TOSHIBA

SERVICE MANUAL

FINISHER

MJ-1021

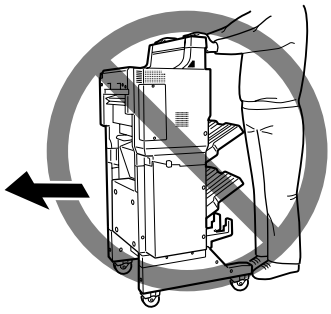
File No. SME02001200
R02122127600-TTEC
Ver00 2002-12

General Precautions for Installation/Servicing/Maintenance for the Finisher MJ-1021

The installation and service should be done by a qualified service technician.

1. When installing the Finisher MJ-1021 to the Plain Paper Copier, be sure to follow the instructions described in the “Unpacking/Set-Up Procedure for the MJ-1021” booklet which comes with unit of the MJ-1021.
2. The MJ-1021 should be installed by an authorized/qualified person.
3. Before starting installation, servicing or maintenance work, be sure to turn off and unplug the copier first.
4. When selecting the installation site, avoid placing the Finisher/Inserter and copier on different levels or inclined floors.
5. When servicing or maintaining the MJ-1021, be careful about the rotating or operation sections such as gears, pulleys, sprockets, cams, belts, etc.
6. When parts are disassembled, reassembly is basically the reverse of disassembly unless otherwise noted in this manual or other related materials. Be careful not to reassemble small parts such as screws, washers, pins, E-rings, toothed washers to the wrong places.
7. Basically, the machine should not be operated with any parts removed or disassembled.
8. Delicate parts for preventing safety hazard problems (such as breakers, thermofuses, fuses, door switches, sensors, etc. if any) should be handled/installed/adjusted correctly.
9. When servicing the machines with the main switch turned on, be sure not to touch live sections and rotating/operating sections. Avoid exposure to laser radiation.
10. Be sure not to touch high-voltage sections such as the high-voltage transformer and power supply unit. Especially, the board of these components should not be touched since the electirc charge may remain in the condensers, etc. on them even after the power is turned OFF.
11. Use suitable measuring instruments and tools.
12. During servicing or maintenance work, be sure to check the serial No. plate and other cautionary labels (if any) to see if they are clean and firmly fixed. If not, take appropriate actions.
13. The PC board must be stored in an anti-electrostatic bag and handled carefully using a wristband, because the ICs on it may be damaged due to static electricity. Before using the wrist band, pull out the power cord plug of the copier and make sure that there is no uninsulated charged objects in the vicinity.
14. For the recovery and disposal of used MJ-1021, consumable parts and packing materials, it is recommended that the relevant local regulations/rules.
15. After completing installation, servicing and maintenance of the MJ-1021, return the MJ-1021 to its original state, and check operation.

16. When you move the finisher, do not move it in the direction of the arrow as shown in the figure [A] below otherwise it might fall down.



[A]

INTRODUCTION

This Service Manual contains basic data and figures for the Finisher (MJ-1021) needed to service the machine in the field.

This manual comprises the following chapters:

Chapter 1 "General Description" introduces the finisher's features, specifications, and names of parts, and shows how to operate the finisher.

Chapter 2 "Finisher Unit Basic Operation" discusses the principles of operation used for the finisher mechanical and electrical systems. It also explains the timing at which these systems are operated.

Chapter 3 "Saddle Finisher Unit Basic Operation" discusses the principles of operation used for the saddle stitcher unit's mechanical and electrical systems. It also explains the timing at which these systems are operated.

Chapter 4 "Mechanical System" discusses how the finisher is constructed mechanically, and shows how it may be disassembled/assembled and adjusted.

Chapter 5 "Maintenance and Inspection" provides tables of periodically replaced parts and consumables and durables, together with a scheduled servicing chart.

Chapter 6 "Troubleshooting" shows how to troubleshoot possible faults and gives electrical parts arrangement diagrams, LED/check pin diagrams by PCB, and self diagnosis tables.

"Appendix" contains diagrams showing tables of signals, overall circuit diagrams and tables of solvents/oils.

Descriptions regarding installation are not mentioned in this Service Manual as the Finisher (MJ-1021)'s packing boxes contain Installation Procedures.

The descriptions in this Service Manual are subject to change without notice for product improvement or other purposes, and major changes will be communicated in the form of Service Information bulletins.

All service persons are expected to have a good understanding of the contents of this Service Manual and all relevant Service Information bulletins, and be able to identify and isolate faults in the machine.

CONTENTS

CHAPTER 1 GENERAL DESCRIPTION

CHAPTER 2 FINISHER UNIT BASIC OPERATION

CHAPTER 3 SADDLE STITCHER UNIT

BASIC OPERATION

CHAPTER 4 MECHANICAL CONSTRUCTION

CHAPTER 5 MAINTENANCE AND INSPECTION

CHAPTER 6 TROUBLESHOOTING

APPENDIX

CHAPTER 1

GENERAL DESCRIPTION

I. FEATURES

1. Available for stapling large quantities of sheets

- MAX. 100 sheets can be stapled.

2. Accommodates large quantities of sheets

- Normally, the finisher holds a stack of sheets 250 mm in height in its two bins (small-size paper: equivalent to 2000 sheets)/140 mm in height (large-size paper: equivalent to 1000 sheets)

3. Has high paper transportation performance

- The finisher is capable of handling papers between 60 and 256 gm/m^2.

4. Offers a job offset function

- The finisher has a job offset function for sorting non-stapled stacks of copies.

5. Offers four types of auto stapling

- The finisher offers a choice of four stapling modes (1-point stapling at rear, diagonal stapling at front, diagonal stapling at rear, 2-point stapling).

6. Uses a buffer roller

- The use of a buffer roller enables the finisher to accept copies without interruption from the host machine even during stapling or offset operation.

7. Has a saddle stitch function

- **The finisher can staple along the center of paper and fold it in two (up to 15 sheets).**

8. Offers a punch function (option: MJ-6003)

- The use of the puncher unit enables the finisher to punch sheets for binders before they are output. (The puncher unit is capable of handling papers between 60 and 256 gm/m^2. It cannot handle special paper, postcards and transparencies.)

9. Insert function (option: MJ-7001)

- Enable the use of special type of paper and printed paper in addition to the staple sorting or the hole punching mode (Available when the optional staple sorting and the hole punching mode units are installed.) This paper is not run through fuser (heat).

II. SPECIFICATIONS

A. Specifications

1. Finisher Unit

Item	Description		
Stacking method	Trays 1 and 2: by lifting tray		
Stacking orientation	Face-down		
Stacking size	AB: A3, A4, A4-R, A5-R, B4, B5, B5-R, FOLIO Inch: LD, LG, LT, LT-R, ST-R, COMPUTER		
Sortable size	A3, A4, A4-R, B4, B5, LD, LG, LT, LT-R, FOLIO, COMPUTER		
Basis weight	60 to 256 g/m^2		
Bins	Trays 1 and 2		
Modes	Non-sort: trays 1 and 2 Sort: trays 1 and 2 Staple sort: trays 1 and 2		
Stacking capacity (Note 1)	Non sort	Small-size (1)	250 mm (2000 sheets) (Note 2)
		Small-size (2)	140 mm (1000 sheets)
		Large-size(1)(2)	140 mm (1000 sheets) (Note 2)
	Sort	Small-size (1)	250 mm (2000 sheets) (Note 2)
		Large-size (1)	140 mm (1000 sheets) (Note 2)
	Staple sort	Small-size (1)	110 mm or 750 sheets or 100 sets
		Large-size (1)	74 mm or 500 sheets or 50 sets
Size mixing (Note 1)	Non-sort/sort mixing: 74 mm or less (500 sheets) Staple mixing: 74 mm or less (500 sheets) or 50 sets Mode mixing: 22 mm or less (150 sheets) or 50 sets		
Stacking direction	Face-down		

Note 1: Approximate when computed with reference to 80 g/m^2 paper.
Note 2: Alignment may not be correct if 750 or more small-size sheets are stacked.
Note 3: The accuracy of the stack height is ± 7 mm/0.28 in.

Table 1-201

Reference:
The term “Small-size (1)” stands for A4, B5 and LT, the term “Small-size (2)” stands for A5-R and ST-R, while the term “Large-size(1)” stands for A3, B4, A4-R, LD, LG, LT-R, FOLIO and COMPUTER, “Large-size (2)” stands for B5-R.
“Non-sort/sort mixing” means stacking different sized paper with non-sort mode, “Staple mixing” means stacking different sized papers with staple mode, and “Mode mixing” mean stacking non-stapled papers and stapled papers.

Item	Description			
Stapling	By rotating cam			
Stapling position	See Figure 1-201.			
Stapling capacity (Note 4)			60 ~ 80 g/m²	90 g/m², 105 g/m²
	Exclusive staple (100 sheets stapling)	Small-size (1)	100 sheets	--- (Note 5)
		Large-size (1)	50 sheets	--- (Note 5)
	Option staple (50 sheets stapling)	Small-size (1)	50 sheets	30 sheets
		Large-size (1)	30 sheets	15 sheets
Staple supply	Exclusive staple cartridge (5000 staples)			
Staples (Note 6)	STAPLE-1700 : Exclusive (100 sheets stapling) : 3 cases of 5000 staples in a package			
	STAPLE-1800 : Option (50 sheets stapling) : 3 cases of 5000 staples and one exclusive cartridge in a package			
	STAPLE-1900 : Option (50 sheets stapling) : 3 cases of 5000 staples in a package			
Staple detection	Provided			
Manual stapling	Not provided			
Stapling size	1-point diagonal stapling (diagonal)	Front	A3, B4, A4, A4-R, B5, LD, LG, LT, LT-R, FOLIO, COMPUTER	
		Rear	A3, B4, A4, B5, LD, LT, COMPUTER	
	1-point	Rear	A4-R, LT-R, LG, FOLIO	
	2-point	A3, B4, A4, B5, A4-R, LD, LG, LT, LT-R, FOLIO, COMPUTER		
Paper detection	Provided			
Control panel	Not provided			
Display	Not provided			
Dimensions	740 × 630 × 1023 mm/29.13 × 24.80 × 40.28 in (W × D × H)			
Weight	66 kg/145.5 lb			
Power supply	AC115-127V (50/60Hz), AC220-240V(50/60Hz)			
Maximum power consumption	160 W or less			

Note 4: Including two sheets of thick stock or cover (200 ~ 256 g/m²)
Note 5: Use the staple for 50 sheets when stapling 90g/m² and 105g/m² paper.
Note 6: 1 cartridge for 100 sheets stapling and 1 case (5000 staples) for 100 sheets stapling are co-packed in the product.

Table 1-202

Stapling Positions (finisher unit)

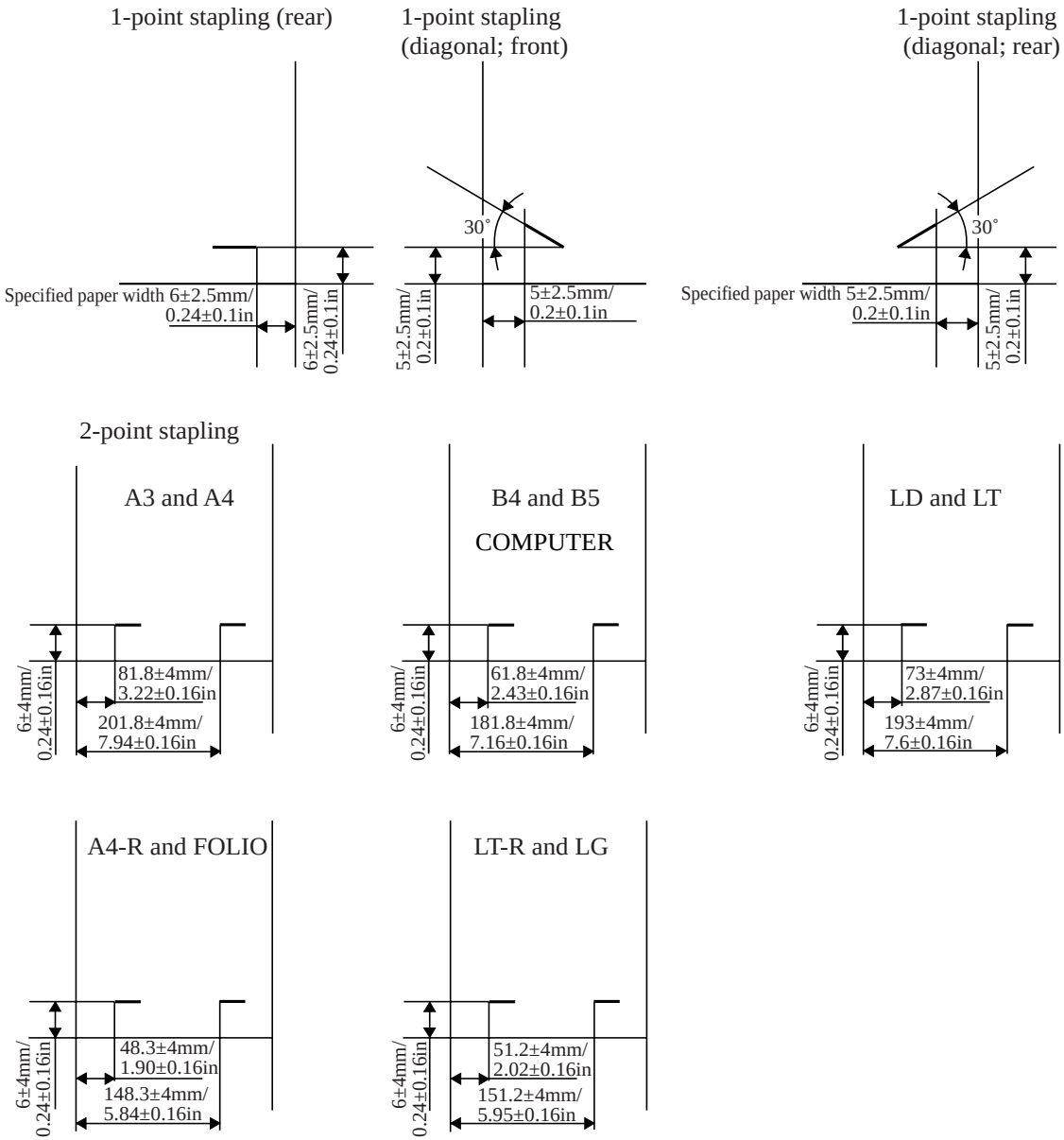


Figure 1-201

2. Saddle Stitcher Unit

Item	Description	
Stapling method	Center binding (double folding)	
Folding position	See Figure 1-202.	
Paper size	A3, B4, A4-R, LD, LT-R	
Capacity	W/binding: 1 sheet W/out binding: 2 to 15 sheets (including single cover page)	
Paper weight	60 to 105 g/m^2 (cover page up to 256 g/m^2) (Note 1)	
Stacking capacity	10 sets (stack of 11 to 15 sheets), 20 sets (stack of 6 to 10 sheets), 25 sets (stack of 5 sheets or less)	
Stapling	Stapling position	2 points (center distribution; fixed interval)
	Staple accommodation	2000 staples
	Staple supply	Special cartridge
	Staples	Special staples (STAPLE-600: 3 cartridges of 2000 staples in a package)
	Staple detection	Provided
	Manual stapling	Not provided
Folding	Folding method	Roller contact
	Folding mode	Double folding
	Folding position	Paper center
	Position adjustment	Provided
Power supply	From finisher unit DC24V, DC5V	
Power consumption	160 W or less	

Note1: Special paper, postcards, transparencies, reproducibles, label paper and hole-punched paper cannot be handled.

Table 1-203

Staple and Folding Position (saddle stitcher unit)

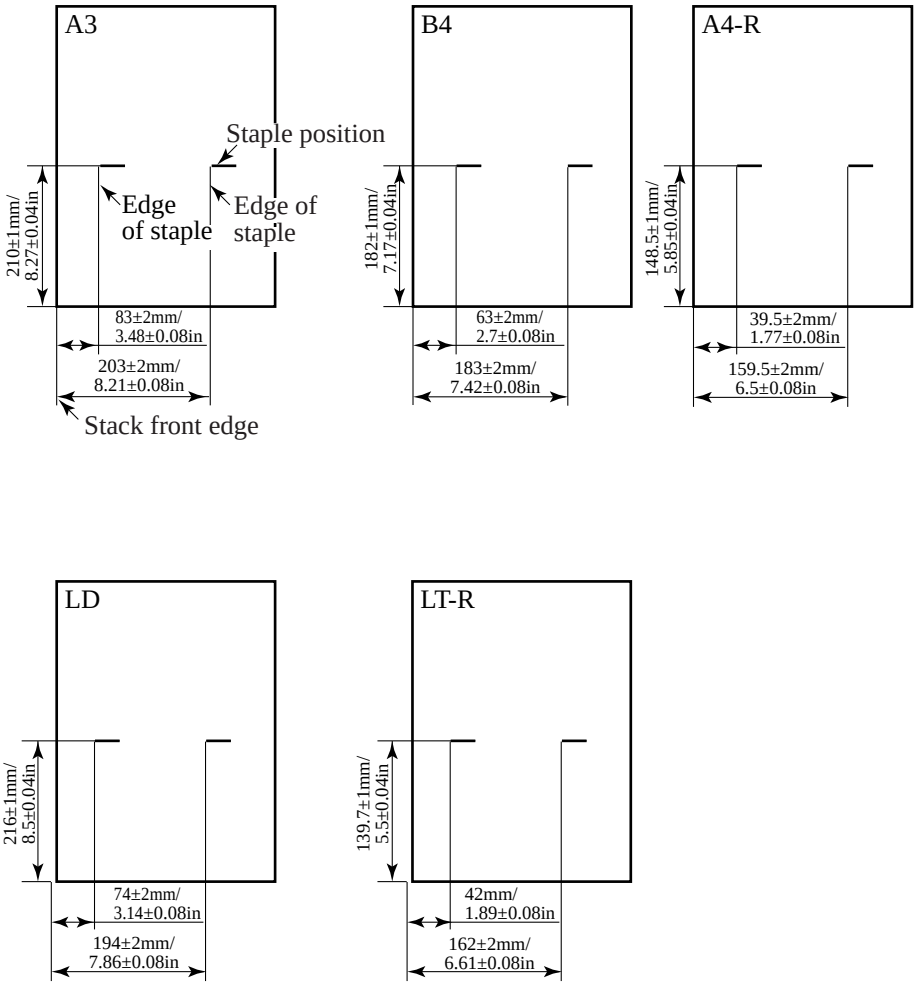
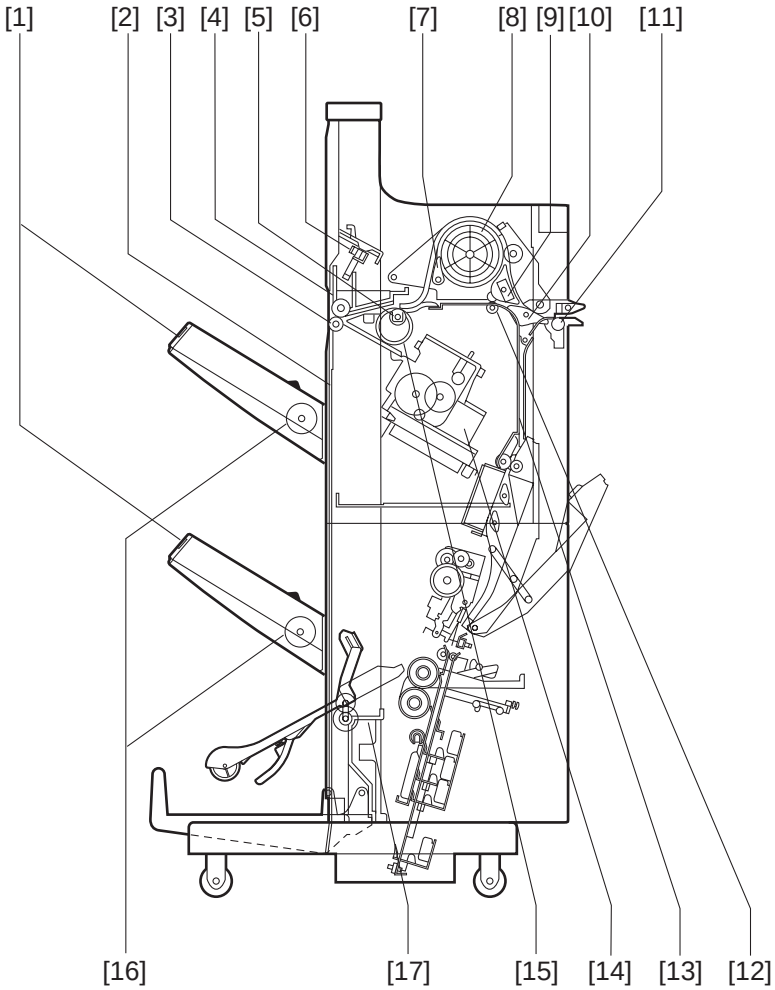


Figure 1-202

B. Cross Section

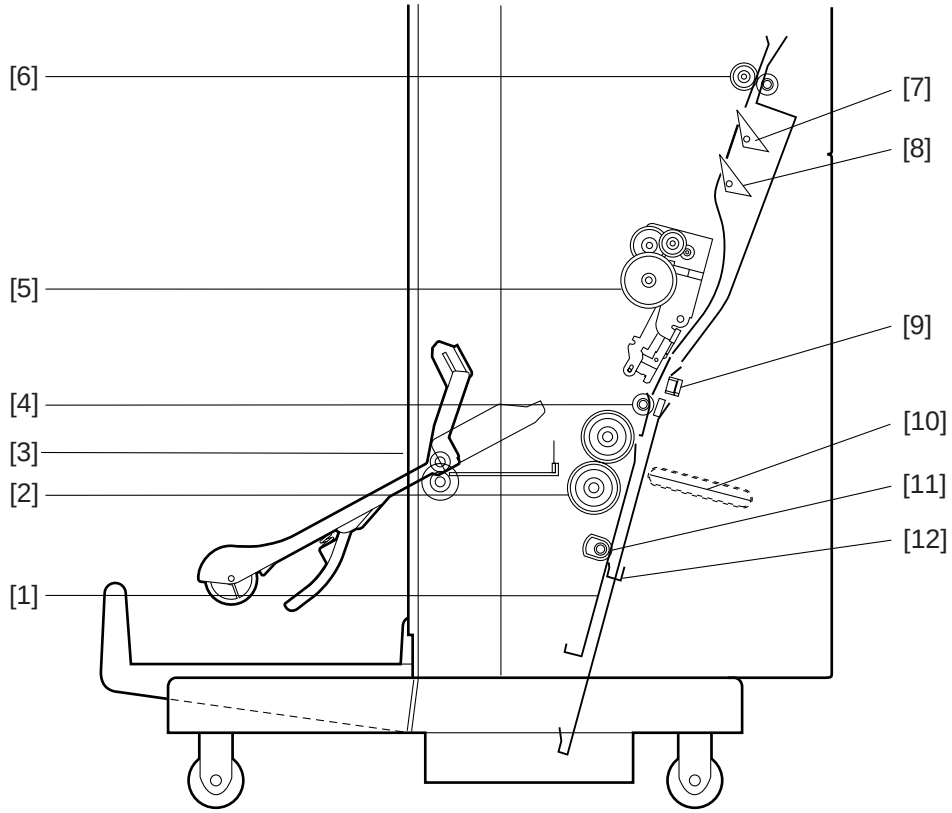
1. Finisher Unit



[1] Tray 1/2
[2] Shutter
[3] Delivery roller
[4] Swing guide
[5] Feed roller 2
[6] Height sensor
[7] Wrap flapper
[8] Buffer roller
[9] Buffer inlet flapper
[10] Saddle stitcher flapper
[11] Inlet feed roller
[12] Feed roller 1
[13] Vertical path
[14] Stapler
[15] Knurled belt
[16] Tray lift motor
[17] Saddle stitcher unit

Figure 1-203

2. Saddle Stitcher Unit



[1] Guide plate
[2] Paper folding roller
[3] Delivery guide plate
[4] Holding roller
[5] Stitcher (front, rear)
[6] Inlet roller
[7] No.1 flapper
[8] No. 2 flapper
[9] Stitcher mount
[10] Paper pushing plate
[11] Crescent roller
[12] Paper positioning plate

Figure 1-204

III. Using the Machine

A. Removing Paper Jams from the Finisher Unit

If the host machine indicates the finisher paper jam message, perform the following to remove the jam.

1) Pushing the finisher unit as shown, move it to detach it from the host machine.

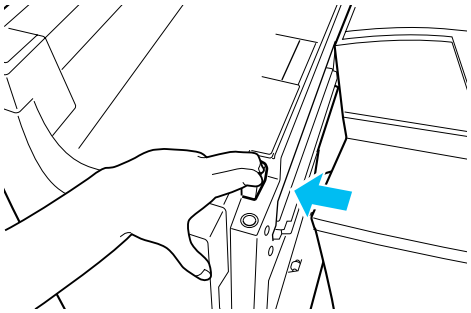


Figure 1-301

2) Remove any jam visible from the outside.

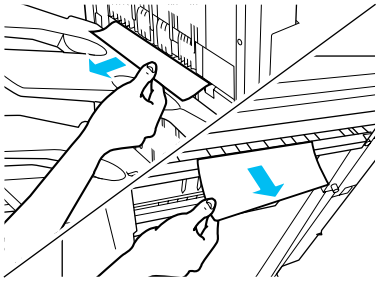


Figure 1-302

3) Open the upper cover, and check the inside of the finisher.

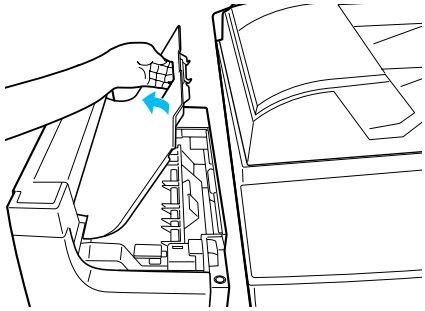


Figure 1-303

4) Lift the buffer roller cover, and remove the jam.

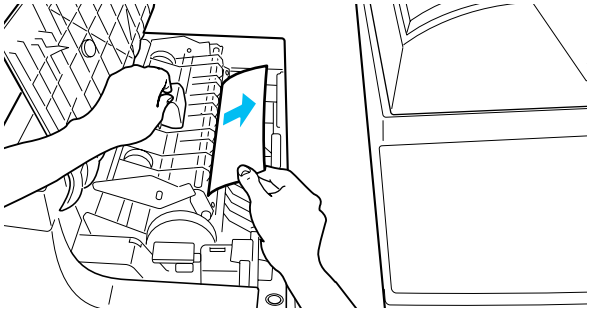


Figure 1-304

5) Lift the buffer roller, and remove the jam.

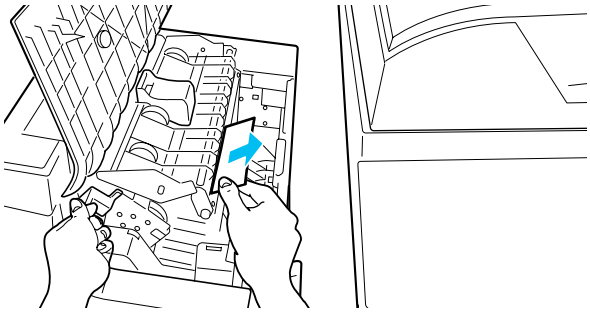


Figure 1-305

6) Return the buffer roller and the buffer roller cover to their original positions, and close the upper cover.

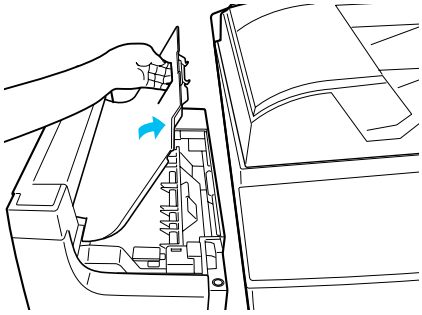


Figure 1-306

7) Connect the finisher to the host machine.

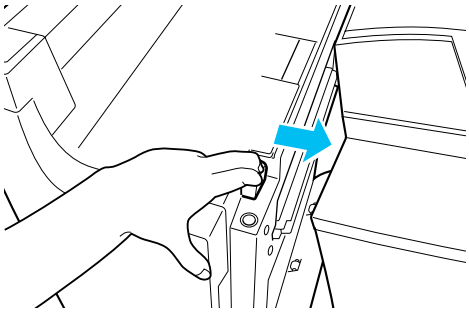


Figure 1-307

8) Operate as instructed on the display.

B. Supplying the Finisher Unit with Staples

If the host machine indicates the finisher unit staple supply message, perform the following to supply it with staples.

1) Open the front cover.

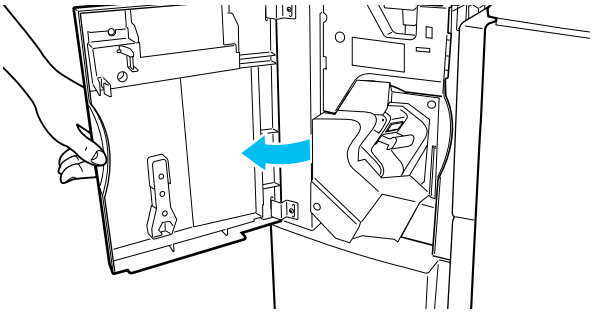


Figure 1-308

2) Lift up and pull the blue lever in the stapler, and slide out the staple cartridge.

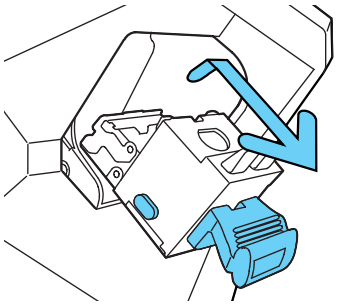


Figure 1-309

3) Push the buttons ① to open the cover ② of the staple cartridge.

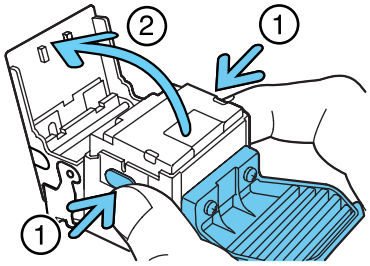


Figure 1-310

4) Remove the empty staple case ① upward from the staple cartridge, and push in a new staple case ② into the cartridge until a click is heard. Do not remove the seal holding the staples until the staple case is set in the cartridge.

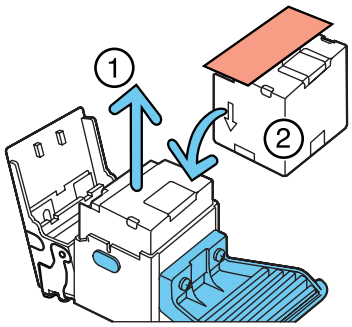


Figure 1-311

Reference:

You may set no more than one staple cartridge at a time.
Make sure that the new cartridge is one specifically designed for the finisher unit.

5) Pull out the seal ① holding the staples straight upward, and close the cover ② manually.

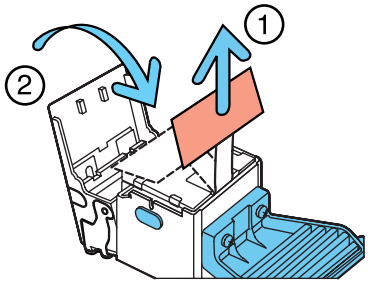


Figure 1-312

6) Return the staple cartridge to its original position until it is caught by the claw and fixed with a click sound, and slightly push the lever down.

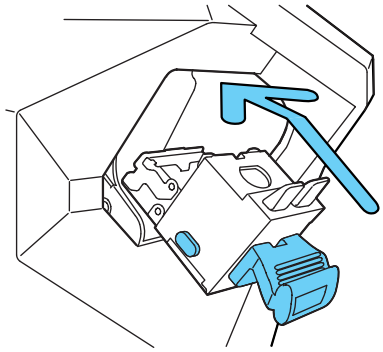


Figure 1-313

7) Close the front cover of finisher.

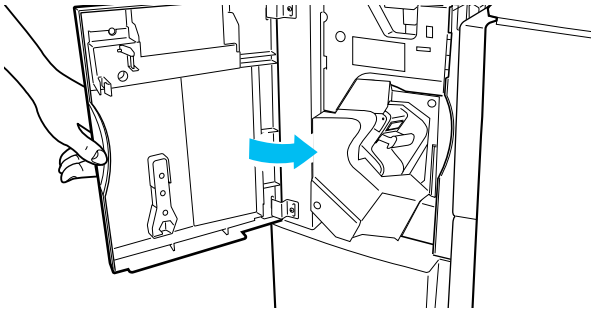


Figure 1-314

Note:

After the type of staple cartridge is switched, be sure to turn off the power then turn it on.

C. Removing Staple Jams from the Finisher Unit

If the host machine indicates the finisher unit staple jam message, perform the following to remove the jam.

1) Remove the stack waiting to be stapled from the delivery tray.

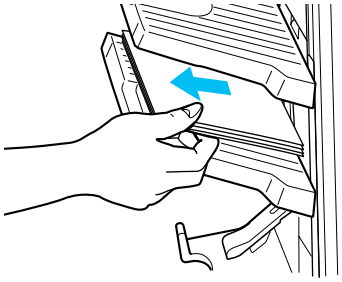


Figure 1-315

2) Open the front cover.

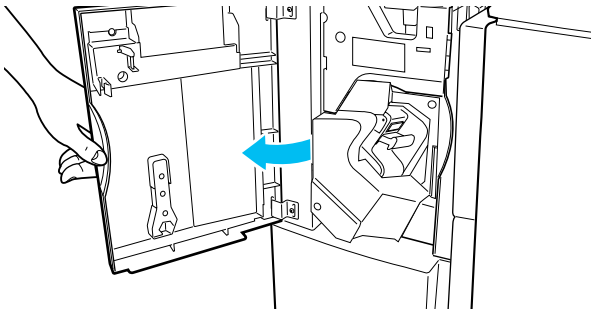


Figure 1-316

3) Lift up and pull the blue lever in the stapler, and slide out the staple cartridge.

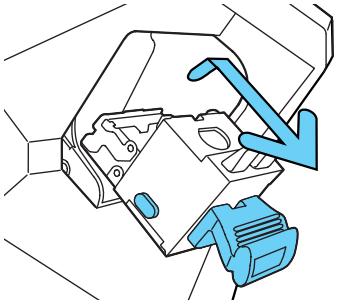


Figure 1-317

4) Shift down the tab on the staple cartridge.

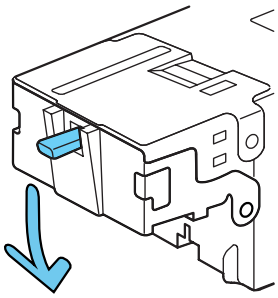


Figure 1-318

5) Remove all staples that have slid out of the staple case.

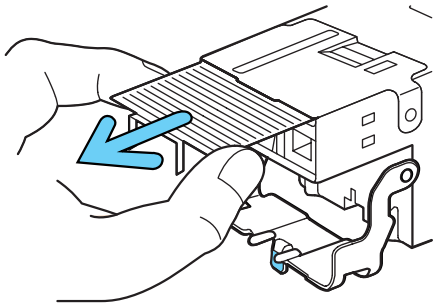


Figure 1-319

6) Return the tab on the staple cartridge to its original position.

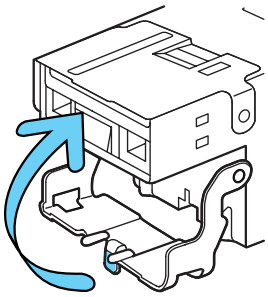


Figure 1-320

7) Return the staple cartridge to its original position until it is caught by the claw and fixed with a click sound, and close the front cover of finisher.

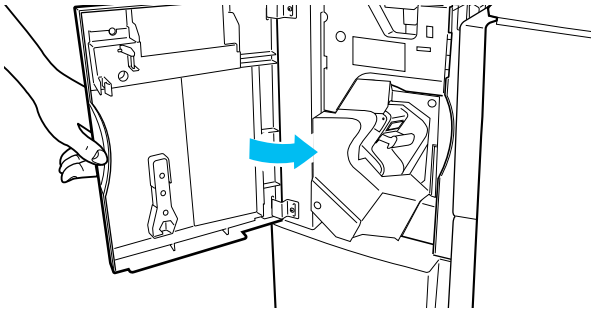


Figure 1-321

Reference

When the cover has been closed, the stapler unit will automatically execute idle punching several times to advance the staples.

D. Removing Paper Jams from the Saddle Stitcher Unit

If the host machine indicates the saddle stitcher unit paper jam message, perform the following to remove the jam.

1) Holding the saddle stitcher unit as shown, move it to detach it from the host machine.

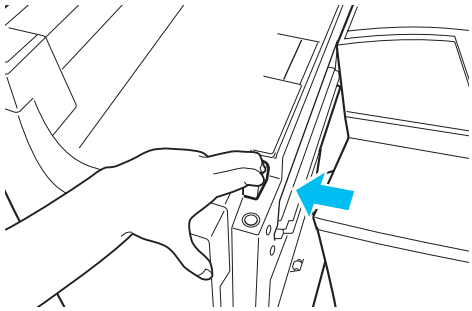


Figure 1-322

2) Open the front lower cover.

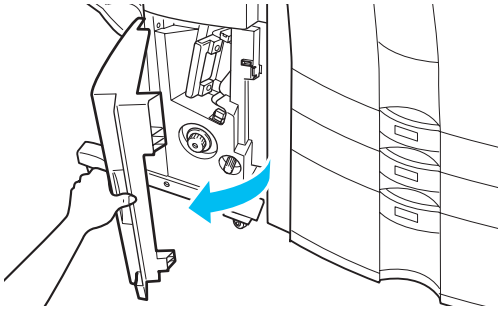


Figure 1-323

3) Turn the knob in the counter clockwise.

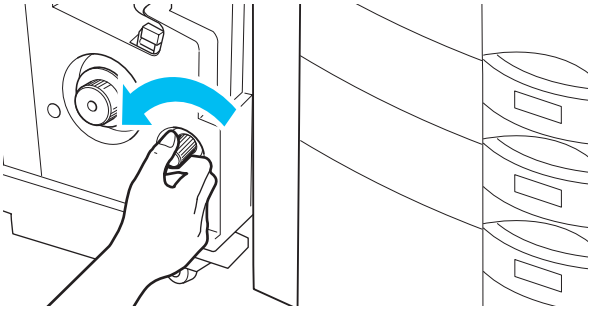


Figure 1-324

4) Turn the knob in the clockwise while pushing it in.

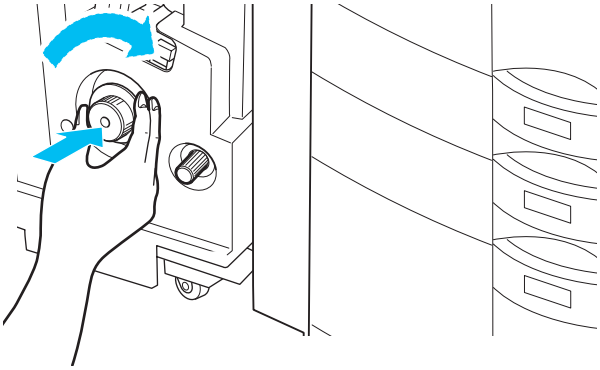


Figure 1-325

5) Remove the jam.

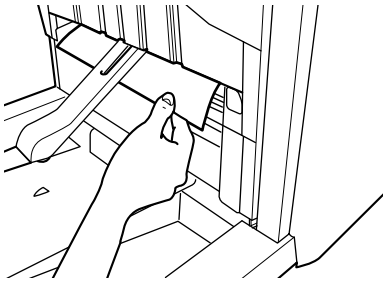


Figure 1-326

6) Open the inlet cover, and remove the jam.

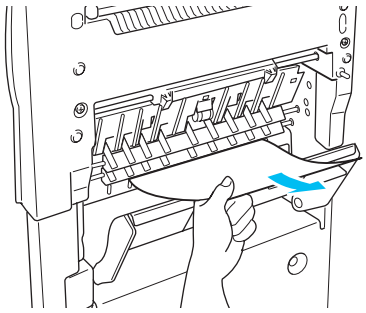


Figure 1-327

7) Close the front lower cover.

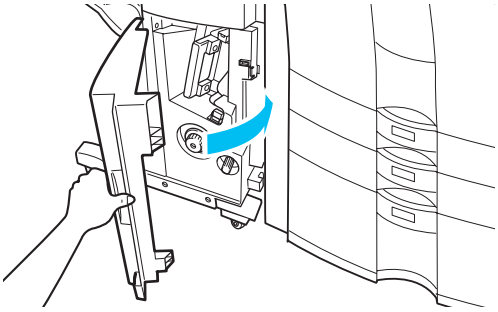


Figure 1-328

8) Connect the finisher unit.

9) Operate as instructed on the display.

E. Supplying the Saddle Stitcher Unit with Staples

If the host machine indicates the saddle stitcher unit staple supply message, perform the following to supply it with staples.

1) Open the front lower cover.

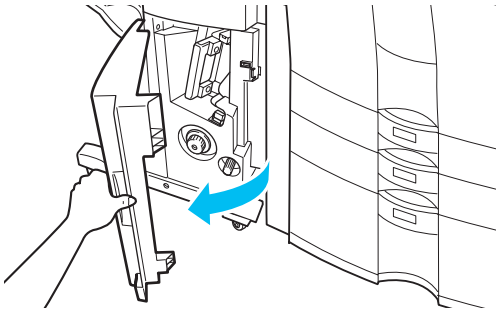


Figure 1-329

2) Slide out the stitcher unit.

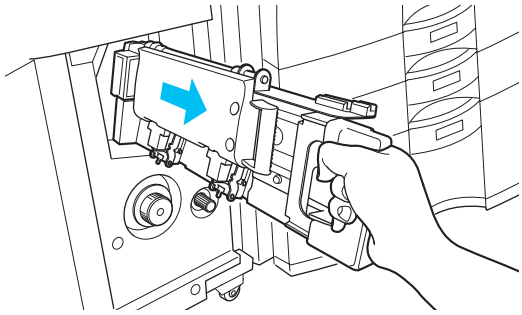


Figure 1-330

3) Pull the stitcher unit to the front once, and then shift it up.

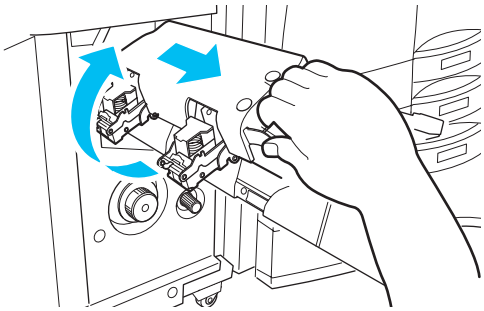


Figure 1-331

4) Hold the empty cartridge on its sides, and remove it.

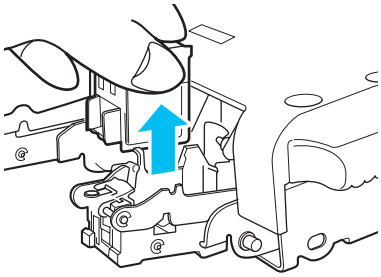


Figure 1-332

5) Set a new cartridge.

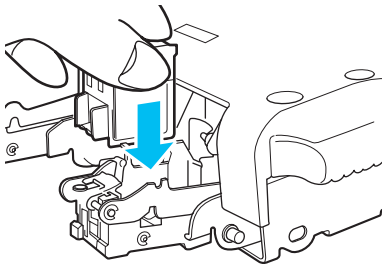


Figure 1-333

Reference

You must always replace both cartridges at the same time.

6) Pull the stitcher to the front once, and then return it to its original position.

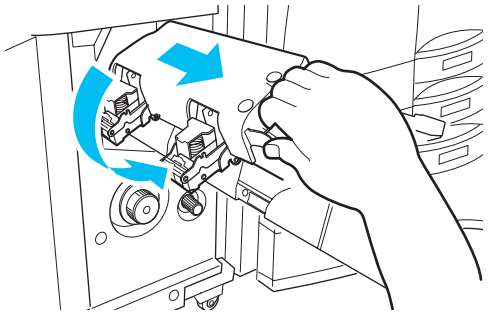


Figure 1-334

7) Push in the stitcher unit, and close the front cover.

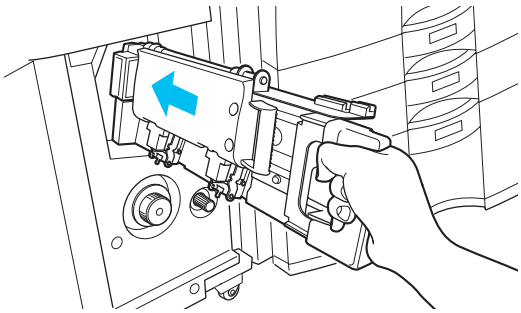


Figure 1-335

F. Removing Staple Jams from the Saddle Stitcher Unit

If the host machine indicates the saddle stitcher unit staple jam message, perform the following to remove the jam.

1) Open the front lower cover.

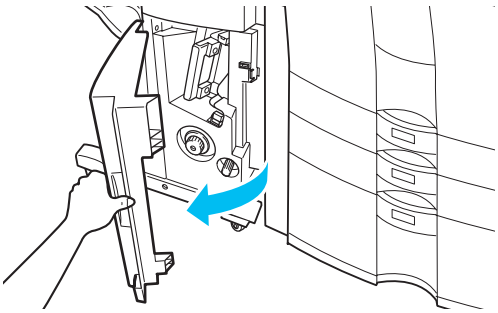


Figure 1-336

2) Slide out the stitcher unit.

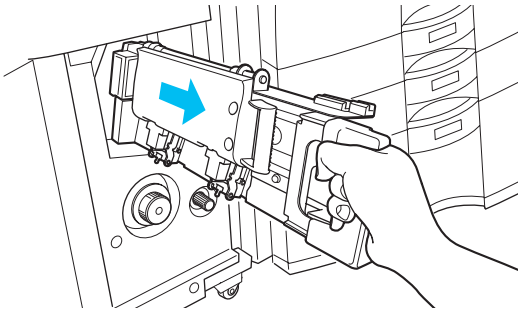


Figure 1-337

3) Pull the stapler of the stitcher unit to the front once, and then shift it up.

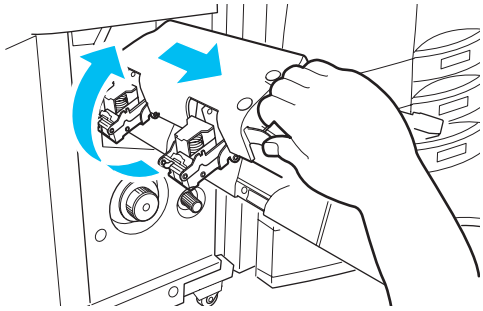


Figure 1-338

4) Hold the cartridge on its sides, and remove it.

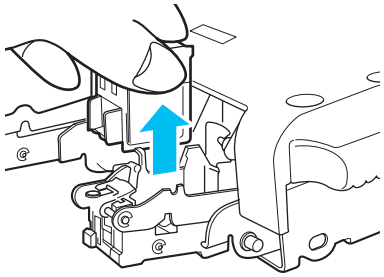


Figure 1-339

5) Push down on the area identified as A, and pull up the tab identified as B.

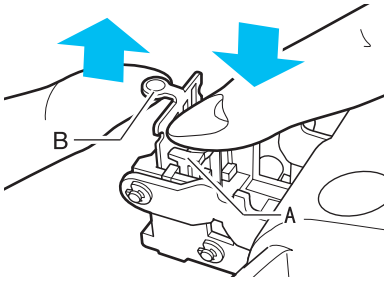


Figure 1-340

6) Remove the staple jam, and return the tab B to its original position.

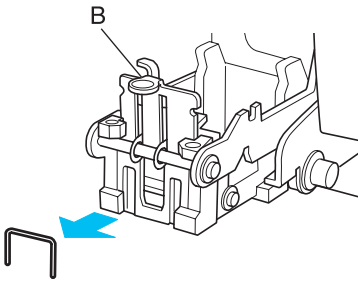


Figure 1-341

7) Return the cartridge to its original position.

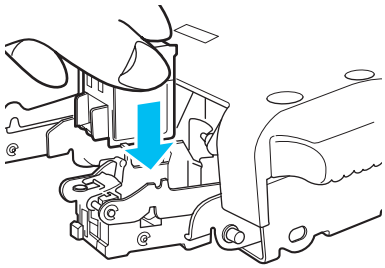


Figure 1-342

8) Pull the stitcher of the stitcher unit to the front once, and then return it to its original position.

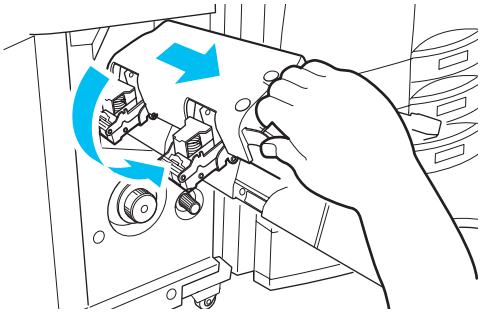


Figure 1-343

9) Push the stitcher unit back to its original position, and close the front lower cover.

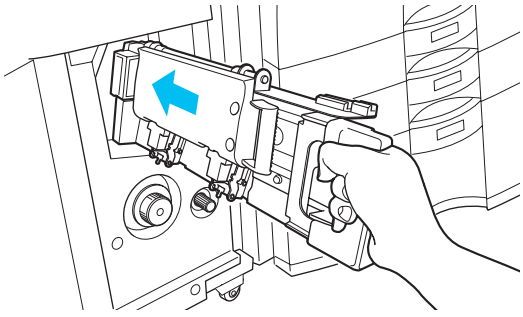


Figure 1-344

Reference

Whenever you have removed a staple jam, be sure to execute staple edging.

IV. MAINTENANCE BY THE USER

A. Maintenance by the User

No.	Item	Timing
1	Replacing the staple cartridge (finisher unit)	When the appropriate indication is made on the host machine's display.
2	Replacing the staple cartridge (saddle stitcher unit)	

Caution:

1. Use different type of staple cartridge for the finisher unit and the saddle stitcher unit.
2. There are two types of staple cartridge for 50 sheets and 100 sheets in the finisher unit.
3. After the type of staple cartridge is switched in the finisher unit, be sure to turn off the power then turn it on.

Table 1-401

CHAPTER 2

FINISHER UNIT BASIC OPERATION

1. This chapter discusses the purpose and role of each of the finisher's functions, and the principles of operation used for the finisher mechanical and electrical systems. It also explains the timing at which these systems are operated.The ▮▮▮ symbol in drawings indicates transmission of mechanical drive, and signals marked by ⟶ together with the signal name indicates the flow of electrical signals.

2. In descriptions of digital circuits on the finisher, "1" indicates a high signal voltage level, while "0" indicates a low signal voltage level. Voltage values differ according to circuit.

   A microprocessor is used on the finisher. A description of microprocessor operation is omitted in this chapter as it is practically impossible to check internal operation of the microprocessor.

   Descriptions in this chapter also assume that PCBs will not be repaired at user sites. For this reason, descriptions of circuits on PCBs is limited to block diagrams. Two types of block diagrams are provided for separate functions: diagrams indicating details from sensors up to input sections of major PCBs, and diagrams indicating details from the output sections of major PCBs up the loads.

I. BASIC OPERATION

A. Outline

The finisher is designed to deliver copies arriving from its host machine, and its modes of delivery include simple stacking, job offset (Note), and staple.

All operations involved in these modes are controlled by the finisher controller PCB, according to the appropriate commands from the host machine.

In the case of the saddle stitch mode, copies from the host machine may be routed to the saddle stitcher unit.

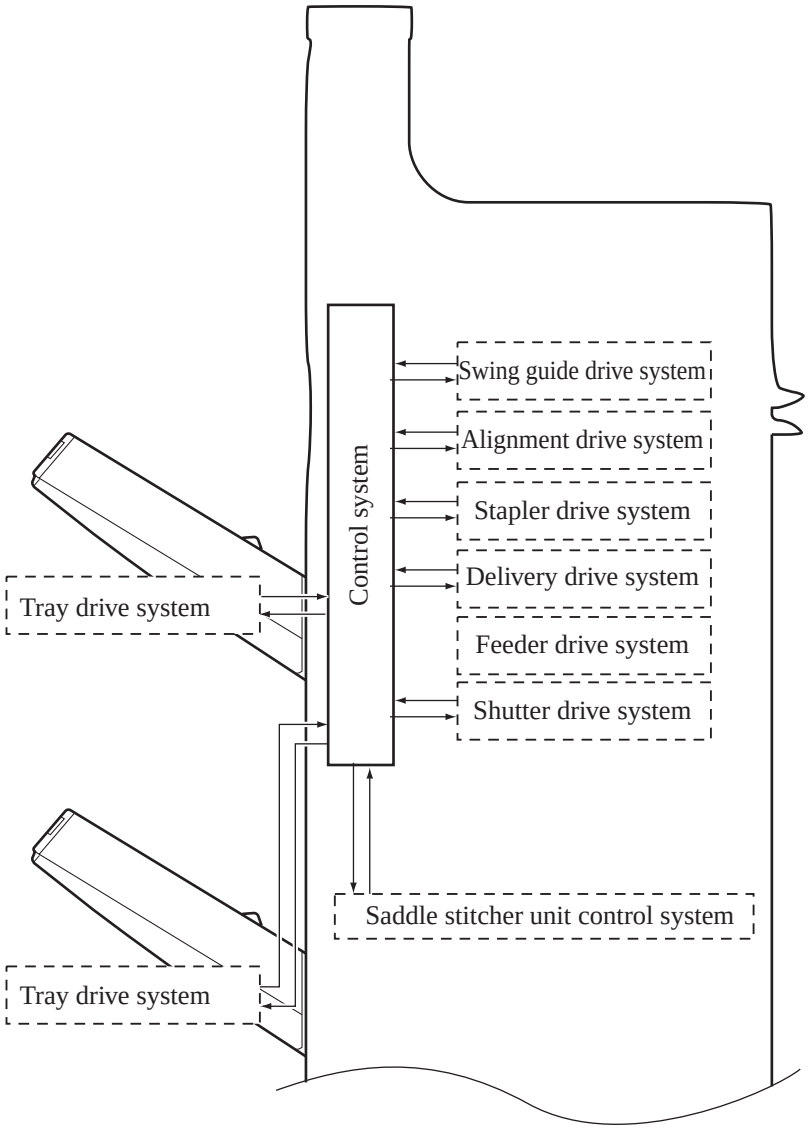


Figure 2-101

Note:
The term job offset refers to shifting each sorting job, separating a single stack into several stacks.

B. Outline of Electrical Circuitry

The finisher's sequence of operation is controlled by the finisher controller PCB. The finisher controller PCB is a 16-bit microprocessor (CPU), and is used for communication with the host machine (serial) in addition to controlling the finisher's sequence of operations.

The finisher controller PCB responds to the various commands coming from the host machine through a serial communications line to drive solenoids, motors, and other loads. In addition, it communicates the finisher's various states (information on sensors and switches) to the host machine through a serial communications circuit.

The finisher controller PCB not only communicates with the saddle stitcher controller PCB but also communicates the saddle stitcher unit's various states (information on sensors and switches) to the host machine.

The ICs used on the finisher controller PCB are designed for the following:

- IC1 (CPU)
  Controls sequence of operations.
- IC2 (EP-ROM)
  Backs up adjustment values.
- IC3
  Contains sequence programs.
- IC6/IC7 (RAM)
  Backs up initial setting data.
- IC4 (communications IC)
  Communicates with the host machine and the saddle stitcher unit.
- IC9 (regulator IC)
  Generates PWM.

Figure 2-102 shows the flow of signals between the finisher and the options controller.

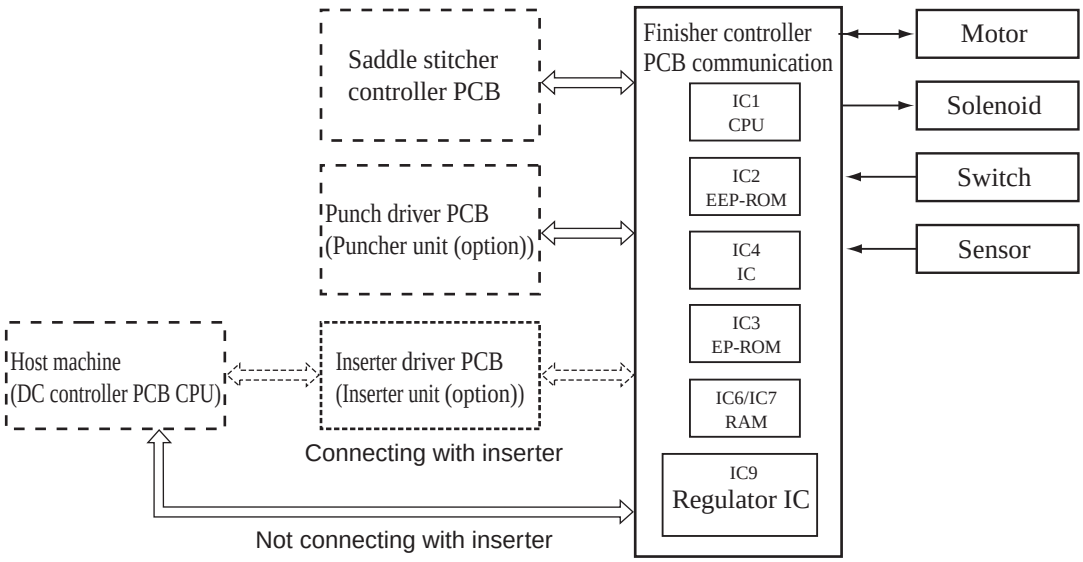

Saddle stitcher controller PCB
Punch driver PCB (Puncher unit (option))
Host machine (DC controller PCB CPU)
Inserter driver PCB (Inserter unit (option))
Connecting with inserter
Not connecting with inserter
Finisher controller PCB communication
IC1 CPU
IC2 EEP-ROM
IC4 IC
IC3 EP-ROM
IC6/IC7 RAM
IC9 Regulator IC
Motor
Solenoid
Switch
Sensor

Figure 2-102

C. Inputs to and Outputs from the Finisher Controller PCB

1. Inputs to the Finisher Controller PCB

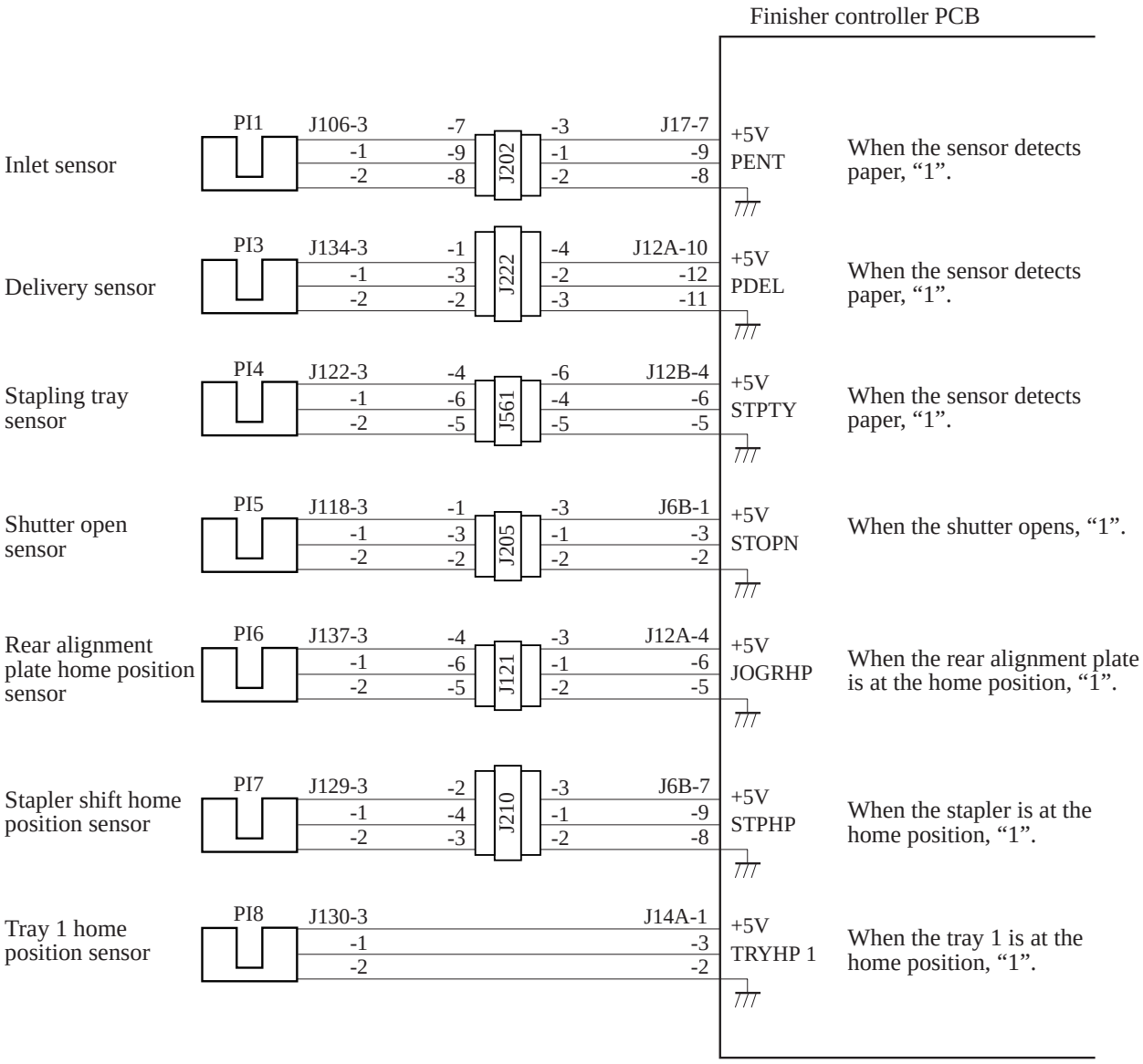


Figure 2-103

2. Inputs to the Finisher Controller PCB

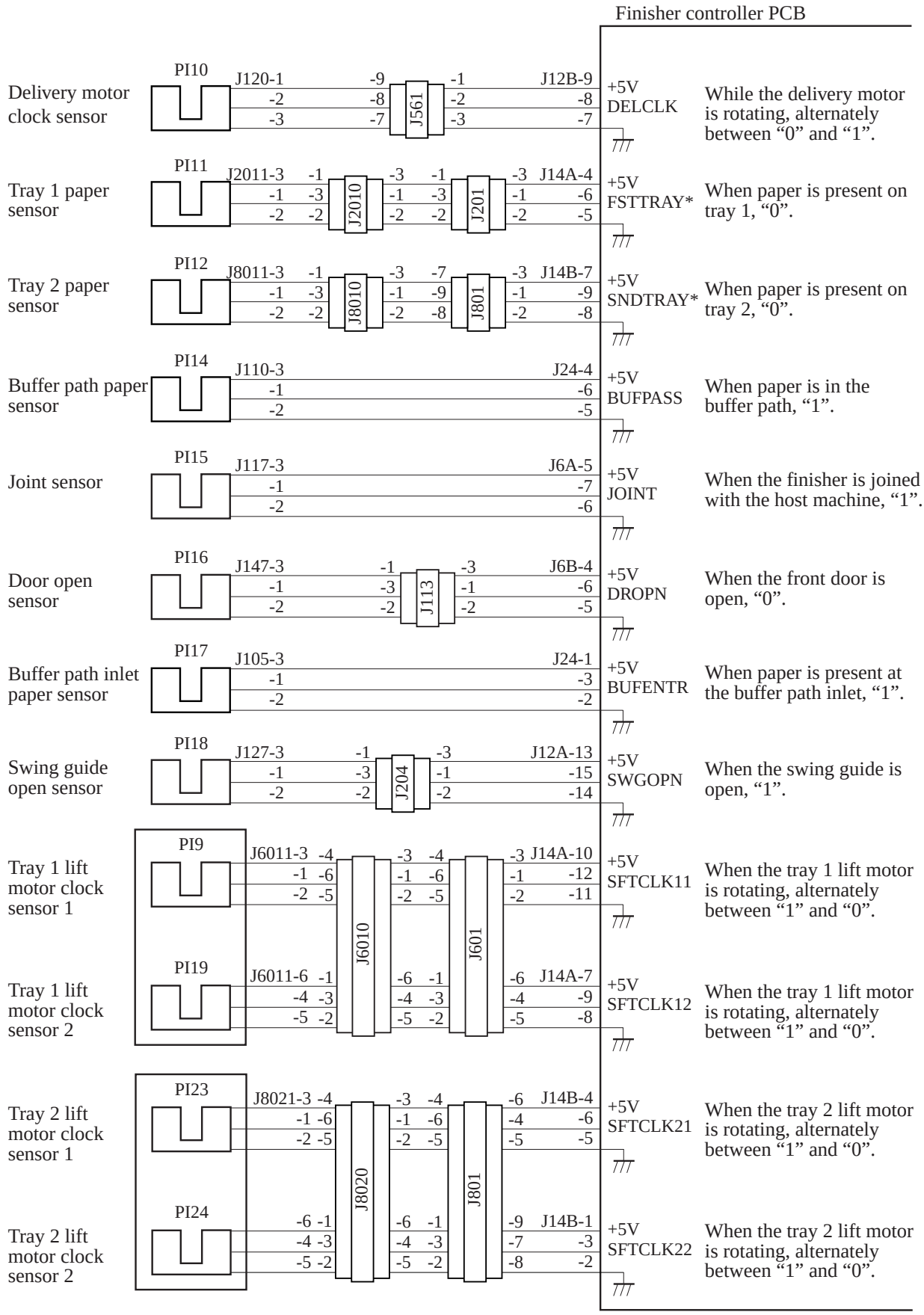


Figure 2-104

3. Inputs to the Finisher Controller PCB

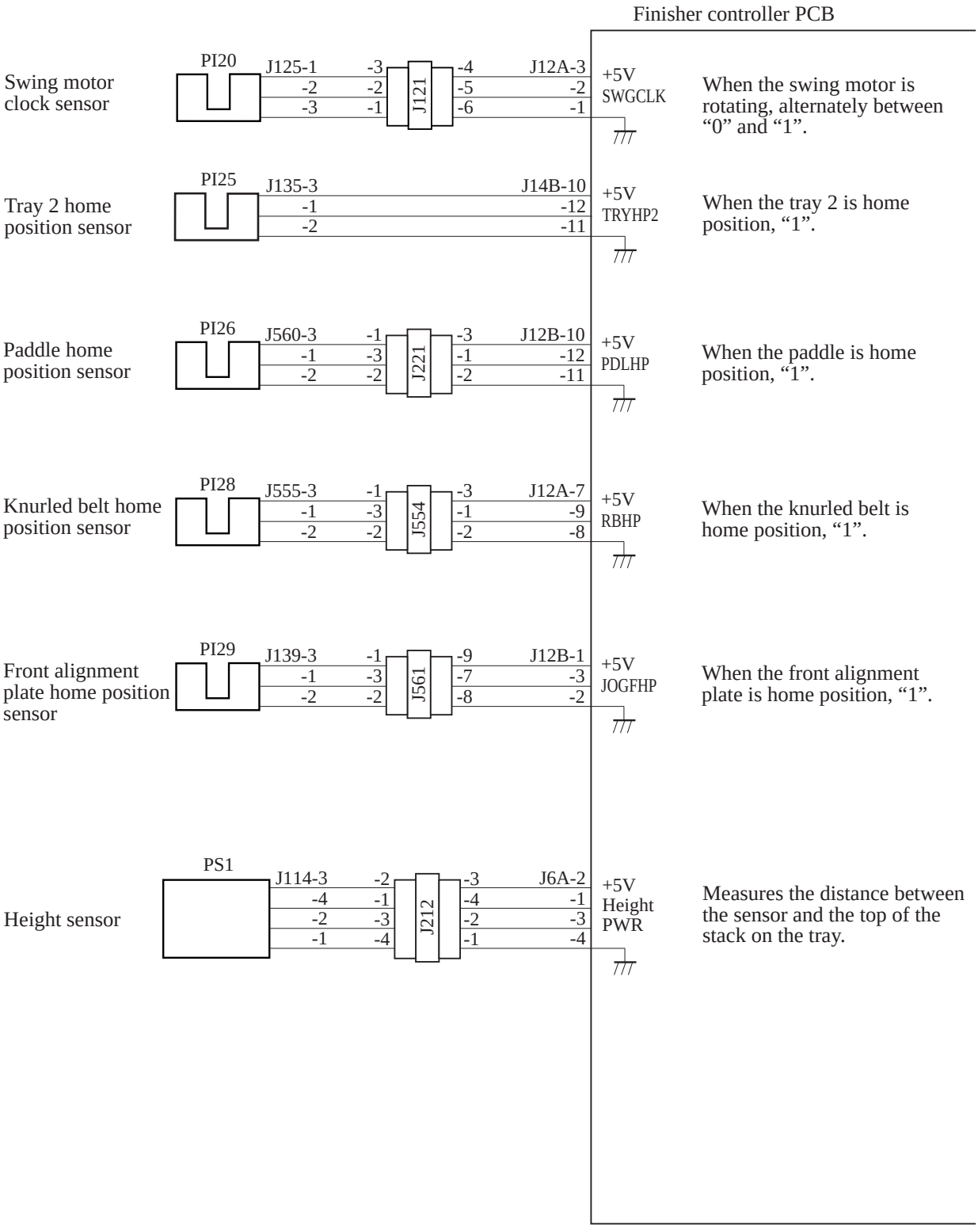


Figure 2-105

4. Inputs to and Outputs from the Finisher Controller PCB

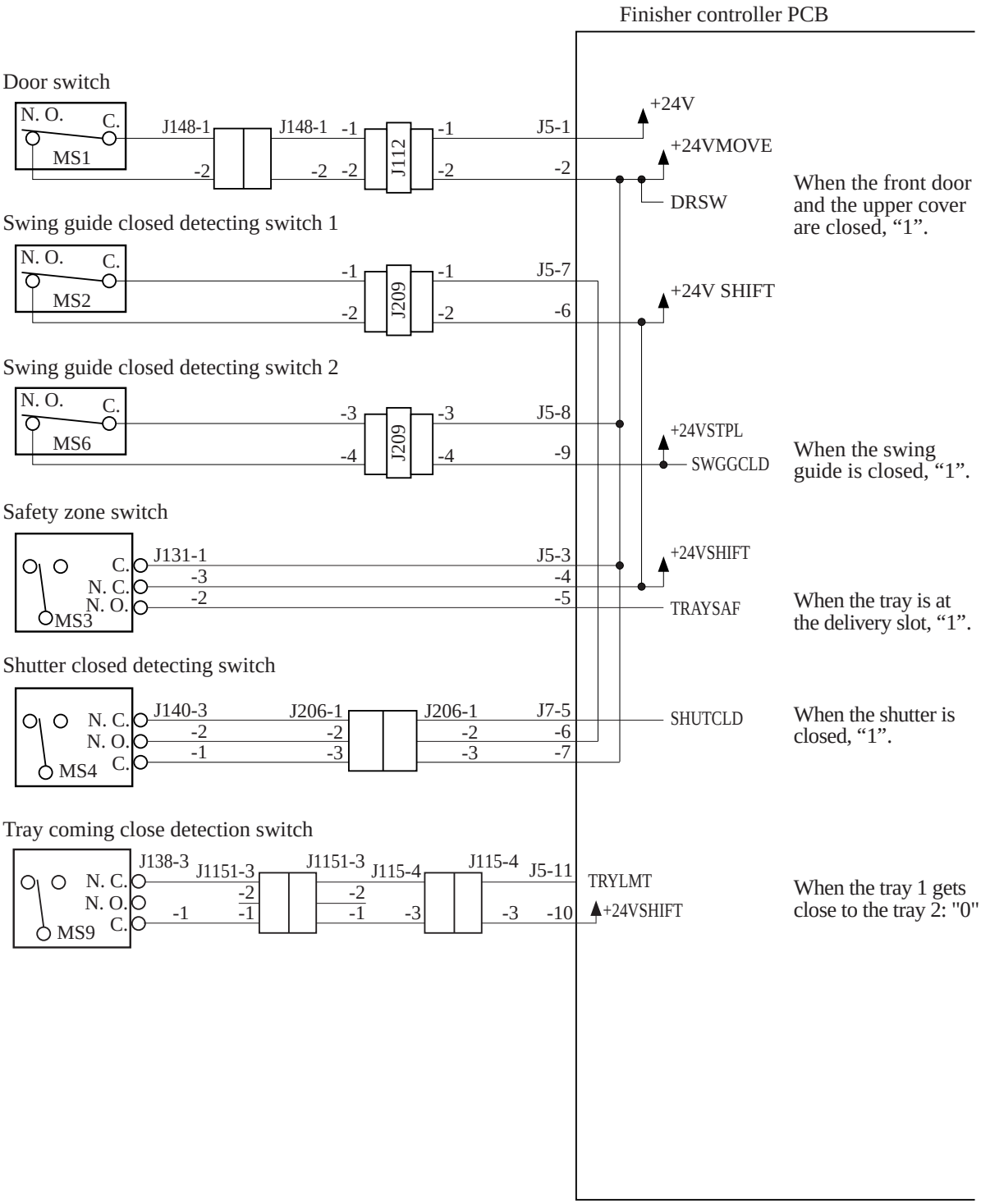


Figure 2-106

5. Outputs from the Finisher Controller PCB

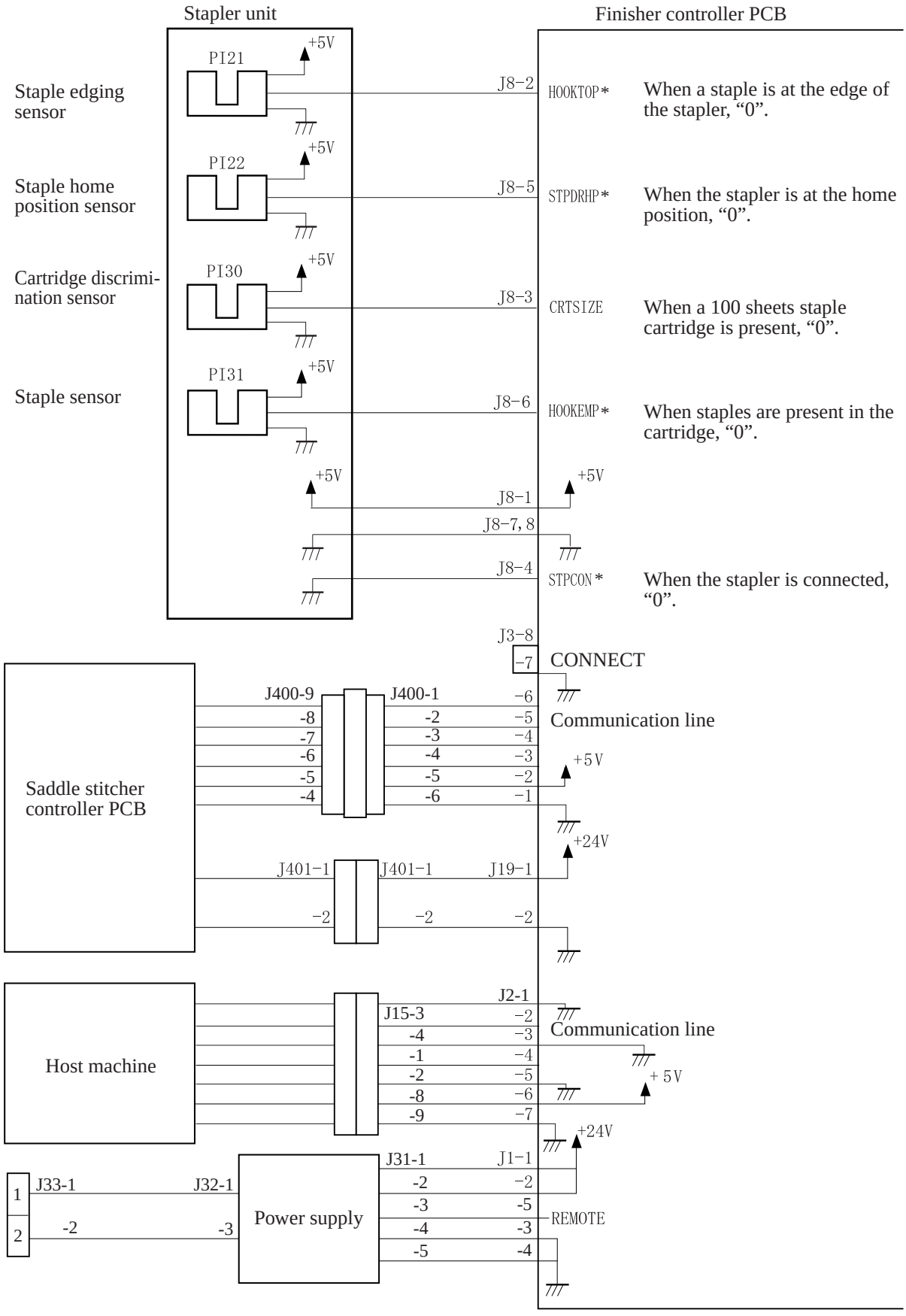


Figure 2-107

6. Outputs from the Finisher Controller PCB

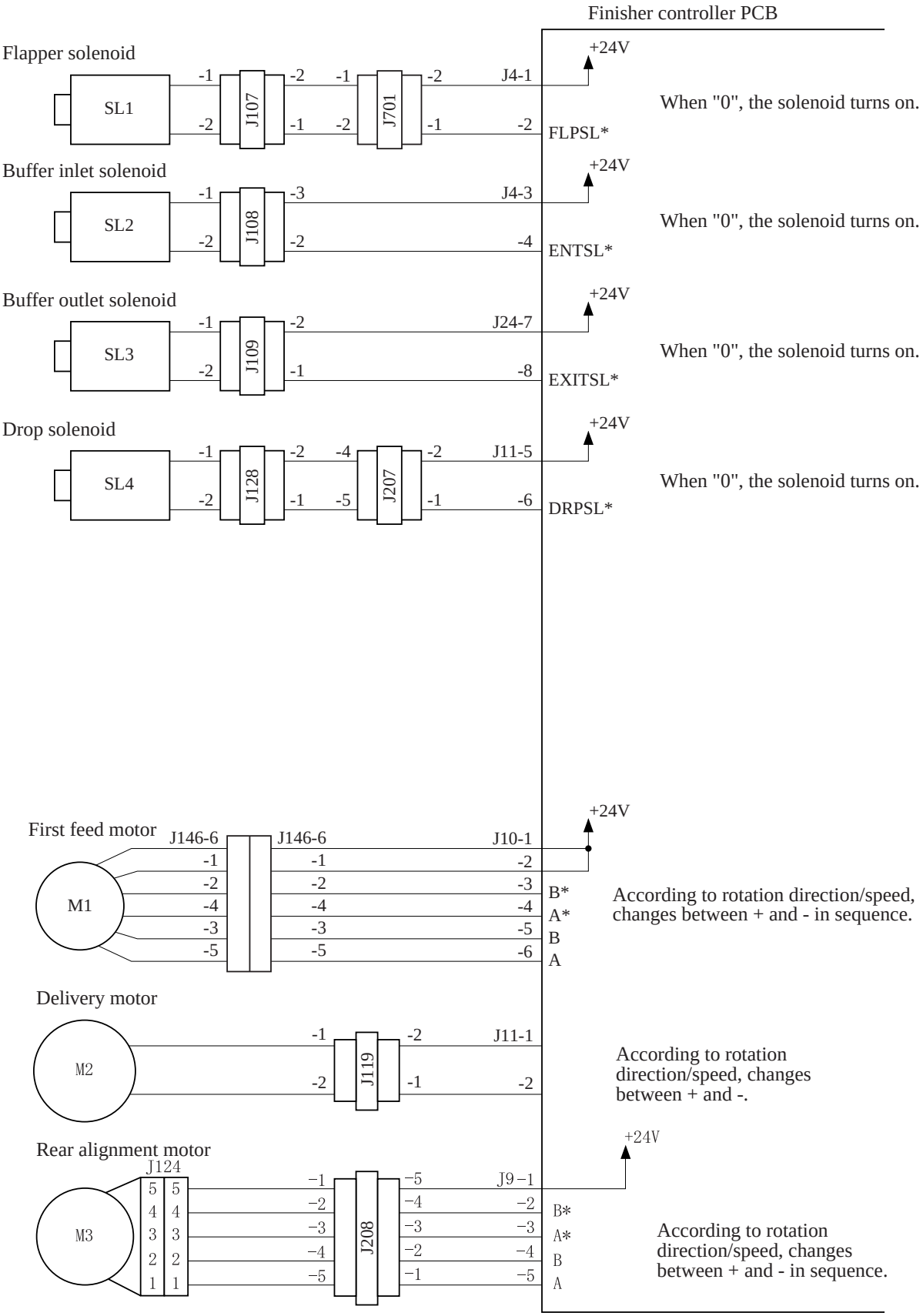


Figure 2-108

7. Outputs from the Finisher Controller PCB

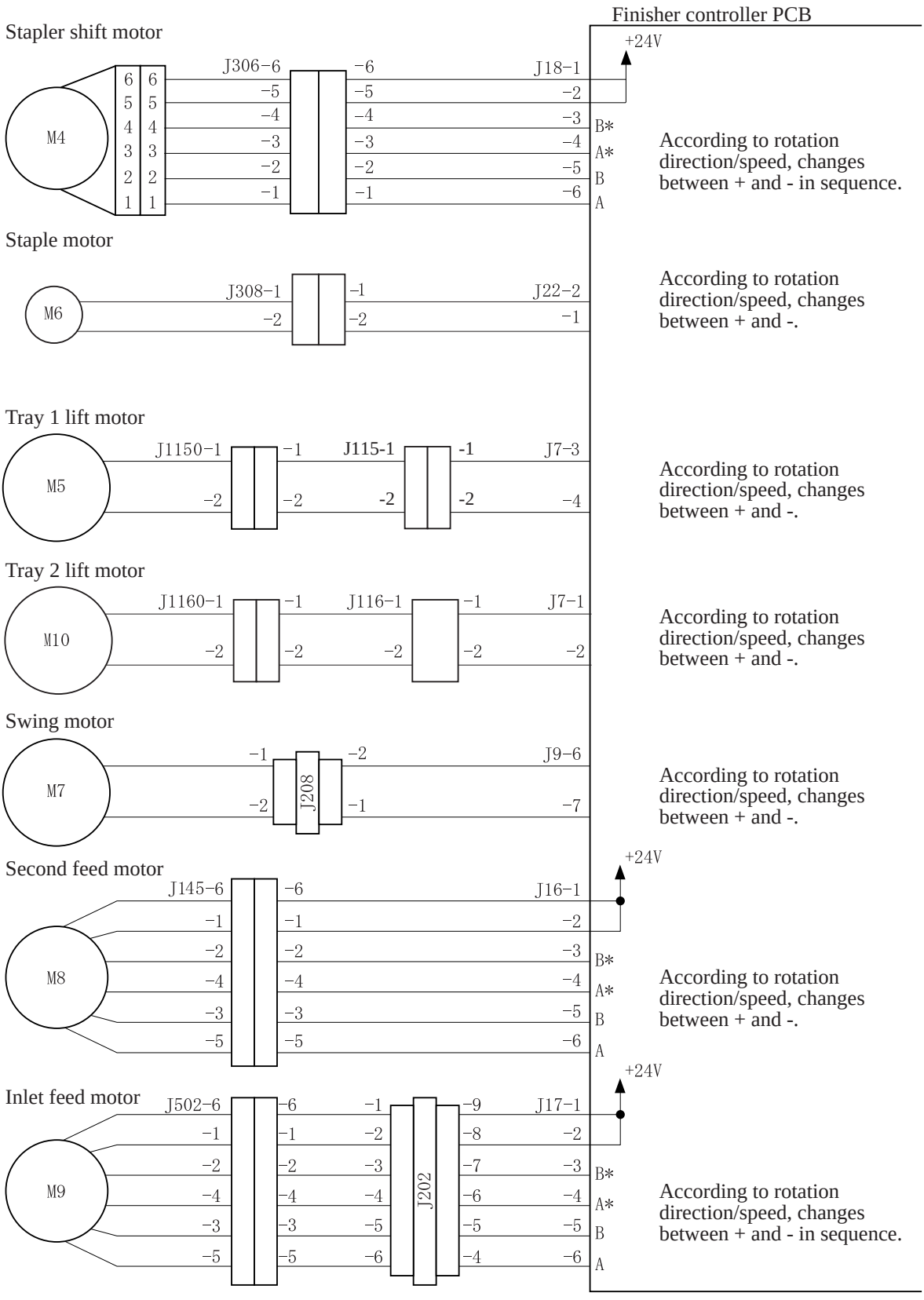


Figure 2-109

8. Outputs from the Finisher Controller PCB

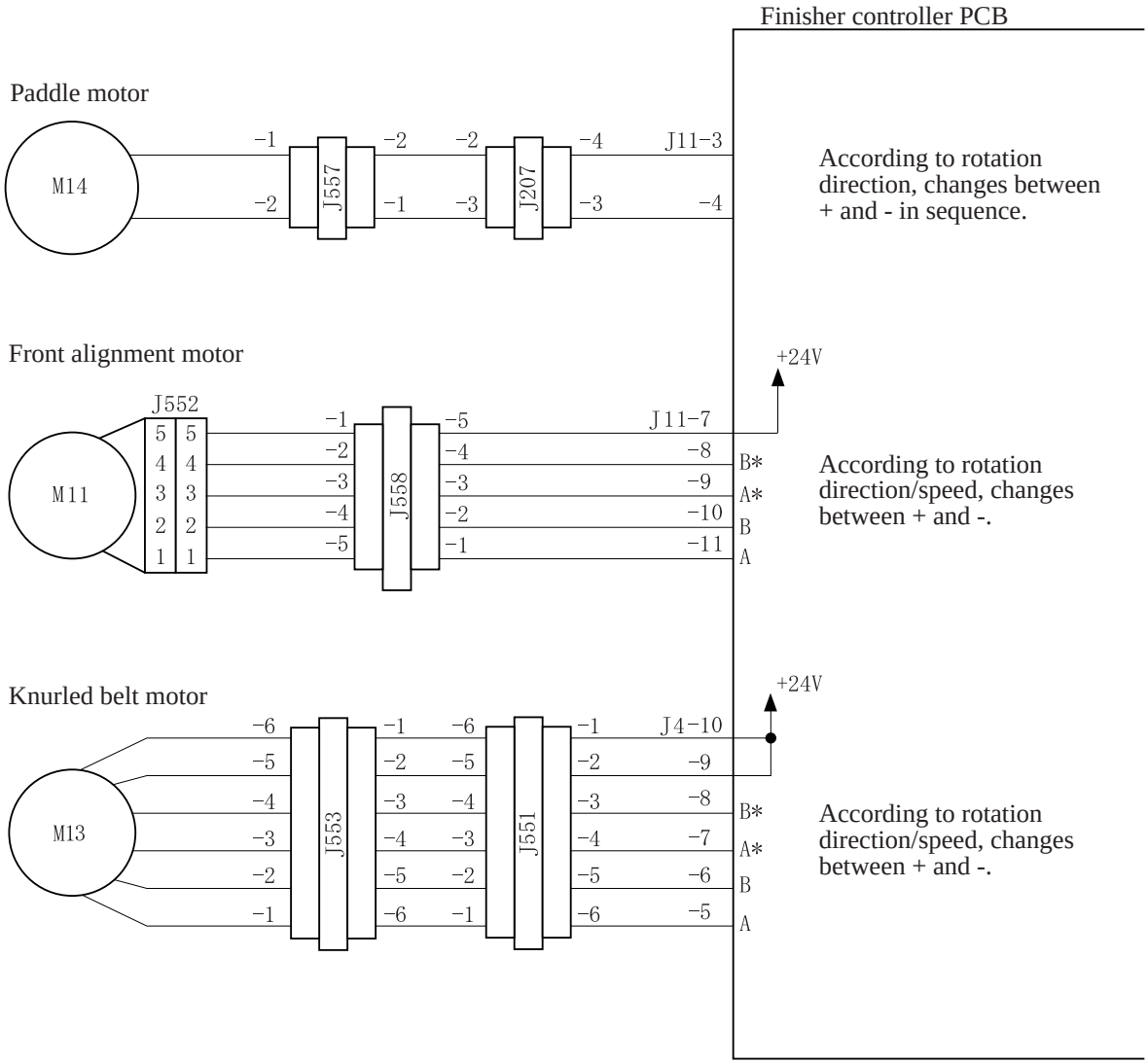


Figure 2-110

II. FEED/DRIVE SYSTEM

A. Outline

The finisher is designed to operate according to the commands from its host machine to deliver arriving copies to trays in the appropriate mode: simple stacking, job offset, stapling.

See Figure 2-201 for a diagram of the four modes of delivery.

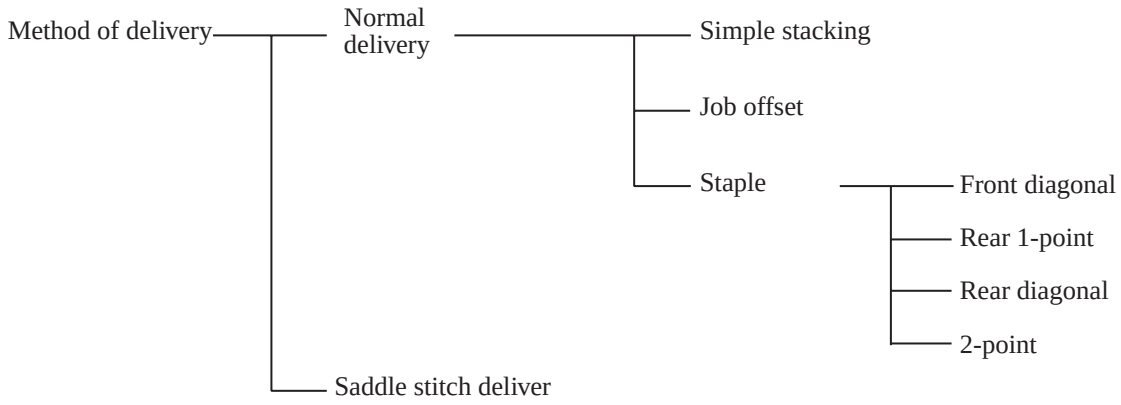


Figure 2-201

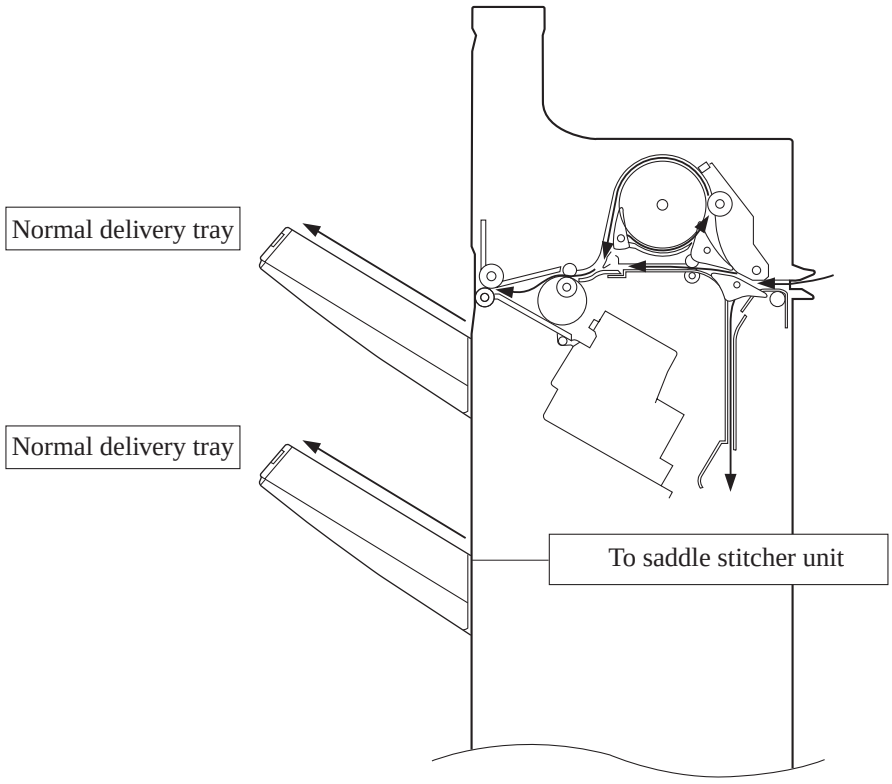


Figure 2-202

1. Normal Delivery

a. Simple Stacking

The finisher delivers copies directly to the tray.

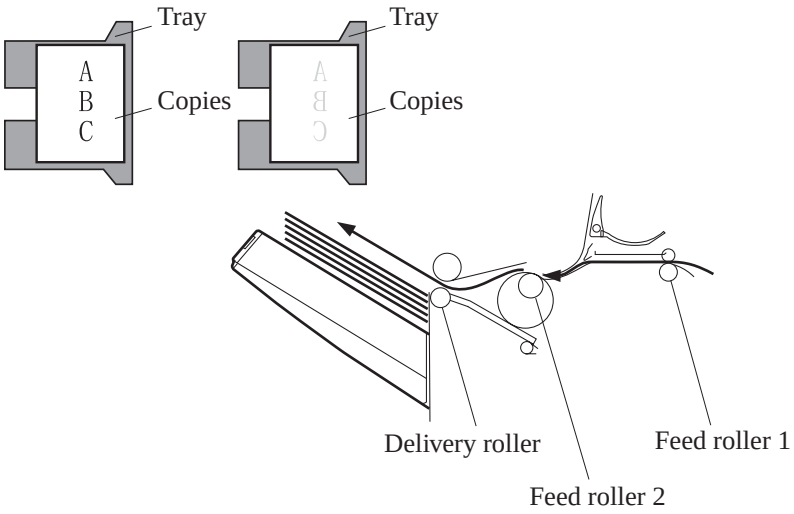


Figure 2-203

b. Job Offset

The finisher forwards all copies of each sort job to the stapling tray. The first sort job on the stapling tray is delivered with a shift to the front of about 30 mm, and the second sort job is delivered without being shifted. Whether the first copy or the last copy of a sort job should be shifted is determined by the host machine.

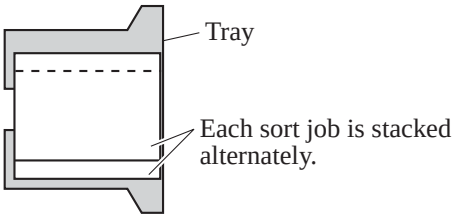


Figure 2-204

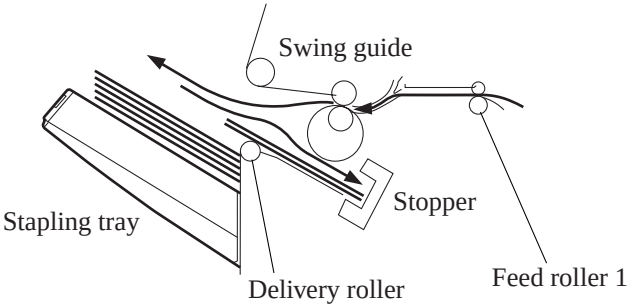


Figure 2-205

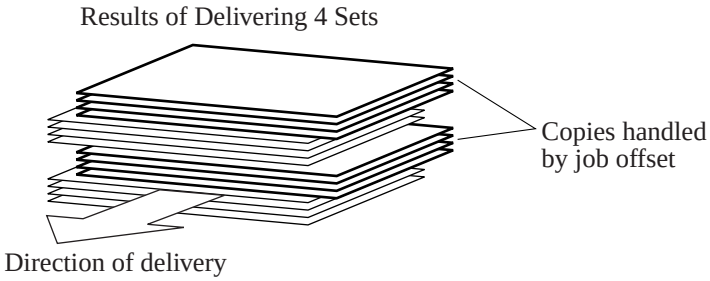


Figure 2-206

c. Stapling

The finisher stacks copies arriving from its host machine on the stapling tray. Then, it staples and delivers the copies to the appropriate tray.

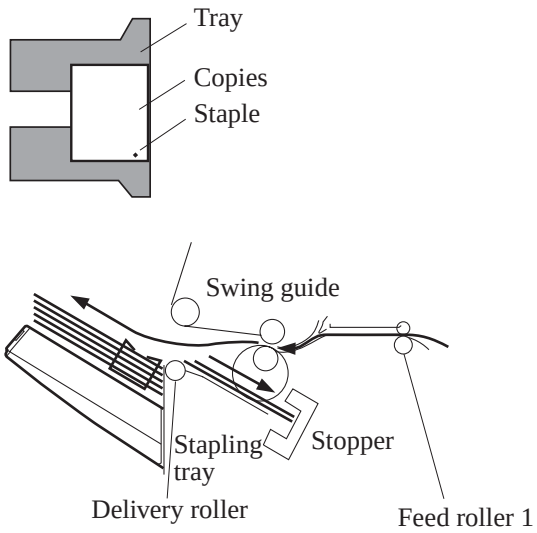


Figure 2-207

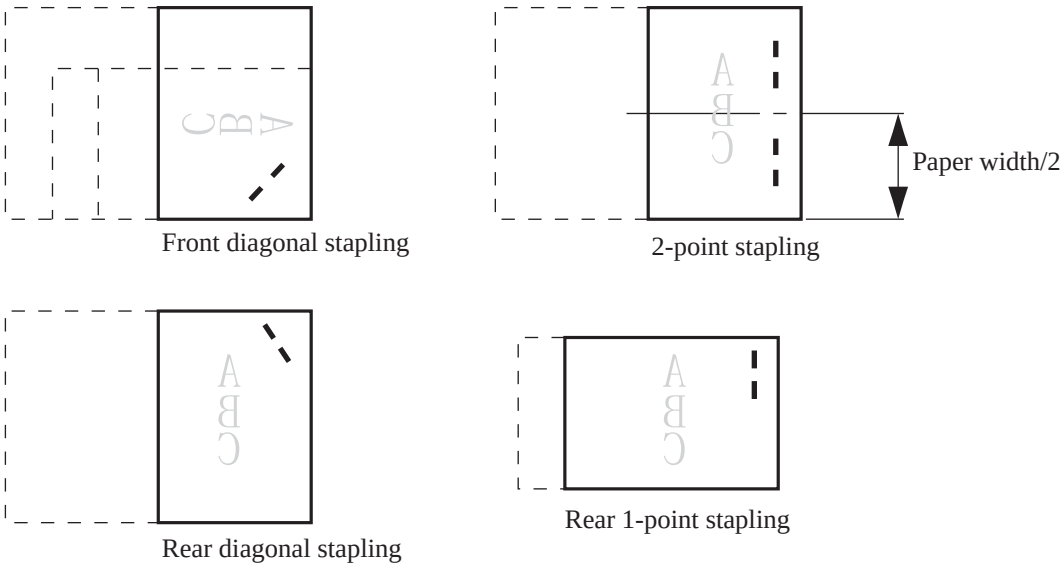


Figure 2-208

2. Saddle Stitch Delivery

A copy arriving in the finisher from the host machine is routed to the saddle stitcher by the paper deflecting plate. The saddle stitcher executes stitching and saddling operations on the copy and then delivers it to the saddle stitcher tray.

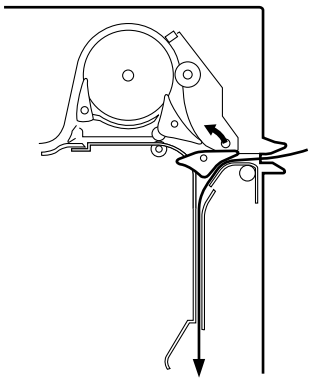


Figure 2-209

B. Type of Delivery Paths

The finisher has three different paper paths for delivery, each selected to suit paper size and delivery mode.

1. Straight Path

When stacking copies shown in Table 2-201, the copies pass under the buffer roller.

Copy size	Length or width 182 mm or less
Typical copy examples	A5-R, ST-R, thick paper

Table 2-201

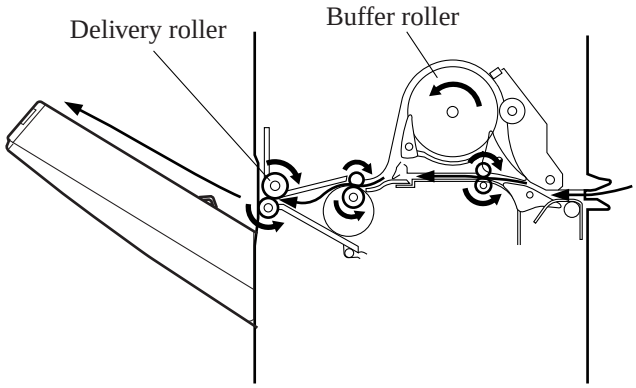


Figure 2-210

2. Buffer Paper Path 1

When stacking copies shown in Table 2-202, the copies pass over the buffer roller, increasing the distance between copies.

Copy size	Length and width 182 mm or more
Typical copy examples	A3, B4, A4, A4-R, B5, B5-R, LD, LG, LT, LT-R, (excluding transparencies and thick paper)

Table 2-202

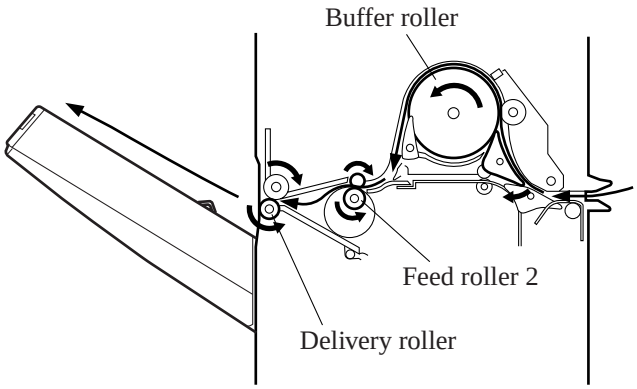


Figure 2-211

3. Buffer Paper Path 2

This is the paper path when copy sizes shown in Table 2-203 are stacked. A maximum of three copies (three originals or more in the staple mode) are wrapped round the buffer roller, during which job offset and stapling are performed on the stapling tray.

Copy size	Length 182 to 232mm, and width 182 to 297mm
Typical copy examples	A4, B5, LT, (excluding transparencies and thick paper)

Table 2-203

The following shows paper delivery operation in the case of three originals in the staple mode.

1) The first copy is moved in the direction of the buffer roller.

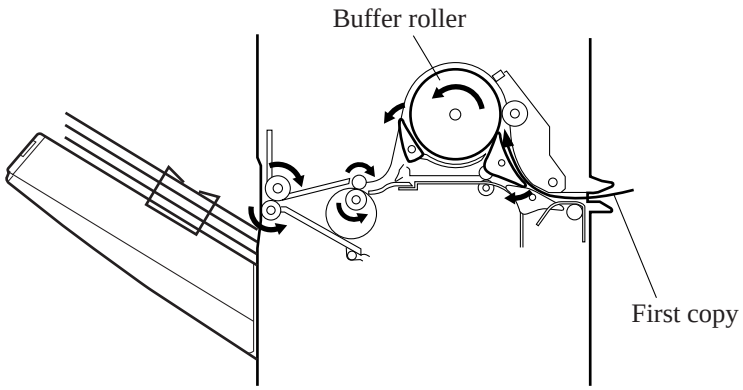


Figure 2-212

2) The first copy wraps around the buffer roller and, at the same time, the second copy arrives from the host machine.

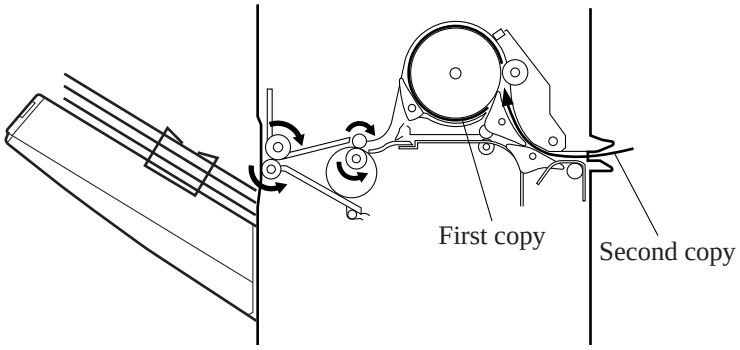


Figure 2-213

3) The second copy is laid over the first copy and, at the same time, the third copy arrives from the host machine.

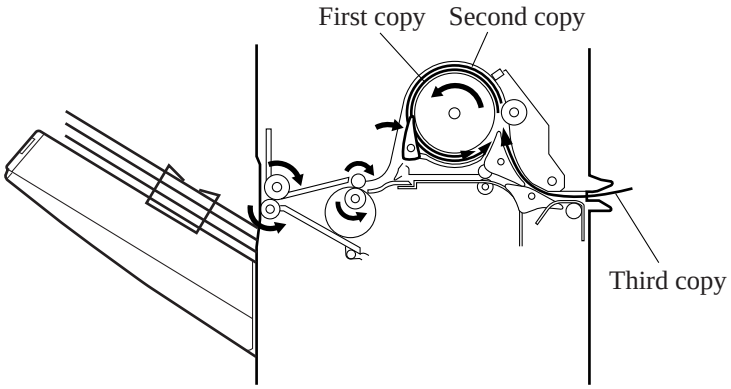


Figure 2-214

4) The first, second and third copies are simultaneously pulled into the stapling tray.

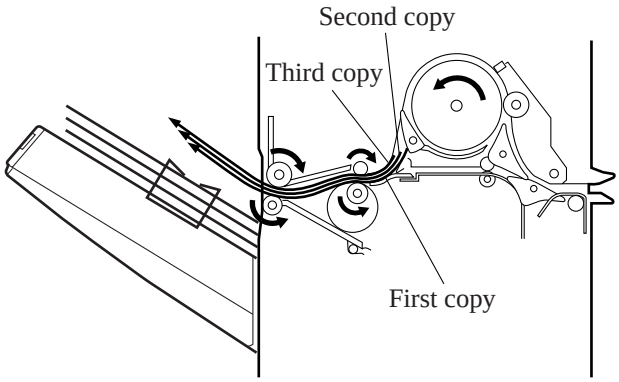


Figure 2-215

Caution:

The third copy as explained here is moved through buffer paper path 1. This fact is omitted from the discussion to avoid interrupting the sequence of operations.

C. Feeding and Delivering

1. Outline

The finisher moves copies arriving from the host machine to the delivery tray, stapling tray, or the saddle stitcher unit according to the mode of delivery. On the stapling tray, the copies are subjected to job offset or stapling as instructed by the host machine.

The first feed motor (M1), second feed motor (M8) and inlet feed motor (M9) are stepping motors, and delivery motor (M2) is a DC motor. These motors are controlled by the microprocessor (CPU) on the finisher controller PCB, and rotate either clockwise or counterclockwise.

The paper paths are equipped with the following four sensors for detection of paper (arrival, passage):

- Inlet sensor (PI1)
- Delivery sensor (PI3)
- Stapling tray sensor (PI4)
- Buffer path paper sensor (PI14)

In addition, each delivery tray is equipped with a sensor designed to detect the presence/absence of paper on it.

- No.1 tray paper sensor (PI11)
- No.2 tray paper sensor (PI12)

If a copy fails to reach or move past each sensor within a specific period of time, the finisher controller PCB identifies the condition as a jam, and stops the ongoing operation, and at the same time, informs the host machine of the condition. When all doors are closed after the paper jam is removed, the buffer path inlet paper sensor (PI17) checks whether or not copies are being detected in addition to the above four sensors (inlet sensor, delivery sensor, stapling tray sensor and buffer path paper sensor). If the sensors detect a copy, the finisher unit judges that paper jams have not completely been removed, and sends the paper jam removal signal to the host machine again.

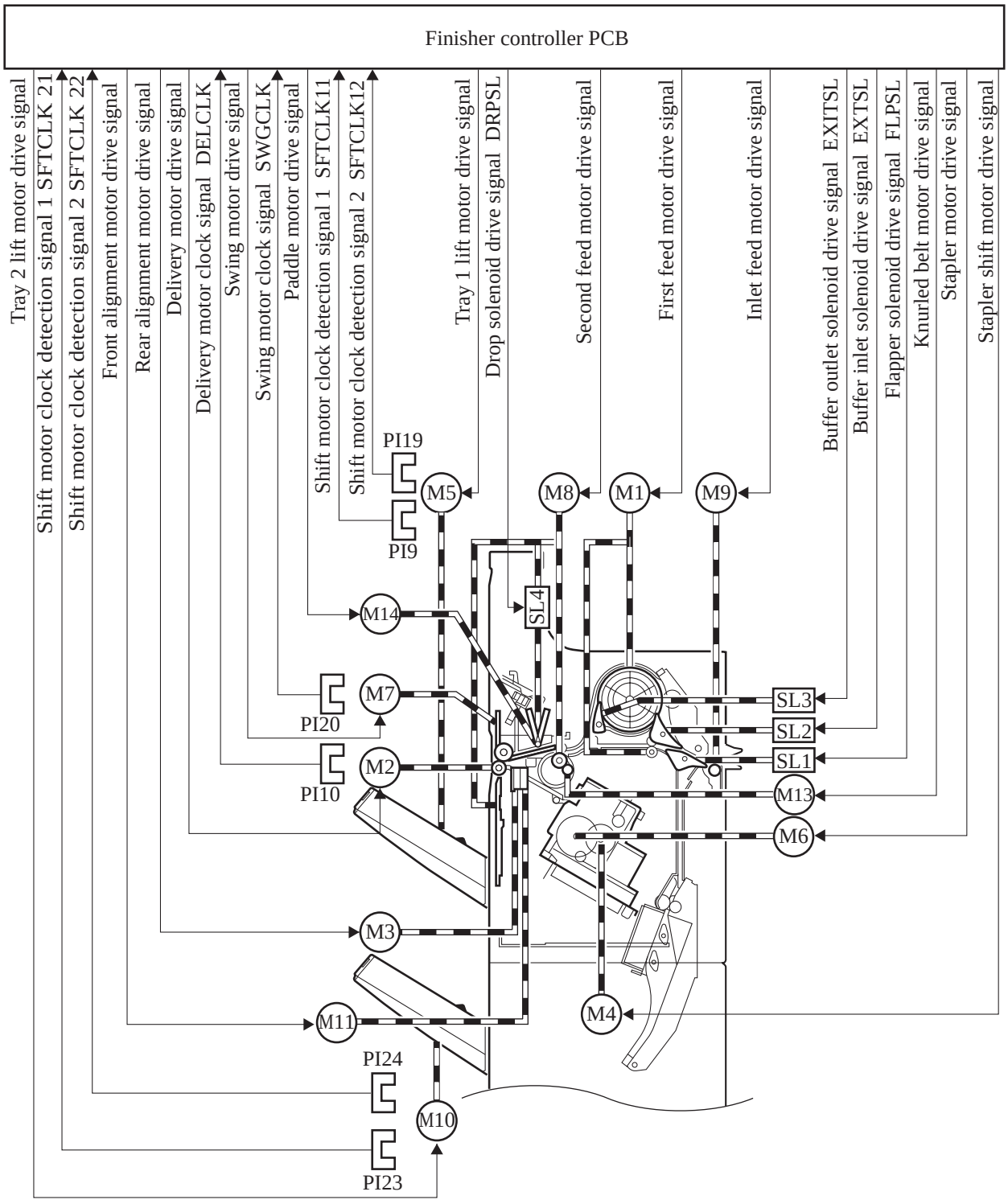

Finisher controller PCB
Tray 2 lift motor drive signal
Shift motor clock detection signal 1 SFTCLK 21
Shift motor clock detection signal 2 SFTCLK 22
Front alignment motor drive signal
Rear alignment motor drive signal
Delivery motor drive signal
Delivery motor clock signal DELCLK
Swing motor drive signal
Swing motor clock signal SWGCLK
Paddle motor drive signal
Shift motor clock detection signal 1 SFTCLK11
Shift motor clock detection signal 2 SFTCLK12
Tray 1 lift motor drive signal
Drop solenoid drive signal DRPSL
Second feed motor drive signal
First feed motor drive signal
Inlet feed motor drive signal
Buffer outlet solenoid drive signal EXITSL
Buffer inlet solenoid drive signal EXTSL
Flapper solenoid drive signal FLPSL
Knurled belt motor drive signal
Stapler motor drive signal
Stapler shift motor drive signal
PI19
PI9
PI20
PI10
PI24
PI23
M5
M8
M1
M9
M14
M7
M2
M3
M11
M10
M4
M6
M13
SL4
SL3
SL2
SL1

Figure 2-216

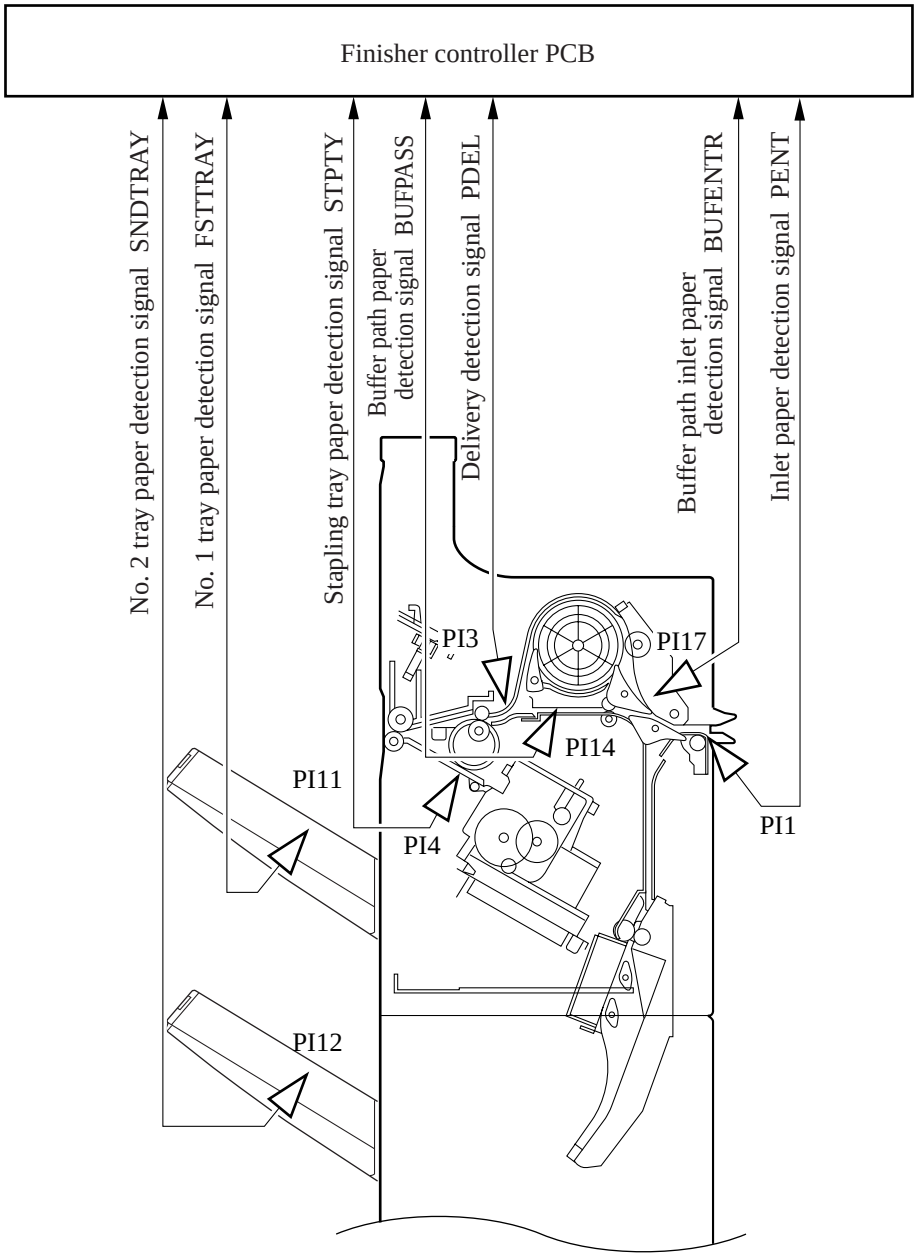

Finisher controller PCB
No. 2 tray paper detection signal SNDTRAY
No. 1 tray paper detection signal FSTTRAY
Stapling tray paper detection signal STPTY
Buffer path paper detection signal BUFPASS
Delivery detection signal PDEL
Buffer path inlet paper detection signal BUFENTR
Inlet paper detection signal PENT
PI3
PI17
PI14
PI11
PI4
PI1
PI12

Figure 2-217

D. Job Offset

1. Outline

In the job offset mode, sort jobs and entire copy groups are shifted to the front or rear for delivery to the tray, and other copies are delivered to the tray without a shift.

The copies are shifted by the front and rear alignment plates. The alignment plate is checked by the alignment plate home position sensor (PI6, PI29) to find out whether it is at the home position.

The finisher controller PCB drives the front and rear alignment motors (M3, M11) at power-on to return the alignment plate to its home position.

The finisher controller PCB stops the delivery motor (M2) when the trailing edge of the copy has moved past the feed roller 2. Then, the finisher controller PCB rotates the delivery motor counterclockwise, and drives the swing motor (M7). As a result, the drive of the delivery motor is transmitted to the swing guide to move up the guide. When the swing guide open sensor (PI18) detects the swing guide, the delivery motor stops, and the swing guide is held at the up position.

When the swing guide has moved up, the feed belts attached to the feed roller 2 move the copy to the stapling tray. The presence of paper on the stapling tray is monitored by the stapling tray sensor (PI4). (The first sheet is fed to the stapling tray while the swing guide is moving up.)

The finisher controller PCB drives the alignment motor (M3, M11) in advance, and keeps the alignment plate in wait at a waiting position of the trailing edge of a sheet. Whenever one sheet is moved to the stapling tray, each sheet is aligned, and the fifth or last sheet in a sort job/group is fed to the stapling tray. Then the alignment motor shifts the sheets front or rear by 15 mm.

When the copy has been shifted, the finisher controller PCB rotates the alignment motor counterclockwise to move the alignment plate to a waiting position of the trailing edge of the sheet. This alignment operation is repeated until alignment of the fifth or last sheet in a sort job is completed. At this time, the swing guide is moved down and is closed, and the delivery motor rotates clockwise to deliver the sheet.

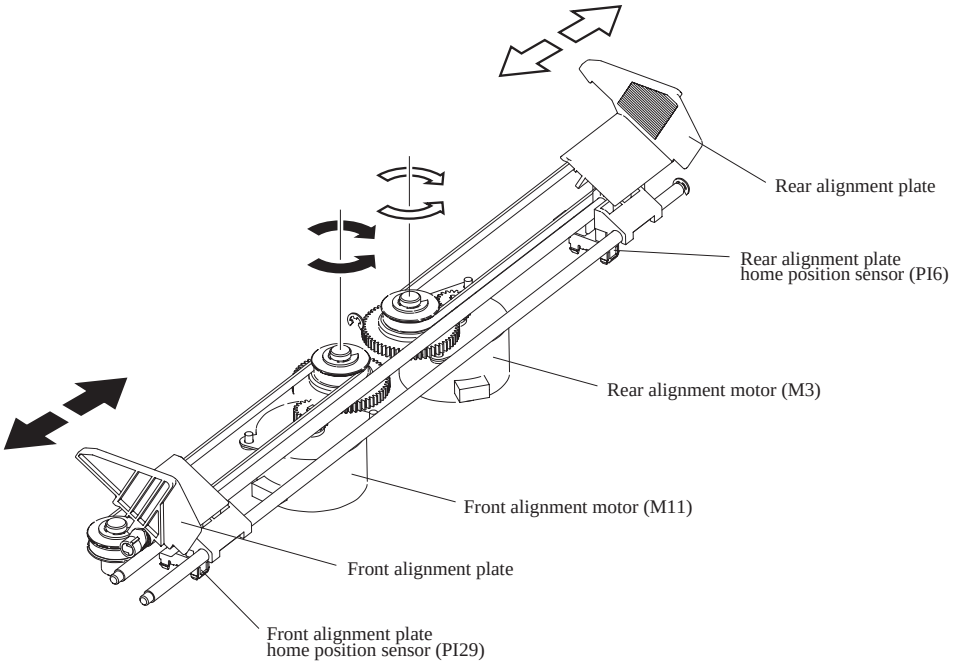


Figure 2-218

Sequence of Operation (job offset)

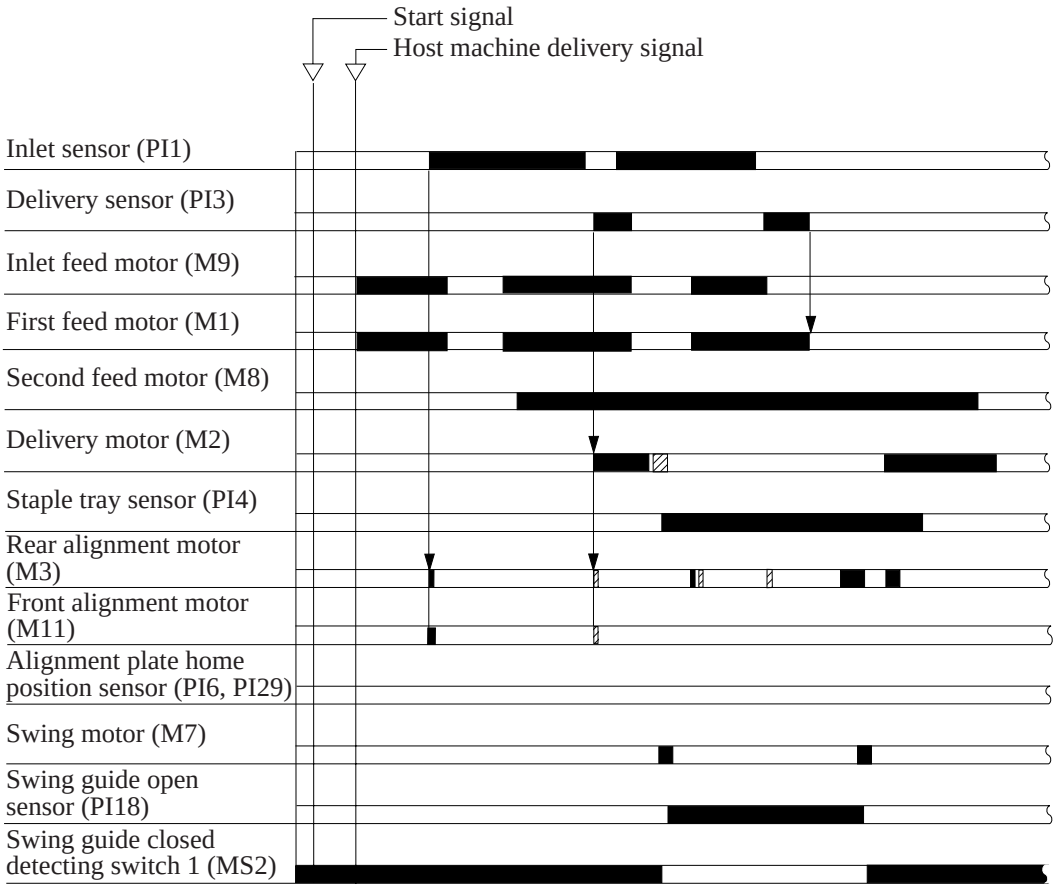


Figure 2-219

2. Flow of Job Offset Operations

1) The swing guide moves up and, at the same time, the knurled belts move the sheet to the stapling tray.

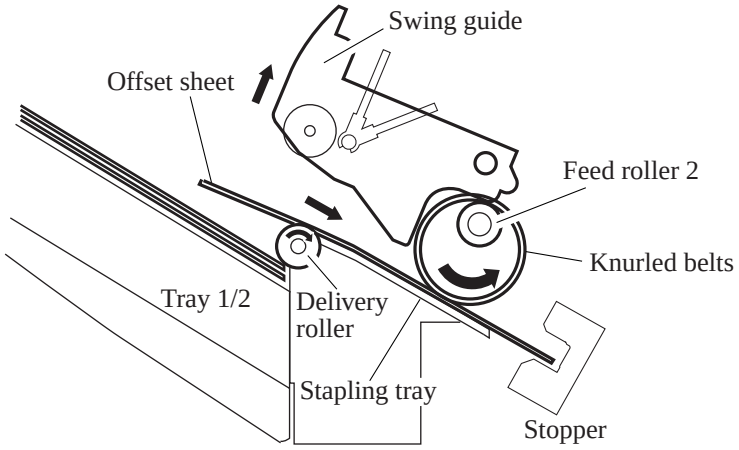


Figure 2-220

2) The alignment plate shifts the sheet to the front.

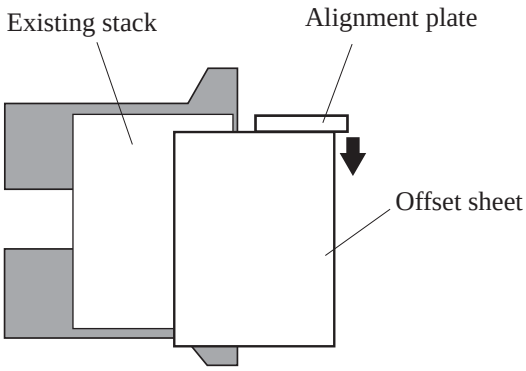


Figure 2-221

3) The swing guide moves down and, at the same time, the delivery roller delivers the sheet.

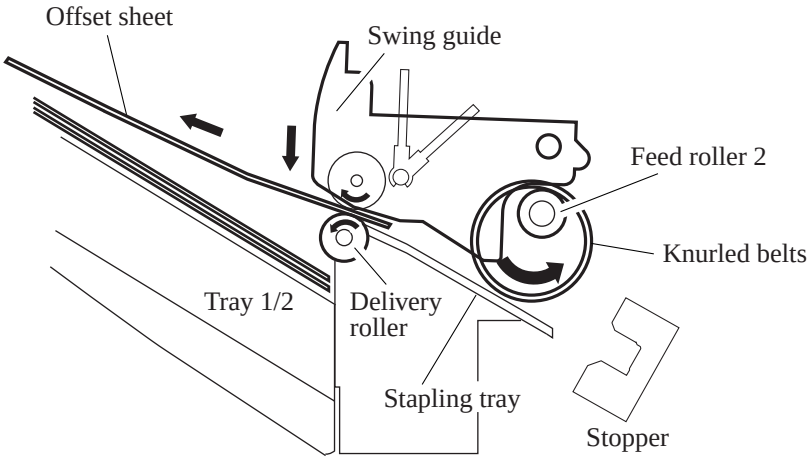


Figure 2-222

E. Staple Operation

1. Outline

The stapler unit staples a stack of as many sheets as specified.

The stapling position differs according to the selected staple mode and paper size.

The stapler unit is checked by the stapler shift home position sensor (PI7) to find out whether it is at the home position.

When starting operation after power-on, the finisher controller PCB drives the stapler shift motor (M4) to return the stapler unit to the home position. If the stapler is already at the home position, it is kept as it is in wait.

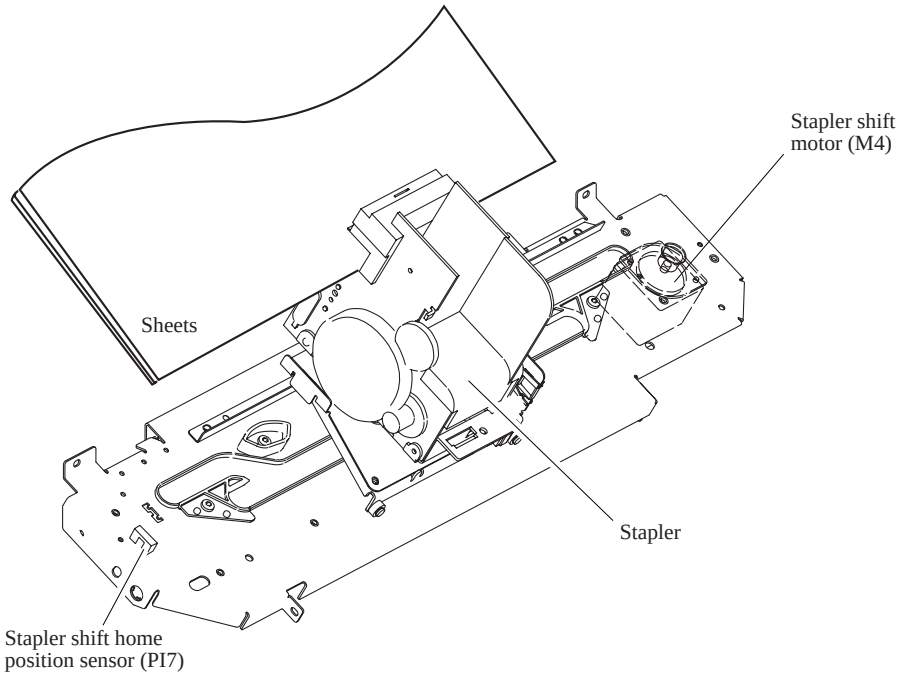


Figure 2-223

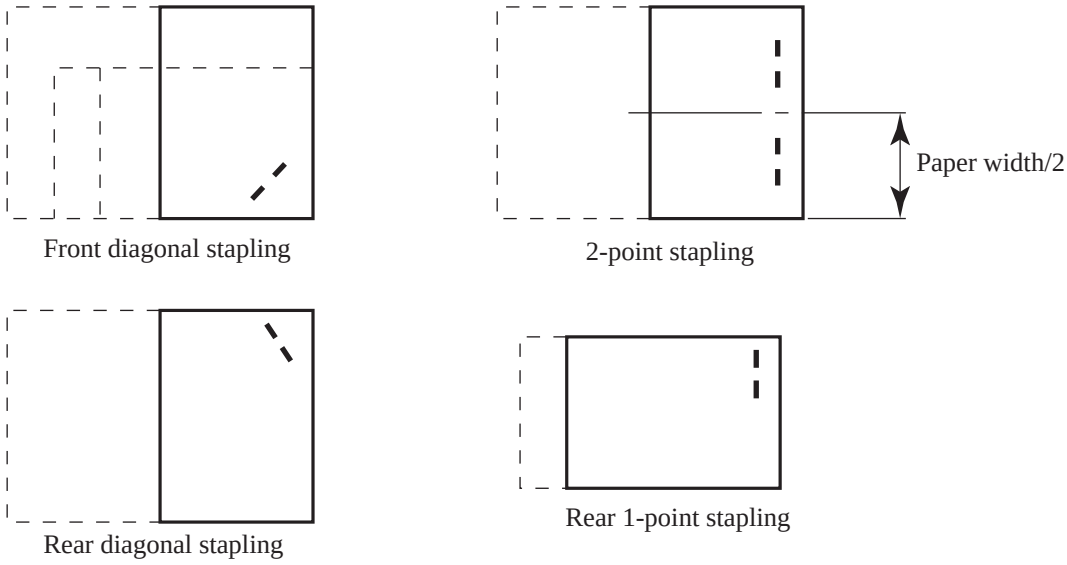

Front diagonal stapling
2-point stapling
Paper width/2
Rear diagonal stapling
Rear 1-point stapling

Figure 2-224

2. First Sheet

The finisher controller PCB turns on the drop solenoid (SL4) as soon as the first sheet of paper is detected with the delivery sensor (PI3) to escapes the drop lever arm upward. When the sheet passed through the delivery sensor, the finisher controller PCB turns off the drop solenoid to lower the drop lever arm and drop the trailing edge of the sheet on the stapling tray.

The finisher controller PCB stops the delivery motor (M2) as soon as the trailing edge of the first sheet has moved past the feed roller 2. Then, it rotates the delivery motor clockwise to switch the gear drive to the swing motor (M7), causing the swing guide to move up. When the swing guide open sensor (PI18) finds the swing guide at the up position, the swing motor stops, maintaining the swing guide at the up position.

When the swing guide has moved up, the knurled belts of the feed roller 2 move the sheet to the stapling tray. (The first sheet is fed to the stapling tray while the swing guide is moving up.) The presence of paper on the stapling tray is detected by the stapling tray sensor (PI4).

The finisher controller PCB drives the alignment motors (M3, M11) when the stapling tray paper sensor has detected paper to put sheets in order. The alignment plate is kept in wait in advance at a point 10 mm behind the trailing edge of the paper.

The swing guide is kept in wait at the up position until the last sheet is output onto the stapling tray.

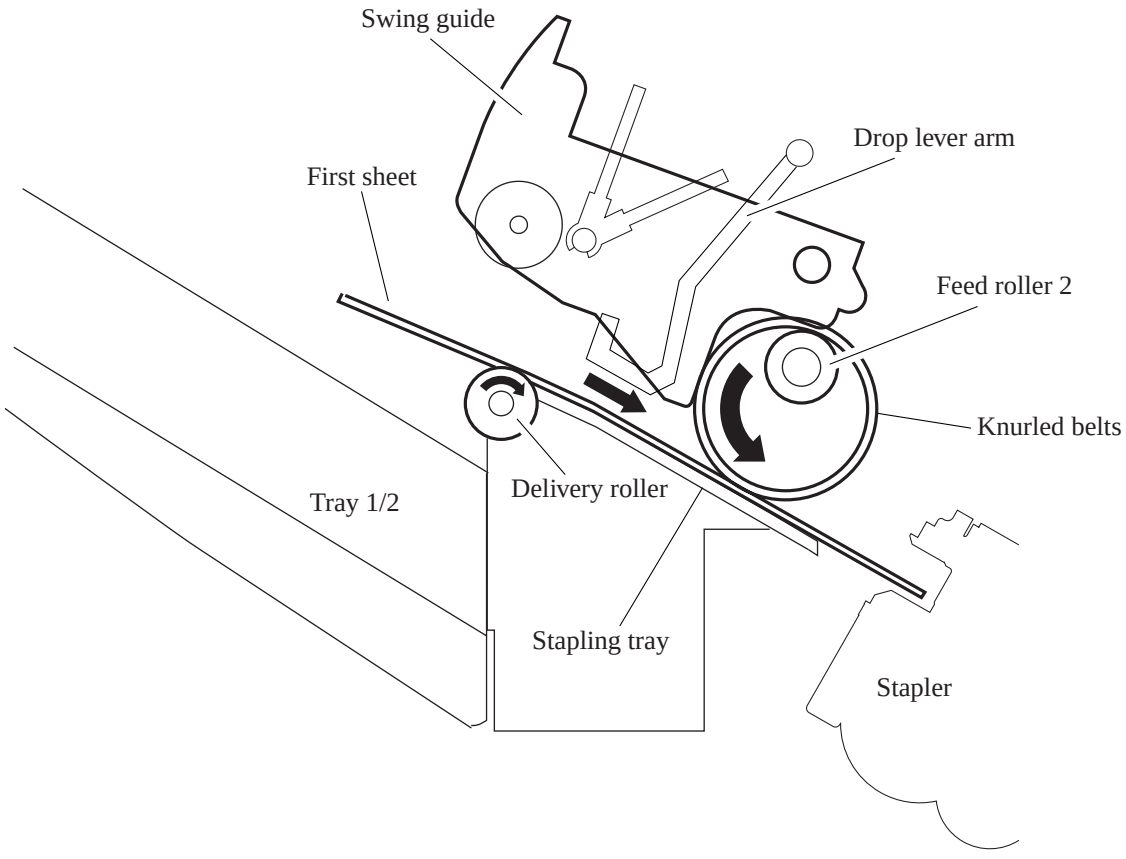


Figure 2-225

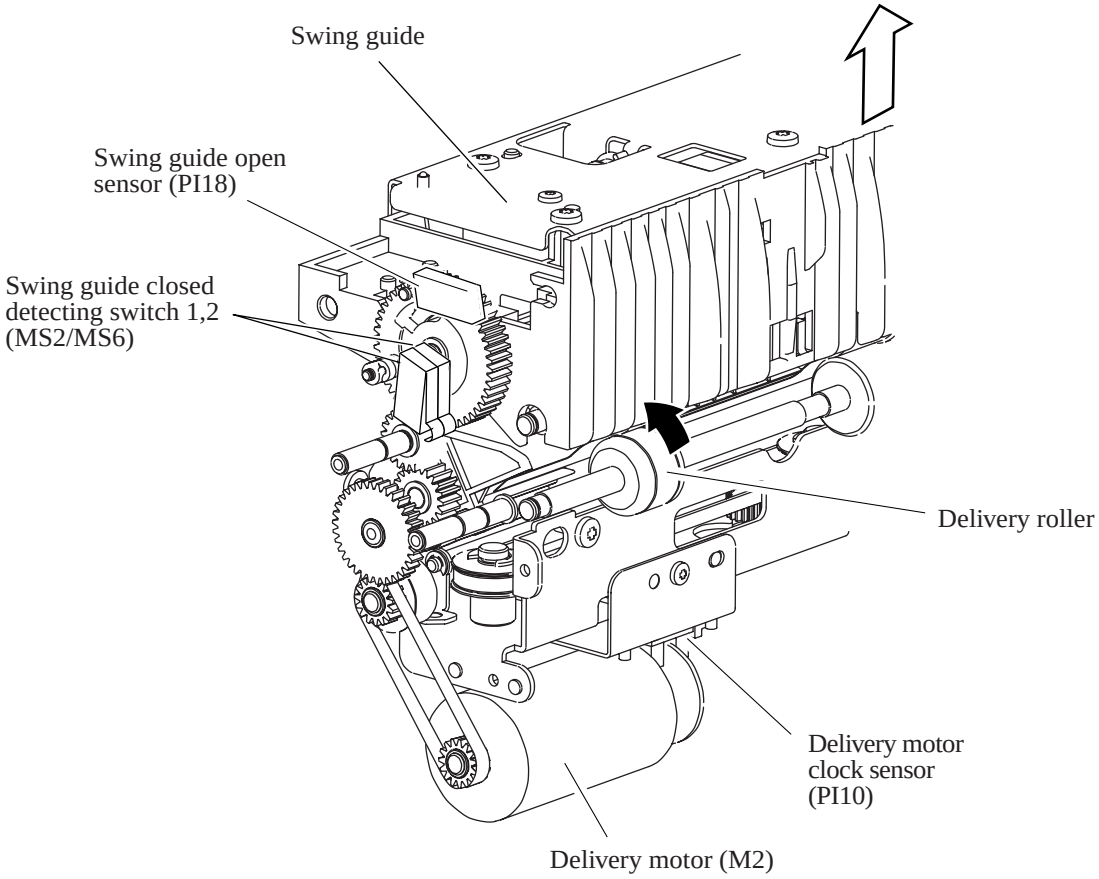

Swing guide
Swing guide open sensor (PI18)
Swing guide closed detecting switch 1,2 (MS2/MS6)
Delivery roller
Delivery motor clock sensor (PI10)
Delivery motor (M2)

Figure 2-226

3. Second and Subsequent Sheets

Then the finisher controller PCB turns on the paddle motor (M14) as soon as the trailing edge of the second and subsequent sheets passses the feed roller 2, causing the paddle to rotate once, the sheet is pushed by the paddle and sent to the stapling tray. When the sheet outputs onto the stapling tray, the finisher controller PCB rotates the alignment motors (M3, M11) to put the sheets in order. When the 11th, 21st, 31st or 41st sheet of paper is fed on the stapling tray, the finisher controller PCB turns on the knurled belt motor (M13) to transfer the knurled belts for proper feeding of the sheet.

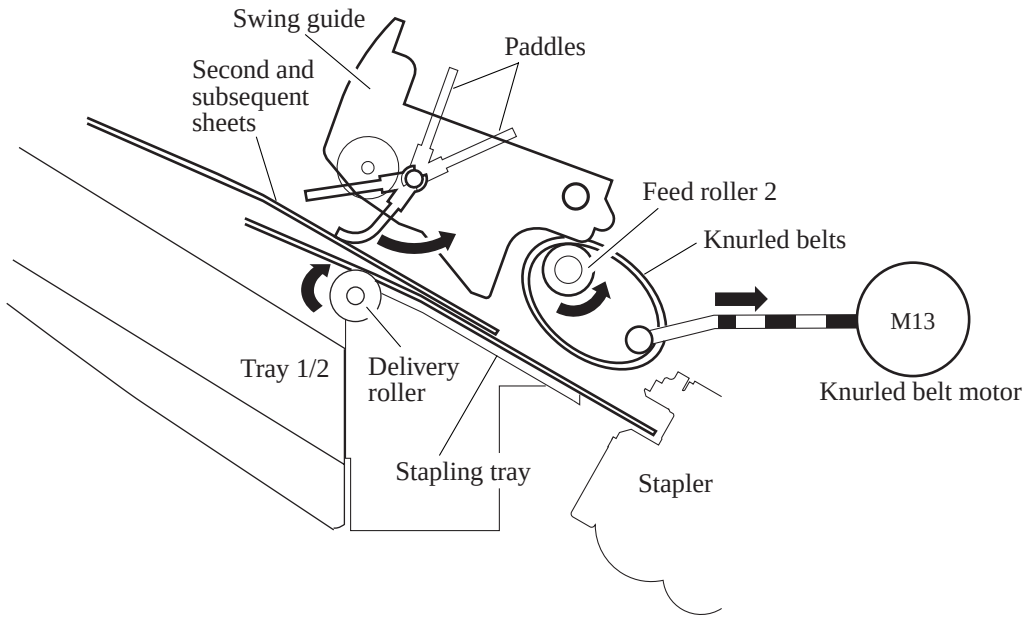


Figure 2-227

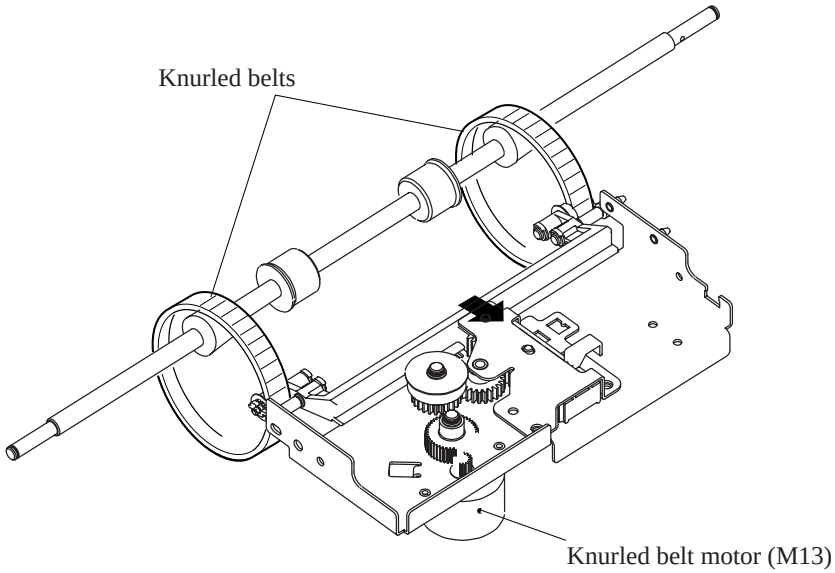


Figure 2-228

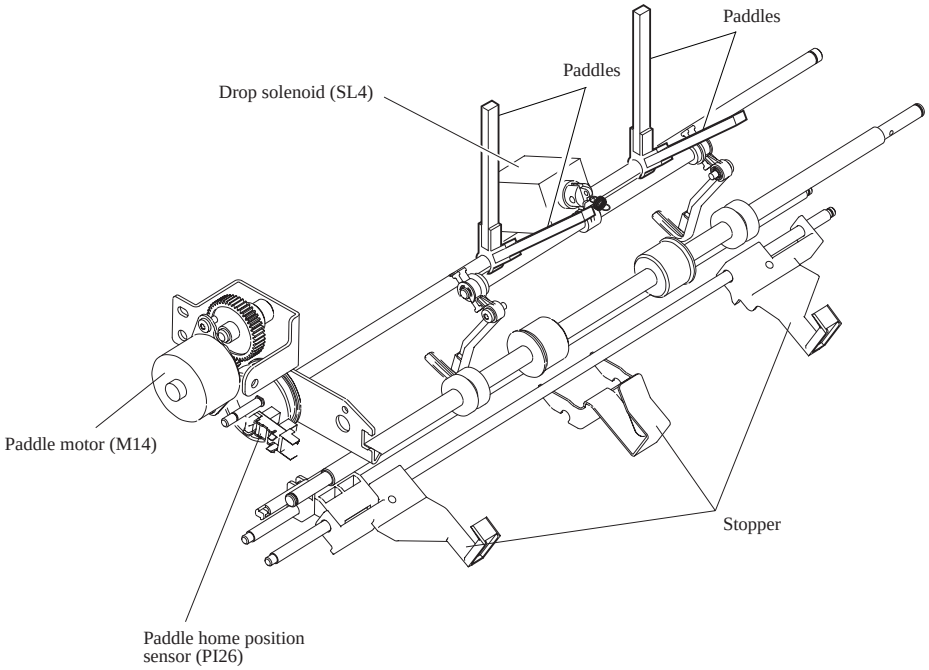


Figure 2-229

4. Last Sheet

When the last sheet has been put in order, the finisher controller PCB turns on the alignment motors (M3, M11) to move the alignment plate to the alignment position (to butt the plate against the stack). Then, the finisher controller PCB rotates the swing motor (M7) counterclockwise to move down the swing guide.

The finisher controller PCB moves the stapler according to the staple mode for stapling.

From then on, it rotates the delivery motor (M2) clockwise to deliver the stack to the tray.

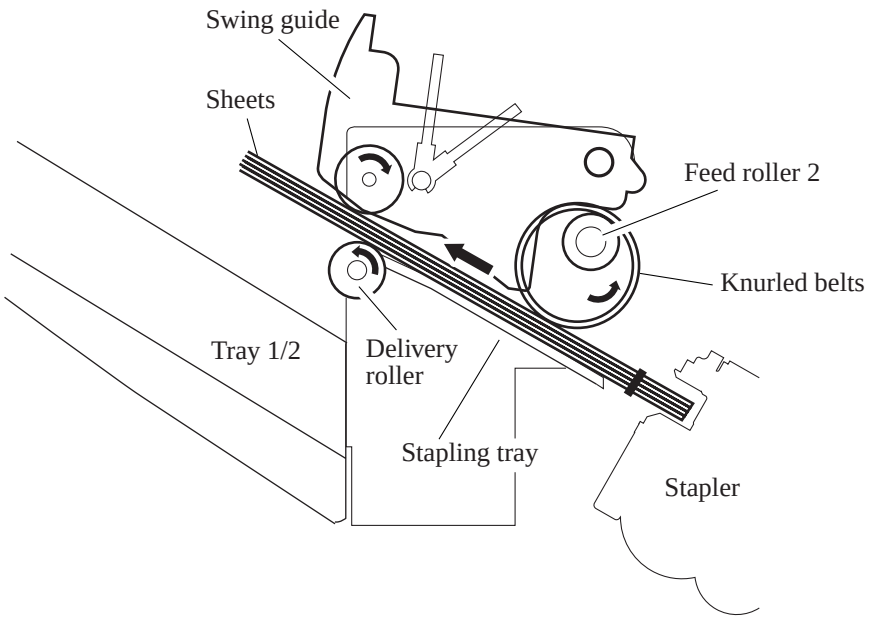


Figure 2-230

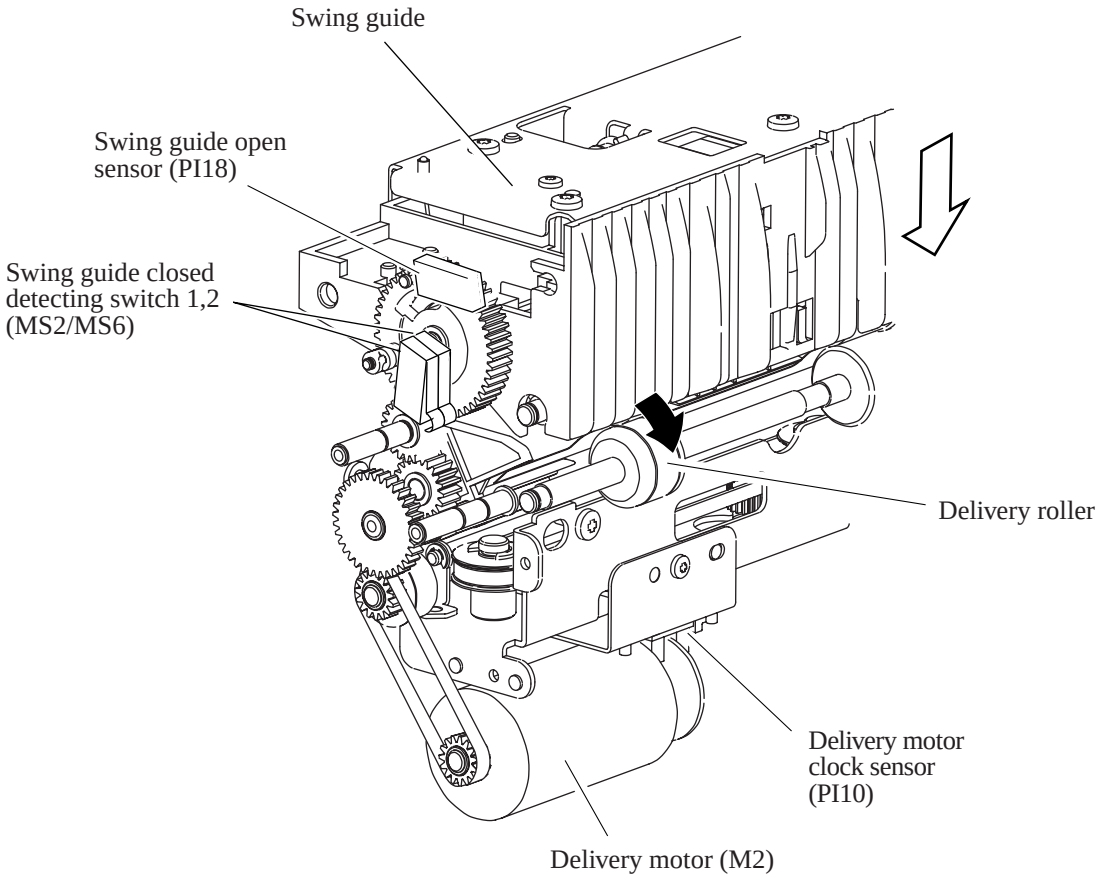

Swing guide
Swing guide open sensor (PI18)
Swing guide closed detecting switch 1,2 (MS2/MS6)
Delivery roller
Delivery motor clock sensor (PI10)
Delivery motor (M2)

Figure 2-231

F. Stapler Unit

Stapling is executed by the staple motor (M6). A single rotation of the cam by the motor results in one stapling operation.

The cam is checked by the staple home position sensor (PI22) to find out whether it is at the home position.

The stapler motor is controlled by the microprocessor (IC1) on the finisher controller so that it is rotated clockwise or counterclockwise.

When the stapling home position sensor is off, the finisher controller PCB rotates the stapler motor clockwise until the sensor turns on so as to return the stapling cam to its initial state.

The staple cartridge is judged as 'Absence' when both staple edging sensor (PI21) and staple sensor (PI31) indicate "1". The presence/absence of staples inside the staple cartridge is detected by the staple sensor (PI31). The staple edge sensor (PI21) is used to find out whether a staple has been edged out to the end of the cartridge.

The finisher controller PCB does not drive the staple motor (M6) unless the swing guide closed detecting switch 2 (MS6) is on (i.e., the swing guide is closed). This is to protect against injuries that could occur when a finger is stuck inside the stapler.

Also, this finisher detects the type of staple cartridge when turning on the power. After the cartridge for stapling 100 sheets is switched to that for stapling 50 sheets or vice versa, be sure turn off the power then turn it on.

Note:

When displaying "Set stapler cartridge" even though the staple cartridge is installed, it may not be installed correctly. If you move the gear of stapler unit manually, the cartridge cannot be detected due to the dislocation of gear because it is not correctly installed. In this case, move the gear to the position as shown below and reinstall the cartridge.

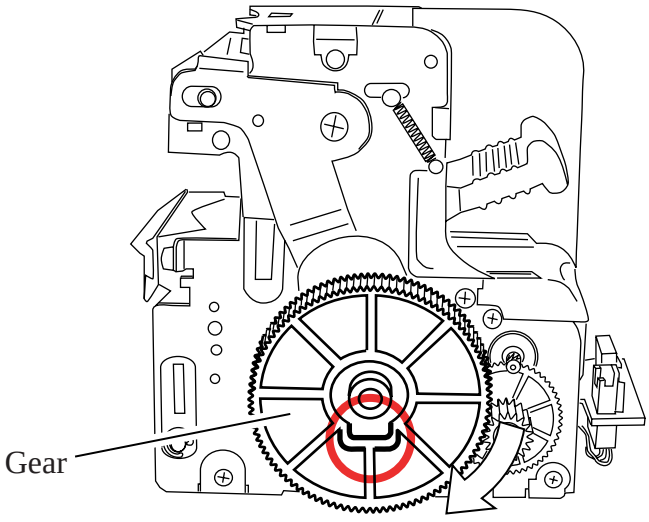


Figure 2-232

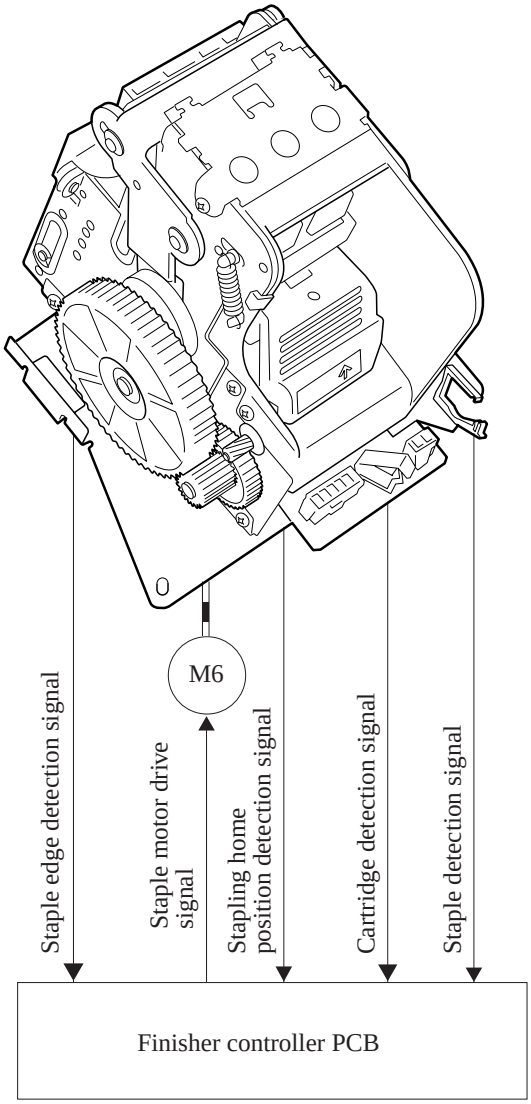

M6
Staple edge detection signal
Staple motor drive signal
Stapling home position detection signal
Cartridge detection signal
Staple detection signal
Finisher controller PCB

Figure 2-233

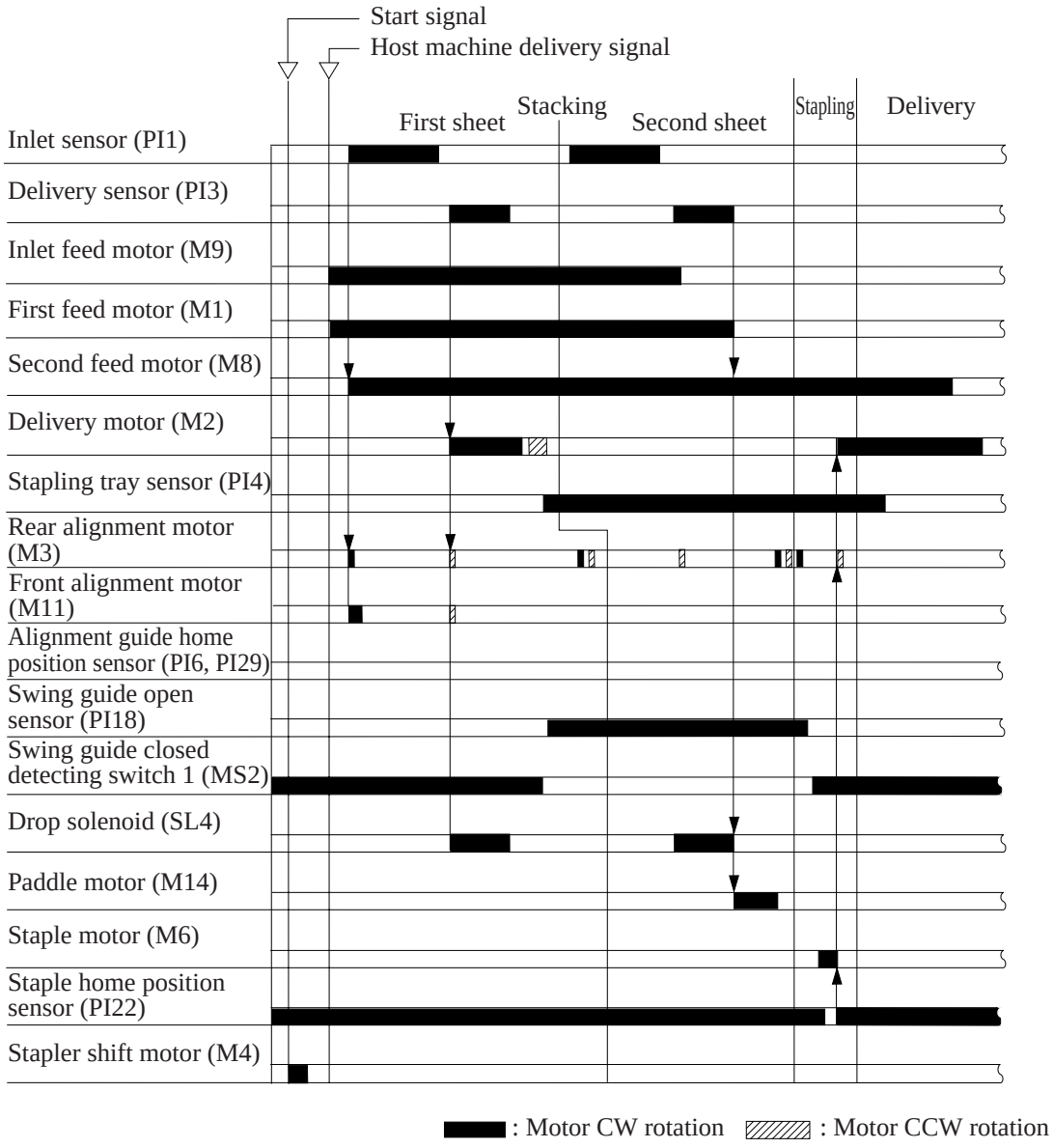

Start signal
Host machine delivery signal
First sheet
Stacking
Second sheet
Stapling
Delivery
Inlet sensor (PI1)
Delivery sensor (PI3)
Inlet feed motor (M9)
First feed motor (M1)
Second feed motor (M8)
Delivery motor (M2)
Stapling tray sensor (PI4)
Rear alignment motor (M3)
Front alignment motor (M11)
Alignment guide home position sensor (PI6, PI29)
Swing guide open sensor (PI18)
Swing guide closed detecting switch 1 (MS2)
Drop solenoid (SL4)
Paddle motor (M14)
Staple motor (M6)
Staple home position sensor (PI22)
Stapler shift motor (M4)
: Motor CW rotation
: Motor CCW rotation

Figure 2-234

5. Shifting the Stapler Unit

The stapler unit is moved by the stapler shift motor (M4). Its home position is detected by the stapler shift home position sensor (PI7). When the start signal arrives from the host machine, the stapler moves to the center of its movement range. This movement occurs regardless of the selected mode of delivery, as no specific mode is recognized at this point in time. When the command for stapling arrives from the host machine after the first sheet has reached the host machine pre-registration sensor, the stapler moves to the staple wait position to suit the appropriate stapling position and paper size.

See Figures 2-235 and later for an idea of the wait position according to the stapling mode.

a. Front Diagonal Stapling

The position is the same as the stapling position.

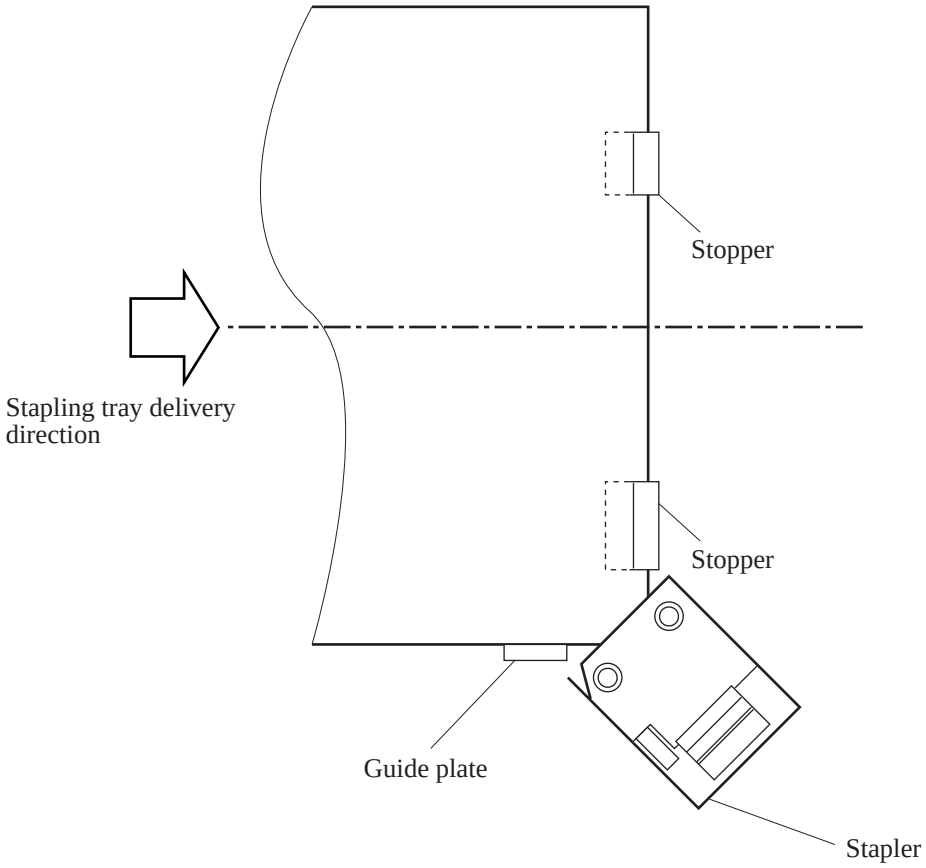


Figure 2-235

b. Rear 1-Point Stapling

The stapler is kept in wait at the center position. The stapler is moved to and from the stapling position for each stapling operation.

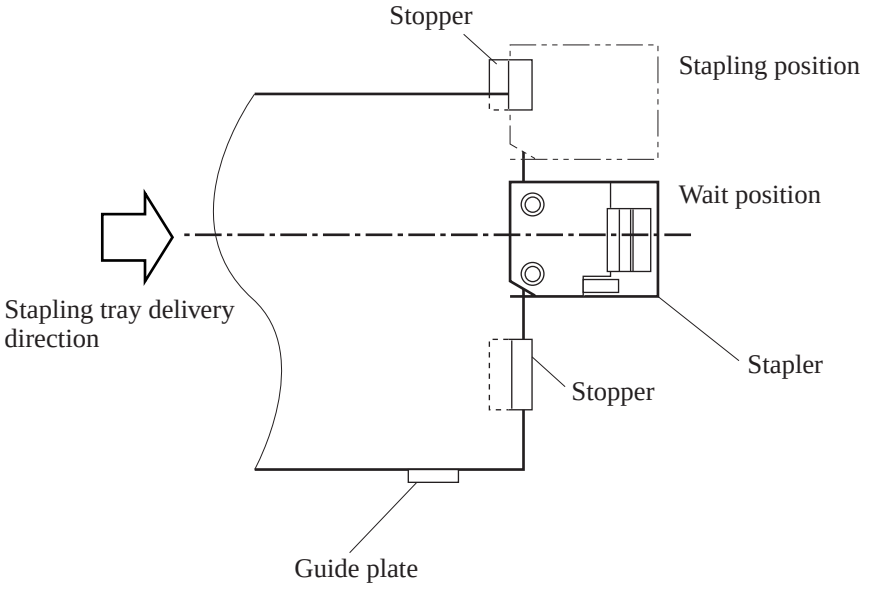


Figure 2-236

c. Rear Diagonal Stapling

For A4, LT and B5 sizes, the stapler is kept in wait toward the rear away from the stapling position. The stapler is moved to and from the stapling position for each stapling operation.

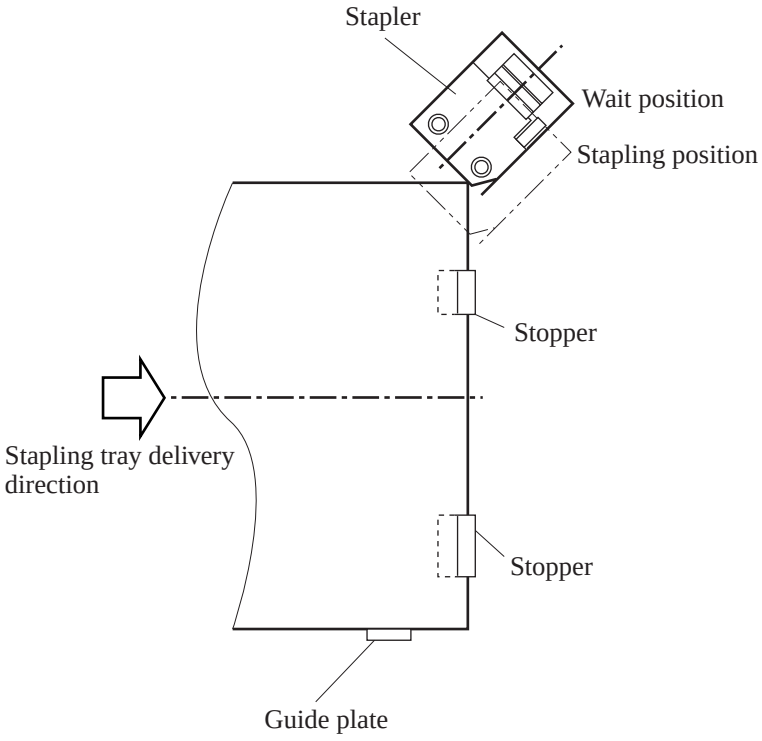


Figure 2-237

d. 2-Point Stapling

The stapler is kept in wait at the center of the paper. Stapling occurs at two points, first at the rear and then at the front.

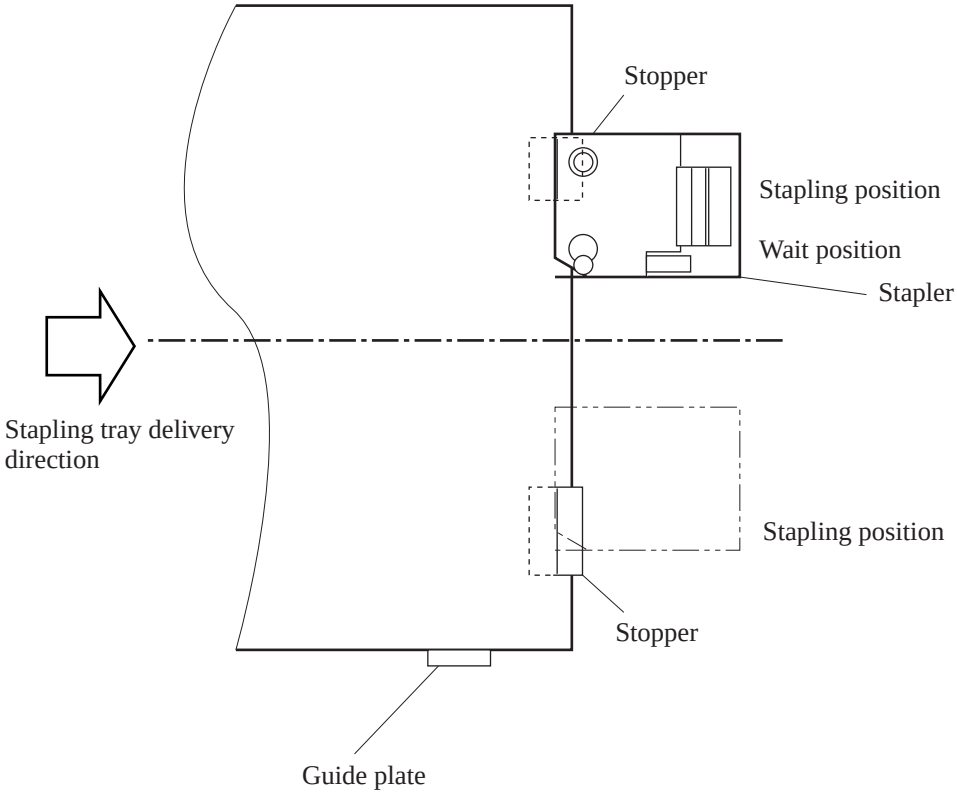


Figure 2-238

G. Tray Operation

The finisher has two delivery trays - upper tray 1 and lower tray 2. The upper and lower trays move up and down independently.

Tray 1 is moved up and down by the tray 1 lift motor (M5), and tray 2 by the tray 2 lift motor (M10).

The tray 1 position is detected by counting the clock pulses of tray 1 lift motor clock sensors 1 and 2 (PI9 and PI19) in relation to the tray 1 home position sensor (P18). The tray 2 position is detected by counting the clock pulses of tray 2 lift motor clock sensors 1 and 2 (PI23 and PI24) in relation to the tray 2 home position sensor (PI25).

When the tray is already at the home position, it is moved away from the home position once, then returned to that position.

When both tray 1 and tray 2 are at the home position, the above operation is performed for tray 1 and tray 2 in this order.

The finisher controller PCB moves up and down the tray selected by the host machine so that it is positioned at the delivery slot.

The upper limit of the tray is detected by the tray coming close detecting switch (MS9). The finisher controller PCB stops the drive (up) of the tray 1 lift motor (M5) as soon as the tray upper limit detecting switch turns on.

The height of the stack on the tray is identified by the height sensor (PS1), which measures its distance from the top of the stack. The tray is moved down when the distance between the top of the stack and the delivery assembly drops to a specific measurement.

The finisher controller PCB cuts off the +24V power of the tray 1 lift motor (M5) as soon as the safety zone switch (MS3) turns on while the shutter and the swing guide are open, stopping the operation of the finisher.

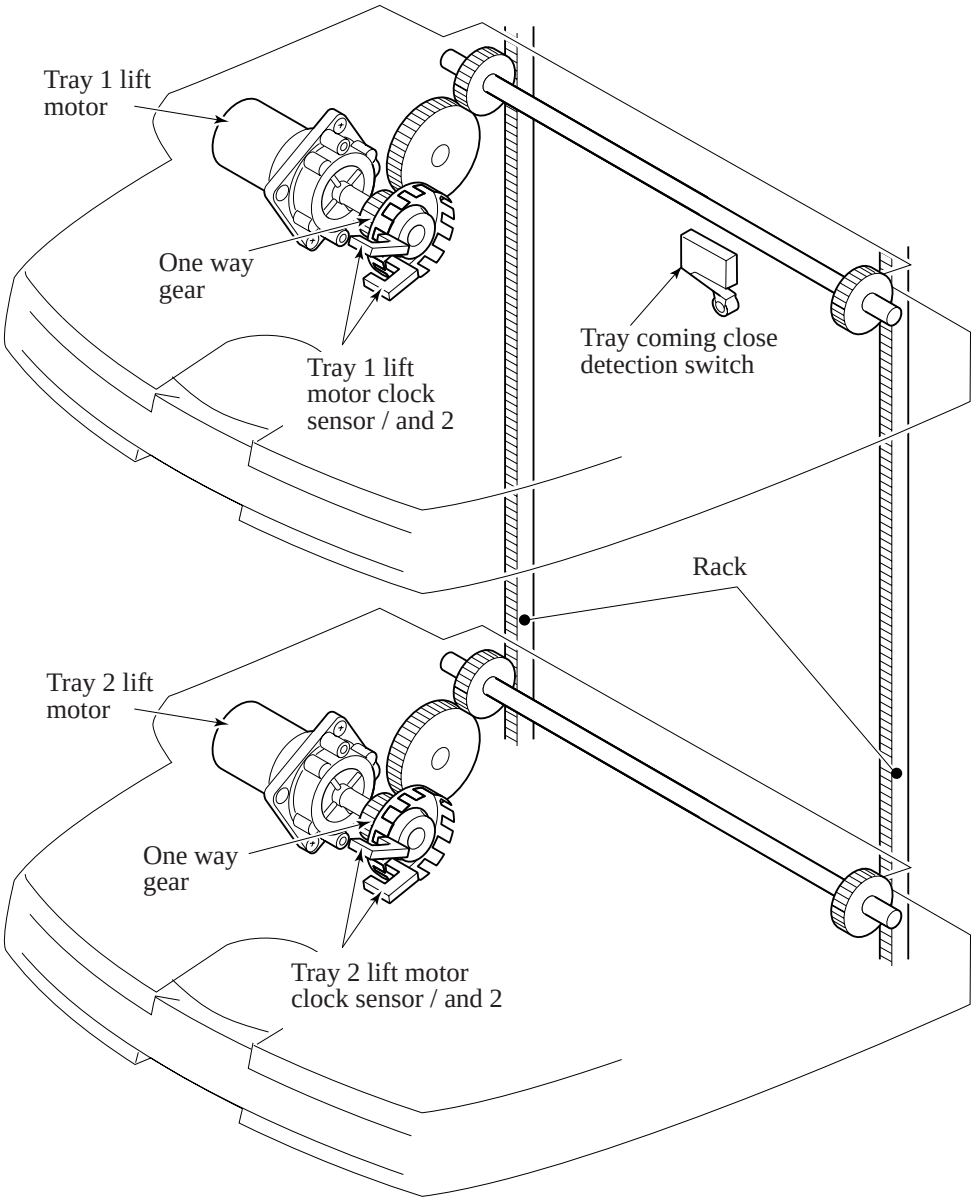

Tray 1 lift motor
One way gear
Tray 1 lift motor clock sensor / and 2
Tray coming close detection switch
Rack
Tray 2 lift motor
One way gear
Tray 2 lift motor clock sensor / and 2

Figure 2-239

H. Detecting the Height of Stack on the Tray

1. Outline

The number of sheets delivered to the tray and the number of sets (number of stapling operations) are stored in memory by the finisher controller PCB. The height of the stack is checked by the height sensor (PS1). See Table 2-204 for the maximum loading capacity of each tray.

The finisher controller PCB stops operation when the conditions in Table 2-204 occur, informing the host machine that the tray is full.

Stacking mode		Height
Non-staple mode	Small-size (1)	250 mm high (2000 sheets)
	Small-size (2)	140 mm high (1000 sheets)
	Large-size (1)(2)	140 mm high (1000 sheets)
	Size mixing	74 mm high (500 sheets)
Sort mode	Small-size (1)	250 mm high (2000 sheets)
	Large-size (1)	140 mm high (1000 sheets)
Staple sort mode	Small-size (1)	110 mm high (750 sheets or 100sets)
	Large-size (1)	74 mm high (500 sheets or 50 sets)
	Size mixing	74 mm high (500 sheets or 50 sets)
Mode mixing		22 mm high (150 sheets or 50 sets)

Notes: 1. The capacity for the non-staple sort mode is approximate and computed based on 80 g/m^2 paper.
2. Alignment for stacks containing 750 sheets or more is not guaranteed.
3. Stacking height precision is ±7 mm.
4. "Mode mixing" means stacking non-stapled papers and stapled papers.
5. The term "Small-size (1)" stands for A4, B5 and LT, the term "Small-size (2)" stands for A5-R and ST-R, while the term "Large-size (1)" stands for A3, B4, A4-R, LD, LG, LT-R, FOLIO and COMPUTER, "Large-size (2)" stands for B5-R.

Table 2-204

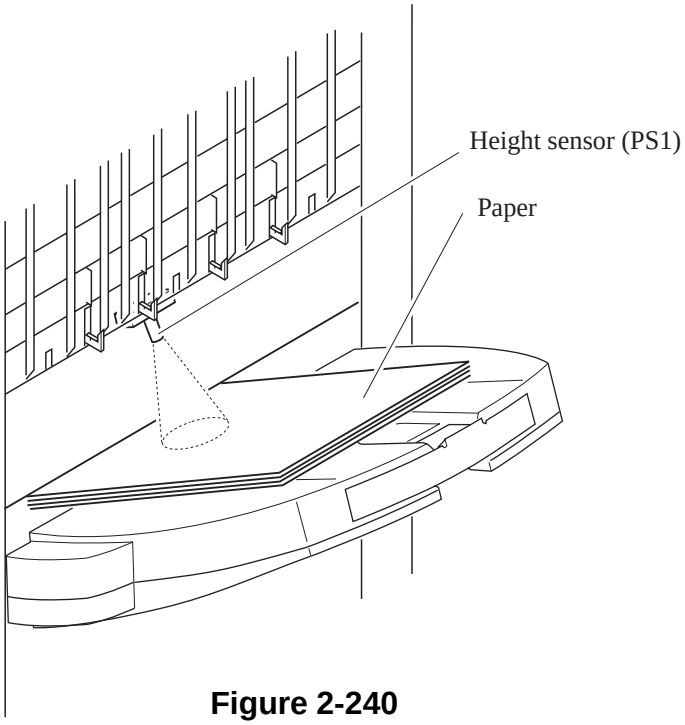


Figure 2-240

I. Shutter Operation

When the tray 1 passes the delivery slot, the finisher controller PCB closes the shutter mounted on the delivery slot before moving the tray, preventing the existing stack on the tray by the delivery slot and intrusion of the hands.

The shutter moves up (to close) when the second feed motor (M8) rotates counterclockwise, and is held in position when the motor stops. When the second feed motor rotates counterclockwise once again, it moves down (to open) to enable delivery.

When the shutter is held at the up position, claws slide out of the swing guide to engage the back of the shutter. This way, the existing slack and the swing guide engage while the tray is moved, preventing the guide from opening. The claws slide in when the shutter is moved down to release the engagement.

The upward movement of the shutter is monitored by the shutter closed detecting switch (MS4), and the downward movement is monitored by the shutter open sensor (PI5).

See the following diagrams for how these operations take place.

1) The second feed motor rotates counterclockwise to move the shutter up.

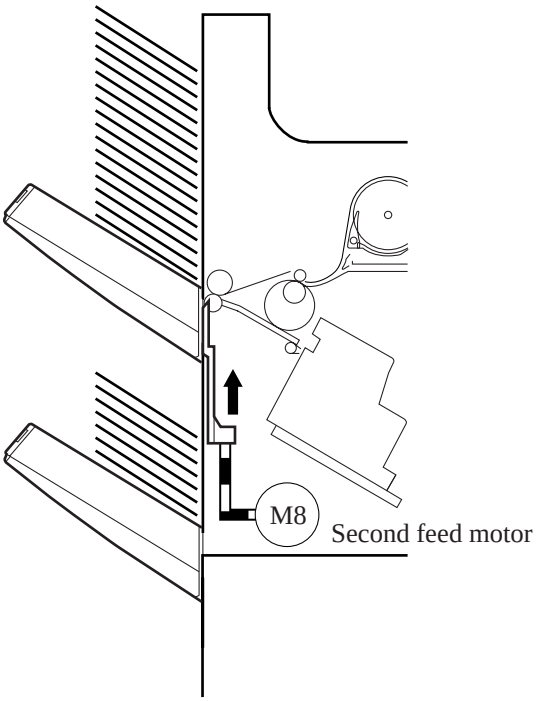


Figure 2-241

2) The tray 1,2 lift motor rotates, and the new tray moves to the stacking lower limit. The distance of movement is detected by1 the tray 1 lift motor clock sensor 1/2 (PI9/19) or tray 2 lift motor clock sensor 1/2 (PI22/PI24).

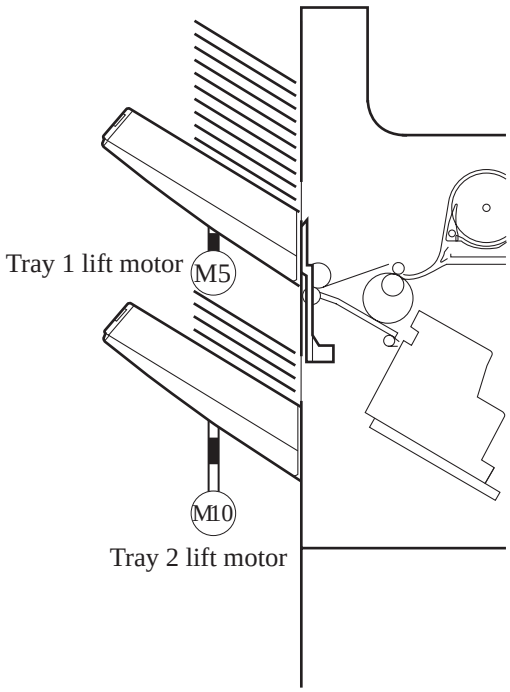


Figure 2-242

3) The second feed motor rotates counterclockwise, and the shutter moves down.

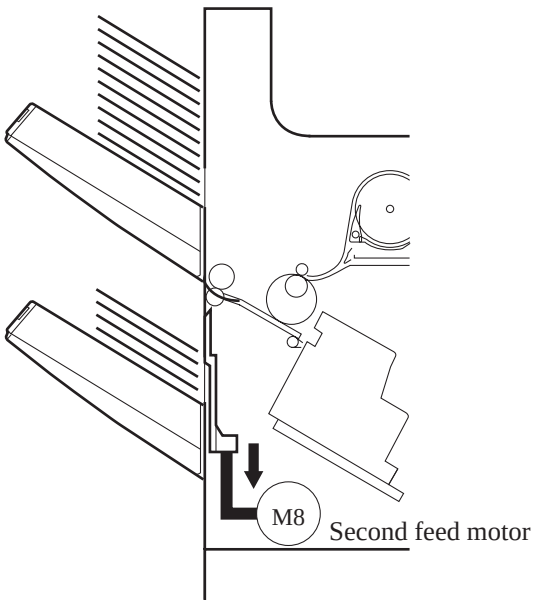


Figure 2-243

4) The tray lift motor rotates, and the tray moves to suit the height of the stack. The appropriate height in relation to the existing stack is checked by the height sensor (PS1).

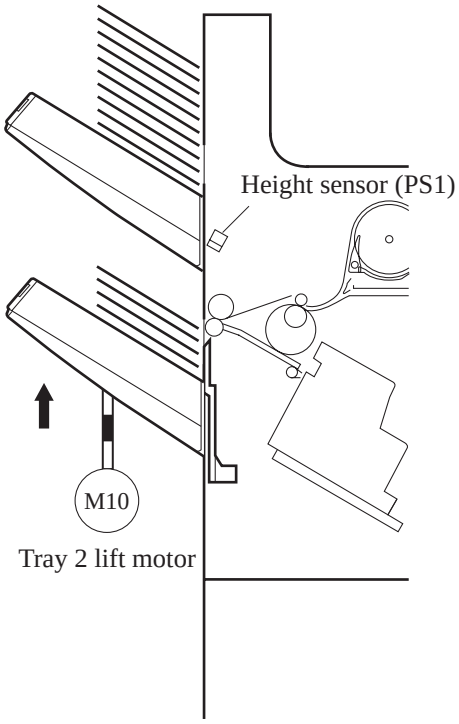


Figure 2-244

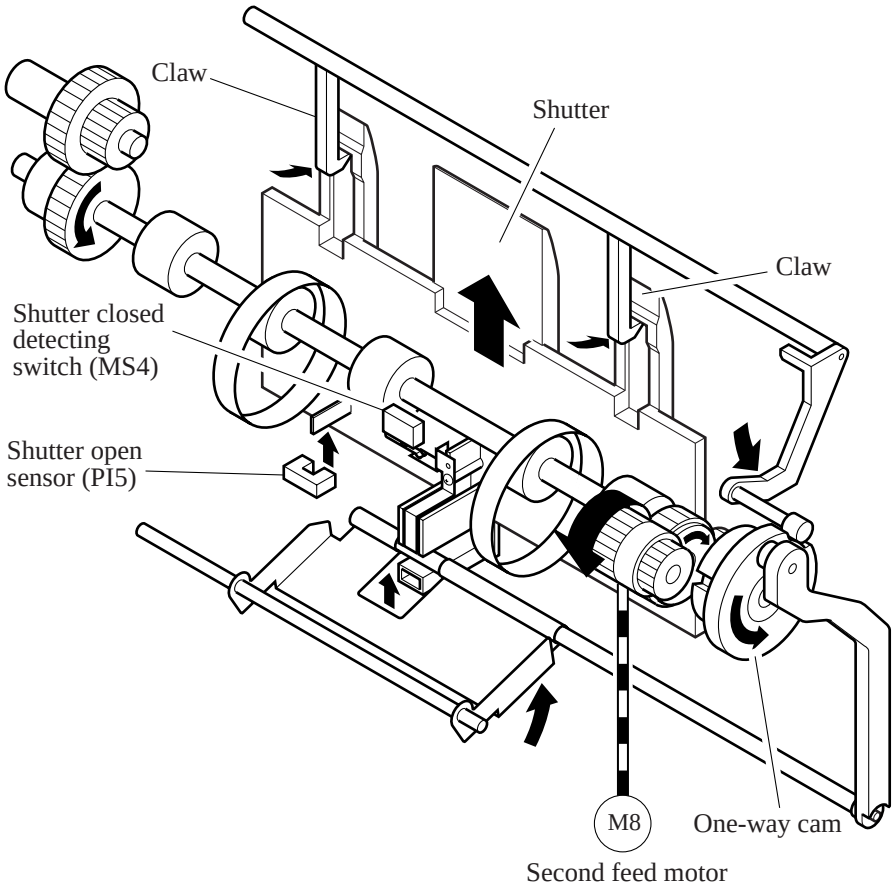


Figure 2-245

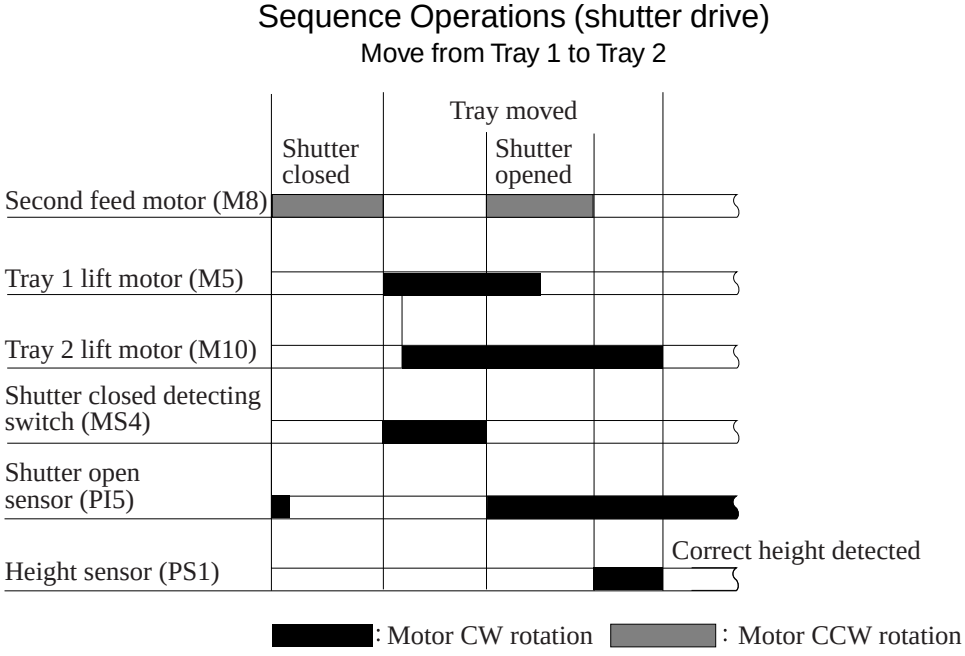

Sequence Operations (shutter drive)
Move from Tray 1 to Tray 2
Tray moved
Shutter closed
Shutter opened
Second feed motor (M8)
Tray 1 lift motor (M5)
Tray 2 lift motor (M10)
Shutter closed detecting switch (MS4)
Shutter open sensor (PI5)
Height sensor (PS1)
Correct height detected
: Motor CW rotation
: Motor CCW rotation

Figure 2-246

J. Buffer Path Operation

1. Outline

This machine is provided with a buffer paper path for continuously receiving paper from the host machine during stapling and job offset operation on the stapling tray. A maximum of three copies (three originals or more in the staple mode) are wrapped around the buffer roller. During this time, job offset and stapling are performed on the stapling tray.

The following shows operation on the buffer paper path.

1) When the first sheet arrives, the buffer inlet solenoid (SL2) remains off. The first sheet enters the buffer path.

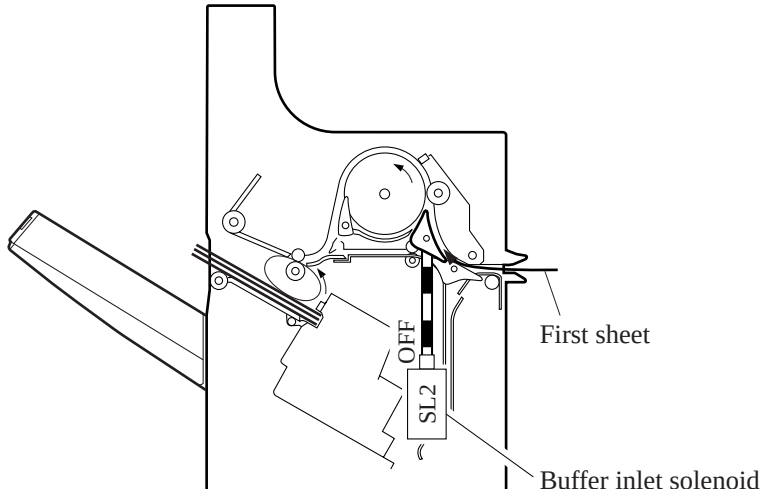


Figure 2-247

2) When the leading edge of the sheet has moved past the buffer path inlet paper sensor (PI17), the buffer outlet solenoid (SL3) turns on so as to cause the sheet to wrap around the buffer roller.

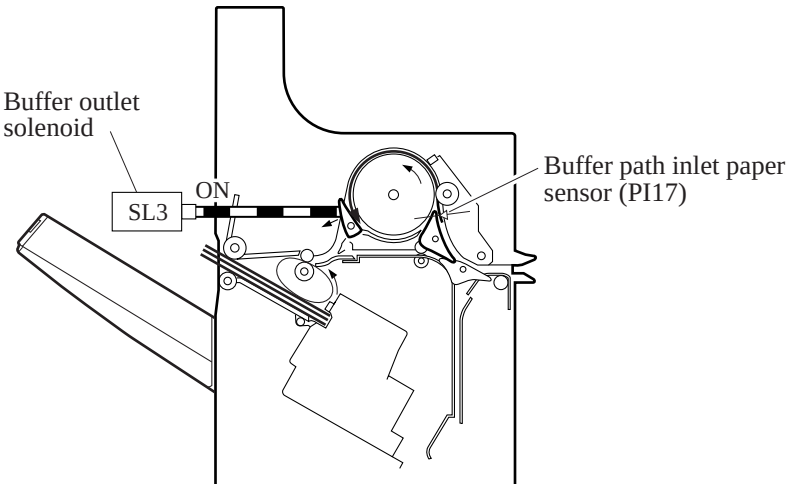


Figure 2-248

3) When the leading edge of the sheet has moved past the buffer path paper sensor (PI14), the buffer roller stops and waits for the second sheet.

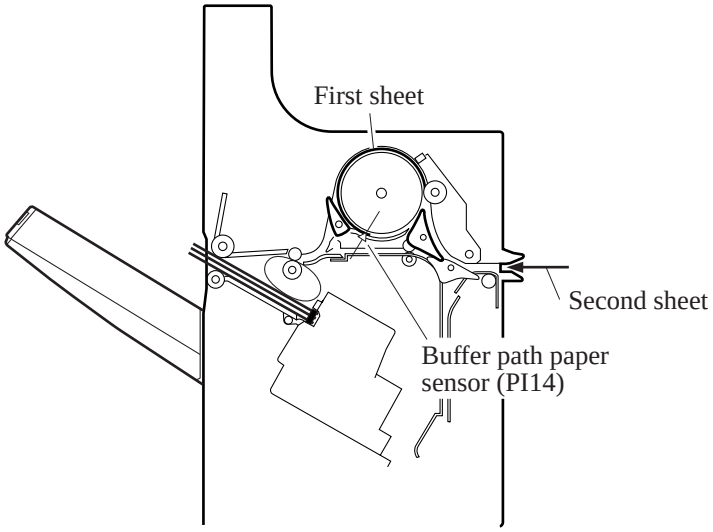


Figure 2-249

4) When the second sheet arrives and its leading edge reaches the inlet sensor (PI1), the buffer roller starts to operate once again.

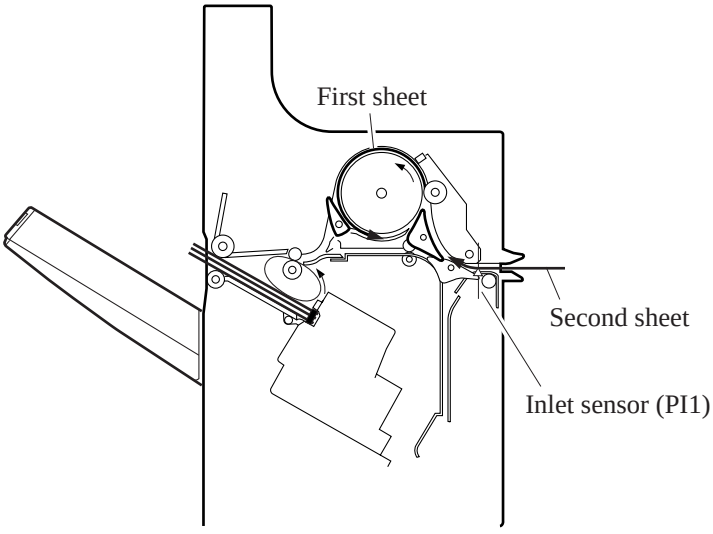


Figure 2-250

5) The buffer roller continues to rotate, and the second sheet overlaps the first sheet.

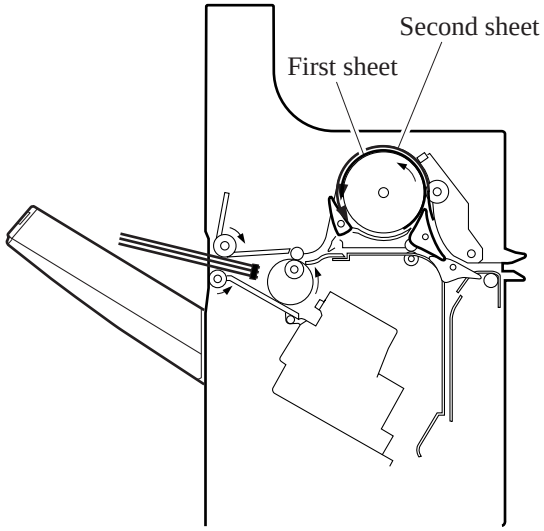


Figure 2-251

6) When the trailing edge of the second sheet has moved past the buffer path paper sensor (PI14), the buffer roller stops and waits for the third sheet.

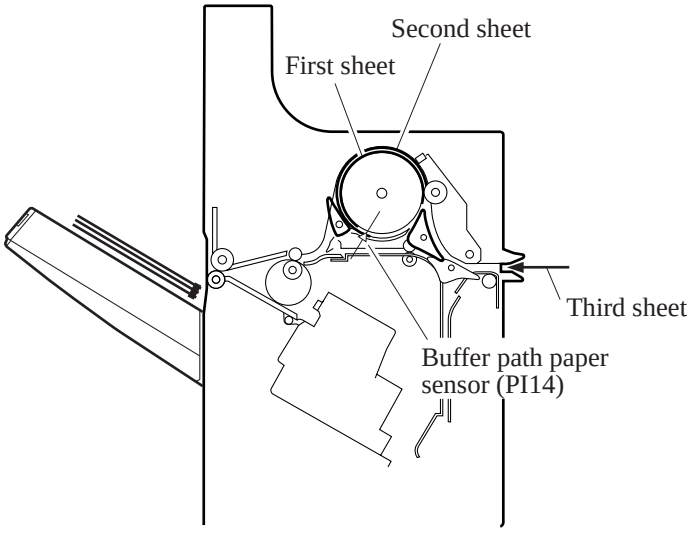


Figure 2-252

7) When the third sheet arrives and its leading edge reaches the inlet sensor (PI1), the buffer roller starts to operate once again.

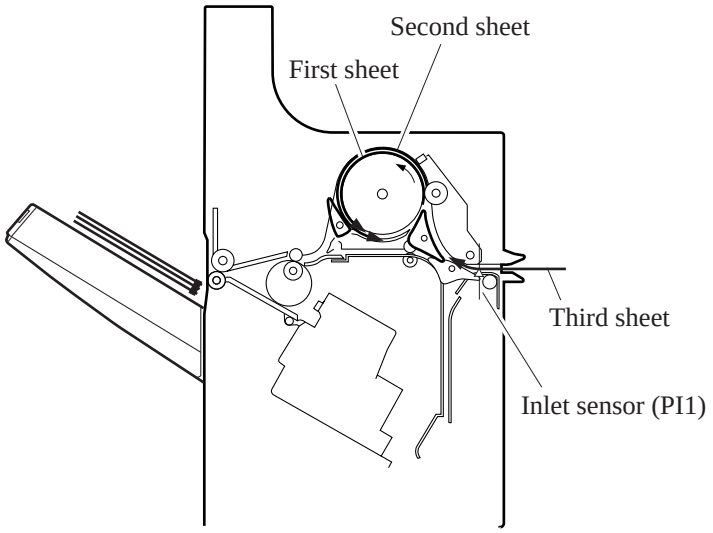


Figure 2-253

8) When the leading edge of the third sheet reaches the inlet sensor (PI1), the buffer outlet solenoid (SL3) turns off so that the path is directed in the direction of delivery. (The actual switchover will occur after the trailing edge of the first sheet has moved past the flapper.)

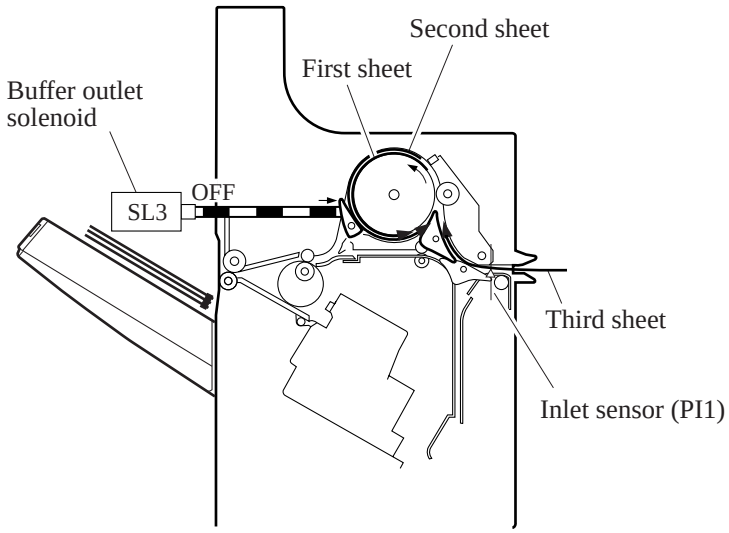


Figure 2-254

9) The buffer roller continues to rotate, the third sheet overlaps the first and second sheets, and the three sheets are fed together towards the delivery roller.

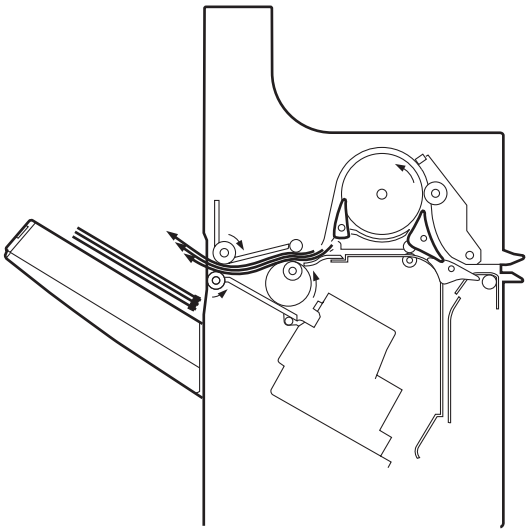


Figure 2-255

K. Detecting Jams

The following sensors are used to detect the presence/absence of paper and to make sure that sheets are moved properly:

- Inlet sensor (PI1)
- Delivery sensor (PI3)
- Stapling tray sensor (PI4)
- Buffer path paper sensor (PI14)

A jam is identified with reference to the presence/absence of paper at each specific sensor at the times programmed in the memory of the microprocessor (CPU) on the finisher controller PCB.

When the CPU identifies a jam, it suspends the finisher's delivery operation and informs the host machine DC controller of the presence of a jam. After the paper jam is removed, the buffer path inlet paper sensor (PI17) checks whether or not copies are being detected in addition to the above four sensors (inlet sensor, delivery sensor, stapling tray sensor and buffer path paper sensor). If the sensors detect a copy when all doors are closed, the finisher unit judges that paper jams have not completely been removed, and sends the paper jam removal signal to the host machine again.

The tray 1 paper sensor (PI11) and tray 2 paper sensor (PI12) are not used to detect jams.

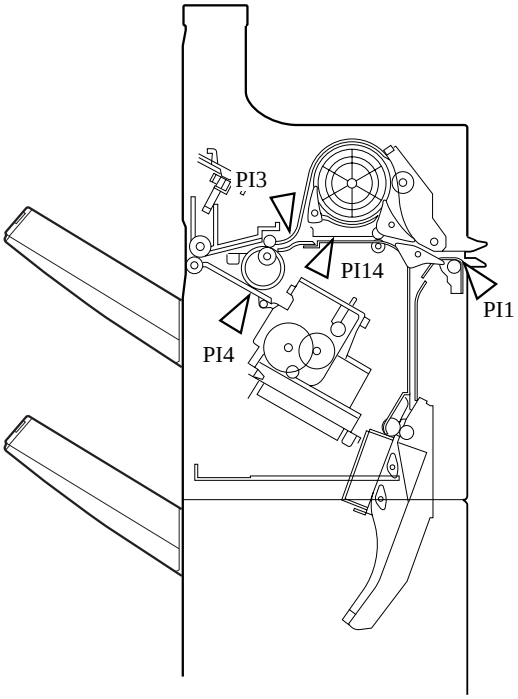


Figure 2-256

No.	Sensor names
PI1	Inlet sensor
PI3	Delivery sensor
PI4	Stapling tray sensor
PI14	Buffer path paper sensor

Table 2-205

1. Inlet Sensor Delay Jam

The inlet sensor does not detect paper when feeding an equivalent of 400 mm from when the host machine delivery signal has been issued.

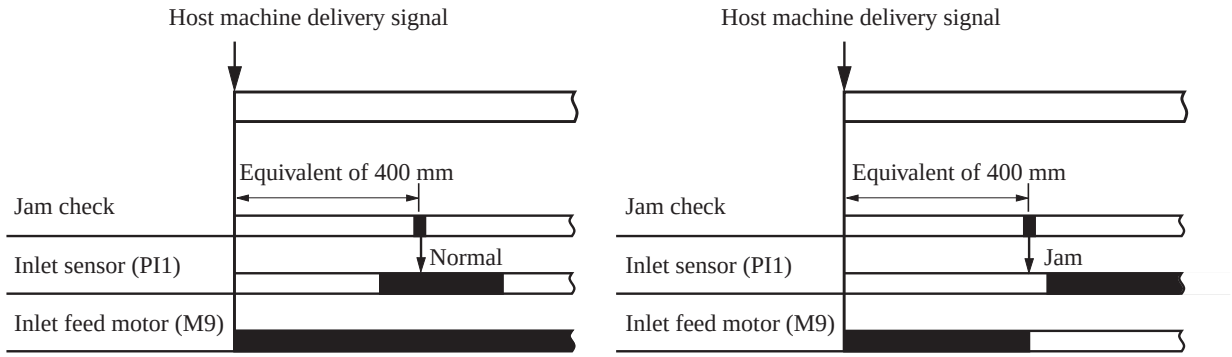


Figure 2-257

2. Inlet Sensor Stationary Jam

The sheet does not move past the inlet sensor when an equivalent of twice the feeding length of the sheet has been fed after the sensor turned on.

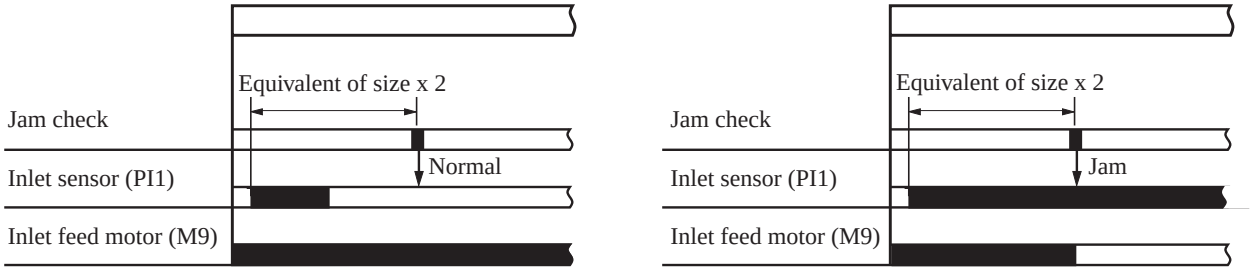


Figure 2-258

3. Buffer Path Paper Sensor Delay Jam

The buffer inlet sensor does not detect paper when an equivalent of 550 mm has been fed after the inlet sensor turned on.

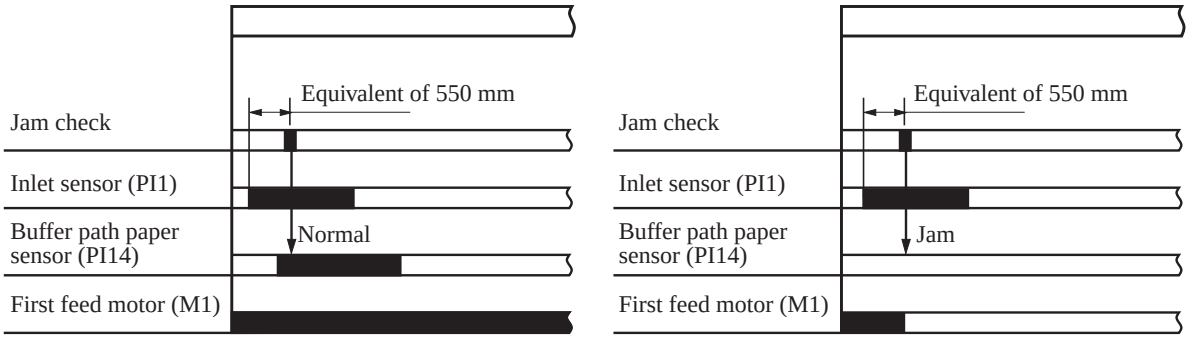


Figure 2-259

4. Buffer Path Paper Sensor Stationary Jam

The sheet does not move past the buffer inlet sensor when an equivalent of twice the feeding length of the sheet has been fed after the sensor turned on.

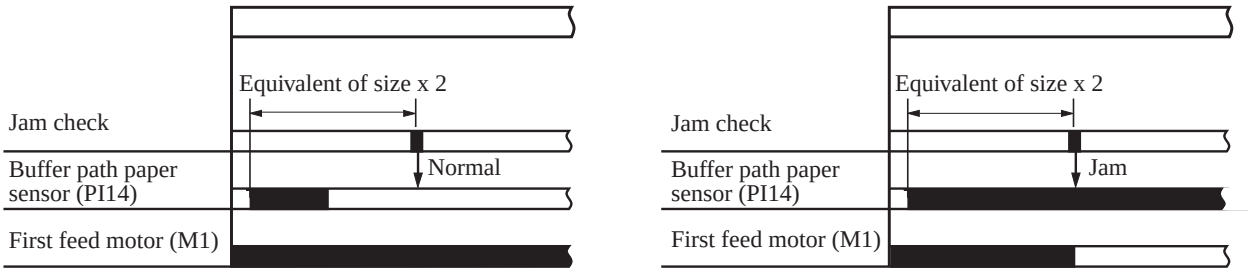


Figure 2-260

5. Delivery Sensor Delay Jam

a. Straight Path

The delivery sensor does not detect paper when an equivalent of 476 mm has been fed after the inlet sensor turned on.

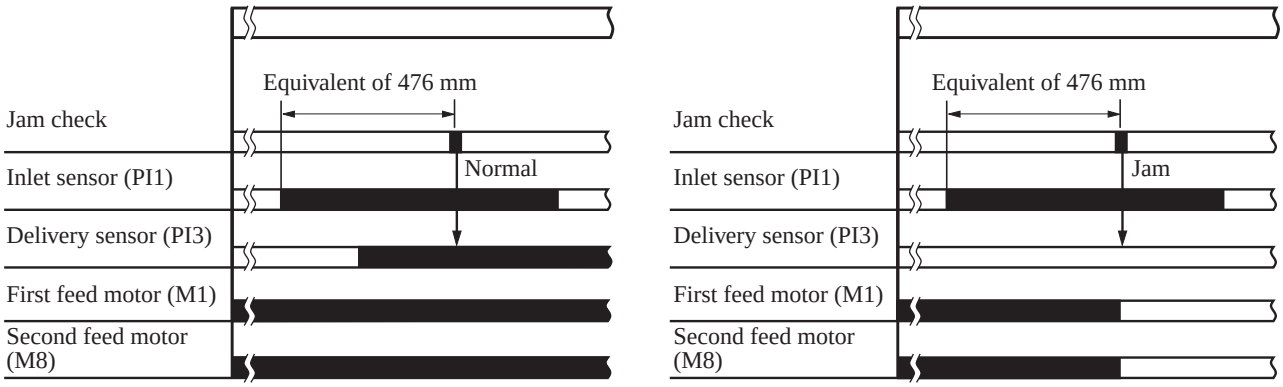


Figure 2-261

b. Buffer Path

The delivery sensor does not detect paper when an equivalent of 772 mm has been fed after the inlet sensor turned on.

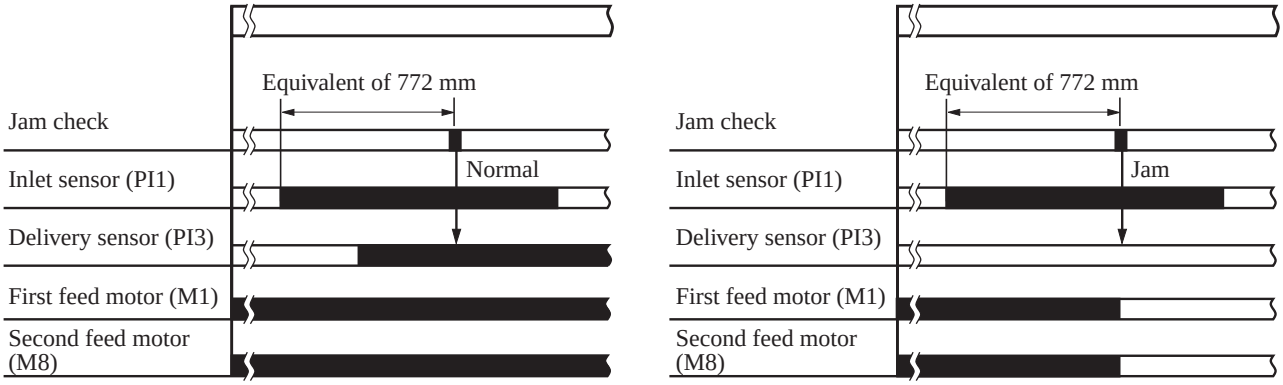


Figure 2-262

6. Delivery Sensor Stationary Jam

The sheet does not move past the delivery sensor when an equivalent of twice the feeding length of the sheet has been fed after the delivery sensor turned on.

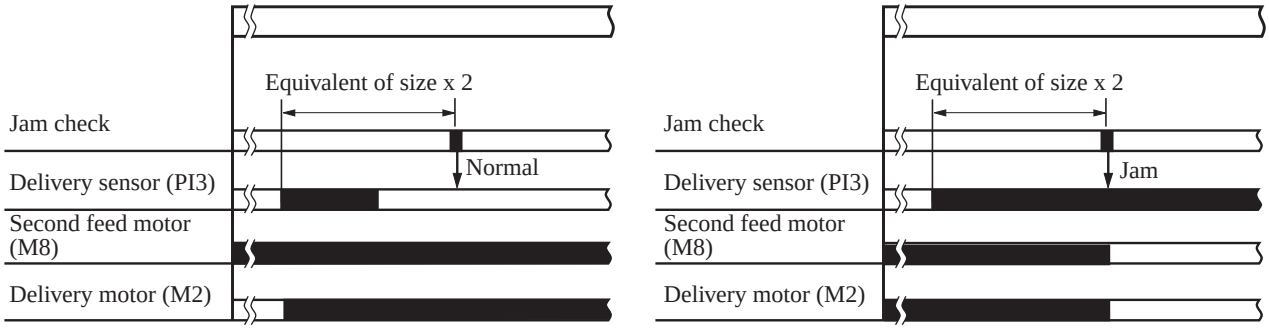


Figure 2-263

7. Stapling Tray Sensor Stationary Jam

The sheet does not move past the stapling tray sensor 1 sec after the delivery motor (M2) turned on.

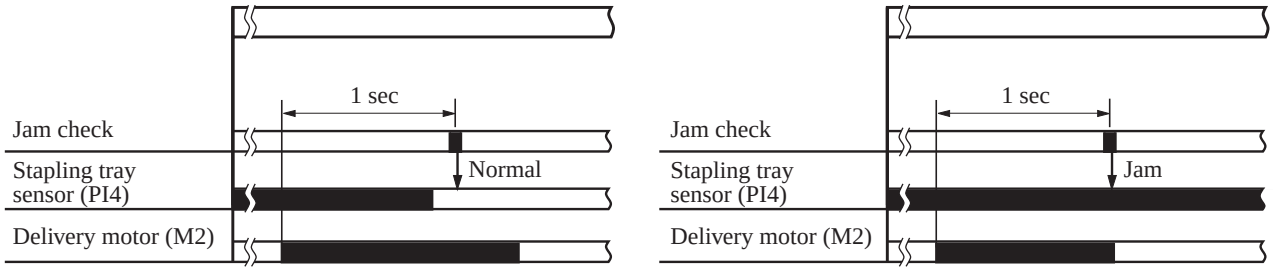


Figure 2-264

8. Timing Jam

The inlet sensor (PI1) detects a sheet before the delivery signal is received from the host machine.

9. Staple Jam

When the staple motor (M6) is rotating clockwise, the staple home position sensor (PI22) does not turn on within 0.5 sec. after it has turned off. However, the sensor turns on within 0.5 sec. after the motor has been rotated counterclockwise.

10. Power-On Jam

One of the inlet sensor (PI1), delivery sensor (PI3), buffer path paper sensor (PI4) or buffer path inlet paper sensor (PI17) detects paper at power-on.

11. Door Open Jam

One of the joint sensor (PI15), door open sensor (PI16) or door switches (MS1) detects the cover open during operation (including front door switch (MS2P) when the optional puncher unit is mounted).

12. Punch Jam

The punch home sensor (PI3P) does not turn on again within 200 msec after turning off.

13. Stay Jam Caused By Finisher Start Signal OFF

The finisher start signal is turned OFF in the host machine while paper is being fed in the finisher.

III. POWER SUPPLY SYSTEM

1. Outline

When the host machine is turned on, 5VDC power is supplied to the finisher controller PCB from the host machine. Then the finisher controller PCB sends the power-on signal (REMOTE) to the power supply unit. The power is turned on due to this operation, and 24VDC power is supplied to the finisher controller PCB. 24VDC power is used to drive the motors and the solenoids, while 5VDC power is used for sensors and ICs on PCB. Both lines are also used to feed power from the finisher controller PCB to the saddle stitcher controller PCB. Power is also supplied to the punch driver PCB when the optional puncher unit is mounted.

Some of the 24 VDC power used to drive motors is cut off when the door switch (MS1) is open. However, the power to the saddle stitcher controller PCB and the punch driver PCB will not be cut off.

Figure 2-301 is a block diagram showing the power supply system.

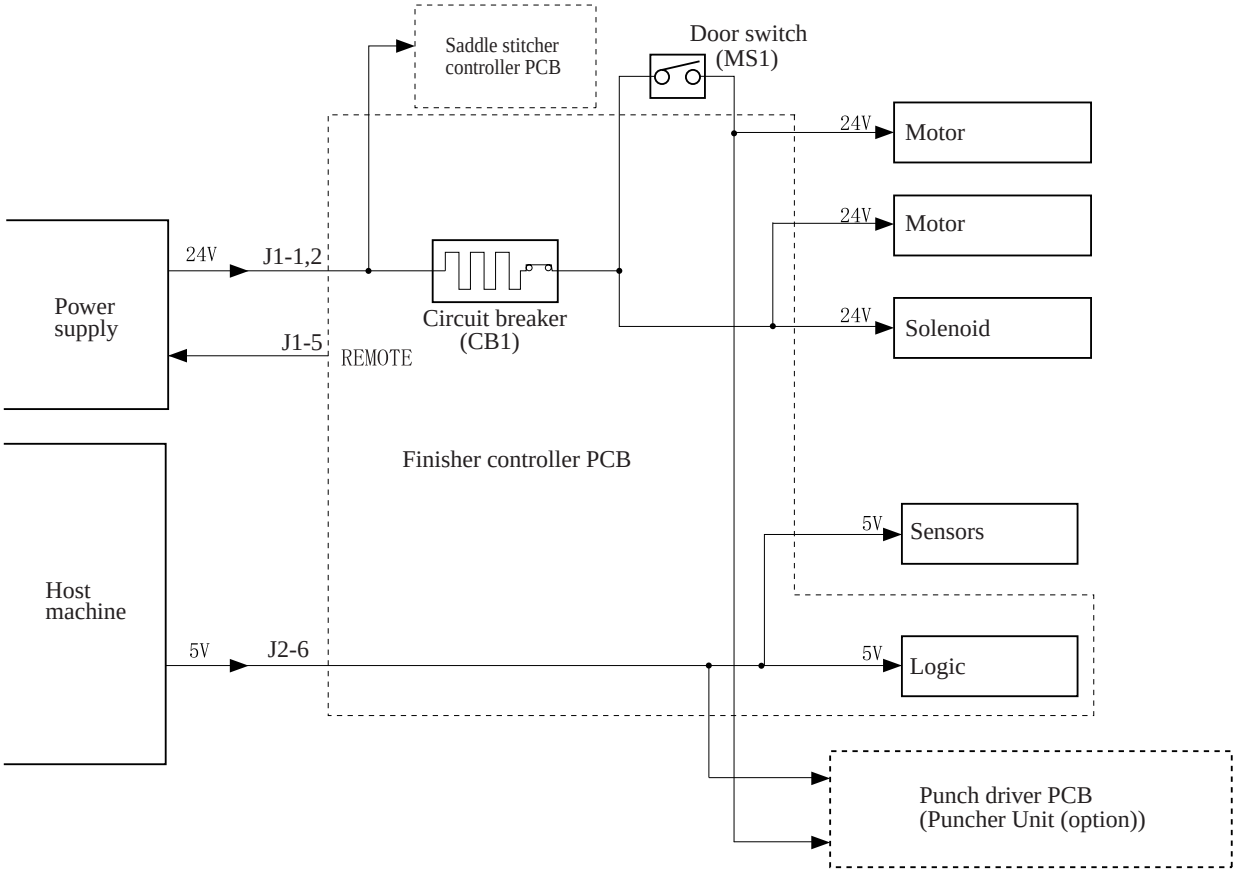


Figure 2-301

2. Protection Functions

The 24 VDC power line used to drive motors and solenoids is equipped with a circuit breaker (CB1) for protection against overcurrent. The 24 V line used to drive the first feed motor (M1), alignment motors (M3, M11), and stapler shift motor (M4) are equipped with a fuse, which is designed to blow when an overcurrent occurs.

CHAPTER 3

SADDLE STITCHER UNIT BASIC OPERATION

1. This chapter discusses the purpose and role of each of the stitcher's functions, and the principles of operation used for the stitcher mechanical and electrical systems. It also explains the timing at which these systems are operated.

   The ▮▮▮ symbol in drawings indicates transmission of mechanical drive, and signals marked by ⟶ together with the signal name indicates the flow of electrical signals.

2. In descriptions of digital circuits on the stitcher, "1" indicates a high signal voltage level, while "0" indicates a low signal voltage level. Voltage values differ according to circuit.

   A microprocessor is used on the stitcher. A description of microprocessor operation is omitted in this chapter as it is practically impossible to check internal operation of the microprocessor.

   Descriptions in this chapter also assume that PCBs will not be repaired at user sites. For this reason, descriptions of circuits on PCBs is limited to block diagrams. Two types of block diagrams are provided for separate functions: diagrams indicating details from sensors up to input sections of major PCBs, and diagrams indicating details from the output sections of major PCBs up the loads.

I. BASIC OPERATION

A. Outline

The unit “stitches” (2 points) a stack of sheets delivered by the finisher unit and folds it in two for delivery. All these operations are controlled by the saddle stitcher controller PCB in response to commands from the host machine via the finisher unit.

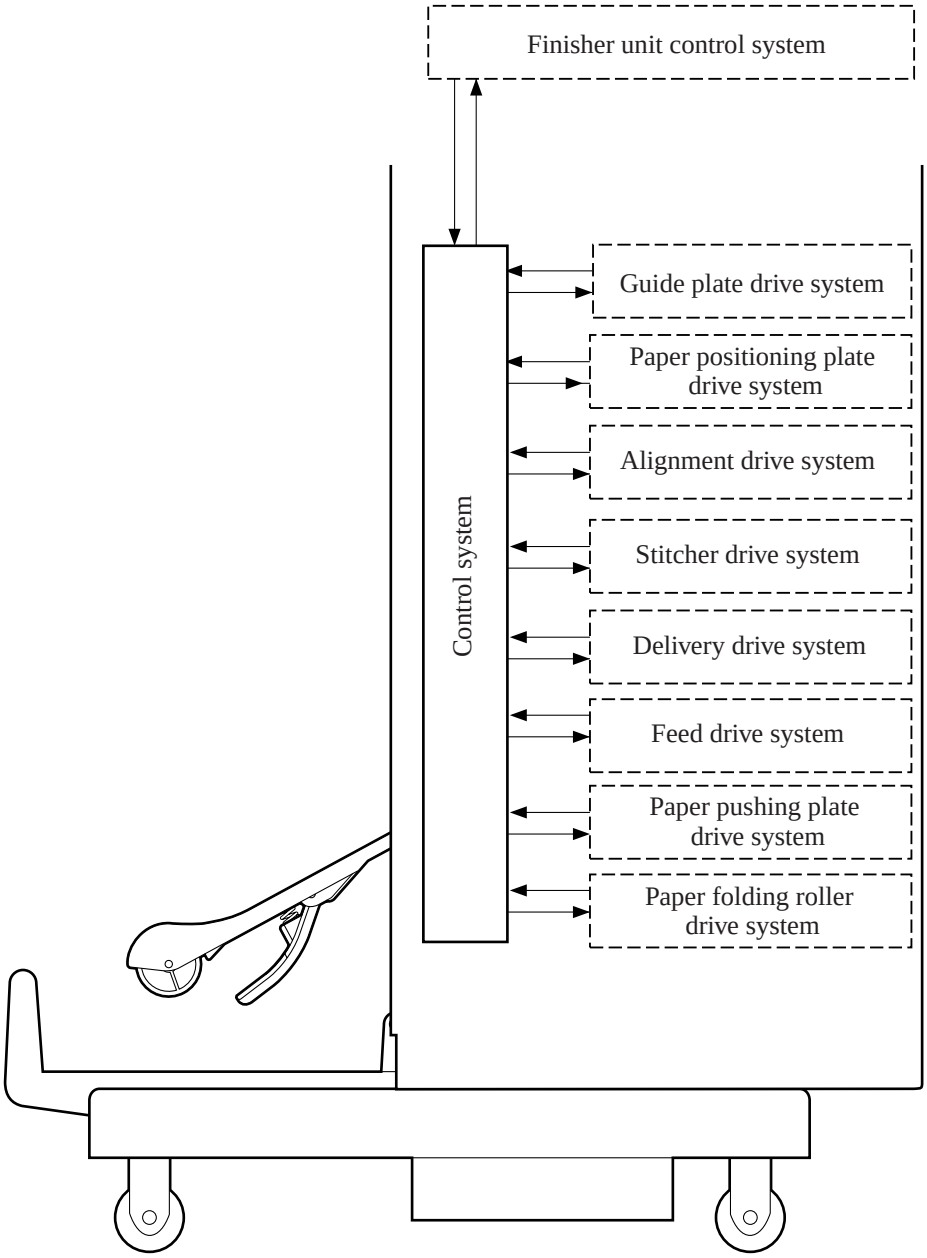


Figure 3-101

B. Electrical Circuitry

The sequence of operations used for the saddle stitcher is controlled by the saddle stitcher controller PCB. The saddle stitcher controller PCB has a microprocessor. This microprocessor is used to control the sequence of operations and to handle serial communications with the finisher controller PCB, driving solenoids and motors in response to the various commands from the finisher controller PCB.

The saddle stitcher controller PCB is also used to communicate the state of various sensors and switches to the finisher controller PCB in serial.

The functions of the major ICs mounted on the saddle stitcher controller PCB are as follows:

- Q1
  Controls the sequence of operations.
- Q2
  Contains the sequence program.
- Q3
  Controls the sequence of operations.
- Q4
  Handles IPC communications.

Electrical circuitry block diagram

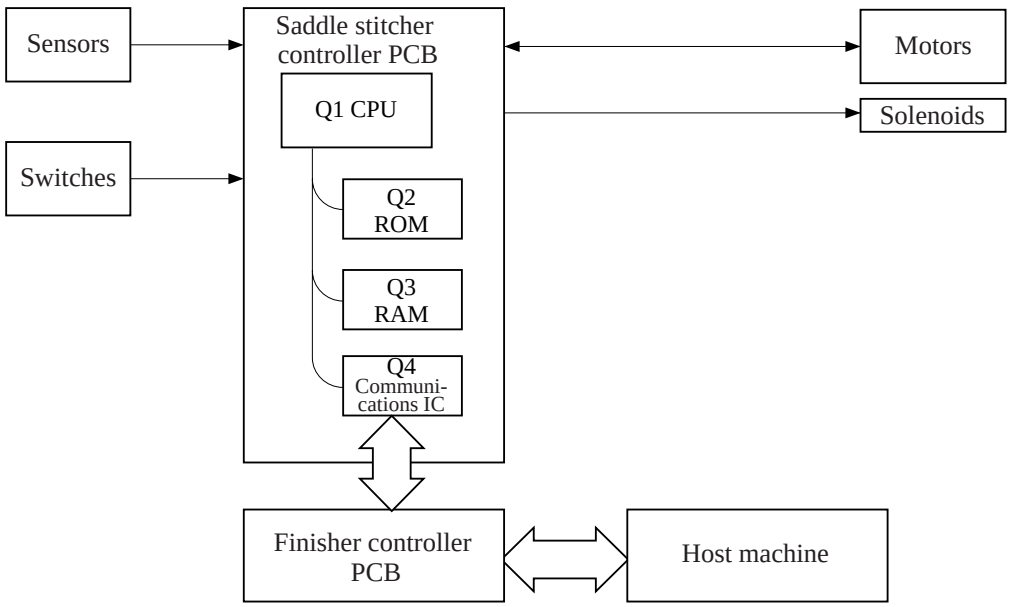


Figure 3-102

C. Inputs to and Outputs from the Saddle Stitcher Controller PCB

1. Inputs to the Saddle Stitcher Controller PCB

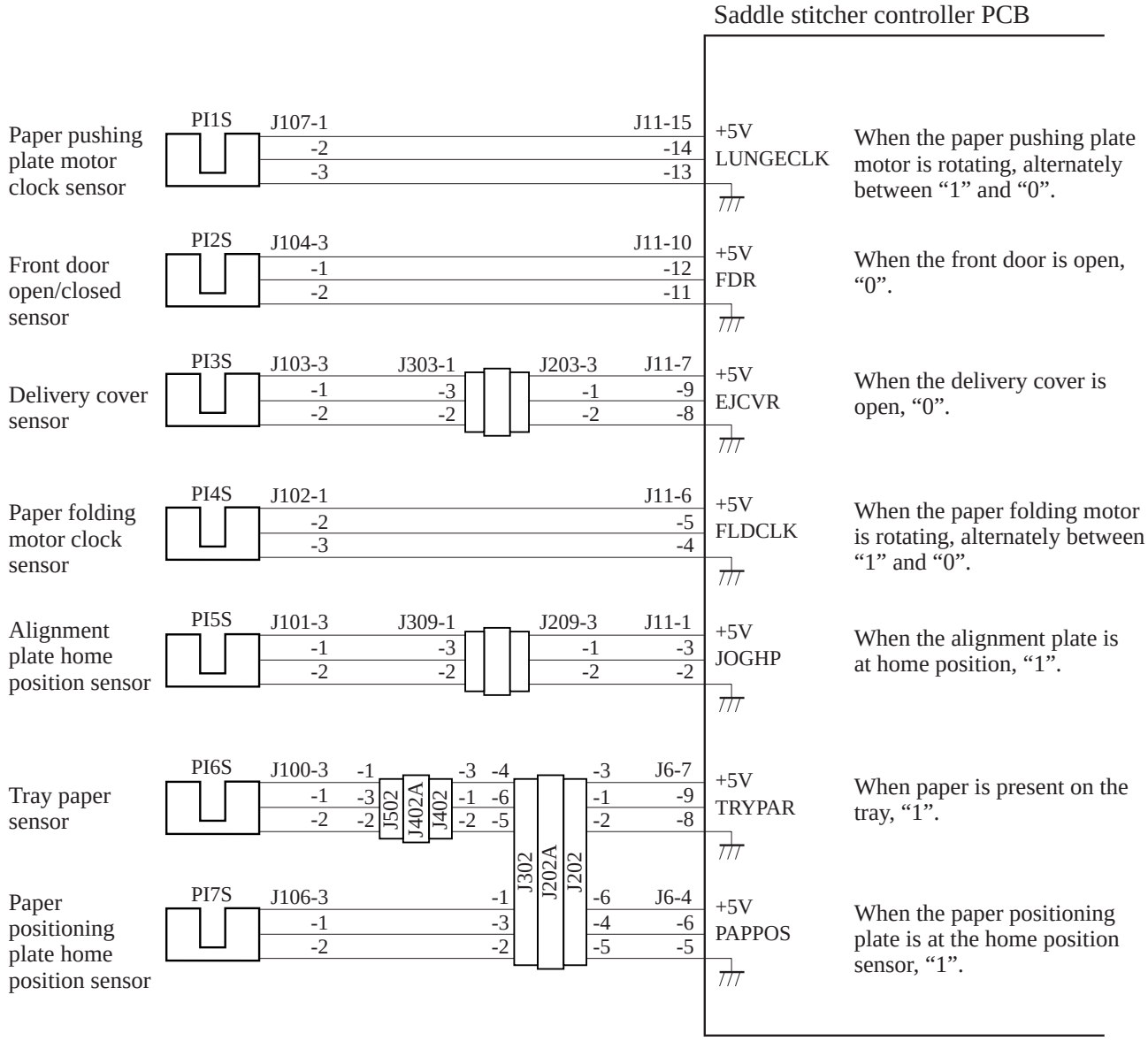


Figure 3-103

2. Inputs to the Saddle Stitcher Controller PCB

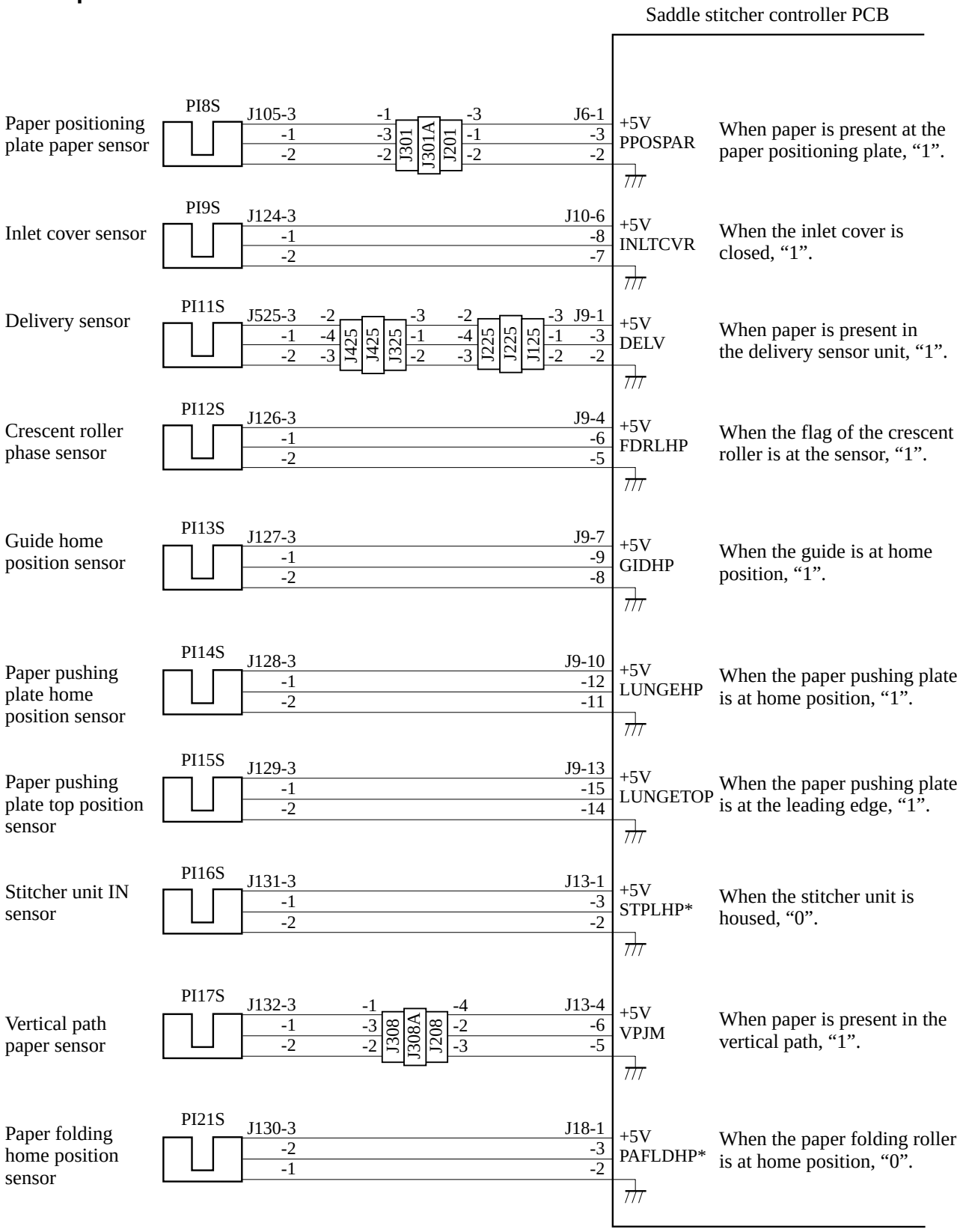


Figure 3-104

3. Inputs to the Saddle Stitcher Controller PCB

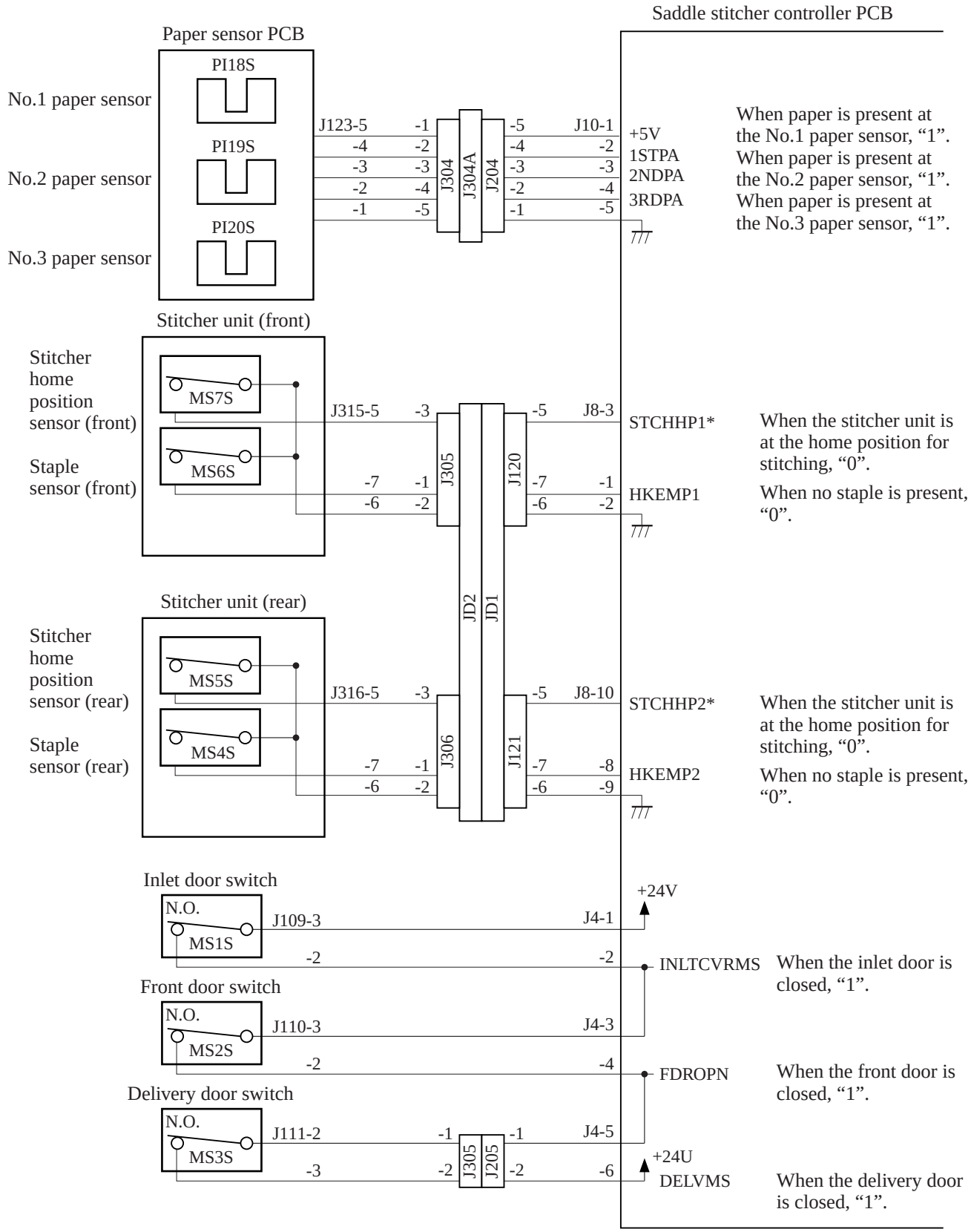


Figure 3-105

4. Outputs from the Saddle Stitcher Controller PCB

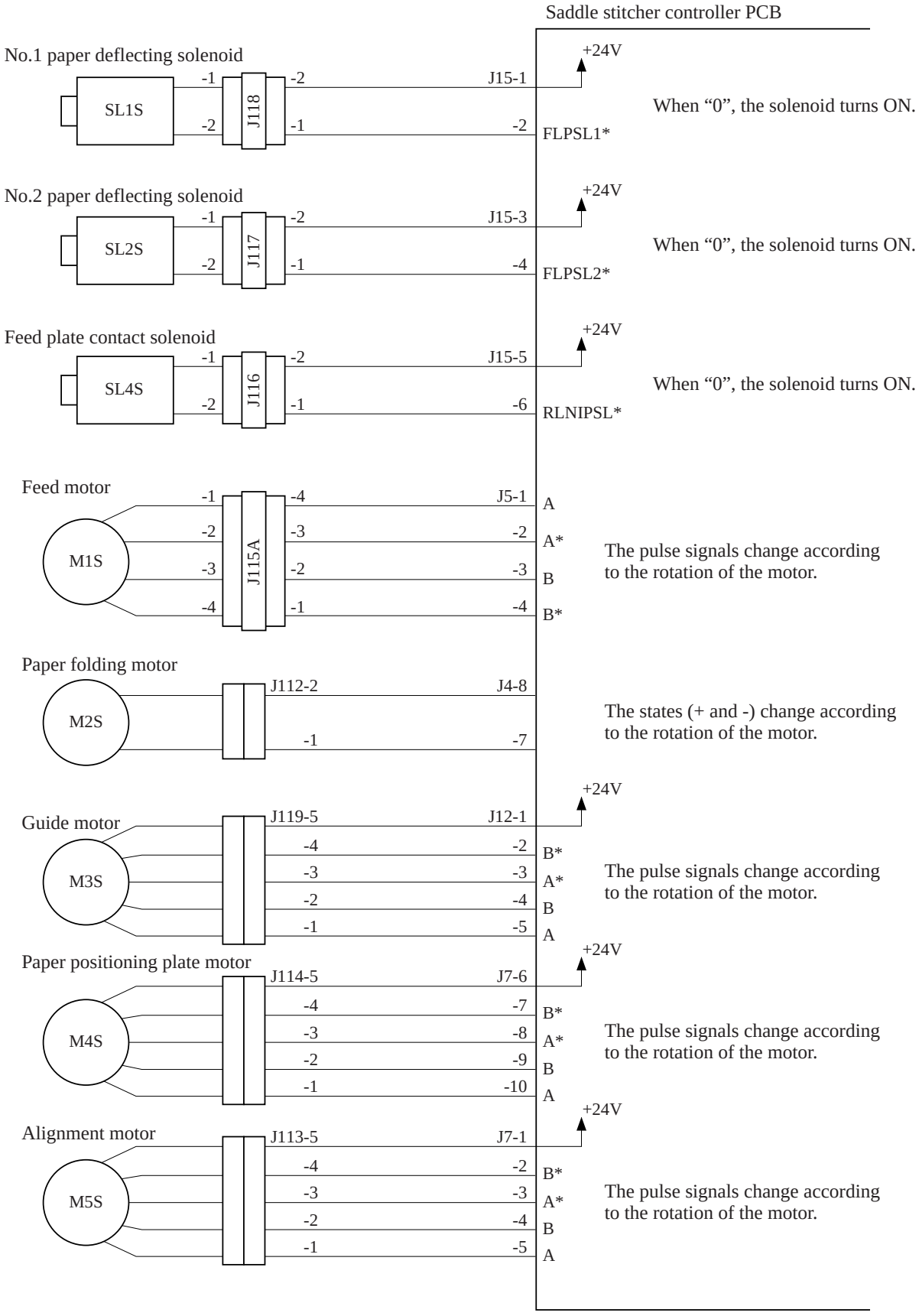


Figure 3-106

5. Outputs from the Saddle Stitcher Controller PCB

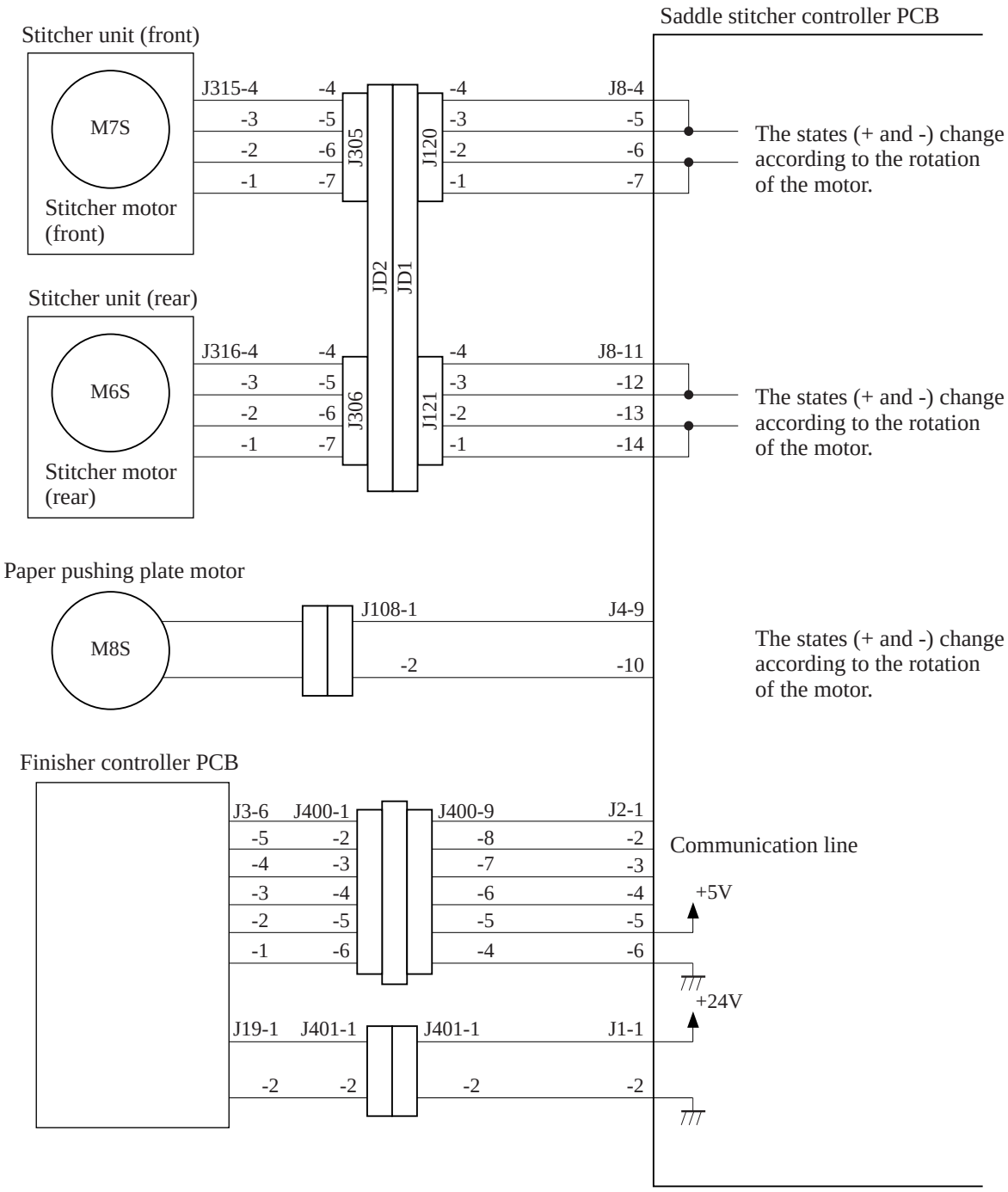


Figure 3-107

II. FEEDING/DRIVE SYSTEM

A. Outline

The stitcher unit aligns the sheets coming from the finisher unit and stitches the resulting stack for delivery to the delivery tray according to the commands coming from the finisher controller PCB.

The machine's operation consists of the following:

1. Receive sheets.
2. Aligns the sheets
3. Stitches the stack.
4. Feeds the stack.
5. Folds and delivers the stack.

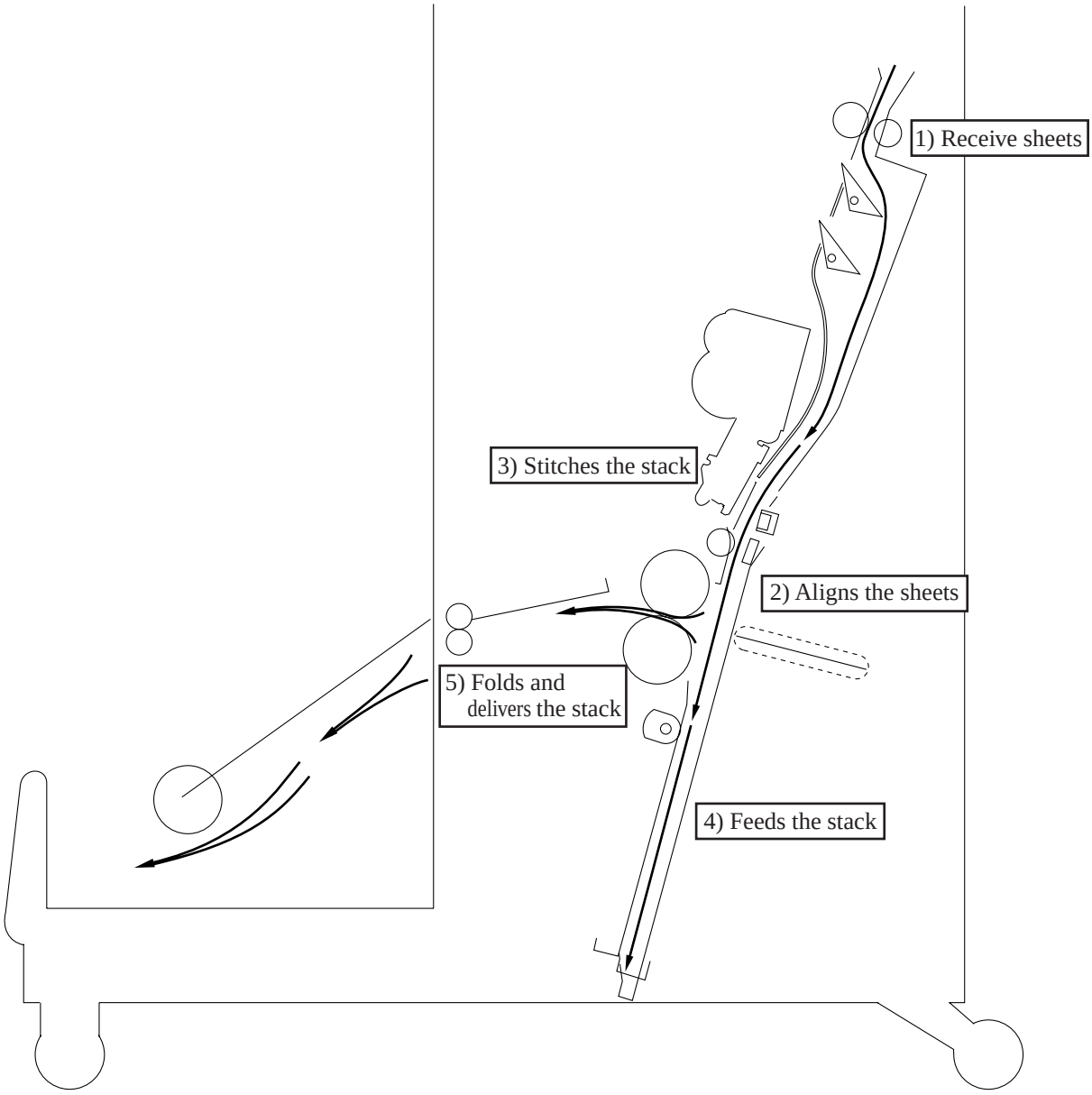


Figure 3-201

1. Receiving Sheets

The stitcher unit receives sheets from the finisher unit and outputs them inside the vertical path in vertical orientation.

The vertical path, while sheets are being output, is configured by two paper deflecting plates.

The position of the sheets being output is set by the paper positioning plate so that the center of the stack matches the stapling/folding position.

Sheets coming later are output closer to the delivery slot, and the volume of paper that may be output is as follows:

- 15 sheets (maximum of 14 sheets of 80 g/m^2 + 1 sheet of 256 g/m^2)

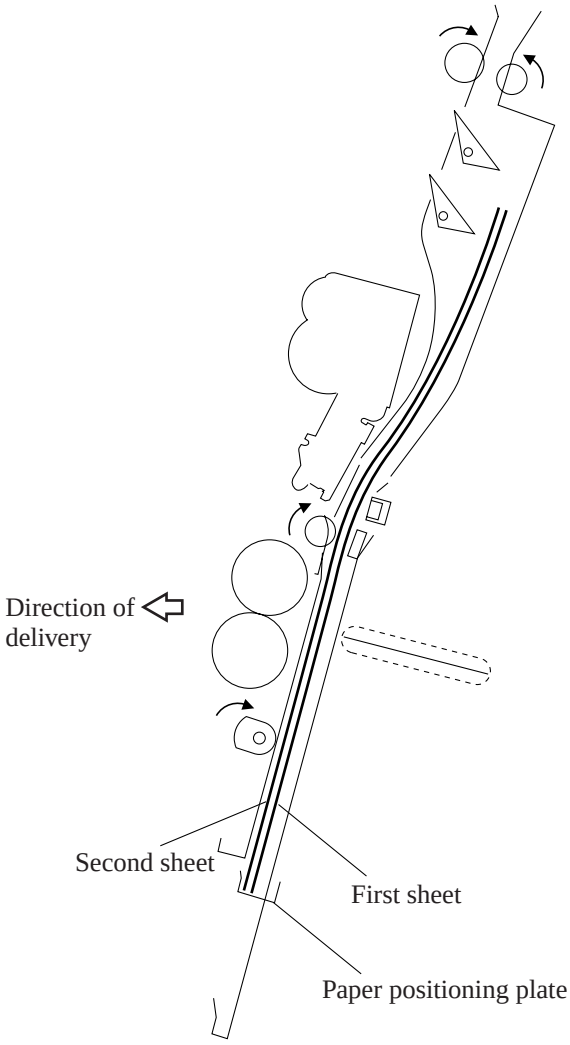


Figure 3-202

2. Aligning the Sheets

The alignment plates operate to put the sheets in order each time a sheet of paper is output to the vertical path assembly. The alignment plates are mounted at the edge of the vertical path assembly.

The alignment plates also operate after stapling to prepare the stack for delivery.

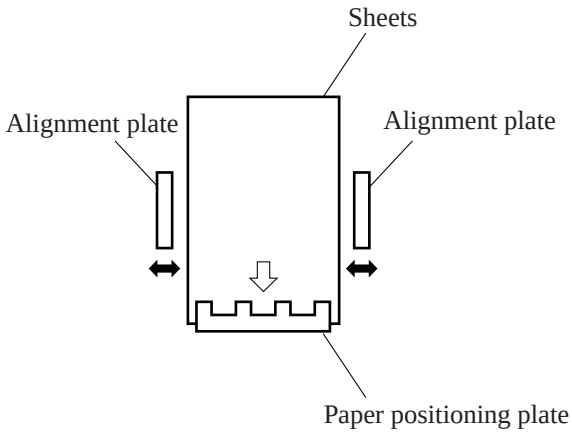


Figure 3-203

3. Stitching

When all sheets have been output, the two stitchers stitch the stack. The stitchers are positioned so that they face the center of a stack.

The two stitchers are not operated simultaneously so as to prevent the paper from wrinkling between two staples and to limit the load on the power supply.

If only one sheet of paper arrives from the host machine, stitching does not take place and the sequence goes to the next operation (stack feeding).

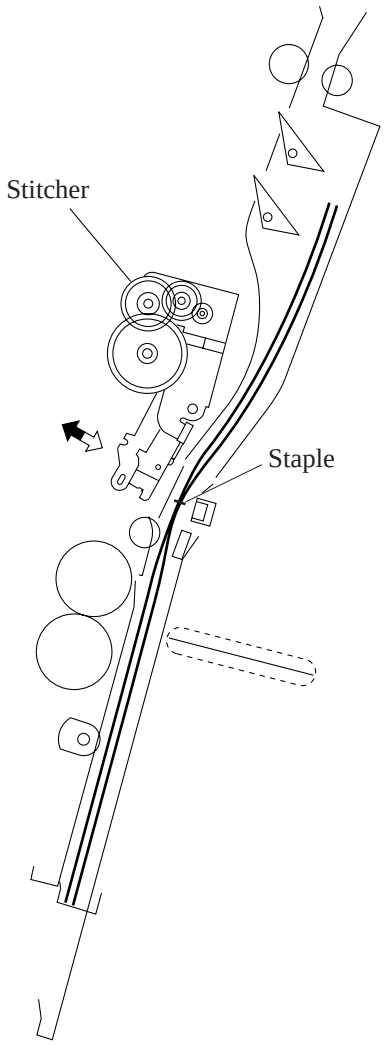


Figure 3-204

4. Feeding the Stack

The unit folds the stitched stack of sheets, and then feeds it to the point of delivery. This point is where the center of the stack, i.e., stapling position, matches the height of the paper pushing plate and the paper folding roller nip.

The stack is moved forward by operating the paper positioning plate. When the plate is operated, the guide plate which has been covering the paper folding rollers, also moves down so that the paper folding rollers directly face the stack.

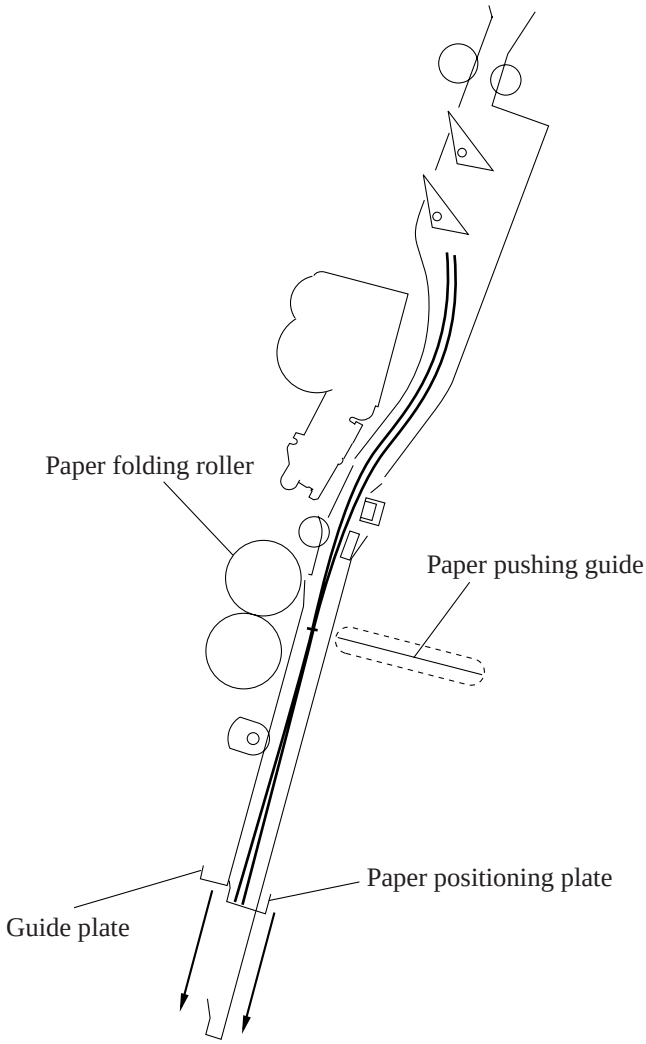


Figure 3-205

5. Folding/Delivering the Stack

The paper pushing plate pushes against the center of the stack to move it in the direction of the paper folding rollers. In response, the paper folding rollers pick the stack along its center and fold it in two. The paper folding rollers together with the delivery roller then move the stack along to output it on the delivery tray.

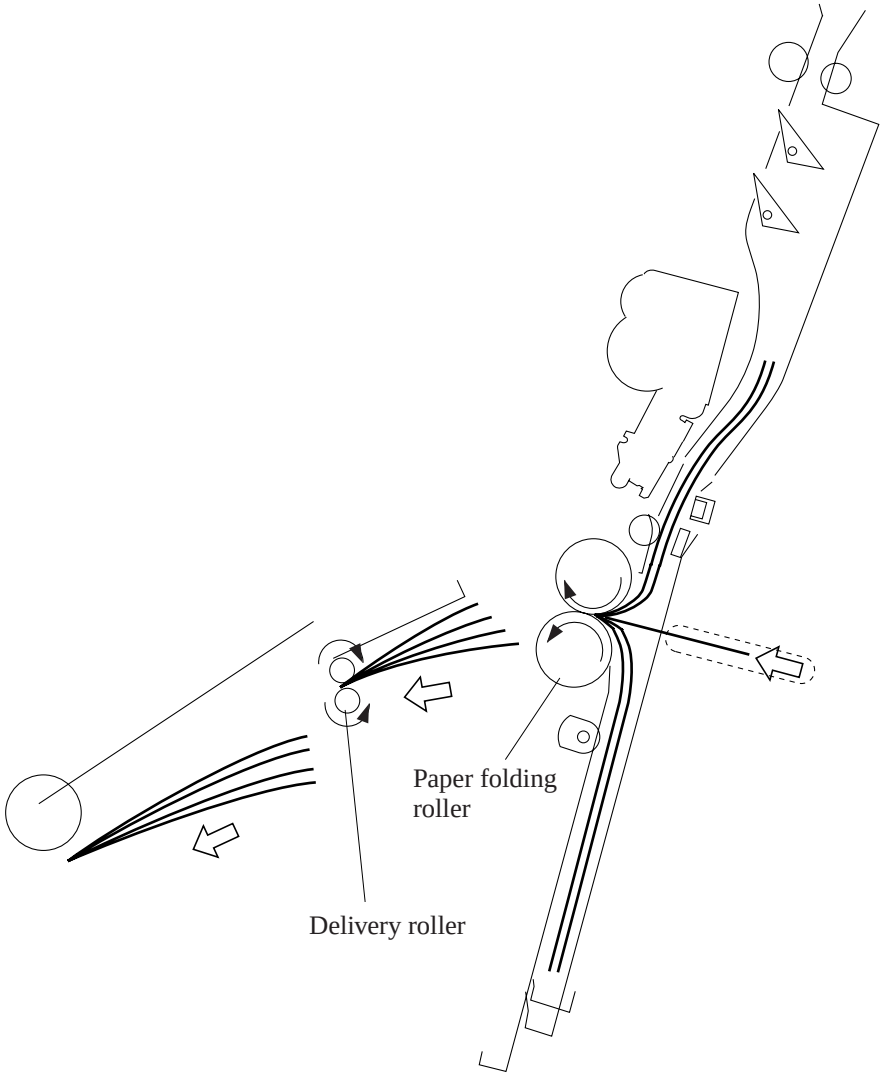


Figure 3-206

III. PAPER OUTPUT MECHANISM

A. Outline

The paper output mechanism serves to keep a stack of sheets coming from the finisher in place for the next steps (stapling, folding).

The paper inlet is equipped with the No.1 flapper and the No.2 flapper, which operate to configure the paper path to suit the size of paper. The paper positioning plate is kept in wait at a predetermined location to suit the size of paper. The paper positioning plate is driven by the paper positioning plate motor (M4S), and the position of the plate is identified in reference to the number of motor pulses coming from the paper positioning plate home position sensor (PI7S). A sheet moved by the inlet roller is handled by the feed rollers and the crescent roller and held in a predetermined position. The feed plate serve to move sheets by coming into contact with or moving away from sheets as needed.

The alignment plates put the stack into order each time a sheet is output. The alignment plates are driven by the alignment motor (M5S), whose position is identified in reference to the number of motor pulses coming from the alignment plate home position sensor (PI5S).

To prevent interference between paper and the paper folding rollers when the paper is being output, the folding rollers are designed to be covered by a guide plate. The guide plate moves down before paper is folded so as to expose the paper folding rollers.

The inlet is equipped with the No.1, No.2 and No.3 paper sensors (PI18S, PI19S, PI20S) each suited to a specific paper size, and the paper positioning plate is equipped with a paper positioning plate paper sensor (PI8S).

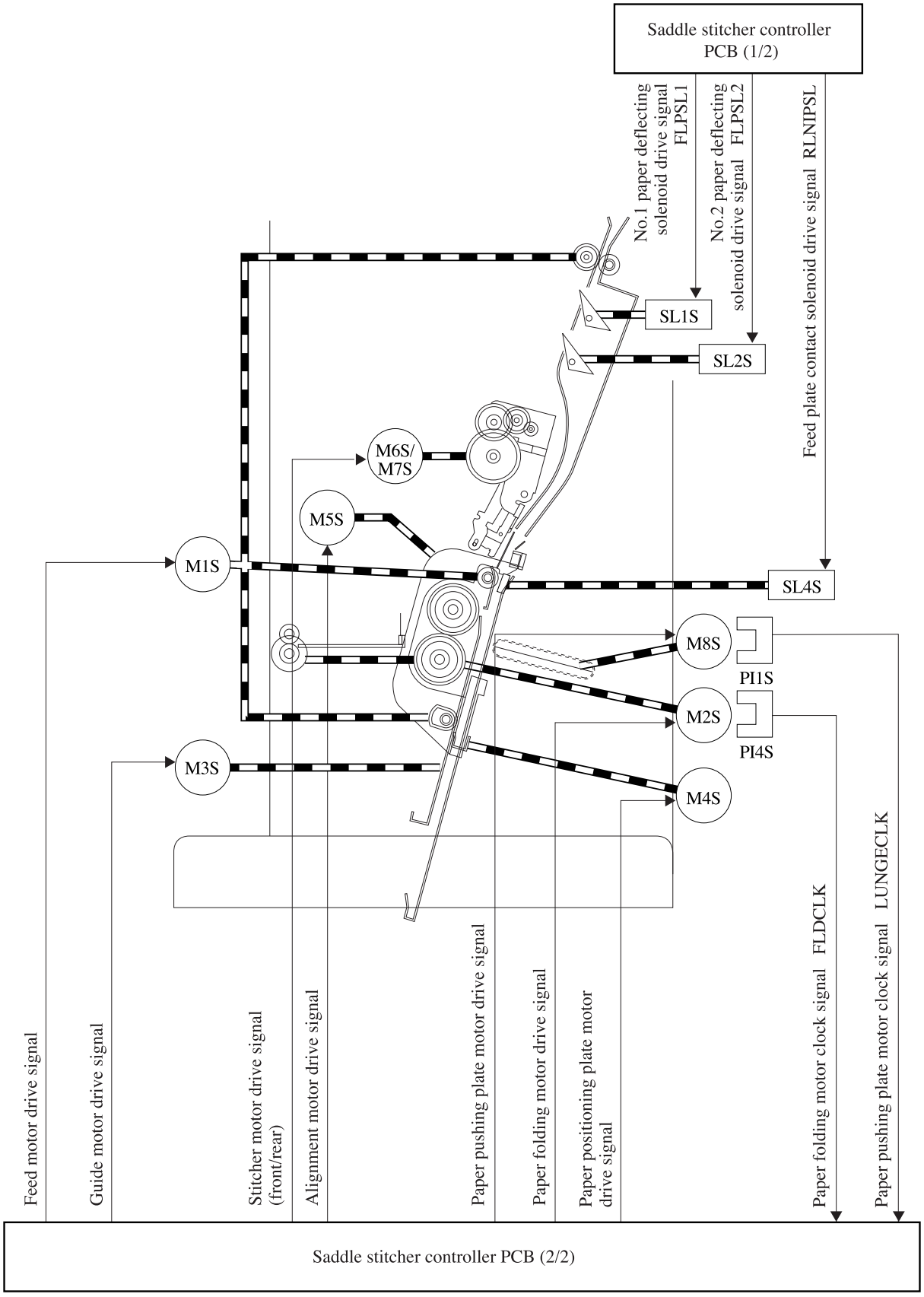

Saddle stitcher controller PCB (1/2)
No.1 paper deflecting solenoid drive signal FLPSL1
No.2 paper deflecting solenoid drive signal FLPSL2
Feed plate contact solenoid drive signal RLNIPSL
SL1S
SL2S
M6S/ M7S
M5S
M1S
SL4S
M8S
PI1S
M2S
PI4S
M3S
M4S
Feed motor drive signal
Guide motor drive signal
Stitcher motor drive signal (front/rear)
Alignment motor drive signal
Paper pushing plate motor drive signal
Paper folding motor drive signal
Paper positioning plate motor drive signal
Paper folding motor clock signal FLDCLK
Paper pushing plate motor clock signal LUNGECLK
Saddle stitcher controller PCB (2/2)

Figure 3-301

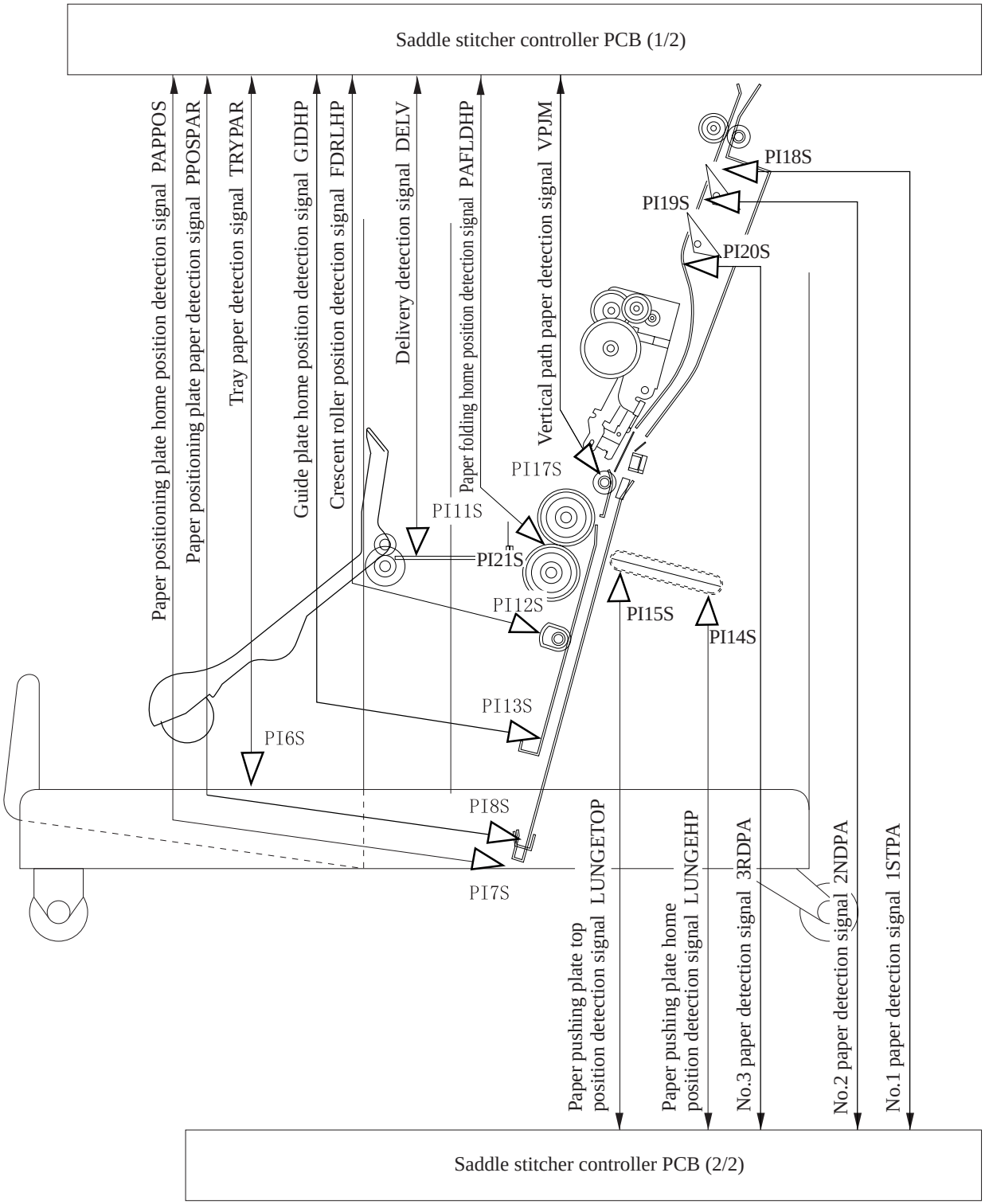

Saddle stitcher controller PCB (1/2)
Paper positioning plate home position detection signal PAPPOS
Paper positioning plate paper detection signal PPOSPAR
Tray paper detection signal TRYPAR
Guide plate home position detection signal GIDHP
Crescent roller position detection signal FDRLHP
Delivery detection signal DELV
Paper folding home position detection signal PAFLDHP
Vertical path paper detection signal VPJM
PI18S
PI19S
PI20S
PI17S
PI11S
PI21S
PI12S
PI15S
PI14S
PI13S
PI6S
PI8S
PI7S
Paper pushing plate top position detection signal LUNGETOP
Paper pushing plate home position detection signal LUNGEHP
No.3 paper detection signal 3RDPA
No.2 paper detection signal 2NDPA
No.1 paper detection signal 1STPA
Saddle stitcher controller PCB (2/2)

Figure 3-302

B. Controlling the Inlet Flappers

1. Outline

The two flappers mounted at the paper inlet are operated to configure the feed path according to the size of paper. The flappers are used to enable the following:

1. To detect the passage of the trailing edge of the paper being moved by an appropriate sensor.
2. To prevent the following sheet from butting against the top of the existing stack,

Table 3-301 shows the relationship between sensors and paper sizes.

Sensor	A3/LD	B4	A4-R/LT-R
No.1 paper sensor (PI18S)	Used	Used	Used
No.2 paper sensor (PI19S)	Not used	Used	Used
No.3 paper sensor (PI20S)	Not used	Not used	Used

Table 3-301

Each flapper is driven by its own solenoid.

Table 3-302 shows the relationship between solenoids and paper sizes.

Solenoid	A3/LD	B4	A4-R/LT-R
No.1 paper deflecting solenoid (SL1S)	OFF	ON	ON
No.2 paper deflecting solenoid (SL2S)	OFF	OFF	ON

Table 3-302

2. A3/LD Paper Path (3 sheets)

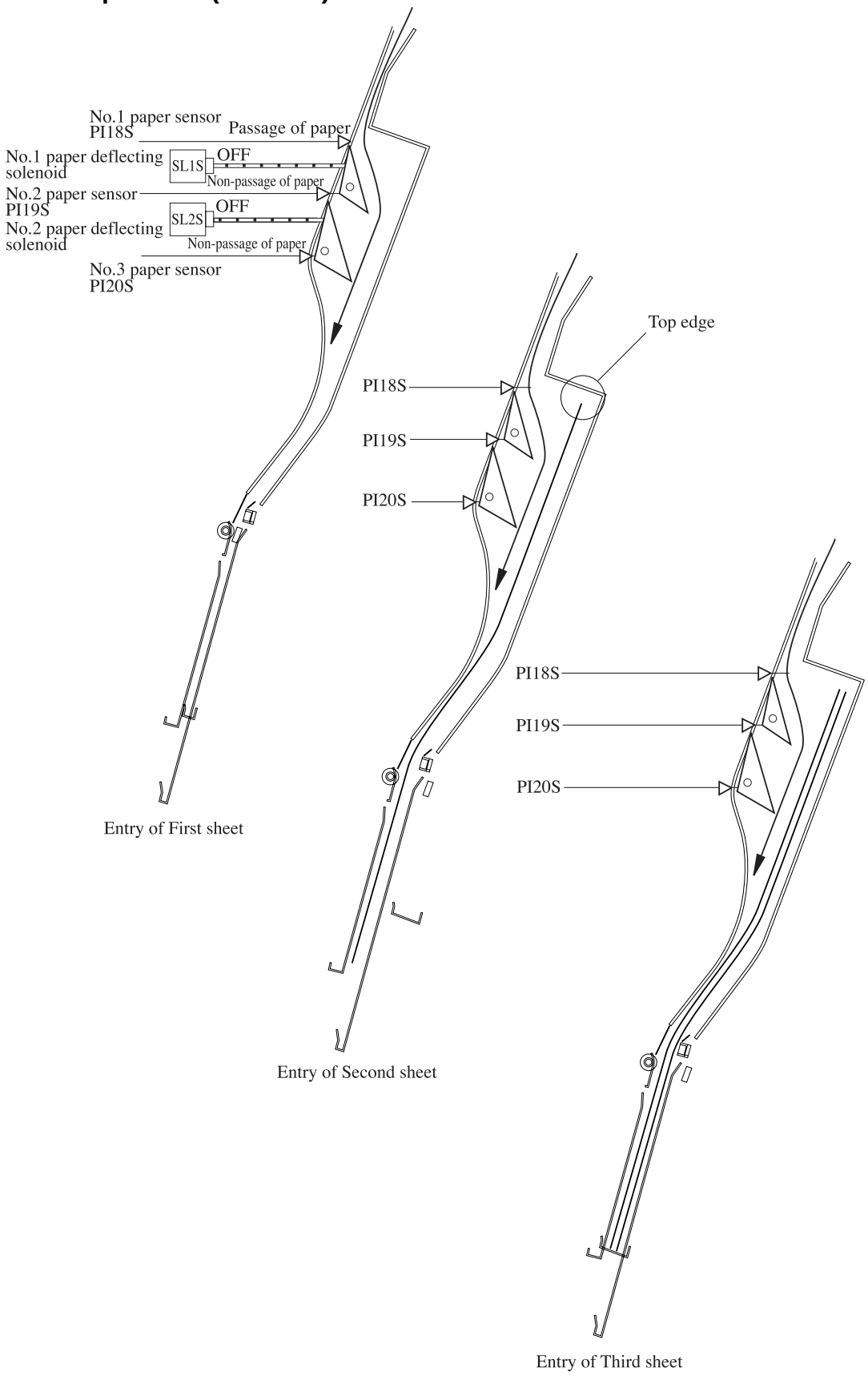


Figure 3-303

3. B4 Paper Path (3 sheets)

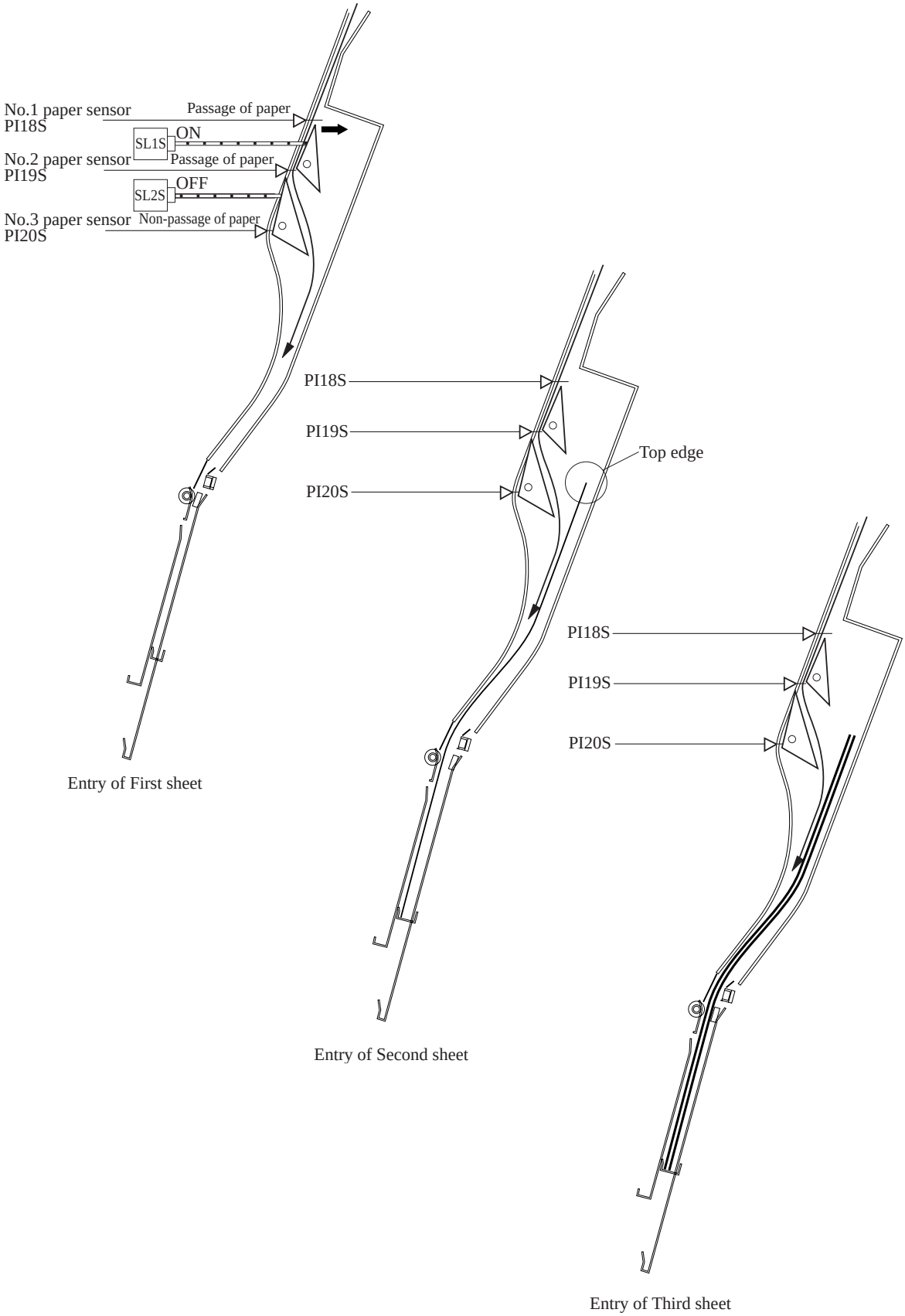


Figure 3-304

4. A4-R/LT-R Paper Path (3 sheets)

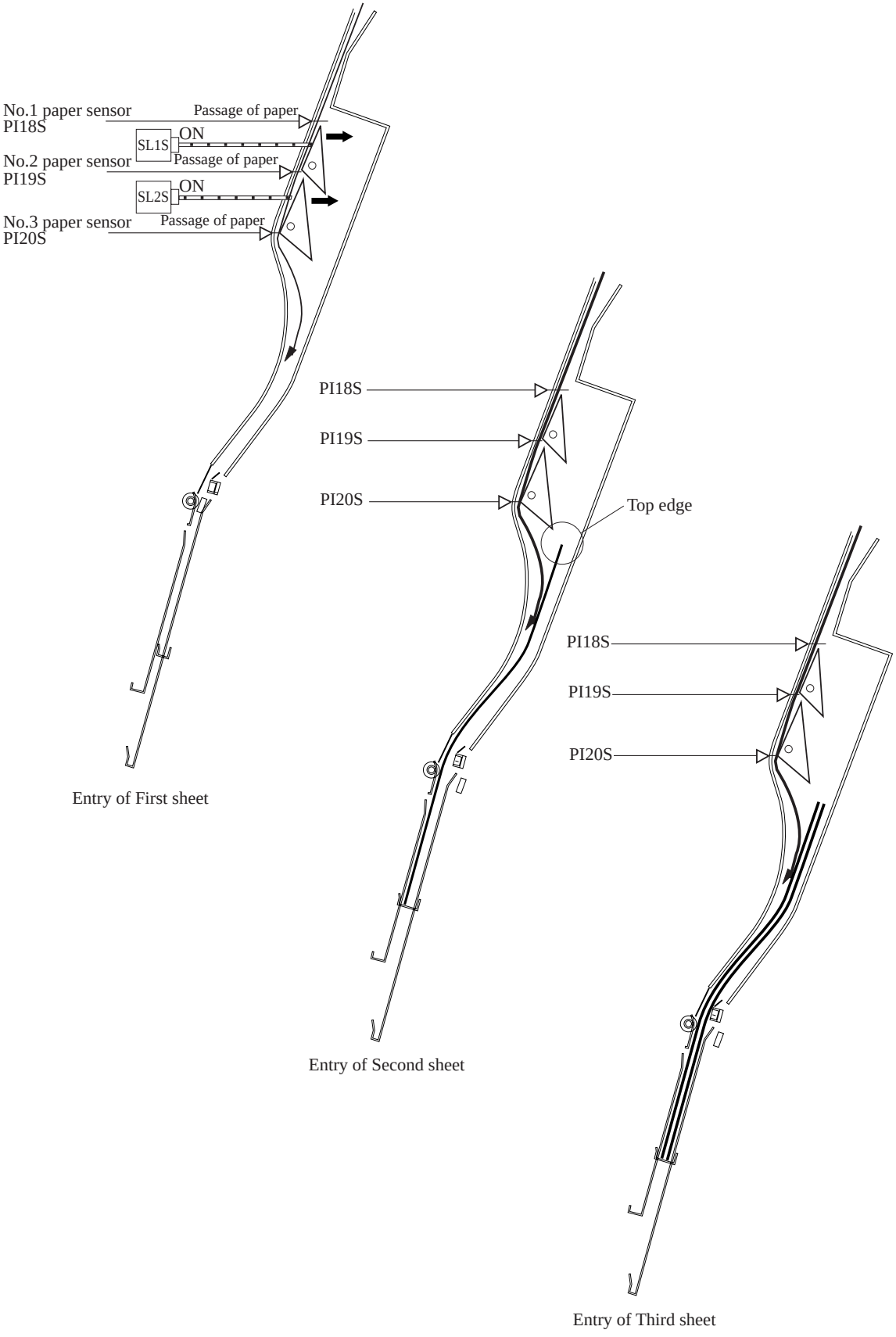


Figure 3-305

C. Controlling the Movement of Sheets

When the leading edge of a sheet has moved past the inlet flapper, the intermediate feed roller and the crescent roller start to move the sheet forward.

The intermediate feed roller is normally not in contact with the path bed. When the leading edge of a sheet reaches the intermediate feed roller contact section, the feed plate contact solenoid (SL4S) causes the roller to come into contact with the path bed so as to move the sheet. The contact is broken as soon as the leading edge of the sheet reaches the paper positioning plate. This series of operations is executed each time a sheet arrives.

When the leading edge of the first sheet reaches the paper positioning plate, the paper positioning plate paper sensor (PI8S) turns ON. The arrival of the second and subsequent sheets will not be checked since the first sheet will still be over the sensor.

The crescent roller keeps rotating while sheets are being output, butting the leading edge of each sheet against the paper positioning plate, and ultimately, keeping the leading edge of the stack in order.

The alignment plate motor (M5S) drives the alignment plates for each sheet so as to put both left and right edges of the sheet in order.

1) The solenoid turns ON while paper is being moved so that the feed plate comes into contact.

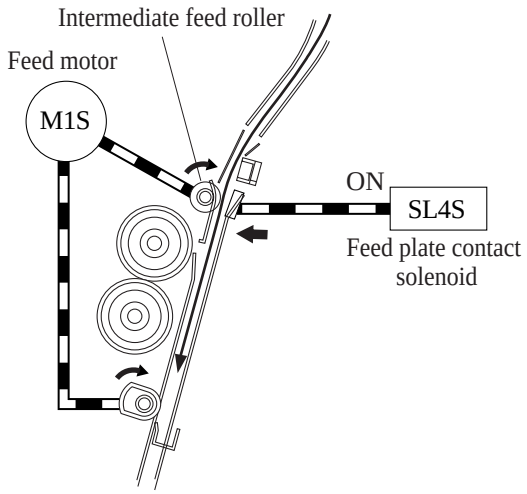


Figure 3-306

2) The solenoid turn OFF when the paper butts against the paper positioning plate. The feed motor continues to rotate.

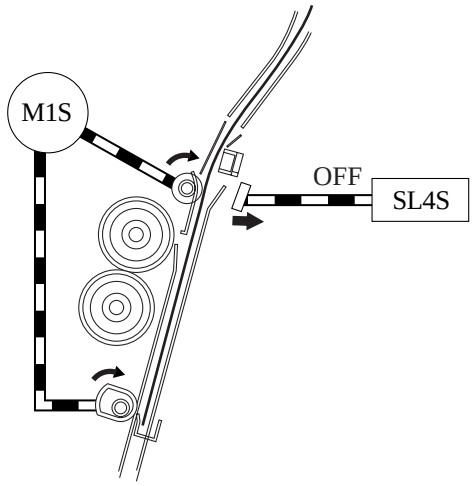


Figure 3-307

3) The solenoid turns ON when the next sheet arrives, and the feed plate comes into contact.

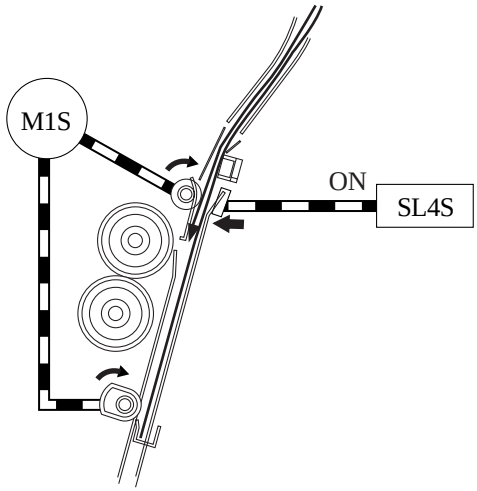


Figure 3-308

D. Aligning the Sheets

The alignment motor (M5S) drives the alignment plates each time a sheet is output, putting both left and right edges of the sheet in order. The alignment plate motor is a 4-phase stepping motor. The position of the alignment plate is identified in reference to the number of motor pulses from the alignment plate home position sensor (PI5S).

The following briefly describes what takes place when the saddle stitching mechanism operates on two sheets.

1) When the first sheet has been output, the alignment plates butt against the left and right edges of the stack (first alignment). The alignment plates leave the home position in advance and remain in wait at points 10 mm from the edges of the stack.

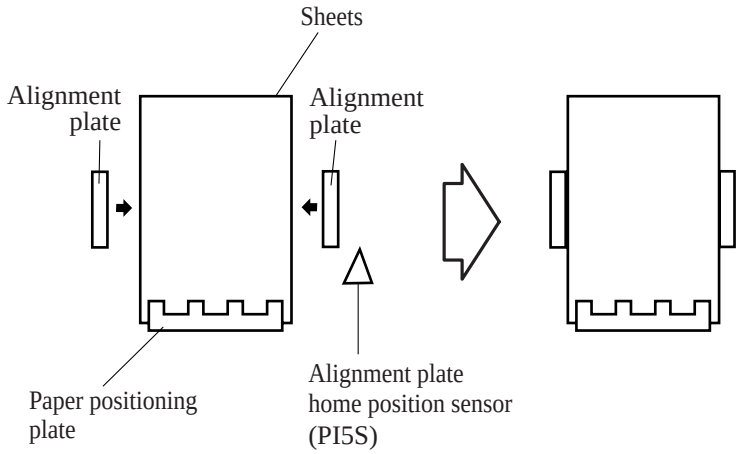


Figure 3-309

2) The alignment plates move away from the edges of the stack over a short distance and then butt against the edges once again (Second alignment).

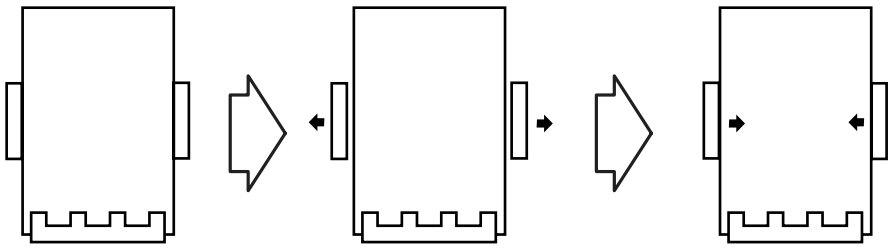


Figure 3-310

3) The alignment plates escape to points 10 mm from the edge of the stack.

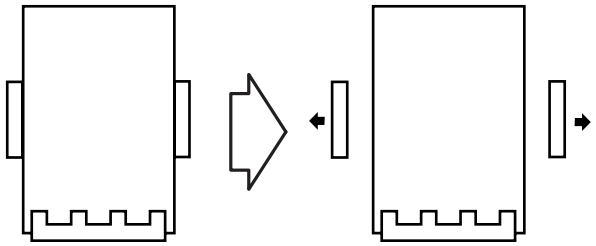


Figure 3-311

4) When the following stack arrives, steps 1 through 3 above are repeated.
5) The alignment plates butt against the stack once again, during which stitching takes place.

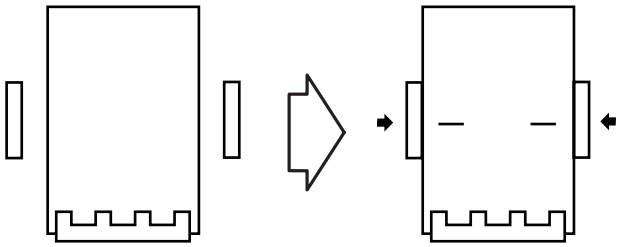


Figure 3-312

6) The alignment plates escape to points 10 mm from the edges of the stack, after which folding and delivery take place.

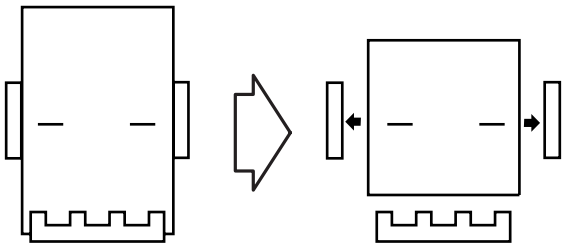


Figure 3-313

7) When the first sheet of the following stack reaches the No.1 paper sensor, the guide moves to a point 10 mm from the edge of the stack to be ready for the next alignment operation.

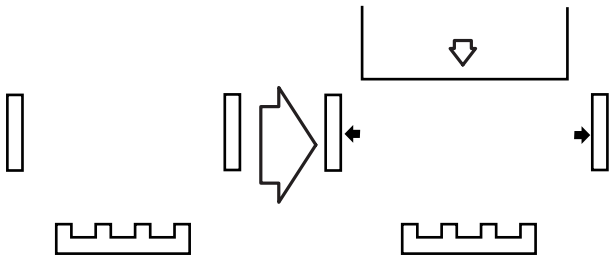
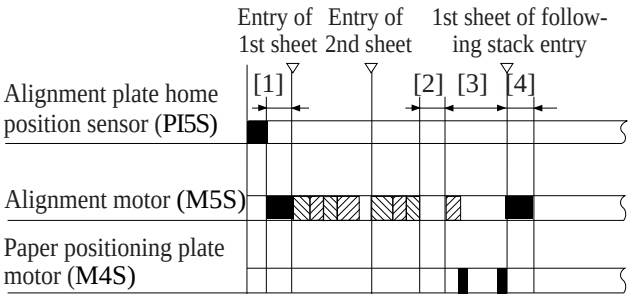


Figure 3-314

In case of 2 sheets:



: Alignment : Escape

[1]: Move to wait position
[2]: Stapling period
[3]: Paper folding/delivery period
[4]: Move to following stack size wait position

Figure 3-315

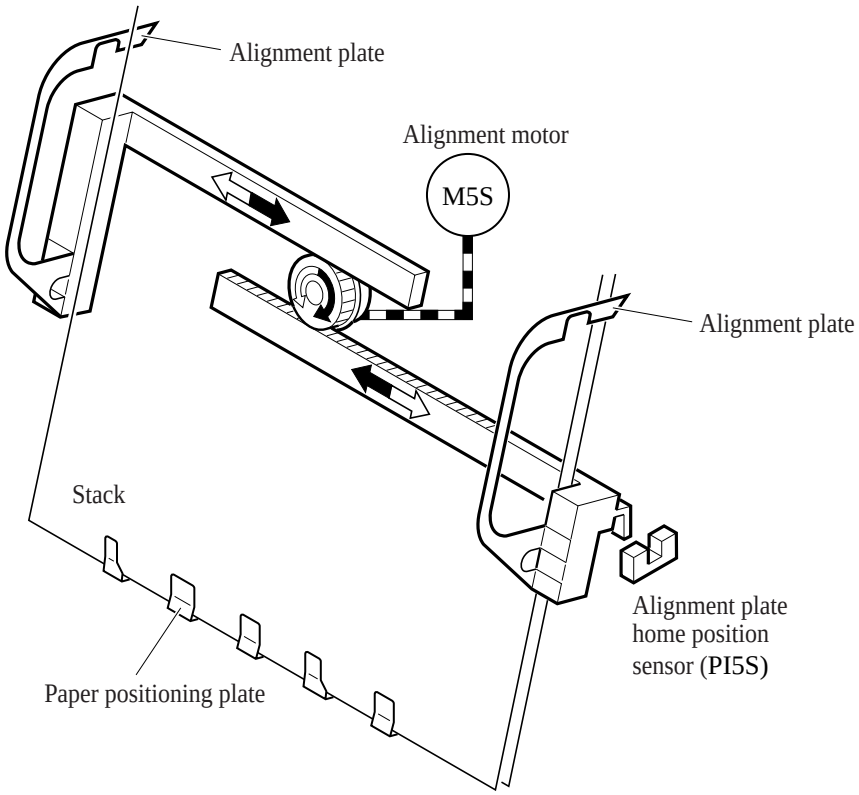


Figure 3-316

E. Controlling the Phase of the Crescent Roller

1. Outline

If alignment was executed with the crescent roller in contact with the stack of sheets, the resulting friction against the roller causes the stack to move inappropriately (Figure 3-317). To prevent this problem, the phase of the roller is identified and used to determine the timing of alignment.

The phase of the crescent roller is identified by the crescent roller phase sensor (PI12S). The flag for the crescent roller phase sensor is mounted to the crescent roller shaft. The flag will leave the sensor while the roller shaft rotates, turning the sensor ON or OFF, enabling the assumption that the crescent roller is positioned at the opposite side of the stack (Figure 3-319). The alignment plates are operated to correspond with this change in the state of the sensor.

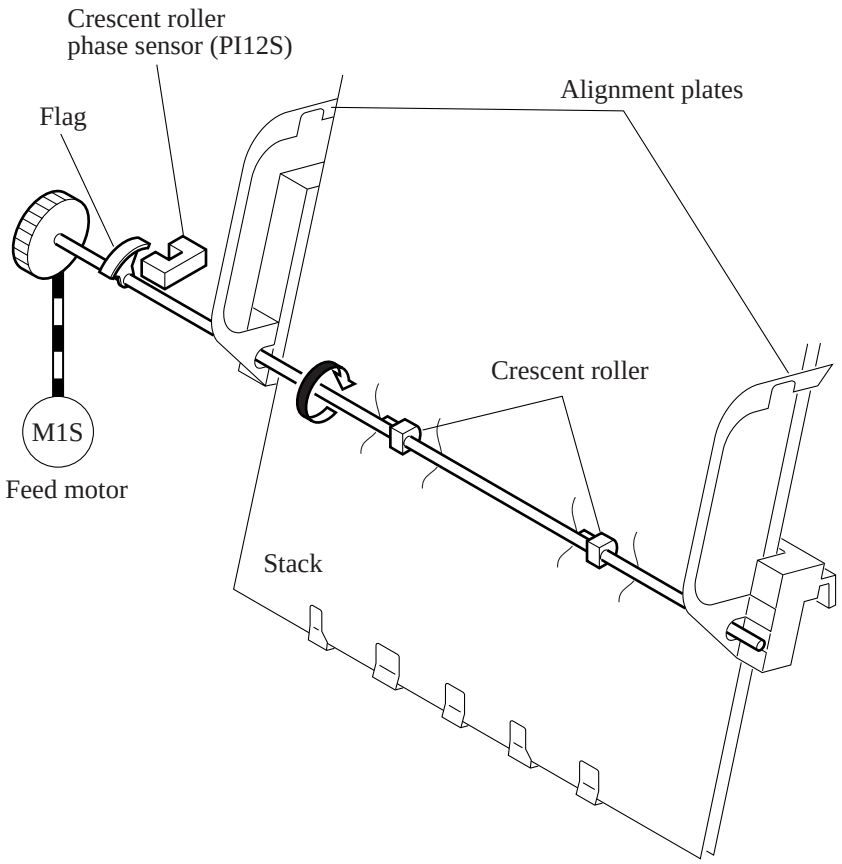


Figure 3-317

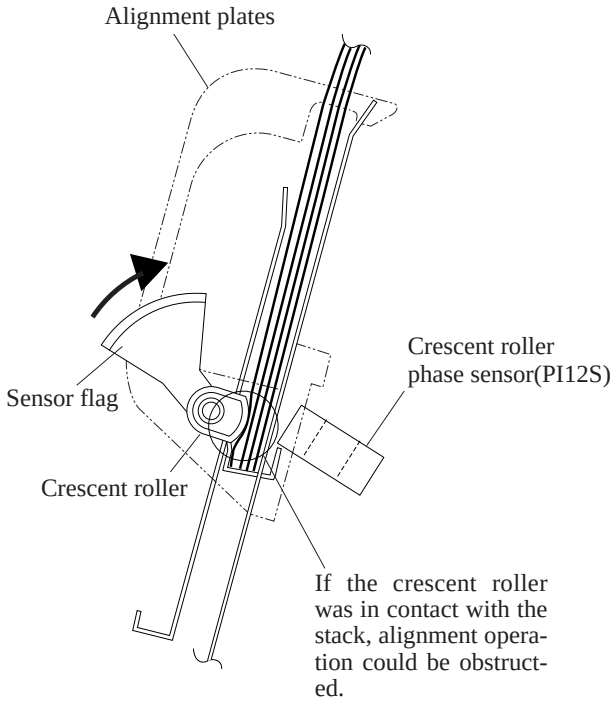


Figure 3-318

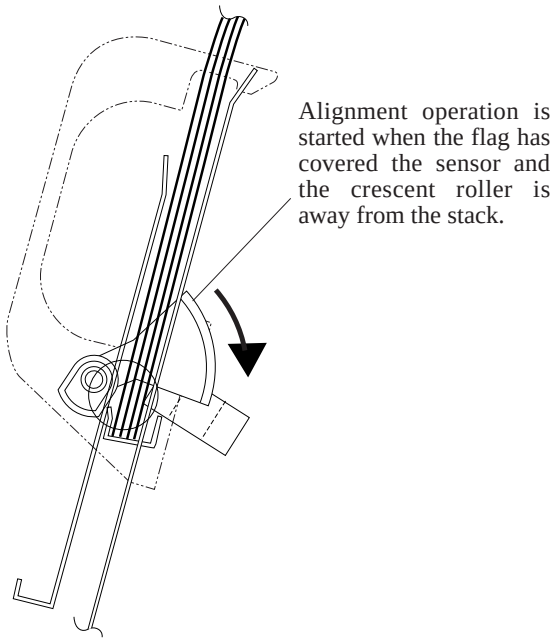


Figure 3-319

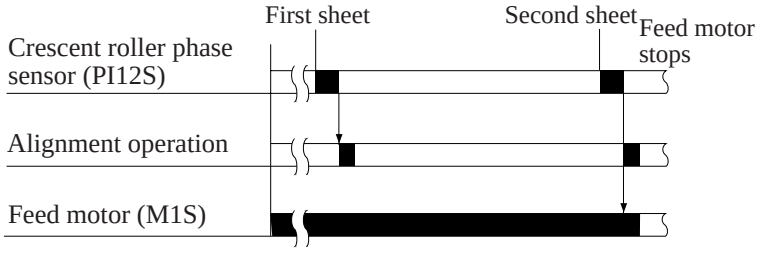


Figure 3-320

IV. STITCHING SYSTEM

1. Outline

The stitching system “stitches” the center of an output stack with staples.

To enable stitching at two locations on a stack, two stitcher units (front, rear) are used. Each stitcher unit is equipped with a stitcher motor (M7S, M6S) for drive, a stitcher home position sensor (MS7S, MS5S) for detection of position and a staple sensor (MS6S, MS4S) for detection of the presence/absence of staples.

The stitcher base is designed so that it may be drawn out to the front from the saddle stitcher for replacement of the staple cartridge or removal of a staple jam. The stitcher unit in sensor (PI16S) is used to make sure that the stitcher base is properly fitted to the saddle stitcher.

Safety switches are not mounted for the stitcher unit (front, rear), as the location does not allow access by the user.

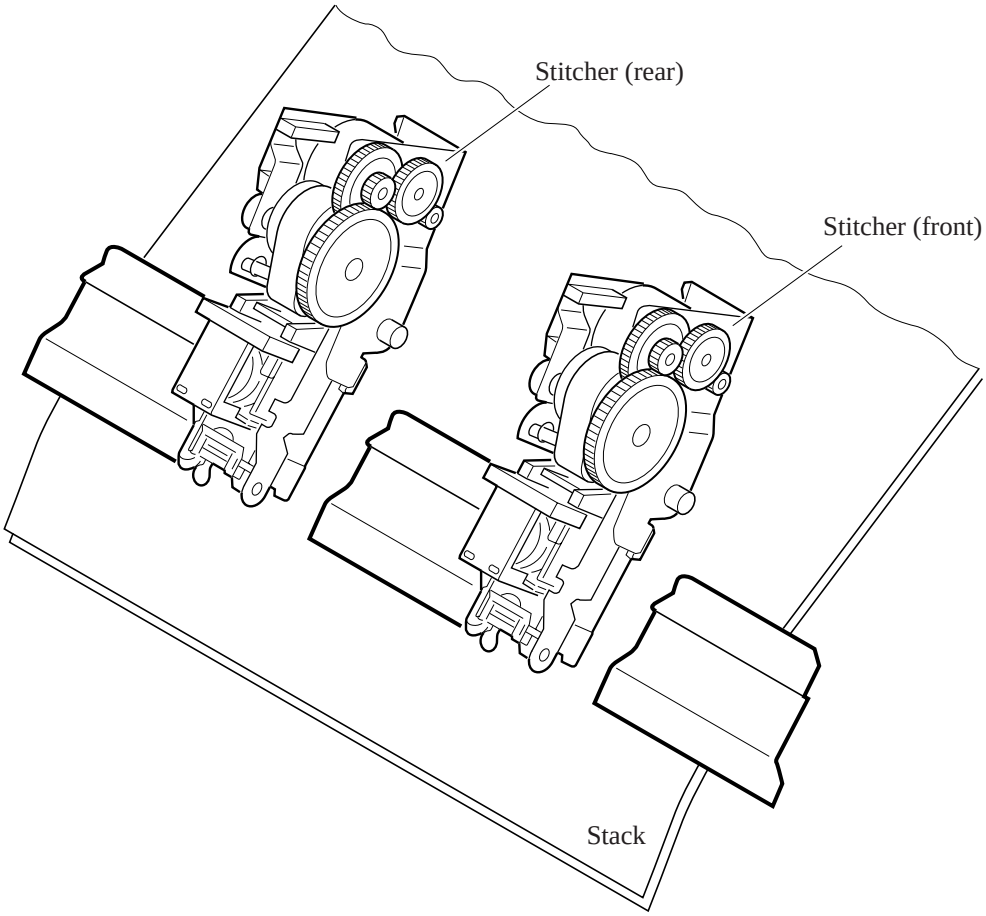


Figure 3-401

2. Stitcher Unit Operation

The stitcher base unit consists of two stitchers and stitcher bases. The stitchers are fixed in position, and are not designed to slide or swing.

Stitching is executed by driving the rotary cam by the stitcher motor (M7S, M6S). The front and rear stitcher units are operated with a time delay so as to prevent wrinkling of paper and to limit the load applied to the power supply. (A time delay for initiating the stitcher motor startup current helps decrease the load on the power supply.)

The stitcher home position sensor (MS7S, MS5S) is used to monitor the movement of the rotary cam, enabling identification of individual stitcher operations. The presence/absence of staples inside the staple cartridge fitted to the stitcher is detected by the staple sensor (MS6S, MS4S).

The alignment plates keep both edges of the stack in place while stitching takes place.

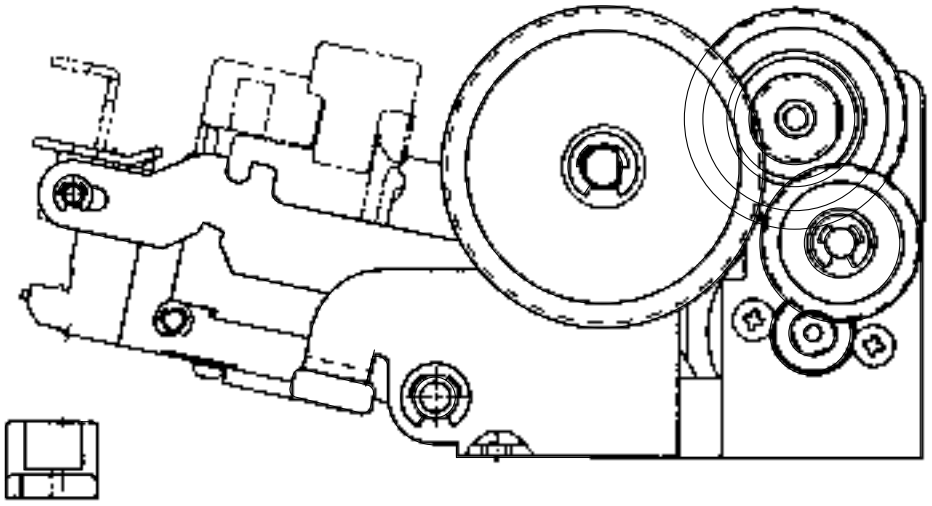


Figure 3-402

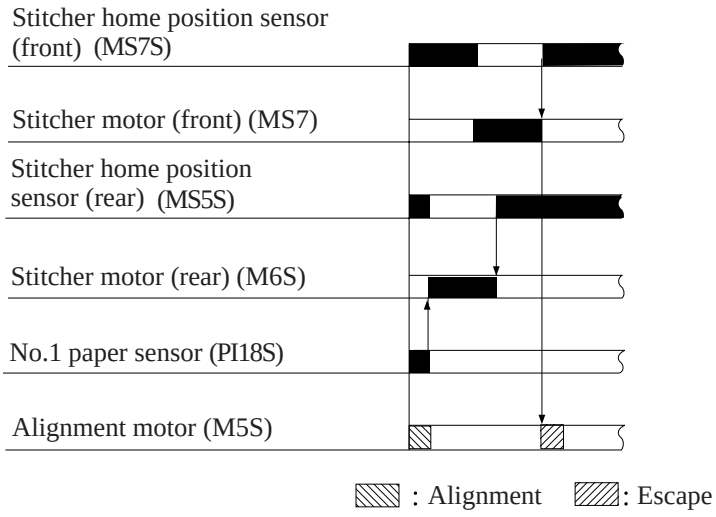


Figure 3-403

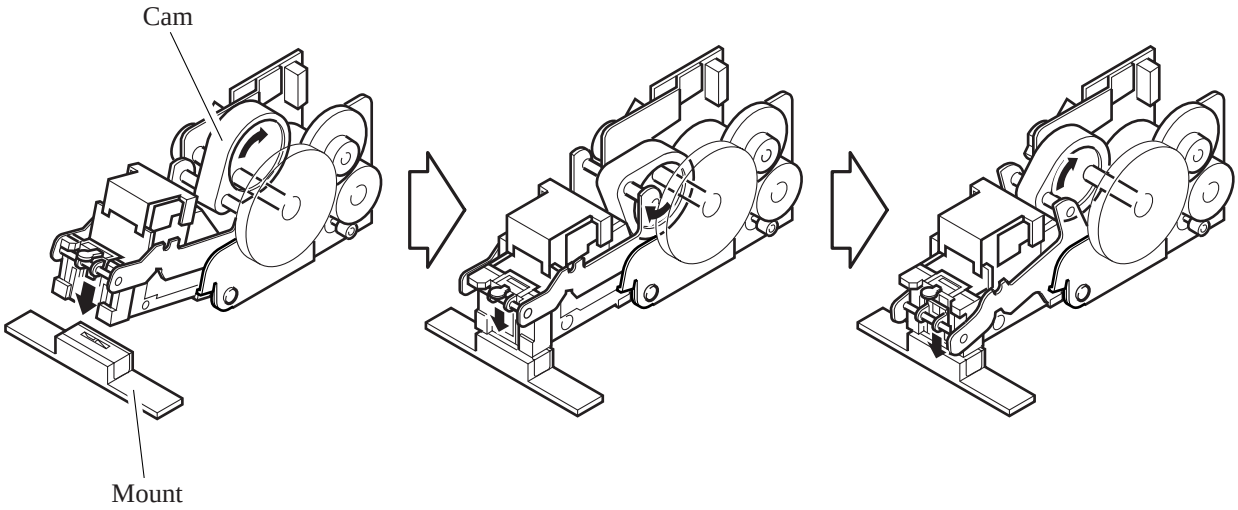


Figure 3-404

V. FOLDING/DELIVERY SYSTEM

1. Outline

The paper folding mechanism consists of a guide plate, paper folding rollers, paper pushing plate, and paper positioning plate.

The guide plate is used to cover the folding rollers while sheets are output so as to prevent sheets from coming into contact with the folding rollers during output. Before the stack is folded, the guide plate moves down to enable the folding rollers to operate.

The folding rollers are driven by the paper folding motor (M2S), and the drive of the motor is monitored by the paper folding motor clock sensor (PI4S). The mechanism is also equipped with a paper folding home position sensor (PI21S) for detecting the position of the paper folding rollers.

The paper pushing plate is driven by the paper pushing plate motor (M8S), and the drive of the paper pushing plate motor is monitored by the paper pushing plate motor clock sensor (PI1S). The paper pushing plate home position sensor (PI14S) and the paper pushing plate top position sensor (PI15S) are used to detect the position of the paper pushing plate.

After being folded into two by the paper folding rollers, a stack is moved ahead by the delivery roller for delivery. The delivery roller is driven by the paper folding motor. The delivery sensor (PI11S) is mounted to the delivery assembly to detect delivery of paper. The tray paper sensor (PI6S) is used to detect the presence/absence of paper on the tray, but does not detect jams. The vertical path paper sensor (PI17S) serves to detect the presence of paper after jam removal.

2. Controlling the Movement of Stacks

When a stack has been stitched (2 points), the paper positioning plate lowers so that the stack will move to where the paper folding rollers come into contact with the stack and where the paper pushing plate is located. The position of the paper positioning plate is controlled in reference to the number of motor pulses coming from the paper positioning home position sensor (PI7S).

At the same time as the paper positioning plate operates, the guide plate lowers so that folding may take place.

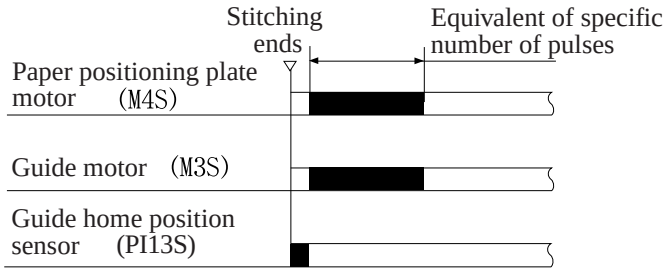


Figure 3-501

3. Folding a Stack

A stack is folded by the action of the paper folding rollers and the paper pushing plate.

The paper pushing plate pushes against the center of a stack toward the roller contact section. The paper pushing plate starts at its home position and waits at the leading edge position until the stack has been drawn to the paper folding roller and is gripped for a length of 10 mm. When the paper folding roller has gripped the stack for a length of about 10 mm, the paper pushing plate motor starts to rotate once again, and the paper pushing plate returns to its home position. The stack gripped in this way by the paper folding roller is drawn further by the paper folding roller and then is moved by the delivery roller to the paper tray.

Half of the peripheral area of the paper folding rollers excluding the center part is punched out. This punched out area only feeds the paper as the paper feeding roller (lower) contacts the paper feeding roller (upper) only at the center of the roller to prevent the paper from wrinkling. As the paper feeding roller (lower) contacts the paper feeding roller (upper) at their entire surfaces on the remaining half of the peripheral area, paper folding starts from this half of the peripheral area, and paper is fed while it is being folded. The stop position of the paper folding rollers is in this half of the peripheral area.

The paper folding start and stop positions on the paper folding rollers is controlled according to the motor clock signals from the paper folding home position sensor (PI21S).

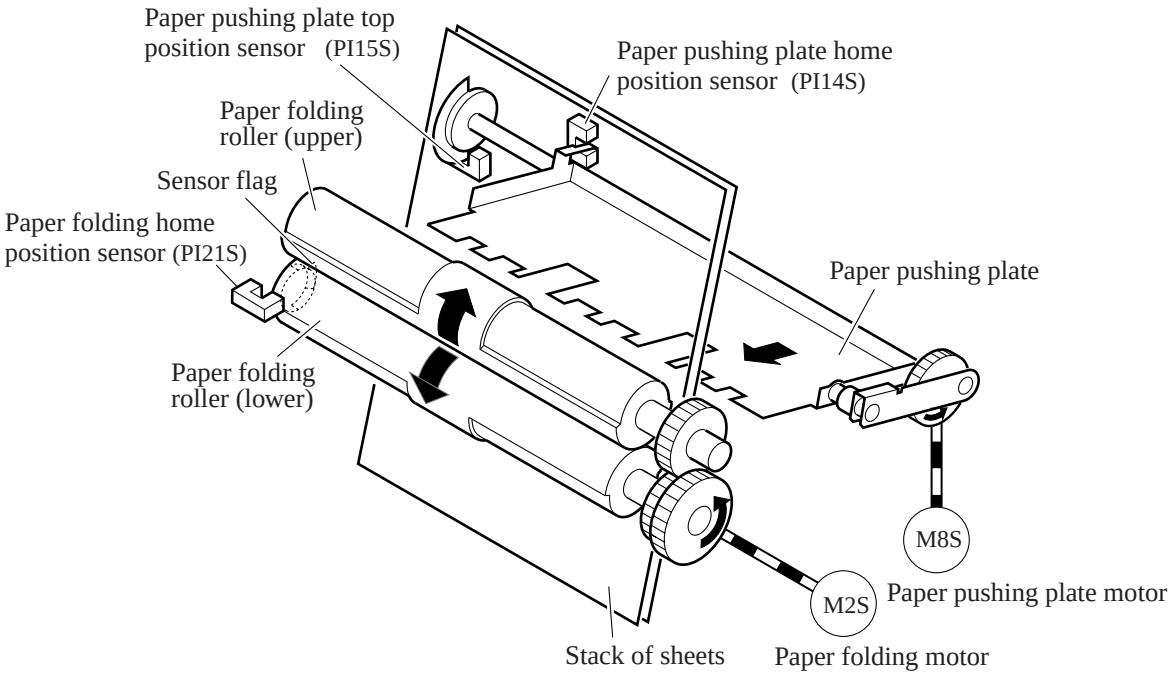


Figure 3-502

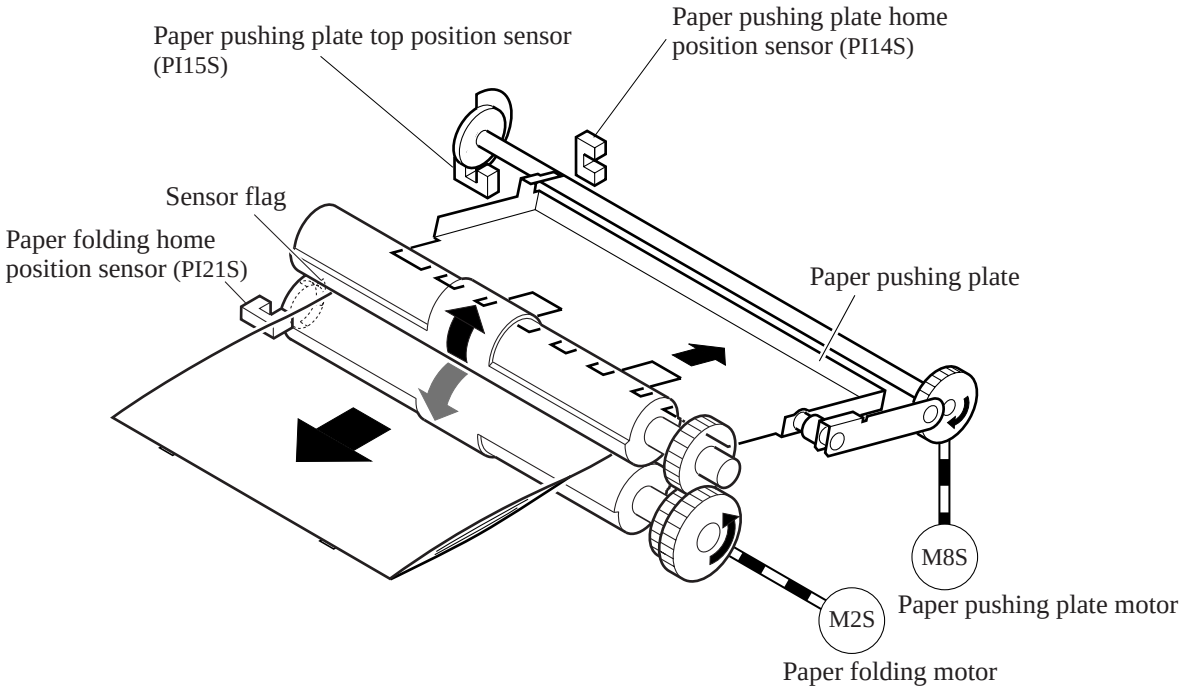


Figure 3-503

[Paper folding start position]

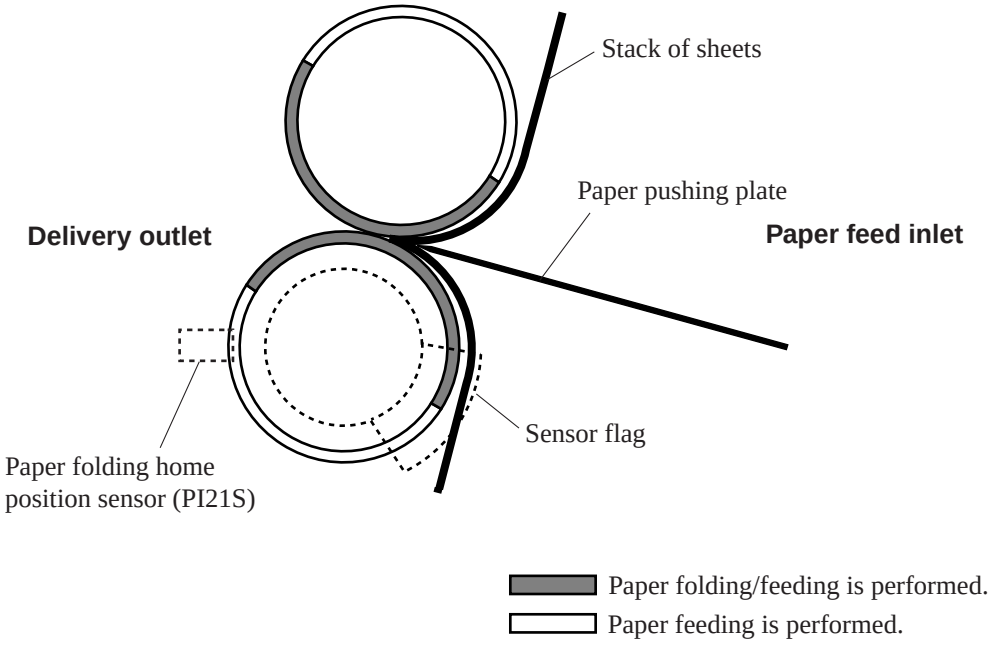


Figure 3-504

[Paper folding roller stop position]

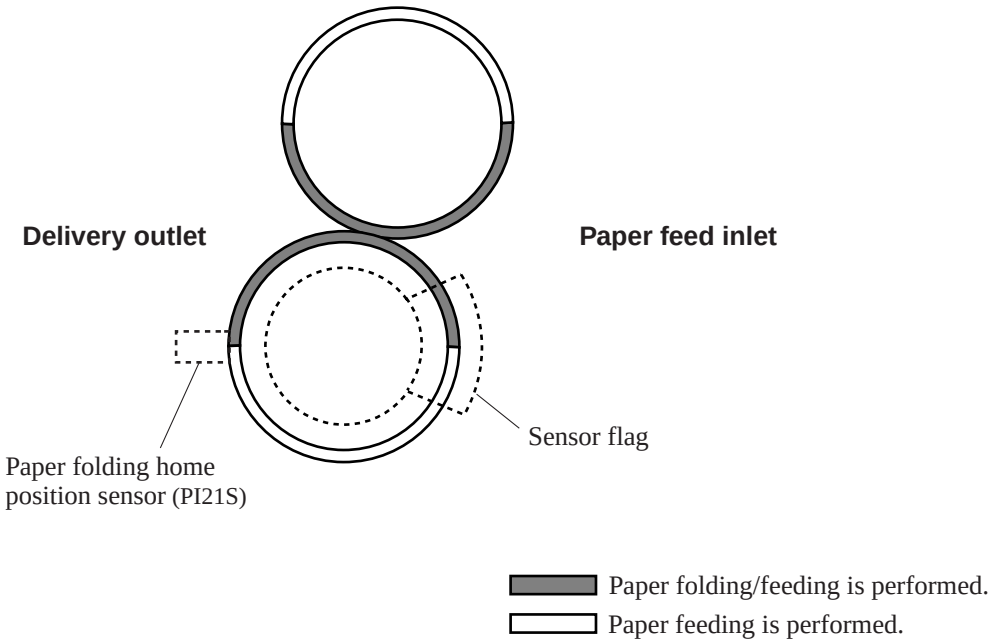


Figure 3-505

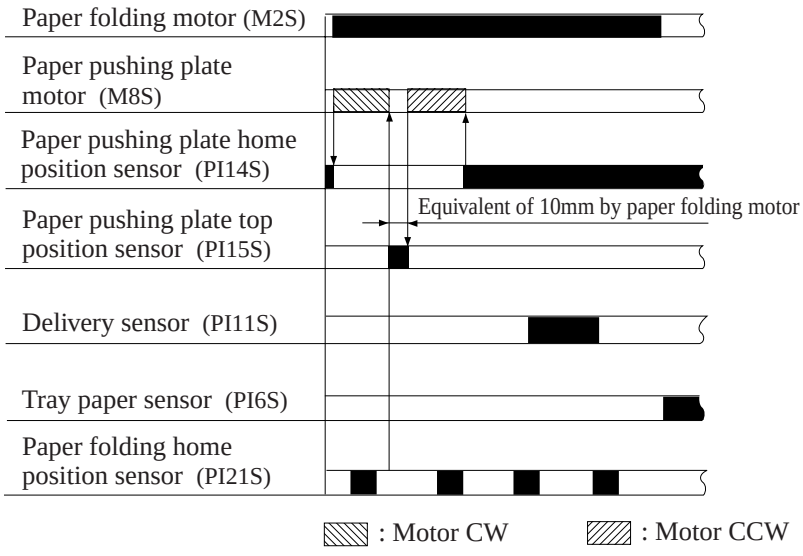


Figure 3-506

4. Double Folding a Stack

To fold a stack consisting of 10 or more A4-R or LT-R sheets, folding is executed twice for the same sheet.

The paper folding rollers rotate in reverse for an equivalent of 20 mm after gripping the stack for a length of 20 mm, enabling the paper folding rollers to apply an increased degree of pressure along the crease on the stack. Then, the paper folding rollers rotate normally, and the paper pushing plate returns to its home position while the stack is being delivered.

This way, a stack requiring a large force may properly be folded with less pressure.

1) The paper pushing plate pushes the stack in the direction of the paper folding rollers.

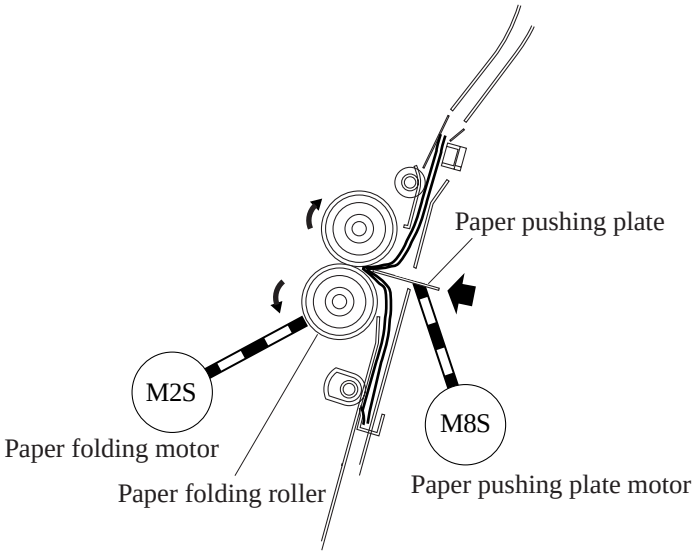


Figure 3-507

2) The paper folding rollers grip the stack for a length of about 20 mm.

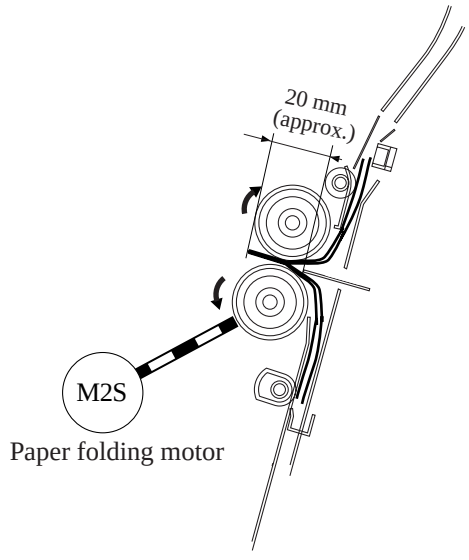


Figure 3-508

3) The paper folding rollers rotate in reverse, pushing back the stack for a length of about 20 mm (reverse feeding).

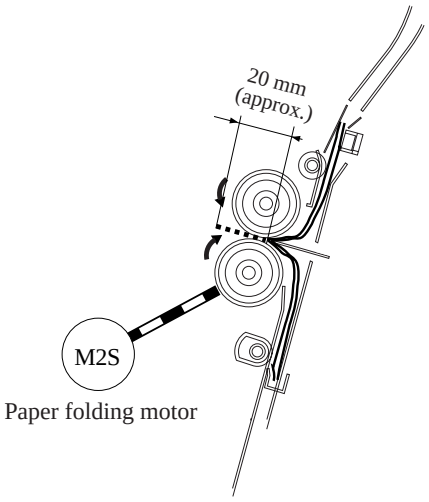


Figure 3-509

4) The paper folding rollers rotate again, feeding out the stack. The paper pushing plate returns to its home position.

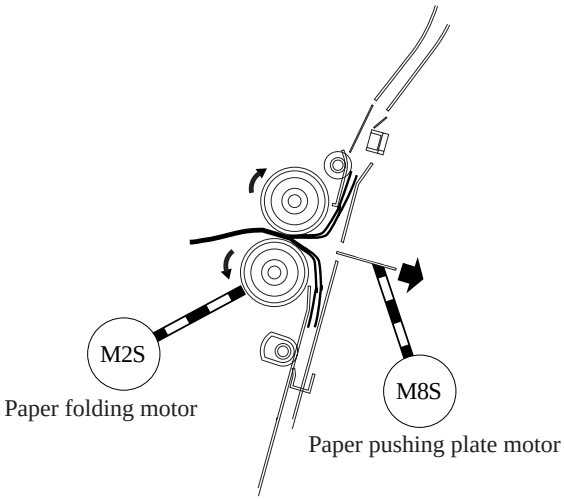


Figure 3-510

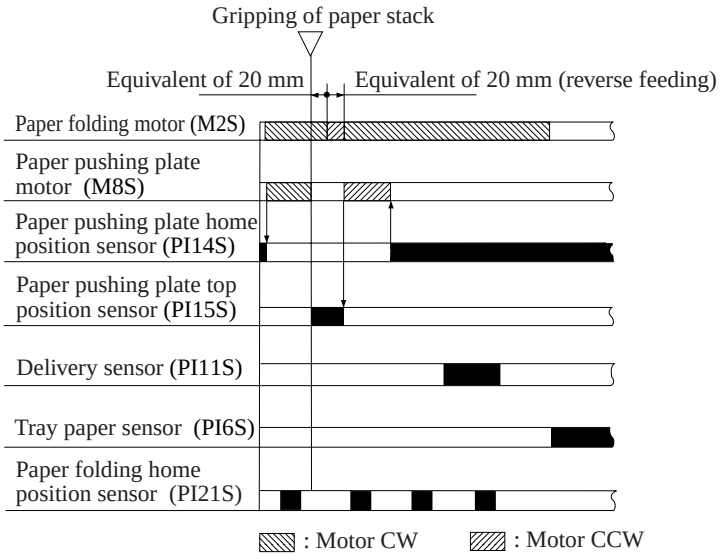


Figure 3-511

VI. CHECKING FOR A JAM

1. Checking for a Jam

The saddle stitcher unit identifies any of the following conditions as a jam, and sends the jam signal to the host machine. In response, the host machine may stop copying operation and indicate the presence of a jam on its control panel.

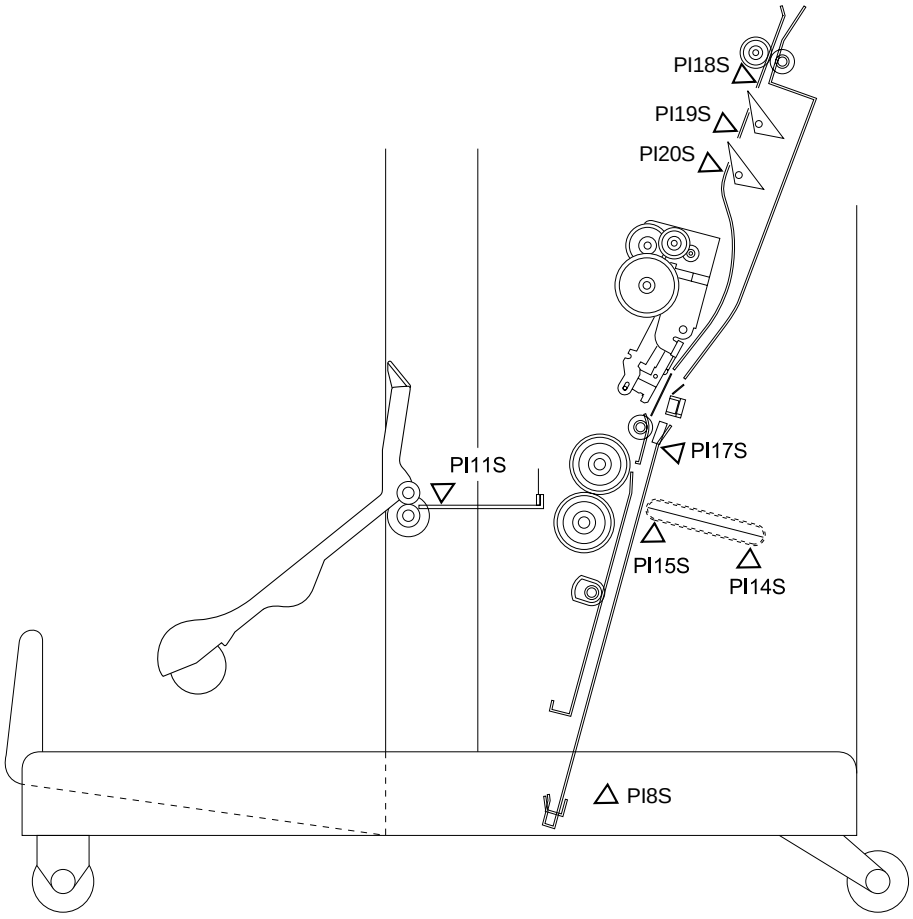


Figure 3-601

No.	Sensor
PI8S	Paper positioning plate paper detection sensor
PI11S	Delivery sensor
PI14S	Paper pushing plate home position sensor
PI15S	Paper pushing plate top position sensor
PI17S	Vertical path paper sensor
PI18S	No.1 paper sensor
PI19S	No.2 paper sensor
PI20S	No.3 paper sensor

Table 3-601

2. Inlet Delay Jam

The No.1 paper sensor (PI18S) on the paper sensor PCB does not turn ON for a specific period of time after the inlet sensor (PI1) of the finisher turned ON.

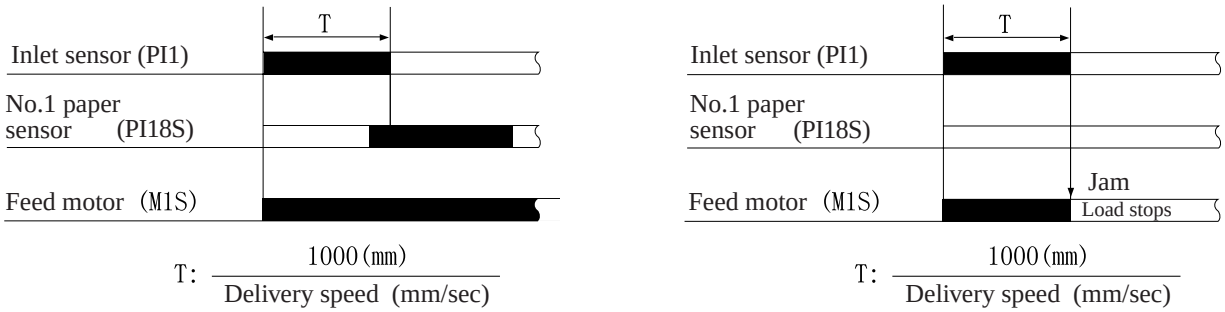


Figure 3-602

3. Inlet Stationary Jam

The No.1 paper sensor (PI18S), No.2 paper sensor (PI19S), and No.3 paper sensor (PI20S) on the paper sensor PCB do not turn OFF when the stack has been fed for a specific period after the No.1 paper sensor (PI18S) turns ON. The paper sensor used varies according to the paper size.

a. A3/LD Stack

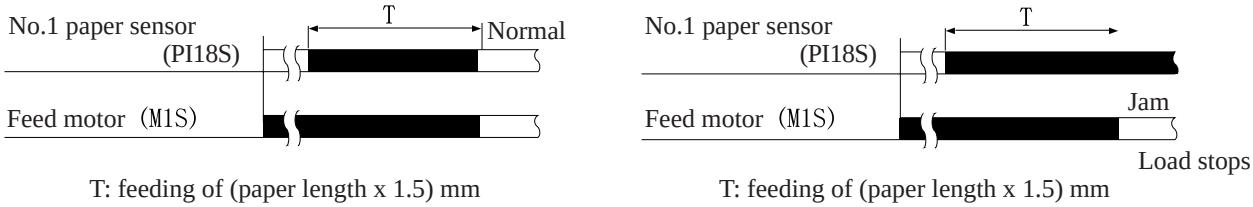
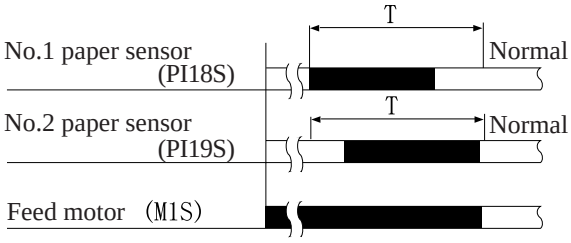
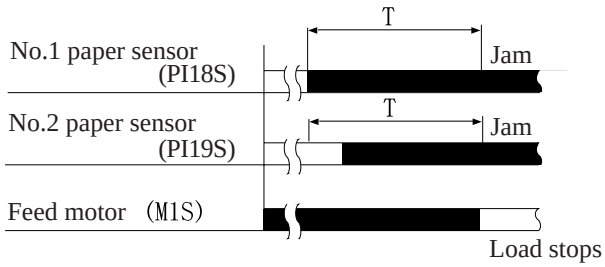


Figure 3-603

b. B4 Stack



T: feeding of (paper length x 1.5) mm

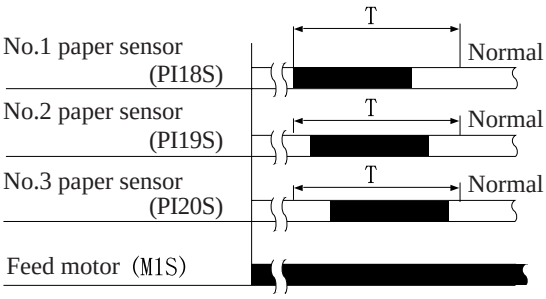


T: feeding of (paper length x 1.5) mm

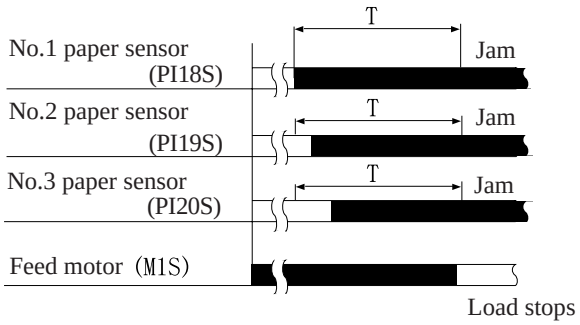
Note: The diagram shows two sensors checking for jams. Single detection, however, uses only one sensor.

Figure 3-604

c. A4-R/LT-R Stack



T: feeding of (paper length x 1.5) mm



T: feeding of (paper length x 1.5) mm

Note: The diagram shows three sensors checking for jams. Single detection, however, uses only one sensor.

Figure 3-605

4. Delivery Delay Jam

a. By delivery sensor

The delivery sensor (PI11S) does not turn ON within a specific period of time after the paper pushing plate top position sensor has turned ON.

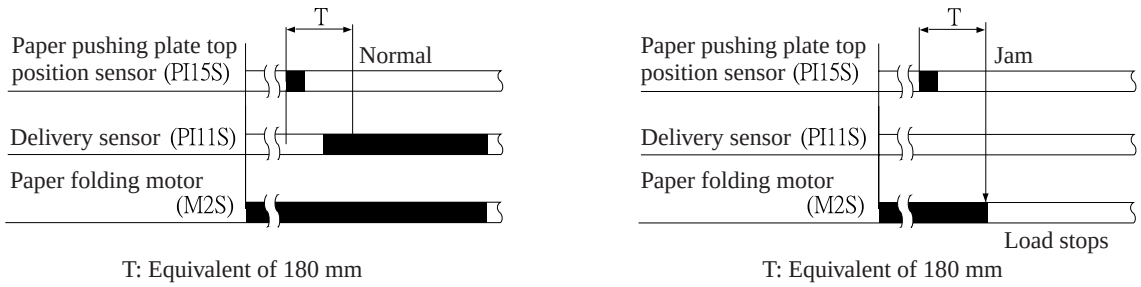
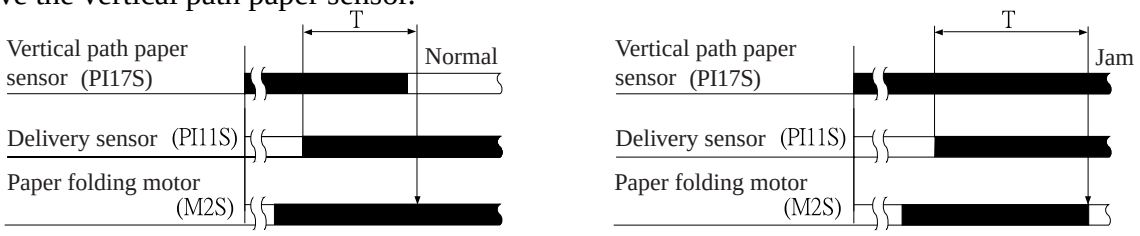


Figure 3-606

5. Delivery Stationary Jam

a. By vertical path paper sensor

The vertical path paper sensor (PI17S) does not turn OFF within a specific period of time (feeding) after the delivery sensor (PI11S) has turned ON, i.e., the trailing edge of the stack does not leave the vertical path paper sensor.



T: Feeding of $\left(\frac{\text{Paper length}}{2} - 130\right)$ + 50 mm

T: Feeding of $\left(\frac{\text{Paper length}}{2} - 130\right)$ + 50 mm

Note: The length 130 mm is the length of the feeding path from the vertical path paper sensor to the delivery paper sensor, while the length 50 mm is a margin.

Figure 3-607

b. By delivery sensor

The delivery sensor (PI11S) does not turn OFF within a specific period of time (feeding) after it has turned ON.

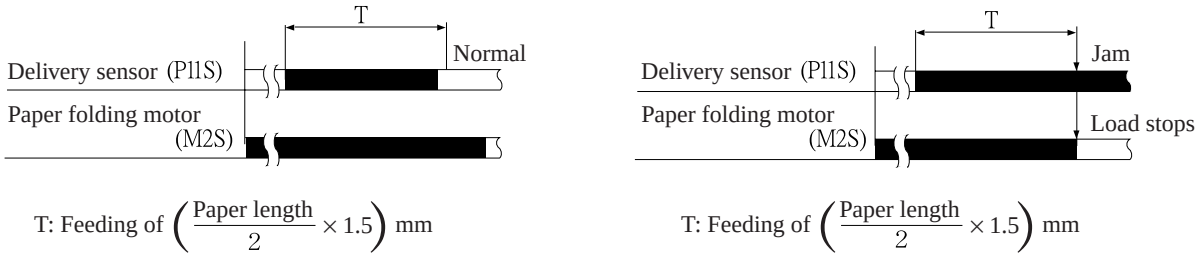


Figure 3-608

6. Power-ON Jam

Any of the No.1 paper sensor (PI18S), No.2 paper sensor (PI19S), No.3 paper sensor (PI20S), Vertical path paper sensor (PI17S) or delivery sensor (PI11S) on the paper sensor PCB detects paper at power-ON.

7. Door Open Jam

The front door open/closed sensor (PI2S), outlet cover sensor (PI3S), or inlet cover sensor (PI9S) finds that the respective cover is open during operation.

8. Stitcher Staple Jam

When the stitcher motor (M7S/M6S) is rotating clockwise, the stitcher home position sensor (MS7S/MS5S) does not turn ON within 0.5 secs after it has turned OFF. In addition, the sensor turns ON within 0.5 secs after the motor has been rotated counterclockwise.

9. Saddle Feeding Delay Jam (by the paper sensor for the paper positioning plate)

The paper sensor for the paper positioning plate is not turned ON at the start of the push (folding) operation.

Reference:

When all doors are closed after the user has removed the jam, the saddle stitcher unit checks whether the vertical path paper sensor (PI17S) has detected the presence of paper. If the sensor has detected paper, the unit will identify the condition as being faulty jam removal and send the jam signal to the host machine once again.

VII. POWER SUPPLY

1. Outline

When the host machine power switch is turned ON, 24V and 5V power lines are supplied by the finisher controller PCB.

The 24V power is used to drive solenoids. The 24V power from the finisher controller PCB to solenoids does not pass through any protective mechanisms (microswitches, or the like).

The 24V power to motors, on the other hand, will not be supplied if any of the three door switches is open.

The 5V power is used to drive sensors and ICs.

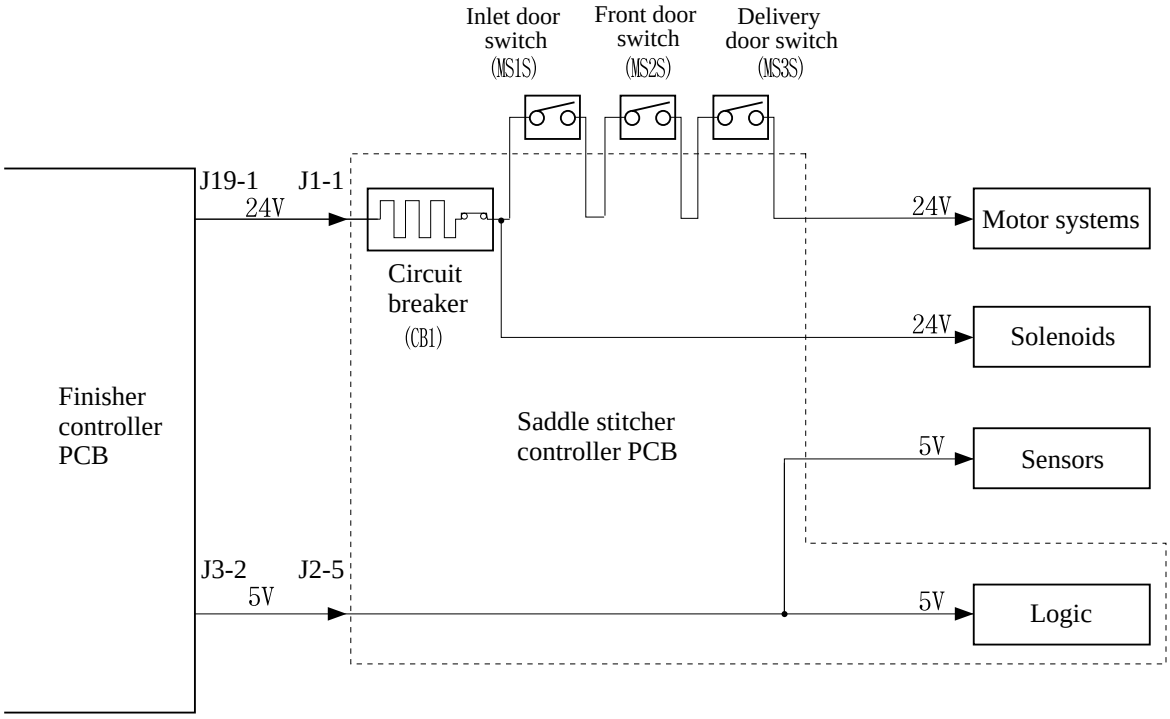


Figure 3-701

2. Protective Mechanisms

The 24 VDC power supply used for motors and solenoids is equipped with a circuit breaker (CB1). The 24V power supply used to drive the feed motor (M1S), alignment motor (M5S), and the paper positioning plate motor (M4S) is equipped with a fuse designed to blow when an overcurrent flows.

CHAPTER 4

MECHANICAL CONSTRUCTION

This chapter describes the mechanical features and operations, and disassembly and assembly procedures.

Be sure to observe the following points when disassembling and assembling the machine:

1. ⚠ Before performing disassembly and assembly, be sure to unplug the power plug for safety's sake.

2. Assemble parts by following the disassembly procedure in reverse unless otherwise mentioned.

3. Assemble screws, etc., making sure that their type (length and diameter) and location of use are correct.

4. In principle, do not operate the machine with any parts removed.

I. FINISHER UNIT

A. Externals and Controls

[1] Upper door
[2] End cap
[3] Front door
[4] Front lower door
[5] Tray 1
[6] Tray 2
[7] Grate-shaped upper guide (6)
[8] Grate-shaped lower guide (6)
[9] Saddle delivery tray
[10] Sub-support upper cover (2)
[11] Sub-support lower cover (2)
[12] Rear cover (3)
[13] Rear lower cover (4)
Figures in parenthese ( ) indicate the number of mounting screws.

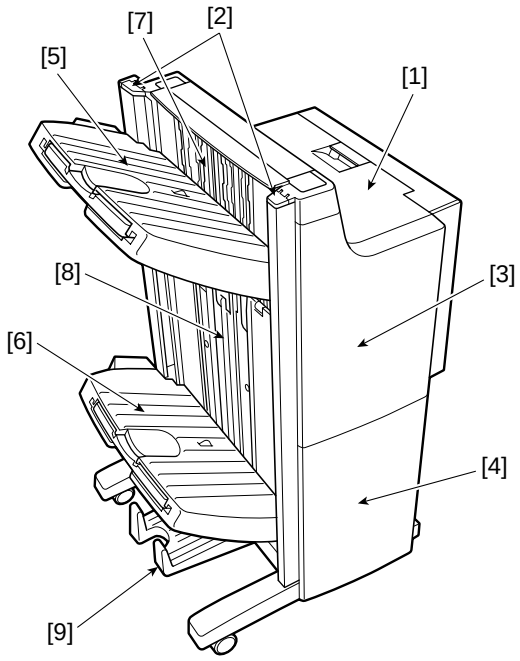


Figure 4-101

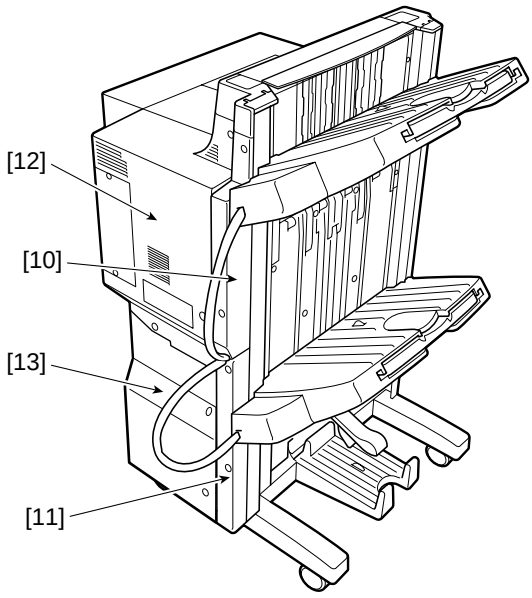


Figure 4-102

1. Removing the Front Door Assembly

1) Open the front door assembly [1].
2) Remove the screw [2], and remove the bushing [3] (center).
3) Remove the screw [4], and remove the bushing (top) [5]. Then, remove the front door assembly.

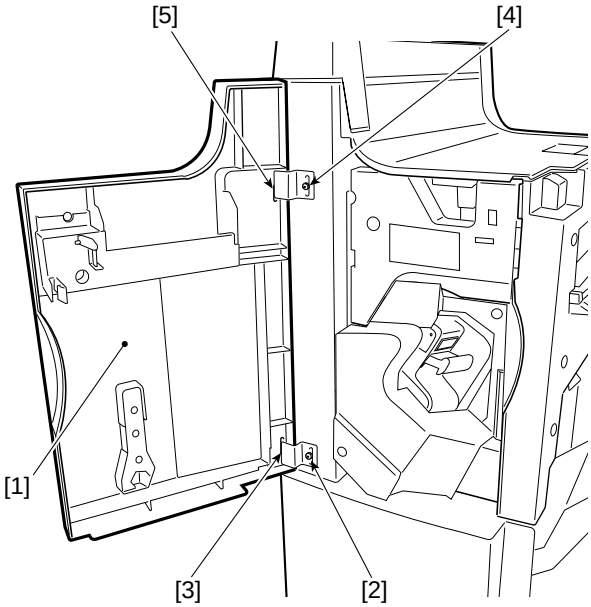
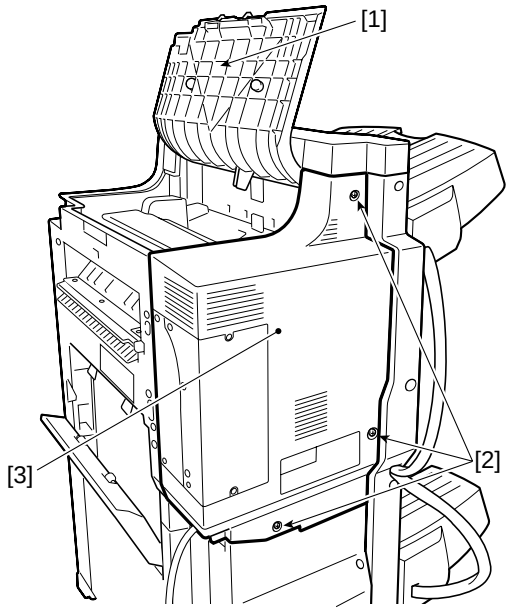


Figure 4-103

2. Removing the Rear Cover

1) Open the upper door assembly [1].
2) Remove the three screws [2], and lift the rear cover [3] to remove.



[1] Upper door assembly
[2] Screws
[3] Rear cover

Figure 4-104

3. Removing the Upper Door Assembly

1) Open the upper door assembly [1].
2) Remove the two claws [2], and remove the upper door assembly.

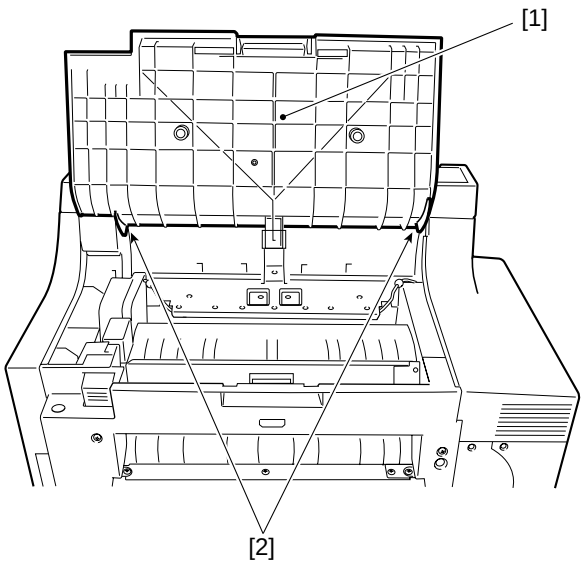


Figure 4-105

4. Removing the Front Cover

1) Open the front door assembly [1].
2) Remove the screw [2], and remove the front cover [3].

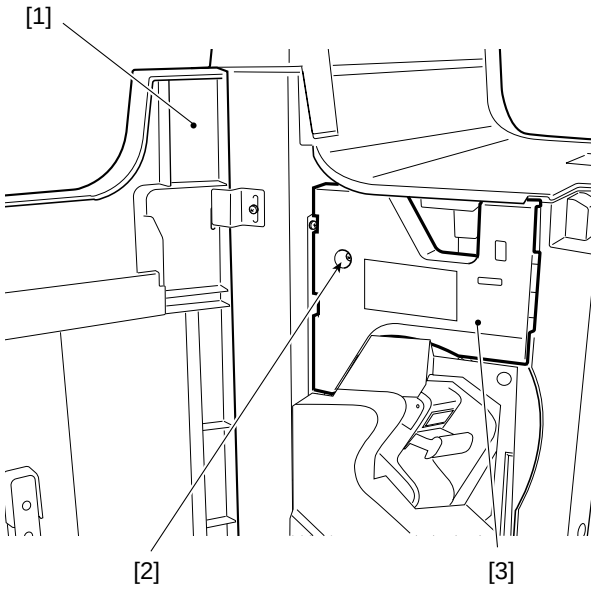


Figure 4-106

5. How to Lower the Tray 1/2 Unit

1) Insert a screwdriver or similar object into the hole [2] while supporting the tray assembly [1].
2) Release the tray lift motor one-way gear, and lower the tray 1/2 unit.

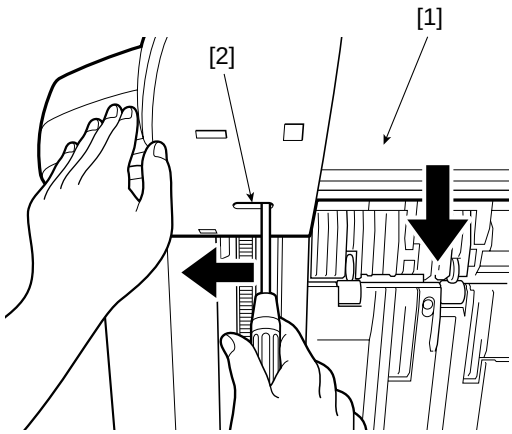


Figure 4-107

6. Removing the Tray 1 Unit

1) Open the upper cover and remove the end caps [1].
2) Remove the prop upper cover [2] and the prop lower cover [3].

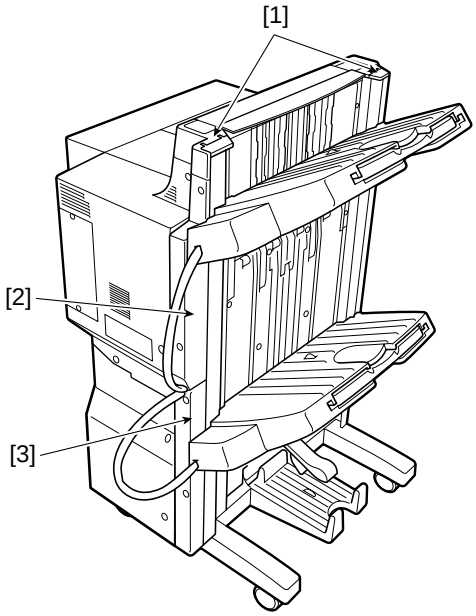


Figure 4-108

3) Remove the harness [1] from the bracket [2].
4) Disconnect the three connectors [3]. Remove the screw [4], and remove the bracket.
5) Lift the tray 1 unit to remove.

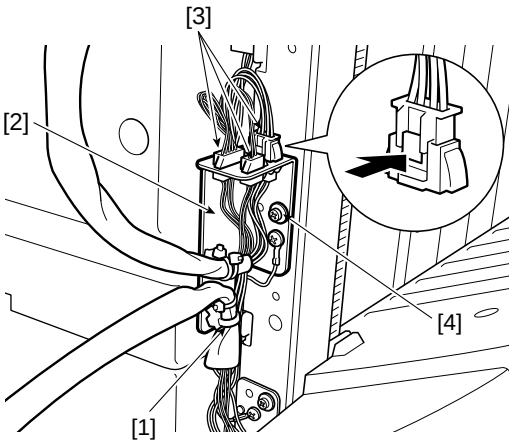


Figure 4-109

7. Removing the Tray 2 Unit

1) Remove the tray 1 unit.
2) Disconnect the two connnectors [1] and grounding wire [2] and remove harness [3].
3) Lift the tray 2 unit to remove.

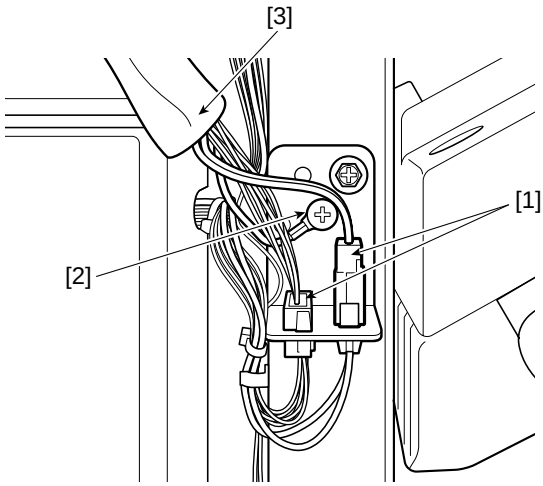


Figure 4-110

8. Removing the Tray 1/2 Lift Motor

1) Remove the tray 1/2.
2) Remove two screws [1], and two lift blocks [2].
3) Remove the five screws [3], and remove the tray from the tray unit.

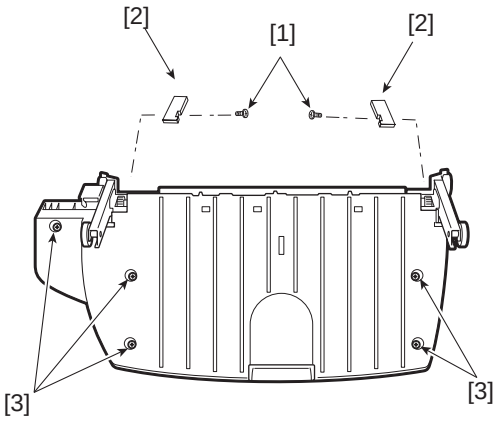


Figure 4-111

4) Release the two harness stops [1]. Remove the four screws [2], and remove the tray frame [3]. Release the claws [4] to remove.

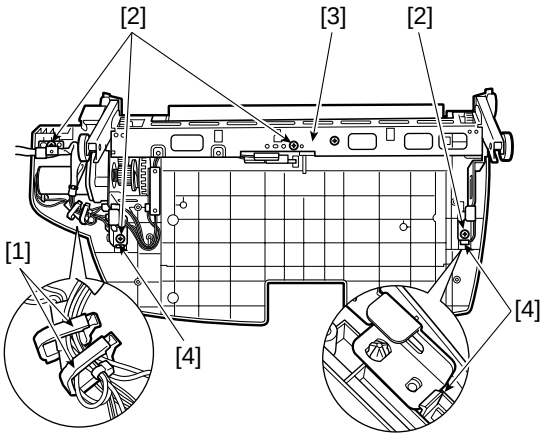


Figure 4-112

5) Disconnect the connector [1], and remove the two screws [2].

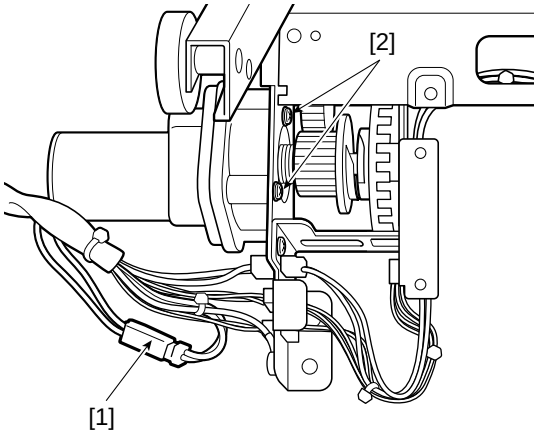


Figure4-113

6) Pull out the motor slightly, and remove the parallel pin [1] and the motor.

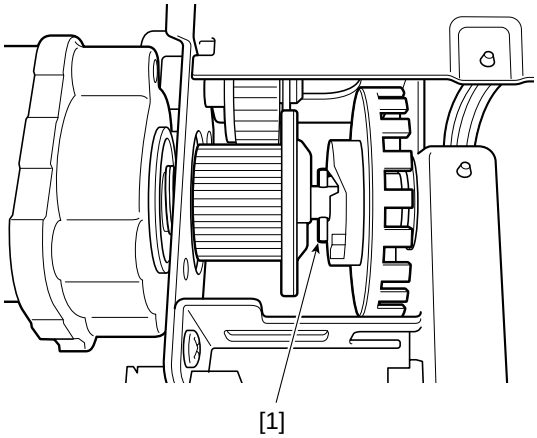


Figure 4-114

9. Removing the Grate-Shaped Upper Guide

1) Remove the slide guide [1] and end caps [2].
2) Release the tray lift motor gear clutch [6] with a screwdriver or similar object while supporting the tray assembly, and gently lower the tray assembly down to its lowest position.
3) Remove the five screws [3] (M4).
4) Remove the screw [4] (M3), and remove the grate-shaped upper guide [5].

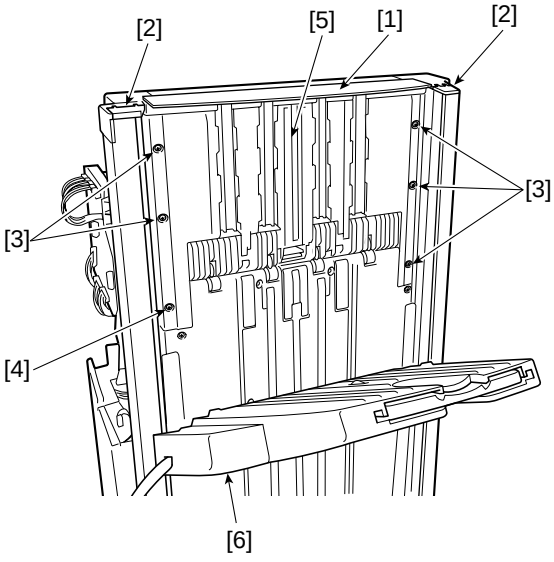


Figure 4-115

10. Removing the Grate-Shaped Lower Guide

1) Remove the tray assembly.
2) Remove the five screws [1] (M4), and remove the front sub-support [2].
3) Remove the three screws [3] (M4).
4) Remove the three screws [4] (M3), and open the grate-shaped lower guide [5] to the front.

Caution:

To remove a sub-support, remove the front sub-support [2]. The rear sub-support [6] is adjustable. If the rear sub-support [6] has been removed, be sure to adjust the rear sub-support screw to the marking at which it was set prior to the removal, or adjust parallelism referring to "11. Installing the Rear Sub-Support."

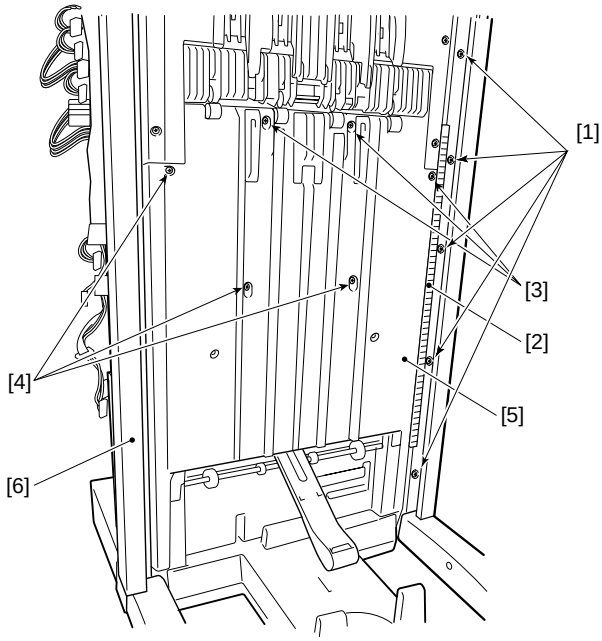


Figure 4-116

5) Free the harness [9] from the harness stop [8].
6) Disconnect the two connectors [10], and remove the grate-shaped lower guide [7].

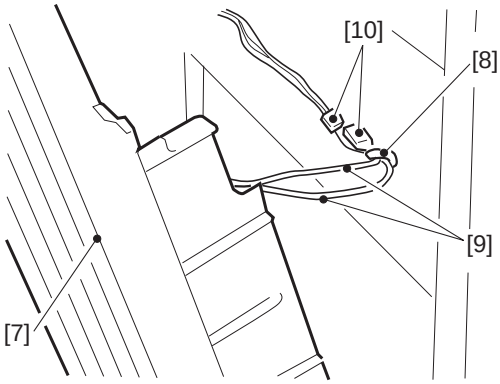


Figure 4-117

11. Installing the Rear Sub-Support

1) Install the front sub-support [1]. Loosely fasten the rear sub-support [2].
2) Install tray 2. Fasten the rear sub-support so that the tray drive gear [3] is placed at the center of the rack gear [4] of the rear sub-support when tray 2 is at the upper limit position and the lower limit position.
3) Move tray 2 by hand and check that it moves smoothly.

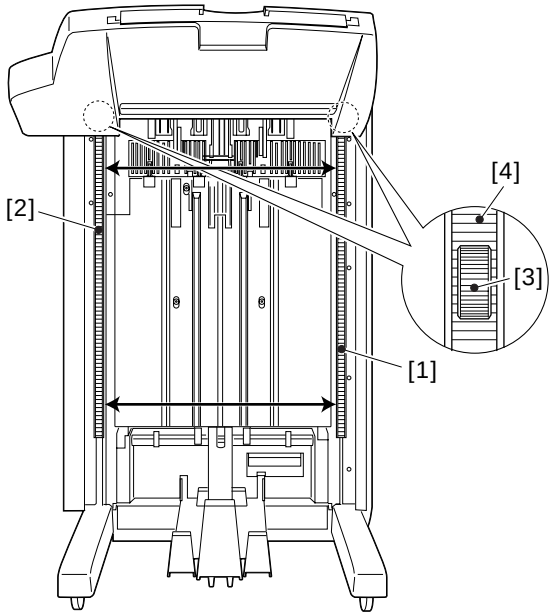


Figure 4-118

12. Removing the Right Guide Assembly

1) Remove the four screws [5] to take out the latch unit [4]
2) Remove the rear cover (see I-A-2).
3) Open the front door assembly [1].
4) Remove the one screw [2], and remove the right guide assembly [3].

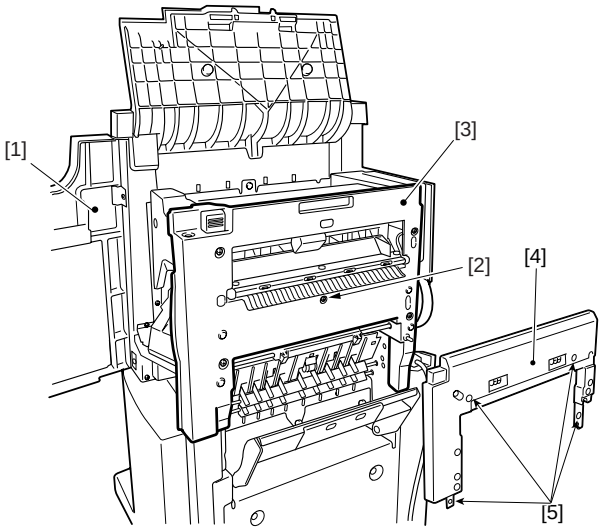


Figure 4-119

B. FEEDING SYSTEM

1. Removing the Swing Unit

1) Remove the tray assembly (see I-A-6, 7).
2) Remove the grate-shaped upper guide (see I-A-9).
3) Remove the grate-shaped lower guide (see I-A-10).
4) Remove the rear cover (see I-A-2).
5) Remove the stapler cover (see I-B-4).

Caution:

When removing the swing unit, make sure the stapler assembly unit is at its home position in front side (at the front-end position). If not, shift it to the home position manually. Be sure to escape the front paper stopper to rear side before moving the stapler assembly unit.

6) Remove the harness from the six harness clamps [1], and disconnect the seven connectors [2].

7) Push and shift the stapler assembly unit to the center.
8) Release the stopper of the knurled belt escape roller [3] at front side, and remove two flanges [4] and one roller [5]. (same for the rear side)

Caution:

1. Be sure not to drop the roller and flange when installing or removing them.

2. Make sure the direction of flange when installing the flange and the roller.

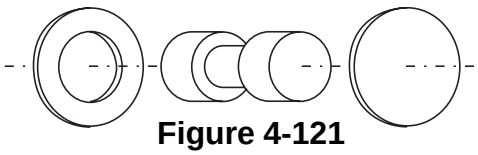


Figure 4-121

9) Remove the front knurled belt [6] from the shaft [7]. (same for the rear side)

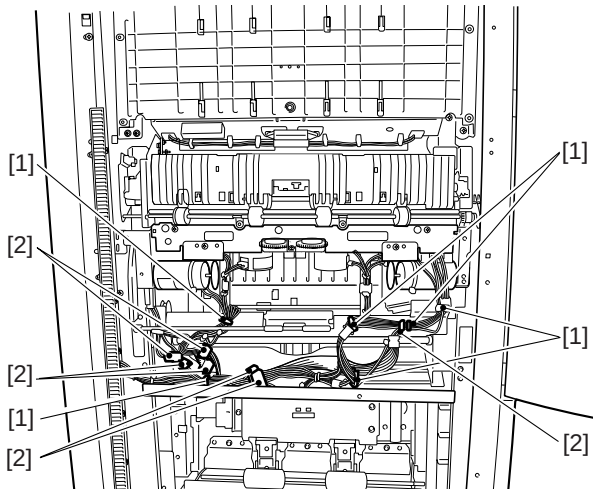


Figure 4-120

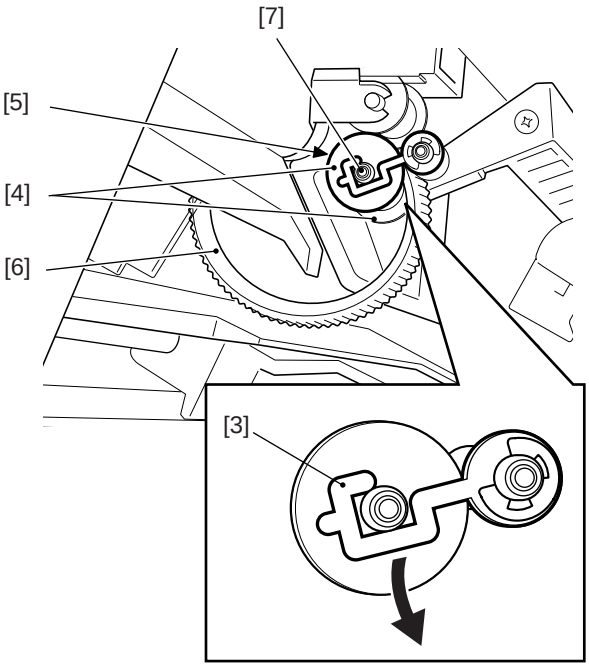


Figure 4-122

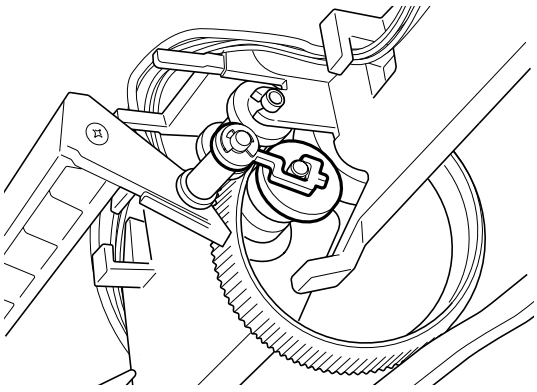


Figure 4-123

10) Remove the three screws [8] and slide out the swing unit [9] to the exit side.

Caution:
Be careful not for the swing unit to be hit by height sensor.

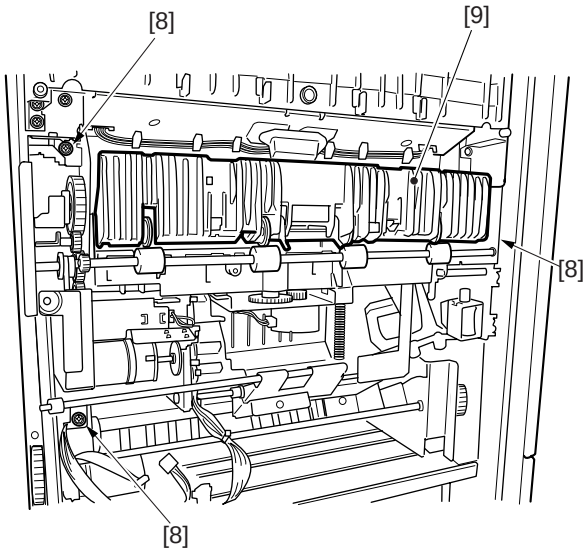


Figure 4-124

Caution:
Install the swing unit to the machine so that the black plastic of swing unit is overlaid on the plate.

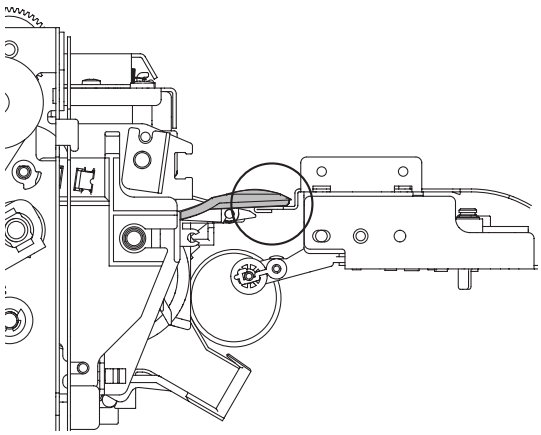


Figure 4-125

2. Removing the Feed Drive Unit

1) Remove the finisher controller PCB (see I-C-1).
2) Remove the three screws [1] and pull down PCB base [2].

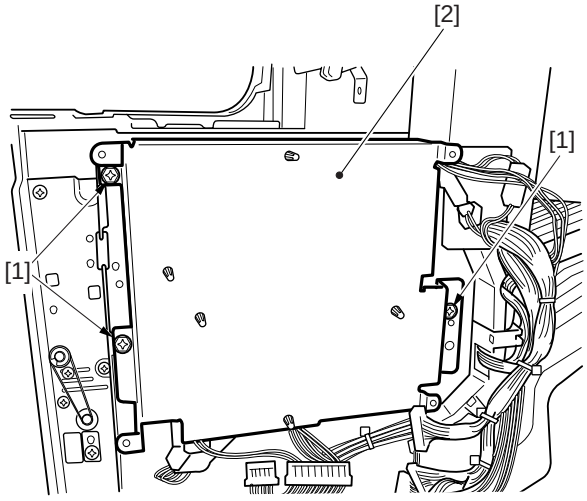


Figure 4-126

3) Remove the harness from the harness clamp [3].
4) Remove the two connecors [4] of motors.
5) Remove the three screws [5], and remove the feed drive unit [6].

Caution:

Before re-attaching the removed feed drive unit back on the finisher unit, loosen the move gear stop screw [7] to relieve the tension, and then fasten the screw after attaching the feed drive unit.
The move gear attachment must be adjusted also when removing and attaching the swing unit.
If you forget to fasten the screw, the gear teeth may disengage, resulting in defective feed.

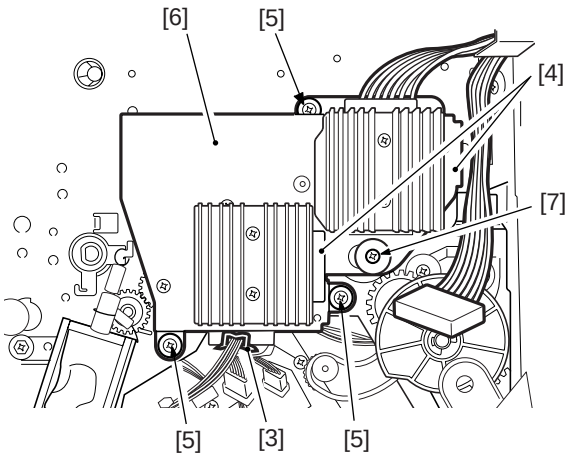


Figure 4-127

3. Removing the Buffer Roller Assembly

1) Remove the finisher controller PCB (see I-C-1).
2) Remove the feed drive unit (see I-B-2).
3) Remove the screw [1], and remove the guide support plate assembly [2] to slide out the harness leads [3] towards the buffer roller assembly side.

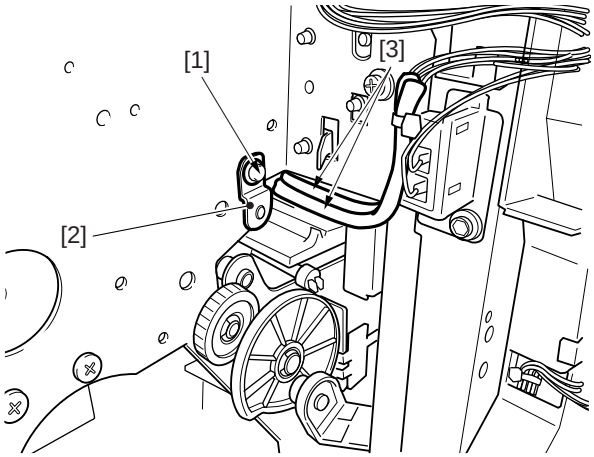


Figure 4-128

4) Remove the front cover (see I-A-4).
5) Remove the screw [4], and remove the guide support plate assembly [5]. Then, remove the buffer roller assembly [6].

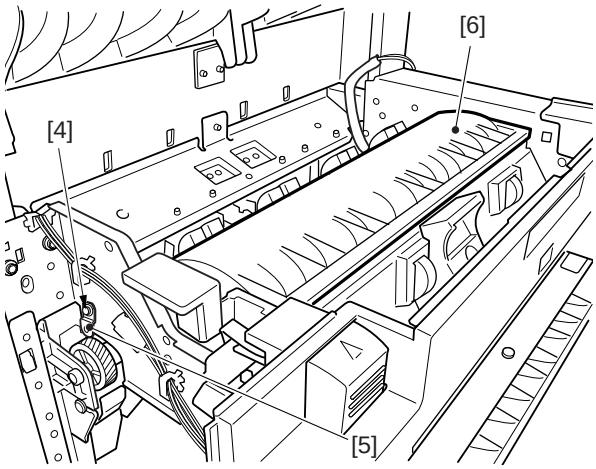


Figure 4-129

4. Removing the Stapler

1) Open the front cover. Remove two screws [1], and remove the stapler cover [2].

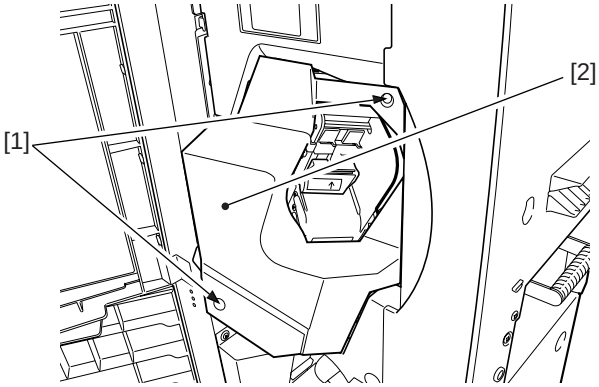


Figure 4-130

2) Move the stapler assembly unit [3] to the front.
3) Remove two connectors [4] and one screw [5].
4) Turn the stapler assembly unit clockwise, and pull it out upward.

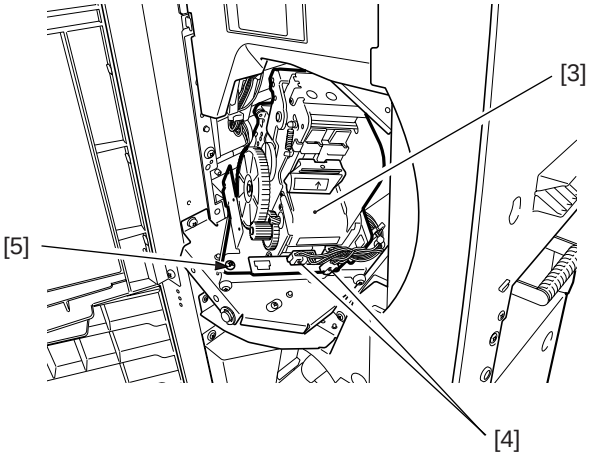


Figure 4-131

Caution:

When displaying "Set stapler cartridge" even though the staple cartridge is installed, it may not be installed correctly. If you move the gear of stapler unit manually, the cartridge cannot be detected due to the dislocation of gear because it is not correctly installed. In this case, move the gear to the position as shown below and reinstall the cartridge.

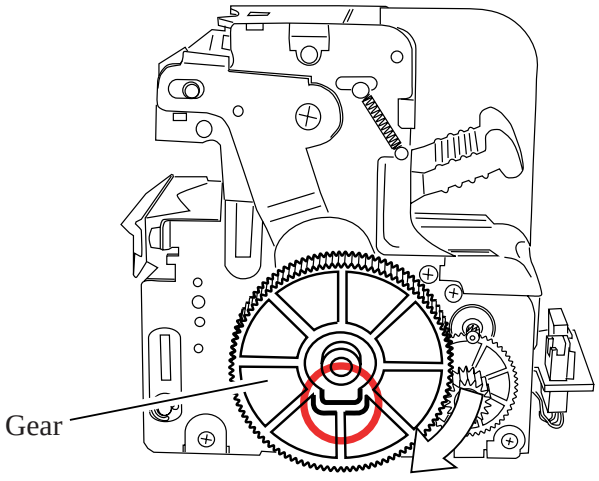


Figure 4-132

C. PCBs

1. Removing the Finisher Controller PCB

1) Remove the rear cover.
2) Disconnect the 19 connectors [1].
3) Remove the four screws [2], and remove the finisher controller PCB [3].

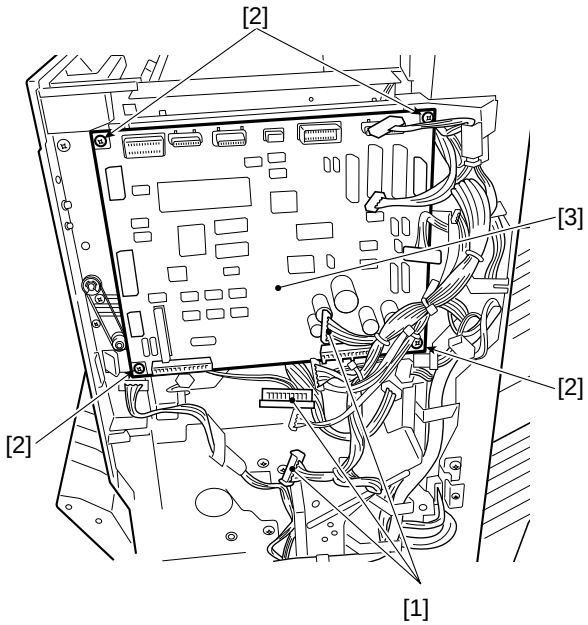


Figure 4-133

D. Caution when removing MJ-1021

1. After removing MJ-1021, make sure to install "BLIND-FIN-CABLE" (6LA01294000).

1) Install the "BLIND-FIN-CABLE" [1] with two screws.

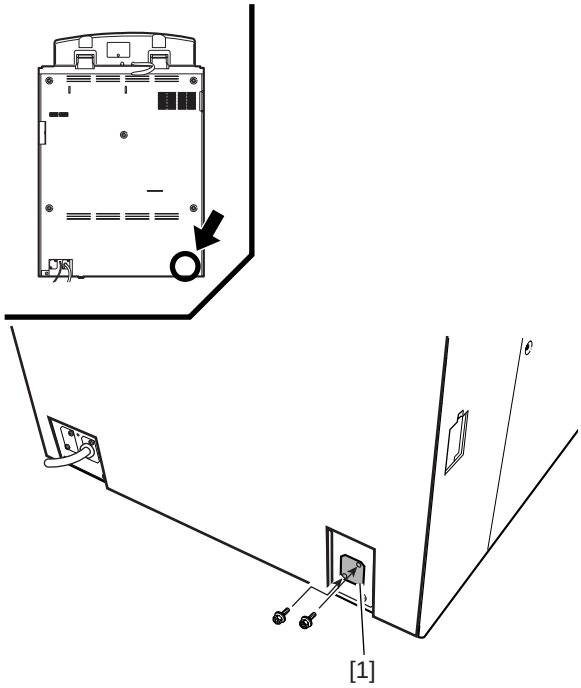


Figure 4-134

II. SADDLE STITCHER UNIT

A. Externals and Controls

1. Removing the Front Lower Door Assembly

1) Open the front lower door assembly [1].
2) Remove the screw [2] and remove the bushing [3], and then remove the front lower door assembly.

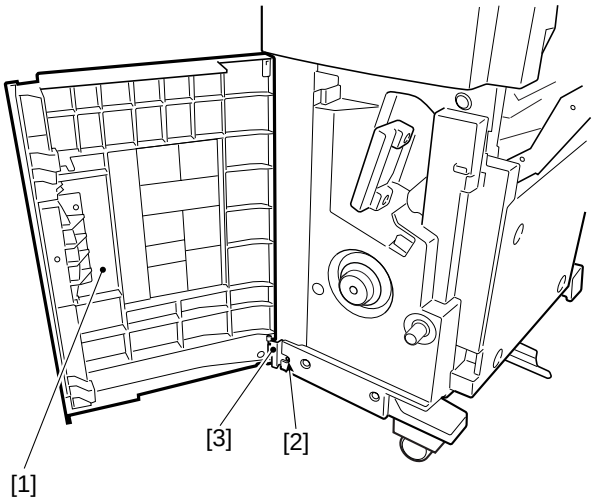


Figure 4-201

2. Removing the Rear Lower Cover

1) Remove the four screws [1], and remove the rear lower cover [2].

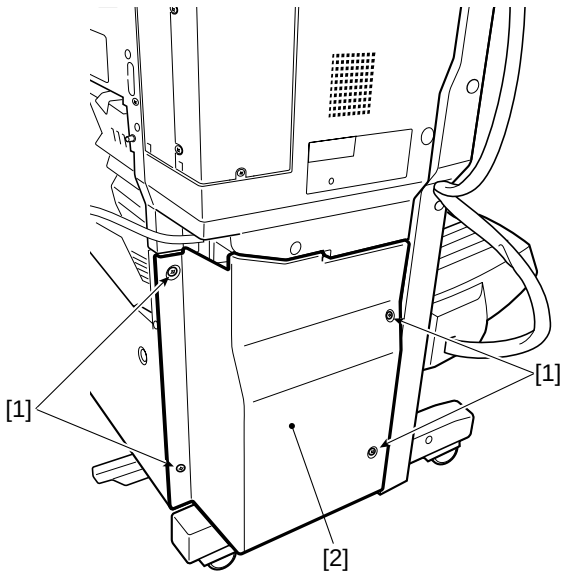


Figure 4-202

3. Removing the Front Inside Cover

1) Open the front lower door assembly [1].
2) Remove the screw [2], and remove the folding roller knob [3].
3) Remove the five screws [4], and remove the front inside cover [5].

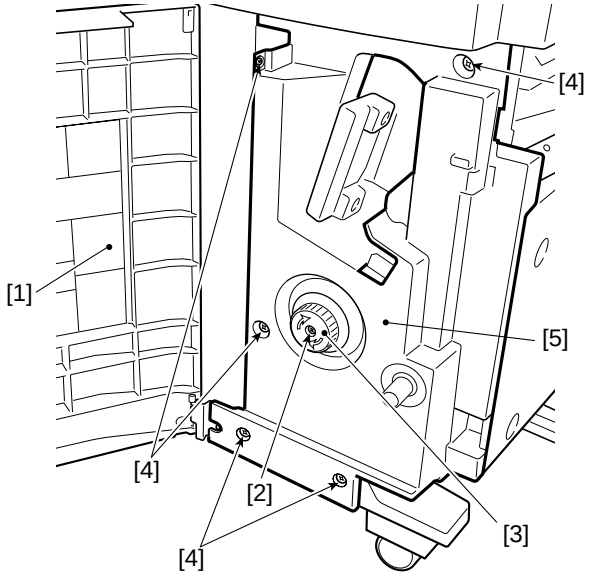


Figure 4-203

4. Removing the Saddle Delivery Tray Assembly

1) Lift up the open/close lever [2] of the saddle delivery tray assembly [1], and open the saddle delivery tray assembly.

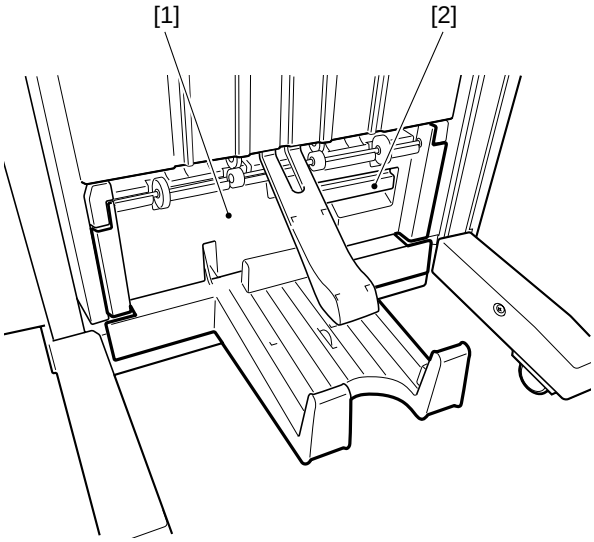


Figure 4-204

2) Remove the door shaft [3] in the direction of the arrow, and slide out towards the front of the saddle delivery tray assembly [4].

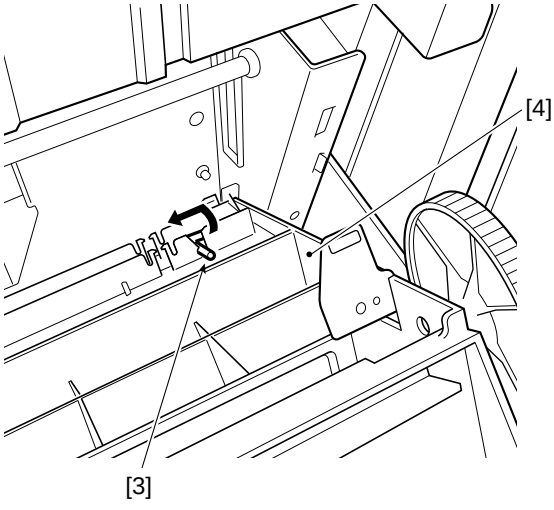


Figure 4-205

3) Remove the harness leads from the harness stop [5] and edge saddle [6].
4) Disconnect the two connectors [7], and remove the saddle delivery tray assembly [8].

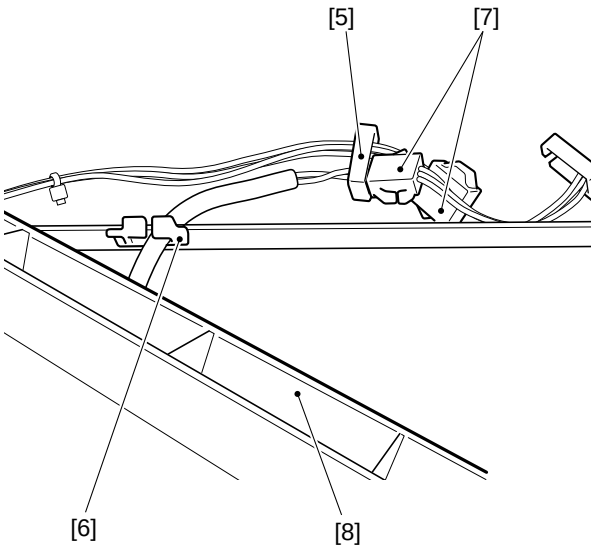


Figure 4-206

5. Removing Upper Delivery Guide Assembly

1) Remove the grate-shaped lower guide (see I-A-10).
2) Remove the two screws [1] and ground lead [2], and remove the upper delivery guide assembly [3].

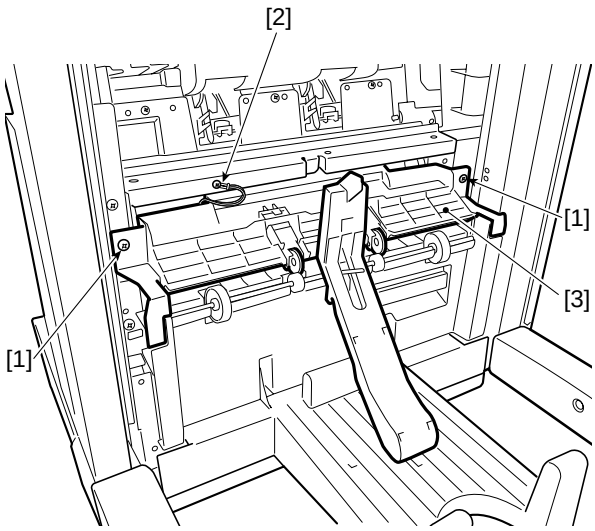


Figure 3-207

6. Removing the PCB Cover

1) Remove the four screws [1], and remove the PCB cover [2].

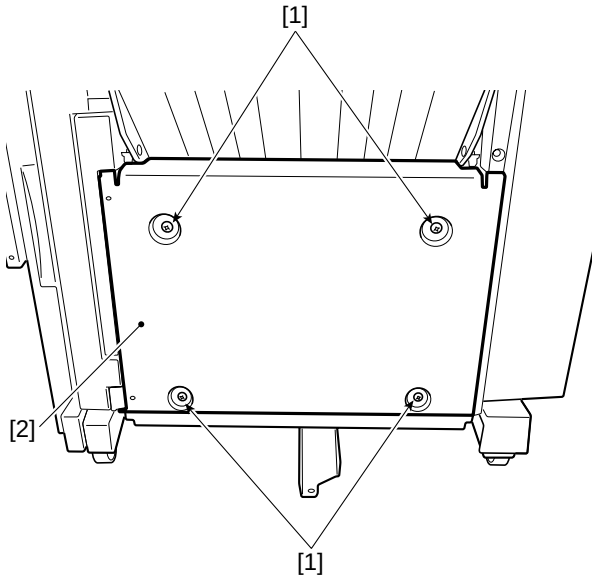


Figure 4-208

B. SADDLE UNIT

1. Removing the Saddle Unit

1) Remove the grate-shaped lower guide (see I-A-7).
2) Remove the right guide assembly (see I-A-8).
3) Remove the front lower door assembly (see II-A-1).
4) Remove the rear lower cover (see II-A-2).
5) Remove the front inside cover (see II-A-3).
6) Remove the saddle delivery tray assembly (see II-A-4).

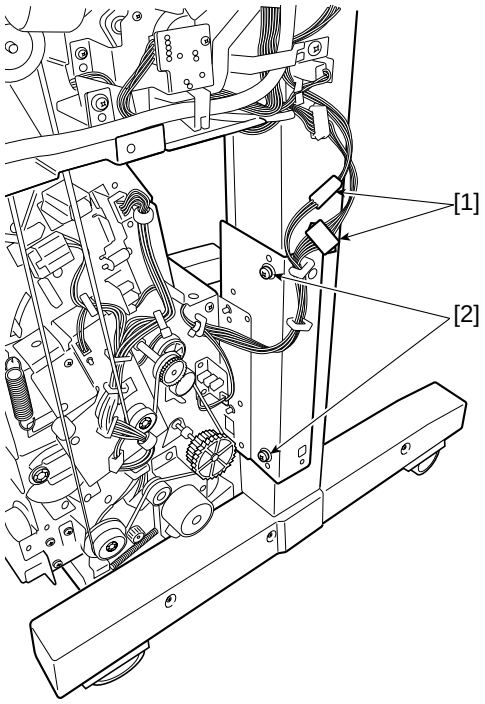


Figure 4-209

7) Remove the harness from the harness clamp [3] and harness lead [4].
8) Remove the upper delivery guide (see II-A-5).
9) Remove the PCB cover (see II-A-6).
10) Disconnect two connectors [1] and remove the two screws [2].

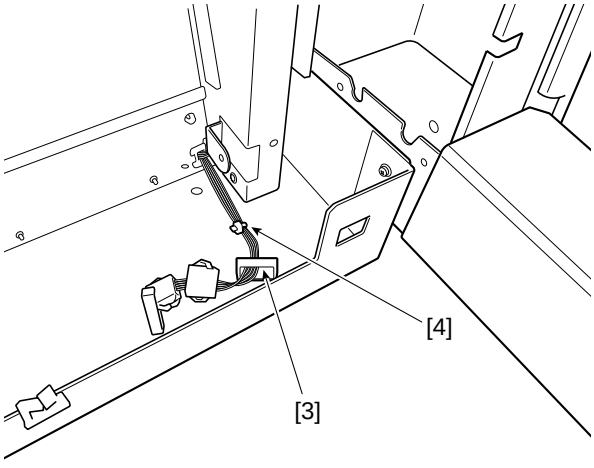


Figure 4-210

11) Remove the screw [5].

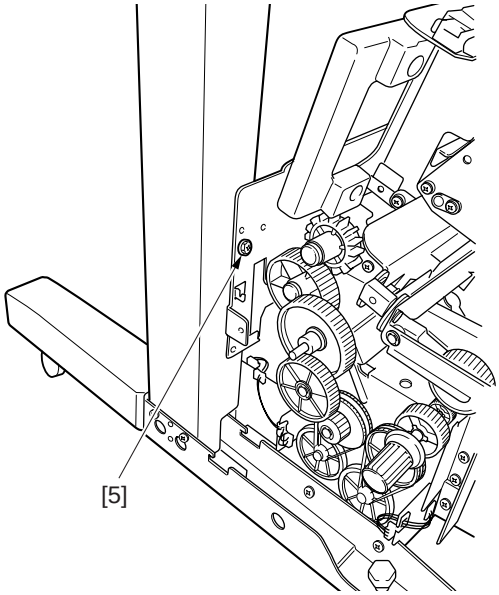


Figure 4-211

12) Remove the two screws [6], and remove the saddle stitcher unit [7] by moving it in the pick-up direction.

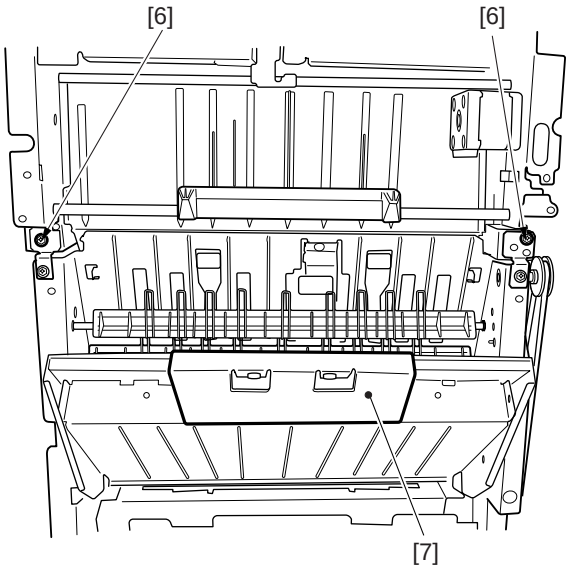


Figure 4-212

Caution:

When removing the saddle unit from the finisher unit body, prevent the timing belt [8] from catching on the communications cable bracket [9].

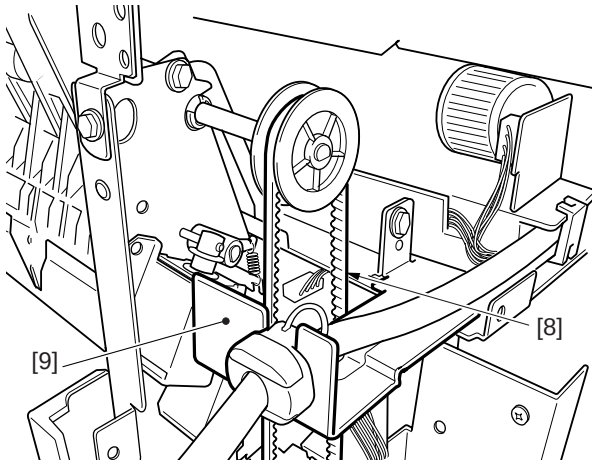


Figure 4-213

2. Removing the Paper Folding Roller

1) Remove the front lower door assembly (see II-A-1).
2) Remove the front inside cover (see II-A-3).
3) Remove the upper delivery guide assembly (see II-A-5).
4) Remove the PCB cover (see II-A-6).
5) Disconnect the two connectors [1].

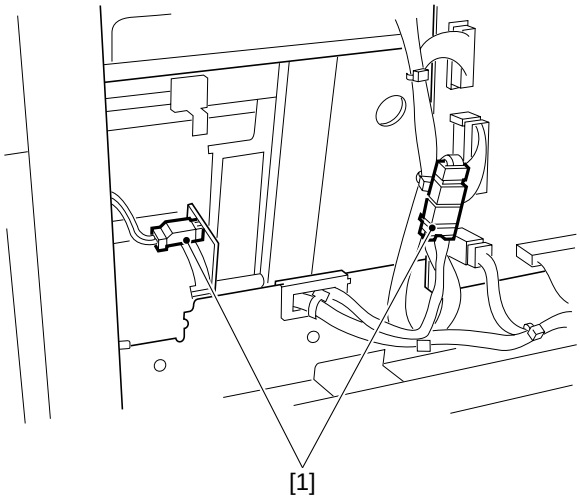


Figure 4-214

6) Disconnect two connectors [2], remove the three screws [3], and remove the paper pushing motor mount [4].

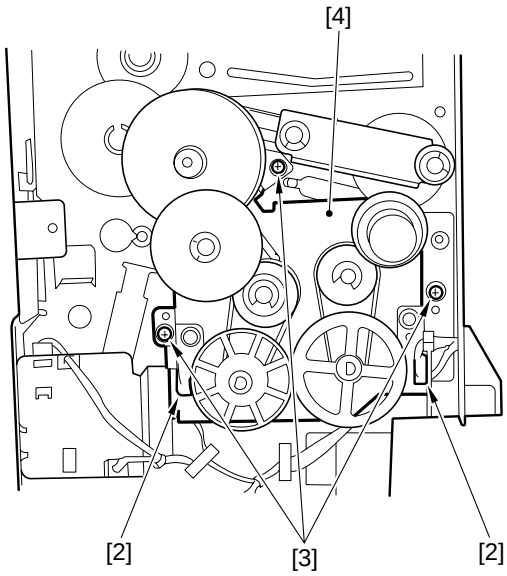


Figure 4-215

7) Remove the tension springs (front [5], rear [6]).

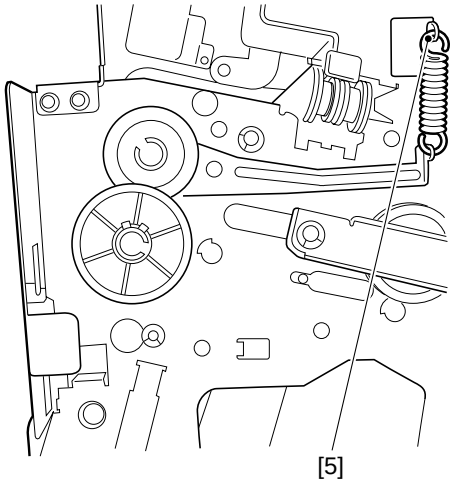


Figure 4-216

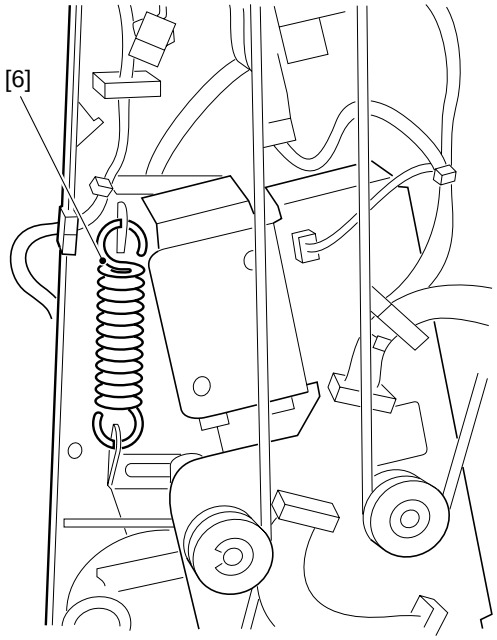


Figure 4-217

8) Remove the two C-rings [7], and remove the sensor flag [8] and two bearings [9] at the rear.

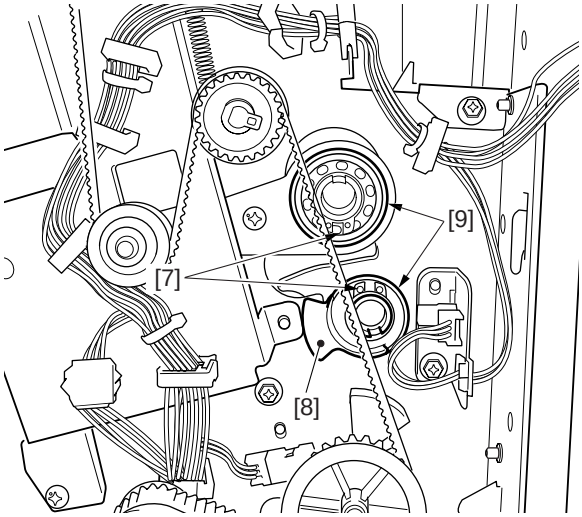


Figure 4-218

9) Remove the two C-rings [10], and remove the two gears [11] at the front.

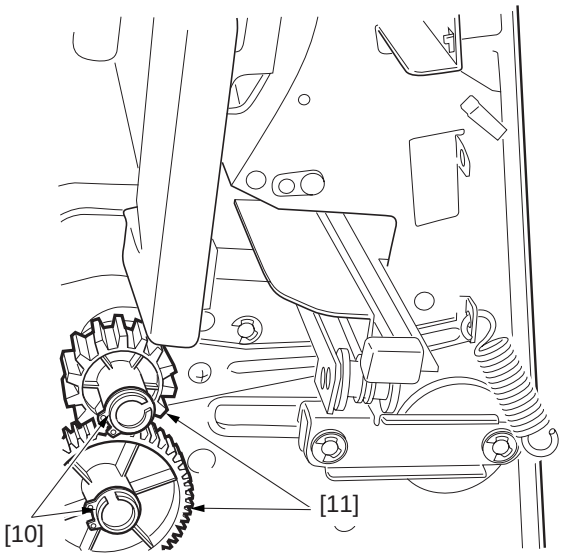


Figure 4-219

10) Remove the two bearings [12].

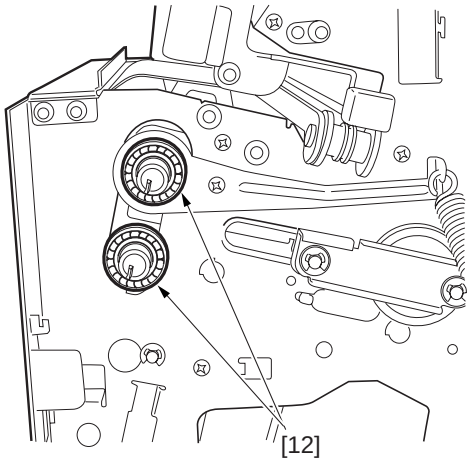


Figure 4-220

11) Open the saddle delivery tray assembly [13].
12) Remove the two screws [14], and remove the two alignment plates [15].
13) Slide the paper folding roller [16] to the front, and pull it out in the delivery direction.

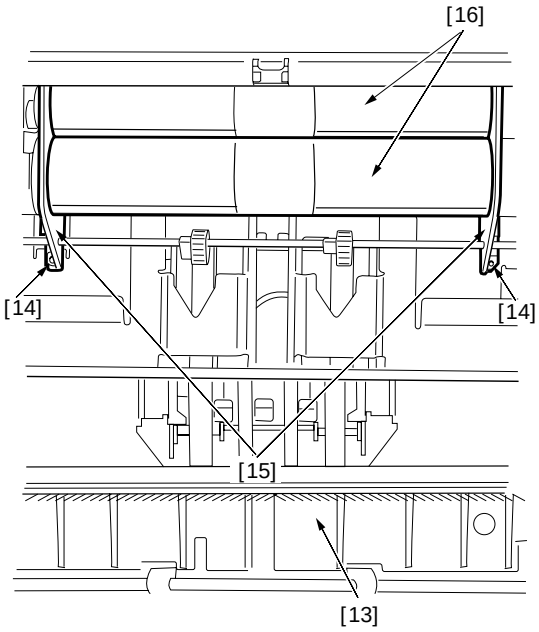


Figure 4-221

3. Installing the Paper Folding Roller

1) Attach the gear [2] so that the grooved section [1] on the gear is facing the grooved section [1] on the paper folding roller to align the phases.

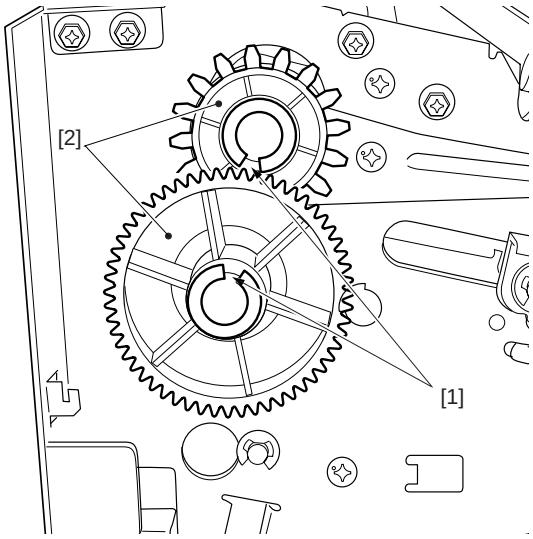


Figure 4-222

4. Removing the Stitcher Mount Unit

1) Remove the front inside cover (see II-A-3).
2) Remove the E-ring [1], and remove the roll [2] and the shaft [3].

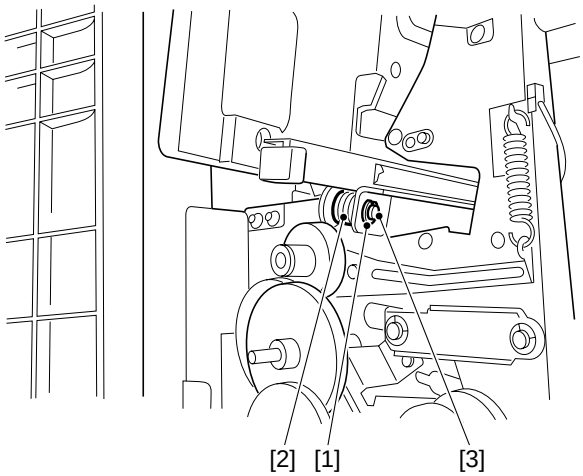


Figure 4-223

3) Pull out the stitcher mount unit [4] to the front.

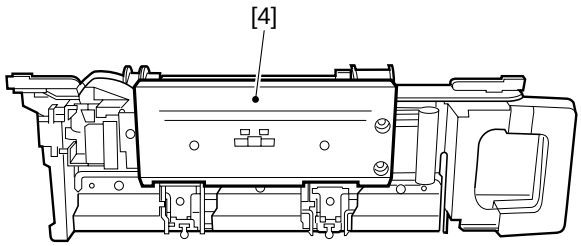


Figure 4-224

5. Adjusting the Stitcher Position

1) Remove the front lower door assembly (see II-A-1).
2) Remove the front inside cover (see II-A-3).
3) Open the front door assembly.
4) Pull out the stitcher mount unit to the front, then pull out the stitcher towards you and then pull the stitcher down.
5) Remove the three screws [1], and remove the stitcher mount unit cover [2].

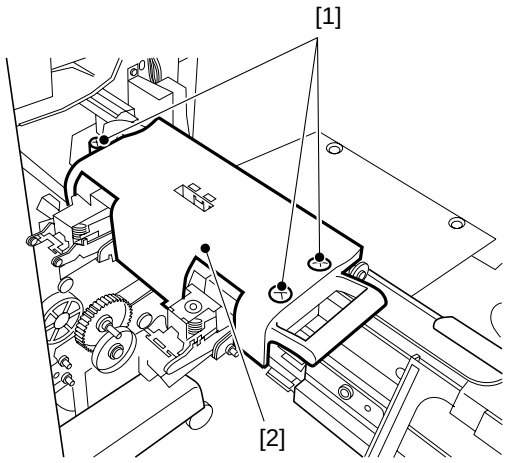


Figure 4-225

6) Remove the stitcher positioning tool [3] from the back of the cover.

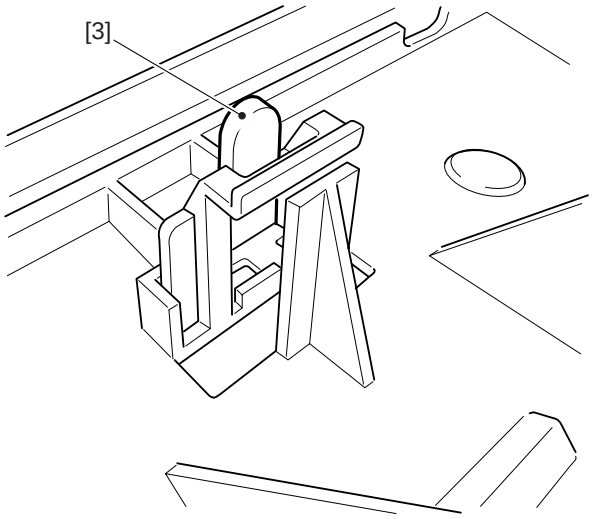


Figure 4-226

7) If you must adjust the front stitcher, remove the center guide plate [5] and front guide plate [4] (one screw each). If you must adjust the rear stitcher, remove the center guide plate [5] and the rear guide plate [6] (one screw each).

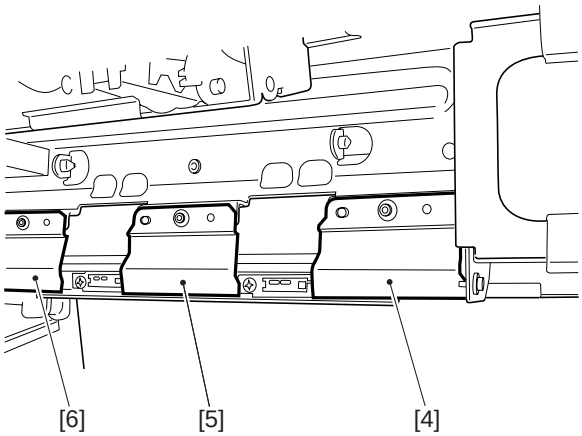


Figure 4-227

8) If you must adjust the front stitcher, loosen the two screws [8] on the stitcher mount [7]. If you must adjust the rear stitcher, loosen the two screws [9].

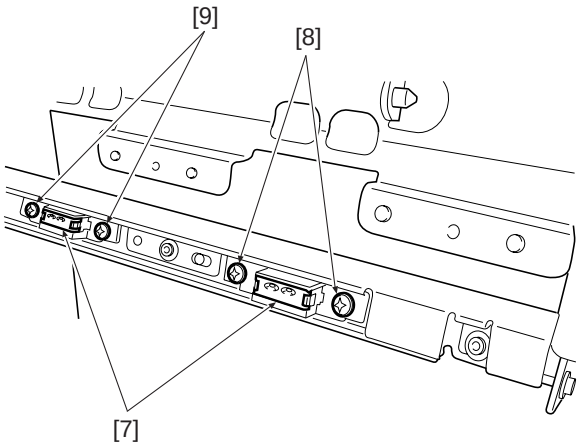


Figure 4-228

9) Insert the tool [10] into the staple slot of the stitcher [9].

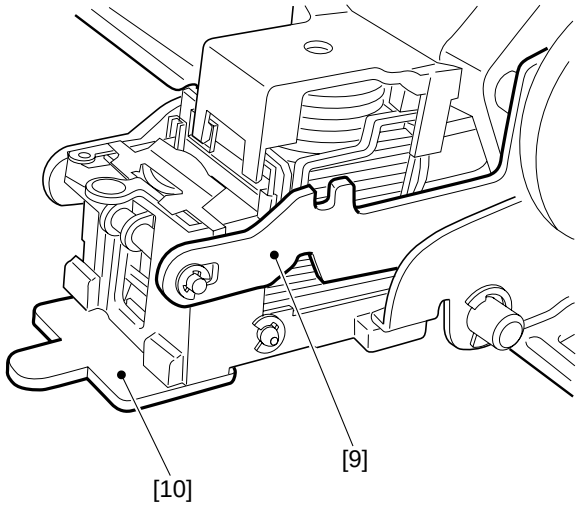


Figure 4-229

10) Shift down the stitcher, and turn the stitcher gear so that the boss on the tool [11] and the recess of the mount match. Then, tighten the screws [12] on the mount to fix the two in place.

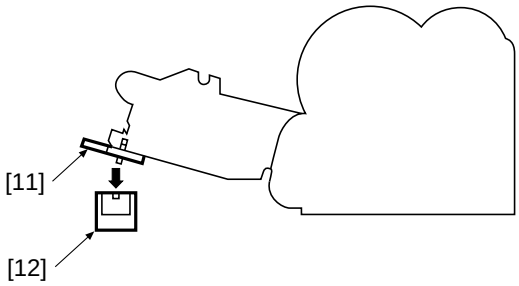


Figure 4-230

6. Removing the Positioning Plate Unit

1) Remove the saddle stitcher controller PCB (see II-C-1).
2) Disconnect the two connectors [1], remove the three harness clamps [2], and remove the harness leads [3] from the two edge saddles [4].
3) Remove the two screws [5], slide the positioning plate unit [6] once towards the front and remove from the rear side.

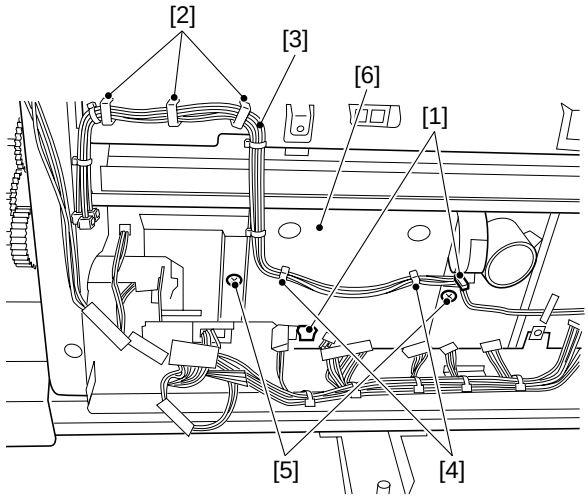


Figure 4-231

7. Removing the No.1 and No.2 Paper Deflecting Plates

1) Remove the rear cover (see I-A-2).
2) Remove the rear lower cover (see II-A-2).
3) Remove the claw [1] of the No.1 paper deflecting plate bushing, and pull out the No.1 paper deflecting plate shaft [2] toward the rear. (The procedure is the same for the No.2 paper deflecting plate.)

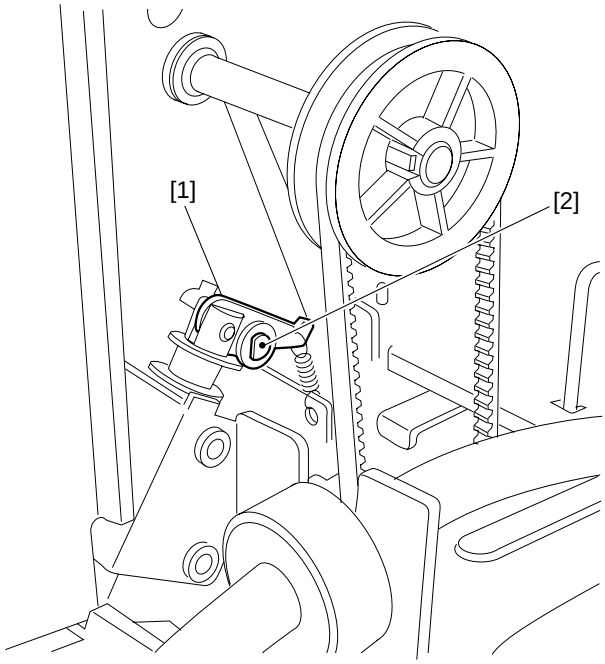


Figure 4-232

4) After detaching the front shaft of the No.1 paper deflecting plate [3] from the front side plate, remove the No.1 paper deflecting plate.

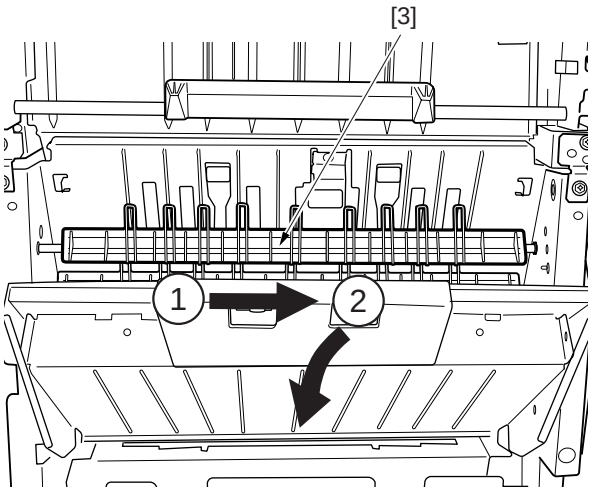


Figure 4-233

C. PCBs

1. Removing the Saddle Stitcher Controller PCB

1) Remove the PCB cover (see II-A-6).
2) Remove the four screws [1] and 14 connectors [2], and remove the saddle stitcher controller PCB [3].

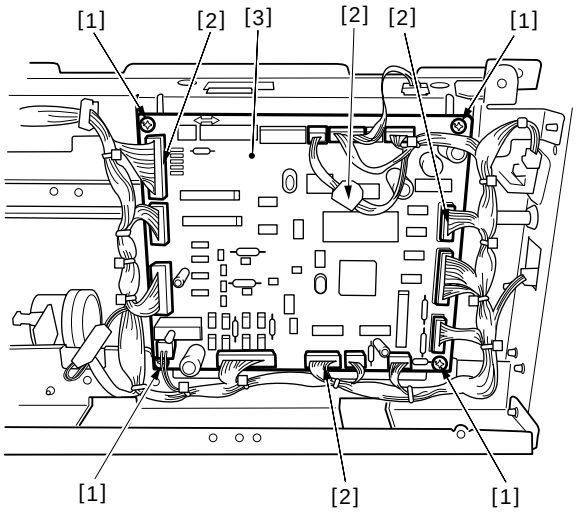


Figure 4-234

D. Power supply unit

1. Removing the Power Supply Unit

1) Remove the rear lower cover (see II-A-2).
2) Remove one connector [1] and two screws [2] to remove the power supply unit [3].

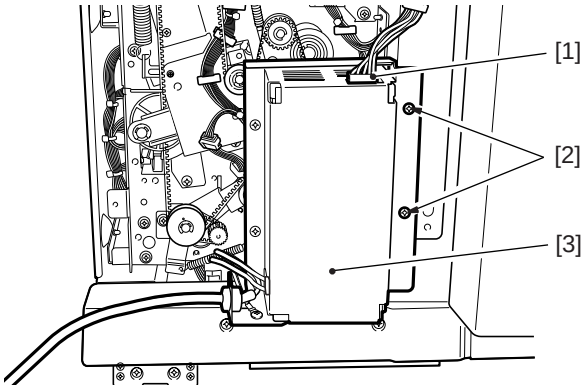


Figure 4-235

E. Accessory

1. Support tray

Install the support tray (accessory) to the suddle delivery tray when the paper stacking on the saddle delivery tray is significantly deteriorated, causing paper to drop, etc.

* 2 screws are needed to install the support tray.
* Refer to the pats list for the parts numbers and so on.

1) Take off the saddle delivery tray assembly (see II-A-4).
2) Install the support tray [2] to the saddle delivery tray [1] with 2 screws[3].

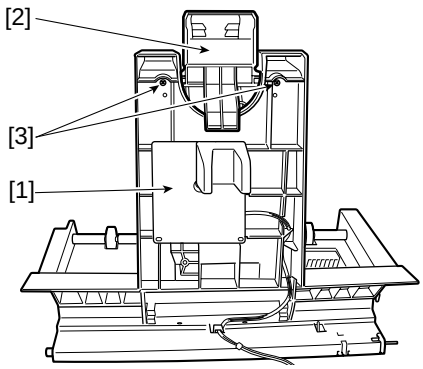


Figure 4-236

3) Install the saddle delivery tray.

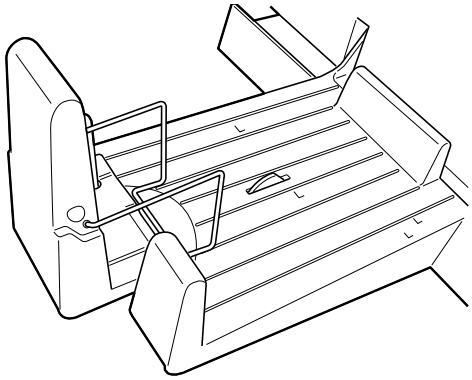


Figure 4-237

CHAPTER 5

MAINTENANCE AND INSPECTION

I. PERIODICALLY REPLACED PARTS

A. Finisher Unit

The finisher unit does not have parts that must be replaced on a periodical basis.

B. Saddle Stitcher Unit

The saddle stitcher unit does not have parts that must be replaced on a periodical basis.

II. CONSUMABLES AND DURABLES

Some of the parts of the machine may need to be replaced one or more times because of wear or tear during the machine's warranty period. Replace them as necessary.

A. Finisher Unit

No.	Name	Q'ty	Estimated Life	Remarks
1	Stapler	1	500,000 operations	5,000 operations/cartridge
2	Knurled belt	2	1,000,000 copies	
3	Paddle	2	1,000,000 copies	Paddle unit
		4		Paddle rubber only

B. Saddle Stitcher Unit

No.	Name	Q'ty	Estimated Life	Remarks
1	Stitcher	2	200,000 operations	2,000 operations/cartridge

III. PERIODICAL SERVICING

Item	Interval	Work	Remarks
Knurled belt	Host machine minimum servicing interval	Cleaning	Use moist cloth
Paddle			

CHAPTER 6

TROUBLESHOOTING

I. ADJUSTMENTS

A. Electrical System (finisher unit)

1. Adjusting the Height Sensor (PS1)

Perform the following adjustments whenever you have replaced the finisher controller PCB or the height sensor (PS1).

1) Set SW3 on the finisher controller PCB as indicated.

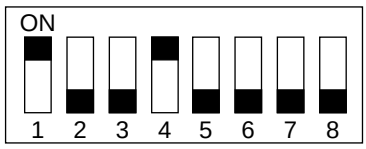


Figure 6-101

2) Place a paper on the tray.
3) Press SW1 on the finisher controller PCB. This causes the finisher to execute automatic adjustment, in which the tray unit will shift.
   - At the end of adjustment, trays will return to their home positions.
   - During adjustment, LED1 flashes. At the end of adjustment, LED1 turns and remains ON.
   - If automatic adjustment fails, the mechanism stops while the tray in question is being adjusted (at the same time, LED1 turns OFF).
4) Shift all bits on SW3 to OFF, and turn OFF the host machine once.

2. Adjusting the Rear Alignment Position

If you have replaced the finisher controller PCB or if an alignment fault occurs, adjust as follows. Performing the steps will affect all paper sizes.

1) Remove the rear cover of the finisher unit.
2) Set SW3 of the finisher controller PCB as indicated.

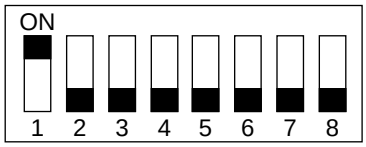


Figure 6-102

3) If you are using A4 paper, press SW1 on the finisher controller PCB. If you are using LT paper, press SW2 on the finisher controller PCB.
   - Pressing SW1/2 will open the swing guide and cause the rear alignment plate to move to A4/LT positions.
4) Place 10 sheets of A4/LT paper between the front and rear alignment plate, butting them against the stoppers.
5) Press SW1 or SW2 on the finisher controller PCB, and butt the rear alignment plate against the sheets.
   - Pressing SW1 will shift the rear alignment plate to the front in 0.35 mm increments.
   - Pressing SW2 will shift the rear alignment plate to the rear in 0.35 mm increments.

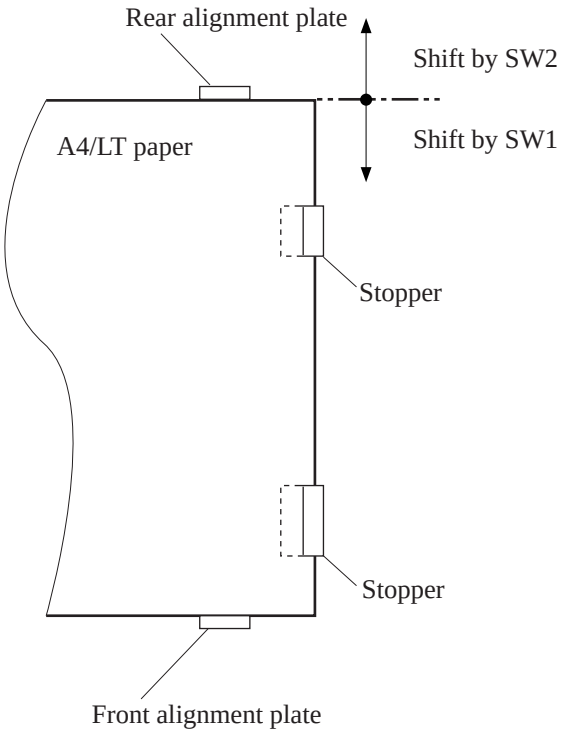


Figure 6-103

6) Press SW1 and SW2 simultaneously to store the adjustment value (this will lower the swinging guide).
7) Shift all bits of SW3 to OFF, and install the rear cover of the finisher unit.

3. Adjusting the Staple Position (stapler movement range)

Adjust as follows if you have replaced the finisher controller PCB. Performing this one step adjusts the position of all paper sizes in front and rear side of staple.

1) Remove the rear cover from the finisher unit.
2) Set SW3 on the finisher controller PCB as indicated.

In case of use A4 paper:

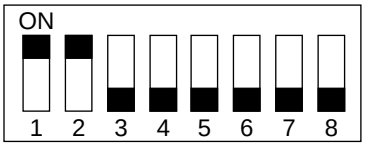


Figure 6-104

In case of use LT paper:

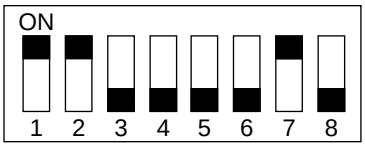


Figure 6-105

3-a) Press the SW1 (finisher controller PCB) for adjusting the rear side of staple position.
3-b) Press the SW2 (finisher controller PCB) for adjusting the front side of staple position.
- Pressing SW1/2 will open the swing guide and cause the knurled belt to rotate.
- Before adjusting either front or rear side of staple after another, turn off the power then turn it on, or turn off all switches (bits) of SW3.

4) Within 5 secs after pressing the switch, place one sheet of paper between the front and rear alignment plate, butting it against the stoppers.
- When the finisher detects the paper, it will lower the swing guide and execute stapling (rear, 1-position). Take out the stapled paper manually as delivery will not be executed.

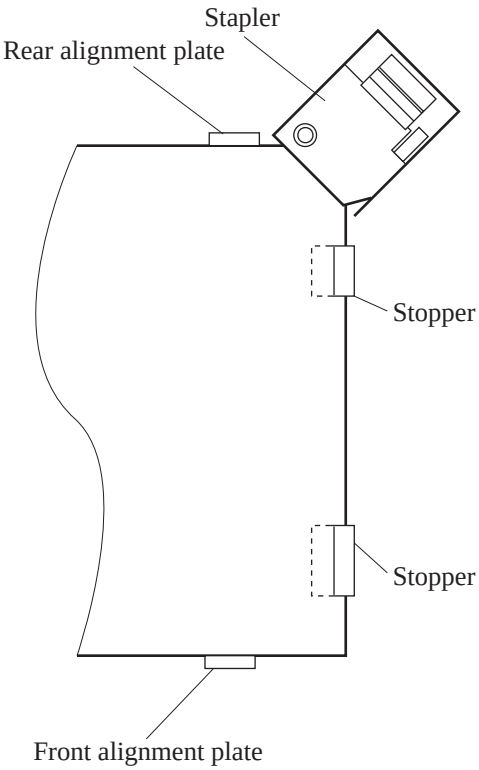


Figure 6-106

5) If the stapling position is correct, set all bits on SW3 to OFF to end the adjustments. If you need to change the stapling position, on the other hand, go to the next step.
6) To suit the position of the staple on the paper, press SW1 or SW2 on the finisher controller PCB as many times as necessary.
   - Pressing SW1 will shift the stapling position to the front in 0.3 mm increments.
   - Pressing SW2 will shift the stapling position to the rear in 0.3 mm increments.

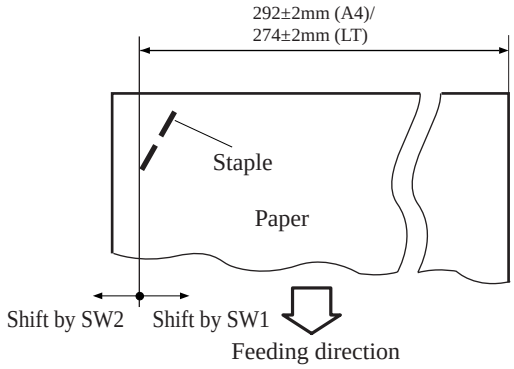


Figure 6-107

7) Press SW1 and SW2 simultaneously.
   - This will open the swing guide, and cause the knurled belt to rotate. Placement of one sheet of paper will cause the finisher to start stapling.
8) Check the stapling position. If good, set all bits of SW3 to OFF. If re-adjustments are necessary, go back to Step 6.

Caution:

The settings held by the finisher controller PCB are changed as soon as SW1 or SW2 is pressed. As such, to recover the previous settings after the press, you must press the other of the two switches as many times as you pressed previously.

4. Adjusting the Buffer Roller Winding Amount

Perform this adjustment in the following instances:

a. When the finisher controller PCB or the EEPROM (Q2) on the finisher controller PCB has been replaced
b. When something causes the winding amount to fluctuate
The "winding amount" is the amount of difference between the First and Second sheets wound onto the buffer roller device in the feed direction.

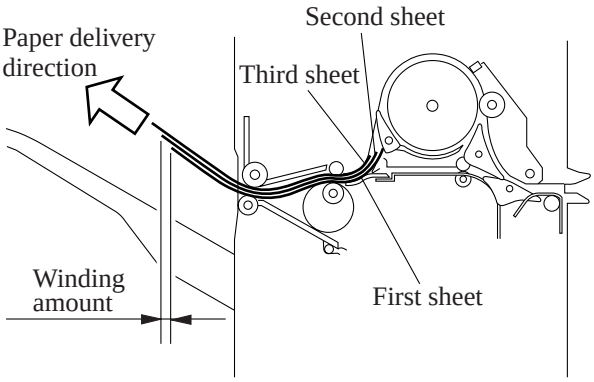


Figure 6-108

1) Set SW3 on the finisher controller PCB as indicated.

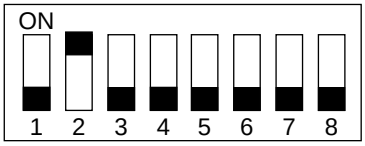


Figure 6-109

2) Turn the host machine OFF then back ON again.
3) Set the mode setting on the host machine to "1" and the number of originals (A4 or LT) to "3" in the staple mode.
4) Press the copy start key.
• Copying starts, three sheets for the first copy are output as a stack on the staple tray, and copying stops with the copies held at the delivery roller.
5) Remove the stack of sheets from the finisher delivery taking care to prevent the offset of the output sheets from changing.
6) Measure the winding amount (shift) of the stack of sheets, and compare this amount with the standard amounts.
• This amount should be measured at the center of the paper leading edge.

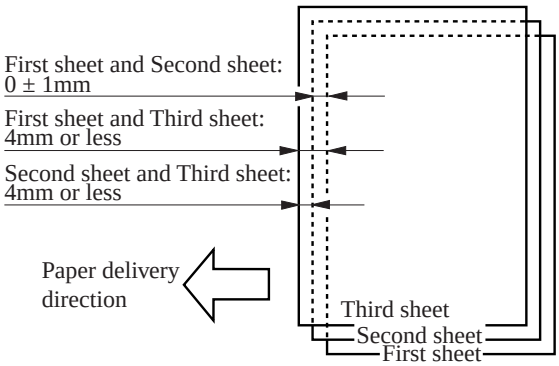


Figure 6-110

7) If the amount is within the standard, turn the host machine OFF, and then set all bits of SW3 to OFF. If the amount is outside the standard, perform the following.
8) Turn the host machine OFF, and set SW3 on the finisher controller PCB as indicated. If EEPROM (Q2) on the finisher controller PCB has been replaced, proceed to step 10).

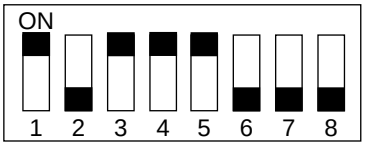


Figure 6-111

9) Turn the host machine ON, and then press SW2 on the finisher controller LCB.
• The current setting values are displayed at LED1.

Adjustment value 0	Lights for 1 second (once)
Adjustment value +N	Blinks (lights for 0.2 second) for N times.
Adjustment value -N	Lights for 1 second (once), and blinks (lights for 0.2 second) for N times.

The adjustment width is 0.72mm for each N=1.

Table 6-101

10) Turn the host machine OFF, and then set SW3 on the finisher controller PCB as indicated.

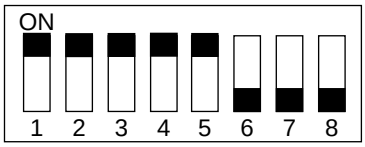


Figure 6-112

11) Press SW1 or SW2 on the finisher controller PCB as necessary.
- Each press of SW1 increments the winding amount in 0.72mm increments.
- Each press of SW2 decrements the winding amount in 0.72mm increments.

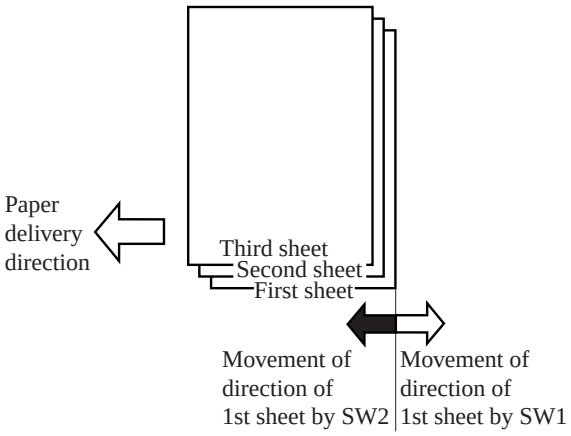


Figure 6-113

12) Repeat steps 1) though 6) twice. Check that the winding amount is within the standard in both times.
13) Turn the host machine OFF, and set all bits of SW3 to OFF.
This completes the adjustment.

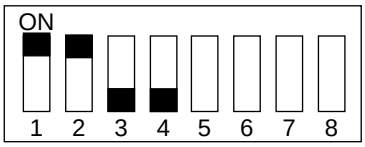
B. Electrical System (saddle stitcher unit)

1. Adjusting the Folding Position

The folding position is adjusted by changing the settings of bits 6 through 8 of DIPSW1 on the saddle stitcher controller PCB to match the stitching position (i.e., adjusting the distance over which the paper positioning plate is moved to the folding position from the stitching position.)

If you have replaced the saddle stitcher controller PCB, be sure to set the new DIPSW1 so that the settings will be the same as those on the old DIPSW1. If, for any reason, you must change the following position, perform the following steps:

1) Remove the PCB cover, and set bits 1 through 4 of DIPSW1 on the saddle stitcher controller PCB as indicated.



Do not change bits 5 through 8.

Figure 6-114

2) Remove the rear cover of the saddle stitcher unit, and tape the actuator of the inlet cover open sensor (PI9S) and the inlet cover open detection switch (MS1S) of the saddle stitcher unit in place.
3) Before inserting the paper, mark the top of the paper (you will be using two sheets of A3 or LD paper).

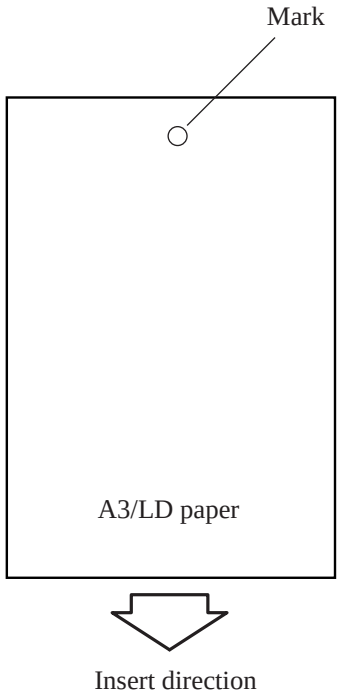


Figure 6-115

4) Press SW2 on the saddle stitcher controller PCB so that the feed motor (M1S) starts to rotate. (Press SW2 three seconds or more if LD paper is used).
5) Open the inlet cover, and insert two sheets of paper (push them in by hand until the leading edge of the sheets butts against the paper positioning plate).

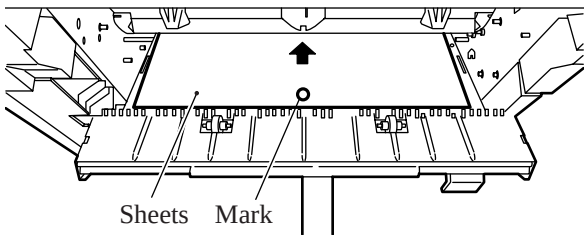
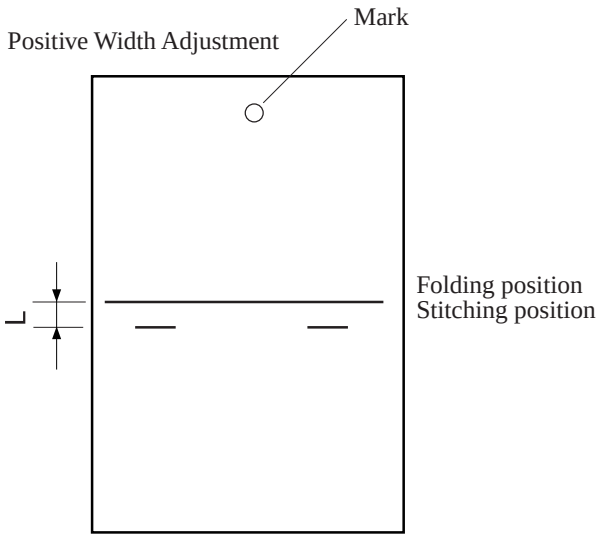


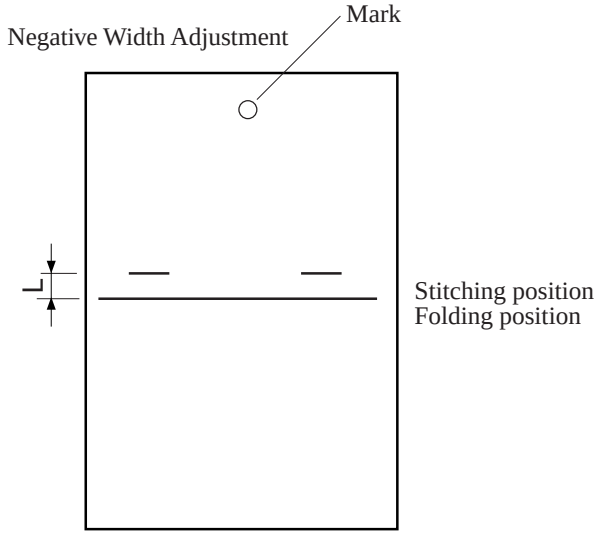
Figure 6-116

6) Close the inlet door while holding it down with your hand.
7) Press SW2 on the saddle stitcher controller PCB.
   - The saddle stitcher unit will “stitch” the sheets, and fold and deliver the stack automatically.

8) Measure the distance (L) between the stitching position and the folding position. Then, perform "positive width adjustment" or "negative width adjustment" to suit the relationship between the stitching position and the folding position.
   - If the stitching position is below the folding position, perform "positive width adjustment."
   - If the stitching position is above the folding position, perform "negative width adjustment."



Unit: mm
Example: If L is 1 mm, provide "+1 mm".



Unit: mm
Example: If L is 0.5 mm, provide "-0.5 mm".

Figure 6-117

9) Change the settings of bits 6 through 8 on DIPSW1 referring to Table 6-102 below.
   - If the width adjustment is "0", The stitching position and the folding position match, requiring no change.
   - If for "positive width adjustment," Set DIPSW1 so that the difference resulting from subtraction of the interval from the appropriate setting in Table 6-102 is provided.
     For instance, if the DIPSW1 is currently set to +2 and the interval is +1 mm, set DIPSW1 to reflect -2.
   - If for "negative width adjustment" Set DIPSW1 so that the sum resulting from addition of the interval from the appropriate setting is provided.
     For instance, if the DIPSW1 is currently set to -1 and the interval is +0.5 mm, set DIPSW1 to reflect +1.

DIPSW1 bit settings			Settings (in units of 0.5 mm)
bit 6	bit 7	bit 8	
OFF	ON	ON	+3
OFF	ON	OFF	+2
OFF	OFF	ON	+1
OFF	OFF	OFF	0
ON	OFF	ON	–1
ON	ON	OFF	–2
ON	ON	ON	–3

Do not touch the following:

bit 6	bit 7	bit 8
ON	OFF	OFF

Table 6-102

10) Set bits 1 through 4 on DIPSW1 to OFF.

2. Stitching Position (adjusting center stitching)

Use the host machine adjustment mode to perform the following:

II. ARRANGEMENT OF ELECTRICAL PARTS

A. Finisher Unit

1. Sensors

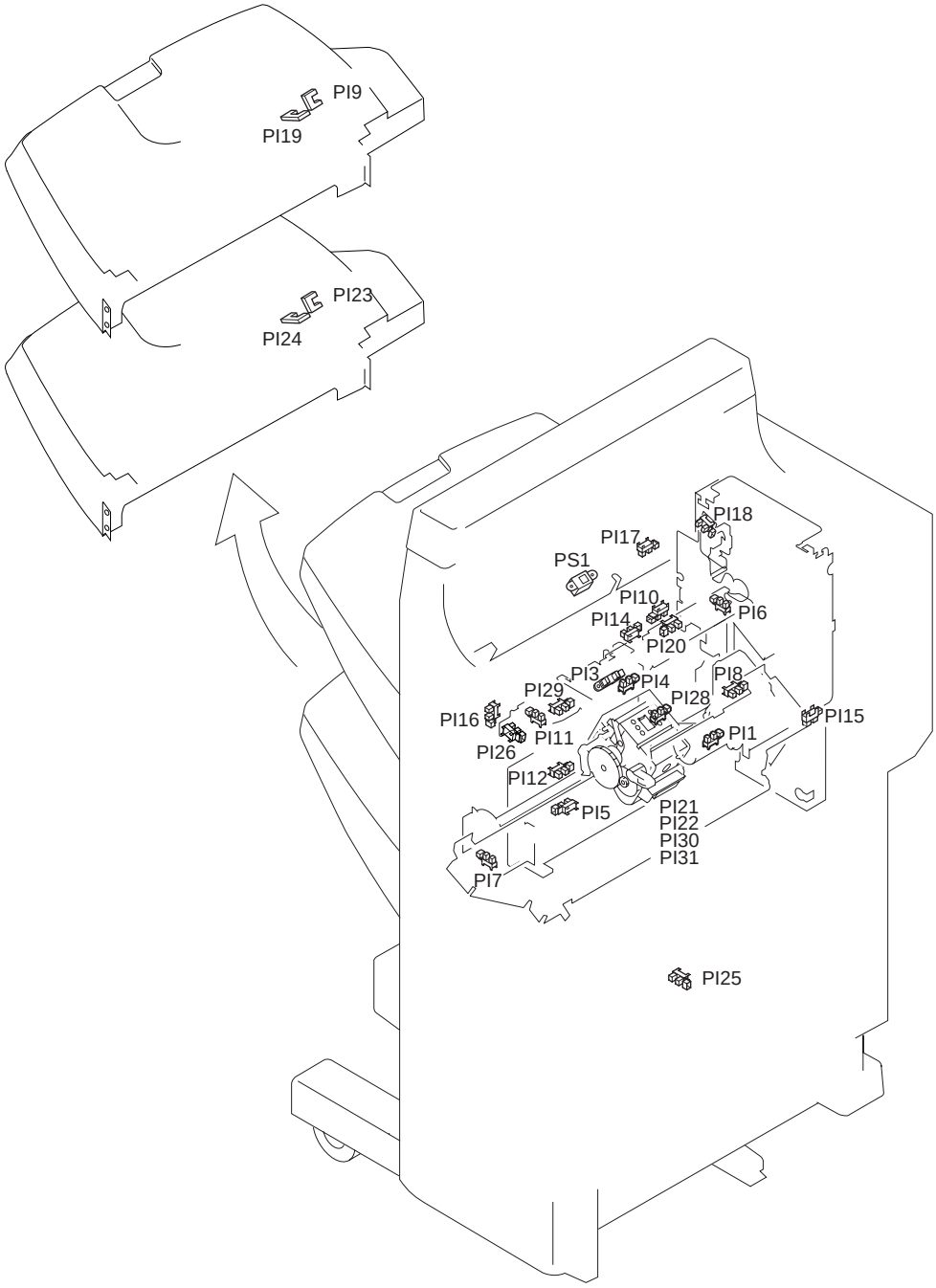


Figure 6-201

Name	Notation	Function
Photointerrupter	PI1	Detects paper in the inlet area
	PI3	Detects paper in the delivery area
	PI4	Detects paper on the stapling tray
	PI5	Detects the state (open) of the shutter
	PI6	Detects rear alignment plate at home position
	PI29	Detects front alignment plate at home position
	PI7	Detects the stapler at home position
	PI8	Detects the tray at home position
	PI10	Detects delivery motor clock pulses
	PI11	Detects paper on tray 1
	PI12	Detects paper on tray 2
	PI14	Detects paper in the buffer path
	PI15	Detects the finisher joint
	PI16	Detects the state (open) of the door
	PI17	Detects paper at the inlet to the buffer path
	PI18	Detects the state (open) of the swing guide
	PI9	Detects tray 1 lift motor clock pulses 1 (on sensor PCB)
	PI19	Detects tray 1 lift motor clock pulses 2 (on sensor PCB)
	PI20	Detects swing guide clock
	PI21	Detects edging of staples (inside stapler)
	PI22	Detects staple drive home position (inside stapler)
	PI23	Detects tray 2 lift motor clock pulses 1 (on sensor PCB)
	PI24	Detects tray 2 lift motor clock pulses 2 (on sensor PCB)
	PI25	Detects tray home position
	PI26	Detects paddle home position
	PI28	Detects knurled belt home position
	PI30	Detects the cartridge discrimination (inside stapler)
	PI31	Detects the staple (inside stapler)
Height sensor	PS1	Detects the height of the stack on the tray

Table 6-201

2. Microswitches

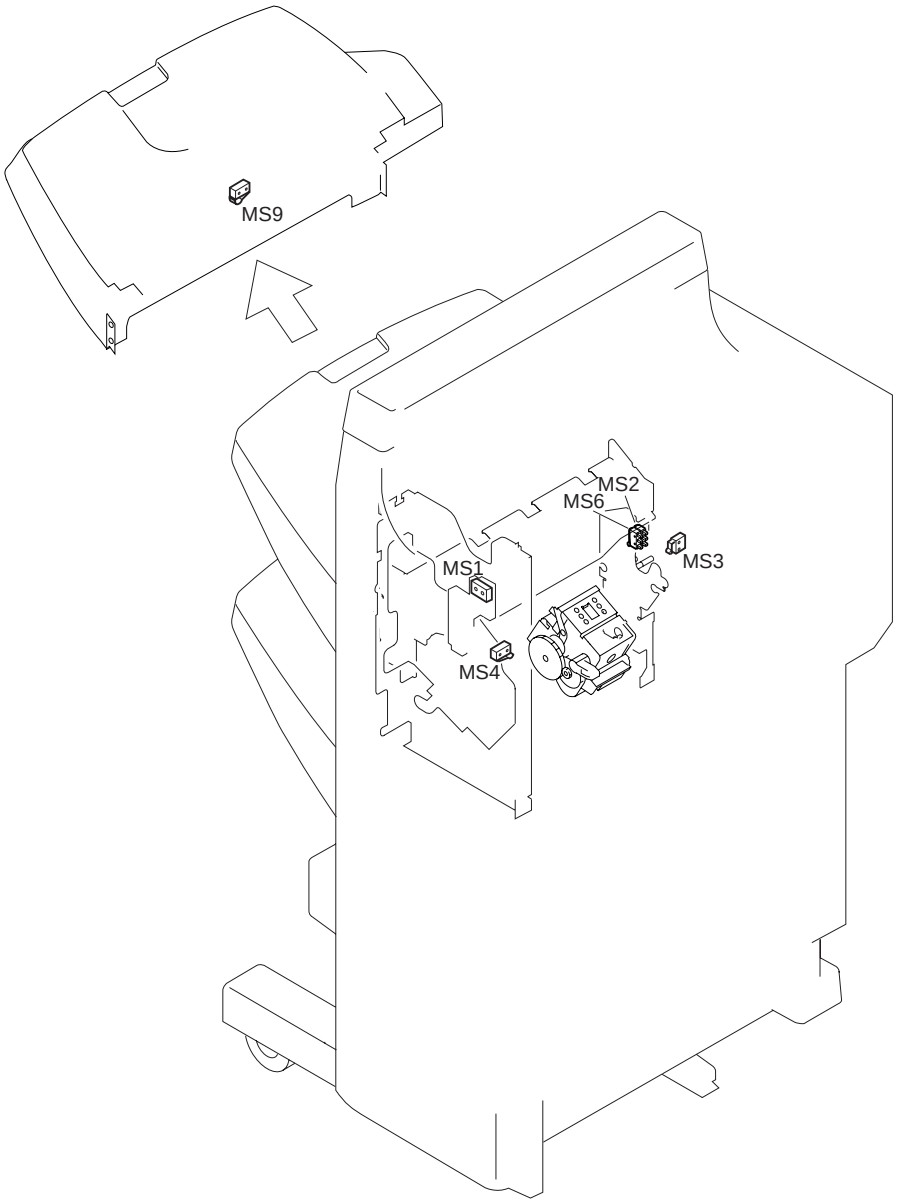


Figure 6-202

Name	Notation	Function
Microswitches	MS1	Detects the state (open) of the front door and the upper door
	MS2	Detects the state (closed) of the swing guide 1
	MS3	Detects the safety zone
	MS4	Detects the state (closed) of the shutter
	MS6	Detects the state (closed) of the swing guide 2
	MS9	Detects the tray coming close

Table 6-202

3. Motors

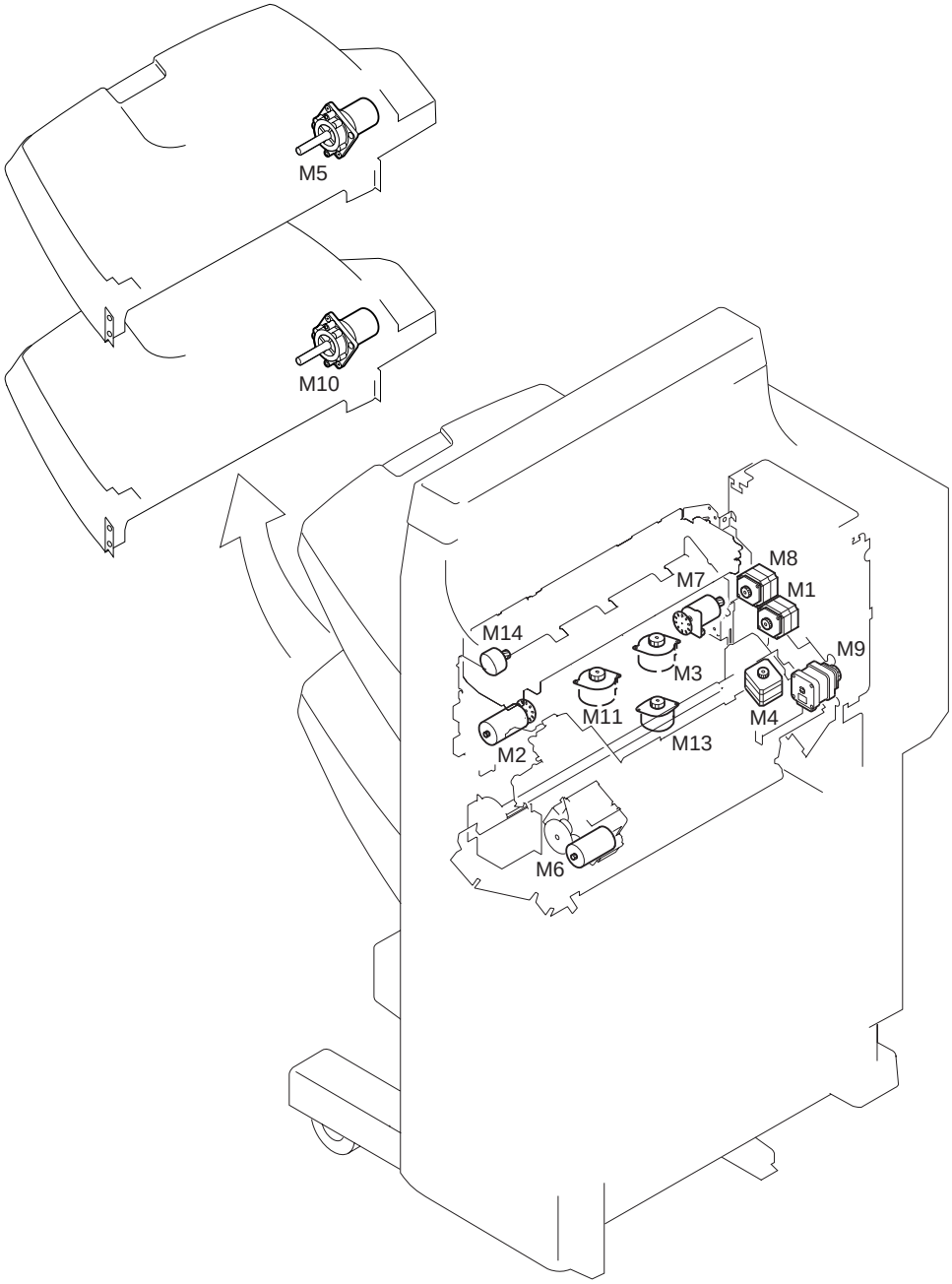


Figure 6-203

Name	Notation	Function
Motor	M1	First Feed motor
	M2	Delivery motor
	M3	Rear alignment motor
	M4	Stapler shift motor
	M5	Tray 1 lift motor
	M6	Staple motor
	M7	Swing motor
	M8	Second feed motor
	M9	Inlet feed motor
	M10	Tray 2 lift motor
	M11	Front alignment motor
	M13	Knurled belt motor
	M14	Paddle motor

Table 6-203

4. Solenoids

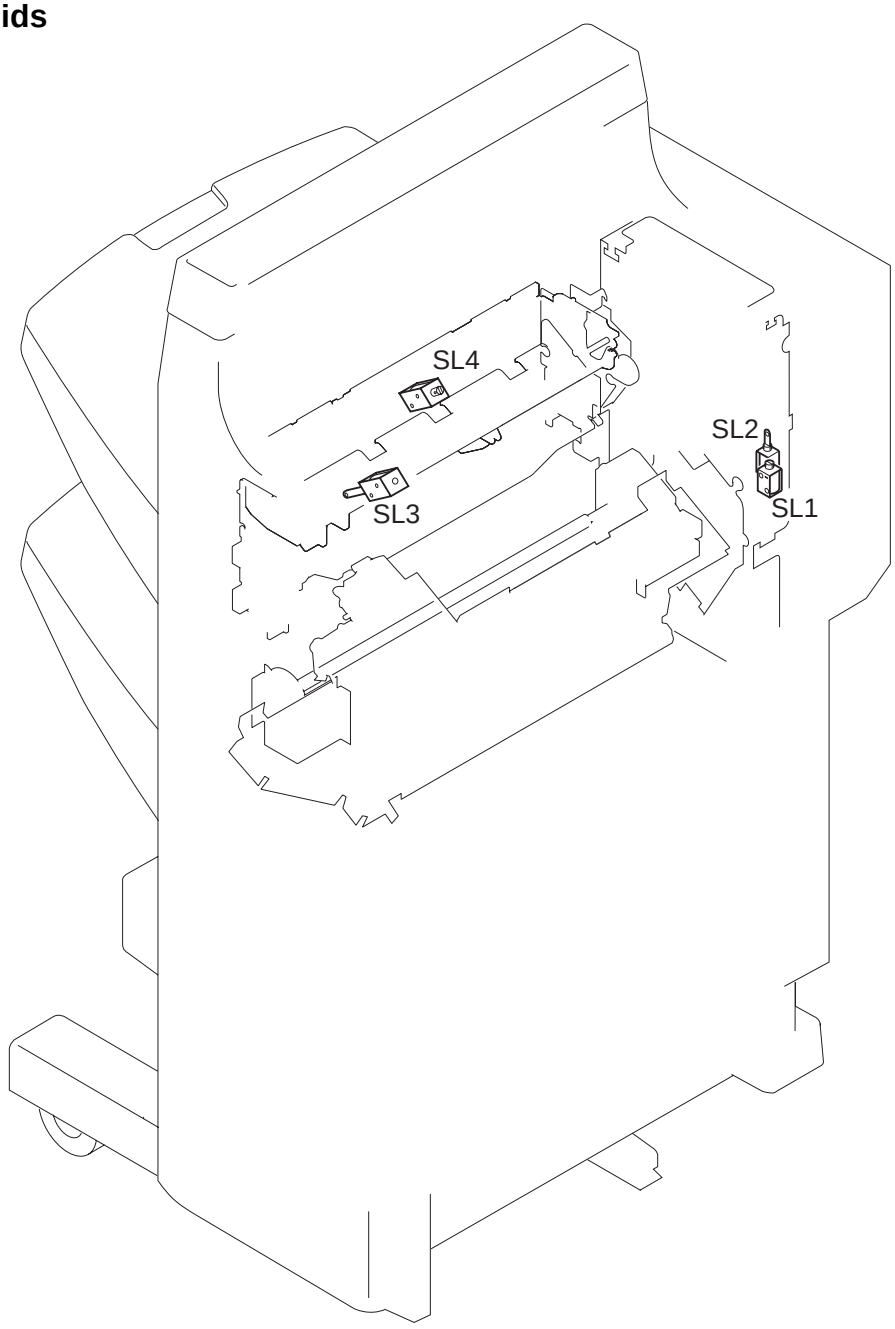


Figure 6-204

Name	Notation	Function
Solenoid	SL1	Flapper solenoid
	SL2	Buffer inlet solenoid
	SL3	Buffer outlet solenoid
	SL4	Paddle solenoid

Table 6-204

5. PCBs

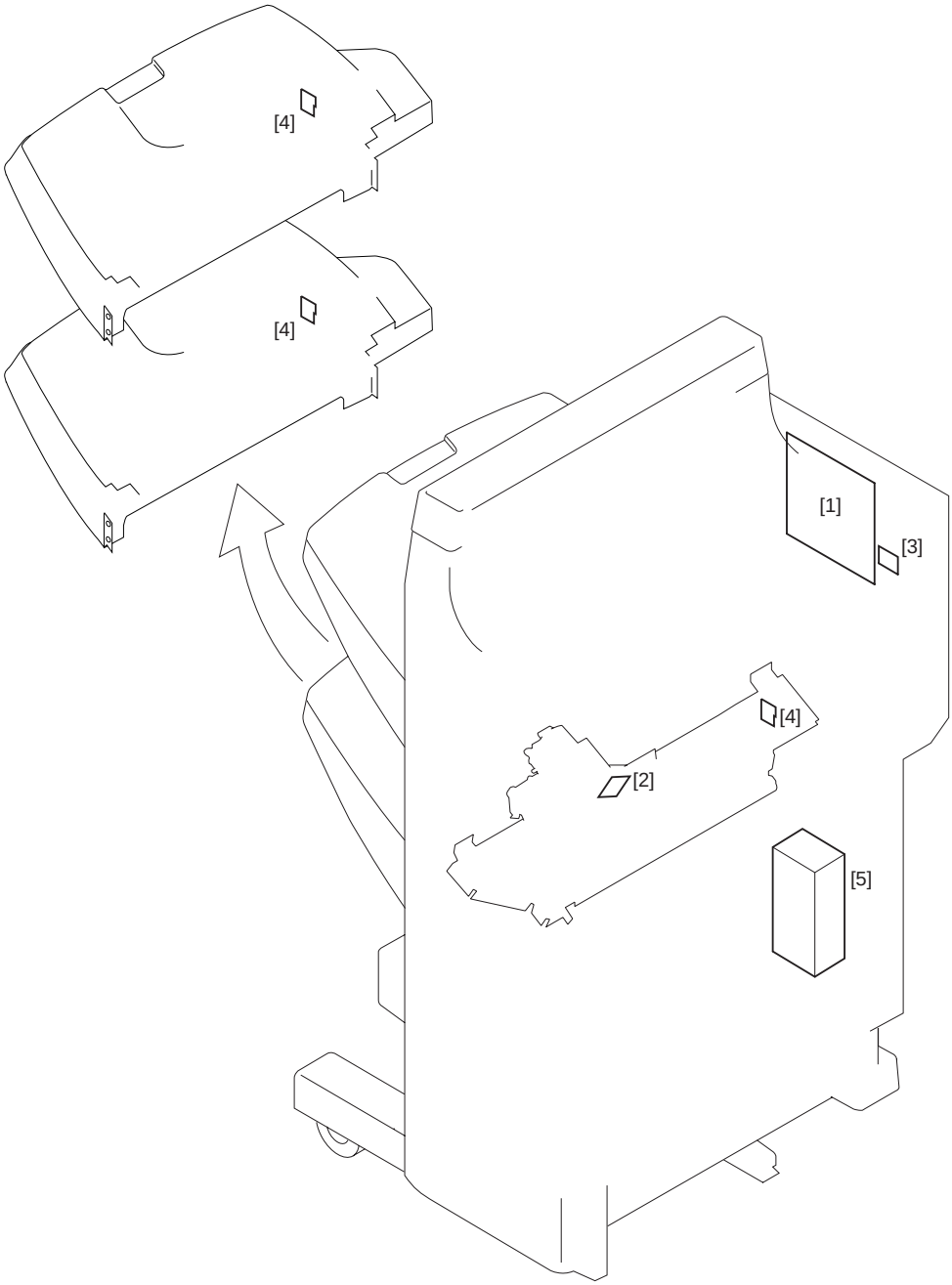


Figure 6-205

Reference	Name
[1]	Finisher controller PCB
[2]	Relay PCB 4
[3]	Relay PCB 3
[4]	Sensor PCB
[5]	Power supply unit

Table 6-205

B. Saddle Stitcher Unit

1. Photointerrupters

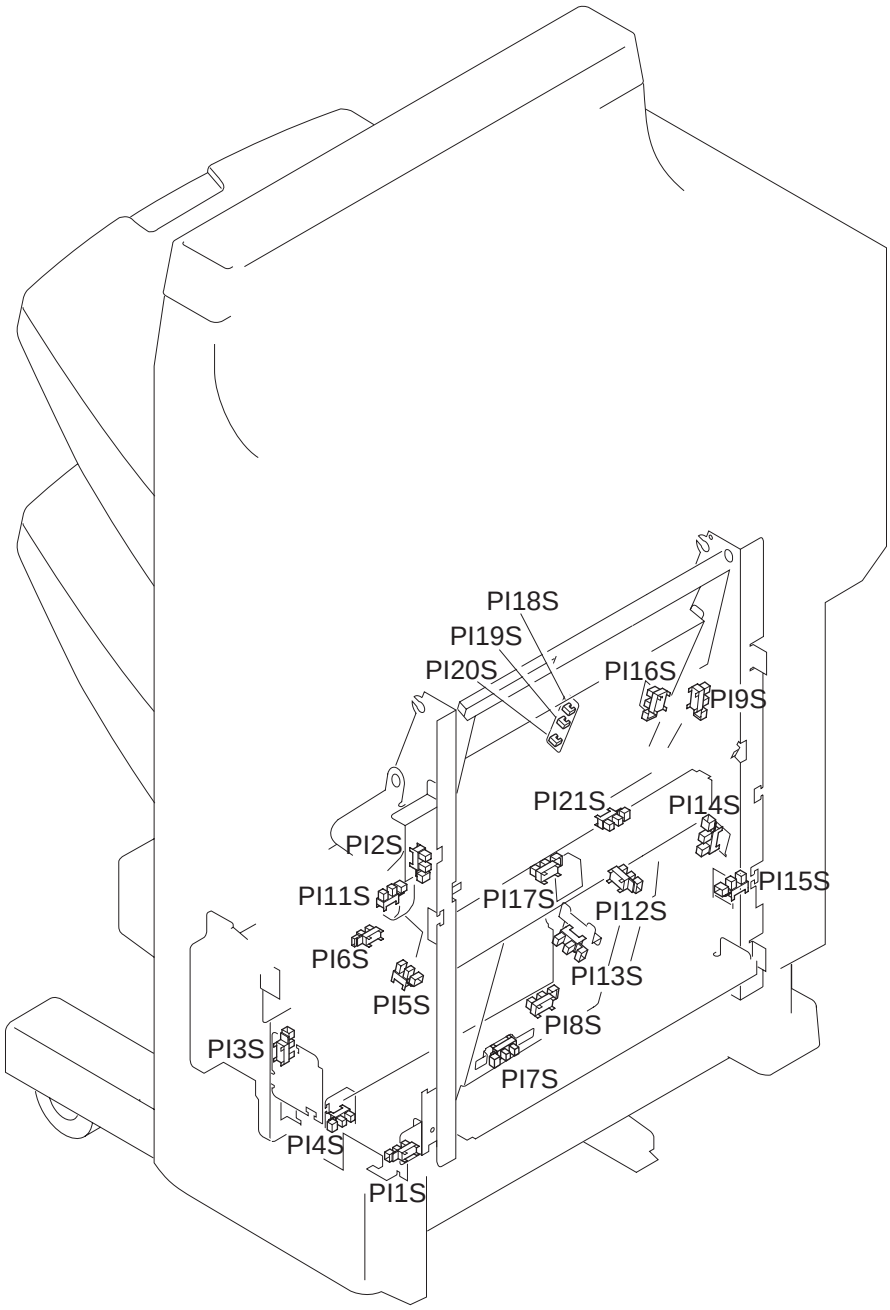


Figure 6-206

Name	Notation	Function
Photointerrupter	PI1S	Detects clock pulses from the paper pushing plate motor
	PI2S	Detects the state (open) of the front door
	PI3S	Detects the state (open) of the delivery cover
	PI4S	Detects clock pulses from the paper folding motor
	PI5S	Detects the alignment plates at home position
	PI6S	Detects paper on the tray
	PI7S	Detects paper positioning plate at home position
	PI8S	Detects paper on the paper positioning plate
	PI9S	Detects the state (open) of the inlet cover
	PI11S	Detects paper in the delivery area
	PI12S	Detects the phase of the crescent roller
	PI13S	Detects the guide at home position
	PI14S	Detects the paper pushing plate at home position
	PI15S	Detects the paper pushing plate at top position
	PI16S	Detects the state (in) of the stitcher unit
	PI17S	Detects paper in the vertical path
	PI18S	Detects paper (No. 1; on paper sensor PCB)
	PI19S	Detects paper (No. 2; on paper sensor PCB)
	PI20S	Detects paper (No. 3; on paper sensor PCB)
	PI21S	Detects the paper folding at home position

Table 6-206

2. Microswitches

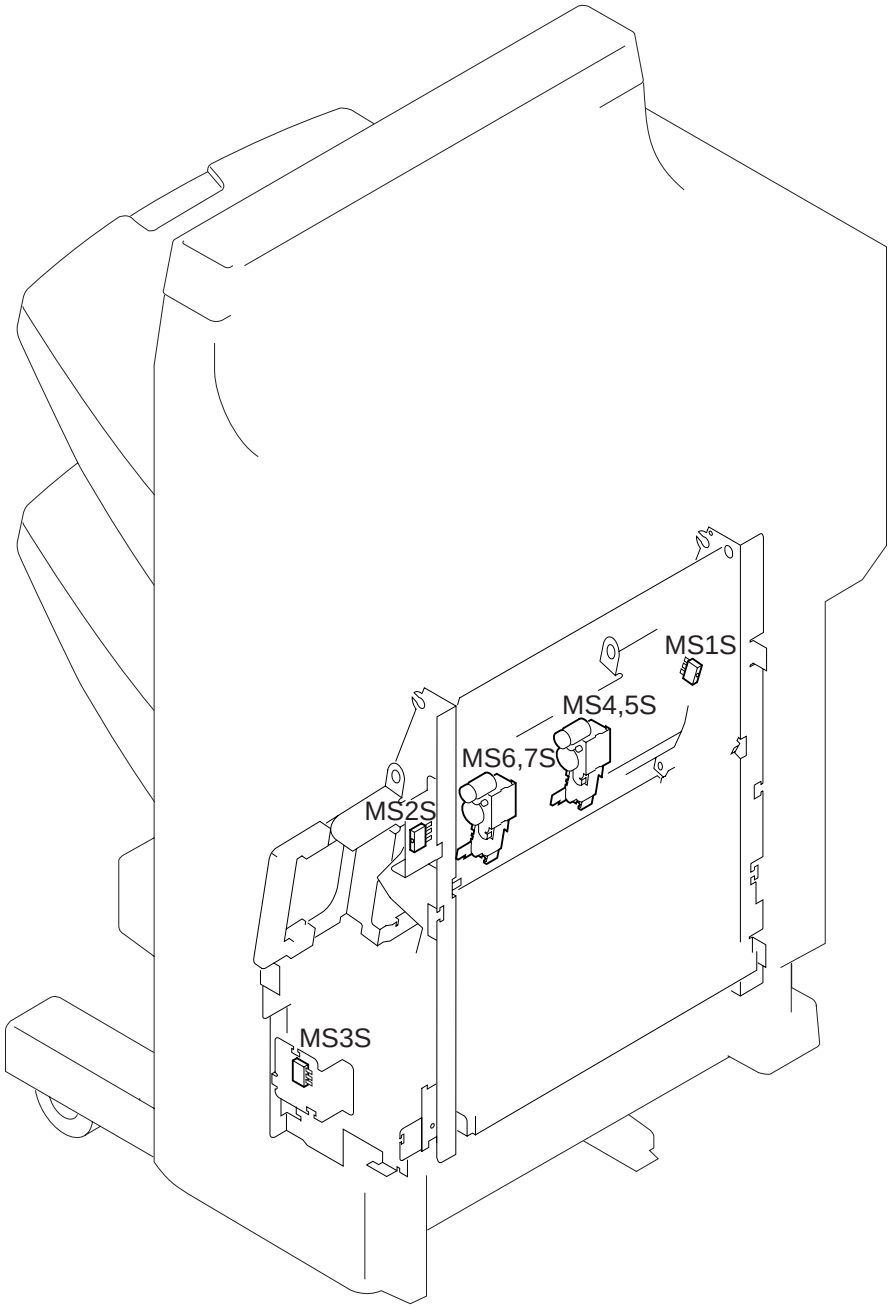


Figure 6-207

Name	Notation	Function
Microswitches	MS1S	Detects the state (open) of the inlet door
	MS2S	Detects the state (open) of the front door
	MS3S	Detects the state (open) of the delivery door
	MS4S	Detects the presence of staples (rear)
	MS5S	Detects stitching home position (rear)
	MS6S	Detects the presence of staples (front)
	MS7S	Detects stitching home position (front)

Table 6-207

3. Motors

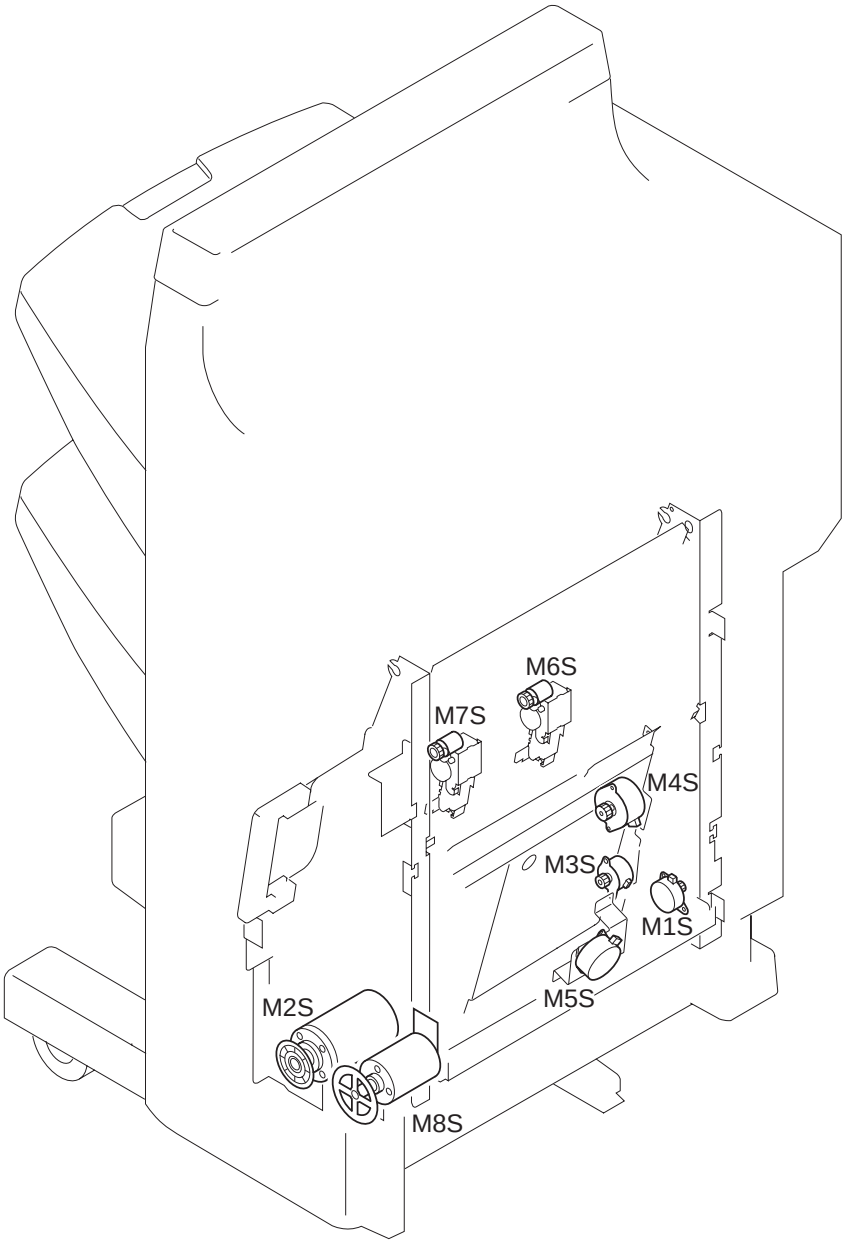


Figure 6-208

Name	Notation	Function
Motor	M1S	Feed motor
	M2S	Paper folding motor
	M3S	Guide motor
	M4S	Paper positioning plate motor
	M5S	Alignment motor
	M6S	Stitcher motor (rear)
	M7S	Stitcher motor (front)
	M8S	Paper pushing plate motor

Table 6-208

4. Solenoids

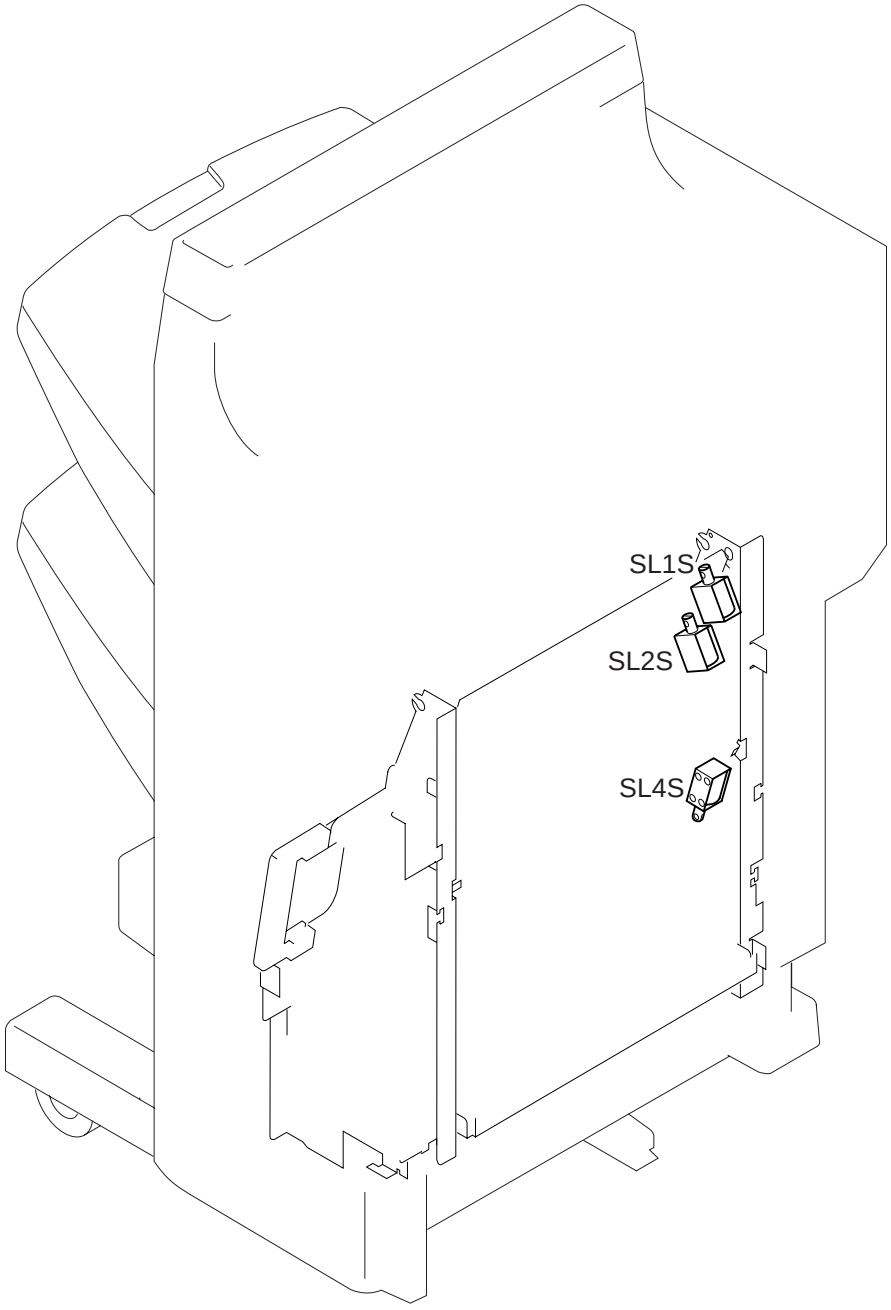


Figure 6-209

Name	Notation	Function
Solenoid	SL1S	No. 1 paper deflecting plate solenoid
	SL2S	No. 2 paper deflecting plate solenoid
	SL4S	Feed plate contact solenoid

Table 6-209

5. PCBs

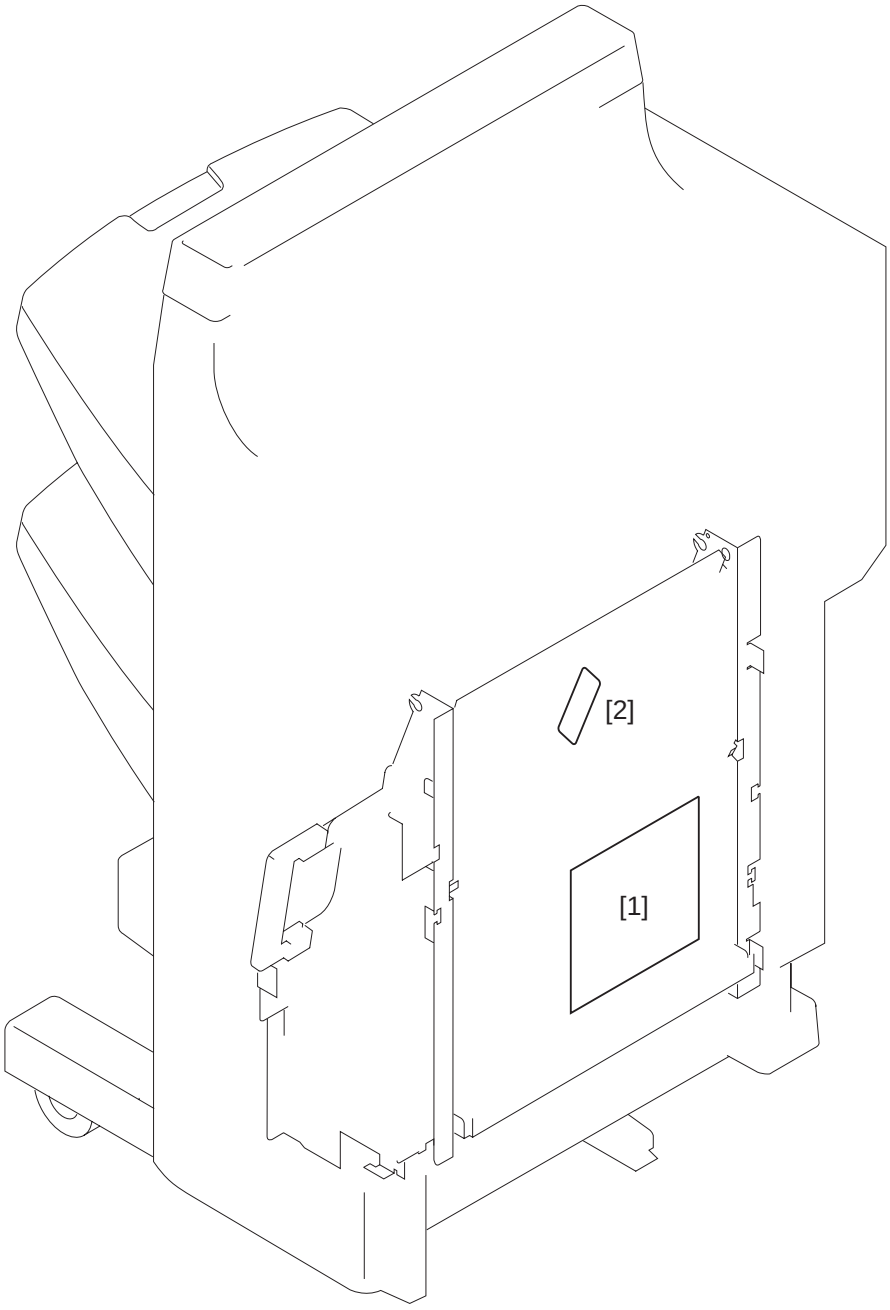


Figure 6-210

Reference	Name
[1]	Saddle stitcher controller PCB
[2]	Paper sensor PCB

Table 6-210

C. Light-Emitting Diodes (LED) and Check Pins by PCB

This section discusses the LED s and check pins used in the machine that are needed in the field.

Caution:

The VRs and check pins not discussed in this section are for factory use only. Making adjustments and checks using these will require special tools and instruments and adjustments must be to high accuracy. Do not touch them in the field.

1. Finisher Controller PCB

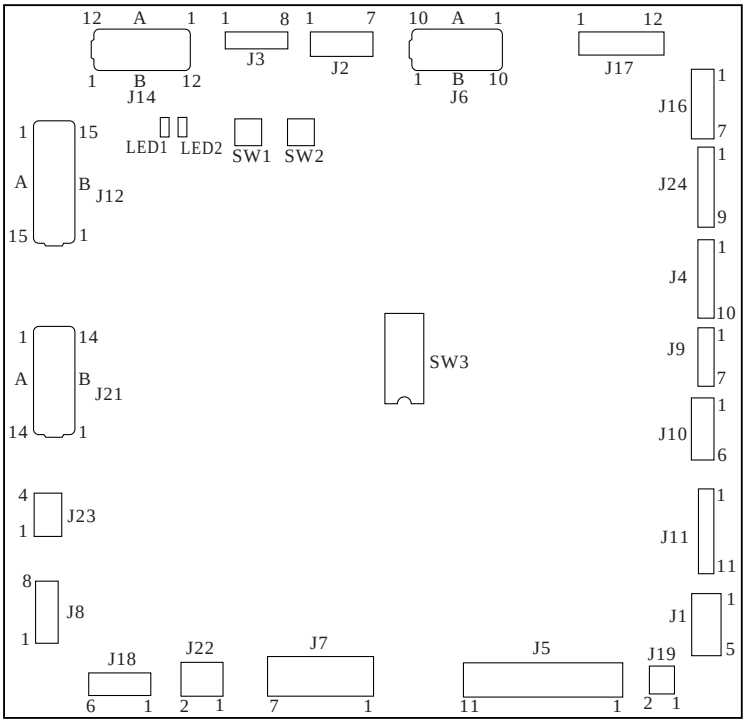


Figure 6-211

Switch	Function
SW1	Adjust the height sensor/alignment plate position/stapling position and move the trays up, etc.
SW2	Adjust the alignment plate position/staple position and move the trays down, etc.
SW3	Adjust the height sensor/alignment plate position and stapling position, etc.

Table 6-211

2. Saddle Stitcher Controller PCB

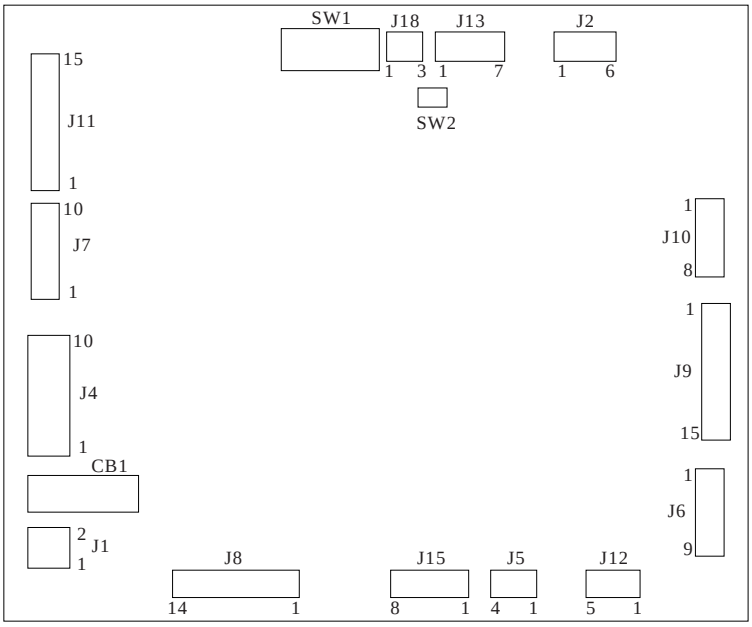


Figure 6-212

Switch	Function
DIPSW1 (bits 1-2)	Starts correction of discrepancy between stitching position and folding position.
DIPSW1 (bits 6-8)	Stores corrected settings for stapling position and folding position.
SW2	Starts correction of discrepancy between stitching position and folding position.

Table 6-212

III. TROUBLESHOOTING

A. Finisher Unit

1. Fault in communication with host machine

Cause	Step	Checks	Yes/No	Action
Finisher controller PCB, Host machine DC controller PCB	1	Turn the host machine OFF then ON. Is the problem corrected?	Yes	End.
Wiring	2	Is the wiring between the finisher controller PCB and the host machine controller PCB normal?	No	Correct it.
Finisher controller PCB, Host machine DC controller PCB	3	Replace the finisher controller PCB and the host machine DC controller PCB. Is the problem corrected?	Yes	End.
			No	Mulfunction of the host machine.

2. Fault in communication with saddle stitcher unit

Cause	Step	Checks	Yes/No	Action
Finisher controller PCB, Saddle stitcher controller PCB	1	Turn the host machine OFF then ON. Is the problem corrected?	Yes	End.
Wiring	2	Is the wiring between the finisher controller PCB and the saddle stitcher controller PCB normal?	No	Correct it.
Power supply	3	Measure the voltage between J19-1 (+) and J19-2 (–) on the finisher controller PCB. Is it 24 VDC?	No	Replace the finisher controller PCB.
Saddle stitcher controller PCB			Yes	Replace the saddle stitcher controller PCB.

3. Faulty height sensor (communication)

Cause	Step	Checks	Yes/No	Action
Finisher controller PCB	1	Turn the host machine OFF then ON. Is the problem corrected?	Yes	End.
Wiring	2	Is the wiring between the finisher controller PCB and the sensors normal?	No	Correct the wiring.
Power supply	3	Measure the voltage between J6-2 (+) and J6-4 (–) on the finisher controller PCB. Is it 5 VDC?	No	Replace the finisher controller PCB.
Height sensor (PS1)			Yes	Adjust the height sensor once again. If an error occurs again, replace the height sensor.

4. Faulty height sensor (disconnection)

Cause	Step	Checks	Yes/No	Action
Connector	1	Is J6 on the finisher controller PCB, J114 on the height sensor, or the relay connector J212 disconnected?	Yes	Connect the connector.
Power supply	2	Measure the voltage between J6-2 (+) and J6-4 (–) on the finisher controller PCB. Is it 5 VDC?	No	Replace the finisher controller PCB.
Height sensor (PS1)	3	Is the wiring between the finisher controller PCB and sensors normal?	Yes	Replace the height sensor.
Wiring			No	Correct the wiring.

5. Faulty height sensor (adjustment)

Cause	Step	Checks	Yes/No	Action
Adjustment	1	Try making adjustments using the DIP switch once again. Is the problem corrected?	Yes	End.
Wiring	2	Is the wiring between the finisher controller PCB and sensors normal?	No	Correct the wiring.
Power supply	3	Measure the voltage between J6-2 (+) and J6-4 (–) on the finisher controller PCB. Is it 5 VDC?	No	Replace the finisher controller PCB.
Height sensor (PS1)			Yes	Replace the height sensor.

6. Faulty back-up RAM

Cause	Step	Checks	Yes/No	Action
Finisher controller PCB, punch drive PCB	1	Turn the host machine OFF then ON. Is the problem corrected?	Yes	End.
	2	Replace the finisher controller PCB and punch driver PCB. Is the problem corrected?	Yes	End.

7. Faulty delivery motor

Cause	Step	Checks	Yes/No	Action
Deliver roller	1	Turn the delivery roller by hand. Does it turn smoothly?	No	Correct mechanical operation.
Delivery motor clock sensor (PI10)	2	Check the delivery motor clock sensor. Is the sensor normal?	No	Replace the sensor.
Finisher controller PCB	3	Does the voltage between J11-1 and J11-2 on the finisher controller PCB change to 24 VDC as soon as the delivery motor starts to rotate?	No	Replace the finisher controller PCB.
			Yes	Check the wiring from the motor to the controller PCB. If normal, replace the motor.

8. Faulty alignment motor

Cause	Step	Checks	Yes/No	Action
Alignment plate home position sensors (PI6, PI29)	1	Check the alignment plate home position sensor. Is it normal?	No	Replace the sensor.
Wiring	2	Is the wiring between the finisher controller PCB and the alignment plate motor normal?	No	Correct the wiring.
Alignment plate	3	Is there any mechanical obstacle in the path of the alignment plate?	Yes	Remove the mechanical obstacle.
Alignment motors (M3, M11)	4	Replace the alignment motor. Is the problem corrected?	Yes	End.
Finisher controller PCB			No	Replace the finisher controller PCB.

9. Faulty staple motor

Cause	Step	Checks	Yes/No	Action
Wiring	1	Is the wiring between the stapler and the finisher controller PCB normal?	No	Correct the wiring.
Stapler	2	Replace the stapler. Is the problem corrected?	Yes	End.
Finisher controller PCB			No	Replace the finisher controller PCB.

10. Faulty stapler shift motor

Cause	Step	Checks	Yes/No	Action
Stapler shift home position sensor (PI7)	1	Check the stapler shift home position sensor. Is the sensor normal?	No	Replace the sensor.
Wiring	2	Is the wiring between the finisher controller PCB and the stapler shift motor normal?	No	Correct the wiring.
Stapler shift base	3	Is there any mechanical obstacle in the path of the stapler shift base?	Yes	Remove the mechanical obstacles.
Stapler shift motor (M4)	4	Replace the stapler motor. Is the problem corrected?	Yes	End
Finisher controller PCB			No	Replace the finisher controller PCB.

11. Faulty swing motor (related to MS6)

Cause	Step	Checks	Yes/No	Action
Swinging mechanism	1	Turn the swing motor in reverse by hand. Does the swing guide move up and down?	No	Correct the swing mechanism.
Swing guide closed detection switch 2 (MS6)	2	Is the swing guide closed detection switch 2 normal?	No	Replace the microswitch.
Swing motor (M7)	3	Does the swing motor rotate in reverse at a specific timing?	No	Replace the motor.
Finisher controller PCB			Yes	Replace the finisher controller PCB.

12. Faulty swing motor (related to PI18)

Cause	Step	Checks	Yes/No	Action
Swinging mechanism	1	Turn the delivery motor in reverse by hand. Does the swing guide move up and down?	No	Correct the swinging mechanism.
Swing guide open sensor (PI18)	2	Is the swing guide open sensor normal?	No	Replace the sensor.
Swing motor (M7)	3	Does the swing motor rotate in reverse at a specific timing?	No	Replace the motor.
Finisher controller PCB			Yes	Replace the finisher controller PCB.

13. Faulty swing motor (related to MS3)

Cause	Step	Checks	Yes/No	Action
Safety zone switch (MS3)	1	Check the safety zone switch. Is the switch normal?	No	Replace the switch.
	2	Is the safety zone detection switch pressed correctly?	No	Correct mechanical operation.
Swing guide closed detection switch 2 (MS6)	3	Check the swing guide closed detection switch 2. Is the switch normal?	No	Replace the switch.
	4	Is the swing guide closed detection switch 2 pressed correctly?	No	Correct mechanical operation.
Finisher controller PCB			Yes	Replace the finisher controller PCB.

14. Faulty swing motor (related to PI20)

Cause	Step	Checks	Yes/No	Action
Swing motor clock sensor (PI20)	1	Check the swing motor clock sensor. Is the sensor normal?	No	Replace the sensor.
Finisher controller PCB	2	Does the voltage of the swing motor between J9-6 and -7 on the finisher controller PCB reach 24 V at a specific rotation timing?	No	Replace the finisher controller PCB.
			Yes	Check the wiring from the motor to the finisher controller PCB. If normal, replace the motor.

15. Faulty tray 1 lift motor (related to PI8)

Cause	Step	Checks	Yes/No	Action
Tray 1 home position sensor (PI8)	1	Check the tray 1 home position sensor. Is it normal?	No	Replace the sensor.
Tray 1 lift mechanism	2	Check the tray 1 lift mechanism. Is the mechanism normal?	No	Correct the mechanism.
Finisher controller PCB	3	Is the tray 1 lift motor supplied with 24 VDC by the finisher controller PCB as soon as the tray is driven?	No	Replace the finisher controller PCB.
Wiring	4	Check the wiring from the finisher controller PCB to the tray 1 lift motor. Is the wiring normal?	No	Correct the wiring.
Tray 1 lift motor (M5)			Yes	Replace the tray 1 lift motor.

16. Faulty tray 2 lift motor (related to PI25)

Cause	Step	Checks	Yes/No	Action
Tray 2 home position sensor (PI25)	1	Check the tray 2 home position sensor. Is it normal?	No	Replace the sensor.
Tray 2 lift mechanism	2	Check the tray 2 lift mechanism. Is the mechanism normal?	No	Correct the mechanism.
Finisher controller PCB	3	Is the tray 2 lift motor supplied with 24 VDC by the finisher controller PCB as soon as the tray is driven?	No	Replace the finisher controller PCB.
Wiring	4	Check the wiring from the finisher controller PCB to the tray 2 lift motor. Is the wiring normal?	No	Correct the wiring.
Tray 2 lift motor (M10)			Yes	Replace the tray 2 lift motor.

17. Faulty tray 1 motor (related to PI9/PI19)

Cause	Step	Checks	Yes/No	Action
___	1	Does the tray 1 move up/down?	No	Go to step 2.
			Yes	Go to step 4.
	2	Is the motor supplied with power by the finisher controller PCB as soon as the tray 1 moves up/down?	Yes	Go to step 3.
Finisher controller PCB			No	Replace the finisher controller PCB.
Tray 1 lift mechanism	3	Is there a fault in the tray 1 lift mechanism?	Yes	Correct the tray 1 lift mechanism.
Tray 1 lift motor (M5)			No	Replace the tray 1 lift motor.
Tray 1 lift motor clock sensor 1/2 (PI9/19)	4	Is the tray 1 lift motor clock sensor 1/2 normal?	No	Replace the sensor PCB.
Finisher controller PCB			Yes	Replace the finisher controller PCB.

18. Faulty tray 2 motor (related to PI23/24)

Cause	Step	Checks	Yes/No	Action
___	1	Does the tray 2 move up/down?	No	Go to step 2.
			Yes	Go to step 4.
	2	Is the motor supplied with power by the finisher controller PCB as soon as the tray 2 moves up/down?	Yes	Go to step 3.
Finisher controller PCB			No	Replace the finisher controller PCB.
Tray 2 lift mechanism	3	Is there a fault in the tray 2 lift mechanism?	Yes	Correct the tray 2 lift mechanism.
Tray 2 lift motor (M10)			No	Replace the tray 2 lift motor.
Tray 2 lift motor clock sensor 1/2 (PI23/24)	4	Is the tray 2 lift motor clock sensor 1/2 normal?	No	Replace the sensor PCB.
Finisher controller PCB			Yes	Replace the finisher controller PCB.

19. Faulty second feed motor (related to PI5)

Cause	Step	Checks	Yes/No	Action
Second feed motor (M8)	1	Does the second feed motor in reverse at a specific timing?	No	Replace the second feed motor or the finisher controller PCB.
Shutter mechanism	2	Are the shutter and the shutter upper/lower bar engaged correctly?	No	Engage them correctly.
	3	Turn the feed roller 2 in reverse by hand. Does the shutter upper/lower bar move up/down?	No	Correct mechanism from the shutter upper/lower bar to the gear of the feed roller 2.
Shutter open detection sensor (PI5)	4	Is the shutter open detection sensor normal?	No	Replace the sensor.
Finisher controller PCB			Yes	Replace the finisher controller PCB.

20. Faulty second feed motor (related to MS4)

Cause	Step	Checks	Yes/No	Action
Second feed motor (M8)	1	Does the second feed motor rotate in reverse at a specific timing?	No	Replace the second feed motor or the finisher controller PCB.
Shutter mechanism	2	Are the shutter and the shutter upper/lower bar engaged correctly?	No	Engage them correctly.
	3	Turn the feed roller 2 in reverse by hand. Does the shutter upper/lower bar move up/down?	No	Correct the mechanism from the shutter upper/lower bar to the gear of the feed roller 2.
Shutter closed detection switch (MS4)	4	Is the shutter closed detection switch normal?	No	Replace the switch.
Finisher controller PCB			Yes	Replace the finisher controller PCB.

21. Faulty second feed motor (related to MS3)

Cause	Step	Checks	Yes/No	Action
Safety zone switch (MS3)	1	Check the safety zone switch. Is the switch normal?	No	Replace the switch.
	2	Is the safety zone detection switch passed correctly?	No	Correct mechanical operation.
Shutter closed detection switch (MS4)	3	Check the shutter closed detection switch. Is the switch normal?	No	Replace the switch.
	4	Is the shutter closed detection switch pressed correctly?	No	Correct the mechanism.
Finisher controller PCB			Yes	Replace the finisher controller PCB.

B. Saddle Stitcher Unit

1. Faulty paper positioning plate

Cause	Step	Checks	Yes/No	Action
Paper positioning plate home position sensor (PI7S)	1	Check the paper positioning plate home position sensor. Is the sensor normal?	No	Replace the sensor.
Saddle stitcher controller PCB	2	Do the paper positioning plates operate at a specific timing?	Yes	Replace the saddle stitcher controller PCB.
Paper positioning plate motor (M4S)			No	Check the positioning plate drive mechanism. If a fault is found, correct it. Otherwise, go to step 3.
	3	Replace the paper positioning plate motor. Is the problem corrected?	Yes	End.
Saddle stitcher controller PCB			No	Replace the saddle stitcher controller PCB.

2. Faulty paper folding motor

Cause	Step	Checks	Yes/No	Action
Paper folding motor clock sensor (PI4S)	1	Check the paper folding motor clock sensor. Is the sensor normal?	No	Replace the sensor.
Paper folding home position sensor (PI21S)	2	Check the paper folding home position sensor. Is the sensor normal?	No	Replace the sensor.
Saddle stitcher controller PCB	3	Does the paper folding motor operate at a specific timing?	Yes	Replace the saddle stitcher controller PCB.
Paper folding motor (M2S)			No	Check the paper folding roller drive mechanism. If a fault is found, correct it. Otherwise, go to step 4.
	4	Replace the paper folding motor. Is the problem corrected?	Yes	End.
Saddle stitcher controller PCB			No	Replace the saddle stitcher controller PCB.

3. Faulty guide motor

Cause	Step	Checks	Yes/No	Action
Guide home position sensor (PI13S)	1	Check the guide home position sensor. Is the sensor normal?	No	Replace the sensor.
Saddle stitcher controller PCB	2	Does the guide motor operate at a specific timing?	Yes	Replace the saddle stitcher controller PCB.
Guide motor (M3S)			No	Check the guide plate drive mechanism. If a fault is found, correct it. Otherwise, go to step 3.
	3	Replace the guide motor. Is the problem corrected?	Yes	End.
Saddle stitcher controller PCB			No	Replace the saddle stitcher controller PCB.

4. Faulty alignment motor

Cause	Step	Checks	Yes/No	Action
Alignment plate home position sensor (PI5S)	1	Check the alignment plate home position sensor. Is the sensor normal?	No	Replace the sensor.
Saddle stitcher controller PCB	2	Does the alignment motor operate at a specific timing?	Yes	Replace the saddle stitcher controller PCB.
Alignment motor (M5S)			No	Check the alignment plate drive mechanism. If a fault is found, correct it. Otherwise, go to step 3.
	3	Replace the alignment motor. Is the problem corrected?	Yes	End.
Saddle stitcher controller PCB			No	Replace the saddle stitcher controller PCB.

5. Faulty stitcher

Cause	Step	Checks	Yes/No	Action
Stitcher (installation)	1	Are the front and rear stitchers and bases installed correctly?	No	Install them correctly.
Stitching home position switch (MS7S/MS5S)	2	Is the stitching home position switch of the front and the rear stitchers normal?	No	Replace the front or rear stitcher.
Saddle stitcher controller PCB	3	Do the front and the rear stitchers operate at a specific timing?	Yes	Check the wiring between the stitcher and the saddle stitcher controller PCB. If normal, replace the controller PCB.
Stitcher motor (M7S/ M6S)			No	Replace the front or the rear stitcher.

6. Faulty paper pushing plate motor (related to PI14S)

Cause	Step	Checks	Yes/No	Action
Paper pushing plate home position sensor (PI14S)	1	Check the paper pushing plate home position sensor. Is the sensor normal?	No	Replace the sensor.
Paper pushing top position sensor (PI15S)	2	Check the paper pushing plate top position sensor. Is the sensor normal?	No	Replace the sensor.
Saddle stitcher controller PCB	3	Does the paper pushing plate motor operate at a specific timing?	Yes	Replace the saddle stitcher controller PCB
Paper pushing plate motor (M8S)			No	Check the paper pushing plate drive mechanisms. If a fault is found, correct it. Otherwise, go to step 3.
	4	Replace the paper pushing plate motor. Is the problem corrected?	Yes	End.
Saddle stitcher controller PCB			No	Replace the saddle stitcher controller PCB.

7. Faulty paper pushing plate motor (related to PI15S)

Cause	Step	Checks	Yes/No	Action
Paper pushing top position sensor (PI15S)	1	Check the paper pushing plate top position sensor. Is the sensor normal?	No	Replace the sensor.
Saddle stitcher controller PCB	2	Does the paper pushing plate motor operate at a specific timing?	Yes	Replace the saddle stitcher controller PCB.
Paper pushing plate motor (M8S)			No	Check the paper pushing plate drive mechanism. If a fault is found, correct it. Otherwise, go to step 3.
	3	Replace the paper pushing plate motor. Is the problem corrected?	Yes	End.
Saddle stitcher controller PCB			No	Replace the saddle stitcher controller PCB.

8. Faulty paper pushing plate motor (related to PI1S)

Cause	Step	Checks	Yes/No	Action
Paper pushing plate motor clock sensor (PI1S)	1	Check the paper pushing plate motor clock sensor. Is the sensor normal?	No	Replace the sensor.
Saddle stitcher controller PCB	2	Does the paper pushing plate motor operate at a specific timing?	Yes	Replace the saddle stitcher controller PCB.
Paper pushing plate motor (M8S)			No	Check the paper pushing plate drive mechanism. If a fault is found, correct it. Otherwise, go to step 3.
	3	Replace the paper pushing plate motor. Is the problem corrected?	Yes	End.
Saddle stitcher controller PCB			No	Replace the saddle stitcher controller PCB.

9. Disconnected sensor connector (related to PI13S)

Cause	Step	Checks	Yes/No	Action
Guide home position sensor (PI13S; disconnected)	1	Are the connectors of the guide home position sensor and the saddle stitcher controller PCB connected correctly?	No	Connect the connectors.
Wiring	2	Is the wiring between the sensor and the saddle stitcher broken?	Yes	Correct the wiring.
Power supply	3	Is 5 VDC present at J9-7 on the saddle stitcher controller PCB?	No	Replace the saddle stitcher controller PCB.
Ground	4	Is J9-8 on the saddle stitcher controller PCB grounded correctly?	No	

10. Disconnected sensor connector (related to PI14S)

Cause	Step	Checks	Yes/No	Action
Paper pushing plate home position sensor (PI14S; disconnected)	1	Are the connectors of the paper pushing plate home position sensor and the saddle stitcher controller PCB connected correctly?	No	Connect the connectors.
Wiring	2	Is the wiring between the sensor and the saddle stitcher broken?	Yes	Correct the wiring.
Power supply	3	Is 5 VDC present at J9-10 on the saddle stitcher controller PCB?	No	Replace the saddle stitcher controller PCB.
Ground	4	Is J9-11 on the saddle stitcher controller PCB grounded correctly?	No	

11. Disconnected sensor connector (PI15S)

Cause	Step	Checks	Yes/No	Action
Paper pushing plate home position top position sensor (PI15S; disconnected)	1	Are the connectors of the paper pushing plate top position sensor and the saddle stitcher controller PCB connected correctly?	No	Connect the connectors.
Wiring	2	Is the wiring between the sensor and the saddle stitcher broken?	Yes	Correct the wiring.
Power supply	3	Is 5 VDC present at J9-13 on the saddle stitcher controller PCB?	No	Replace the saddle stitcher controller PCB.
Ground	4	Is J9-14 on the saddle stitcher controller PCB grounded correctly?	No	

12. Faulty microswitch

Cause	Step	Checks	Yes/No	Action
Switch actuator	1	Check the switch actuator of the inlet door. Do the switch and the sensor operate correctly?	No	Correct the mechanism.
Inlet door switch (MS1S)	2	Check the inlet door switch. Is the switch normal?	No	Replace the switch.
Inlet cover sensor (PI9S)	3	Measure the voltage at J10-8 on the saddle stitcher controller PCB with the inlet cover open. Is it 5 V?	Yes	The sensor is faulty. Replace the sensor.
Power supply, wiring	4	Measure the voltage between J19-1 (+) and J19-2 (–) on the finisher controller PCB. Is it 24 V?	No	Replace the finisher controller PCB.
			Yes	Check the wiring between J19 on the finisher controller PCB and J1 on the saddle stitcher controller PCB. If a fault is found, correct it. Otherwise, replace the saddle stitcher controller PCB.

13. Faulty microswitch (related to MS2S)

Cause	Step	Checks	Yes/No	Action
Switch actuator	1	Check the switch actuator of the front door. Do the switch and the sensor operate correctly?	No	Correct the mechanism.
Front door switch (MS2S)	2	Check the front door switch. Is the switch normal?	No	Replace the switch.
Front door open/closed sensor (PI12S)	3	Measure the voltage at J11-12 on the saddle stitcher controller PCB with the front door open. Is it 5 V?	Yes	The sensor is faulty. Replace the sensor.
			No	Replace the saddle stitcher controller PCB.

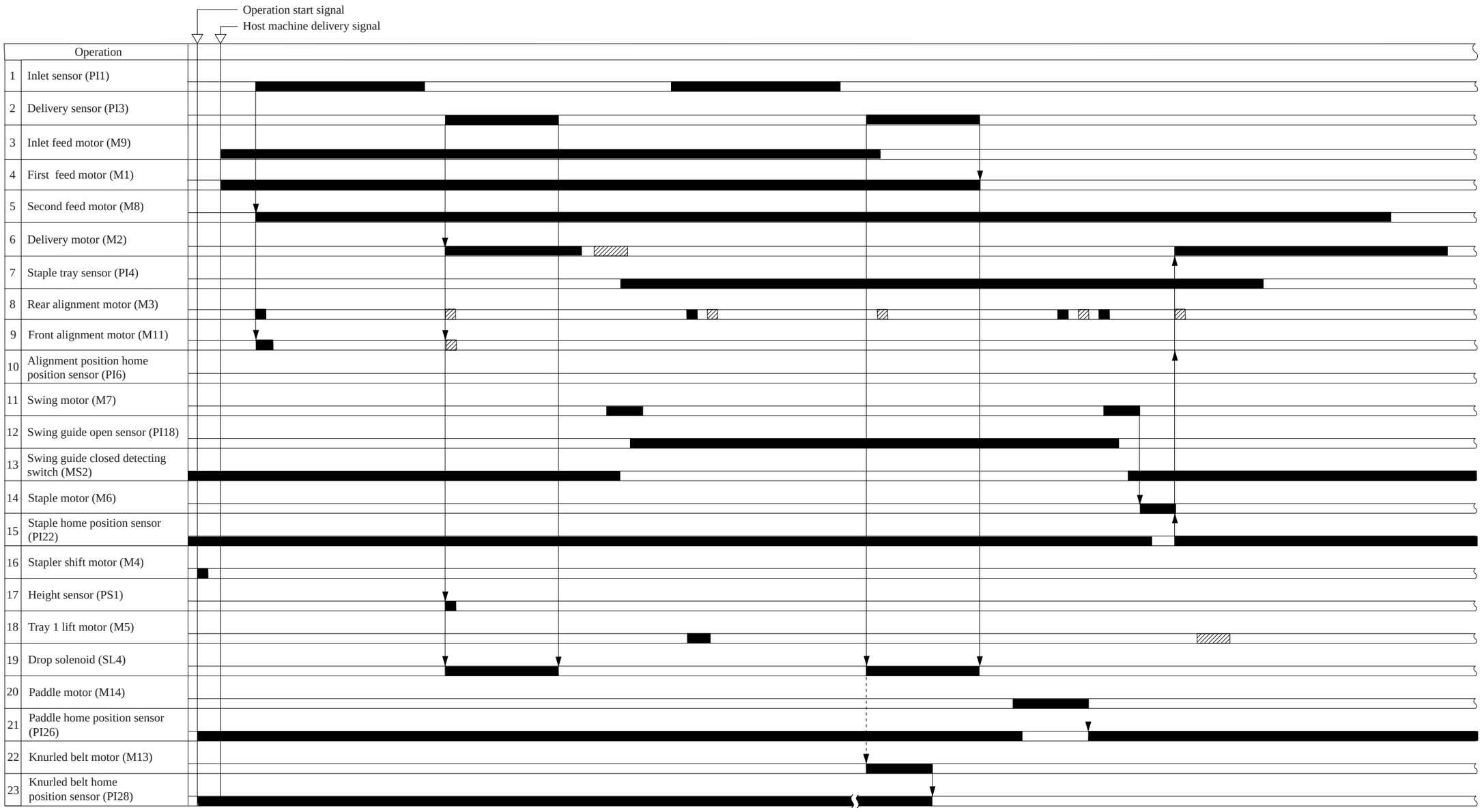
14. Faulty microswitch (related to MS3S)

Cause	Step	Checks	Yes/No	Action
Switch actuator	1	Check the delivery door switch actuator. Do the switch and the sensor operate correctly?	No	Correct the mechanism.
Delivery switch (MS3S)	2	Check the delivery door switch. Is the switch normal?	No	Replace the switch.
Delivery cover sensor (PI3S)	3	Measure the voltage at J11-9 on the saddle stitcher controller PCB with the delivery door open. Is it 5 V?	Yes	The sensor is faulty. Replace the sensor.
			No	Replace the saddle stitcher controller PCB.

APPENDIX

A. FINISHER UNIT GENERAL TIMING CHART

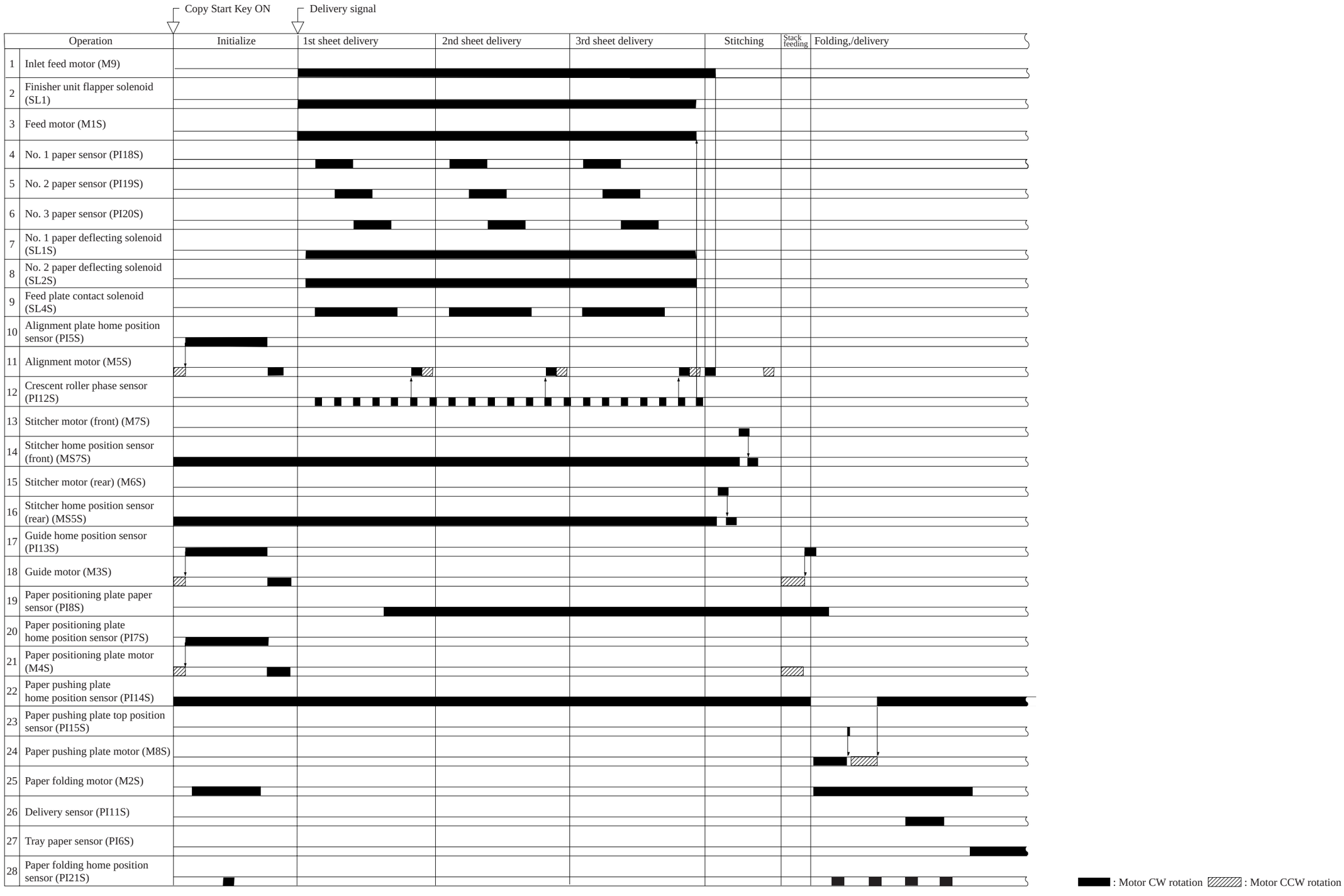
A4, 2 Sheets, 1-Point Stapling (rear), 1 Set



Note) When the 11th, 21st, 31st or 41st sheet of paper is fed on the stapling tray, the finisher controller PCB turns on the knurled belt motor (M13).

B. SADDLE STITCHER UNIT GENERAL TIMING CHART

A4R, 3 Sheets, Stitching, 1 Set



C. SIGNAL AND ABBREVIATIONS

The following presents the abbreviations of signals used in this manual and in drawings, and the meanings of each signal.

Reference:

Signals enclosed by brackets [ ] are electrical signals. However, the state “1” or “0” of these analog signals cannot be indicated. Otherwise, the state of digital signals “1” or “0” can be indicated.

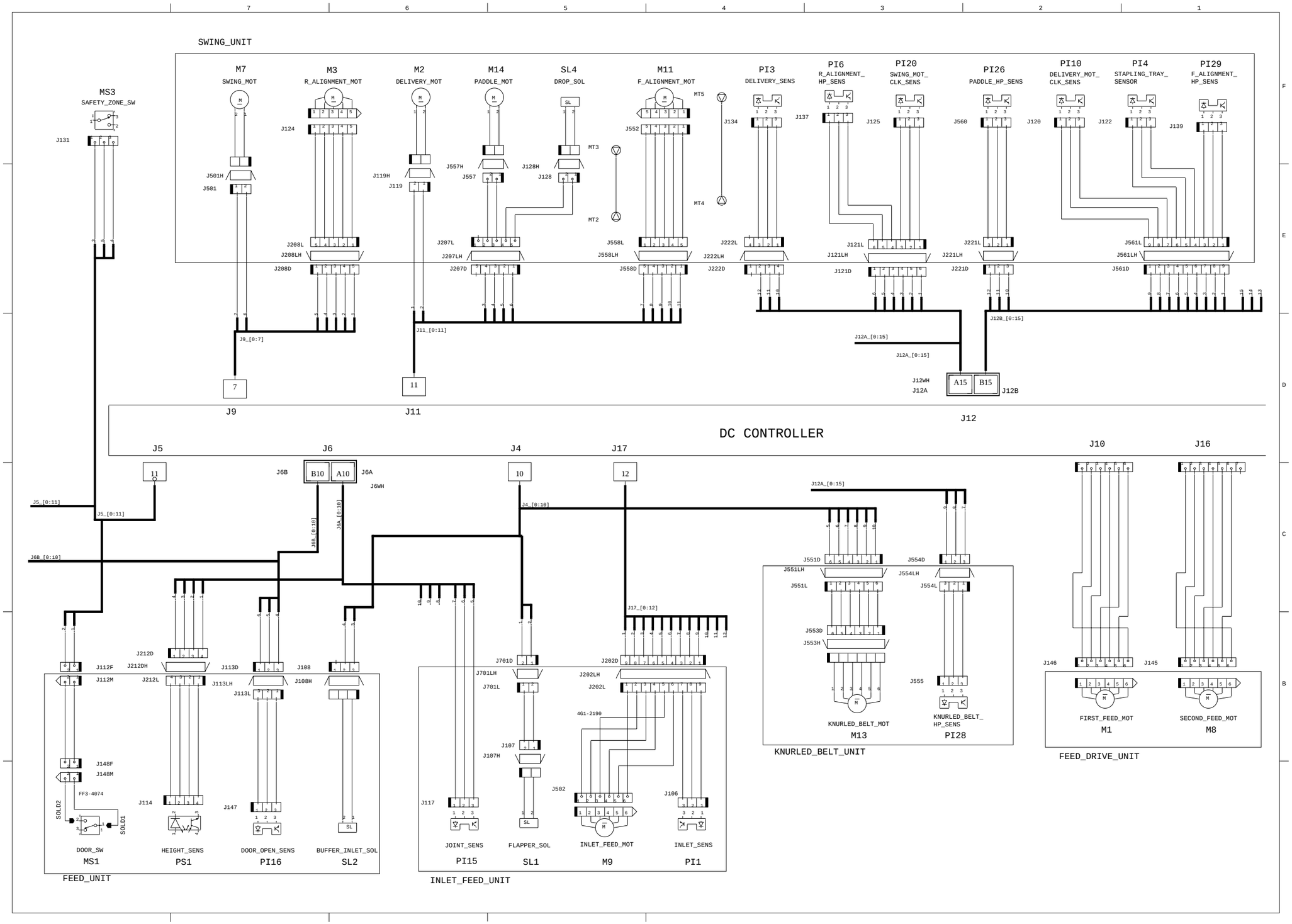
Finisher unit

BUFENTR	BUFFER PATH INLET PAPER DETECT Signal
BUFPASS	BUFFER PATH PAPER DETECT Signal
CRTSIZE	CARTRIDGE TYPE DETECT Signal
DELCLK	DELIVERY MOTOR CLOCK DETECT Signal
DROPN	DOOR OPEN DETECT Signal
DRSW	DOOR SWITCH Signal
ENTSL	BUFFER INLET SOLENOID DRIVE Signal
EXITSL	BUFFER OUTLET SOLENOID DRIVE Signal
FLPSL	FLAPPER SOLENOID DRIVE Signal
FSTTRAY	TRAY 1 PAPER DETECT Signal
HOOKEMP	HOOK EMPTY DETECT Signal
HOOKTOP	HOOK STOP POSITION DETECT Signal
JOGRHP	REAR ALIGNMENT PLATE HP DETECT Signal
JOINT	JOINT DETECT Signal
PDEL	DELIVERY DETECT Signal
DRPSL	DROP SOLENOID DRIVE Signal
PENT	INLET PAPER DETECT Signal
SFTCLK11	TRAY LIFT MOTOR CLOCK DETECT Signal 11
SFTCLK12	TRAY LIFT MOTOR CLOCK DETECT Signal 12
SFTCLK21	TRAY LIFT MOTOR CLOCK DETECT Signal 21
SFTCLK22	TRAY LIFT MOTOR CLOCK DETECT Signal 22
SHUTCLD	SHUTTER CLOSED DETECT SWITCH Signal
SNDTRAY	TRAY 2 PAPER DETECT Signal
STOPN	SHUTTER OPEN DETECT Signal
STPCON	STAPLER CONNECT DETECT Signal
STPDRHP	STAPLER DRIVE HP DETECT Signal
STPHP	STAPLER SHIFT HP DETECT Signal
STPTY	STAPLE TRAY PAPER DETECT Signal
SWGCLK	SWING MOTOR CLOCK DETECT Signal
SWGGCLD	SWING GUIDE CLOSED DETECT SWITCH Signal
SWGOPN	SWING GUIDE OPEN DETECT Signal
TRAYSAF	TRAY SAFETY ZONE SWITCH Signal
TRYHP1, TRYHP2	TRAY HOME POSITION DETECT Signal
TRYLMT	TRAY UPPER LIMIT DETECTING SWITCH Signal
PDLHP	PADDLE HOME POSITION DETECT Signal
RBHP	KNURLED BELT HOME POSITION DETECT Signal
JOGFHP	FRONT ALIGNMENT PLATE HP DETECT Signal

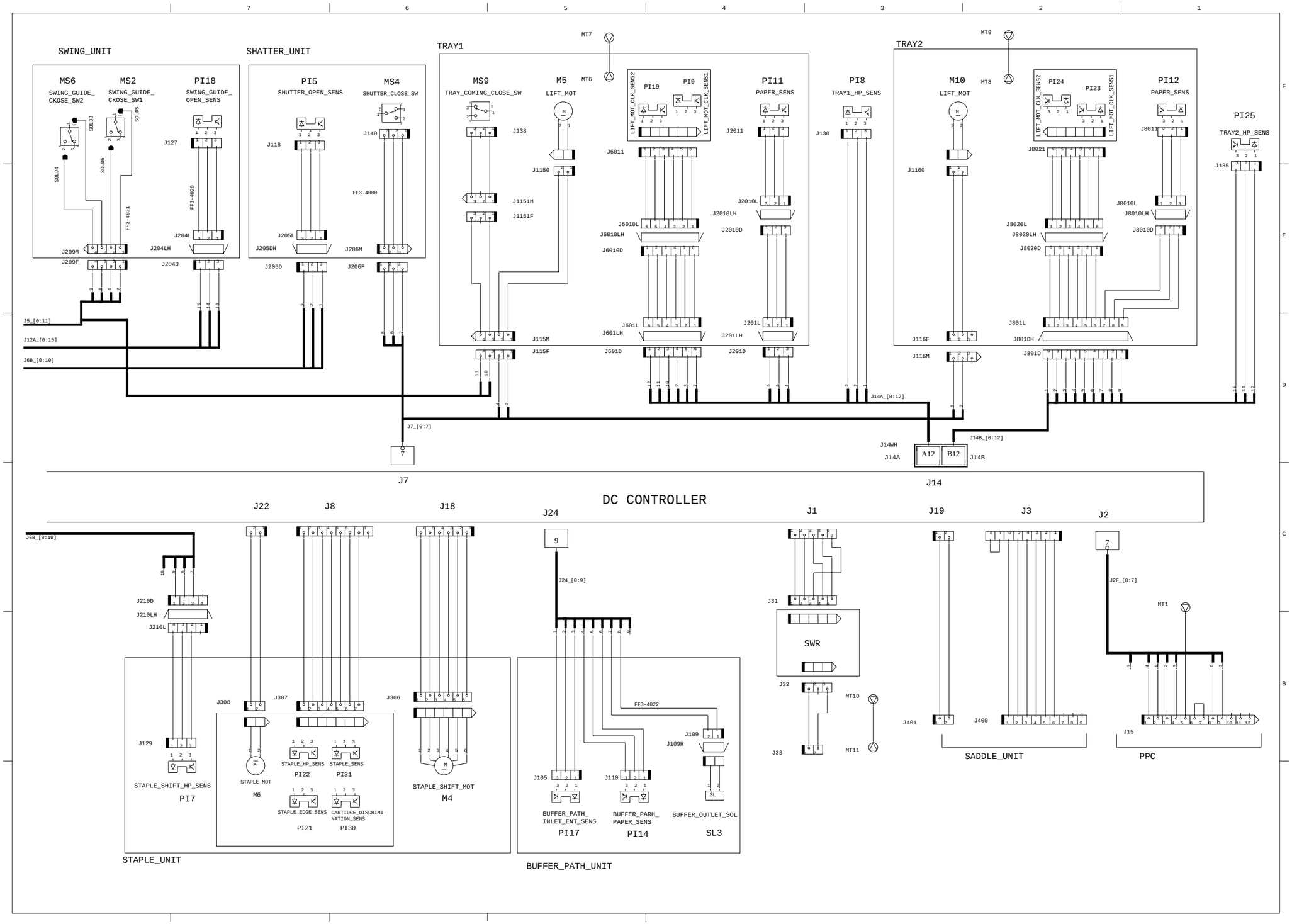
Saddle stitcher unit

1STPA	No.1 PAPER SENSOR DETECT Signal
2NDPA	No.2 PAPER SENSOR DETECT Signal
3RDDPA	No.3 PAPER SENSOR DETECT Signal
DELV	DELIVERY DETECT Signal
DELVMS	DELIVERY DOOR OPEN DETECT SWITCH Signal
EJCVR	DELIVERY DOOR OPEN DETECT Signal
FDR	FRONT DOOR OPEN DETECT Signal
FDRLHP	CRESCENT ROLLER PHASE DETECT Signal
FDROPN	FRONT DOOR OPEN DETECT SWITCH Signal
FLDCLK	FOLD MOTOR CLOCK Signal
FLPSL1	FLAPPER DRIVE Signal 1
FSPSL2	FLAPPER DRIVE Signal 2
GIDHP	PAPER GUIDE HOME POSITION DETECT Signal
HKEMP1	HOOK EMPTY DETECT Signal 1
HKEMP2	HOOK EMPTY DETECT Signal 2
INLTCVR	INLET COVER OPEN DETECT Signal
INLTCVRMS	INLET COVER OPEN SWITCH Signal
JOGHP	ALIGNMENT HP DETECT Signal
LUNGECLK	LUNGE MOTOR CLOCK Signal
LUNGEHP	LUNGE HOME POSITION DETECT Signal
LUNGETOP	LUNGE TOP POSITION DETECT Signal
PAFLDHP	PAPER FOLD HOME POSITION DETECT Signal
PAPPOS	PAPER POSITION PLATE HP DETECT Signal
PPOSPAR	PAPER POSITIONING GUIDE PAPER DETECT Signal
RLNIPSL	FEED PLATE CONTACT SOLENOID DRIVE Signal
STCHHP1	STITCHING HP DETECT Signal 1
STCHHP2	STITCHING HP DETECT Signal 2
STPLHP	STITCHER IN DETECT Signal
TRYPAR	TRAY PAPER DETECT Signal
VPJM	VERTICAL PATH PAPER DETECT Signal

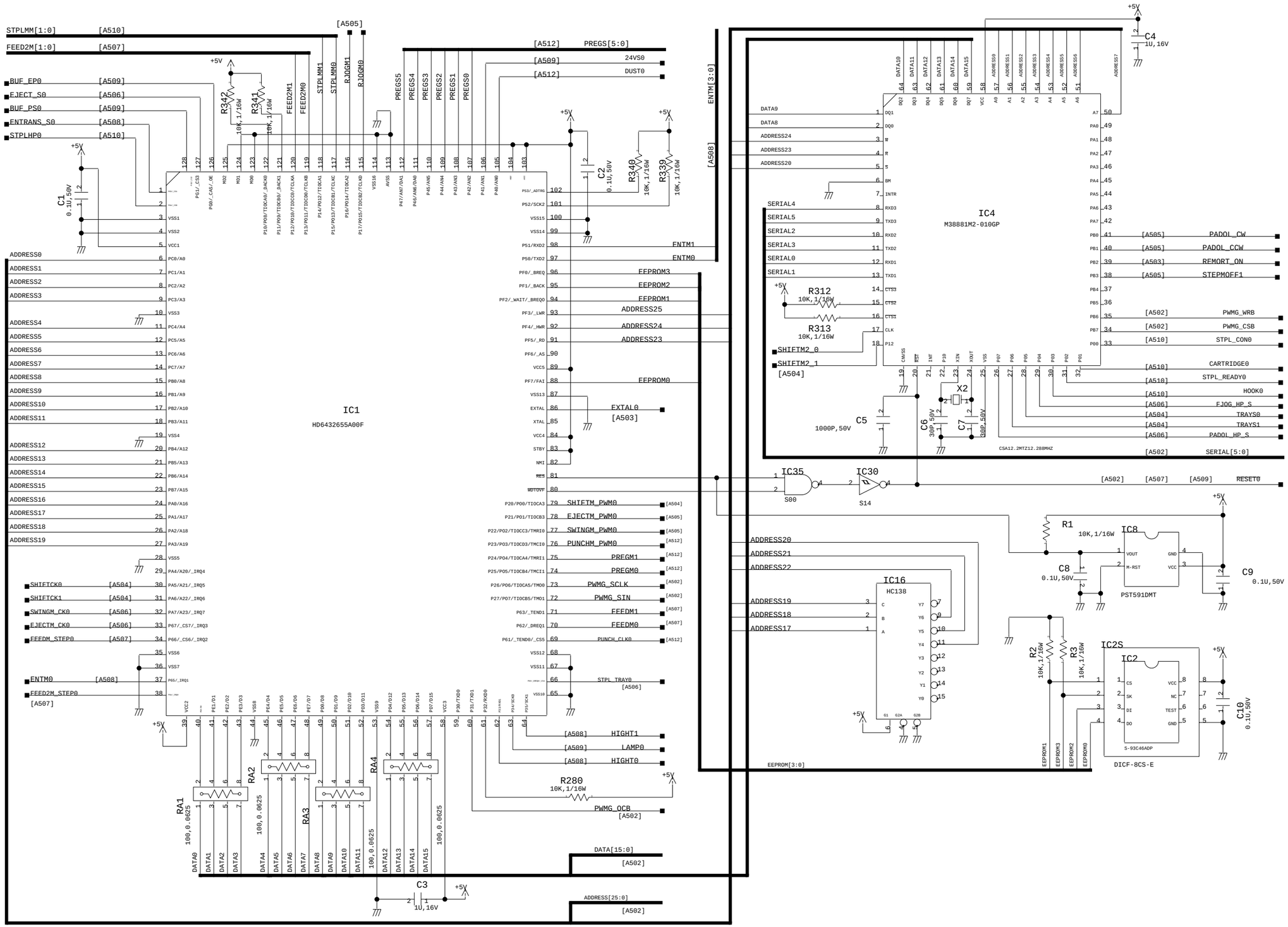
D. FINISHER UNIT CIRCUIT DIAGRAM (1/2)

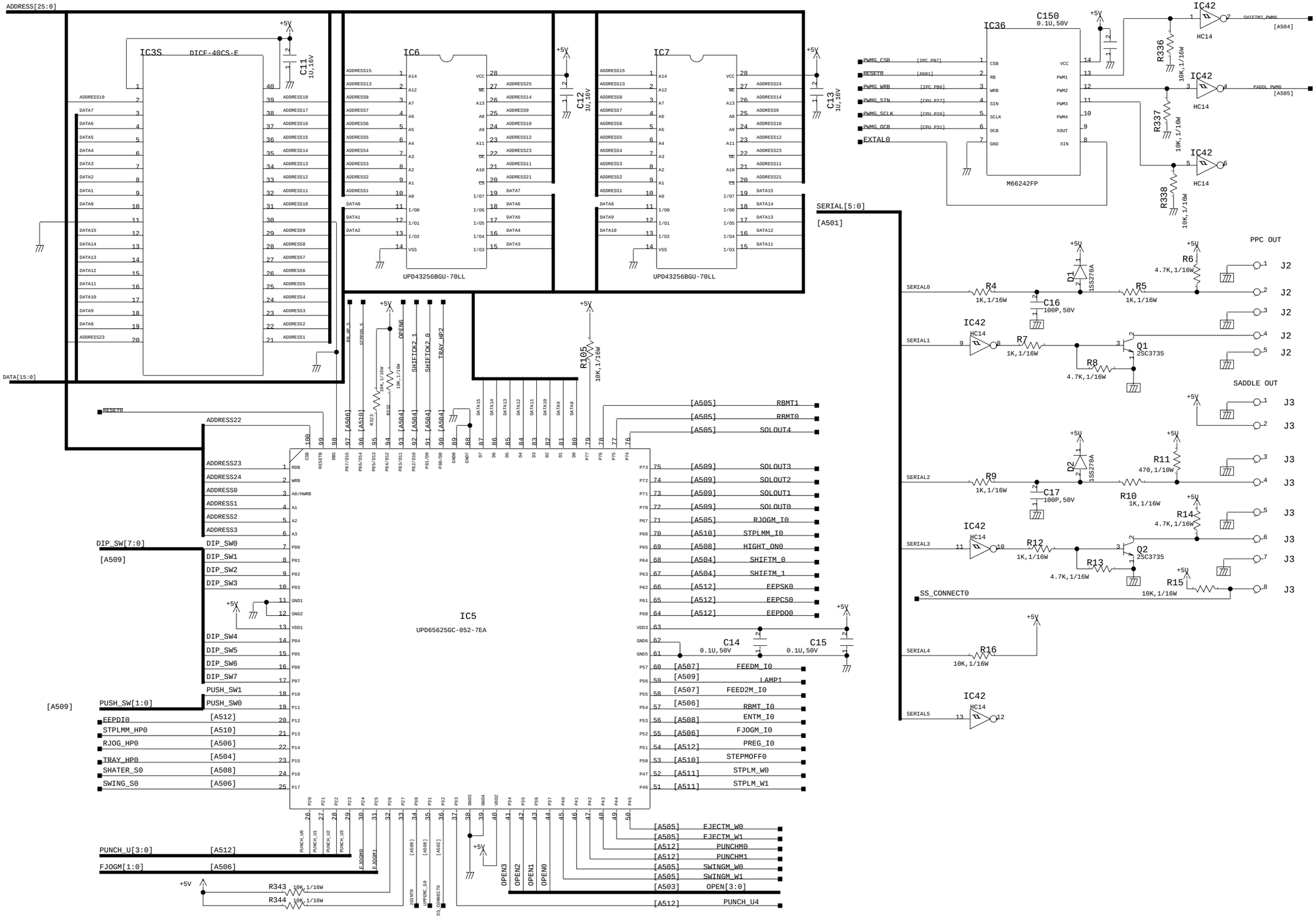


D. FINISHER UNIT CIRCUIT DIAGRAM (2/2)

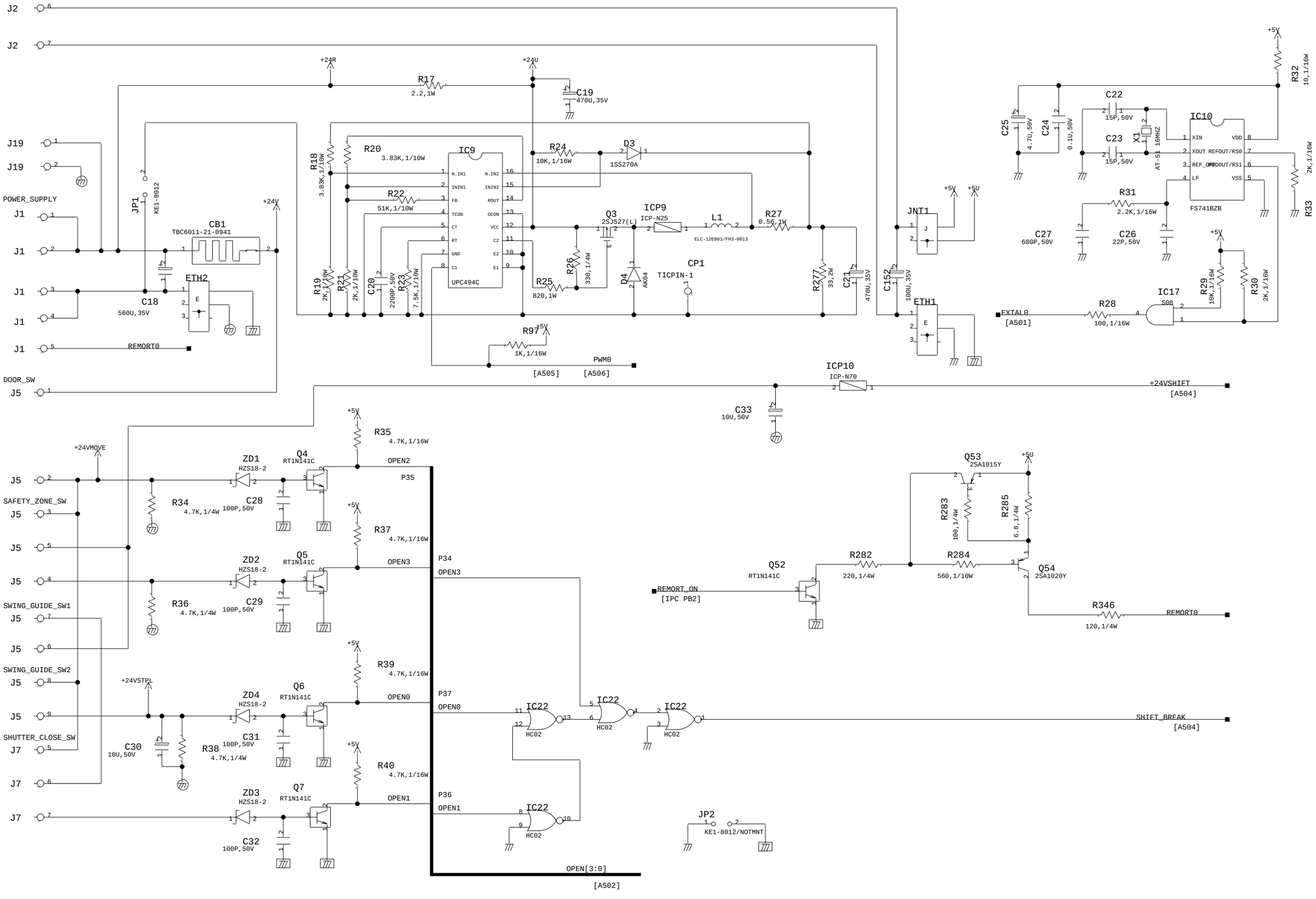


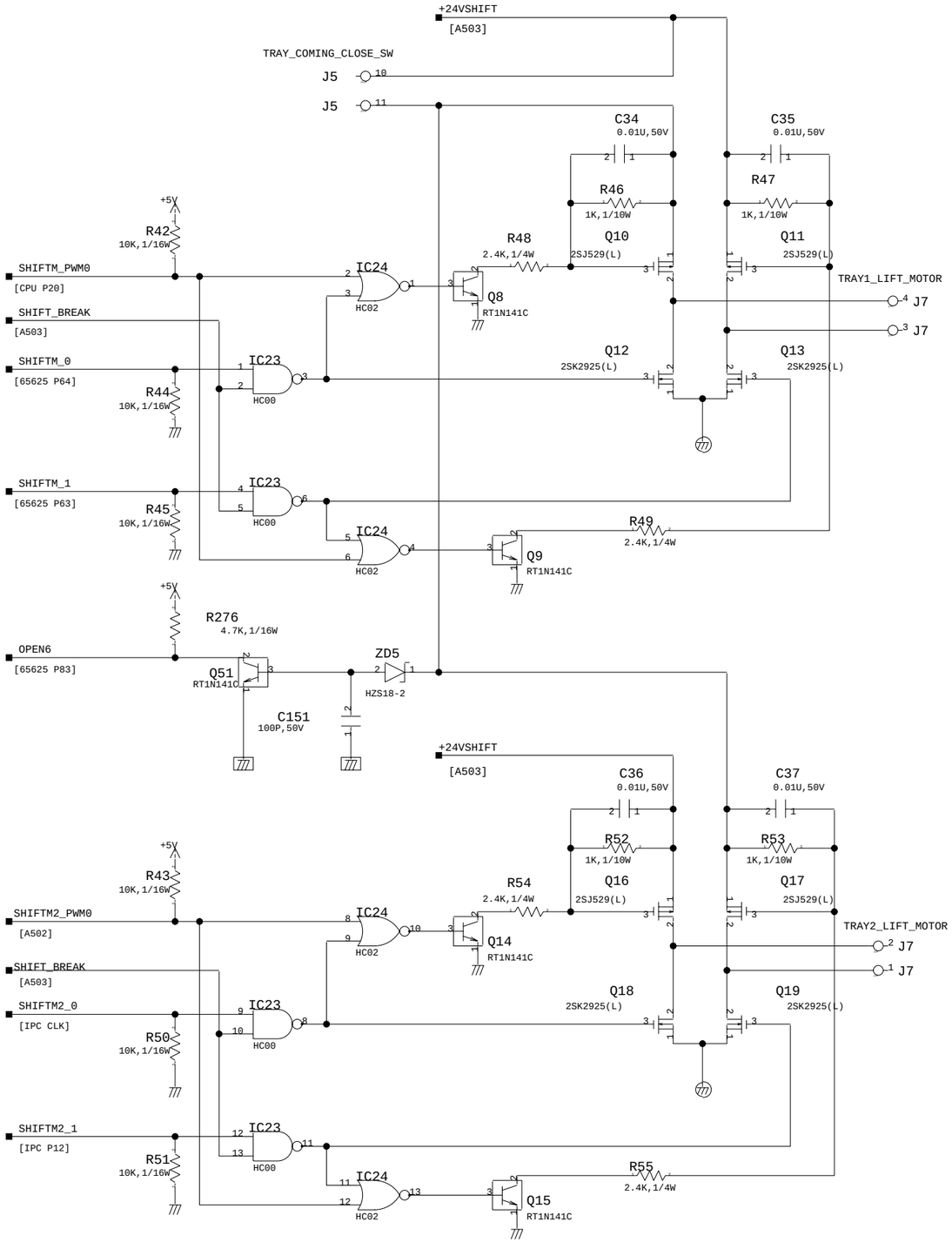
1. Finisher Controller PCB (A501)

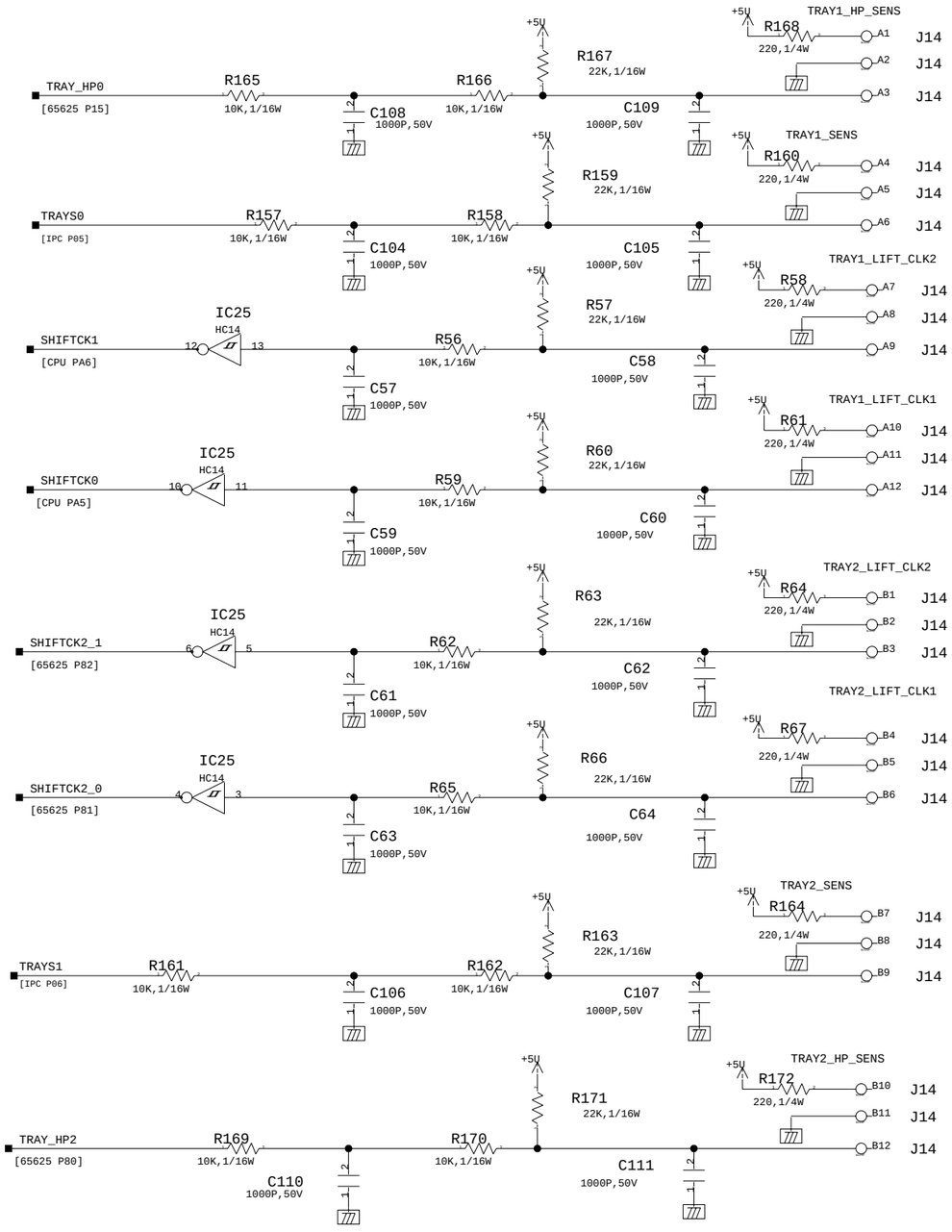



ADDRESS[25:0]
DATA[15:0]
IC3S DICE-40CS-E
C11 10U,16V
IC6
UPD43256BGU-70LL
C12 10U,16V
IC7
UPD43256BGU-70LL
C13 1U,16V
IC5
UPD65625GC-052-7EA
C14 0.1U,50V
C15 0.1U,50V
IC36
M66242FP
C150 0.1U,50V
PWMG_CSB [IPC P87]
RESET0 [A501]
PWMG_WRB [IPC P86]
PWMG_SIN [CPU P27]
PWMG_SCLK [CPU P26]
PWMG_OCB [CPU P31]
EXTAL0
R336 10K,1/16W
R337 10K,1/16W
R338 10K,1/16W
IC42 HC14
SWITM2_PWM0 [A504]
PADDL_PWM0 [A505]
SERIAL[5:0]
[A501]
PPC OUT
SADDLE OUT
R6 4.7K,1/16W
R4 1K,1/16W
R5 1K,1/16W
C16 100P,50V
D1 1SS270A
R7 1K,1/16W
R8 4.7K,1/16W
Q1 2SC3735
R9 1K,1/16W
C17 100P,50V
D2 1SS270A
R10 1K,1/16W
R11 470,1/10W
R12 1K,1/16W
R13 4.7K,1/16W
Q2 2SC3735
R14 4.7K,1/16W
R15 10K,1/16W
SS_CONNECT0
R16 10K,1/16W
SERIAL0
SERIAL1
SERIAL2
SERIAL3
SERIAL4
SERIAL5
J2
J3
RESET0
ADDRESS22
ADDRESS23
DIP_SW[7:0]
[A509]
PUSH_SW[1:0]
EEPDI0
STPLMM_HP0
RJOG_HP0
TRAY_HP0
SHATER_S0
SWING_S0
PUNCH_U[3:0]
FJOGM[1:0]
R343 10K,1/16W
R344 10K,1/16W
R105 10K,1/16W
R323 10K,1/16W
R332 10K,1/16W
OPEN3
OPEN2
OPEN1
OPEN0
[A505] RBMT1
[A505] RBMT0
[A505] SOLOUT4
[A509] SOLOUT3
[A509] SOLOUT2
[A509] SOLOUT1
[A509] SOLOUT0
[A505] RJOGM_I0
[A510] STPLMM_I0
[A508] HIGHT_ON0
[A504] SHIFTM_0
[A504] SHIFTM_1
[A512] EEPSK0
[A512] EEPCS0
[A512] EEPDO0
[A507] FEEDM_I0
[A509] LAMP1
[A507] FEED2M_I0
[A506] RBMT_I0
[A508] ENTM_I0
[A506] FJOGM_I0
[A512] PREG_I0
[A510] STEPMOFF0
[A511] STPLM_W0
[A511] STPLM_W1
[A505] EJECTM_W0
[A505] EJECTM_W1
[A512] PUNCHM0
[A512] PUNCHM1
[A505] SWINGM_W0
[A505] SWINGM_W1
[A503] OPEN[3:0]
[A512] PUNCH_U4

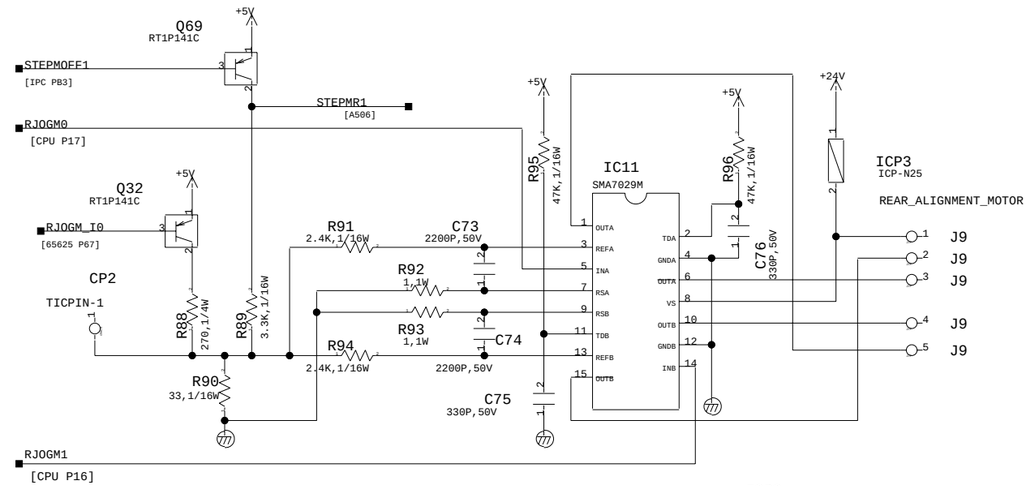
1. Finisher Controller PCB (A503)

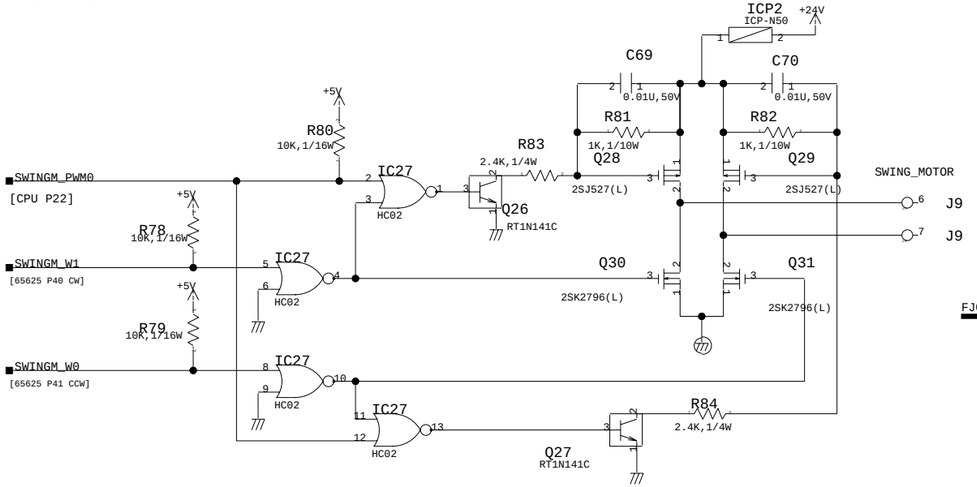


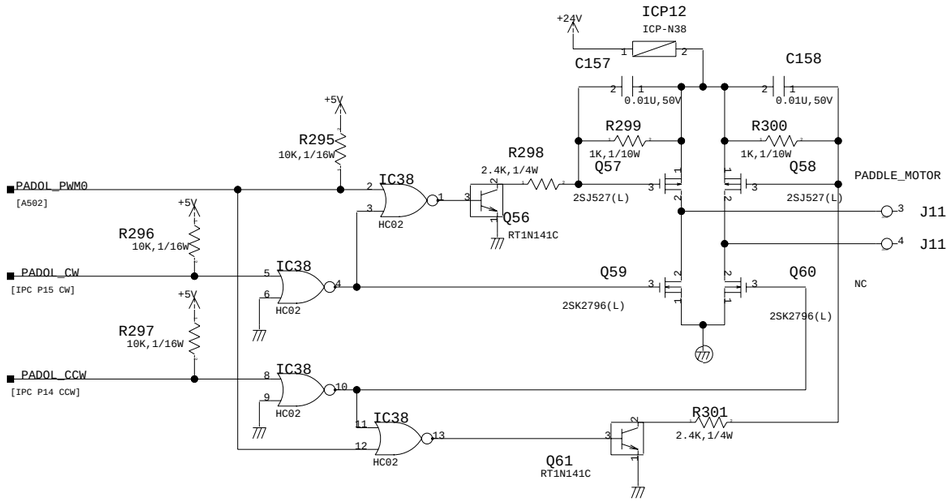

+24VSHIFT
[A503]
TRAY_COMING_CLOSE_SW
J5 10
J5 11
C34
0.01U,50V
C35
0.01U,50V
R46
1K,1/10W
R47
1K,1/10W
R48
2.4K,1/4W
Q10
2SJ529(L)
Q11
2SJ529(L)
R42
10K,1/16W
SHIFTM_PWM0
[CPU P20]
IC24
HC02
Q8
RT1N141C
TRAY1_LIFT_MOTOR
J7
J7
SHIFT_BREAK
[A503]
SHIFTM_0
[65625 P64]
IC23
HC00
R44
10K,1/16W
Q12
2SK2925(L)
Q13
2SK2925(L)
SHIFTM_1
[65625 P63]
R45
10K,1/16W
IC23
HC00
IC24
HC02
R49
2.4K,1/4W
Q9
RT1N141C
R276
4.7K,1/16W
OPEN6
[65625 P83]
Q51
RT1N141C
ZD5
HZS18-2
C151
100P,50V
+24VSHIFT
[A503]
C36
0.01U,50V
C37
0.01U,50V
R52
1K,1/10W
R53
1K,1/10W
R43
10K,1/16W
R54
2.4K,1/4W
Q16
2SJ529(L)
Q17
2SJ529(L)
SHIFTM2_PWM0
[A502]
IC24
HC02
Q14
RT1N141C
TRAY2_LIFT_MOTOR
J7
J7
SHIFT_BREAK
[A503]
SHIFTM2_0
[IPC CLK]
IC23
HC00
R50
10K,1/16W
Q18
2SK2925(L)
Q19
2SK2925(L)
SHIFTM2_1
[IPC P12]
R51
10K,1/16W
IC23
HC00
IC24
HC02
R55
2.4K,1/4W
Q15
RT1N141C

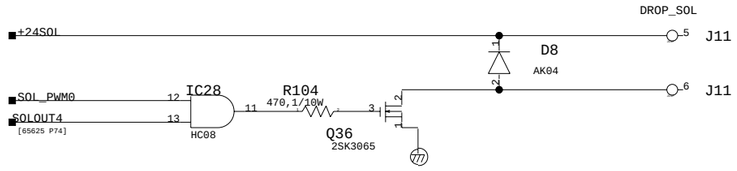

TRAY_HP0
[65625 P15]
R165
10K,1/16W
C108
1000P,50V
R166
10K,1/16W
R167
22K,1/16W
C109
1000P,50V
TRAY1_HP_SENS
R168
220,1/4W
J14
TRAYS0
[IPC P05]
R157
10K,1/16W
C104
1000P,50V
R158
10K,1/16W
R159
22K,1/16W
C105
1000P,50V
TRAY1_SENS
R160
220,1/4W
J14
SHIFTCK1
[CPU PA6]
IC25
HC14
R56
10K,1/16W
C57
1000P,50V
R57
22K,1/16W
C58
1000P,50V
TRAY1_LIFT_CLK2
R58
220,1/4W
J14
SHIFTCK0
[CPU PA5]
IC25
HC14
R59
10K,1/16W
C59
1000P,50V
R60
22K,1/16W
C60
1000P,50V
TRAY1_LIFT_CLK1
R61
220,1/4W
J14
SHIFTCK2_1
[65625 P82]
IC25
HC14
R62
10K,1/16W
C61
1000P,50V
R63
22K,1/16W
C62
1000P,50V
TRAY2_LIFT_CLK2
R64
220,1/4W
J14
SHIFTCK2_0
[65625 P81]
IC25
HC14
R65
10K,1/16W
C63
1000P,50V
R66
22K,1/16W
C64
1000P,50V
TRAY2_LIFT_CLK1
R67
220,1/4W
J14
TRAYS1
[IPC P06]
R161
10K,1/16W
C106
1000P,50V
R162
10K,1/16W
R163
22K,1/16W
C107
1000P,50V
TRAY2_SENS
R164
220,1/4W
J14
TRAY_HP2
[65625 P80]
R169
10K,1/16W
C110
1000P,50V
R170
10K,1/16W
R171
22K,1/16W
C111
1000P,50V
TRAY2_HP_SENS
R172
220,1/4W
J14

1. Finisher Controller PCB (A505)

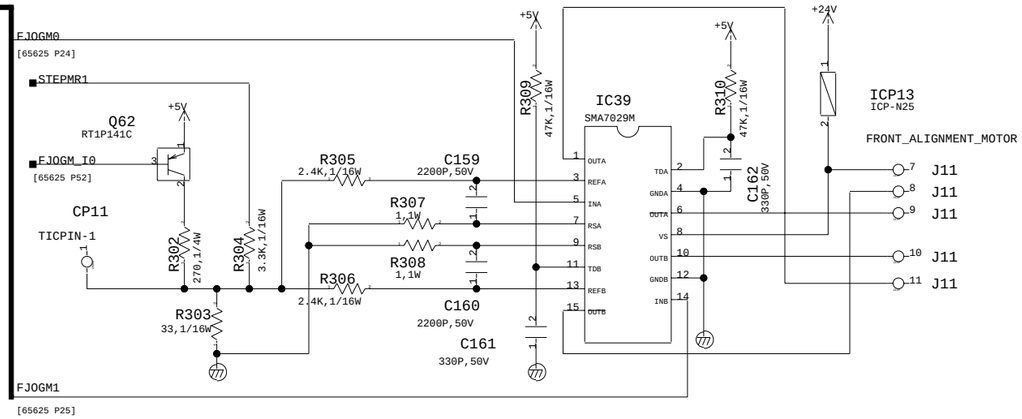


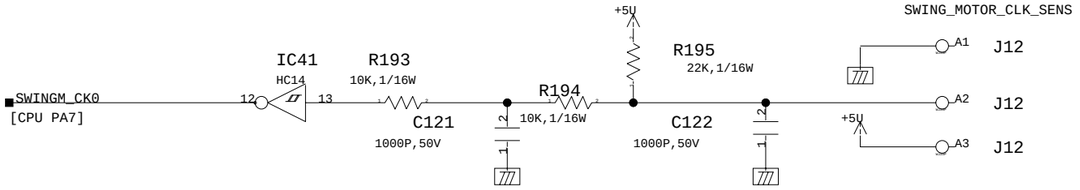


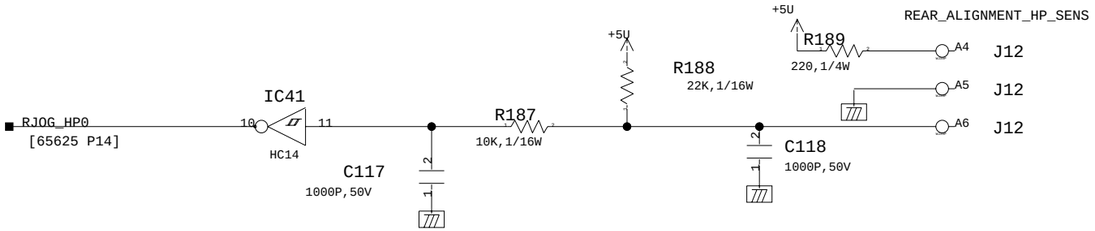


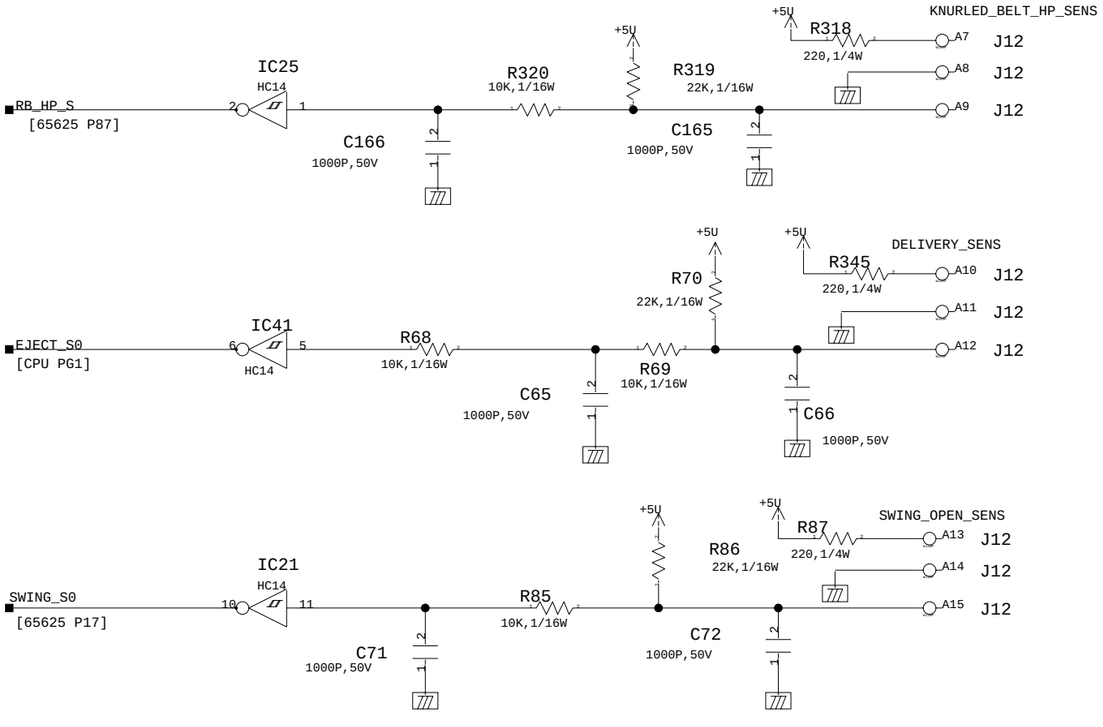


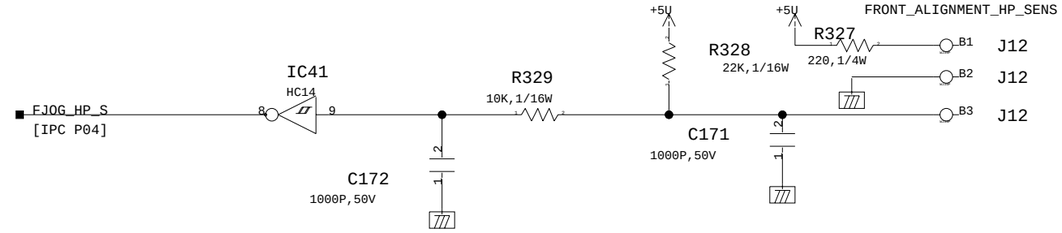
FJOGM[1:0]

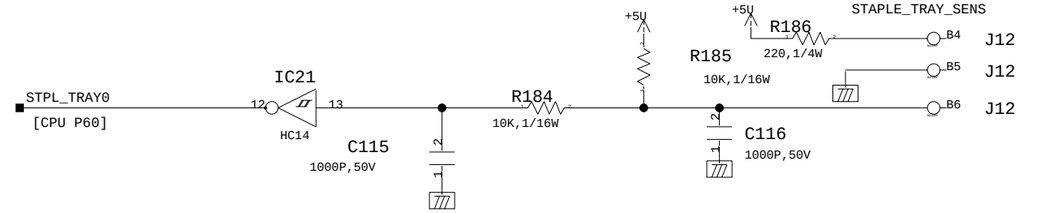


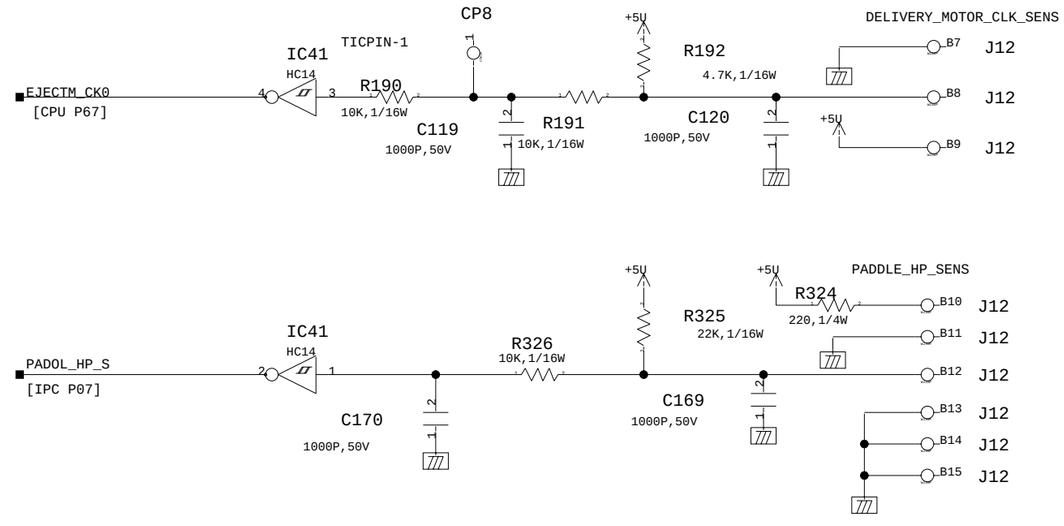

SWINGM_CK0
[CPU PA7]
IC41
HC14
12
13
R193
10K,1/16W
C121
1000P,50V
R194
10K,1/16W
+5U
R195
22K,1/16W
C122
1000P,50V
+5U
SWING_MOTOR_CLK_SENS
A1
A2
A3
J12
J12
J12


RJOG_HP0
[65625 P14]
IC41
HC14
10
11
C117
1000P,50V
R187
10K,1/16W
+5U
R188
22K,1/16W
+5U
R189
220,1/4W
C118
1000P,50V
REAR_ALIGNMENT_HP_SENS
A4
A5
A6
J12
J12
J12

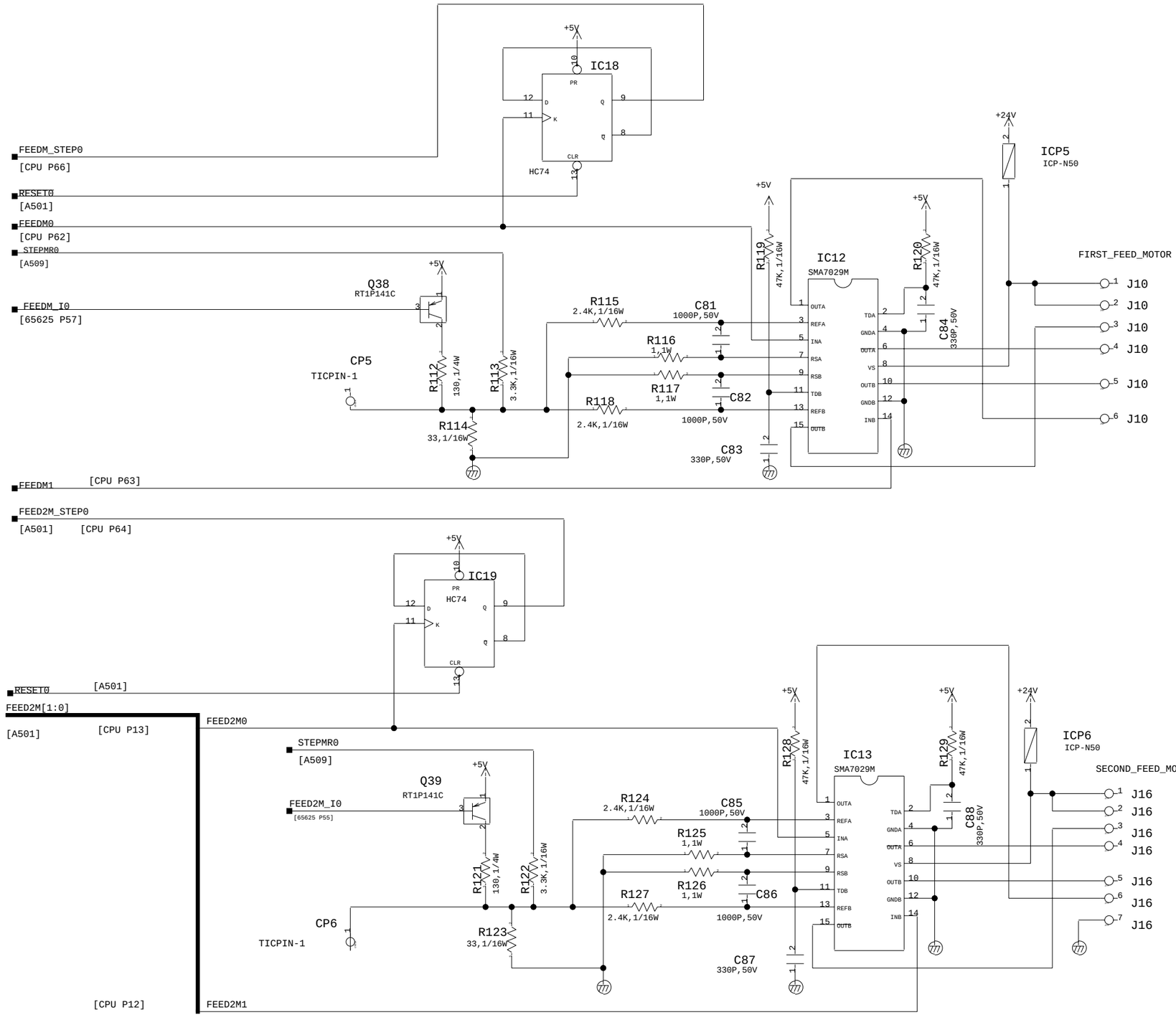

RB_HP_S
[65625 P87]
IC25
HC14
2
1
C166
1000P,50V
R320
10K,1/16W
+5U
R319
22K,1/16W
C165
1000P,50V
+5U
R318
220,1/4W
KNURLED_BELT_HP_SENS
A7
A8
A9
J12
J12
J12
EJECT_S0
[CPU PG1]
IC41
HC14
6
5
C65
1000P,50V
R68
10K,1/16W
+5U
R70
22K,1/16W
R69
10K,1/16W
+5U
R345
220,1/4W
C66
1000P,50V
DELIVERY_SENS
A10
A11
A12
J12
J12
J12
SWING_S0
[65625 P17]
IC21
HC14
10
11
C71
1000P,50V
R85
10K,1/16W
+5U
R86
22K,1/16W
C72
1000P,50V
+5U
R87
220,1/4W
SWING_OPEN_SENS
A13
A14
A15
J12
J12
J12

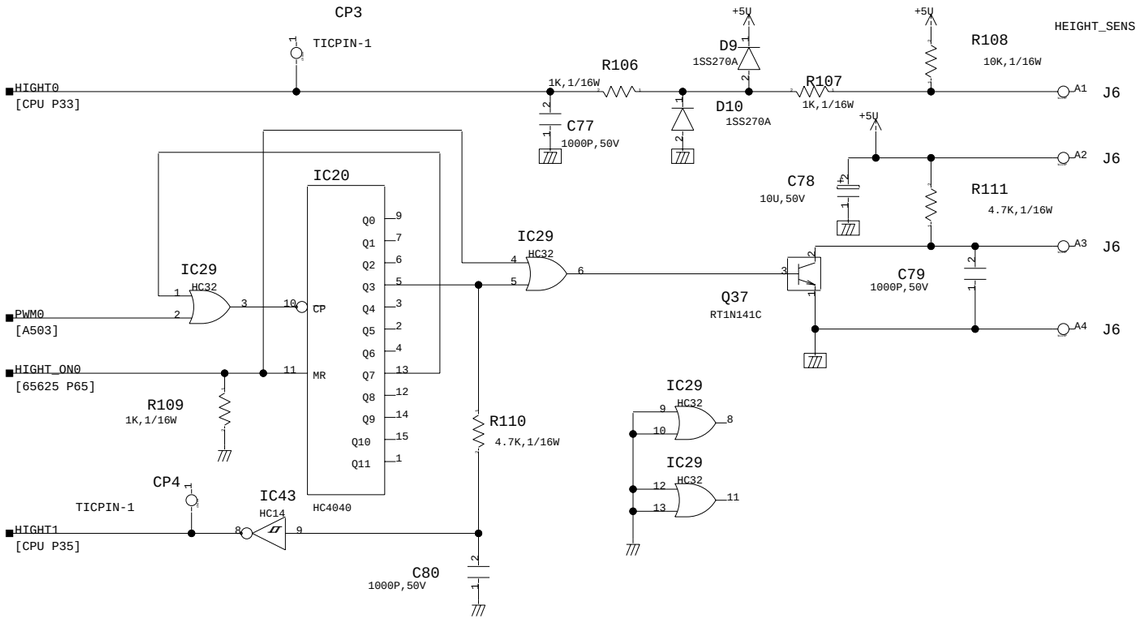

FJOG_HP_S
[IPC P04]
IC41
HC14
8
9
C172
1000P,50V
R329
10K,1/16W
+5U
R328
22K,1/16W
C171
1000P,50V
+5U
R327
220,1/4W
FRONT_ALIGNMENT_HP_SENS
B1
B2
B3
J12
J12
J12

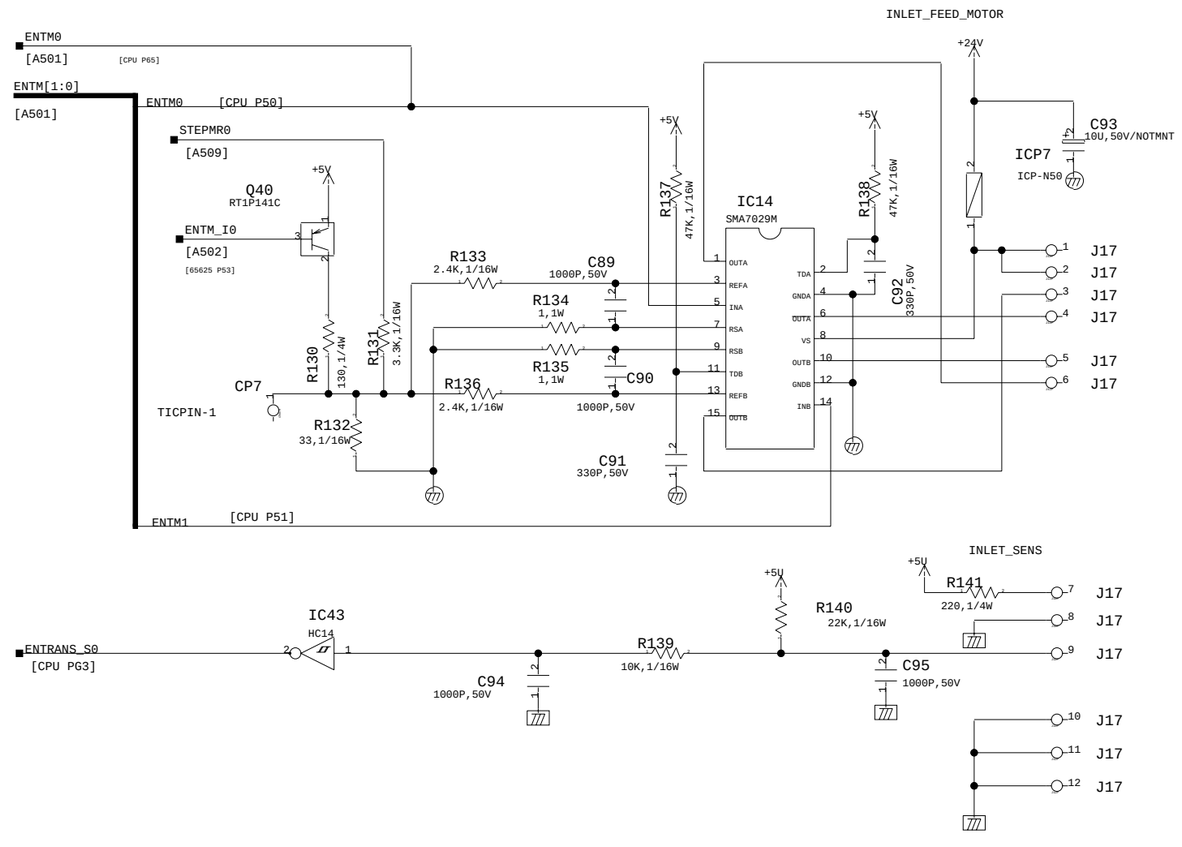

STPL_TRAY0
[CPU P60]
IC21
HC14
12
13
C115
1000P,50V
R184
10K,1/16W
+5U
R185
10K,1/16W
C116
1000P,50V
+5U
R186
220,1/4W
STAPLE_TRAY_SENS
B4
B5
B6
J12
J12
J12


EJECTM_CK0
[CPU P67]
IC41
HC14
4
3
C119
1000P,50V
R190
10K,1/16W
CP8
TICPIN-1
R191
10K,1/16W
+5U
R192
4.7K,1/16W
C120
1000P,50V
+5U
DELIVERY_MOTOR_CLK_SENS
B7
B8
B9
J12
J12
J12
PADOL_HP_S
[IPC P07]
IC41
HC14
2
1
C170
1000P,50V
R326
10K,1/16W
+5U
R325
22K,1/16W
C169
1000P,50V
+5U
R324
220,1/4W
PADDLE_HP_SENS
B10
B11
B12
B13
B14
B15
J12
J12
J12
J12
J12
J12

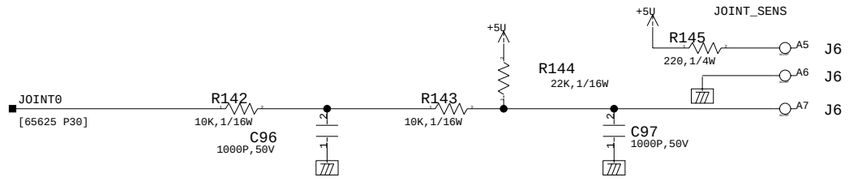
1. Finisher Controller PCB (A507)

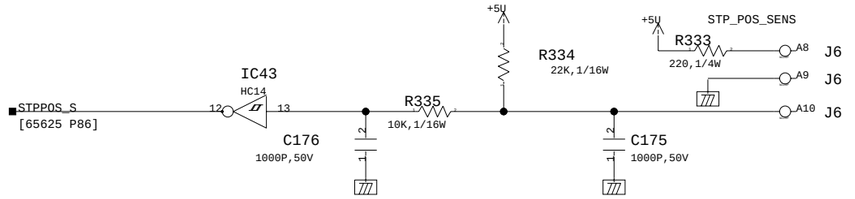


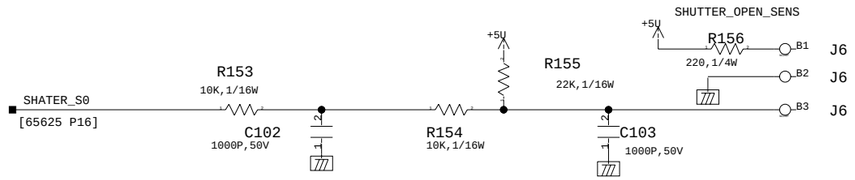

CP3
TICPIN-1
HIGHT0
[CPU P33]
R106
1K,1/16W
D9
1SS270A
D10
1SS270A
R107
1K,1/16W
R108
10K,1/16W
HEIGHT_SENS
J6
C77
1000P,50V
C78
10U,50V
R111
4.7K,1/16W
IC20
HC4040
IC29
HC32
PWM0
[A503]
HIGHT_ON0
[65625 P65]
R109
1K,1/16W
R110
4.7K,1/16W
C79
1000P,50V
Q37
RT1N141C
CP4
TICPIN-1
IC43
HC14
HIGHT1
[CPU P35]
C80
1000P,50V

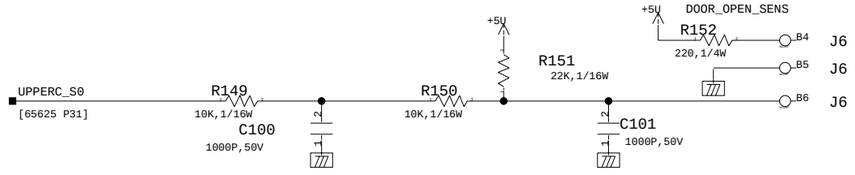

ENTM0
[A501]
[CPU P65]
ENTM[1:0]
[A501]
ENTM0 [CPU P50]
STEPMR0
[A509]
Q40
RT1P141C
ENTM_I0
[A502]
[65625 P53]
R130
130,1/4W
R131
3.3K,1/16W
R133
2.4K,1/16W
R134
1,1W
R135
1,1W
R136
2.4K,1/16W
R132
33,1/16W
C89
1000P,50V
C90
1000P,50V
C91
330P,50V
CP7
TICPIN-1
ENTM1 [CPU P51]
INLET_FEED_MOTOR
+24V
ICP7
ICP-N50
C93
10U,50V/NOTMNT
R137
47K,1/16W
R138
47K,1/16W
IC14
SMA7029M
C92
330P,50V
J17

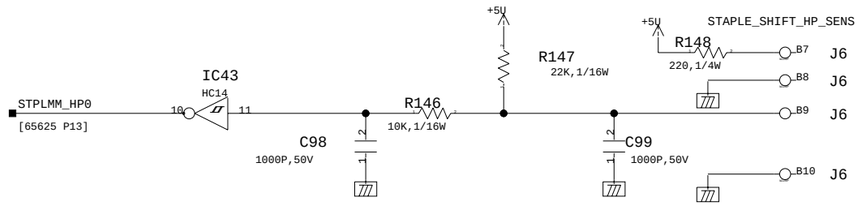
INLET_SENS
IC43
HC14
ENTRANS_S0
[CPU PG3]
R139
10K,1/16W
R140
22K,1/16W
R141
220,1/4W
C94
1000P,50V
C95
1000P,50V
J17


JOINT_SENS
JOINT0
[65625 P30]
R142
10K,1/16W
R143
10K,1/16W
R144
22K,1/16W
R145
220,1/4W
C96
1000P,50V
C97
1000P,50V
J6

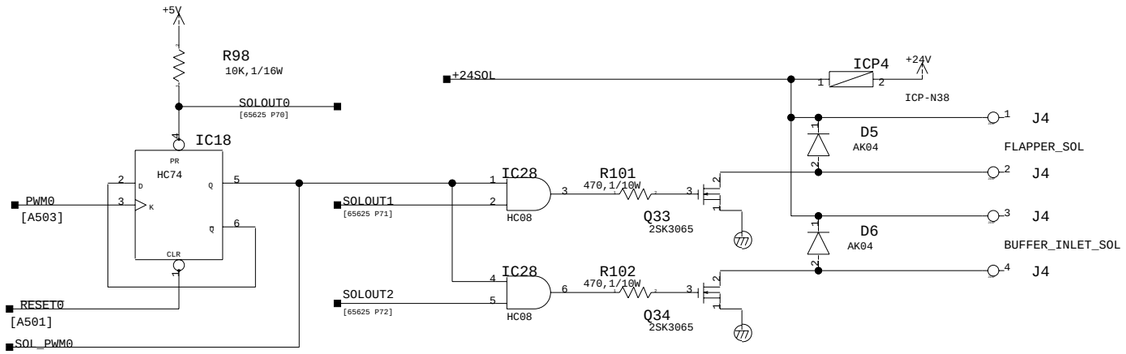

STP_POS_SENS
STPPOS_S
[65625 P86]
IC43
HC14
R333
220,1/4W
R334
22K,1/16W
R335
10K,1/16W
C176
1000P,50V
C175
1000P,50V
J6

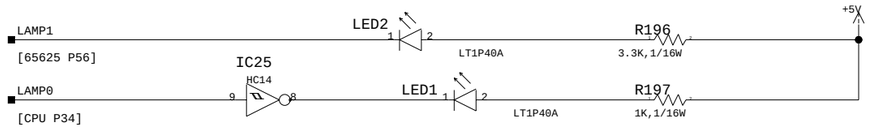

SHUTTER_OPEN_SENS
SHATER_S0
[65625 P16]
R153
10K,1/16W
R154
10K,1/16W
R155
22K,1/16W
R156
220,1/4W
C102
1000P,50V
C103
1000P,50V
J6

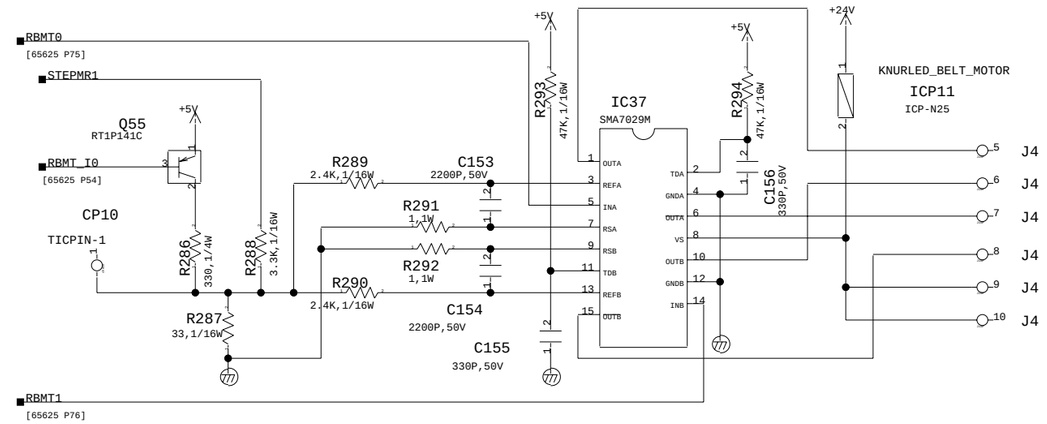

DOOR_OPEN_SENS
UPPERC_S0
[65625 P31]
R149
10K,1/16W
R150
10K,1/16W
R151
22K,1/16W
R152
220,1/4W
C100
1000P,50V
C101
1000P,50V
J6

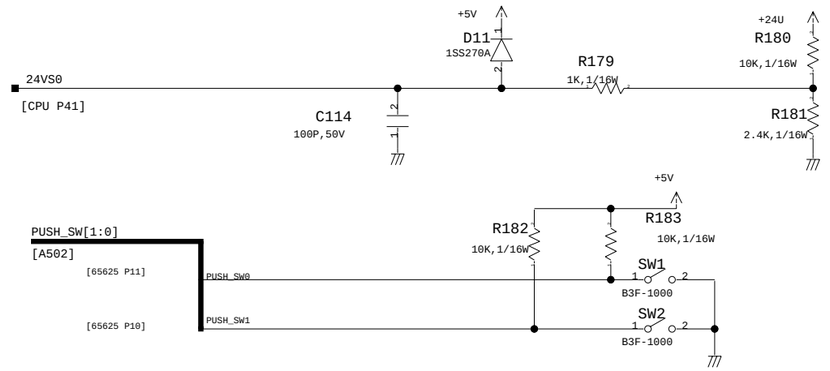

STAPLE_SHIFT_HP_SENS
IC43
HC14
STPLMM_HP0
[65625 P13]
R146
10K,1/16W
R147
22K,1/16W
R148
220,1/4W
C98
1000P,50V
C99
1000P,50V
J6

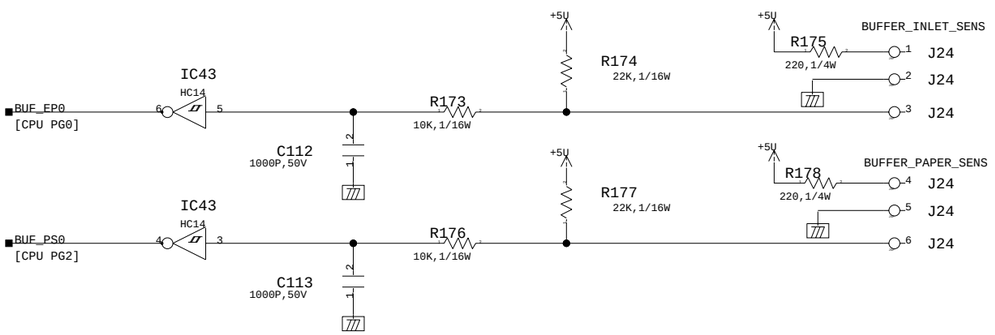
1. Finisher Controller PCB (A509)

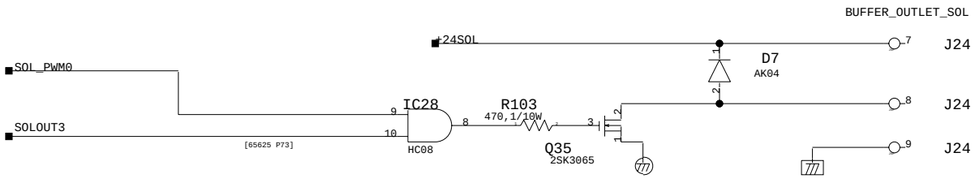


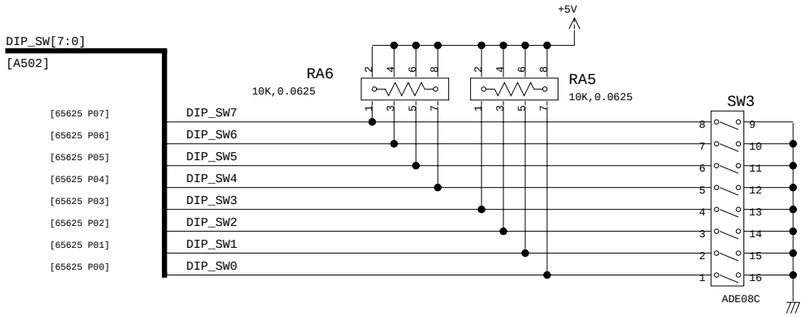


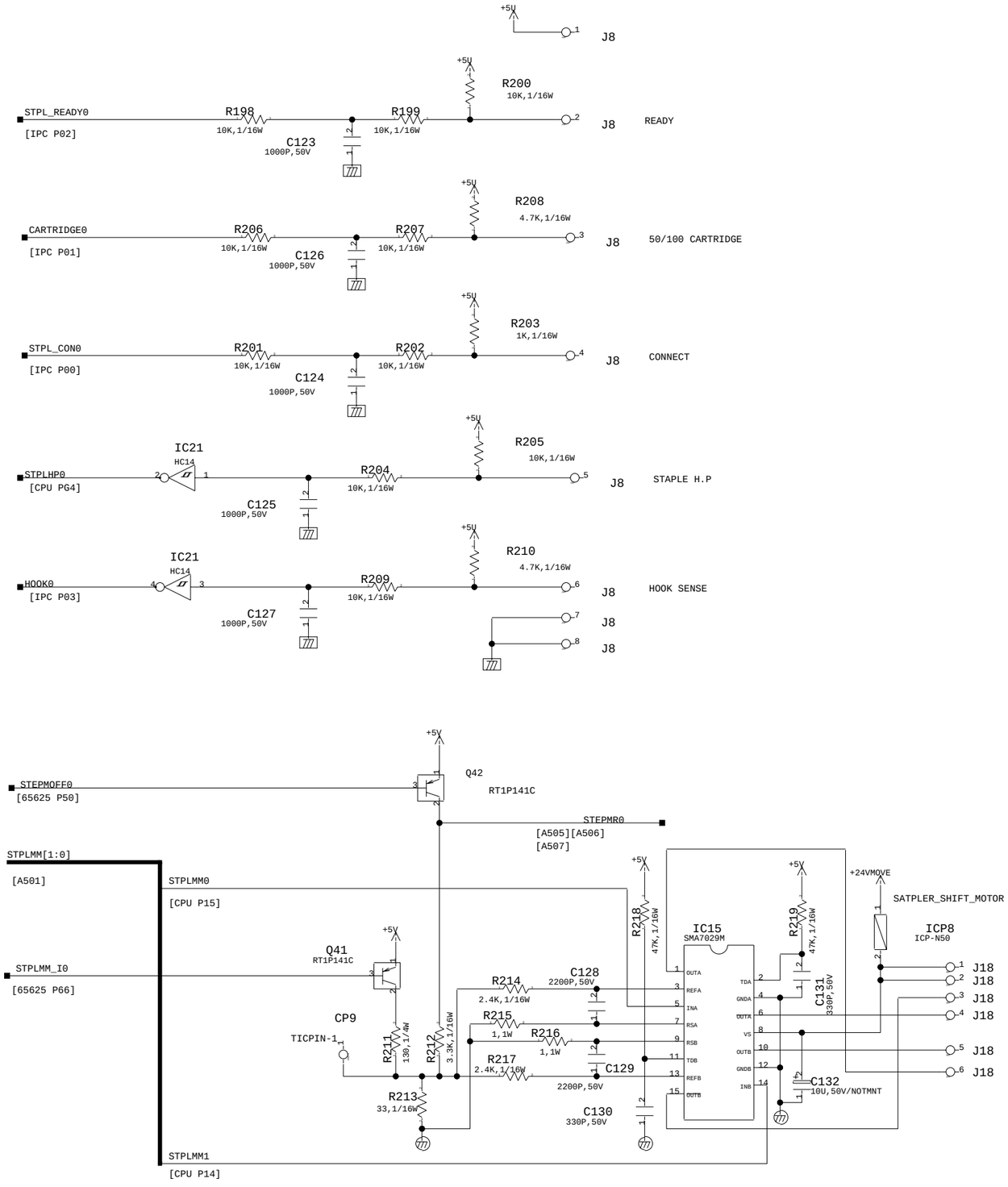




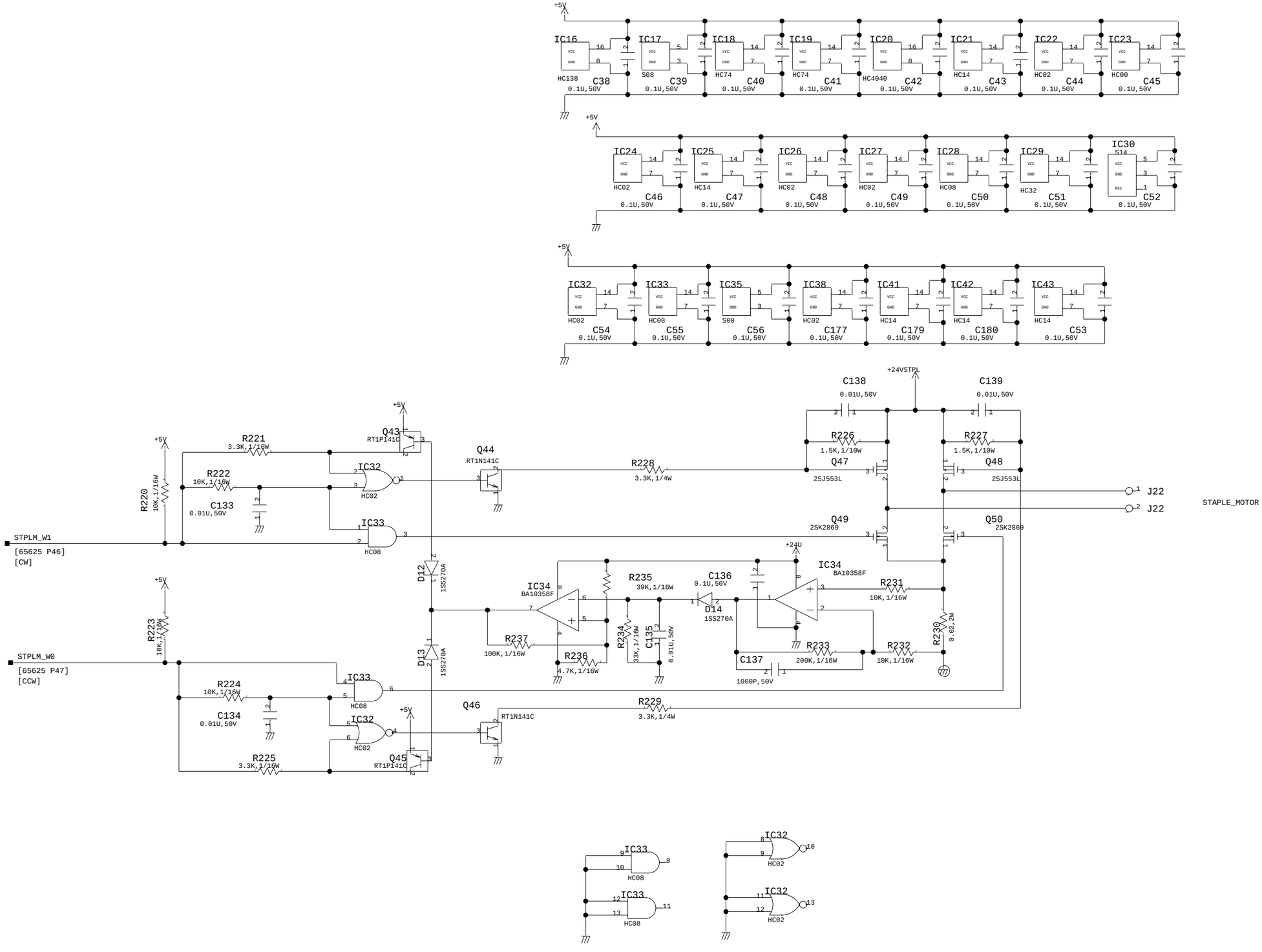


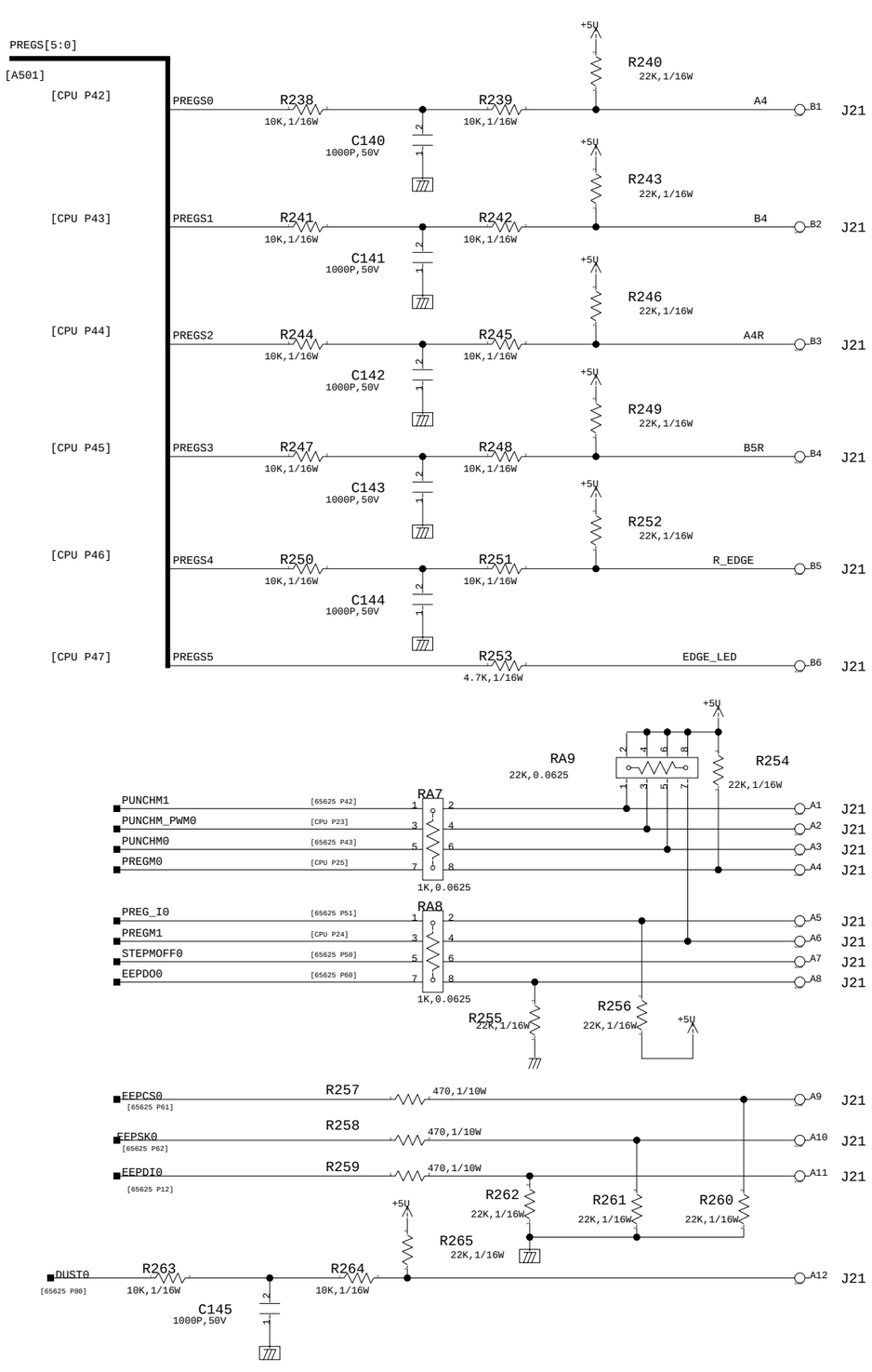


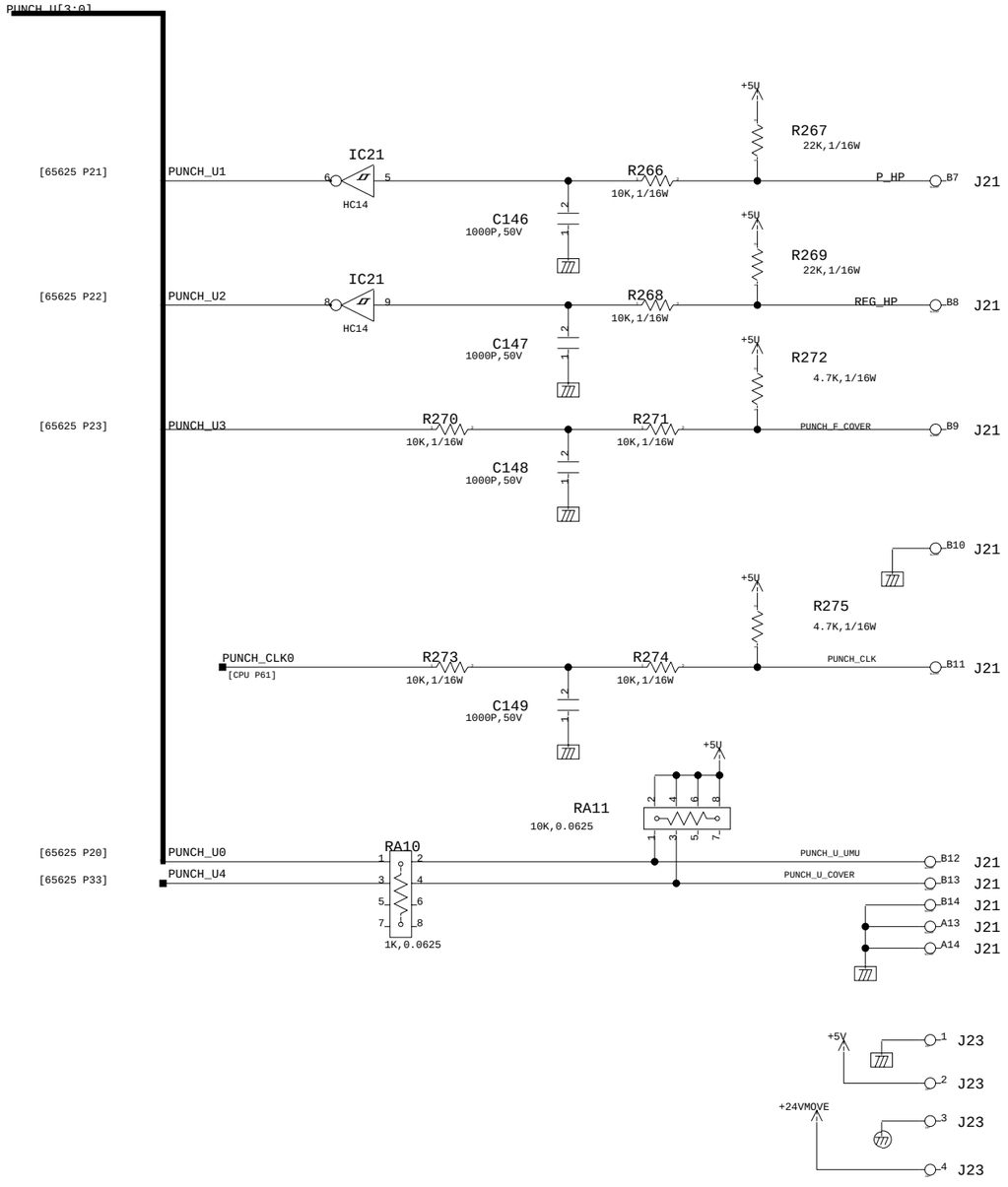



+5V
J8
R200
10K,1/16W
STPL_READY0
[IPC P02]
R198
10K,1/16W
R199
10K,1/16W
C123
1000P,50V
READY
CARTRIDGE0
[IPC P01]
R206
10K,1/16W
R207
10K,1/16W
R208
4.7K,1/16W
C126
1000P,50V
50/100 CARTRIDGE
STPL_CON0
[IPC P00]
R201
10K,1/16W
R202
10K,1/16W
R203
1K,1/16W
C124
1000P,50V
CONNECT
IC21
HC14
STPLHP0
[CPU PG4]
R204
10K,1/16W
R205
10K,1/16W
C125
1000P,50V
STAPLE H.P
HOOK0
[IPC P03]
R209
10K,1/16W
R210
4.7K,1/16W
C127
1000P,50V
HOOK SENSE
STEPMOFF0
[65625 P50]
Q42
RT1P141C
STEPMR0
[A505][A506]
[A507]
STPLMM[1:0]
[A501]
STPLMM0
[CPU P15]
STPLMM_I0
[65625 P66]
Q41
RT1P141C
CP9
TICPIN-1
R211
130,1/4W
R212
3.3K,1/16W
R213
33,1/16W
R214
2.4K,1/16W
R215
1,1W
R216
1,1W
R217
2.4K,1/16W
C128
2200P,50V
C129
2200P,50V
C130
330P,50V
R218
47K,1/16W
IC15
SMA7029M
OUTA
REFA
INA
RSA
RSB
TDB
REFB
OUTB
TDA
GNDA
VS
GNDB
INB
R219
47K,1/16W
C131
330P,50V
C132
10U,50V/NOTMNT
+24VMOVE
SATPLER_SHIFT_MOTOR
ICP8
ICP-N50
J18
STPLMM1
[CPU P14]

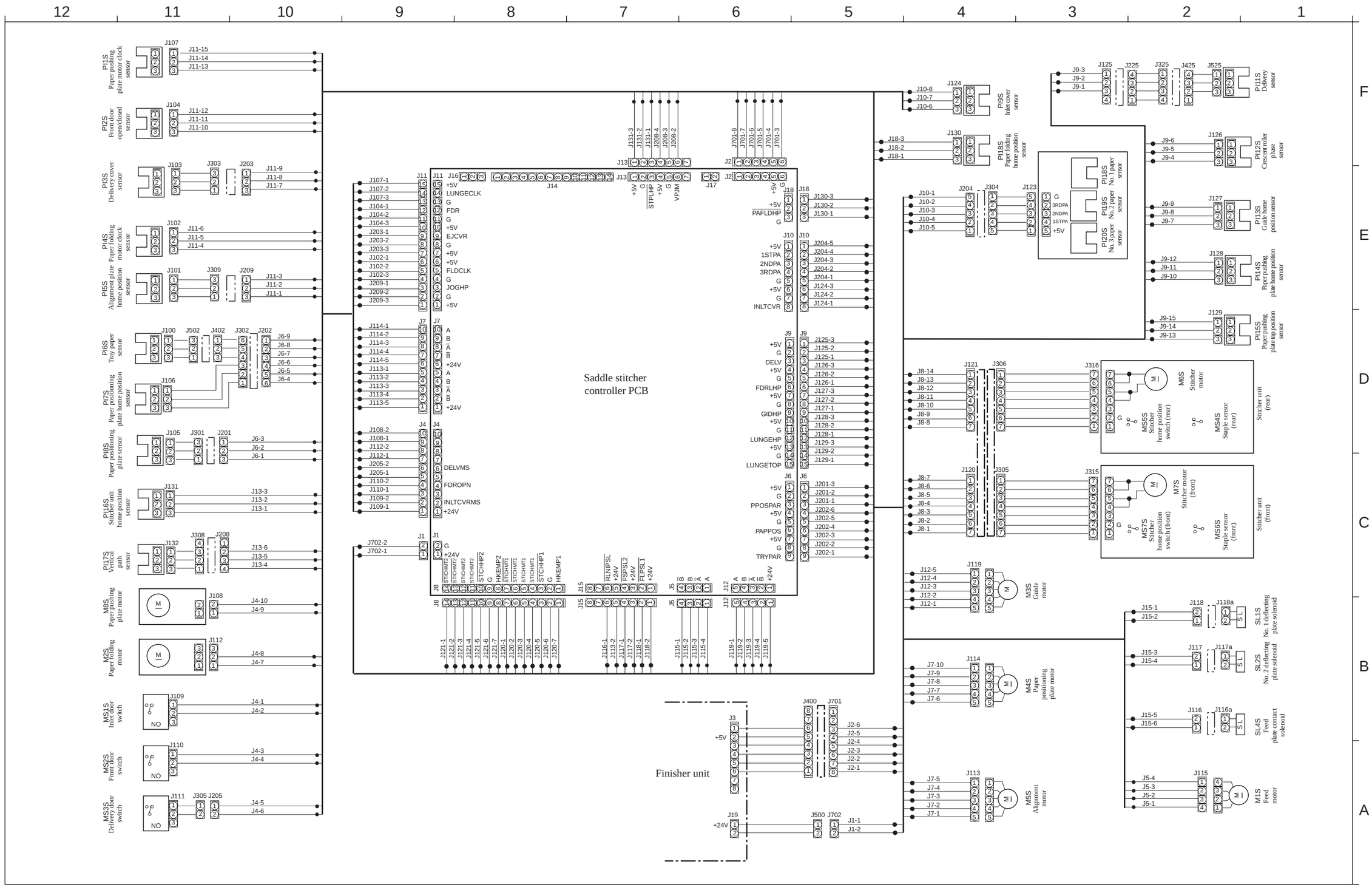
1. Finisher Controller PCB (A511)



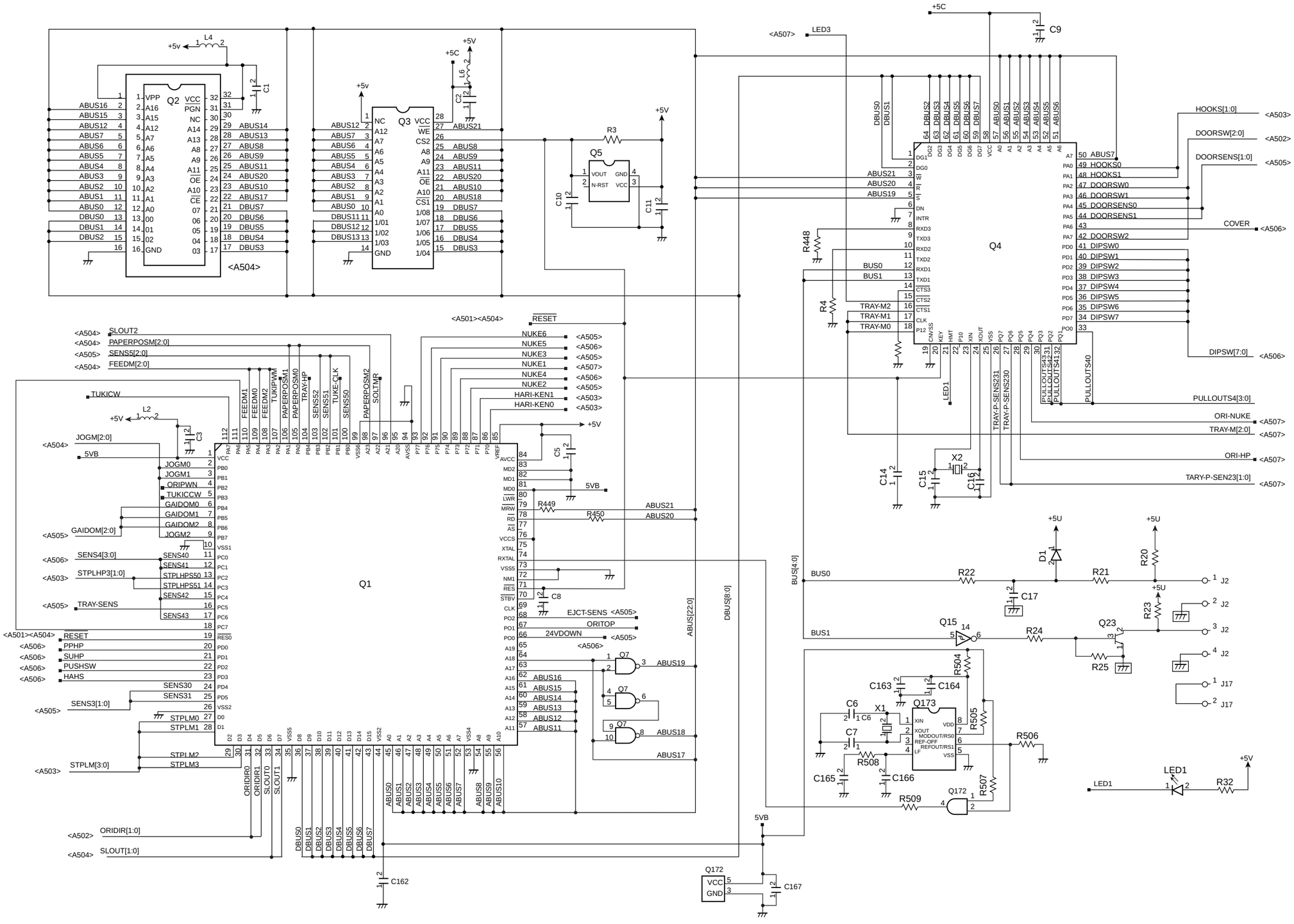

PREGS[5:0]
[A501]
[CPU P42]
PREGS0
R238
10K,1/16W
R239
10K,1/16W
R240
22K,1/16W
+5U
A4
B1
J21
C140
1000P,50V
[CPU P43]
PREGS1
R241
10K,1/16W
R242
10K,1/16W
R243
22K,1/16W
B4
B2
C141
1000P,50V
[CPU P44]
PREGS2
R244
10K,1/16W
R245
10K,1/16W
R246
22K,1/16W
A4R
B3
C142
1000P,50V
[CPU P45]
PREGS3
R247
10K,1/16W
R248
10K,1/16W
R249
22K,1/16W
B5R
B4
C143
1000P,50V
[CPU P46]
PREGS4
R250
10K,1/16W
R251
10K,1/16W
R252
22K,1/16W
R_EDGE
B5
C144
1000P,50V
[CPU P47]
PREGS5
R253
4.7K,1/16W
EDGE_LED
B6
RA9
22K,0.0625
R254
22K,1/16W
RA7
PUNCHM1
[65625 P42]
PUNCHM_PWM0
[CPU P23]
PUNCHM0
[65625 P43]
PREGM0
[CPU P25]
1K,0.0625
A1
A2
A3
A4
RA8
PREG_I0
[65625 P51]
PREGM1
[CPU P24]
STEPMOFF0
[65625 P50]
EEPDO0
[65625 P60]
1K,0.0625
A5
A6
A7
A8
R255
22K,1/16W
R256
22K,1/16W
EEPCS0
[65625 P61]
R257
470,1/10W
A9
EEPSK0
[65625 P62]
R258
470,1/10W
A10
EEPDI0
[65625 P12]
R259
470,1/10W
A11
R262
22K,1/16W
R261
22K,1/16W
R260
22K,1/16W
R265
22K,1/16W
DUST0
[65625 P80]
R263
10K,1/16W
R264
10K,1/16W
A12
C145
1000P,50V


PUNCH_U[3:0]
[65625 P21]
PUNCH_U1
IC21
HC14
R266
10K,1/16W
R267
22K,1/16W
P_HP
B7
J21
C146
1000P,50V
[65625 P22]
PUNCH_U2
R268
10K,1/16W
R269
22K,1/16W
REG_HP
B8
C147
1000P,50V
[65625 P23]
PUNCH_U3
R270
10K,1/16W
R271
10K,1/16W
R272
4.7K,1/16W
PUNCH_F_COVER
B9
C148
1000P,50V
B10
R275
4.7K,1/16W
PUNCH_CLK0
[CPU P61]
R273
10K,1/16W
R274
10K,1/16W
PUNCH_CLK
B11
C149
1000P,50V
RA11
10K,0.0625
[65625 P20]
PUNCH_U0
[65625 P33]
PUNCH_U4
RA10
1K,0.0625
PUNCH_U_UMU
PUNCH_U_COVER
B12
B13
B14
A13
A14
+5V
+24VMOVE
J23

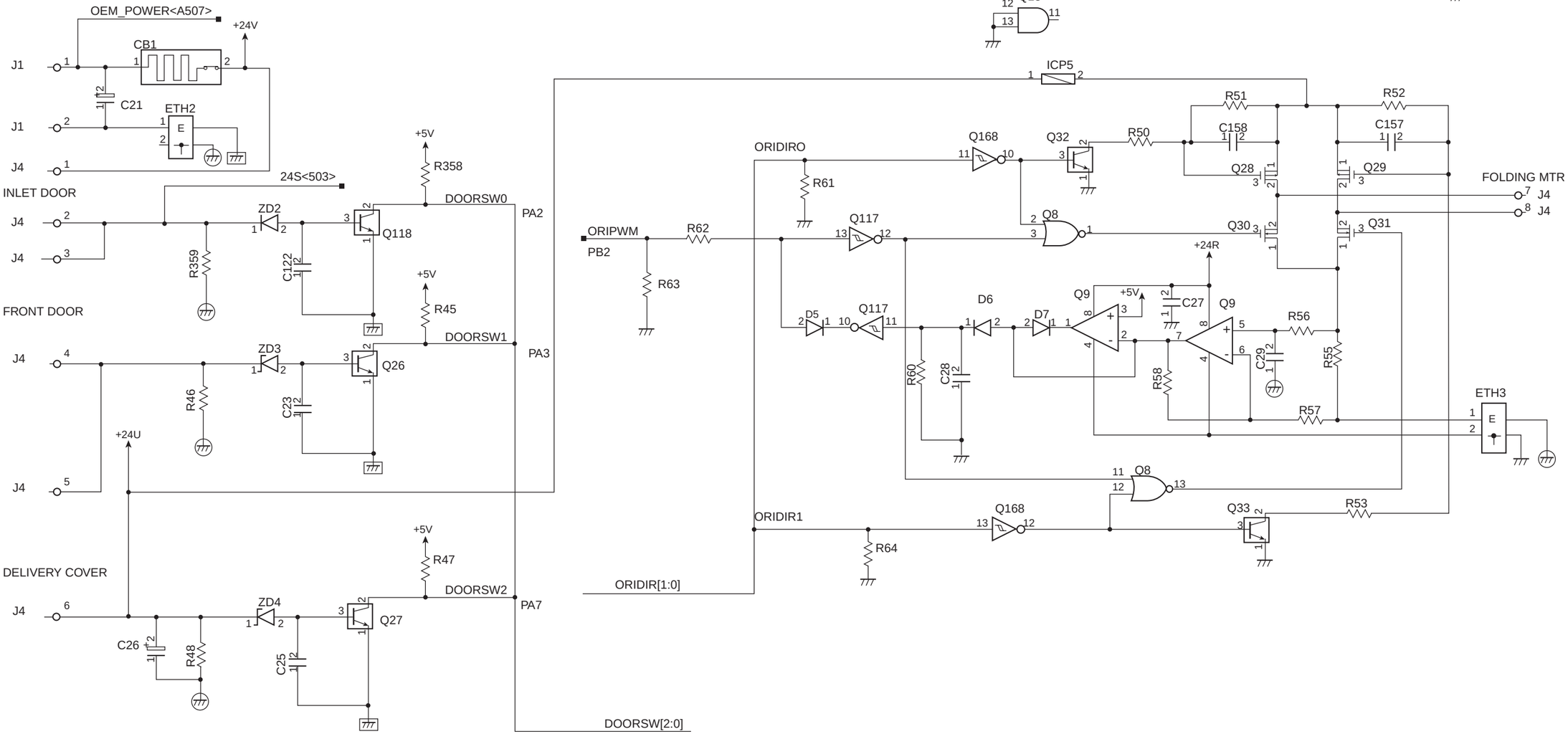
E. SADDLE STITCHER UNIT CIRCUIT DIAGRAM

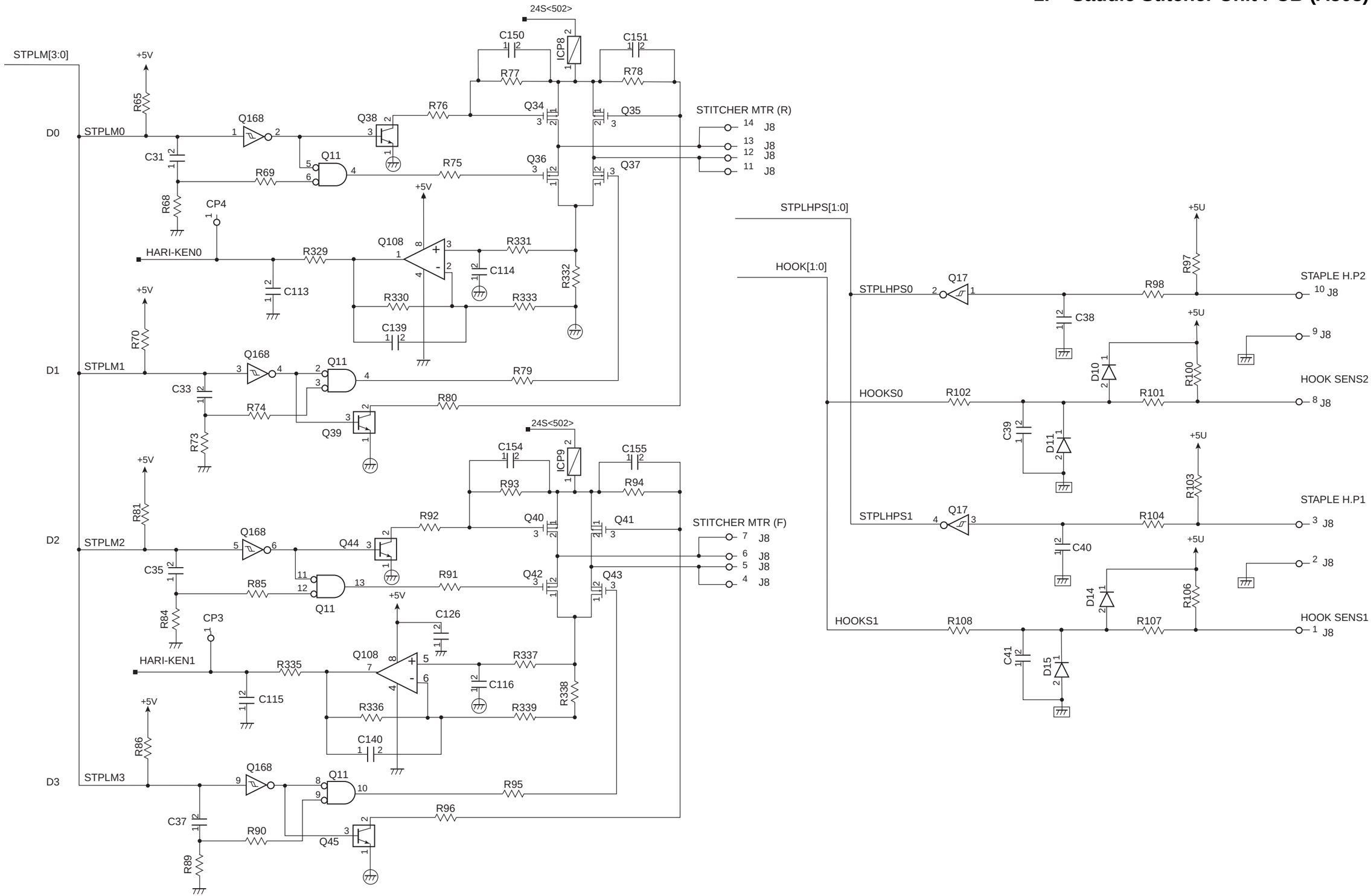


1. Saddle Stitcher Unit PCB (A501)

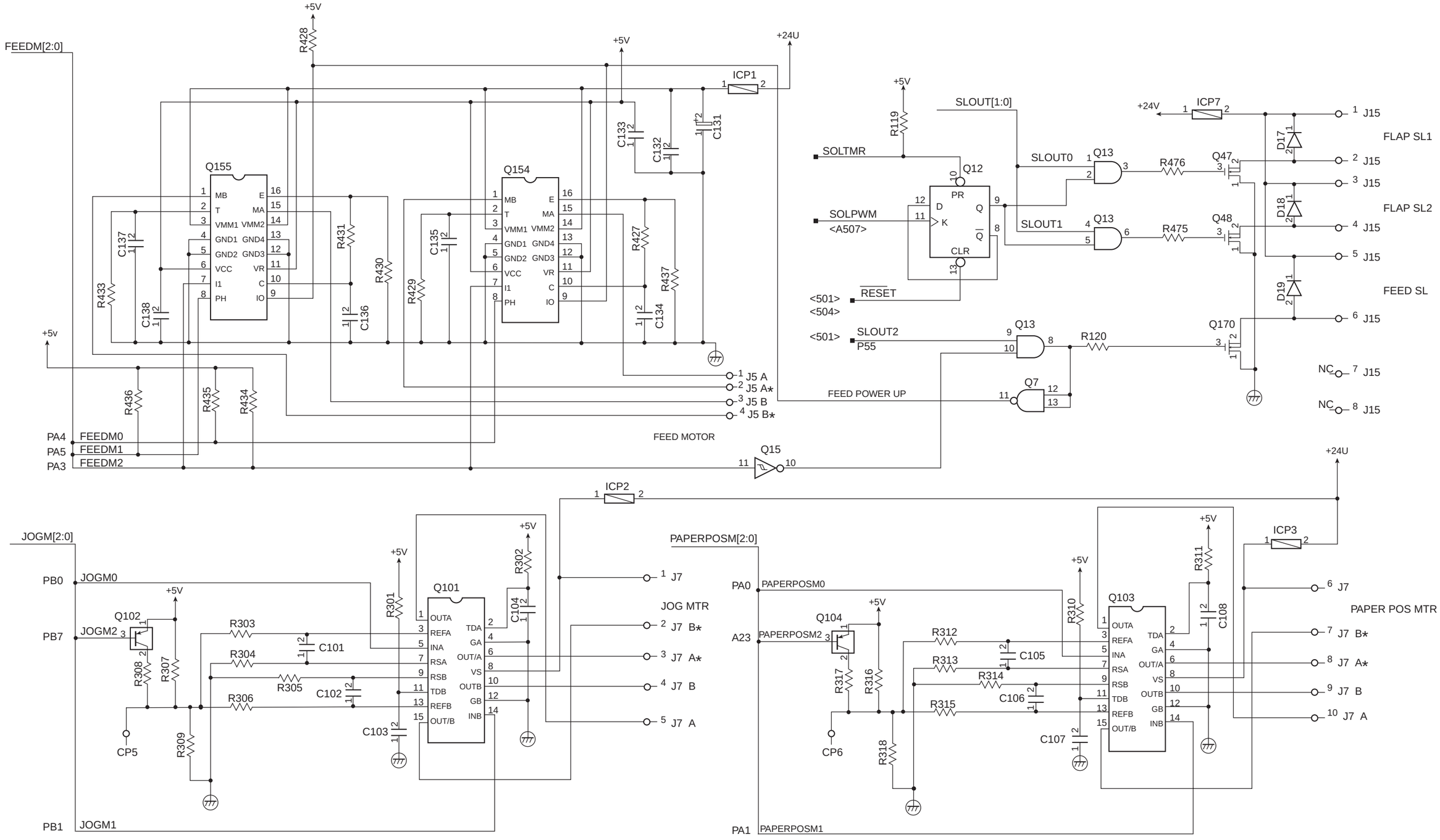


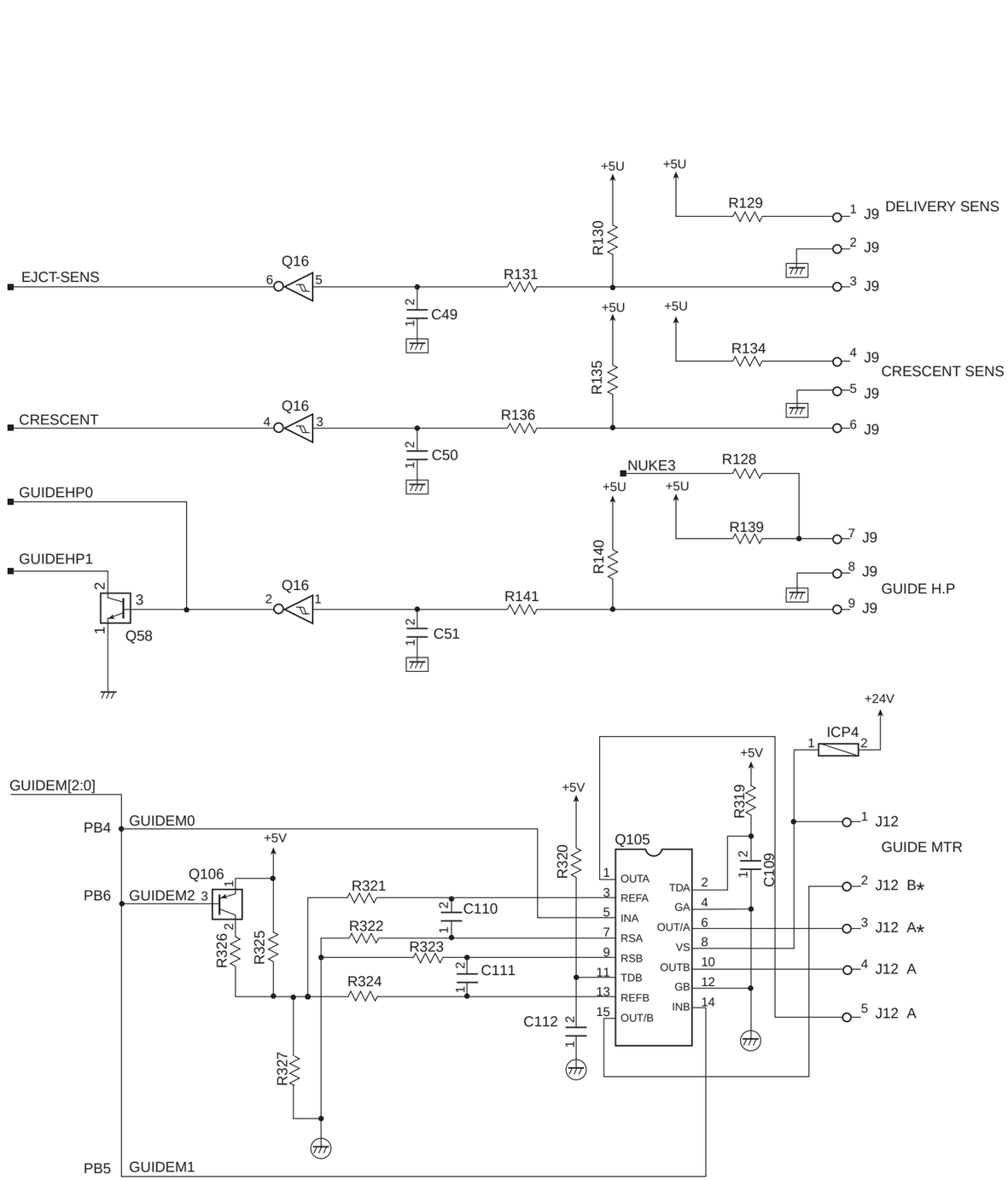
1. Saddle Stitcher Unit PCB (A502)



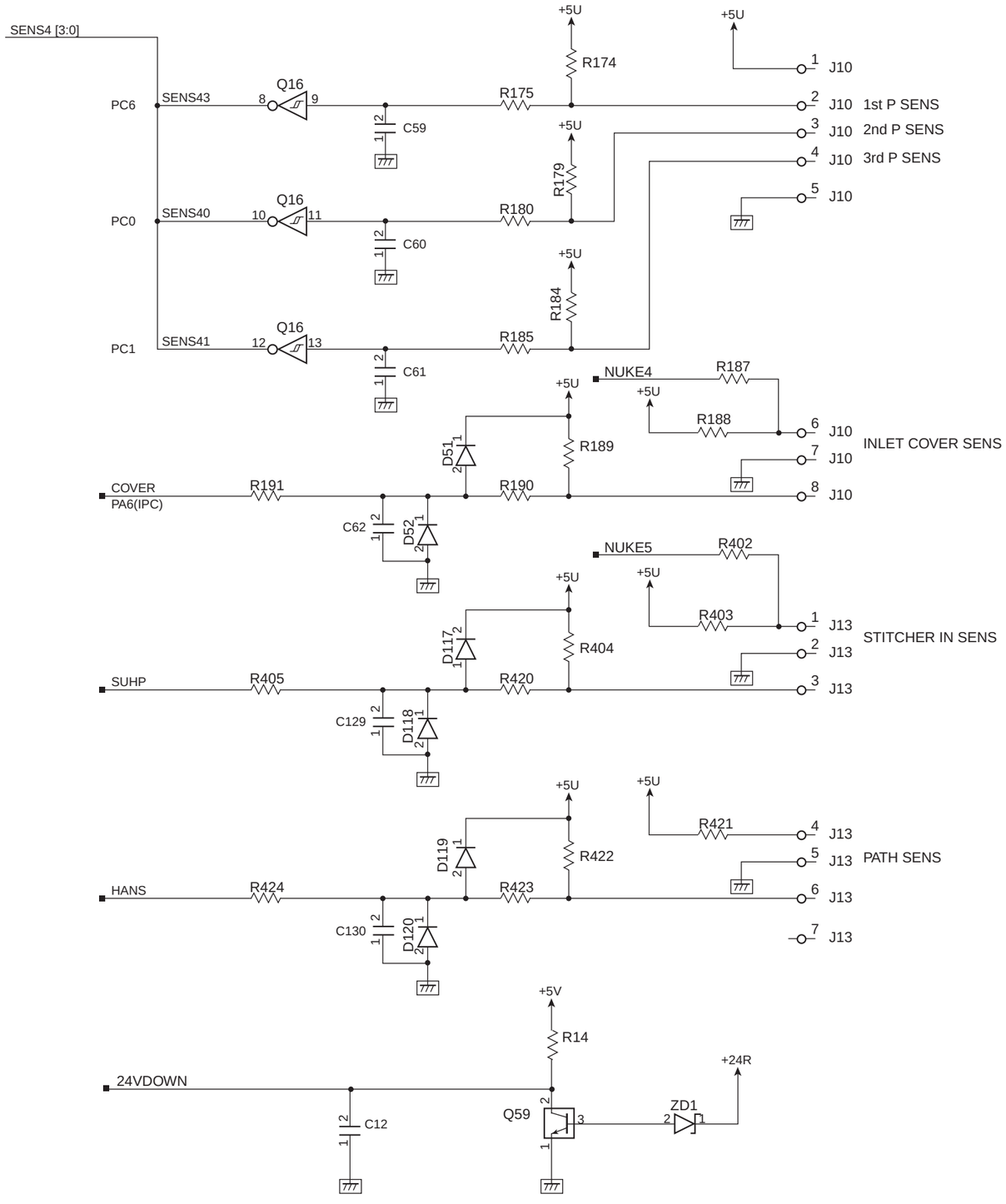

STPLM[3:0]
D0
STPLM0
D1
STPLM1
D2
STPLM2
D3
STPLM3
+5V
R65
R70
R81
R86
Q168
C31
C33
C35
C37
R68
R69
R74
R73
R84
R85
R89
R90
Q11
Q38
Q39
Q44
Q45
R75
R76
R79
R80
R91
R92
R95
R96
CP4
CP3
HARI-KEN0
HARI-KEN1
R329
R335
C113
C115
Q108
C139
C140
C114
C116
C126
R330
R331
R332
R333
R336
R337
R338
R339
24S<502>
C150
C151
C154
C155
ICP8
ICP9
R77
R78
R93
R94
Q34
Q35
Q36
Q37
Q40
Q41
Q42
Q43
STITCHER MTR (R)
STITCHER MTR (F)
14 J8
13 J8
12 J8
11 J8
7 J8
6 J8
5 J8
4 J8
STPLHPS[1:0]
HOOK[1:0]
STPLHPS0
STPLHPS1
HOOKS0
HOOKS1
Q17
+5U
R97
R98
R100
R101
R102
R103
R104
R106
R107
R108
C38
C39
C40
C41
D10
D11
D14
D15
STAPLE H.P2
10 J8
9 J8
HOOK SENS2
8 J8
STAPLE H.P1
3 J8
2 J8
HOOK SENS1
1 J8

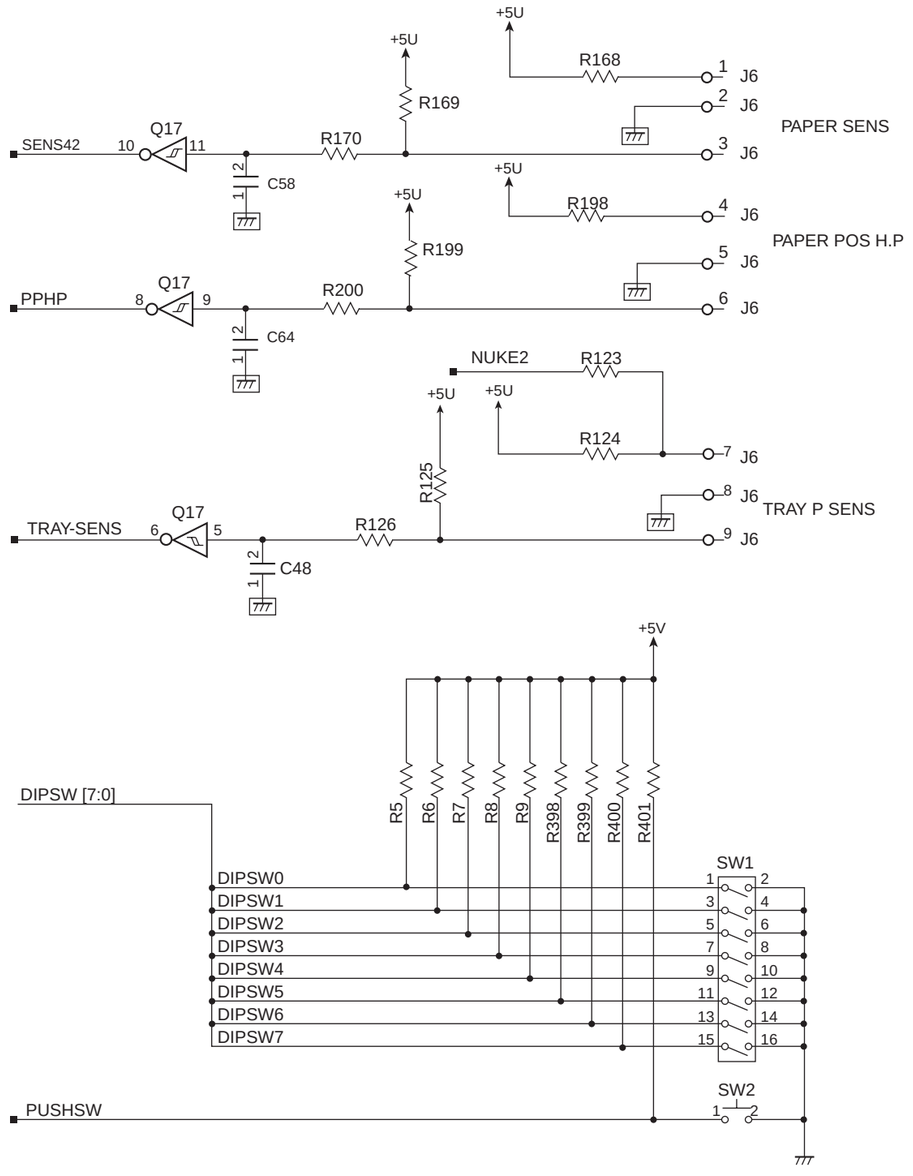
1. Saddle Stitcher Unit PCB (A504)



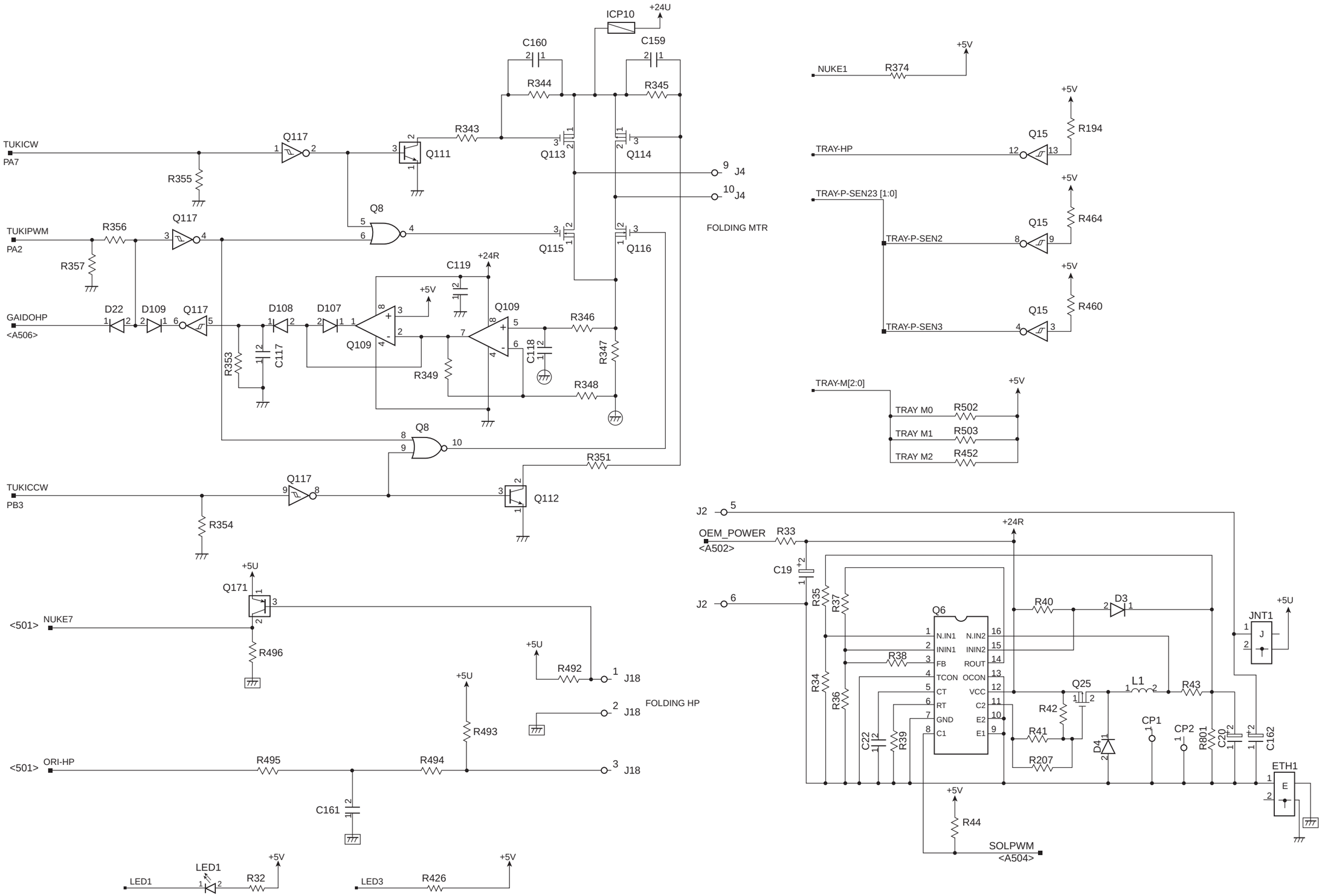

EJCT-SENS
Q16
R131
C49
R130
R129
DELIVERY SENS
CRESCENT
R136
C50
R135
R134
CRESCENT SENS
GUIDEHP0
GUIDEHP1
Q58
Q16
R141
C51
R140
NUKE3
R128
R139
GUIDE H.P
GUIDEM[2:0]
PB4
GUIDEM0
PB6
GUIDEM2
PB5
GUIDEM1
Q106
R321
R322
R323
R324
C110
C111
C112
R325
R326
R327
Q105
R320
R319
C109
ICP4
+24V
GUIDE MTR
J12 B*
J12 A*
J12 A
J12 A
SENS51
R153
C54
D36
R152
D35
R151
Q151
PULLOUTS41
R411
R150
PUSHING H.P
R208
NUKE6
R408
PUSHING TOP S
ORITOP
Q17
C79
R210
R209
PULLOUTS4[3:0]
Q150
PULLOUTS40
R410
R145
ALIGNMENT H.P
Q15
C53
R147
R146
FOLDING CLK
R156
C55
D38
R155
D37
R154
Q152
PULLOUTS42
R412
R158
DELIVERY COVER
DOORSENS0
R161
C56
D40
R160
D39
R159
Q153
PULLOUTS43
R413
163
FRONT DOOR
DOORSENS1
R166
C57
D42
R165
R164
TUKI-CLK
R365
C125
R366
R367
TUKI CLK SENS
+5U
+5V

1. Saddle Stitcher Unit PCB (A506)





1. Saddle Stitcher Unit PCB (A507)



F. SOLVENTS AND OILS

No.	Name	Description	Composition	Remarks
1	Cleaner	Cleaning: e.g., glass, plastic, rubber parts, external covers	Hydrocarbon (fluorine family) Alcohol Surface activating agent Water	· Do not bring near fire. · Procure locally. · Isopropyl alcohol may be substituted.
2	Lubricant	Drive, friction parts, lead cam	Silicone oil	

TOSHIBA

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1-1, KANDA NISHIKI-CHO, CHIYODA-KU, TOKYO, 101-8442, JAPAN