

STAPLER STACKER SS-72

SERVICE MANUAL

REVISION 0

Canon

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PREFACE

This Service Manual contains basic information required for after-sales service of the Stapler stacker SS-72. This information is vital to the service technician in maintaining the high print quality and performance of the stacker.

This manual consists of the following chapters:

Chapter 1: Product information

Features, specifications, 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

Troubleshooting procedures, measurement and adjustments, maintenance and servicing, etc.

Appendix: General circuit diagram and 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 the Service Information Bulletins.

A thorough understanding of this stapler stacker, 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 DAINIPPON SCREEN MFG CO. LTD DT-R3100.

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CHAPTER 1

PRODUCT INFORMATION

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I. FEATURES

1. Large-capacity output trays

The stacker has 3 bins, each of which can hold up to 670 sheets of A4 or Letter size paper (64 g/m²). Using the all 3 bins, total of up to about 2,000 sheets of paper can be stacked.

2. Job offset

This feature shifts the very first page of each job to one side when it is output and groups the printed paper in the tray by the job.

3. Stapling mechanism

By the control signal from an external device, stapling positions on the leading edge of the paper can be selected from two points in the middle, one point on the nearer corner and one point on the farther corner.

II. SPECIFICATIONS

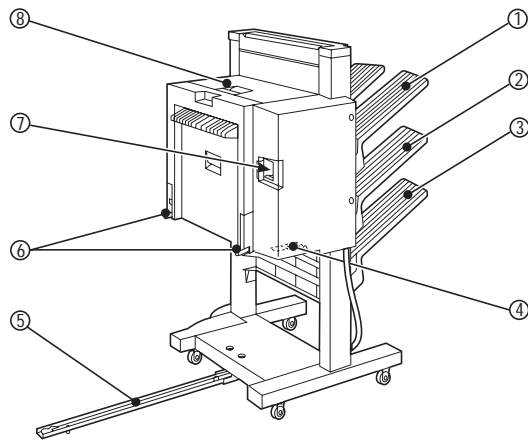
Stacking method	3-tray ascending/descending type
Number of trays	3
Paper delivery	Face-down or face-up
Stacking types	
Face-down	Simple stacking, job offset or stapled
Face-up	Simple stacking
Paper types (Note 1)	Plain paper, colored paper, thick paper, labels, OHT, envelopes
Paper sizes	Plain paper of A3, B4, A4, A4R, B5R, A5R, Ledger, Legal, Letter, Letter-R and Executive-R size and 98.4mm × 190.5mm (min.) ~ 297mm × 432mm (max.) (64 ~ 128 g/m ² recommended paper)
	Envelopes for Monarch, COM-10, DL, B5, C5
	Envelopes of 98.4mm × 190.5mm (min.) ~ 176mm × 250mm (max.)
Tray capacity	All trays: Approx. 670 sheets of 64 g/m ² paper (A4 or Letter size plain paper)
	(Total max. 2,000 sheets)
Stapler unit	
Staple type	Exclusive for Stapler stacker
Staple replacement	Cartridge type
Cartridge capacity	2000 staples/cartridge
Number of sheets stapled	2 ~ 20 sheets of 64 g/m ² paper per set per tray (Max. 30 sets or 300 sheets)
Stapling positions	One point diagonal (nearer corner or farther corner), one point parallel (farther corner) or two points parallel (middle)
Paper sizes	A3, B4, A4, A4R, B5R, A5R, Ledger, Legal, Letter, Letter-R, Executive-R
Power consumption	Max. about 150W or less (with 20°C room temperature and a rated voltage)
Noise level (Officially announced level based on ISO 9296) (Note 2)	Sound power level (1B=10dB) 7.2B or less (printing) 5.3B or less (standby)
	Sound pressure level (Bystander position) 56dB or less (printing) 38dB or less (standby)
Dimensions (Note 3)	641 (W) × 678 (D) × 1013 (H) mm
Weight	About 32 kg
Line voltage requirements	100 - 127V (-10%, +6%) 50/60Hz (±2Hz) 220 - 240V (-10%, +6%) 50/60Hz (±2Hz)

- Notes:** 1. Envelopes are delivered face-up to Tray 3.
2. When stapler stacker is installed to printer.
3. The height is 1180mm when it is fully extended.

Specifications are subject to change with product modification.

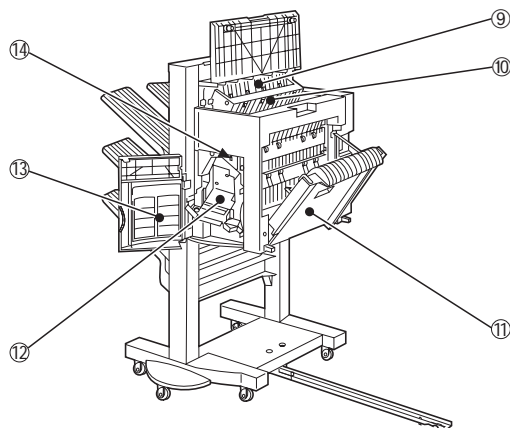
III. PARTS OF THE STAPLER STACKER

A. External Views



- 1: Delivery bin 1
- 2: Delivery bin 2
- 3: Delivery bin 3
- 4: Option interface connector
- 5: Guide rail
- 6: Latches
- 7: Power receptacle
- 8: Upper cover

Figure 1-3-1



- 9: Upper guide
- 10: Center guide
- 11: Right cover unit
- 12: Stapler unit
- 13: Front cover
- 14: Staple test switch

Figure 1-3-2

B. Cross Sectional View

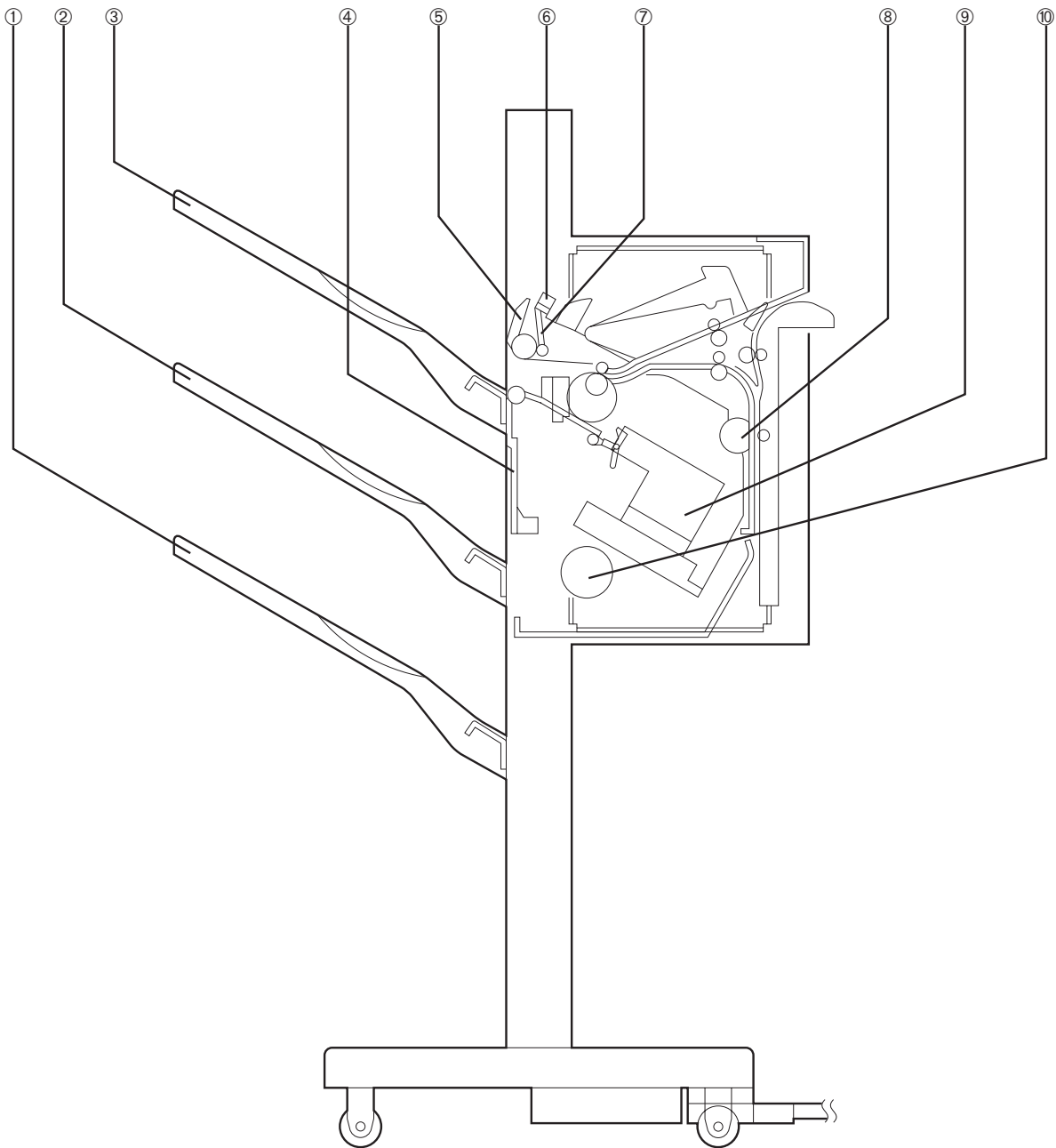


Figure 1-3-3

- | | |
|-------------------|-----------------------------|
| 1: Delivery bin 3 | 6: Distance sensor |
| 2: Delivery bin 2 | 7: Paddle |
| 3: Delivery bin 1 | 8: Reversing roller |
| 4: Shutter | 9: Stapler unit |
| 5: Swing guide | 10: Tray unit up/down motor |

IV. INSTALLATION

A. Notes

Use the following power supplies;

- Line voltage (AC): -10%, +6% of rated voltage
- Power frequency: 50/60Hz \pm 2Hz

B. Unpacking and installation

If the boxed stapler stacker is brought into the warm from a cold storeroom, condensation will form on the stapler stacker surfaces. This will cause various problems, such as transport errors. To stop this happening, make sure you leave the stapler stacker in its box to gradually warm up to room temperature before unpacking it. This will take at least an hour.

1. Unpacking the stable stacker

- 1) Open the stable stacker package and remove the carton.
- 2) Check that the following are present.

① Trays	② Screws	③ Grounding adapter
④ Paper delivery slot adapter	⑤ Guide rail	⑥ Cable holder
⑦ Interface cable	⑧ Manuals	
- 3) Have two persons lift and erect the stable stacker. Two persons are required to do so because the stacker moves easily on casters.

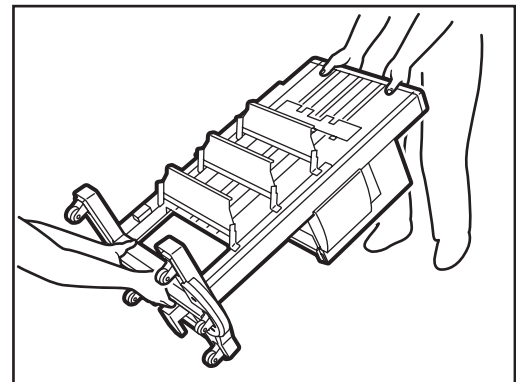
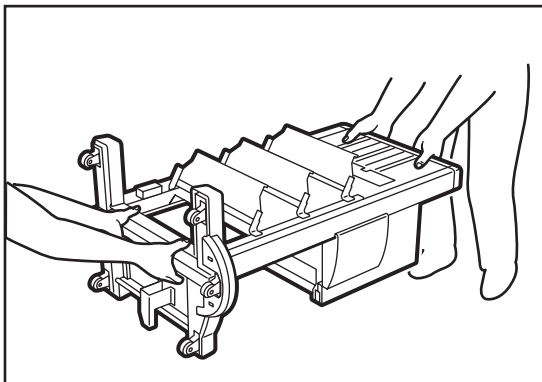


Figure 1-4-1

- 4) Remove the plastic bag from the stable stacker and peel the tape off it. Confirm that the covers were not damaged or deformed during transport.
- 5) Open the front cover and remove two packings.
- 6) Open the top cover and remove packings.

- 7) Insert the projections of the bin into the mounting holes in the stacker (1) and push it down (2).

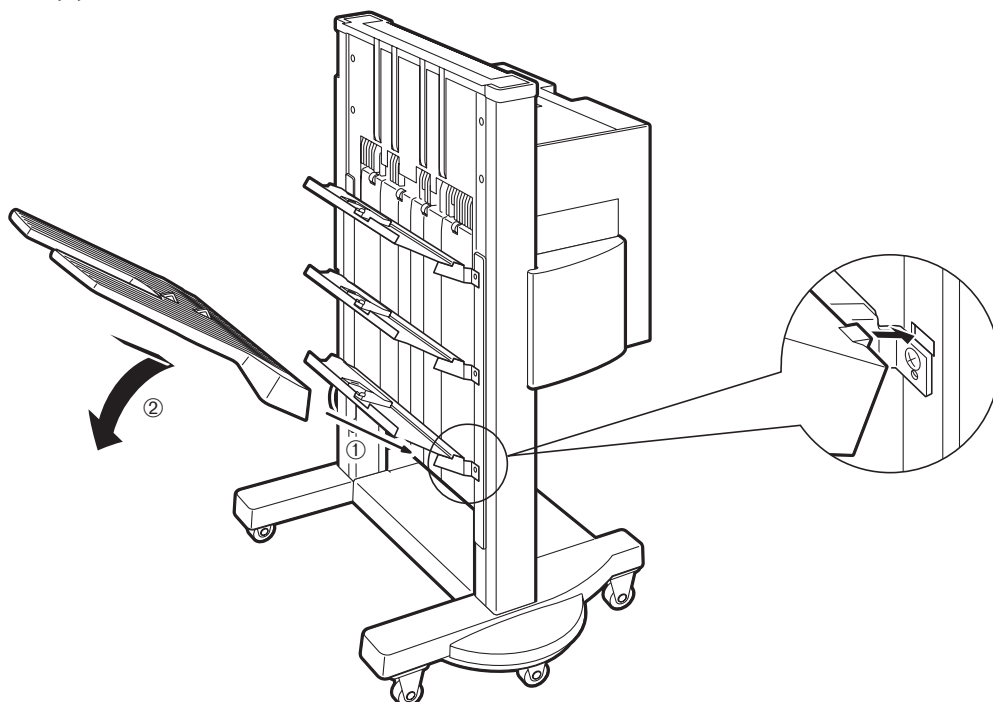


Figure 1-4-2

- 8) Secure the bin on the stacker with the supplied screws (3).

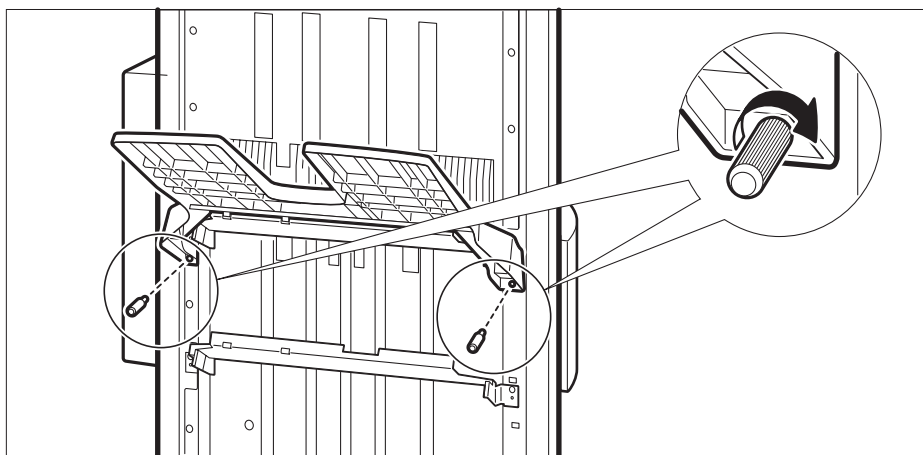
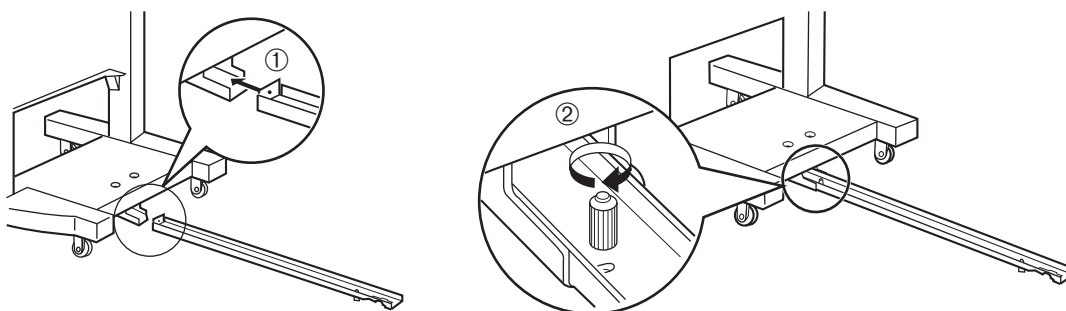


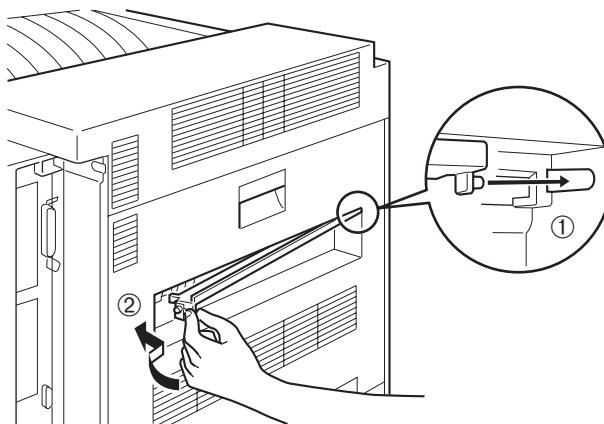
Figure 1-4-3

2. Installing the staple stacker on the stapler stacker

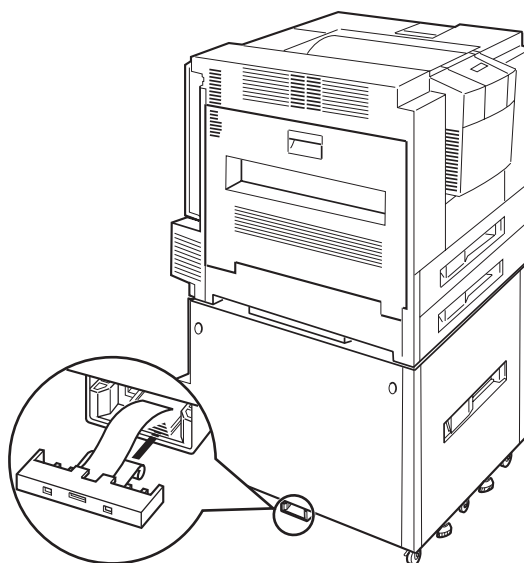
- 1) Move the staple stacker to the printer, attach the guide rail along the staple stacker guide (1) and secure it with the supplied screw (2).

**Figure 1-4-4**

- 2) Attach the paper delivery adapter to the face-up delivery slot of the printer.

**Figure 1-4-5**

- 3) Attach the ground adapter to the paper deck guide.

**Figure 1-4-6**

- 4) Connect the rail of stapler stacker to the guide of paper deck.

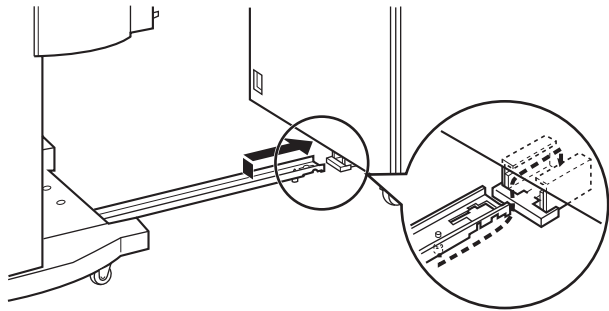


Figure 1-4-7

- 5) Insert the cord holder between the printer and paper deck as shown.

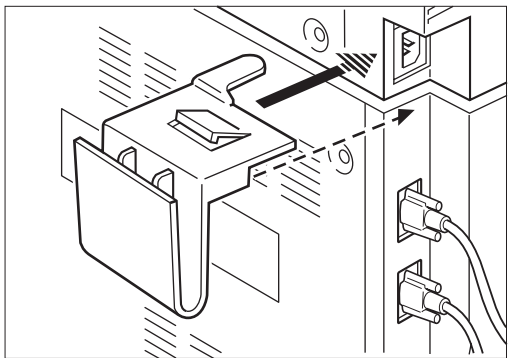


Figure 1-4-8

- 6) Connect the 14-pin connector of the interface cable to the paper deck and the 15-pin connector to the stapler stacker.

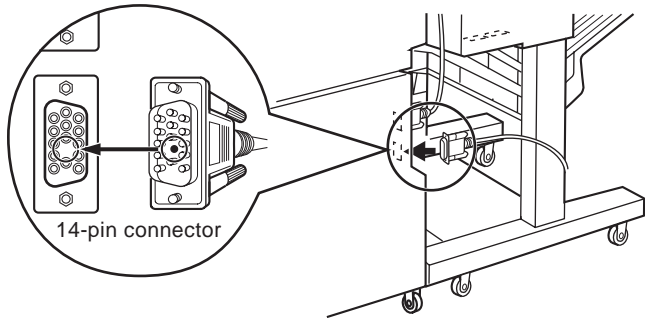


Figure 1-4-9

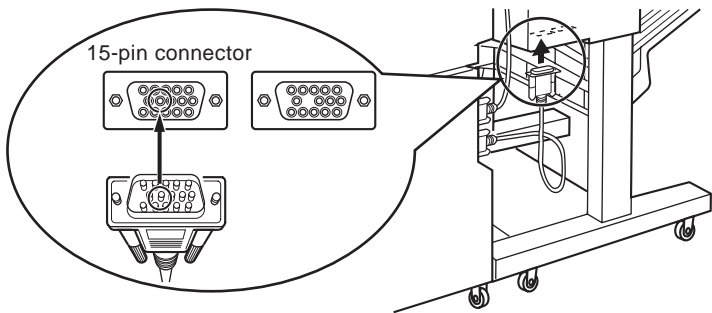


Figure 1-4-10

Note: Be aware that connectors on the both ends of the interface connector differ in shape, 15-pin and 14-pin, as shown below.

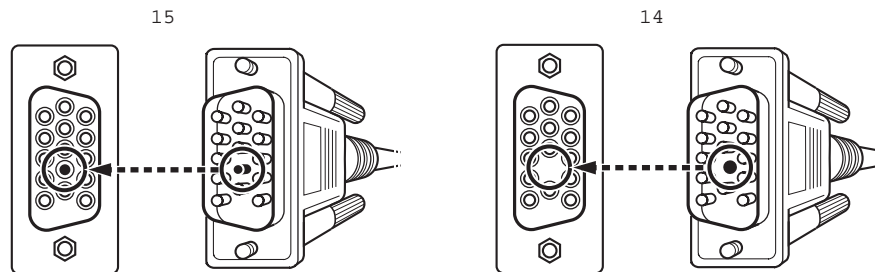


Figure 1-4-11

- 7) Plug the power cord to the stapler stacker and power socket, and then put the cord in the cord holder.

D. Paper Jams

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

1. Paper jams in the reversing unit

- 1) Separate the stapler stacker from the printer.

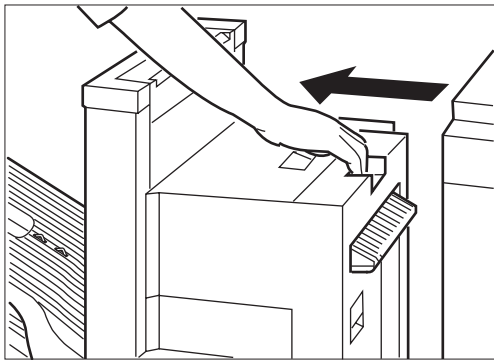


Figure 1-4-12

- 2) Remove the jammed paper.

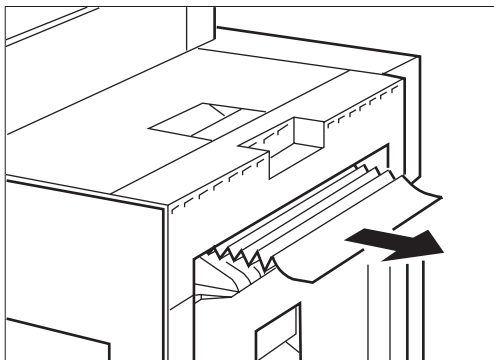


Figure 1-4-13

- 3) If jammed paper cannot be removed, open the reversing guide and remove it.

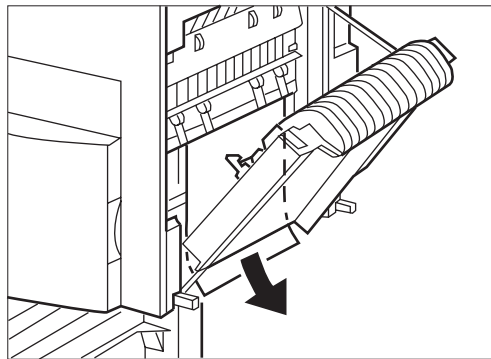


Figure 1-4-14

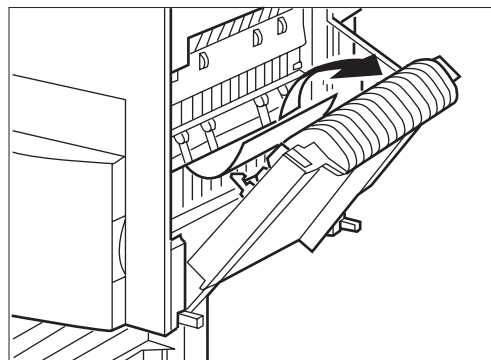


Figure 1-4-15

2. Paper jams in the paper feeding unit

- 1) Open the top cover.

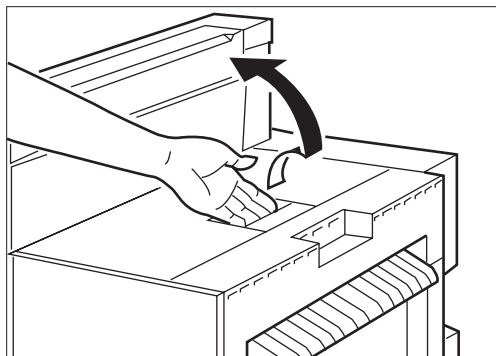


Figure 1-4-16

- 2) Lift the upper guide by holding the knob indicated "1."
- 3) Remove the jammed paper.

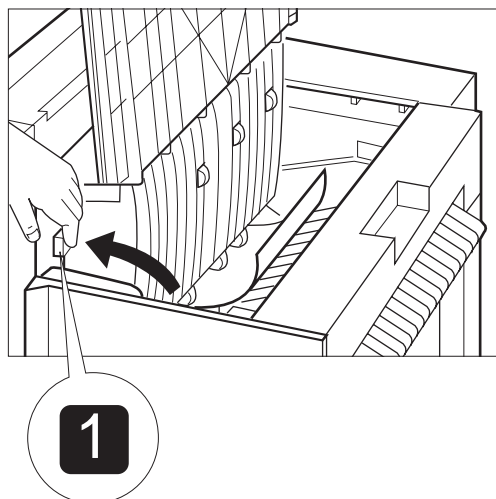


Figure 1-4-17

- 4) If jammed paper cannot be seen, lift the center guide by holding the knob indicated "2."
- 5) Remove the jammed paper.

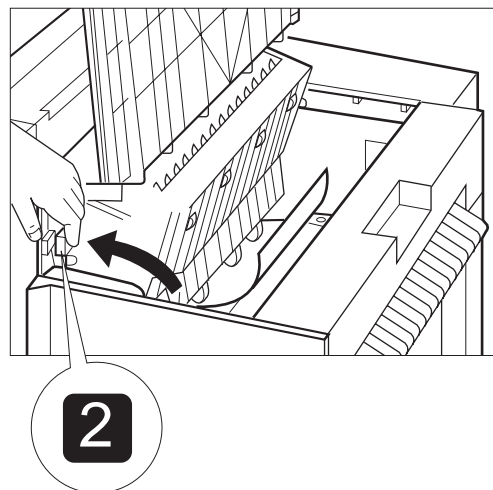


Figure 1-4-18

3. Paper jams in the paper delivery unit

- 1) Lift the swing guide and remove the jammed paper.

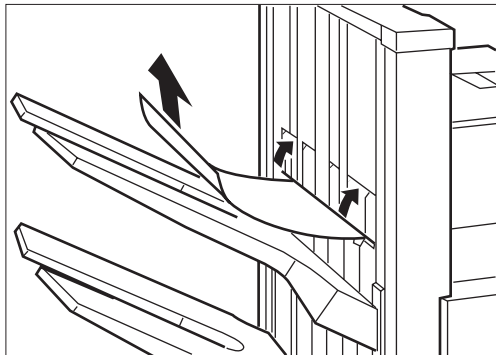


Figure 1-4-19

- 2) Open the front cover, top cover or left cover once, then close it.

E. Staple Jams

- 1) Open the front cover.

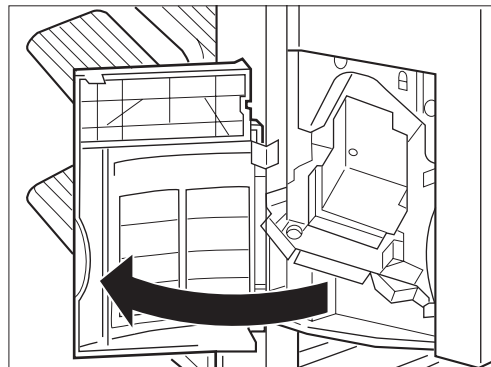


Figure 1-4-20

- 2) Pull up the stapler unit.

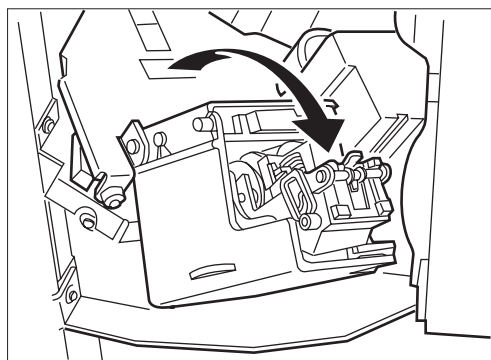


Figure 1-4-21

- 3) While pressing the green lever (①), hold the knob (②) and pull out the staple guide.

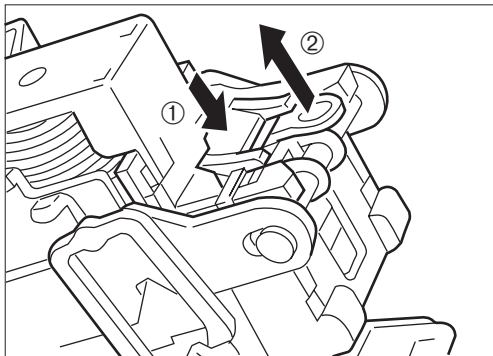


Figure 1-4-22

- 4) Remove the jammed staples by using a pointed object.

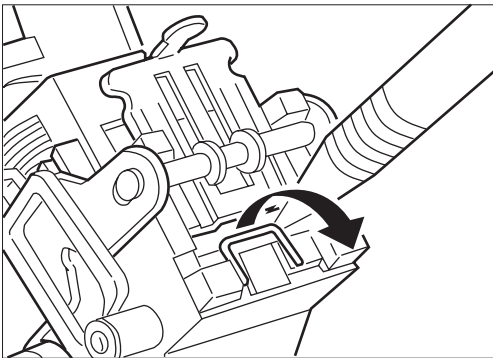


Figure 1-4-23

- 5) Return the staple guide to the original position by holding the knob.

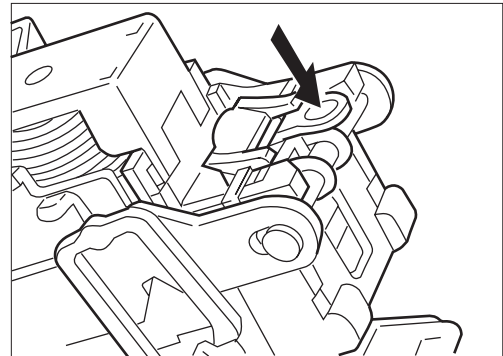


Figure 1-4-24

- 6) Put the stapler unit back to its original location, and then close the front cover.

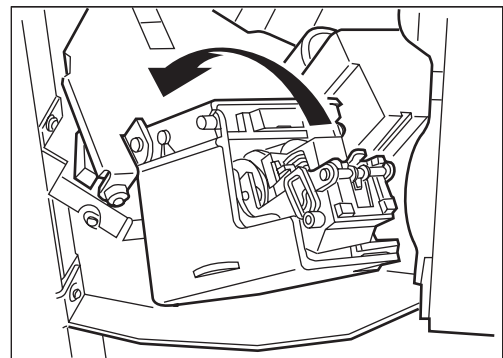


Figure 1-4-25

V. MAINTENANCE AND SERVICING BY THE CUSTOMER

A. Replacing the staple cartridge

Follow the procedures below to replace the staple cartridge.

- 1) Open the front cover.

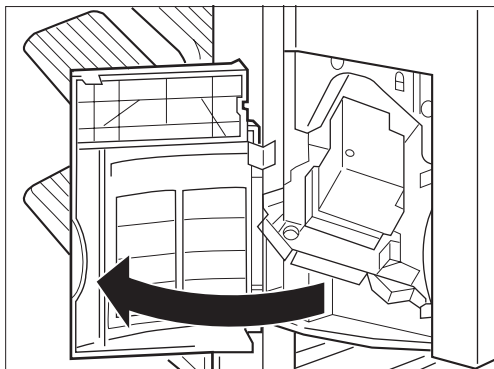


Figure 1-5-1

- 2) Pull up the stapler unit.

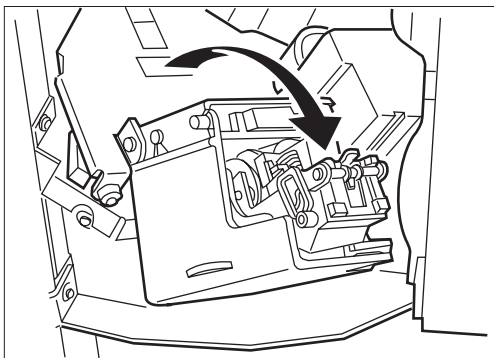


Figure 1-5-2

- 3) Pull out the staple cartridge.

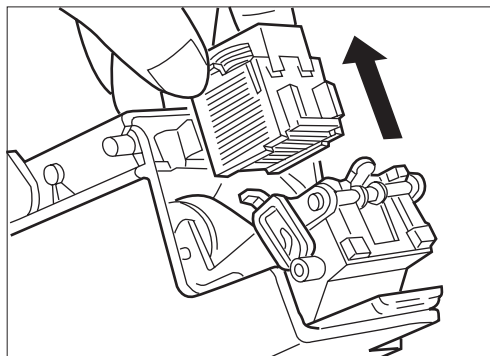


Figure 1-5-3

- 4) Insert a new staple cartridge until its claws are in the secured position.

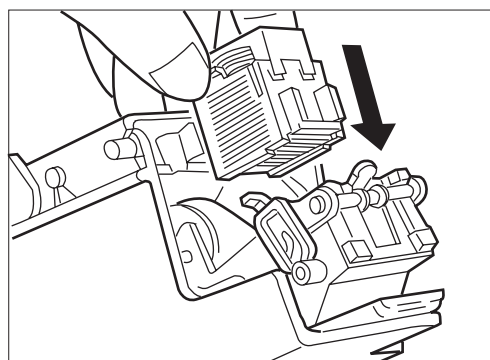


Figure 1-5-4

- 5) Return the stapler unit to the original position.
- 6) Press the On Line key of the printer to take the printer off-line.
- 7) Press the Menu key to select "TEST MENU."
- 8) Press the Item key to select "STAPLE TEST", and then press the Enter key. Then, a sheet of paper is fed from the printer to the stapler stacker, and stapling operation is conducted.

Notes: **1.** Be sure to perform the staple test after replacing the staple cartridge.

2. In test stapling, a sheet of blank print paper is delivered from the printer for 12-position stapling operation in order to set the staples in the stapling position of the stapler unit.

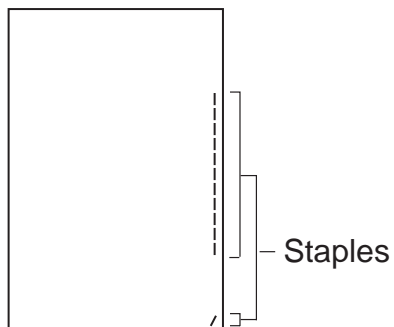





Figure 1-5-6

CHAPTER 2

OPERATION AND TIMING

1. This chapter describes the stacker 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 stacker. 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 stapler stacker conducts face-up or face-down delivery of the printed paper output from the printer. In the case of face-down delivery, job offset or stapling is available. These operations are controlled by the stapler stacker driver PCB.

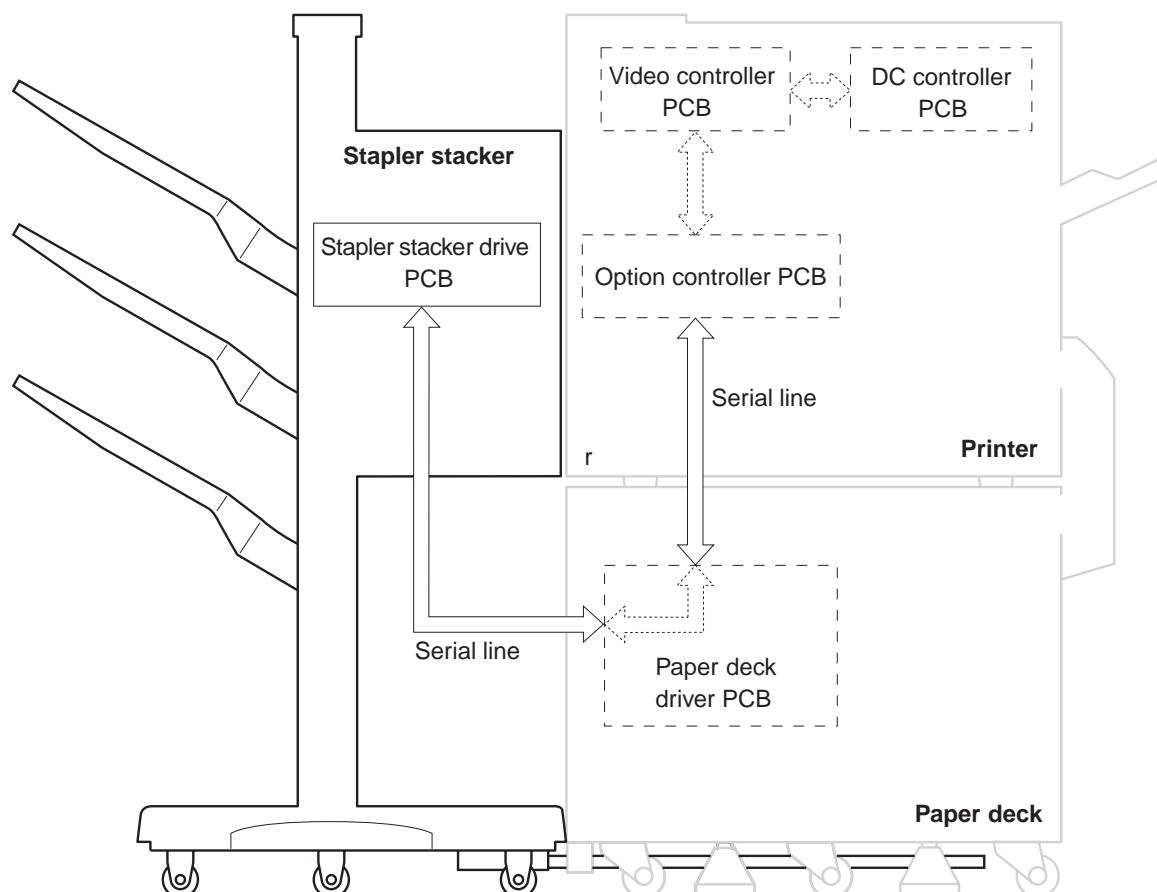


Figure 2-1-1

B. Outline of the Electrical System

The operation sequences of the stapler stacker are controlled by the stapler stacker driver PCB. The stapler stacker driver PCB contains 2 microcomputers (main-CPU, sub-CPU) which control the sequences and the serial communication with the option controller PCB.

The stapler stacker driver drives the solenoids and motors according to the various commands sent from the option controller through the serial line. The stapler stacker driver also reports the information of the sensors and switches to the option controller through the serial line.

The main functions of the ICs installed on the stapler stacker driver are listed below.

- IC14/IC15 (main-CPU, sub-CPU)
Sequence control
- IC23 (EEP-ROM)
Initial data backup

Figure 2-1-2 shows the flow of signals between the stapler stacker and option controller.

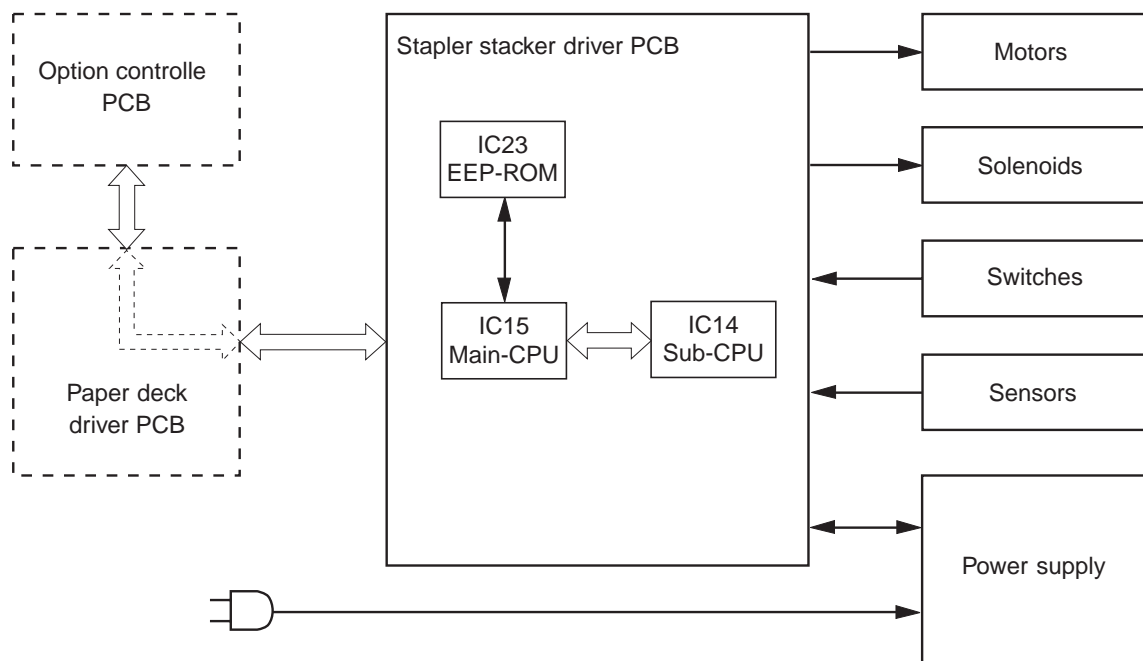


Figure 2-1-2

C. Input/Output of the Stapler Stacker Driver PCB

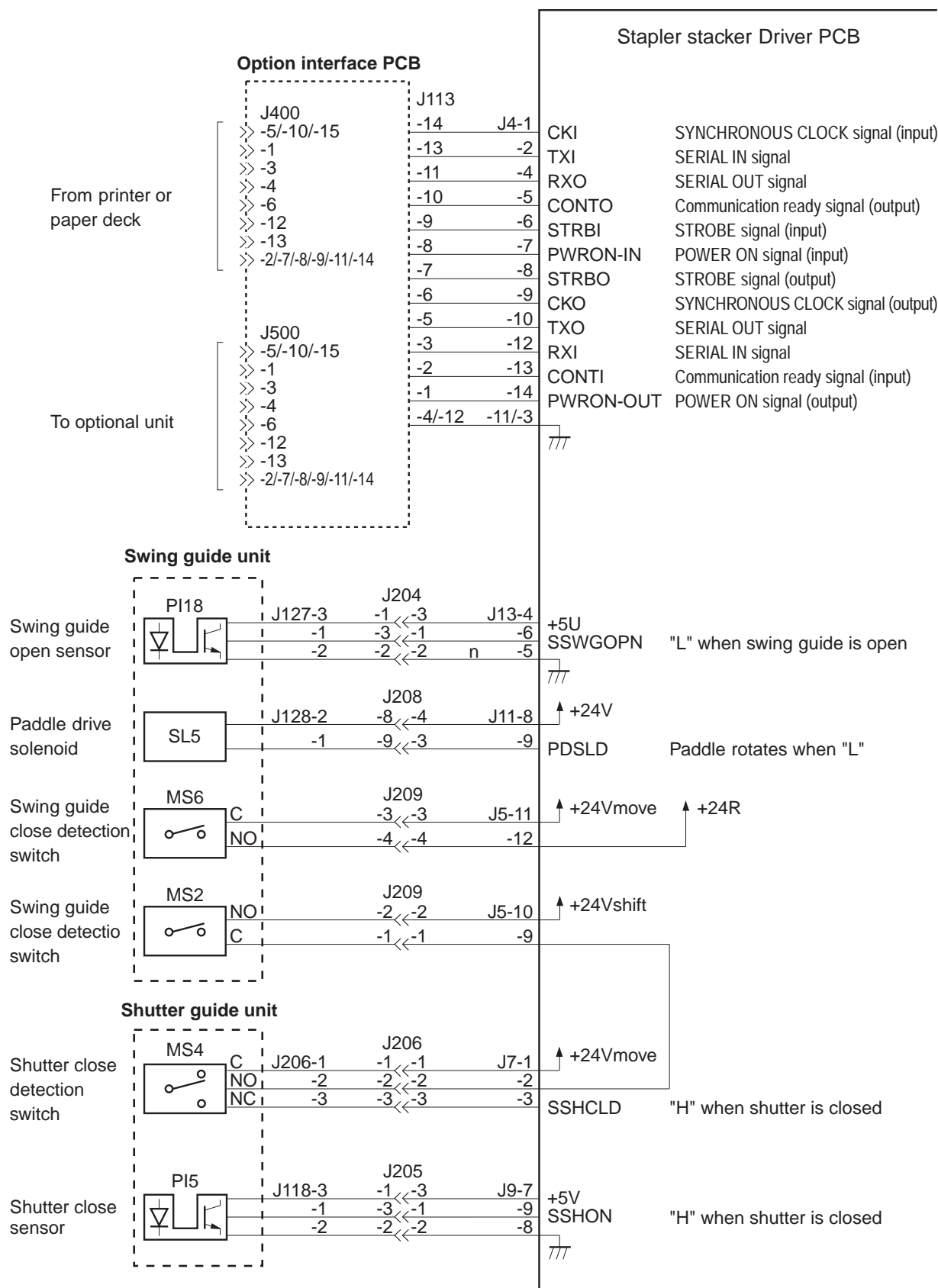


Figure 2-1-3

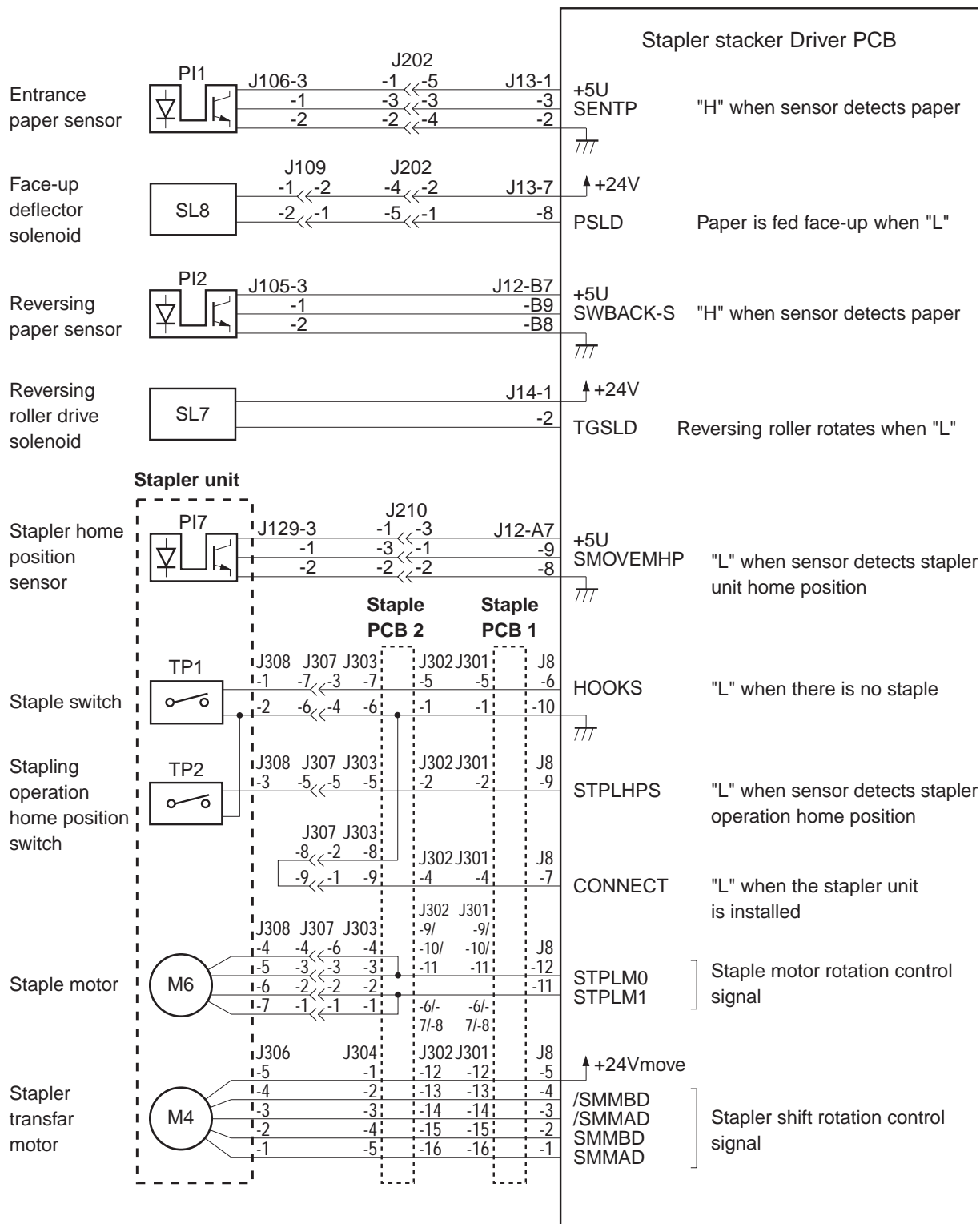


Figure 2-1-4

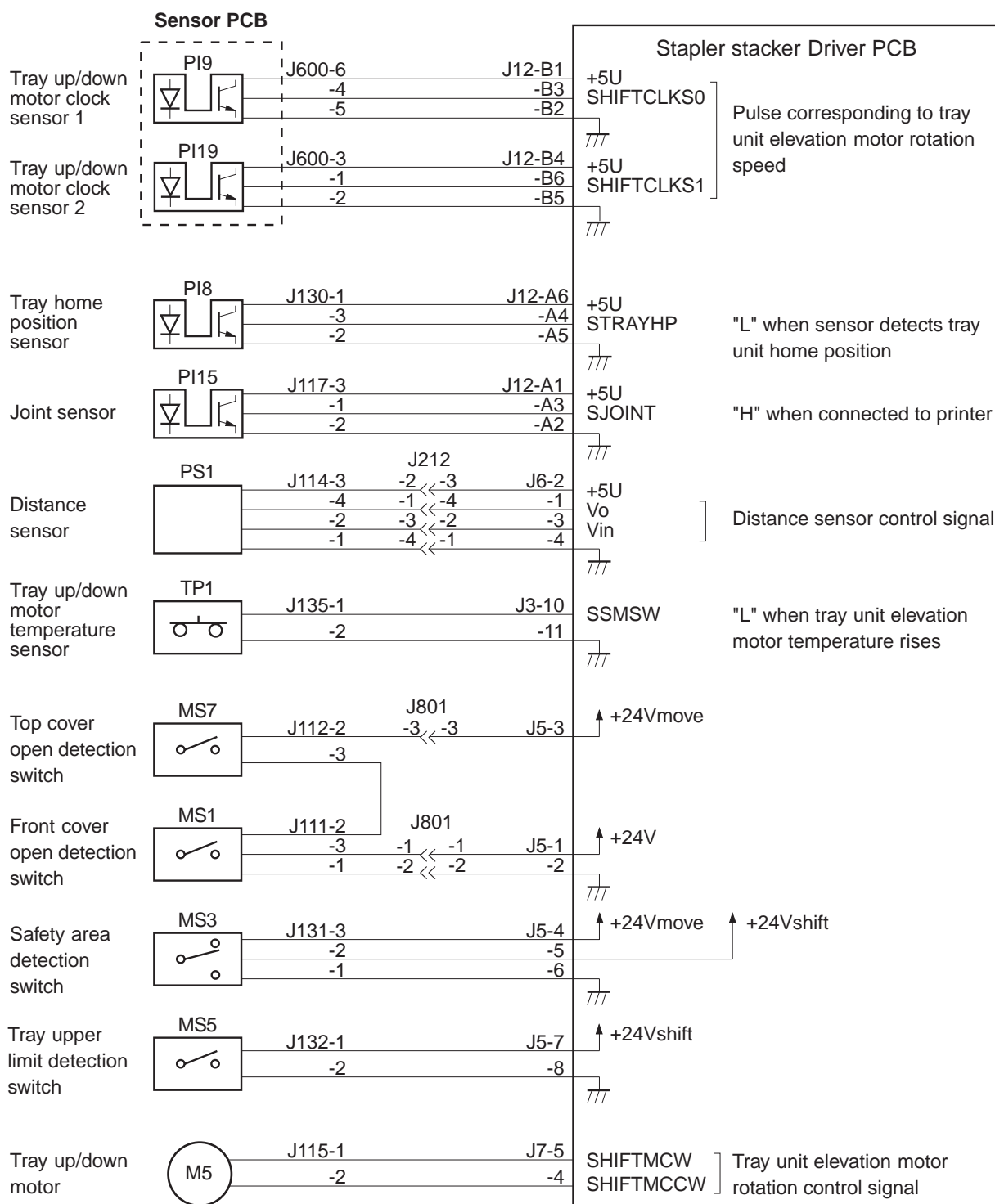


Figure 2-1-5

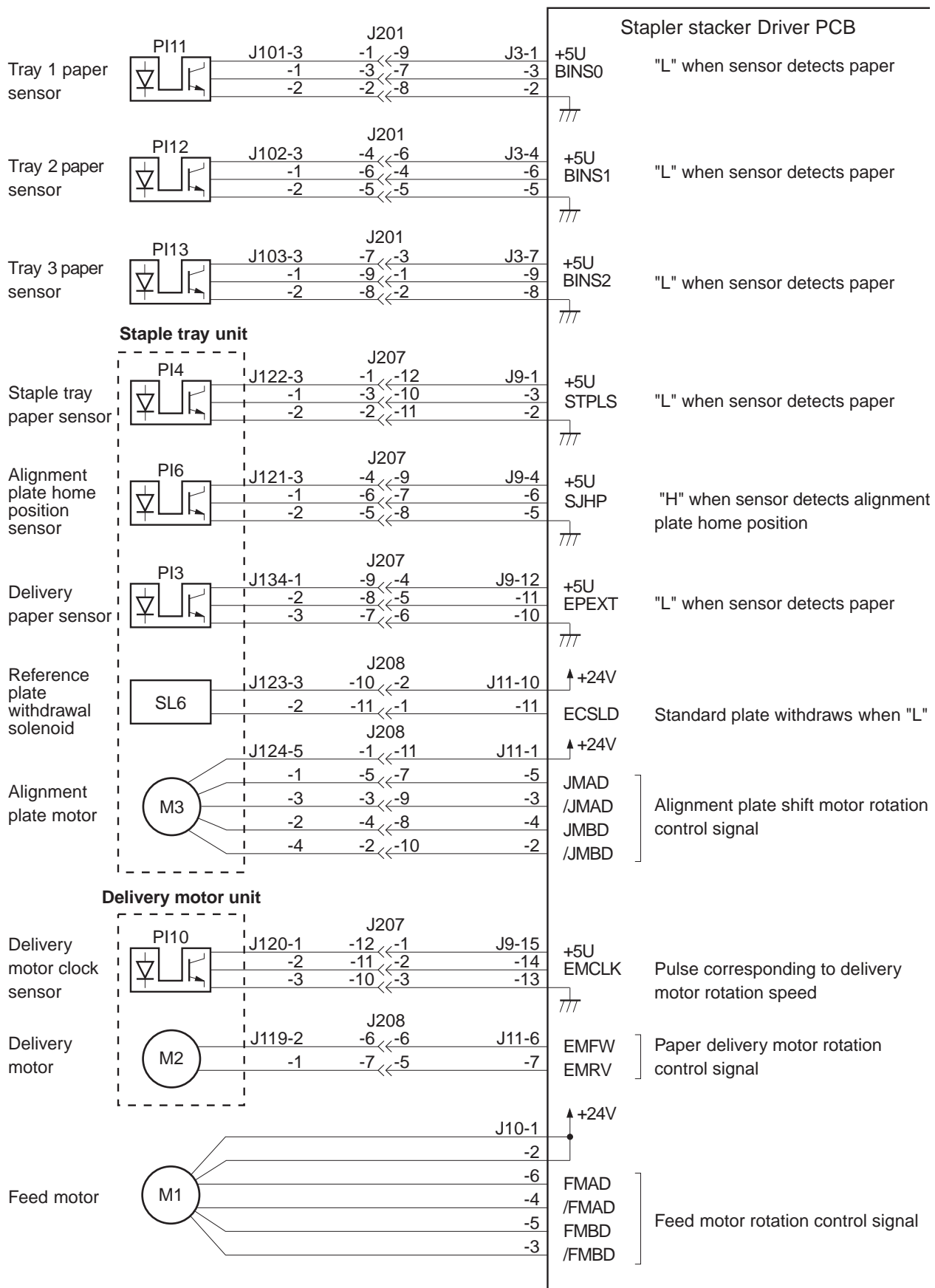


Figure 2-1-6

II. FEED/DRIVE SYSTEM

A. Outline

The stapler stacker stacks paper sent from the printer in simple stacking, job offset, or stapling mode according to the commands sent from the video controller via the option controller.

Figure 2-2-1 shows the stacking types available in this stapler stacker.

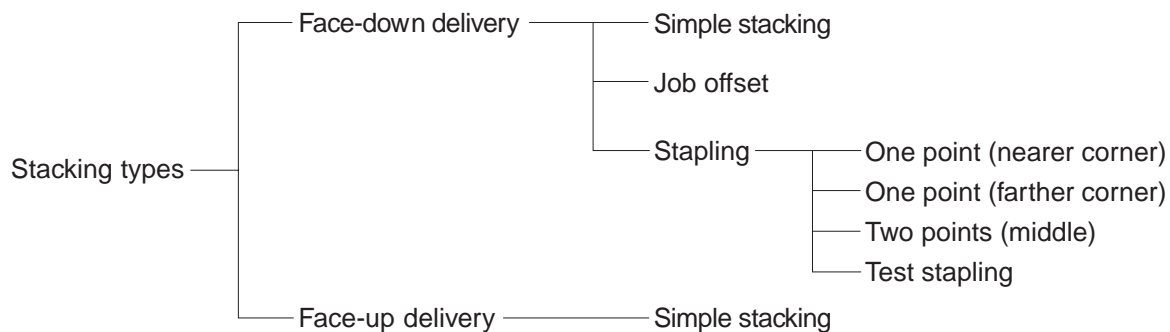


Figure 2-2-1

Table 2-2-1

Stacking types Paper size	Face-up delivery	Face-down delivery				
	Simple stacking	Simple stacking	Job offset	Stapling		
				One point (nearer corner)	One point (farther corner)	Two points (middle)
A3	○	○	○	○	○	○
B4	○	○	○	○	○	○
A4	○	○	○	○	○	○
A4R	○	○	○	○	○	×
B5R	○	○	×	×	×	×
A5R	○	○	×	×	×	×
Ledger	○	○	○	○	○	○
Lagal	○	○	○	○	○	×
Latter	○	○	○	○	○	○
Latter-R	○	○	○	○	○	×
Executive-R	○	×	×	×	×	×
Universal	○	×	×	×	×	×
Envelope	○	×	×	×	×	×

1. Face-down delivery

a. Simple stacking

The stapler stacker reverses the paper output from the printer and delivers the paper face-down.

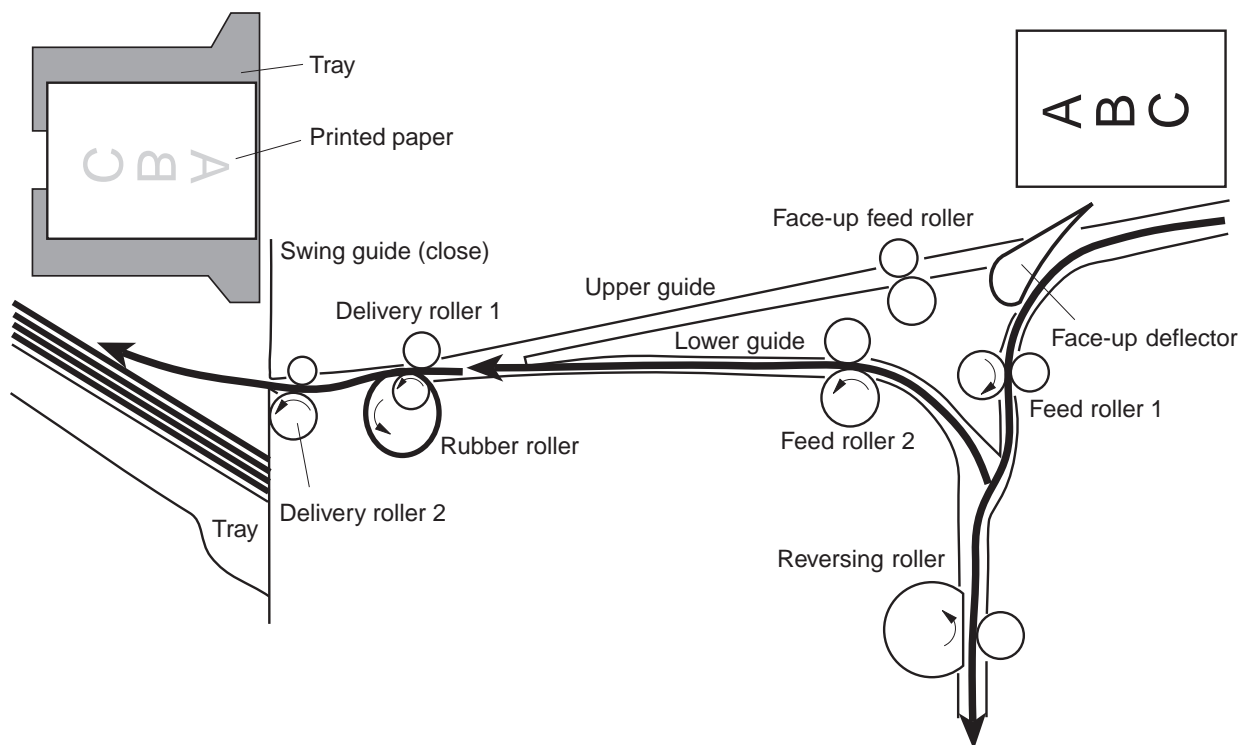
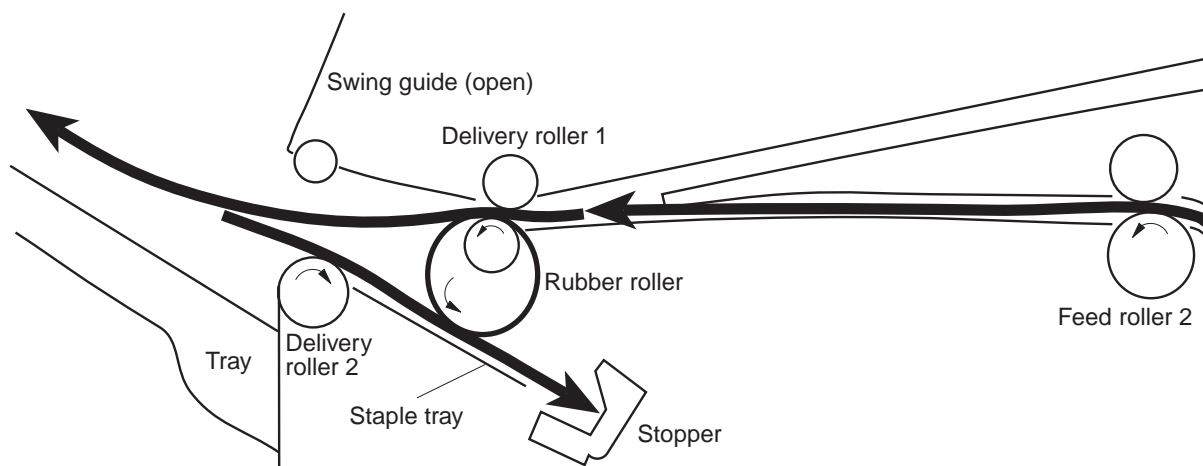


Figure 2-2-2

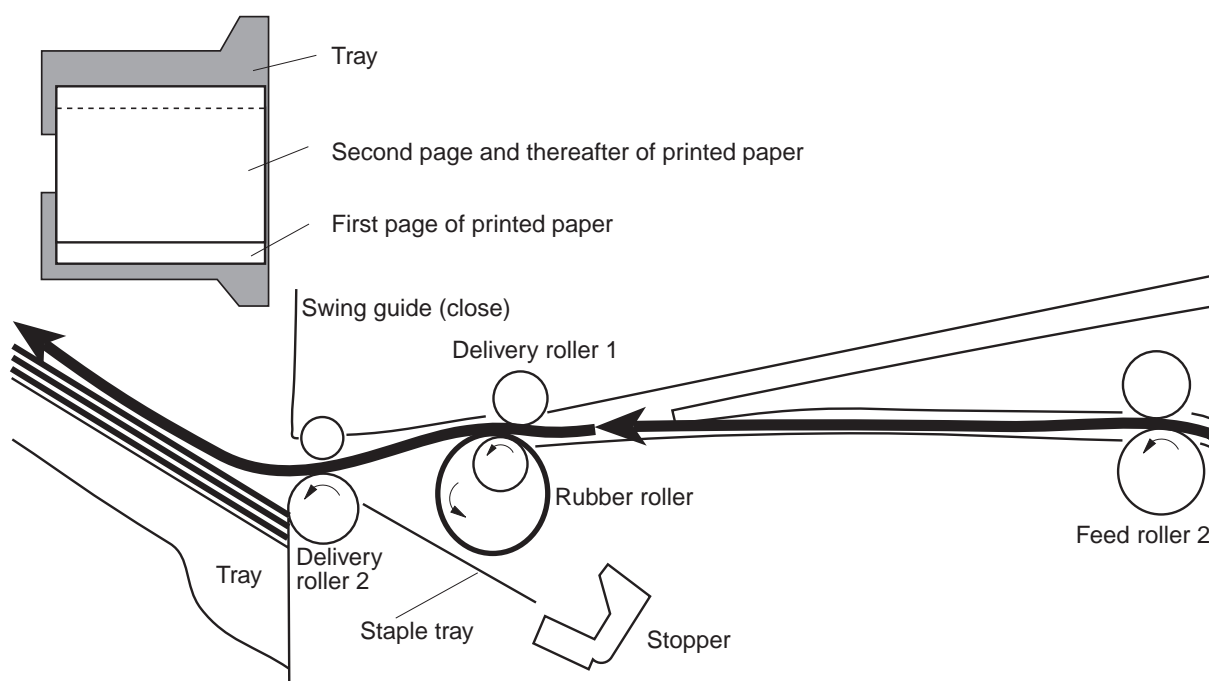
b. Job offset

The very first page of each job is reversed and fed to the staple tray. Then it is shifted to the front side of the stapler stacker and delivered face-down to the tray. The second page and thereafter are also reversed and delivered face-down to the tray but without being fed to the staple tray.

- First page

**Figure 2-2-3**

- Second page and thereafter

**Figure 2-2-4**

c. Stapling

The paper is reversed and stacked on the staple tray. The paper of the same job is stapled and delivered to the tray.

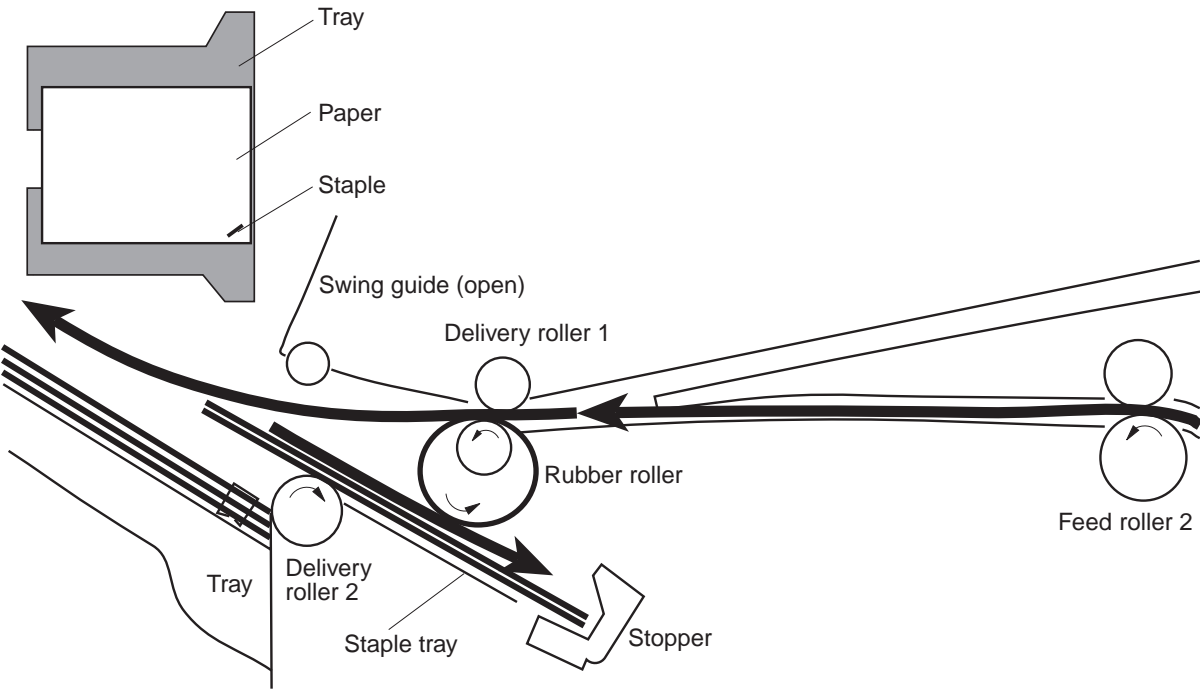


Figure 2-2-5

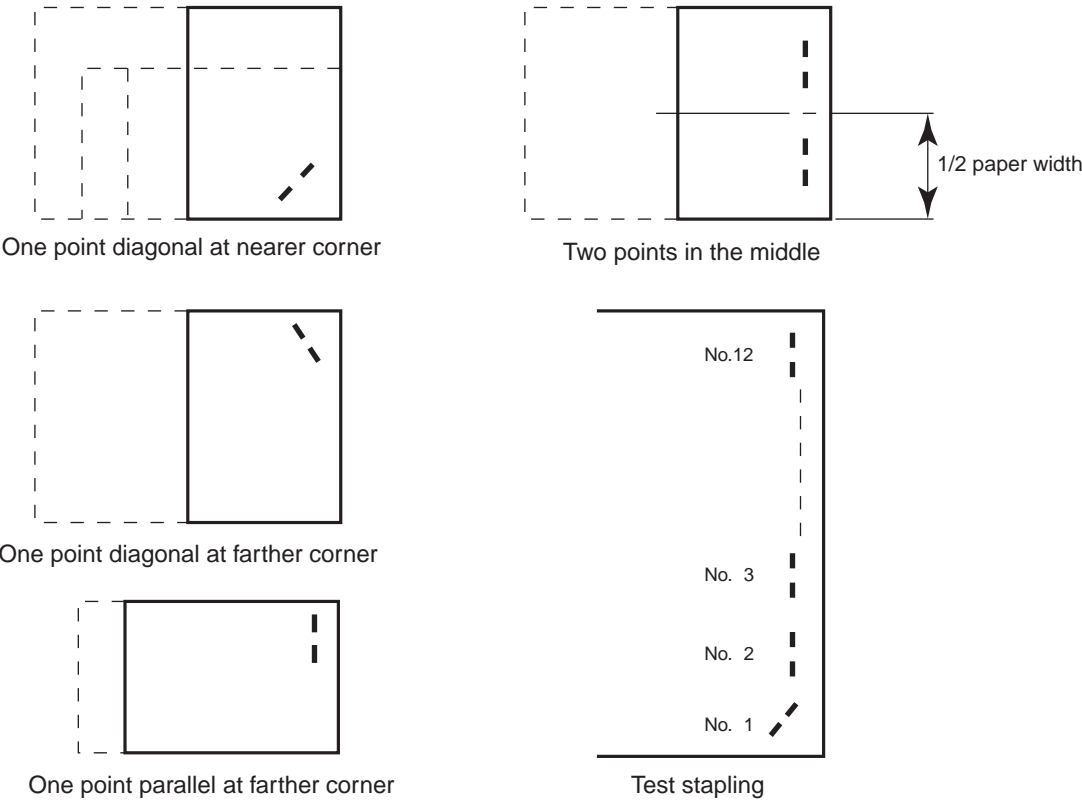


Figure 2-2-6

2. Face-up delivery**a. Simple stacking**

The paper is directly delivered to the tray face-up.

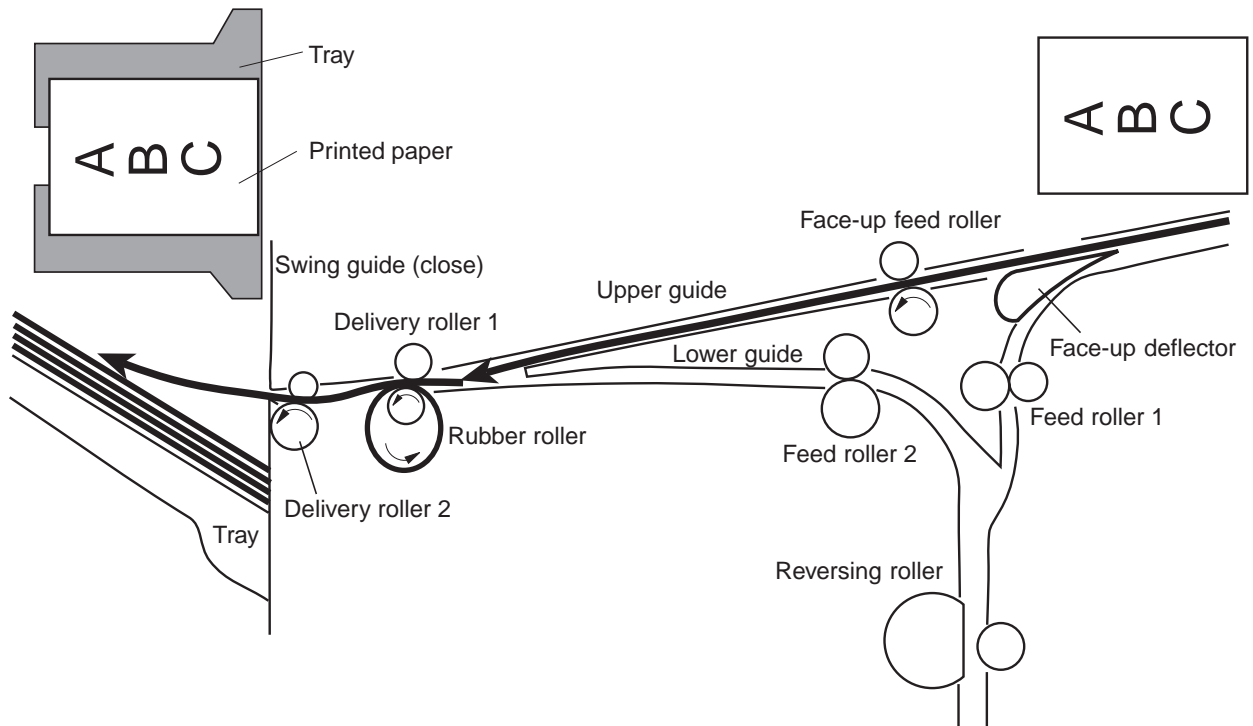


Figure 2-2-7

B. Paper Feed/Delivery

1. Outline

The stapler stacker reverses the paper output from the printer when delivering it face-down. The feed motor (M1) is a stepping motor and delivery motor (M2) is a DC motor. Clockwise/counterclockwise rotation of these motors is controlled by the microcomputer (CPU) on the stapler stacker driver PCB.

The feed path of the paper has three photo interrupters; entrance paper sensor (PI1), reversing paper sensor (PI2) and delivery paper sensor (PI3), which detect the arrival or passing of the paper.

If the paper does not reach or pass those sensors in certain time, the stapler stacker judges it as paper jams, stops the operation and informs the option controller of the jams.

2. Face-down feed (Reversing)

When the entrance paper sensor (PI1) detects the paper output from the printer, the stapler stacker rotates the feed motor (M1) clockwise, which rotates feed roller 1, feed roller 2 and delivery roller. When the feed roller 1 rotates, a sheet of paper is fed to the reversing unit. When PI1 detects the trailing edge of the paper, the reversing roller drive solenoid (SL7) is turned ON, and M1 rotates the reversing roller clockwise. The paper is fed to the reversing position by this roller. When the paper arrives at the reversing position, the reversing roller rotates counterclockwise and feeds the paper to the feed guide. The paper is then fed by the feed roller 2 and delivery roller 1.

3. Face-up feed

In the case of face-up delivery of the paper, when the entrance paper sensor (PI1) detects the paper, the stapler stacker driver rotates the feed motor (M1) clockwise, which rotates the feed roller 1, face-up feed roller and, delivery roller 1. At the same time, face-up deflector solenoid (SL8) is turned ON, which switches the face-up deflector to the face-up side. The paper is fed without being reversed.

4. Delivery

When the delivery paper sensor (PI3) detects the fed paper, the stapler stacker driver rotates the delivery motor (M2) clockwise, which rotates the delivery roller 2. The paper is delivered by the delivery roller 2.

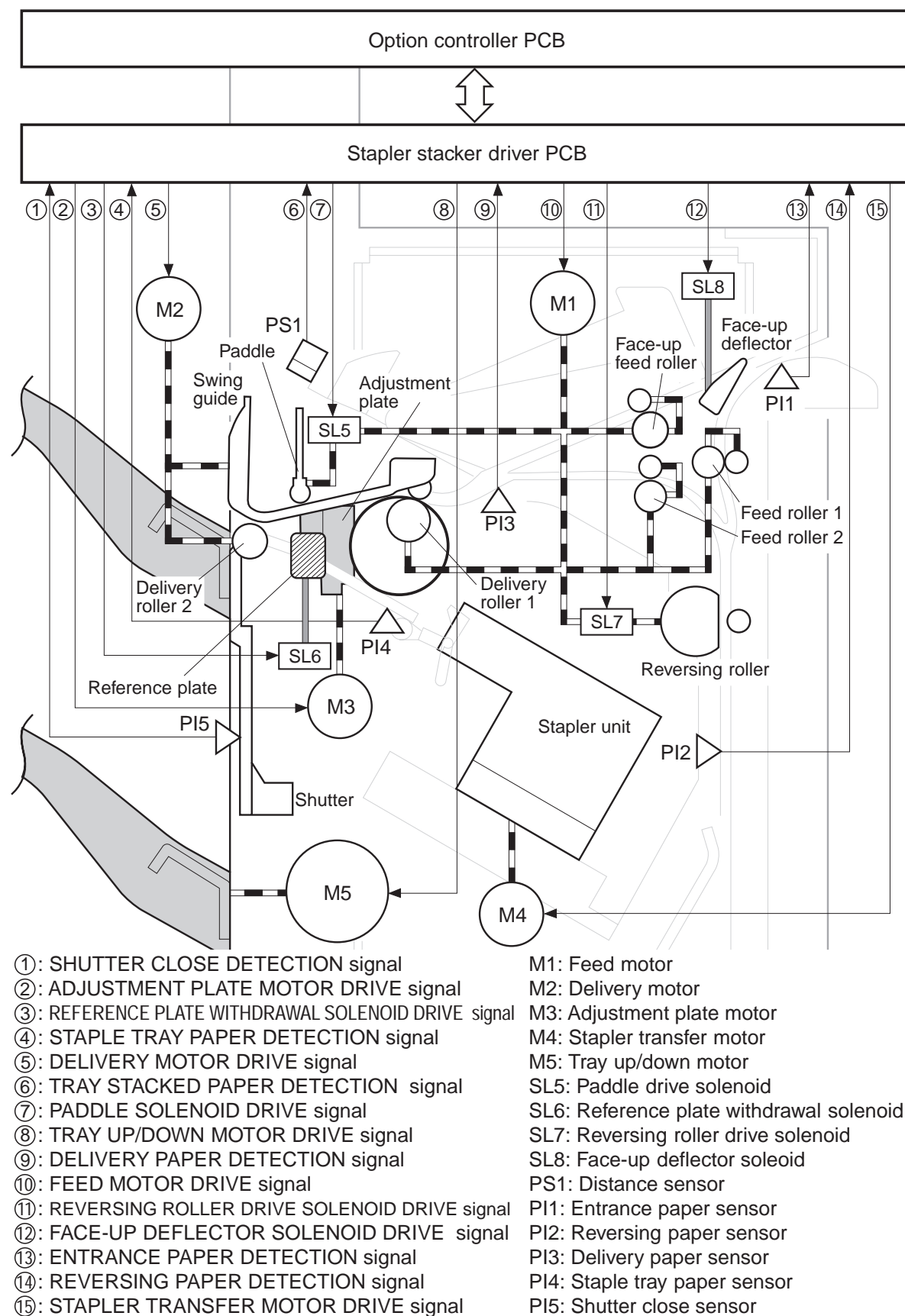


Figure 2-2-8

C. Job Offset

In job offset, the adjustment plate shifts the very first page of the job to one side but the rest of the pages remain unshifted. Whether or not the adjustment plate is in the home position is detected by the adjustment plate home position sensor (PI6).

When the power of the stapler stacker is turned ON, the stapler stacker driver rotates the adjustment plate motor (M3) in order to return the adjustment plate to the home position. If the adjustment plate is in the home position, it remains in the position and stands by. In the case that the paper size is other than A3 or A4-horizontal, as the shifting distance of the adjustment plate is long, the stapler stacker driver shifts the adjustment plate to the standby position (**Note 1**).

The stapler stacker driver stops the delivery motor (M2) when the trailing edge of the first page passes the delivery roller 1 by 20mm. 0.2 seconds later, M2 is rotated counterclockwise, which shifts the M2 gear to the swing guide drive side. As a result, M2 rotates the swing guide drive and the swing guide is lifted. The swing guide stops when it is detected by the swing guide close sensor (PI18).

When the swing guide is lifted, the paper is pulled back to the staple tray by the rubber rollers on the delivery roller 1. The paper placed in the staple tray is detected by the staple tray paper sensor (PI4).

0.2 sec. after PI4 detects the paper, the stapler stacker driver drives the adjustment plate motor (M3) and shifts the paper by 30mm. Depending on the paper size, the left edge may prevent the paper from being shifted. In such a case, the stapler stacker driver turns ON the reference plate withdrawal solenoid (SL6) and withdraws the left edge reference plate before shifting the paper.

After shifting the paper, the stapler stacker driver rotates M3 counterclockwise to shift the adjustment plate to the reset position (**Note 2**).

The stapler stacker driver rotates M2 counterclockwise to lower the swing guide. When the swing guide turns ON the swing guide close detection switch (MS2), M2 starts rotating clockwise which rotates the delivery roller 2. Paper is delivered to the tray by the delivery roller 2. Second page and thereafter in each job are delivered to the tray without being shifted.

When the shifted amount of the adjustment plate during the home position detection exceeds the prescribed maximum shifted amount, the stapler stacker driver judges it as motor trouble and informs it to the option controller.

Notes: 1. The standby position is 10mm off to the outside from the center of the width of the paper.

2. The reset position is 4mm off to the outside from the home position.

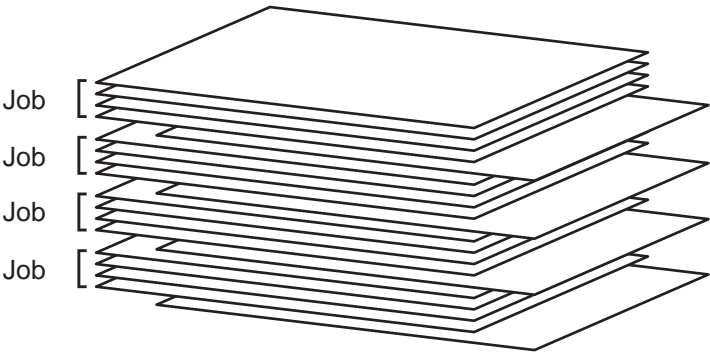


Figure 2-2-9

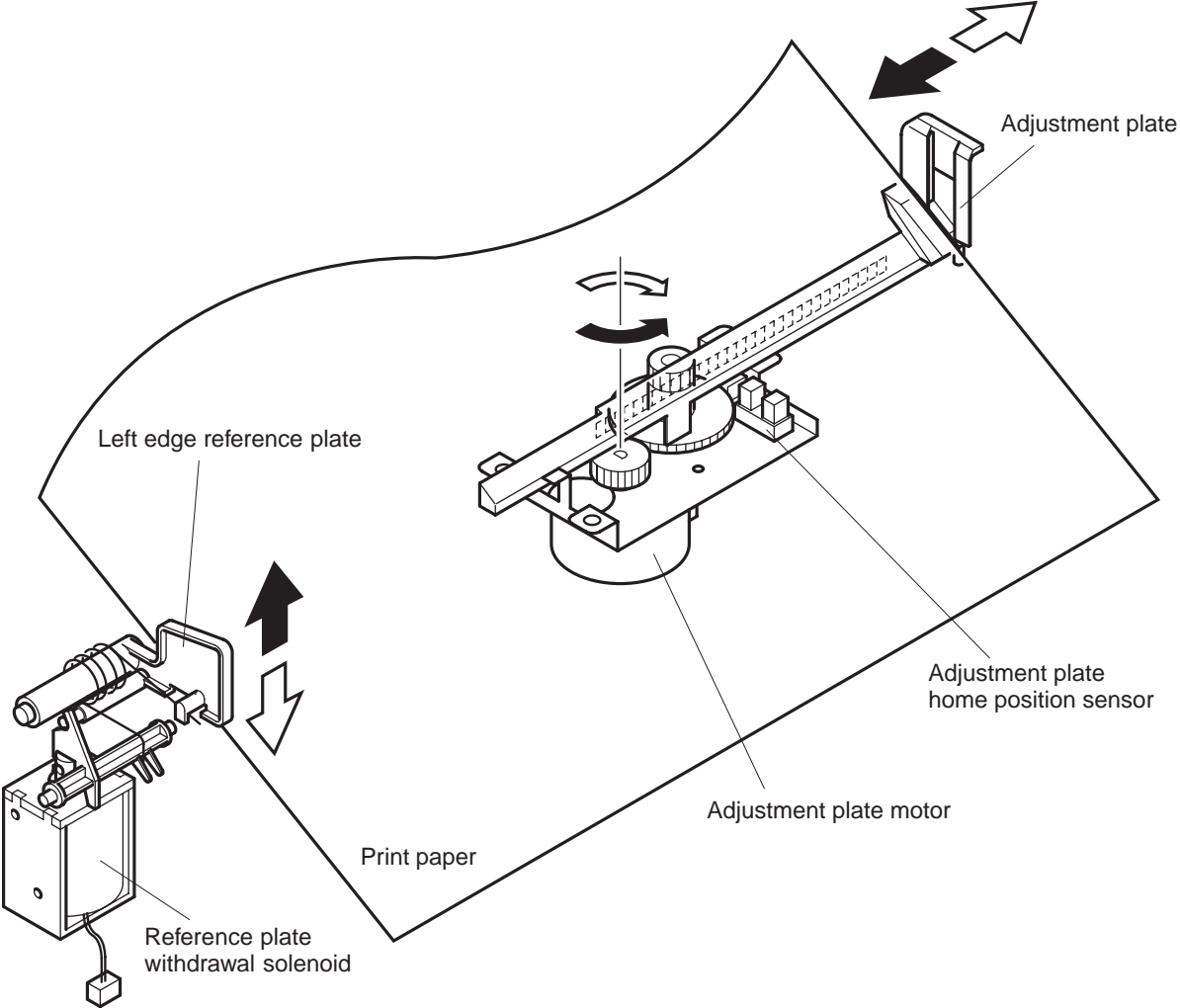


Figure 2-2-10

D. Stapling Operation

1. Outline

In stapling operation, the specified number of sheets of paper are stapled by the stapler unit. Stapling positions vary according to the staple modes and paper sizes (see table 2-2-2).

Whether or not the stapler unit is in the home position is detected by the stapler home position sensor (PI7).

When the power of the stapler stacker is turned ON, the stapler stacker driver rotates the stapler transfer motor (M4) in order to return the stapler unit to the home position. If the stapler is in the home position, it remains in the position and stands by.

When the leading edge of paper is detected by the entrance paper sensor (PI1), the stapler stacker driver drives the stapler transfer motor (M4) to shift the stapler unit to the center standby position (**Note**).

Note: The center standby position is the position for the stapler unit to stand by before the paper is sent to the staple tray. It prevents the paper on the staple tray from getting curled, which disables stapling.

Table 2-2-2

Paper size	A3	A4	B4	Ledger	Letter	A4R	Letter-R	Legal	Others
One point at front	①								
One point at back	②					③			
Two points in the center	④								
Test staple	⑤								

See Figure 2-2-11 for ① ~ ⑤

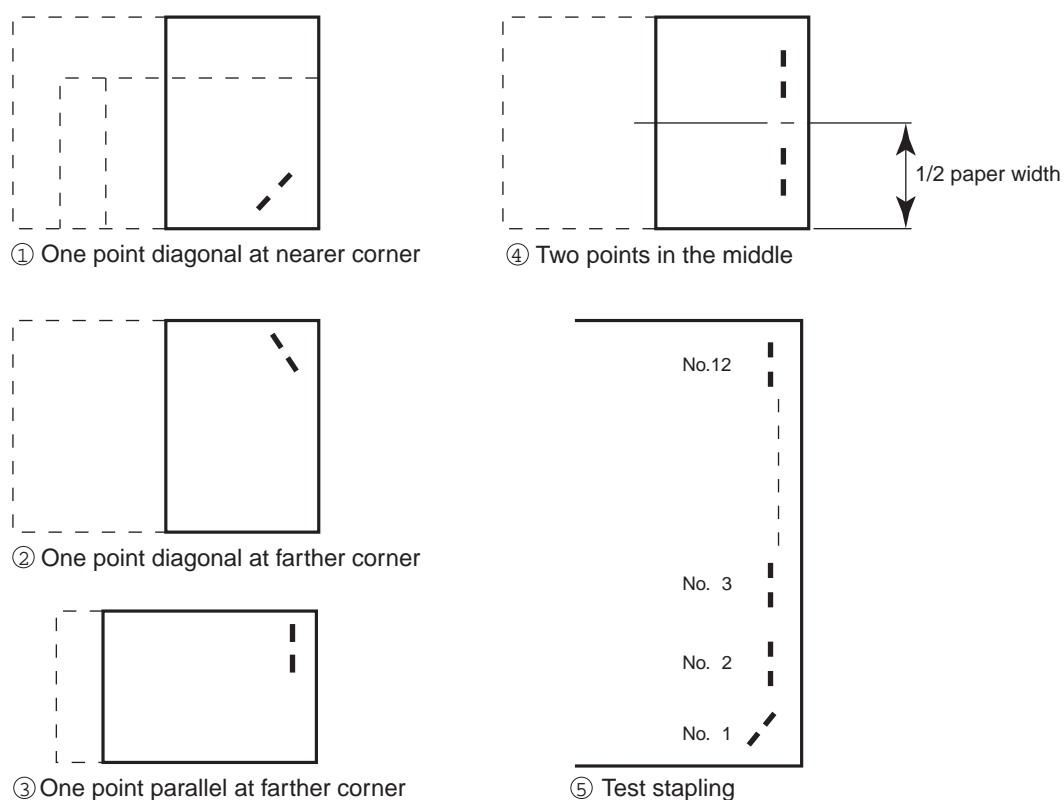


Figure 2-2-11

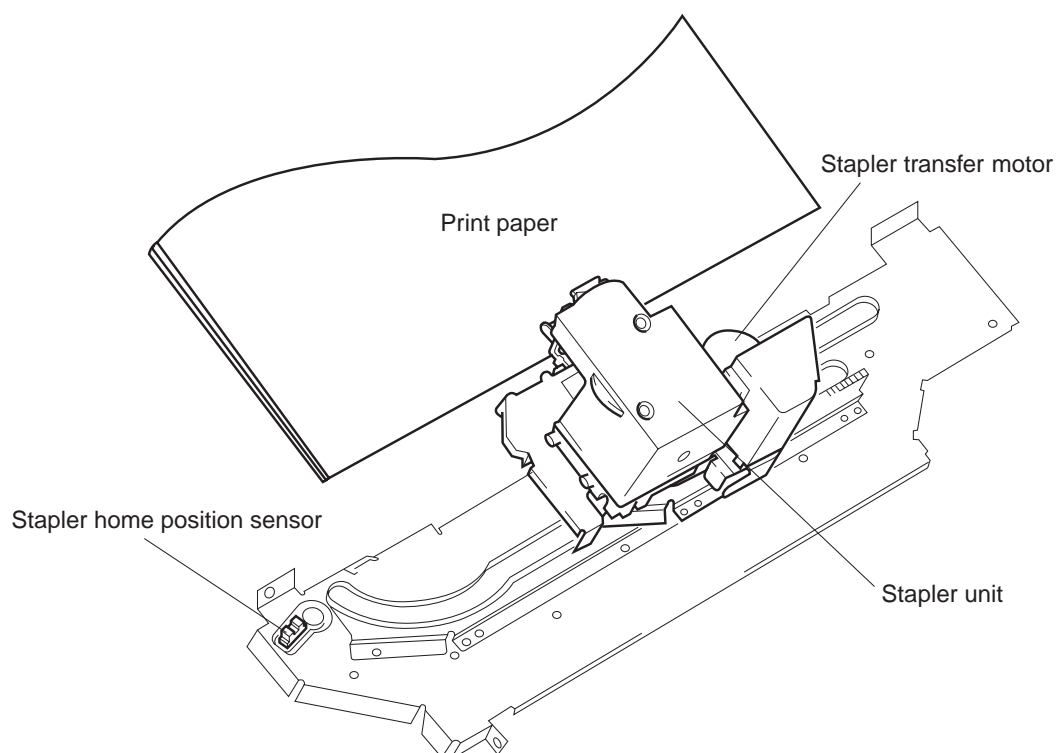


Figure 2-2-12

2. First page

The stapler stacker driver stops the delivery motor (M2) when the trailing edge of the first page passes the delivery roller 1 by 20mm. 0.2 seconds later, M2 is rotated counterclockwise, which shifts the M2 gear to the swing guide gear side. As a result, M2 rotates the swing guide gear and the swing guide is lifted (open). The swing guide stops when it is detected by the swing guide close sensor (PI18).

When the swing guide is open, the paper is pulled back by the rubber rollers of the delivery roller 1 to the staple tray and is detected by the staple tray paper sensor (PI4).

The stapler stacker driver lifts the tray by 20 mm and drives the adjustment plate motor (M3) after P14 detected the paper, and aligns the paper.

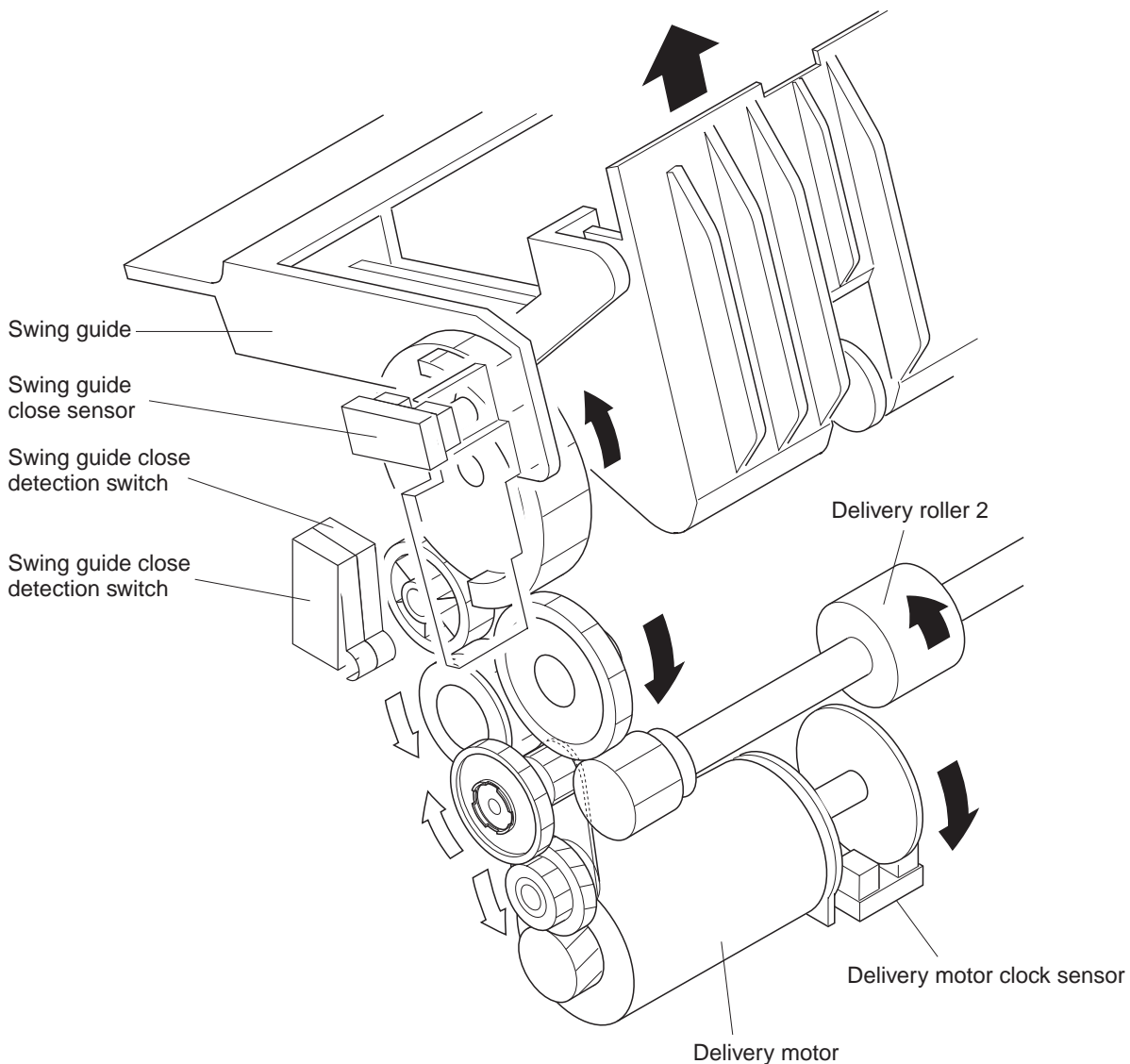


Figure 2-2-13

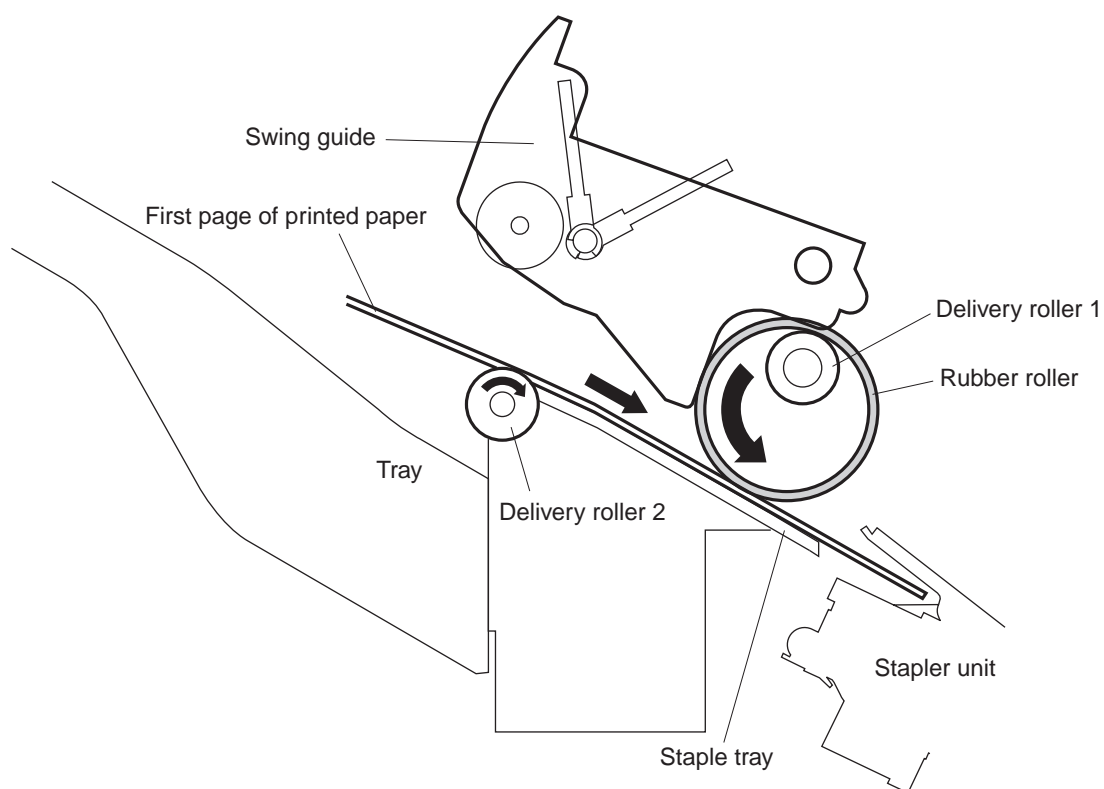


Figure 2-2-14

3. Second page and thereafter

The stapler stacker driver stops the delivery motor (M2) when the trailing edge of the second sheet of paper passes the delivery roller 1 by 20 mm. 0.2 sec. later, the paddle drive solenoid (SL5) is turned ON, and the feed motor (M1) rotates the paddle. The paper is pulled back to the staple tray by this paddle. 0.6 sec. later, the stapler stacker driver turns the paddle drive solenoid (SL5) ON and rotates the paddle. 0.4 sec. later, the stapler stacker rotates the adjustment plate motor (M3) and moves the paper to the adjustment position (**Note**) to align it.

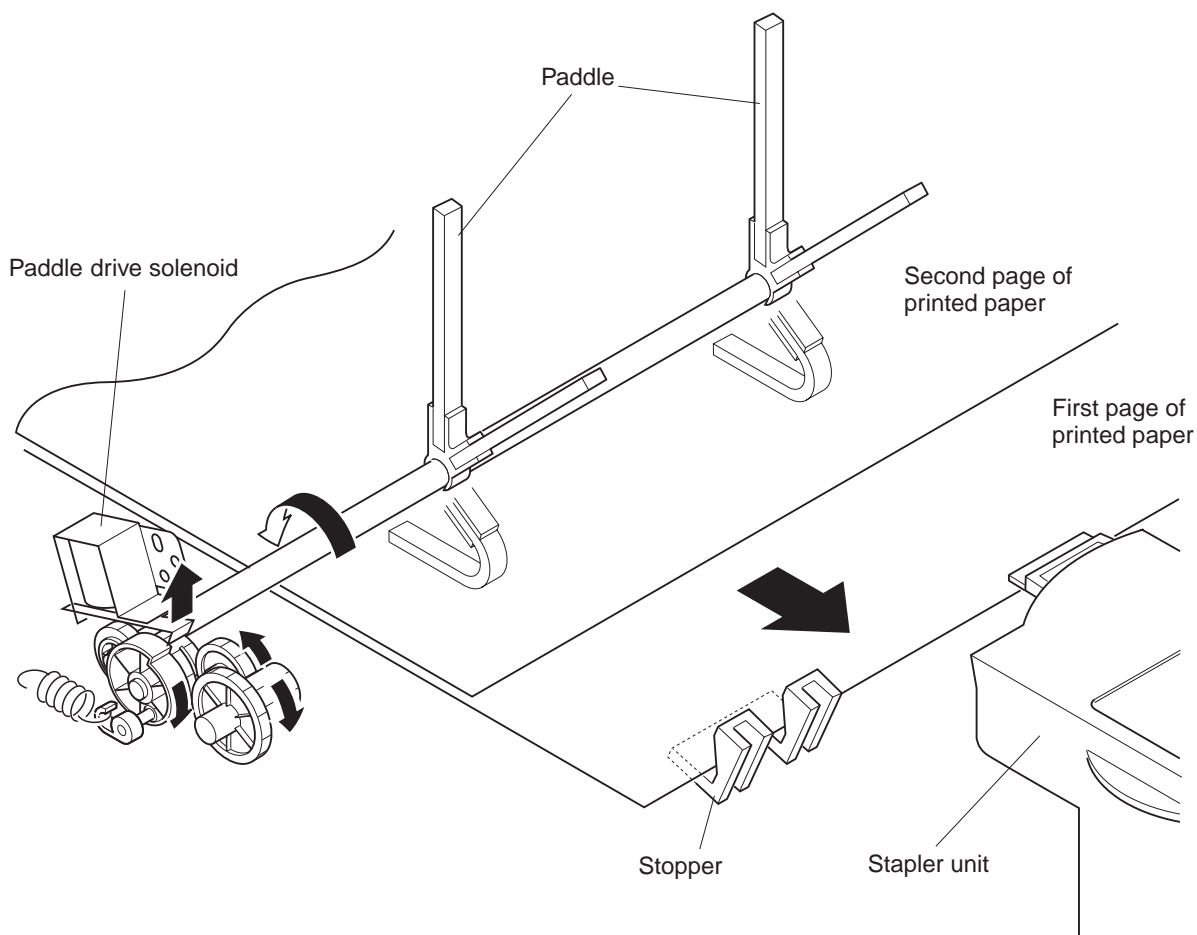


Figure 2-2-15

Note: The adjustment position is 1.0 mm inside the side edge of the paper.

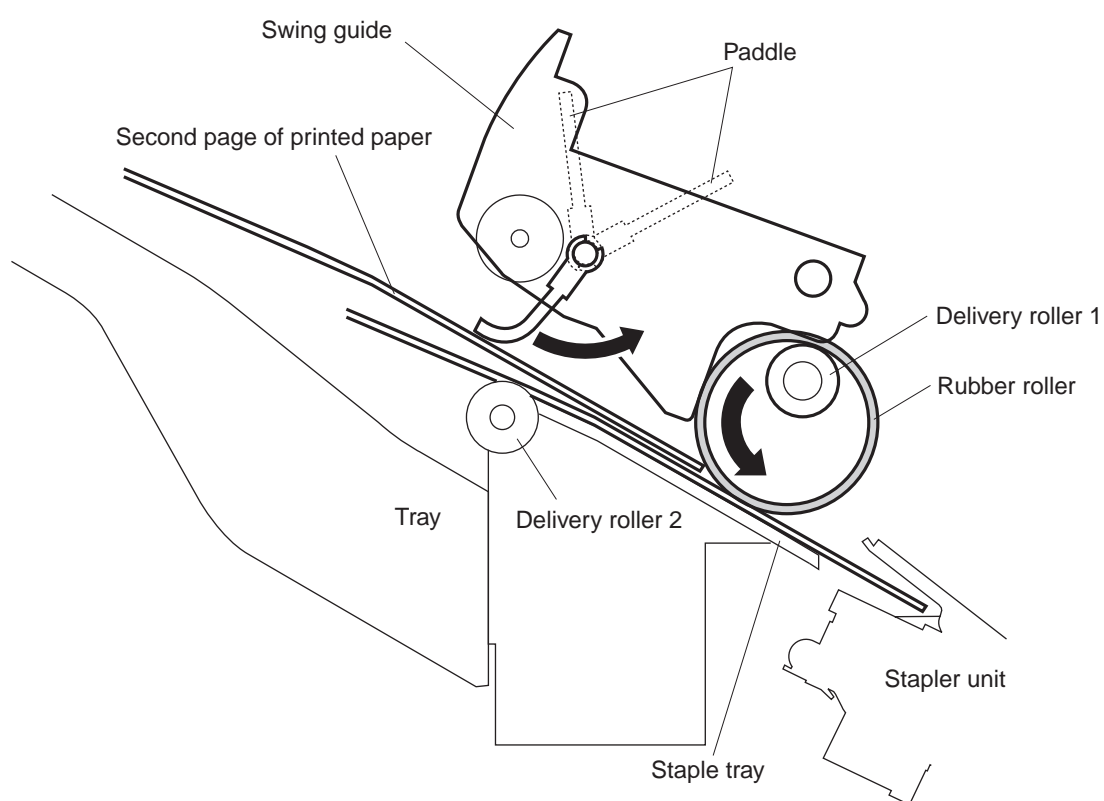


Figure 2-2-16

4. Last page

When adjustment of the last page is completed, the stapler stacker driver drives the adjustment plate motor (M3) again and shifts the adjustment plate to the staple adjustment position (**Note 1**) until all the paper of the same job is aligned. The stapler stacker driver rotates M2 counter-clockwise to lower the swing guide.

According to the staple mode (see table 2-2-2 on page 2-16) specified by the video controller PCB via the option controller PCB, the stapler stacker driver shifts the stapler to staple the paper. When stapling is completed, the stapler stacker driver drives M3 to shift the adjustment plate to the withdrawal position during paper delivery (**Note 2**). Then the delivery motor (M2) is rotated to rotate the delivery roller 2, which delivers stapled paper.

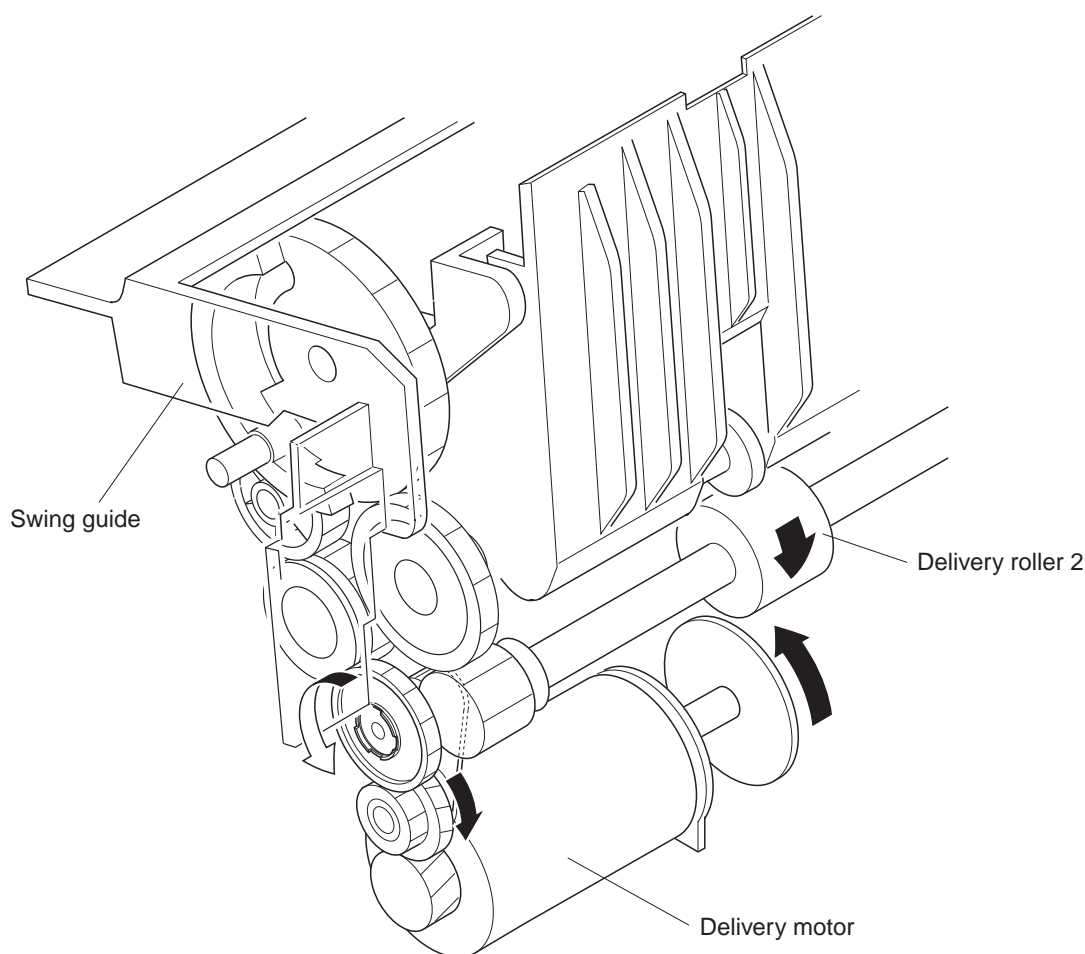


Figure 2-2-17

-
- Notes:**
- 1.** The staple adjustment position is the width of the paper.
 - 2.** The withdrawal position during paper delivery is 5.0mm off to the outside from the width of the paper.
-

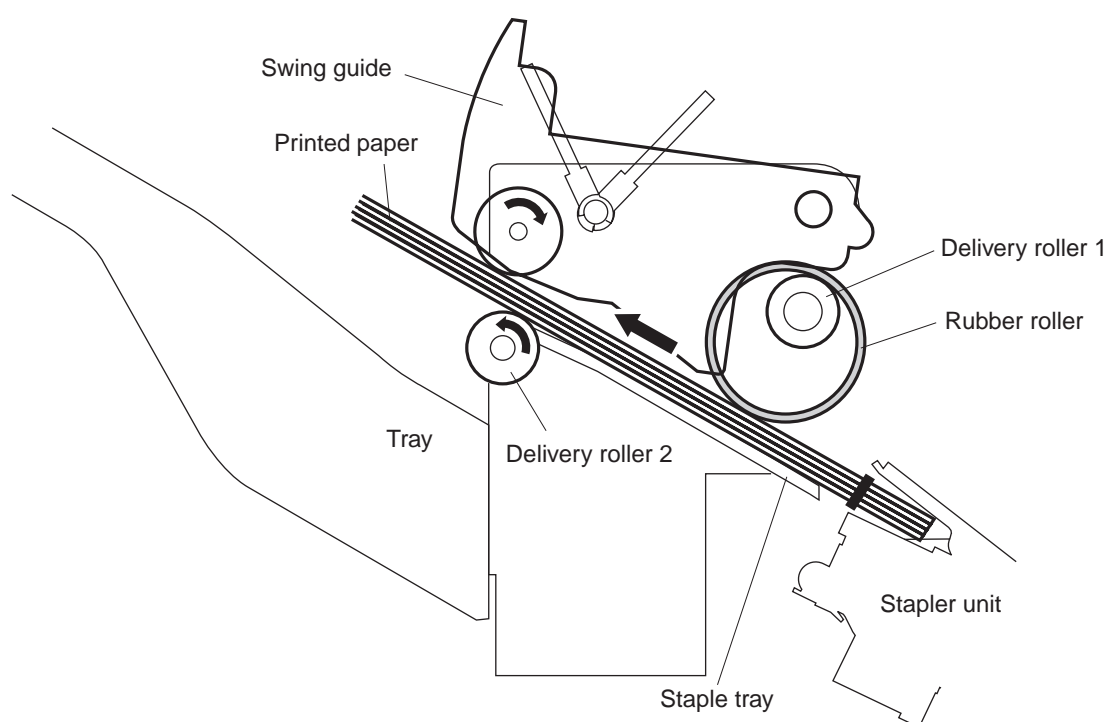


Figure 2-2-18

E. Tray Movement

The stapler stacker is equipped with three trays, to which paper is delivered. Ascending and descending of the trays is operated by the tray up/down motor (M5). Each position of the tray is calculated by detecting the pulse of the encoder mounted on the M5 by tray up/down motor clock sensor 1 and 2 (PI9). The tray home position sensor (PI8) detects whether the tray is in the home position or not.

When the power of the stapler stacker is turned ON, the stapler stacker driver rotates the tray up/down motor (M5) in order to return the tray to the home position. If the tray is in the home position, it remains in the position and stands by.

The stapler stacker elevates the tray so that the tray specified by the video controller PCB via the option controller PCB comes to the delivery slot.

The upper limit of the tray is detected by the tray upper limit detection switch (MS5). The stapler stacker driver stops the tray up/down motor (M5) when MS5 is turned ON.

The height of paper stacked on the tray is detected by the distance sensor (PS1). When the height of the stacked paper reaches the prescribed value, the tray descends.

The stapler stacker shuts off the +24VDC supply to the M5 and stops its operations when the safety area detection switch (MS3) is turned ON in the condition that the shutter and swing guide are open.

The stapler stacker driver informs the option controller PCB of tray up/down motor trouble in the following cases:

1. Home position detection does not finish in 15 sec. after the detection started.
2. The tray home position detection sensor (PI8) detects the trays 0.5 sec. after the start of tray elevation.
3. The tray up/down motor clock sensor (PI9) does not detect the encoder clock signal (SHIFTMCLK) 0.2 sec. after the start of tray elevation.

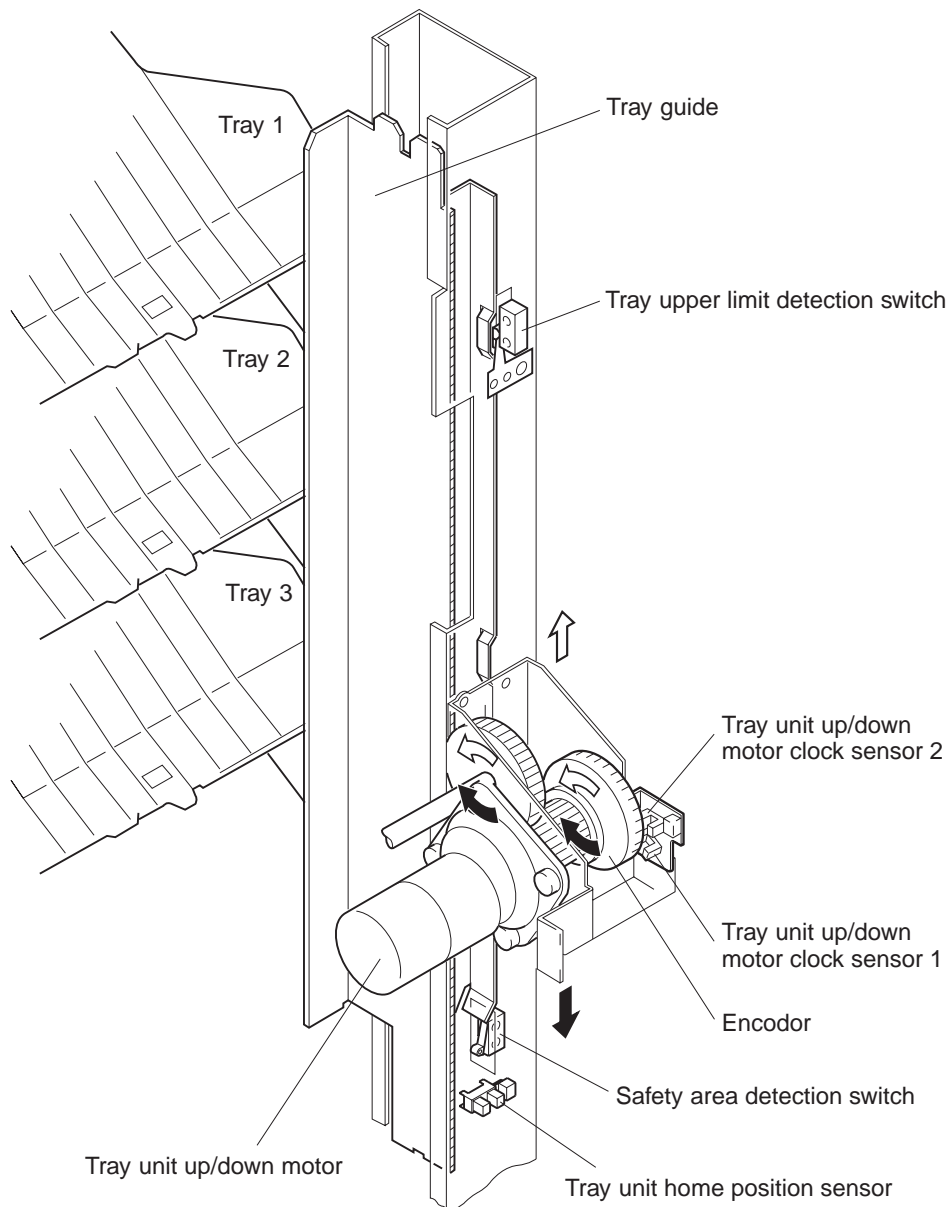


Figure 2-2-19

F. Stapler Unit

Stapling is operated by the staple motor (M6), and one rotation of the cam completes one cycle of stapling operation. The home position of the cam is detected when the stapling operation home position switch (PT2) is turned ON.

The staple motor (M6) is controlled by the microcomputer (CPU) on the stapler stacker driver PCB for clockwise and counterclockwise rotation.

When PT2 is off, the stapler stacker driver rotates M6 counterclockwise until PT2 is turned ON and initializes the stapling operation.

The staples inside the staple cartridge are detected by the staple switch (PT1).

The stapler stacker driver does not drive the staple motor (M6) unless the swing guide close detection switches (MS2, MS6) are ON (swing guide is closed). This is a safety protection function in case a finger is inserted when stapling.

The stapler stacker driver informs the option controller PCB of the staple motor trouble in the following cases:

1. Home position detection does not finish in 0.5 sec. after it started.
2. Stapling operation home position switch (PT2) remains ON when 0.5 sec. passes since the start of stapling operation.

Furthermore, during stapling operation if the Stapling operation home position switch (PT2) does not turn OFF 0.5 sec. after it was turned ON, the stapler stacker driver judges it as staple jams and rotates the staple motor (M6) counterclockwise until PT2 is turned ON. If PT2 is not turned ON after 0.5 sec., it is regarded as a staple motor failure. It also informs the option controller of the jams or staple motor failure.

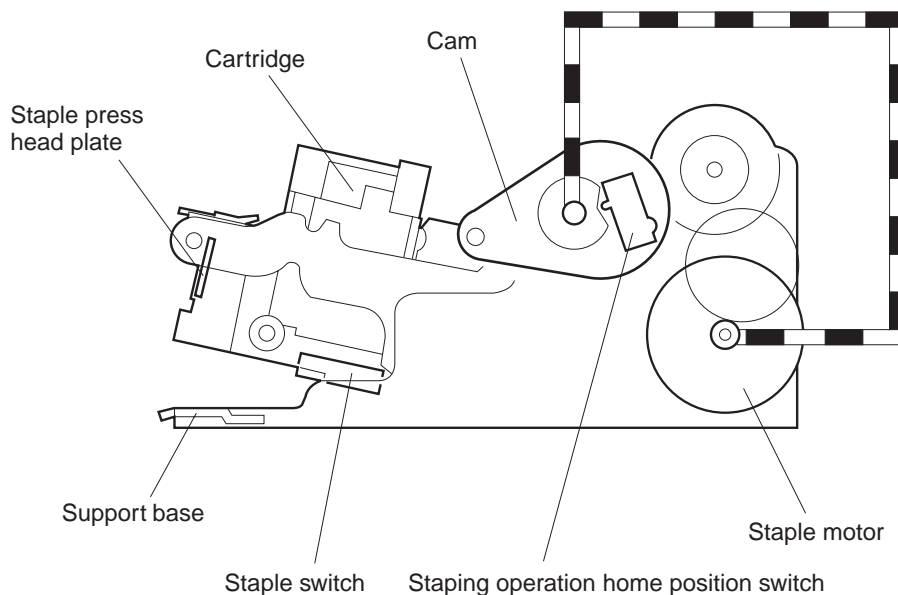


Figure 2-2-20

G. Detection of Paper Stacked on Tray

The paper stacked on the tray is detected after the tray is changed or after paper is delivered to the tray.

The height of the paper stacked on the tray is detected by the distance sensor (PS1). The number of paper delivered to the tray and the number of sets (number of stapling) are stored in the stapler stacker driver. The capacity of each tray is shown in the table below.

The stapler stacker driver stops when the conditions in the table below are fulfilled, and informs the option controller that the tray is full.

Table 2-2-3

Stacking mode Tray	1	2	3	4	5
Tray 1	91mm	51mm	Max. 30 sets, 300 sheets or stacking height of 91mm	Max. 30 sets, 300 sheets or stacking height of 51mm	61mm
Tray 2	91mm	51mm	Max. 30 sets, 300 sheets or stacking height of 91mm	Max. 30 sets, 300 sheets or stacking height of 51mm	61mm
Tray 3	91mm	51mm	Max. 30 sets, 300 sheets or stacking height of 91mm	Max. 30 sets, 300 sheets or stacking height of 51mm	61mm

- Stacking mode details

Modes: 1. All sheets of paper satisfy the following conditions during simple stacking or job off-setting.

1. Face-down delivery
2. Same size (**Note 1**)
3. Small size (**Note 2**)

2. All sheets of paper do not satisfy any of the mode 1 conditions during simple stacking or job offsetting.

3. All sheets of paper of the same size are stapled.

4. Others (including large size (**Note 3**), including face-up delivery, mixed sizes, etc.)

5. All sheets of paper satisfy the following conditions during simple stacking or job off-setting.

1. Face-down delivery
2. Same size (**Note 1**)
3. Middle size (**Note 4**)

Notes: 1. Combinations of "A4 and Letter", "A4-R and Letter-R", "B5-R and Executive-R" and "A3 and Ledger" are considered as the same size.

2. Small sizes: A4, A4-R, Letter, Letter-R, B5-R, A5-R, Executive-R

3. Large sizes: A3, B4, Legal, Ledger, Universal (297 × 432 mm)

4. Middle sizes: B4, Ledger

H. Paper Jam Detection

The following sensors are installed on the stapler stacker in order to detect the presence of the paper and whether the paper is being fed properly or not.

- Entrance paper sensor (PI1)
- Reversing paper sensor (PI2)
- Delivery paper sensor (PI3)
- Staple tray paper sensor (PI4)

Paper jams are judged by these sensors; whether they detect the paper or not at check timing stored in the microcomputer (CPU) on the stapler stacker driver PCB. If CPU judges as paper jams, the delivery operation of the stapler stacker is interrupted and the stapler stacker informs the option controller PCB of the jams.

1. Entrance paper sensor delay jam

The CPU detects an entrance paper sensor delay jam if the leading edge of the paper does not reach the entrance paper sensor (PI1) within the prescribed time after the CPU receives a load notice command from the option controller.

2. Entrance paper sensor premature arrival jam

The CPU detects an entrance paper sensor premature arrival jam if any one of the following events occurs when the leading edge of the paper reaches the entrance paper sensor (PI1) after paper feeding begins.

- The tray is changed.
- The delivery paper sensor (PI3) detects the trailing edge of the preceding paper when the delivery method is changed (from face-down to face-up or from face-up to face-down).
- Stapling is performed.
- No prior notice comes from the option controller.
- There is no print paper feed data.

3. Reversing paper sensor delay jam

The CPU detects a reversing paper sensor delay jam if the leading edge of the paper does not reach the reversing paper sensor (PI2) within the prescribed time after the leading edge of the paper passes through the entrance paper sensor (PI1).

4. Delivery paper sensor delay jam

a. Face-down delivery

The CPU detects a delivery paper sensor delay jam if the leading edge of the paper does not reach the delivery paper sensor (PI3) within the prescribed time after the leading edge of the paper passes through the reversing paper sensor (PI2).

b. Face-up delivery

The CPU detects a delivery paper sensor delay jam if the leading edge of the paper does not reach the delivery paper sensor (PI3) within the prescribed time after the leading edge of the paper passes through the entrance paper sensor (PI1).

5. Delivery paper sensor stationary jam

a. Face-down delivery

The CPU detects a delivery paper sensor stationary jam if the trailing edge of the paper does not pass through the delivery paper sensor (PI3) within the prescribed time after the delivery paper sensor (PI3) detects the leading edge of the paper.

b. Face-up delivery

The CPU detects a delivery paper sensor stationary jam if the trailing edge of the paper does not pass through the delivery paper sensor (PI3) within the prescribed time after the delivery paper sensor (PI3) detects the leading edge of the paper.

6. Staple tray paper sensor delay jam

The CPU detects a staple tray paper sensor delay jam if the leading edge of the paper does not reach the staple tray paper sensor (PI4) within the prescribed time after the swing guide close sensor (PI18) detects the swing guide.

7. Staple tray paper sensor stationary jam

The CPU detects a staple tray paper sensor stationary jam if the trailing edge of the paper does not pass through the staple tray paper sensor (PI4) within the prescribed time after the delivery of the first sheet for job offset or a stapled paper to the tray begins.

8. Residual paper jam

- a. The CPU detects a residual paper jam if one of the following sensors detects the paper after the power switch is turned ON.
- b. The CPU detects a residual paper jam if one of the following sensors detects the paper after the stapler stacker delivers the paper automatically.
 - Entrance paper sensor (PI1)
 - Reversing paper sensor (PI2)
 - Delivery paper sensor (PI3)
 - Staple tray paper sensor (PI4)

III. POWER SUPPLIES

A. Outline

The power supply unit of the stapler stacker uses a remote switch system. When the power switch of the printer is turned ON, the printer outputs the commands to the option controller PCB via the video controller PCB. According to these commands, the option controller PCB outputs the POWER ON signal (PWRON-IN) to the power unit via the stapler stacker driver PCB, and turns ON the power. The power supply circuit supplies +24V to the stapler stacker driver when PWRON-IN is "H."

+24V is used to drive systems such as motors and solenoids. The +5V is generated by the stapler stacker driver and is supplied to the sensors and ICs on the stapler stacker driver PCB.

Figure 2-3-1 is a block diagram of the power supply unit.

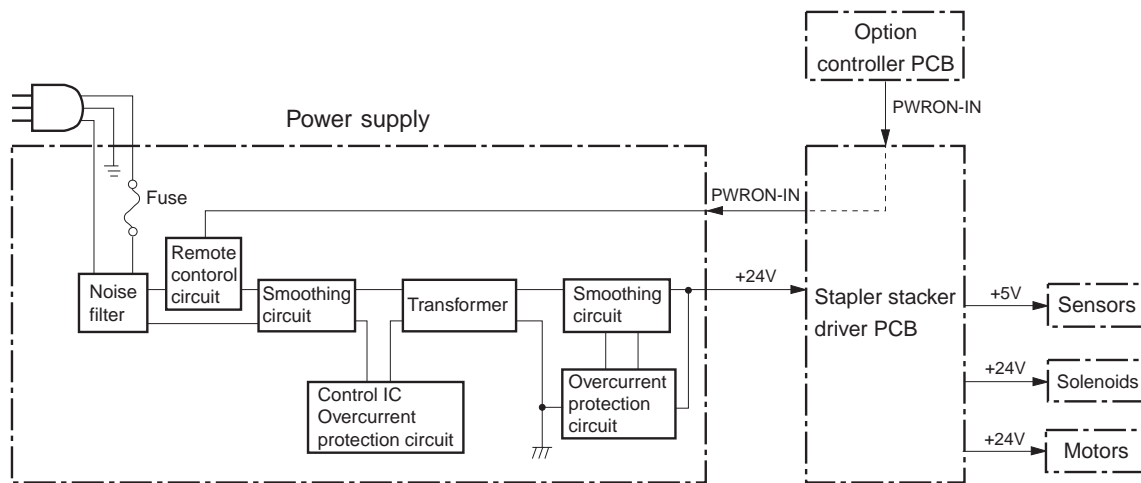


Figure 2-3-1

B. Protection System

The +24VDC power supply circuit has an excess current protection mechanism. If a short circuit or other faults causes excess current, the mechanism automatically shuts off the output voltage to prevent damaging the power supply circuit. When no DC voltage is output from the power supply circuit as a result of the activation of excess current protection, the user must turn the power OFF and rectify the problem. Then turn the power back ON.

CHAPTER 3

THE MECHANICAL SYSTEM

I. PREFACE	3-1	VI. SENSORS	3-15
II. EXTERNALS	3-2	VII. SOLENOIDS	3-24
III. MAIN UNITS	3-6	VIII. MOTORS	3-27
IV. MAIN PARTS	3-9	IX. ELECTRICAL PARTS	3-31
V. SWITCHES	3-11		

I. PREFACE

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

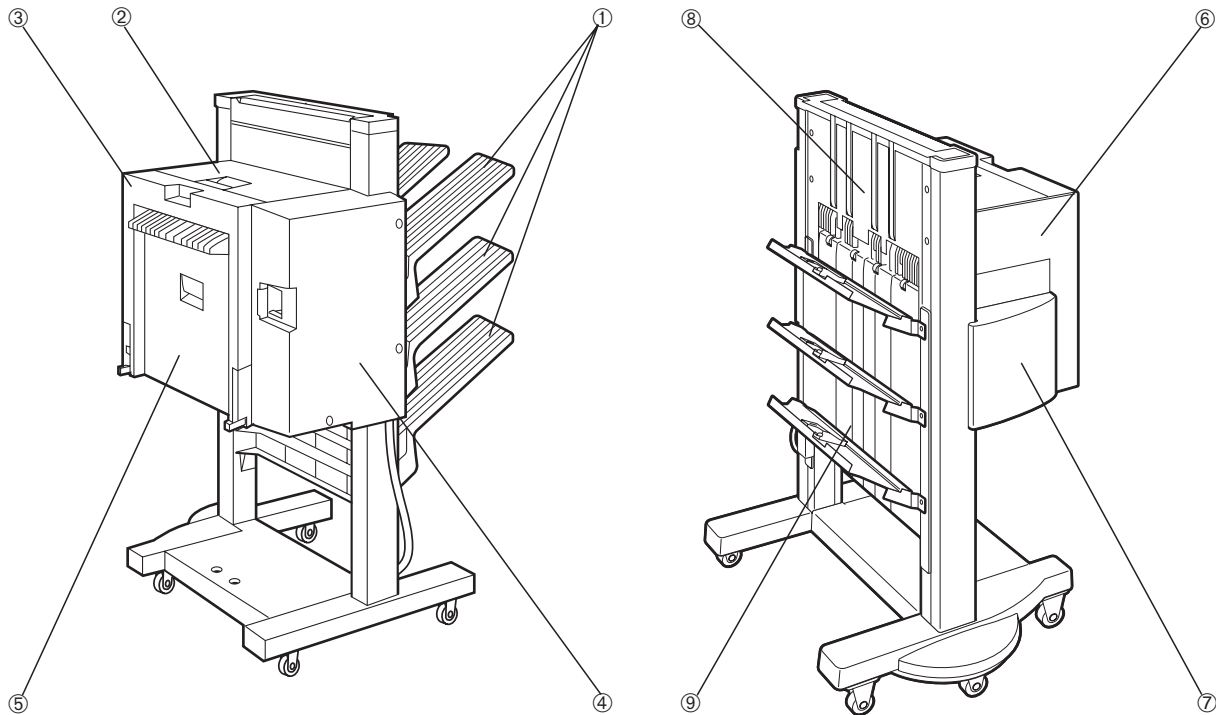
The service technician is to identify the cause of malfunction according to "Chapter 4 Troubleshooting" and to replace the defective part(s) following the disassembly procedure of each part.

Note the following precautions when working on the stacker.

1. **▲ CAUTION: Before servicing the stacker, 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 stacker, be sure to use them in their original locations.
4. Do not operate the stacker with any parts removed.
5. Discharge electrical static from your body by touching the metal frame of the stacker prior to handling the PCB in order to avoid causing damage by the difference in static charge at that time.

II. EXTERNALS

A. Locations



- | | |
|------------------------|------------------|
| ① Tray unit | ② Top cover unit |
| ③ Right top cover unit | ④ Rear cover |
| ⑤ Right cover unit | ⑥ Front cover |
| ⑦ Front door unit | ⑧ Top guide |
| ⑨ Bottom guide | |

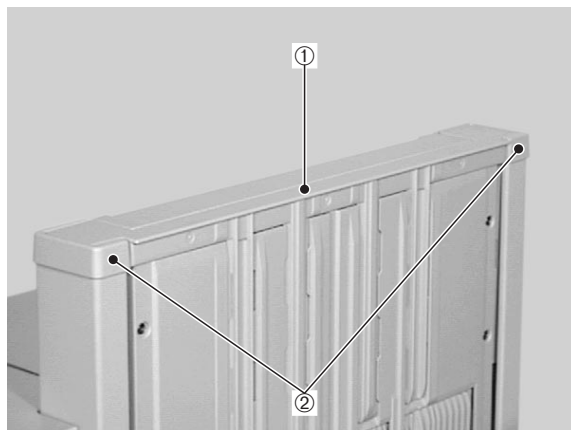
Figure 3-2-1

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

The removal procedures of the covers that can be removed simply by taking out the screws without removing other parts are omitted.

B. External Covers**1. Tray unit**

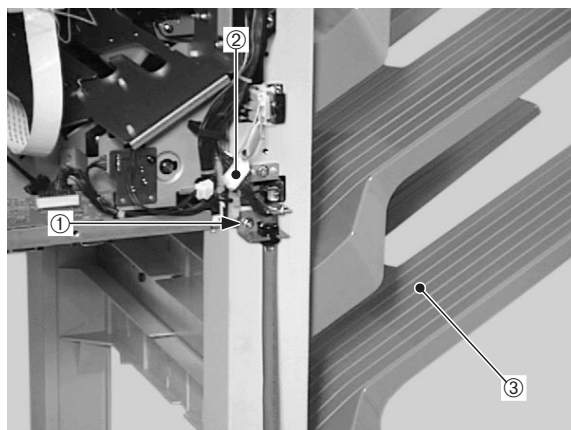
- 1) Remove the slide guide unit.
- 2) Unhook the 2 claws and then remove the stoppers (right and left).



① Slide guide unit ② Stoppers

Figure 3-2-2

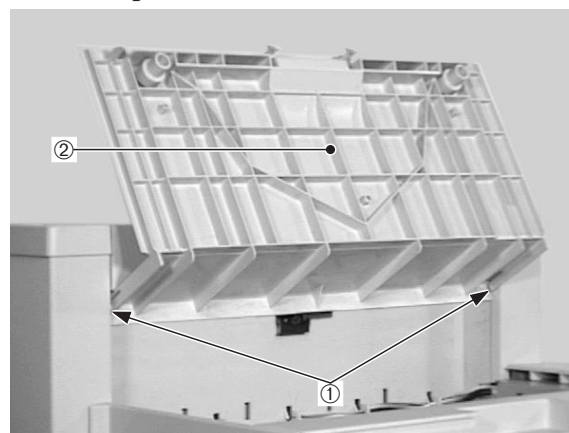
- 3) Following the rear cover removal procedure described on Page 3-4, remove the rear cover.
- 4) Remove the screw and the connector. Then, lift up the tray unit to remove.



① Screw ② Connector
③ Tray unit

Figure 3-2-3**2. Top cover unit**

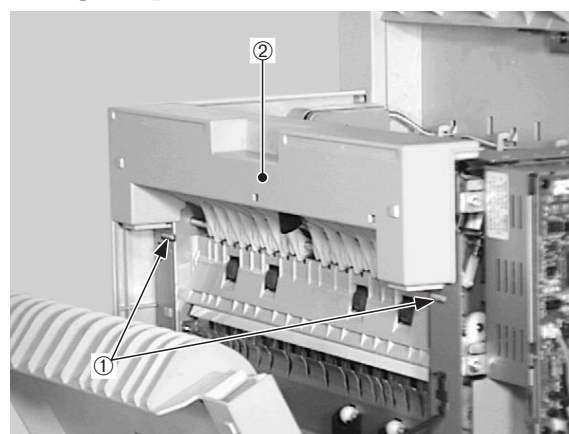
- 1) Open the top cover unit.
- 2) Unhook the 2 claws, and then remove the top cover unit.



① Claws ② Top cover unit

Figure 3-2-4**3. Right top cover**

- 1) Following the rear cover removal procedure described on Page 3-4, remove the rear cover.
- 2) Open the top cover unit.
- 3) Open the right cover unit.
- 4) Unhook the 2 claws, and then lift up the right top cover to remove.

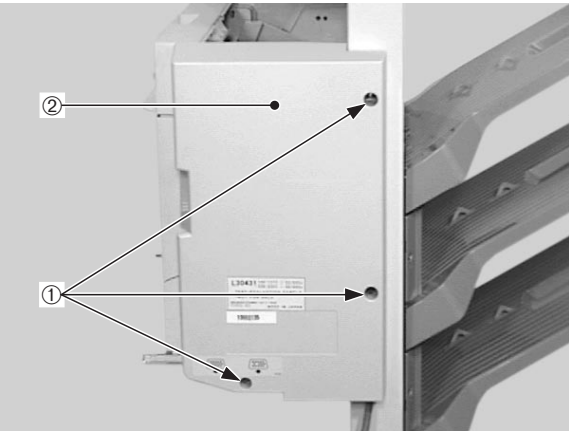


① Claws ② Right top cover

Figure 3-2-5

4. Rear cover

- 1) Open the top cover unit.
- 2) Remove the 3 screws, and then take out the rear cover by lifting it up.

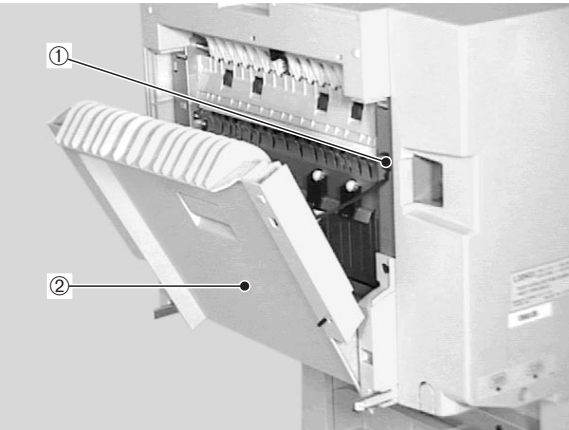


① Screws ② Rear cover

Figure 3-2-6

5. Right cover unit

- 1) Open the right cover unit.
- 2) Remove the hinge, and then take out the right cover unit by pulling it toward you.

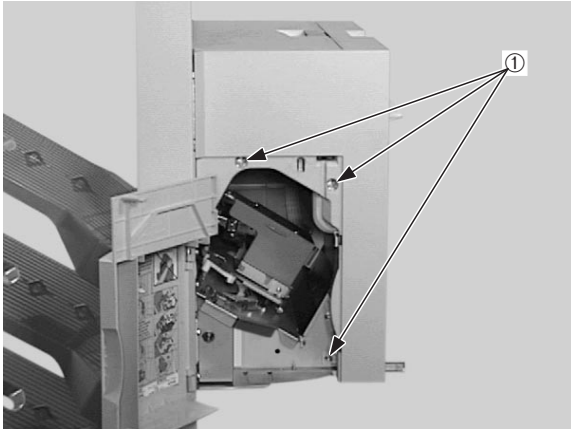


① Hinge ② Right cover unit

Figure 3-2-7

6. Front cover

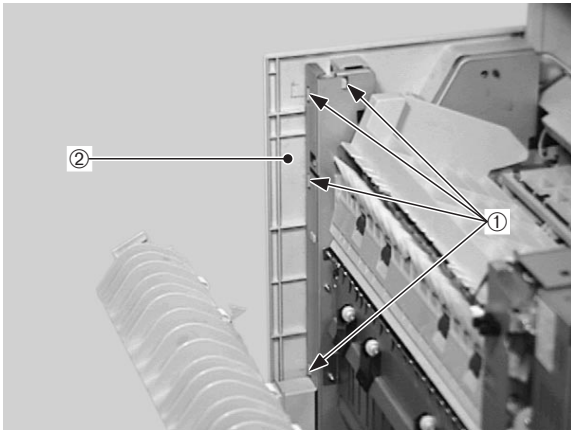
- 1) Open the front door unit and right cover unit.
- 2) Following the right top cover removal procedure described on Page 3-3, remove the right top cover.
- 3) Remove the 3 screws.



① Screws

Figure 3-2-8

- 4) Unhook the 4 claws, and then remove the front cover.

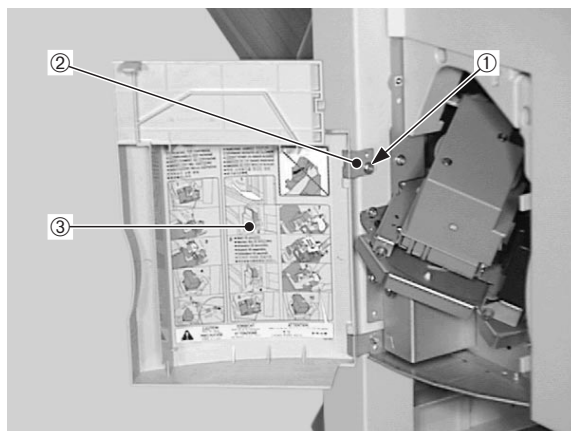


① Claws ② Front cover

Figure 3-2-9

7. Front door unit

- 1) Open the front door unit.
- 2) Remove the screw, bushing, and then front door unit.

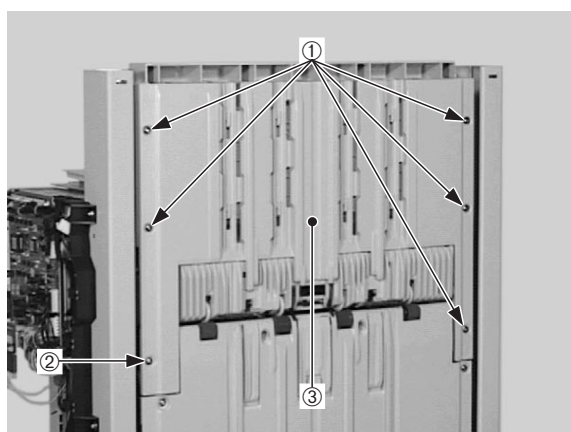


- ① Screw ② Bushing
③ Front door unit

Figure 3-2-10

8. Top guide

- 1) Following the tray unit removal procedure described on Page 3-3, remove the tray unit.
- 2) Remove the 5 screws (4M), 1 screw (3M) and then top guide.

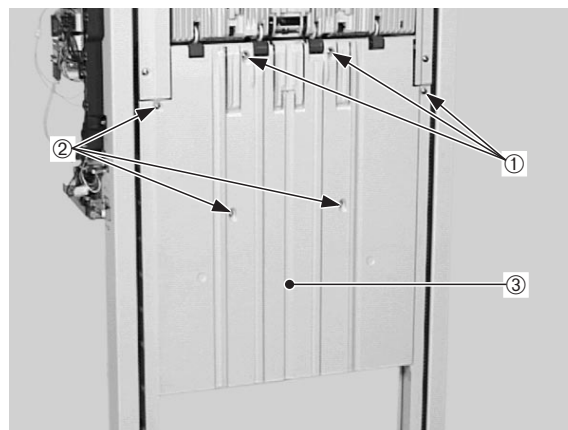


- ① Screws (4M) ② Screw (3M)
③ Top guide

Figure 3-2-11

9. Bottom guide

- 1) Following the tray unit removal procedure described on Page 3-3, remove the tray unit.
- 2) Remove the 3 screws (4M) and 3 screws (3M), and then open the bottom guide toward you.



- ① Screws (4M) ② Screws (3M)
③ Bottom guide

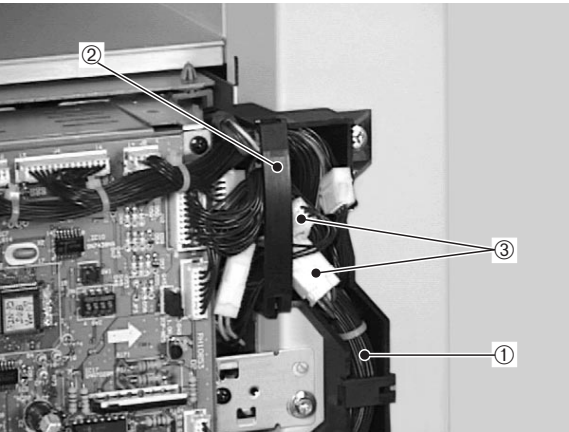
Figure 3-2-12

- 3) Remove the cable from the cable clamp.
- 4) Disconnect the 2 connectors, and then remove the bottom guide.

III. MAIN UNITS

A. Staple Tray Unit

- 1) Following the rear cover removal procedure described on Page 3-4, remove the rear cover.
- 2) Following the top guide and bottom guide removal procedures described on Page 3-5, remove the top guide and bottom guide.
- 3) Remove the cable from the cable guide, and then disconnect the 2 connectors.



① Cable ② Cable guide
③ Connectors

Figure 3-3-1

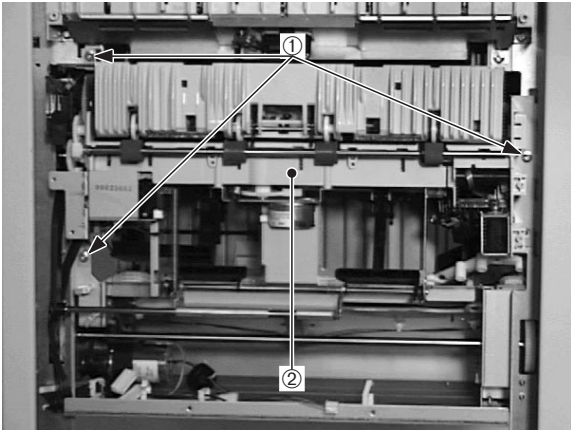
- 4) Remove the cable from the cable guide, and then disconnect the 2 connectors.



① Cable ② Cable guide
③ Connectors

Figure 3-3-2

- 5) Remove the 3 screws and then the staple tray unit.

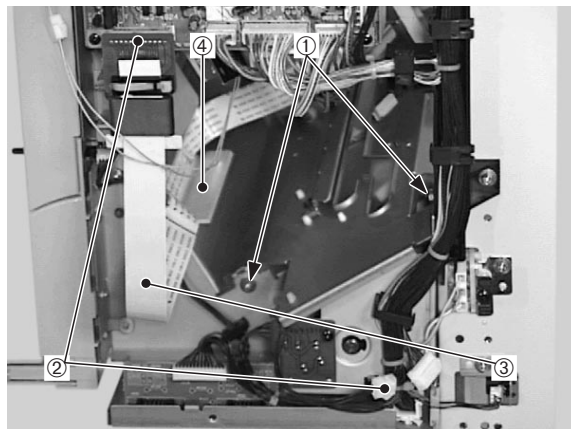


① Screws ② Staple tray unit

Figure 3-3-3

B. Staple Unit

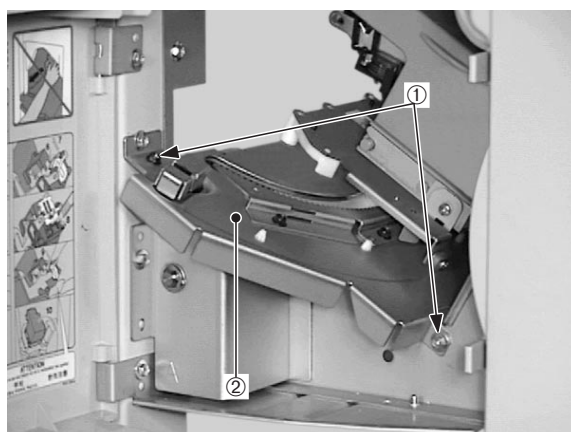
- 1) Following the staple tray unit removal procedure described on Page 3-6, remove the staple tray unit.
- 2) Remove the front door unit.
- 3) Remove the 2 screws, disconnect the 2 connectors, and then take out the flat cable from the flat cable guide.



- | | |
|--------------|--------------------|
| ① Screws | ② Connectors |
| ③ Flat cable | ④ Flat cable guide |

Figure 3-3-4

- 4) Remove the 2 screws and then staple unit.

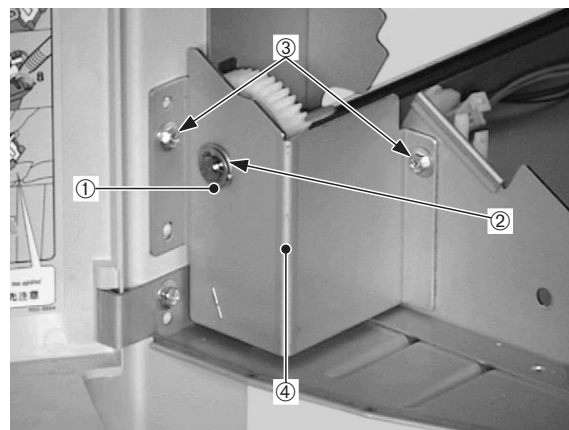


- | | |
|----------|---------------|
| ① Screws | ② Staple unit |
|----------|---------------|

Figure 3-3-5

C. Tray Drive Unit

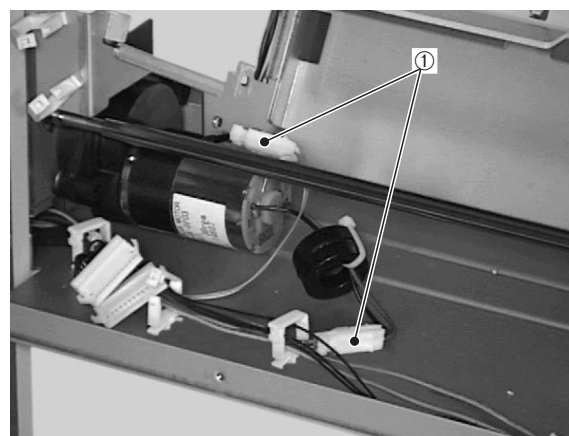
- 1) Remove the staple unit.
- 2) Remove the E-ring, bushing, 2 screws and then cover.



- | | |
|----------|-----------|
| ① E-ring | ② Bushing |
| ③ Screws | ④ Cover |

Figure 3-3-6

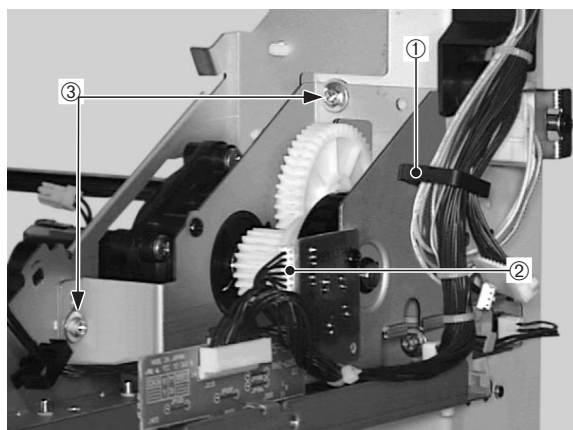
- 3) Disconnect the 2 connectors.



- | |
|--------------|
| ① Connectors |
|--------------|

Figure 3-3-7

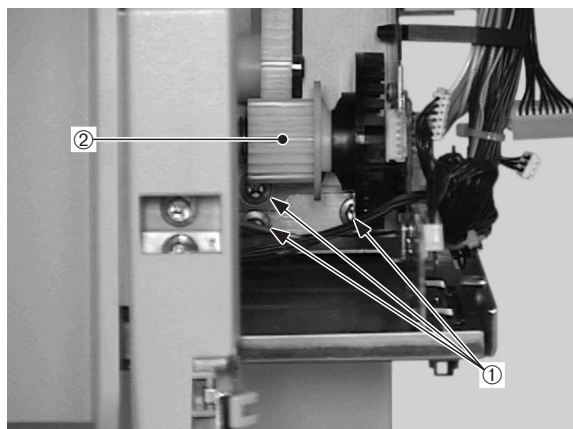
- 4) Remove the cable clamp and 2 screws, and then disconnect the connector.



- ① Cable clamp ② Connector
③ Screws

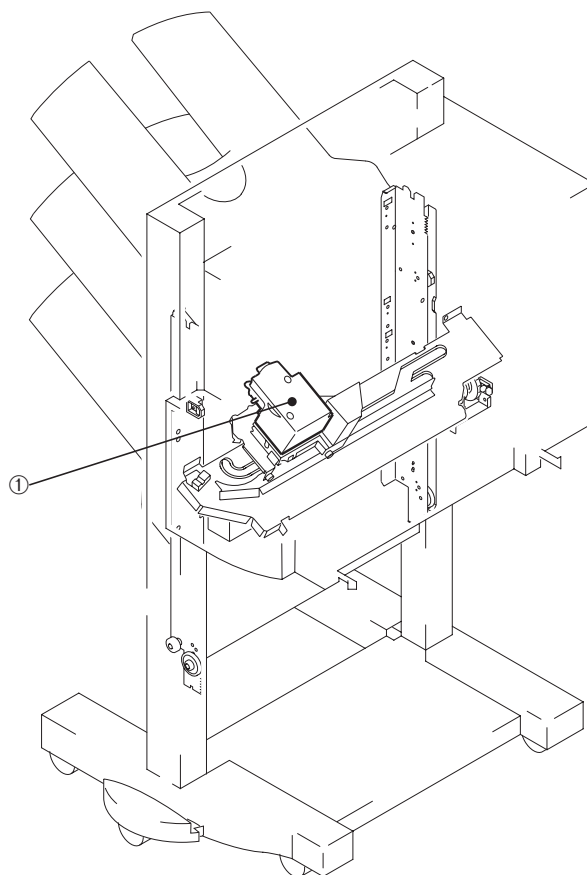
Figure 3-3-8

- 5) Remove the 3 screws and then tray drive unit.



- ① Screws ② Tray drive unit

Figure 3-3-9

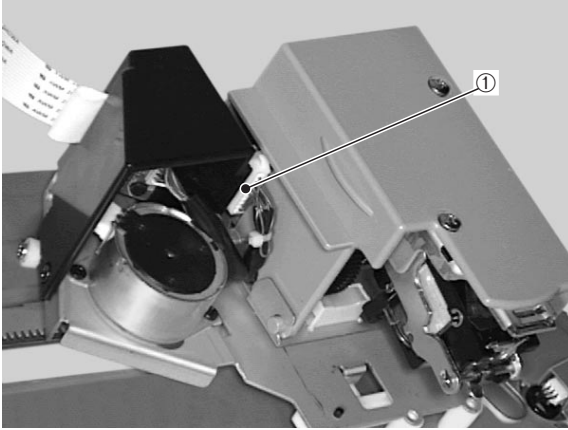
IV. MAIN PARTS**A. Locations**

① Stapler

Figure 3-4-1

B. Stapler

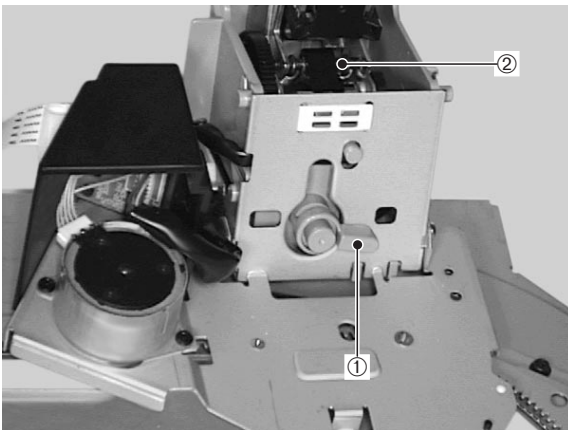
- 1) Following the staple unit removal procedure described on Page 3-7, remove the staple unit.
- 2) Disconnect the connector.



① Connector

Figure 3-4-2

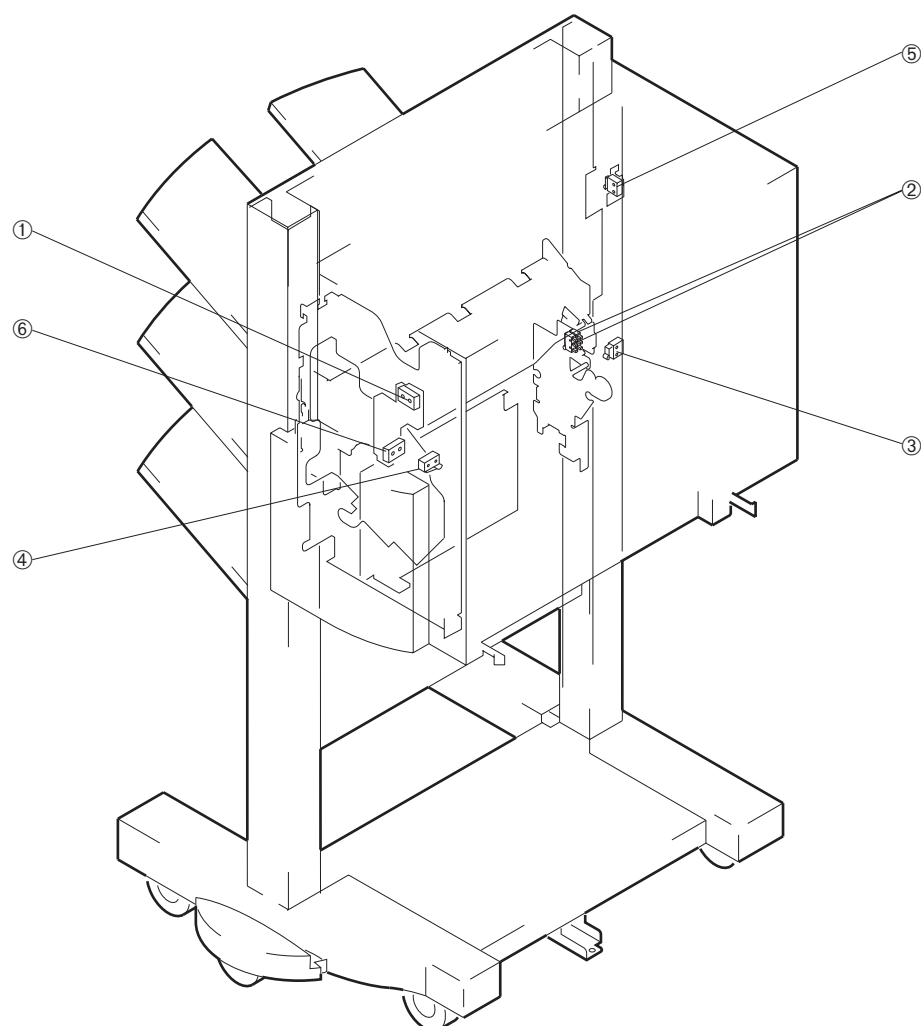
- 3) Lifting up the stapler, shift the lever at the back, and then remove the stapler.



① Lever

② Stapler

Figure 3-4-3

V. SWITCHES**A. Locations**

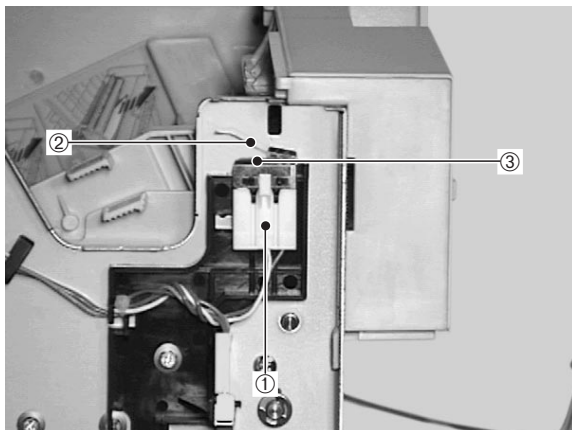
- ① Top cover open detection switch
- ③ Safety area detection switch
- ⑤ Tray upper limit detection switch

- ② Swing guide close detection switch
- ④ Shutter close detection switch
- ⑥ Front cover open detection switch

Figure 3-5-1

B. Top Cover Open Detection Switch

- 1) Following the front cover removal procedure described on Page 3-4, remove the front cover.
- 2) Disconnect the connector, remove the switch cover, and then take out the top cover open detection switch.

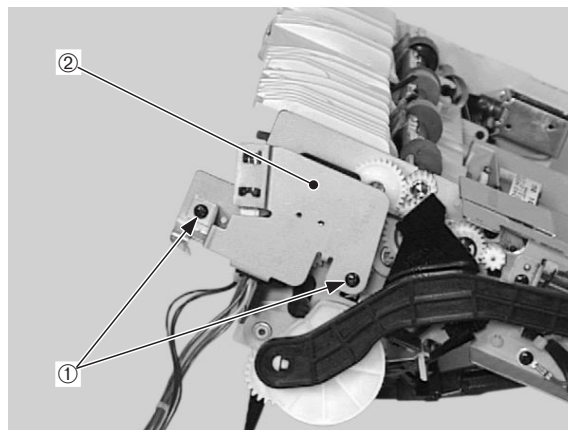


- ① Connector
- ② Switch cover
- ③ Top cover open detection switch

Figure 3-5-2

C. Swing Guide Close Detection Switch

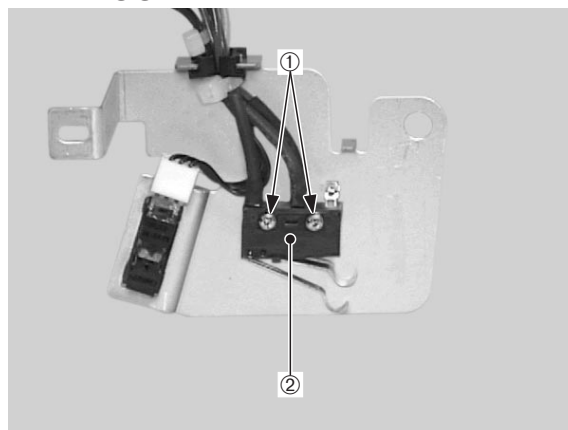
- 1) Following the staple tray unit removal procedure described on Page 3-6, remove the staple tray unit.
- 2) Remove the 2 screws and then the mounting plate.



- ① Screws
- ② Mounting plate

Figure 3-5-3

- 3) Remove the 2 screws and then the swing guide close detection switch.

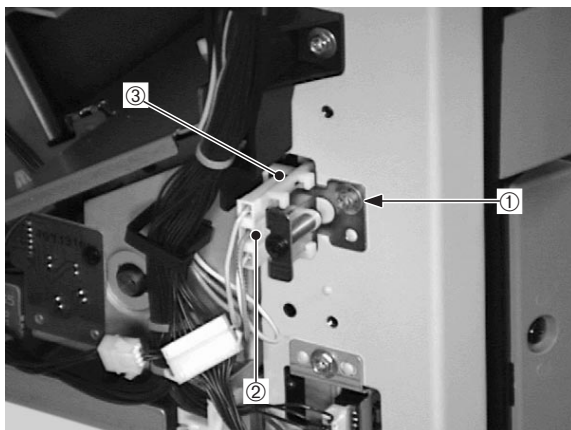


- ① Screws
- ② Swing guide close detection switch

Figure 3-5-4

D. Safety Area Detection Switch

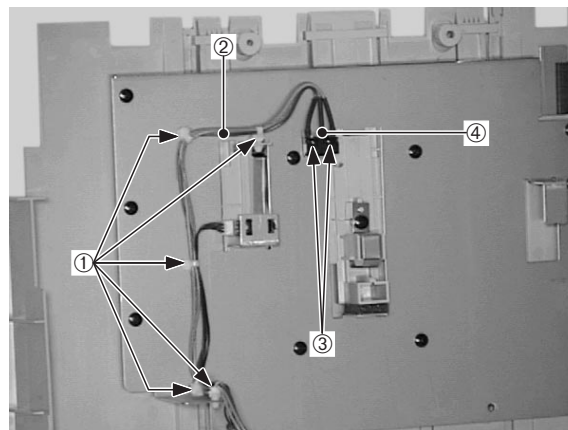
- 1) Following the rear cover removal procedure described on Page 3-4, remove the rear cover.
- 2) Remove the screw, disconnect the connector, and then take out the safety area detection switch.



- ① Screw
- ② Connector
- ③ Safety area detection switch

Figure 3-5-5**E. Shutter Close Detection Switch**

- 1) Following the bottom guide removal procedure described on Page 3-5, remove the bottom guide.
- 2) After taking out the cable from the cable clamp, remove the 2 screws and then the shutter close detection switch.

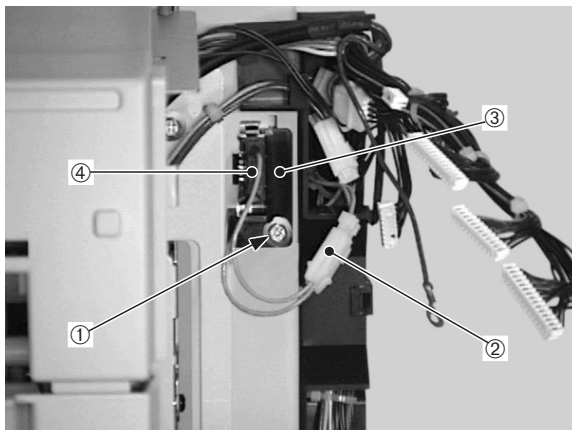


- ① Cable clamp
- ② Cable
- ③ Screws
- ④ Shutter close detection switch

Figure 3-5-6

F. Tray Upper Limit Detection Switch

- 1) Following the power supply unit removal procedure described on Page 3-32, remove the power supply unit.
- 2) Remove the screw, disconnect the connector, and then take out the tray upper limit detection switch from the switch cover.

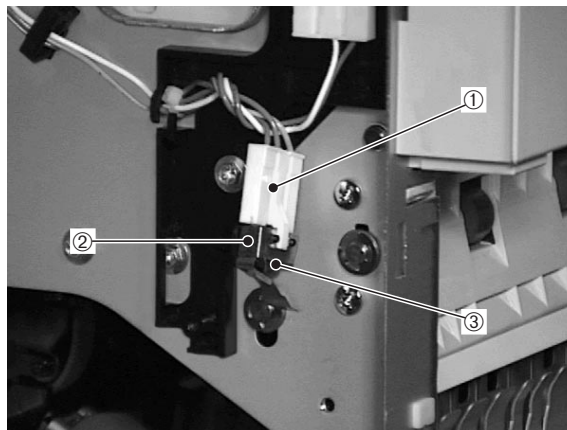


- ① Screw
- ② Connector
- ③ Switch cover
- ④ Tray upper limit detection switch

Figure 3-5-7

G. Front Cover Open Detection Switch

- 1) Following the front cover removal procedure described on Page 3-4, remove the front cover.
- 2) Disconnect the connector, remove the switch cover, and then take out the front cover open detection switch.

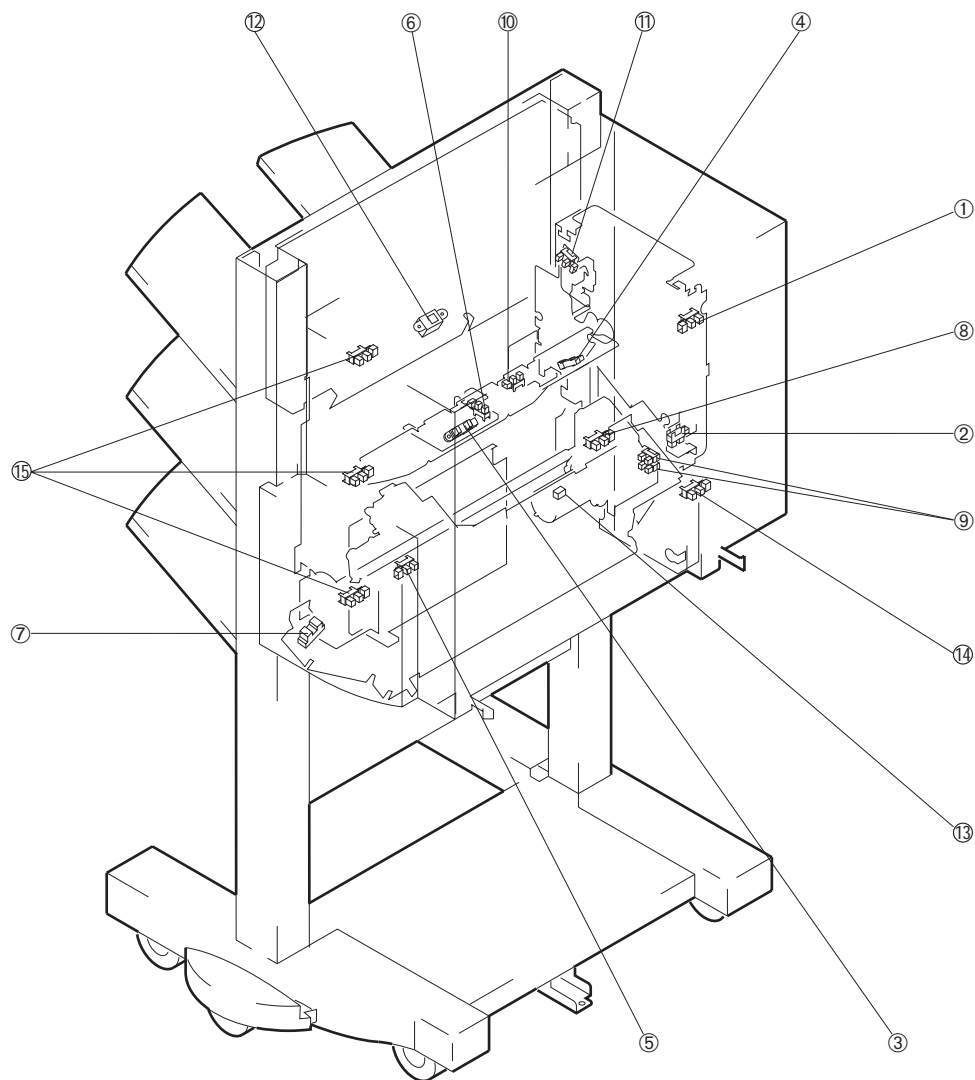


- ① Connector
- ② Switch cover
- ③ Front cover open detection switch

Figure 3-5-8

VI. SENSORS

A. Locations

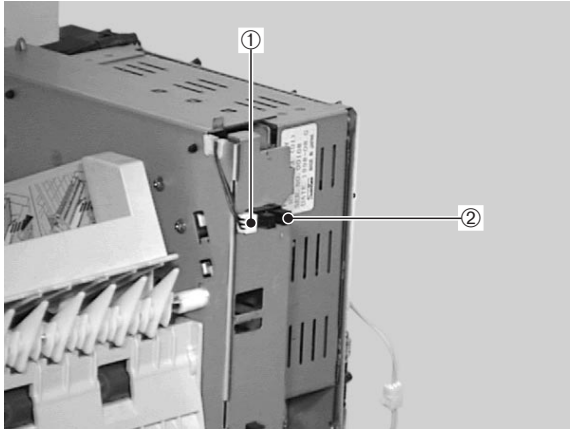


- | | |
|--|---|
| 1 Entrance paper sensor | 2 Reversing paper sensor |
| 3 Delivery paper sensor | 4 Staple tray paper sensor |
| 5 Shutter close sensor | 6 Adjustment plate home position sensor |
| 7 Stapler home position sensor | 8 Tray home position sensor |
| 9 Tray up/down motor clock sensor (1 to 2) | 10 Delivery motor clock sensor |
| 11 Swing guide close sensor | 12 Distance sensor |
| 13 Tray up/down motor temperature sensor | 14 Joint sensor |
| 15 Tray paper sensor (1 to 3) | |

Figure 3-6-1

B. Entrance Paper Sensor

- 1) Following the right top cover removal procedure described on Page 3-3, remove the right top cover.
- 2) Disconnect the connector, and then remove the entrance paper sensor.

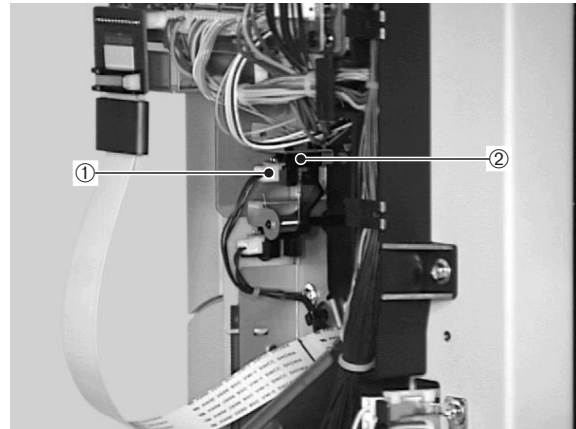


- ① Connector
② Entrance paper sensor

Figure 3-6-2

C. Reversing Paper Sensor

- 1) Following the rear cover removal procedure described on Page 3-4, remove the rear cover.
- 2) Disconnect the connector, and then remove the reversing paper sensor.

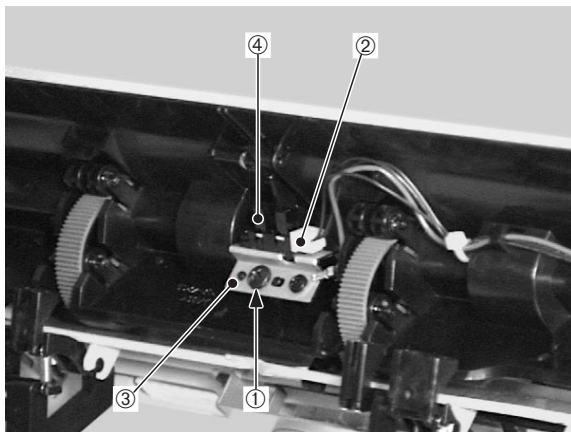


- ① Connector
② Reversing paper sensor

Figure 3-6-3

D. Delivery Paper Sensor

- 1) Following the staple tray unit removal procedure described on Page 3-6, remove the staple tray unit.
- 2) Remove the screw, disconnect the connector, and then take out the sensor mount.



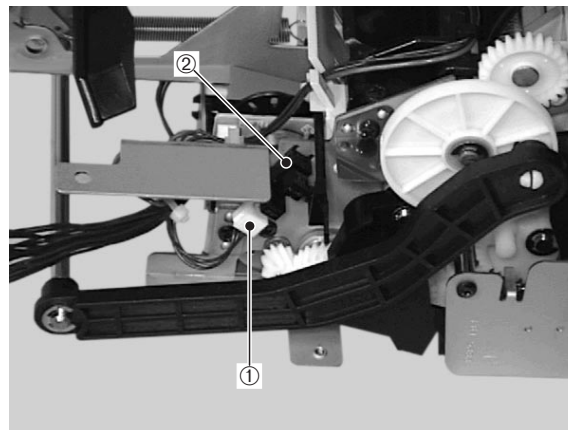
- ① Screw
- ② Connector
- ③ Sensor mount
- ④ Delivery paper sensor

Figure 3-6-4

- 3) Remove the screw and then the delivery paper sensor.

E. Staple Tray Paper Sensor

- 1) Following the staple tray unit removal procedure described on Page 3-6, remove the staple tray unit.
- 2) Disconnect the connector, and then remove the staple tray paper sensor.

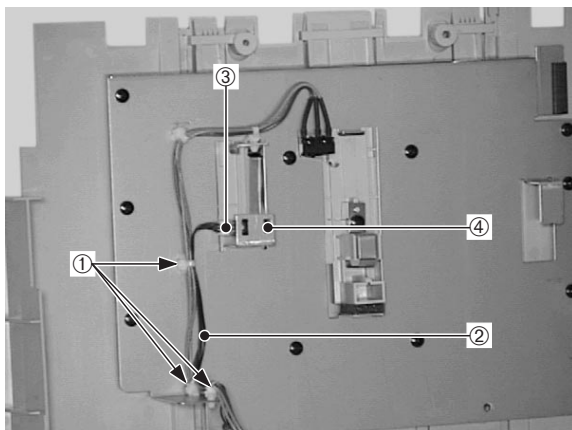


- ① Connector
- ② Staple tray paper sensor

Figure 3-6-5

F. Shutter Close Sensor

- 1) Following the bottom guide removal procedure described on Page 3-5, remove the bottom guide.
- 2) After taking out the cable from the cable clamp, disconnect the connector, and then remove the shutter close sensor.

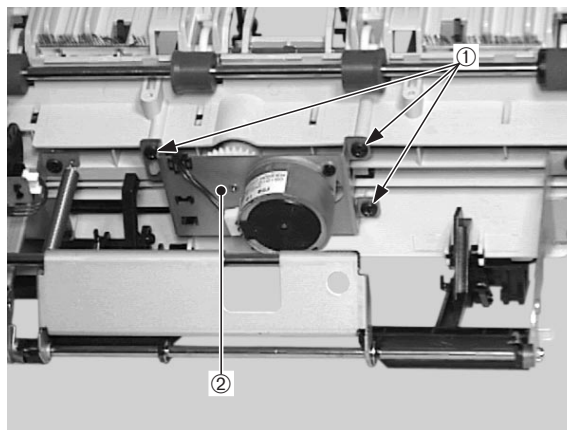


- ① Cable clamp
- ② Cable
- ③ Connector
- ④ Shutter close sensor

Figure 3-6-6

G. Adjustment Plate Home Position Sensor

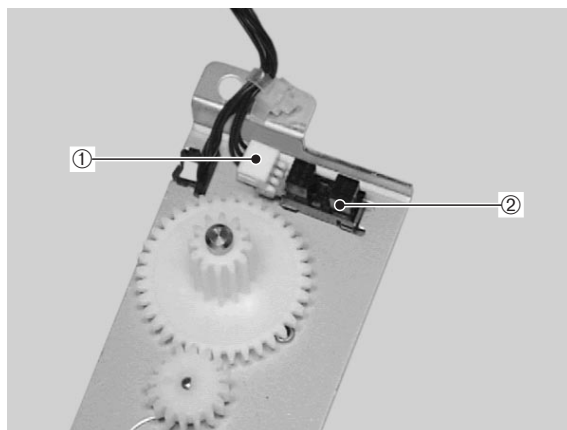
- 1) Following the staple tray unit removal procedure described on Page 3-6, remove staple tray unit.
- 2) Remove the 3 screws and then the motor unit.



- ① Screws
- ② Motor unit

Figure 3-6-7

- 3) Disconnect the connector, and then remove the adjustment plate home position sensor.

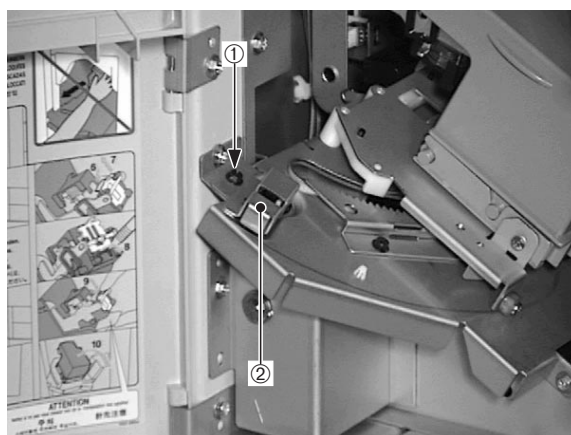


- ① Connector
- ② Adjustment plate home position sensor

Figure 3-6-8

H. Stapler Home Position Sensor

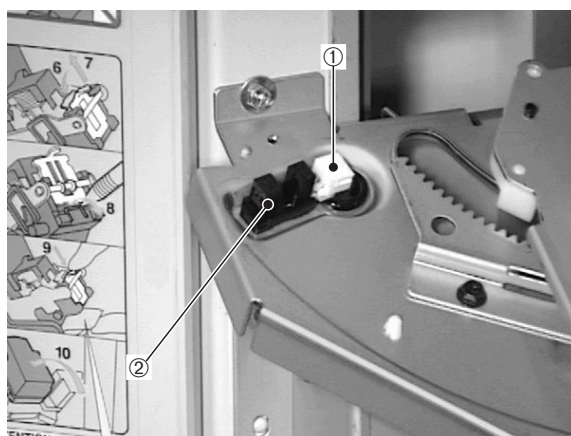
- 1) Open the front door unit.
- 2) Remove the screw and then the cover.



① Screw ② Cover

Figure 3-6-9

- 3) Disconnect the connector, and then remove the stapler home position sensor.

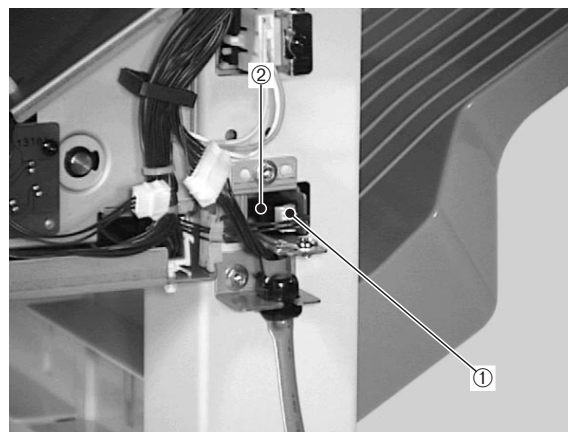


① Connector
② Stapler home position sensor

Figure 3-6-10

I. Tray Home Position Sensor

- 1) Following the rear cover removal procedure described on Page 3-4, remove the rear cover.
- 2) Disconnect the connector, and then remove the tray home position sensor.



① Connector
② Tray home position sensor

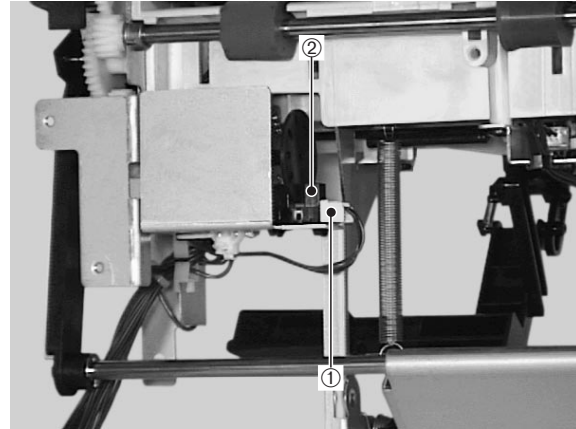
Figure 3-6-11

J. Tray Up/Down Motor Clock Sensor (1 to 2)

- 1) Following the tray up/down motor clock sensor PCB removal procedure described on Page 3-33, remove the tray up/down motor clock sensor PCB.

K. Delivery Motor Clock Sensor

- 1) Following the staple tray unit removal procedure described on Page 3-6, remove the staple tray unit.
- 2) Disconnect the connector, and then remove the delivery motor clock sensor.

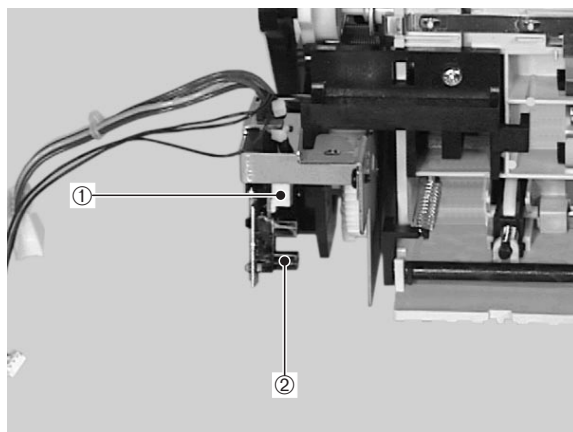


- ① Connector
② Delivery motor clock sensor

Figure 3-6-12

L. Swing Guide Close Sensor

- 1) Following the staple tray unit removal procedure described on Page 3-6, remove the staple tray unit.
- 2) Disconnect the connector, and then remove the swing guide close sensor.



- ① Connector
② Swing guide close sensor

Figure 3-6-13

M. Distance Sensor

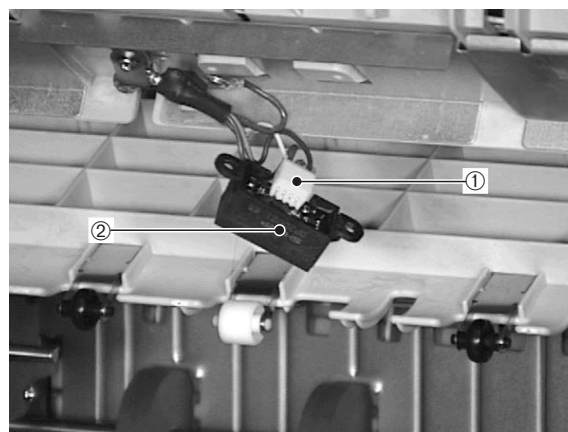
- 1) Following the staple tray unit removal procedure described on Page 3-6, remove the staple tray unit.
- 2) Remove the 2 screws and then the sensor cover.



- ① Screws
② Sensor cover

Figure 3-6-14

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



- ① Connector
② Distance sensor

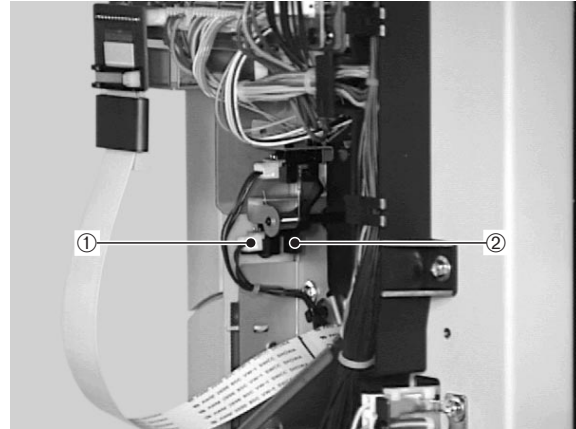
Figure 3-6-15

N. Tray up/down motor temperature sensor

- 1) Following the tray up/down motor removal procedure described on Page 3-30, remove the tray up/down motor.

O. Joint Sensor

- 1) Following the rear cover removal procedure described on Page 3-4, remove the rear cover.
- 2) Disconnect the connector, and then remove the joint sensor.



① Connector

② Joint sensor

Figure 3-6-16

P. Tray Paper Sensor (1 to 3)

The removal procedure of the tray paper sensor 1 is described in this section. The removal procedures of the tray paper sensors 2 and 3 are omitted here as they can be taken out in the same way as the sensor 1.

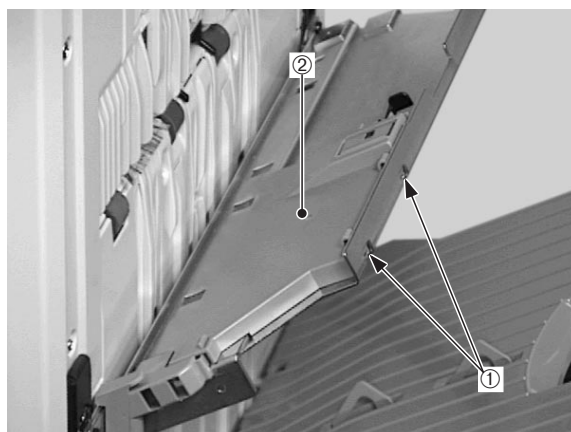
- 1) Remove the 2 screws and then the tray 1.



① Screws ② Tray 1

Figure 3-6-17

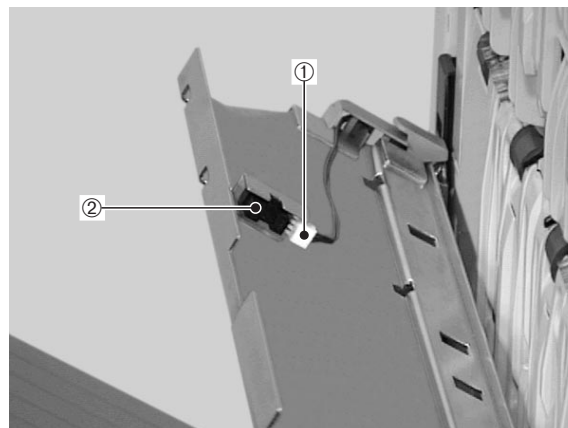
- 2) Unhook the 2 claws, and then remove the cover.



① Claws ② Cover

Figure 3-6-18

- 3) Disconnect the connector, and then remove the tray paper sensor 1.

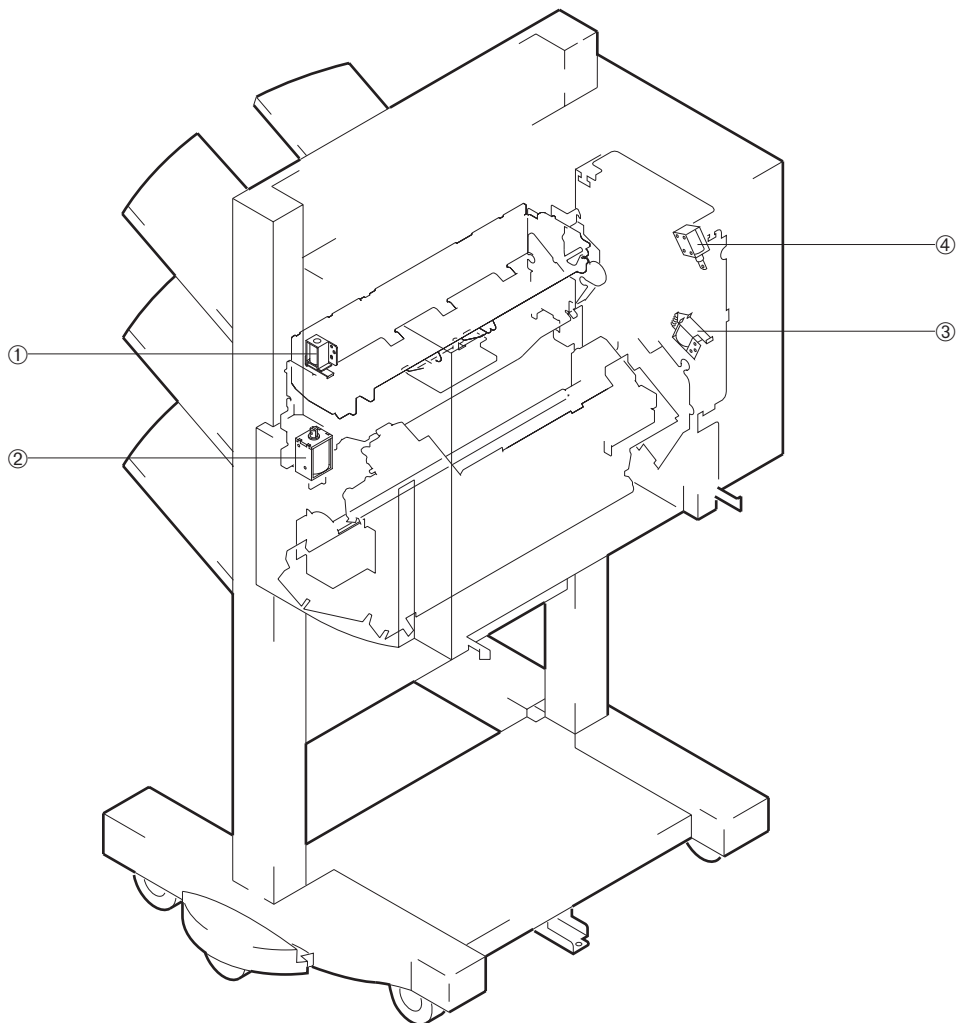


① Connector ② Tray paper sensor 1

Figure 3-6-19

VII. SOLENOIDS

A. Locations

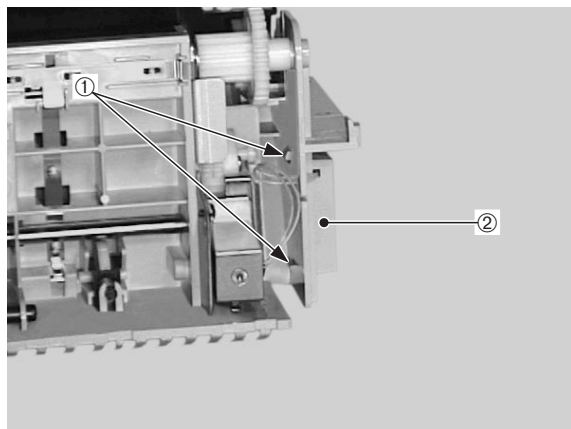


- | | |
|-----------------------------------|---------------------------------------|
| ① Paddle drive solenoid | ② Reference plate withdrawal solenoid |
| ③ Reversing roller drive solenoid | ④ Face-up deflector solenoid |

Figure 3-7-1

B. Paddle Drive Solenoid

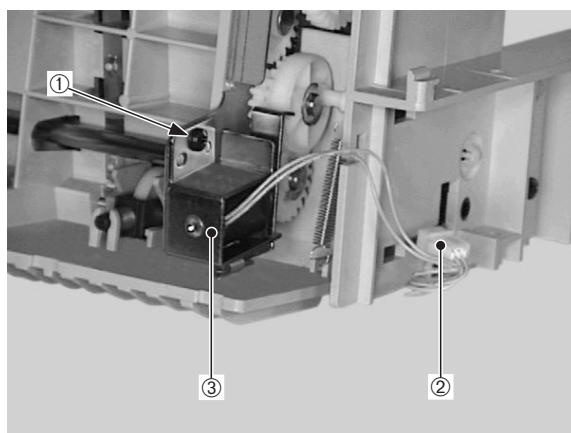
- 1) Following the staple tray unit removal procedure described on Page 3-6, remove the staple tray unit.
- 2) Unhook the 2 claws, and then remove the connector cover.



① Claws ② Connector cover

Figure 3-7-2

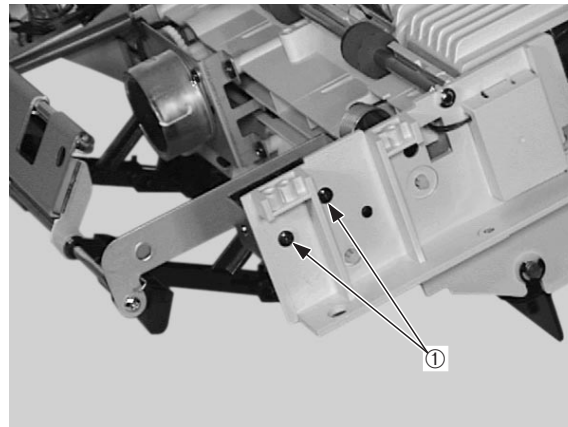
- 3) Remove the screw, disconnect the connector, and then take out the paddle drive solenoid.



① Screw
② Connector
③ Paddle drive solenoid

Figure 3-7-3**C. Reference Plate Withdrawal Solenoid**

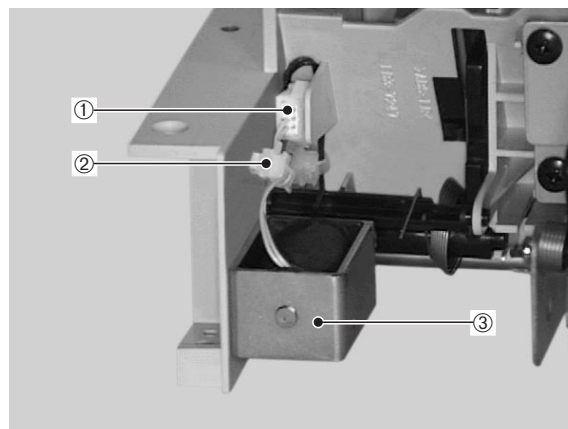
- 1) Following the staple tray unit removal procedure described on Page 3-6, remove the staple tray unit.
- 2) Remove the 2 screws.



① Screws

Figure 3-7-4

- 3) Disconnect the connector, remove the cable clamp, and then take out the reference plate withdrawal solenoid.

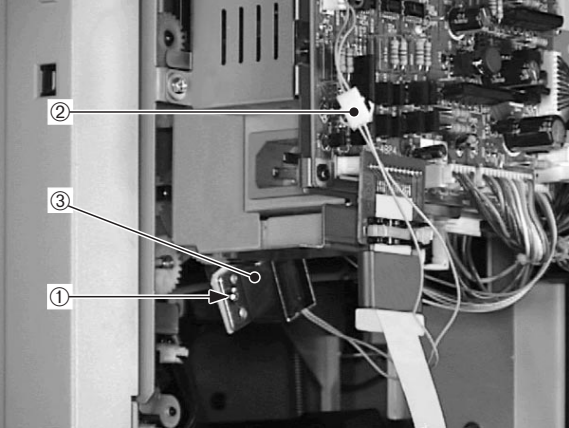


① Connector
② Cable clamp
③ Reference plate withdrawal solenoid

Figure 3-7-5

D. Reversing Roller Drive Solenoid

- 1) Following the rear cover removal procedure described on Page 3-4, remove the rear cover.
- 2) Remove the screw, disconnect the connector, and then take out the reversing roller drive solenoid.

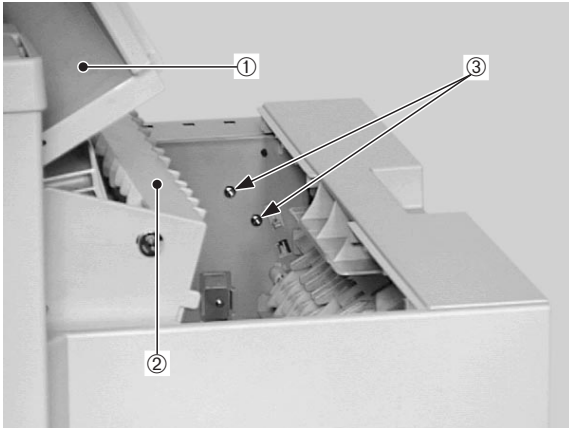


- ① Screw
- ② Connector
- ③ Reversing roller drive solenoid

Figure 3-7-6

E. Face-up Deflector Solenoid

- 1) Following the power supply unit removal procedure described on Page 3-32, remove the power supply unit.
- 2) Open the top cover unit. Lifting up the jam clearance cover, remove the 2 screws.



- ① Top cover unit
- ② Jam clearance cover
- ③ Screws

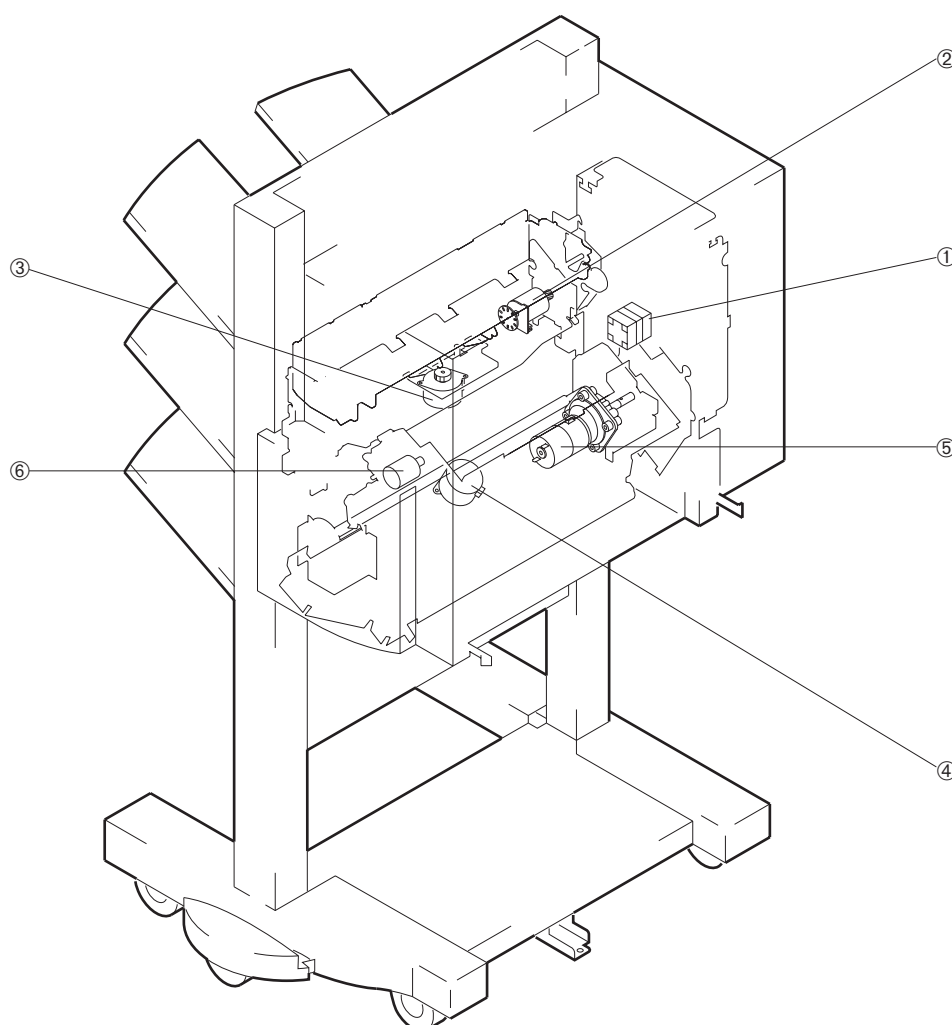
Figure 3-7-7

- 3) Disconnect the connector, and then remove the face-up deflector solenoid.



- ① Connector
- ② Face-up deflector solenoid

Figure 3-7-8

VIII. MOTORS**A. Locations**

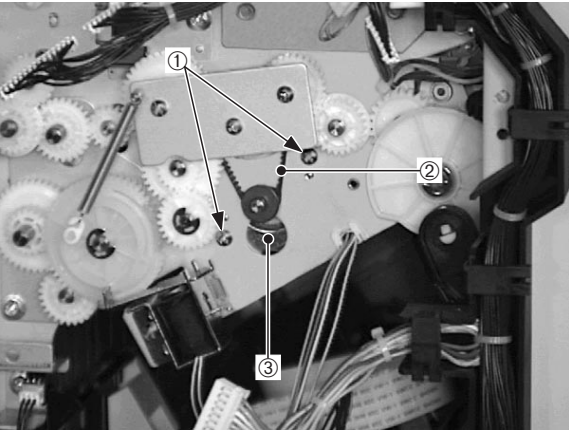
- ① Feed motor
- ③ Adjustment plate motor
- ⑤ Tray up/down motor

- ② Delivery motor
- ④ Stapler transfer motor
- ⑥ Staple motor

Figure 3-8-1

B. Feed Motor

- 1) Following the power supply unit removal procedure described on Page 3-32, remove the power supply unit.
- 2) Remove the 2 screws. Then, getting the belt out of the way, remove the feed motor.

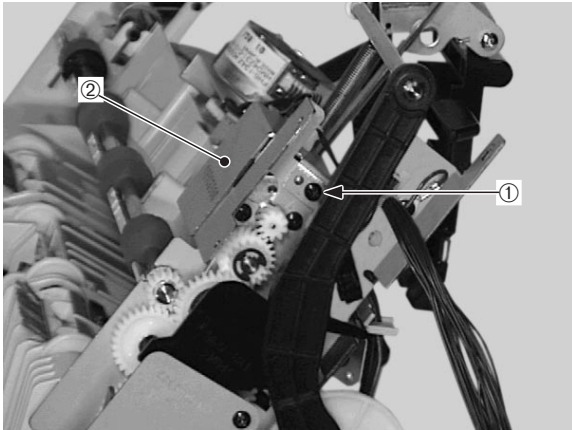


- ① Screws
- ② Belt
- ③ Feed motor

Figure 3-8-2

C. Delivery Motor

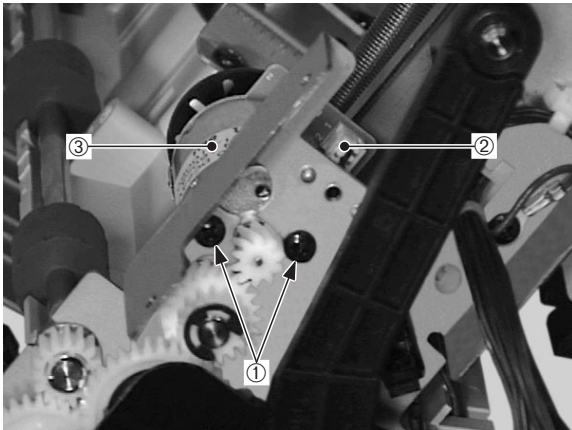
- 1) Following the staple tray unit removal procedure described on Page 3-6, remove the staple tray unit.
- 2) Remove the screw and then the motor cover.



- ① Screw
- ② Motor cover

Figure 3-8-3

- 3) Remove the 2 screws, disconnect the connector, and then take out the delivery motor.

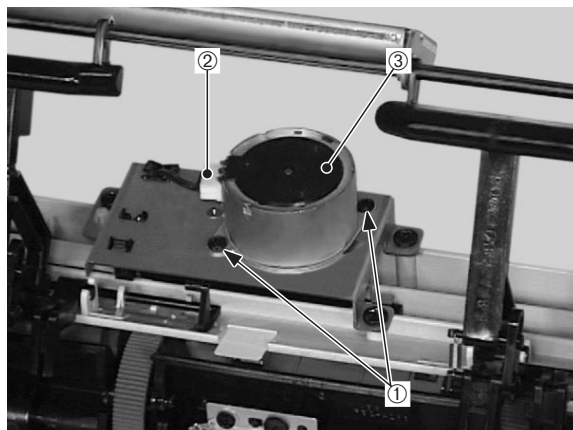


- ① Screws
- ② Connector
- ③ Delivery motor

Figure 3-8-4

D. Adjustment Plate Motor

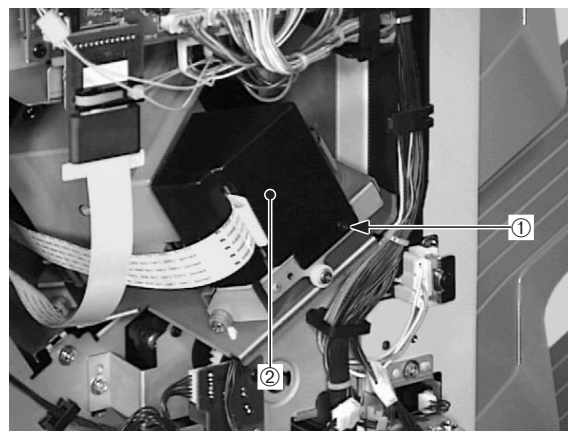
- 1) Following the staple tray unit removal procedure described on Page 3-6, remove the staple tray unit.
- 2) Remove the 2 screws, disconnect the connector, and then take out the adjustment plate motor.



- ① Screws
- ② Connector
- ③ Adjustment plate motor

Figure 3-8-5**E. Stapler Transfer Motor**

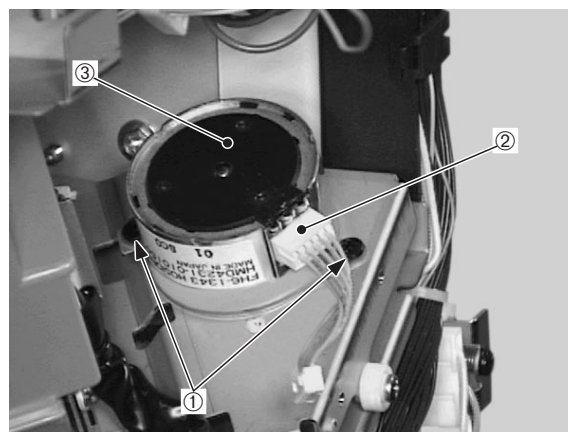
- 1) Remove the rear cover.
- 2) Remove the screw and then the PCB cover.



- ① Screw
- ② PCB cover

Figure 3-8-6

- 3) Remove the 2 screws, disconnect the connector, and then take out the stapler transfer motor.



- ① Screws
- ② Connector
- ③ Stapler transfer motor

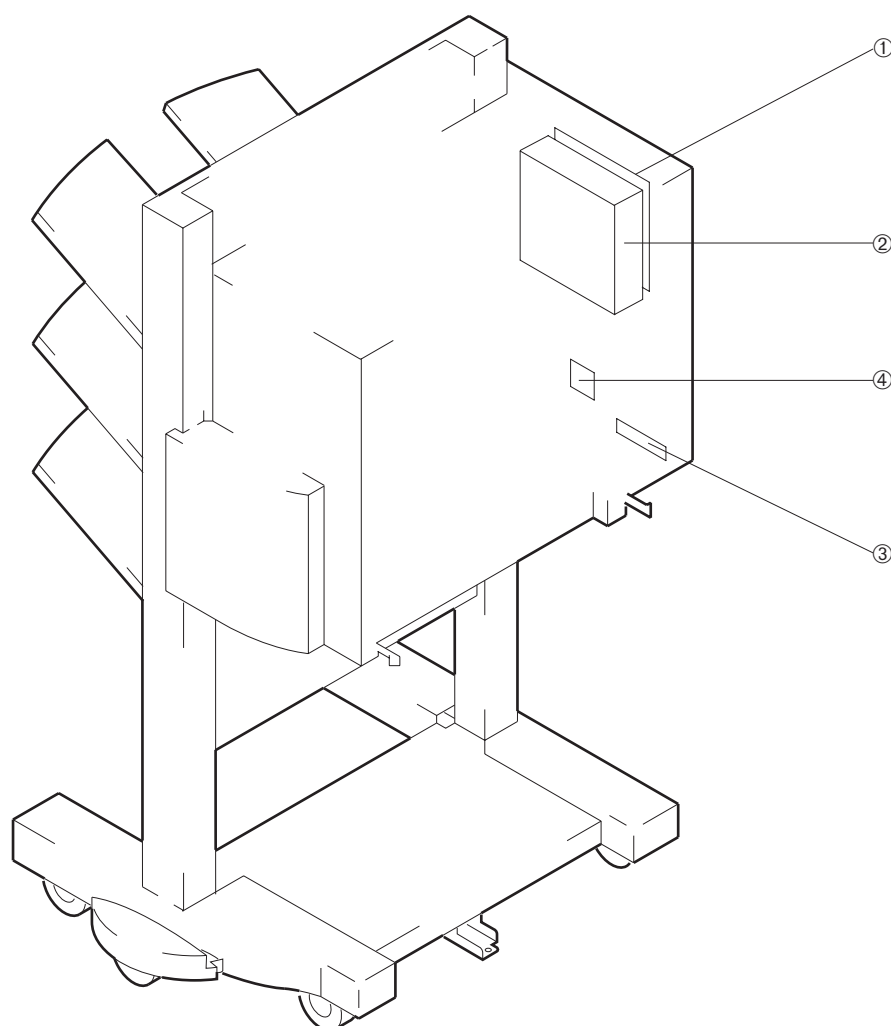
Figure 3-8-7

F. Tray Up/Down Motor

- 1) Following the tray drive unit removal procedure described on Page 3-7, remove the tray drive unit.

G. Staple Motor

- 1) Following the stapler removal procedure described on Page 3-10, remove the stapler.

IX. ELECTRICAL PARTS**A. Locations**

① Staple stacker driver PCB

② Power supply unit

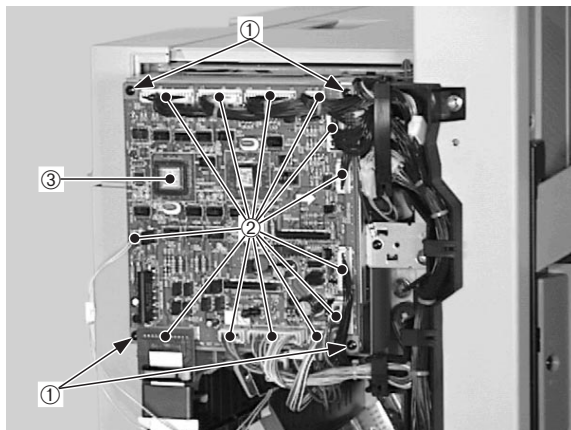
③ Option interface PCB

④ Tray up/down motor clock sensor PCB

Figure 3-9-1

B. Staple Stacker Driver PCB

- 1) Following the rear cover removal procedure described on Page 3-4, remove the rear cover.
- 2) Remove the 4 screws, disconnect the 13 connectors, and then take out the staple stacker driver PCB.

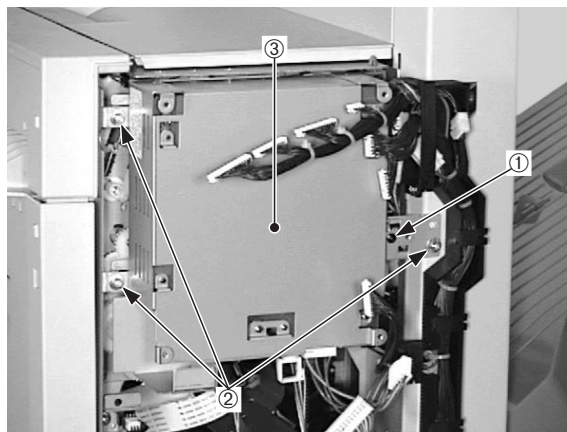


- ① Screws
- ② Connectors
- ③ Staple stacker driver PCB

Figure 3-9-2

C. Power Supply Unit

- 1) Following the staple stacker driver PCB removal procedure described on this page, remove the staple stacker driver PCB.
- 2) Remove the screw (3M), 3 screws (4M) and then the power supply unit.

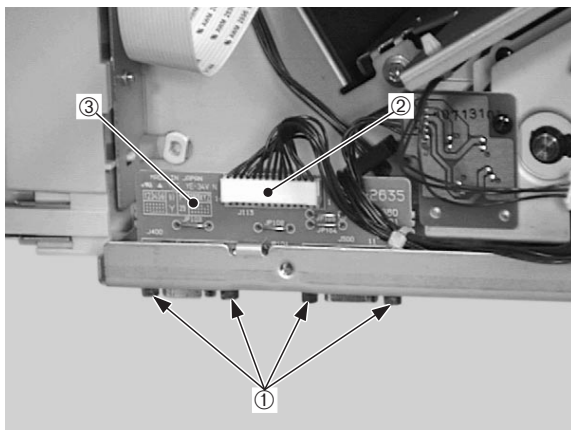


- ① Screw (3M)
- ② Screws (4M)
- ③ Power supply unit

Figure 3-9-3

D. Option Interface PCB

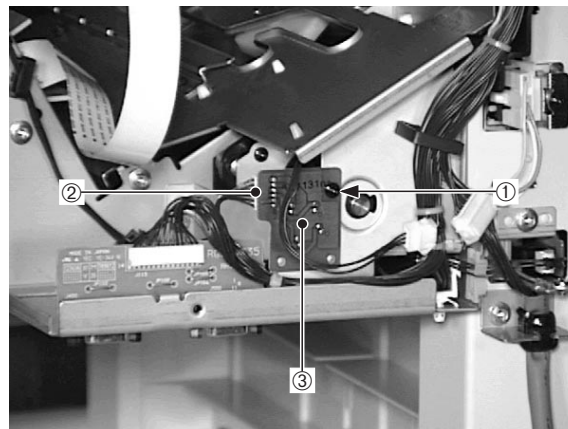
- 1) Following the rear cover removal procedure described on Page 3-4, remove the rear cover.
- 2) Remove the 4 screws, disconnect the connector, and then take out the option interface PCB.



- ① Screws
- ② Connector
- ③ Option interface PCB

Figure 3-9-4**E. Tray Up/Down Motor Clock Sensor PCB**

- 1) Following the rear cover removal procedure described on Page 3-4, remove the rear cover.
- 2) Remove the screw, disconnect the connector, and then take out the tray up/down motor clock sensor PCB.



- ① Screw
- ② Connector
- ③ Tray up/down motor clock sensor PCB

Figure 3-9-5

CHAPTER 4

TROUBLESHOOTING

I. PREFACE	4-1	VI. MALFUNCTION STATUS	
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III. PAPER JAMS		VII. MEASUREMENT AND	
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IV. PAPER TRANSPORT		VIII. MAINTENANCE AND	
 TROUBLESHOOTING	4-11	 SERVICING	4-23
V. MALFUNCTION		IX. LOCATION OF CONNECTORS	4-25
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I. PREFACE

A. Malfunction Diagnosis Flowchart

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

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

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 stacker to discharge static electricity, as it can cause damage to the PCBs.

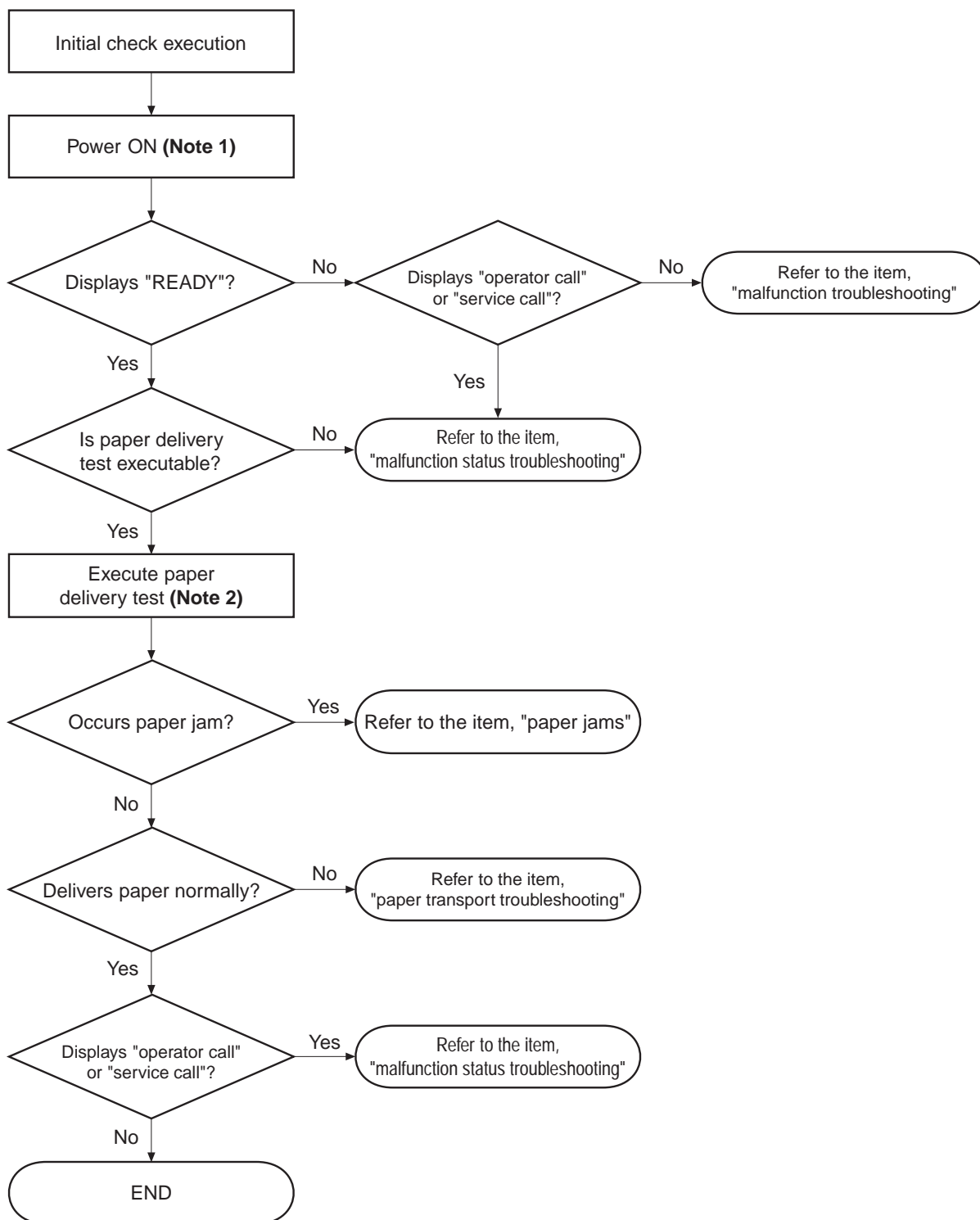


Figure 4-1-1

Notes: 1. Connect the stacker to the printer. Then, turn ON the printer power switch.
2. Select the stacker from the external device or control panel. Then, make a test print.

B. Initial Check

Before the execution of troubleshooting, check the following points. If any problem is found, correct the problem and advise the customer.

1. Installation environment

The same as the printer.

2. Paper checks

- a. The recommended paper for the stacker is used.
- b. Paper is not damp.

3. Condensation

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

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

II. SERVICE MODE

A. Outline

When a paper jam or failure occurred in the stacker, the condition of the stacker can be checked with the Service LED on the staple stacker driver PCB (LED1: Red light). The Service mode can be changed according to the combination of the DIP switches (SW2) on the same PCB.

B. Service Mode

1. Service LED indications

Details of failures, errors, and other troubles of the stacker are indicated by the flashing frequencies of the LED on the staple stacker driver PCB. Refer to Table 4-5-1 for details.

The LED flashes in the order of the header, group (flashing L times), pause, content 1 (flashing M times), pause, content 2 (flashing N times) and pause, which constitute one cycle of flashing indication.

LED flashing intervals are as shown below.

- 1) Header (ON for 2.0 seconds, OFF for 1.0 second)
- 2) Group (On for 0.3 seconds, OFF for 0.2 seconds)
- 3) Pause (OFF for 0.5 seconds)
- 4) Content 1 (ON for 0.3 seconds, OFF for 0.2 seconds)
- 5) Pause (OFF for 0.5 seconds)
- 6) Content 2 (ON for 0.3 seconds, OFF for 0.2 seconds)
- 7) Pause (OFF for 0.5 seconds)

When there is no failure, error or other troubles, 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 stationary jam

- 1) Header (fixed)
(ON for 2.0 seconds, OFF for 1.0 second)
- 2) Group (flashing L times)
(ON for 0.3 seconds, OFF for 0.2 seconds) × 3: Jam
- 3) Pause (fixed)
(OFF for 0.5 seconds)
- 4) Content 1 (flashing M times)
(ON for 0.3 seconds, OFF for 0.2 seconds) × 1: Entrance sensor
- 5) Pause (fixed)
(OFF for 0.5 seconds)
- 6) Content 2 (flashing N times)
(ON for 0.3 seconds, OFF for 0.2 seconds) × 2: Stationary
- 7) Pause (fixed)
(OFF for 0.5 seconds)

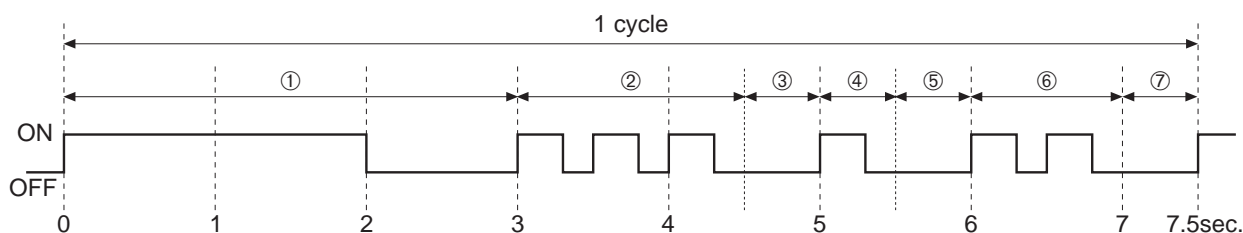


Figure 4-2-1

Table 4-2-1

L (Group)	M (Content 1)	N (Content 2)
1: Failure (mechanical drive parts and others)	1: Distance sensor 2: Back-up power supply 3: Shutter 4: Swing guide	
2: Failure (motors)	1: Delivery motor 2: Stapler transfer motor 3: Staple motor 4: Adjustment plate motor 5: Tray up/down motor	
3: Paper jam	1: Entrance sensor 2: Reversing paper sensor 3: Delivery paper sensor 4: Staple tray paper sensor	1: Delay 2: Stationary 3: Initial 4: Early arrival
4: Operation error	1: Staple out 2: Current tray full	
5: Others	1: Door open 2: Staple jam 3: Current tray full stop 4: Tray up/down motor overheat	

2. Self-drive mode

The Self-drive mode delivers paper (A3, A4, Ledger or Letter) sent from the printer in simple stacking mode (face-down) or delivers paper after performing the corner staple, test staple or job offset.

The simple stacking delivers paper sent from the printer to the bin 1.

The corner staple staples the back corner of the 2 sheets of paper sent from the printer and delivers it to the bin 1.

The test staple staples 12 points of the 2 sheets of paper sent from the printer and delivers it to the bin 1.

The job offset delivers the 1st sheet of paper to the bin 1, shifts the 2nd sheet and then delivers it also to the bin 1.

Note: When performing the corner staple, test staple, or job offset, the number of sheets of paper sent continuously from the printer should be 2. If 3 or more sheets are sent, paper jam will result.

Perform the self-drive mode in the following order.

- 1) Set the DIP switches (SW2) on the staple stacker driver PCB as follows.

A3: 1-ON, 2-OFF, 3-ON, 4-ON

A4: 1-ON, 2-OFF, 3-OFF, 4-ON

Ledger: 1 -ON, 2-OFF, 3-ON, 4-OFF

Letter: 1-ON, 2-OFF, 3-OFF, 4-OFF

- 2) Turn ON the printer power switch. Then, the Service LED on the staple stacker driver PCB will flash (ON for 0.3 seconds, OFF for 1.0 second).
- 3) Set DIP switches (SW2) 1 and 2 as follows.
Simple stacking: 1-ON, 2-OFF
Corner staple: 1-OFF, 2-OFF
Test staple: 1-ON, 2-ON
Job offset: 1-OFF, 2-ON
- 4) Turn the push switch (SW1) ON. Then, the stacker will perform the initial operation, and the Service LED on the staple stacker driver PCB will flash (ON for 0.5 seconds, OFF for 0.3 seconds).
- 5) When paper is sent from the printer, the stacker performs the operation specified in step 3).

3. Sensor check mode

The sensor check mode allows you to check the sensors and switches listed below.

- Entrance sensor
- Reversing paper sensor
- Delivery paper sensor
- Staple tray paper sensor
- Shutter open sensor
- Shutter close detection switch
- Swing guide open sensor
- Swing guide close detection switch
- Staple operation home position detection switch
- Tray unit home position sensor
- Stapler home position sensor
- Adjustment plate home position sensor
- Front cover open detection switch
- Joint sensor
- Top cover open detection switch
- Tray upper limit detection switch
- Tray 1 paper sensor
- Tray 2 paper sensor
- Tray 3 paper sensor

Follow the procedure below to check the sensors and switches.

- 1) Sets the DIP switches on the staple stacker driver PCB as follows.
1-OFF, 2-OFF, 3-ON, 4-ON
- 2) Turn ON the printer power switch. The condition of the sensors and switches at this point will be the default values.
- 3) Move the sensor lever of the sensor you wish to check or push the switch you wish to check, and see if the Service LED lights up. Move/push one sensor lever/switch at a time. If you move/push more than one sensor lever/switch, you cannot know which sensor/switch is defective.
- 4) If the Service LED does not light up. It means that the sensor or switch you checked in step 3) is defective.

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III. PAPER JAMS TROUBLESHOOTING

Paper passes through two major sections of the stacker.

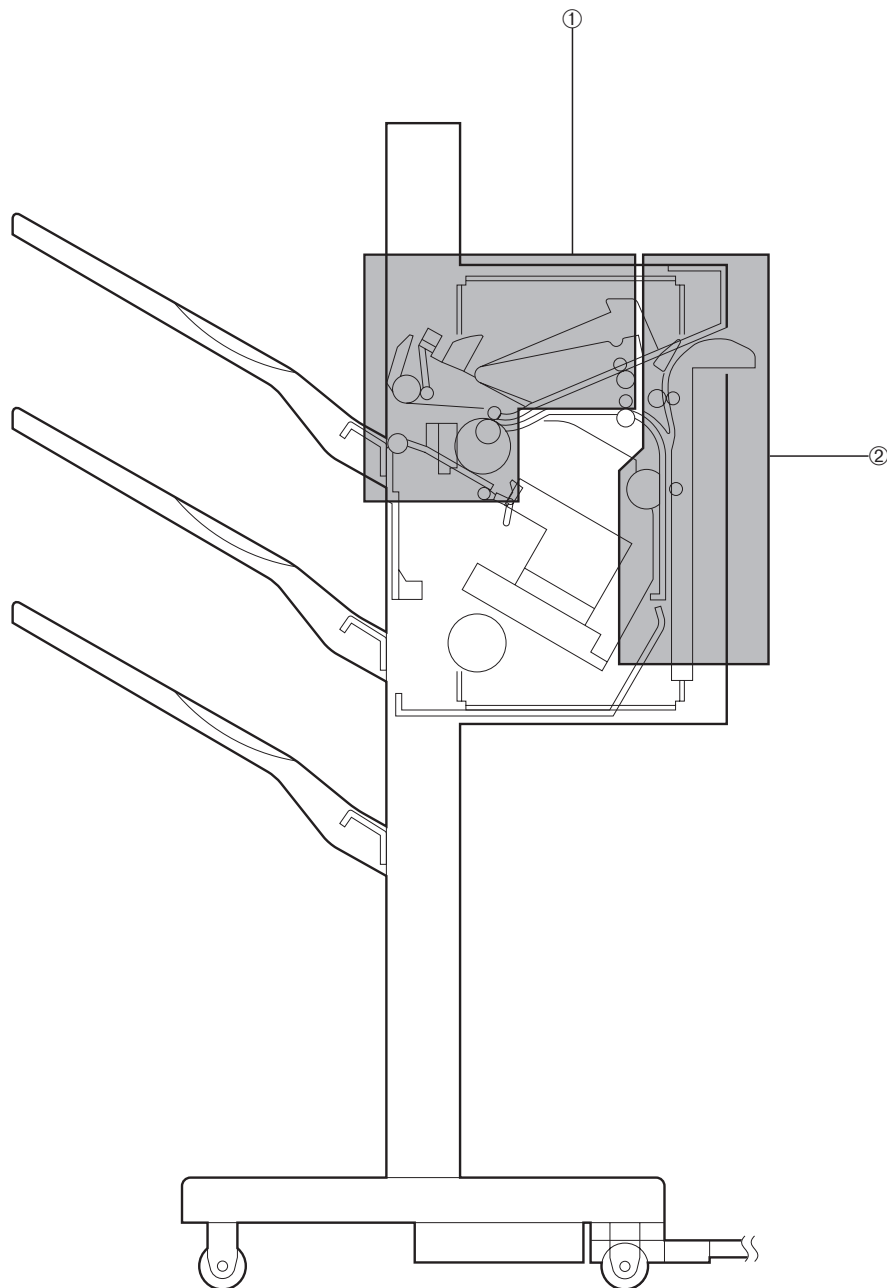


Figure 4-3-1

III-1: Delivery block

III-2: Printer connection block

If the factor of malfunction was identified as "paper jams" by the malfunction diagnosis flow-chart, check the block in which the paper jam occurred and find the defective part.

III-1. Delivery block

<Possible causes>

1. Worn/deformed/dirty feed roller 2
Action: Clean the roller if dirty. Replace the roller if worn or deformed.
2. Worn/deformed/dirty face-up feed roller
Action: Clean the roller if dirty. Replace the roller if worn or deformed.
3. Worn/deformed/dirty delivery roller 1
Action: Clean the roller if dirty. Replace the roller if worn or deformed.
4. Worn/deformed/dirty delivery roller 2
Action: Clean the roller if dirty. Replace the roller if worn or deformed.
5. Delivery paper sensor lever does not move smoothly or is damaged.
Action: Reset the lever correctly. Replace the lever if damaged.
6. Delivery paper sensor lever spring failure
Action: Reset the spring correctly. Replace the spring if deformed or damaged.
7. Delivery paper sensor failure
Action: Conduct the sensor check mode described on Page 4-7 and see if the sensor is normal. If it is not normal, replace it.
8. Staple tray paper sensor lever does not move smoothly or is damaged.
Action: Reset the lever correctly. Replace the lever if damaged.
9. Staple tray paper sensor lever spring failure
Action: Reset the spring correctly. Replace the spring if deformed or damaged.
10. Staple tray paper sensor failure
Action: Conduct the sensor check mode described on Page 4-7 and see if the sensor is normal. If it is not normal, replace it.
11. Poor contact in feed motor drive signal line connector
Action: Reconnect the connector J10 on the staple stacker driver PCB.
12. Feed motor failure
Action: Disconnect the connector J10 on the staple stacker driver PCB. Measure the resistance between the connector J10-1 and J10-4 or -6 and between J10-2 and J10-3 or -5 on the motor side. If it is not about 3.9 Ω , replace the feed motor.
13. Staple stacker driver PCB failure
Action: Replace it.

III-2. Printer connection block

<Possible causes>

1. Entrance sensor lever does not move smoothly or is damaged.
Action: Reset the lever correctly. Replace the lever if damaged.

2. Entrance sensor lever spring failure
Action: Reset the spring correctly. Replace the spring if deformed or damaged.
3. Entrance sensor failure
Action: Conduct the sensor check mode described on Page 4-7 and see if the sensor is normal. If it is not normal, replace it.
4. Face-up deflector failure
Action: Check the deflector, and replace it if it is worn, fractured, dented, or scarred.
5. Worn/deformed/dirty feed roller 1.
Action: Clean the roller if dirty. Replace the roller if worn or deformed.
6. Worn/deformed/dirty reversing roller
Action: Clean the roller if dirty. Replace the roller if worn or deformed.
7. Damaged gears
Action: Replace any damaged gear.
8. Poor contact in reversing roller drive solenoid drive signal line connector.
Action: Reconnect the connector J14 on the staple stacker driver PCB.
9. Reversing roller drive solenoid failure
Action: Disconnect the connector J14 on the staple stacker driver PCB. Measure the resistance between the connector J14-1 and J14-2 on the solenoid side. If it is not about 125 Ω , replace the reversing roller drive solenoid.
10. Staple stacker driver PCB failure
Action: Replace it.

IV. PAPER TRANSPORT TROUBLESHOOTING

If the factor of malfunction was identified as "paper transport troubleshooting" by the malfunction diagnosis flowchart (Figure 4-1-1), perform the following actions.

IV-1. Wrinkles/bent leading edge

<Possible causes>

1. Worn/deformed roller

Action: Replace any worn/deformed roller.

IV-2. Bent leading edge

<Possible causes>

1. Scarred/deformed feed guide

Action: Check the paper feed path. Replace the feed guide if scarred or deformed.

V. MALFUNCTION TROUBLESHOOTING

If the factor of malfunction was identified as "malfunction troubleshooting" by the malfunction diagnosis flowchart (Figure 4-1-1), perform the following actions.

V-1. No power

<Possible causes>

1. POWER-ON signal is not input due to poor contact in option interface connector.

Action: Reconnect the option interface connector correctly.

2. Blown fuse

Action: Remove the power supply unit and replace the fuse.

3. Power supply unit failure

Action: Turn OFF the printer power switch. Disconnect the connector J1 from the staple stacker driver PCB.

Plug the power cord to the power supply unit, and then turn ON the printer power switch. Then, measure the output of the DC power supply of the connector J1, making sure not to short it.

If the specified value is not output, replace the power supply unit.

4. Wiring, DC loads, staple stacker driver PCB.

Action: Turn OFF the printer power switch. Check the wiring and DC loads ahead of the staple stacker driver PCB. If the wiring and DC loads are normal, replace the staple stacker driver PCB.

VI. MALFUNCTION STATUS TROUBLESHOOTING

If the factor of malfunction was identified as "malfunction status troubleshooting" by the malfunction diagnosis flowchart (Figure 4-1-1), perform the following actions.

VI-1. Distance sensor failure

<Possible causes>

1. Poor contact in distance sensor signal line connector
Action: Reconnect the connector J6 on the staple stacker driver PCB.
2. Distance sensor failure
Action: Measure the voltage between the connector J6-4 (GND), J6-2 (Vcc) and 3 (Vin) on the staple stacker driver PCB. If it is not about 5V, replace the distance sensor.
3. Staple stacker driver PCB failure
Action: Replace it.

VI-2. Back-up power supply failure

<Possible causes>

1. Staple stacker driver PCB failure
Action: Replace it.

VI-3. Shutter failure

<Possible causes>

1. Poor contact in connectors
Action: Reconnect the connectors J7, J9 and J10 on the staple stacker driver PCB.
2. Shutter close detection switch failure
Action: Disconnect the connector J7 on the staple stacker driver PCB. Measure the resistance between the connector J7-1 and J7-2 on the switch side. If it is not 0 Ω with the shutter up and $\infty \Omega$ with the shutter down, replace the shutter close detection switch.
3. Shutter open sensor failure
Action: Measure the voltage between the connector J9-8 and J9-9 on the staple stacker driver PCB. If it is not 0V with the shutter up and 5V with the shutter down, replace the shutter open sensor.
4. Staple stacker driver PCB failure
Action: Replace it.

VI-4. Swing guide failure

<Possible causes>

1. Poor contact in connectors
Action: Reconnect the connectors J5, J11 and J13 on the staple stacker driver PCB.
2. Swing guide close detection switch (MS2) failure
Action: Disconnect the connector J5 on the staple stacker driver PCB. Measure the resis-

tance between the connector J5-9 and J5-10 on the switch side. If it is not $0\ \Omega$ with the swing guide down and $\infty\ \Omega$ with the guide up, replace the swing guide close detection switch (MS2).

3. Swing guide close detection switch (MS6) failure

Action: Disconnect the connector J5 on the staple stacker driver PCB. Measure the resistance between the connector J5-11 and J5-12 on the switch side. If it is not $0\ \Omega$ with the swing guide down and $\infty\ \Omega$ with the guide up, replace the swing guide close detection switch (MS6).

4. Swing guide open sensor failure

Action: Measure the voltage between the connector J13-5 and J13-6 on the staple stacker driver PCB. If it is not 0V with the swing guide down and 5V with the swing guide up, replace the swing guide open sensor.

5. Staple stacker driver PCB failure

Action: Replace it.

VI-5. Delivery motor failure

<Possible causes>

1. Poor contact in delivery motor clock detection signal line connector

Action: Reconnect the connectors J9, J207 and J210 between the staple stacker driver PCB and delivery motor clock sensor correctly.

2. Poor contact in delivery motor drive signal line connector

Action: Reconnect the connector J11 on the staple stacker driver PCB.

3. Delivery motor failure

Action: Disconnect the connector J11 on the staple stacker driver PCB. Measure the resistance between the connector J11-6 and J11-7 on the motor side. If it is not about $42\ \Omega$, replace the delivery motor.

4. Delivery motor clock sensor failure

Action: Replace it.

5. Staple stacker driver PCB failure

Action: Replace it.

VI-6. Stapler transfer motor failure

<Possible causes>

1. Poor contact in stapler home position detection signal line connector

Action: Reconnect the connectors J12, J210 and J129 between the staple stacker driver PCB and stapler home position sensor.

2. Stapler home position sensor failure

Action: Conduct the sensor check mode described on Page 4-7 and see if the sensor is normal. If it is not normal, replace it.

3. Poor contract in stapler transfer motor drive signal line connector

Action: Reconnect the connector J8 on the staple stacker driver PCB correctly.

4. Stapler transfer motor failure

Action: Disconnect the connector J8 on the staple stacker driver PCB. Measure the resistance between the connector J8-5 and J8-4, -3, -2, or -1 on the motor side. If it is not about 16.5 Ω , replace the stapler transfer motor.

5. Staple stacker driver PCB failure

Action: Replace it.

VI-7. Staple motor failure**<Possible causes>**

1. Poor contact in staple motor drive signal line connector

Action: Reconnect the connector J8 on the staple stacker driver PCB.

2. Staple motor failure

Action: Disconnect the connector J8 on the staple stacker driver PCB. Measure the resistance between the connector J8-11 and J8-12 on the motor side. If it is not about 6 to 10 Ω , replace the stapler.

3. Staple stacker driver PCB failure

Action: Replace it.

VI-8. Adjustment plate motor failure**<Possible causes>**

1. Poor contact in adjustment plate home position detection signal line connector

Action: Reconnect the connectors J9, J207 and J121 between the staple stacker driver PCB and adjustment plate home position sensor.

2. Adjustment plate home position sensor failure

Action: Conduct the sensor check mode described on Page 4-7 and see if the sensor is normal. If it is not normal, replace it.

3. Poor contact in adjustment plate motor drive signal line connector

Action: Reconnect the connector J11 on the staple stacker driver PCB correctly.

4. Adjustment plate motor failure

Action: Disconnect the connector J11 on the staple stacker driver PCB. Measure the resistance between the connector J11-1 and J11-2, -3, -4, or -5 on the motor side. If it is not about 16 Ω , replace the adjustment plate motor.

5. Staple stacker driver PCB failure

Action: Replace it.

VI-9. Tray up/down motor failure**<Possible causes>**

1. Poor contact in tray up/down motor clock detection signal line connector

Action: Reconnect the connectors J12 and J600 between the staple stacker driver PCB and sensor PCB.

2. Poor contact in tray up/down motor drive signal line connector

Action: Reconnect the connector J7 on the staple stacker driver PCB.

3. Tray up/down motor failure

Action: Disconnect the connector J7 on the staple stacker driver PCB. Measure the resistance between the connector J7-4 and J7-5 on the motor side. If it is not about 6.5 Ω , replace the tray up/down motor.

4. Tray up/down motor clock sensor failure

Action: Replace the sensor.

5. Staple stacker driver PCB failure

Action: Replace it.

VI-10. Printer cannot become READY because "staple out status" is output when the stapler is loaded with staples.

<Possible causes>

1. Poor contact in connectors

Action: Reconnect the connector J308 on the stapler, J8 on the intermediate PCB 1, J303 on the intermediate PCB 2 and J8 on the staple stacker driver PCB correctly.

2. Stapler failure

Action: Replace it.

3. Staple stacker driver PCB failure

Action: Replace it.

VI-11. Printer cannot become READY because "current tray full status" is output when the tray currently used is not full.

<Possible causes>

1. Staple stacker driver PCB failure

Action: Replace it.

VI-12. Printer cannot become READY because "door open status" is output when the door is closed.

<Possible causes>

1. Projection of the front cover is damaged.

Action: Replace the front cover.

2. Projection of the top cover is damaged.

Action: Replace the top cover.

3. Front cover detection switch failure

Action: Replace it.

4. Top cover detection switch failure

Action: Replace it.

5. Staple stacker driver PCB failure

Action: Replace it.

VI-13. Printer cannot become READY because "staple jam status" is output when the staples are not jammed.

<Possible causes>

1. Poor contact in connectors.

Action: Reconnect the connector J308 on the stapler, J8 on the intermediate PCB 1, J303 on the intermediate PCB 2 and J8 on the staple stacker driver PCB correctly.

2. Stapler failure

Action: Replace it.

3. Staple stacker driver PCB failure

Action: Replace it.

VI-14 Printer cannot become READY because "current tray full stop status" is output when the tray currently used is not full.

<Possible causes>

1. Staple stacker driver PCB failure

Action: Replace it.

VI-15 Printer cannot become READY because "tray up/down motor overheat status" is output when the motor is normal.

<Possible causes>

1. Poor contact in connectors

Action: Reconnect the connector J135 on the tray up/down motor temperature sensor and connector J3 on the staple stacker driver PCB.

2. Tray up/down motor temperature sensor failure

Action: Replace it.

3. Staple stacker driver PCB failure

Action: Replace it.

VII. MEASUREMENT AND ADJUSTMENT

A. Mechanical Adjustment

- No mechanical adjustment required.

B. Electrical Adjustment

1. Adjusting the distance sensor

This adjustment is required if the staple stacker driver PCB or the distance sensor is replaced or if the back-up power supply failure is indicated with the LED (see Page 4-7).

As the distance sensor is adjusted at the factory, its adjustment at the time of installation is not necessary. However, the distance sensor must be initialized when the staple stacker driver PCB or the distance sensor is replaced in the field. It also needs to be initialized when a back-up power supply failure is indicated by the LED on the staple stacker driver PCB. The procedures are as indicated below.

- 1) Turn OFF the printer power switch.
- 2) Set the DIP switches (SW2) on the staple stacker driver PCB as follows.
1-OFF, 2-OFF, 3-OFF, 4-ON

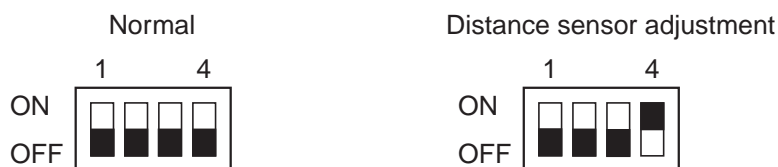
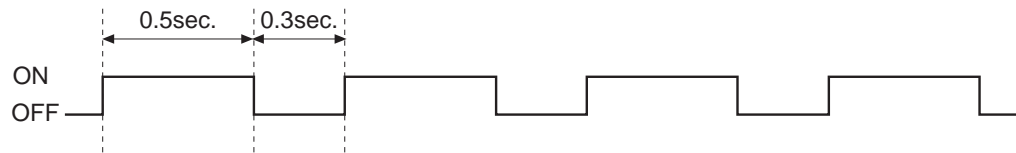


Figure 4-7-1

- 3) Load one sheet of blank paper in each tray.
- 4) Turn ON the printer power switch to start distance sensor initialization as follows:
 1. Runs the feed motor and delivery motor and closes the swing guide and shutter.
 2. Runs the tray up/down motor and brings the tray unit to its home position.
 3. Runs the feed motor and opens the shutter.
 4. Runs the tray up/down motor and lifts the tray unit to the position about 82mm away from the home position (distance adjustment value input position).
 5. Reads distance data through the distance sensor.
 6. Runs the feed motor and closes the shutter.
 7. Runs the tray up/down motor and lowers the tray unit to its home position (Paper level detection position of the tray 1)
 8. Reads distance data of the tray 1 through the distance sensor (Learn the tray 1 paper detection level)
 9. Runs the feed motor and closes the shutter.
 10. Runs the tray up/down motor and lifts the tray unit to the position about 177mm away from the home position (Paper level detection position of the tray 2).
 11. Reads distance data of the tray 2 through the distance sensor (Learn the tray 2 paper detection level)
 12. Runs the feed motor and closes the shutter.
 13. Runs the tray up/down motor and lifts the tray unit to the position about 346mm away from the home position (Paper level detection position of the tray 3).
 14. Reads distance data of the tray 3 through the distance sensor (Learn the tray 3 paper detection level)
 15. Runs the feed motor and closes the shutter.
 16. Runs the tray up/down motor and lowers the tray unit to its home position.



17. Runs the feed motor and opens the shutter.
- 5) When the operation ends normally, the LED on the staple stacker driver PCB lights.
- 6) Turn OFF the DIP switch (SW2) 4, turn the printer OFF and then ON, and confirm that the LED on the staple stacker driver PCB flashes (ON for 0.5 seconds, OFF for 0.3 seconds).

**Figure 4-7-2**

C. Variable Resistors, LEDs, Test Pins, Jumpers and Switches on PCBs

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

All other variable resistors, 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.

- Notes:** 1. Some LEDs receive leakage current during normal operation, thus glow dimly even when they should be OFF.
2. Variable resistor which may be adjusted in the field are marked 
- Variable resistor which may not be adjusted in the field are marked ... 

1. Staple stacker driver PCB

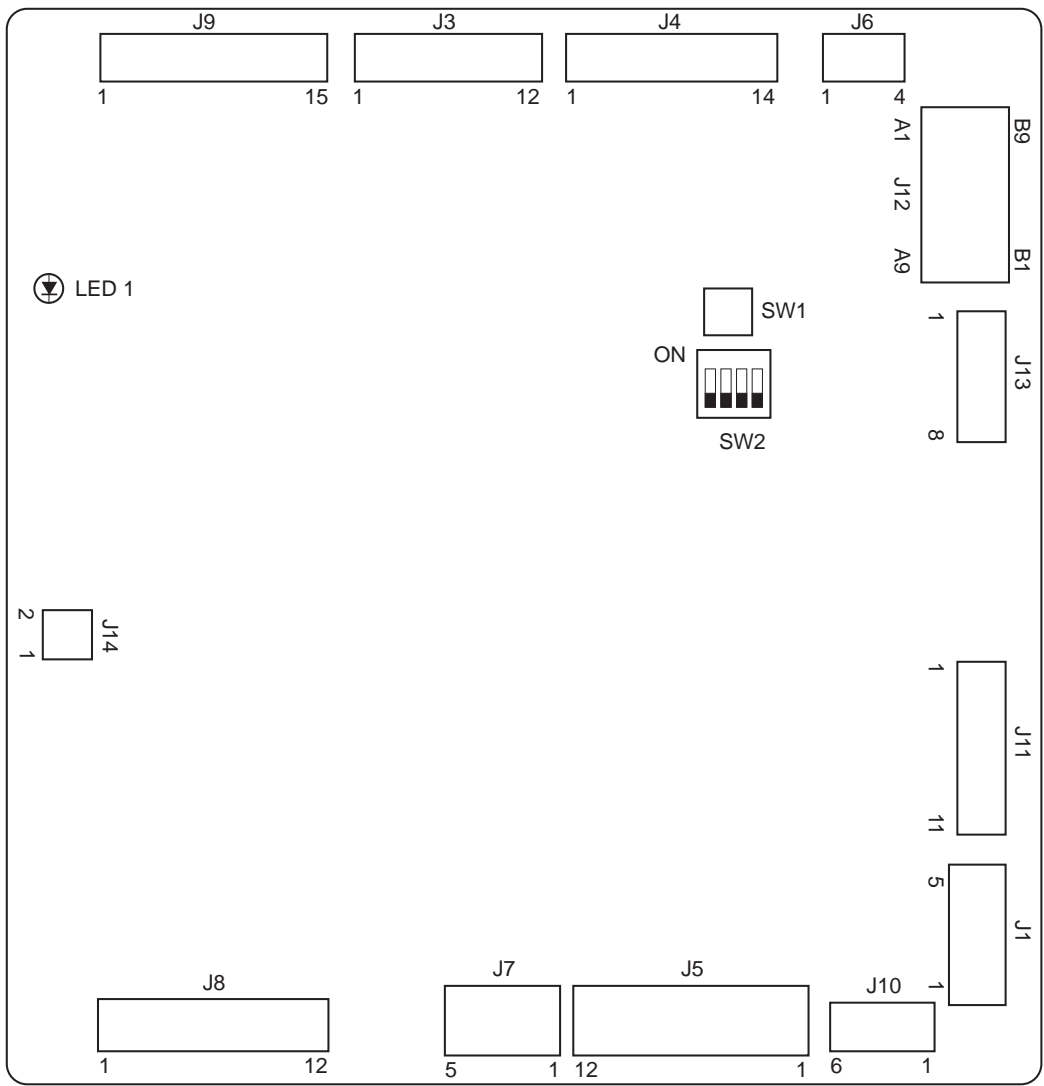


Figure 4-7-3

Table 4-7-1

No.		Function
SW 1		Operation check switches (Refer to page 4-4)
SW 2	1	
	2	
	3	
	4	
LED 1		Check LED for service technician

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VIII. MAINTENANCE AND SERVICING

A. Periodic Replacement Parts

- No parts require periodic replacement in this stacker.

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

Consumables require replacement one or more times during the warranty period of the stacker due to deterioration or damage. Replace them when the parts are proven faulty.

Table 4-8-1

As of January, 1999

No.	Part name	Part No.	Qt'y	Expected life	Remarks
1	Stapler	RB1-8585-000	1	100,000 times of stapling	

Note: The values above are only estimates based on part data, and are subject to change.

C. Periodic Service

- The stacker has no parts that require periodic servicing.

D. Standard Tools

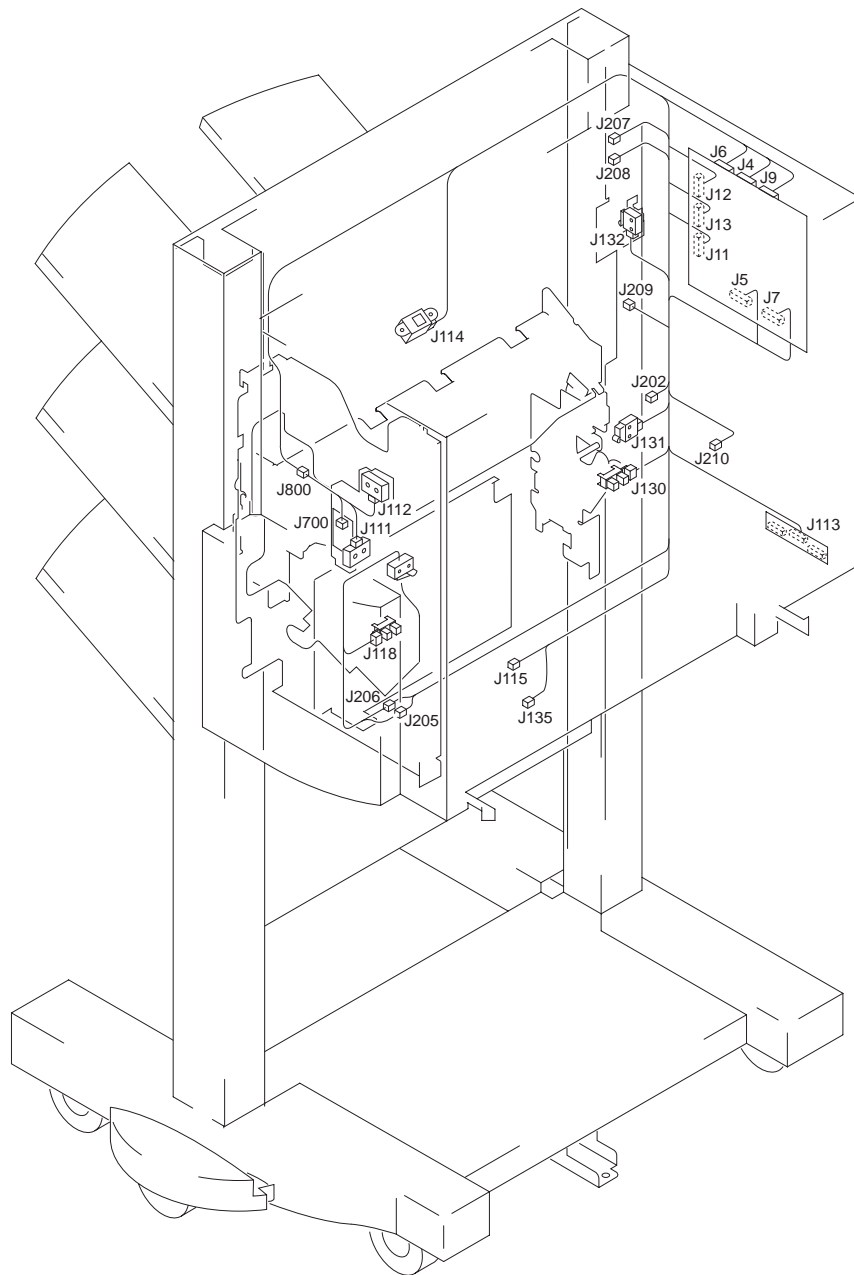
- The standard tools that are required to service the stacker are the same as that for the printer.

E. Special Tools

- No special tools required for this stacker.

G. Solvents and Oil List**Table 4-8-2**

No.	Material name	Use	Components	Remarks
1	Alcohol: ethyl (pure or denatured) or isopropyl (pure or denatured)	Cleaning: plastic, rubber	$\text{C}_2\text{H}_5\text{OH}$, $(\text{CH}_3)_2\text{CHOH}$	<ul style="list-style-type: none">• Purchase locally• Flammable: keep away from flame
2	MEK (methyl ethyl ketone)	Cleaning: oil and toner stains	$\text{CH}_3\text{CO}-\text{C}_2\text{H}_5$	<ul style="list-style-type: none">• Purchase locally• Highly flammable: keep away from flame
3	Lubricating oil	Apply between gear and shaft	Petroleum mineral oil	<ul style="list-style-type: none">• Tool No. CK-8003 (100 ml bottle)• Tellus Oil 68 (Shell)
4	Lubricating agent	Apply between gear and shaft	Lithium oil	<ul style="list-style-type: none">• Tool No. CK-8005 (40 g bottle)• Permalub SHV-2 (Nippon Koyu Ltd)

IX. LOCATION OF CONNECTORS**Figure 4-9-1**

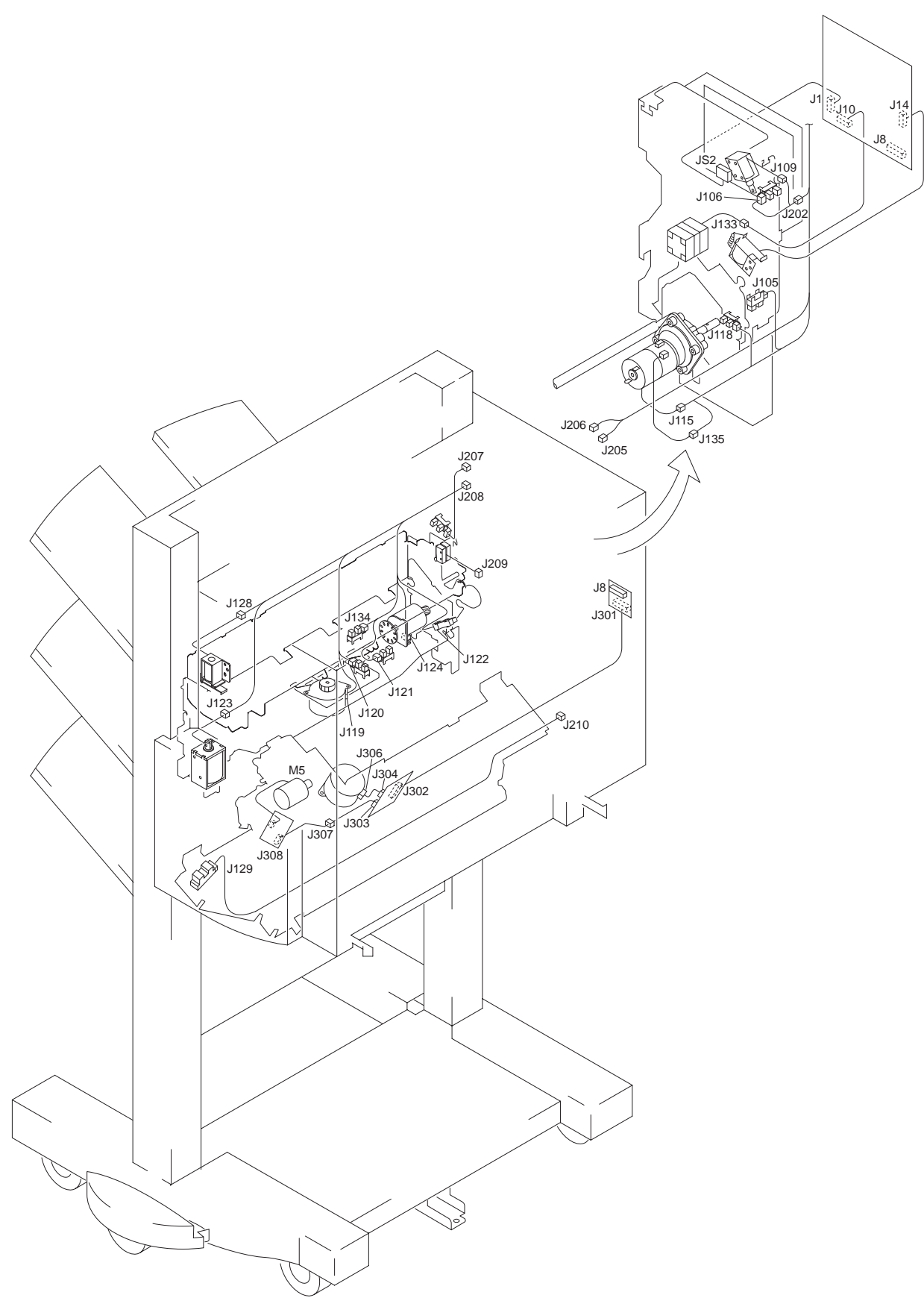


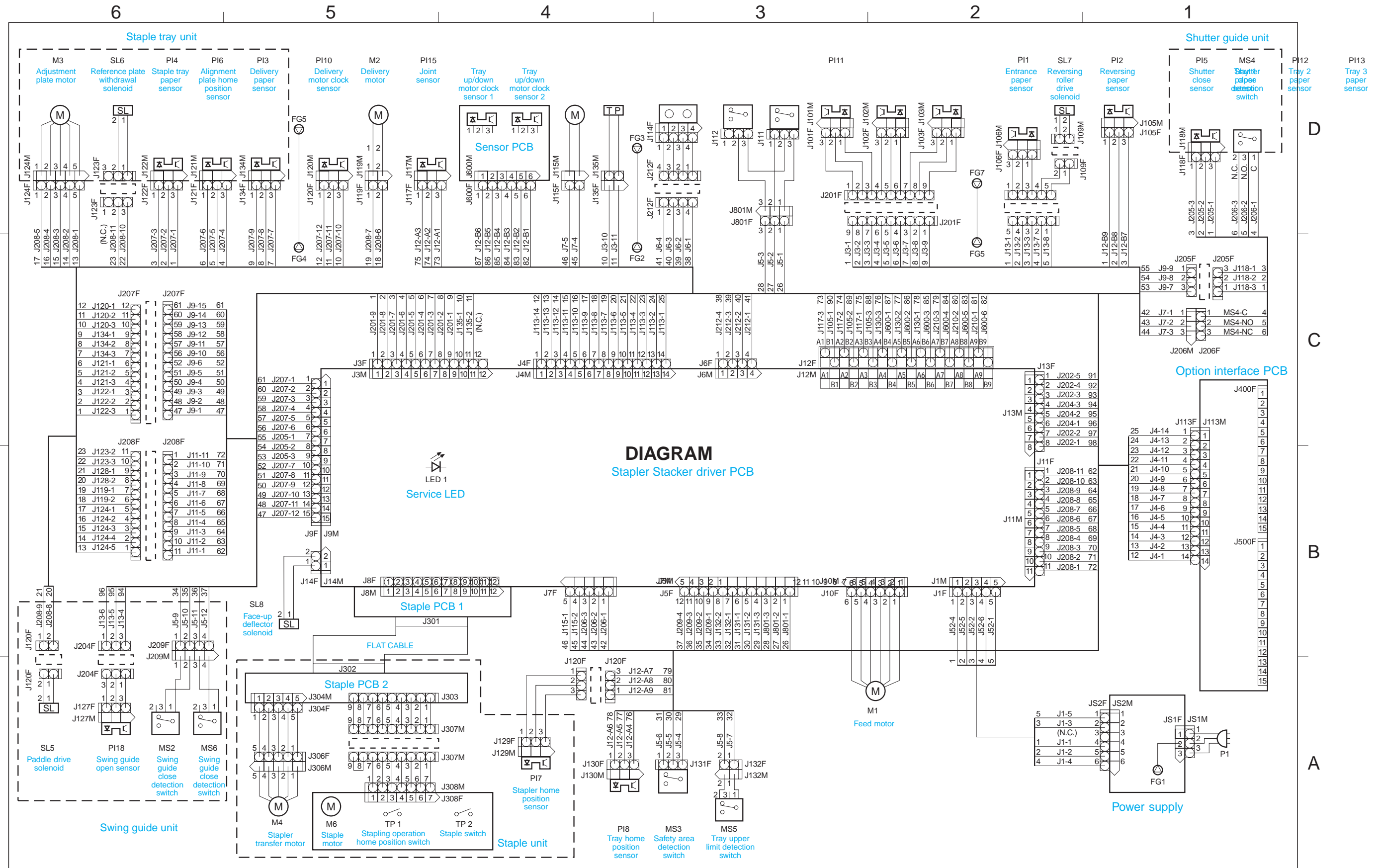
Figure 4-9-2

APPENDIX

I. GENERAL CIRCUIT DIAGRAM A-1

II. LIST OF SIGNALS A-3

I. GENERAL CIRCUIT



II. LIST OF SIGNALS

A. Input/output signals to stapler stacker driver PCB

Connector	Pin	Abbreviation	I/O	Logic	Signal name
J1	1	PWRON	O	L	Power on signal
	2	+24V	O		
	3	GND			
	4	+24V	O		
	5	GND			
J4	1	CKI	I	L	Synchronous clock signal
	2	TXI	I	L	Serial in signal
	3	GND			
	4	R XO	O	L	Serial out signal
	5	CONTO	O	L	Communication ready signal
	6	STRBI	I	L	Strobe signal
	7	PWRON-IN	I	L	Power on signal
	8	STRBO	O	L	Strobe signal
	9	CKO	O	L	Synchronous clock signal
	10	TXO	O	L	Serial out signal
	11	GND			
	12	R XI	I	L	Serial in signal
	13	CONTI	I	L	Communication ready signal
	14	PWRON-OUT	O	L	Power on signal
J5	1	+24V	O		
	2	GND			
	3	+24Vmove	I		
	4	+24Vmove	I		
	5	+24Vshift	I		
	6	GND			
	7	+24Vshift	I		
	8	GND			
	9				
	10	+24Vshift	I		
	11	+24Vmove	I		
	12	+24R	O		
J6	1	Vo	O		Distance sensor control signal
	2	+5V	O		
	3	Vin	I		Distance sensor control signal
	4	GND			
	5	SHSW			Test staple start signal
	6	GND			
J7	1	+24Vmove	O		
	2				
	3	SSHCLD	O	H	
	4	SHIFTMCCW	O		
	5	SHIFTCW	O		
J8	1	SMMAD	O		Stapler transfer motor drive signal
	2	/SMMBD	O		Stapler transfer motor drive signal

Connector	Pin	Abbreviation	I/O	Logic	Signal name
	3	/SSAD	O		Stapler transfer motor drive signal
	4	SMMBD	O		Stapler transfer motor drive signal
	5	+24Vmove	O		
	6	HOOK SENSE	I	L	Staple detection signal
	7	CONNECT	I	L	Stapler unit detection signal
	8	+5V			
	9	STPL HPS	I	L	Staple home position detection signal
	10	GND			
	11	STPLMPWD	O		Staple motor drive signal
	12	STPLMREV	O		Staple motor drive signal
J9	1	+5V	O		
	2	GND			
	3	SSTPLTP	I	L	Staple tray paper detection signal
	4	+5V	O		
	5	GND			
	6	SJHP	I	H	Alignment plate home position detection signal
	7	+5V	O		
	8	GND			
	9	SSHON	I	L	Shutter close detection signal
	10	GND			
	11	EPEXT	I	L	Delivery paper detection signal
	12	+5V	O		
	13	GND			
	14	EMCLK	I	P	Delivery motor clock detection signal
	15	+5V	O		
J10	1	+24V	O		
	2	+24V	O		
	3	/FMBD	O		Feed motor drive signal
	4	/FMAD	O		Feed motor drive signal
	5	FMBD	O		Feed motor drive signal
	6	FMAD	O		Feed motor drive signal
J11	1	+24V	O		
	2	/JMBD	O		Alignment plate motor drive signal
	3	/JMAD	O		Alignment plate motor drive signal
	4	JMBD	O		Alignment plate motor drive signal
	5	JMAD	O		Alignment plate motor drive signal
	6	EMFW	O		Delivery motor drive signal
	7	EMRV	O		Delivery motor drive signal
	8	+24V	O		
	9	PDSLD	O	L	Paddle drive solenoid drive signal
	10	+24V	O		
	11	ECSLD	O	L	Reference plate withdrawal solenoid drive signal
J12	1	+5V	O		
	2	GND			
	3	SJOINT	I	H	Joint detection signal
	4	+5V	O		
	5	GND			
	6	STRAYHP	I	L	Tray home position detection signal

[illegible]

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