

# **SORTER S-82**

## **SERVICE MANUAL**

**REVISION 0**

**Canon**

**JAN. 1999**

**RY8-1393-000**

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Use of this manual should be strictly supervised to avoid disclosure of confidential information.
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## **PREFACE**

This Service Manual contains basic information required for after-sales service of the SORTER S-82.

This information is vital to the service technician in maintaining the high print quality and performance of the SORTER S-82.

This manual consists of following chapters:

Chapter 1: Product information

Features, specifications, parts of the sorter, and installation

Chapter 2: Operation and Timing

A description of the operating principles and timing sequences of the electrical and mechanical systems.

Chapter 3: The Mechanical System

Explanation of mechanical operation, disassembly, reassembly, and adjustment procedures

Chapter 4: Troubleshooting

Maintenance and servicing, reference values and adjustments, troubleshooting procedures, lubricants, and solvents

Appendix: General circuit diagram, list of signals

Information in this manual is subject to change as the product is improved or redesigned.

All relevant information in such cases will be supplied in Service Information Bulletins.

A thorough understanding of this printer, based on information in this Manual and Service Information Bulletins, is required for maintaining its performance and for locating and repairing the causes of malfunctions.

**DTP system**

This manual was produced on an Apple PowerMacintosh 9500/200 personal computer and output by an Apple LaserWriter 16/600 PS laser beam printer; final pages were printed on AGFA Selectset avantra 25.

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# **CHAPTER 1**

## **PRODUCT INFORMATION**

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## **I. FEATURES**

This sorter is operated in the following 4 modes in response to the command sent from the printer.

### **1. Mail Box**

The 7 face-down bins are respectively allocated to each user.

### **2. Job Separation**

Face-down bins can be changed so that the printed paper can be sorted according to jobs.

### **3. Stacker**

Printed paper is loaded into bins in succession from the lowest one.

### **4. Sorting**

When a document comprising multiple sheets is printed multiple times, the face-down bins are changed over for each document.

**II. SPECIFICATIONS**

- |                             |   |
|-----------------------------|---|
| 1) Paper delivery method    |   |
| Face-up                     | with 1 bin fixed (removable, printer tray is used)  |
| Face-down                   | with 7 bins fixed   |
| 2) Loading method           |   |
| Face-down                   | Mail box, job separation, stacker, sorting  |
| Face-up                     | Simple loading  |
| 3) Printing paper types     |   |
| Face-down                   | Plain paper, colored paper, and thick paper   |
| Face-up                     | Plain paper, colored paper, thick paper, label paper, OHP film, and envelope  |
| 4) Paper size               |   |
| Face-down                   | A3, B4, A4, Ledger, Legal, and Letter sized plain paper (60g/m <sup>2</sup> to 105g/m <sup>2</sup> recommended paper).  |
| Face-up                     | A3, B4, A4, A4-R, Ledger, Legal, Letter, Letter-R, B5-R, A5-R, executive sized plain paper (60g/m <sup>2</sup> to 199g/m <sup>2</sup> recommended paper), 98.4mm (W) x 190.5mm(L) (min.) to 304.8mm(W) x 469.9mm(L) (max.) sized plain paper (60g/m <sup>2</sup> to 199g/m <sup>2</sup> recommended paper), Monarch, COM-10, DL, B5, C5, Western standard No.4 and 98.4mm x 190.5mm (min.) to 176mm x 250mm (max.) sized envelopes. |
| 5) Capacity                 | Face-up bin: Approx. 100 sheets of 75g paper can be loaded.<br>Face-down bin: Approx. 120 sheets of 75g paper can be loaded.  |
| 6) Max. power consumption   | About 28W or below<br>(at room temperature of 20C, rated power voltage input)   |
| 7) Dimensions <b>(Note)</b> | 520(W) x 470(D) x 530(H) mm   |
| 8) Weight                   | About 14kg  |
| 9) Line voltage             | 100-127V (50/60Hz)<br>200-240V (50/60Hz)  |

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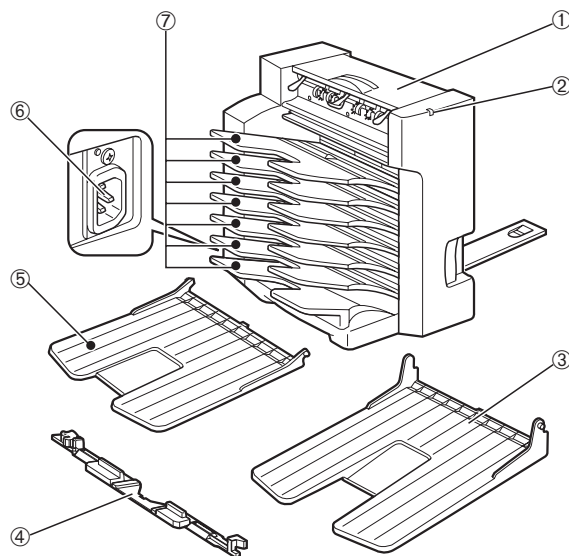
**Note:** Base unit width (excluding the tray) is 290mm.

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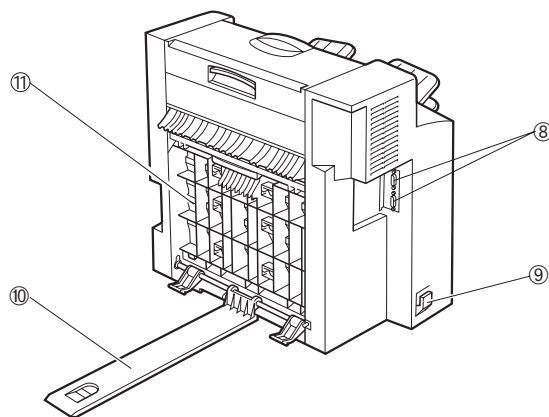
Specifications are subject to change with product modification.

### III. PARTS OF THE SORTER

#### A. External Views



**Figure 1-3-1**

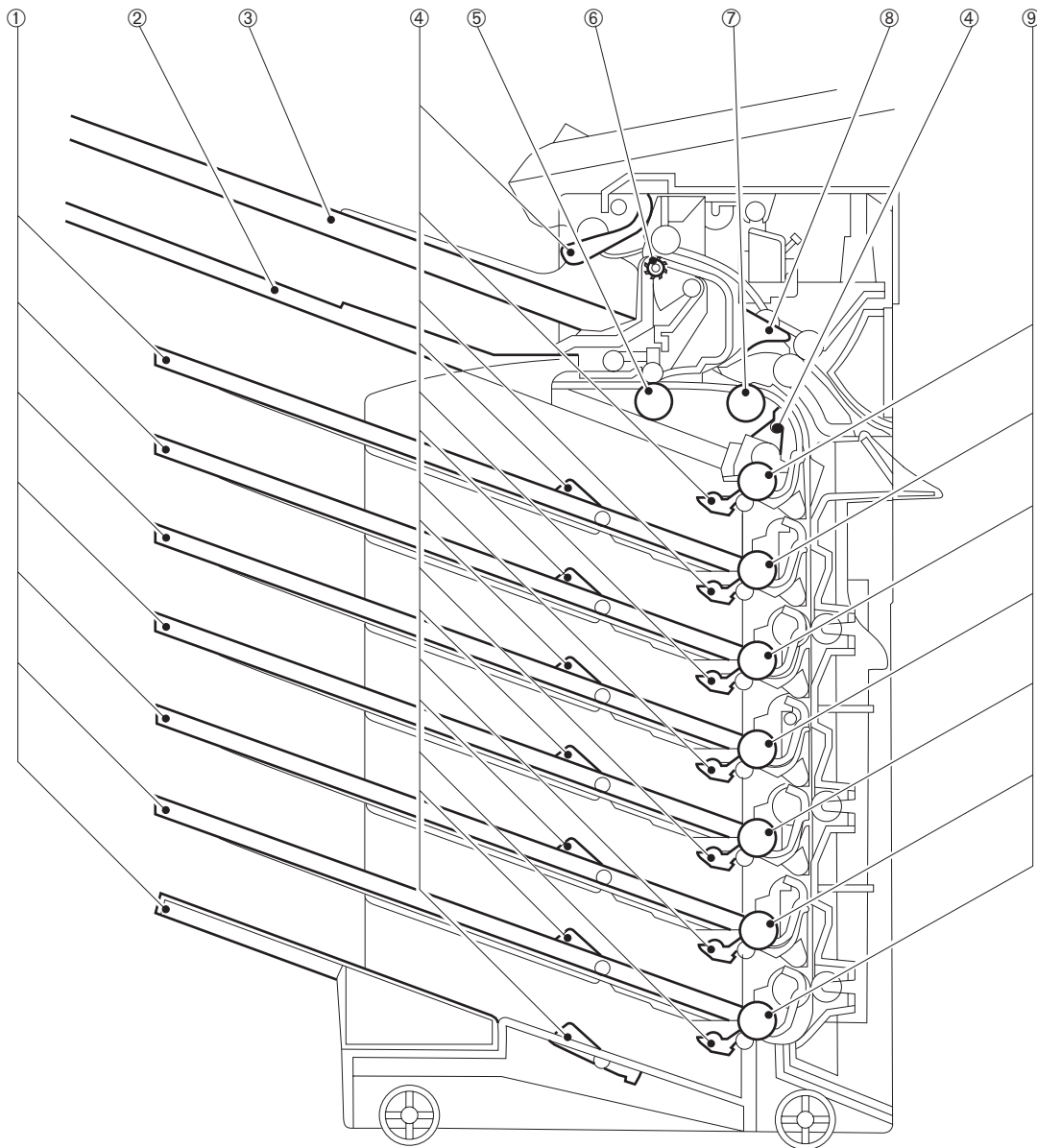


**Figure 1-3-2**

- 1: Top cover unit
- 2: Status LED
- 3: Face-up tray (printer FU tray)
- 4: Sorter adapter plate
- 5: Reversing tray
- 6: Power receptacle
- 7: Face-down bin

- 8: Interface connector
- 9: Cable holder
- 10: Guide rail
- 11: Right cover

### B. Cross Sectional View



**Figure 1-3-3**

- 1: Face-down bin
- 2: Reversing tray
- 3: Face-up tray (printer FU tray)
- 4: Sensor lever
- 5: Reversing roller
- 6: Face-up delivery roller
- 7: Feed roller
- 8: Face-up deflector
- 9: Face-down delivery roller

## **IV. INSTALLATION**

### **A. Cautions for Installation**

Use the power source which meets the following requirements:

AC: Rated voltage -10% to +6%

Power frequency: 50/60Hz  $\pm$ 2Hz

### **B. Installation Space**

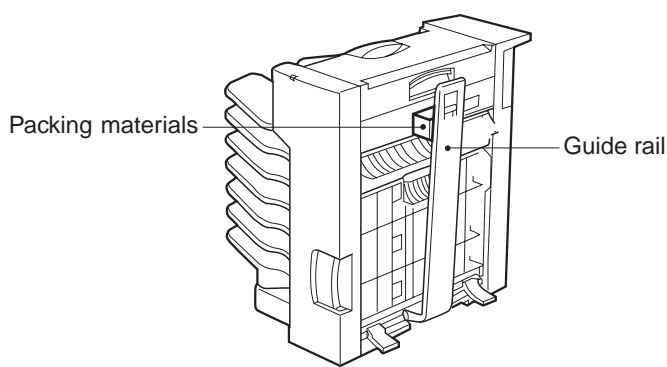
Refer to the Service Manual of the printer.

### C. Unpacking and Installation Procedure

Condensation will form on surfaces when brought into a warm room from the cold. Condensation on the surfaces of the sorter can cause feeding failures. Therefore, when moving the sorter to a warm environment, leave it packed in its box for at least an hour to acclimatize to room temperature.

#### 1. Unpacking the Sorter

- 1) Open the sorter packaging.
- 2) Take out the accessories. Confirm that the power cord, reversing tray, sorter adapter plate and interface cable are included.
- 3) Remove the sorter from the box and stand it upright near the printer. Check that none of the covers were scratched or deformed during shipment.
- 4) Remove the plastic bag from the sorter.
- 5) Peel off the packing tape, remove the guide rail packing materials, and then lower the guide rail gently.



**Figure 1-4-1**

- 
- Note:**
1. The guide rail will fall over once the packing tape is peeled off. Be sure to support the guide rail when removing the packing tape.
  2. Save the packing materials in case you have to move or transport the sorter in the future, as they are needed for the movement or transportation.
-

## 2. Attaching the sorter to Your Printer

- 1) Remove the face-up tray attached to the side of the printer.

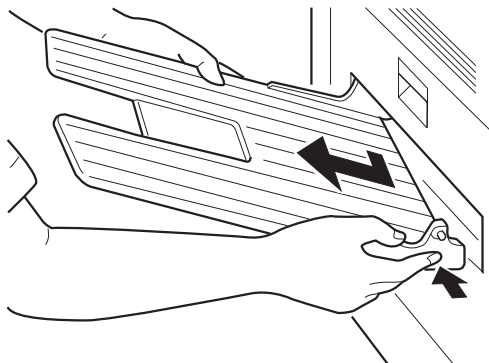


Figure 1-4-2

- 2) Grasp the lock lever of the dial lock of the sorter adapter plate and squeeze it gently in the direction of the arrow to release the lock.

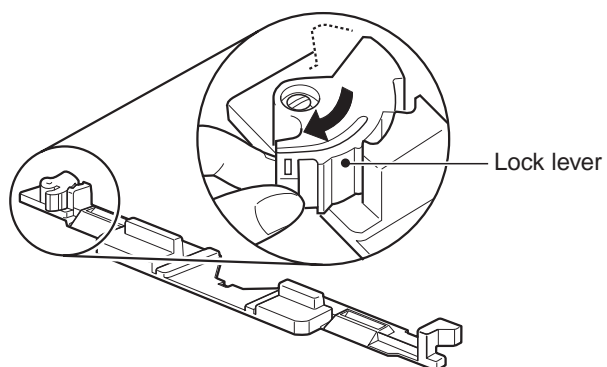


Figure 1-4-3

- 3) Slide the edge 1 and then 2 of the sorter adapter plate into the recess at the bottom of the printer so the plate is fitted to the printer.

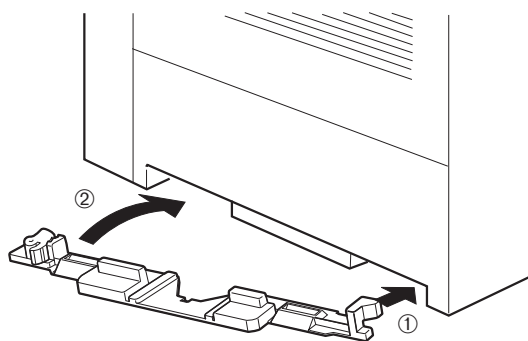
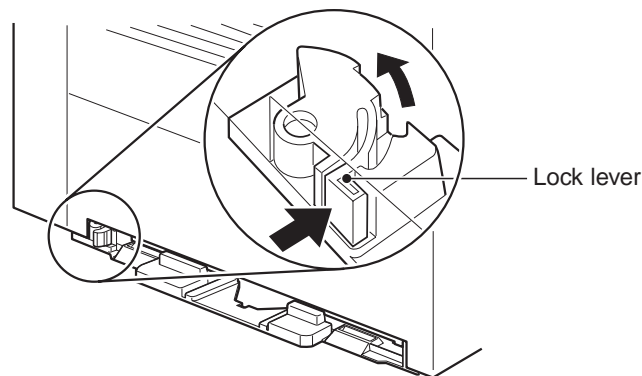


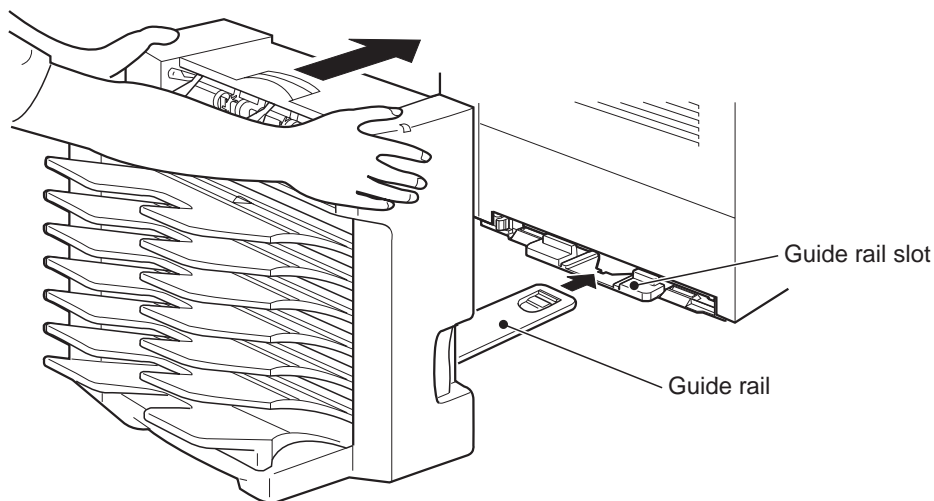
Figure 1-4-4

- 4) Grasp the lock lever of the dial lock and squeeze it gently in the direction of the arrow until it is locked in position.



**Figure 1-4-5**

- 5) Align the guide rail with the guide rail slot in the sorter adapter plate. Gently push the sorter towards the printer until it clicked into place.



**Figure 1-4-6**



- 6) Check whether the sorter attached to the printer is parallel to the printer.

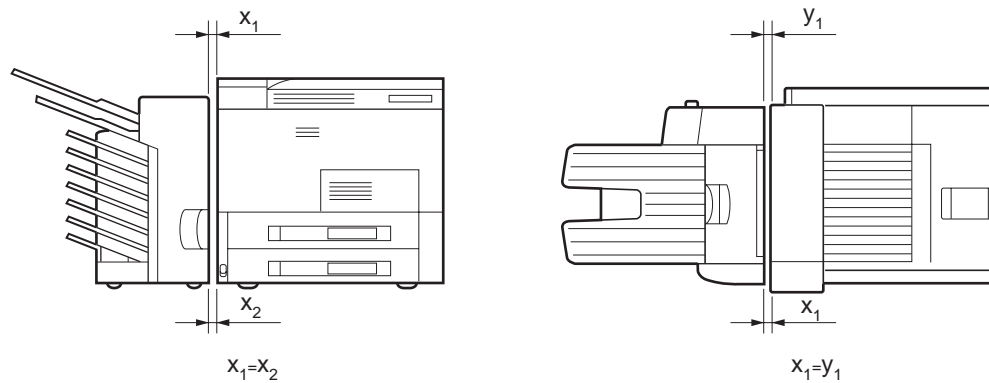


Figure 1-4-7

If not, adjust with the height adjusting lever under the sorter.

Pushing the height adjusting lever rightward ( ➡ direction) raises the tray side of the sorter.

Pushing the height adjusting lever leftward ( ⬅ direction) lowers the tray side of the sorter.

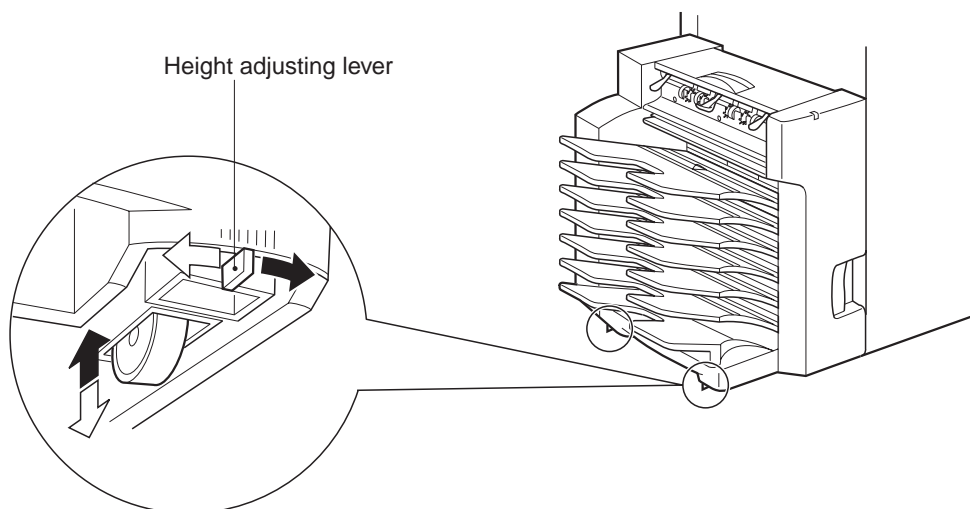
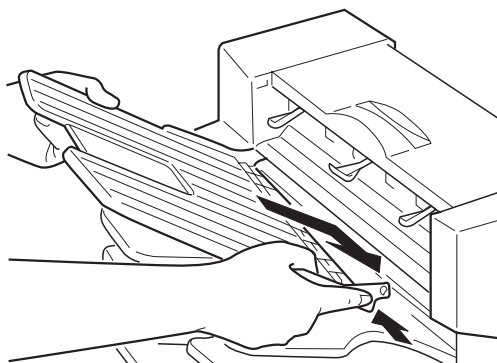


Figure 1-4-8

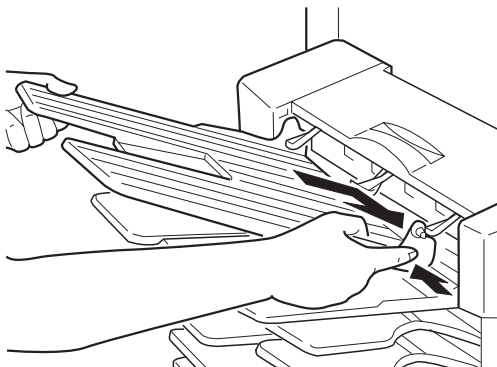
- Note:**
1. Lift the sorter slightly to make space between the casters and the floor when moving the height adjusting lever.
  2. If the printer and the sorter do not become parallel to each other by the above adjustment, move the printer and the sorter to a level place.

- 7) Insert the left and then the right side of the reversing tray into the slot on the sorter.



**Figure 1-4-9**

- 8) Insert the left and then the right side of the printer face-up tray into the slot on the sorter.

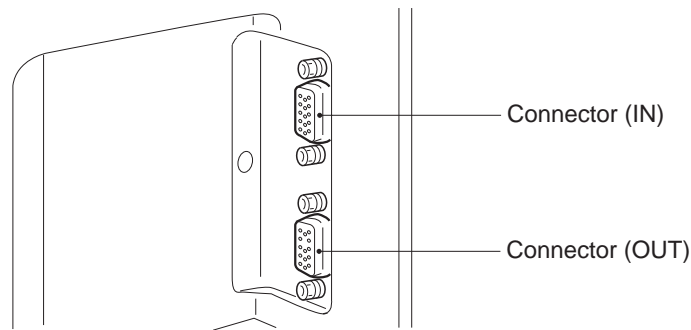


**Figure 1-4-10**

### 3. Connecting the Interface Cables

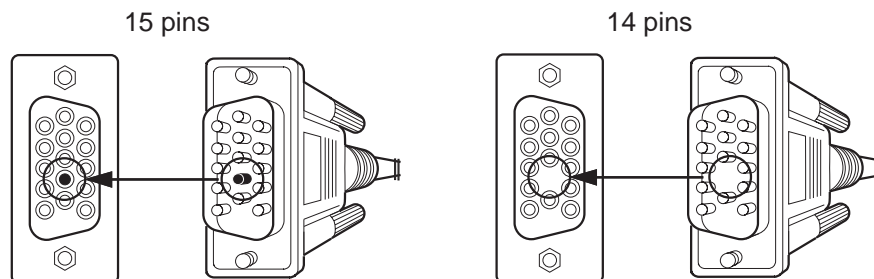
Always turn the printer and sorter OFF and remove the plug from the AC outlet before connecting or disconnecting the interface cable.

- 1) The sorter has two interface connectors. Use the upper connector (IN) to connect the sorter to the printer, and the lower connector (OUT) to connect the sorter to other optional devices.



**Figure 1-4-11**

- 2) The connectors at each end of the interface cable that connects the sorter to the printer are different from each other as illustrated below. The connector on the sorter side has 15 pins and the one on the printer side has 14 pins.



**Figure 1-4-12**

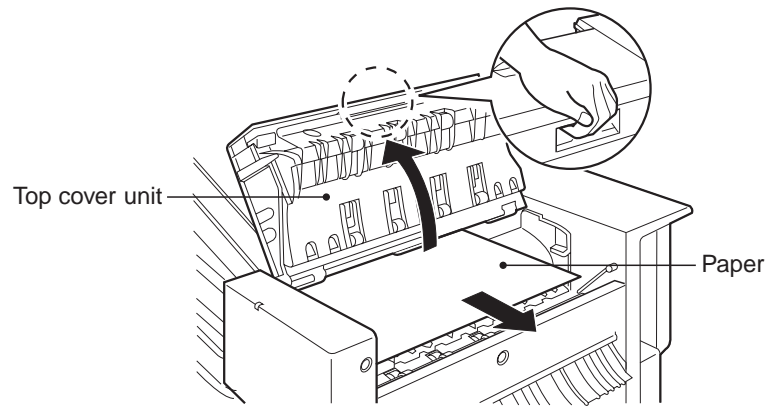
- 3) Plug the connector with 15 pins on the interface cable into the upper connector (IN) on the sorter and secure with the fixing screws.
- 4) Connect the connector with 14 pins on the other end of the interface cable to the option controller in the printer.

### D. Paper Jams

When paper jams occur, follow the procedures below to remove the paper jammed inside the unit.

#### 1. Paper Jams in the Face-up Area

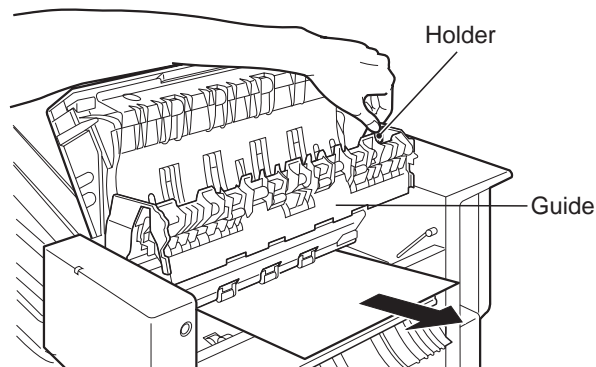
- 1) Separate the sorter from the printer.
- 2) Open the top cover unit at the top of the sorter, then pull out the jammed paper.



**Figure 1-4-13**

#### 2. Paper Jams in the Reversing Tray Guide Area

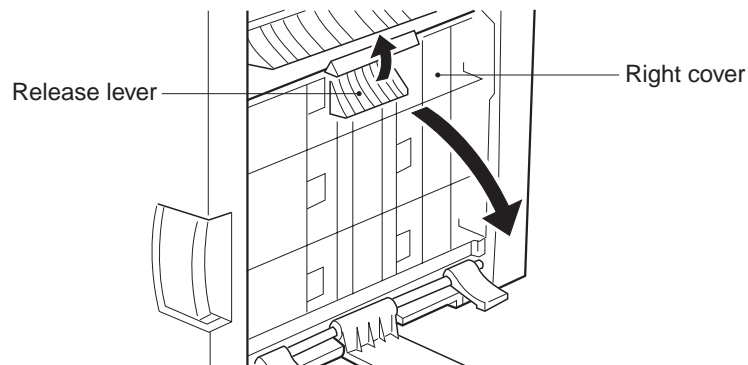
- 1) Open the top cover unit.
- 2) Grasp the holder at the end of the guide and lift the guide as shown in the figure below, then pull out the jammed paper.



**Figure 1-4-14**

**3. Paper Jams in the Transfer Area**

- 1) If the paper is jammed at the right cover of the sorter, lift up the release lever and open the right cover in the direction of the arrow.

**Figure 1-4-15**

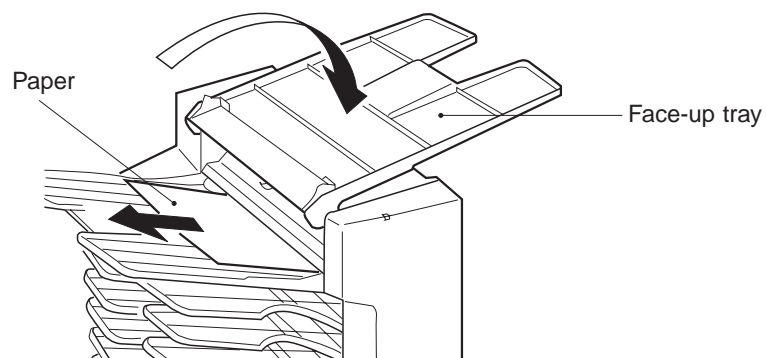
- 2) Gently release the edge of paper by pulling the paper downwards, then remove the jammed paper from the transfer area.

**4. Paper Jams in the Face-down Bin Area**

- 1) If the paper is jammed in one of the face-down bins, grasp the paper and gently pull it out of the sorter.

**5. Paper Jams in the Reversing Tray Area**




- 1) If the paper is jammed in the reversing tray of the sorter, fold the face-up tray backwards, then gently pull out the jammed paper.

**Figure 1-4-16**



# CHAPTER 2

## OPERATION AND TIMING

1. This chapter describes the printer functions, the relationships between mechanisms and circuits, and the timing of operations. Mechanical linkages are indicated by black and white lines (  ), the flow of control signals by solid arrows (  ), and the flow of groups of signals by outline arrows (  ).
2. An active-high signal is indicated by "H" or by a signal name without a slash in front of it, such as "PSNS." An active-low signal is indicated by "L" or by a signal name with a slash in front of, such as "/SCNON."

A signal that is "H" or has a name without a slash is active at the supply voltage level (indicating that the signal is being output), and inactive at ground level (indicating that the signal is not being output).

A signal that is "L" or has a slash in front of its name is active at ground level, and inactive at the supply voltage level.

There is a microcomputer in this printer. But as the internal operation of the microcomputer cannot be checked, an explanation of the operation of the microcomputer has been left out.

As it is assumed that no repair will be made to customer circuit boards, the explanation of board circuits is limited to an outline using block diagrams. So there are two types of circuit explanations; (1) everything from the sensor to the input sections of the major circuit boards, (2) everything from the output sections of the major circuit boards to the loads. These are explained with block diagrams according to the function.

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## I. BASIC OPERATION

### A. Outline

The sorter delivers the paper fed from the printer face-down or face-up. In case of face-down delivery, the job separation, sorting, etc. can be operated.

These operations are controlled by the various commands sent from the printer through the option controller.

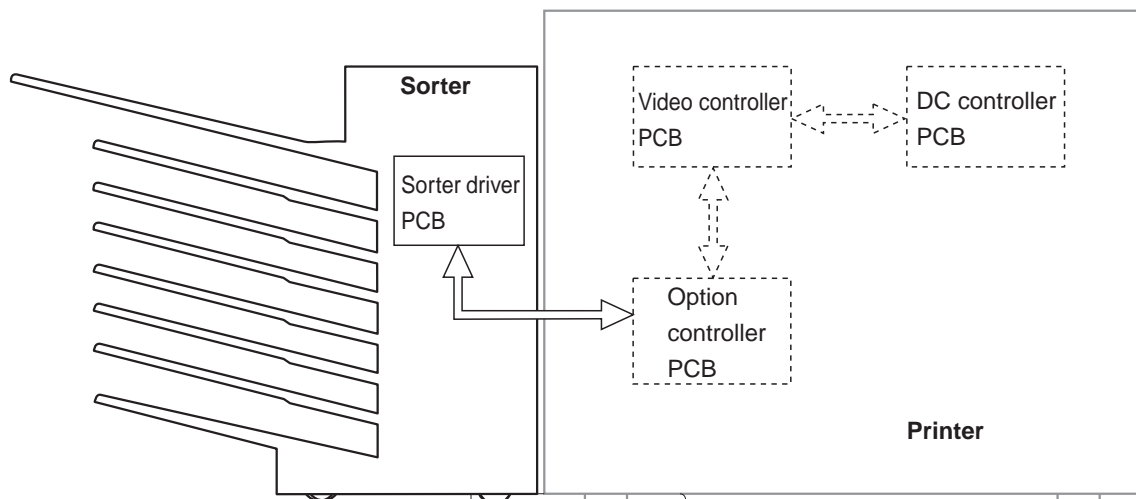


Figure 2-1-1

### B. Outline of Electric Circuit

The operation sequence of the sorter is controlled by the sorter driver PCB. The sorter driver PCB employs an 8-bit microcomputer (CPU) and performs the sequence control and serial communication with the option controller PCB.

The sorter driver PCB drives the solenoids, motor, etc. in response to various commands sent from the option controller. The sorter driver sends information on sensors and switches to the option controller.

The ICs mounted on the sorter driver are as follows.

- IC6 (CPU)
  - Sequence control
  - Backup of initial data values
- IC7 (motor driver)
  - Motor drive control

Flow of signals between the sorter and option controller is shown in the figure below.

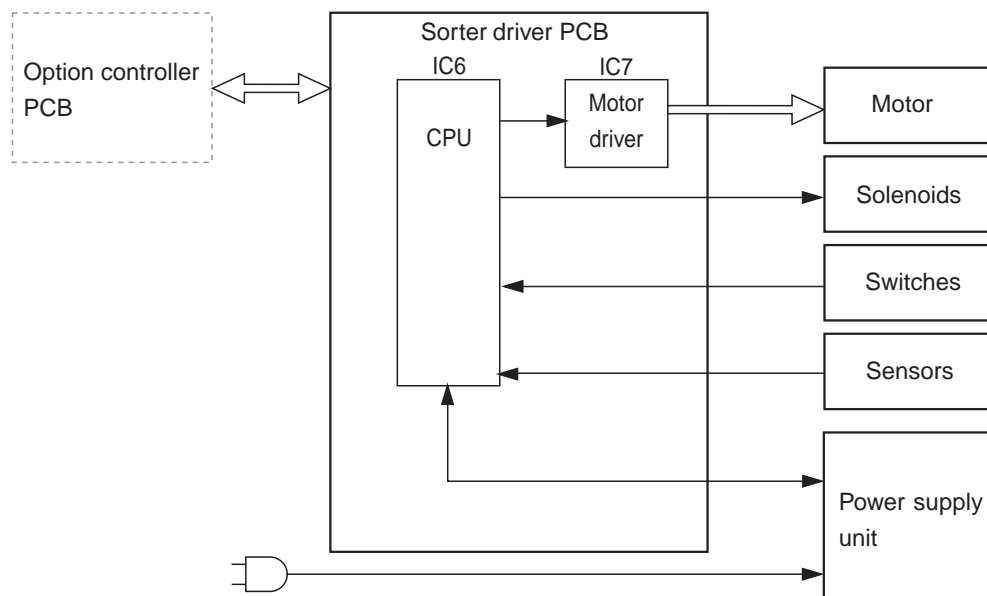


Figure 2-1-2

### C. Inputs/Outputs of the Sorter Driver

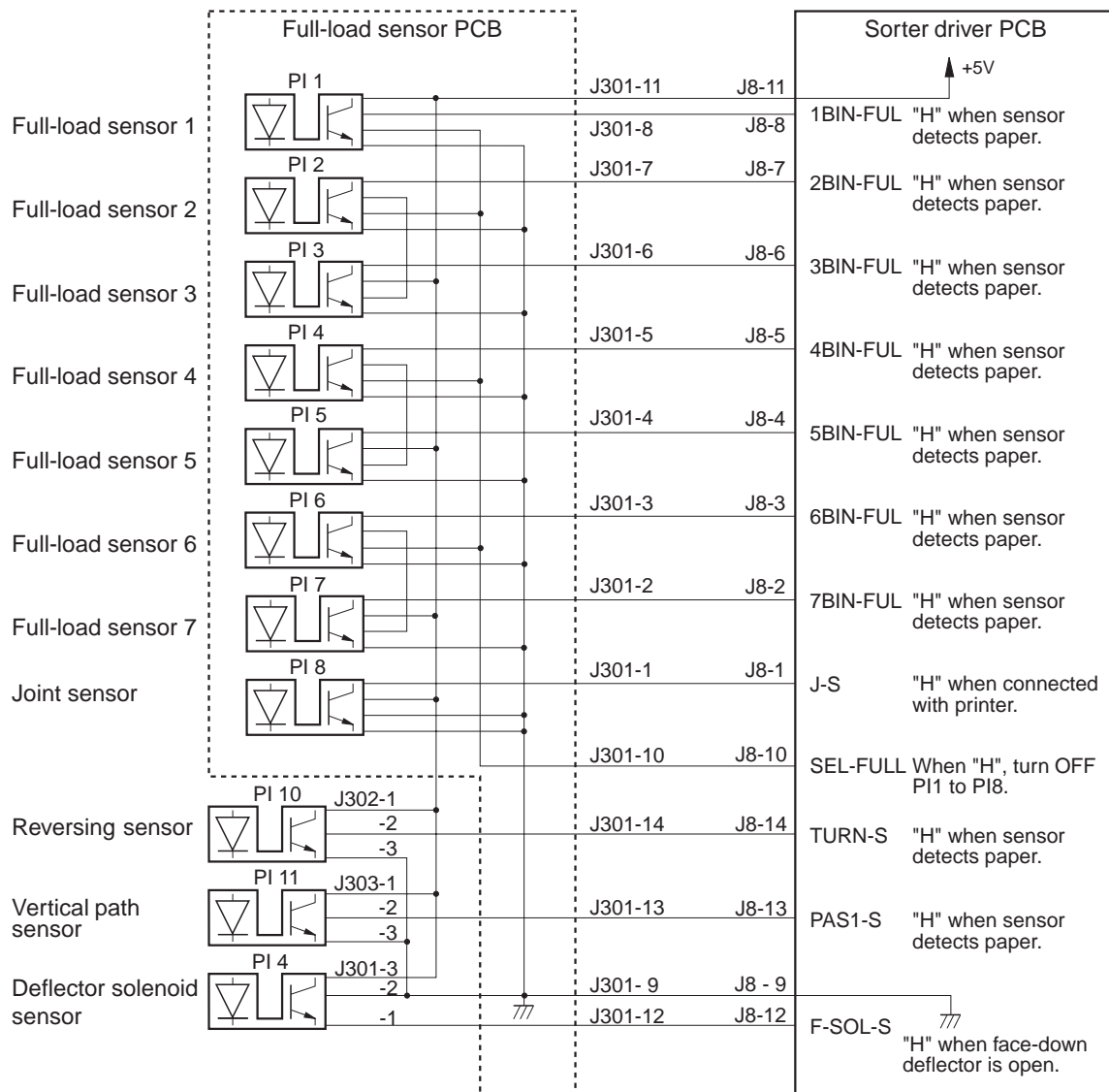


Figure 2-1-3

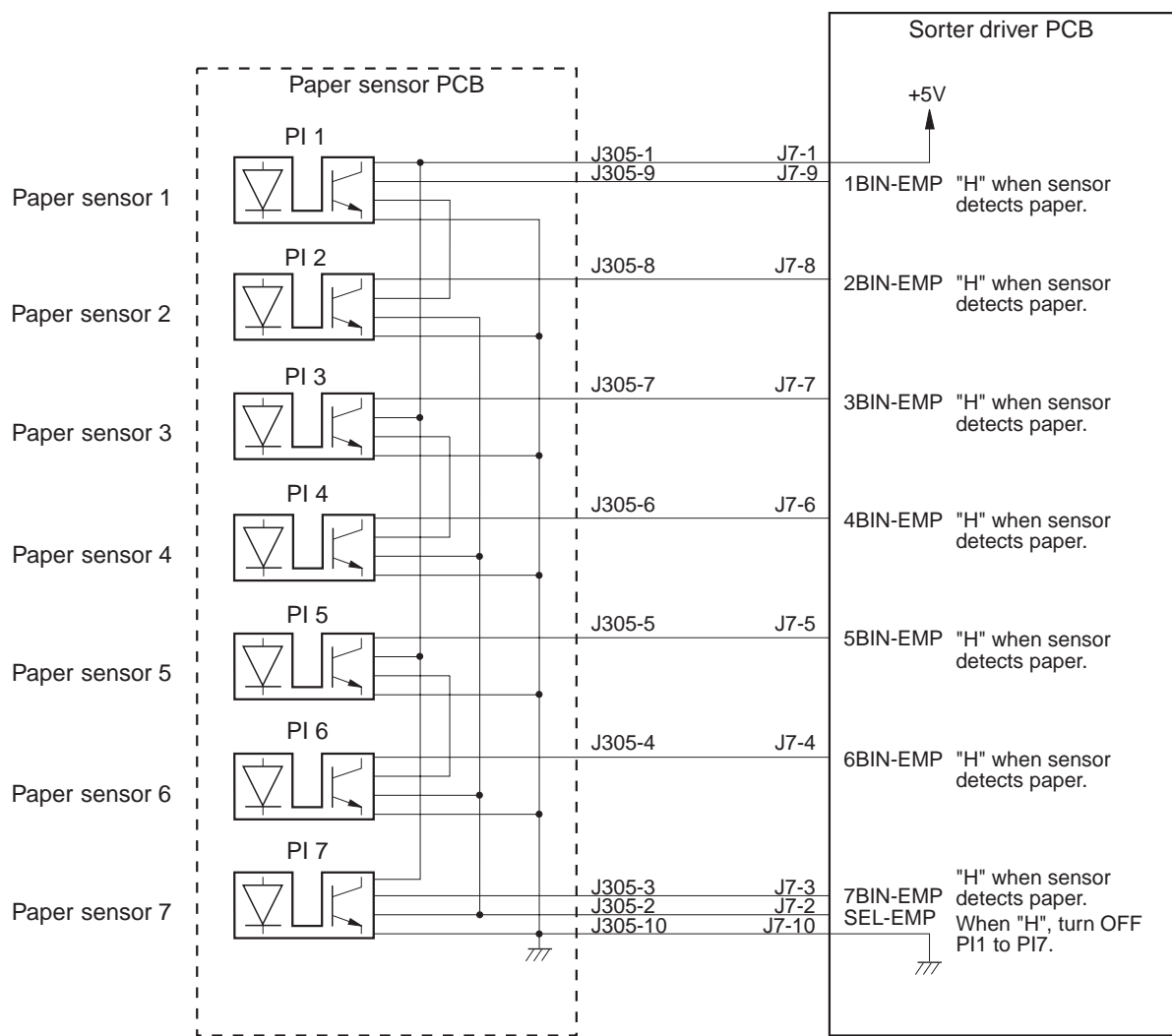


Figure 2-1-4

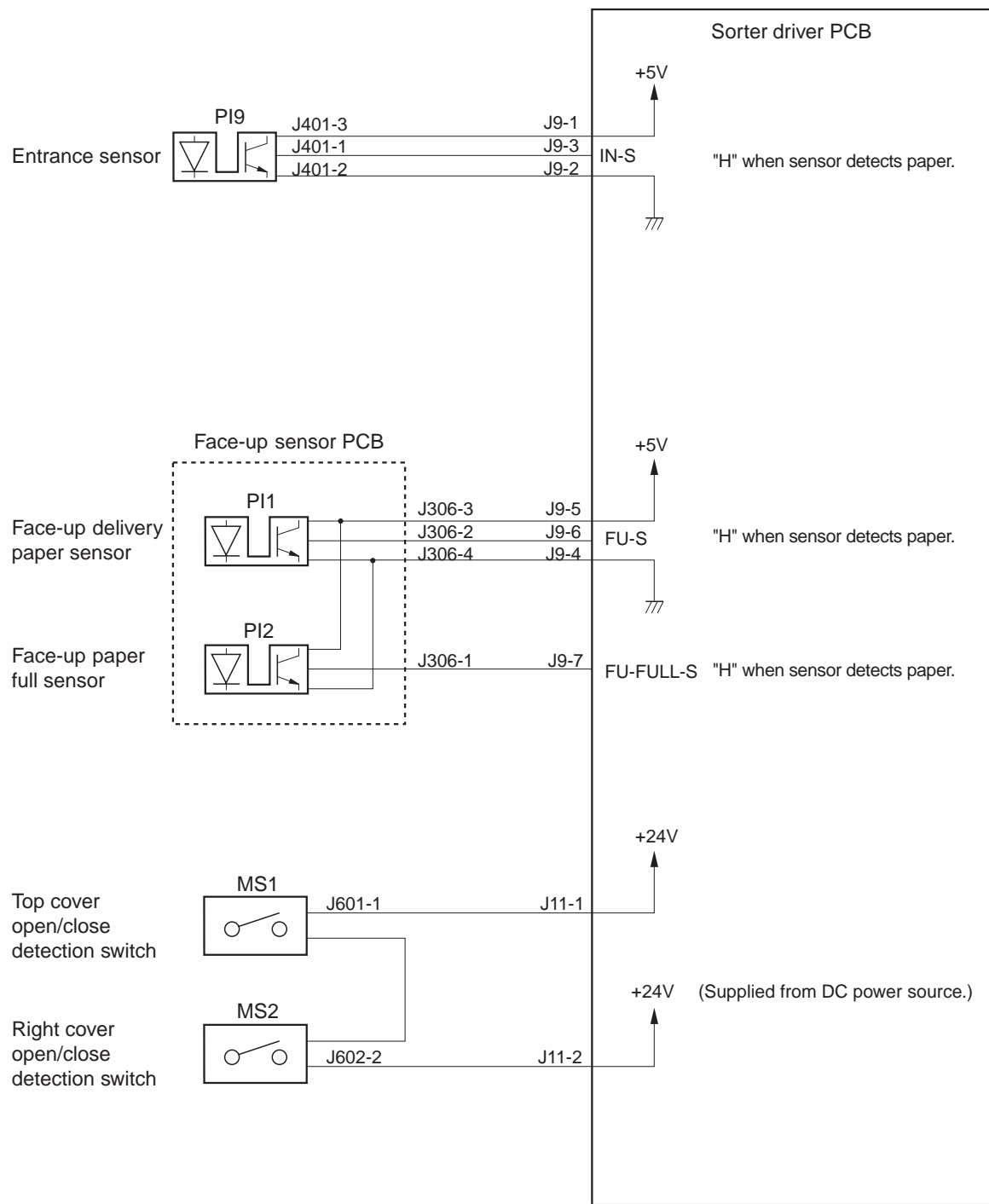


Figure 2-1-5

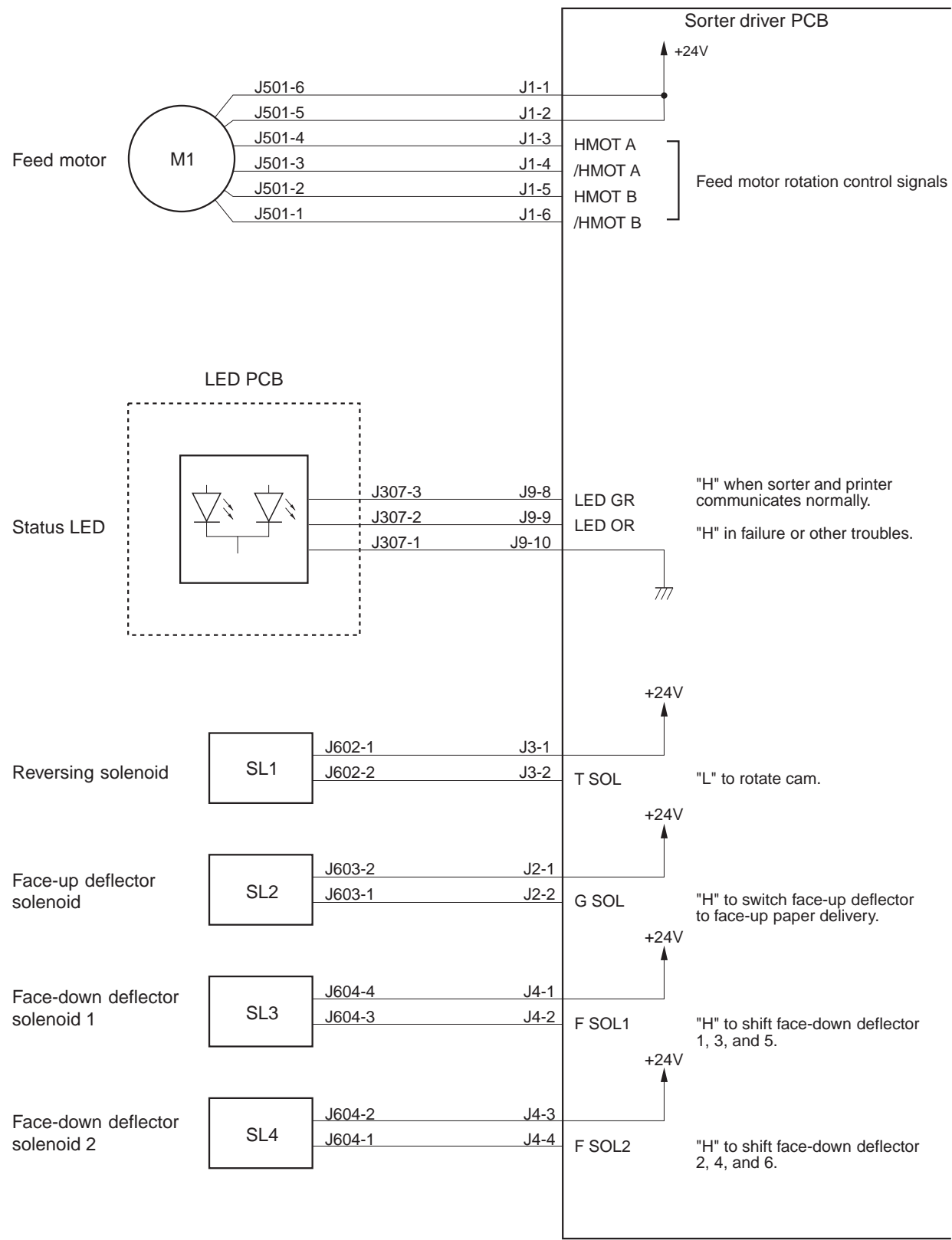


Figure 2-1-6

## II. FEED/DRIVE SYSTEM

### A. Outline

The sorter delivers the paper sent from the printer face-up or face-down according to the commands sent from the video controller through the option controller.

In case of face-up delivery, the paper is simply loaded into the face-up tray.

In case of face-down delivery, the paper can be delivered to the 7 face-down bins in the following 4 modes.

1) Mail box

The mail box delivers the paper to the face-down bin specified by the video controller.

2) Job separation

The job separation switches the face-down bins according to the job to deliver the paper.

3) Stacker

The Stacker handles the 7 face-down bins as 1 bin. The paper is delivered from the lowest bin 7. When the bin 7 becomes full, delivery is switched to the bin 6, and then to 5, and so on to the upper ones.

4) Sorting

The sorting is designed so that, when multiple sheets of documents are printed multiple times, the first copy is delivered to the uppermost face-down bin 1, the second copy to the bin below the first one, and so forth, changing the bins every copy.

---

**Note:** If the paper has some size other than the face-down delivery permitted sizes (A3, A4, A4R, A5R, B4, B5R, Ledger, Legal, Letter, Letter-R, Executive), the paper is delivered to the face-up tray in the face-up mode, instead of being delivered to the face-down bin.

---

The paper sent from the printer is switched between the face-up delivery and face-down delivery by the reversing deflector 2.

The feed motor (M1) is a stepping motor. The rotation of the motor is controlled by the micro-computer (CPU) on the sorter driver PCB.

There are 11 photo interrupters on the feed path to detect arrival or passing of the paper. These are the entrance sensor (PI9), reversing sensor (PI10), vertical path sensor (PI11), face-up delivery paper sensor (face-up sensor PCB, PI1) and paper sensors (paper sensor PCB, PI1 to PI7).

If the paper does not reach or pass through the sensors within the specified period of time, the sorter driver determines that a paper jam has occurred, stops the operation and reports the jam to the option controller.

There are also full-load sensors (full-load sensor PCB, PI1 to PI7) and face-up full-load sensor (face-up sensor PCB, PI2) to detect full-load condition of the tray and bins.

When the bins or the tray is fully loaded with paper, the sorter driver informs the option controller of the full-load condition. Paper having been already printed with the printer is delivered to the same bin.

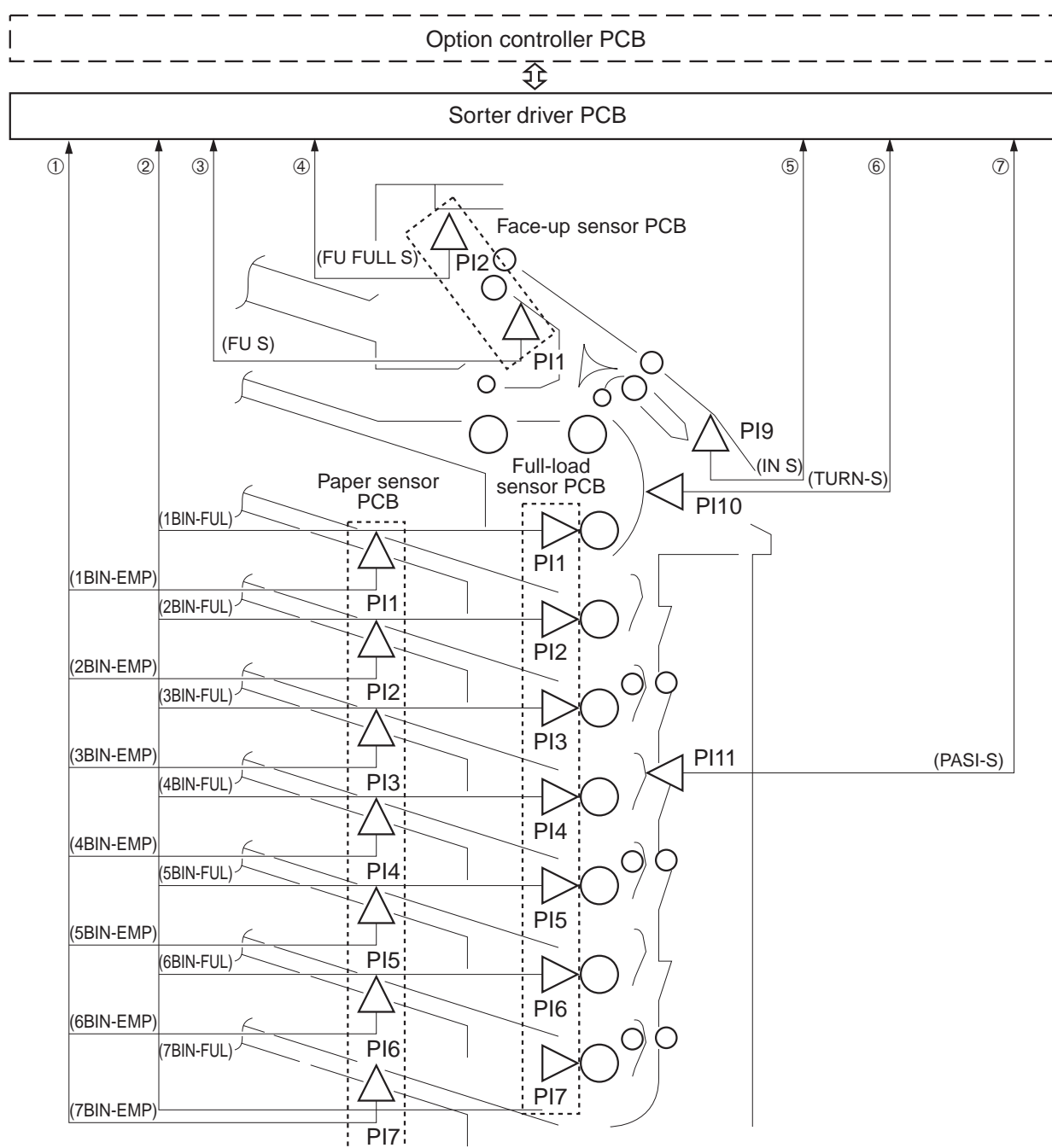
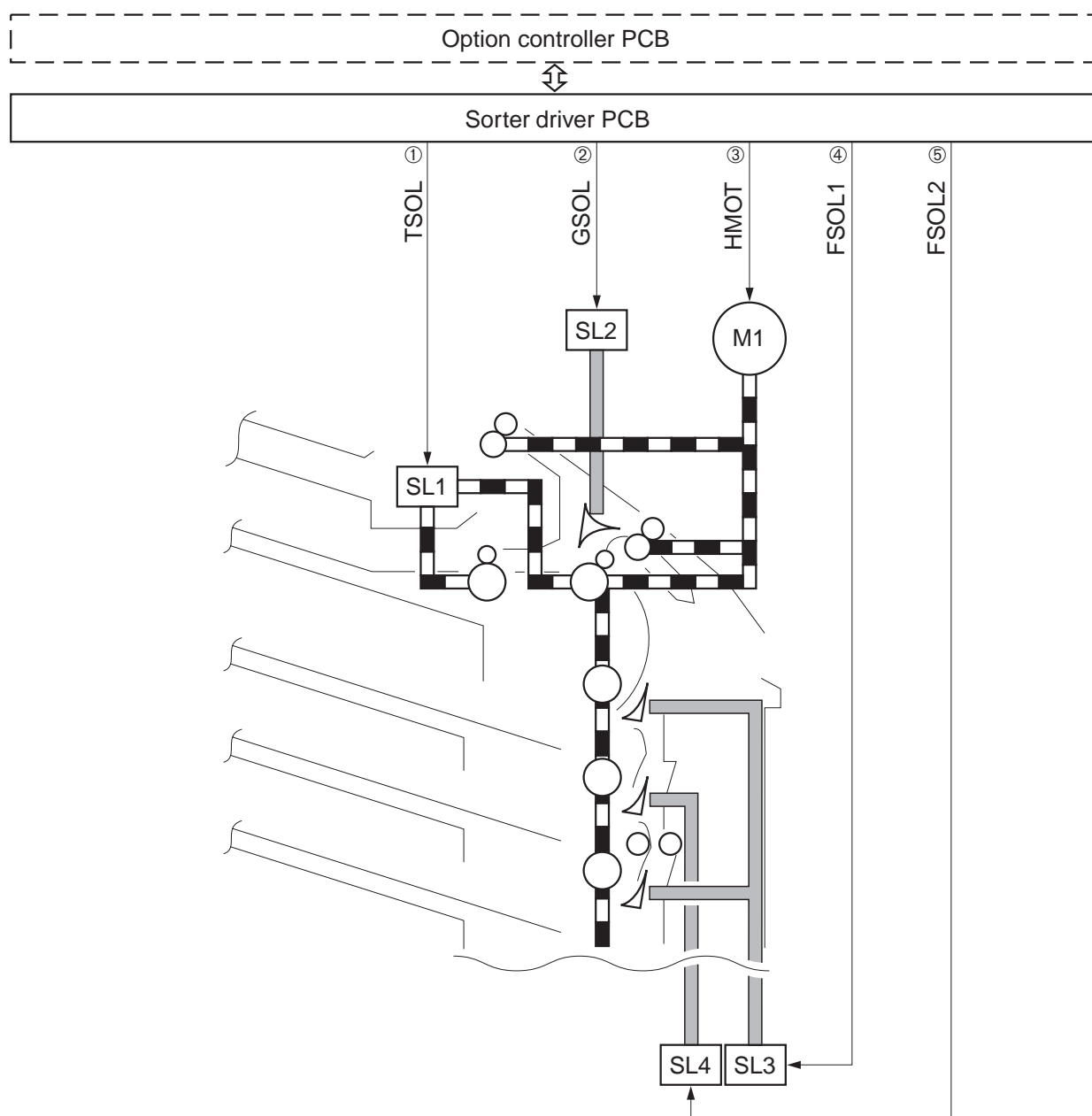


Figure 2-2-1

- ① : Paper detection signal
- ② : Full-load detection signal
- ③ : Face-up delivery paper detection signal
- ④ : Face-up paper full-load detection signal
- ⑤ : Entrance paper detection signal
- ⑥ : Reversed paper detection signal
- ⑦ : Vertical path paper detection signal
- PI9 : Entrance sensor
- PI10 : Reversing sensor

- PI11 : Vertical path sensor
- PI1 (Face-up sensor PCB) : Face-up delivery paper sensor
- PI2 (Face-up sensor PCB) : Face-up full-load sensor
- PI1~PI7 (Full-load sensor PCB) : Full-load sensor
- PI1~PI7 (Paper sensor PCB) : Paper sensor



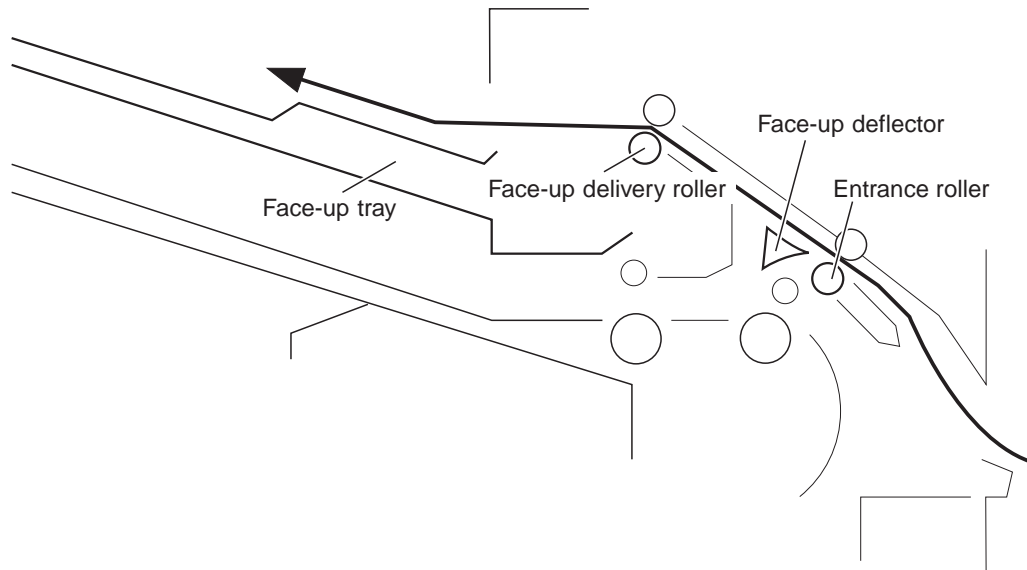


**Figure 2-2-2**

- |   |                                      |
|---|--------------------------------------|
| ① : Reversing solenoid drive signal             | M1 : Feed motor                      |
| ② : Face-up deflector solenoid drive signal     | SL1 : Reversing solenoid             |
| ③ : Feed motor drive signal                     | SL2 : Face-up deflector solenoid     |
| ④ : Face-down deflector solenoid 1 drive signal | SL3 : Face-down deflector solenoid 1 |
| ⑤ : Face-down deflector solenoid 2 drive signal | SL4 : Face-down deflector solenoid 2 |

### B. Face-up Feed/Delivery

When the paper sent from the printer is to be delivered face-up, the sorter driver receives a command from the option controller and drives the feed motor (M1) to rotate the face-up delivery roller and entrance roller. When the entrance sensor (PI9) detects the paper sent from the printer, the face-up deflector solenoid (SL2) is turned ON to switch the deflector to the face-up side so that the paper is fed without being reversed and delivered to the face-up tray.



**Figure 2-2-3**

### C. Face-down Feed/Delivery

#### 1. Reversing operation

When the paper sent from the printer is to be delivered face-down, the sorter driver receives a command from the option controller and drives the feed motor (M1) to rotate the entrance roller, reversing roller, feed roller and face-down delivery roller.

The paper delivered from the printer is sent into the reversing tray by the rotation of the entrance roller. Then, when the entrance sensor (PI9) detects the trailing edge of the paper, the sorter driver turns ON the reversing solenoid (SL1). This releases the solenoid claw from the cam, and the M1 drive rotates the cam to rotate the reversing roller clockwise and then counterclockwise. The cam is fixed again with the claw of the solenoid and the reversing roller stops. The reversing sub-roller is lowered by the cam when the reversing roller starts rotating and is lifted also by the cam when the reversing roller stops rotating. The paper is sent to the feed roller by the counterclockwise rotation of the reversing roller and to the vertical path by the rotation of the feed roller. Then, the paper is fed by the rotation of the face-down delivery roller and delivered to a specified face-down bin.

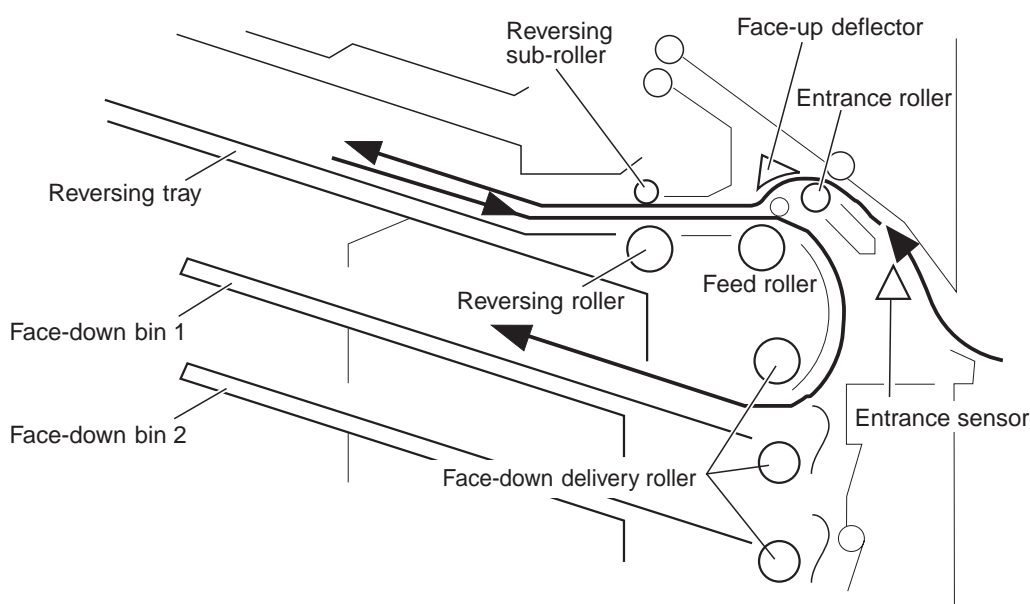
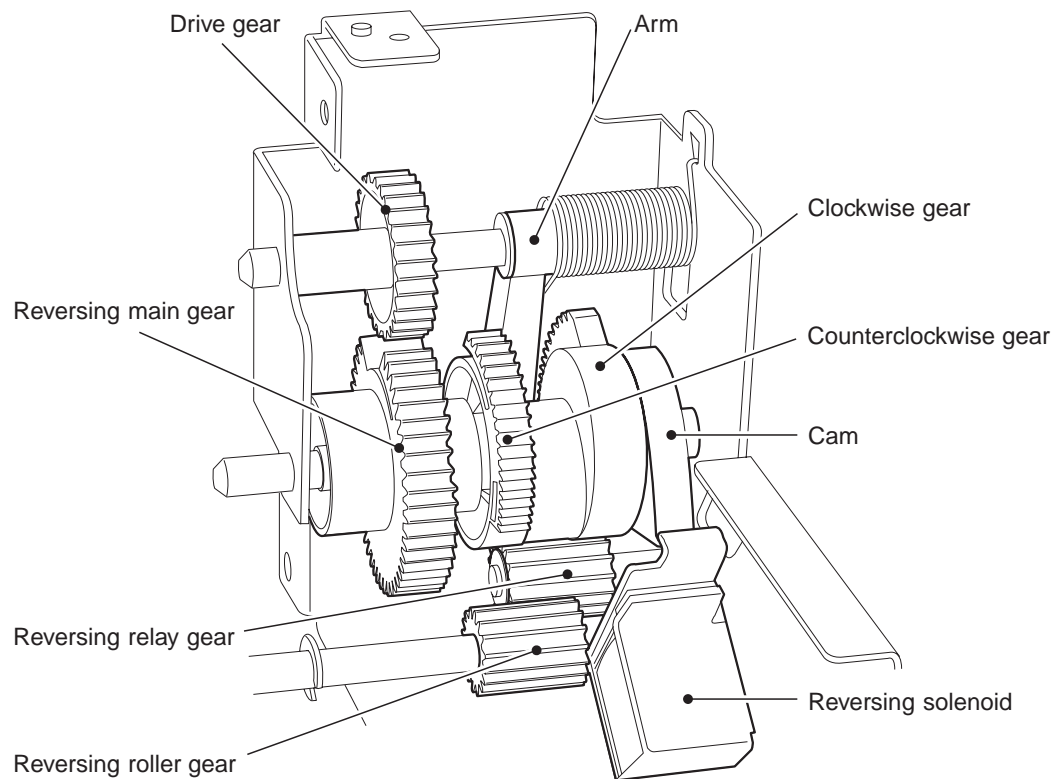


Figure 2-2-4

### a. Clockwise/Counterclockwise rotation of the reversing roller

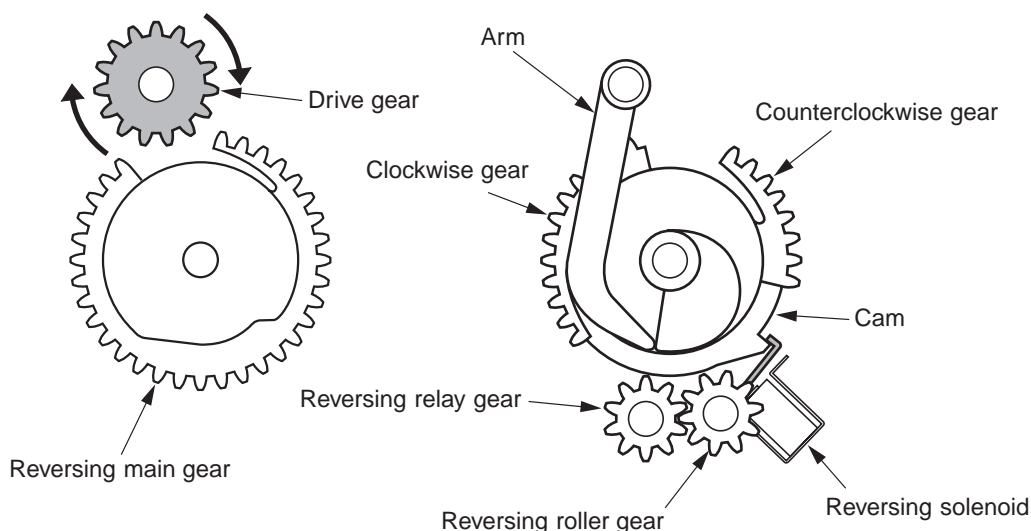
Configuration of the gears in the drive unit that rotate the reversing roller clockwise(CW)/counterclockwise(CCW) are shown in the figure below.



**Figure 2-2-5**

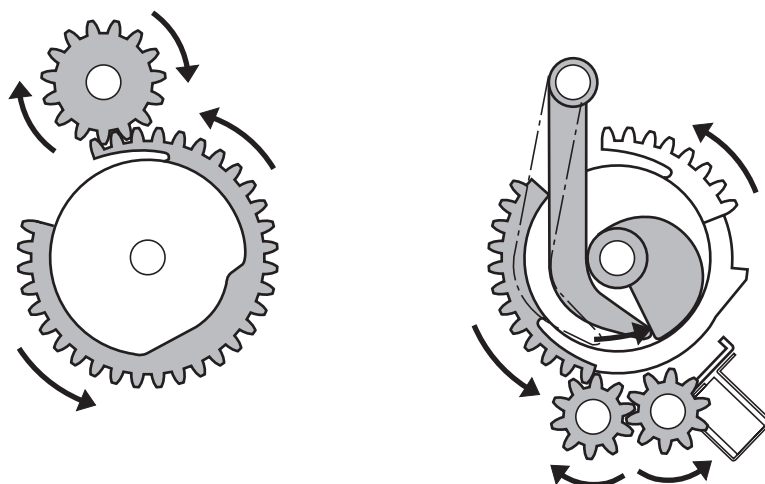
The following section describes how the reversing roller rotates CW/CCW.

- 1) The drive gear rotates in the linkage with the rotation of the feed motor (M1). At this time, the reversing main gear, clockwise gear and counterclockwise gear do not rotate since the cam is fixed with the claw of the reversing solenoid.



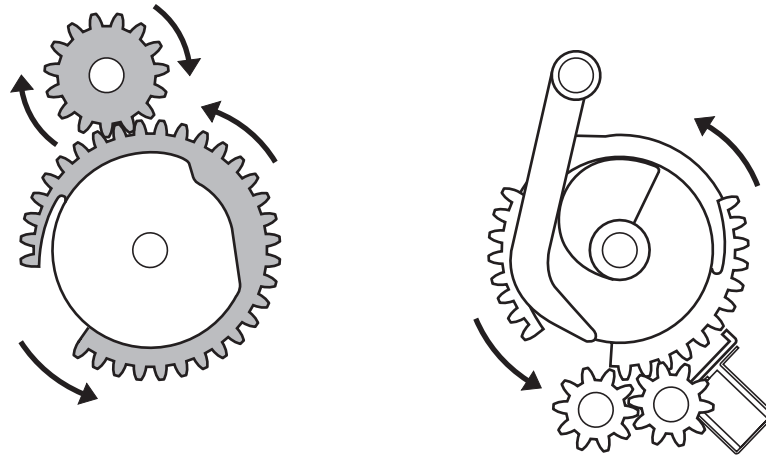
**Figure 2-2-6**

- 2) When the entrance sensor (PI9) detects the trailing edge of the paper, the reversing solenoid (SL1) is turned ON and the claw of the solenoid releases the cam. At the same time, the reversing main gear is rotated in the direction of the arrow by the tension of the arm spring. Then the reversing main gear becomes engaged with the drive gear and starts rotating. The clockwise gear rotates in the linkage with the reversing main gear. When the clockwise gear is engaged with the reversing relay gear, the driving force is transmitted to the reversing roller gear and the reversing roller rotates CW.



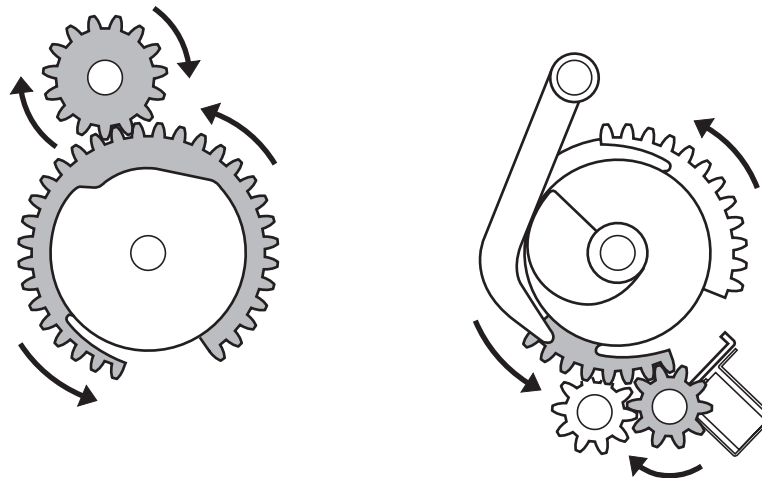
**Figure 2-2-7**

- 3) When the clockwise gear is disengaged from the reversing relay gear, the reversing relay gear and reversing roller gear stop rotating.



**Figure 2-2-8**

- 4) The counterclockwise gear rotates in the linkage with the reversing main gear. When the counterclockwise gear is engaged with the reversing roller gear, the reversing roller is rotated CCW.



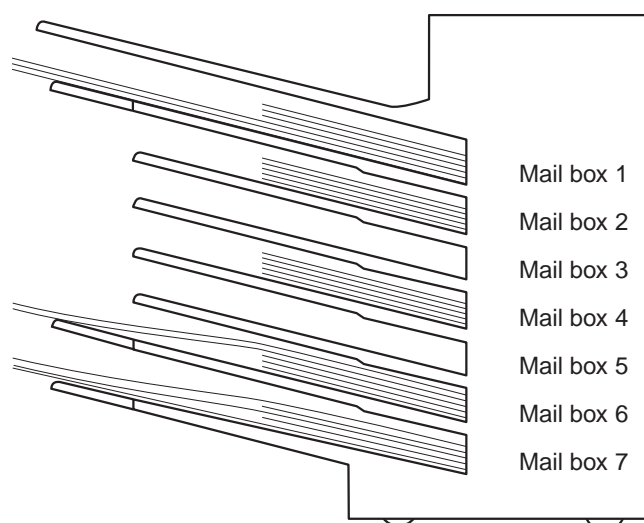
**Figure 2-2-9**

## 2. Mail Box

After the paper is reversed, it is fed back into the sorter by the rotation of the feed roller and detected by the reversing sensor (PI10). Then, the sorter driver turns ON either the deflector solenoid 1 (SL3) or 2 (SL4) according to the specified delivery bin, and the paper is delivered to the specified face-down bin.

When the face-down bin 1, 3, or 5 is specified, SL3 is turned ON. When the face-down bin 2, 4, or 6 is specified, SL4 is turned ON. When the face-down bin 7 is specified, neither SL3 nor 4 is turned ON.

When the specified bin is full, the sorter driver informs the option controller of the full-load condition. If printing has been already started, the printed paper is delivered to the specified bin. When the fully loaded bin is unloaded, the printer resumes printing and paper is delivered to the specified bin.



**Figure 2-2-10**

### 3. Job Separation

After the paper is reversed, it is fed back into the sorter by the rotation of the feed roller and detected by the reversing sensor (PI10). Then, the sorter driver turns ON either the deflector solenoid 1 (SL3) or 2 (SL4) according to the specified delivery bin, and the paper is delivered to the specified face-down bin.

When the face-down bin 1, 3, or 5 is specified, SL3 is turned ON. When the face-down bin 2, 4, or 6 is specified, SL4 is turned ON. When the face-down bin 7 is specified, neither SL3 nor 4 is turned ON.

Whether the face-down bins are loaded with paper or not is detected by the paper sensors (paper sensor PCB, PI1 to PI7).

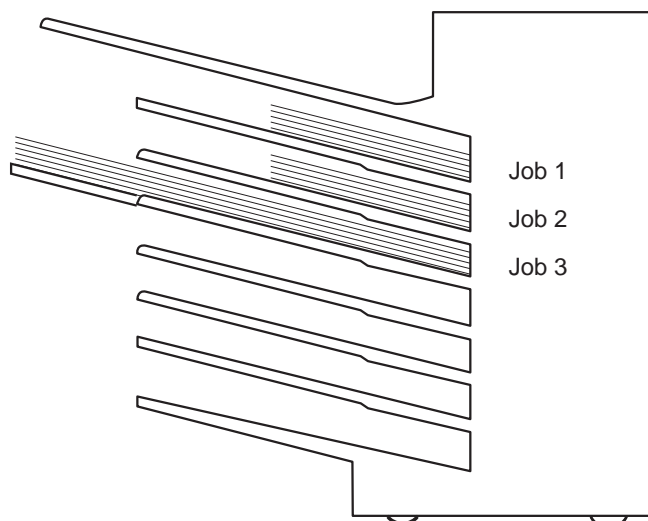
When there is an empty bin, the paper is delivered to the bin. When more than one bin are empty, the paper is delivered from the uppermost empty bin like 1, then 2, and so forth according to the job. When all bins are empty, the paper is delivered from the bin 1 in succession to the lower ones according to the job.

When no bins are empty any more, the paper is delivered to the bin to which the paper has not been delivered the longest. Following jobs are delivered to the bin below the one of the previous job until the bins are emptied. When the previous job was delivered to the face-down bin 7, the next job is delivered to the face-down bin 1.

If some of the bins are already loaded with paper at power-ON, an unoccupied bin is searched in the order of the face-down 1, 2 and so on and the paper is delivered in that order. When no bins are empty any more, the paper is delivered to the uppermost bin among those which had paper at power-ON. Following jobs are delivered to the bin below the one of the previous job until the bins are emptied. When the previous job was delivered to the face-down bin7, the next job is delivered to the face-down bin 1. When there are fully loaded bins, they are skipped and the paper is delivered to the bin below the fully loaded bin.

When the specified bin is fully loaded, the sorter driver notifies the option controller of the full-load condition. If printing has been already started, the printed paper is delivered to the specified bin.

By unloading the bins, the printer resumes printing and delivery of printed paper to a specified bin is continued.



**Figure 2-2-11**



#### 4. Stacker

After the paper is reversed, it is fed back into the sorter by the rotation of the feed roller and detected by the reversing sensor (PI10). Then, the sorter driver turns ON either the deflector solenoid 1 (SL3) or 2 (SL4) according to the specified delivery bin, and the paper is delivered to the specified face-down bin.

When the face-down bin 1, 3, or 5 is specified, SL3 is turned ON. When the face-down bin 2, 4, or 6 is specified, SL4 is turned ON. When the face-down bin 7 is specified, neither SL3 nor 4 is turned ON.

The paper is delivered from the face-down bin 7 in succession to upper ones. When power is turned OFF and then ON again, delivery is started from the uppermost bin among these loaded with paper.

When all of the face-down bins are fully loaded, the sorter driver notifies the option controller of the full-load condition. However, the paper already being printed is delivered to the specified bin. When all the face-down bins are unloaded, the sorter driver notifies the option controller of unloaded bin condition and the printer resumes printing and the paper is delivered from the lowermost face-down bin 7.

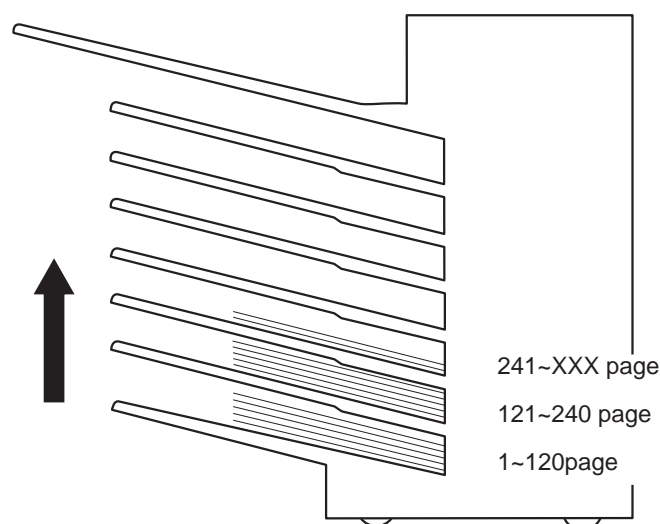


Figure 2-2-12

5. Sorting

After the paper is reversed, it is fed back into the sorter by the rotation of the feed roller and detected by the reversing sensor (PI10). Then, the sorter driver turns ON either the deflector solenoid 1 (SL3) or 2 (SL4) according to the specified delivery bin, and the paper is delivered to the specified face-down bin.

When the face-down bin 1, 3, or 5 is specified, SL3 is turned ON. When the face-down bin 2, 4, or 6 is specified, SL4 is turned ON. When the face-down bin 7 is specified, neither SL3 nor 4 is turned ON.

The paper is delivered from the bin 1 in succession to the lower ones, whether there are empty bins or not. When the paper is delivered down to the bin 7, the bin is shifted to the uppermost face-down bin 1 and the paper is delivered to it, followed by the bin 2, bin 3 and so on.

When a bin is fully loaded, the sorter driver informs the option controller of the full-load condition. The paper already printed is delivered to the specified bin.

By removing the printed paper loaded in the bins, the printer resumes printing and paper delivery to the specified bins is continued.

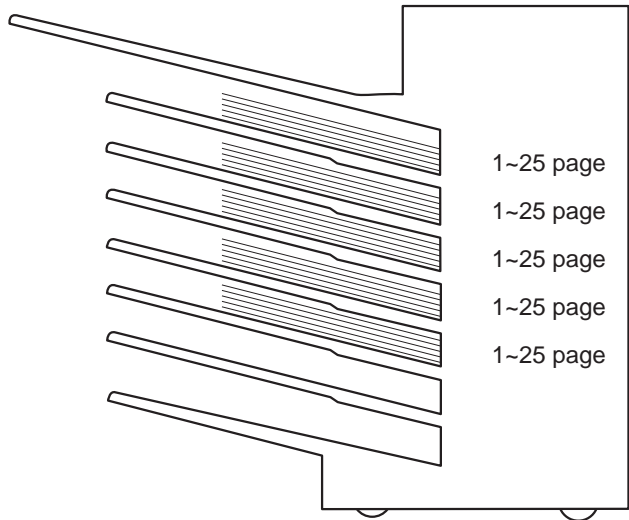


Figure 2-2-13

### D. Detecting Paper Jam

The following sensors are provided to detect presence of paper and whether it is being fed normally.

- Entrance sensor (PI9)
- Reversing sensor (PI10)
- Vertical path sensor (PI11)
- Face-up delivery sensor (Face-up sensor PCB, PI1)

The CPU determines whether or not a paper jam has occurred by checking for the presence of paper in the sensor at the timing stored in the CPU on the sorter driver.

If the CPU determines that a paper jam has occurred, it stops the paper delivery or warming up (Note) operation of the sorter and reports the jam to the option controller.

---

**Note:** The sorter driver performs the following warming up operation when the sorter is turned ON.

- Drives the feed motor and turns ON the reversing solenoid to check for residual paper in the sorter. Turns ON the face-down deflector solenoid 1 and 2 to check the operation.
  - Checks whether it is in the Service mode or not.
- 

#### 1. Residual paper jam

The CPU assesses a residual paper jam if the entrance sensor (PI9), reversing sensor (PI10) or vertical path sensor (PI11) detects paper during the warming up operation.

#### 2. Entrance sensor early paper arrival jam

The CPU assesses an entrance sensor early paper arrival jam if the entrance sensor (PI9) detects paper without receiving a feed notice command from the option controller.

#### 3. Entrance sensor delay jam

The CPU assesses an entrance sensor delay jam if the entrance sensor (PI9) does not detect the leading edge of paper within about 3.0 seconds after the feed notice command is received.

#### 4. Entrance sensor stationary jam

The CPU assesses an entrance sensor stationary jam if the entrance sensor (PI9) cannot detect the trailing edge of the paper within a specified period of time (T1) after it detects the leading edge of the paper.

$$T1 = (\text{paper length} + 55\text{mm}) / \text{approx. } 144\text{mm/s}$$

#### 5. Face-up delivery delay jam

The CPU assesses a face-up delivery delay jam if the face-up delivery sensor (face-up sensor PCB, PI11) cannot detect the paper within about 1.0 second after the entrance sensor (PI9) detects the leading edge of the paper.

#### 6. Face-up delivery stationary jam

The CPU assesses a face-up delivery stationary jam if the trailing edge of the paper does not pass through the face-up delivery sensor (face-up sensor PCB, PI11) within a specified period of time (T2) after its leading edge was detected by the sensor.

$$T2 = (\text{paper length mm} + 58\text{mm}) / \text{approx. } 144\text{mm/s}$$

#### 7. Reversing delay jam

The CPU assesses a reversing delay jam if the reversing sensor (PI10) cannot detect the paper within about 1.5 seconds after the entrance sensor (PI9) detects the trailing edge of the paper.

### **8. Reversing stationary jam**

The CPU assesses a reversing stationary jam if the trailing edge of the paper does not pass through the reversing sensor (PI10) within a specified period of time (T3) after the sensor detects the leading edge of the paper.

The CPU also assesses a reversing stationary jam if the reversing sensor (PI10) is ON about 0.3 seconds after the sensor detects the trailing edge of the paper.

$T3 = (\text{paper length mm} + 84\text{mm}) / \text{about } 202\text{mm/s}$

### **9. Vertical path delay jam (when paper is delivered to face-down bin 4 to 7)**

The CPU assesses a vertical path delay jam if the vertical path sensor (PI11) cannot detect the leading edge of the paper within about 1.3 seconds after the reversing sensor (PI10) detects the leading edge of the paper.

### **10. Vertical path stationary jam (when paper is delivered to face-down bin 4 to 7)**

The CPU assesses a vertical path stationary jam if the trailing edge of the paper does not pass through the vertical path sensor (PI11) within a specified period of time (T3) after the sensor detects the leading edge of the paper.

The CPU also detects the vertical path stationary jam if the vertical path sensor (PI11) is ON about 0.3 seconds after the sensor detects the trailing edge of the paper.

$T3 = (\text{paper length mm} + 80\text{mm}) / \text{approx. } 202\text{mm/s}$

### III. POWER SUPPLY

#### A. Outline

The power supply unit employs a remote switch system.

When the printer is turned ON, the printer outputs a command to the option controller via the video controller. The option controller outputs a POWER-ON signal (PWRON-IN) to the power supply unit via the sorter driver according to this command to turn ON the power. The power supply unit supplies +24V and +5V to the sorter driver when the PWRON-IN signal is "H."

+24V is used for driving the feed motor and solenoids. +5V is used for sensors and ICs on the sorter driver PCB.

The power supply unit is provided with a stand-alone mode switch which allows the unit to turn ON/OFF the power without POWER-ON signal (PWRON-IN) and to perform the Service mode.

The block diagram is shown below.

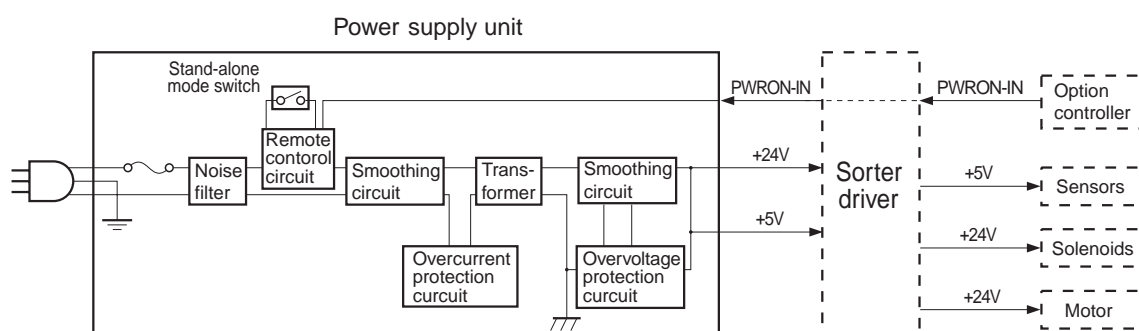


Figure 2-3-1

#### B. Protective Function

The +24V and +5V power supply circuits each have overcurrent/overvoltage protective functions which cut off the output voltage when troubles, such as short-circuit, occurred on the load side and resulted in abnormal voltage or overcurrent flow, to prevent failure of the power supply circuits.

Therefore, if the overcurrent/overvoltage protective functions are activated and no DC voltage is output from the power supply circuit, turn OFF the power switch of the printer, rectify the trouble on the load side and then turn the power switch ON again.



# **CHAPTER 3**

## **THE MECHANICAL SYSTEM**

<b>I. PREFACE .....</b>	<b>3-1</b>	<b>IV. SENSORS/SWITCHES .....</b>	<b>3-8</b>
<b>II. EXTERNALS .....</b>	<b>3-2</b>	<b>V. SOLENOIDS/MOTOR .....</b>	<b>3-12</b>
<b>III. MAIN UNITS .....</b>	<b>3-6</b>	<b>VI. PCBS .....</b>	<b>3-15</b>





## **I. PREFACE**

This chapter describes the disassembly and reassembly procedures of the sorter.

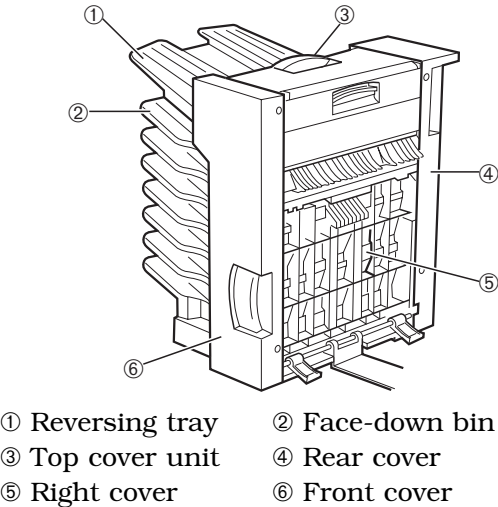
The service technician is to identify the cause of malfunction according to "Chapter 4 Troubleshooting" and to replace the defective part(s) following the disassembly procedure of each part.

Note the following precautions when working on the sorter.

1. **⚠ CAUTION:** Before servicing the sorter, disconnect its power cord from the electrical outlet.
2. Assembly is the reverse of disassembly unless otherwise specified.
3. Note the lengths, diameters, and locations of screws as you remove them. When reassembling the sorter, be sure to use them in their original locations.
4. Do not operate the sorter with any parts removed.
5. Discharge electrical static from your body by touching the metal frame of the sorter prior to handling the PCB in order to avoid causing damage by the difference in static charge at that time.
6. Note that the sorter may move during disassembly/reassembly as the casters have no stoppers.

**II. EXTERNALS**

**A. Location**



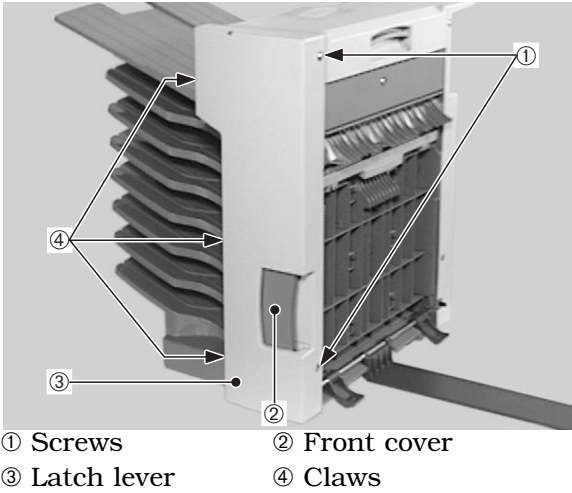
**Figure 3-2-1**

Following the procedures described in this section, remove the necessary covers when cleaning, checking or repairing inside the sorter.

**B. External Covers**

**1. Front cover**

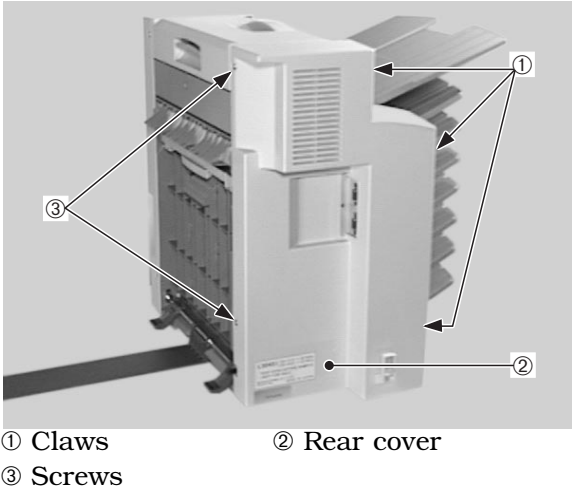
- 1) Remove the 2 screws and 3 claws, and then take off the front cover by shifting the latch lever.



**Figure 3-2-2**

**2. Rear cover**

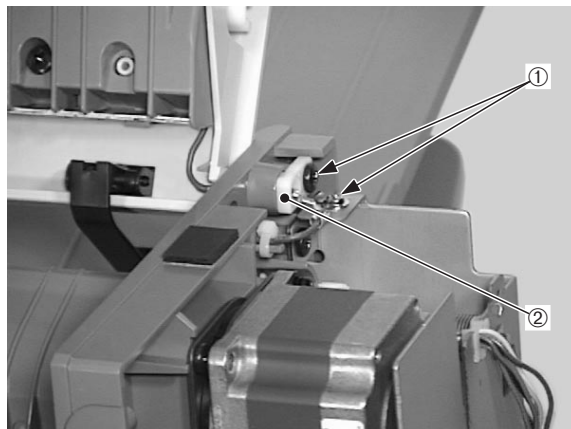
- 1) Remove the 2 screws, and then take off the rear cover by unhooking the 3 claws.



**Figure 3-2-3**

### 3. Top cover unit

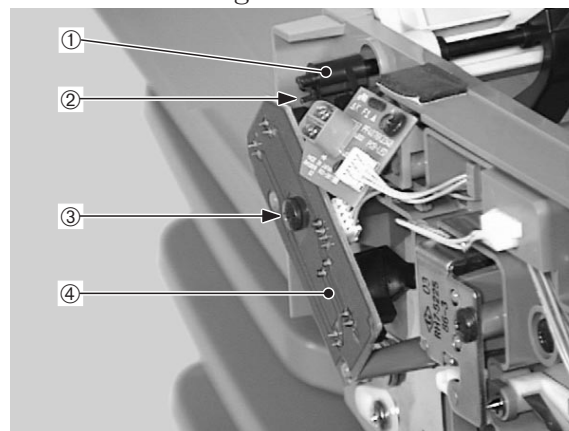
- 1) Remove the front and rear covers.
- 2) Open the top cover unit.
- 3) Remove the 2 screws and then the top cover bracket.



① Screws                      ② Top cover bracket

**Figure 3-2-4**

- 4) Remove the screw and then the face-up sensor PCB. Holding the claw, take off the sensor flag.



① Sensor flag                      ② Claw  
③ Screw                          ④ Face-up sensor PCB

**Figure 3-2-5**

- 5) Bending it slightly, remove the full-load sensor lever, and then take off the top cover unit.

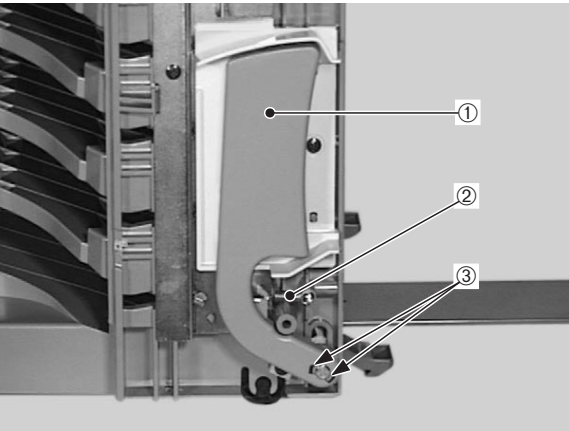


① Top cover unit  
② Full-load sensor lever

**Figure 3-2-6**

**4. Right cover**

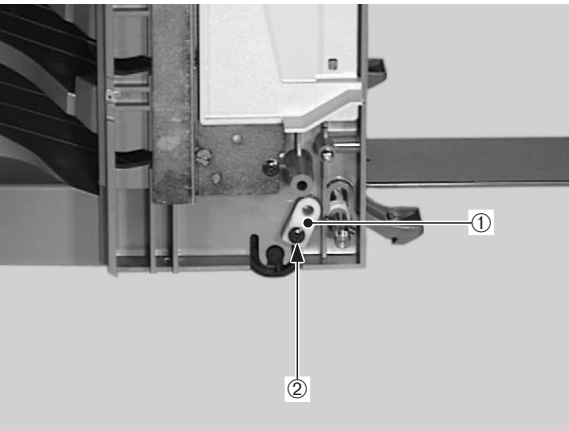
- 1) Remove the front cover.
- 2) Remove the spring, and then take out the latch lever by spreading the claw.



- ① Latch lever
- ② Spring
- ③ Claw

**Figure 3-2-7**

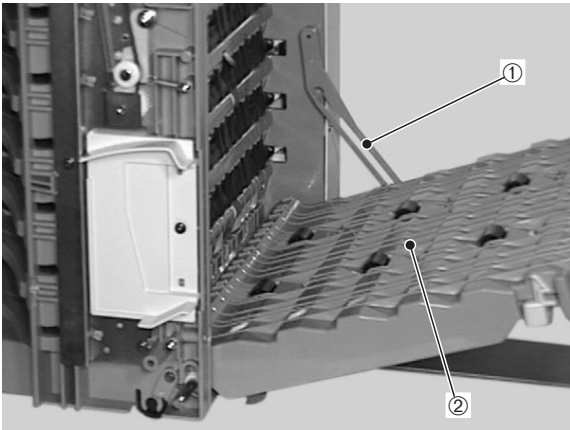
- 3) Remove the screw and then the right cover bracket.



- ① Right cover bracket
- ② Screw

**Figure 3-2-8**

- 4) Lifting up the right cover, remove the cover from the side frame stopper.

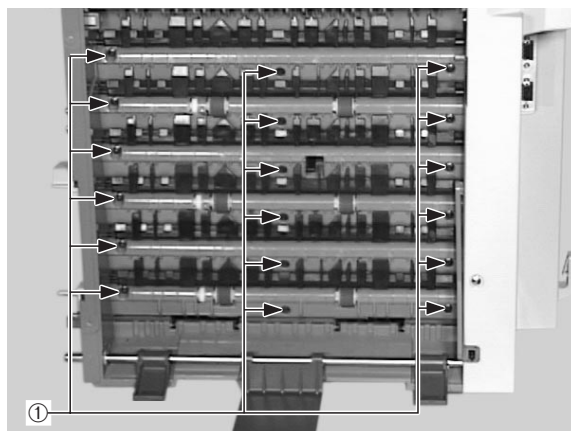


- ① Side frame stopper
- ② Right cover

**Figure 3-2-9**

**5. Face-down bin**

- 1) Remove the right cover.
- 2) Remove the 18 screws.



① Screws

**Figure 3-2-10**

- 3) Take out the face-down bin by pulling it to the left.

III. MAIN UNITS

A. Drive Unit

- 1) Following the rear cover removal procedure on Page 3-2, take off the rear cover.
- 2) Remove the 3 screws and disconnect the 2 connectors.

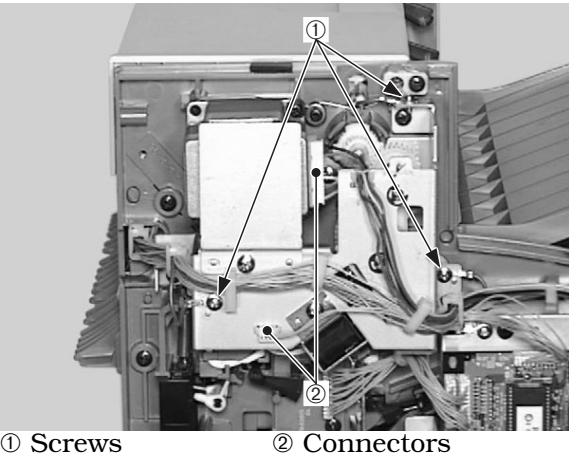


Figure 3-3-1

- 3) Remove the cable from the cable guide.

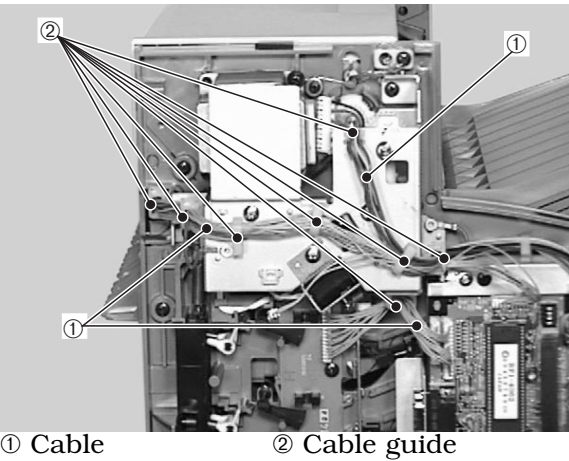


Figure 3-3-2

- 4) Remove the 3 screws and then the drive unit.

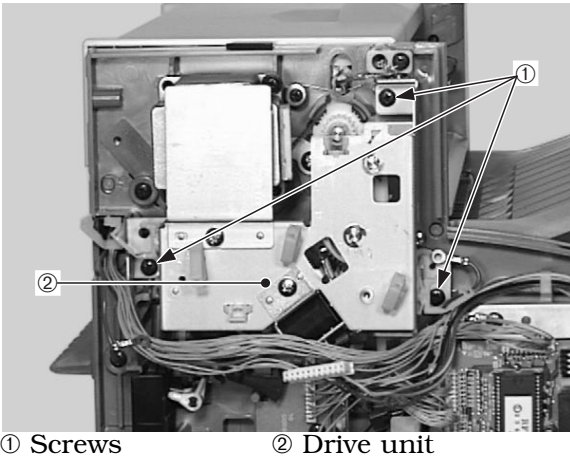
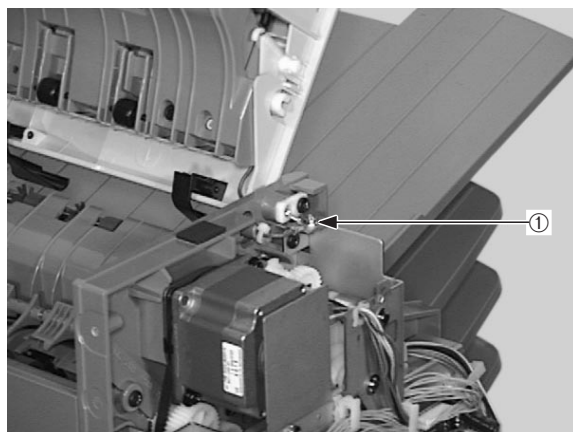


Figure 3-3-3



### B. Reversing Unit

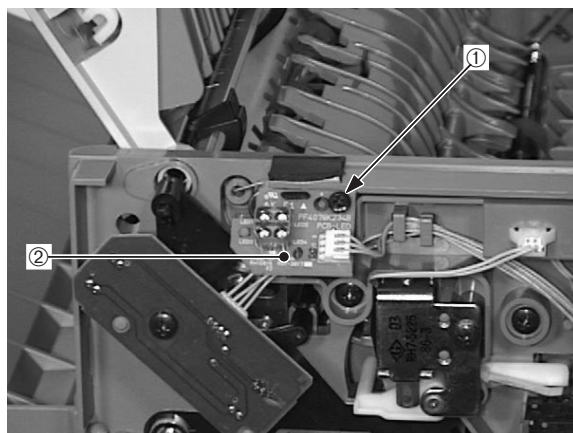
- 1) Following the removal procedures of the front and rear covers on Page 3-2, take off the front and rear covers.
- 2) Open the top cover unit.
- 3) Remove the screw.



① Screw

**Figure 3-3-4**

- 4) Remove the screw and then the LED PCB.

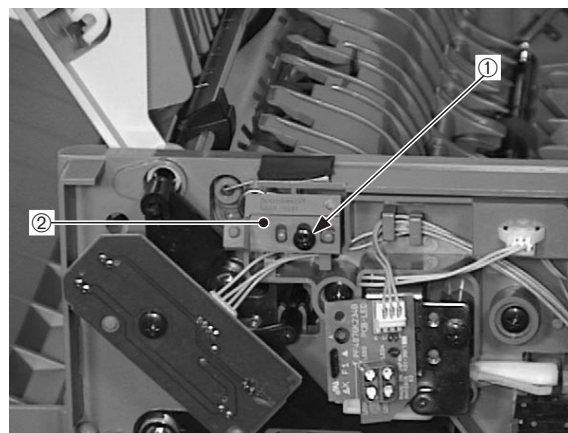


① Screw

② LED PCB

**Figure 3-3-5**

- 5) Remove the screw and then the LED PCB mount.

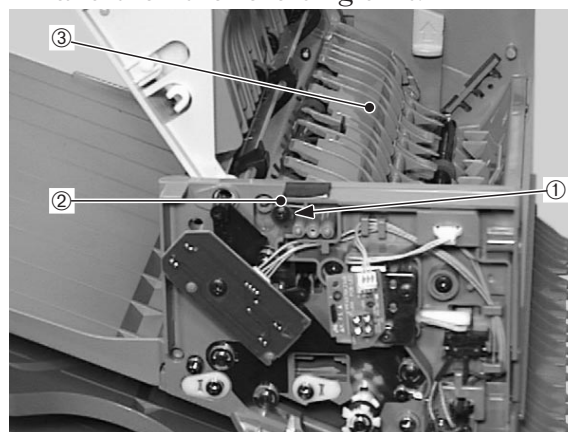


① Screw

② LED PCB mount

**Figure 3-3-6**

- 6) Remove the screw, cam tension spring and then the reversing unit.



① Screw

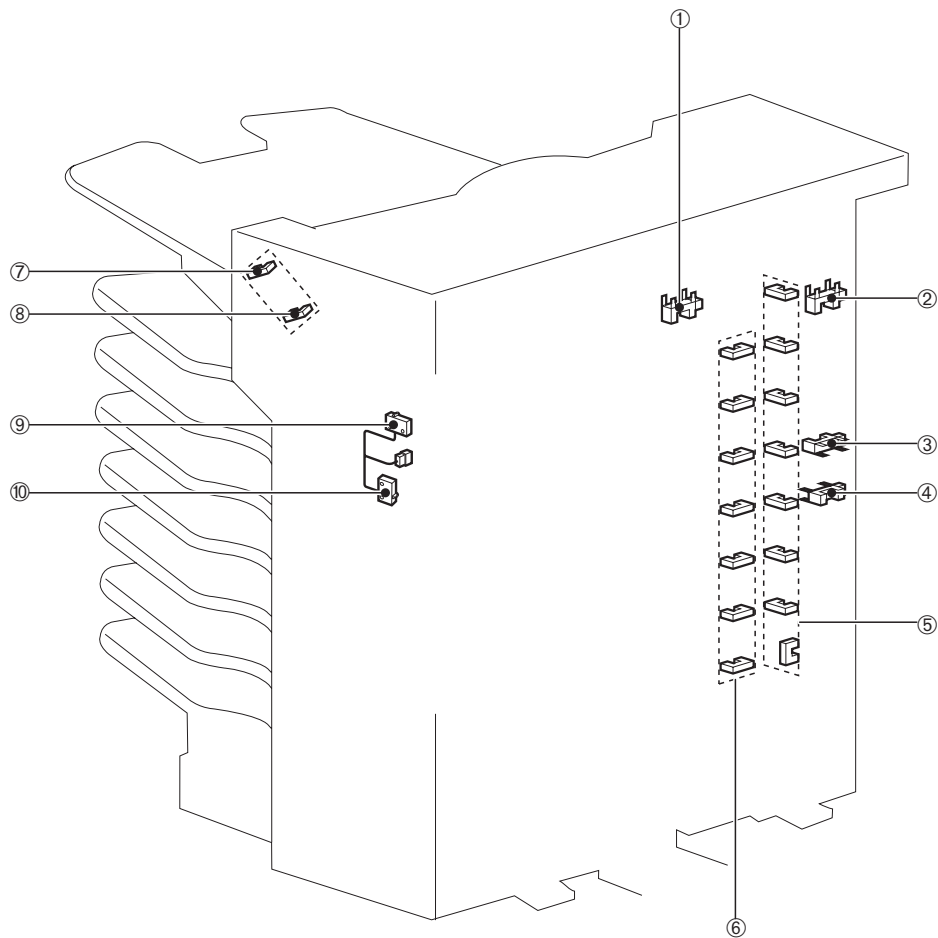
② Cam tension spring

③ Reversing unit

**Figure 3-3-7**

## IV. SENSORS/SWITCHES

### A. Location



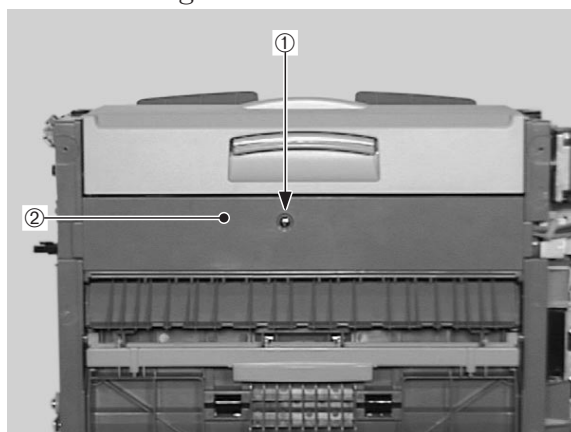
**Figure 3-4-1**

- 1: Entrance sensor
- 2: Reversing sensor
- 3: Vertical path sensor
- 4: Deflector solenoid sensor
- 5: Full-load sensor 1 to 7, joint sensor (full-load sensor PCB)
- 6: Paper sensor 1 to 7 (paper sensor PCB)
- 7: Face-up full-load sensor
- 8: Face-up delivery paper sensor
- 9: Top cover open/close detection switch
- 10: Right cover open/close detection switch



**B. Entrance Sensor**

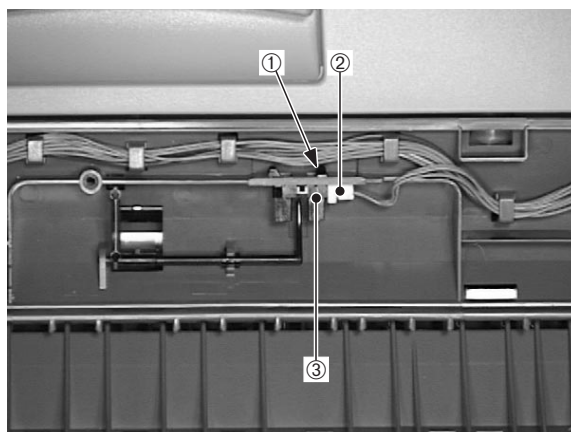
- 1) Following the removal procedures of the front and rear covers on Page 3-2, remove the front and rear covers.
- 2) Remove the screw and then the entrance guide cover.



- ① Screw  
② Entrance guide cover

**Figure 3-4-2**

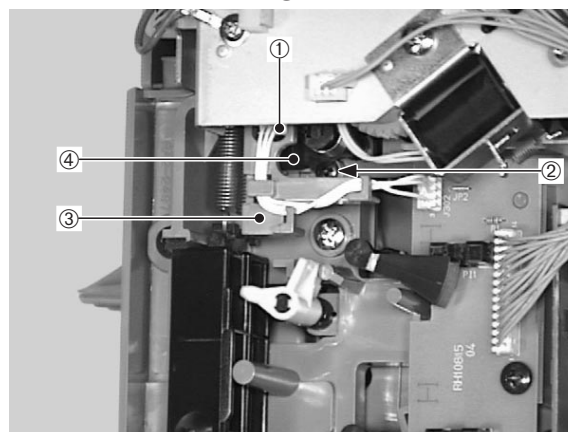
- 3) Disconnect the connector, and then remove the entrance sensor by unhooking the claw.



- ① Claw                      ② Connector  
③ Entrance sensor

**Figure 3-4-3****C. Reversing Sensor**

- 1) Following the rear cover removal procedure on page 3-2, remove the rear cover.
- 2) Disconnect the connector. Lifting up the sensor lever, remove the screw and then the reversing sensor holder.



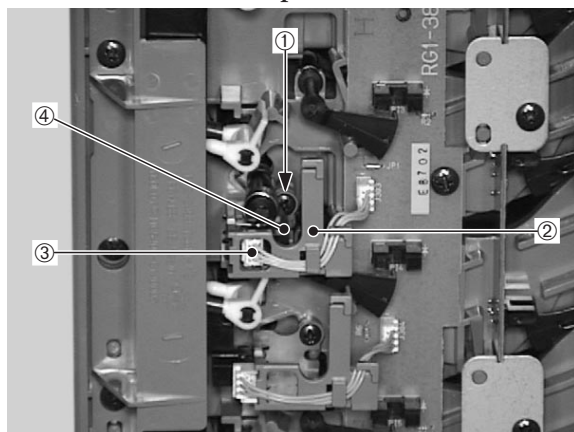
- ① Connector  
② Screw  
③ Reversing sensor holder  
④ Sensor lever

**Figure 3-4-4**

- 3) Unhook the claw, and then remove the reversing sensor from the reversing sensor holder.

### D. Vertical Path Sensor

- 1) Following the rear cover removal procedure on Page 3-2, remove the rear cover.
- 2) Disconnect the connector. Lifting up the sensor lever, remove the screw and then the vertical path sensor holder.



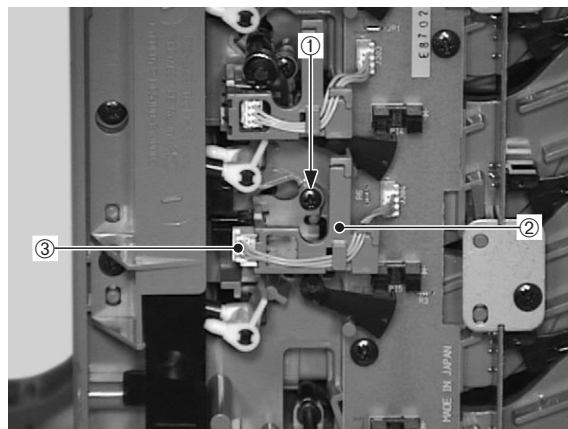
- ① Screw
- ② Vertical path sensor holder
- ③ Connector
- ④ Sensor lever

**Figure 3-4-5**

- 3) Unhook the claw, and then remove the vertical path sensor from the vertical path sensor holder.

### E. Deflector Solenoid Sensor

- 1) Following the rear cover removal procedure on Page 3-2, remove the rear cover.
- 2) Remove the screw, connector and then deflector solenoid sensor holder.



- ① Screw
- ② Deflector solenoid sensor holder
- ③ Connector

**Figure 3-4-6**

- 3) Unhook the claw, and then remove the deflector solenoid sensor from the deflector solenoid sensor holder.

**F. Full-load Sensor 1 to 7/Joint Sensor**

- 1) Following the full-load sensor PCB removal procedure on Page 3-17, remove the full-load sensor PCB.

**G. Paper Sensor 1 to 7**

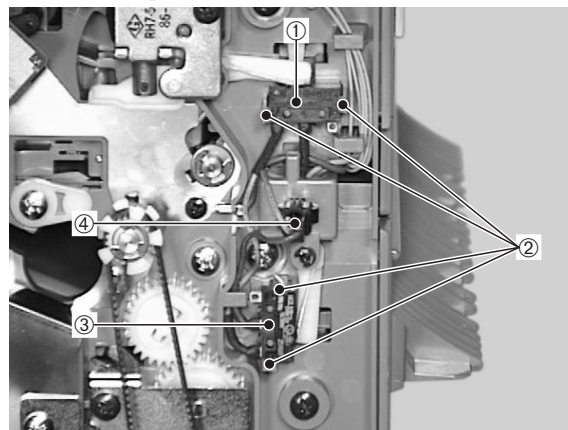
- 1) Following the paper sensor PCB removal procedure on Page 3-16, remove the paper sensor PCB.

**H. Face-up Delivery Paper Sensor/Face-up Full-load Sensor**

- 1) Following the face-up sensor PCB removal procedure on Page 3-17, remove the face-up sensor PCB.

**I. Top Cover Open/Close Detection Switch and Right Cover Open/Close Detection Switch (Cover Open/Close Detection Switch Unit)**

- 1) Following the front cover removal procedure on Page 3-2, remove the front cover.
- 2) Disconnect the connector, unhook the claw, and then remove the top cover open/close detection switch and right cover open/close detection switch.

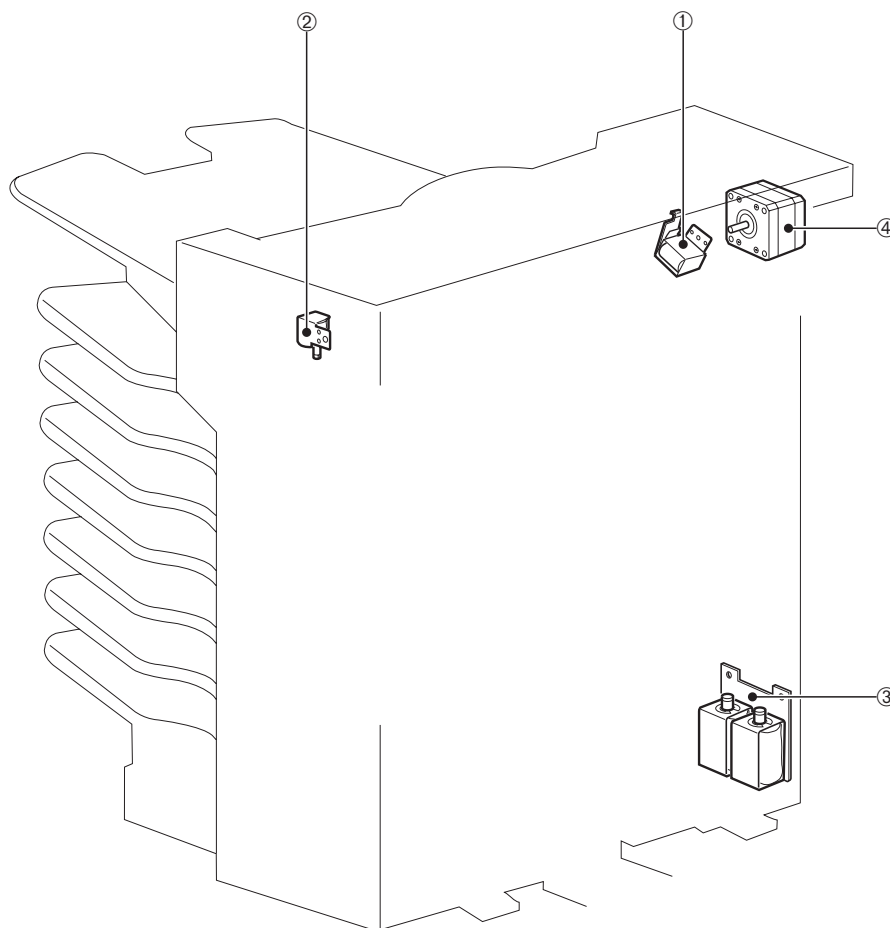


- ① Top cover open/close detection switch
- ② Claw
- ③ Right cover open/close detection switch
- ④ Connector

**Figure 3-4-7**

## **V. SOLENOIDS/MOTOR**

### **A. Location**

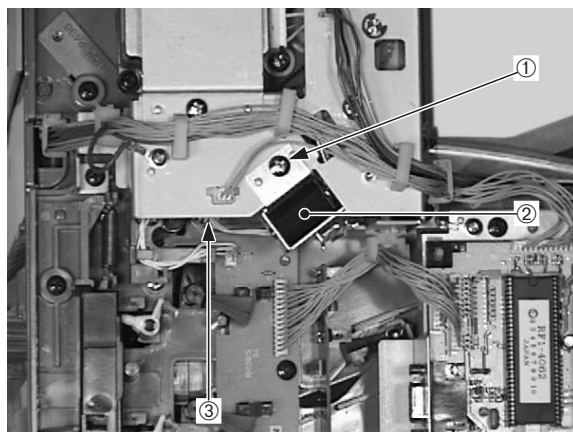


**Figure 3-5-1**

- 1: Reversing solenoid
- 2: Face-up deflector solenoid
- 3: Deflector solenoid unit
- 4: Feed motor

**B. Reversing Solenoid**

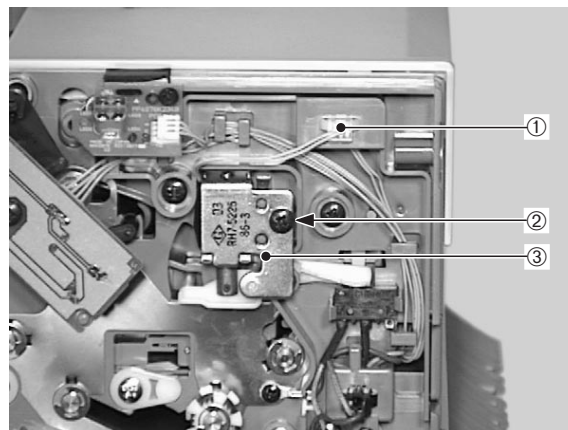
- 1) Following the rear cover removal procedure on Page 3-2, remove the rear cover.
- 2) Remove the screw, disconnect the connector, and then take off the reversing solenoid.



- ① Screw                      ② Reversing solenoid  
③ Connector

**Figure 3-5-2****C. Face-up Deflector Solenoid**

- 1) Following the front cover removal procedure on page 3-2, remove the front cover.
- 2) Remove the screw, disconnect the connector, and then take off the face-up deflector solenoid.

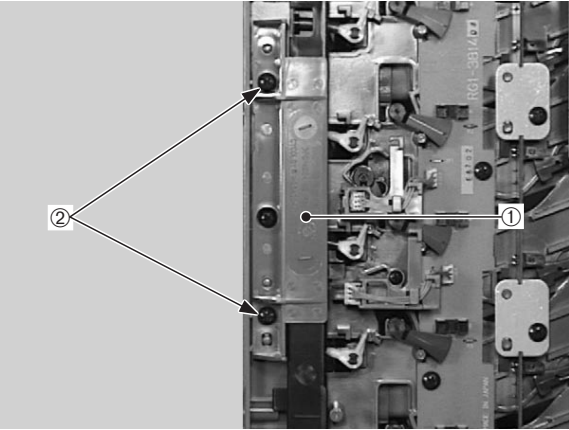


- ① Connector  
② Screw  
③ Face-up deflector solenoid

**Figure 3-5-3**

**D. Deflector Solenoid Unit**

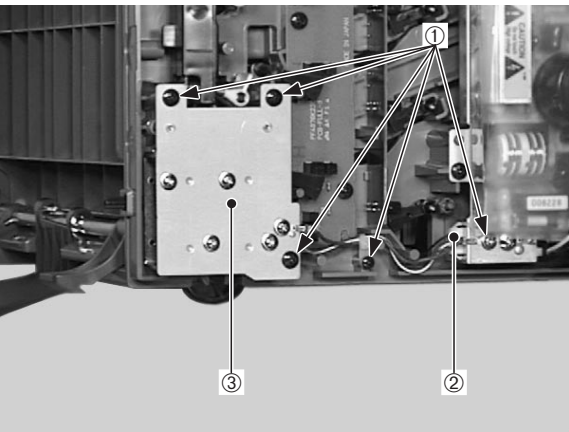
- 1) Following the rear cover removal procedure on Page 3-2, remove the rear cover.
- 2) Remove the 2 screws and then the deflector link guide.



- ① Deflector link guide  
② Screws

**Figure 3-5-4**

- 3) Remove the 5 screws, disconnect the connector, and then take out the deflector solenoid unit.

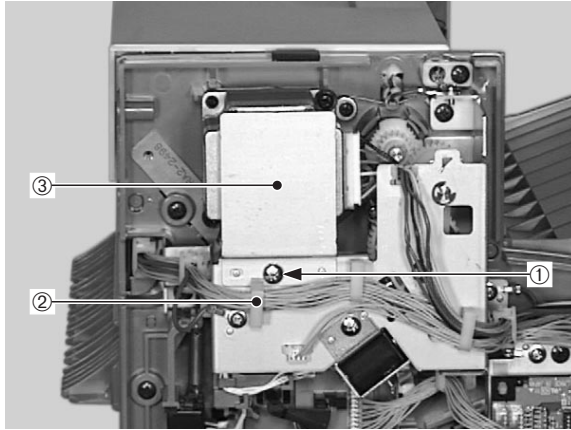


- ① Screws  
② Connector  
③ Deflector solenoid unit

**Figure 3-5-5**

**E. Feed Motor**

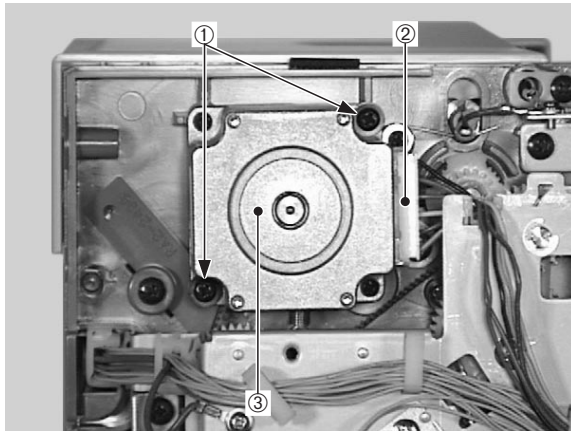
- 1) Following the rear cover removal procedure on Page 3-2, remove the rear cover.
- 2) Remove the screw, and then take off the shield plate by slanting the cable retainer.



- ① Screw  
② Cable retainer  
③ Shield plate

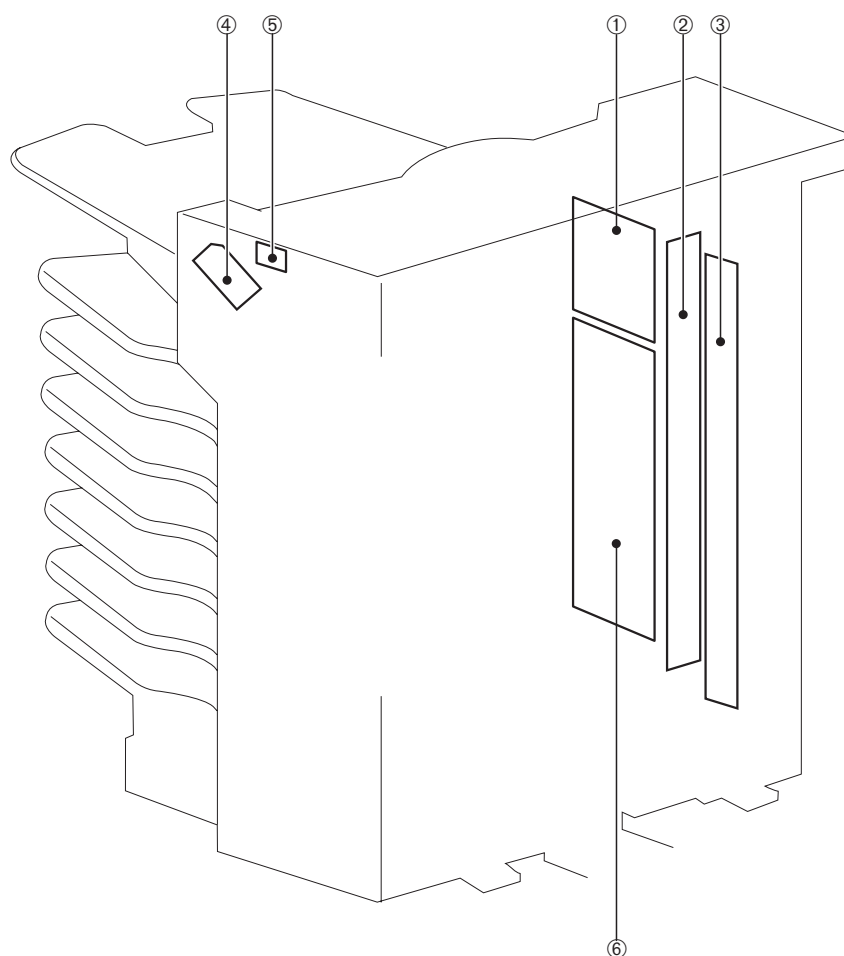
**Figure 3-5-6**

- 3) Remove the 2 screws, disconnect the connector, and then take off the feed motor.



- ① Screws  
② Connector  
③ Feed motor

**Figure 3-5-7**

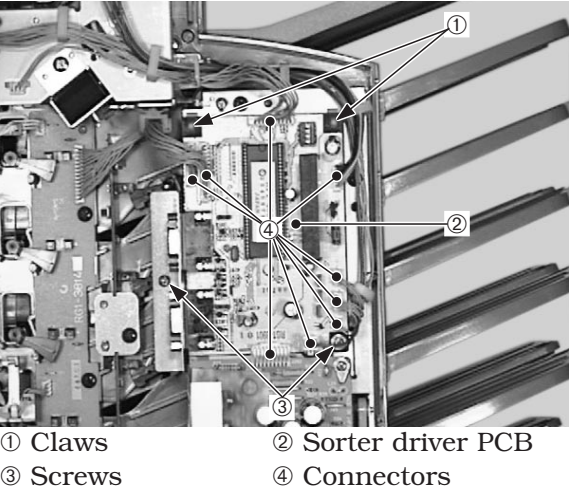
**VI. PCBS****A. Location****Figure 3-6-1**

- 1: Sorter driver PCB
- 2: Paper sensor PCB
- 3: Full-load sensor PCB
- 4: Face-up sensor PCB
- 5: LED PCB
- 6: Power supply PCB



**B. Sorter Driver PCB**

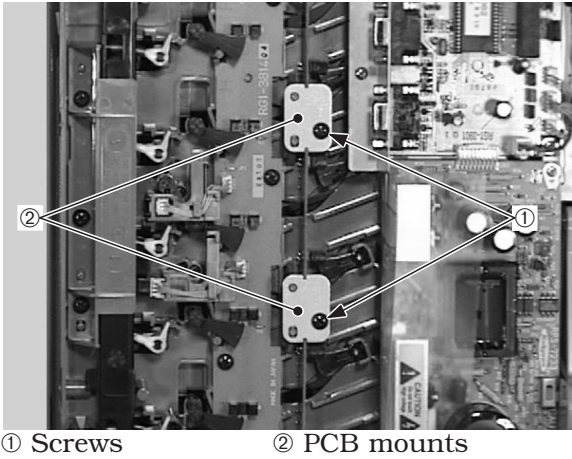
- 1) Following the rear cover removal procedure on Page 3-2, remove the rear cover.
- 2) Remove the 2 screws, disconnect the 9 connectors, and then holding the 2 claws, take out the sorter driver PCB.



**Figure 3-6-2**

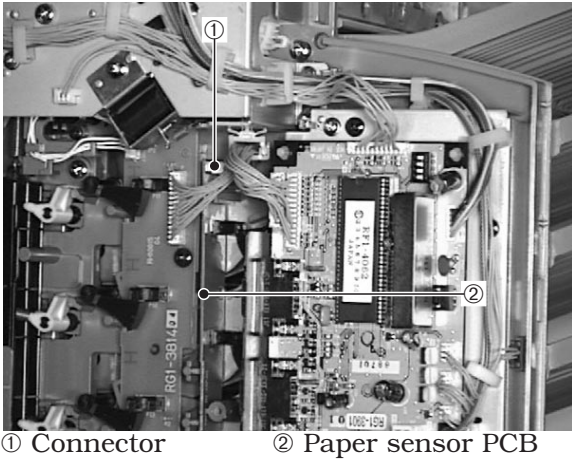
**C. Paper Sensor PCB**

- 1) Following the rear cover removal procedure on Page 3-2, remove the rear cover.
- 2) Remove the 2 screws and then the 2 PCB mounts.



**Figure 3-6-3**

- 3) Disconnect the connector, and then remove the paper sensor PCB.

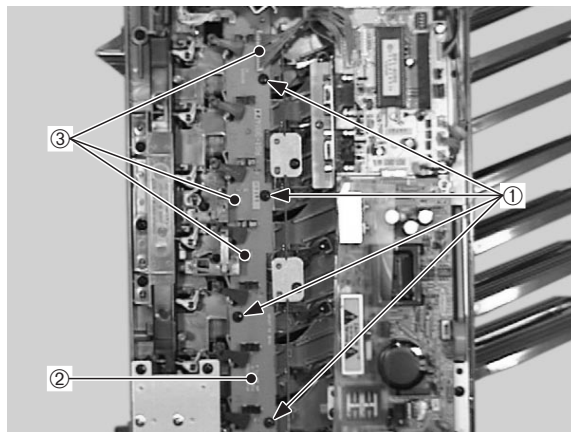


**Figure 3-6-4**



**D. Full-load Sensor PCB**

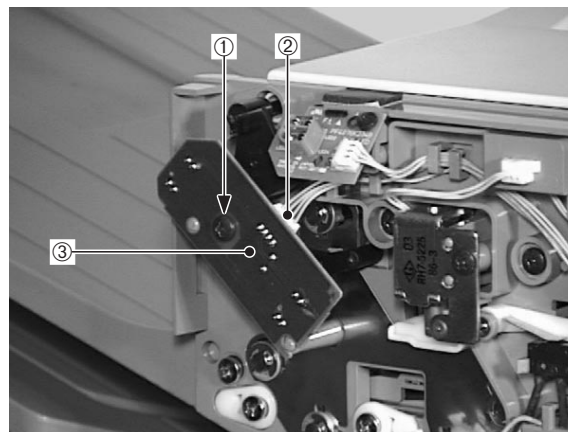
- 1) Following the rear cover removal procedure on Page 3-2, remove the rear cover.
- 2) Remove the 4 screws, disconnect the 4 connectors, and then take off the full-load sensor PCB.



- ① Screws
- ② Full-load sensor PCB
- ③ Connectors

**Figure 3-6-5****E. Face-up Sensor PCB**

- 1) Following the front cover removal procedure on Page 3-2, remove the front cover.
- 2) Remove the screw, disconnect the connector, and then take out the face-up sensor PCB.

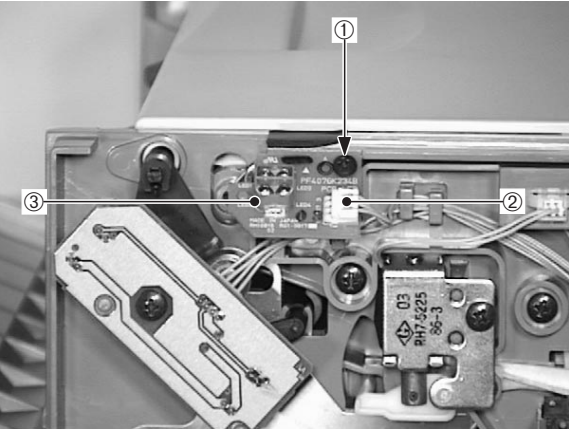


- ① Screw
- ② Connector
- ③ Face-up sensor PCB

**Figure 3-6-6**

**F. LED PCB**

- 1) Following the front cover removal procedure on Page 3-2, remove the front cover.
- 2) Remove the screw, disconnect the connector, and then take off the LED PCB.

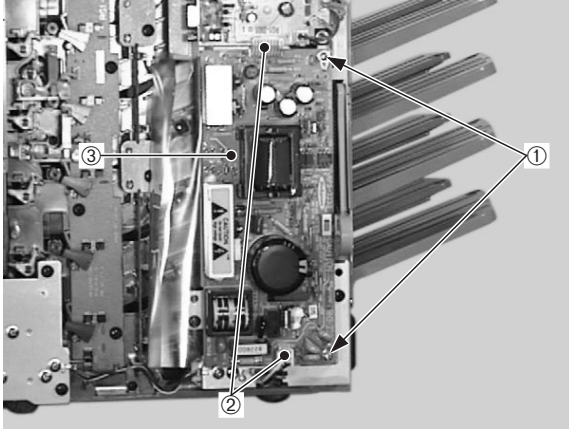


① Screw  
② Connector  
③ LED PCB

**Figure 3-6-7**

**G. Power Supply PCB**

- 1) Following the rear cover removal procedure on Page 3-2, remove the rear cover.
- 2) Remove the 2 screws, disconnect the 2 connectors, and then take out the power supply PCB.



① Screws  
② Connectors  
③ Power supply PCB

**Figure 3-6-8**

# **CHAPTER 4**

## **TROUBLESHOOTING**

<b>I. PREFACE .....</b>	<b>4-1</b>	<b>VI. MALFUNCTION STATUS</b>	
<b>II. SERVICE MODE .....</b>	<b>4-4</b>	<b>    TROUBLESHOOTING .....</b>	<b>4-15</b>
<b>III. PAPER JAM.....</b>	<b>4-9</b>	<b>VII. MEASUREMENT AND</b>	
<b>IV. PAPER TRANSPORT</b>		<b>    ADJUSTMENT .....</b>	<b>4-17</b>
<b>    TROUBLESHOOTING .....</b>	<b>4-13</b>	<b>VIII. MAINTENANCE AND</b>	
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<b>    TROUBLESHOOTING .....</b>	<b>4-14</b>	<b>IX. LOCATION OF CONNECTORS .</b>	<b>4-20</b>



## **I. PREFACE**

### **A. Malfunction Diagnosis Flowchart**

The malfunctions that occur in the sorter are broadly classified into four factors; "paper jams," "paper transport troubleshooting," "malfunction troubleshooting," and "malfunction status troubleshooting."

If a malfunction occurred in the sorter, the service technician is to find the factor according to the malfunction diagnosis flowchart and to clear the problem following the action procedure for each malfunction.

Make sure the following points at the execution of troubleshooting.

- Be sure that the connector has no poor contact when measuring the voltage at the specified terminal of the connector.
- Before handling PCBs, be sure to touch a metal part of the printer to discharge static electricity, as it can cause damage to the PCBs.

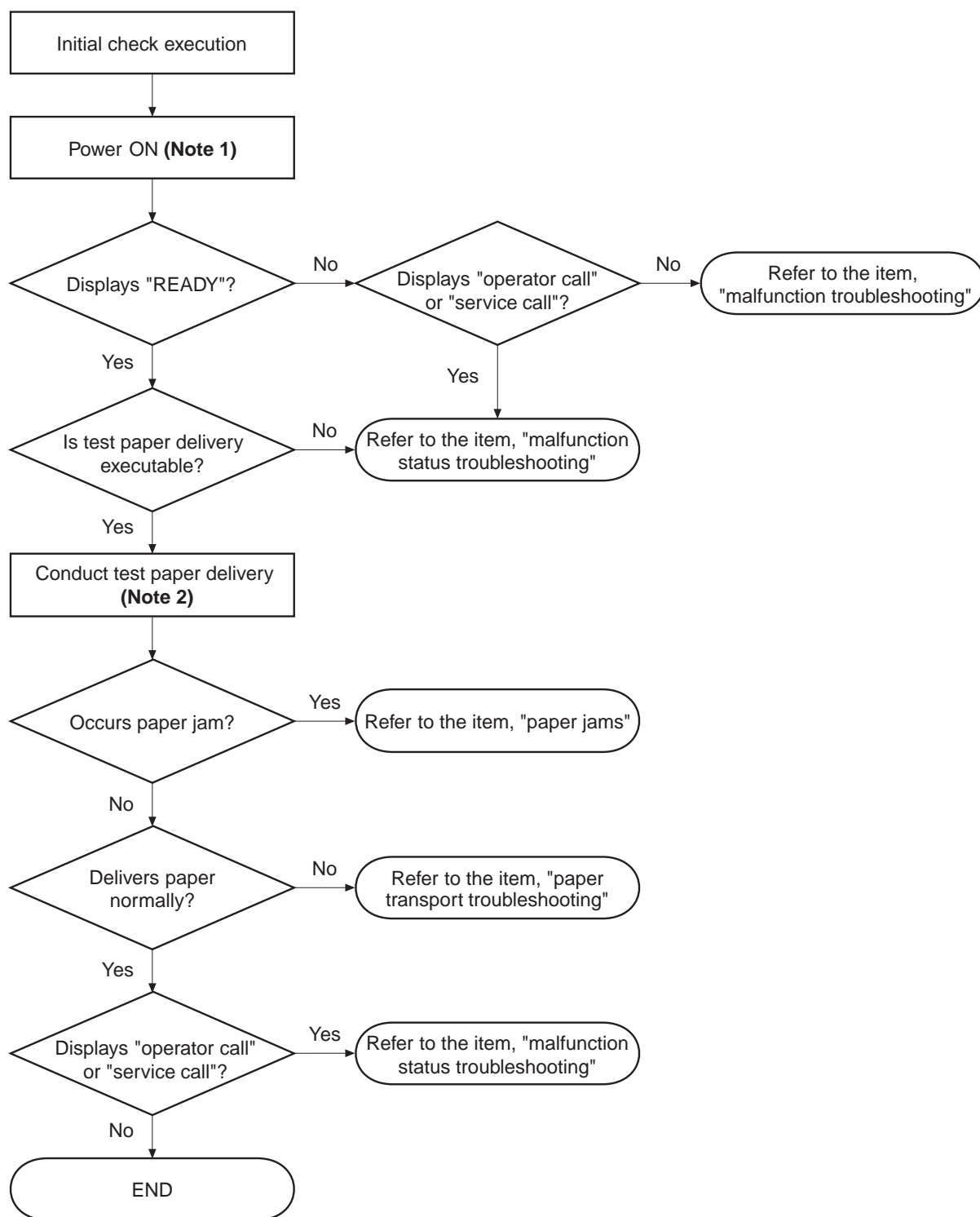


Figure 4-1-1

- Note:**
1. Turn ON the power by turning ON either the printer or the stand alone mode switch. To turn ON the stand alone mode switch, disconnect the power code of the sorter, remove the rear cover, and then connect the power code.
  2. Either select the sorter delivery from an external device or perform the self-drive mode 1 or 2 on Page 4-7.

**B. Initial Check****1. Installation environment**

Refer to the Service Manual for the printer.

**2. Paper checks**

- The recommended paper for the sorter is used.
- Paper is not damp.

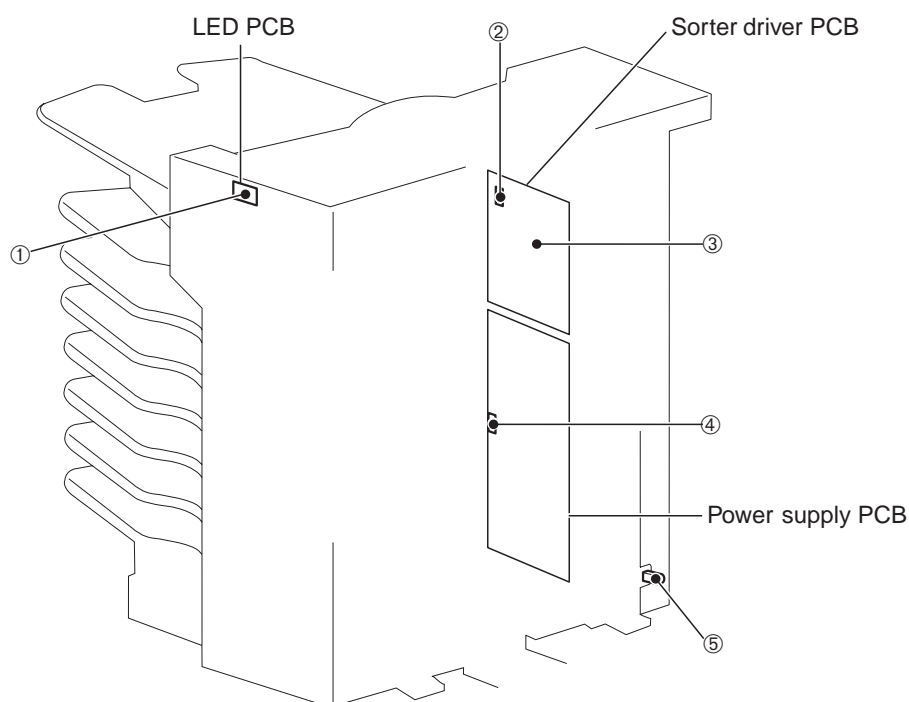
**3. Condensation**

During winter, particularly when moving the sorter into a warm room from a cold location such as a warehouse, various problems can occur due to condensation in the sorter.

When condensation was formed, either wipe the parts with dry cloth or leave the sorter ON for 10 to 20 minutes.

### II. SERVICE MODE

#### A. Outline



- ① Status LED
- ② Service LED
- ③ DIP switches

- ④ Stand alone mode switch
- ⑤ Joint sensor lever

**Figure 4-2-1**

The sorter has an status LED (LED1: LED PCB), which allows the user to check the condition of the sorter, and a service LED (LED1: sorter driver PCB), which allows the service technician to check the operation when a malfunction occurred in the sorter. The Service mode can be changed according to the combination of the DIP switches (SW1) on the sorter driver PCB.

The status LED can indicate the following 3 conditions of the sorter.

- 1) Green light ON: Normal communication between the sorter and printer.
- 2) Orange light flashing: Operator intervention is required due to problems like paper jam, door open, etc.
- 3) Orange light ON: Failure has occurred.

---

**Note:** The status LED is effective only when all of the DIP switches are OFF (as factory-setup).

---



## B. Service Mode

### 1. Service LED indications

Details of failures, errors, and other troubles of the sorter are indicated by the flashing frequencies of the service LED (LED1: lighting in red) on the sorter driver PCB. Refer to the table below for details.

The service LED flashes in the order of the header (flashing L times), contents of detection (flashing M times) and pause, which constitute one cycle of flashing indication.

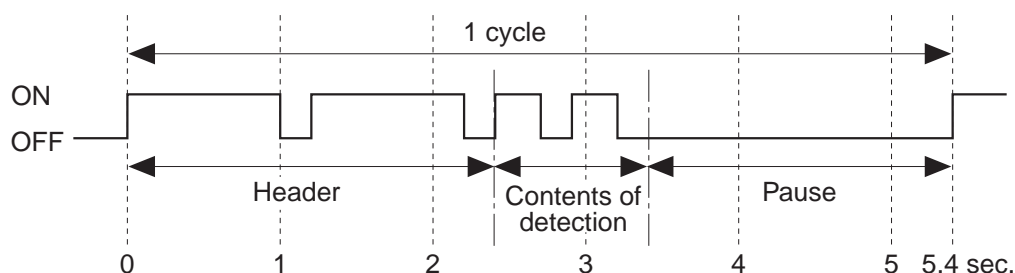
Service LED flashing intervals are as shown below.

- 1) Header (ON for 1.0 second, OFF for 0.2 seconds) x L
- 2) Contents of detection (ON for 0.3 seconds, OFF for 0.2 seconds) x M
- 3) Pause (OFF for 2.0 seconds)

When there is no failure, error or other trouble, the LED is kept ON during the warm up period and flashes after the period (ON for 0.5 seconds, OFF for 0.3 seconds).

- Example: Indication of entrance sensor paper early arrival jam

- 1) Header (flashing L times)  
(ON for 1.0 second, OFF for 0.2 seconds) x 2: Jam
- 2) Contents of detection (flashing M times)  
(ON for 0.3 seconds, OFF for 0.2 seconds) x 2: Entrance sensor paper early arrival jam
- 3) Pause (fixed)  
(OFF for 2.0 seconds)



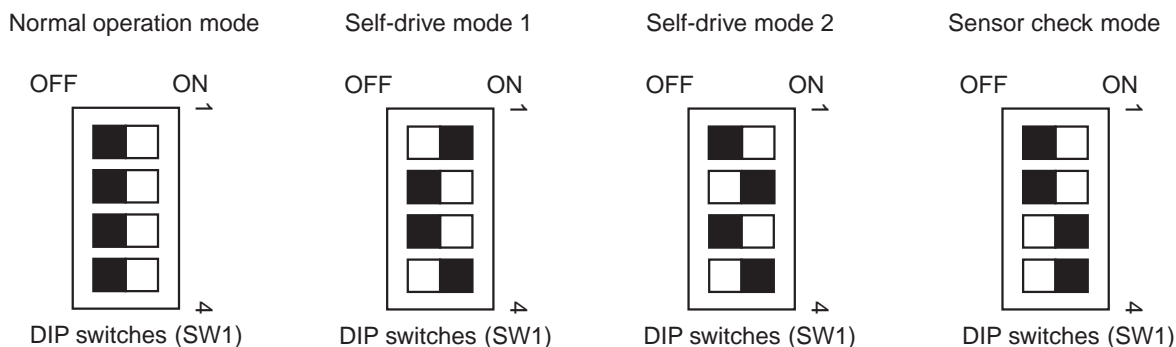
**Figure 4-2-2**

**Table 4-2-1**

Summary of error	Header: Flashing frequency (L)	Contents of detection: Flashing frequency (M)	Contents of error
Failure	3	1	Deflector solenoid 1, 2 failure
Jam	2	1 2 3 4 5 6 7 8 9 10	Residual paper jam Entrance sensor paper early arrival jam Entrance sensor delay jam Entrance sensor stationary jam Face-up delivery delay jam Face-up delivery stationary jam Reversed paper delay jam Reversed paper stationary jam Vertical path delay jam Vertical path stationary jam
Others	1	1 2	Door open Stop due to full-loading in self-drive mode.

### 2. Operation Check

When sensors, motors, switches or solenoids of the sorter are suspected to be defective or replaced, you can check whether they are operating normally or not by operating the DIP switches (SW1) on the sorter driver PCB. The operation check can be conducted in 3 modes: self-drive mode 1, 2 and sensor check mode according to the combinations of the DIP switches (SW1). The self-drive mode 1 and 2 send paper into the sorter to check the motors, switches, solenoids and sensors on the paper path. The sensor check mode allows you to check all the sensors.



**Figure 4-2-3**

Follow the procedure below to conduct the operation check.

- When the sorter is connected to the printer:
  - 1) Turn OFF the printer.
  - 2) Remove the rear cover of the sorter.
  - 3) Set the DIP switches to the service mode.
  - 4) Turn ON the printer.
  - 5) Following the procedure of each mode described in the following section, conduct the operation check.
- When the sorter is not connected to the printer.
  - 1) Remove the rear cover of the sorter.
  - 2) Set the DIP switches to the service mode.
  - 3) Turn ON the stand alone mode switch in the sorter power supply unit.
  - 4) Following the procedure of each mode described in the following section, conduct the operation check.

**a. Self-drive mode**

The self-drive mode consists of 2 modes: self-drive mode 1 and self-drive mode 2.

The self-drive mode 1 delivers the first sheet of paper to the face-up tray, 2nd sheet to the face-down bin 1, 3rd sheet to the face-down bin 2, and so forth. After the paper delivery to the face-down bin 7, the next sheet will be delivered to the face-up tray. When one of the bins becomes full, it stops feeding paper. If the uppermost DIP switch is turned OFF after executing the self-drive mode 1, it stops feeding paper when all the bins become full.

The self-drive mode 2 delivers paper to the face-down bin 7. When the bin 7 becomes full, it changes the delivery destination to the face-down bin 6. Every time the full-load condition is detected, it switches the bin to the bin 5, 4, ..., and face-up tray. When the face-up tray becomes full, it stops feeding paper.

In the self-drive mode 1 and 2, the paper transport is made possible by blocking the joint sensor (PI8: Full-load sensor PCB) to rotate the feed motor. When operating the sorter without printer, you need to press the joint sensor lever.

Follow the procedure below to perform the operation check. You can select either the self-drive mode 1 or 2. The self-drive mode 1 is more convenient to check the operation than the self-drive mode 2.

- 1) Set the DIP switches to either the self-drive mode 1 or 2. Then, turn ON either the printer or the stand alone mode switch.
- 2) If the feed motor does not rotate when the joint sensor is blocked, either the joint sensor or the feed motor is defective. In such a case, perform the sensor check mode to determine which one is defective.
- 3) Open the top cover and right cover with the joint sensor blocked.  
If the feed motor does not stop rotating at this point, either the top cover open/close detection switch or the right cover open/close detection switch is defective.
- 4) Deliver paper to the face-up tray. (If the sorter is connected to the printer, specify the face-up delivery from the printer and make test prints. If the sorter is operated without printer, insert paper to the sorter manually.)  
If the sorter stops at this point, the face-up deflector solenoid is defective.
- 5) Deliver paper to the face-down bins.  
If the sorter stops at this point, the reversing solenoid is defective.

### **b. Sensor check mode**

The sensor check mode allows you to check the following sensors.

Entrance sensor

Reversing sensor

Vertical path sensor

Deflector solenoid sensor

Full-load sensor 1 to 7

Joint sensor

Paper sensor 1 to 7

Face-up delivery sensor

Face-up full-load sensor

Follow the procedure below to perform the operation check.

- 1) Set the DIP switches to the sensor check mode.
- 2) Select one of the following 3 methods according to the sensor you wish to check.
  - a. Joint sensor  
With the sorter pulled away from the printer, turn ON either the power switch of the printer or the stand alone mode switch of the sorter.
  - b. Entrance sensor, face-up delivery sensor  
With the top cover open, turn ON either the printer or the stand alone mode switch of the sorter.
  - c. Reversing sensor, vertical path sensor, deflector solenoid sensor, full-load sensor 1 to 7, paper sensor 1 to 7.  
Turn ON either the printer or the stand alone mode switch of the sorter.
- 3) Shift the sensor lever of the sensor you wish you check and see if the service LED lights up. Be sure to shift only one sensor lever at a time as you cannot determine which one is defective if more than one sensor lever are sifted simultaneously.
- 4) If the service LED does not light up when you shift a sensor lever, the sensor is defective.

### III. PAPER JAM

If the factor of a malfunction was determined as "paper jam", check the block in which the paper jam occurred, find out the defective part and rectify the problem.

The paper path is broadly divided into 3 blocks: 1. face-up delivery block, 2. printer connecting block and 3. face-down delivery block.

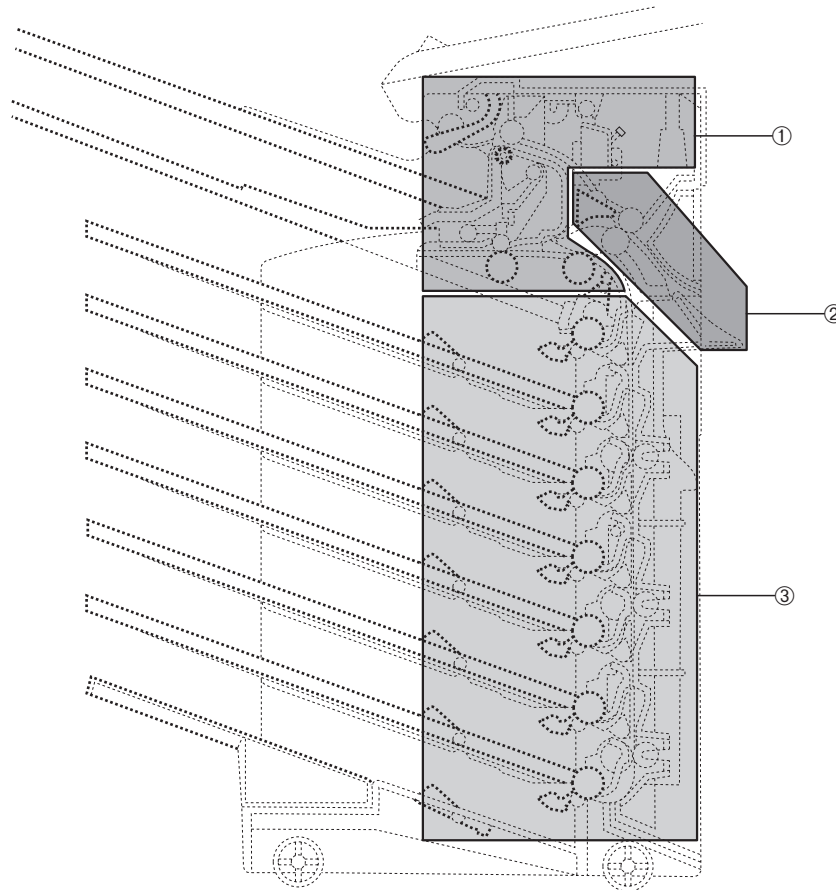


Figure 4-3-1

### J-1 Face-up delivery block

#### <Possible causes>

1. Worn/deformed/dirty face-up delivery roller  
**Action:** Clean the roller if dirty. Replace it if worn or deformed.
2. Worn/deformed/dirty reversing roller  
**Action:** Clean the roller if dirty. Replace it if worn or deformed.
3. Worn/deformed/dirty feed roller.  
**Action:** Clean the roller if dirty. Replace it if worn or deformed.
4. Face-up delivery sensor lever does not move smoothly or is damaged.  
**Action:** Replace the lever if damaged.
5. Defective face-up delivery sensor lever spring  
**Action:** Set the spring in the right position if it is out of place. Replace it if deformed or damaged.
6. Defective face-up delivery sensor  
**Action:** Perform the sensor check mode on Page 4-8 to see whether or not the sensor is in fact defective. Replace the face-up delivery sensor (PI1) if it is found defective.
7. Face-up full-load sensor lever does not move smoothly or is damaged.  
**Action:** Replace the lever if damaged.
8. Defective face-up full-load sensor lever spring  
**Action:** Set the spring in the right position if it is out of place. Replace it if deformed or damaged.
9. Defective face-up full-load sensor  
**Action:** Perform the sensor check mode on Page 4-8 to see whether or not the sensor is in fact defective. Replace the face-up full-load sensor (PI2) if it is found defective.
10. Poor contact in reversing solenoid drive signal line connector  
**Action:** Reconnect the connector J3 on the sorter driver PCB.
11. Defective reversing solenoid  
**Action:** Disconnect the reversing solenoid connector J3. Measure the resistance between J3-1 and J3-2 on the cable side. Replace the reversing solenoid if it is not about 120  $\Omega$ .
12. Defective sorter driver PCB  
**Action:** Replace the sorter driver PCB.

### J-2 Printer connecting block

#### <Possible causes>

1. Worn/deformed/dirty entrance roller  
**Action:** Clean the roller if dirty. Replace it if worn or deformed.
2. Entrance sensor lever does not move smoothly or is damaged.

**Action:** Replace the lever if damaged. If the problem persists after replacing the lever, replace the entrance sensor (PI9).

3. Defective entrance sensor lever spring

**Action:** Set the spring in the right position if it is out of place. Replace it if deformed or damaged.

4. Defective entrance sensor

**Action:** Perform the sensor check mode on Page 4-8 to see whether or not the sensor is in fact defective. Replace it if defective.

5. Defective face-up deflector

**Action:** Replace the deflector if worn, fractured or scarred.

6. Poor contact in face-up deflector solenoid drive line connector

**Action:** Reconnect the connector J2 on the sorter driver PCB.

7. Defective face-up deflector solenoid

**Action:** Disconnect the face-up deflector solenoid connector J2. Measure the resistance between the connector J2-1 and J2-2 on the cable side. Replace the face-up deflector solenoid if it is not about 100Ω.

8. Defective sorter driver PCB

**Action:** Replace the sorter driver PCB.

### J-3 Face-down delivery block

#### <Possible causes>

1. Worn/deformed/dirty face-down delivery roller

**Action:** Clean the roller if dirty. Replace it if worn or deformed.

2. Full-load sensor lever does not move smoothly or is damaged.

**Action:** Replace the lever if damaged. If the problem persists after replacing the lever, replace the full-load sensor PCB.

3. Defective full-load sensor lever spring

**Action:** Set the spring in the right position if it is out of place. Replace it if deformed or damaged.

4. Defective full-load sensor

**Action:** Perform the sensor check mode on Page 4-8 to see whether or not the sensor is in fact defective. Replace the full-load sensor PCB if the sensor is found defective.

5. Paper sensor lever does not move smoothly or is damaged.

**Action:** Replace the lever if damaged. If the problem persists after replacing the lever, replace the paper sensor PCB.

6. Defective paper sensor lever spring

**Action:** Set the spring in the right position if it is out of place. Replace it if deformed or damaged.

7. Defective paper sensor

**Action:** Perform the sensor check mode on Page 4-8 to see whether or not the sensor is in fact defective. Replace the paper sensor PCB if the sensor is found defective.

8. Reversing sensor lever does not move smoothly or is damaged.

**Action:** Replace the lever if damaged. If the problem persists after replacing the lever, replace the reversing sensor (PI10).

9. Defective reversing sensor lever spring

**Action:** Set the spring in the right position if it is out of place. Replace it if deformed or damaged.

10. Defective reversing sensor

**Action:** Perform the sensor check mode on Page 4-8 to see whether or not the sensor is in fact defective. Replace the sensor if defective.

11. Vertical path sensor lever does not move smoothly or is damaged.

**Action:** Replace the lever if damaged. If the problem persists after replacing the lever, replace the vertical path sensor (PI11).

12. Defective vertical path sensor lever spring

**Action:** Set the spring in the right position if it is out of place. Replace it if deformed or damaged.

13. Defective vertical path sensor

**Action:** Perform the sensor check mode on Page 4-8 to see whether or not the sensor is in fact defective. Replace the sensor if defective.

14. Defective face-down deflector

**Action:** Replace the deflector if worn, fractured or scarred.

15. Defective sorter driver PCB

**Action:** Replace the sorter driver PCB.



## IV. PAPER TRANSPORT TROUBLESHOOTING

### T-1 Wrinkles

#### <Possible causes>

1. Worn or deformed roller

**Action:** Check the rollers and replace any worn or deformed roller.

### T-2 Bent leading edge

#### <Possible causes>

1. Scarred or deformed feed guide

**Action:** Check the paper path and replace any scarred or deformed feed guide.

### T-3 Skew

#### <Possible causes>

1. Paper dust and dirt are accumulated on the paper path.

**Action:** Clean the dirty area.

2. Scarred or deformed roller

**Action:** Replace any scarred or deformed roller.

### V. MALFUNCTION TROUBLESHOOTING

#### N-1 No power

##### <Possible causes>

1. No POWER-ON signal is input due to poor contact in interface connector.  
**Action:** Reconnect the interface connector.
2. Blown fuse  
**Action:** Remove the power supply unit and replace the fuse.
3. Overcurrent/overvoltage protective circuits have been activated.  
**Action:** Turn OFF the power, reconnect the power connector correctly, and then turn ON the power again. If the problem persists, find out the cause of the activation of the overcurrent/overvoltage protective circuits. Wait for more than 2 minutes before turning ON the power again.
4. Defective power supply unit  
**Action:** Turn OFF the printer and then disconnect the connector J10 from the power supply unit. Turn ON the printer and measure the output of the DC power source circuit of the connector J10, taking care to avoid short circuit. If specified output is not obtained, replace the power supply unit.
5. Wiring, DC load and sorter driver PCB  
**Action:** Turn OFF the printer and check the wiring and DC load ahead of the sorter driver PCB. If no problem was found with wiring and DC load, replace the sorter driver PCB.

#### N-2 Feed motor failure

##### <Possible causes>

1. Poor contact in feed motor drive signal line  
**Action:** Reconnect the connector J501 on the feed motor and the connector J1 on the sorter driver PCB.
2. Defective feed motor  
**Action:** Replace the feed motor.
3. Defective sorter driver PCB  
**Action:** Replace the sorter driver PCB.

## VI. MALFUNCTION STATUS TROUBLESHOOTING

### M-1 Face-down deflector solenoid 1, 2 failure

#### <Possible causes>

1. Poor contact in face-down deflector solenoid 1 drive signal line connector.  
**Action:** Reconnect the connector J2 on the sorter driver PCB.
2. Poor contact in face-down deflector solenoid 2 drive signal line connector.  
**Action:** Reconnect the connector J4 on the sorter driver PCB.
3. Defective face-down deflector solenoid 1  
**Action:** Disconnect the face-down deflector solenoid 1 connector J4. Measure the resistance between the connector J4-1 and J4-2 on the cable side. If it is not about 80Ω, replace the deflector solenoid unit.
4. Defective face-down deflector solenoid 2  
**Action:** Disconnect the face-down deflector solenoid 2 connector J4. Measure the resistance between the connector J4-3 and J4-4 on the cable side. If it is not about 80Ω, replace the deflector solenoid unit.
5. Defective sorter driver PCB  
**Action:** Replace the sorter driver PCB.

### M-2 The printer cannot become READY because the sorter outputs "Jam status" when paper is not jammed.

#### <Possible causes>

1. Entrance sensor lever does not move smoothly or is damaged.  
**Action:** Set the lever correctly so that it moves smoothly. Replace the lever if damaged.
2. Reversing sensor lever does not move smoothly or is damaged.  
**Action:** Set the lever correctly so that it moves smoothly. Replace the lever if damaged.
3. Vertical path sensor lever does not move smoothly or is damaged.  
**Action:** Set the lever correctly so that it moves smoothly. Replace the lever if damaged.
4. Deflector solenoid sensor lever does not move smoothly or is damaged.  
**Action:** Set the lever correctly so that it moves smoothly. Replace the lever if damaged.
5. Defective sensor  
**Action:** Perform the sensor check mode on Page 4-8 and replace any defective sensor.

### **M-3 The printer cannot become READY because the sorter outputs "Door open status" when the covers are closed.**

#### **<Possible causes>**

1. Projection on the top cover unit, which presses the top cover open/close detection switch, is damaged.  
**Action:** Replace the part with the projection.
2. Joint sensor lever does not move smoothly or is damaged.  
**Action:** Set the lever correctly so that it moves smoothly. Replace the lever if damaged.
3. Defective joint sensor  
**Action:** Perform the sensor check mode on Page 4-8 and replace the full-load sensor PCB if the joint sensor was found defective.
4. Poor contact in connectors  
**Action:** Reconnect the connector J601 on the cover open/close detection switch unit and the connector J11 on the sorter driver PCB.
5. Defective top or right cover open/close detection switch  
**Action:** Replace the defective cover open/close detection switch unit.
6. Defective sorter driver  
**Action:** Replace the sorter driver

## VII. MEASUREMENT AND ADJUSTMENT

### A. Mechanical Adjustment

No adjustment is required for the mechanical system of this sorter.

### B. Electrical Adjustment

No adjustment is required for the electrical system of this sorter.

### C. LEDs, Test Pins, Jumpers and Switches on PCBs

Only the LEDs, test pins, jumpers, and switches required for after-sales service in the field are listed below.

All other test pins, etc. are for the factory use only. The adjustment and check using these test pins, etc. require special tools, measuring instruments and high precision. Do not touch them in the field.

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**Note:** Some LEDs receive leakage current during normal operation, thus glow dimly even when they should be OFF.

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1. Sorter driver PCB

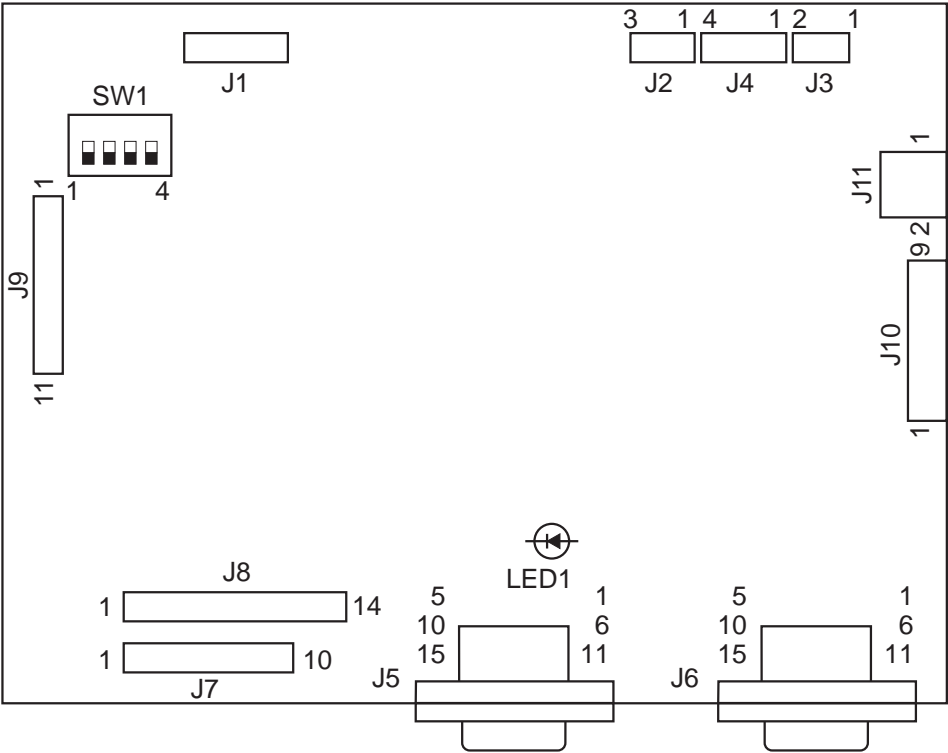


Figure 4-7-1

Table 4-7-1

No.		Function
SW1	1	Various check can be conducted by turning ON/OFF the DIP switches. Refer to Figure 4-2-3 on Page 4-6 for the operation check.
	2	
	3	
	4	
LED1		Indicates condition of the sorter.

## VIII. MAINTENANCE AND SERVICING

### A. Periodic Replacement Parts

No parts require periodic replacement in this sorter.

**Note:** Periodic replacement parts are the parts that must be replaced at regular intervals, even if they are functioning properly and show no signs of wear. (Failure of these parts can seriously affect the performance.) These parts should be replaced during a regular service visit closest to the end of the parts expected life.

### B. Expected Service Life of Consumable Parts

No consumable parts in this sorter.

**Note:** Consumable parts are the parts that can be used until they become defective.

### C. Periodic Service

The sorter has no parts that require periodic servicing.

### D. Standard Tools

The standard tools that are required to service the sorter are the same as that for the printer.

### E. Special Tools

No special tools required for this sorter.

### F. List of Lubricants and Cleaners

**Table 4-8-1**

No.	Material name	Components	Use	Remarks
1	Alcohol: ethyl (pure or denatured) or isopropyl (pure or denatured)	$C_2H_5OH$ , $(CH_3)_2CHOH$	Cleaning: plastic, rubber, external parts	<ul style="list-style-type: none"> <li>• Purchase locally</li> <li>• Flammable: keep away from flame</li> </ul>
2	MEK (methyl ethyl ketone)	$CH_3CO-C_2H_5$	Cleaning: oil and toner stains	<ul style="list-style-type: none"> <li>• Purchase locally</li> <li>• Highly flammable: keep away from flame</li> </ul>
3	Lubricating agent	Special oil Special solid lubricating material Lithium soap	Apply to gears	<ul style="list-style-type: none"> <li>• Tool No. HY9-0007 (20 g tube)</li> </ul>

**Note:** After using solvent, wipe it out completely.

IX. LOCATION OF CONNECTORS

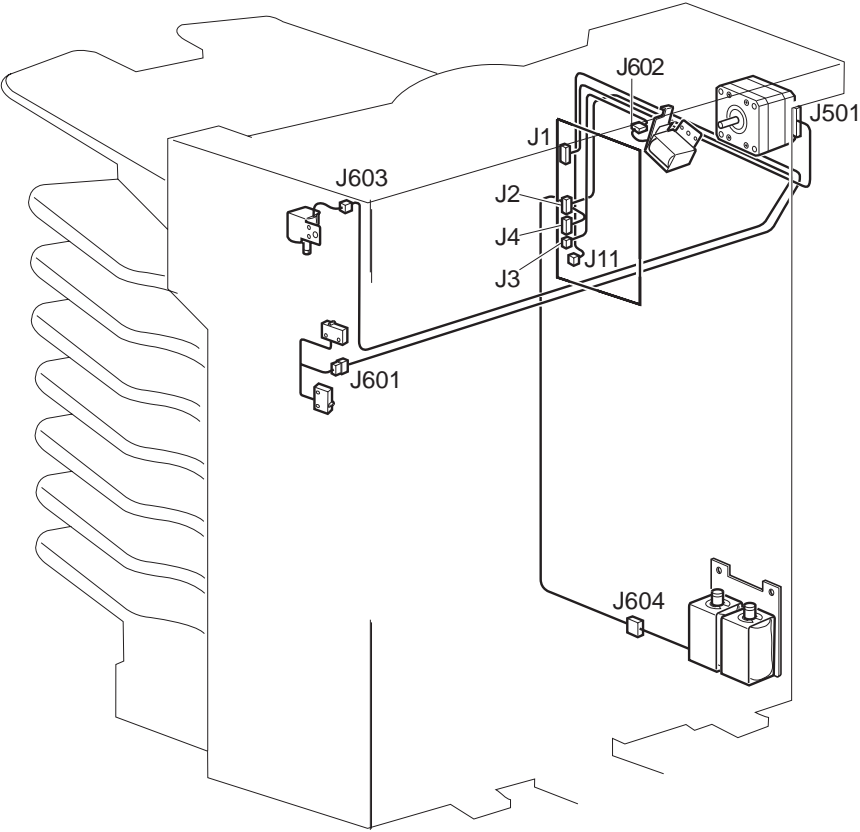


Figure 4-9-1



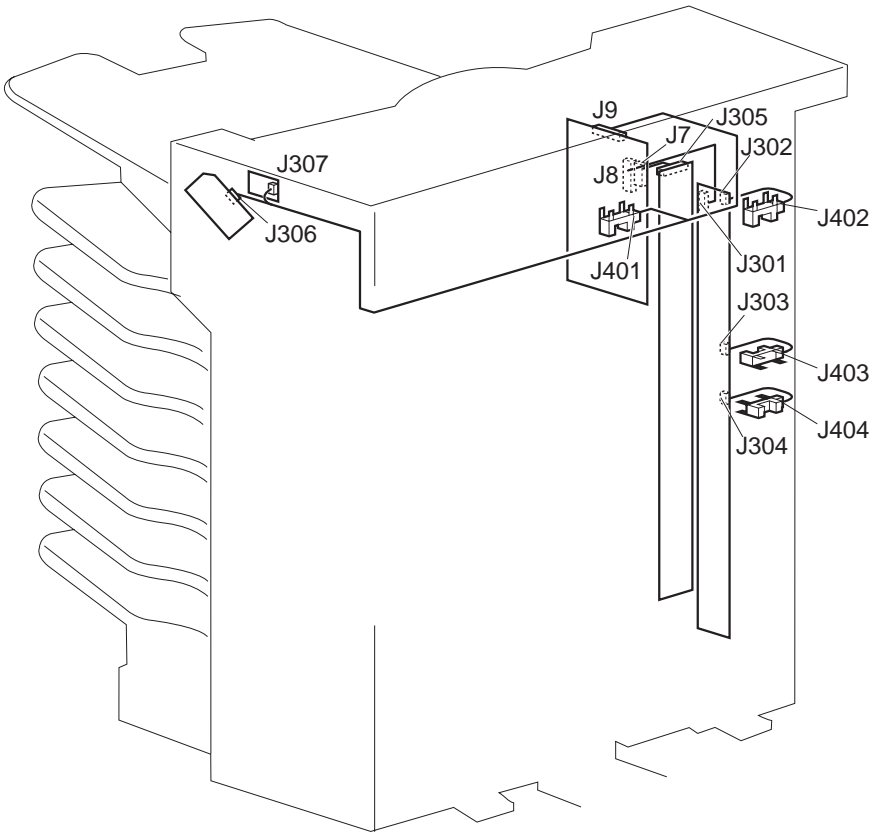


Figure 4-9-2



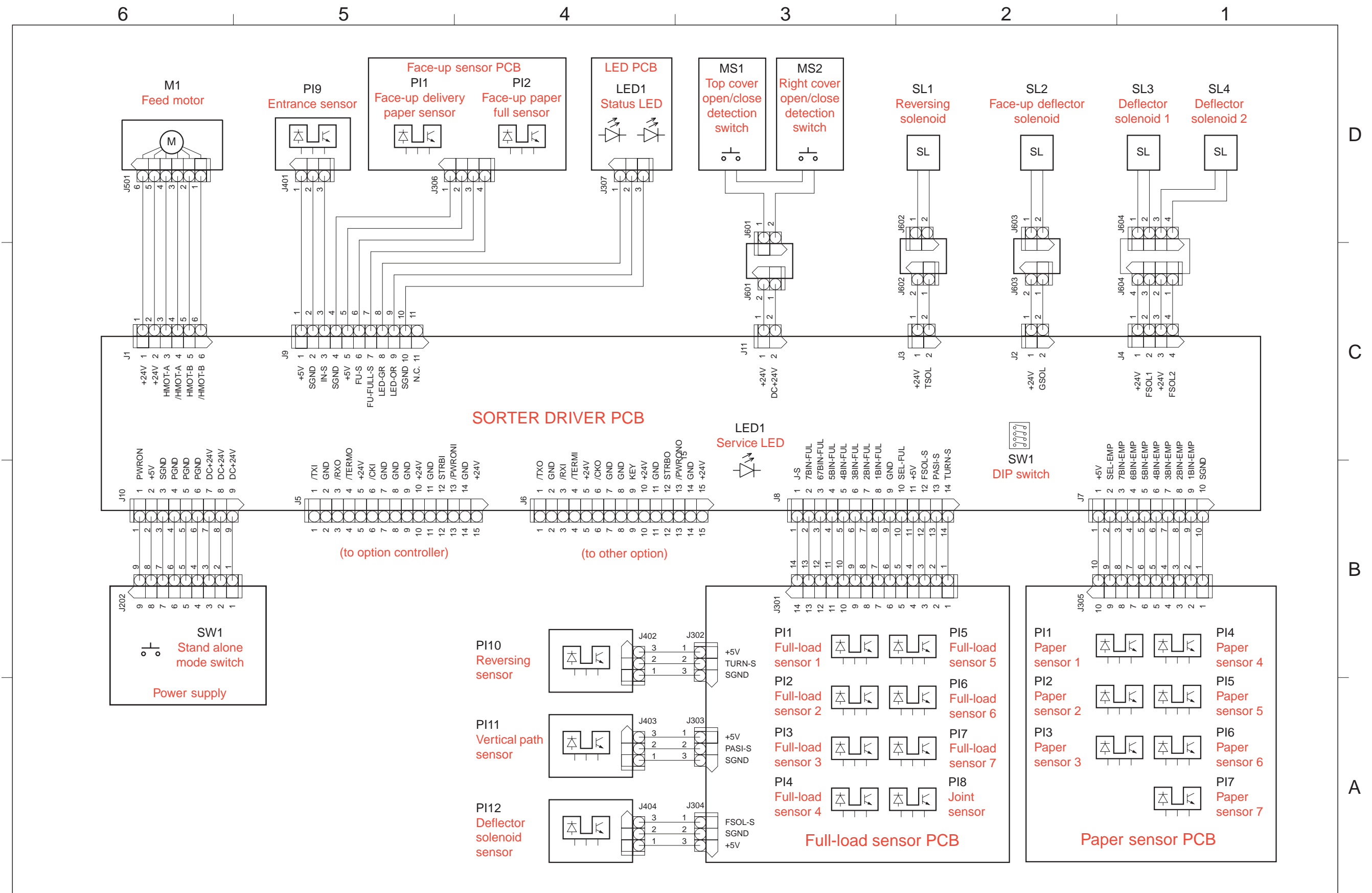
# **APPENDIX**

**I. GENERAL CIRCUIT DIAGRAM A-1**

**II. LIST OF SIGNALS..... A-3**



## I. GENERAL CIRCUIT DIAGRAM





## II. LIST OF SIGNALS

### A. Input/output signals to sorter driver PCB

Connector	Pin	Abbreviation	I/O	Logic	Signal name
J1	1	+24V			
	2	+24V			
	3	HMOY-A	O		Feed motor control signal
	4	/HMOY-A	O		Feed motor control signal
	5	HMOY-B	O		Feed motor control signal
	6	/HMOY-B	O		Feed motor control signal
J2	1	+24V			
	2	GSOL	O	H	Face-up deflector solenoid drive signal
J3	1	+24V			
	2	TSOL	O	H	Reversing solenoid drive signal
J4	1	+24V			
	2	FSOL1	O	H	Face-down deflector solenoid 1 drive signal
	3	+24V			
	4	FSOL2	O	H	Face-down deflector solenoid 2 drive signal
J5	1	/TXI	I	L	Serial input signal
	2	GND			
	3	R XO	O	L	Serial output signal
	4	/TERMO	O	L	Communication ready signal
	5	+24V			
	6	/CKI	I	L	Synchronizing clock signal
	7	GND			
	8	GND			
	9	GND			
	10	+24V			
	11	GND			
	12	STRBI	I	L	Strobe signal
	13	/PWRONI	I	L	POWER ON signal
	14	GND			
	15	+24V			
J6	1	/TXO	O	L	Serial output signal
	2	GND			
	3	/RXI	I	L	Serial input signal
	4	/TERMI	I	L	Communication ready signal
	5	+24V			
	6	/CKO	I	L	Synchronizing clock signal
	7	GND			
	8	GND			
	9	KEY			
	10	+24V			
	11	GND			
	12	STRBO	O	L	Strobe signal
	13	/PWRONO	O	H	POWER ON signal
	14	GND			
	15	+24V			

Connector	Pin	Abbreviation	I/O	Logic	Signal name
J7	1	+5V			
	2	SEL-EMP	I	H	Paper detection signal
	3	7BIN-EMP	I	H	Paper detection signal 7
	4	6BIN-EMP	I	H	Paper detection signal 6
	5	5BIN-EMP	I	H	Paper detection signal 5
	6	4BIN-EMP	I	H	Paper detection signal 4
	7	3BIN-EMP	I	H	Paper detection signal 3
	8	2BIN-EMP	I	H	Paper detection signal 2
	9	1BIN-EMP	I	H	Paper detection signal 1
	10	SGND			
J8	1	J-S	I	H	Joint detection signal
	2	7BIN-FUL	I	H	Full-load detection signal 7
	3	6BIN-FUL	I	H	Full-load detection signal 6
	4	5BIN-FUL	I	H	Full-load detection signal 5
	5	4BIN-FUL	I	H	Full-load detection signal 4
	6	3BIN-FUL	I	H	Full-load detection signal 3
	7	2BIN-FUL	I	H	Full-load detection signal 2
	8	1BIN-FUL	I	H	Full-load detection signal 1
	9	SGND			
	10	SEL-FUL	I	H	Full-load detection signal
	11	+5V			
	12	FSOL-S	I	H	Face-down deflector open/close detection signal
	13	PASI-S	I	H	Vertical path paper detection signal
	14	TURN-S	I	H	Reversed paper detection signal
J9	1	+5V			
	2	SGND			
	3	IN-S	I	H	Entrance paper detection signal
	4	SGND			
	5	+5V			
	6	FU-S	I	H	Face-up delivery paper detection signal
	7	FU-FULL-S	I	H	Face-up paper full-load detection signal
	8	LED-GR	O		Status LED control signal
	9	LED-OR	O		Status LED control signal
	10	SGND			
	11	N.C.			
J10	1	PWRON	O	H	POWER ON signal
	2	+5V			
	3	SGND			
	4	PGND			
	5	PGND			
	6	PGND			
	7	DC+24V			
	8	DC+24V			
	9	DC+24V			
J11	1	+24V			
	2	DC+24V			



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