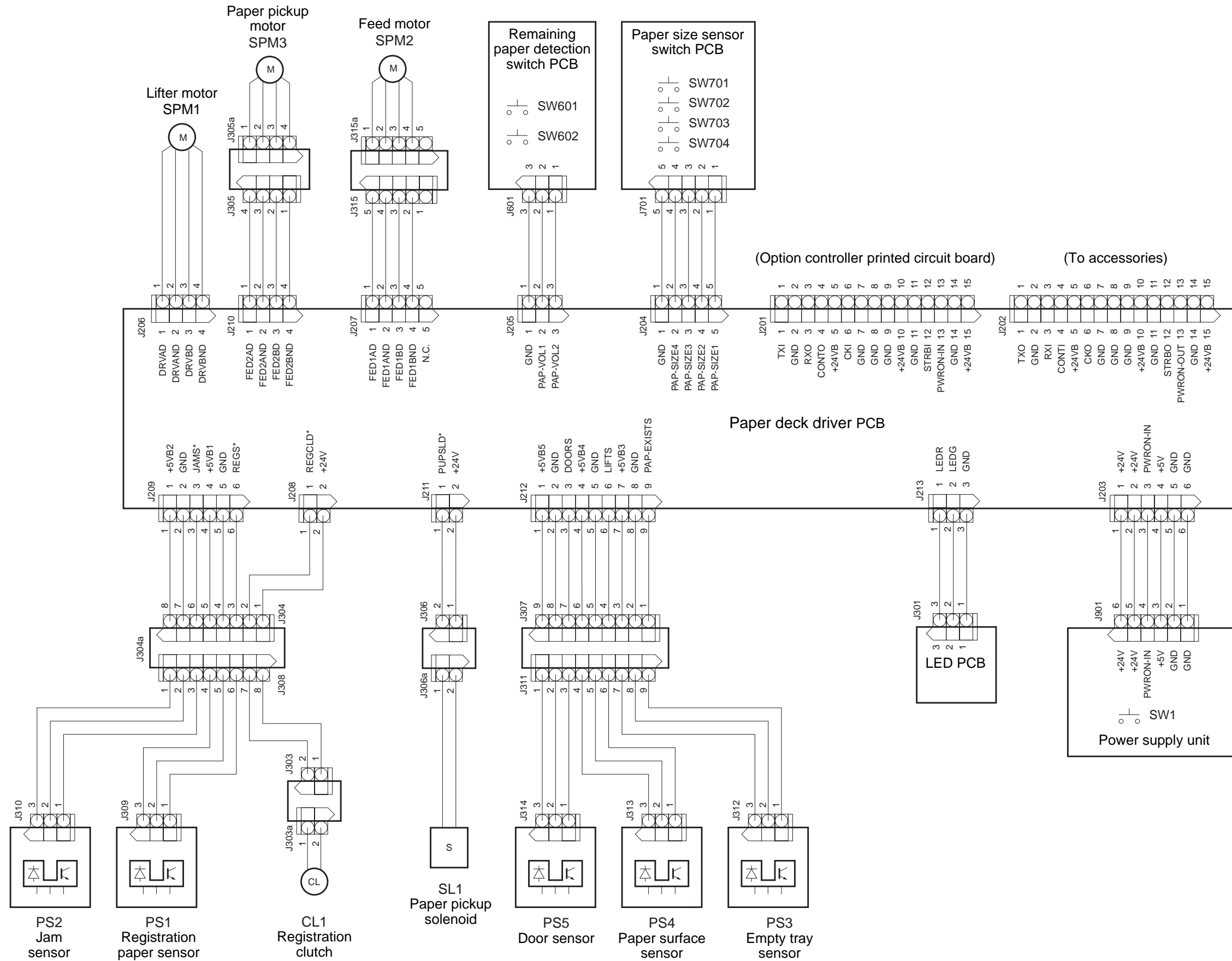
A. SIGNAL NAMES AND CODE TABLE

Input and Output signals to the paper deck drive PCB

Connector	Pin	Code	I/O	Signal Name
J201	1	TXI	Input	Serial input signal
	2	GND		
	3	RXO	Output	Serial output signal
	4	CONTO	Output	Communication ready signal
	5	+24V		
	6	CKI	Input	Synch clock signal
	7	GND		
	8	GND		
	9	GND		
	10	+24V		
	11	GND		
	12	STRBI	Input	Strobe signal
	13	PWRON-IN	Input	Power ON signal
	14	GND		
	15	+24V		
J202	1	TXO	Output	Serial output signal
	2	GND		
	3	RXI	Input	Serial input signal
	4	CONTI	Input	Communication ready signal
	5	+24V		
	6	CKO	Input	Synch clock signal
	7	GND		
	8	GND		
	9	GND		
	10	+24V		
	11	GND		
	12	STRBO	Output	Strobe signal
	13	PWRON-OUT	Output	Power ON signal
	14	GND		
	15	+24V		
J203	1	+24V	Input	Power ON signal
	2	+24V	Input	
	3	PWRON-IN	Output	
	4	+5V	Input	
	5	GND		
	6	GND		

Connector	Pin	Code	I/O	Signal Name
J204	1	GND		
	2	PAP-SIZE4	Input	Paper size jam detection signal
	3	PAP-SIZE3	Input	Paper size jam detection signal
	4	PAP-SIZE2	Input	Paper size jam detection signal
	5	PAP-SIZE1	Input	Paper size jam detection signal
	6	GND		
J205	1	GND		
	2	PAP-VOL1	Input	Remaining paper detection signal
	3	PAP-VOL2	Input	Remaining paper detection signal
J206	1	DRVAD	Output	Lifter motor rotation control signal
	2	DRVAND	Output	Lifter motor rotation control signal
	3	DRVBD	Output	Lifter motor rotation control signal
	4	DRVBND	Output	Lifter motor rotation control signal
J207	1	FED1AD	Output	Feed motor rotation control signal
	2	FED1AND	Output	Feed motor rotation control signal
	3	FED1BD	Output	Feed motor rotation control signal
	4	FED1BND	Output	Feed motor rotation control signal
J208	1	REGCLD*	Output	Registration clutch drive signal
	2	+24V	Output	
J209	1	+5VB2	Output	
	2	GND		
	3	JAMS*	Input	Jam detection signal
	4	+5VB1	Output	
	5	GND		
	6	REGS*	Input	Registration paper jam detection signal
J211	1	PUPSLD*	Output	Paper pickup solenoid drive signal
	2	+24V	Output	
J212	1	+5VB5		
	2	GND		
	3	DOORS		Feeder assembly open jam detection signal
	4	+5VB4		
	5	GND		
	6	LIFTS		Paper surface jam detection signal
	7	+5VB3		
	8	GND		
	9	PAP-EXISTS		Empty tray jam detection signal
J213	1	LED R	Output	Red LED signal
	2	LED G	Output	Green LED signal
	3	GND		

B. GENERAL CIRCUIT DIAGRAM



C. SPECIAL TOOLS

In addition to the standard tools there are no special tools required for servicing the unit.

D. TABLE OF SOLVENTS AND OILS

No.	Name	Application	Chemical composition	Remarks
1	Alcohol solution C-17	Cleaning Ex. plastics rubber exterior covers	Fluorine hydrocarbons Alcohol Surface active agent Water	<ul style="list-style-type: none"> • Keep away from naked flame • Procure locally • Alternative products: C1, IPA (Isopropyl alcohol)
2	Lubricating oil	Apply between the gear and shaft	Petroleum jelly	<ul style="list-style-type: none"> • Developer Oil 68 • Tool number: CK-8003
3	Lubricating solvent	Apply to the gear Not for moulded assembly application.	Lithium grease	<ul style="list-style-type: none"> • Permalube SHV-2 • Tool number: CK-8005

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