

Notices

The information in this manual is subject to change without notification. Additional pages may be inserted in future editions. The user is asked to excuse any technical inaccuracies or typographical errors in the present edition.

No responsibility is assumed if accidents occur while the user is following the instructions in this manual. No responsibility is assumed for defects in the product's firmware.

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Warning

This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only peripherals (computer input/output devices, terminals, etc.) certified to comply with the Class B limits may be attached to this equipment. Operation with non-certified peripherals is likely to result in interference to radio and TV reception.

Conventions

Throughout this manual, the following conventions are used:


Color is available when viewed online to emphasize important notices.

CAPITAL letters are used to name parts and assemblies.

Italic letters refer related chapters or sections or documentations.

Bold letters are also used for emphasis wherever italics may cause a confuse.



This  symbol followed by Warning denotes that the following paragraph(s) includes precautions which, if ignored, could result in personal injury, and/or irrevocable damage to the equipment.

When followed by Caution this symbol denotes that the following paragraph(s) include the precautions which, if ignored, could result in damage to the equipment.

REVISION HISTORY

Version	Date	Replaced Pages	Remarks
1.0	20-April-98	—	Rel. 1
1.1	7-July-98		
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LIVING TOGETHER
 This illustration symbolizes Kyocera's guiding concept of "Living Together."
 The three jigsaw pieces represent our global society, the environment and our host communities -- three areas in which we continually strive to make tomorrow a little bit better than today.



Chapter 1 F E A T U R E S

Contents

Features	2
Large-volume paper ejection	2
Job offset	2
Stapler function	2
Specifications	3
Part names	4
External diagram	4
Internal Component	6
Installation	7
Precautions during installation	7
Location of installation	7
Power supply	7
Operating environment	7
Installation space	8
Procedures for unpacking and installation	8
Unpacking the finisher	8
Removing paper jams	9
Paper jammed in the inversion assembly	9
Paper jammed in the feeder assembly	11
Paper jammed in the paper ejection assembly	12
Staples jammed in the Staple assembly	12
Customer maintenance and inspections	14
Replacing the staple cartridge	14

1.1 Features

Large-volume paper ejection

Tray No.1 has a capacity large enough to hold approximately 600 pieces of paper (64g/m²), and anything up to 700 pieces of paper (64g/m²) can be loaded into trays No.2 and No.3.

Job offset

The printer is equipped with a job offset function. The first page only or whole set of pages (default) of each job is placed aside during ejection, and the paper loaded into the trays can be separated into groups.

Stapler function

A control signal transmitted from an external source enables staples to be set at two locations in the center of the paper, at one location at the left-hand corner or at one location at the right-hand corner depending on the size of the paper.

1.2 Specifications

Table 1.1 Specifications

Item	Specification
Ejection method	3-tray elevation type
Number of trays	3
Loading method	Face-down: Normal loading, job offset, staple Face-up: Normal loading
Paper types ^a	Normal paper, colored paper, thick paper, labels, OHP film and envelopes.
Paper sizes	A3, B4, A4, A4 (vertical), ledger, legal, letter, B5, A5 and normal executive size paper (64g/m ² —128g/m ² recommended); Normal paper with a size of 98.4mm X 190.5mm (smallest) to 297mm X 432mm (largest) (64g/m ² —128g/m ² recommended); Monarch, Com-10, DL, B5, C5, Western No.4 and envelopes with a size of 98.4 mm by 190.5 mm (smallest) to 176mm by 250mm (largest)
Capacity	Tray No.1: Approximately 600 pieces of 64g/m ² paper Tray No.2: Approximately 700 pieces of 64g/m ² paper Tray No.2: Approximately 700 pieces of 64g/m ² paper
Staples	
Staple type	Special staples
Staple exchange method	Cartridge
Staple capacity	2,000 staples per cartridge
Number of pages that can be stapled together	Between 2 and 20 pages of 64g/m ² paper for each tray (Maximum 30 sets, 300 pages, stacking height: whichever comes first out of 188mm or 48mm for tray No.1, or 395mm for trays No.2 and 3.)
Staple location	One location at an angle (left-hand corner or right-hand corner), one horizontal location (right-hand side), two horizontal locations (center)
Paper size	A3, B4, A4, A4 (vertical), ledger, legal and letter
Miscellaneous	
Maximum electrical consumption	Approximately 100W or less (with a room temperature of 20 degrees Celsius and at a rated voltage input)
Dimensions ^b	654 (width) X 641 (depth) X 1158 (height) mm
Weight	Approximately 28kg
Power supply (Within a permissible voltage rate of ±10%)	110-120V (50/60Hz) or 220-240V (50Hz)

a. Paper ejection for labels, OHP films and envelopes is only possible in the face-up mode from tray No.3.

b. 1338mm when extended to the maximum.

The details outlined in this manual are subject to modification in accordance with product improvements.

1.1 Part names

External diagram

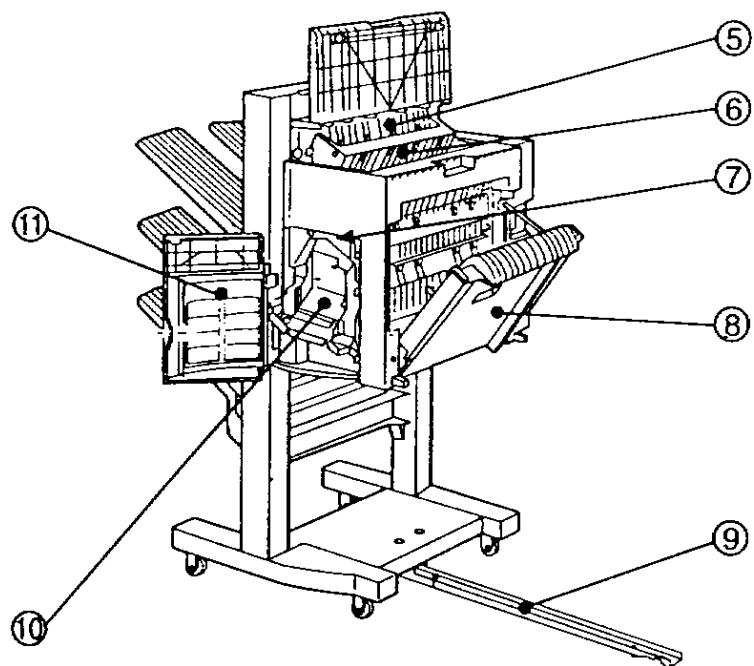
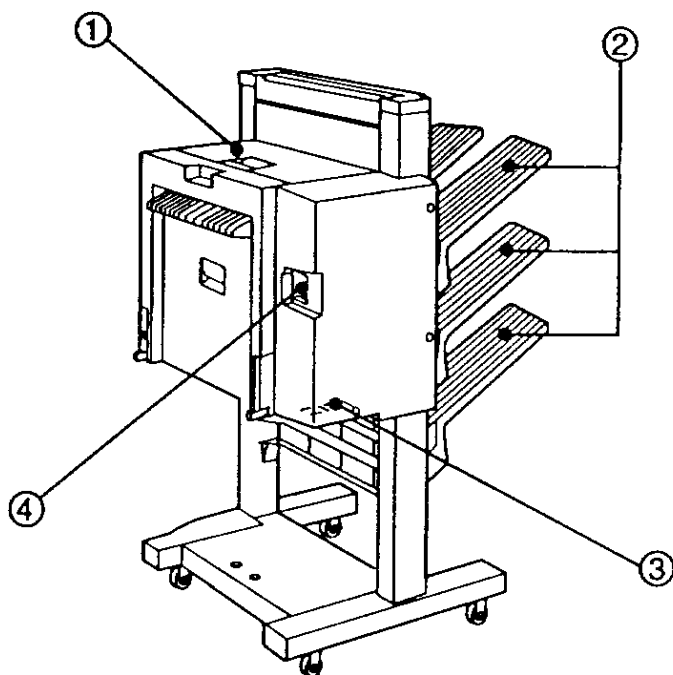


Table 1.2 External Component

Item (See above)	Component
1	Upper door
2	Trays
3	Interface connector
4	Power supply receptacle
5	Upper guide
6	Lower guide
7	Staple reset switch (Not used)
8	Right side cover
9	Guide rail
10	Staple unit
11	Front door

Internal Component

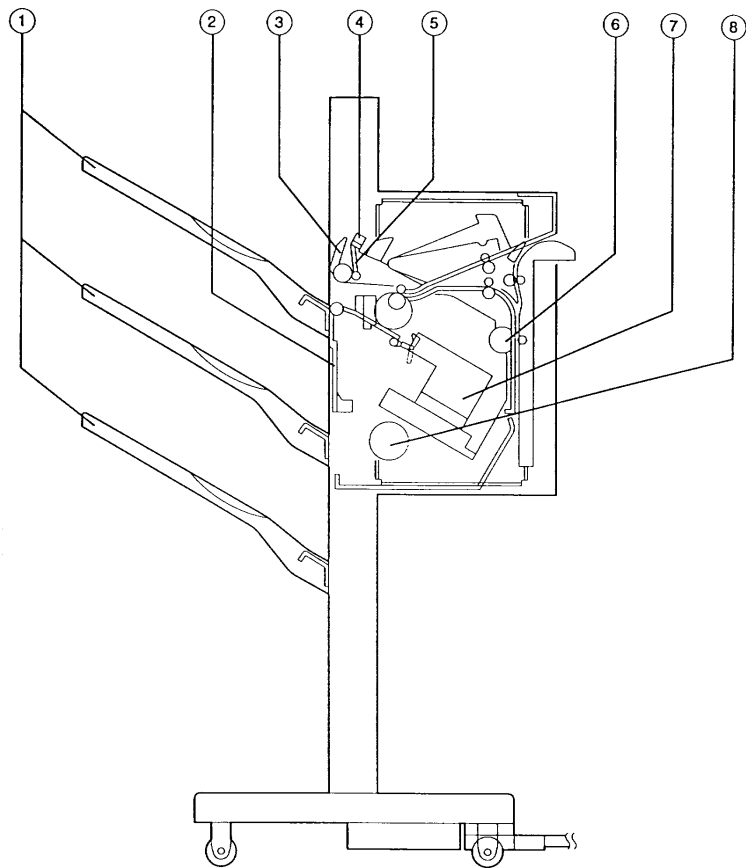


Table 1.3 Internal Component

Item (See above)	Component
1	Trays
2	Shutter
3	Swing guide
4	Distance sensor
5	Paddle
6	Inversion roller
7	Staple unit
8	Tray elevation motor

1.1 Installation

Precautions during installation

All important adjustments were made to this equipment prior to it being packed and shipped from the factory, and it has also been subject to a thorough inspection. The installation procedure is extremely important to ensure that the equipment performs mechanically in accordance with the ratings acquired during the inspection process after it has been unpacked by the customer.

The service engineers must therefore have a full understanding of the mechanical capabilities of this equipment, and it must be installed in a favorable environment in accordance with correct procedures.

Location of installation

Ensure that the location of installation satisfies the following conditions. It is recommended that an area that meets these conditions is determined prior to the unit being delivered to the customer.

Power supply

Prepare a power supply that conforms to the following:

- *Current (AC).* Rated current $\pm 10\%$
- *Supply frequency.* 50/60Hz $\pm 2\text{Hz}$

Operating environment

Ensure that the location of installation conforms to the following:

- A flat and horizontal surface
- Temperature and humidity ranges must be within the following:
 - *Surrounding temperature.* 10 to 32.5 degrees Celsius
 - *Surrounding humidity.* 20 to 80% RH (relative humidity) without condensation
- Areas which are well-ventilated and not subject to steam.
- Avoid installation in the following locations.
- Areas where the device will be subject to direct sunlight.

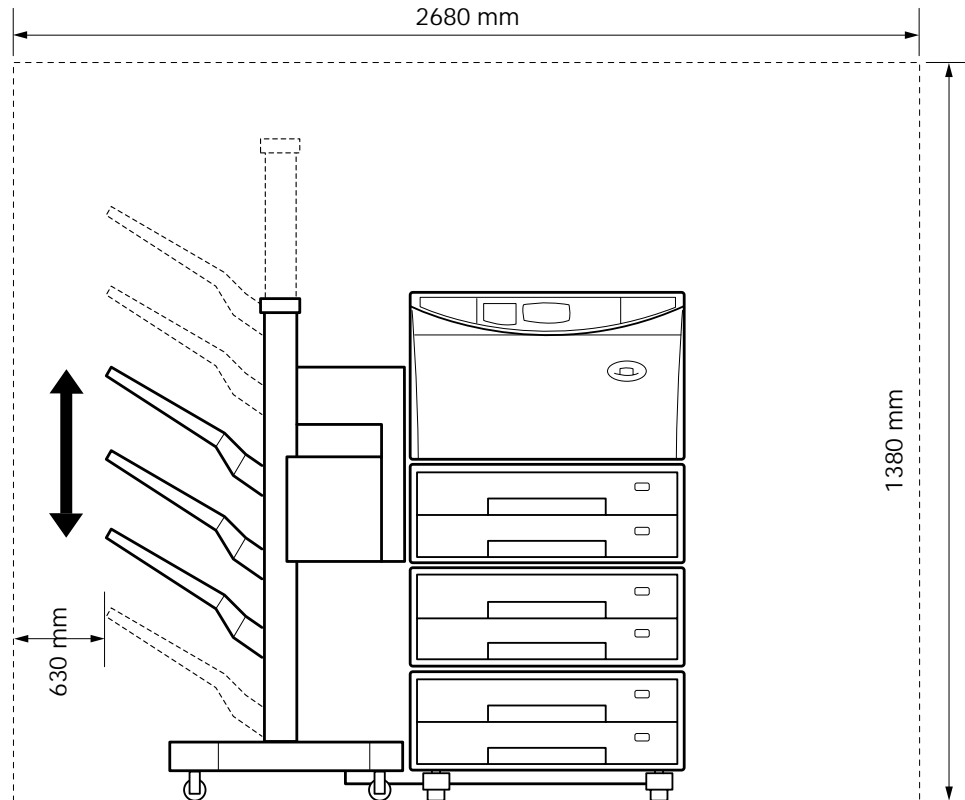
If this is unavoidable and the device must be installed in an area where it is subject to direct sunlight, ensure that a thick curtain or other form of protection is used to deflect the sunlight.

- Areas near magnets or where magnetic fields exist.
- Areas that are subject to vibrations.
- Areas in which dust collects.
- Near to open flames and moisture.

Installation space

Install the device at a suitable distance from walls and other obstructions, and secure enough space to enable easy operations.

Figure 1.1 Installation space



Procedures for unpacking and installation

There are cases where water droplets will form on the surface of metal fittings when brought into warm places from cold places. This is known as condensation, and using equipment on which condensation has formed may result in faults arising with the feeder assembly. To avoid this, do not unpack the device for at least one hour after it has been brought in from a cold place to allow it to become accustomed to room temperature.

Unpacking the finisher

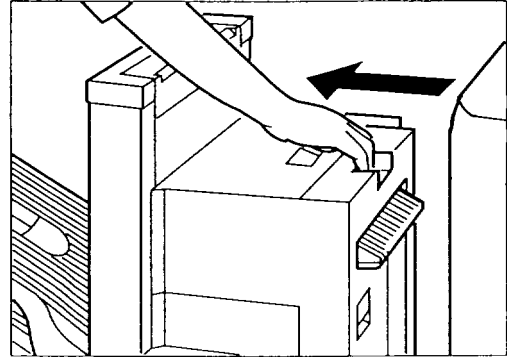
- 1 Remove the outer box in which the finisher is packed.
- 2 Remove the accessories. Confirm that the accessories include the power supply cord, the manual, the guide rails, the trays, the earth adapter and the interface cable.
- 3 Remove the upper pads (left and right) and lift the finisher out of the box.
- 4 Remove the vinyl bag in which the finisher is packed and then peel off the tape that holds each part in place. Verify that the covers were not scratched, bent or otherwise damaged during transportation.
- 5 Open the front cover and remove the two spacers.
- 6 Attach the trays to the finisher with the screws.

1.2 Removing paper jams

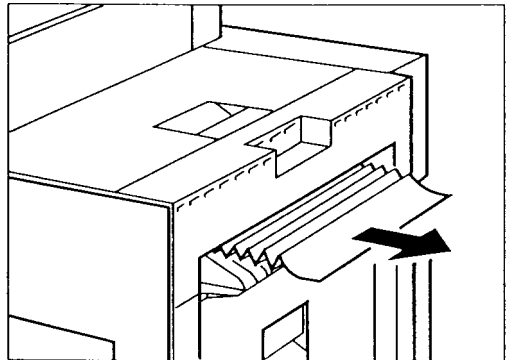
When jams occur, removing the jammed paper from the inside of the machine in accordance with the following procedures.

Paper jammed in the inversion assembly

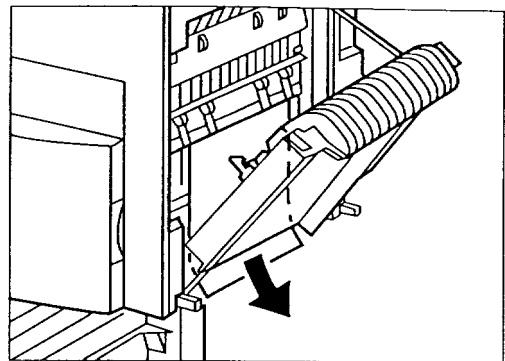
- 1 Separate the finisher from the printer.



- 2 Remove any jammed paper that can be seen.

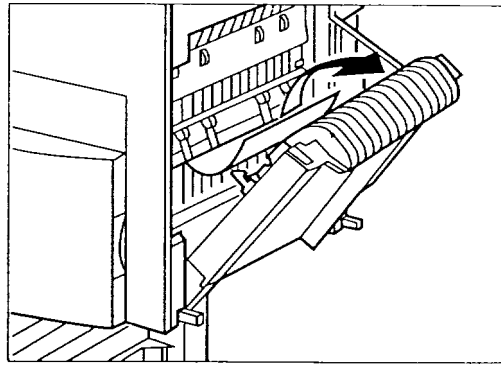


- 3 If the jammed paper cannot be removed, open the inversion cover assembly and remove the jammed paper then.



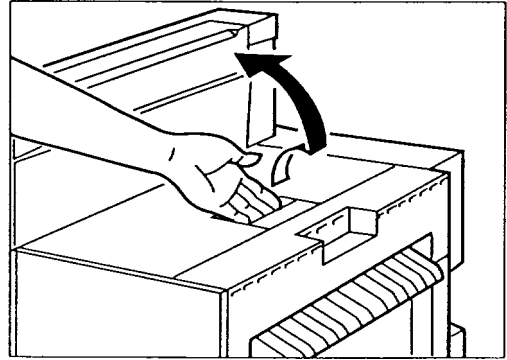
FEATURES

Removing paper jams

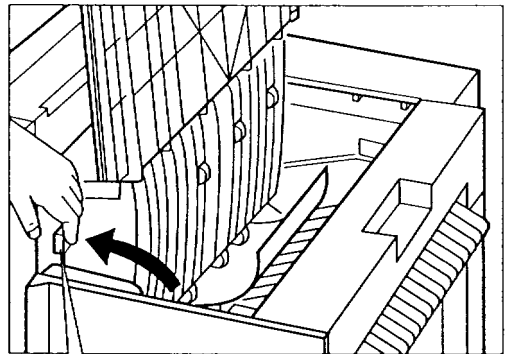


Paper jammed in the feeder assembly

- 1 Open the top cover.

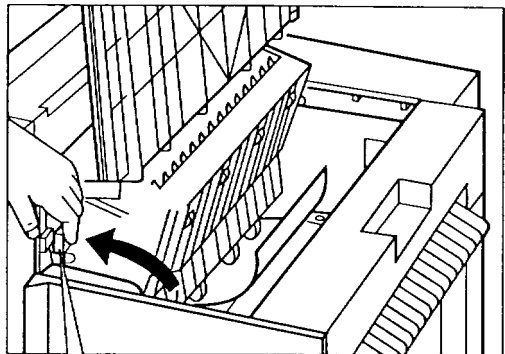


- 2 Grip the knob and open the upper guide.
- 3 Remove any jammed paper that can be seen.
- 4 If the jammed paper cannot be removed, grip the knob and open the lower guide.



1

- 5 Remove any jammed paper that can be seen.



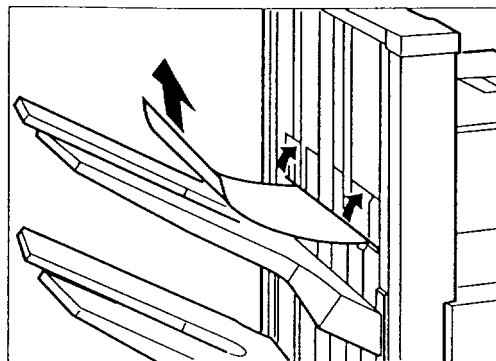
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FEATURES

Removing paper jams

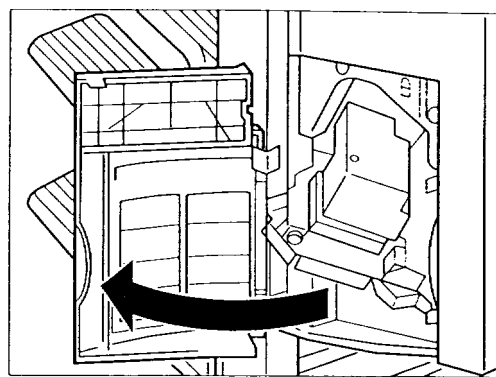
Paper jammed in the paper ejection assembly

- 1 Raise the paper guide and remove any jammed paper.
- 2 Open and close the front cover, the upper cover and the inversion cover.

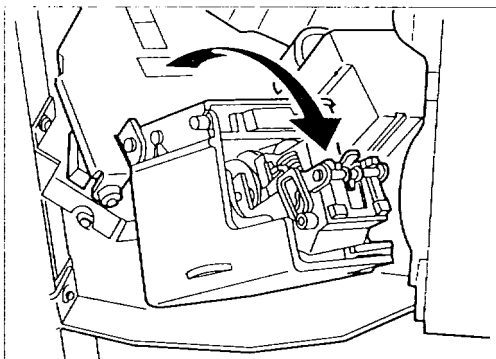


Staples jammed in the Staple assembly

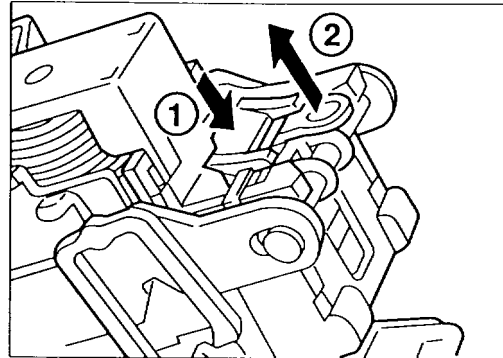
- 1 Open the front cover.



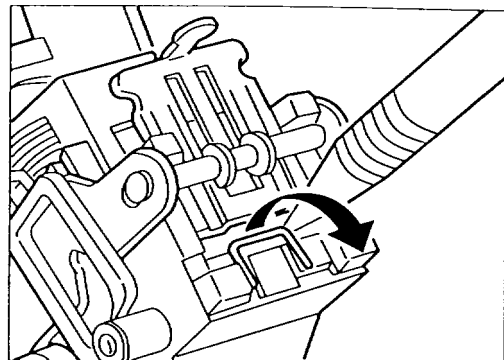
- 2 Pull out the staple assembly.



- 3 Grip the knob while applying pressure to the green lever (") and pull out the Staple guide.



- 4 Remove the jammed staple with a pointed object.
- 5 Grip the knob and replace the staple guide.

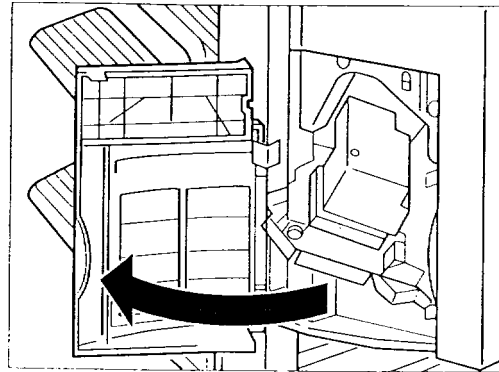


1.3 Customer maintenance and inspections

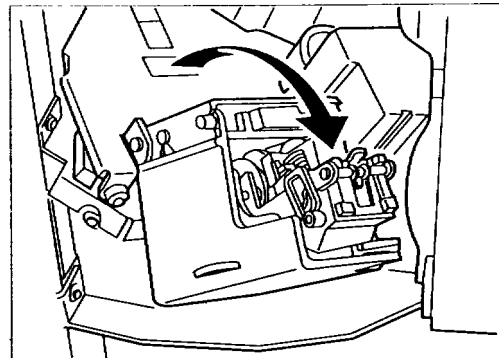
Replacing the staple cartridge

Replace the staple cartridge in accordance with the following procedure.

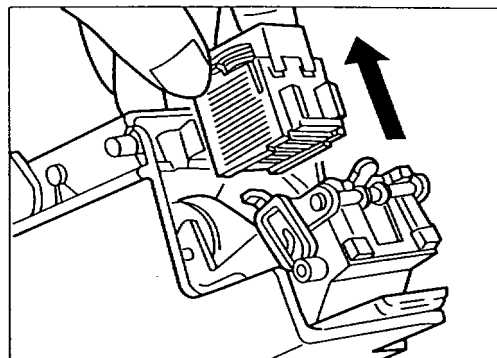
- 1 Open the front cover.



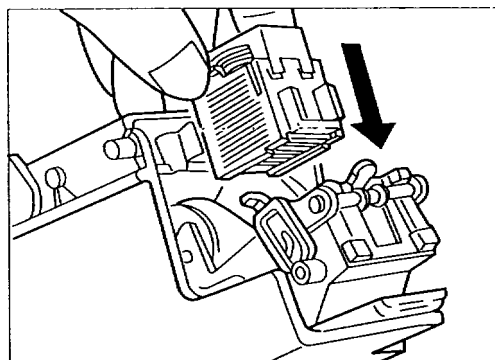
- 2 Pull out the staple assembly.



- 3 Remove the staple cartridge.



- 4 Insert the staple cartridge until it catches on the clip.
- 5 Return the staple assembly to its original position.



FEATURES

Customer maintenance and inspections



Chapter 2 O P E R A T I O N T H E O R Y

Contents

General	2
Basic operations	3
Outline	3
Outline of electrical circuits	3
Finisher driver input/output	5
Feed and drive systems	9
Outline	9
Face-down paper ejection	10
Normal stacking	10
Job offset	10
Stapling	11
Face-up paper ejection	12
Normal stacking	12
Feeding and ejection	13
Outline	13
Face-down feeder (inversion operations)/paper ejection operations	16
Face-up feeder, paper ejection operations	16
Job offset	16
Staple operations	18
Outline	18
First page operations	19
Second and subsequent page operations	21
Last page operations	22
Tray operations	23
Stapler unit	25
Tray loading volume detection	26
Stacking mode details	26
Jam detection	27
Power supply	30
Outline	30
Protection functions	30

2.1 General

This chapter provides explanations on the purpose, role and mechanical system of each function, as well as providing an outline of the operational timing of each part by function.

The descriptions of the digital circuits for this device include signals names without slashes ("/") for H and PSNS electrical signal levels, and signal names with slashes, such as L and /SCNON.

H and other signal names without slashes ("/") are true (indicating that the signal has been output) at the supply voltage level and false (indicating that the signal has not been output) at the GND level. L and other signals names with slashes are true at the ND level and false at the supply voltage level.

This device uses a microcomputer. However, as it is impossible to run an internal operation check on a microcomputer, the explanation for the microcomputer operations has been omitted.

Also, as it is a pre-requisite for the internal printed circuit board to be untampered with by the customer, simple summaries with the use of block diagrams have been used in this manual to cover the descriptions of these printed circuit boards. Owing to this, the explanations for circuits only cover the two areas from the sensors to the input areas of the main substrates and from the output area of the main substrates to the load, and block diagrams are used to explain each function.

2.2 Basic operations

Outline

The finisher performs the face-down ejection and face-up ejection of paper fed through from the printer. The job offset and stapling functions are available with face-down ejection.

These operations are controlled by the finisher driver's circuit board.

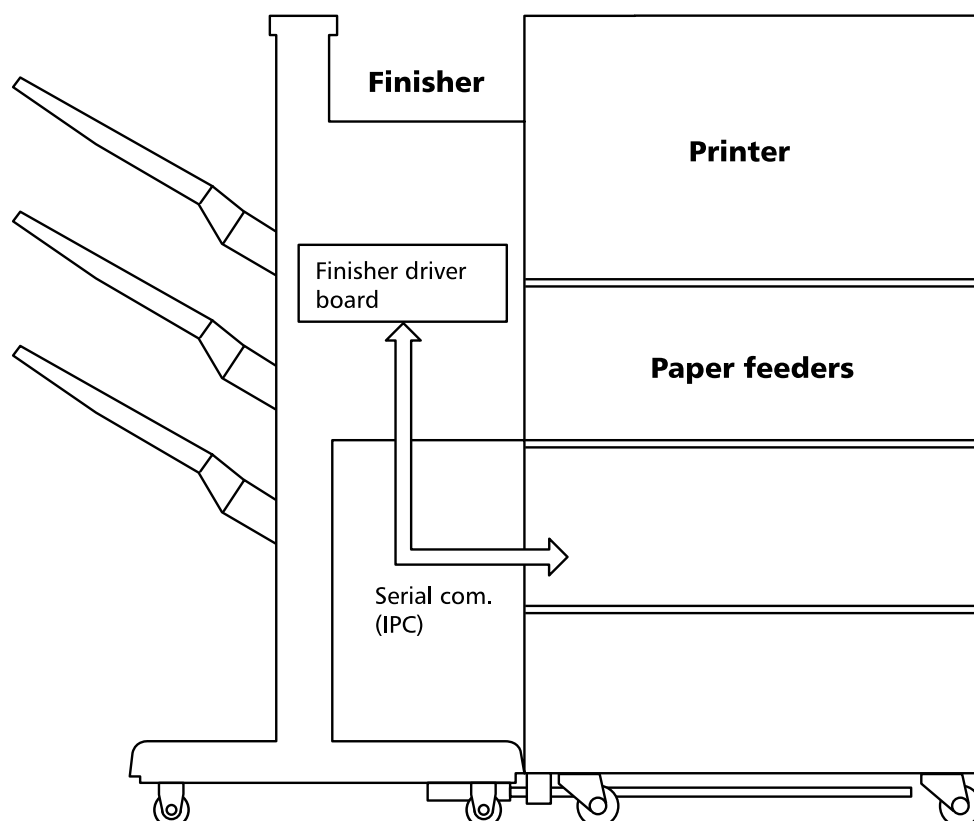


Figure 2.1 Outline of the finisher

Outline of electrical circuits

The finisher's operational sequence is controlled by the finisher driver's circuit board. A 16-bit microcomputer (CPU) is used in the finisher driver's circuit board, and this performed serial communications with the sequential control.

The finisher driver operates the solenoids and motors, etc., in accordance with the various commands that are transmitted from the option controller via the serial communications line. The finisher driver also notifies the option controller of sensor and switch information via the serial communications line.

The major roles of the ICs mounted in the finisher driver are as follows.

- Q1 (CPU). Sequential control.
- Q2 (EP-ROM). Sequential programs built in.
- Q3 (RAM). Used for backing up the initial data.
- Q4 (IPC). Used for communications control.

The diagram below shows the signal flow between the finisher and the printer.

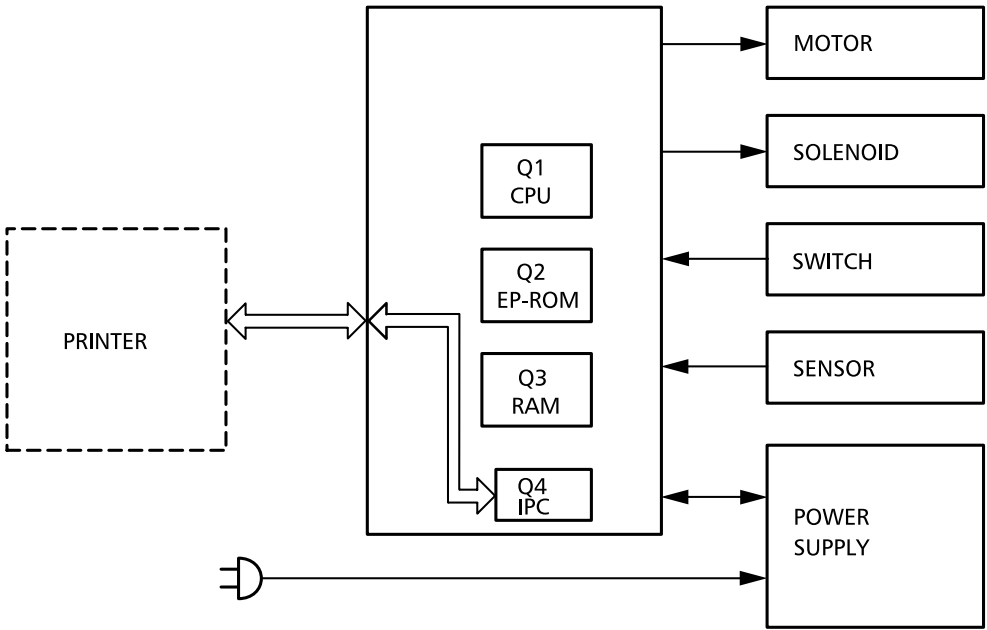
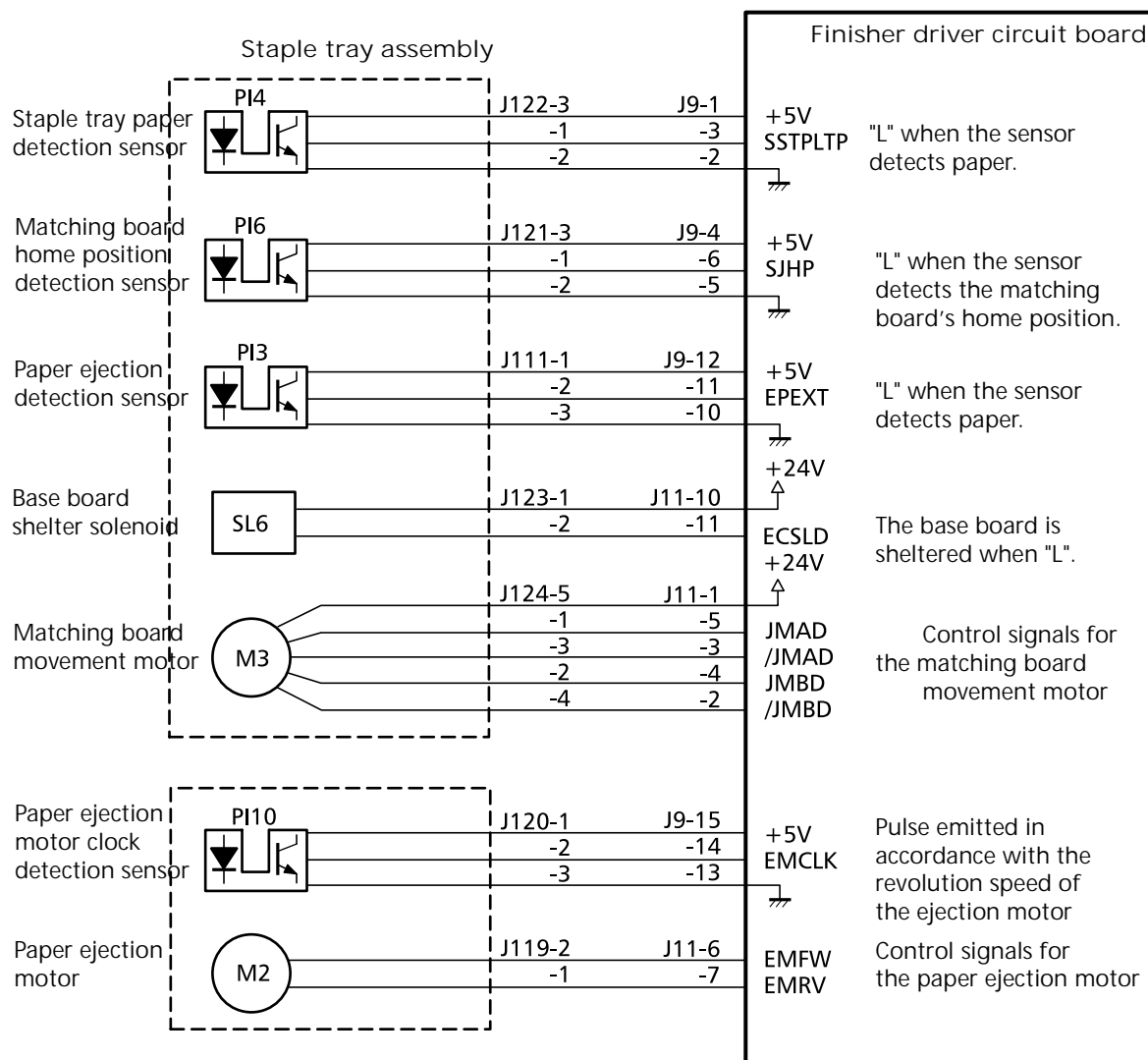
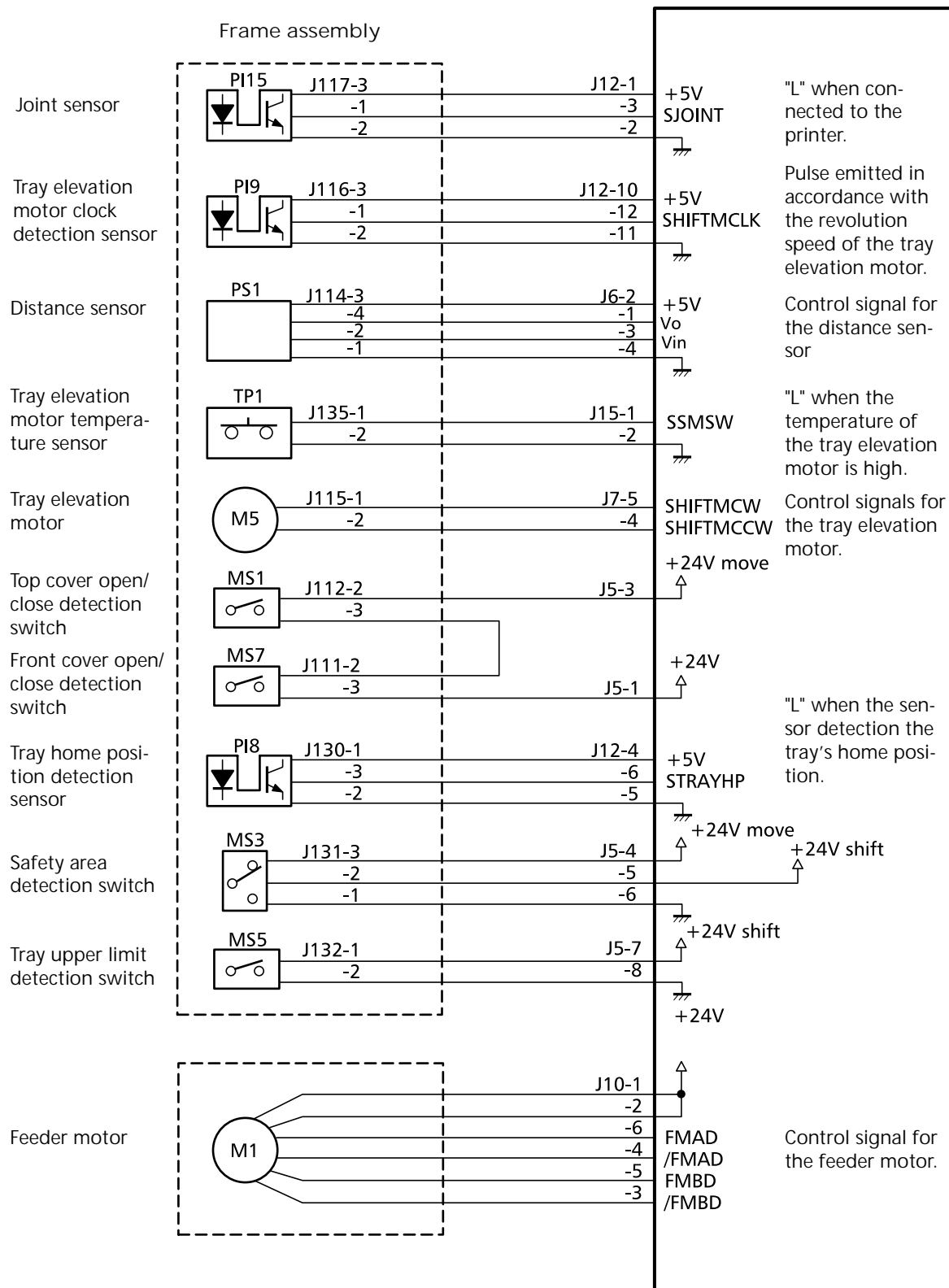
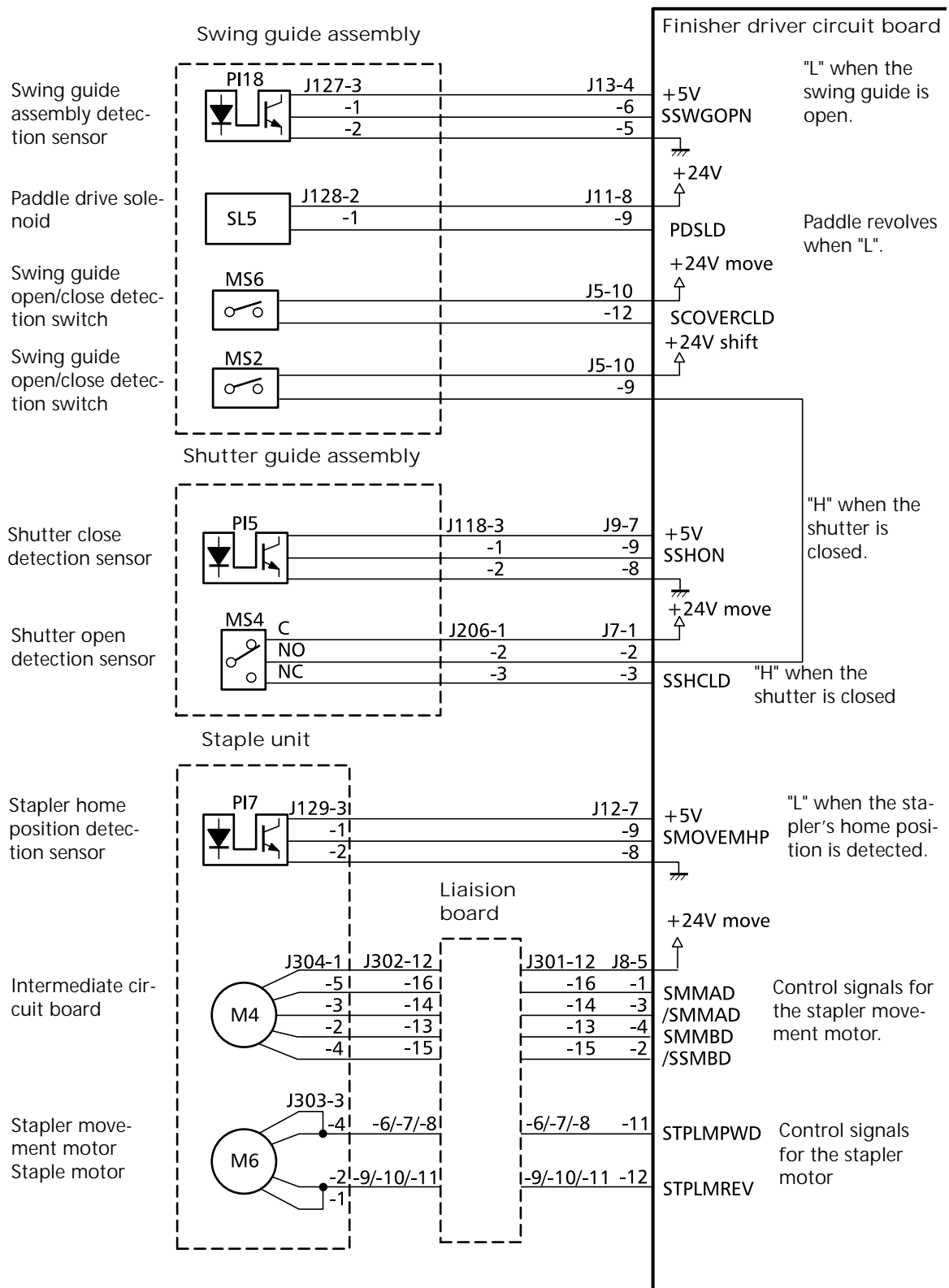


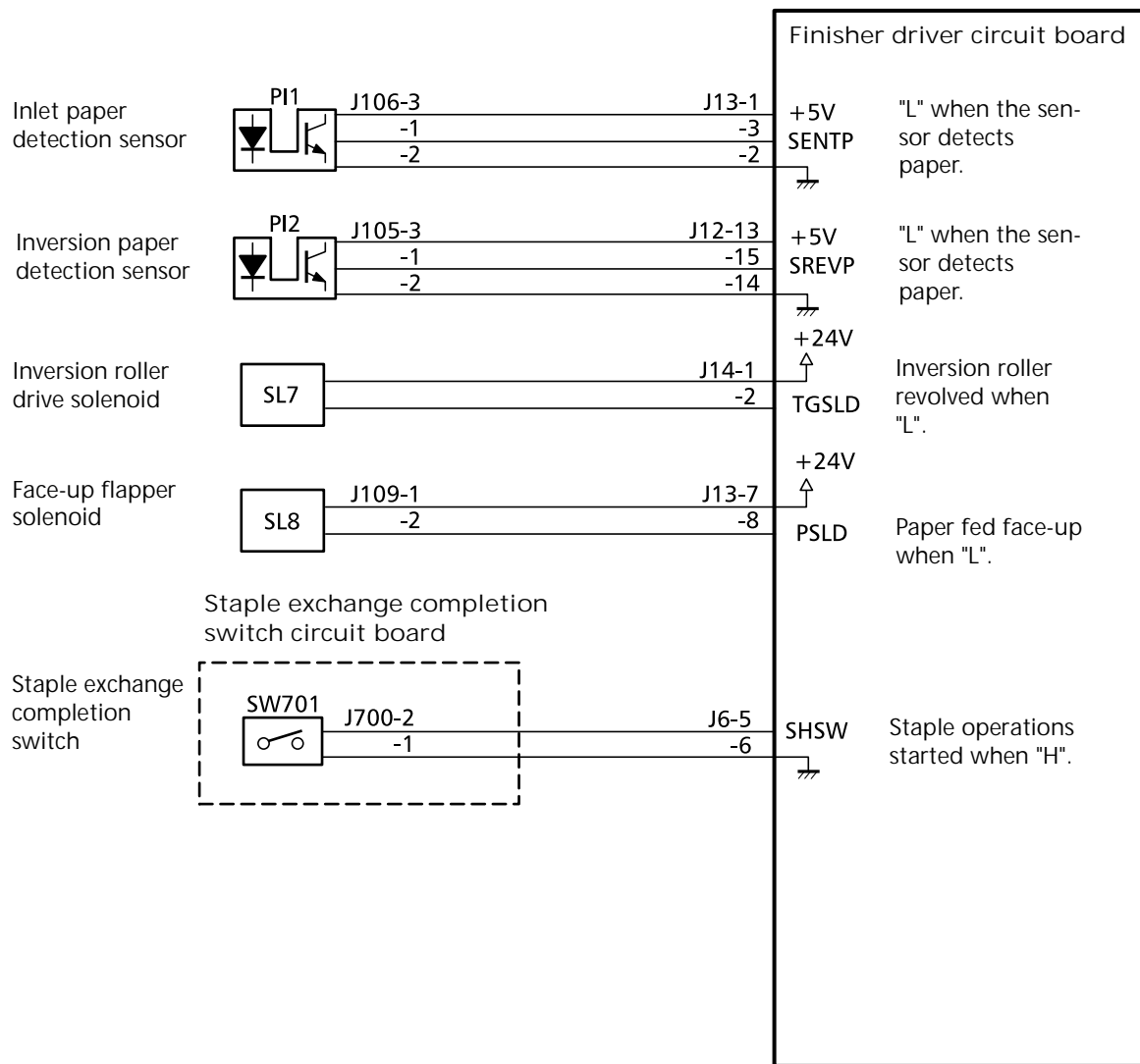
Figure 2.2 Signal flow between the finisher and the printer

Finisher driver input/output









2.3 Feed and drive systems

Outline

This device stacks, shifts, staples and ejects paper to the tray in accordance with the commands transmitted from the printer.

The four different methods of paper ejection are explained below.

Paper ejection methods

Face-down ejection

Normal stacking

Job offset

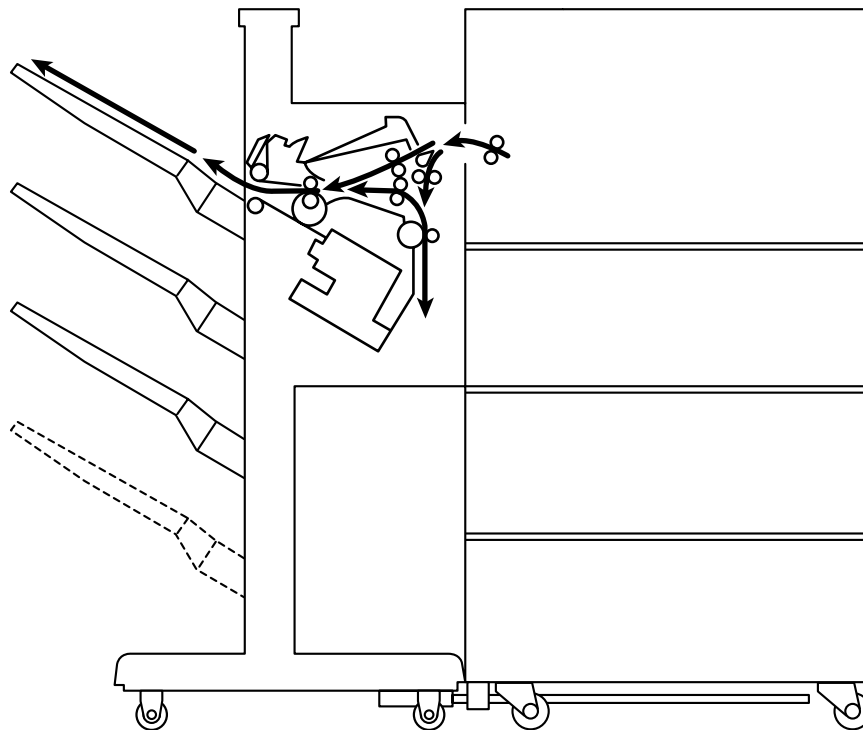
Staple

One on the left-hand side

One on the right-hand side

Two in the center

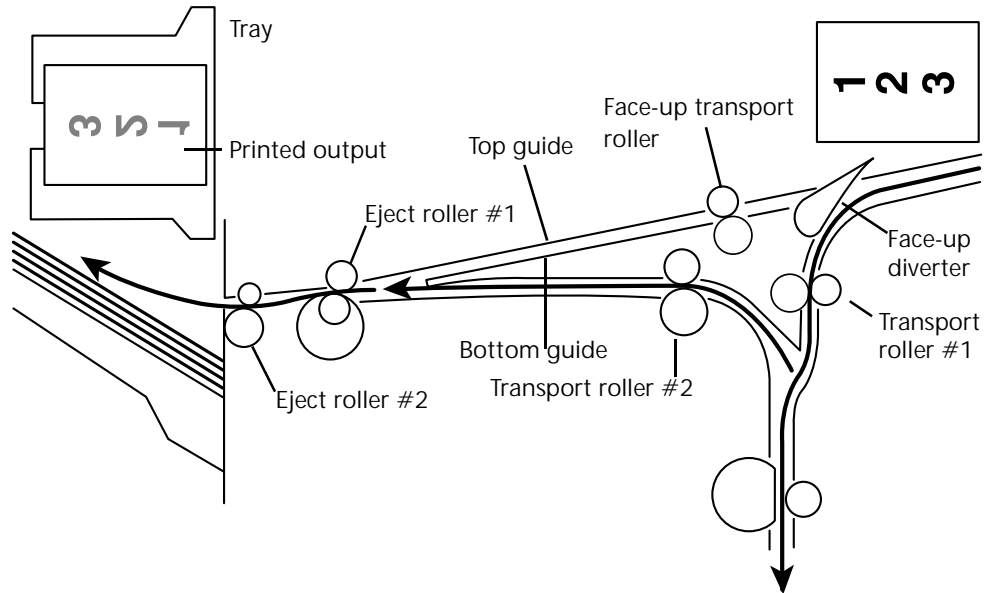
Figure 2.3 Feed and drive system



Face-down paper ejection

Normal stacking

The paper is ejected to the tray face down after being inverted.



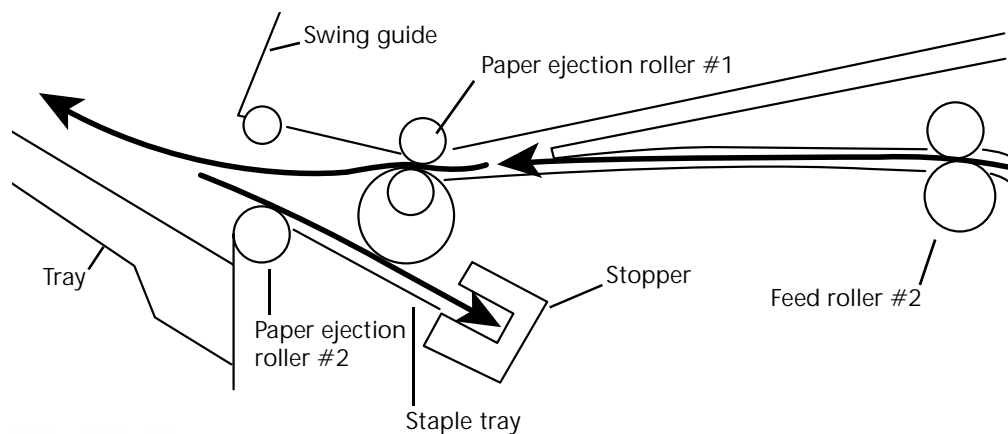
Job offset

The job offset operates in two ways: First-page-only mode and whole-set-of-pages mode.

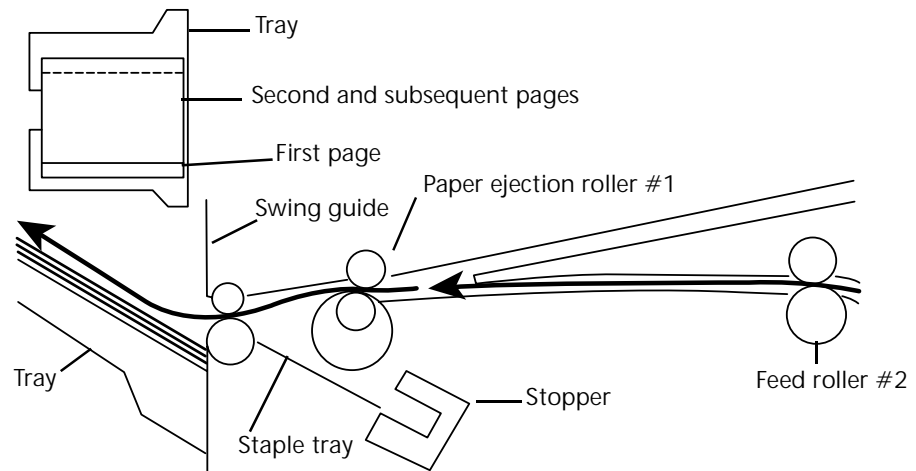
In the first-page-only mode, the first piece of paper is inverted and fed through to the staple tray. The piece of paper is then shifted forward by approximately 30mm, and ejected face down to the tray.

The second and subsequent pieces of paper are inverted and ejected to the tray without being fed into the staple tray.

•First page



•Second and subsequent pages



In the whole set of pages mode (default), the whole page of a print job is fed into the staple tray so that the job is shifted forward. The subsequent job as a whole is not shifted but delivered in a normal manner, allowing every other job is shifted to each other.

Stapling

The pages are inverted, stacked in the staple tray, stapled and then ejected to the tray.

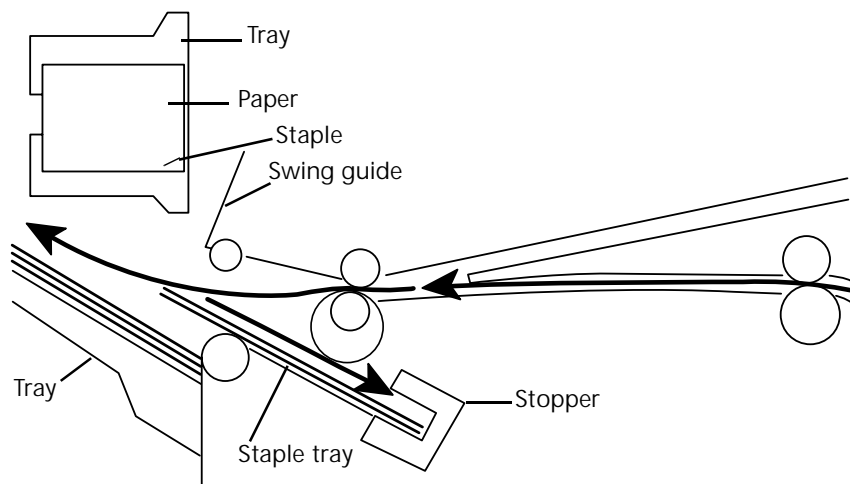
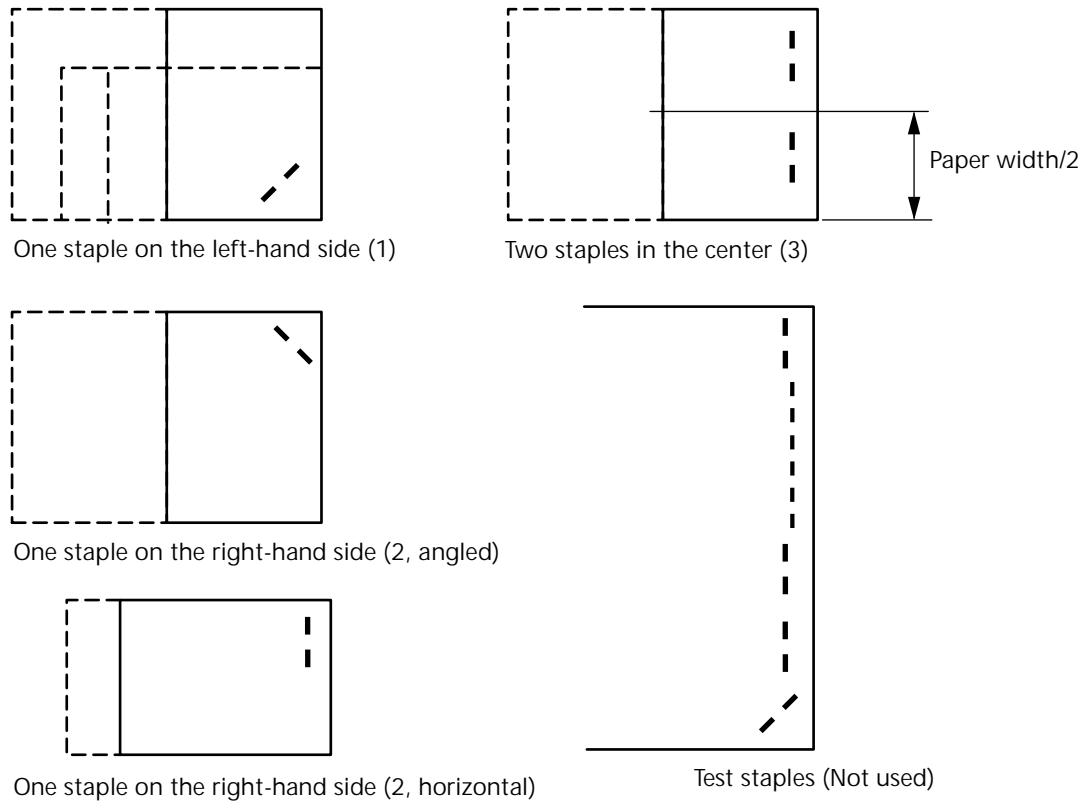


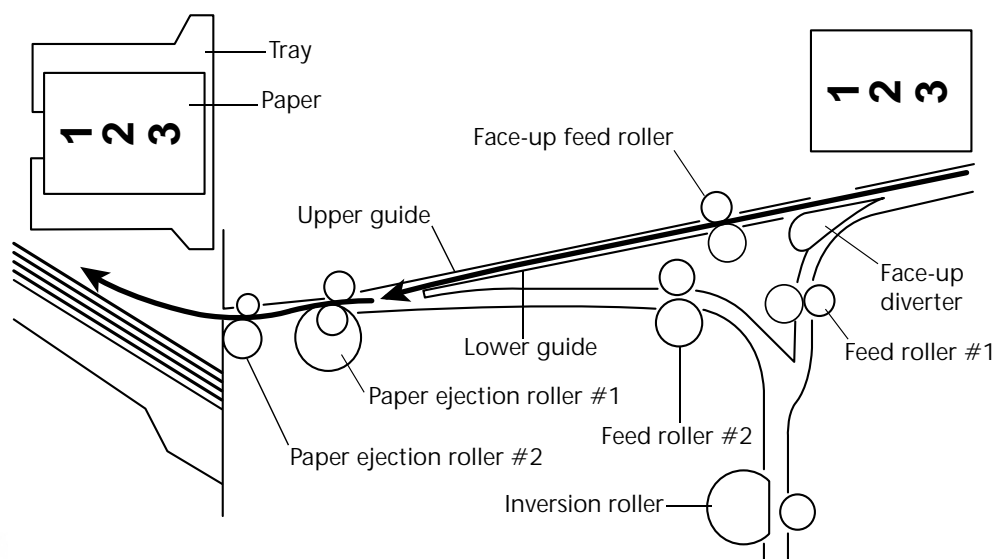
Figure 2.4 Positions of stapling



Face-up paper ejection

Normal stacking

The paper is ejected face-up to the tray without being inverted.



Feeding and ejection

Outline

When the paper fed through from the printer is to be laid face down in the tray, the inversion operation is performed.

The feed motor (M1) is a stepping motor, and the paper ejection motor (M2) is a DC motor. The forward and reverse operation for these motors is controlled by the microcomputer (CPU) in the finisher driver's circuit board.

Three photo-interrupters, the inlet paper detection sensor (P11), the inversion detection sensor (P12) and the paper ejection detection sensor, are situated along the paper's feed route, and these check whether the paper has reached its destination or is still in transit.

The finisher driver will judge that a paper jam has occurred if the paper does not reach or pass each sensor within a pre-determined period of time. In this event, operations are halted and notification of the jam is sent to the printer.

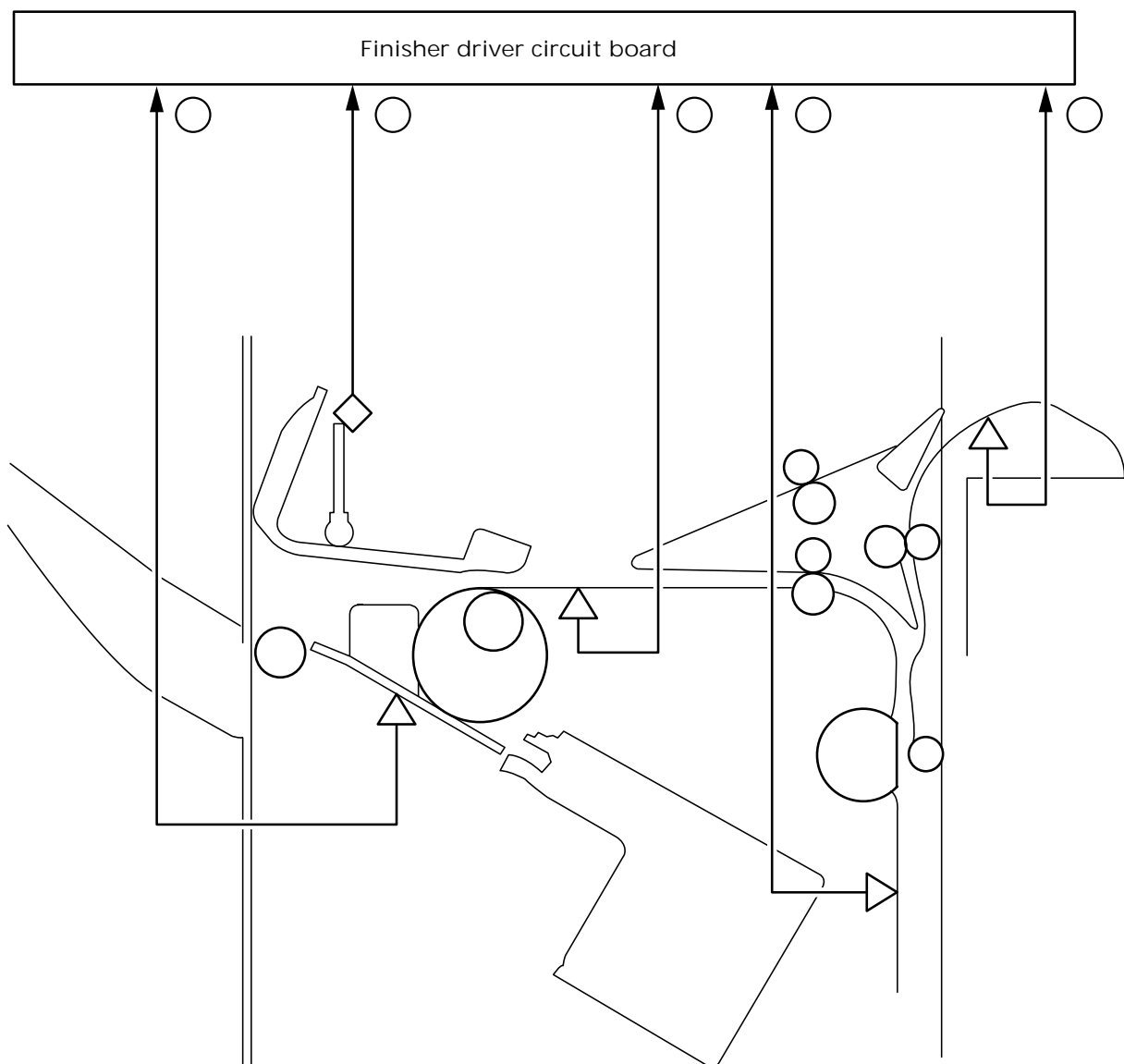


Table 2.1 Detection signals

- (1) Staple tray paper detection signal
- (2) Tray stacking volume detection signal
- (3) Paper ejection detection signal
- (4) Inverted paper detection signal
- (5) Inlet paper detection signal
- PS1: Distance sensor
- PI1: Inlet paper detection sensor
- P12: Inverted paper detection sensor
- P13: Paper ejection detection sensor
- P14: Staple tray paper detection sensor

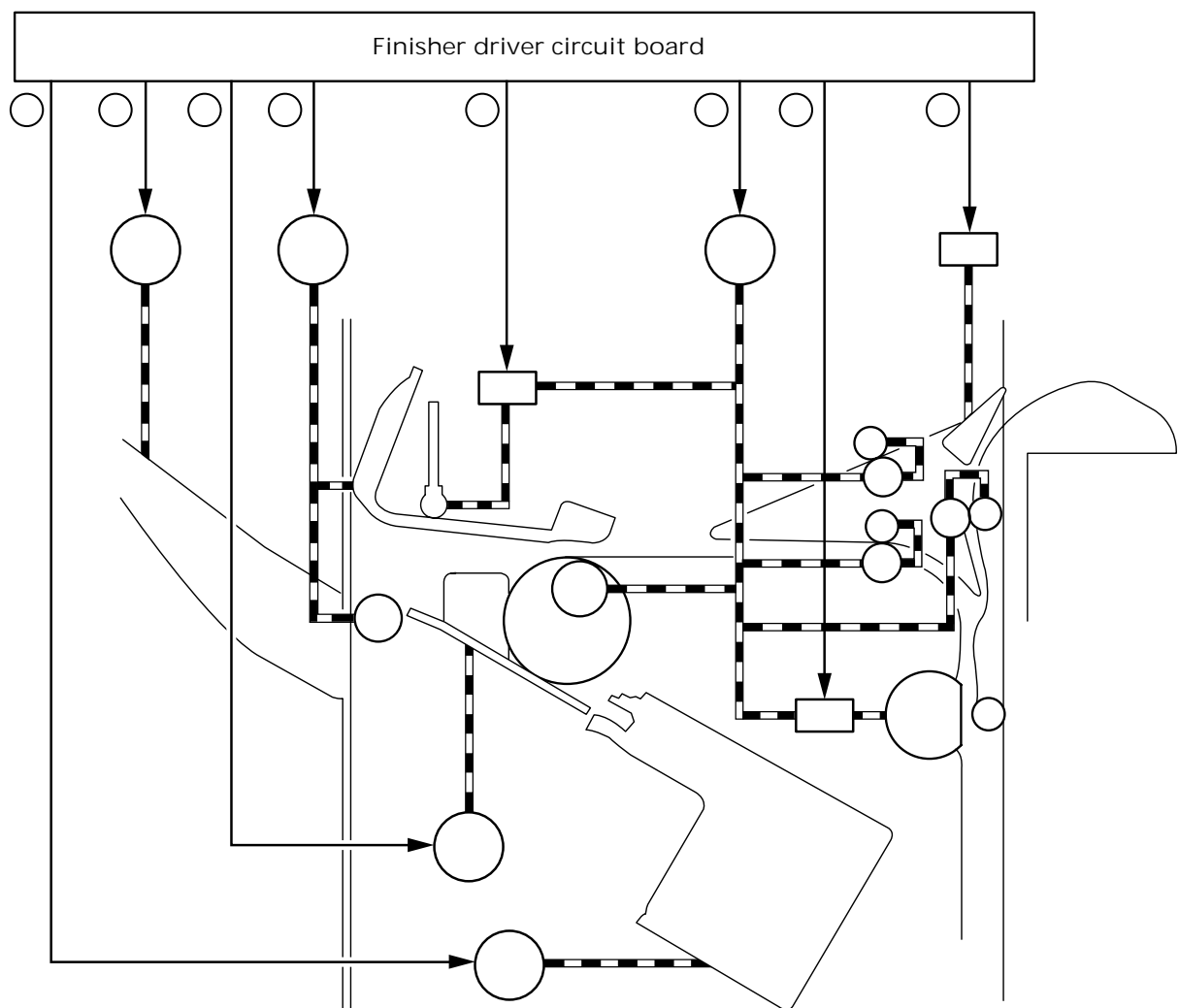


Table 2.2 Motors/solenoids— (1 / 2)

M1:	Feed motor
M2:	Paper ejection motor
M3:	Matching board's movement motor
M4:	Stapler movement motor
M5:	Tray elevation motor
SL5:	Paddle drive solenoid
SL7:	Inversion roller driver solenoid
SL8:	Face-up flapper drive solenoid
(1)	Stapler movement motor drive signal
(2)	Tray elevation motor drive signal
(3)	Matching board movement motor drive signal

Table 2.2 Motors/solenoids— (2 / 2)

(4)	Paper ejection motor drive signal
(5)	Paddle solenoid drive signal
(6)	Feed motor drive signal
(7)	Inversion solenoid drive signal
(8)	Face-up flapper solenoid drive signal

Face-down feeder (inversion operations)/paper ejection operations

The feeder motor (M1) and paper ejection motor (M2) are started up when the finisher driver receives a paper ejection signal from the printer, and feeder roller #1, feeder roller #2, paper ejection roller #1 and paper ejection roller #2 are put into motion. By starting up feeder roller #1, a single sheet of paper is transferred to the inverter. A paper detection sensor (P11) located at the inlet detects the bottom edge of the paper, and after transferring it to the prescribed position, the inversion roller driver's solenoid (SL7) is activated and the M1 driver starts up the inversion roller. This conveys the paper through to an inverted position. Once the paper has been inverted, it is passed through to the feeder guide by the inversion roller operating in the reverse direction. The paper is then fed and ejected by feeder roller #1, feeder roller #2, paper ejection roller #1 and paper ejection roller #2.

Face-up feeder, paper ejection operations

When the paper transferred from the printer to the tray is to be ejected face up, the feeder motor (M1) and the paper ejection motor (M2) are put into motion by a paper ejection signal received by the finisher driver from the printer, and the face-up feeder roller, paper ejection roller #1 and paper ejection roller #2 are started up. At the same time, the face-up flapper driver solenoid (SL8) is activated, and the flapper is switched across to the face-up side. This enables the paper to be fed and ejected without being inverted.

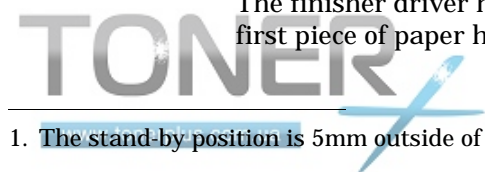
Job offset

Shift operations move only the first piece of paper or whole set of paper (default) for each job, and eject the second and subsequent pieces of paper without moving them.

The paper is moved with the matching board, and the matching board home position detection sensor (P16) detects whether this board is at the home position or not.

The matching board movement motor (M3) is activated when the power supply is switched on in order for the finisher driver to return the matching board to the home position. If the matching board is already in the home position, the system enters the stand-by mode. As the distance for moving the matching board is extended when paper other than A3 and A4 (horizontal) is used, the finisher driver moves the matching board to the stand-by position.¹

The finisher driver halts the operation of the paper ejection motor (M2) after the first piece of paper has passed the far end of paper ejection roller #1. The gear is



1. The stand-by position is 5mm outside of the paper's edge.

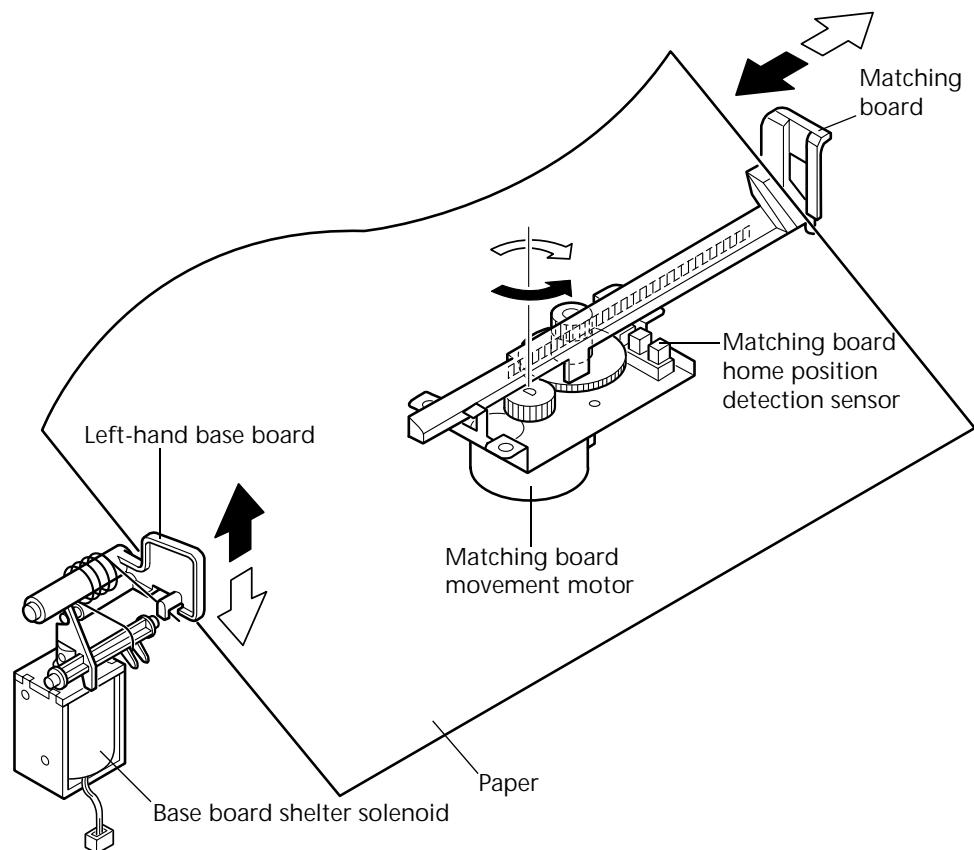
then moved to the swing guide drive assembly after the M2 motor has been put into reverse. This transmits the operation of M2 across to the gear and raises the swing guide. The swing guide is raised until it is detected by the swing guide open detection sensor (PI18) and then halted.

The paper is returned to the staple tray by the rubber surface fitted to paper ejection roller #1 when the swing guide is raised. The paper returned to the staple tray is then detected by the staple tray paper detection sensor (PI4).

The matching board movement motor (M3) is then activated and the paper moved by 30mm. Depending on the size of the paper, there are cases where it cannot be moved by 30mm as it will interfere with the left-hand edge. In this event, the base board shelter solenoid (SL6) is set at ON, and the paper is moved 30mm after the left-hand base board has been sheltered.

The finisher driver activates M3 in the reverse direction and moves the matching board to the stand-by position after the paper has been moved.

The finisher driver then activates M2 in the reverse direction to lower the swing guide. M2 is run in the forward direction when the swing guide open/close detection switch (MS2) is set at ON, and paper ejection roller #2 is activated. This ejects the paper to the tray. The second and subsequent pieces of paper for each job are ejected to the tray without shift movement.



Staple operations

Outline

The staple operations staple together a specified quantity of paper in the stapler unit.

The position of the staples will differ in accordance with the stapler motor and the size of the paper. Refer to table 2-2-1 for further details.

The stapler home position detection sensor (PI7) detects whether the stapler unit is at the home position or not.

The finisher driver activates the stapler movement motor (M4) after receiving the start signal from the printer, and moves the stapler unit to the central stand-by position (note).

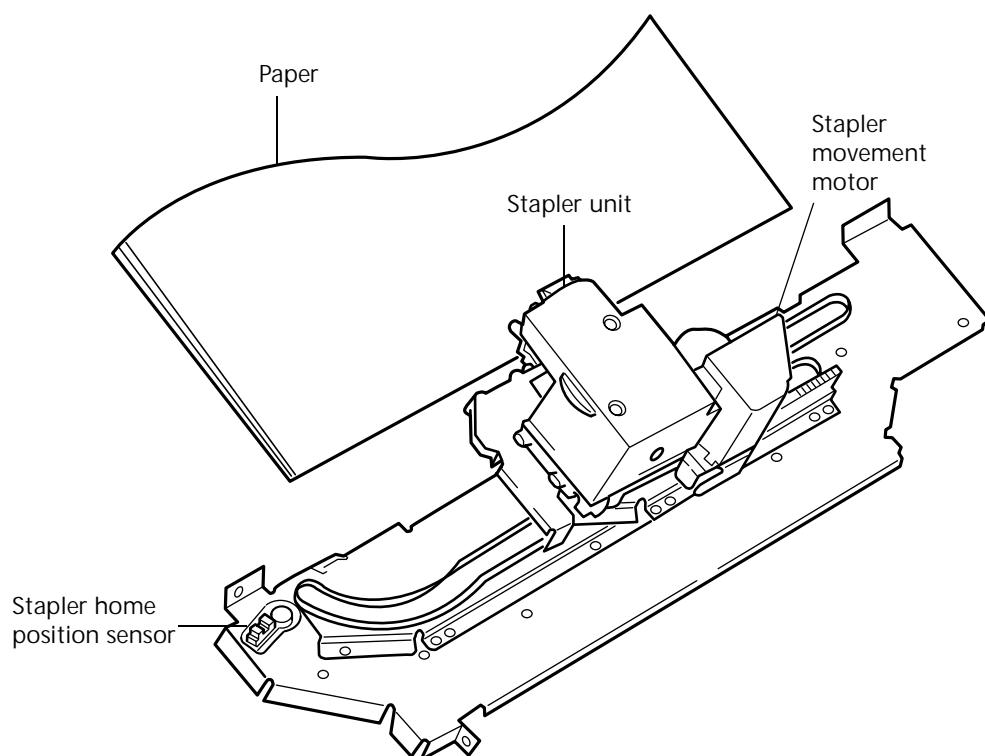
Note

The central stand-by position is the location where the stapler unit is situated prior to the paper being returned to the stapler tray in order to prevent the stapler operations being rendered impossible owing to the paper curling up inside the staple tray.

Table 2.3 Positions of staples

Staple mode	A3	A4R	B5/ B4	Ldg	Ltr/ R	Ltr	A4	Lgl	Otrs	
One, on left-hand side	(1)									
One, on right-hand side	(2)					(3)				
Two, centered	(4)									
Test (Not used)	(5)									

Refer to page 12, table 2.4 on (1) to (5) for details.

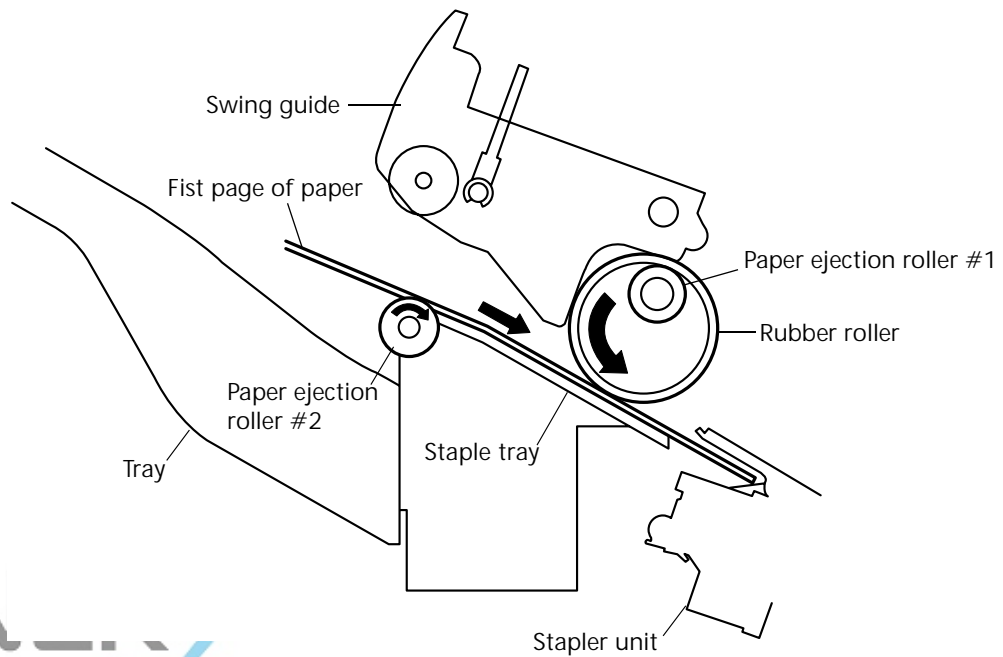
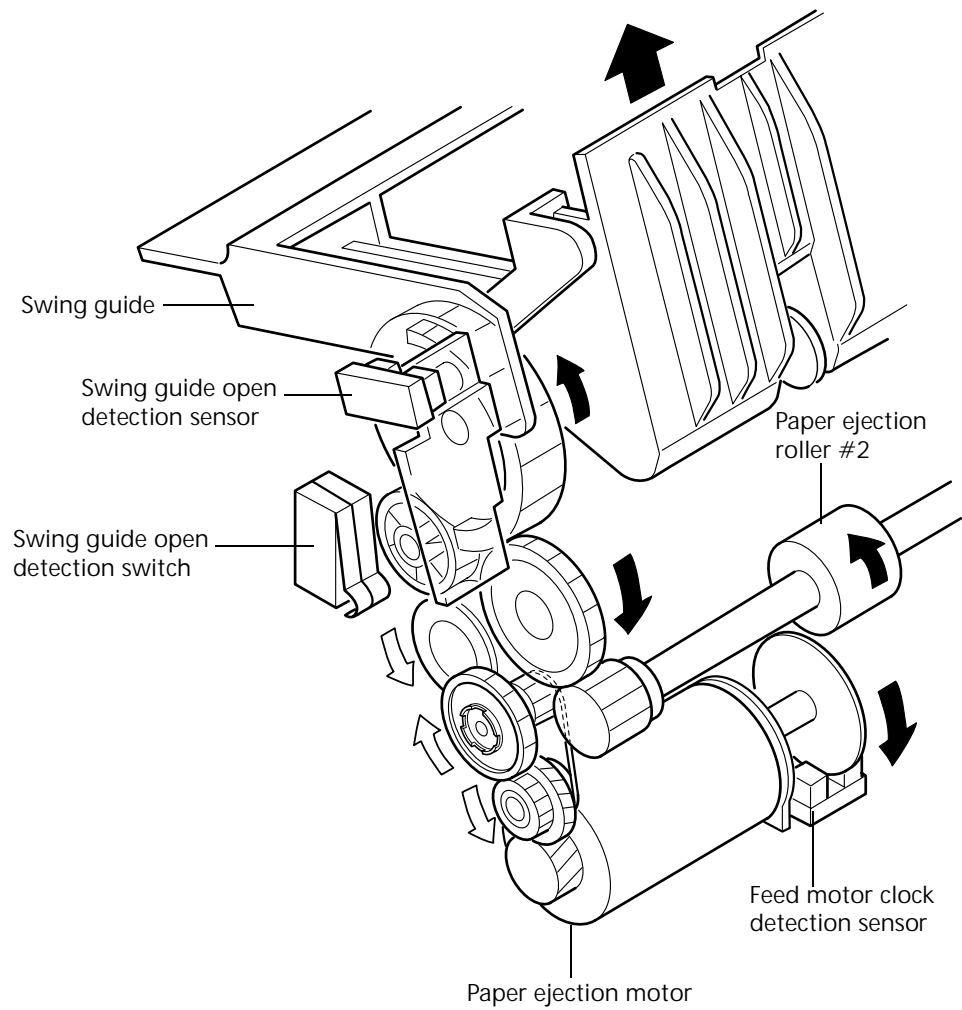


First page operations

The finisher driver halts the operation of the paper ejection motor (M2) after the first piece of paper has passed the far end of paper ejection roller #1. The gear is then moved to the swing guide drive assembly after the M2 motor has been put into reverse. The swing guide is raised by M2 until it is detected by the swing guide open detection sensor (PI18) and then halted. The paddle drive solenoid is then set at ON, and the feed motor drive operates the paddle.

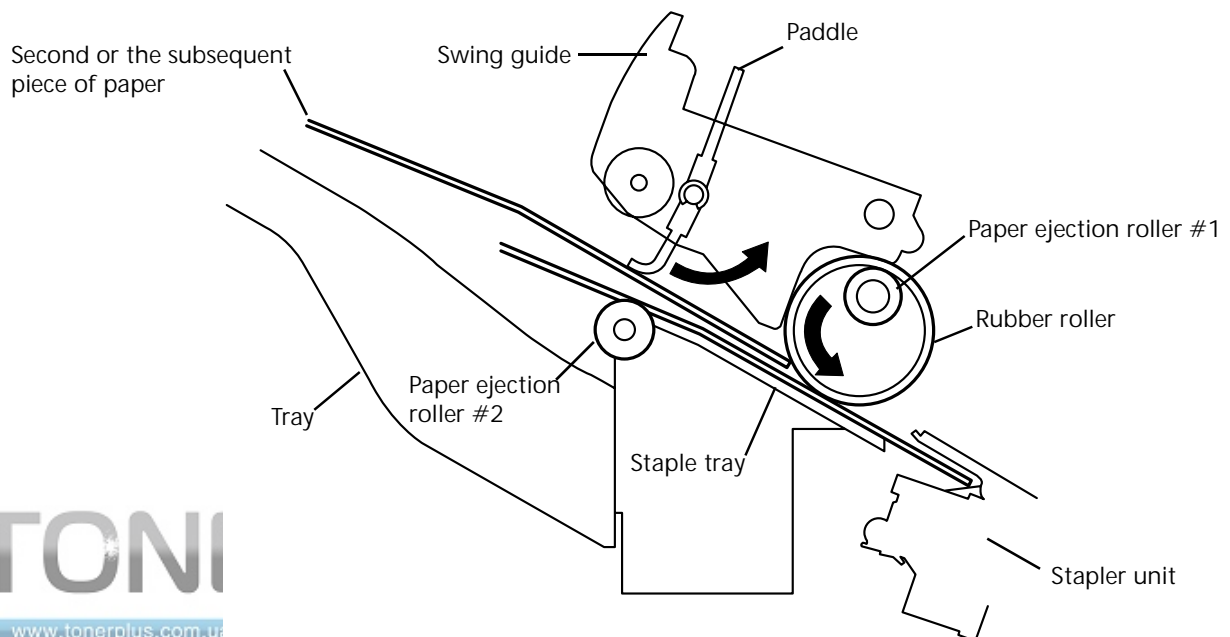
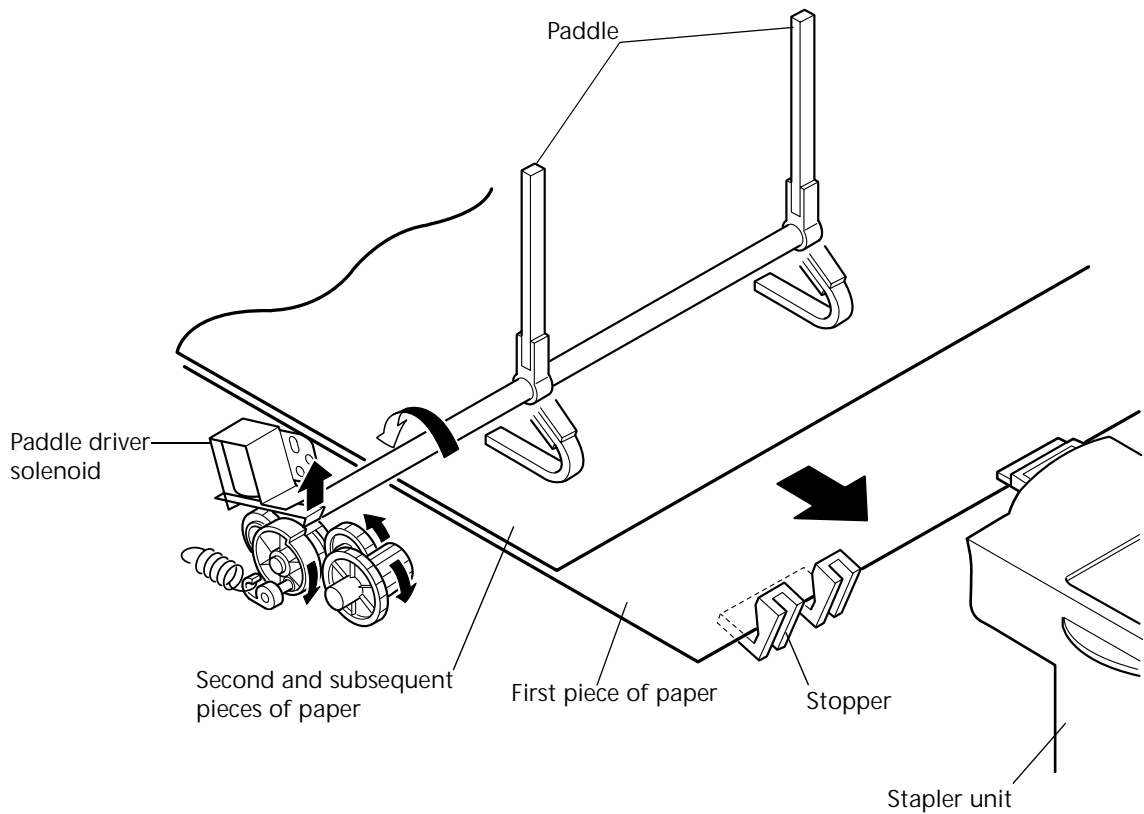
The paper is returned to the staple tray by the rubber surface fitted to paper ejection roller #1 when the swing guide is opened where it is detected by the staple tray paper detection sensor (PI4).

The matching board movement motor (M3) is activated and the pieces of paper are matched up.



Second and subsequent page operations

The finisher driver halts the operation of the paper ejection motor (M2) when the bottom edge of the second and subsequent pieces of paper have passed 20mm through paper ejection roller #1. The paddle drive solenoid is then set at ON, and the feed motor (M1) drive operates the paddle. This returns the paper to the stapler tray, activates the matching board movement motor (M3) and matches up the pieces of paper.

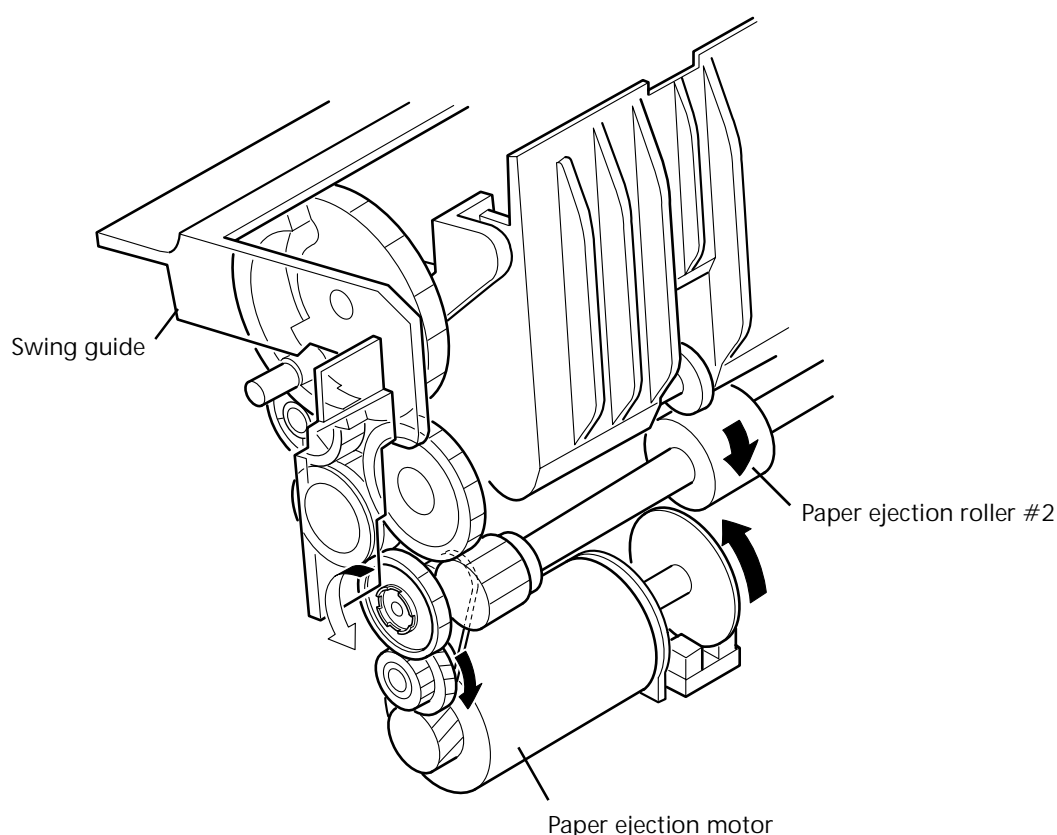


Last page operations

The finisher driver starts up M3 once again after the matching process has been completed for the last piece of paper in order to move the matching board to the staple matching position (note #1). The multiple sheets of paper are then matched up and the motor halted. The finisher driver then activates M2 in the reverse direction and lowers the swing guide.

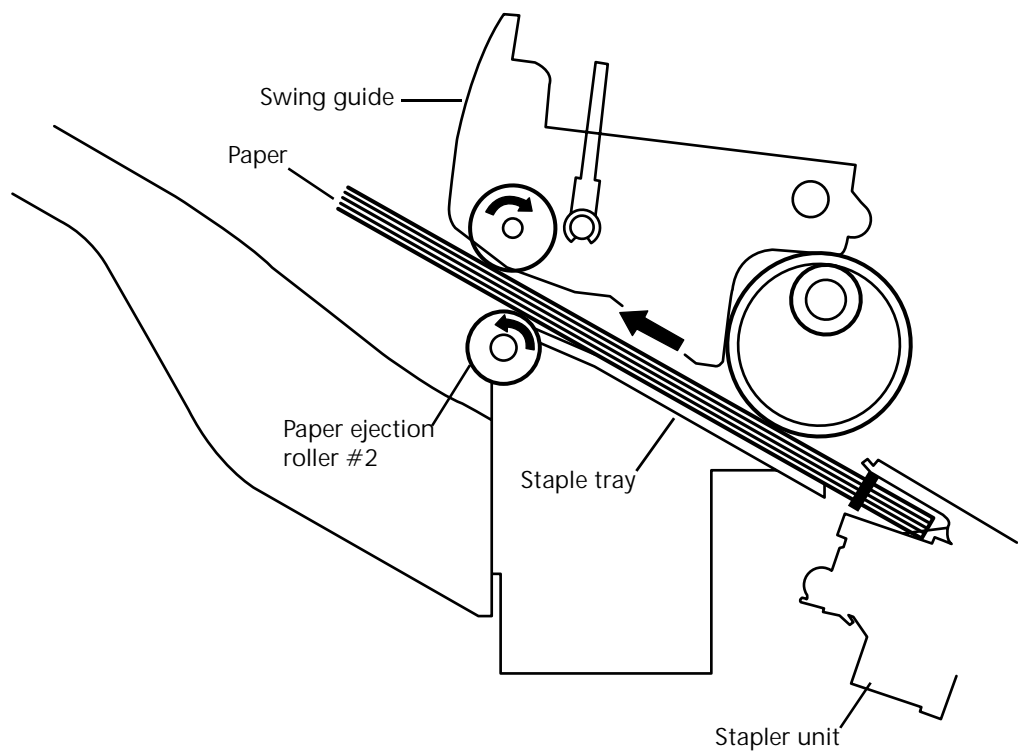
The finisher driver activates the stapling process in accordance with the specified staple mode transmitted from the printer (refer to fig.2-2-12 on page 2-19) and staples the pages together.

The finisher driver activates M3 when the stapling process has been completed and moves the matching board to the shelter position (note #2) when the paper is being ejected. The paper ejection motor (M2) is then activated in the forward direction to operate ejection roller #2 and eject the stapled pages to the tray.



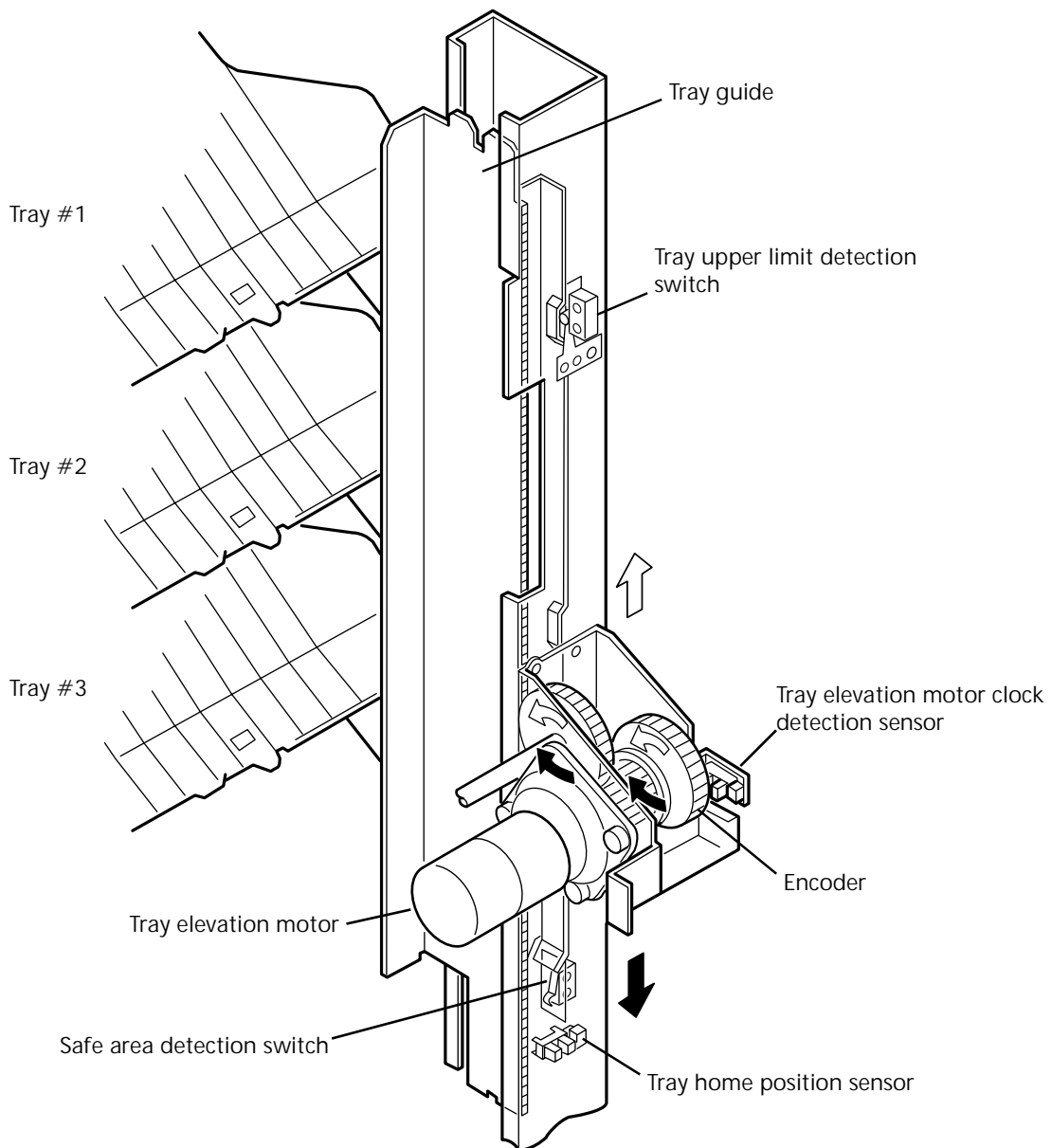
Note

1. The staple matching position is 0.5mm inside the horizontal width of the paper. 2. The shelter position during paper ejection is 5.0mm outside of the horizontal width of the paper.



Tray operations

The finisher driver is equipped with three trays, and paper can be ejected to either of these trays. The trays are moved upwards and downwards with the tray elevation motor (M5). The position of each tray is detected by the tray elevation motor clock detection sensor (PI9) with the amount of encoder pulses fitted to M5. The tray home position detection sensor (PI8) detects whether the trays are at their home positions or not.



The finisher driver raises and lowers the tray guide until it is aligned with the paper ejection outlet specified by the printer.

The upper limit for the tray is detected by the tray upper limit detection switch (MS5). The tray elevation motor (M5) is halted when the finisher driver sets MS5 to ON.

The height of the paper ejected to the tray is detected by the distance sensor (PS1). The tray is lowered when the height of the paper reaches the stipulated value.

The 24V power supply to the tray elevation motor is cut off and the finisher driver operations halted if the safe area detection switch (MS3) is set at ON when the shutter and swing guide are open.

The finisher driver will notify the printer that a fault has occurred with the tray elevation motor in the following cases:

- 1 When the home position detection process does not end within 16.5 seconds of it starting.
- 2 When the tray elevation motor clock detection sensor (PI9) does not detect the tray elevation motor clock detection signal (SHIFTMCLK) within 0.2 seconds of tray elevation starting.
- 3 When the tray upper limit detection switch (MS5) is set at ON during tray elevation.

Stapler unit

Staple operations are performed by the staple motor (M6), and stapling is completed for each revolution of the cam.

The home position for the cam is detected by the staple operation home position detection sensor (PT2) being set at ON.

The forward and reverse operations of the staple motor (M6) are controlled by a microcomputer (CPU) situated on the finisher driver circuit board.

The staple operations are returned to the initial status by the finisher driver operating M6 in the reverse direction when PT2 is OFF and continuing to operate until PT2 is ON.

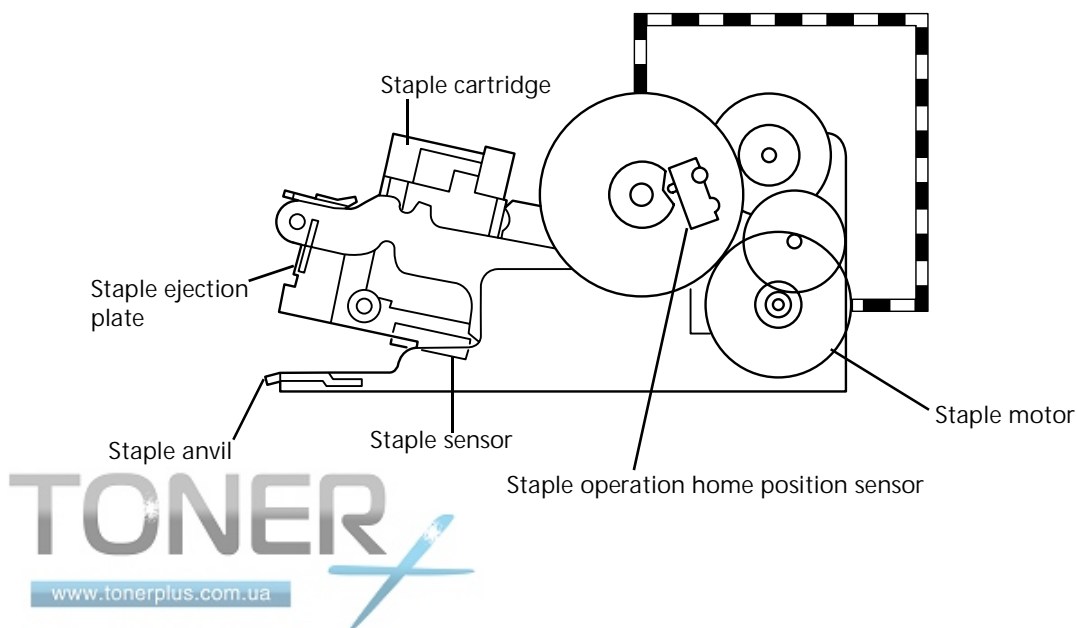
The staple detection sensor (PT1) detects where staples exist within the staple cartridge.

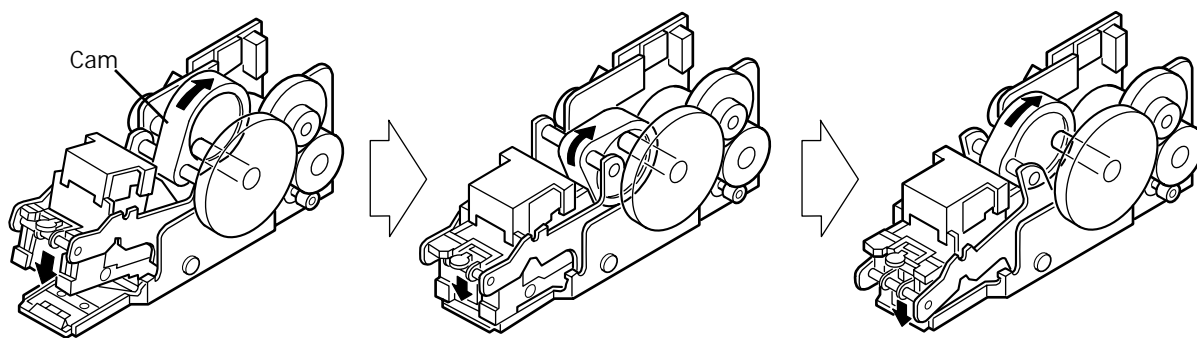
The staple motor (M6) cannot be operated unless the swing guide close detection switches (MS2, MS6) are ON (with the swing guide closed). This is a safety protection function to prevent the stapler from operating when fingers are inside.

The finisher driver will notify the option controller of a fault with the staple motor in the following cases:

- 1 When the home position detection process does not end within 0.5 seconds of it starting.
- 2 When the staple operation home position detection sensor (PT2) is not set at ON within 0.5 seconds of staple operations being started.

Also, the finisher driver will judge a staple jam if the staple operation home position detection sensor (PT2) is not set at ON within 0.5 seconds of it being set at OFF after staple operations have been started, and the staple motor (M6) will be operated in the reverse direction until PT2 is set at ON. The printer will also be notified of the jam.





Tray loading volume detection

The number of pages and stacks (staple number) of paper ejected to the tray is recorded by the finisher driver, and the height of the paper surface is detected by the distance sensor (PS1). The maximum amount of paper that can be stacked in each tray is shown in the table below.

The finisher driver will halt operations when the conditions outlined in the table have been satisfied, and the printer will be notified that the tray is full.

Table 2.4 Loding capacities

Tray #	Tray mode (See <i>details</i> below.)		
	1	2	3
Tray #1	88mm	88mm, 300 pages or 30 stacks	48mm, 300 pages or 30 stacks (note #3)
Tray #2	95mm	95mm, 300 pages or 30 stacks	48mm, 300 pages or 30 stacks (note #3)
Tray #3	95mm	95mm, 300 pages or 30 stacks	48mm, 300 pages or 30 stacks (note #3)

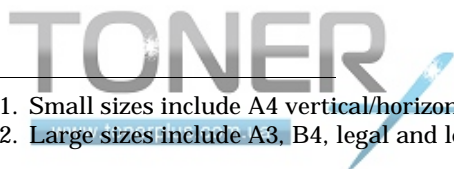
Stacking mode details

Mode #1. For the normal stacking of pages of the same size, of small sizes¹ or during job offset.

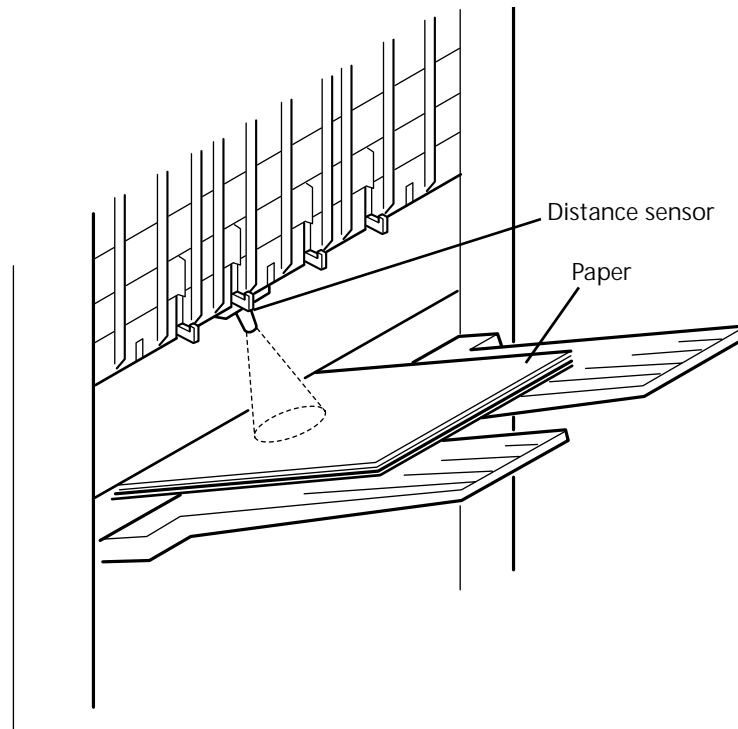
Mode #2. When height, number of pages and number of stacks are relevant for staples only.

Mode #3. Other cases (cross-mode stacking and cross-size stacking, including large sizes²).

Note Number of pages and stacks are only relevant for stapled paper.



1. Small sizes include A4 vertical/horizontal, letter vertical/horizontal, B5 and A5
2. Large sizes include A3, B4, legal and ledger



Jam detection

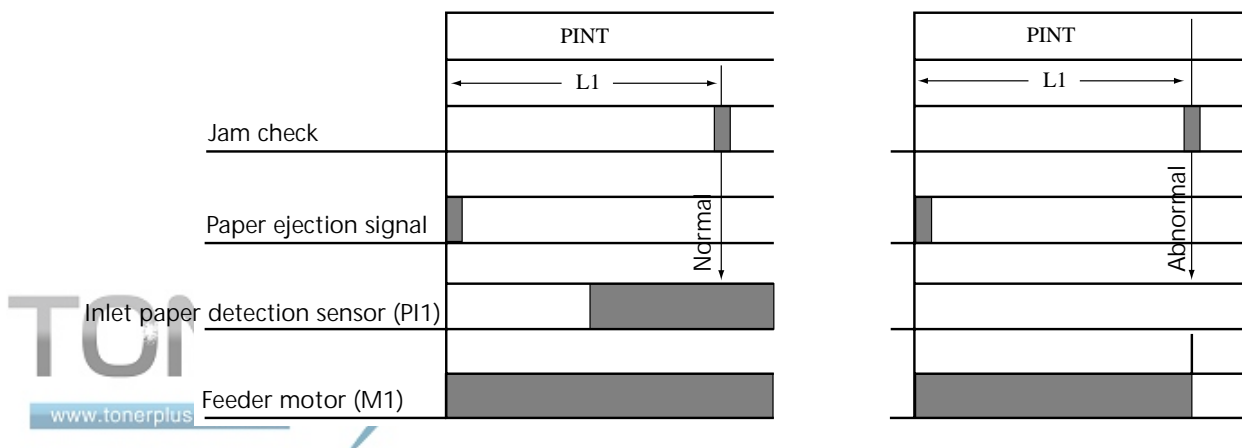
The printer is equipped with the following paper detection sensors to determine the existence of paper and to determine that the paper is being fed correctly:

- Inlet paper detection sensor (PI1)
- Paper inversion detection sensor (PI2)
- Paper ejection detection sensor (PI3)

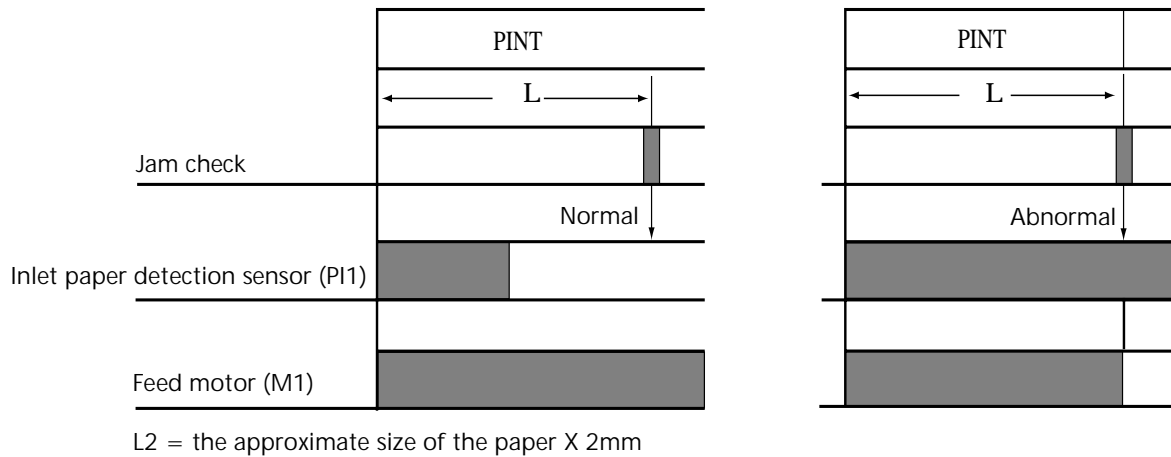
A jam is determined by detecting if the paper has been fed through to the sensor at a certain time pre-set in the microcomputer (CPU) located on the finisher driver. The finisher's paper ejection operations are halted if the CPU determines that a jam has occurred, and this is notified to the printer.

Delayed jam (delayed jam at the inlet sensor). The CPU determines a delayed jam if the paper does not arrive at the inlet's detection sensor despite being fed the prescribed distance (approximately 300mm) after the paper ejection signal is received from the printer.

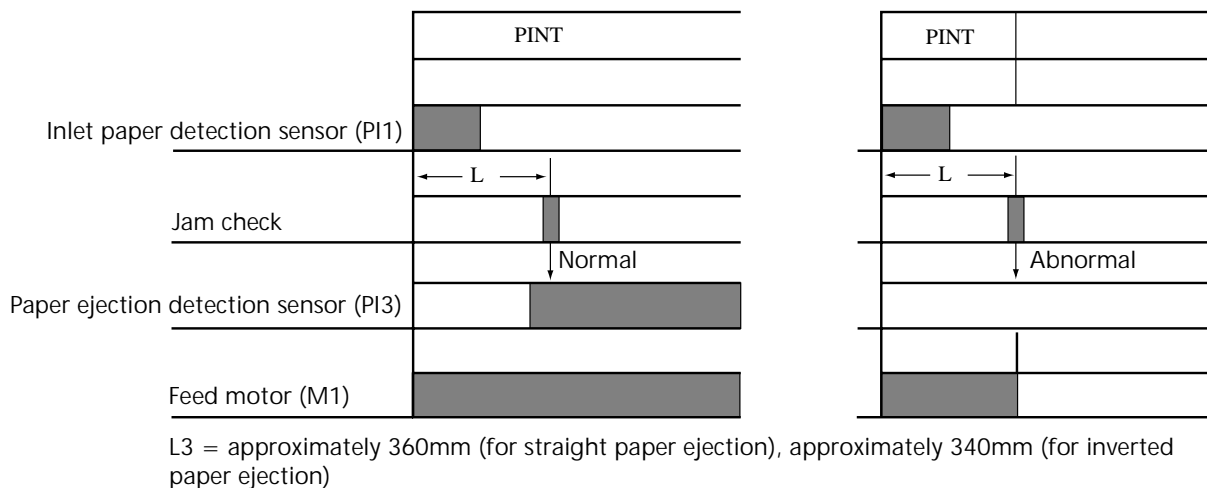
L1 = approximately 300mm



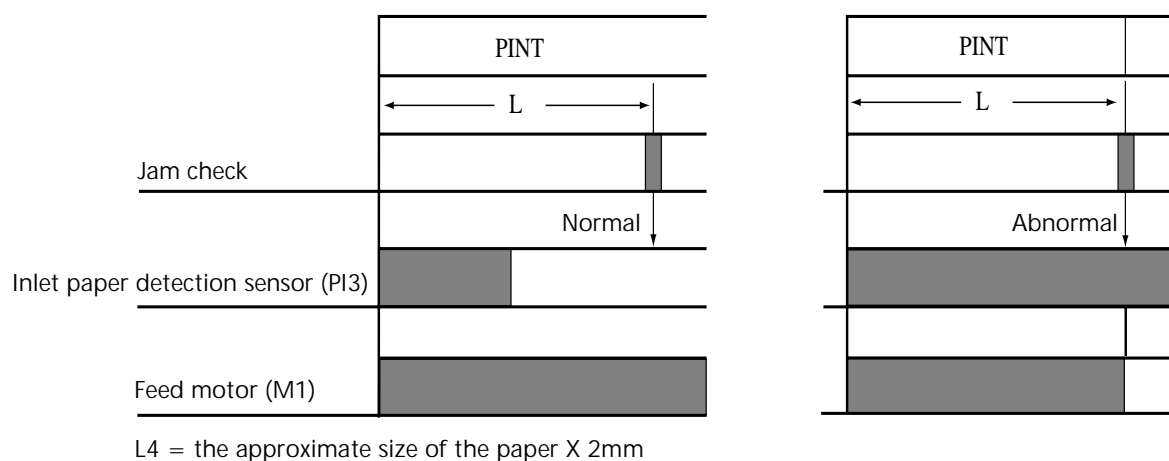
Accumulated jam #1 (inlet sensor accumulated jam). The CPU judges that an accumulated jam has occurred when the inlet paper detection sensor (PI1) detects the front edge of the paper but not the back edge after the paper has been fed the stipulated distance.



Accumulated jam #2 (paper ejection detection sensor delayed jam). The CPU judges that an accumulated jam has occurred when the inlet paper detection sensor (PI1) detects the front edge of the paper but the paper does not arrive at the paper ejection detection sensor (PI3) even after the paper has been fed the stipulated distance.



Accumulated jam #2 (paper ejection detection sensor delayed jam). The CPU judges that an accumulated jam has occurred when the paper ejection detection sensor (PI3) detects the front edge of the paper but not the back edge after the paper has been fed the stipulated distance.



Power on jam. The CPU judges that a power on jam has occurred if paper is detected by either the inlet paper detection sensor (PI1), the inverted paper detection sensor (PI2) or the paper ejection detection sensor (PI3) when the power supply to the finisher is switched on.

2.4 Power supply

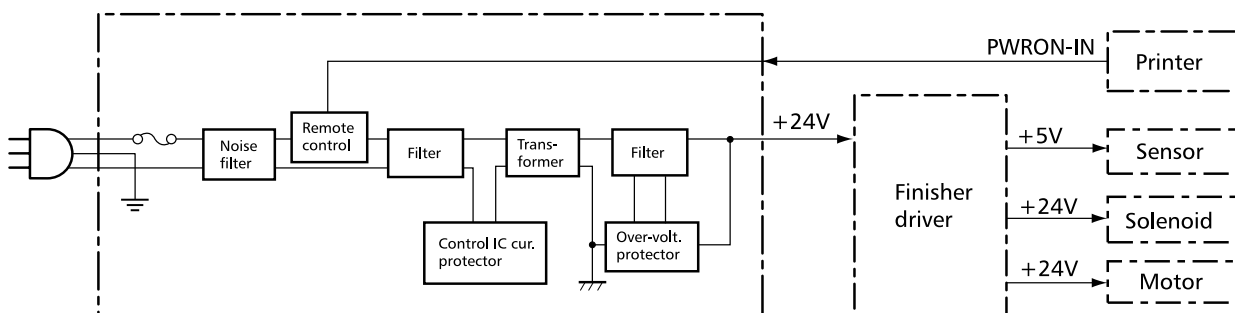
Outline

This device uses a remote switch system for the power supply.

The printer outputs a power on signal (PWRON-IN) to the power supply assembly when the power switch to the printer is turned on, and the power supply is switched on. The power supply circuit supplies +24V to the finisher driver when the PWRON-IN signal is "H".

This +24V is used to drive the feed motor, paper ejection motor, solenoids and other elements. The finisher driver generates +5V, which is used for the sensors and the integrated circuits in the finisher driver's circuit board.

A block diagram is provided below.



Protection functions

The +24V power supply circuit is equipped with an excess current protection circuit to automatically cut off the output voltage when short circuits or other trouble is triggered and excess currents flow in order to prevent the power supply circuit from being damaged.

Consequently, the power switch to the printer is switched off when the excess current protection function is activated and no DC voltage is output from the power supply circuit, and the power is switched on again after the trouble with the load has been repaired.



Chapter 3 M E C H A N I C A L S Y S T E M

Contents

General	2
External control	2
External cover	2
Front door assembly	3
Rear cover	3
Upper door assembly	4
Right-hand cover assembly	4
Upper cover	5
Front cover	6
Tray assembly	7
Slat upper guide	7
Slat lower guide	8
Feeder	9
Staple tray unit	9
Removing the staple tray unit from the main unit	9
Dismantling and assembly	10
Boards	21
Finisher driver circuit board	21
Lithium battery	22
Power supply unit	23
Interface circuit board	24
Staple exchange completion switch circuit board	25

3.1 General

This chapter explains the mechanical features, operations and procedures for dismantling and assembling the finisher driver. Ensure that the following precautions are observed when proceeding with these tasks.



ion Always disconnect the power supply from the socket when dismantling or reassembling the device.

Unless otherwise stated, assembly procedures should be performed in the reverse sequence to dismantling.

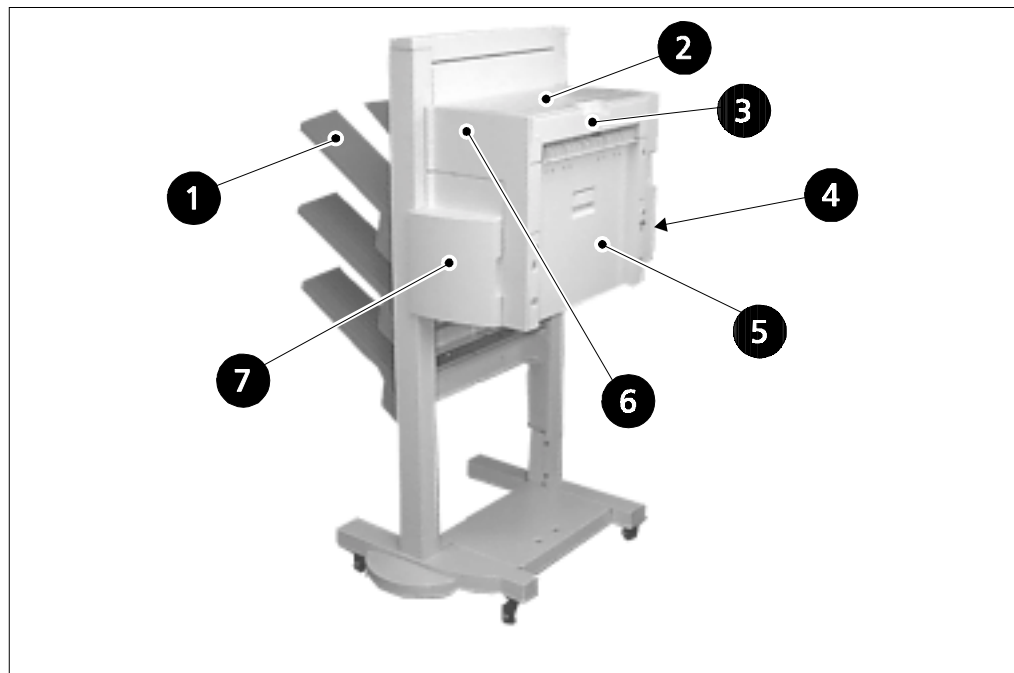
Care must be taken not to use the wrong screws (length, diameter) during assembly.

Never attempt to operate the device with parts removed.

Discharge static electricity from the body by touching a metal part of the printer prior to removing or replacing circuit boards to prevent them from being damaged through static electricity.

External control

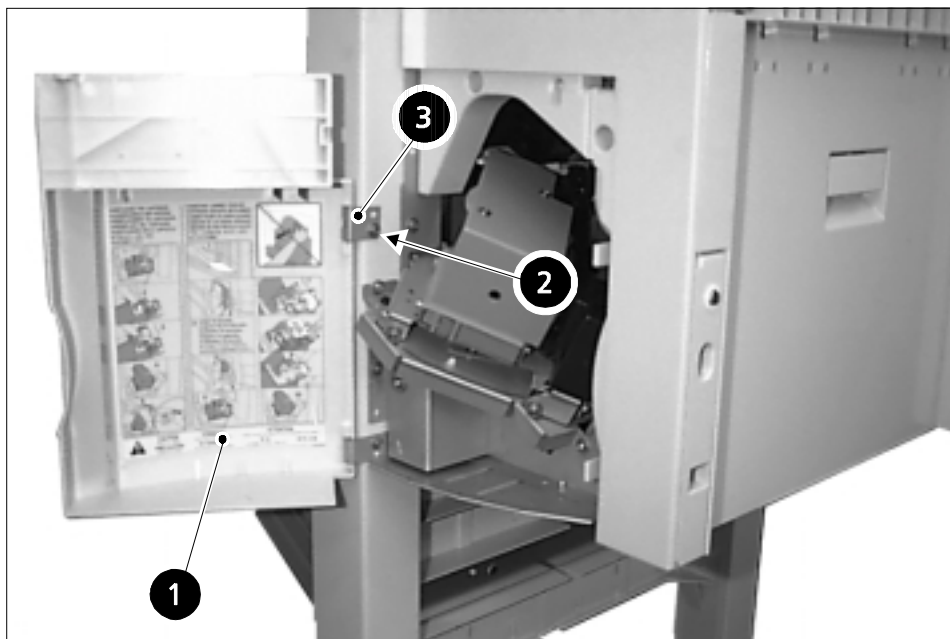
External cover



1. Tray
2. Upper door assembly
3. Upper cover assembly
4. Rear cover
5. Left-hand cover assembly
6. Front cover
7. Front door assembly

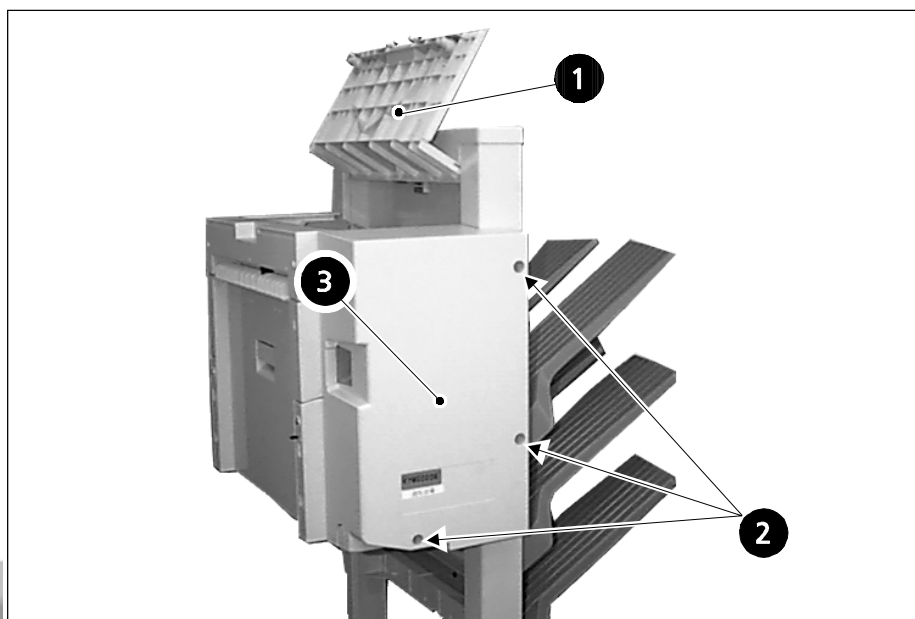
Front door assembly

- 1 Open the front door assembly.
- 2 Remove the single screw.
- 3 Lift off the door assembly after removing the bearings.



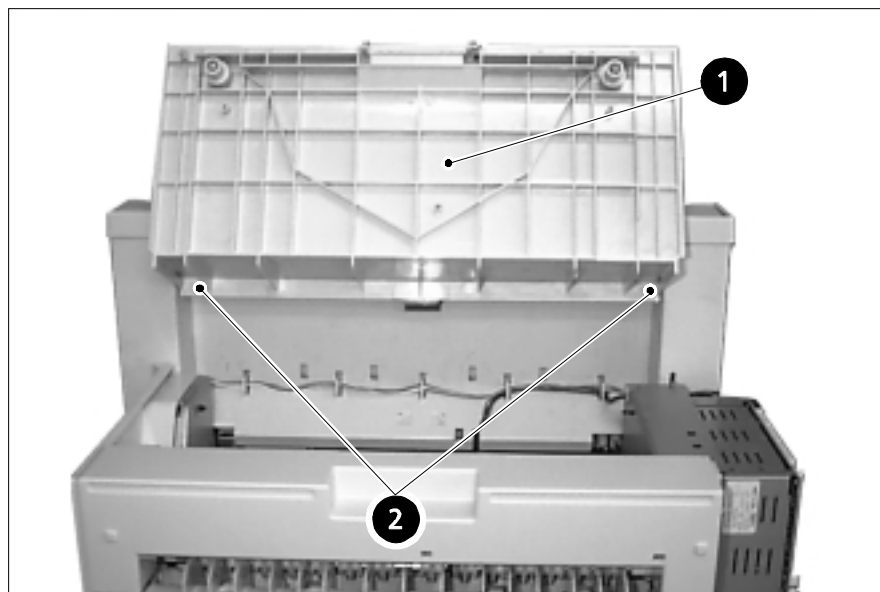
Rear cover

- 1 Open the upper door assembly
- 2 Remove the three screws
- 3 Lift out the rear cover.



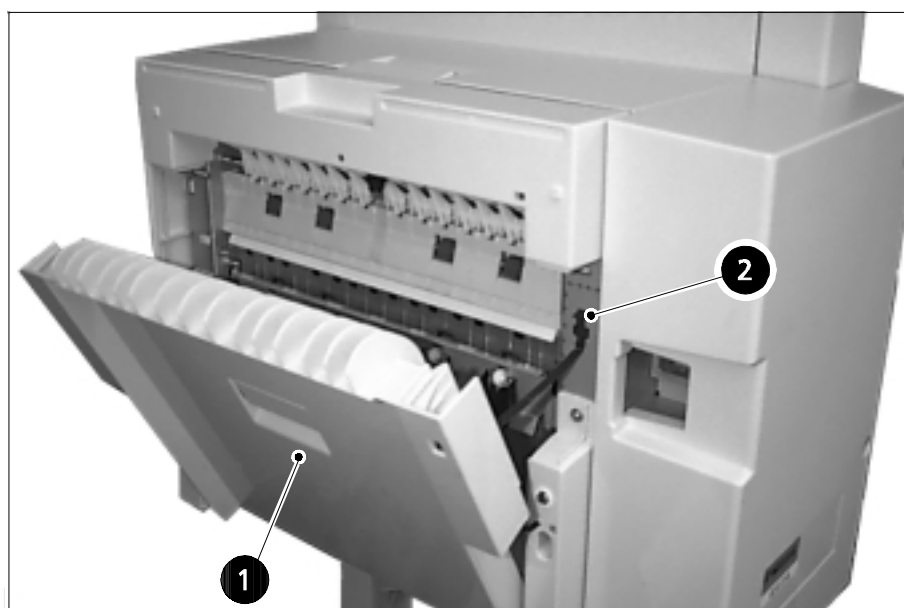
Upper door assembly

- 1 Open the upper door assembly.
- 2 Undo the two clips and remove the upper door assembly.

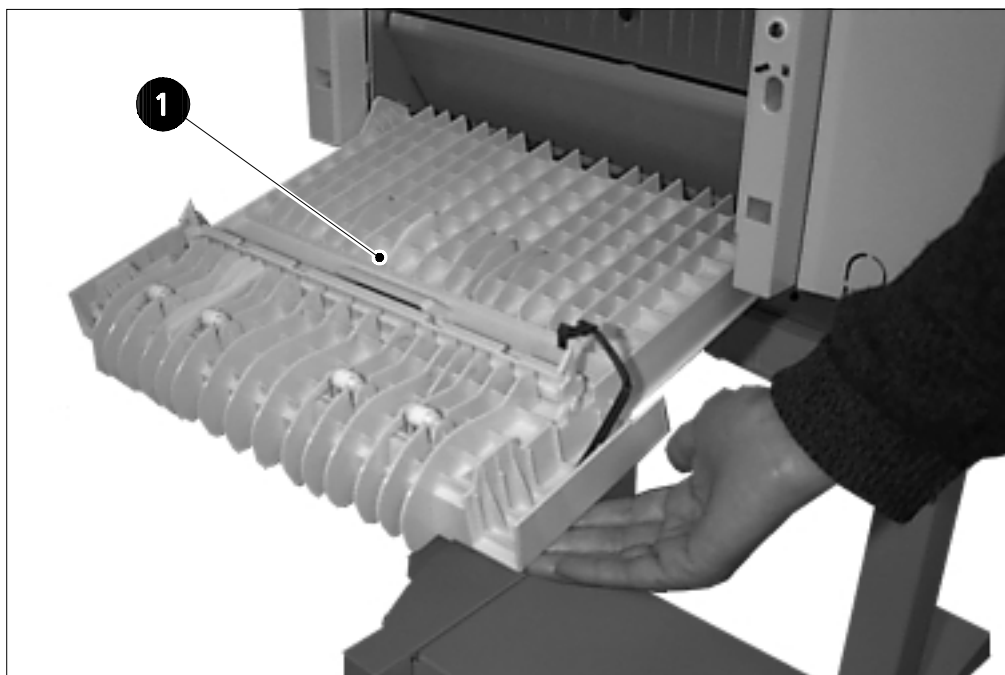


Right-hand cover assembly

- 1 Open the right-hand cover assembly.
- 2 Remove the hinge.

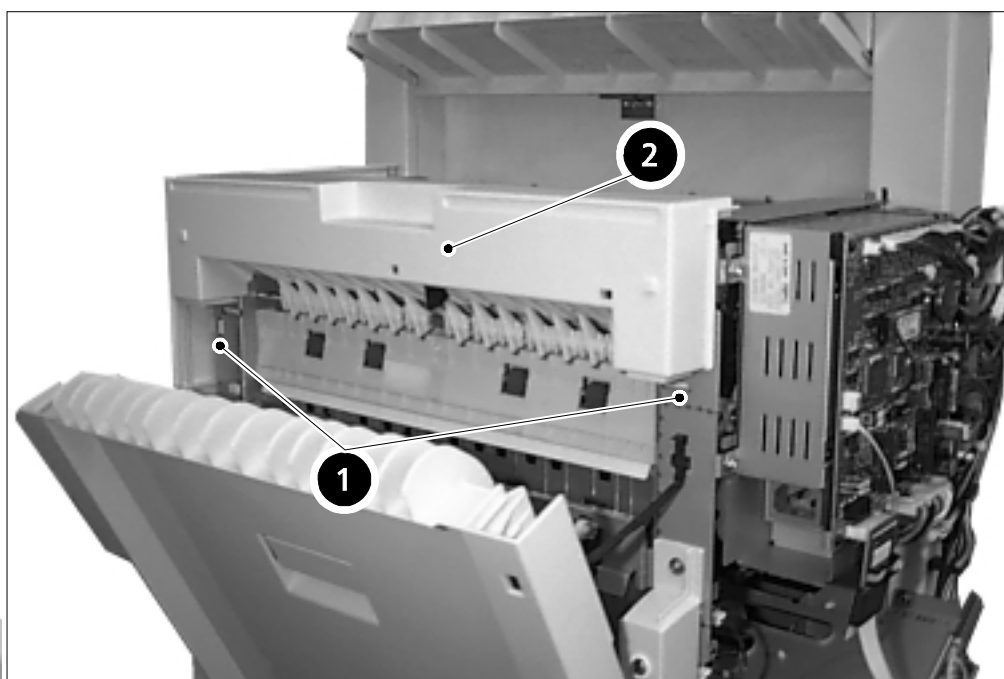


- 3 Remove the right-hand cover by pulling it out from the front.



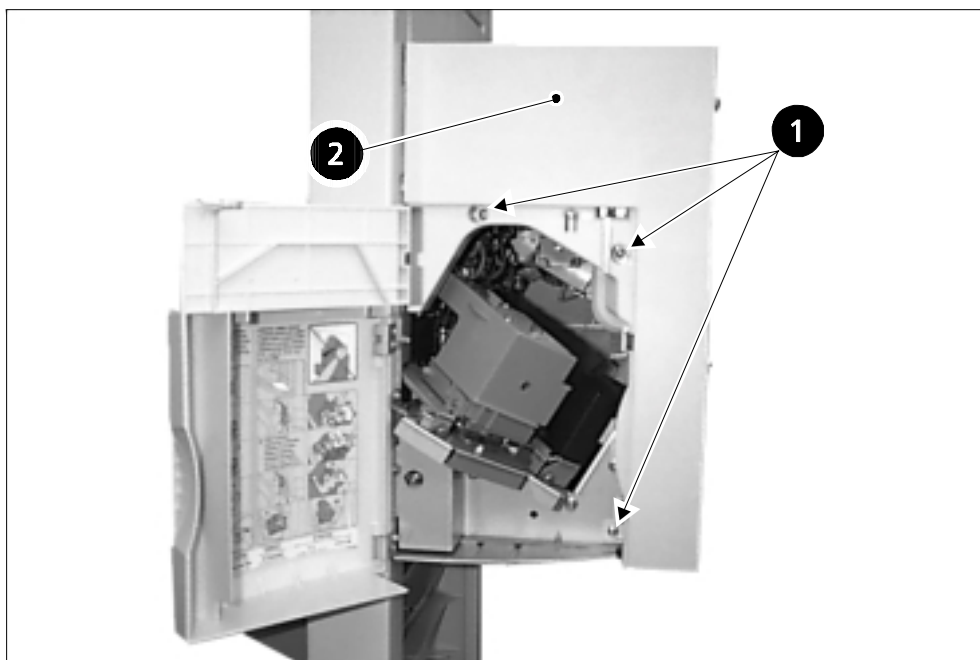
Upper cover

- 1 Open the upper cover assembly
- 2 Remove the rear cover assembly
- 3 Open the left-hand cover assembly
- 4 Undo the two clips (❶ below) and lift the upper cover (❷ below) out.

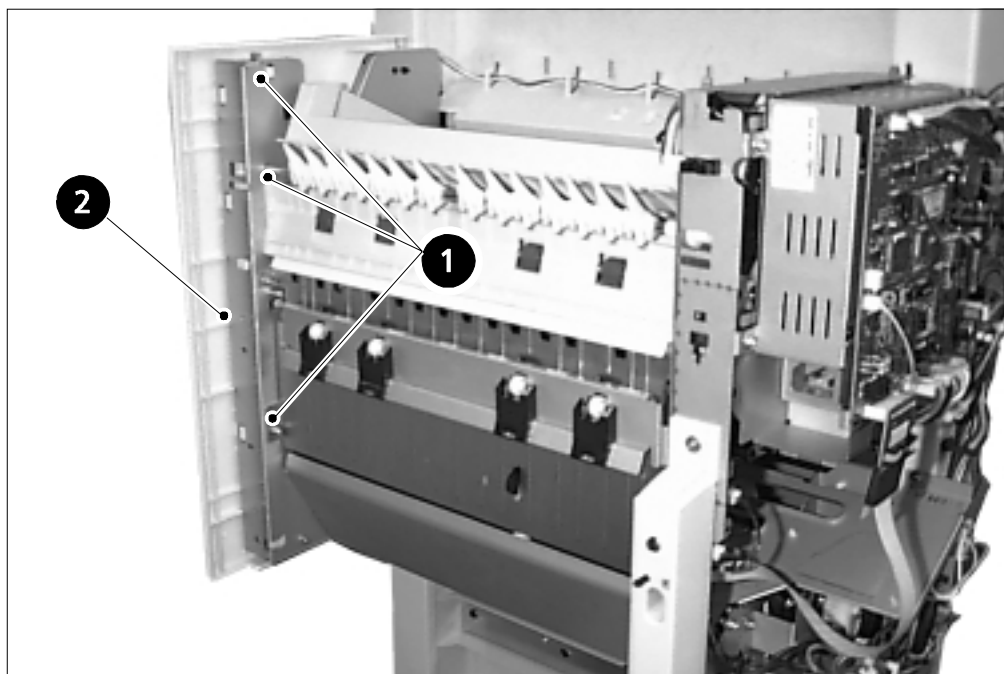


Front cover

- 1 Remove the three screws (❶ below) that secure the front cover (❷ below).

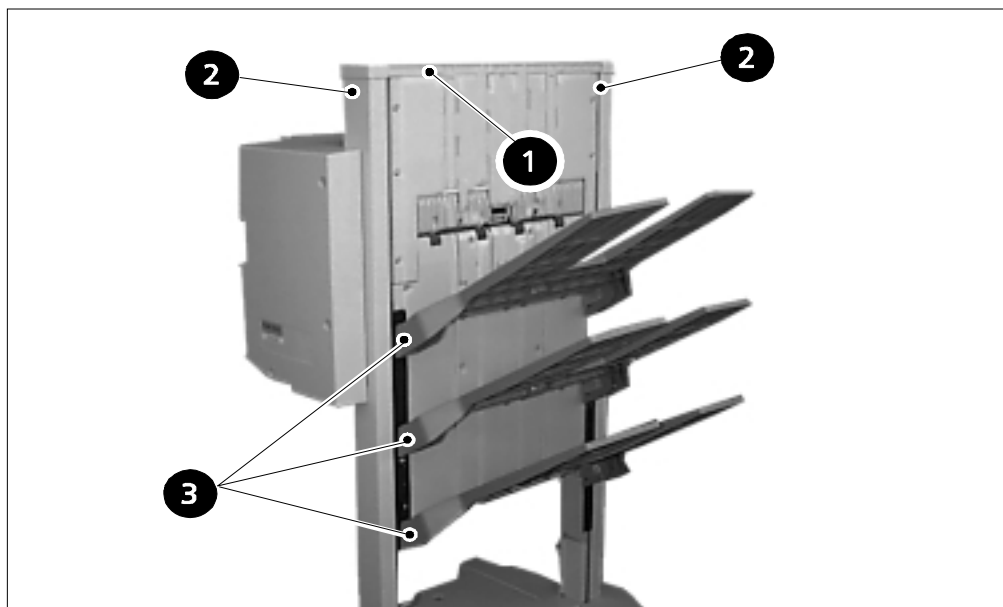


- 2 Undo the three clips (❶ below) and remove the front cover (❷ below).



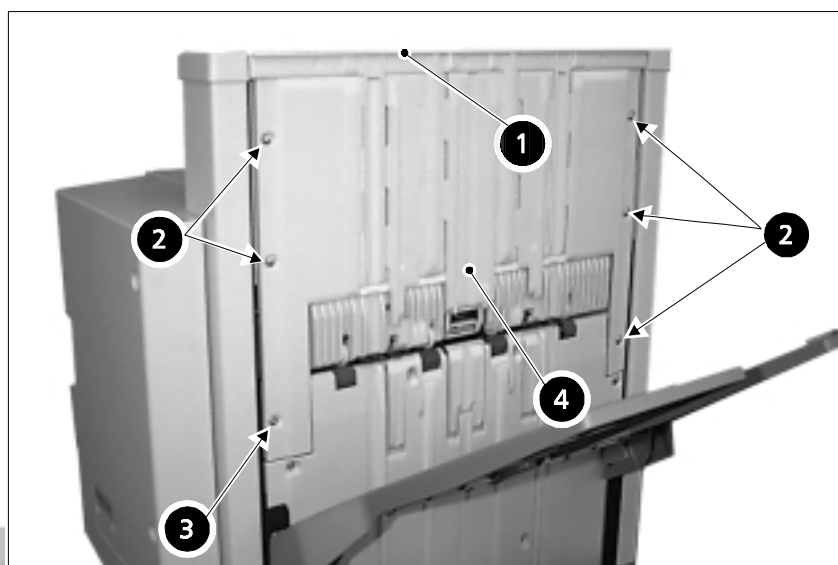
Tray assembly

- 1 Remove the slide guide assembly
- 2 Remove the stopper
- 3 Lift out the tray assembly



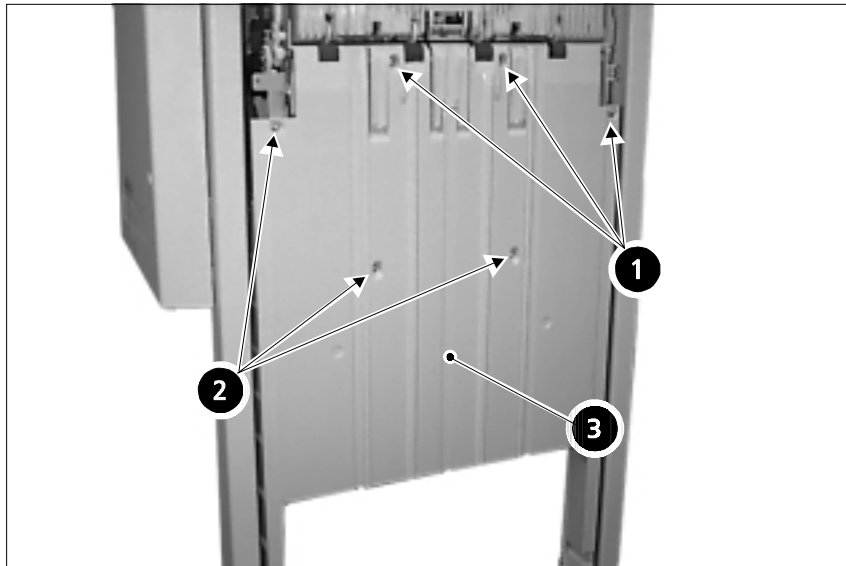
Slat upper guide

- 1 Remove the slide guide (❶ below).
- 2 Remove the five screws (❷, 4M, below).
- 3 Remove the single screw (❸, 3M, below) and remove the slat upper guide (❹ below).

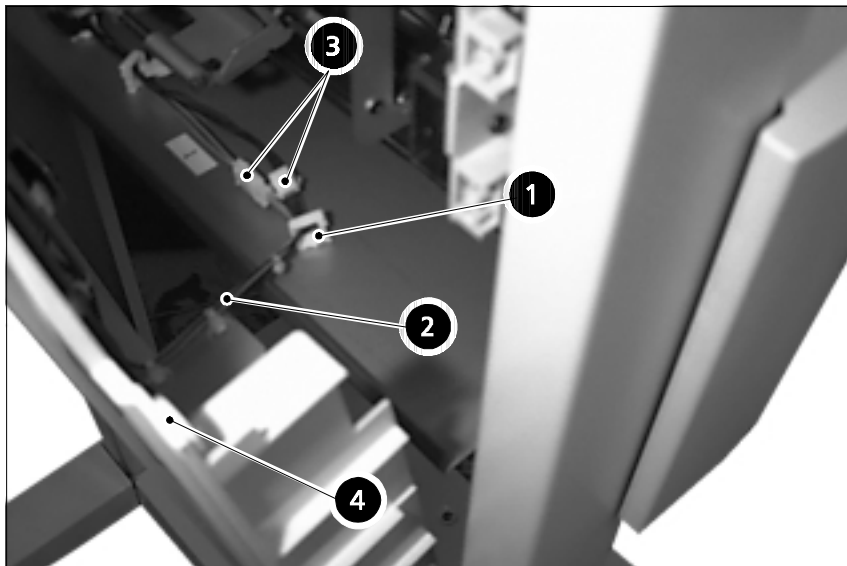


Slat lower guide

- 1 Remove the slide guide.
- 2 Remove the three screws (4M).
- 3 Remove the three screws (3M) and pull the slat lower guide forward.



- 4 Remove the flux lines (② below) from the flux line fastener (① below).
- 5 Remove the two connectors (③ below) and remove the slat lower guide (④ below).

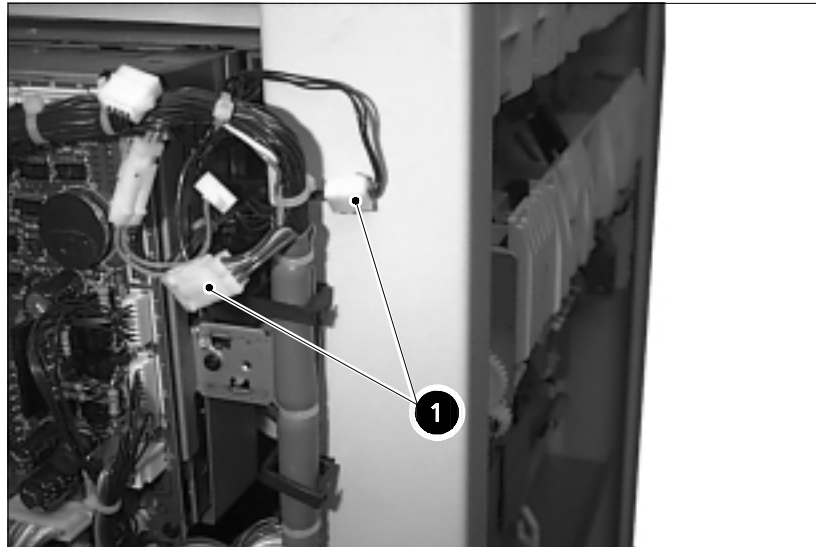


3.2 Feeder

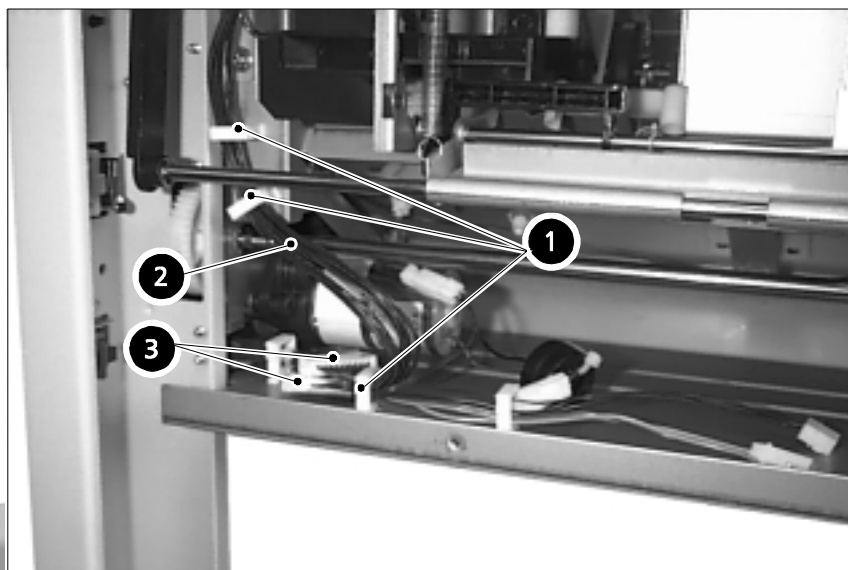
Staple tray unit

Removing the staple tray unit from the main unit

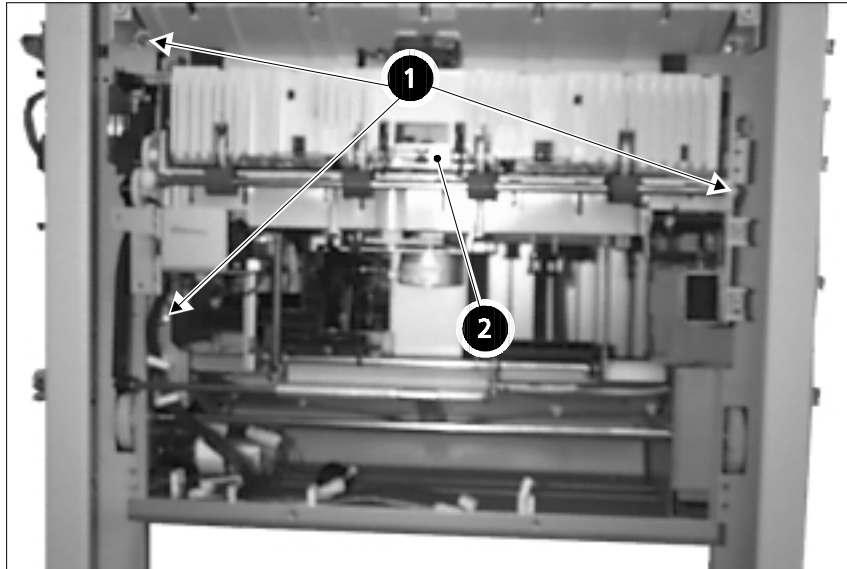
- 1 Remove the rear cover.
- 2 Remove the slat upper guide and the slat lower guide.
- 3 Remove the two connectors (❶ below).



- 4 Remove the flux lines (❷ below) from the flux line fastener (❶ below).
- 5 Remove the two connectors (❸ below).



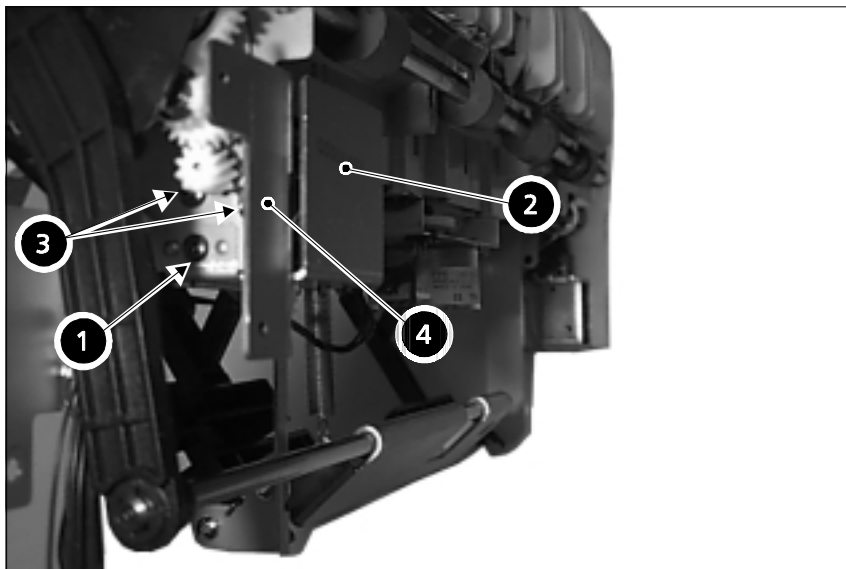
- 6 Remove the three screws and then the staple tray unit



Dismantling and assembly

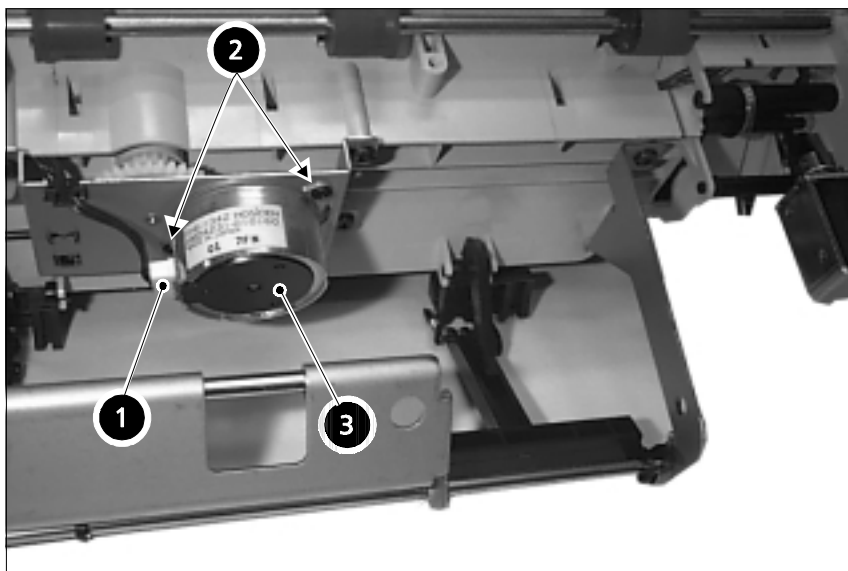
Paper ejection motor

- 1 Remove the single screw (❶ below) and then remove the motor cover (❷ below).
- 2 Remove the two screws (❸ below) and then remove the paper ejection motor (❹ below).



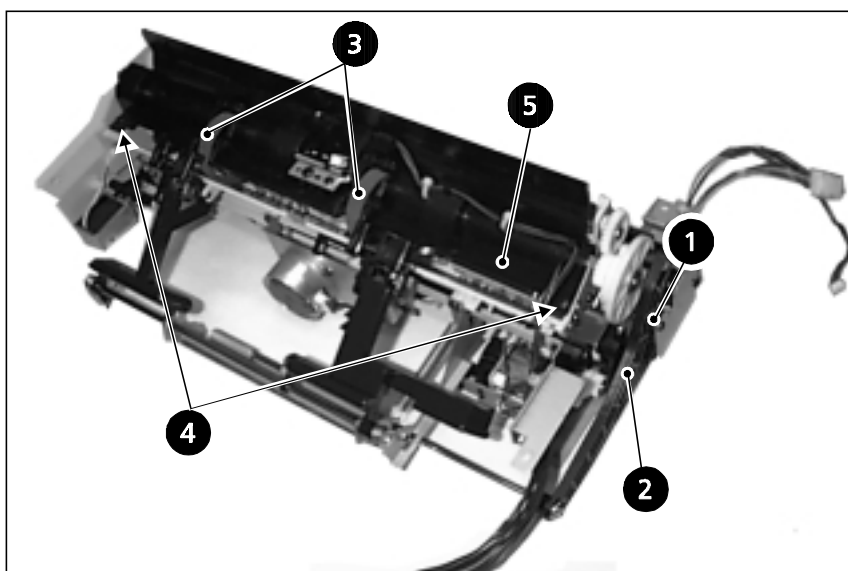
Matching board movement motor

- 1 Remove the single connector (❶ below).
- 2 Remove the two screws (❷ below) and then remove the matching board movement motor (❸ below).

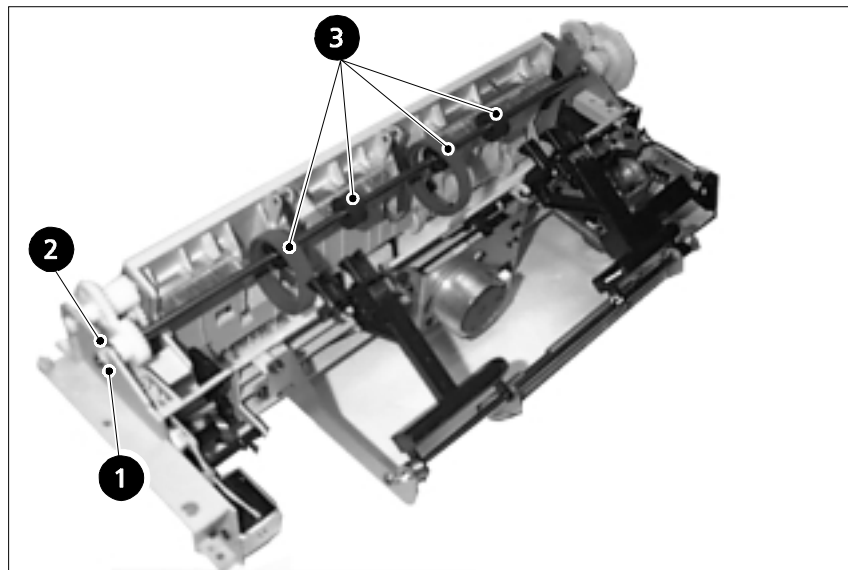


Paper ejection roller #1

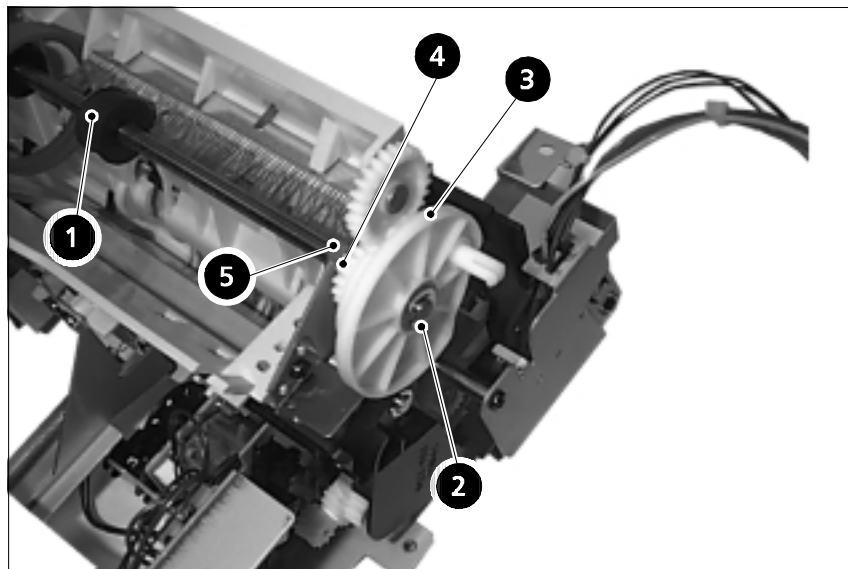
- 1 Undo the clip and remove the arm.
- 2 Remove the two rollers.
- 3 Remove the two screws and then remove the staple guide.



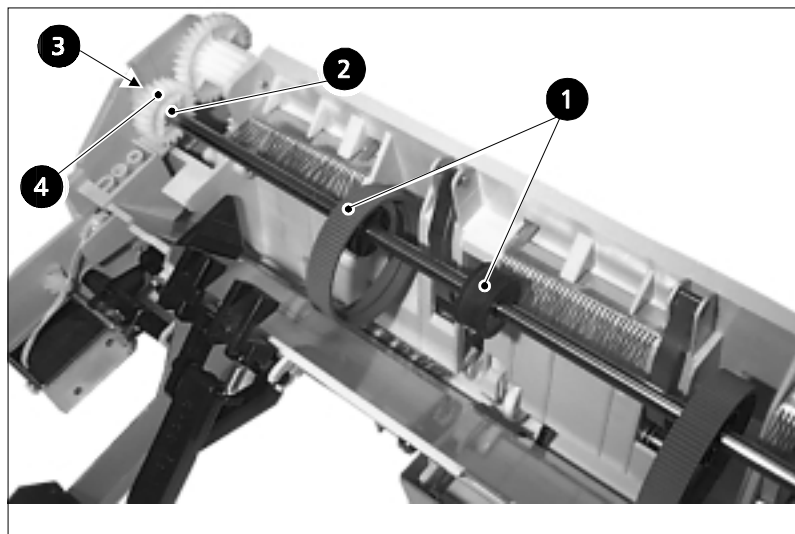
- 4 Remove the E-shaped fastening ring (❶ below) and then remove the single bearing (❷ below).
- 5 Slide them in the direction of the arrow and then remove the paper ejection roller (❸ below).



- 6 Remove the single E-shaped fastening ring (2 below) from the paper ejection roller (1), and then remove the single cam (3), the single gear (4), the single horizontal pin and the single bearing (5).



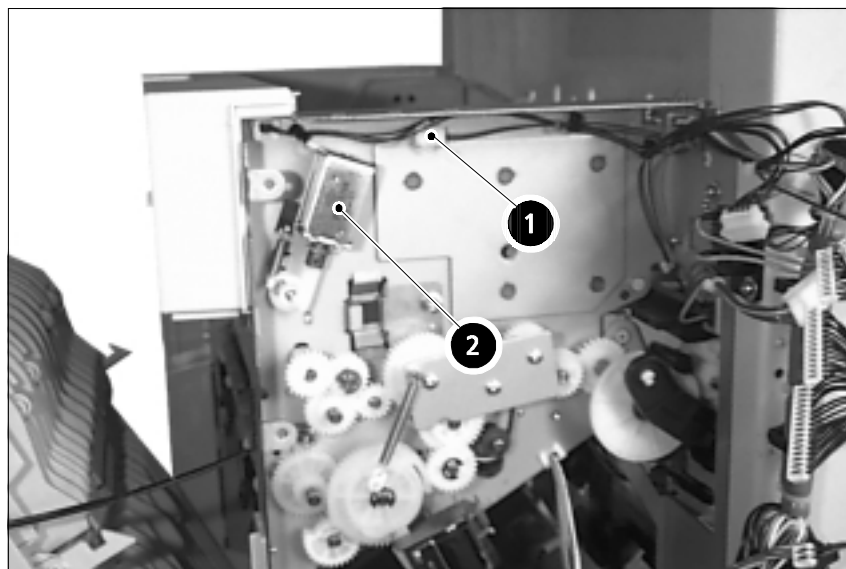
- 7 Remove the single E-shaped fastening ring (2 below) from the paper ejection roller (1), and then remove the single horizontal pin (5) and the single gear (4).



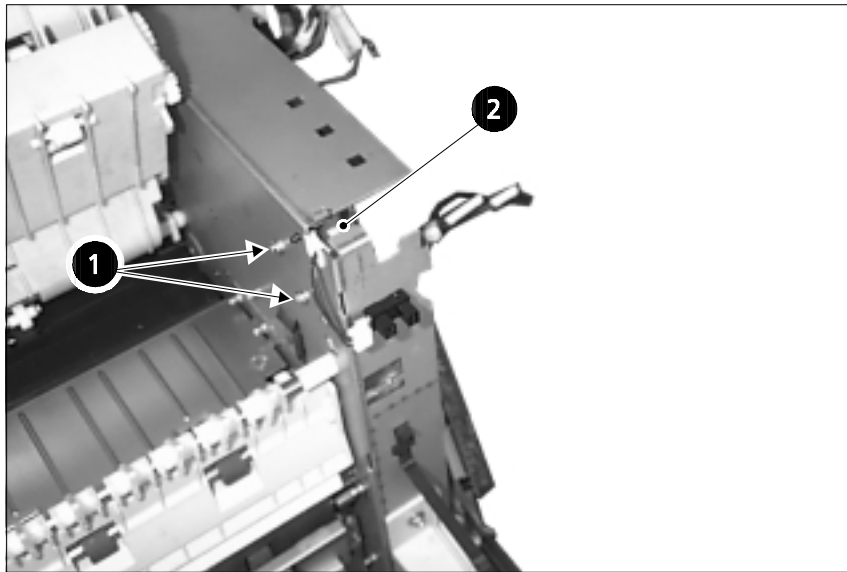
Face-up flapper solenoid

Remove the face-up flapper solenoid (❷ below) from the main unit:

- 1 Remove the rear cover and the upper cover.
- 2 Remove the power supply assembly in accordance with the procedures explained between 1) and 4) on page 3-23, Power supply unit.
- 3 Remove the single connector (❶ below).



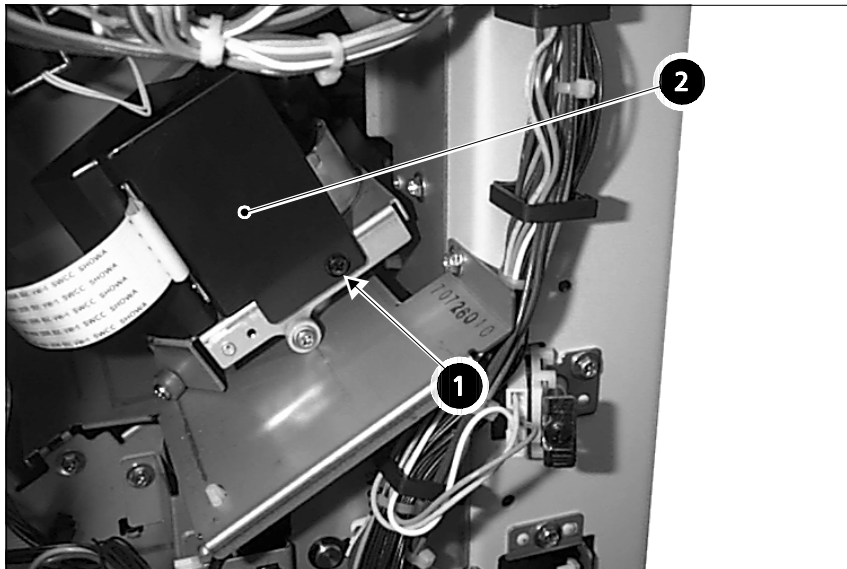
- 4 Remove the two screws (❶ below) from inside the unit, and then remove the face-up flapper solenoid (❷).



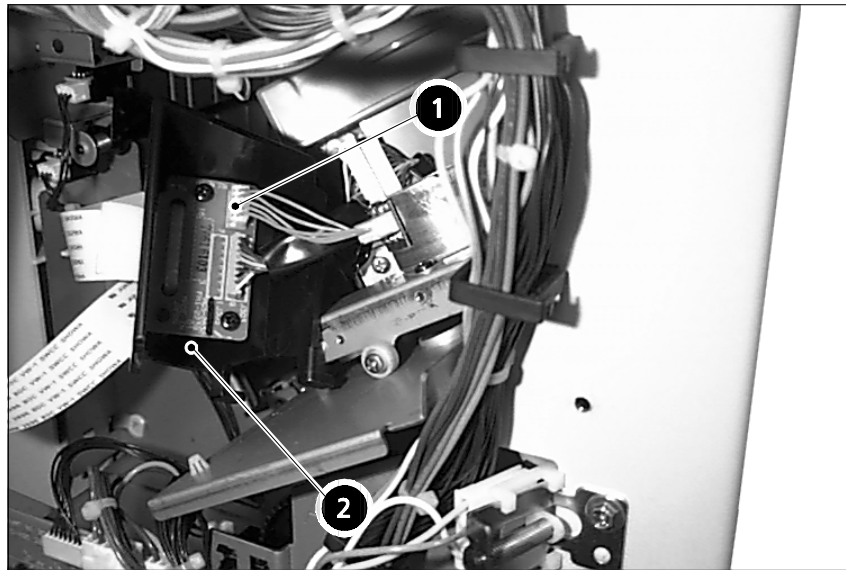
Staple assembly

Remove the staple assembly from the device:

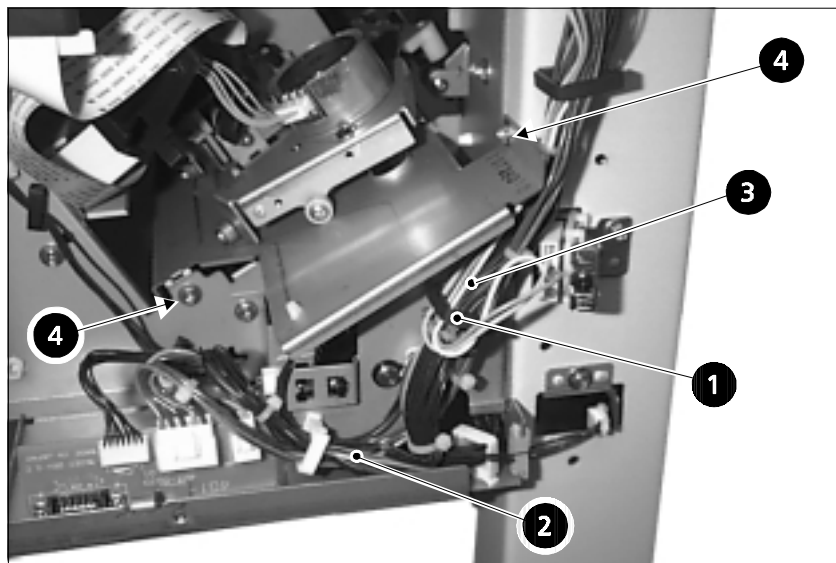
- 1 Remove the rear cover.
- 2 Remove the single screw (2) and then remove the circuit board cover (1).



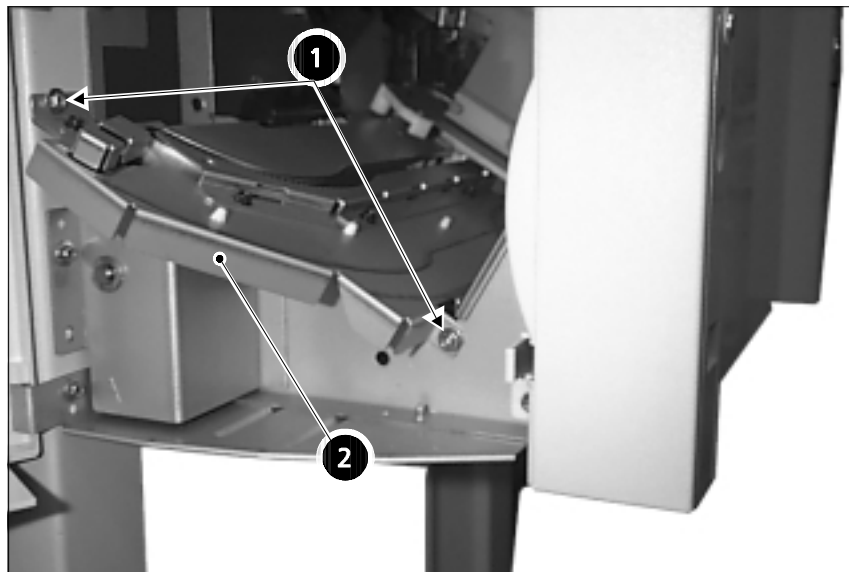
- 3 Remove the single connector (J8 finisher driver, 1). Detach the flexible cable from the guide.(2=circuit board cover)



- 4 4) Perform the procedure explained between 1) and 6) on page 3-6 to remove the staple tray unit.
- 5 5) Remove the flux line fastener and the flux line band, and then remove the single connector.
- 6 6) Remove the two screws



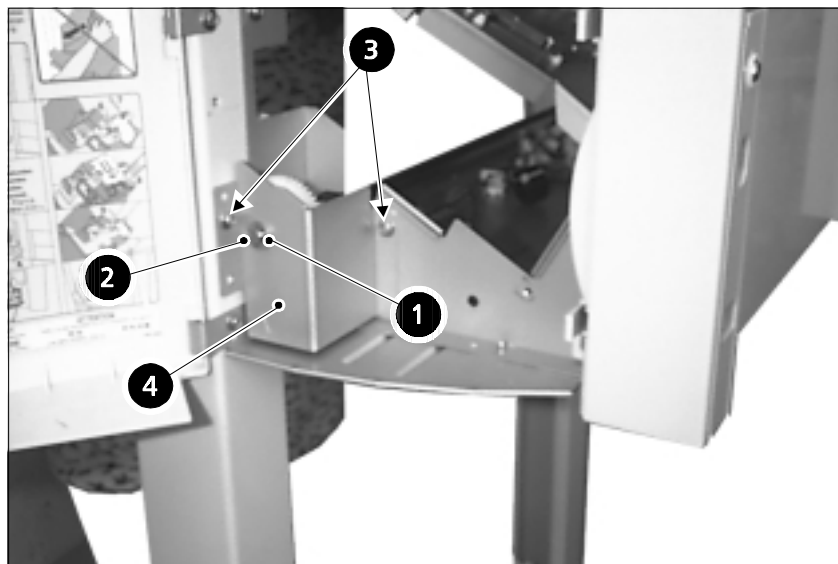
- 7 7) Remove the two screws and then remove the staple assembly



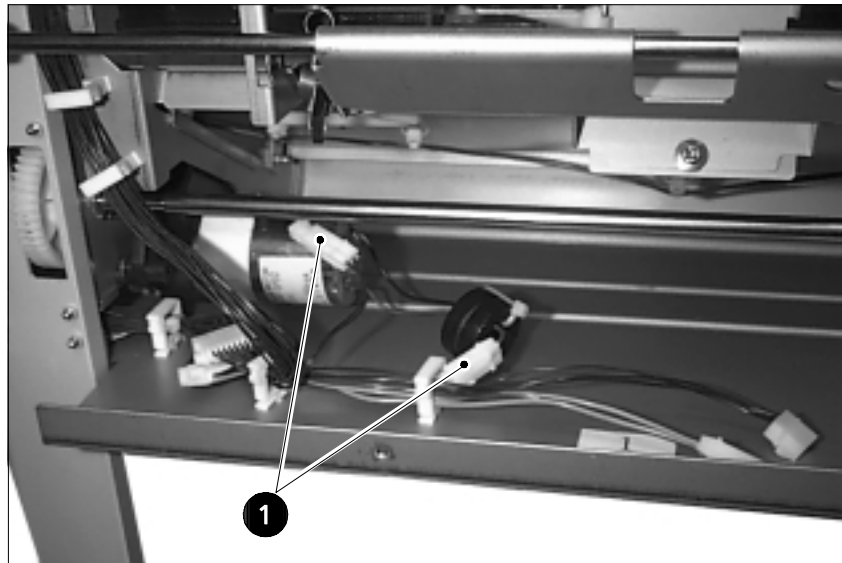
Tray drive assembly

Remove the tray driver assembly from the device:

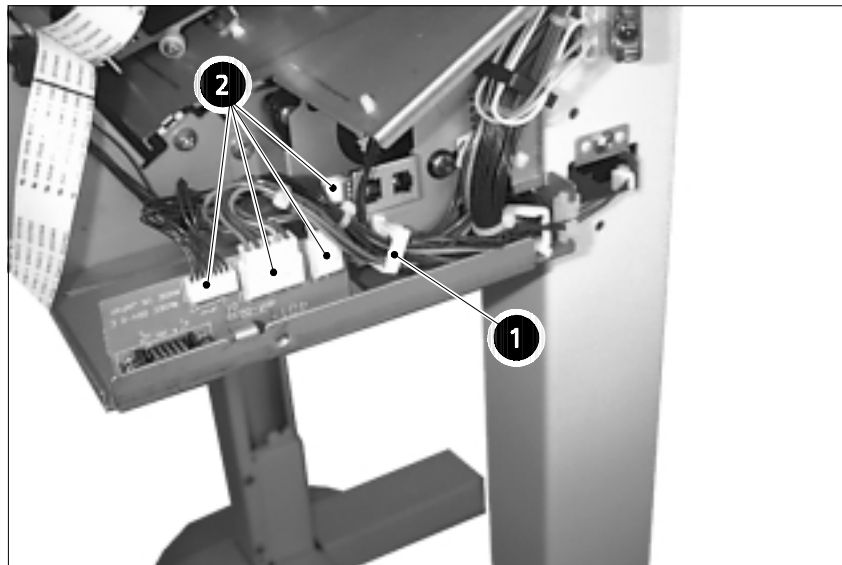
- 1 Perform the procedure explained on page 3-9, Staple tray unit to remove the staple tray unit.
- 2 Remove the E-shaped fastener ring (❶) and then remove the bearing (❷).
- 3 Remove the two screws (❸) and then remove the cover (❹).



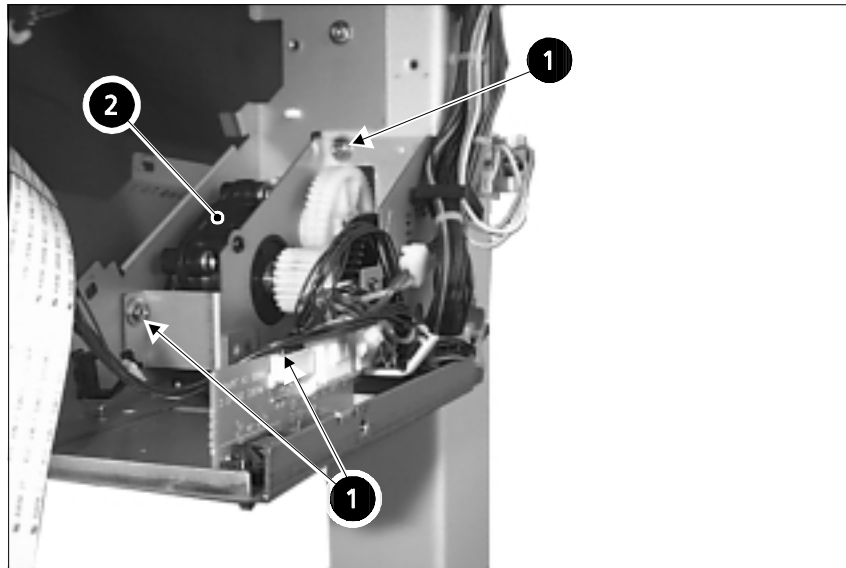
- 4 Remove the two connectors (❶).



- 5 Remove the flux line fastener (❶).
- 6 Remove the four connectors (❷).



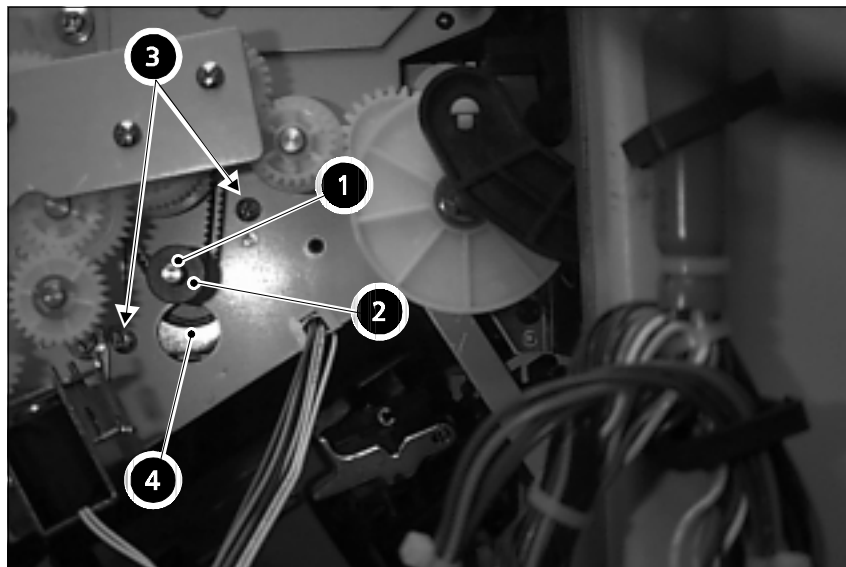
- 7 Remove the three screws (❶) and then remove the tray drive assembly (❷).



Feed motor

Remove the feed motor from the device:

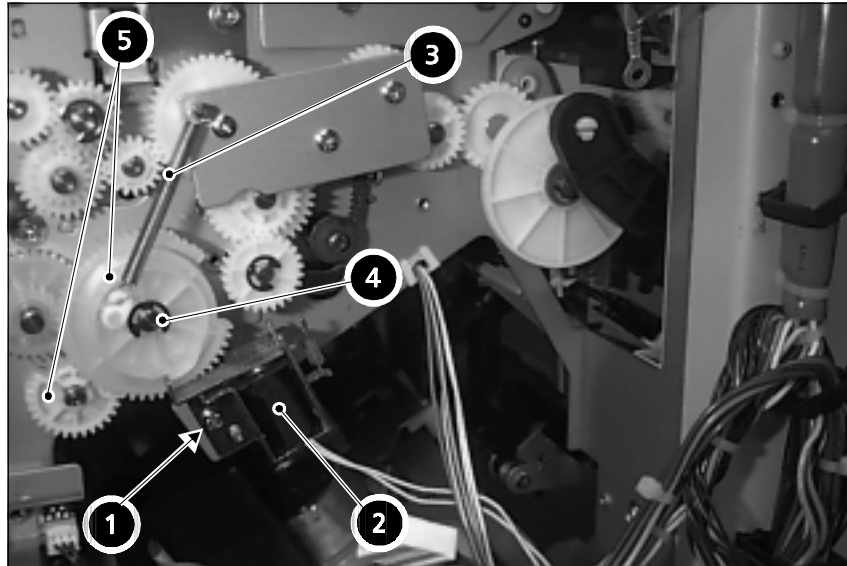
- 1 Perform the procedure explained on page 3-23, Power supply unit, to remove the power supply unit.
- 2 Remove the C-shaped fastener ring and then remove the single gear.
- 3 Remove the two screws and then remove the feed motor from inside the unit.



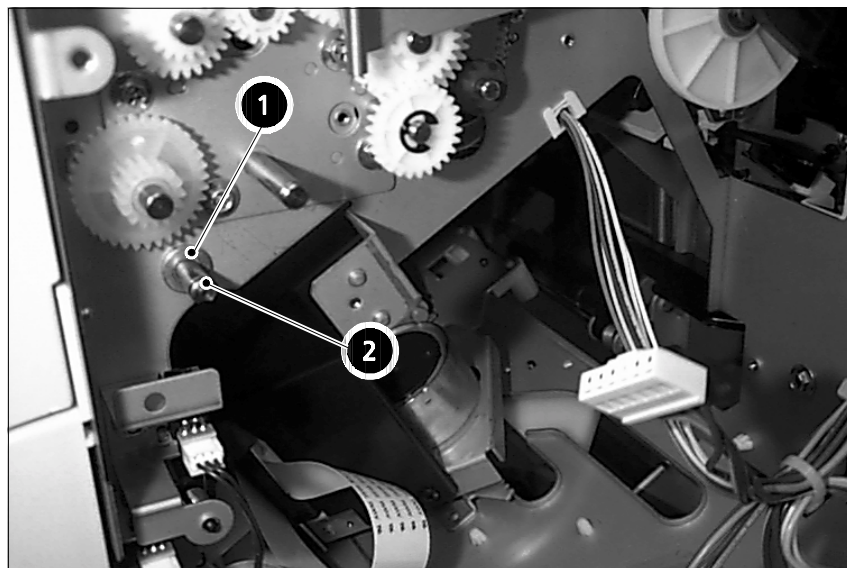
Inversion roller

Remove the inversion roller from the device:

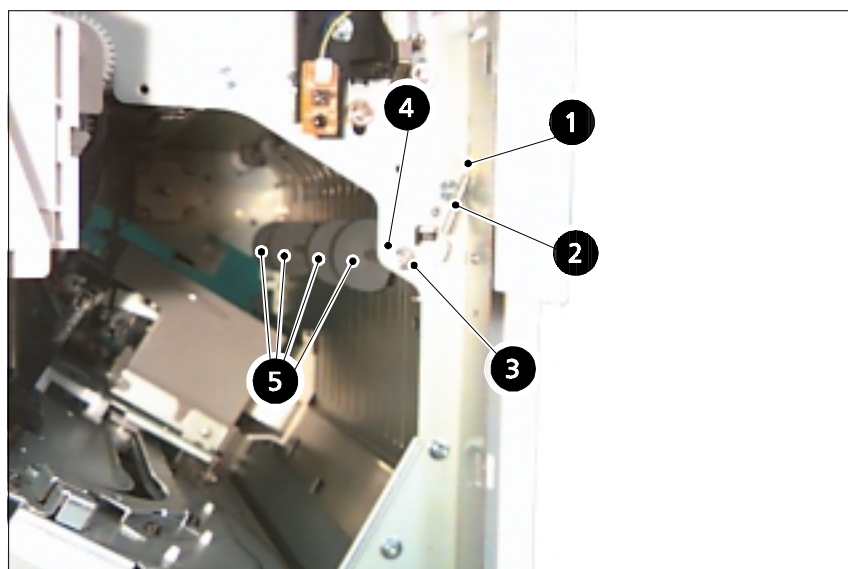
- 1 Perform the procedure explained on page 3-23, Power supply unit to remove the power supply unit.
- 2 Remove the single screw (❶) and then remove the inversion solenoid (❷).
- 3 Remove the single spring (❸).
- 4 Remove the E-shaped fastener ring (❹) and then remove the two gears (❺).



- 5 Remove the single bearing



- 6 Remove the single spring restraint (❶) and then remove the single spring (❷).
- 7 Remove the E-shaped fastening ring (❸) and the single bearing (❹), and then remove the inversion roller (❺).

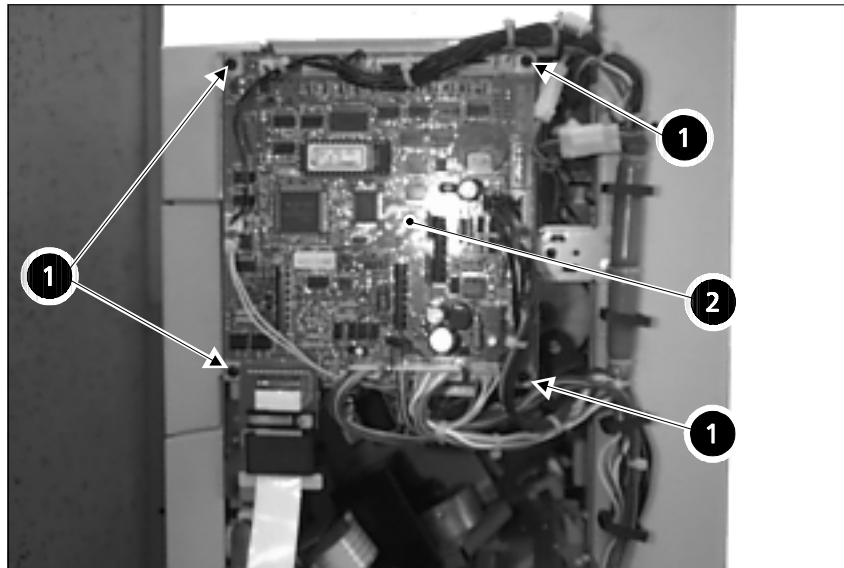


3.3 Boards

Finisher driver circuit board

Remove the finisher driver circuit board from the device:

- 1 Remove the rear cover.
- 2 Remove all the connectors.
- 3 Remove the four screws (❶) and then remove the finisher driver circuit board (❷).



Lithium battery

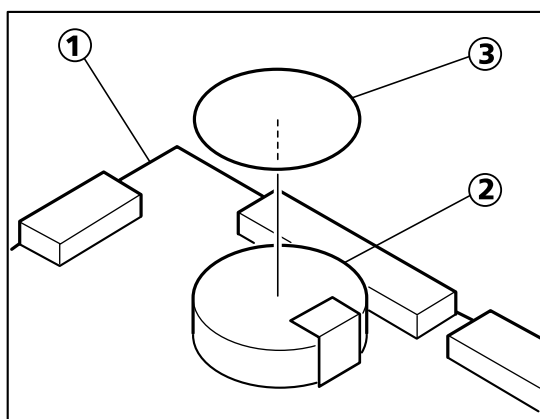


Caution Replace the lithium battery with SONY Lithium Cell CR2450 only. Use of another battery may present a risk of fire or explosion.

The lithium battery includes lithium, an organic catalyst and other flammable substances. The battery may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble, or dispose of in fire.

Caution Keep the battery out of reach of children and discard used battery promptly. When disposing the lithium battery, observe the applicable local laws and ordinances.

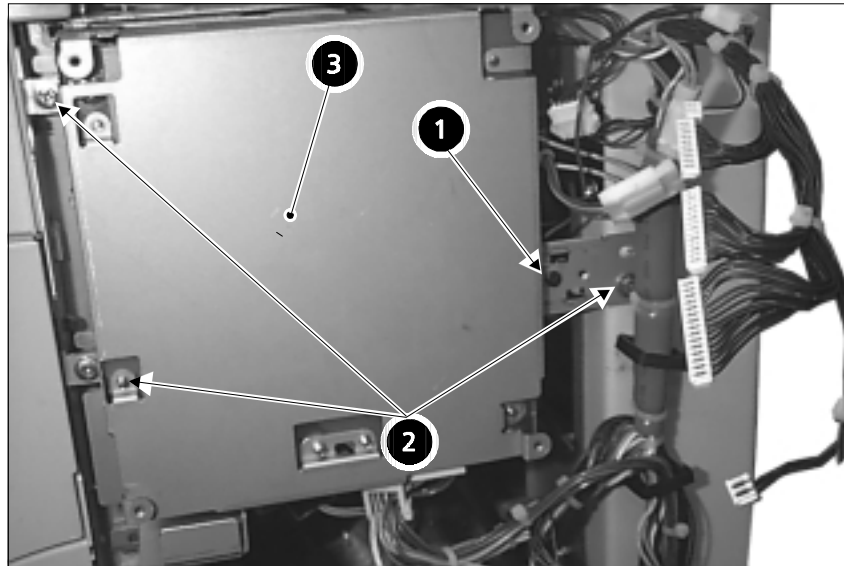
The package of lithium battery includes a seal (❶) in order to prevent short-circuit. When you replace the battery (❷), be sure to seal the new battery after you set it on the board (❸).



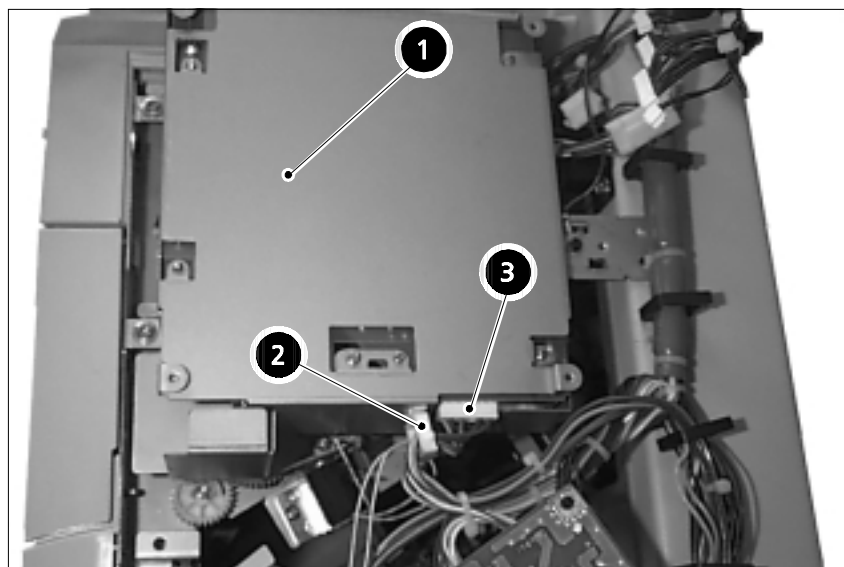
Power supply unit

Remove the power supply unit from the device:

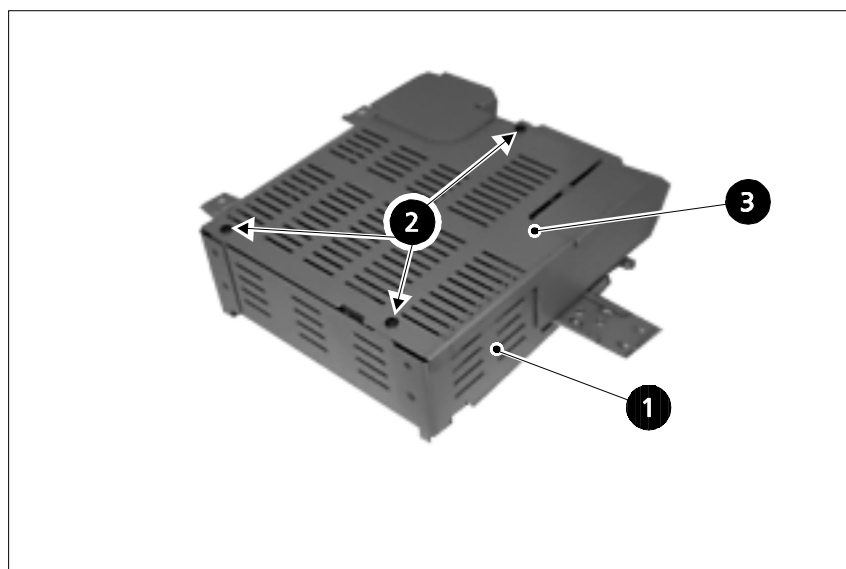
- 1 Perform the procedure explained between 1) and 4) on page 3-14 to remove the finisher driver circuit board.
- 2 Remove the single 3M screw (❶) and the three 4M screws (❷), and then remove the power supply unit (❸).



- 3 Remove the flux line fastener (❷) from the power supply unit (❶) and then remove the single connector (❸).



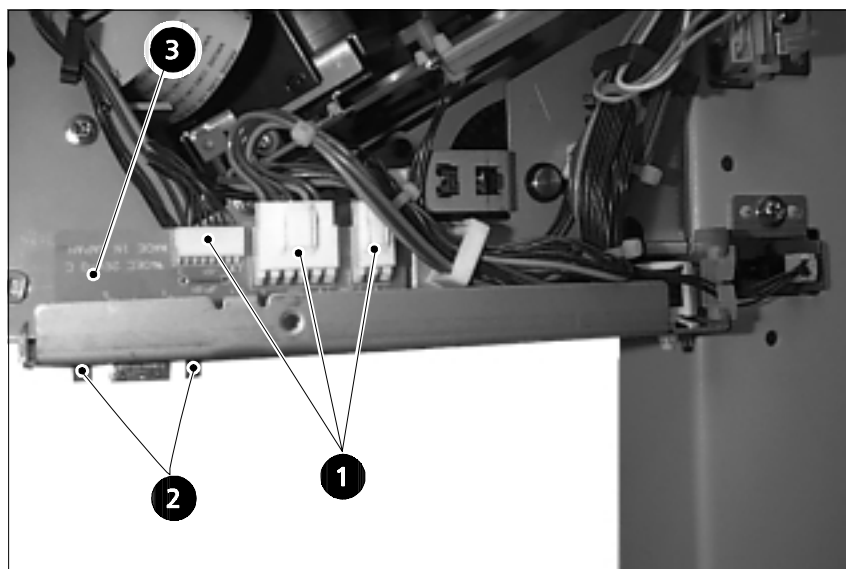
- 4 Remove the three screws (❷) from the power supply unit (❶) and then remove the cover (❸).



Interface circuit board

Remove the interface circuit board from the device:

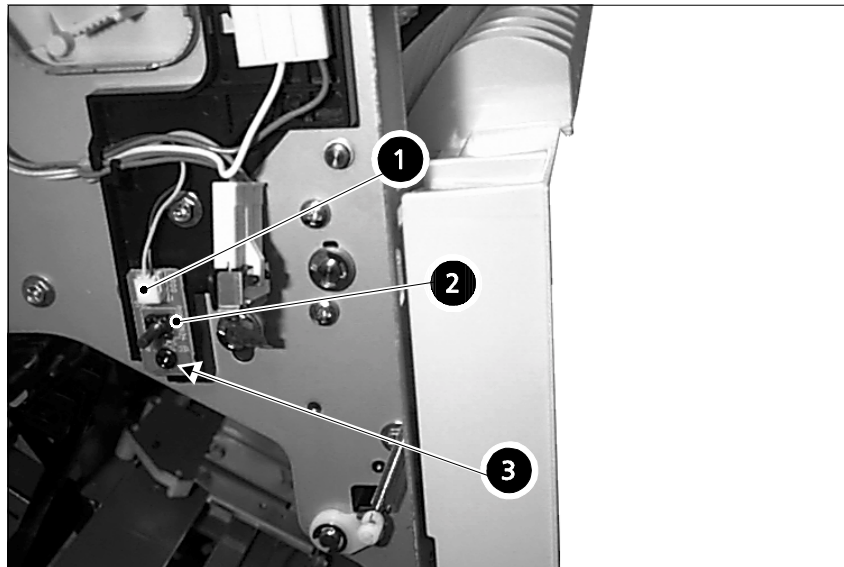
- 1 Remove the rear cover.
- 2 Remove the three connectors (❶).
- 3 Remove the two screws (❷) and then remove the interface circuit board (❸).



Staple exchange completion switch circuit board

Remove the staple exchange completion switch circuit board from the device:

- 1 Remove the front cover.
- 2 Remove the single connector (❶).
- 3 Remove the single screw (❷) and then remove the staple exchange completion switch circuit board (❸).



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Chapter 4 T R O U B L E S H O O T I N G

Contents

General	2
Maintenance and inspections	3
Regular replacement parts	3
Life-expectancy chart for consumable parts	3
Regular servicing	3
Tools	4
Standard tools	4
Special tools	4
Ratings and adjustments	5
Mechanical adjustments	5
Electrical adjustments	5
<i>Distance sensor adjustment</i>	5
Initial inspections	6
Confirming the installation environment	6
Confirm the paper to be used	6
Others	6
Handling operation defects	7
Mechanical defects	7
<i>The power supply will not switch on</i>	7
<i>Distance sensor defects</i>	8
<i>Shutter defects</i>	8
<i>Swing guide defects</i>	8
<i>Abnormal tray height</i>	9
<i>Inversion roller will not operate</i>	9
Printer error messages	10
<i>Stapler movement motor defects</i>	10
<i>Staple motor defects</i>	10
<i>Matching board movement motor defects</i>	11
<i>Tray elevation motor defects</i>	11
<i>Feed motor defects</i>	11
<i>Paper ejection motor defects</i>	12
Wiring and function of electrical parts	13
Switches	13
<i>Sensors</i>	13
<i>Solenoids and motors</i>	14
<i>Printed circuit board</i>	15
<i>Connectors</i>	15
List of solvents and lubricants	16

4.1 General

This section explains on the following topics:

- Maintenance and inspections on page 4-3
- Tools on page 4-4
- Ratings and adjustments on page 4-5
- Initial inspections on page 4-6
- Handling operation defects on page 4-7
- Wiring and function of electrical parts on page 4-13
- List of solvents and lubricants on page 4-19

4.2 Maintenance and inspections

Regular replacement parts

There are no parts that require regular replacement on the main unit.

Note

Regular replacement parts are the parts that must be replaced regularly without fail to ensure a constant standard of functionality with the product (parts which have a great effect during malfunctions despite there being no visible changes or damage to the outside of the device.) It is recommended that the stipulated parts are replaced during the earliest regular service.

Life-expectancy chart for consumable parts

There are certain parts that may require replacement owing to deterioration or damage at least once during the period of product warranty. The expected average life span for parts that may require replacement owing to defects is shown below.

Table 4.1 Consumable parts

Part name	Part number	Qty	Expected average life span	Remarks
Stapler kit		3	100,000 staples	As of April, 1998

Note. The above list is only for reference purposes. Expected life spans may differ in accordance with experimental test data.

Regular servicing

There are no areas that require regular servicing.

4.3 Tools

Standard tools

The standard tools required for servicing the finisher are the same as those for the printer.

Special tools

There are no special tools required for servicing the finisher.

4.4 Ratings and adjustments

Mechanical adjustments

There are no mechanical adjustment required for the finisher.

Electrical adjustments

Distance sensor adjustment

The distance sensor must be adjusted when the finisher driver's circuit board or the distance sensor is replaced, and when an error occurs in the back-up RAM.

The distance sensor is adjusted prior to leaving the factory. It is therefore not necessary to make these adjustments at the time of installation, but they must be corrected if the finisher driver circuit or distance sensor is replaced after this. Initial corrections must also be made when an error occurs in the back-up RAM. The procedure for this is as follows:

- 1 Confirm that the voltage of the lithium battery in the finisher driver circuit board is 2.7V or more.
- 2 Set the finisher driver circuit board's dip switch (SW1) #1 to OFF, #2 to OFF, #3 to OFF and #4 to ON.
- 3 Insert one sheet of white paper in each of the trays.
- 4 Press the push switch (SW2). (To start adjustment)
- 5 Move the trays to each distance adjustment position and load the distance data.
- 6 LED2 will blink during the adjustment process, and will be illuminated when adjustment is complete. If correct adjustment cannot be performed, LED2 will be extinguished and the system will shut down in that position.

4.5 Initial inspections

Confirming the installation environment

Confirm that the environment in which the device is to be used conforms to the following standards:

- a Confirm that the power supply is within +/-10% of the rated voltage.
- b Ensure that the device is install on a flat surface.
- c Ensure that the surrounding temperature is between 10 and 32.5 degrees Celsius, and the surrounding humidity is between 20 and 80% RH.
- d Avoid areas when the device may be exposed to ammonia gas, high temperatures and humidity (nearby water supply faucets, water boilers and humidifiers,) excessive coldness, naked flames or excessive dust.
- e Avoid areas where the device will be exposed to direct sunlight. If this is unavoidable, ensure that the device is protected by a curtain or some other form of screen.
- f Ensure the area is well ventilated.

Confirm the paper to be used

- a Is the paper recommended for use with the finisher being used?
- b Is the paper damp?

Check the above points by inserted a new pack of paper and performing a test run.

Others

If the finisher is stored in a cold area, such as a warehouse during the winter months, and then brought into a warm room, condensation may build up on the various parts and lead to a wide range of trouble. Either dry off all parts of the device or leave it to stand with the electricity on for between 10 to 20 minutes when condensation has built up.

4.6 Handling operation defects

Take note of the following precautions when implementing the measures for handling operational defects outlined in this section.

When measuring the voltage of the specified connector terminals, check to ensure that there are no contact defects in the connector.

Discharge static electricity from the body by touching a metal part of the printer prior to handling circuit boards to prevent them from being damaged through static electricity.

Mechanical defects

The power supply will not switch on

Possible causes	Suggested remedy
The socket is not supplied with the rated voltage	Inform the user that the rated voltage is not being supplied to the socket.
The power supply plugs are not correctly inserted in the printer, finisher or socket.	Correctly plug in the power supply cables.
A defective contact in the interface connector is preventing the power-on signal from being input.	Reconnect the interface connector.
The power-on signal is not being output.	Switch on the power supply switch to the printer. Measure the voltage between JS3-5 (PWRON-IN) and JS3-3 (GND) on the intermediate substrate connector. Check the printer if the measured value is approximately 5V.
Blown fuse.	Disconnect the power supply unit and replace the fuse.
Defective power supply unit	Switch off the printer's power supply and disconnect the J1 and J2 connectors from the finisher driver circuit board. Plug the power supply cable into the power supply unit and switch on the printer's power supply. Then measure the DC power output between the J1 and J2 connectors. Take care not to short the circuit when doing this. Replace the power supply unit if the rated value is not being output.
Wiring, DC load, finisher driver circuit board	Switch off the printer's power supply and check the end of the wiring and leading from the finisher driver circuit board and the DC load. If there are no problems with the wiring and DC load, replace the finisher driver circuit board.

Distance sensor defects

Possible cause	Suggested remedy
A contact defect exists in the distance sensor's signal line connector.	Reconnect the J6 connector on the finisher driver circuit board.
Distance sensor defective	Measure the voltage between the J6-4 (GND) connector and the J6-2 (Vcc) and J6-3 (Vin) connectors on the finisher driver circuit board. Replace the distance sensor if 5V does not exist between J6-4 and J6-2, and if approximately 3V does not exist between J6-4 and J6-3.
Finisher driver circuit board defective	Replace the finisher driver circuit board.

Shutter defects

Possible cause	Suggested remedy
Faulty connector contact	Reconnect the J7, J9 and J10 connectors on the finisher driver circuit board.
Shutter close detection switch defective	Disconnect the J7 connector from the finisher driver circuit board. Measure the resistance between the J7-1 connector on the switch and the J7-2 connector. Replace the shutter close detection switch if the value is not 0 ohms when the shutter is raised and oo ohms when the shutter is lowered.
Shutter open detection switch defective	Measure the voltage between the J9-8 connector and the J9-9 connector on the finisher driver circuit board. Replace the shutter open detection switch if the value is not 0V when the shutter is raised and approximately 5V when the shutter is lowered.
Finisher driver circuit board defective	Replace the finisher driver circuit board.

Swing guide defects

Possible cause	Suggested remedy
Faulty connector contact	Reconnect the J5, J11 and J6 connectors on the finisher driver circuit board.
Swing guide close detection switch (MS2) defective	Disconnect the J5 connector from the finisher driver circuit board. Measure the resistance between the J5-9 connector on the switch and the J5-10 connector. Replace the swing guide close detection switch (MS2) if the value is not 0 ohms when the swing guide is raised and oo ohms when the swing guide is lowered.
Swing guide close detection switch (MS6) defective	Disconnect the J5 connector from the finisher driver circuit board. Measure the resistance between the J5-11 connector on the switch and the J5-12 connector. Replace the swing guide close detection switch (MS6) if the value is not 0 ohms when the swing guide is raised and oo ohms when the swing guide is lowered.

Possible cause	Suggested remedy
4) Swing guide open detection switch defective	Recovery: Measure the voltage between the J6-10 connector and the J6-9 connector on the finisher driver circuit board. Replace the swing guide open detection switch if the value is not 0V when the swing guide is raised and approximately 5V when the swing guide is lowered.
5) Finisher driver circuit board defective	Recovery: Replace the finisher driver circuit board.

Abnormal tray height

Possible cause	Suggested remedy
Faulty connector contact	Reconnect the J5, J7 and J12 connectors on the finisher driver circuit board.
Tray home position detection sensor defective	Measure the voltage between the J12-5 connector and the J12-6 connector on the finisher driver circuit board. Replace the tray home position detection sensor if the value is not approximately 5V when the tray is in the home position and 0V when in any other position.
Tray upper limit detection switch defective	Disconnect the J5 connector from the finisher driver circuit board. Measure the resistance between the J5-7 connector on the switch and the J5-8 connector. Replace the tray upper limit detection switch if the value is not 0 ohms.
Safe area detection switch defective	Measure the voltage between GND (CP1) and the J5-5 and J5-6 connectors on the finisher driver circuit board. Replace the safe area detection switch if the voltage is not between approximately 25V to 0V when tray assemblies #2 and #3 are moved, or between 18V and approximately 24V.
Finisher driver circuit board defective	Replace the finisher driver circuit board.

Inversion roller will not operate

Possible cause	Suggested remedy
Damaged gear	Replace the gear if it is damaged.
Inversion solenoid defective	Disconnect the inversion solenoid's J4 connector. Measure the resistance between the J4-1 connector on the solenoid and the J4-2 connector. Replace the inversion solenoid if the value is not approximately 125 ohms.
Feed motor defective	Press the SW3 push switch with dip switch #3 (SW1) on the finisher driver circuit board set to ON and perform a mechanical check. Replace the feed motor if it cannot be operated during this.
Finisher driver circuit board defective	Replace the finisher driver circuit board.
Paper deck driver circuit board defective	Replace the paper deck driver circuit board.

Possible cause	Suggested remedy
Option controller circuit board defective	Replace the option controller circuit board.
Video controller circuit board defective	Replace the video controller circuit board.

Printer error messages

The following errors are reported by a message on the printer's message display. The printer is not operative until the defect is corrected.

Call service person C8

Stapler movement motor defects

Possible cause	Suggested remedy
A contact defect exists in the stapler movement motor drive's signal line connector.	Reconnect the J8 connector on the finisher driver circuit board.
Stapler movement motor defective	Disconnect the J8 connector from the finisher driver circuit board. Measure the resistance between the J8-5 connector on the motor and the J8-4, J8-3, J8-2 and J8-1 connectors. Replace the stapler movement motor if the value is not approximately 16.5 ohms.
Finisher driver circuit board defective	Replace the finisher driver circuit board.

Call service person C9

Staple motor defects

Possible cause	Suggested remedy
A contact defect exists in the staple motor drive's signal line connector.	Reconnect the J8 connector on the finisher driver circuit board.
Staple motor defective	Disconnect the J8 connector from the finisher driver circuit board. Measure the resistance between the J8-11 connector on the motor and the J8-12 connector. Replace the staple motor if the value is not between 6 and 8 ohms.
Finisher driver circuit board defective	Replace the finisher driver circuit board.

Call service person CA

Matching board movement motor defects

Possible cause	Suggested remedy
A contact defect exists in the matching board movement motor drive's signal line connector.	Reconnect the J11 connector on the finisher driver circuit board.
Matching board movement motor defective	Disconnect the J11 connector from the finisher driver circuit board. Measure the resistance between the J11-1 connector on the motor and the J11-2, J11-3, J11-4 and J11-5 connectors. Replace the matching board movement motor if the value is not approximately 16 ohms.
Finisher driver circuit board defective	Replace the finisher driver circuit board.

Call service person CB

Tray elevation motor defects

Possible cause	Suggested remedy
A contact defect exists in the tray elevation motor drive's signal line connector.	Reconnect the J7 connector on the finisher driver circuit board.
Tray elevation motor defective	Disconnect the J7 connector from the finisher driver circuit board. Measure the resistance between the J7-4 and J7-5 connectors on the motor. Replace the tray elevation motor if the value is not approximately 5.5 ohms.
Finisher driver circuit board defective	Replace the finisher driver circuit board.

Call service person CC

Feed motor defects

Possible cause	Suggested remedy
A contact defect exists in the feed motor drive's signal line connector.	Reconnect the J10 connector on the finisher driver circuit board.
Feed motor defective	Disconnect the J10 connector from the finisher driver circuit board. Measure the resistance between the J10-1, J10-4 and J10-6 connectors on the motor and between the J10-2, J10-3 and J10-5 connectors. Replace the feed motor if the value is not approximately 4.3 ohms.
Finisher driver circuit board defective	Replace the finisher driver circuit board.

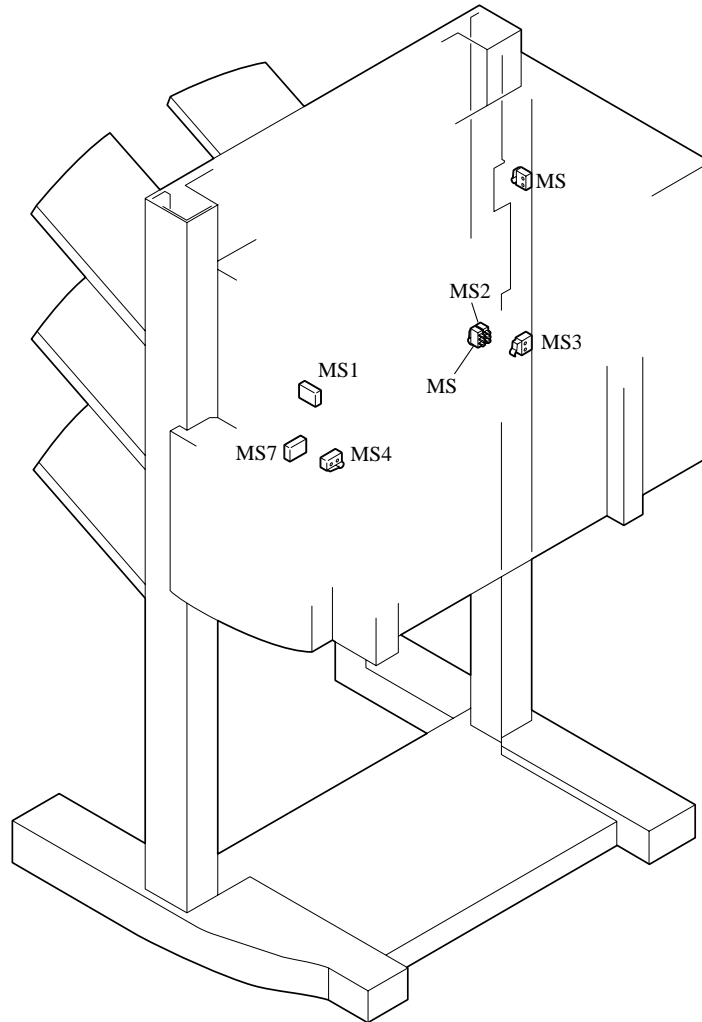
Call service person CD


Paper ejection motor defects

Possible cause	Suggested remedy
A contact defect exists in the paper ejection motor drive's signal line connector.	Reconnect the J11 connector on the finisher driver circuit board.
Paper ejection motor defective	Disconnect the J11 connector from the finisher driver circuit board. Measure the resistance between the J11-6 and J11-7 connectors on the motor. Replace the paper ejection motor if the value is not approximately 42 ohms.
Finisher driver circuit board defective	Replace the finisher driver circuit board.

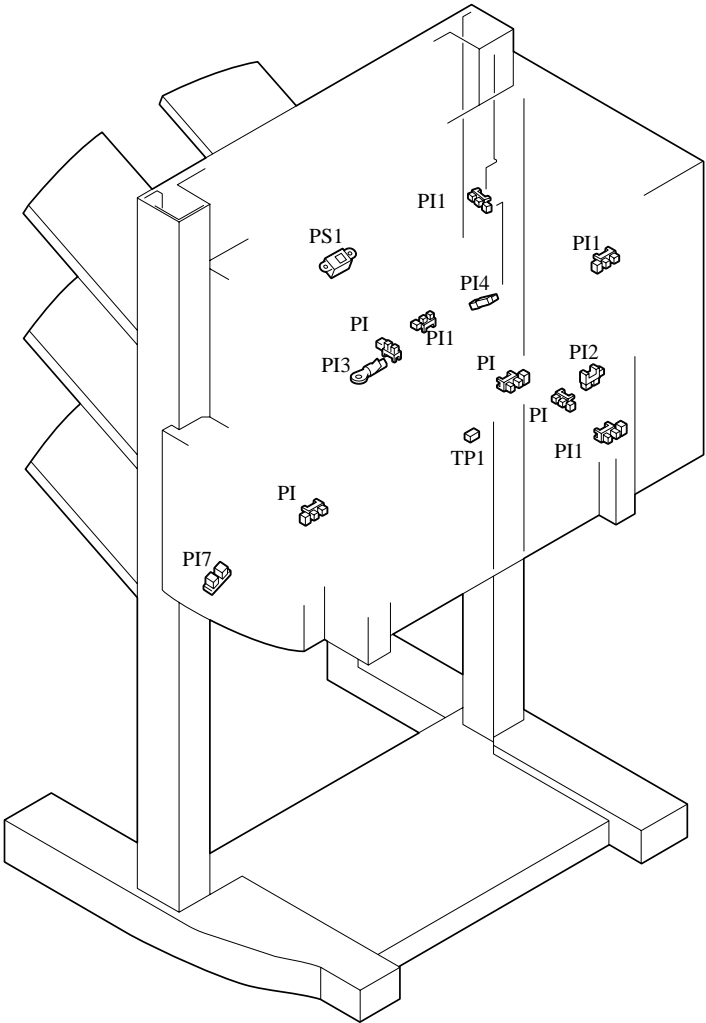
4.7 Wiring and function of electrical parts

Switches



Symbol	Description	ID	Function
	Switch	MS1	Upper cover open/close detection switch
		MS2	Swing guide open detection switch
		MS3	Safe area detection switch
		MS4	Shutter open detection switch
		MS5	Tray upper limit detection switch
		MS6	Swing guide close detection switch
		MS7	Front cover open/close detection switch

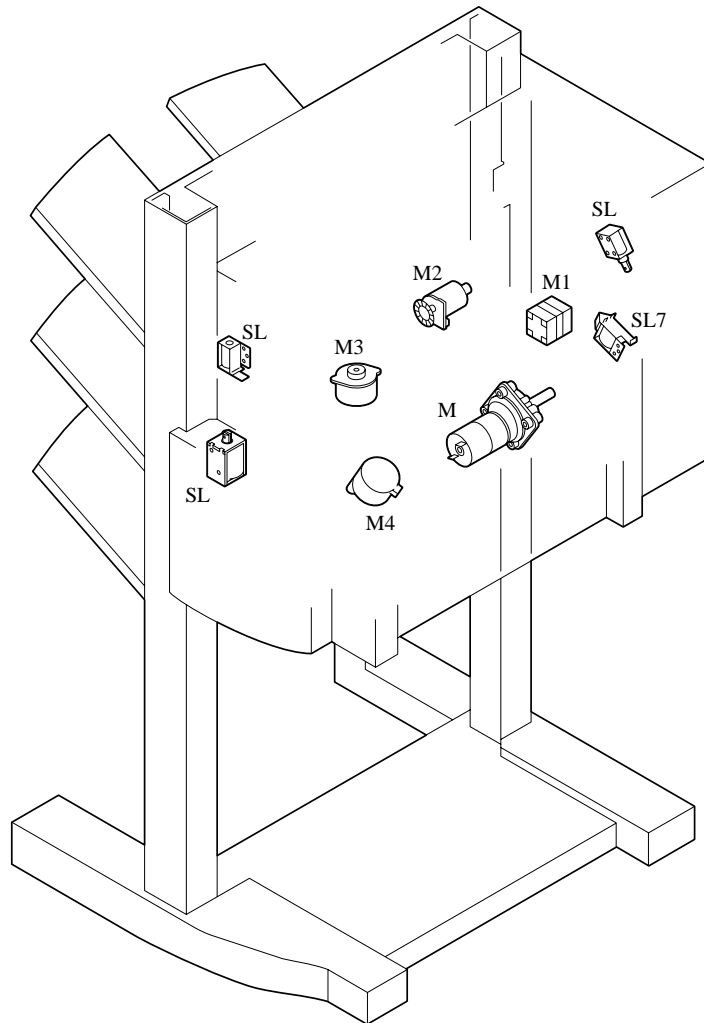
Sensors



Symbol	Description	ID	Function
Photo-inter-rupter		PI1	Inlet paper detection sensor
		PI2	Inverted paper detection sensor
		PI3	Paper ejection detection sensor
		PI4	Stapler tray paper detection sensor
		PI5	Shutter open detection sensor
		PI6	Matching board home position detection sensor
		PI7	Stapler home position detection sensor
		PI8	Tray home position detection sensor
		PI9	Tray elevation motor clock detection sensor
		PI10	Paper eject motor clock detection sensor
		PI15	Joint sensor
		PI18	Swing guide close detection sensor

Symbol	Description	ID	Function
	Photo-sensor	PS1	Distance sensor
	Thermal protector	TP1	Tray elevation motor temperature detection sensor

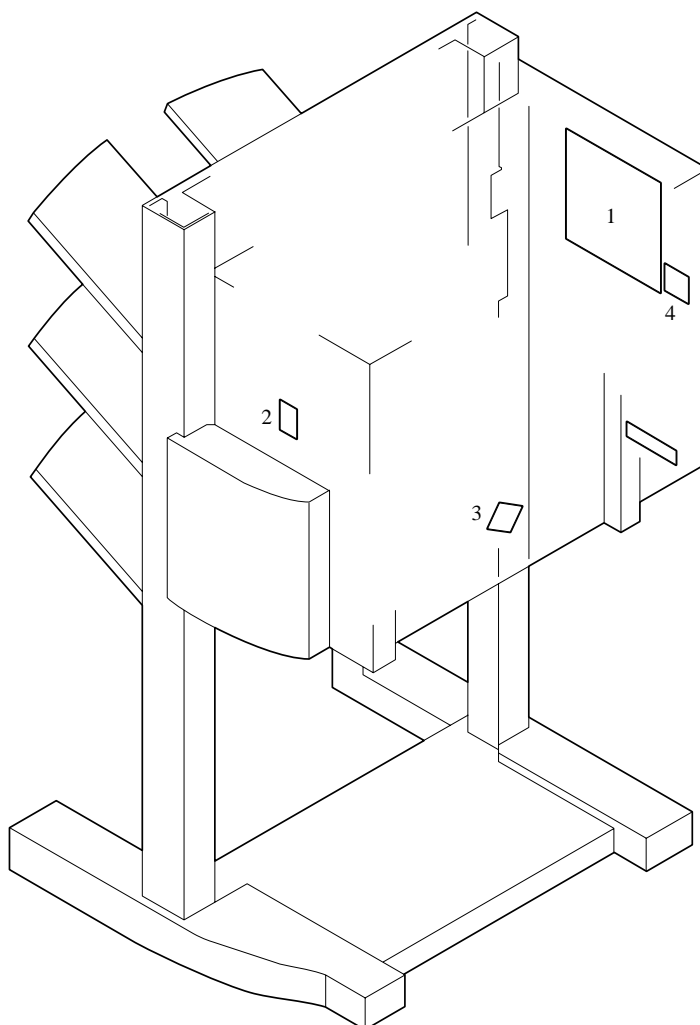
Solenoids and motors



Symbol	Description	ID	Function
Solenoids		SL5	Paddle drive solenoid
		SL6	Base board shelter solenoid
		SL7	Inversion roller drive solenoid
		SL8	Face-up flapper drive solenoid
Motors		M1	Feed motor
		M2	Paper ejection motor
		M3	Matching board movement motor
		M4	Stapler movement motor

Symbol	Description	ID	Function
		M5	Tray elevation motor
		M6	Staple motor

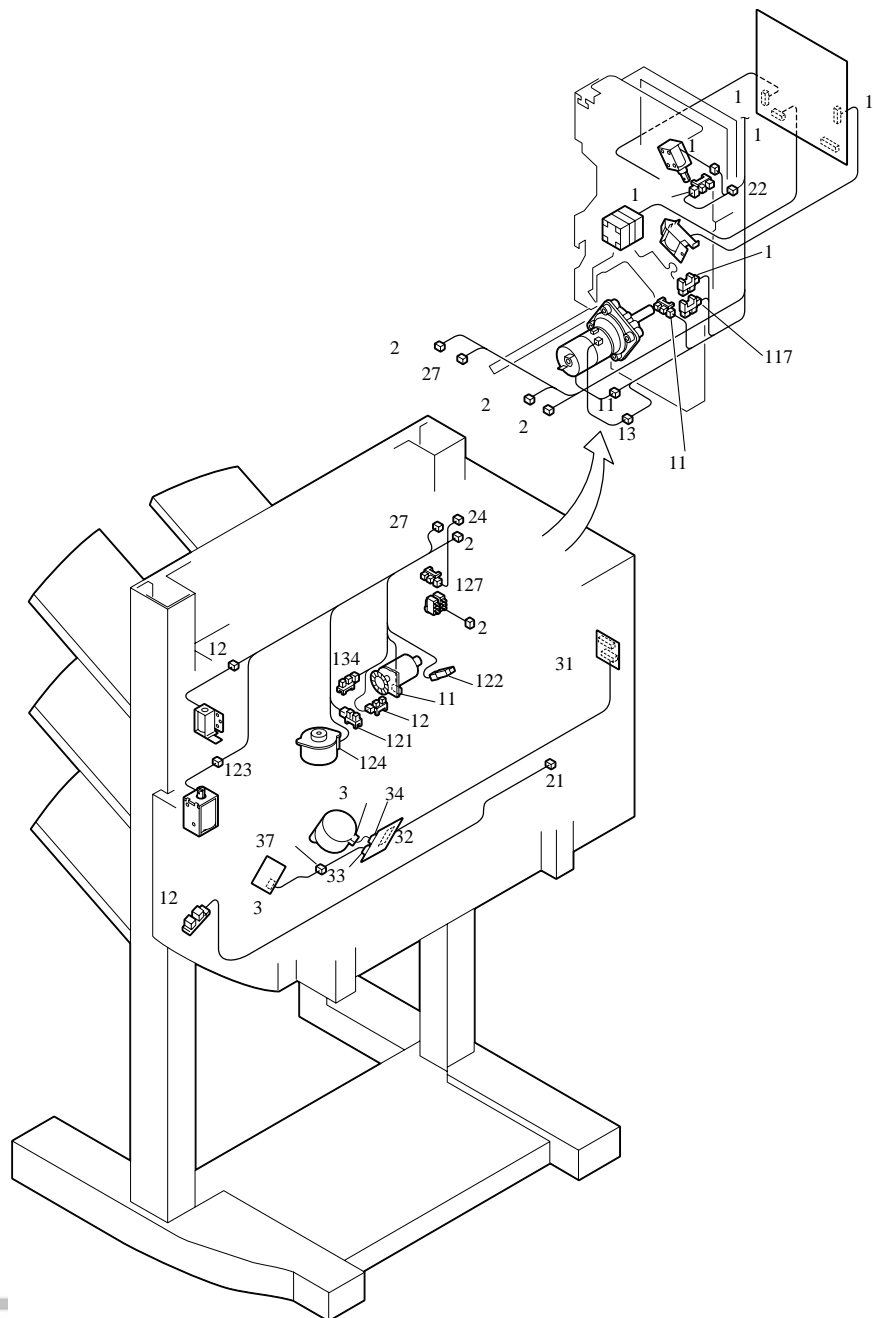
Printed circuit board

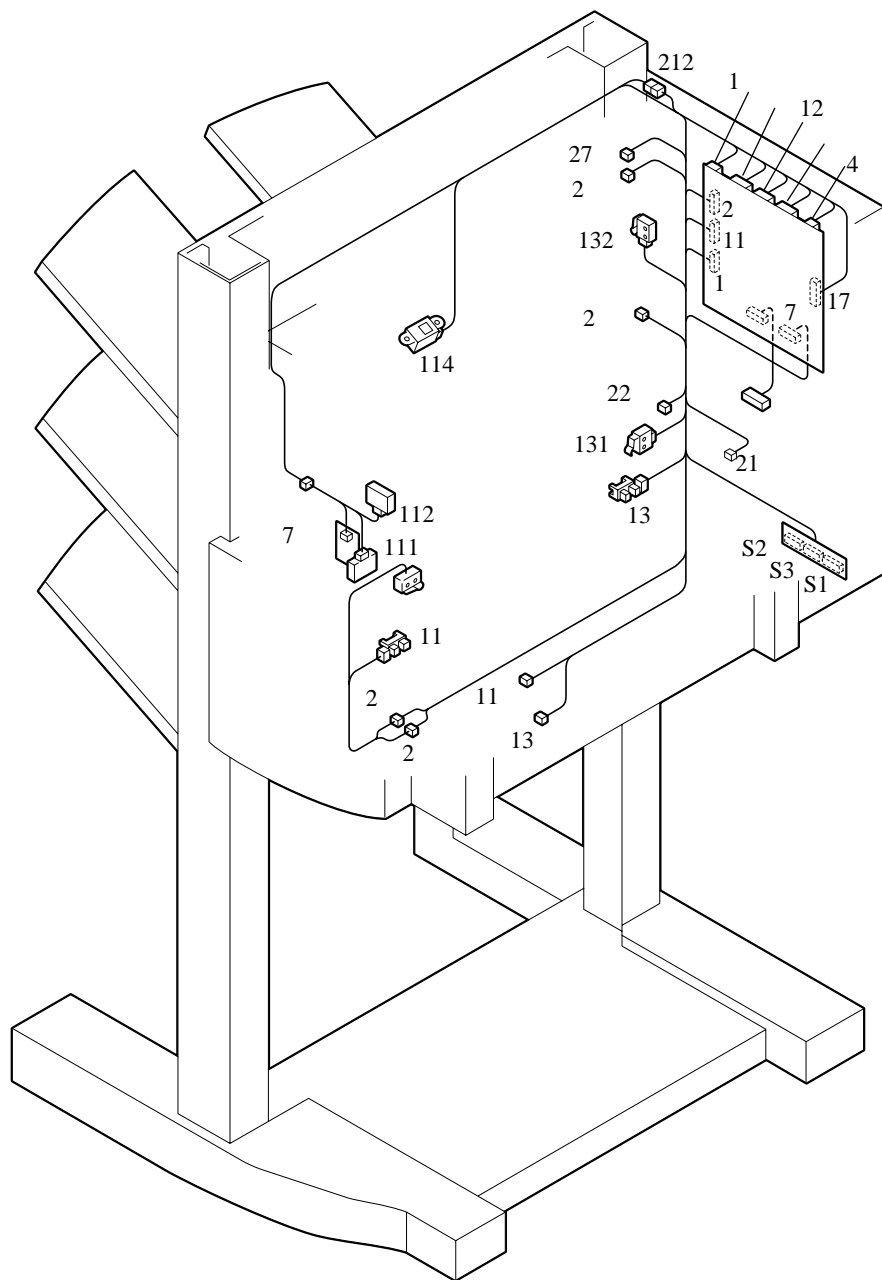


Ref.	Description	Function
1	Finisher driver circuit board	Control of all types of load and various detection functions
2	Staple exchange completion switch circuit board	For the use of test stapling
3	Intermediate circuit board	Interchanges the signals between the various sensors and loads and the finisher driver circuit board.

Ref.	Description	Function
4	Intermediate circuit board	Interchanges the signals between the various sensors and loads and the finisher driver circuit board.
5	Intermediate circuit board	Interchanges the signals between the printer and the finisher driver circuit board.

Connectors





4.8 List of solvents and lubricants

Description	Purpose	Components	Remarks
View clean C-17	Cleaner. Example: Plastic, rubber, outer covers	Fluoride hydrocarbon, alcohol, field active agent, water	To not place near naked flames. Delivered to the site. Substitute: C1, IPA (isopropyl alcohol)
MEK(Methyl Ethyl Ketone) #160	Cleaner. Example: Metal, oil soiling, toner soiling	Fluoride hydrocarbon, chlorine hydrocarbon, alcohol	To not place near naked flames. Delivered to the site. Substitute: MEK
Lubricant	Coated between the gear and axis	Petroleum based mineral oil	Selltellus 68 (manufactured by Showa Shell Sekiyu). Tool No.: CK-8003
Lubricant	Coated on the gear and axis	Silicone oil	Permalube SHV-2 (manufactured by Nihon Oil). Tool No.: CK-8005

Note Ensure that all excess oil has been wiped off after using these solvents.

