CX1145 Finisher Maintenance Manual

042409A

1 Symbols Used

This documentation uses the following symbols to indicate special information:

Symbol	Description
	Indicates an item of a non-specific nature, possibly classified as Note, Caution, or Warning.
	Indicates an item requiring care to avoid electric shocks.
	Indicates an item requiring care to avoid combustion (fire).
	Indicates an item prohibiting disassembly to avoid electric shocks or problems.
	Indicates an item requiring disconnection of the power plug from the electric outlet.

2 Outline of the Manual

This Service Manual contains basic facts and figures needed to service the Finisher/Saddle Finisher in the field, and it consists of the following chapters:

Chapter 1	General Description:	features, specifications
Chapter 2	Finisher Unit Outline of Operation:	mechanical systems by function, electrical systems in reference to principles of operation, timing of operation; construction and outline of electrical circuitry
Chapter 3	Saddle Stitcher Unit Outline of Operation:	mechanical systems by function, electrical systems in reference to principles of operation, timing of operation; construction and outline of electrical circuitry
Chapter 4	Puncher Unit (Option) Outline of Operation:	mechanical systems by function, electrical systems in reference to principles of operation, timing of operation; construction and outline of electrical circuitry
Chapter 5	Bridge Kit (Option):	basic operation, disassembly and adjustment, maintenance
Chapter 6	Mechanical Systems:	construction of mechanical systems; disassembly, assembly, and adjustments
Chapter 7	Maintenance and Inspection:	periodically replacement parts, durables and consumables; scheduled servicing chart
Chapter 8	Troubleshooting:	standards, adjustments, troubleshooting tables
Appendix:		general timing chart, list of signals/abbreviations, general circuit diagrams, etc

For installation, refer to the Installation Procedure found in the shipping box; this manual omits descriptions of the installation work.

The descriptions in this Service Manual are based on he following rules:

1. In each chapter, the uses of the function in question and its relationship to electrical and mechanical systems are discussed and the timing of operation of its associated parts is explained by means of outlines and diagrams.
   In the diagrams, the symbol ▮▮▮ represents a mechanical path, while the symbol ⟶ with a name next to it indicates the flow of an electric signal.
   The expression “turn on the power” means turning on the power switch, closing the front door, and closing the delivery door so that the machine will be supplied with power.
2. In circuit diagrams (digital), a signal whose level is High is expressed as being ‘1’, while a single whose level is Low is expressed as being ‘0’; the level of voltage, however, varies from circuit to circuit.
   The machine uses CPUs, whose internal mechanisms cannot be checked in the field, and, therefore, are not explained. In addition, the machine’s PCBs are not intended for repairs at the user’s and, therefore, are explained by means of block diagrams: two types are used, i.e., between sensors and inputs of PCBs equipped with a control or drive function and between outputs equipped with a control or drive function and loads; in addition, functional block diagrams are used at times.

Changes made to the machine for product improvement are communicated in the form of a Service Information bulletin as needed. All service persons are expected to go through all service documentation including the bulletins and be equipped to respond to the needs of the field (as by being able to identify possible causes of problems).

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CHAPTER 3 SADDLE STITCHER UNIT OUTLINE OF OPERATION

CHAPTER 4 PUNCHER UNIT (OPTION) OUTLINE OF OPERATION

CHAPTER 5 BRIDGE KIT (OPTION)BASIC OPERATION

CHAPTER 6 MECHANICAL SYSTEMS

CHAPTER 7 MAINTENANCE AND INSPECTION

CHAPTER 8 TROUBLESHOOTING

APPENDIX

CHAPTER 1

GENERAL DESCRIPTION

1 Features

a. Use of straight buffering*1

Use of straight buffering (rear copy edge restraining type at straight path) enables the Finisher/Saddle Finisher to continuously receive copy from the host machine during stapling or offset operation.

b. Use of simultaneous stack delivery/ejection*1

Conventional models delivered buffered copy stack to the processing tray after ejecting copy stack to the delivery tray. This Finisher/Saddle Finisher can simultaneously eject copy stack to the delivery tray while delivering copy stack from the processing tray and continuously receive copy from the host machine during stapling or offset operation thus increasing productivity.

c. Use of full front processing mechanism

Installation space is reduced with the use of full front processing mechanism (placing jam handling mechanism on top and front side enables processing without separating from the host machine).

d. Increased stacking capacity

Capable of stacking up to 147 mm of small size paper (equivalent to 1000 sheets) or 73.5 mm of large size paper (equivalent to 500 sheets) on upper and lower trays. (Basis weight 80 g/m^2)

e. Wide range of delivery capability

Capable of handling paper basis weight from 60 to 256 g/m^2.

f. Three different auto stapling functions

There are three different stapling positions (Front 1-point stapling (30 deg./45 deg.), Rear 1-point stapling (30 deg./45 deg.), 2-point center stapling)

g. Saddle stitch function (Saddle Finisher)

Capable of ejecting up to 15 sheets center stapled and center folded. (Basis weight 80 g/m^2)

h. Punch function (optional)

Capable of ejecting copy with binding holes punched with the use of Puncher Unit. (possible with 60 to 256g/m^2 paper, not possible with reproducibles or transparencies)

* Available only when sort/staple sort/group sort is set for A4, B5, or LT paper.

2 Specifications

2.1 Specifications

2.1.1 Finisher Unit

Item	Specification	Remarks
Stacking method	Trays 1 and 2: by lifting tray	
Stacking orientation	Face down	
Stacking size	A3, A4, A4-R, A5-R, B4, B5, B5-R, LD, LG, LT, LT-R, ST-R, FOLIO, COMPUTER	
Basis weight	60 g/m^2 to 256 g/m^2 (16 lb. Bond to 140 lb. Index)	
Bins	Trays 1 and 2	
Modes	Non sort: Trays 1 and 2	
	Sort: Trays 1 and 2	
	Staple: Trays 1 and 2	
Stacking capacity	Tray 1: Non staple sort	
	Large size: 500 sheets (73.5 mm)	Equivalent of 80 g/m^2 (21.3 lb. Bond) paper.
	Small size: 1,000 sheets (147 mm)	
	Tray 2: Non staple sort	
	Large size: 500 sheets (73.5 mm)	
	Small size: 1,000 sheets (147 mm)	
	Tray 1: Staple sort	
	Large size: 500 sheets/30 sets/73.5 mm	Whichever the stack reaches first.
	Small size: 1,000 sheets/30 sets/147 mm	Whichever the stack reaches first.
	Tray 2: Staple sort	
	Large size: 500 sheets/30 sets/73.5 mm	Whichever the stack reaches first.
	Small size: 1,000 sheets/30 sets/147 mm	Whichever the stack reaches first.
Mixed stacking capacity	Size mixing: 500 sheets (73.5 mm)	
	Stapling: 500 sheets/30 sets/73.5 mm	Whichever the stack reaches first.
Stapling	By rotating cam	
Stapling position	See Figure F01-201-01	
Stapling capacity	MJ-1024	
	Small size: 50 sheets, Large size: 30 sheets	Equivalent of 80 g/m^2 (21.3 lb. Bond) paper.
	Small size: 30 sheets, Large size: 15 sheets	Equivalent of 90 g/m^2 (24 lb. Bond) paper.
	Small size: 30 sheets, Large size: 15 sheets	Equivalent of 105 g/m^2 (28 lb. Bond) paper.

Item	Specification	Remarks
Staple supply	Special staple cartridge (5000 staples)	
Staples	Special (STAPLE-2000 : 3 cartridges of 5000 staples in a package)	
Staple detection	Provided	
Manual stapling	Not provided	
Stapling size	Front 1-point stapling (30 deg.) A4-R, LG, LT-R, FOLIO Front 1-point stapling (45 deg.) A3, B4, A4, B5, LD, LT, COMPUTER Rear 1-point stapling (30 deg.) A4-R, LG, LT-R, FOLIO Rear 1-point stapling (45 deg.) A3, B4, A4, B5, LD, LT, COMPUTER 2-point stapling A3, B4, A4, B5, LD, LT, FOLIO, COMUTER, A4-R, LT-R, LG	
Paper detection	Provided	
Control panel	Not provided	
Display	Not provided	
Dimensions	Finisher: 536 (649) x 657 x 1086 mm (W (tray extended) x D x H) Saddle Finisher: 649 (762) x 657 x 1086 mm (W (tray extended) x D x H)	
Weight	Finisher: Approx. 39 kg (86 lb.) Saddle Finisher: Approx. 70kg (154.32 lb.)	
Power supply	From host machine (24VDC, 5VDC)	
Maximum power consumption	170 W or less operating	

Note 1 : Stacking capacity is equivalent of 80 g/m^2 (21.3 lb. Bond) paper.
Note 2 : Alignment may not be correct if 750 or more small-size sheets are stacked.
Note 3 : Stacking capability is not guaranteed for mixed size stacking.
Note 4 : The term “small-size” stands for A4, A5-R, B5, LT, ST-R, while the term “large-size” stands for A3, B4, A4-R, B5-R, LD, LG, LT-R, FOLIO, COMPUTER.
Note 5 : Basis weight: Over 105g/m^2 (28 lb. Bond) cannot be stapled.
Note 6 : Grouping, sorting and stapling are not allowed for A5-R, B5-R and ST-R.

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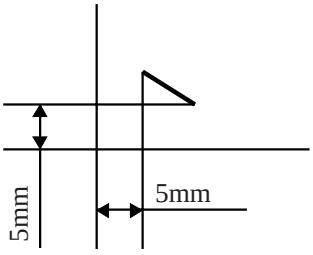
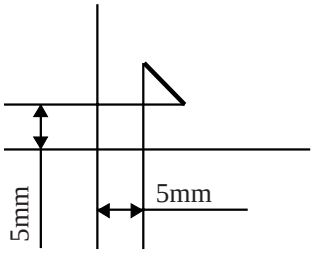
Stapling Positions (Finisher Unit)

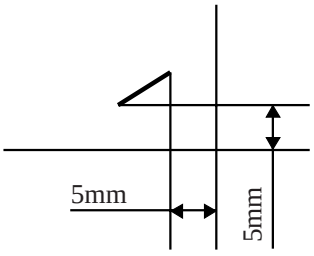
Front 1-point stapling (30deg.)
A4-R, LG, LT-R and FOLIO



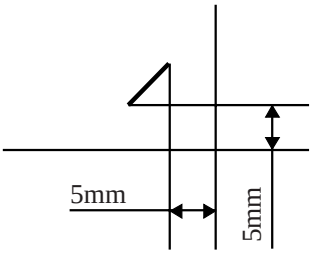
Front 1-point stapling (45deg.)
A3, B4, A4, B5,
LD, LT and COMPUTER



Rear 1-point stapling (30deg.)
A4-R, LG, LT-R and FOLIO



Rear 1-point stapling (45deg.)
A3, B4,A4,B5,
LD, LT and COMPUTER



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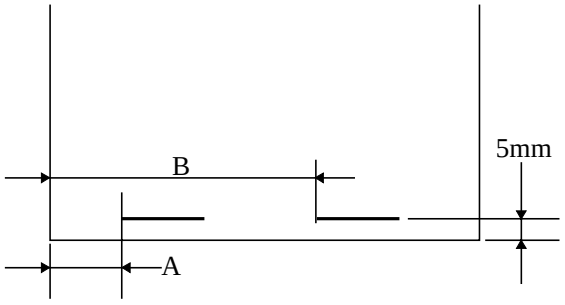
2-point stapling



unit : mm

Paper size	A	B
A3, A4	83	203
A4-R, FOLIO	39.5	159.5
B4, B5, COMPUTER	63	183
LD, LT	74	194
LT-R, LG	42.5	162.5

F01-201-02

2.1.2 Saddle Stitcher Unit

Item	Specification	Remarks
Stapling method	Center binding (double folding)	
Folding position	See Figure F01-201-02	
Paper size	A3, B4, A4-R, LD, LT-R	
Capacity	W/binding: 1 sheet W/out binding: 2 to 15 sheets	Including 1 cover page. Maximum is 1 sheet of 256 g/m^2 paper + 14 sheets of 80 g/m^2 paper.
Paper weight	60 g/m^2 to 256 g/m^2 (17 lb. Bond to 140 lb. Index)	Special paper, postcards, transparencies, reproducibles, label paper, or hole-punched paper cannot be handled
Stapling position	2 points (center distribution; fixed interval)	
Staple accommodation	2000 staples	
Staple supply	Special cartridge (3 cartridges of 2000 staples in a package)	
Staples	Special staple (STAPLE-600)	
Staple detection	Provided	
Manual stapling	Not provided	
Folding method	Roller contact	
Folding mode	Double folding	
Folding position	Paper center	
Position adjustment	Provided	
Power supply	From finisher unit (24 VDC, 5 VDC)	
Power consumption	170 W or less	

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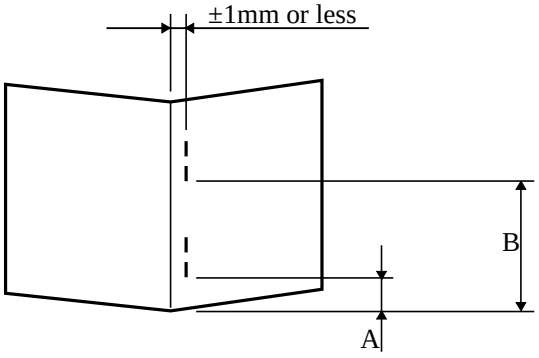
Staple and Folding Position (Saddle Finisher Unit)



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unit : mm

Paper size	A	B
A3	83.0	203.0
B4	63.0	183.0
A4-R	39.5	159.5
LD	74.0	194.0
LT-R	42.0	162.0

2.1.3 Puncher Unit (Option)

Item	Specification	Remarks
Punching method	Reciprocating punching (Sequential punching)	
Paper size	2 holes: A3, A4, A4-R, B4, B5, B5-R, FOLIO, LD, LG, LT-R, LT, COMPUTER 2 or 3 holes: 2 holes/LG, LT-R, A4-R 3 holes/LD, LT, A3, A4 4 holes: (F):A3, A4, LD, LT (S):A3, B4, A4-R, A4, B5-R, B5, FOLIO, LD, LG, LT-R, LT, COMPUTER	
Basis weight	60 g/m^2 to 256 g/m^2 (17 lb. Bond to 140 lb. Index)	Transparencies not allowed
Punched hole diameter	2 holes: 6.5 mm 2 or 3 holes: 8 mm 4 holes: 6.5 mm	
Punched scrap capacity	2 holes: 5,000 sheets or more 2 or 3 holes: 3,000 sheets or more 4 holes: 5,000 sheets or more	64 g/m^2 or equivalent
Dimensions	W 112 x D 502 x H 298 (940.5*) mm	*Including the lower cover
Weight	Approx. 9kg (19.84 lb.)	
Power supply	From finisher unit (24 VDC, 5 VDC)	
Power consumption	120 W or less operating	

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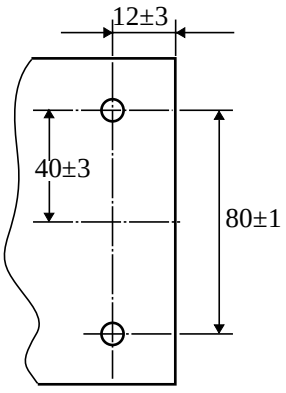
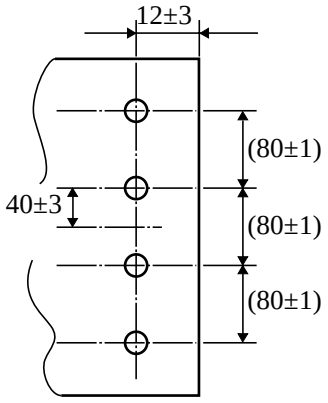
Hole position (Puncher Unit)

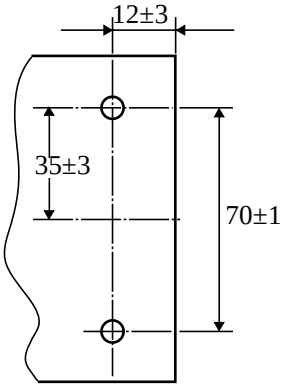
2-Hole(Φ6.5) : MJ-6004E



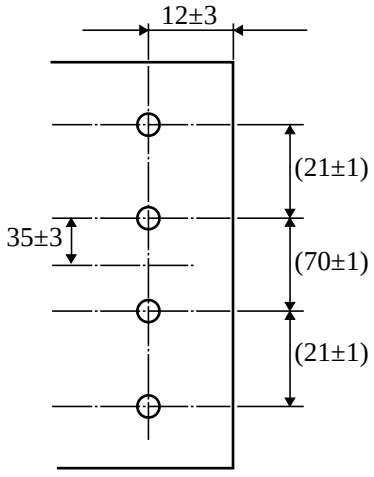
4-Hole(Φ6.5) : MJ-6004F



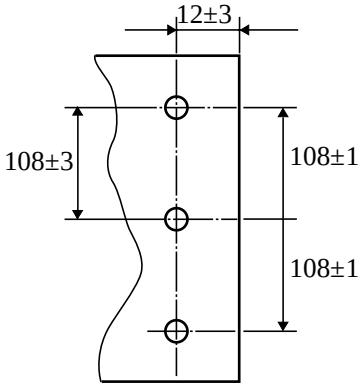
2-Hole(Φ8.0) : MJ-6004N



4-Hole(Φ6.5) : MJ-6004S



3-Hole(Φ8.0) : MJ-6004N



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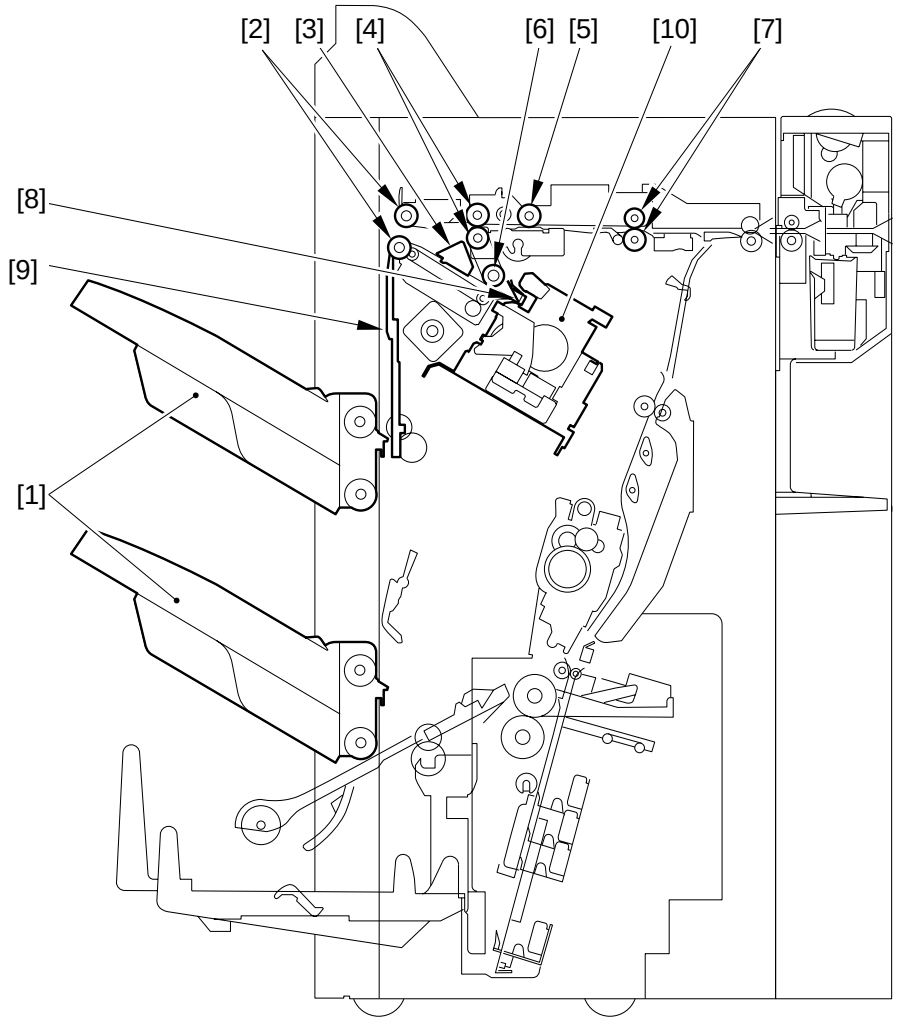
Specifications are subject to change without notice.

3 Names of Parts

3.1 Cross Section

3.1.1 Finisher Unit



[1] Delivery tray
[2] Stack ejection roller
[3] Aligning plate
[4] 1st delivery roller
[5] Buffer roller
[6] Return roller
[7] Inlet roller
[8] Rear end assist guide
[9] Shutter
[10] Stapler

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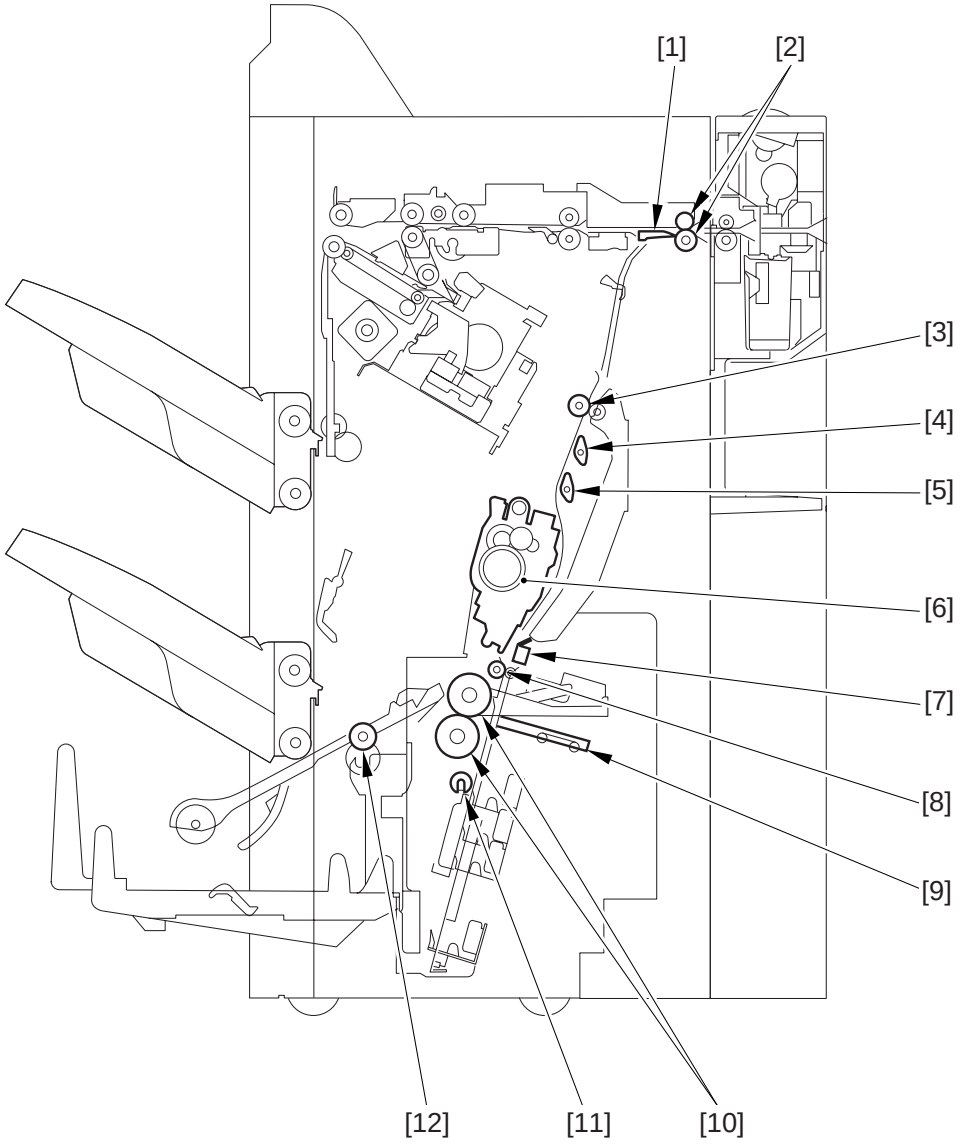
3.1.2 Saddle Stitcher Unit



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

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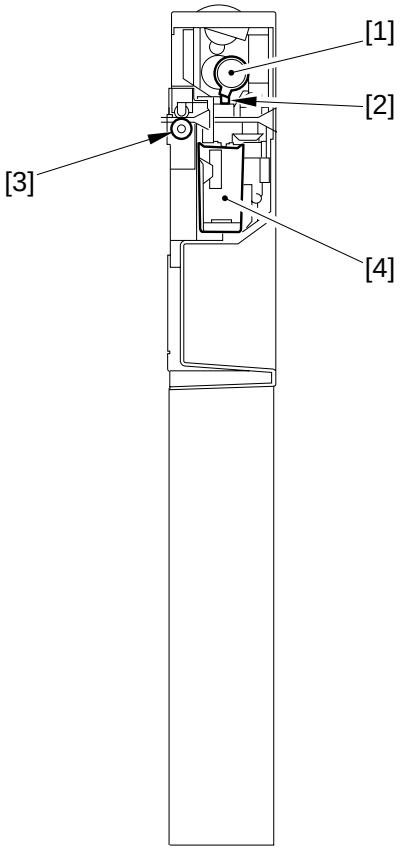
3.1.3 Puncher Unit (Option)



[1] Cam
[2] Hole puncher (Punch blade)
[3] Punch feed roller
[4] Punched scrap container

F01-301-03

4 Routine Maintenance by the User

No.	Item	Timing
1	Staple cartridge replacement (Finisher unit)	When prompted (indicator on host machine control panel)
2	Staple cartridge replacement (Saddle stitcher unit)	When prompted (indicator on host machine control panel)
3	Punched scrap removal (Puncher unit (option))	When prompted (indicator on host machine control panel)

T01-400-01

CHAPTER 2

FINISHER UNIT OUTLINE OF OPERATION

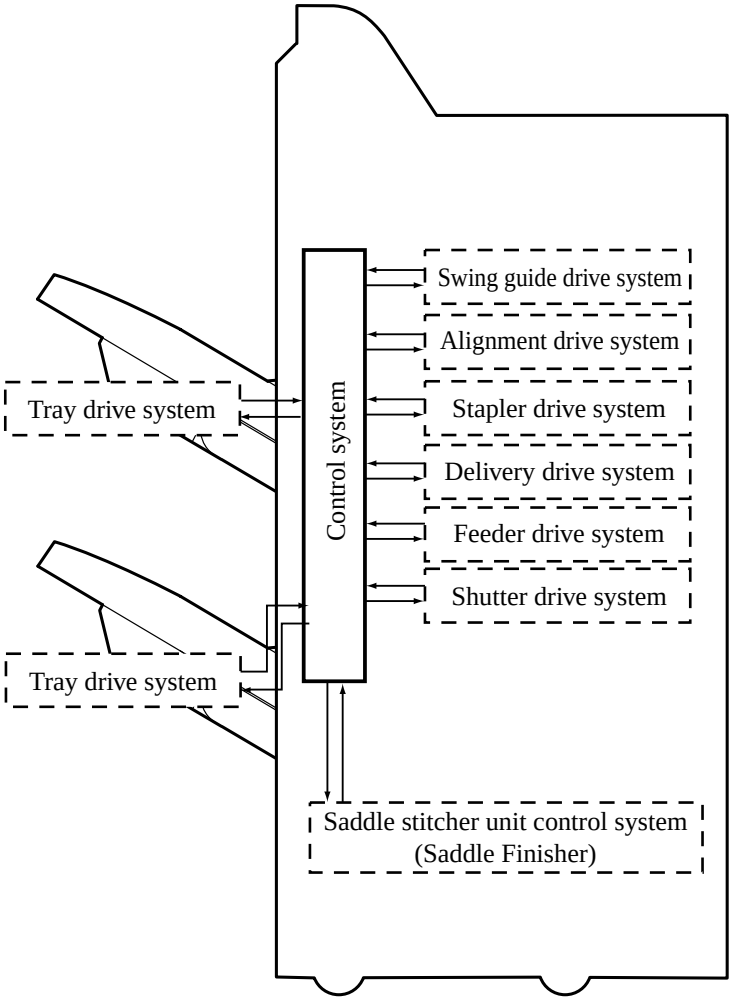
1 Basic Operations

1.1 Specifications

The finisher is designed to deliver sheets 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 Finisher, sheets from the host machine may be routed to the saddle stitcher unit.



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Note:

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

1.2 Outline of the 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.

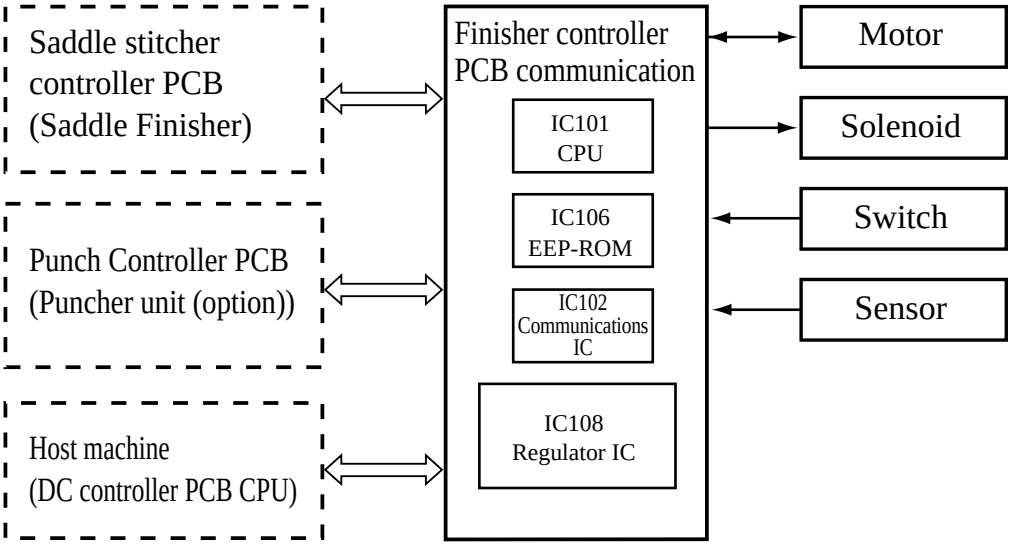
The finisher controller PCB responds to the various commands coming from the host machine through a serial communications line to drive solenoids, motors, and other loads. In addition, it communicates the finisher's various states (information on sensors and switches) to the host machine through a serial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

In the case of the Saddle Finisher, 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:

- IC101 (CPU)
  Controls sequence of operations.
  Contains sequence programs.
- IC106 (EP-ROM)
  Backs up adjustment values.
  Backs up initial setting data.
- IC102 (communications IC)
  Communicates with the host machine and the saddle stitcher unit.
- IC108 (regulator IC)
  Generates 3.3V.

F02-102-01 shows the flow of signals between the finisher and the options controller.


Saddle stitcher
controller PCB
(Saddle Finisher)
Punch Controller PCB
(Puncher unit (option))
Host machine
(DC controller PCB CPU)
Finisher controller
PCB communication
IC101
CPU
IC106
EEP-ROM
IC102
Communications
IC
IC108
Regulator IC
Motor
Solenoid
Switch
Sensor

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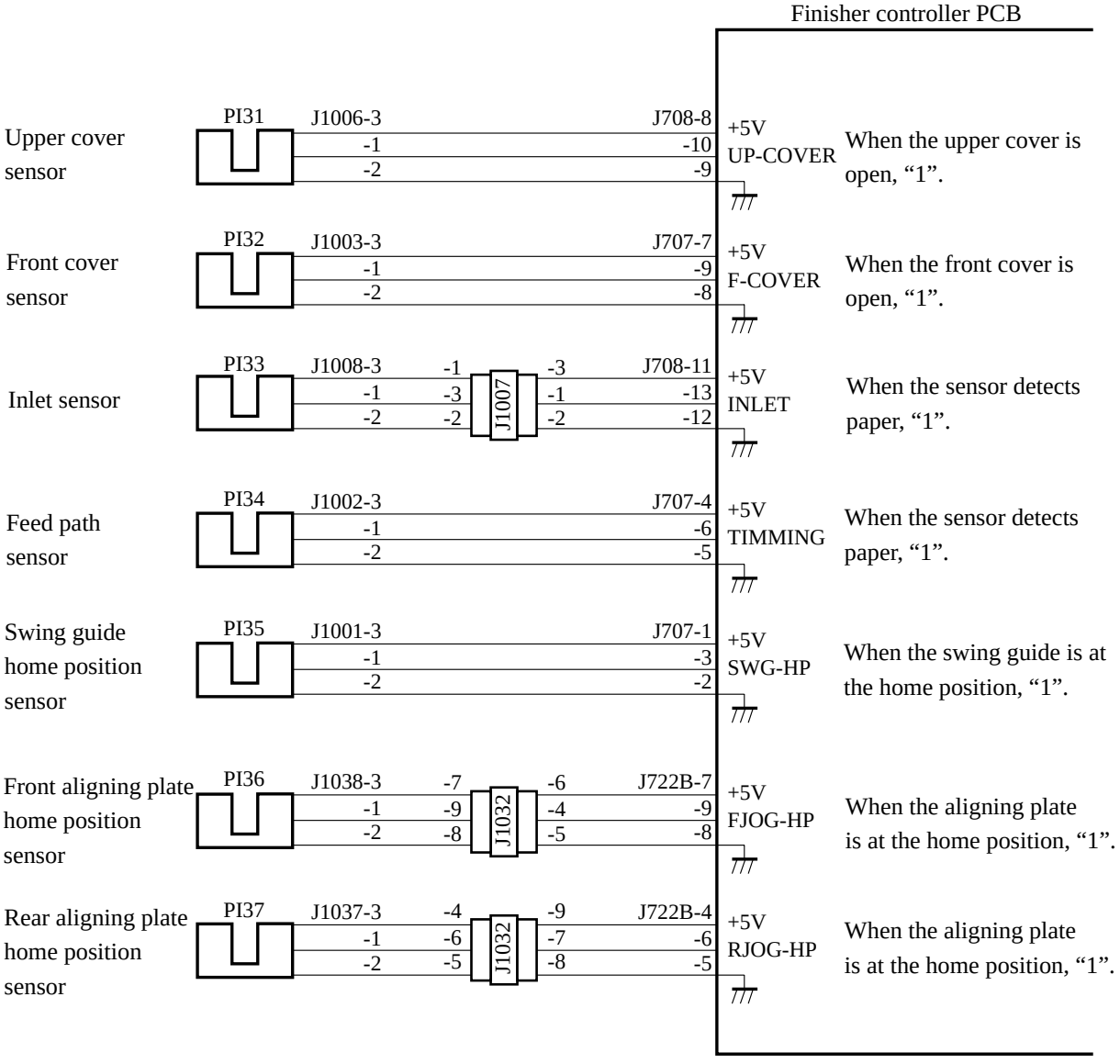
1.3 Inputs to and Outputs from the Finisher Controller PCB

1.3.1 Inputs to the Finisher Controller PCB (1/4)



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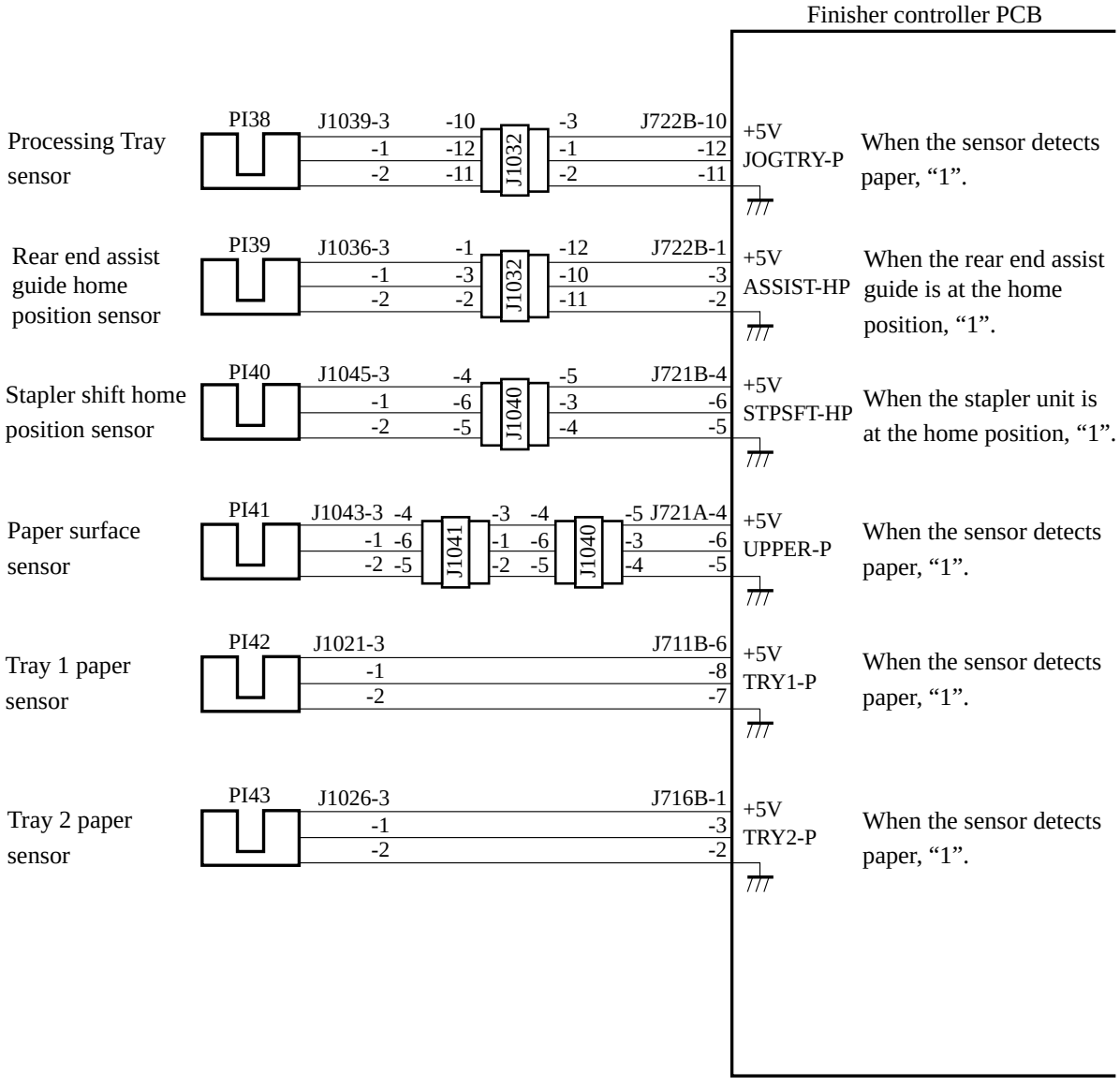
1.3.2 Inputs to the Finisher Controller PCB (2/4)



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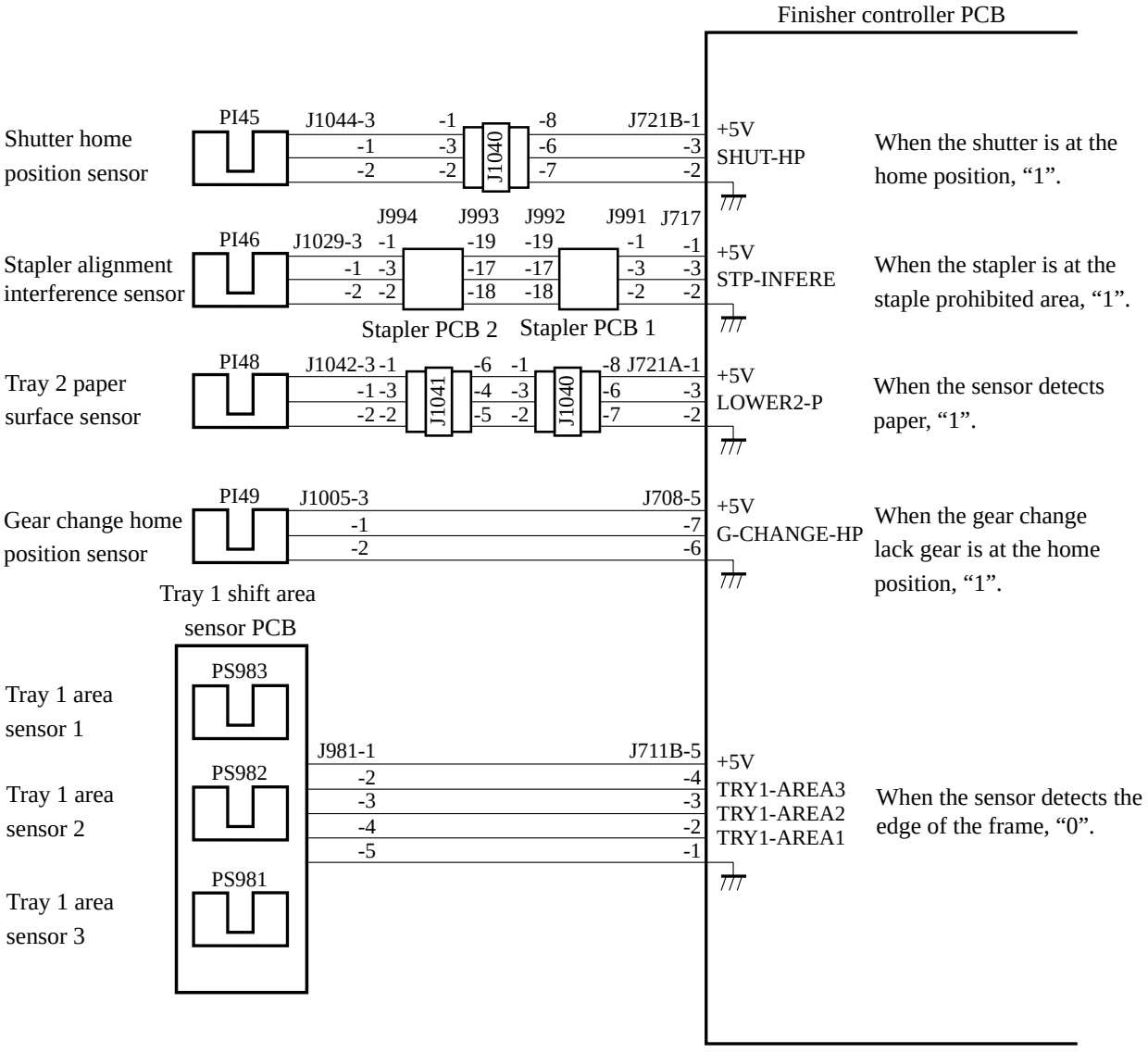
1.3.3 Inputs to the Finisher Controller PCB (3/4)



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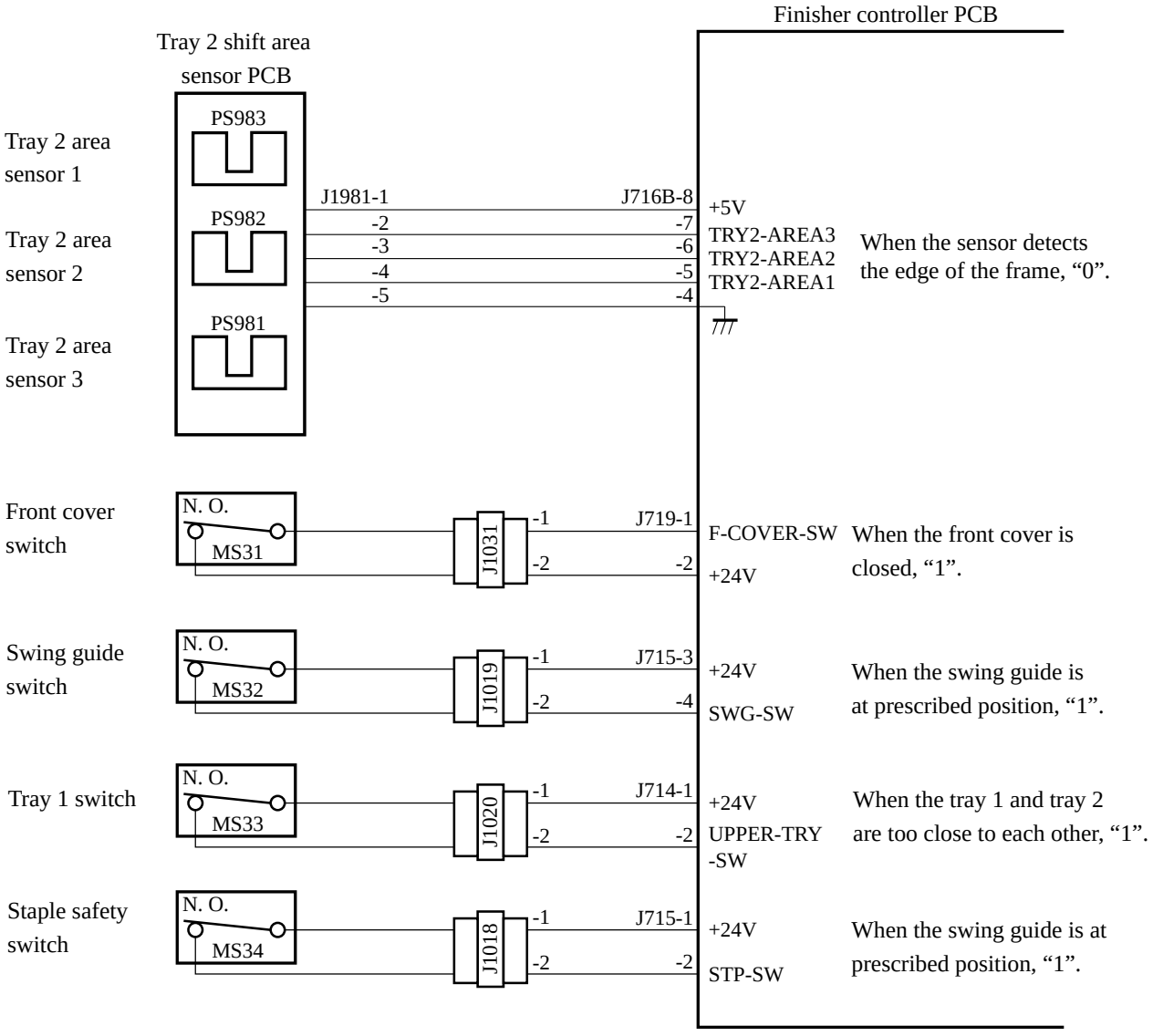
1.3.4 Inputs to the Finisher Controller PCB (4/4)



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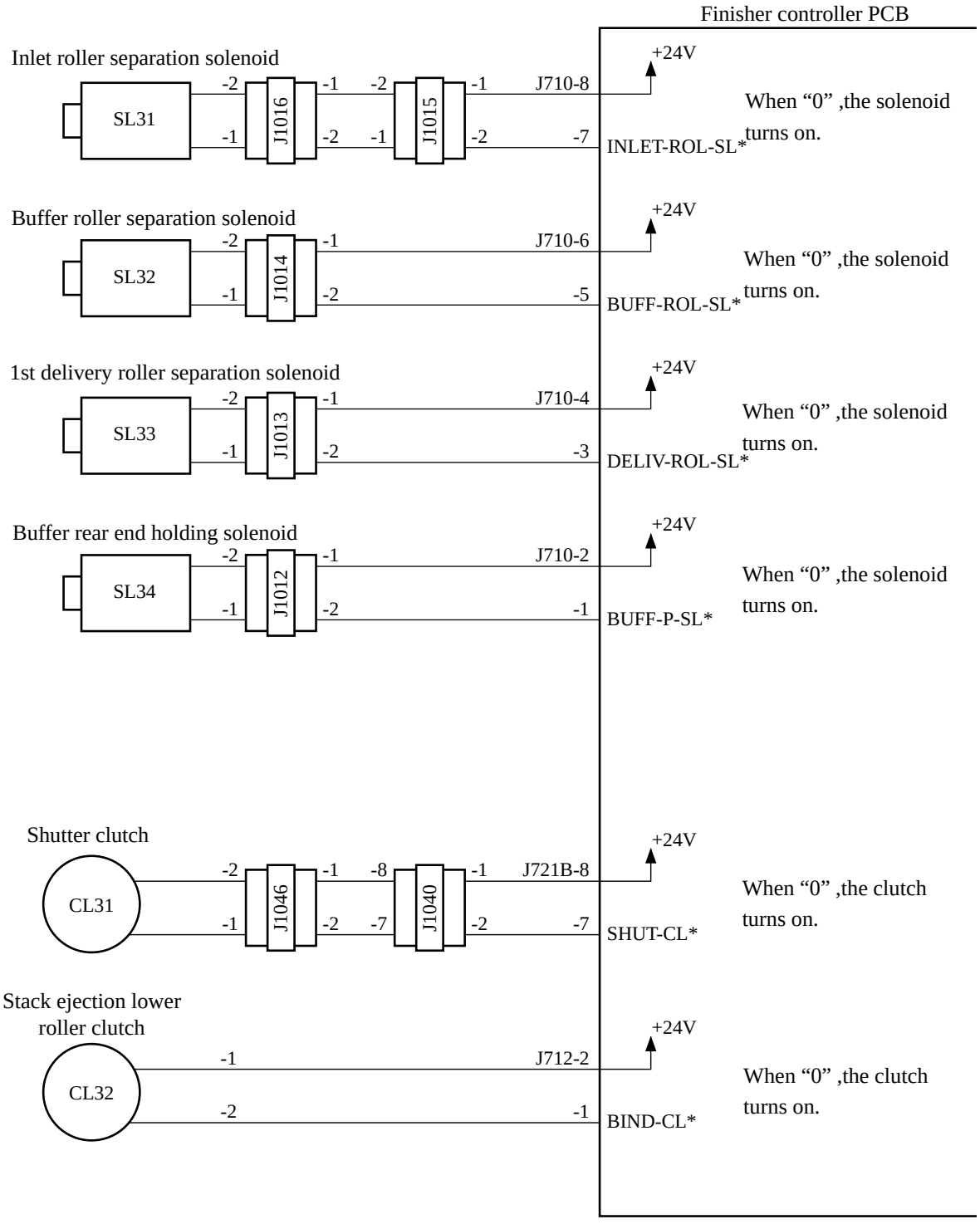
1.3.5 Outputs to the Finisher Controller PCB (1/2)



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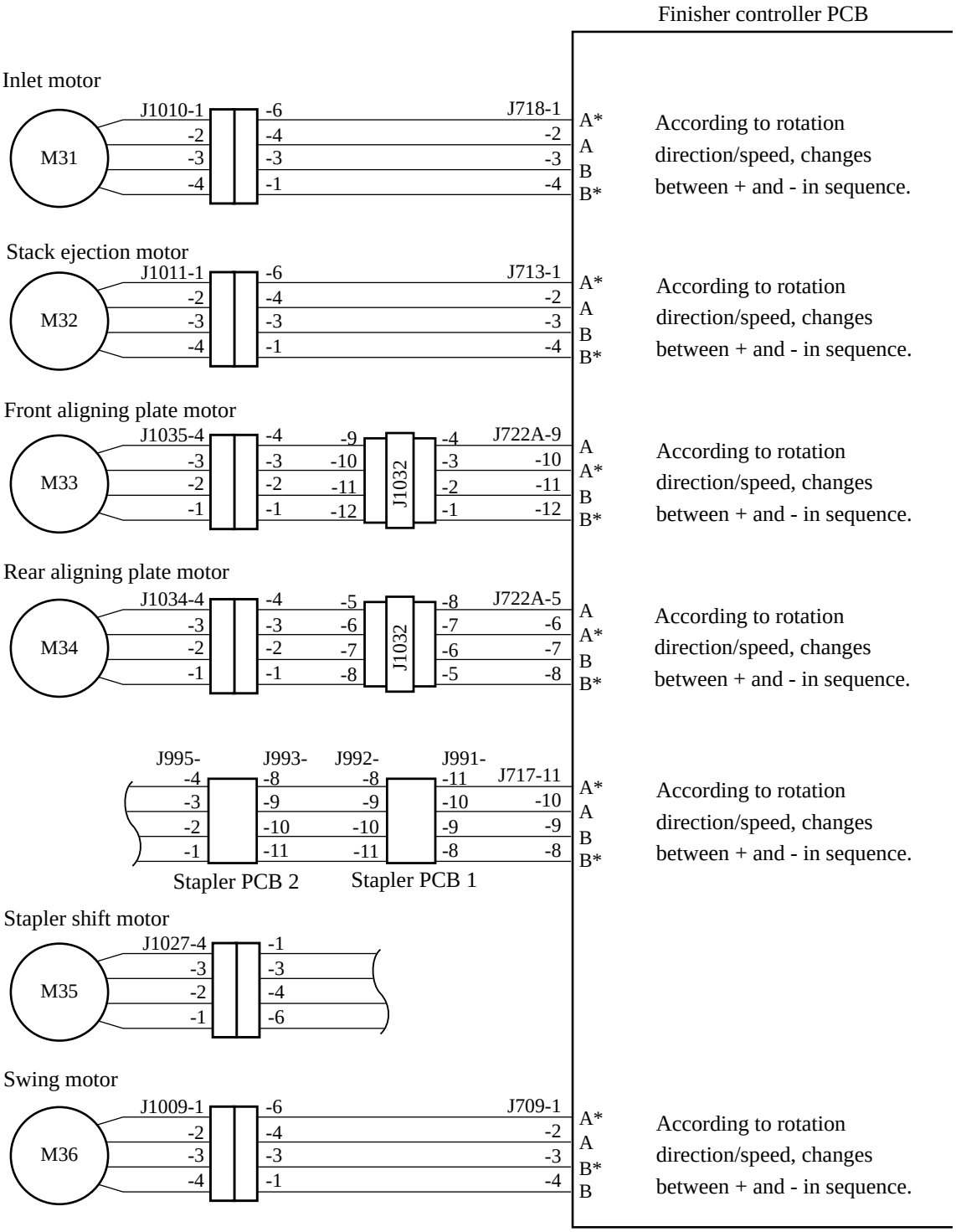
1.3.6 Outputs to the Finisher Controller PCB (2/2)



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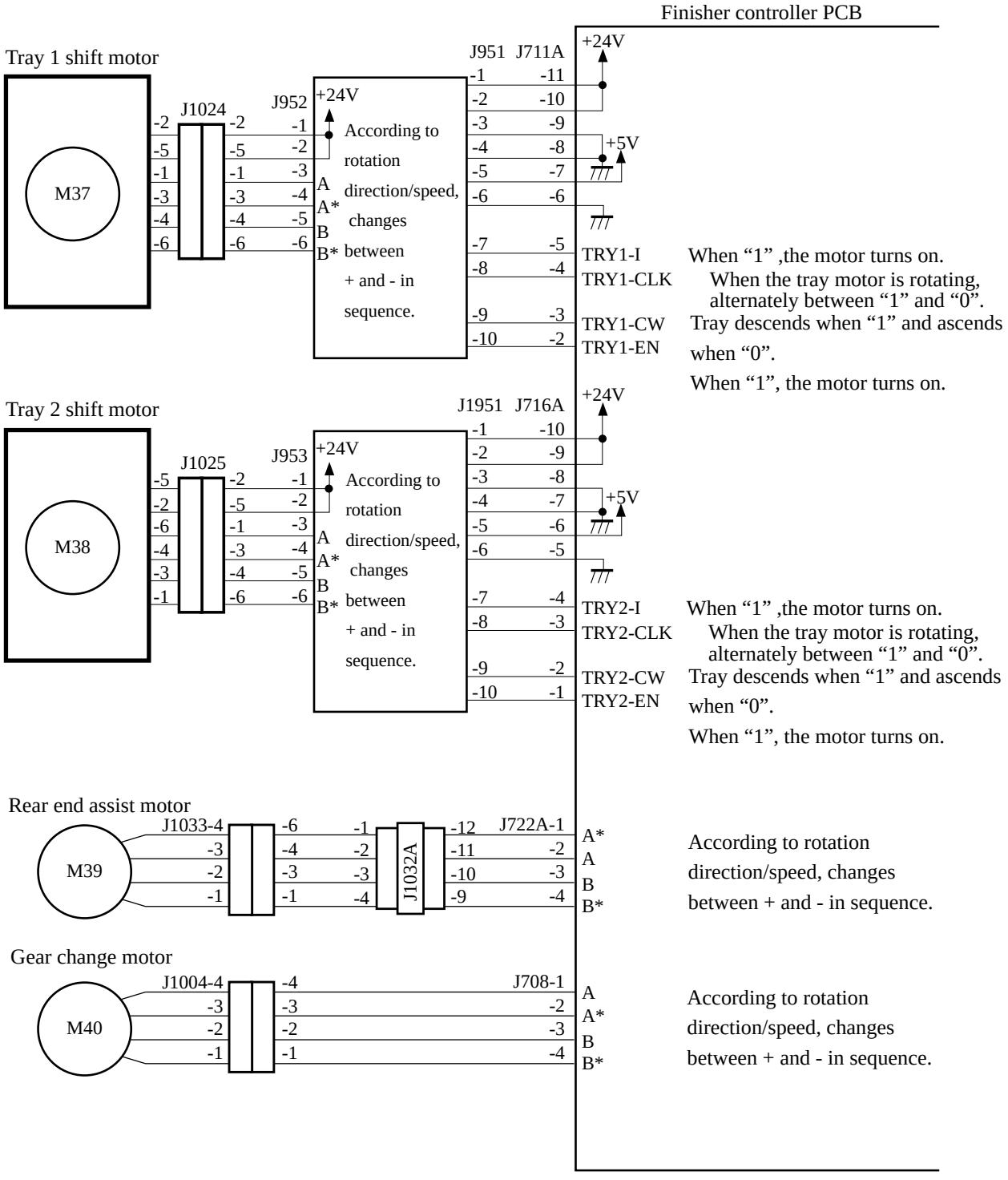
1.3.7 Inputs to and Outputs from the Finisher Controller PCB



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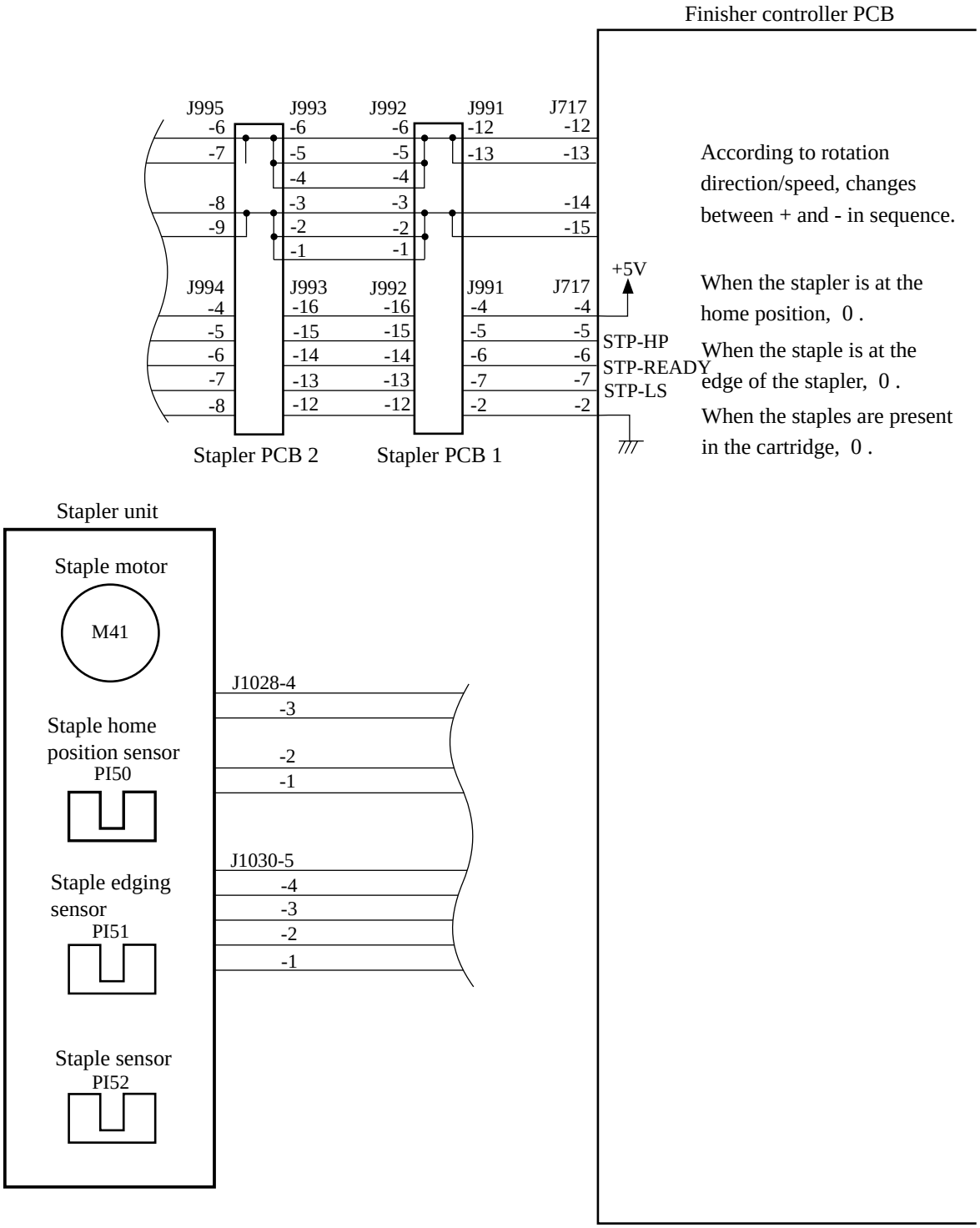
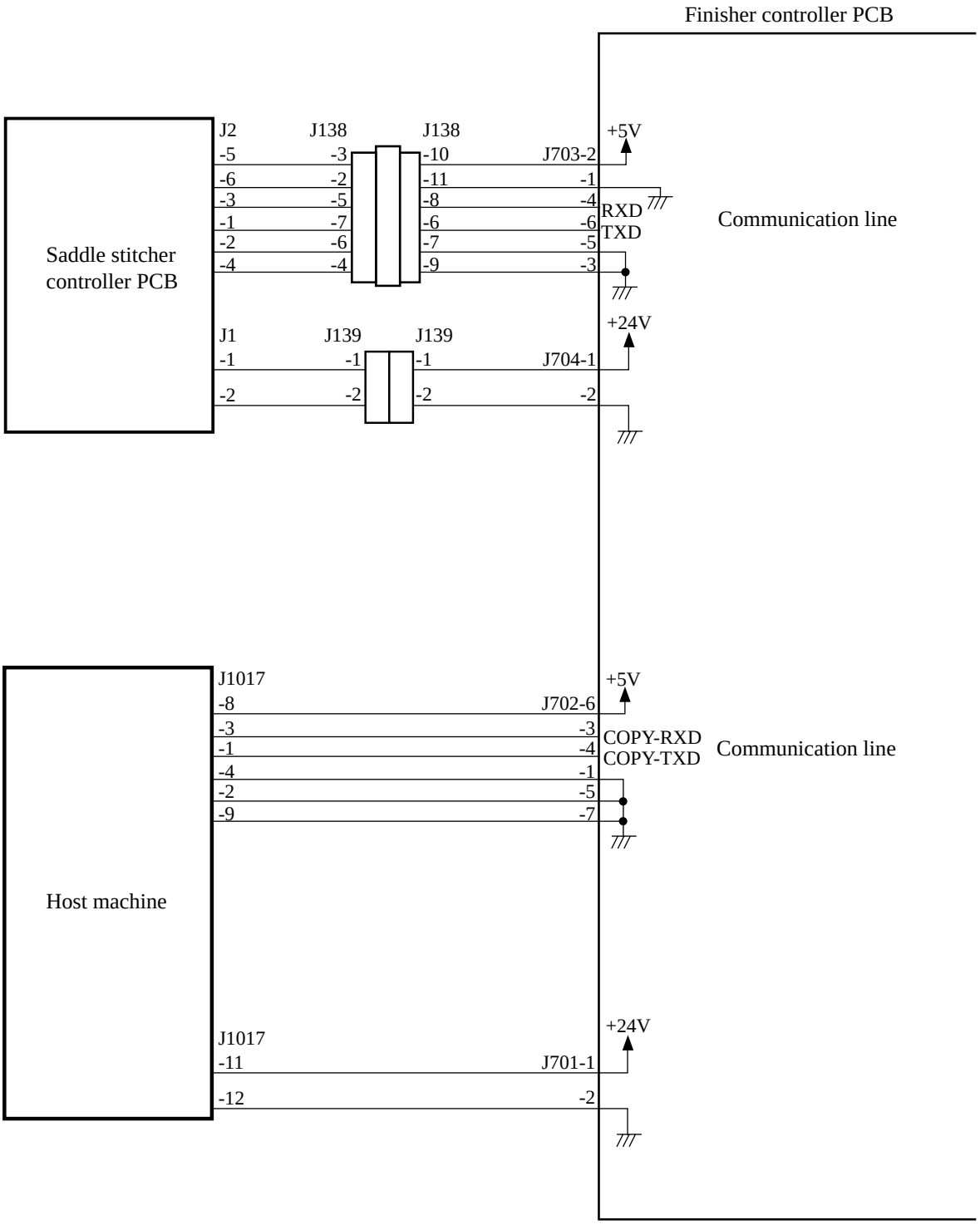
1.3.8 Inputs to and Outputs from the Finisher Controller PCB (1/2)



F02-103-08

1.3.9 Inputs to and Outputs from the Finisher Controller PCB (2/2)



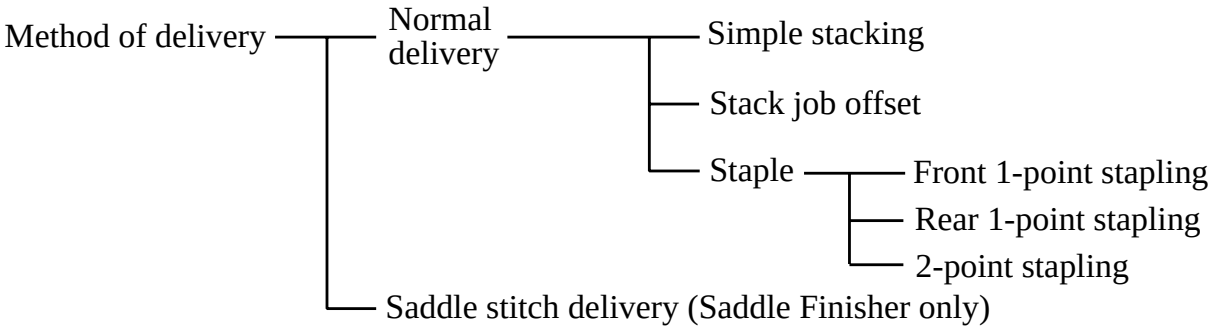
F02-103-09

2 Feed/Drive System

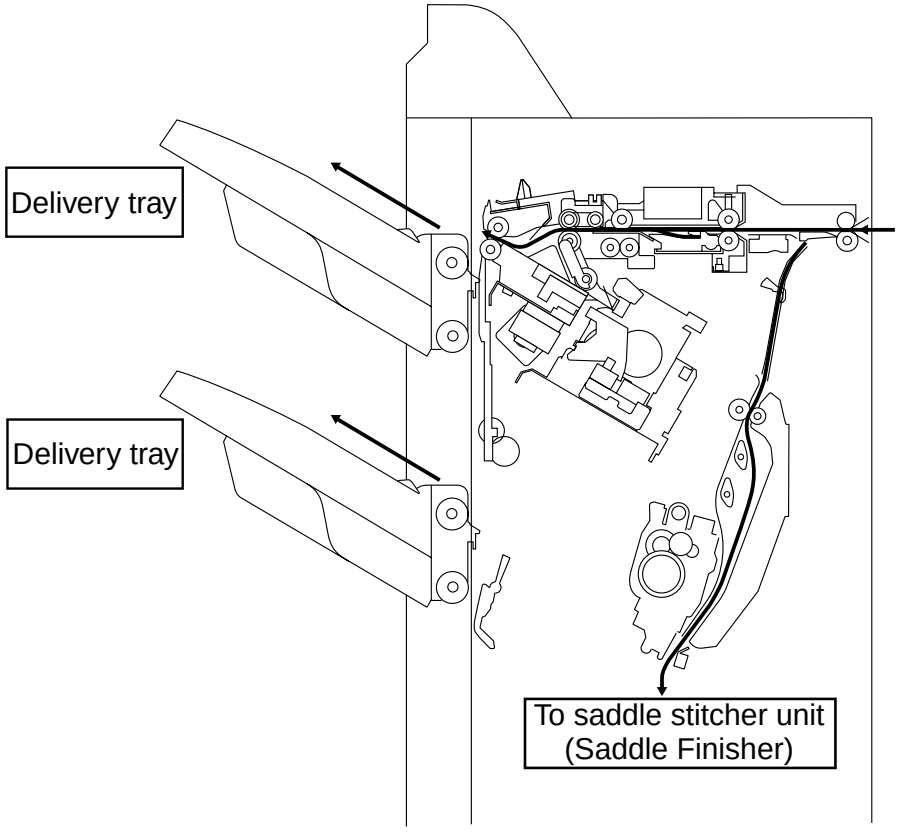
2.1 Outline

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

See F02-201-01 for a diagram of the three modes of delivery (four for the Saddle Finisher).



F02-201-01

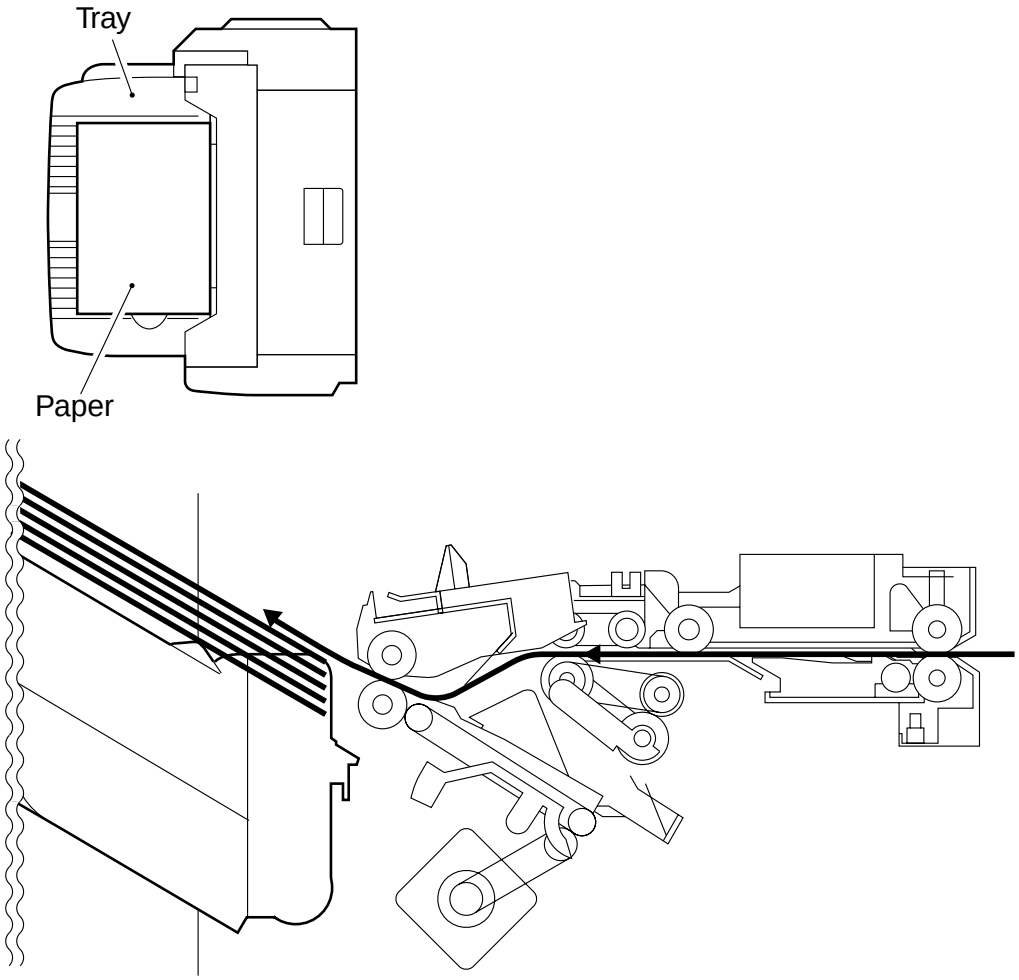


F02-201-02

2.1.1 Normal Delivery

a. Simple Stacking

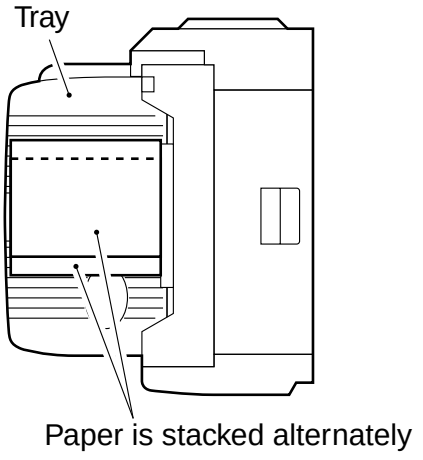
The finisher delivers copies directly to the delivery tray.



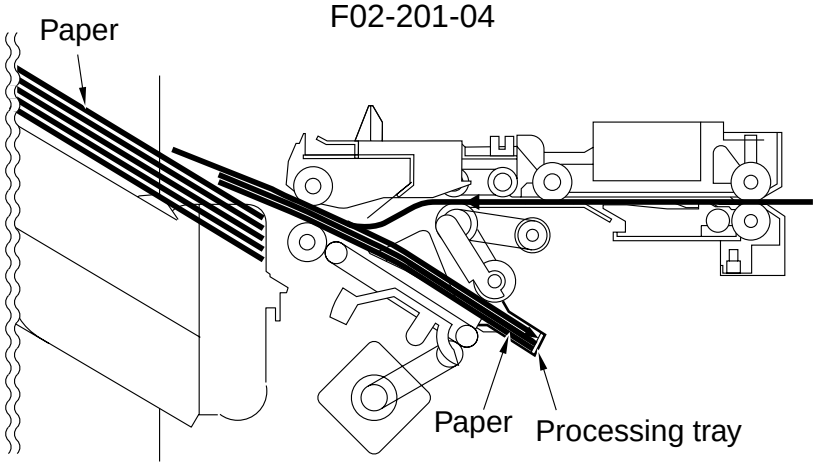
F02-201-03

b. Stack Job Offset

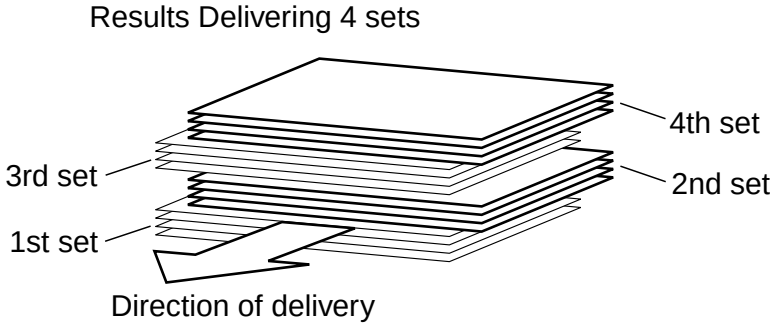
Before ejection, the sheet is first pulled into the processing tray. Then the sheet is aligned to the front or rear by the aligning plate. The stack ejected when the number of sheets in the processing tray reaches a certain amount.



F02-201-04



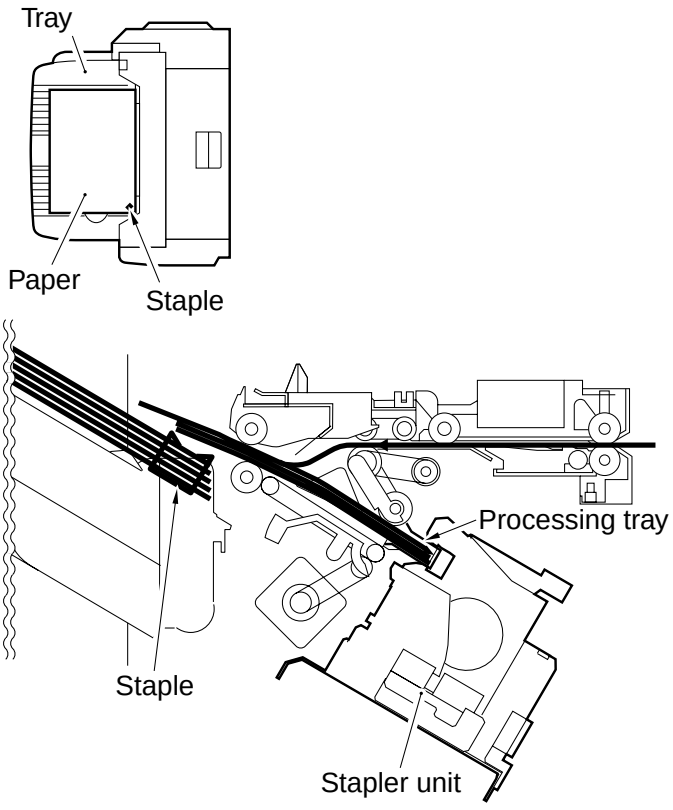
F02-201-05



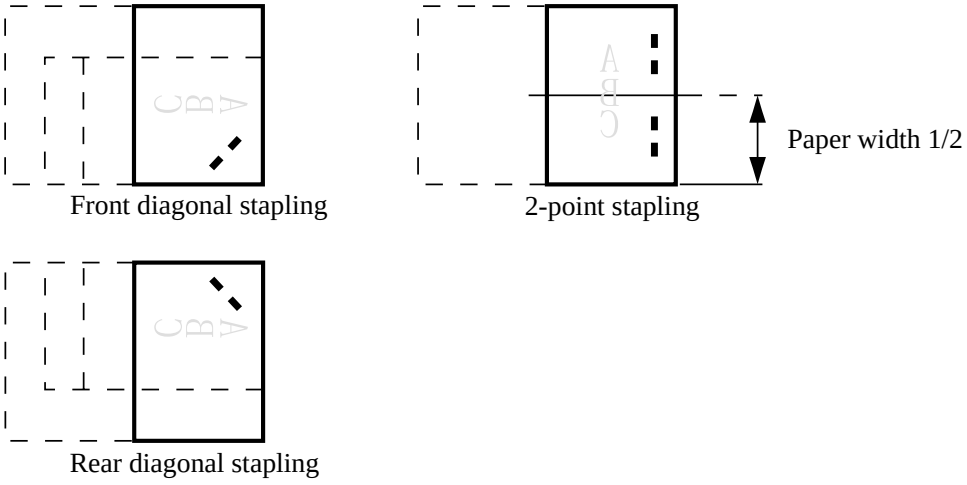
F02-201-06

c. Stapling

The finisher stacks sheets arriving from its host machine on the processing tray. Then, it staples and delivers the sheets to the delivery tray.



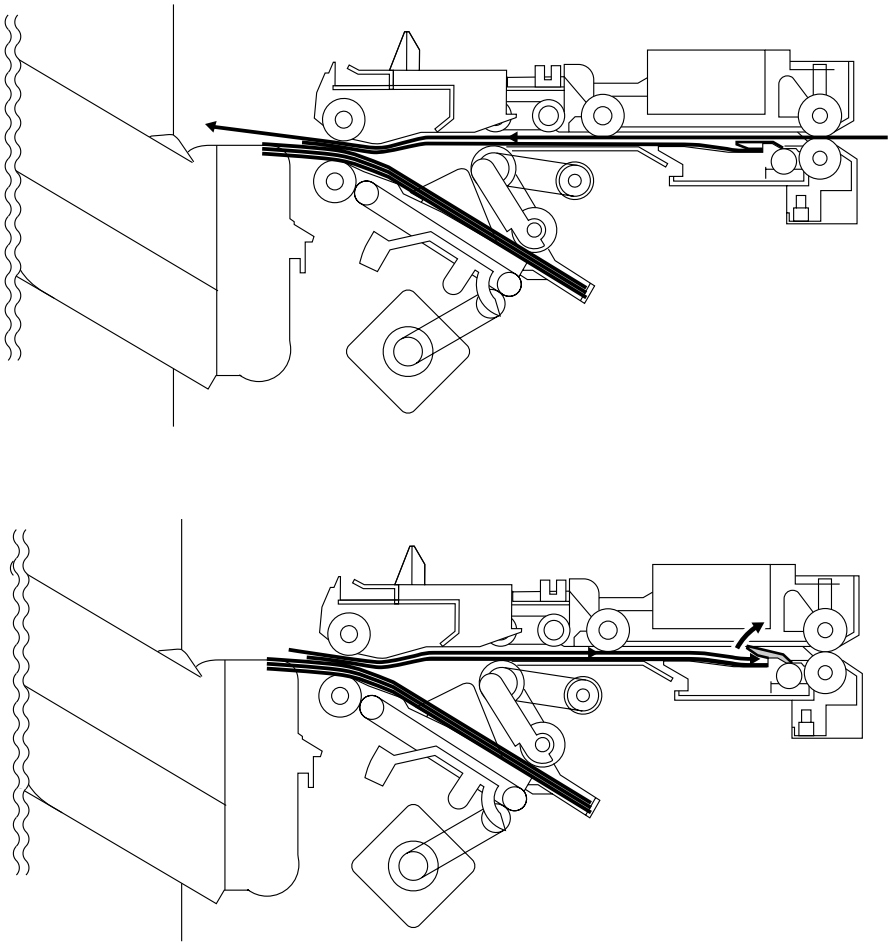
F02-201-07



F02-201-08

d. Buffering

This function is available when set to sort or staple sort for A4, B5, or LT size paper. Since sheet is received continuously from the host machine during print processing, buffering is performed to push and hold the rear end of the paper inside the delivery path. Buffering is performed by overlaying the first two sheets (three sheets for 2-point binding) between stacks, and job offset and stapling are performed in the processing tray during this time.

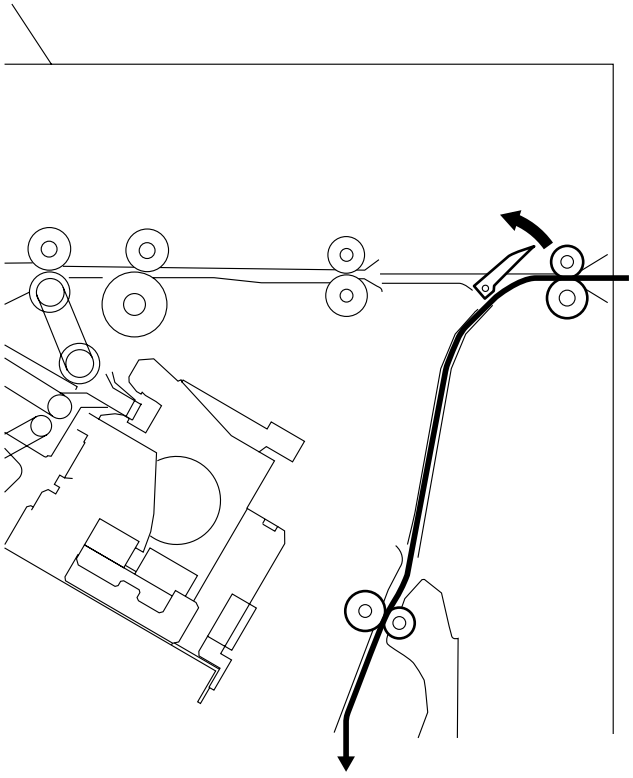


F02-201-09

2.1.2 Saddle Stitcher Delivery(Saddle Finisher)

A copy arriving in the finisher from the host machine is routed to the saddle stitcher by the saddle stitcher flapper. The saddle stitcher executes center binding and double folding operations on the sheets and then delivers it to the saddle stitcher tray.

For discussions of stacks in the saddle stitcher, see Chapter 3.



F02-201-10

2.2 Ejection Path Types

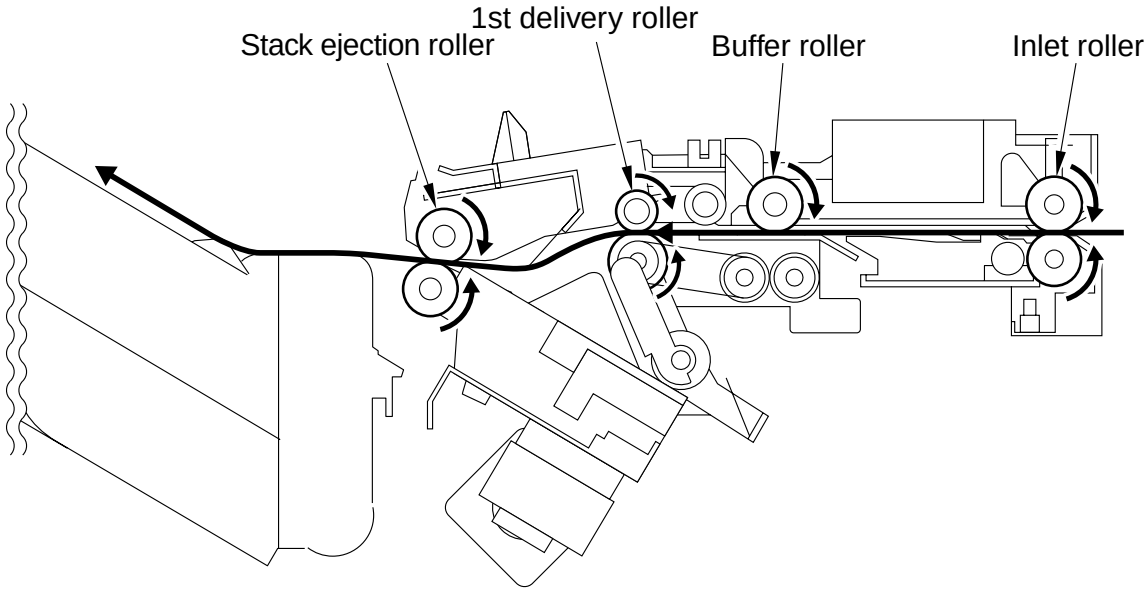
2.2.1 Outline

There are three ejection paths to tray 1 and 2 depending on the ejection processing.

2.2.2 Straight Ejection

When the equipment is set to non-sort, all sheets are ejected through the following path.

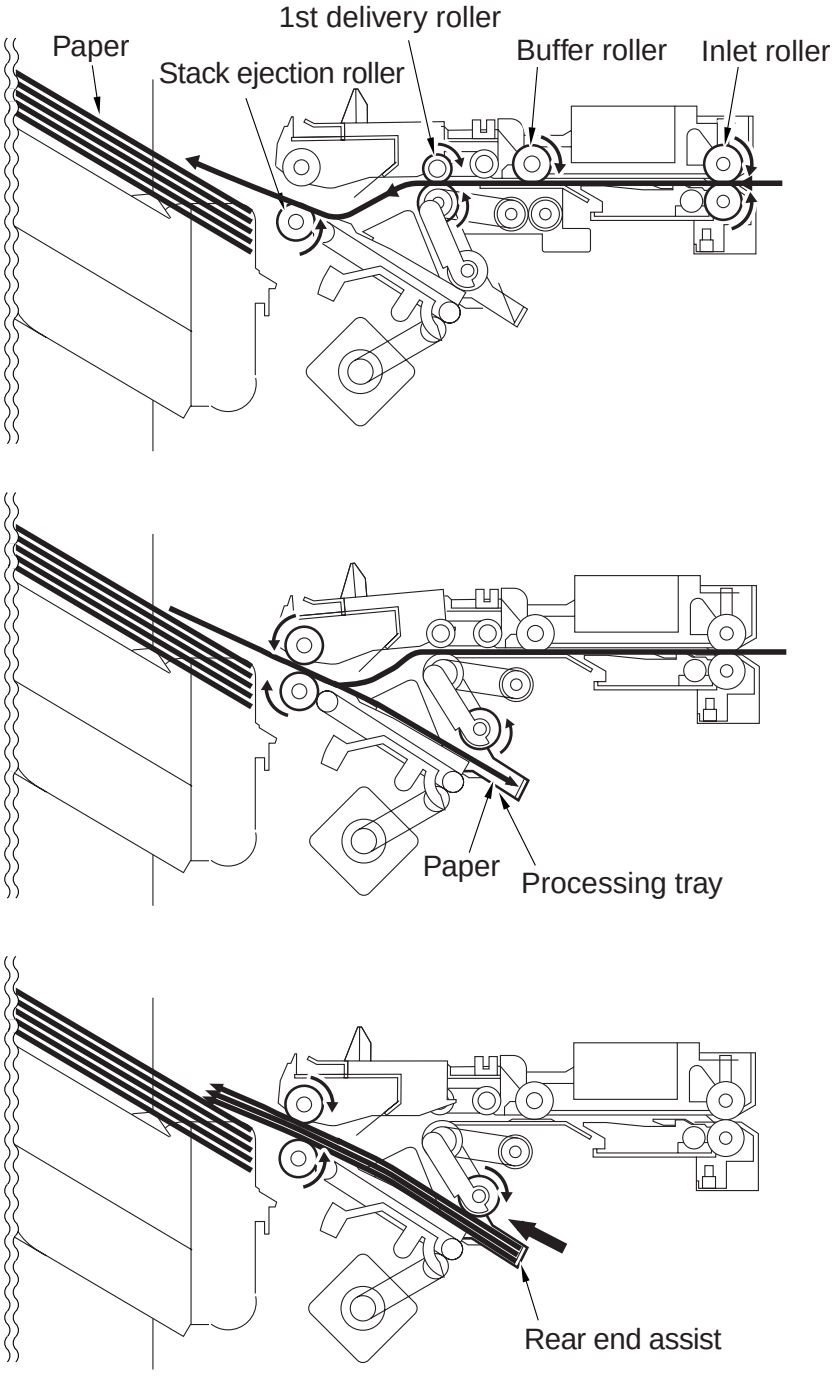
Stack ejection roller



F02-202-01

2.2.3 Processing Tray Path

This is the sheet ejection path when the equipment is set to sort for paper size other than A4, B5, or LT or when set to staple sort. Sheets are delivered to the processing tray for aligning and stapling. Then they are ejected using the rear end assist.



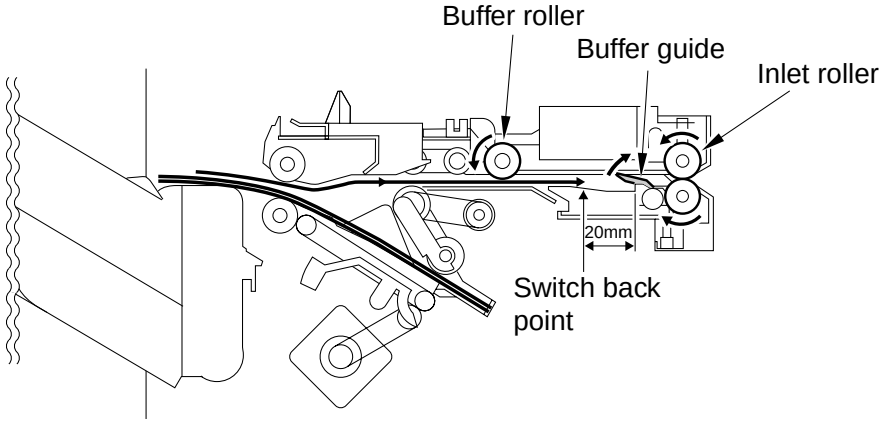
F02-202-02

2.2.4 Buffer/Processing Tray Path

This is the copy ejection path when the equipment is set to sort or staple sort for A4, B5, or LT paper size. Two sheets (3 sheets if 2-point stapling) are delivered to the buffer. Then they are aligned and stapled in the processing tray and ejected. Even while stapling or offset is being performed, simultaneous stack ejection, which simultaneously ejects sheets delivered to the buffer and post processed stack in the processing tray, is performed because sheets are received continuously from the host machine. The stack delivered from the buffer is ejected to the processing tray and the stack processed in the processing tray is ejected to the tray.

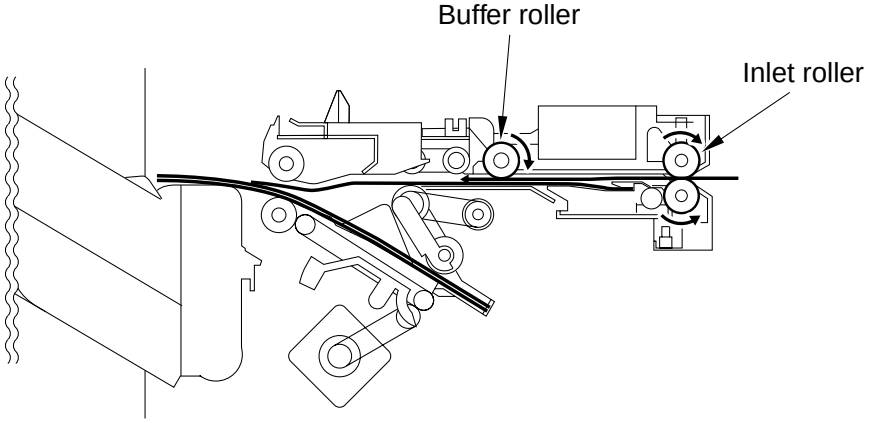
Simultaneous stack ejection operation is described below for two A4 sheets between stacks when the equipment is set to sort.

1) When the first sheet reaches the switch back point, it is sent to the buffer unit and the rear end of the paper is held by the buffer guide.



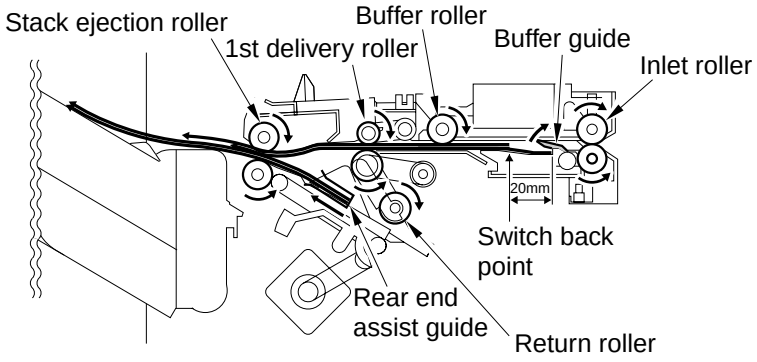
F02-202-03

2) When the first sheet is delivered to the buffer, the second sheet is delivered from the host machine.



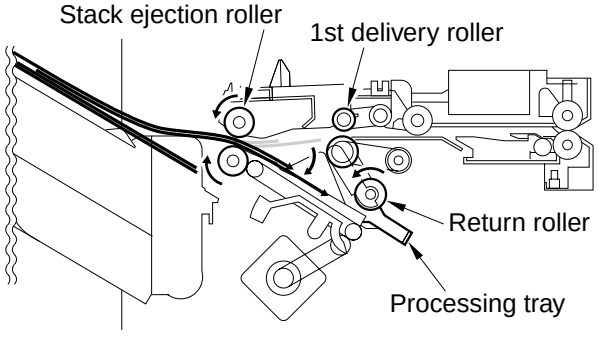
F02-202-04

3) The first delivery roller descends and works together with the stack delivery roller to deliver the 1st and 2nd sheets toward the processing tray. At the same time, the stack in the processing tray is delivered toward the delivery tray by the return roller and rear end assist guide.



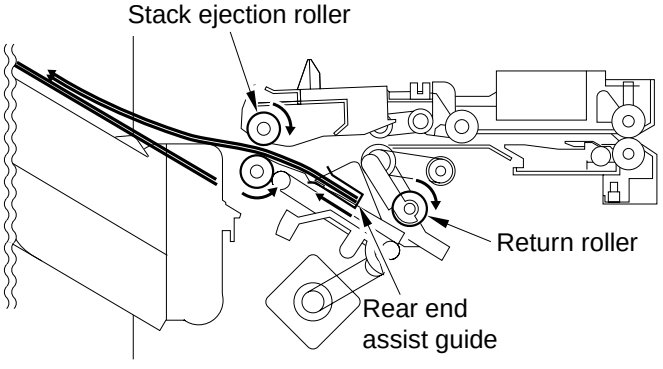
F02-202-05

4) When the stack in the processing tray is delivered to the delivery tray and the rear end of the 1st and 2nd sheets exits the 1st delivery roller, the 1st and 2nd sheet are delivered toward the processing tray by the stack delivery roller and return roller.



F02-202-06

5) The 1st and 2nd sheets delivered to the processing tray are aligned and then delivered to the delivery tray.



F02-202-07

2.3 Delivery/Ejection

2.3.1 Outline

The sheets sent from the host machine is delivered to the ejection tray, processing tray, or saddle stitcher (saddle finisher) according to the ejection type. Job offset or stapling is performed, according to the instruction from the host machine, for sheets delivered to the staple tray.

When ejecting from the processing tray, rear end assist guide is used in addition to the stack ejection roller to eject the stack.

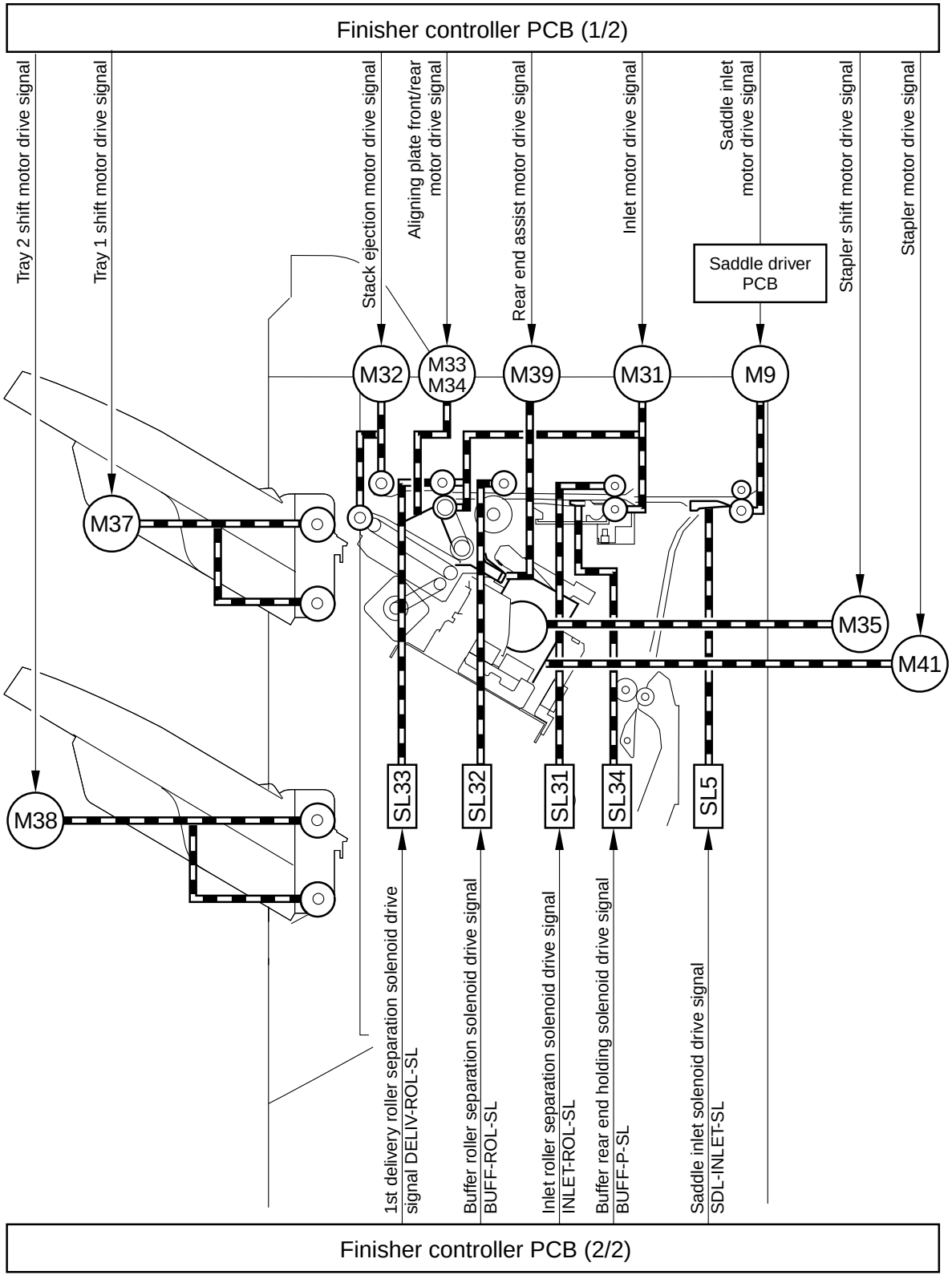
The inlet motor (M31), stack ejection motor (M32), and rear end assist motor (M39) are step motors. These motors are rotated forward or backward by the microcomputer (CPU) in the finisher controller PCB. The following two sensors are provided in the copy delivery path to detect the arrival or passing of sheets.

• Inlet sensor (PI33)
• Feed path sensor (PI34)

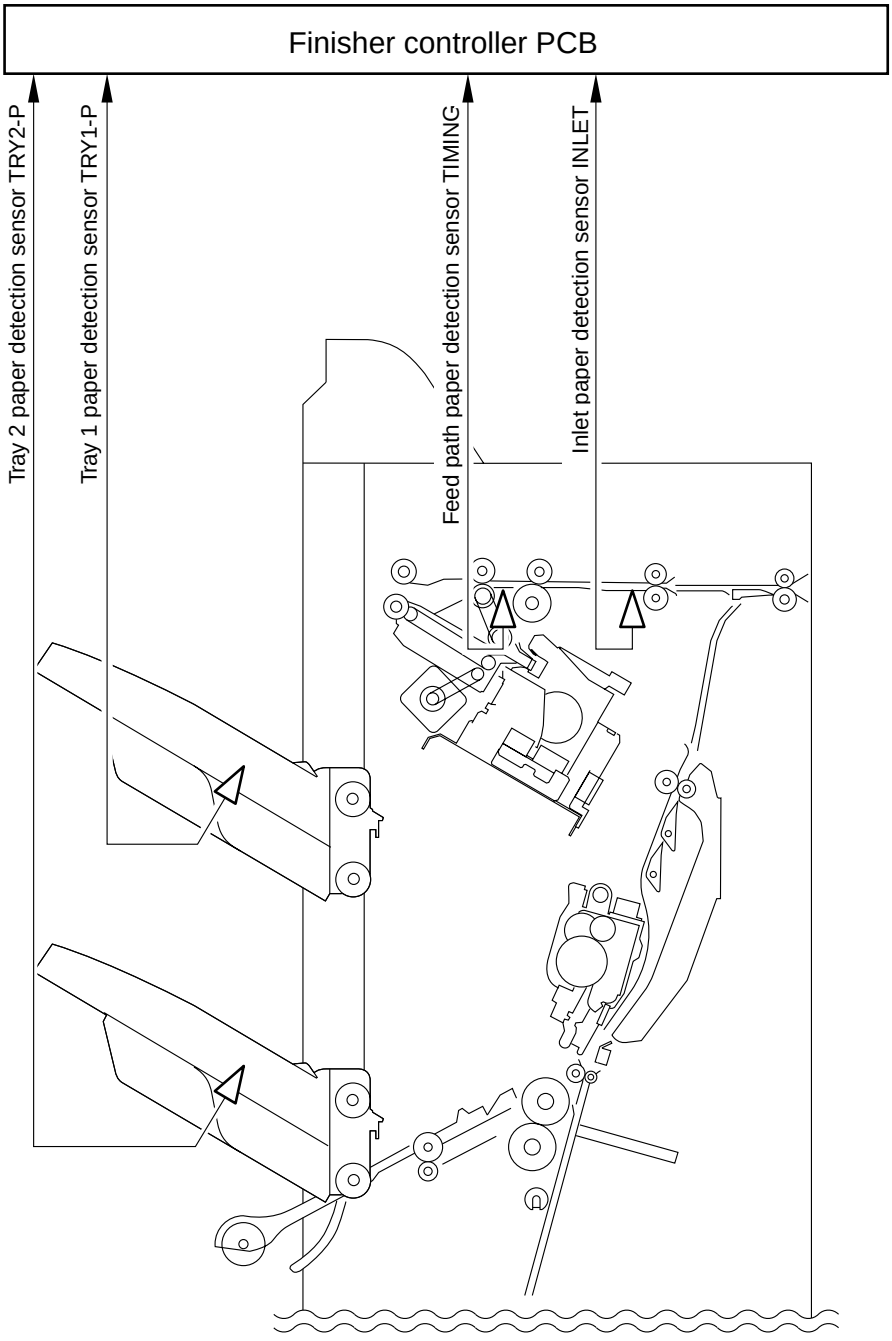
Also, each ejection tray has sensors to detect the presence of sheet on the tray.

• Tray 1 paper sensor (PI42)
• Tray 2 paper sensor (PI43)

If the sheet does not reaches or passes each sensor within prescribed time, the finisher controller PCB determines that the jam has occurred and stops the operation. Then it notifies the host machine that a jam has occurred. When all of the doors are closed after fixing the jam, the finisher checks whether sheet is detected by any of the above two sensors (inlet sensor, delivery path sensor). If any of the sensors detects a sheet, the finisher determines that the jam is not fixed and sends jam processing signal to the host machine once more.


Finisher controller PCB (1/2)
Tray 2 shift motor drive signal
Tray 1 shift motor drive signal
Stack ejection motor drive signal
Aligning plate front/rear motor drive signal
Rear end assist motor drive signal
Inlet motor drive signal
Saddle inlet motor drive signal
Stapler shift motor drive signal
Stapler motor drive signal
Saddle driver PCB
M32
M33
M34
M39
M31
M9
M37
M35
M41
M38
SL33
SL32
SL31
SL34
SL5
1st delivery roller separation solenoid drive signal DELIV-ROL-SL
Buffer roller separation solenoid drive signal BUFF-ROL-SL
Inlet roller separation solenoid drive signal INLET-ROL-SL
Buffer rear end holding solenoid drive signal BUFF-P-SL
Saddle inlet solenoid drive signal SDL-INLET-SL
Finisher controller PCB (2/2)

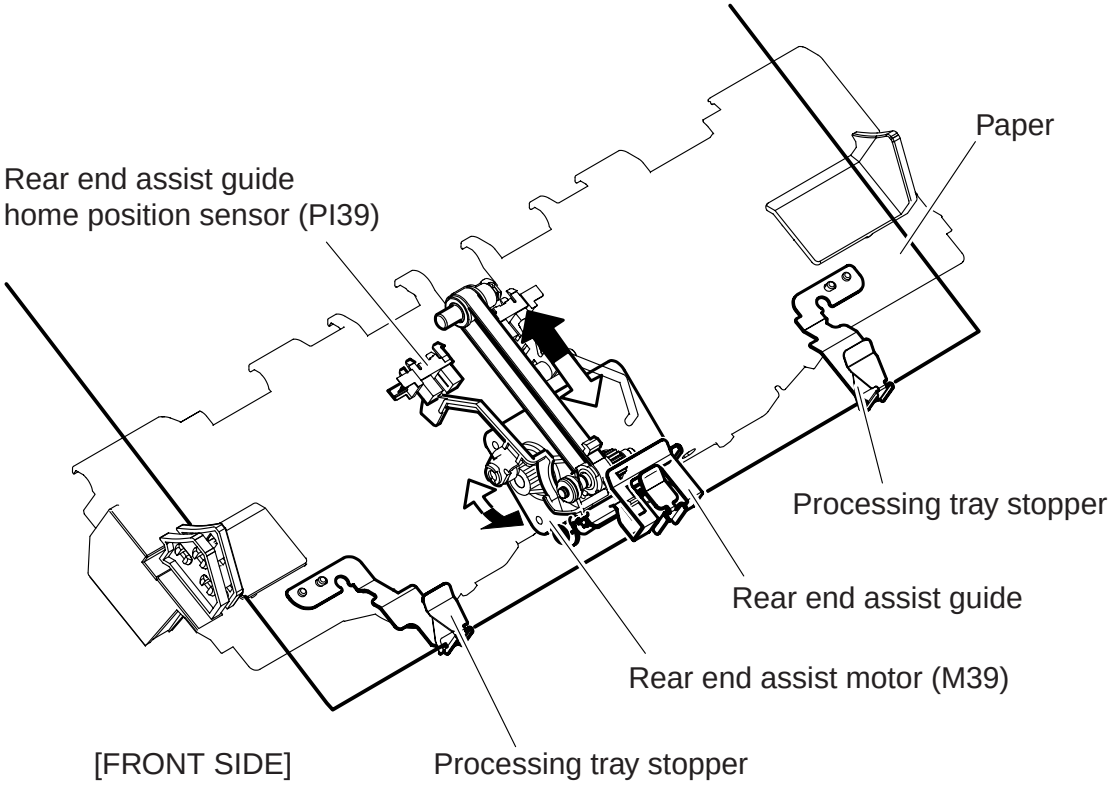
F02-203-01


Finisher controller PCB
Tray 2 paper detection sensor TRY2-P
Tray 1 paper detection sensor TRY1-P
Feed path paper detection sensor TIMING
Inlet paper detection sensor INLET

F02-203-02

2.3.2 Rear End Assist Operation

In order to improve stacking performance when ejecting sheets delivered to the processing tray, a rear end assist guide is used in addition to the stack ejection roller to support the rear end of the stack during stack ejection.



F02-203-03

2.4 Stack Job Offset

2.4.1 Outline

Job offset operation offsets paper stack to the front or rear when ejecting to sort the paper stack.

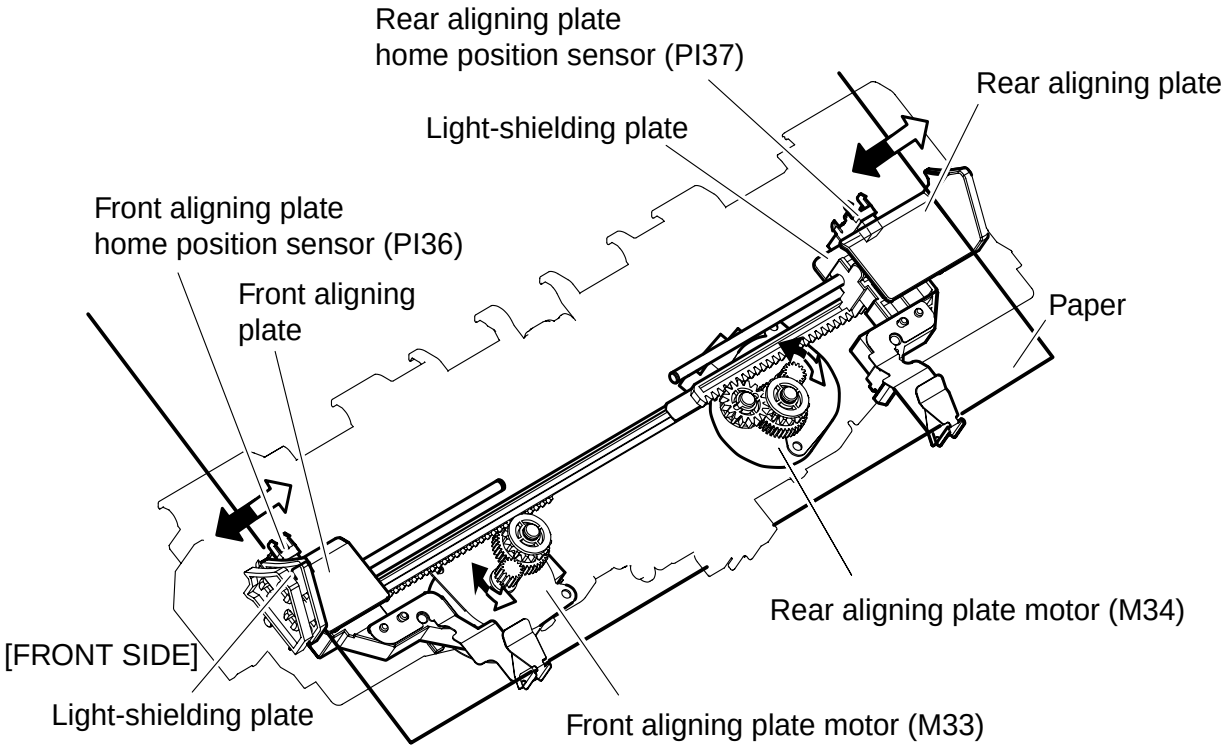
The forward/backward movement of the copy delivered to the processing tray is controlled by the front aligning plate and rear aligning plate.

The aligned copies are stapled or ejected according to the signal from the host machine.

When the power is turned on, the finisher controller PCB drives the Front aligning plate motor (M33) and Rear aligning plate motor (M34) to return the two aligning plates to home position.

The name and function of motors and sensors used by the stack job offset function are shown below.

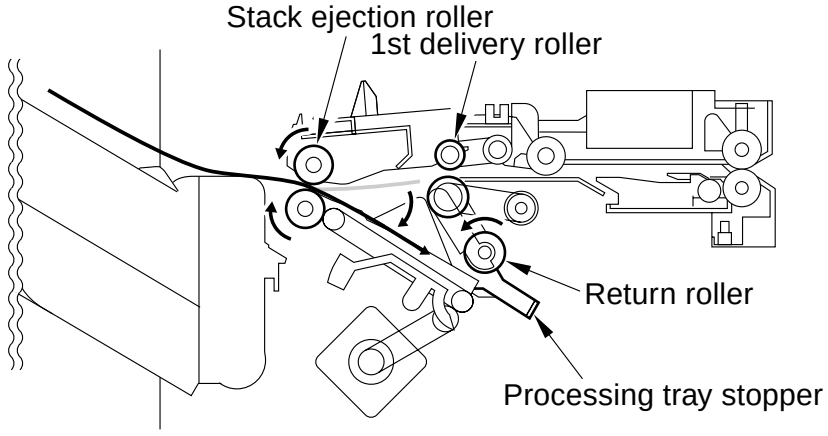
Motor	
Front aligning plate motor (M33)	Aligns paper in processing tray to the front
Rear aligning plate motor (M34)	Aligns paper in processing tray to the rear
Swing motor (M36)	Moves the swing guide up/down
Rear end assist motor (M39)	Aligns the stack end during stack ejection
Sensor	
Swing guide home position sensor (PI35)	Detects the swing guide home position
Front aligning plate home position sensor (PI36)	Detects the aligning plate front home position
Rear aligning plate home position sensor (PI37)	Detects the aligning plate rear home position
Rear end assist guide home position sensor (PI39)	Detects the rear end assist home position


Rear aligning plate
home position sensor (PI37)
Rear aligning plate
Light-shielding plate
Front aligning plate
home position sensor (PI36)
Front aligning
plate
Paper
Rear aligning plate motor (M34)
[FRONT SIDE]
Light-shielding plate
Front aligning plate motor (M33)

F02-204-01

2.4.2 Processing Tray Paper Stacking Operation

When the rear end of the paper exits the 1st delivery roller, the sheet is delivered to the processing tray by the stack delivery roller and return roller and then pushed against the processing tray stopper.



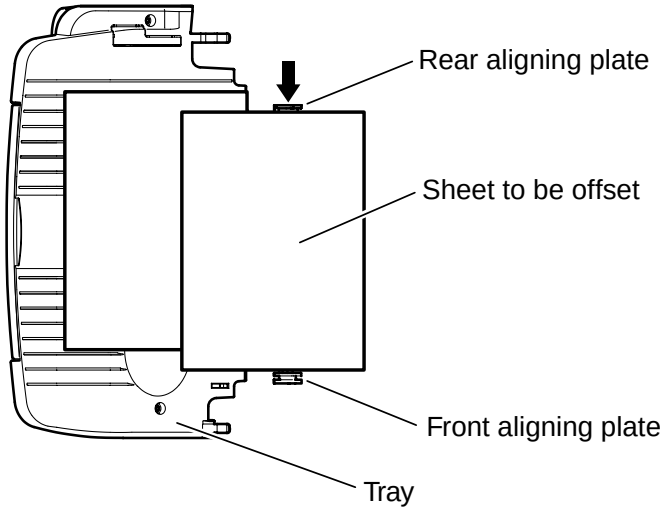
F02-204-02

2.4.3 Offset Operation

Each sheet is pulled forward or backward using the front aligning plate and the rear aligning plate.

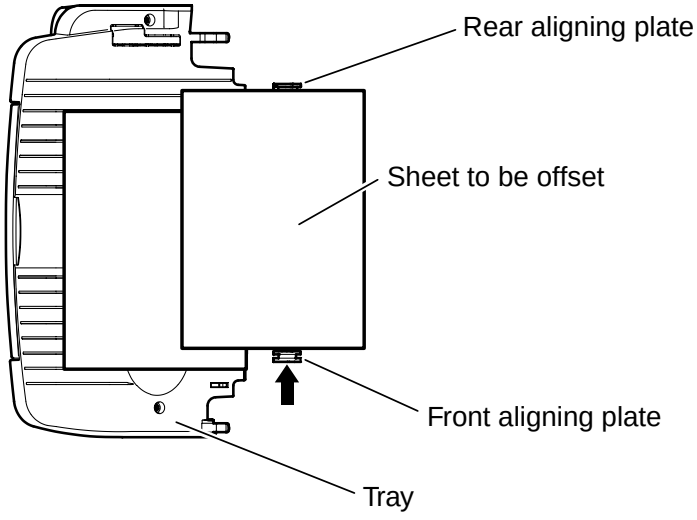
The offset operation is performed each time a sheet is pulled onto the processing tray.

Offsetting in the forward direction



F02-204-03

Offsetting in the backward direction

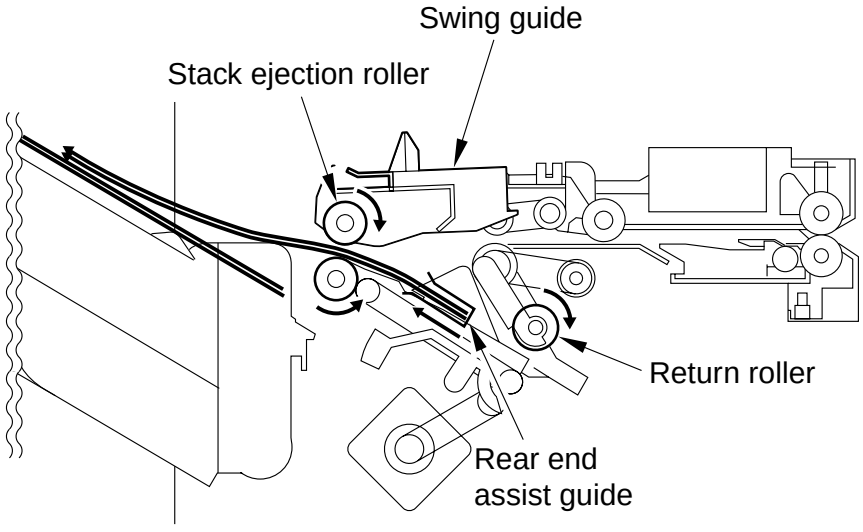


F02-204-04

2.4.4 Stack Delivery Operation

The stack is ejected each time three large size sheets × 1 or five small size sheets × 2 are offset on the processing tray.

The swing motor turns and the swing guide descends. This causes the upper/lower stack delivery rollers to hold the stack. The stack delivery motor turns the stack delivery roller and return roller. At the same time, the rear end assist guide is started by the rear end assist motor and the stack held by the stack delivery rollers is delivered in the ejection direction. The rear end assist guide stops once it reaches the prescribed position and returns to home position when the rear end assist motor is reversed. Then the stack delivery motor starts and ejects the stack with the upper/lower stack delivery rollers.



F02-204-05

*1 Varies between 2 to 4 sheets depending on the number of paper. (Example: When the number of paper is 10, stacks are ejected in the order of 3 sheets, 3 sheets, and 4 sheets.)

*2 Varies between 2 to 6 sheets depending on the number of paper. (Example: When the number of paper is 7, stacks are ejected in the order of 5 sheets and 2 sheets.)

2.5 Stapling Operation

2.5.1 Outline

Stapling operation staples the prescribed number of sheets with the stapler unit.

The staple position depends on the staple mode and paper size.

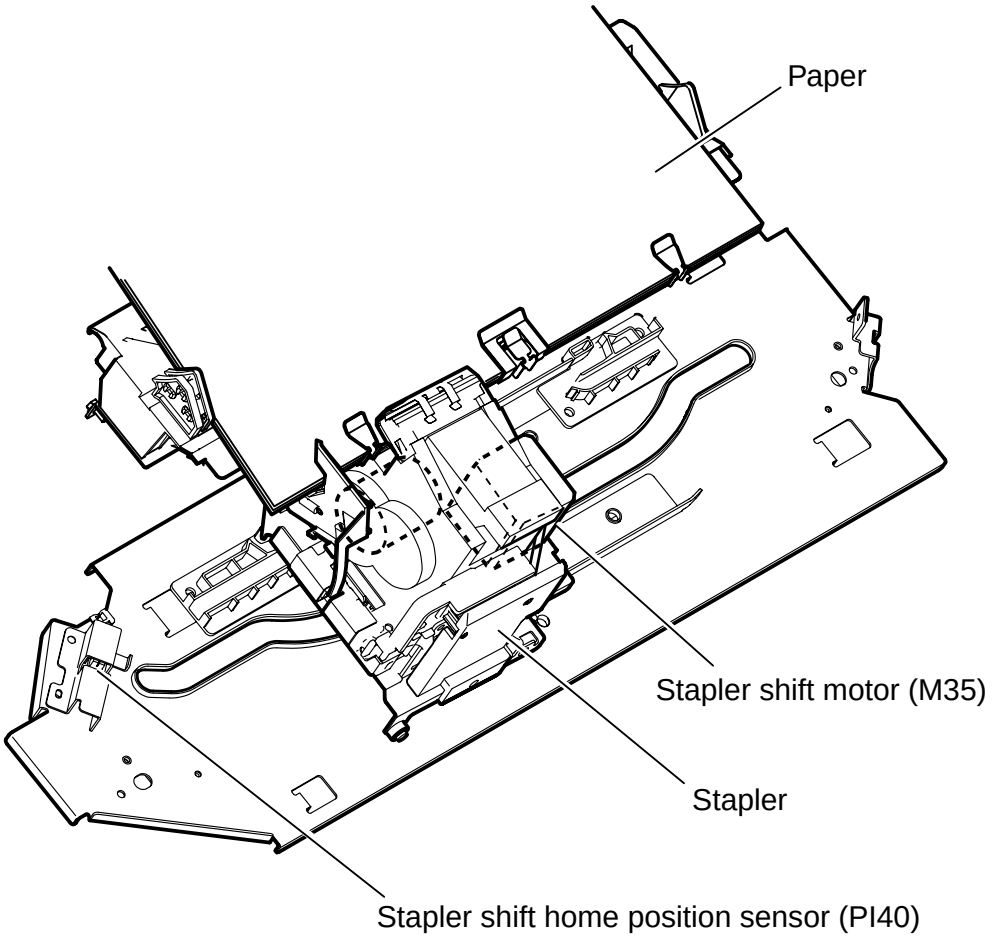
Whether the staple unit is at home position or not is detected by the stapler shift home position sensor (PI40).

When the power is turned on, the finisher controller PCB drives the stapler shift motor (M35) to return the stapler unit to home position. If the stapler unit is already at home position, it waits in that state.

Sensor	Symbol	Connector	Function	Remarks
Stapler shift home position sensor	PI40	J721B-6	Detects the home position for the stapler moving back and forth.	-
Staple home position sensor	PI50	J717-5	Detects the home position for the stapling operation.	In the stapler
Staple edging sensor	PI51	J717-6	Detects the staple top position.	In the stapler
Staple sensor	PI52	J717-7	Detects presence or absence of staples in the cartridge.	In the stapler

Motor	Symbol	Function	Remarks
Stapler shift motor	M35	Moves the stapler.	-
Staple motor	M41	Performs stapling operation.	-

T02-205-01


Paper
Stapler shift motor (M35)
Stapler
Stapler shift home position sensor (PI40)

F02-205-01

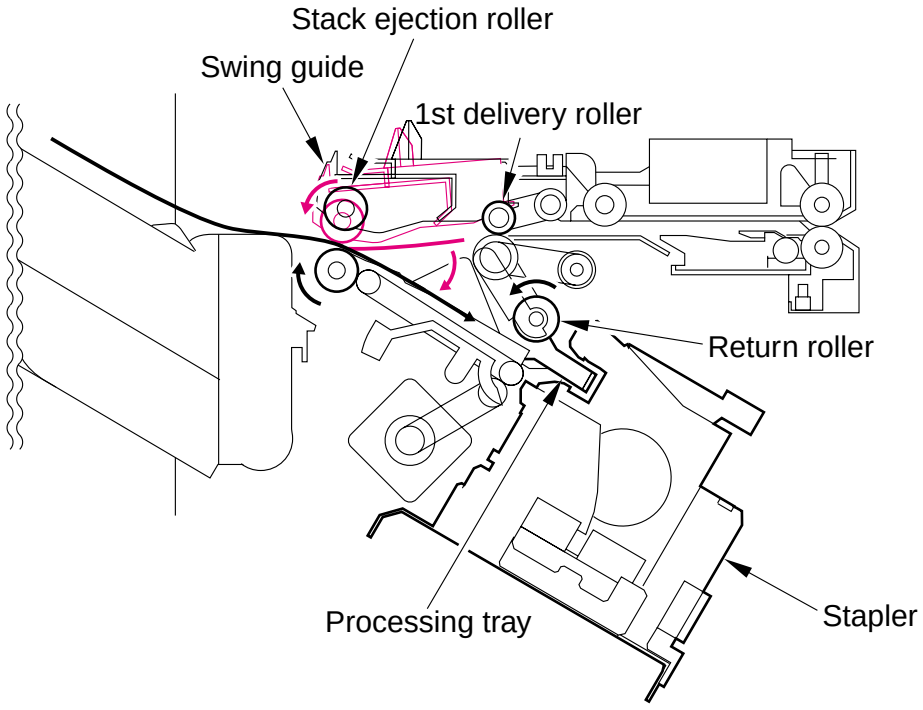
2.5.2 First Sheet

The finisher controller PCB moves the stapler according to the specified stapling position.

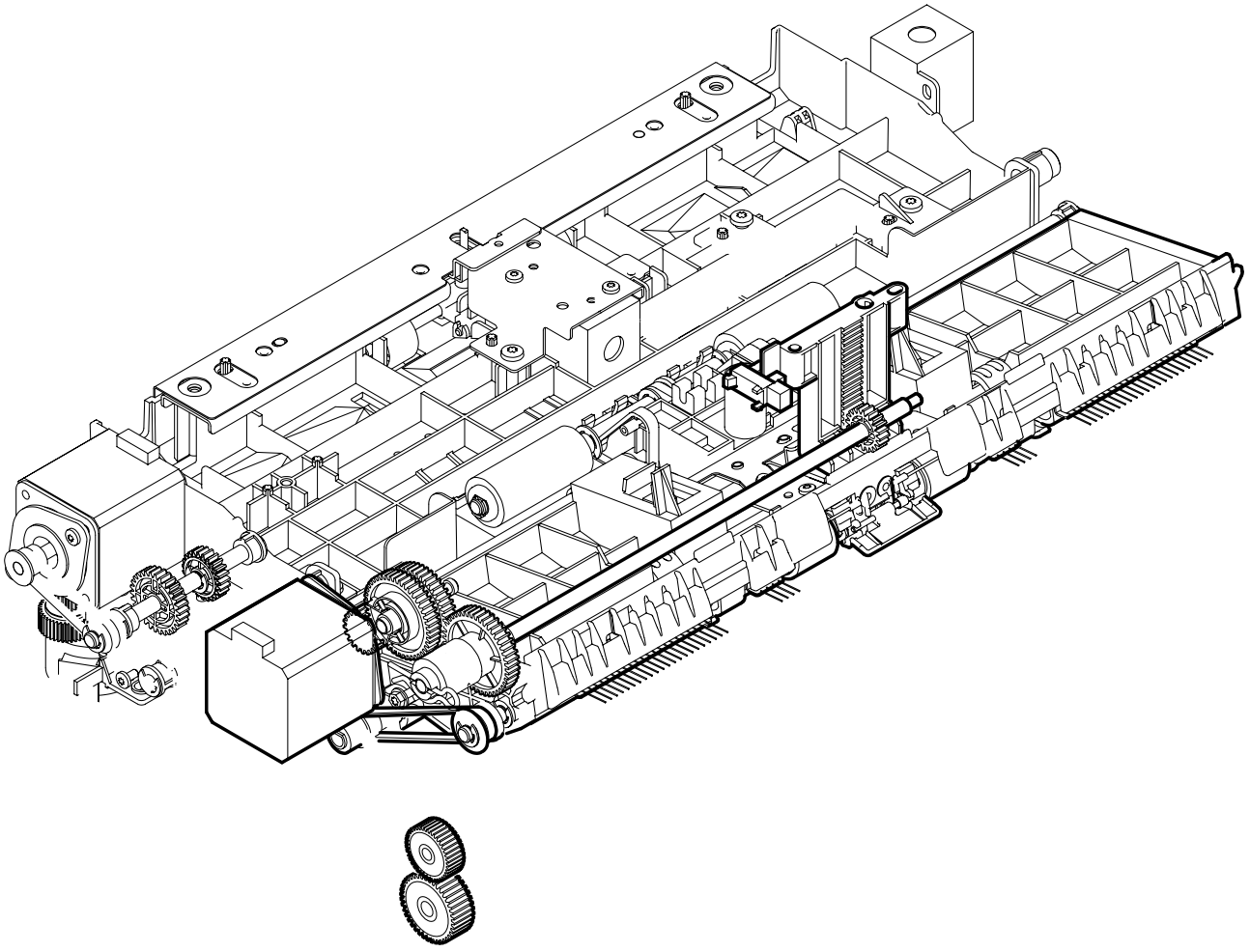
When the rear end of the first sheet passes the 1st delivery roller, the finisher controller PCB stops the stack ejection motor (M32) and then rotates it in reverse. The stack delivery motor rotates the stack delivery roller and return roller and delivers the sheet to the processing tray. The paper in the processing tray is detected by the processing tray sensor (PI38).

When the sheet is delivered to the processing tray, the swing motor (M36) starts and raises the swing guide. When the swing guide home position sensor (PI35) detects the rising of the swing guide, the swing guide motor stops and holds the swing guide at the raised position.

After the processing tray sensor detects the paper, the front and rear aligning plate motors (M33/M34) start and align the sheet.



F02-205-02



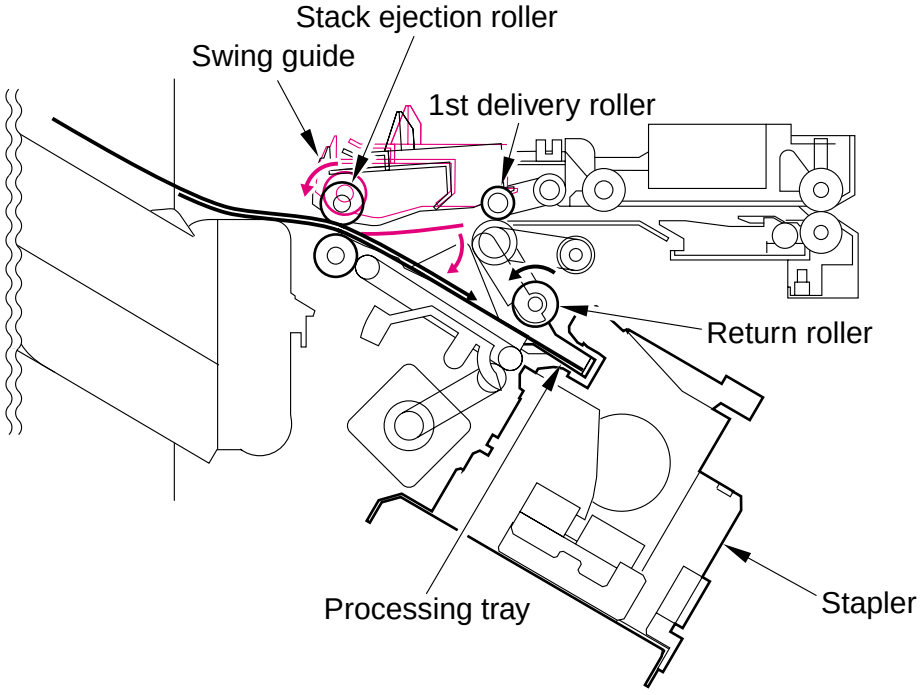
F02-205-03

2.5.3 Second and Subsequent Sheets

The finisher controller PCB starts the swing motor (M36) and lowers the swing guide when the rear end of the 2nd paper passes the 1st delivery roller. The stack delivery motor is reversed. The stack delivery motor rotates the stack delivery roller (upper) and return roller and sends the paper to the processing tray. At this point, the stack delivery roller (lower) does not rotate because the stack ejection lower roller clutch (CL32) is disengaged. The paper in the processing tray is detected by the processing tray sensor (PI38).

When the paper is delivered to the processing tray, the swing motor (M36) starts and raises the swing guide. When the swing guide home position sensor (PI35) detects the rising of the swing guide, the swing guide motor stops and holds the swing guide at the raised position.

After the processing tray paper sensor detects the paper, the front and rear aligning plate motors (M33/M34) start and align the paper.

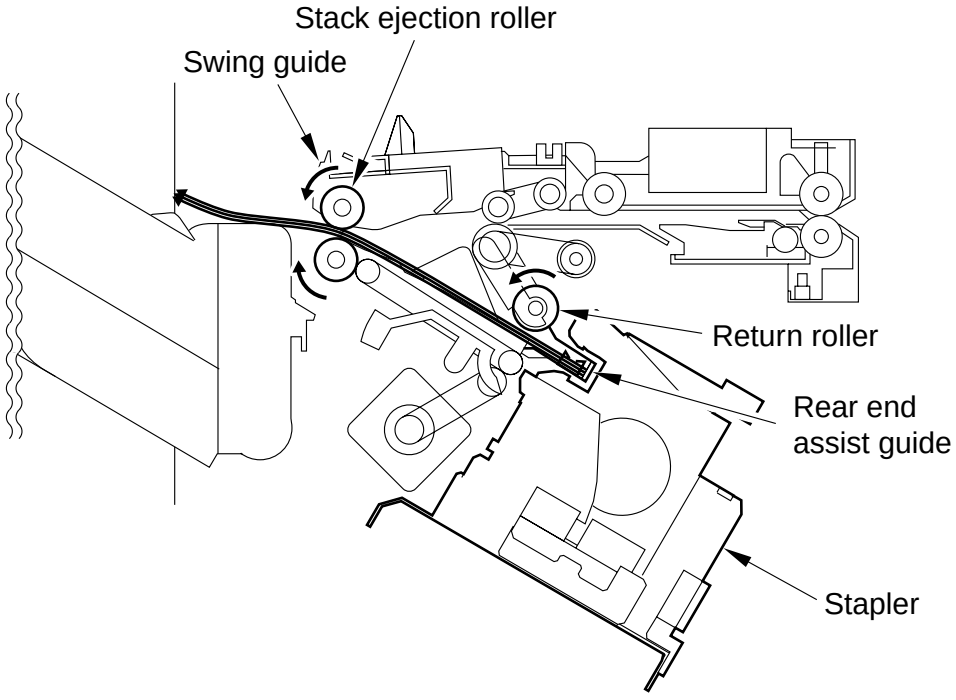


F02-205-04

2.5.4 Last Sheet

When alignment of the last sheet completes, the finisher controller PCB moves the aligning plate to alignment position with the aligning plate motor (M33/M34) (with the paper held with the aligning plate). Then the finisher controller PCB staples at the specified staple position.

After stapling, the finisher controller PCB starts the swing motor (M36) and lowers the swing guide. Then the stack is ejected by the stack delivery roller, return roller, and rear end assist guide.



F02-205-05

2.6 Stapler Unit

The staple motor (M41) is used to perform stapling operation. This motor rotates the cam one turn for stapling. The home position of this cam is detected by the staple home position sensor (PI50).

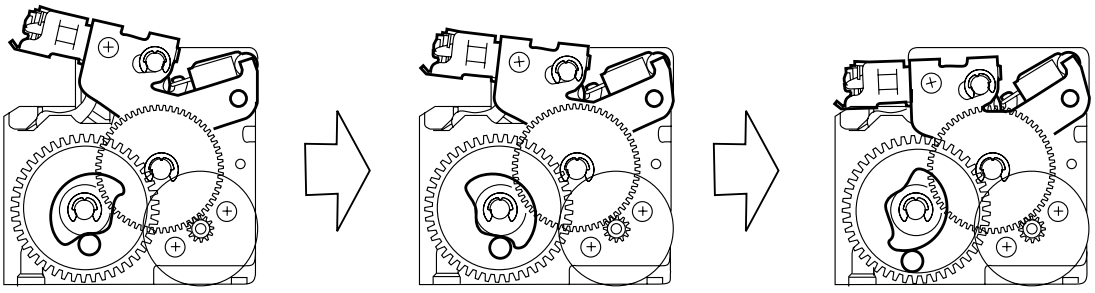
The staple motor is rotated in the forward or reverse direction under the control of the micro computer (IC101) on the finisher controller PCB.

When the staple home position sensor is OFF, the finisher controller PCB rotates the staple motor in the forward direction until the sensor turns ON, allowing the staple cam to the original position.

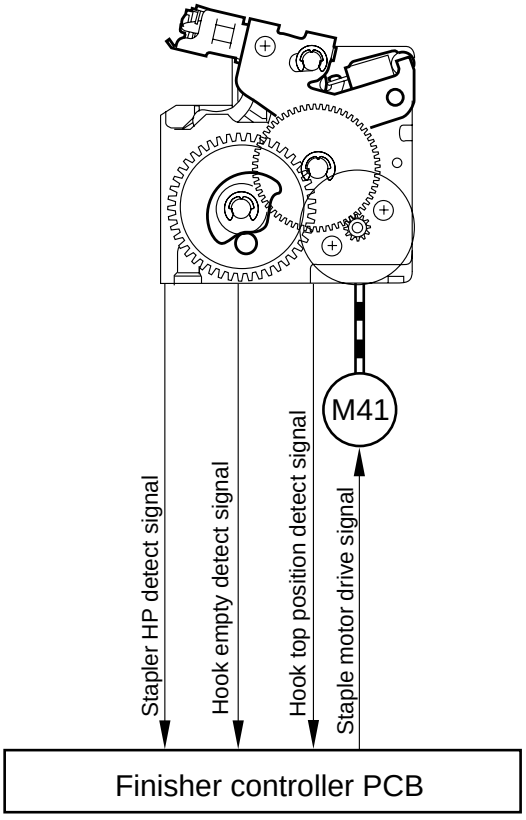
The staple sensor (PI52) is used to detect presence/absence of a staple cartridge in the machine and presence/absence of staples in the cartridge.

The staple edging sensor (PI51) is used to determine whether staples are pushed up to the top of the staple cartridge.

The finisher controller circuit does not drive the staple motor (M41) unless the staple safety switch (MS34) is ON. This assures safety in case where you happen to put your finger in the stapler.



F02-206-01



F02-206-02

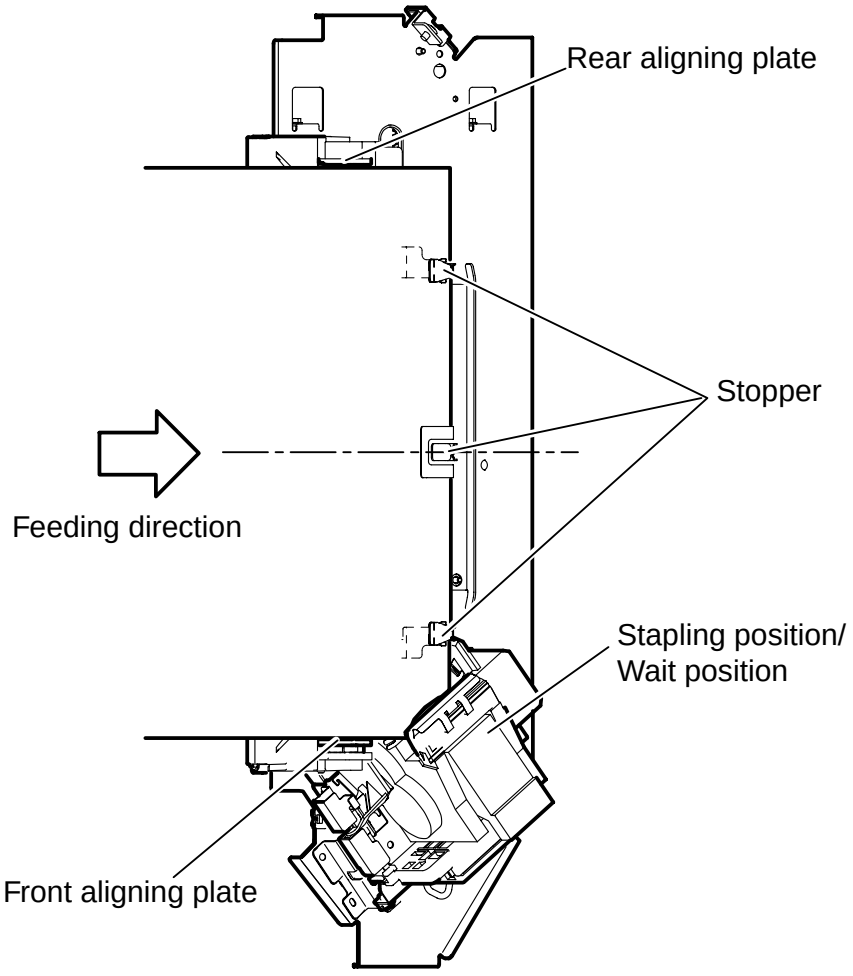
2.6.1 Shifting the Stapler Unit

The stapler unit is shifted by the stapler shift motor (M35). The home position is detected by the stapler shift home position sensor (PI40). When there is a staple command from the host machine, the stapler shifts to the staple ready position, which depends on the stapling position and paper size.

The staple ready positions corresponding to staple mode are shown starting from F02-206-03.

a. Front 1-Point Stapling

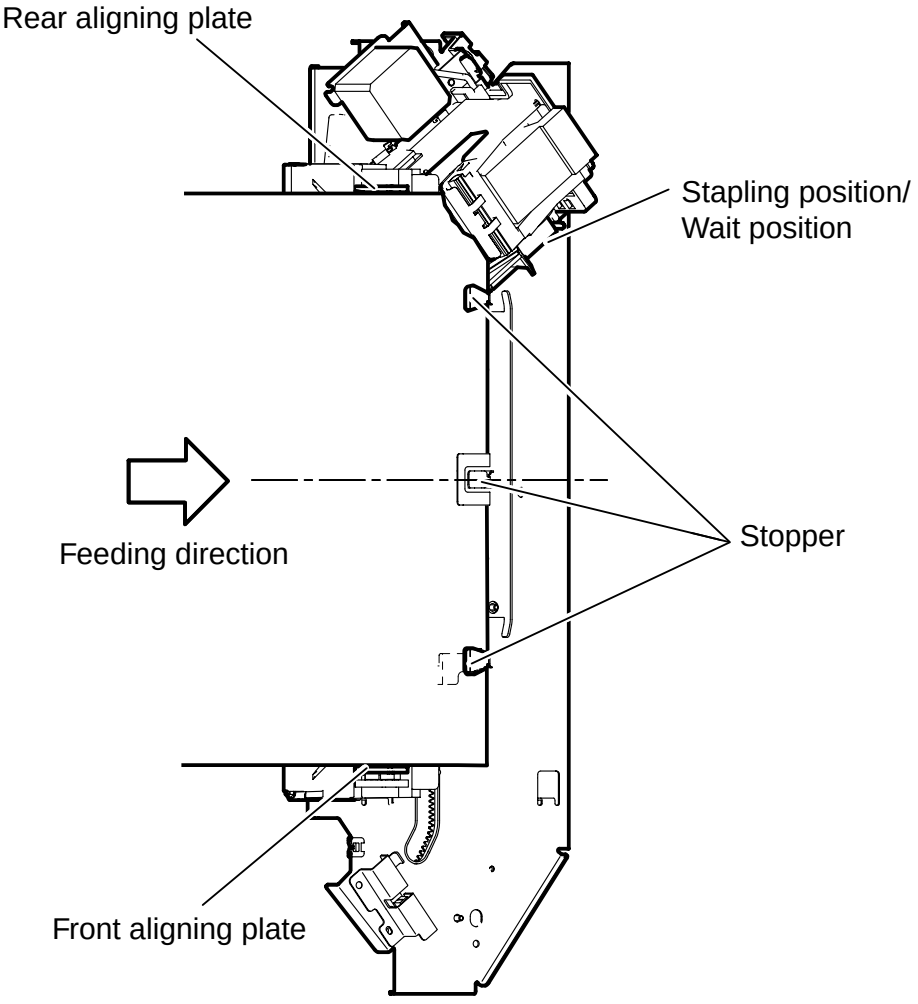
The position is the same as the stapling position.



F02-206-03

b. Rear 1-Point Stapling

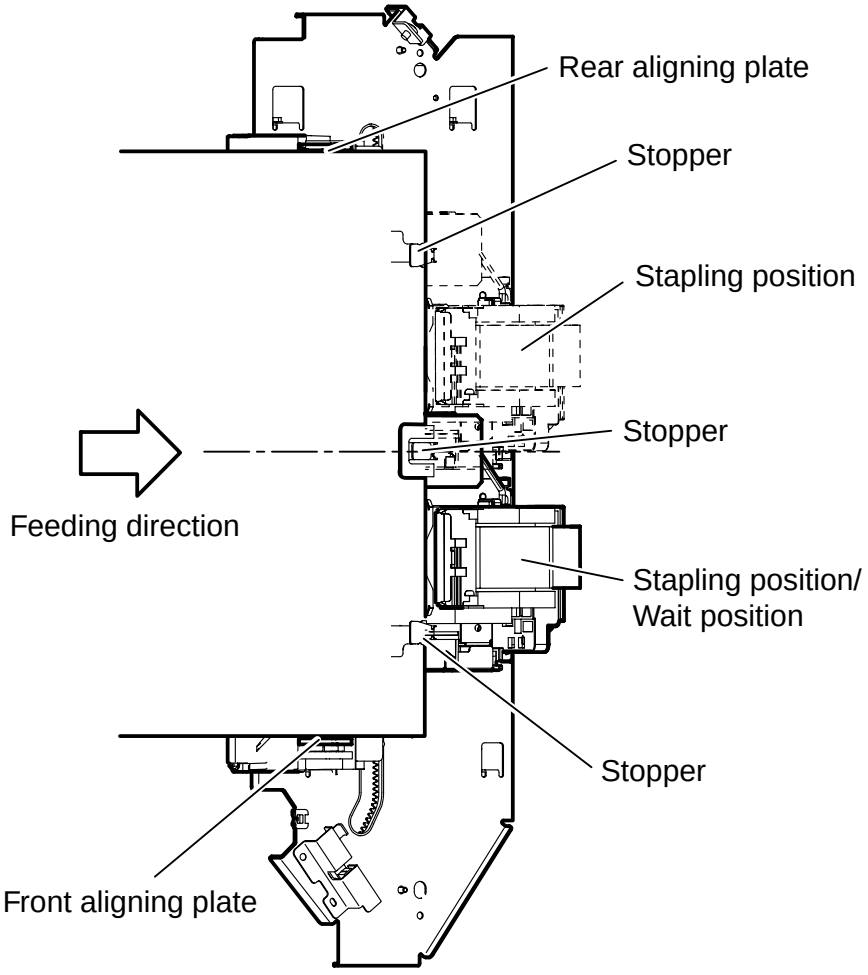
The position is the same as the stapling position.



F02-206-04

c. 2-Point Stapling

The stapler waits at the paper front end side staple position. The stapling sequence is first near side and then far side.



F02-206-05

2.7 Tray Operation

2.7.1 Outline

This equipment has two delivery trays. The upper tray is called tray 1 and the lower tray is called tray 2. The upper and lower tray can move up and down independently.

The trays are moved up and down by the tray 1 shift motor (M37) and tray 2 shift motor (M38).

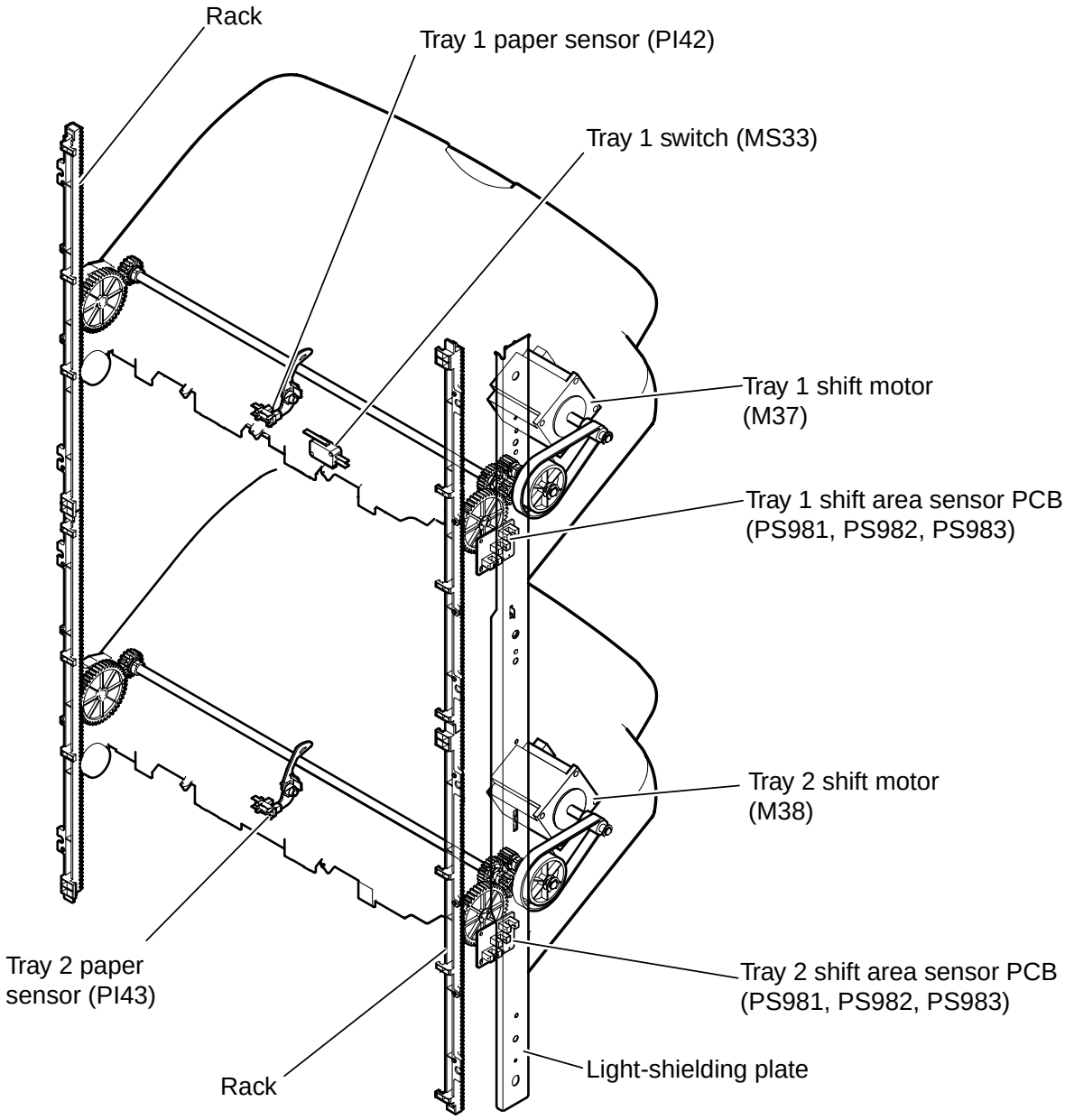
Tray 1 paper sensor (PI42) and tray 2 paper sensor (PI43) are provided to detect the presence of the paper stacked on the tray.

The home position of tray 1 is detected by the paper surface sensor (PI41) and the home position of tray 2 is detected by the tray 2 paper surface sensor (PI48). The home position is the top surface of the paper if papers are already stacked on the tray, or the position where the edge of the tray is detected if no paper is stacked. When the power is turned on, the finisher controller PCB drives the tray 1 shift motor (M37) and tray 2 shift motor (M38) to return the tray to home position. If the tray is already at home position, it is moved out of the home position once and then returned to the home position once more. If both tray 1 and tray 2 are at home position, this is performed for tray 1 and then for tray 2. If the tray specified by the host machine is tray 2, the finisher controller PCB shifts the tray so that tray 2 is at delivery port.

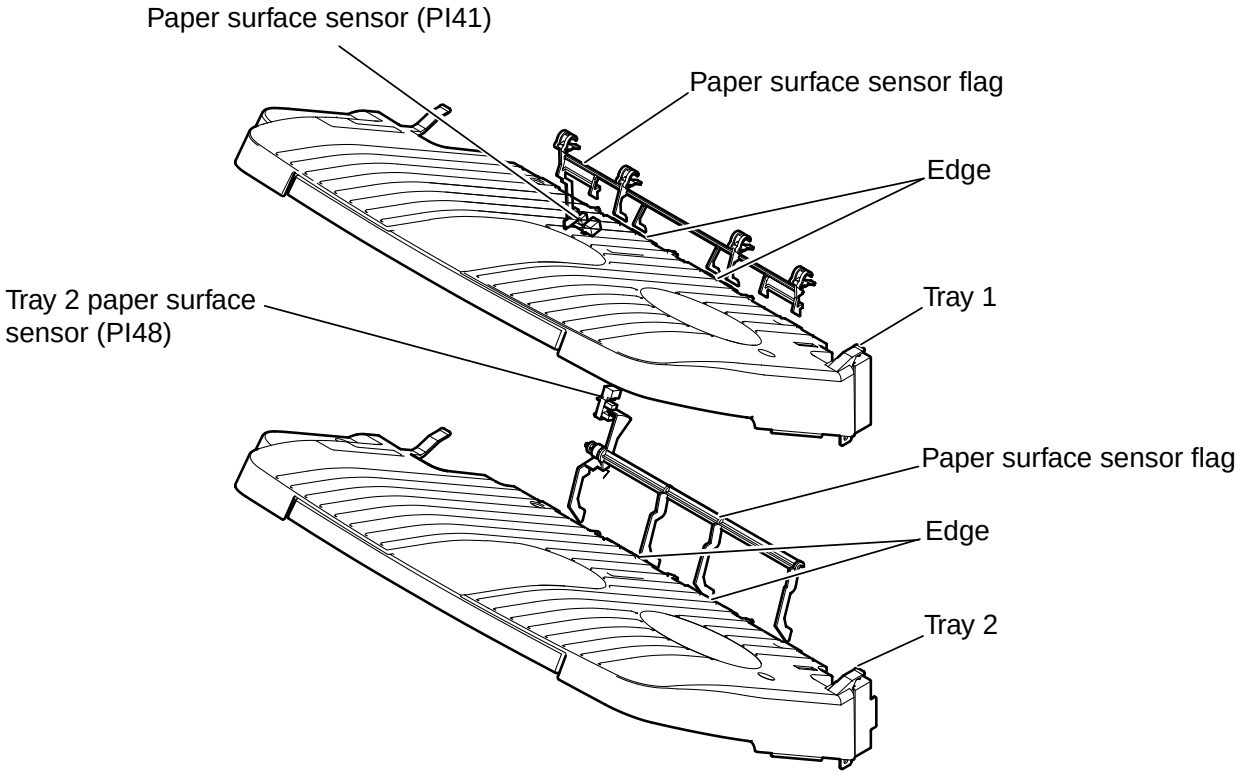
When paper is stacked on the tray, a prescribed number of pulses drive tray 1 shift motor (M37) or tray 2 shift motor (M38) and the tray is lowered. Then the tray returns to home position to prepare for the next stack.

The upper and lower limits of the tray are detected by three area sensors (PS981, PS982, and PS983) on tray 1 and tray 2 shift area sensor PCB. The finisher controller PCB stops driving the tray 1 shift motor (M37) and tray 2 shift motor (M38) when it detects the upper or lower limit of the tray. Also, the ON/OFF combinations of the area sensors (PS981, PS982 and PS983) are used to detect over-stacking according to the stack height for large size and mixed stacking. T02-207-01 shows the items detected with the ON/OFF combinations of the area sensors (PS981, PS982 and PS983).

The finisher controller PCB stops supplying +24V to the tray 1 shift motor (M37) and stops the finisher operation when tray 1 switch (MS33) turns ON.


Rack
Tray 1 paper sensor (PI42)
Tray 1 switch (MS33)
Tray 1 shift motor
(M37)
Tray 1 shift area sensor PCB
(PS981, PS982, PS983)
Tray 2 shift motor
(M38)
Tray 2 paper
sensor (PI43)
Tray 2 shift area sensor PCB
(PS981, PS982, PS983)
Light-shielding plate
Rack

F02-207-01



F02-207-02

	Tray 1 shift area sensor PCB		
Detected items	Area sensor 1 (PS983)	Area sensor 2 (PS982)	Area sensor 3 (PS981)
Tray 1 upper limit	OFF	OFF	OFF
Stack count 500 sheets limit exceeded	ON	ON	OFF
Stack count 1000 sheets limit exceeded	ON	OFF	OFF
Tray 1 lower limit	ON	OFF	ON

	Tray 2 shift area sensor PCB		
Detected items	Area sensor 1 (PS983)	Area sensor 2 (PS982)	Area sensor 3 (PS981)
Tray 2 upper limit	OFF	ON	OFF
Stack count 500 sheets limit exceeded	ON	ON	OFF
Stack count 1000 sheets limit exceeded	ON	OFF	OFF
Tray 2 lower limit (finisher)	OFF	OFF	OFF
Tray 2 lower limit (saddle finisher)	OFF	OFF	ON

T02-207-01

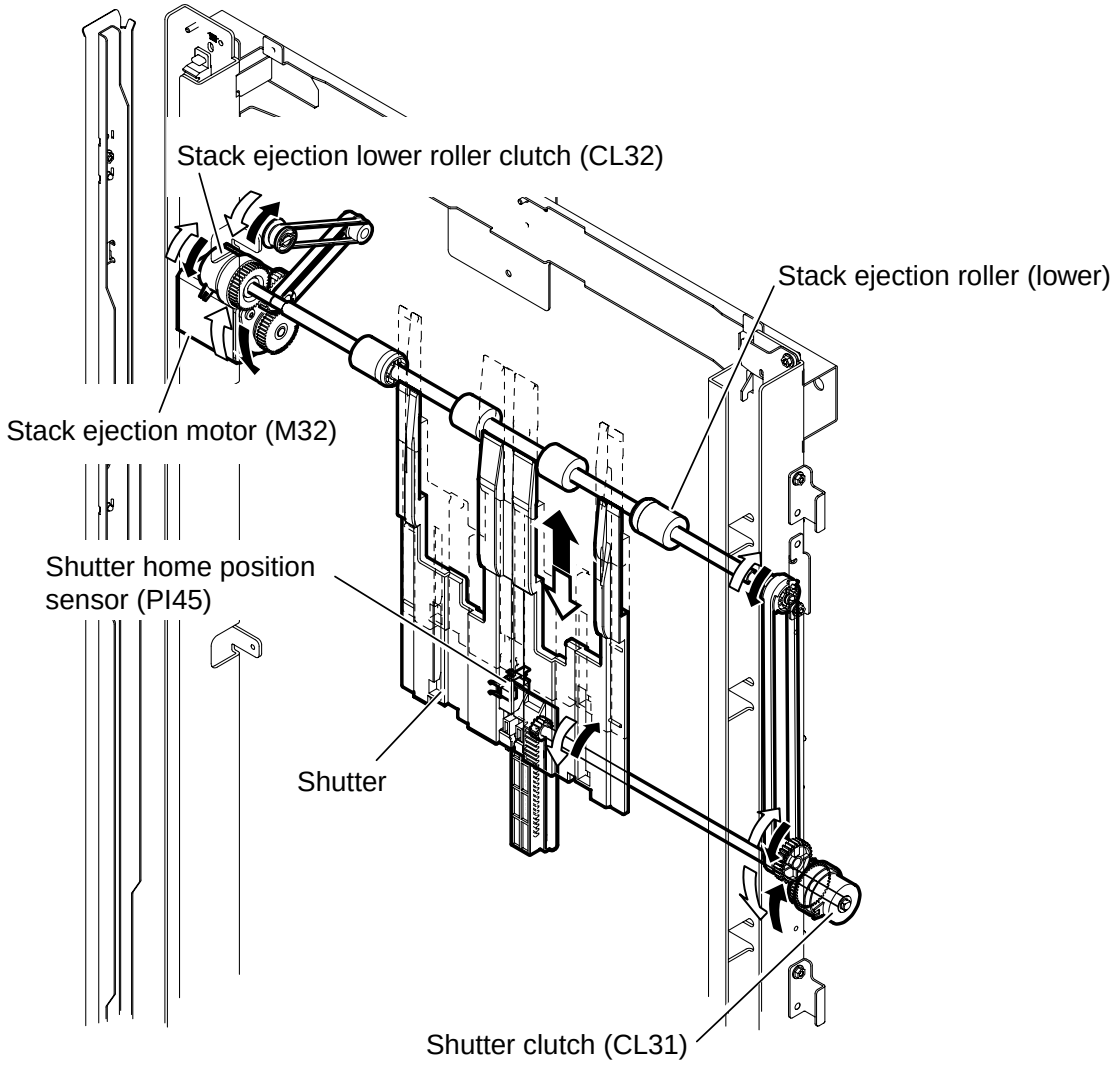
2.8 Shutter Operation

2.8.1 Outline

When tray 1 passes the delivery section with paper already stacked, the stacked paper may get caught by the delivery section. A shutter is provided at the delivery section to prevent this. The shutter closes when tray 1 passes the delivery section. This is performed even when no paper is stacked.

When the shutter clutch (CL31) and stack ejection lower roller clutch (CL32) are ON, the shutter moves up (close) when the stack ejection motor (M32) turns forward and moves down (open, delivery enabled) when the motor turns backward.

The open/close of the shutter is detected by the shutter home position sensor (PI45).



F02-208-01

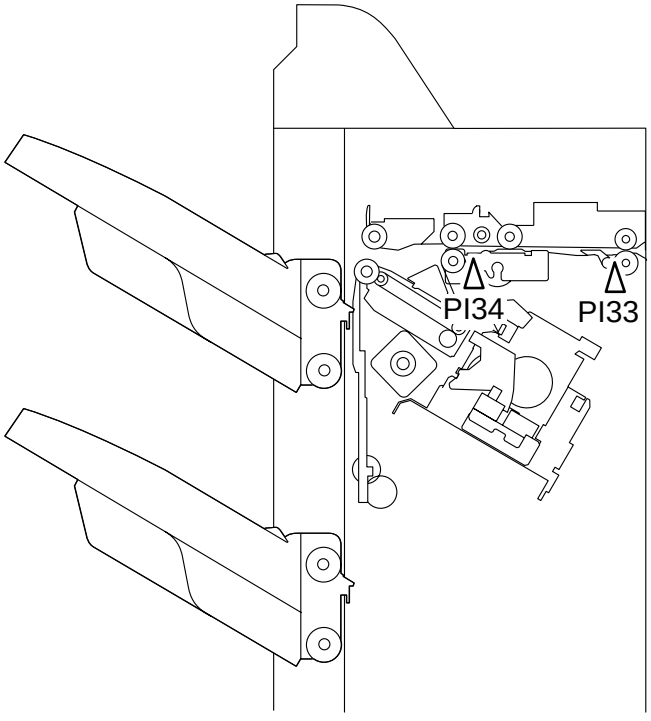
2.9 Detecting Jams

The following sensors are used to detect the presence of paper and to determine that paper is delivered properly.

- Inlet sensor (PI33)
- Feed path sensor (PI34)

A jam is identified by checking whether paper is present at each sensor at the timing programmed in the memory of the microcomputer (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. When all doors are closed after the paper jam is removed, the finisher checks whether paper is detected by the above two sensors (inlet sensor and tray 1 delivery sensor). If the sensors detect paper, the finisher determines that paper jam is not completely removed and sends a jam removal signal to the host machine once more.



PI33:Inlet sensor
PI34:Feed path sensor

F02-209-01

Jam type	Sensor	Jam Condition
Delay at inlet sensor	PI33	When the inlet sensor (PI33) does not detect paper after a prescribed time (distance) has elapsed since receiving a delivery signal from the host machine. If the optional puncher unit is installed, when the inlet sensor (PI33) does not detect paper after delivering for a prescribed time (distance) after the rear end sensor (LED, PTR5) detected paper.
Stationary at inlet sensor	PI33	When paper does not exit the inlet sensor (PI33) after delivering for a prescribed time (distance) after the inlet sensor (PI33) detected paper.
Delay at feed path sensor	PI34	When the feed path sensor (PI34) does not detect paper after prescribed time (distance) has elapsed since the inlet sensor (PI33) detected paper.
Stationary at feed path sensor	PI34	When paper does not exit the feed path sensor (PI34) after delivering for a prescribed time (distance) after the feed path sensor (PI34) has detected paper.
Delivery delay*	LED, PTR5	When the rear end sensor (LED, PTR5) does not detect paper after a prescribed time (distance) has elapsed since receiving a delivery signal from the host machine.
Stationary delivery*	LED, PTR5	When paper does not exit the rear end sensor (LED, PTR5) after delivering for a prescribed time (distance) after the rear end sensor (LED, PTR5) has detected paper.
Timing	PI33	When the inlet sensor (PI33) detects paper before receiving a delivery signal from the host machine.
Staple	PI50	When the staple motor (M41) is rotated forward and the staple home position sensor (PI50) does not turn on within prescribed time after it is turned off and the staple motor (M41) is rotated backward and the staple home position sensor (PI50) turns on within prescribed time.
Power-on	PI33 PI34	When paper is detected by the inlet sensor (PI33) or the feed path sensor (PI34) during power on.
Door open	PI31 PI32 MS31	When the upper cover sensor (PI31), front cover sensor (PI32), or the front cover switch (MS31) detects that the cover is opened.
Punch*	PI63	When the punch home position sensor (PI63) does not turn on after a prescribe time has elapsed since it is turned off.
Punch power-on*	LED1 to 4 PTR1 to 4	When paper is detected by the horizontal registration sensors (LED1 to 4, PTR1 to 4) during power on.

* When the optional puncher unit is installed

T02-209-01

3 Power Supply System

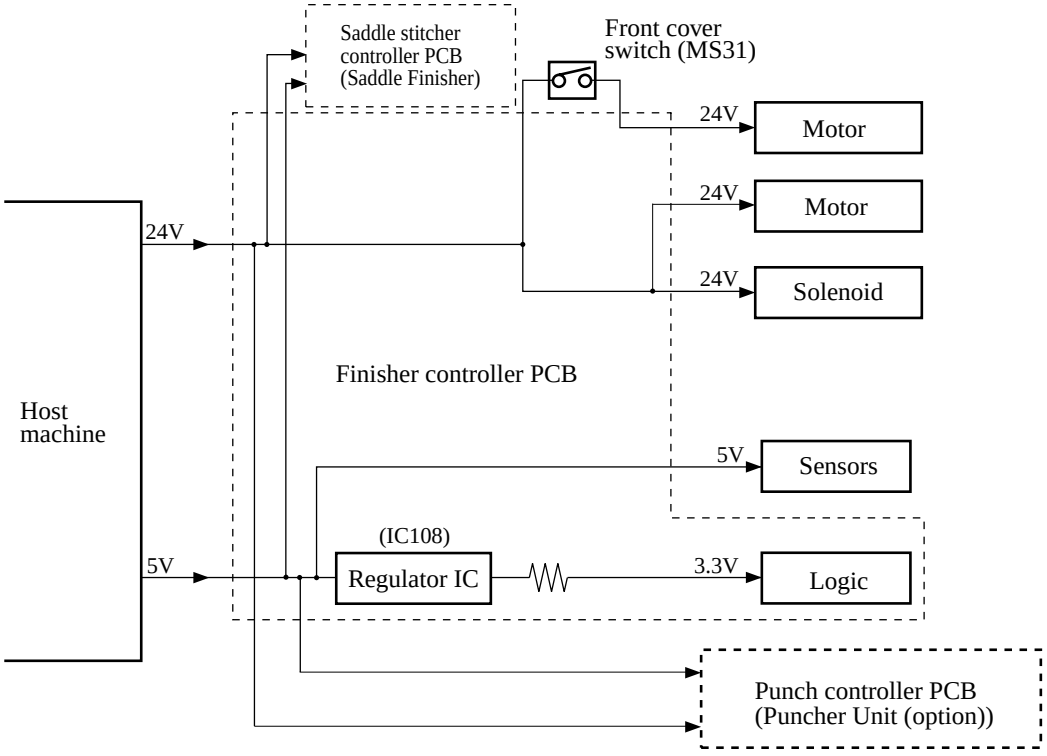
3.1 Outline

When the host machine power is turned on, a 24VDC and a 5VDC power are supplied to the finisher controller PCB from the host machine. The 24VDC power is used to drive the solenoid. The 5VDC power is used to drive the sensors and is converted to 3.3VDC by the regulator IC (IC108) on the finisher controller PCB and used to drive the ICs inside the PCB. Each power supply is also supplied from the finisher controller PCB to the saddle stitcher controller PCB.

If an optional puncher unit is installed, the power is also supplied to the punch controller PCB.

A part of the motor drive 24VDC is cut off when the front cover switch (MS31) is opened.

The power supply block diagram is shown below.



F02-301-01

3.2 Protection Function

The motor solenoid drive 24 VDC line has a fuse which melts when there is an over current.

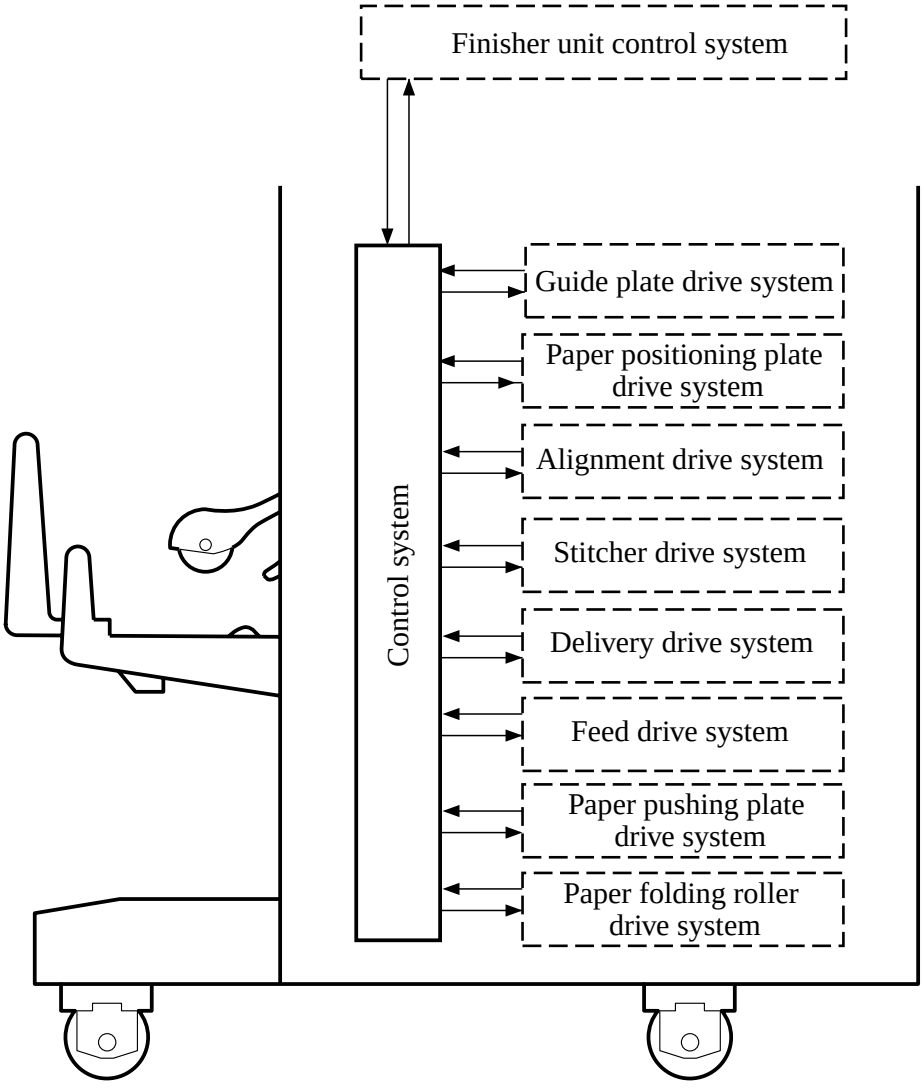
CHAPTER 3

SADDLE STITCHER UNIT OUTLINE OF OPERATION

1 Basic Operations

1.1 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.



F03-101-01

1.2 Electrical Circuitry

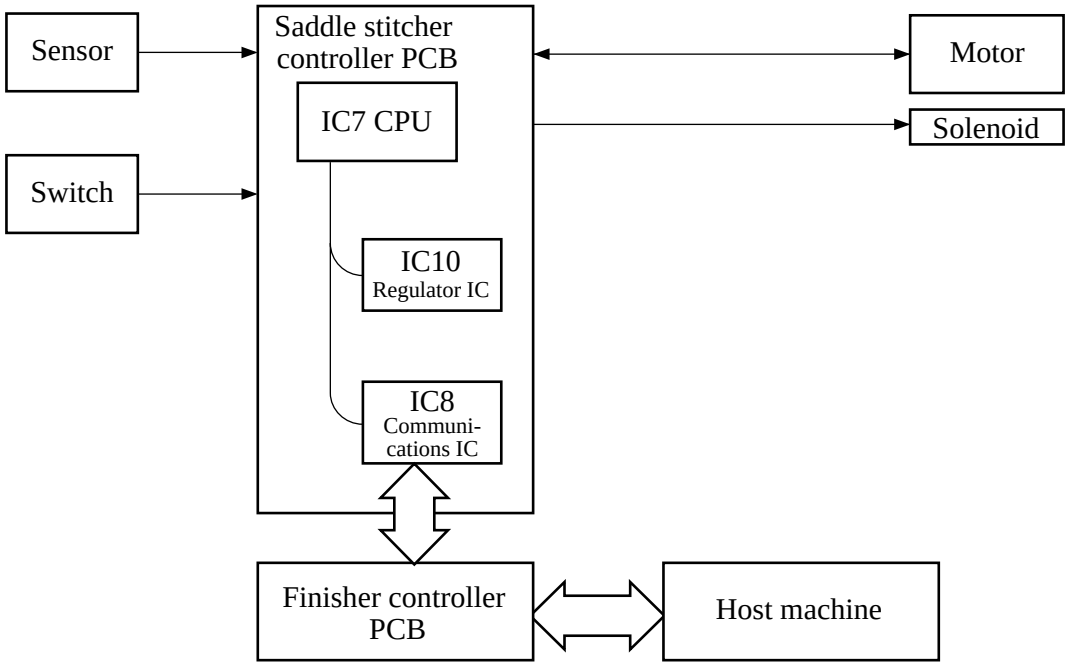
The sequence of operations used for the saddle stitcher is controlled by the saddle stitcher controller PCB. The saddle stitcher controller PCB has a microprocessor. This microprocessor is used to control the sequence of operations and to handle serial communications with the finisher controller PCB, 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:

- IC7 (CPU)
  Controls the sequence of operations.
  Contains the sequence program.
- IC8 (communications IC)
  Communicates with the finisher unit.
- IC10 (regulator IC)
  Generates 3.3V.

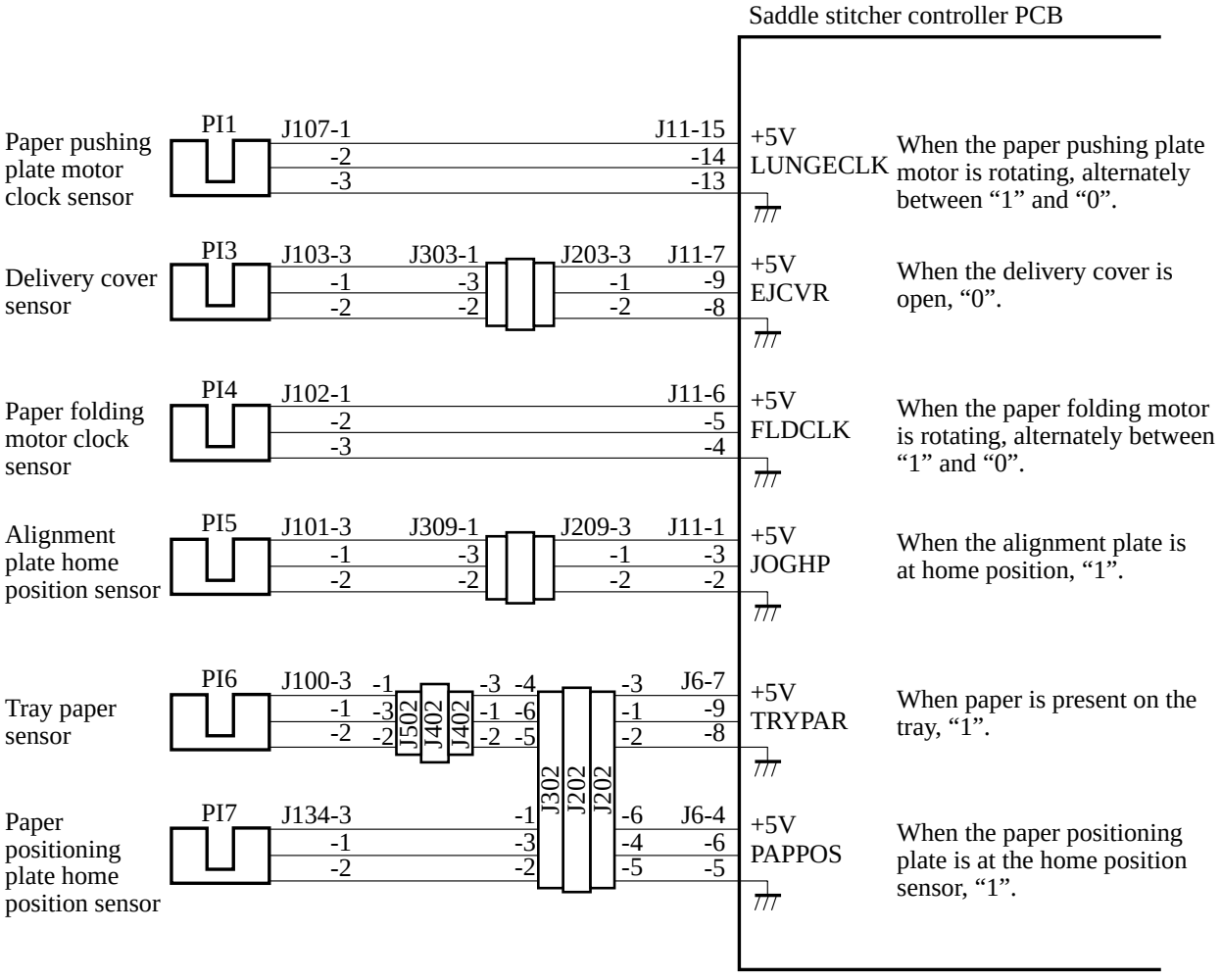
Electrical circuitry block diagram



F03-102-01

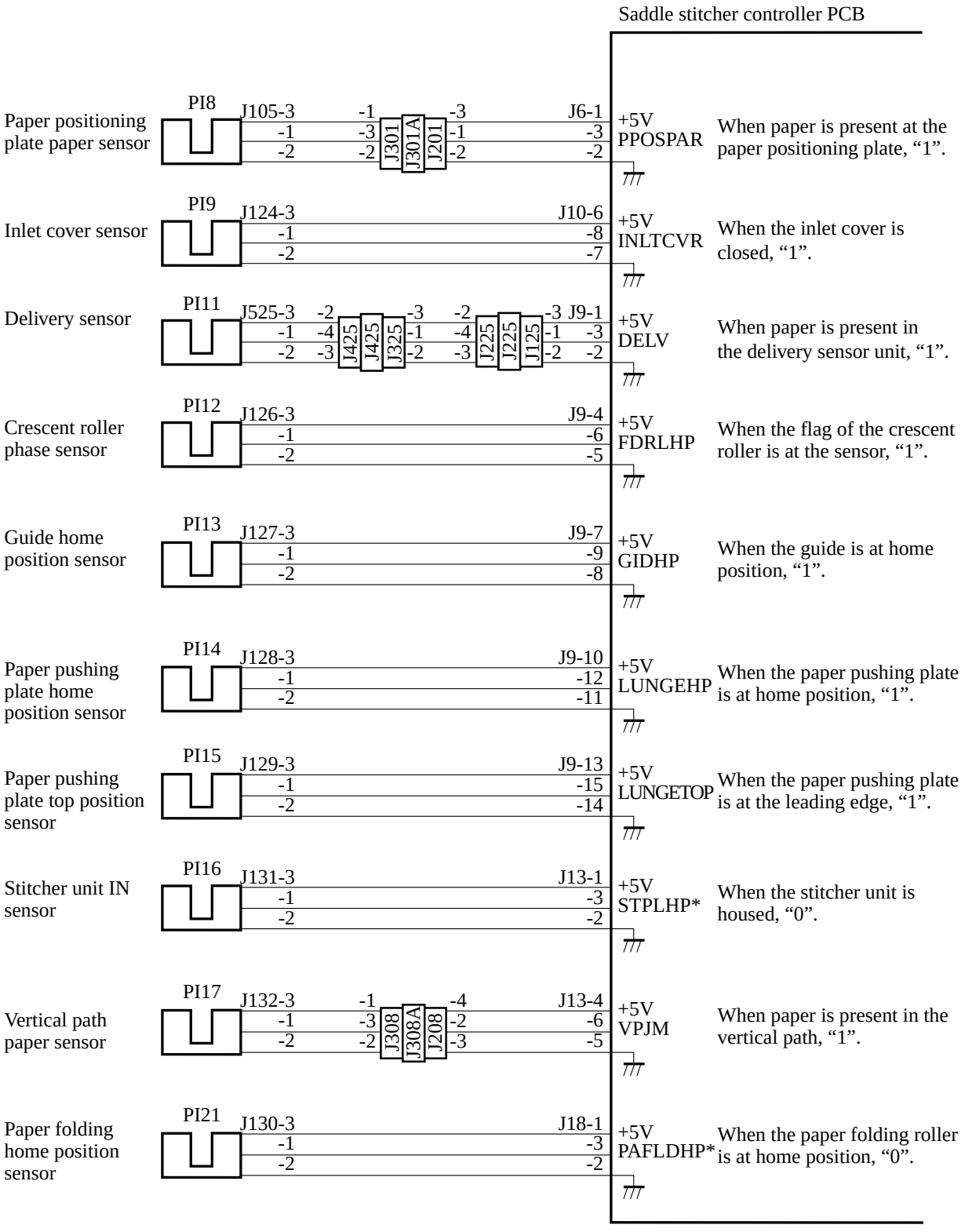
1.3 Inputs to and Outputs from the Saddle Stitcher Controller PCB

1.3.1 Inputs to the Saddle Stitcher Controller PCB (1/3)



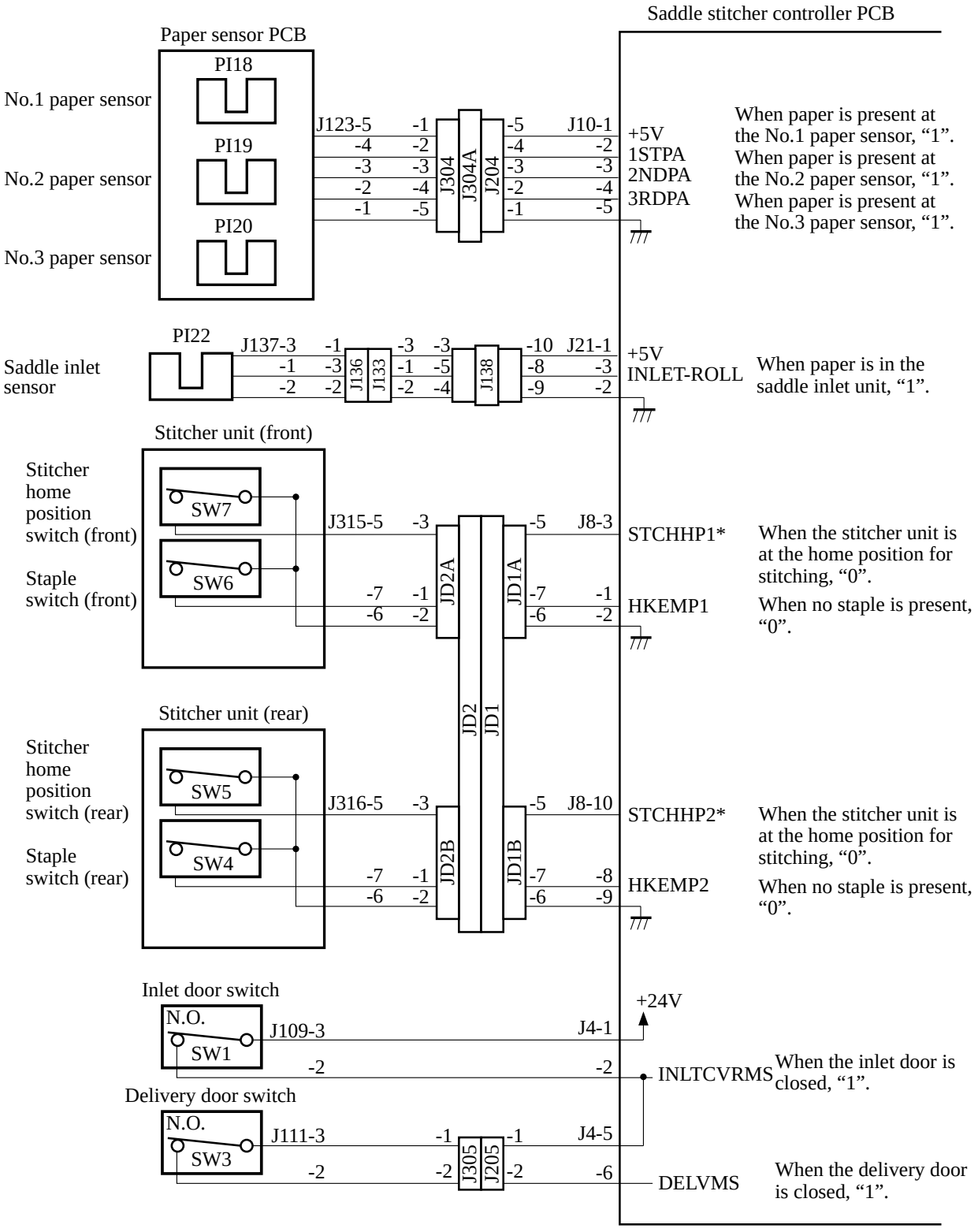
F03-103-01

1.3.2 Inputs to the Saddle Stitcher Controller PCB (2/3)



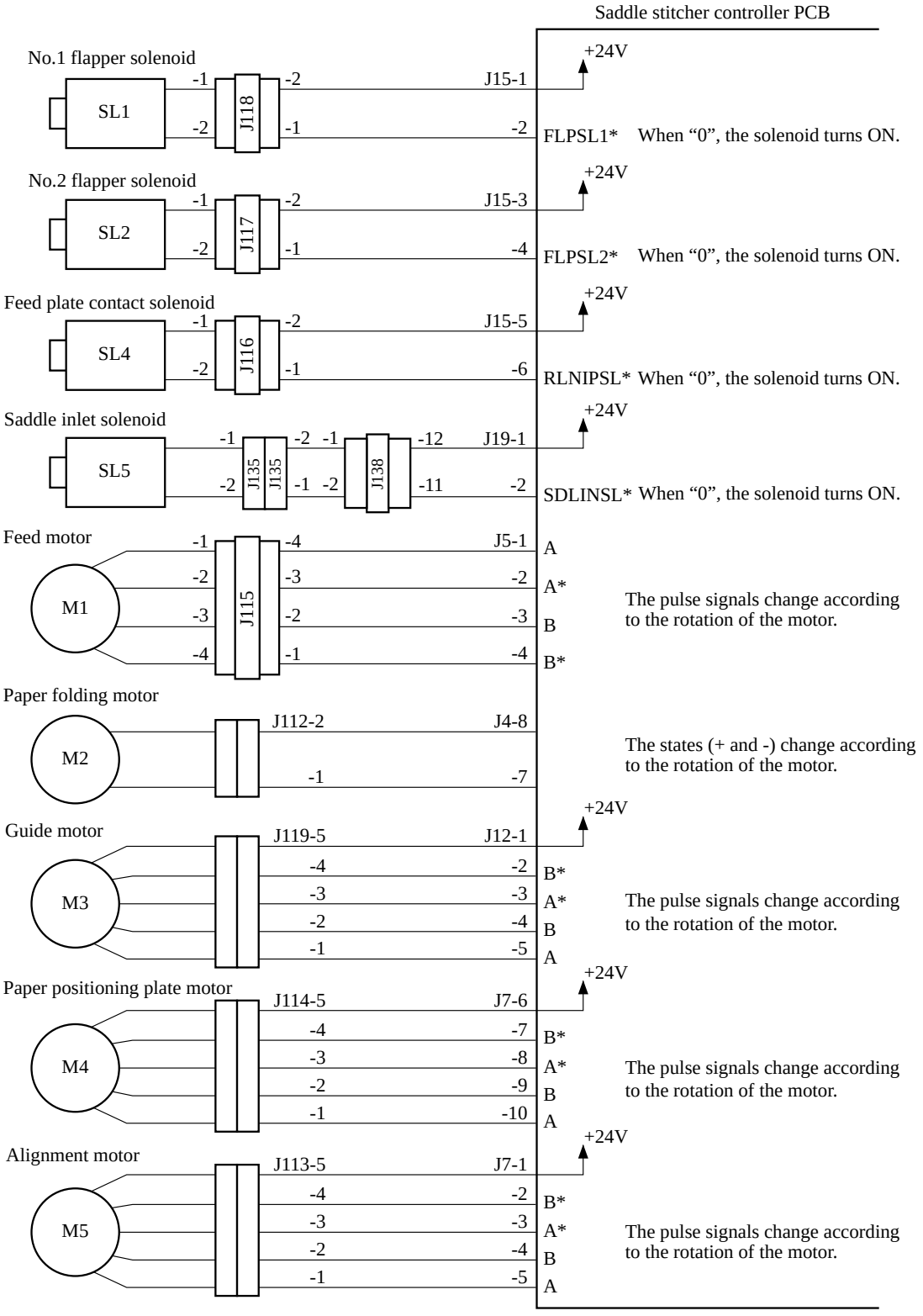
F03-103-02

1.3.3 Inputs to the Saddle Stitcher Controller PCB (3/3)



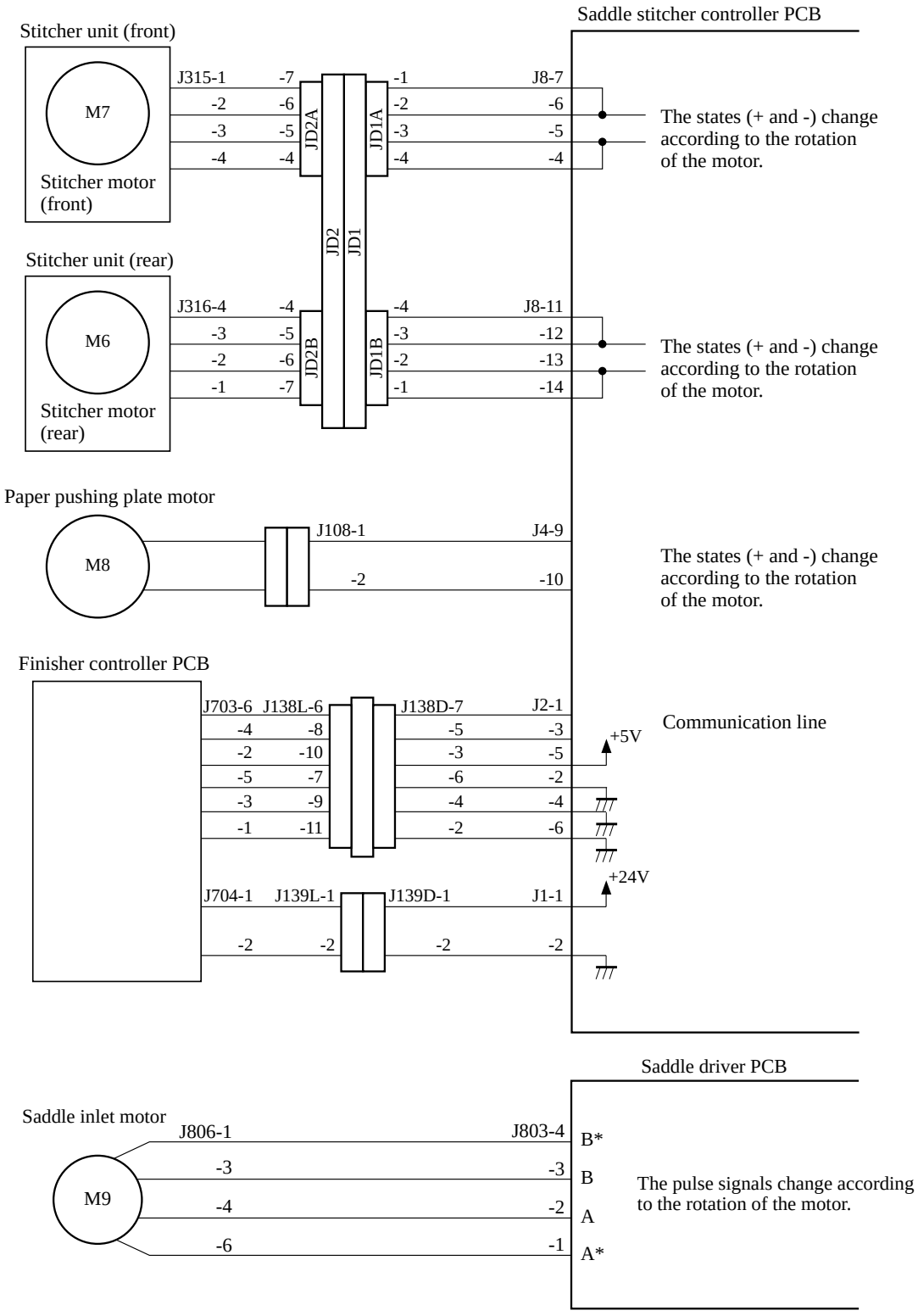
F03-103-03

1.3.4 Outputs from the Saddle Stitcher Controller PCB (1/2)



F03-103-04

1.3.5 Outputs from the Saddle Stitcher Controller PCB (2/2)



F03-103-05

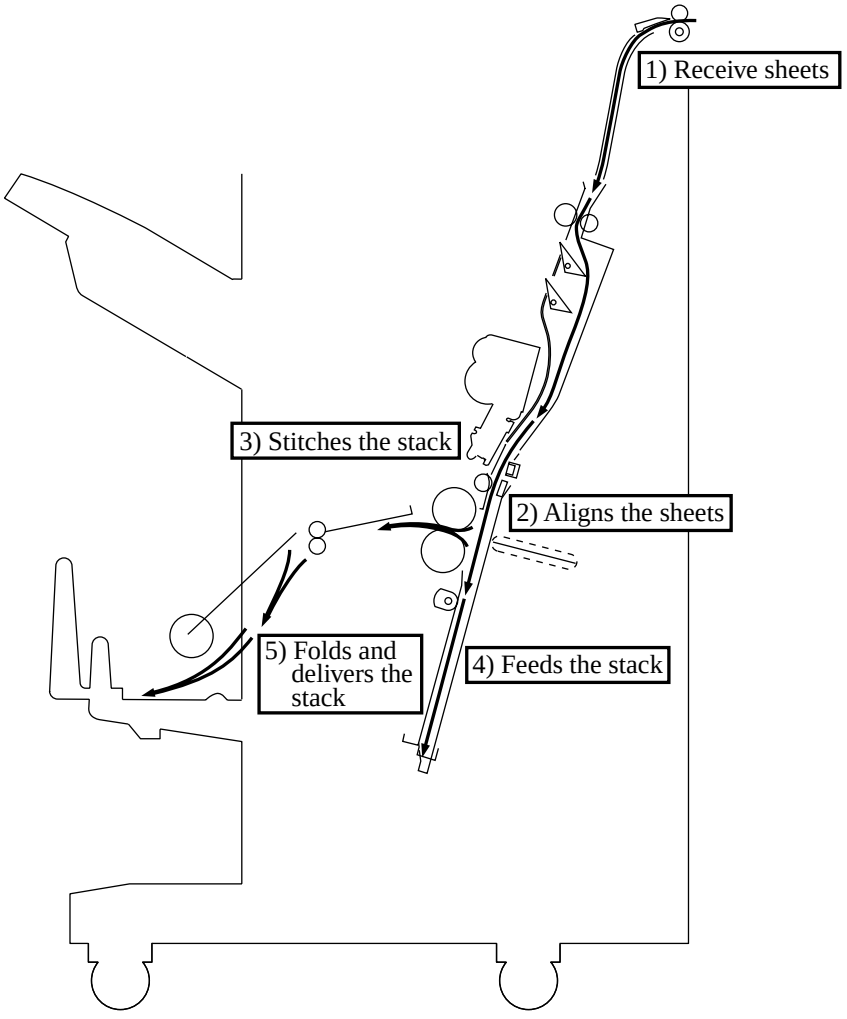
2 Feeding/Drive System

2.1 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



F03-201-01

2.1.1 Receiving Sheets

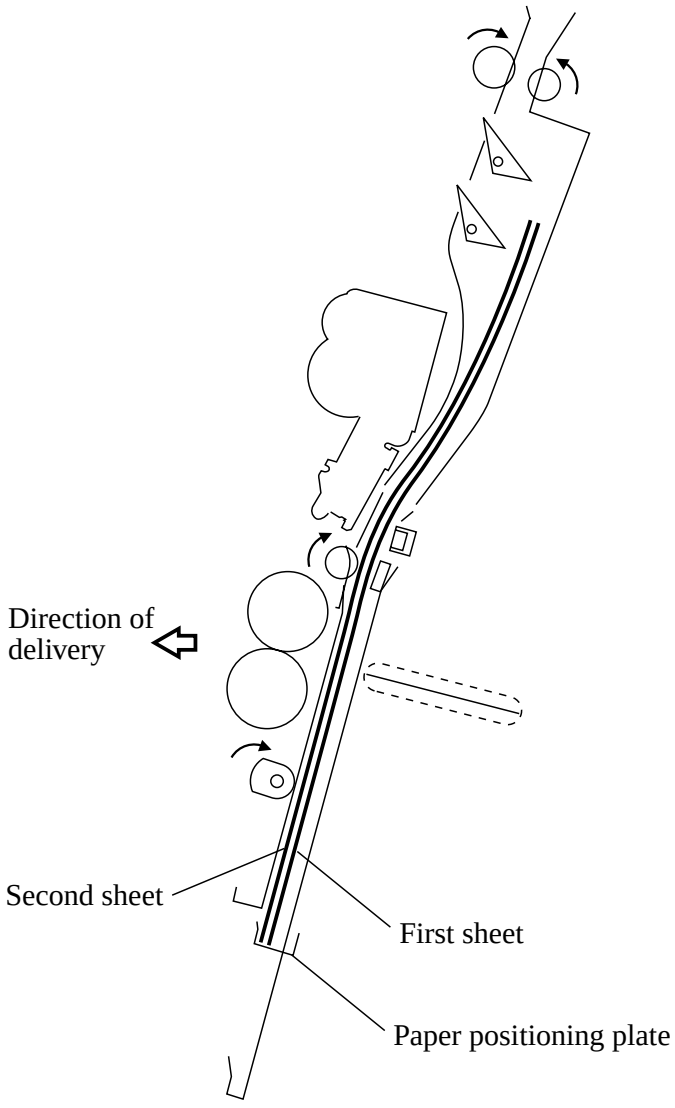
The stitcher unit receives sheets from the finisher unit and outputs them inside the vertical path in vertical orientation.

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)

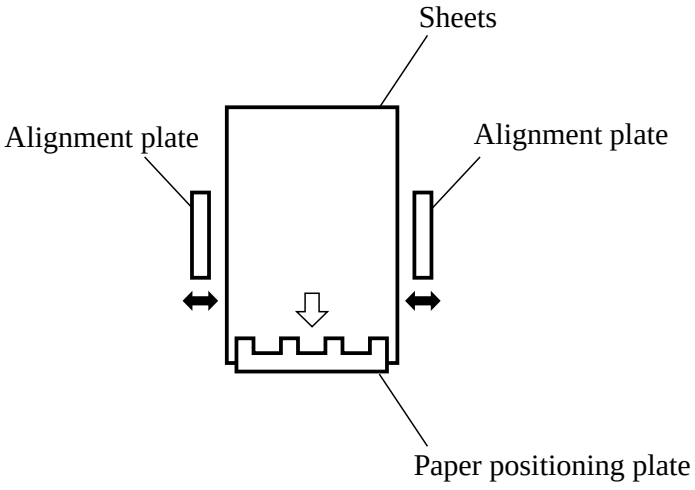


F03-201-02

2.1.2 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.



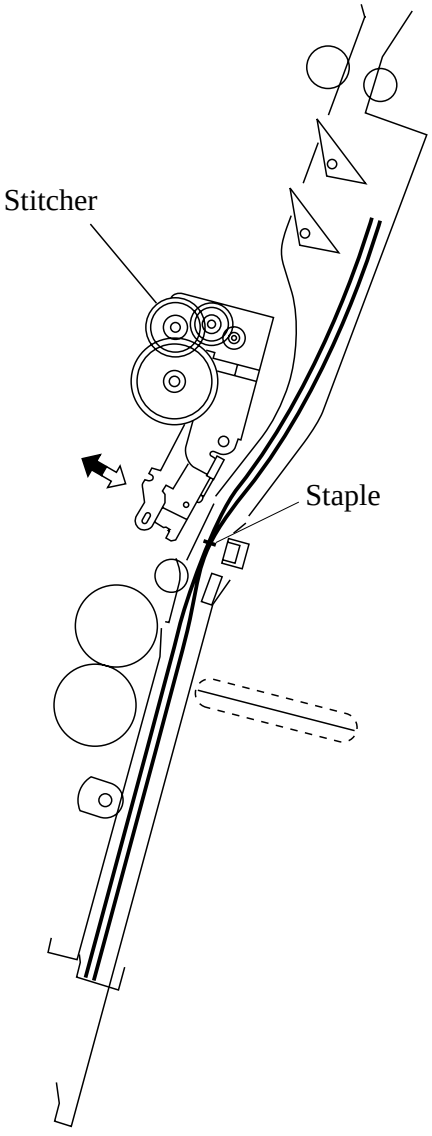
F03-201-03

2.1.3 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).

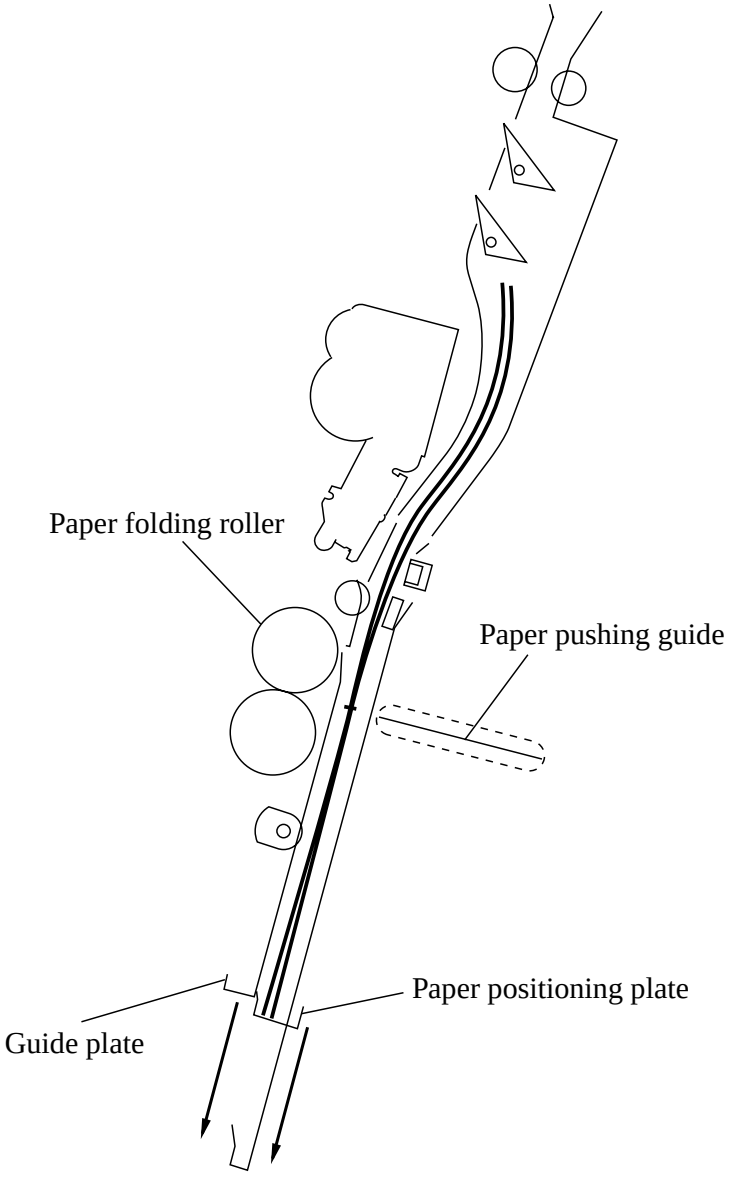


F03-201-04

2.1.4 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.

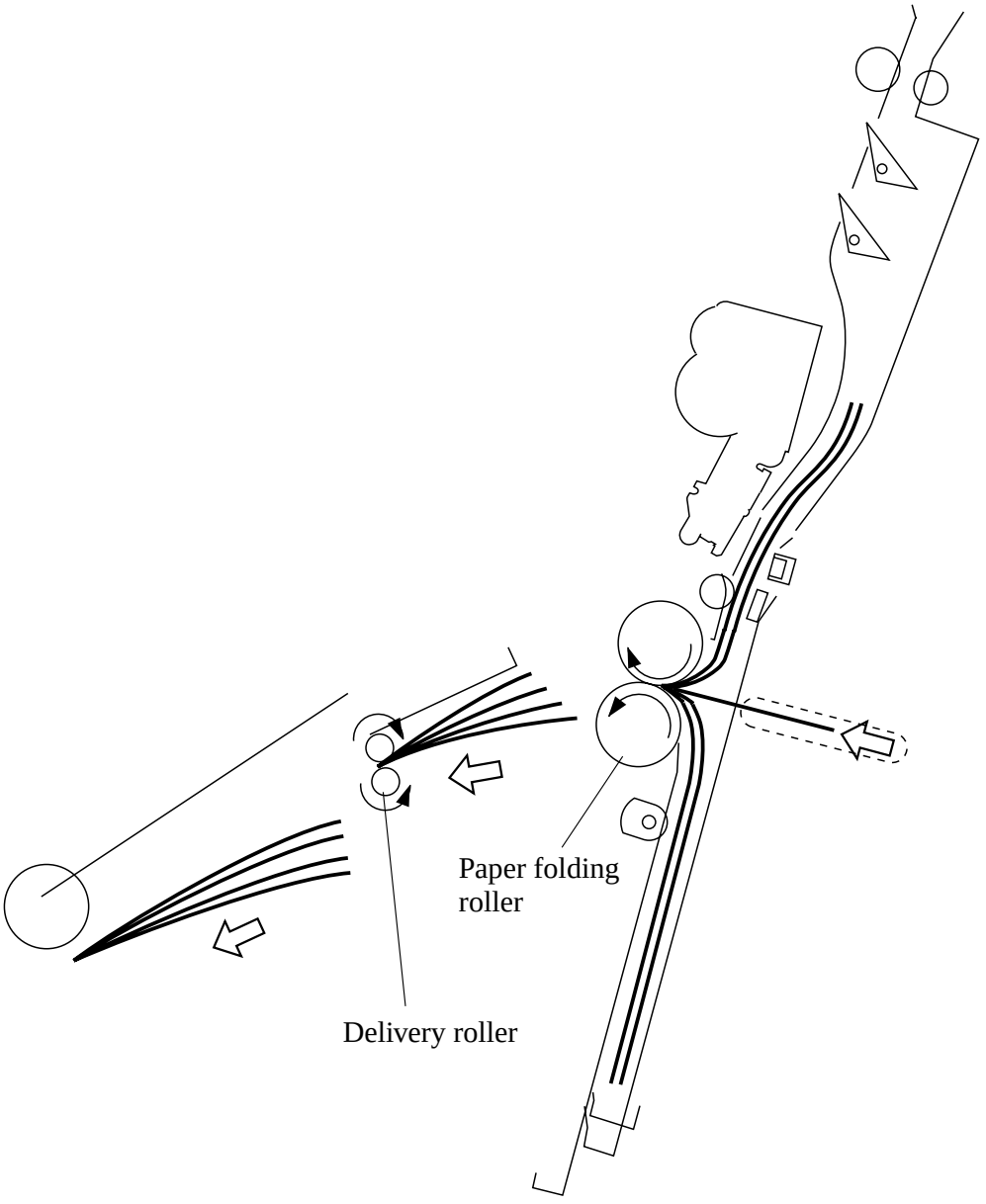
The stack is moved forward by operating the paper positioning plate. When the plate is operated, the guide plate which has been covering the paper folding rollers, also moves down so that the paper folding rollers directly face the stack.



F03-201-05

2.1.5 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.



F03-201-06

3 Paper Output Mechanism

3.1 Outline

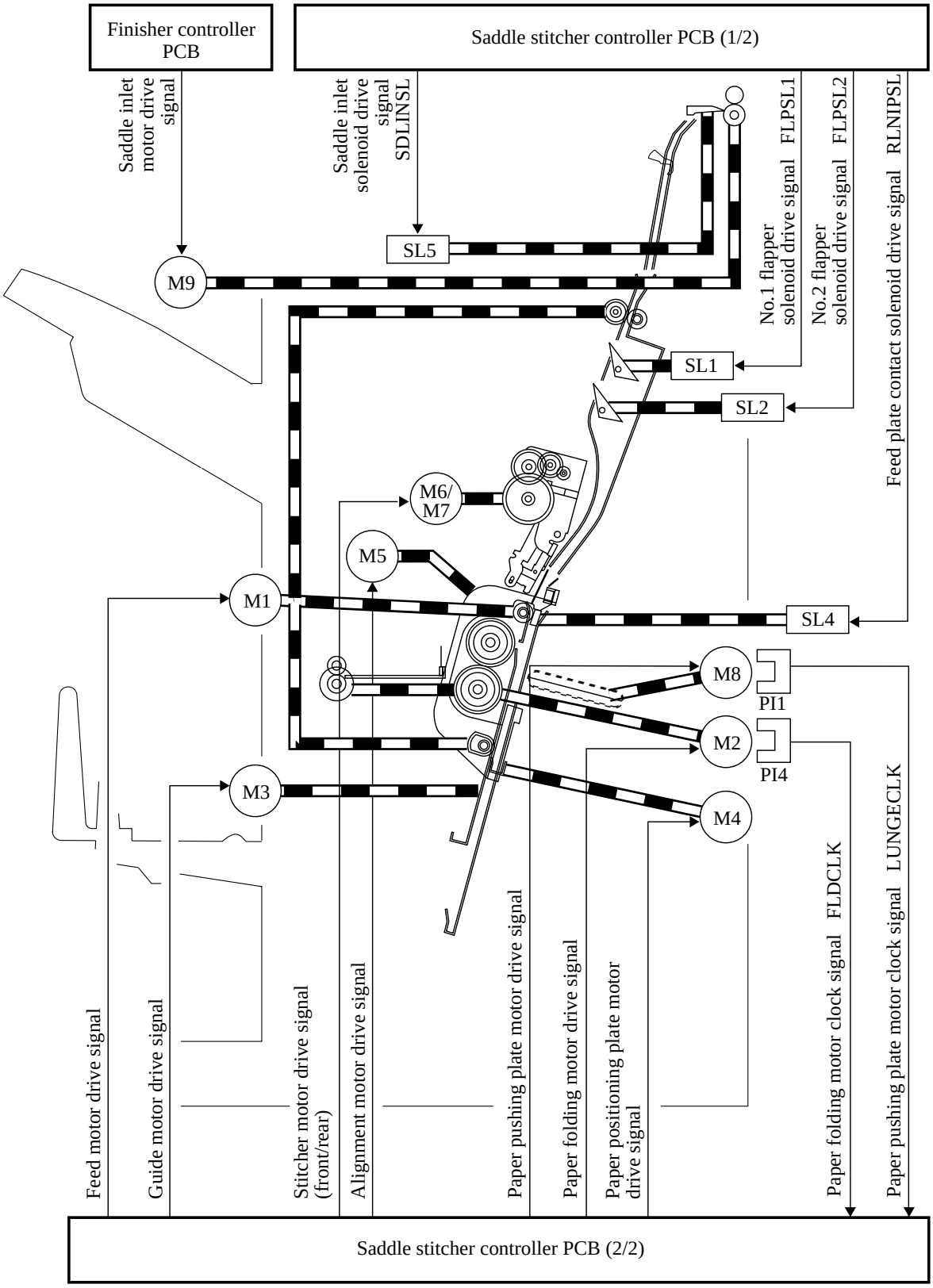
The paper output mechanism serves to keep a stack of sheets coming from the finisher in place for the next steps (stapling, folding).

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 (M4), 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 (PI7). 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.

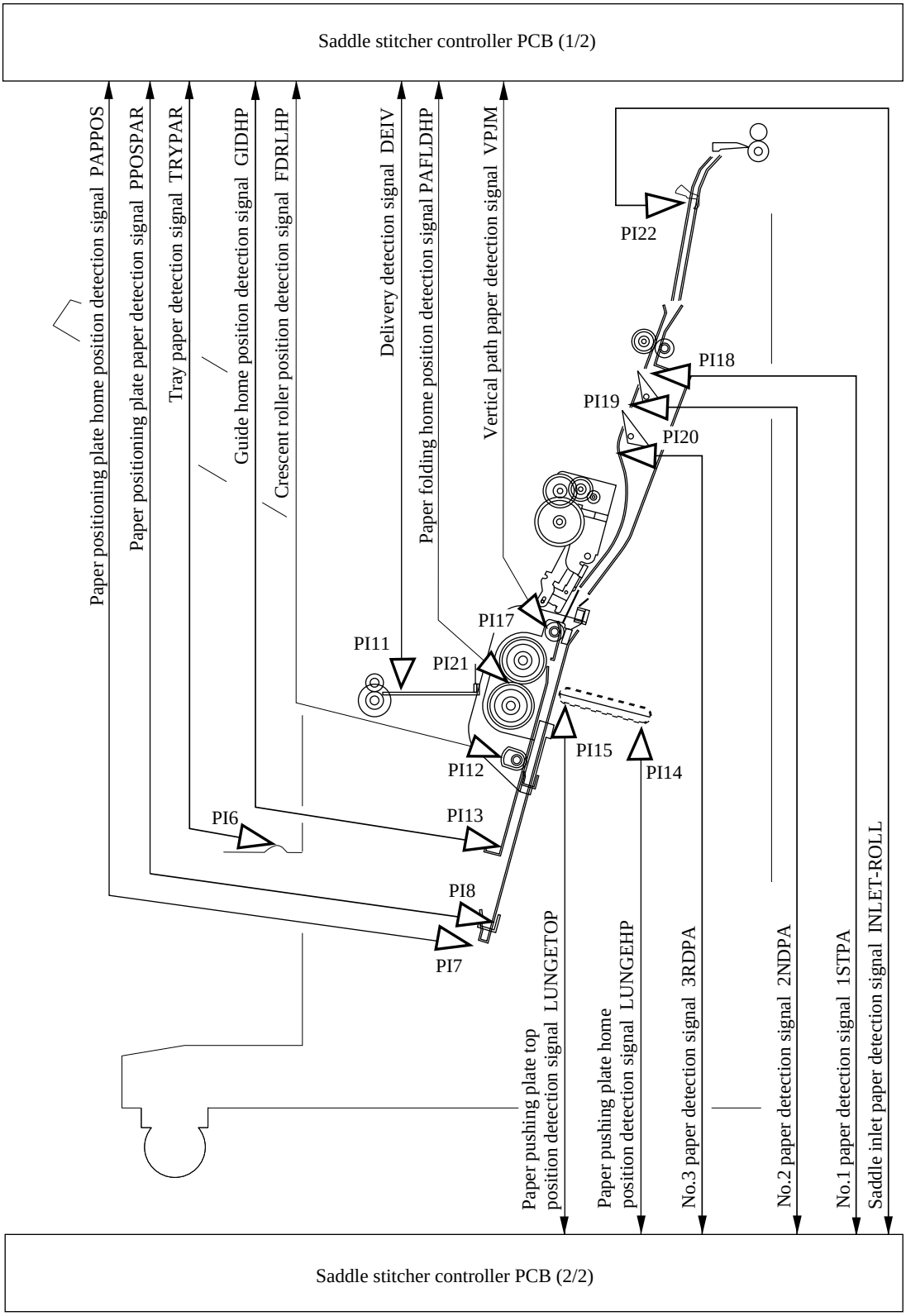
The alignment plates put the stack into order each time a sheet is output. The alignment plates are driven by the alignment motor (M5), whose position is identified in reference to the number of motor pulses coming from the alignment plate home position sensor (PI5).

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 (PI18, PI19 and PI20) each suited to a specific paper size, and the paper positioning plate is equipped with a paper positioning plate paper sensor (PI8).


Finisher controller PCB
Saddle stitcher controller PCB (1/2)
Saddle inlet motor drive signal
Saddle inlet solenoid drive signal SDLINSL
No.1 flapper solenoid drive signal FLPSL1
No.2 flapper solenoid drive signal FLPSL2
Feed plate contact solenoid drive signal RLNIPSL
SL5
M9
SL1
SL2
M6/ M7
M5
M1
SL4
M8
PI1
M2
PI4
M3
M4
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)

F03-301-01


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 home position detection signal GIDHP
Crescent roller position detection signal FDRLHP
Delivery detection signal DEIV
Paper folding home position detection signal PAFLDHP
Vertical path paper detection signal VPJM
PI22
PI18
PI19
PI20
PI17
PI11
PI21
PI15
PI14
PI12
PI6
PI13
PI8
PI7
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 inlet paper detection signal INLET-ROLL
Saddle stitcher controller PCB (2/2)

F03-301-02

3.2 Controlling the Inlet Flappers

3.2.1 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 T03-302-01 shows the relationship between sensors and paper sizes.

SENSOR	A3/LD	B4	A4-R/LT-R
No.1 paper sensor (PI18)	Used	Used	Used
No.2 paper sensor (PI19)	Not used	Used	Used
No.3 paper sensor (PI20)	Not used	Not used	Used

T03-302-01

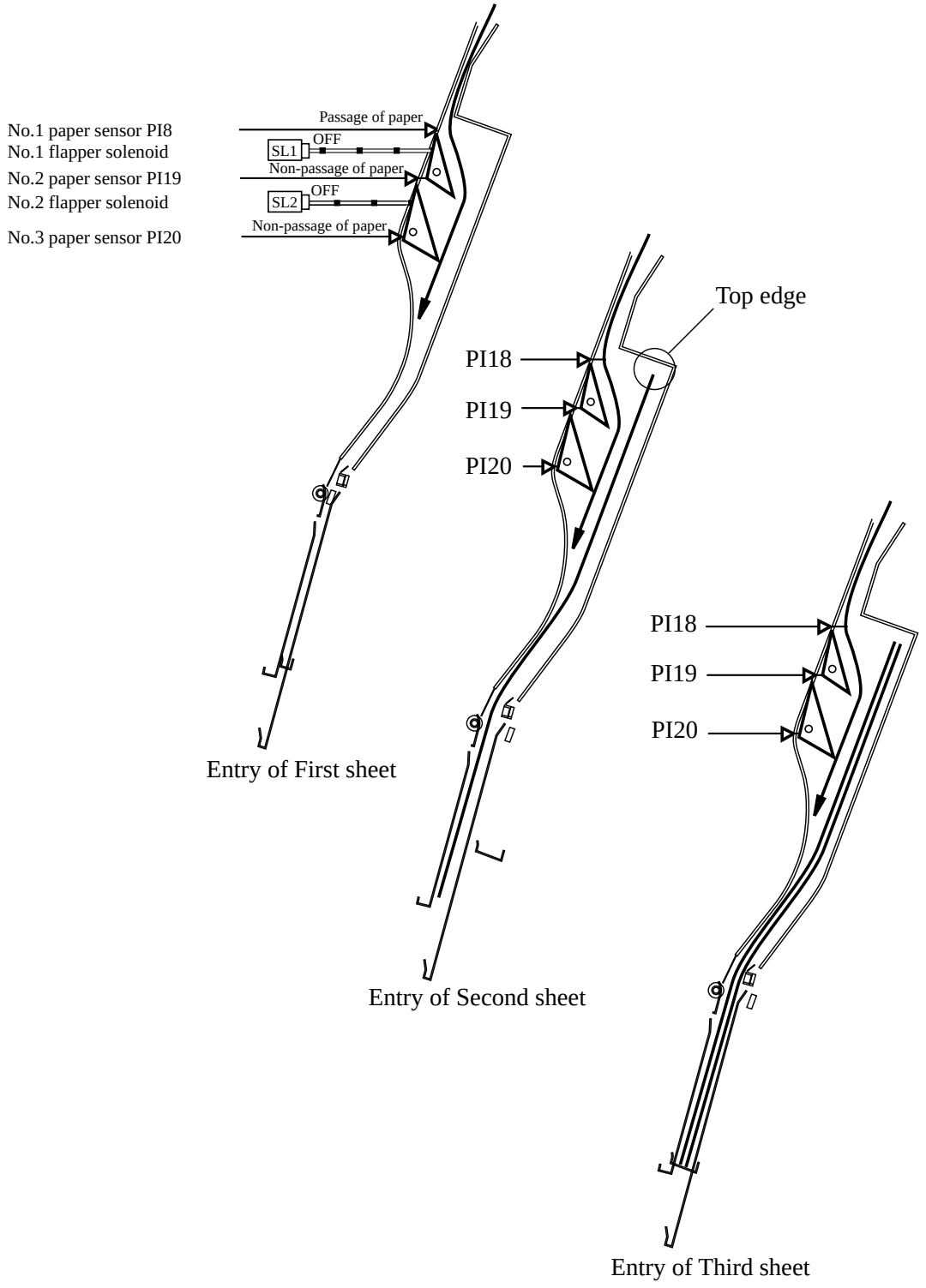
Each flapper is driven by its own solenoid.

T03-302-02 shows the relationship between solenoids and paper sizes.

Solenoid	A3/LD	B4	A4-R/LT-R
No.1 flapper solenoid (SL1)	OFF	ON	ON
No.2 flapper solenoid (SL2)	OFF	OFF	ON

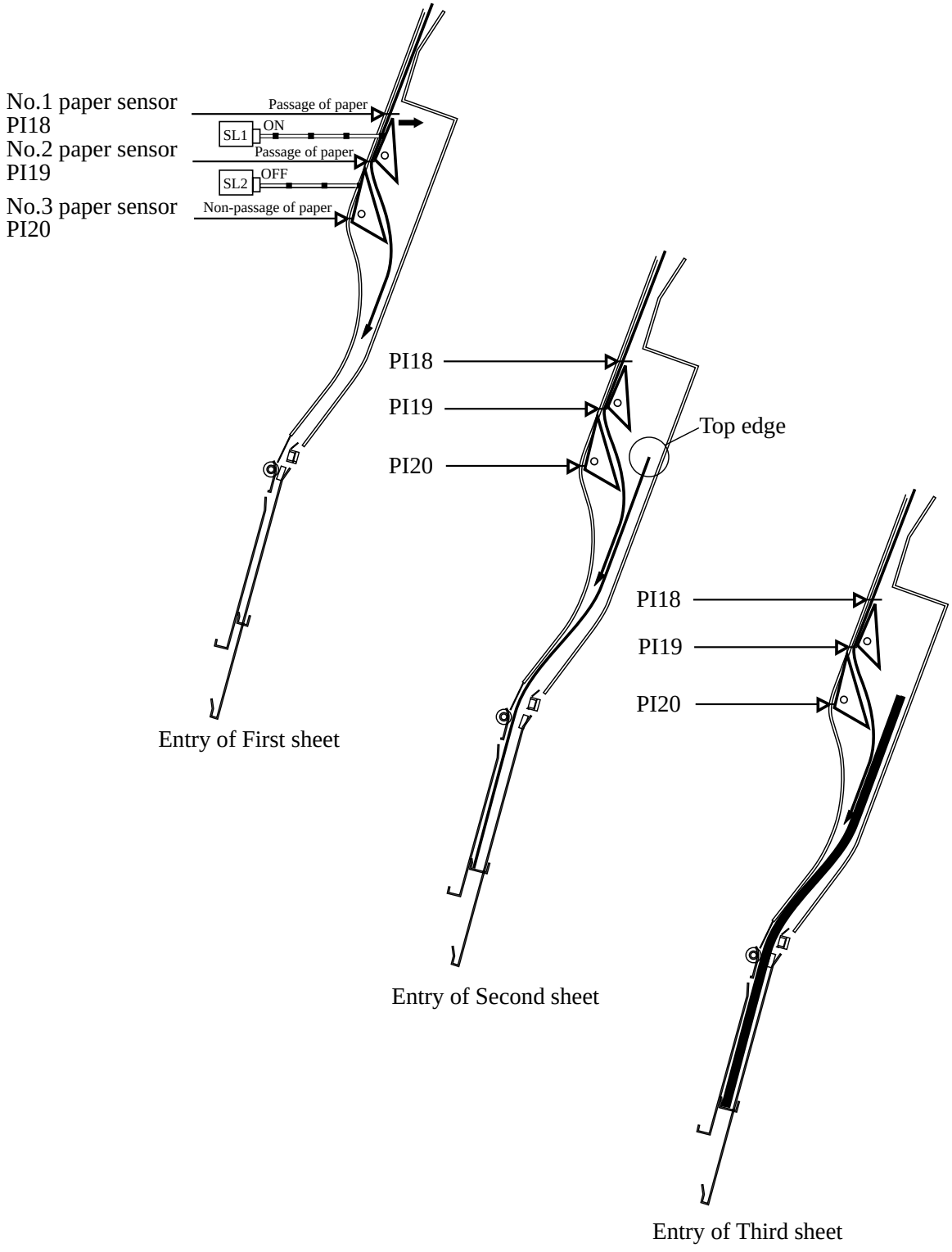
T03-302-02

3.2.2 A3/LD Paper Path (3 sheets)



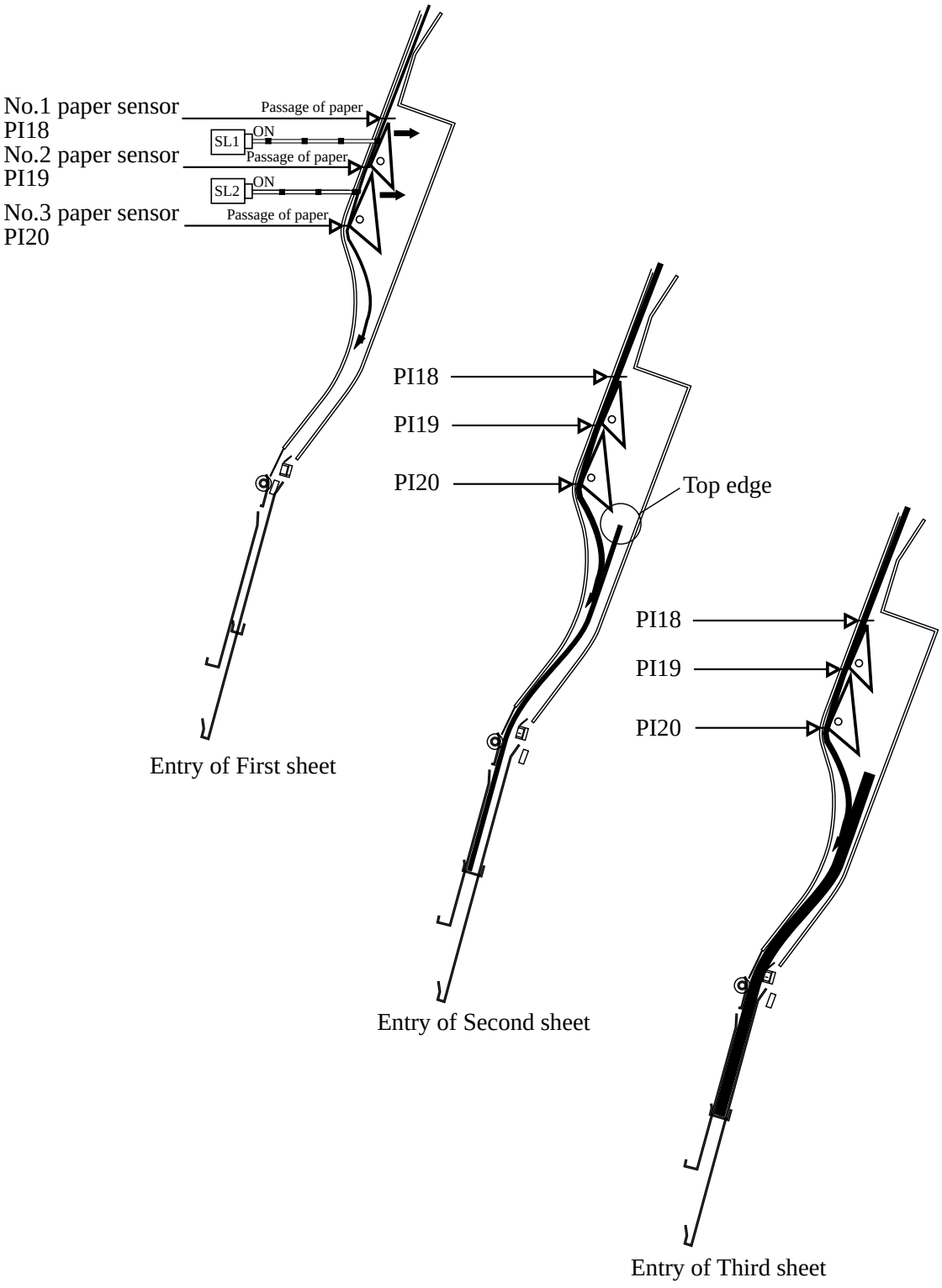
F03-302-01

3.2.3 B4 Paper Path (3 sheets)



F03-302-02

3.2.4 A4-R/LT-R Paper Path (3 sheets)



F03-302-03

3.3 Controlling the Movement of Sheets

3.3.1 Outline

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.

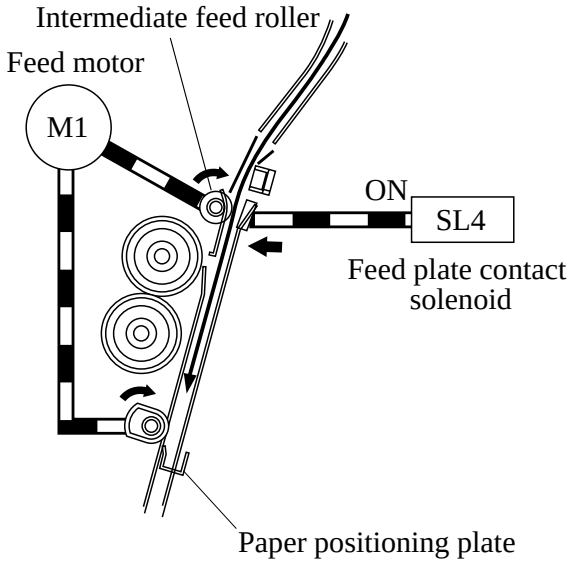
The intermediate feed roller is normally not in contact with the path bed. When the leading edge of a sheet reaches the intermediate feed roller contact section, the feed plate contact solenoid (SL4) causes the roller to come into contact with the path bed so as to move the sheet. The contact is broken 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 (PI8) 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.

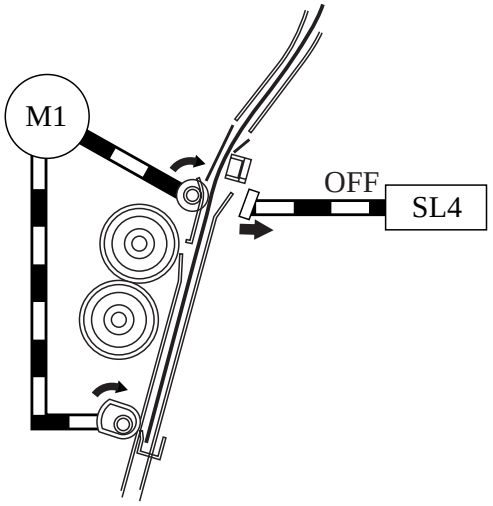
The alignment motor (M5) drives the alignment plates for each sheet so as to put both left and right edges of the sheet in order.

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



F03-303-01

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



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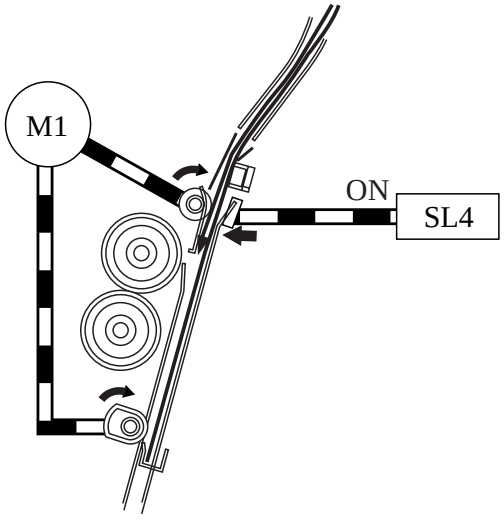
3) The solenoid turns ON when the next sheet arrives, and the feed plate comes into contact.



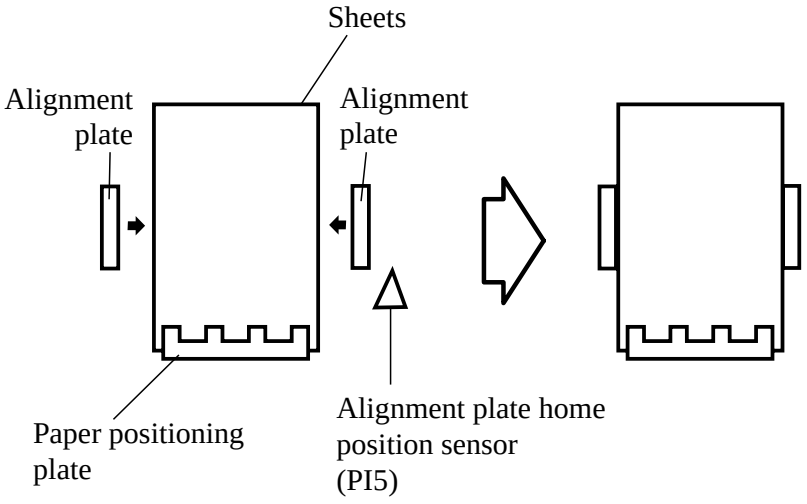
F03-303-03

3.4 Controlling the Aligning the Sheets

The alignment motor (M5) drives the alignment plates each time a sheet is output, putting both left and right edges of the sheet in order. The alignment 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 (PI5).

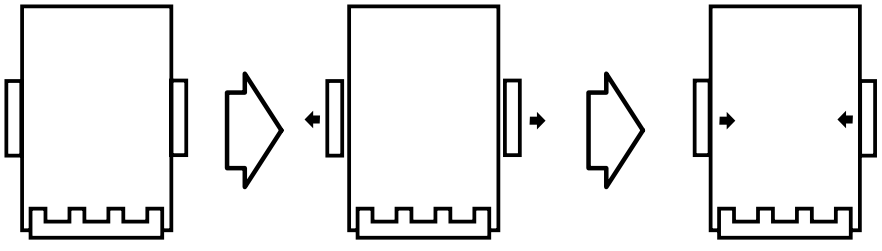
The following briefly describes what takes place when the saddle stitching mechanism operates on two sheets.

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.



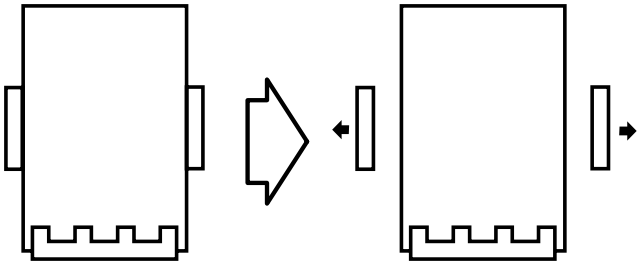
F03-304-01

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).



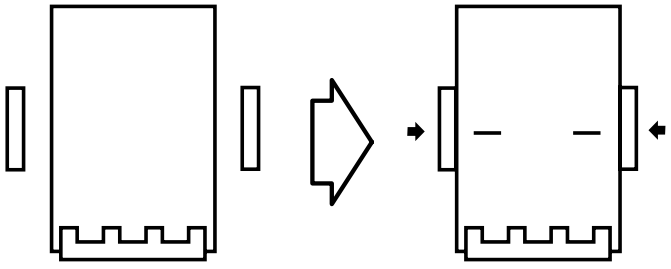
F03-304-02

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



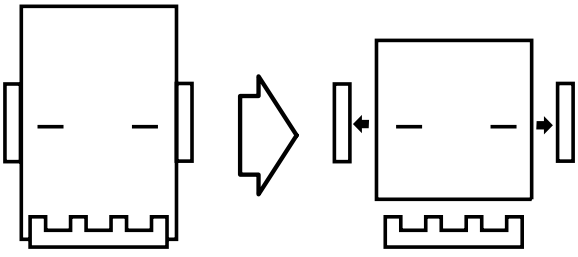
F03-304-03

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.



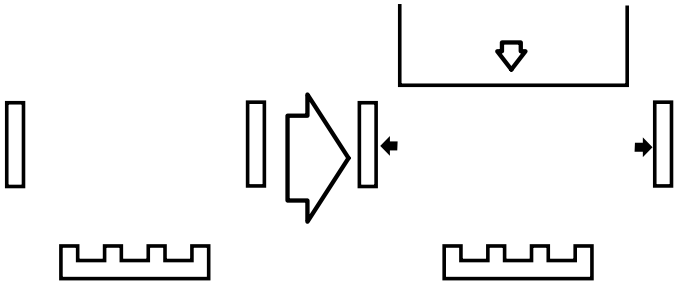
F03-304-04

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



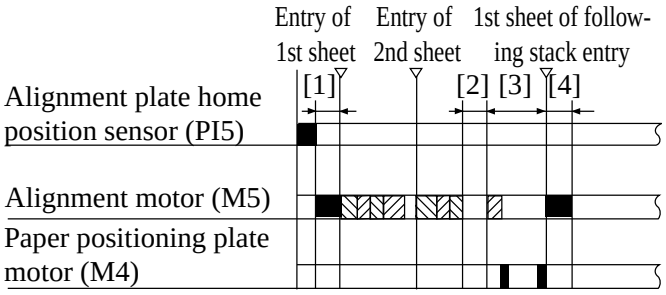
F03-304-05

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.



F03-304-06

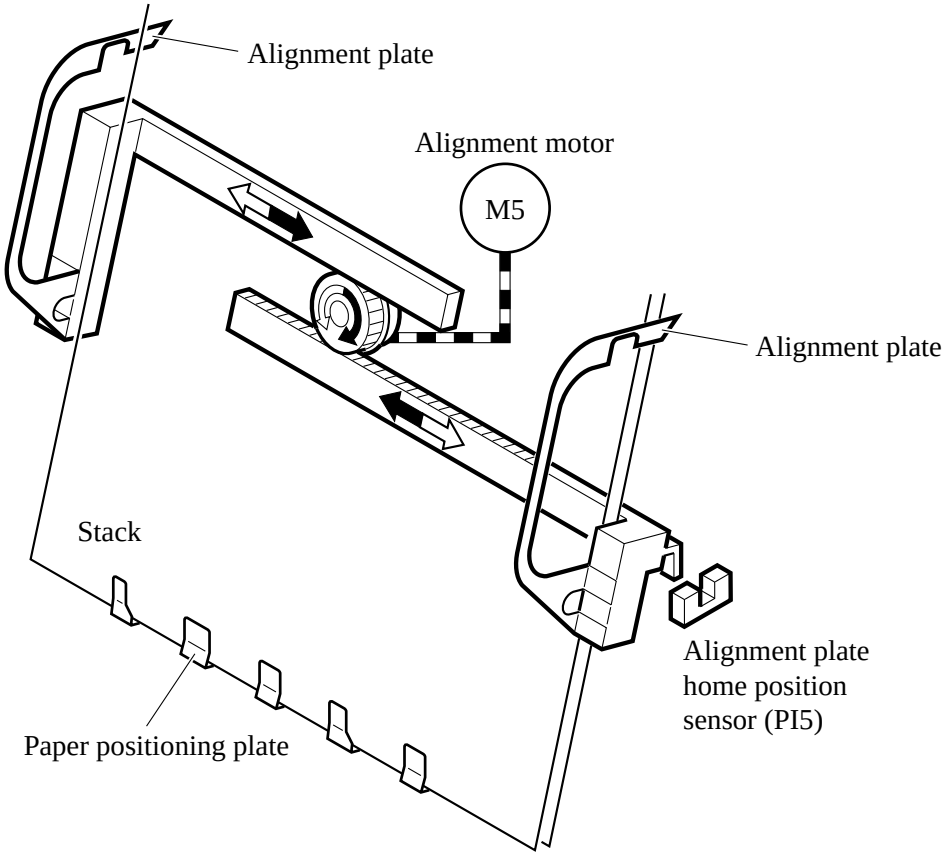
In case of 2 sheets:



: Alignment : Escape

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

F03-304-07



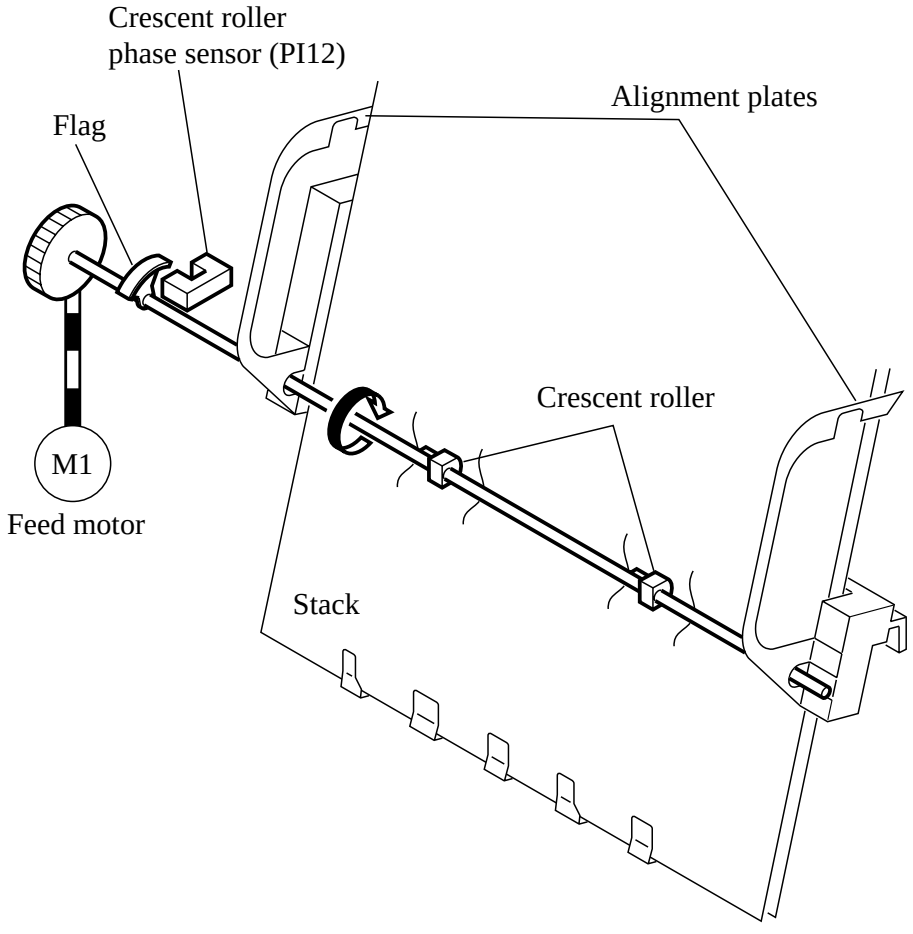
F03-304-08

3.5 Controlling the Phase of the Crescent Roller

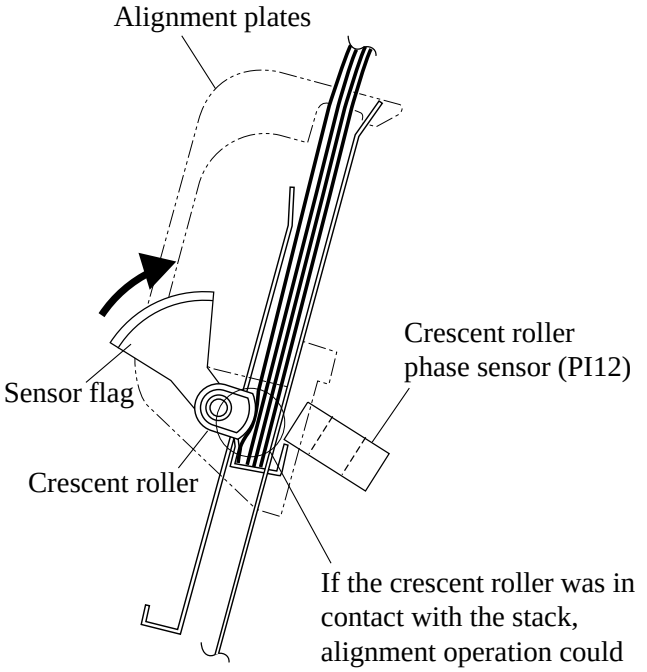
3.5.1 Outline

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 F03-305-01). To prevent this problem, the phase of the roller is identified and used to determine the timing of alignment.

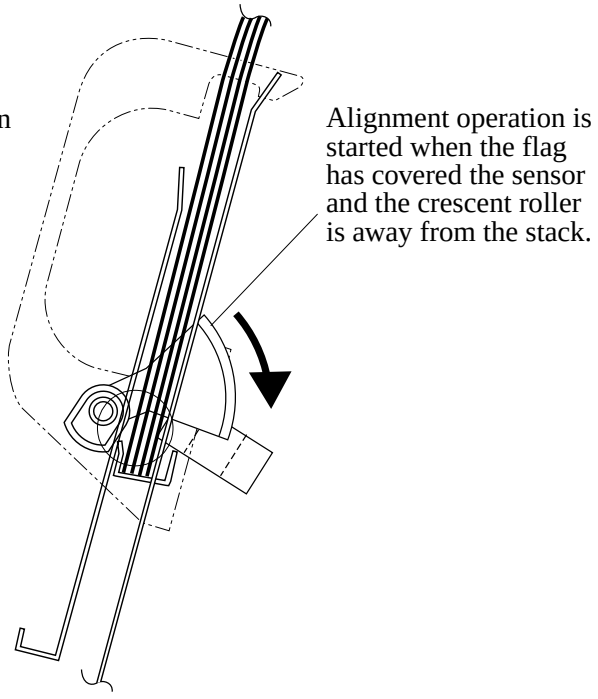
The phase of the crescent roller is identified by the crescent roller phase sensor (PI12). The flag for the crescent roller phase sensor is mounted to the crescent roller shaft. The flag will leave the sensor while the roller shaft rotates, turning the sensor ON or OFF, enabling the assumption that the crescent roller is positioned at the opposite side of the stack (Figure F03-305-03). The alignment plates are operated to correspond with this change in the state of the sensor.



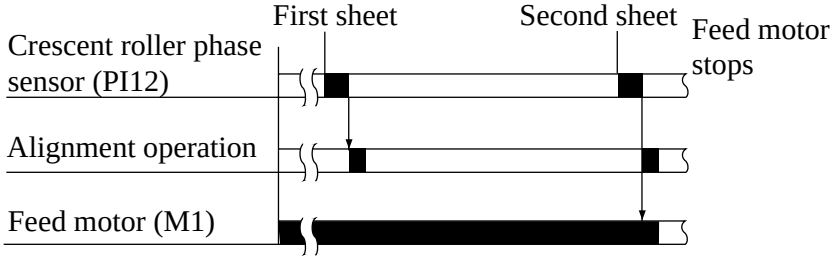
F03-305-01



F03-305-02



F03-305-03



F03-305-04

4 Stitching System

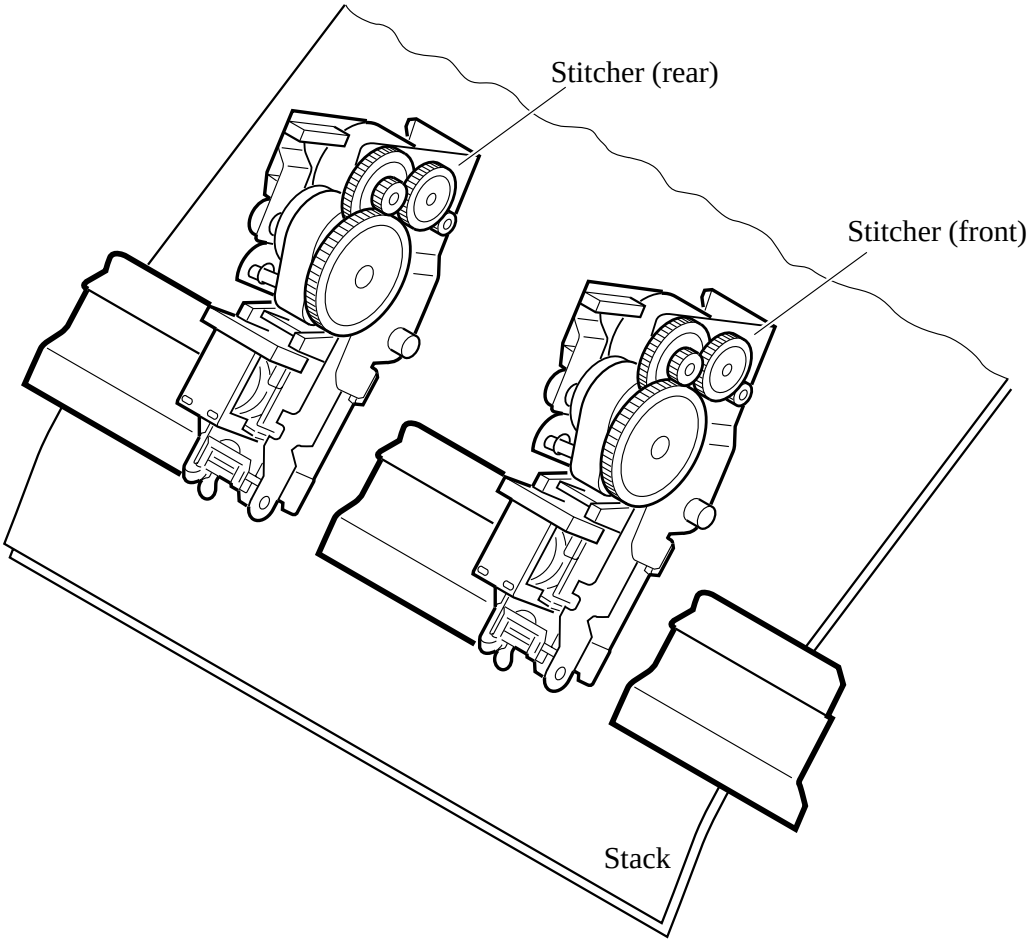
4.1 Outline

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 (M7, M6) for drive, a stitcher home position switch (SW7, SW5) for detection of position and a staple switch (SW6, SW4) 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 (PI16) 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.



F03-401-01

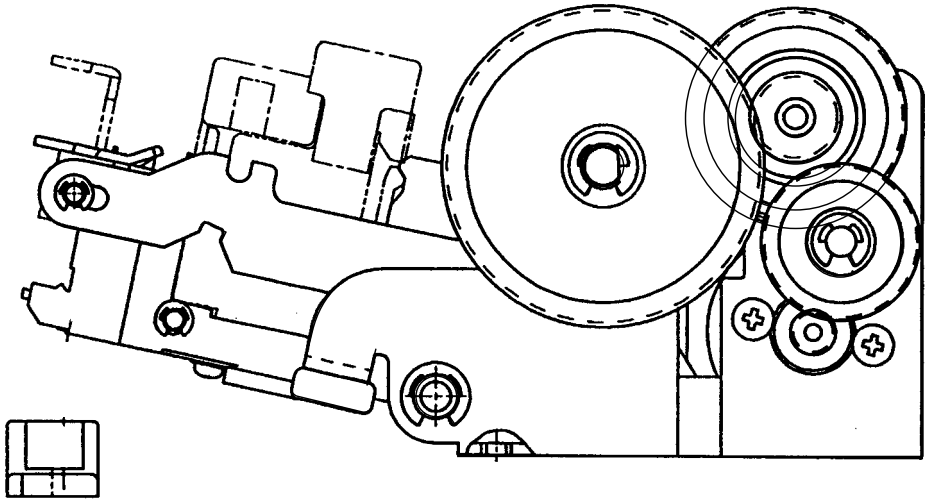
4.2 Stitcher Unit Operation

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.

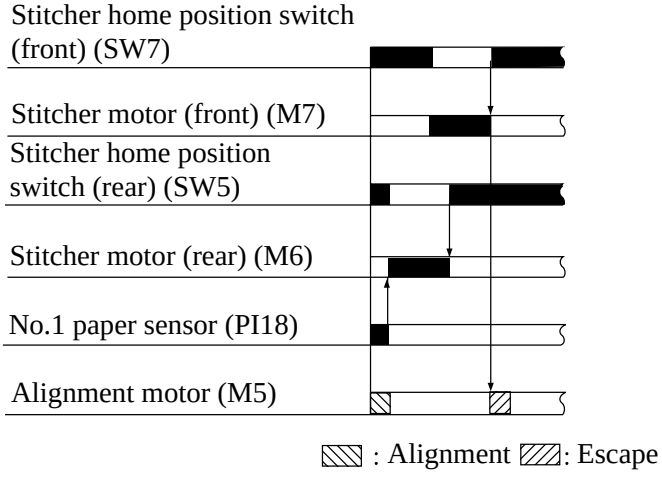
Stitching is executed by driving the rotary cam by the stitcher motor (M7, M6). The front and rear stitcher units are operated with a time delay so as to prevent wrinkling of paper and to limit the load applied to the power supply. (A time delay for initiating the stitcher motor startup current helps decrease the load on the power supply.)

The stitcher home position switch (SW7, SW5) 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 switch (SW6, SW4).

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



F03-402-01



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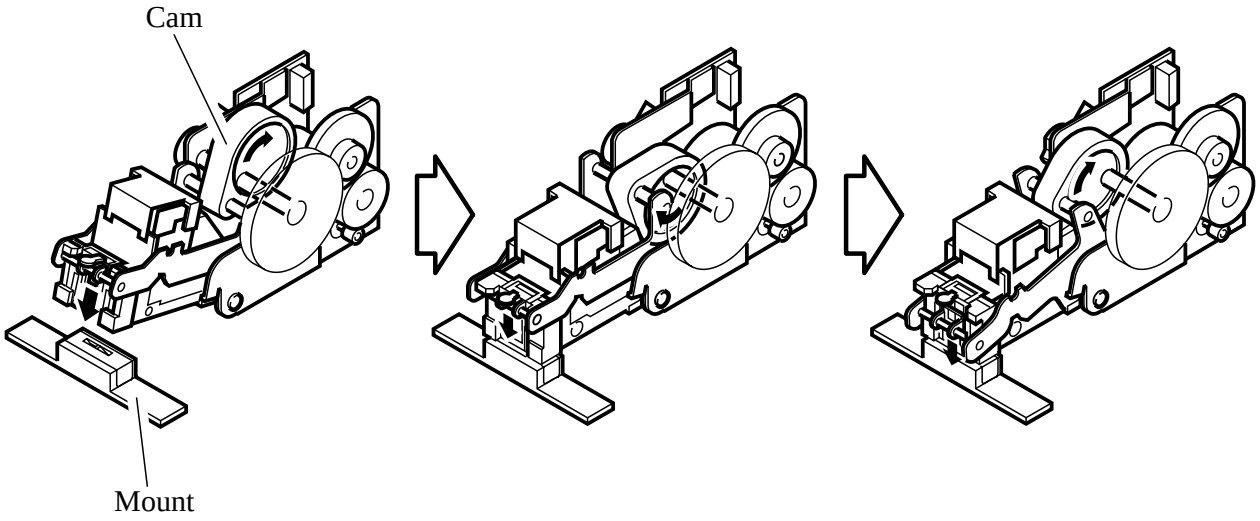


F03-402-03

5 Folding/Delivery System

5.1 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 (M2), and the drive of the motor is monitored by the paper folding motor clock sensor (PI4). The mechanism is also equipped with a paper folding home position sensor (PI21) for detecting the position of the paper folding rollers.

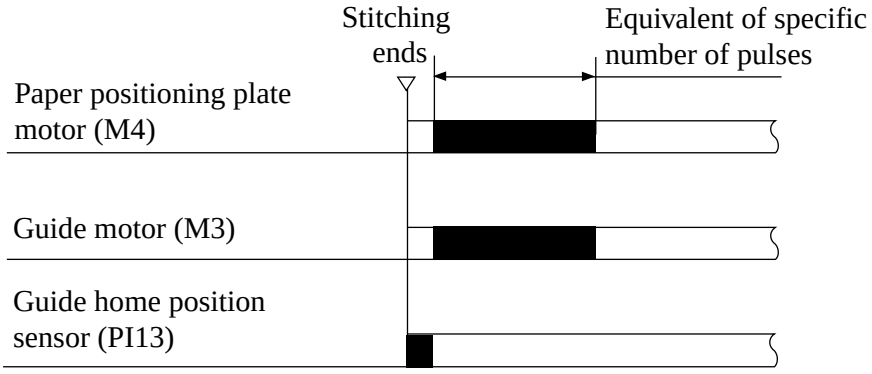
The paper pushing plate is driven by the paper pushing plate motor (M8), and the drive of the paper pushing plate motor is monitored by the paper pushing plate motor clock sensor (PI1). The paper pushing plate home position sensor (PI14) and the paper pushing plate top position sensor (PI15) are used 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 (PI11) is mounted to the delivery assembly to detect delivery of paper. The tray paper sensor (PI6) is used to detect the presence/absence of paper on the tray, but does not detect jams. The vertical path paper sensor (PI17) serves to detect the presence of paper after jam removal.

5.2 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 (PI7).

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



F03-502-01

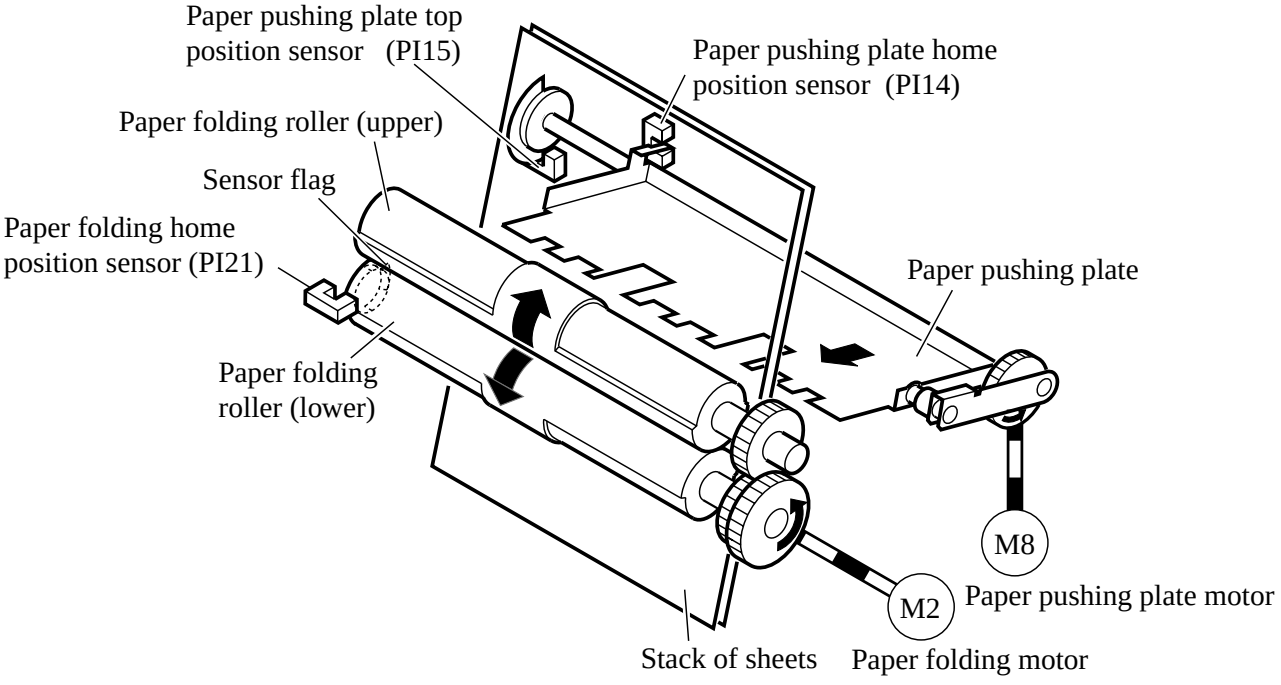
5.3 Folding a Stack

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 (PI21).



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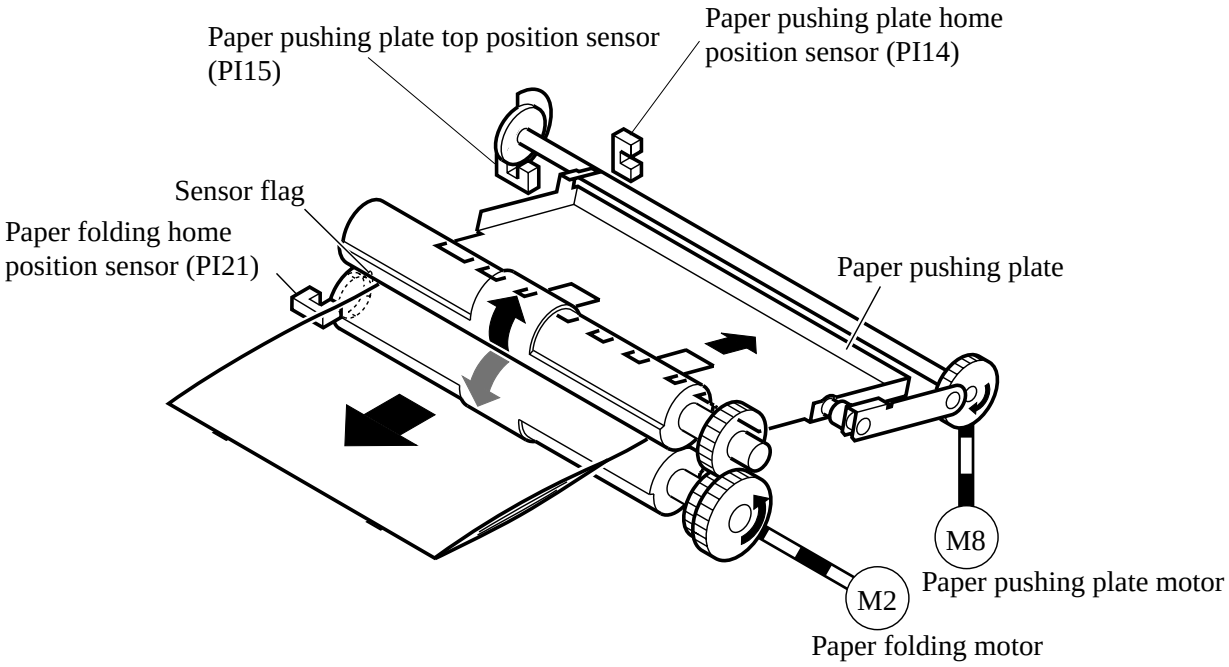
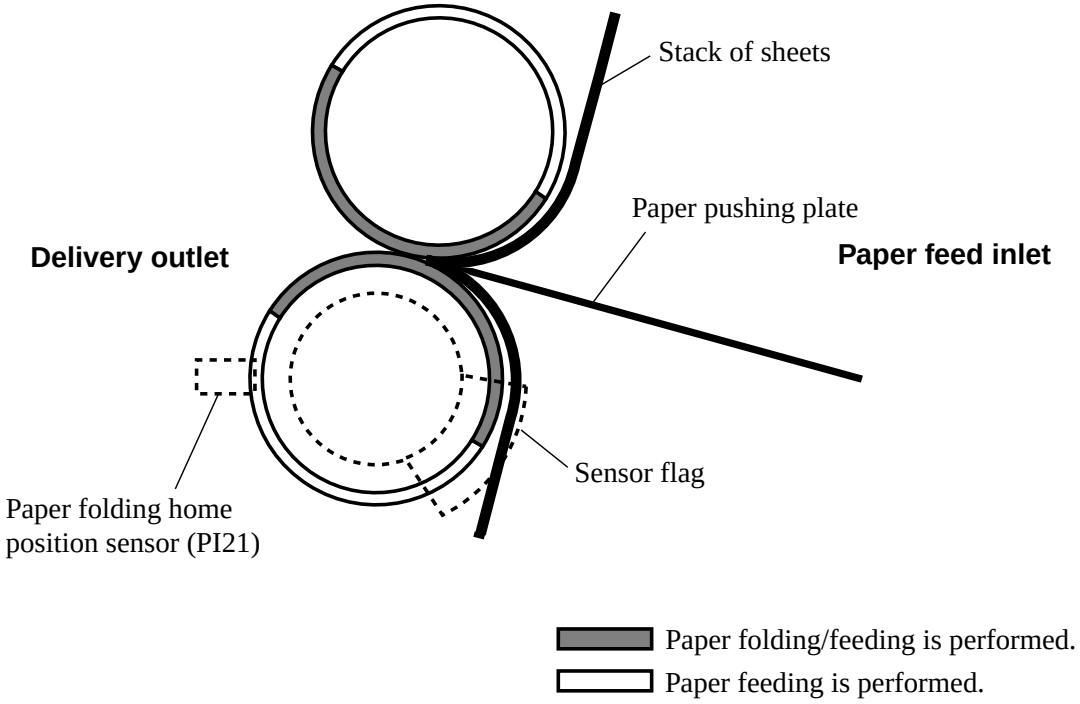


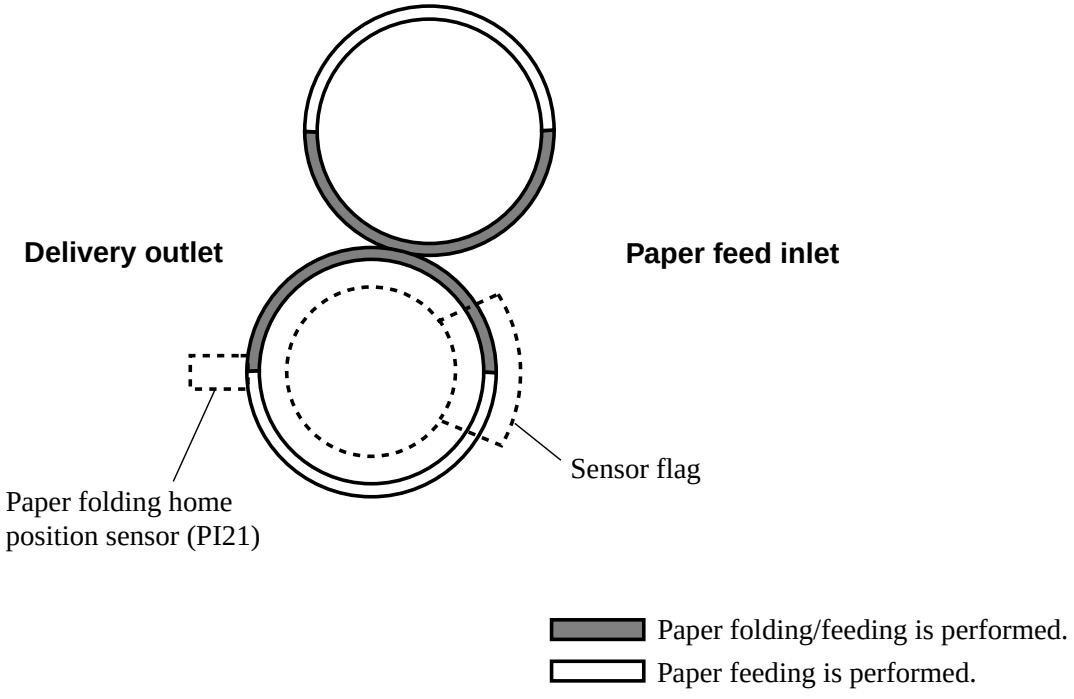
F03-503-02

[Paper folding start position]



F03-503-03

[Paper folding roller stop position]



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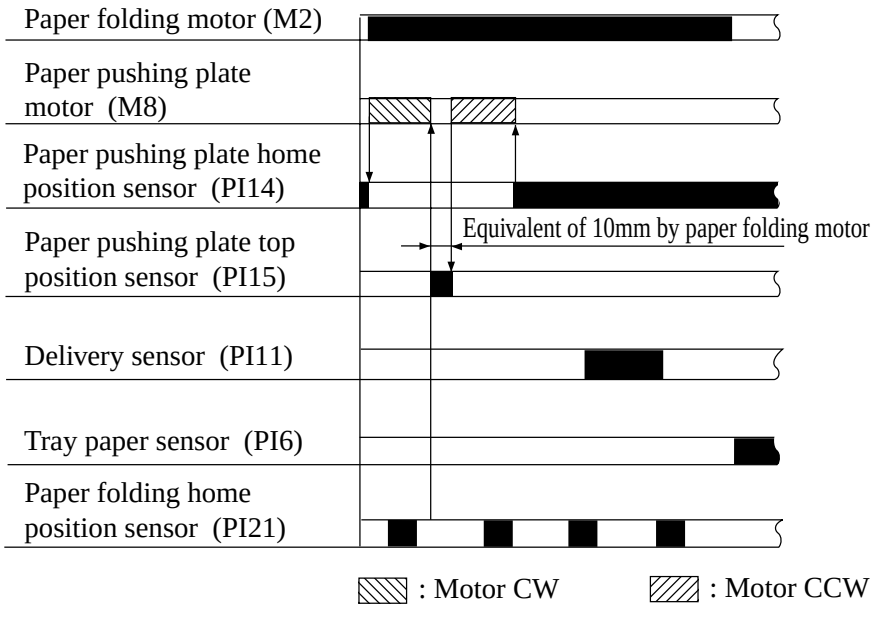


F03-503-05

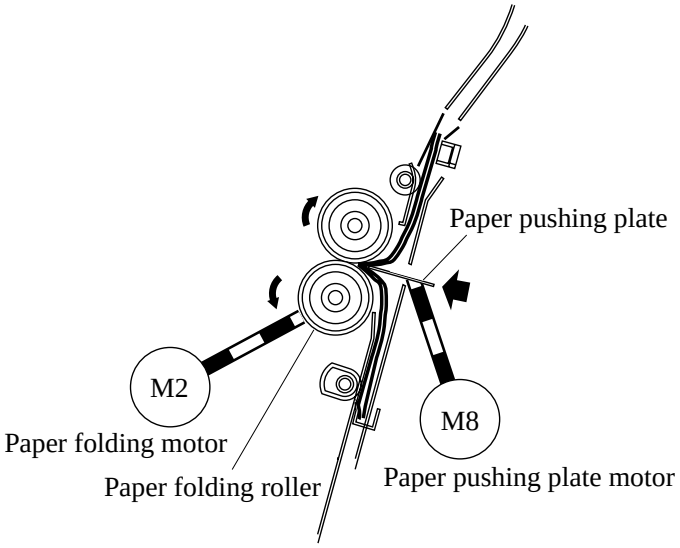
5.4 Double Folding a Stack

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.

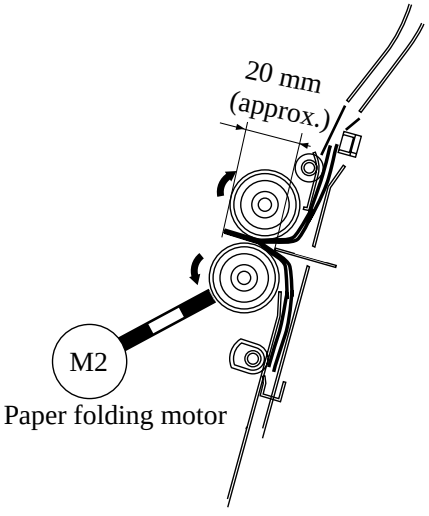
This way, a stack requiring a large force may properly be folded with less pressure.

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



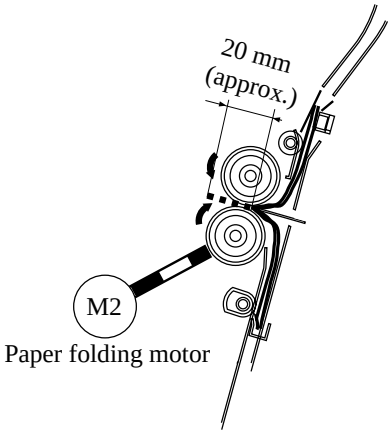
F03-504-01

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



F03-504-02

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



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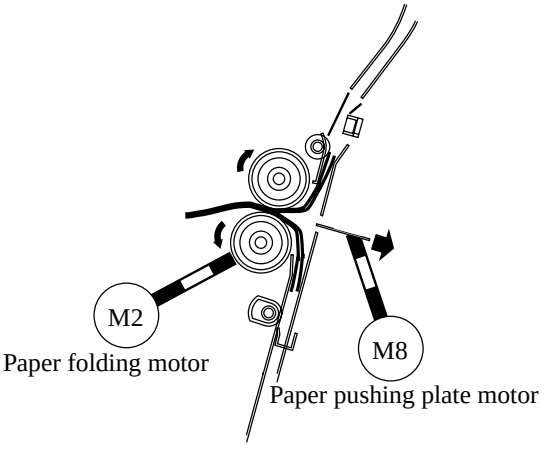
4) The paper folding rollers rotate again, feeding out the stack. The paper pushing plate returns to its home position.



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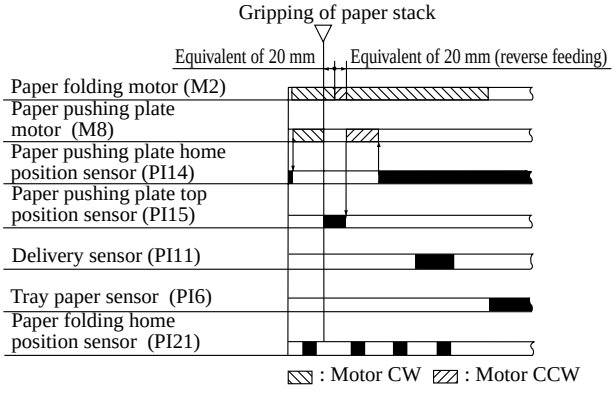


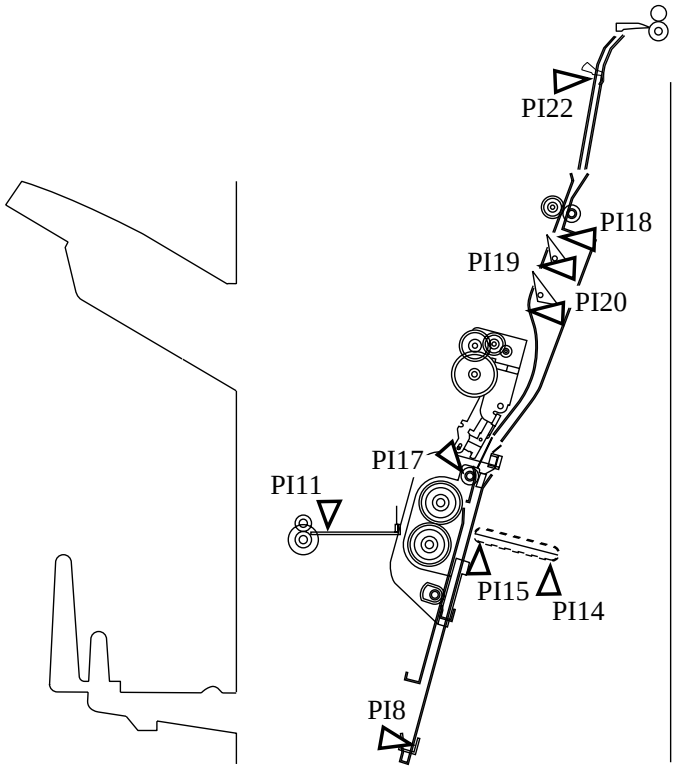
F03-504-05

6 Checking For a Jam

6.1 Outline

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 printing operation and indicate the presence of a jam on its control panel.

When all doors are closed after the user has removed the jam, the saddle stitcher unit checks whether the vertical path paper sensor (PI17) 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.



F03-601-01

No.	Sensor
PI11	Delivery sensor
PI17	Vertical path paper sensor
PI18	No.1 paper sensor
PI19	No.2 paper sensor
PI20	No.3 paper sensor
PI22	Saddle inlet sensor

T03-601-01

Jam Type	Sensor	Jam Condition
Delay at inlet sensor	PI22	When the saddle inlet sensor (PI22) does not detect paper after a prescribed time (distance) has elapsed since receiving a saddle delivery request from the Finisher.
Stationary at inlet sensor	PI22	When paper does not exit the saddle inlet sensor (PI22) after delivering for a prescribed amount with the feed motor (M1) after the saddle inlet sensor (PI22) detected the leading edge of the paper.
Delay at delivery sensor	PI18	When the 1st paper sensor (PI18) does not detect paper after prescribed time (distance) has elapsed since the saddle inlet sensor (PI22) detected the leading edge of the paper.
Stationary at delivery sensor	PI18 PI19 PI20	When paper does not exit the 1st paper sensor (PI18), 2nd paper sensor (PI19), and 3rd paper sensor (PI20) after delivering for a prescribed amount with the feed motor (M1) after the 1st paper sensor (PI18) has detected the leading edge of the paper.
Delivery delay	PI11	When delivery sensor (PI11) cannot detect the paper after delivering the stack for a prescribed amount with the paper folding motor (M2) after completing paper pushing motion with the paper pushing plate.
Stationary delivery	PI11 PI17	When stack does not exit the delivery sensor (PI11) after delivering the stack for a prescribed amount with the paper folding motor (M2) after detecting the leading edge of the paper with the delivery sensor (PI11). When stack does not exit the vertical path paper sensor (PI17) after delivering the stack for a prescribed amount with the paper folding motor (M2) after detecting the stack with the delivery sensor (PI11).
Stitcher staple	SW7 SW5	When stitcher motors (M7/M6) are rotated forward and the stitch home position switches (SW7/SW5) do not turn ON within 0.5 seconds after they are turned OFF and the motors are rotated backward and the sensors turn ON within 0.5 seconds.
Power-on	PI8 PI11 PI17 PI18 PI19 PI20 PI22	When paper is detected by one of the sensor on the paper sensor PCB (1st paper sensor (PI18), 2nd paper sensor (PI19), 3rd paper sensor (PI20)), vertical path paper sensor (PI17), delivery sensor (PI11), paper positioning plate paper sensor (PI8), or saddle inlet sensor (PI22) during power ON.
Door open	PI3 PI9 PI32	When the delivery cover sensor (PI3) or inlet cover sensor (PI9) detects that the cover is opened during operation. When the front cover sensor (PI32) detects cover open with paper present on the processing tray while the device is not operating.

T03-601-02

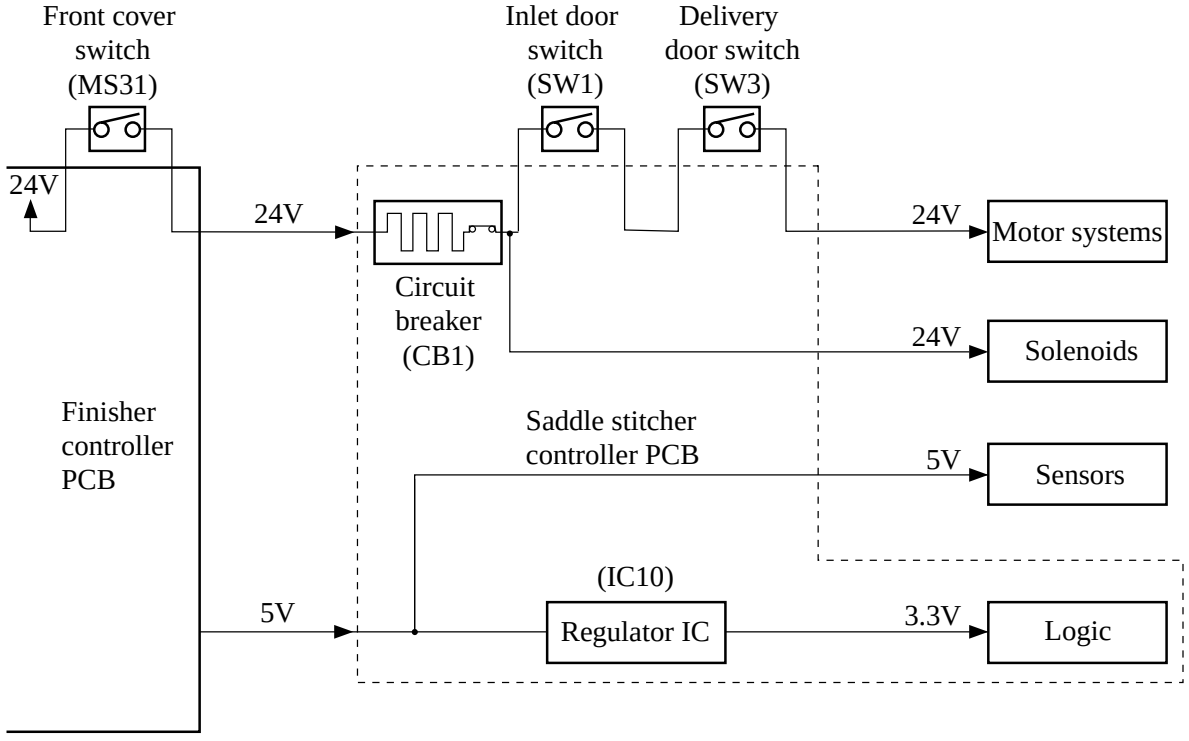
7 Power Supply

7.1 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 two door switches is open. The 5 VDC power is used to drive the sensor. It is also converted to 3.3 VDC by the regulator IC (IC10) on the saddle stitch controller PCB to drive the ICs on the PCB.



F03-701-01

7.2 Protection Function

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 guide motor (M3), alignment motor (M5), and the paper positioning plate motor (M4) is equipped with a fuse designed to blow when an overcurrent flows.

CHAPTER 4

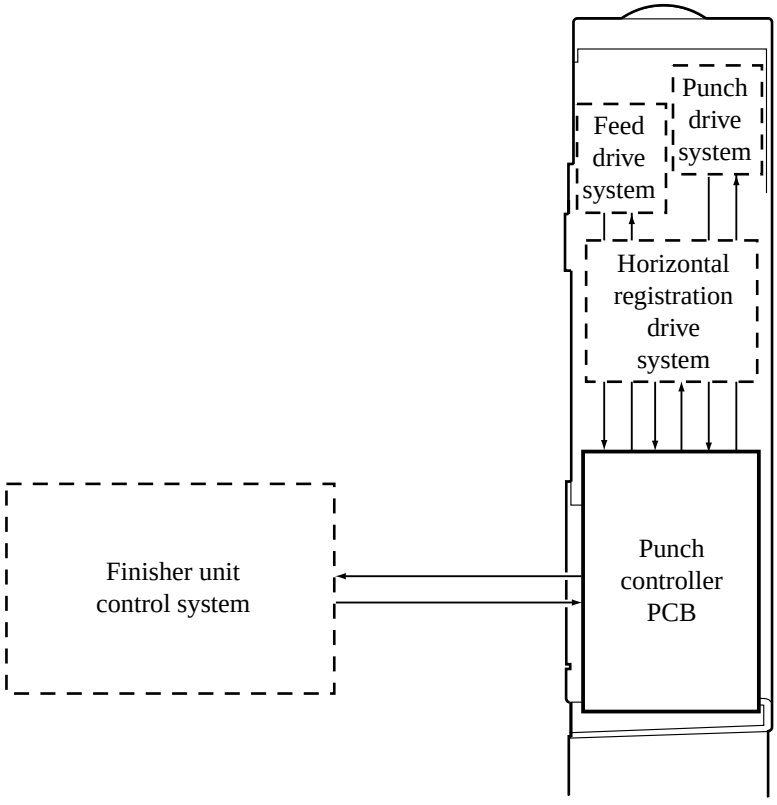
PUNCHER UNIT (OPTION) OUTLINE OF OPERATION

1 Basic Operation

1.1 Outline

The puncher unit is optionally installed in the delivery path between the host machine and the finisher.

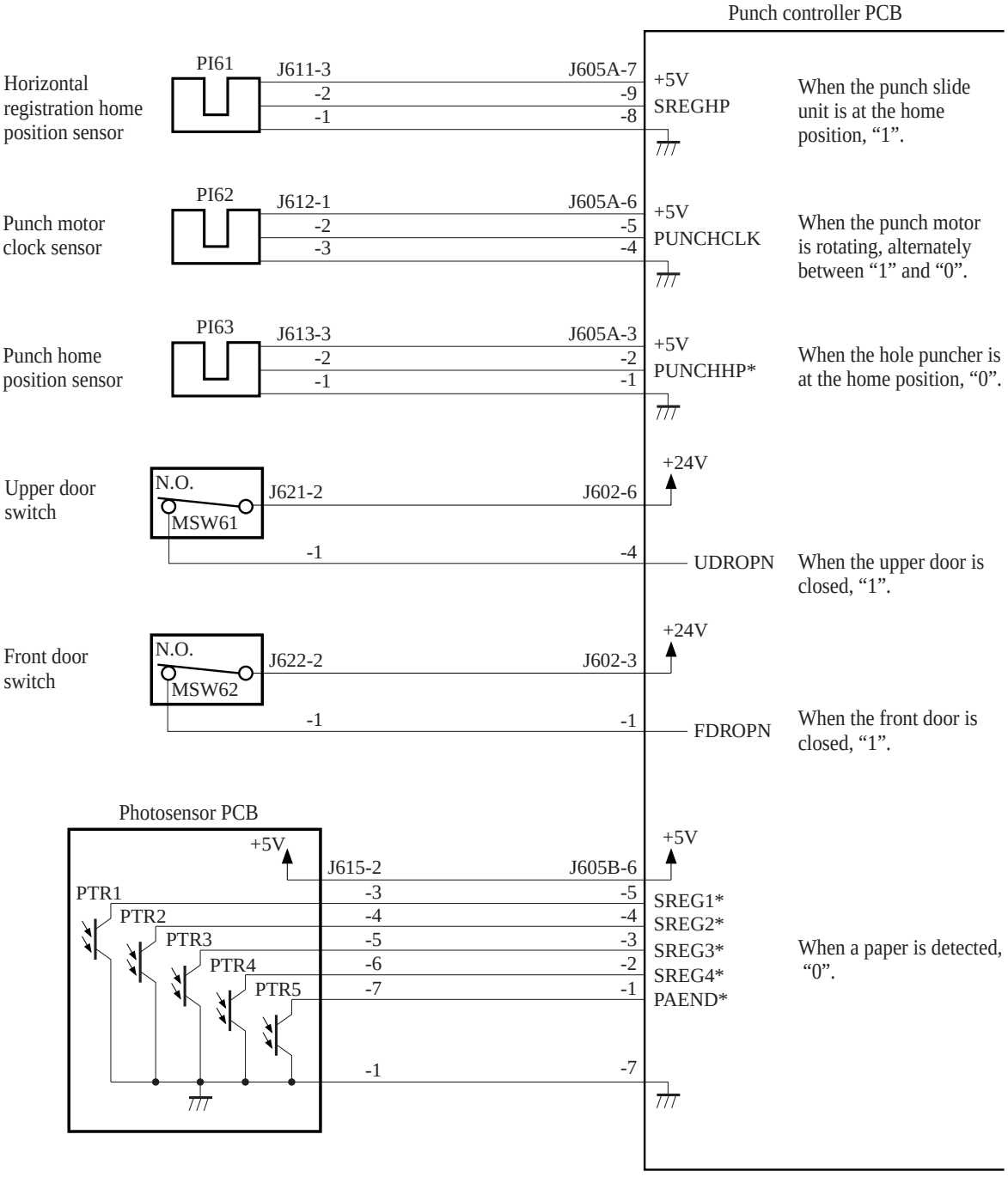
When the paper delivered from the host machine reaches the puncher unit, it is fed by the punch feed roller. Then when the trailing edge of the paper is detected, the paper is temporarily stopped and the punch axis rotates to punch holes in the trailing edge of the paper. These operations are controlled by the finisher controller PCB and the punch controller PCB drives each puncher component.



F04-101-01

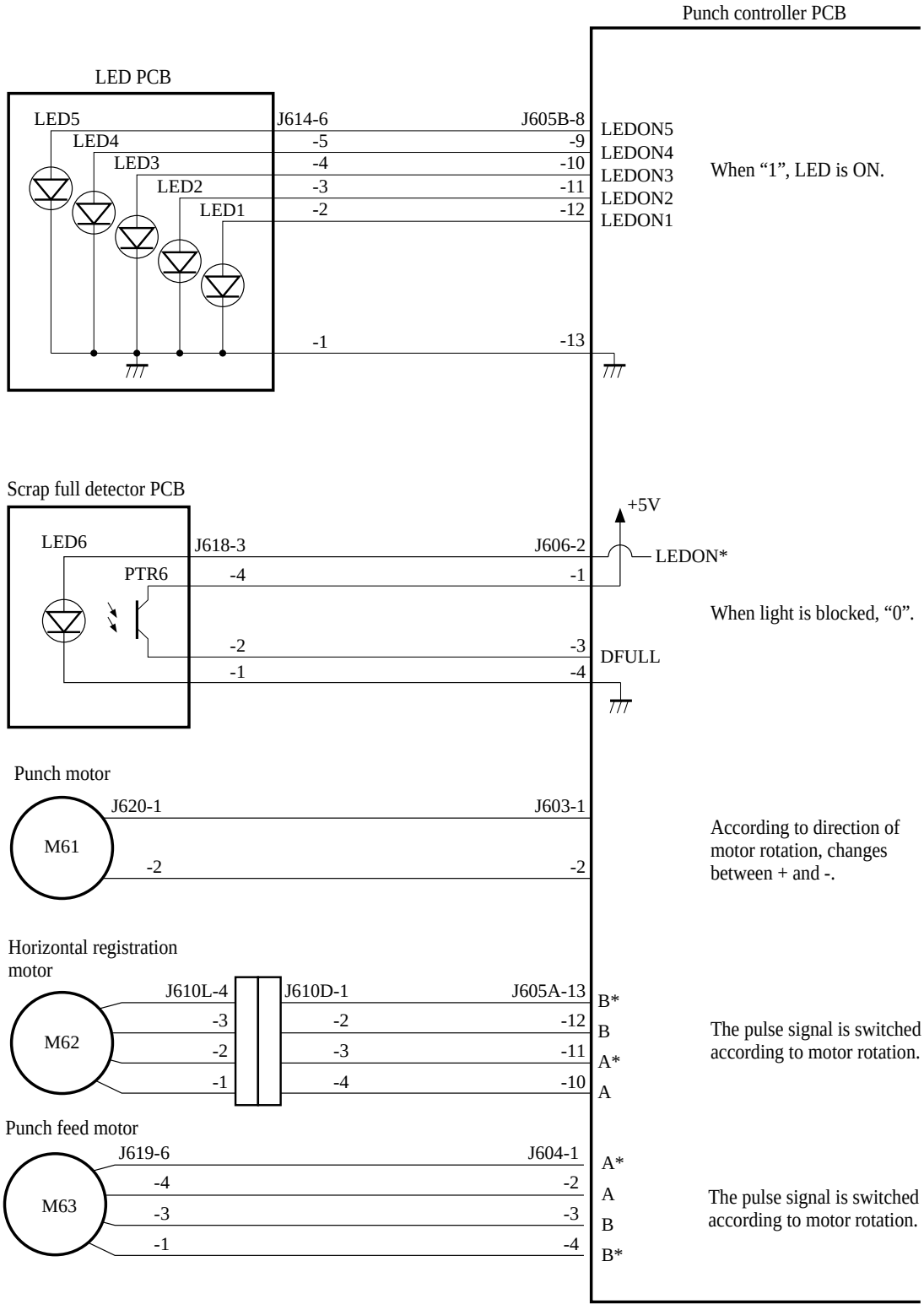
1.2 Inputs to and Outputs from Punch Driver PCB

1.2.1 Inputs to Punch Driver PCB (1/1)



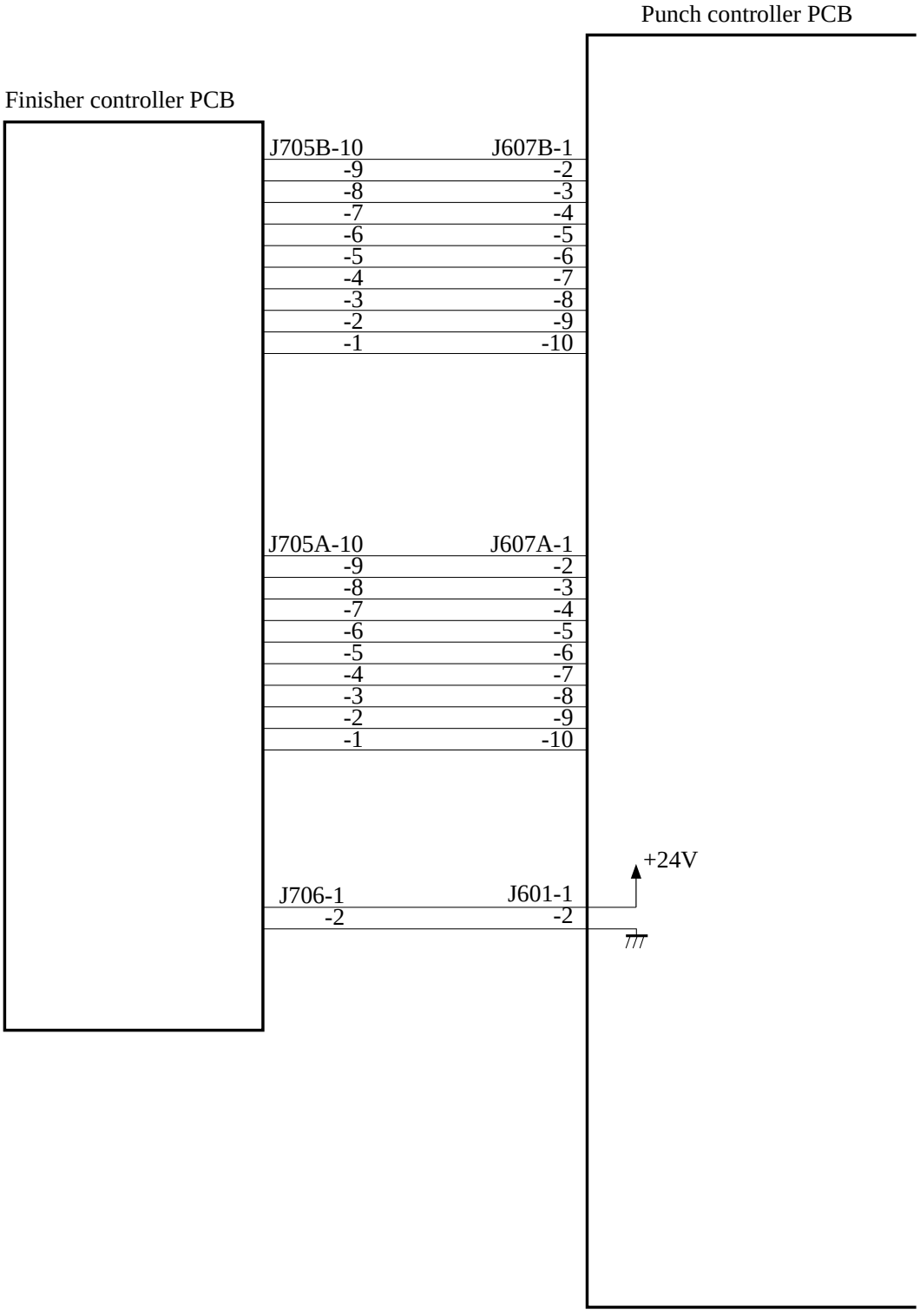
F04-102-01

1.2.2 Outputs from Punch Driver PCB (1/2)



F04-102-02

1.2.3 Outputs from Punch Driver PCB (2/2)



F04-102-03

2 Punch Operation

2.1 Outline

The puncher unit is located on the feed path between the host machine and the finisher, and successively punches holes when the paper stops temporarily.

The paper delivered from the host machine is fed by the punch feed roller. The punch feed roller is driven by the punch feed motor (M63). When the trailing edge of the paper reaches the puncher unit, the inlet roller of the finisher unit temporarily stops the paper and holes are punched on the trailing edge of the paper.

The puncher unit consists of a die and hole puncher (punch blade).

The hole puncher is driven by the punch motor (M61). The hole puncher is attached to the eccentric cam of the punch shaft, and rotary action of the punch shaft is converted to reciprocal motion to perform punching.

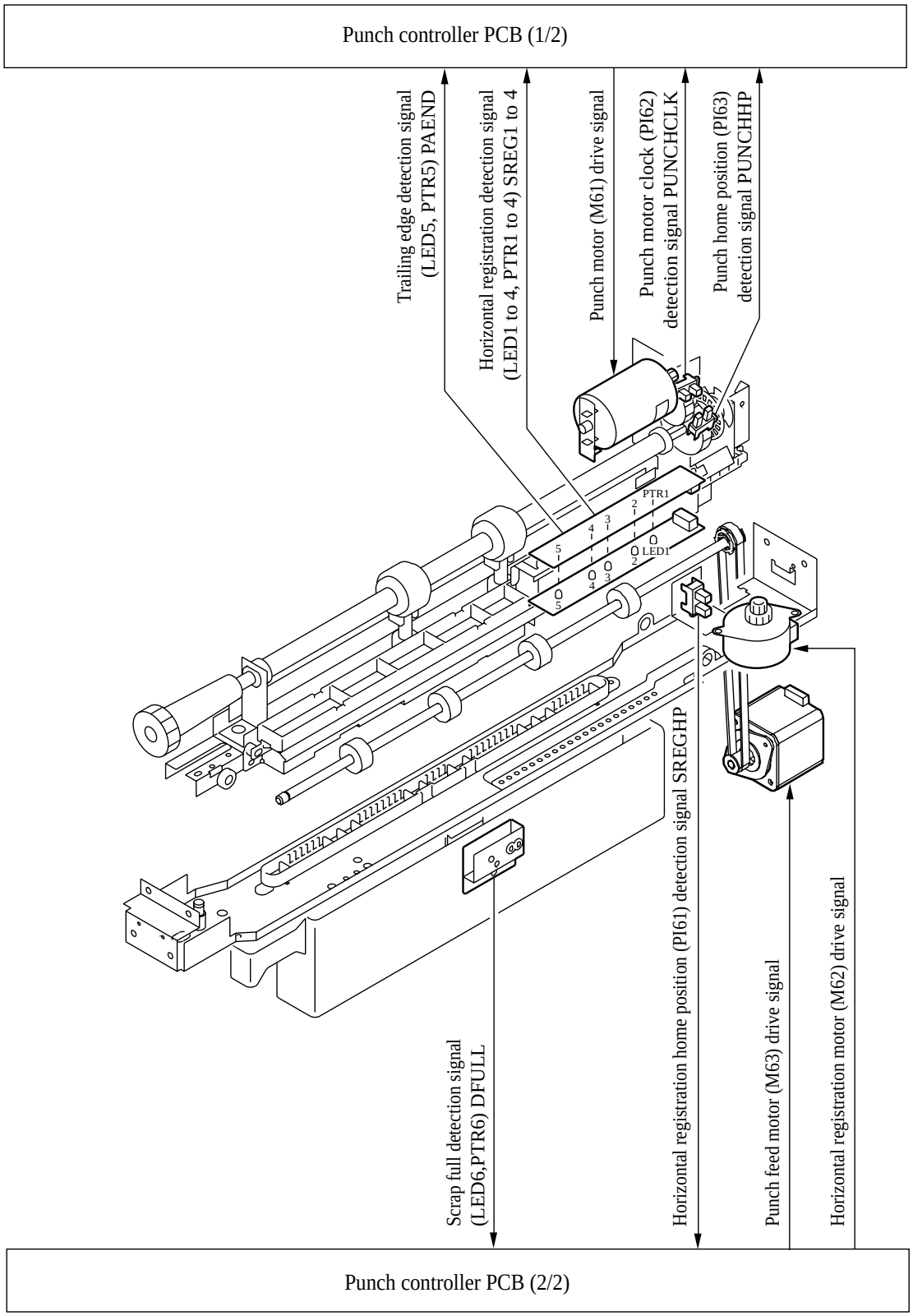
Punch motor (M61) is a DC motor. The home position of the punch shaft is detected by punch home position sensor (PI63). To stop the DC punch motor accurately at its home position, the punch motor clock sensor (PI62) counts a predetermined number of clock pulses to stop the punch motor. A single punch operation is performed by rotating the punch shaft 180° from its home position.

Five light sensors (photosensor PCB) are located at the upper side of the inlet paper feed path of the puncher unit and a set of five LEDs (LED PCB) are located at the lower side. These sensors and LEDs function as five sensors. The frontmost sensor (LED5, PTR5) are the trailing edge sensor and are used for detecting the trailing edge of the paper. The remaining sensors (LED1 to LED4, PTR1 to PTR4) are horizontal registration sensors, and are used for detecting the inner position of the paper for determining the hole punching position.

The punch motor, puncher unit and above sensors comprise the punch slide unit. This unit moves backwards and forwards according to the size of the paper. Backward and forward movement is driven by the horizontal registration motor (M62). The home position of the punch slide unit is detected by the horizontal registration home position sensor (PI61). The horizontal registration motor (M62) is a 2-phase stepping motor.

The punch motor and horizontal registration motor is driven by the punch controller PCB according to control signals from the finisher controller PCB.

Punch scraps caused by punching are stored in the punched scrap container. Scrap full detection is performed by a reflective sensor (LED6 and PTR6 on the scrap full detector PCB unit).


Punch controller PCB (1/2)
Trailing edge detection signal (LED5, PTR5) PAEND
Horizontal registration detection signal (LED1 to 4, PTR1 to 4) SREG1 to 4
Punch motor (M61) drive signal
Punch motor clock (PI62) detection signal PUNCHCLK
Punch home position (PI63) detection signal PUNCHHP
PTR1
LED1
Scrap full detection signal (LED6,PTR6) DFULL
Horizontal registration home position (PI61) detection signal SREGHP
Punch feed motor (M63) drive signal
Horizontal registration motor (M62) drive signal
Punch controller PCB (2/2)

F04-201-01

2.2 Punch Operation

The hole puncher is driven by the punch motor (M61). The hole puncher home position is detected by the punch home position sensor (PI63).

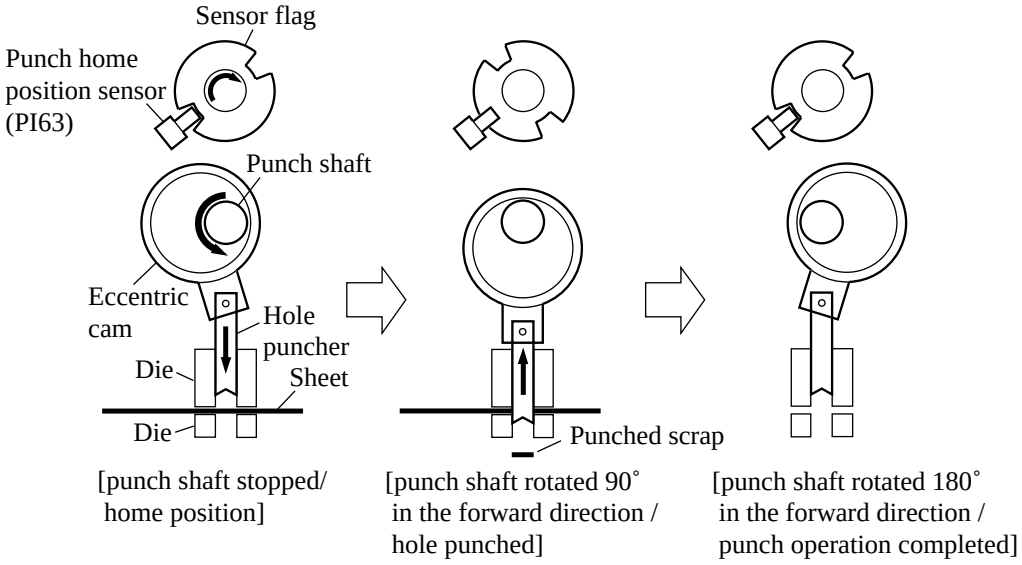
In all, there are four types of puncher units depending on the destination: 2-hole type (MJ-6004E), 2-/3-hole Dual Use (MJ-6004N), and two 4-hole types (MJ-6004F and MJ-6004S). With the 2-hole and 4-hole types, the hole puncher is moved reciprocally and punching is performed by the punch shaft rotating 180° from its home position. With the 2-/3-hole dual use type, too, the hole puncher is moved reciprocally and punching is performed by the punch shaft rotating 180° from its home position. However, half of the peripheral area of the punch shaft can be used as a 2-hole type while the other half can be as a 3-hole type. Whether the punch shaft is used as a 2-hole punch or a 3-hole punch depends on the instructions from the host machine.

2.2.1 2-/4-hole Type

At the home position, the punch home position sensor is ON. Punching of the first sheet ends when the punch shaft has rotated in the forward direction 180°, and the state of the punch home position sensor has changed from OFF to ON. Punching of the second sheet ends when the punch shaft has rotated in the reverse direction 180°, and the state of the punch home position sensor has changed from OFF to ON.

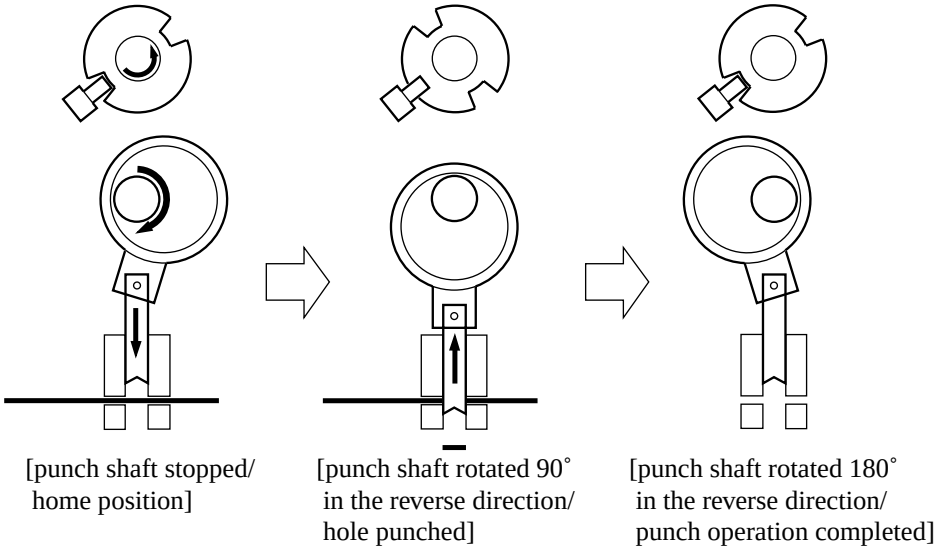
The following illustrates punching when two sheets are punched.

1) A hole is punched in the trailing edge of the first sheet.



F04-202-01

2) A hole is punched in the trailing edge of the second sheet.



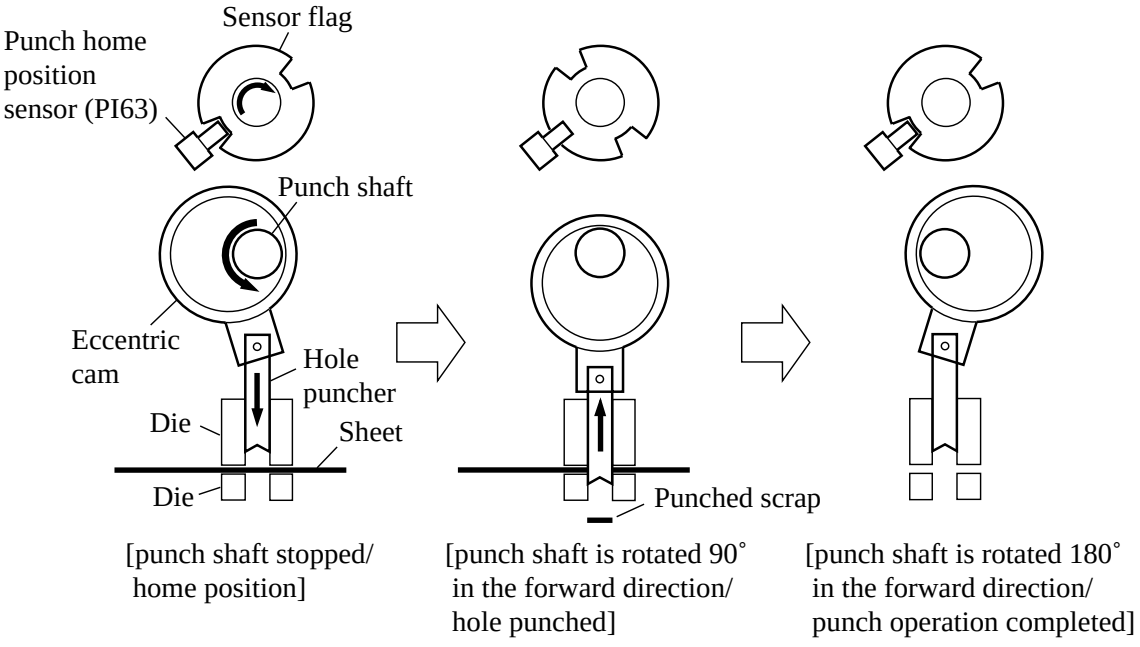
F04-202-02

2.2.2 2-/3-hole Dual Use Type

At the home position, the punch home position sensor is ON. To punch two holes, punching of the first sheet ends when the punch shaft half peripheral area has rotated in the forward direction 180°, and the state of the punch home position sensor has changed from OFF to ON. At this time, the 3-hole puncher is moved reciprocally in the escape direction (hole puncher rise direction) on the remaining half peripheral area on the punch shaft. Punching of the second sheet ends when the punch shaft half peripheral area has rotated in the reverse direction 180°, and the state of the punch home position sensor has changed from OFF to ON. Also at this time, the 3-hole puncher is moved reciprocally in the escape direction (hole puncher rise direction) on the remaining half peripheral area on the punch shaft. To punch three holes, the 2-hole puncher is moved reciprocally in the escape direction (hole puncher rise direction).

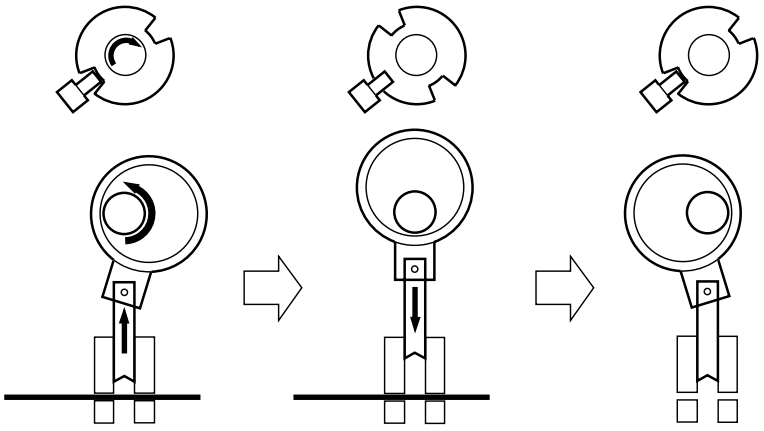
The following illustrates punching when two sheets are punched with two holes.

1) A hole is punched in the trailing edge of the first sheet.



F04-202-03

When two holes are punched, the 3-hole puncher is fed reciprocally in the escape direction (hole puncher rise direction) as shown below.



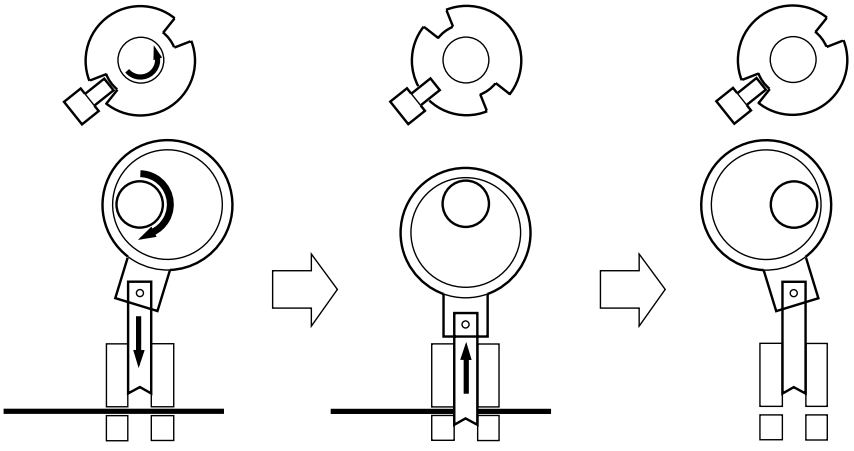
[punch shaft stopped/ home position]

[punch shaft is rotated 90˚ in the forward direction/ hole puncher rises to topmost position]

[punch shaft is rotated 180˚ in the forward direction/ hole puncher returns to original position]

F04-202-04

2) A hole is punched in the trailing edge of the second sheet.



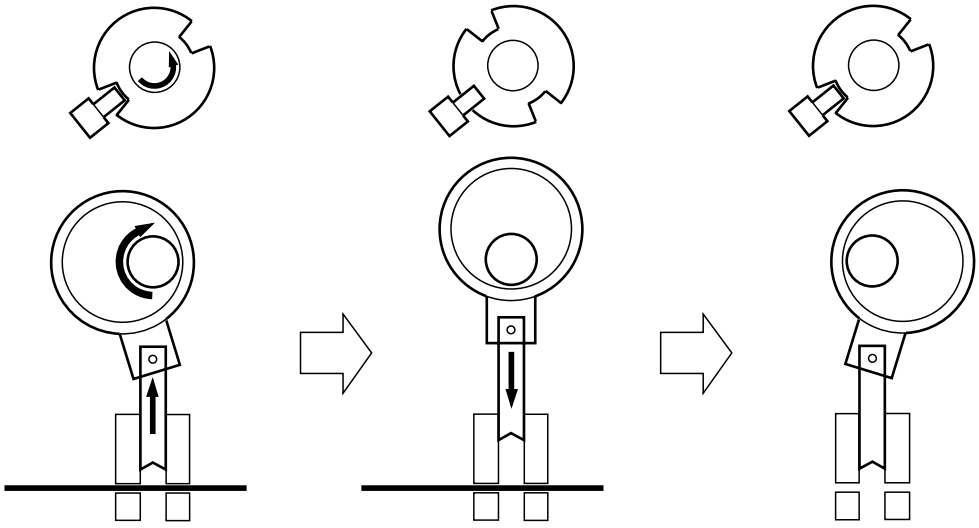
[punch shaft stopped/ home position]

[punch shaft is rotated 90˚ in the reverse direction/ hole punched]

[punch shaft is rotated 180˚ in the reverse direction/ punch operation completed]

F04-202-05

When two holes are punched, the 3-hole puncher is fed reciprocally in the escape direction (hole puncher rise direction) as shown below.



[punch shaft stopped/ home position]

[punch shaft is rotated 90˚ in the reverse direction/ hole puncher rises to topmost position]

[punch shaft is rotated 180˚ in the reverse direction/ hole puncher returns to original position]

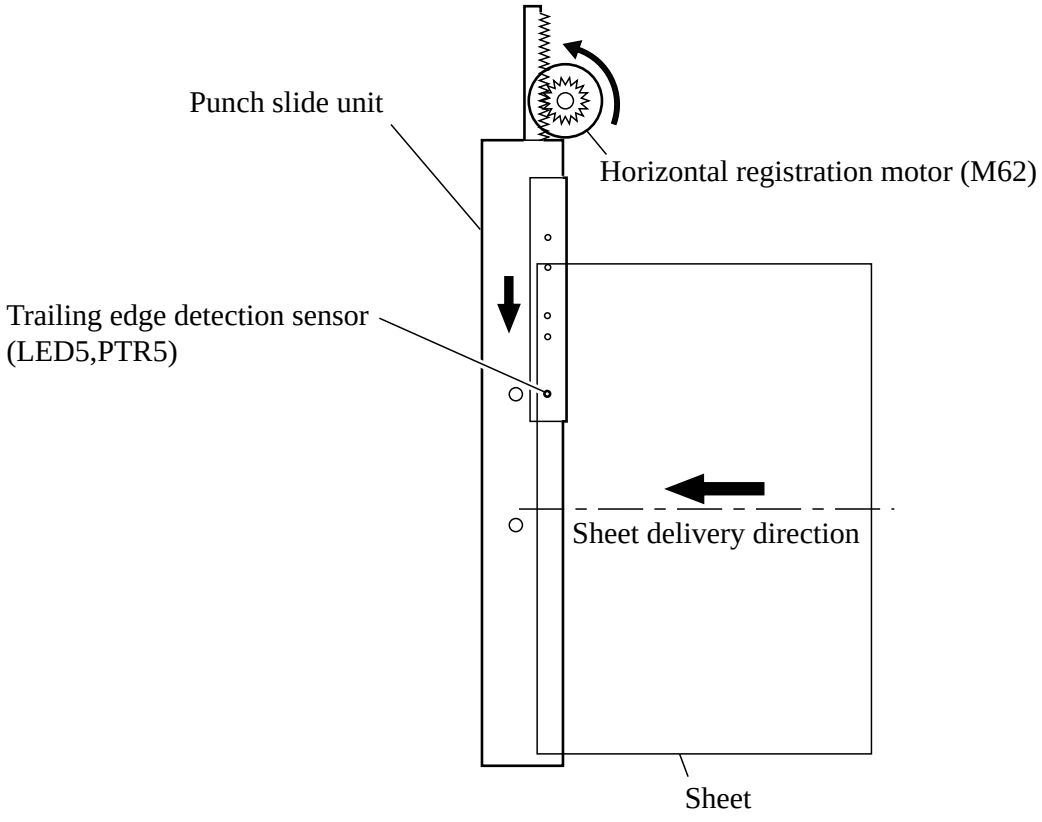
F04-202-06

2.3 Horizontal Registration Operation

Horizontal registration drive of the punch slide unit is performed by the horizontal registration motor (M62). The home position of the punch slide unit is detected by the horizontal registration home position sensor (PI61). The punch slide unit detects the trailing edge of the paper by the trailing edge sensor (LED5, PTR5) and horizontal registration sensors (LED1 to 4, PTR1 to 4) and is moved to the trailing edge position matched to the paper size.

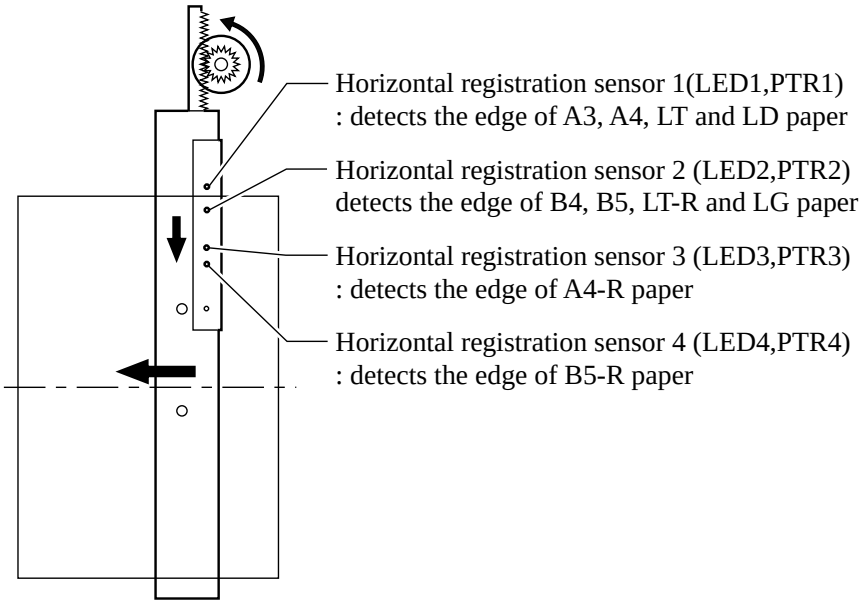
The following shows horizontal registration operation.

1) When the leading edge of the paper from the host machine is detected by the trailing edge sensor (LED5, PTR5) on the puncher unit, the horizontal registration motor (M62) starts to move the punch slide unit towards the front.



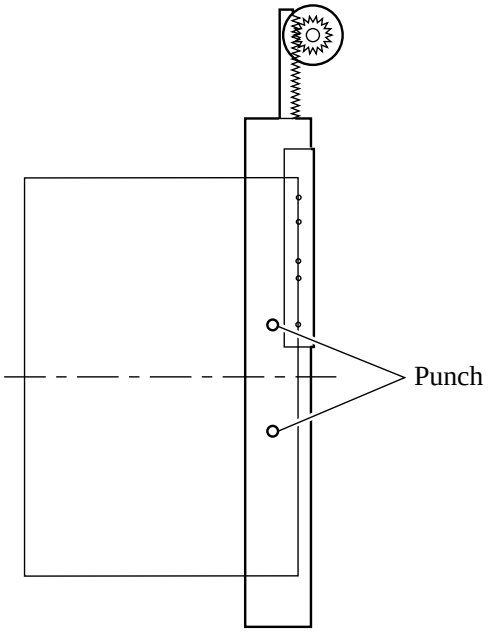
F04-203-01

2) After the horizontal registration sensors (LED1 to 4, PTR1 to 4) detect the edge of the paper at its inner side in keeping with the paper size signals arriving from the host machine, the horizontal registration motor (M62) drives the punch slide unit to a predetermined position further towards the front, and stops the unit at this position.



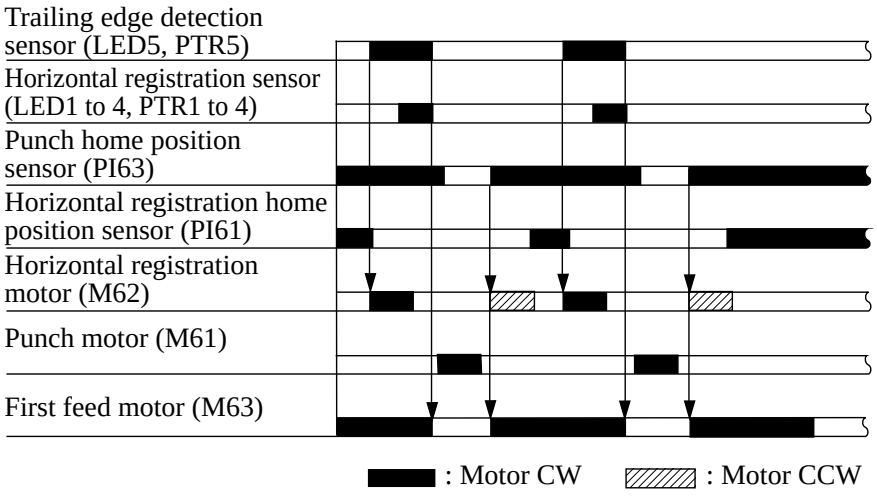
F04-203-02

3) When the trailing edge sensor (LED5, PTR5) detects the trailing edge of the paper, drive of the punch feed motor (M63) is stopped to stop paper feed. Next, the punch motor (M61) is driven to punch holes in the paper.



F04-203-03

4) When punching ends, drive of the punch feed motor (M63) is started, the horizontal registration motor (M62) is operated in the reverse direction, and the punch slide unit is returned to its home position where it comes to a stop.
5) Even if paper to be punched continues to arrive, the punch slide unit returns to its home position for each arriving sheet, and steps 1 to 4 are repeated.



F04-203-04

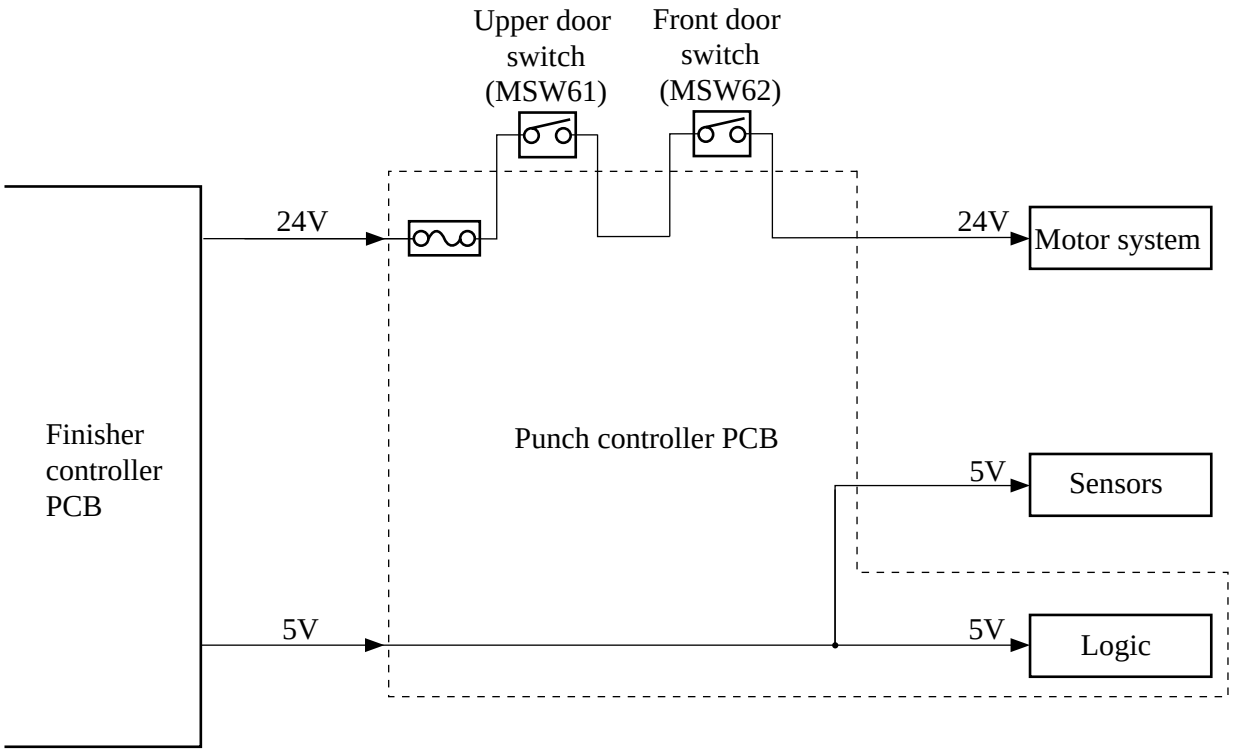
3 Power Supply System

3.1 Outline

24V power and 5V power are supplied from the finisher controller PCB when the power switch on the host machine is turned ON.

24V power is used for driving motors, while 5V power is used for driving sensors and the ICs on the punch controller PCB.

24V power to the motors is not supplied when either of the two door switches on the puncher unit is open.



F04-301-01

3.2 Protection Function

The 24V power supplies are equipped with a fuse designed to blow when an overcurrent flows.

CHAPTER 5

BRIDGE KIT (OPTION) BASIC OPERATION

1 Basic Operation

1.1 Outline

This unit transports paper from the exit section of the equipment to the finisher. The transport rollers which comprise the bridge unit are rotated by the drive from the host machine.

This unit has a switching gate on its entrance section which decides whether the transported paper from the exit roller of the host machine is transported to the finisher or to the receiving tray. The gate operates with ON/OFF of the gate solenoid.

The sensor which detects the paper full on the receiving tray is also equipped.

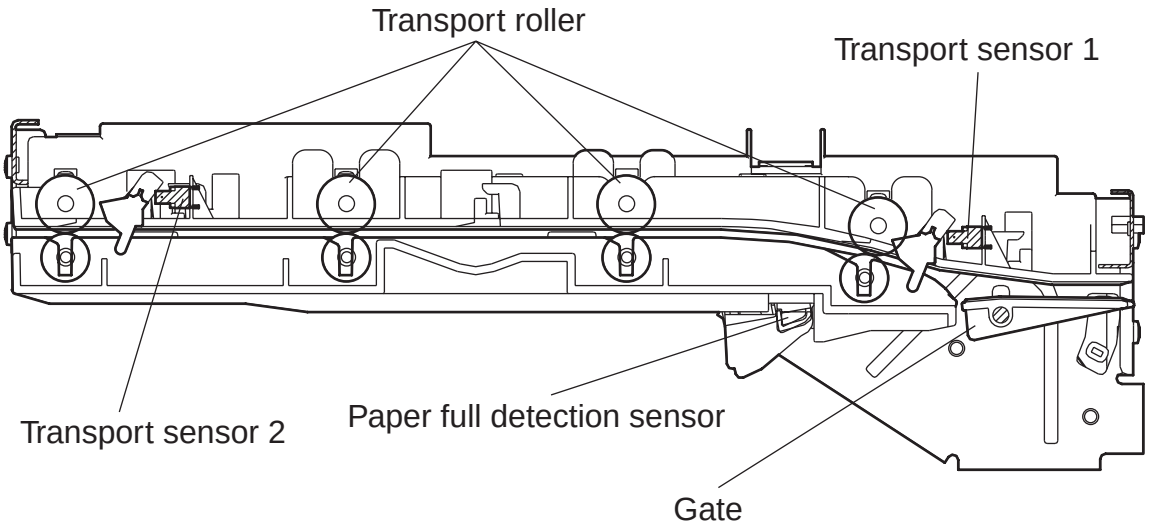
KN-3511: For e-STUDIO3511/4511/281c/351c/451c

KN-3520: For e-STUDIO350/450/352/452 (e-STUDIO200L/230/280/202L/232/282)

1.2 Construction

1.2.1 Front side sectional view

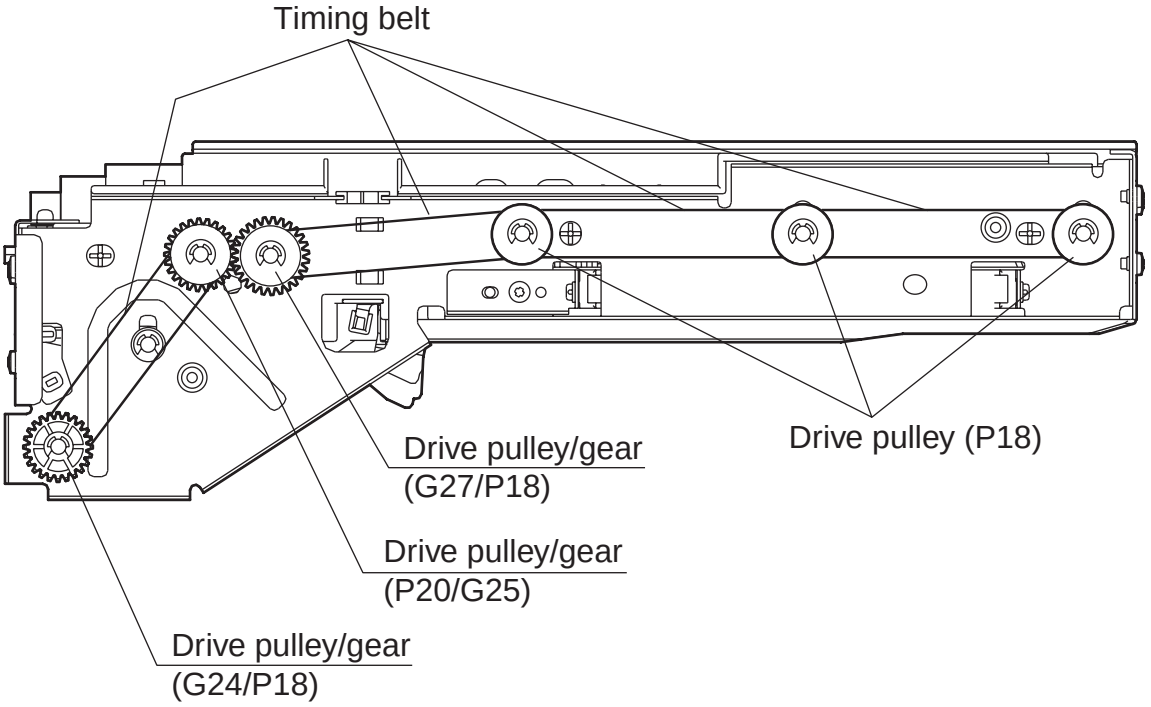
• The figure below is that of KN-3511.



F05-102-01

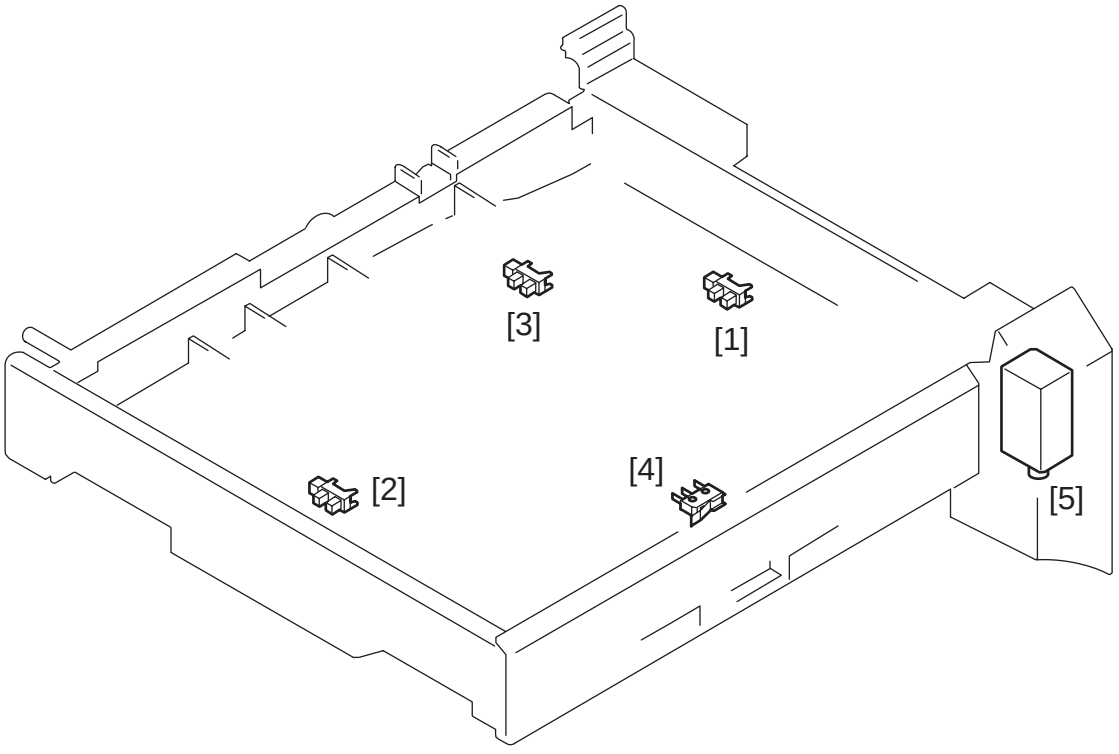
1.2.2 Rear side view

• The figure below is that of KN-3511.



F05-102-02

1.3 Arrangement of Electrical Parts



F05-103-01

Name	Notation	Function
Photointerrupter	1	Bridge unit transport sensor 1 - Detecting paper on transport path (Bridge unit entrance side)
	2	Bridge unit transport sensor 2 - Detecting paper on transport path (Bridge unit exit side)
	3	Paper full detection sensor - Detecting paper full on receiving tray
Microswitch	4	Cover open/close detection switch - Detecting open/close of bridge unit jam access cover
Solenoid	5	Gate solenoid - Switching paper transport path

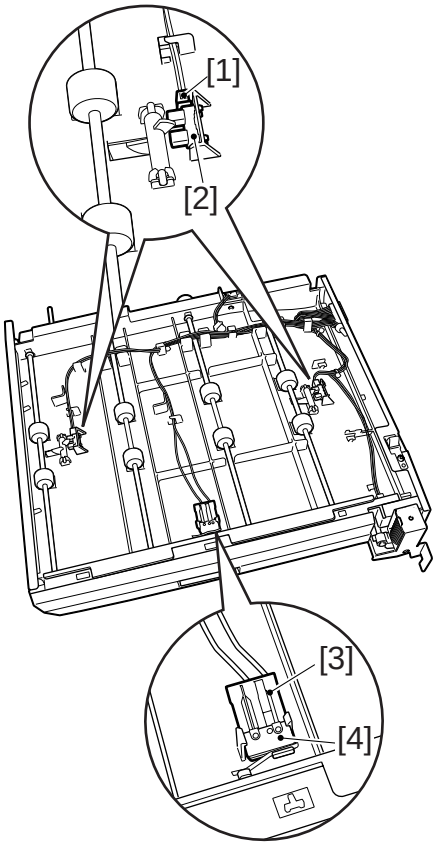
T05-103-01

2 Disassembly and Adjustment

2.1 Electrical Parts

1. Bridge unit transport sensors 1 and 2, cover open/close detection switch

1) Take off the bridge unit.
2) Disconnect each connector for transport sensor [1], release the corresponding latches and take off the bridge unit transport sensor [2].
3) Disconnect 1 connector [3], release the latches and take off the cover open/close detection switch [4].

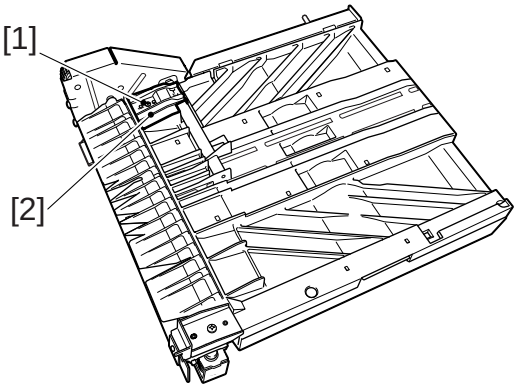


F05-201-01

2. Paper full detection sensor

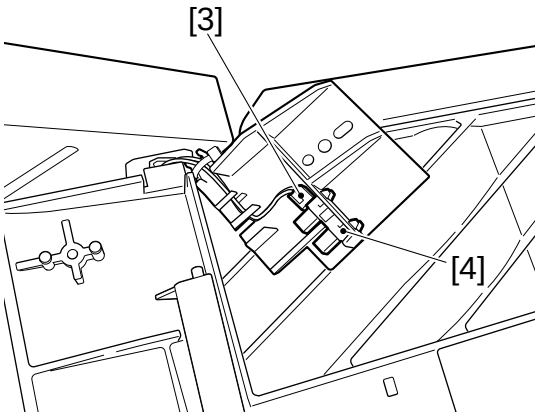
[KN-3511]

1) Take off the bridge unit.
2) Remove 1 screw [1] and take off the cover [2].



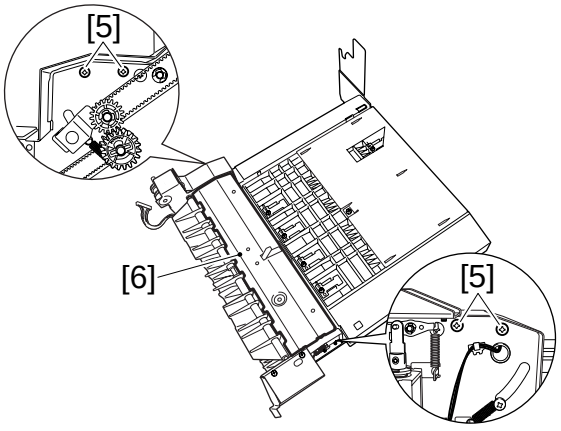
F05-201-02

3) Disconnect 1 connector [3] and take off the paper full detection sensor [4].



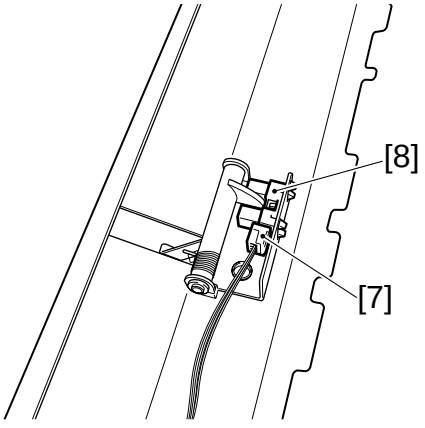
F05-201-03

[KN-3520]
1) Take off the bridge unit.
2) Remove 4 screws [5] and take off the guide [6].



F05-201-04

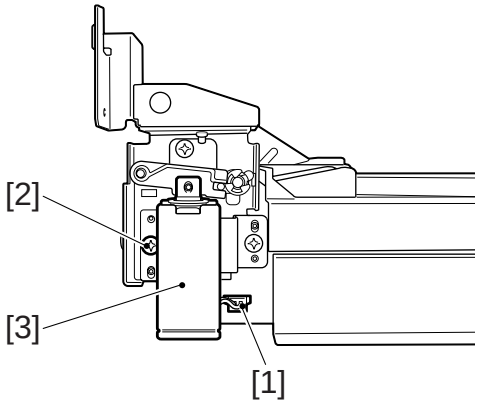
3) Disconnect 1 connector [7] and take off the paper full detection sensor [8].



F05-201-05

3. Gate solenoid

1) Take off the bridge unit.
2) Disconnect 1 connector [1]. Remove 1 screw [2] and take off the gate solenoid [3].



F05-201-06

3 Maintenance

3.1 Periodically Replaced Parts

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

3.2 Scheduled Maintenance

Clean the transport rollers and transport guide at the finisher maintenance.

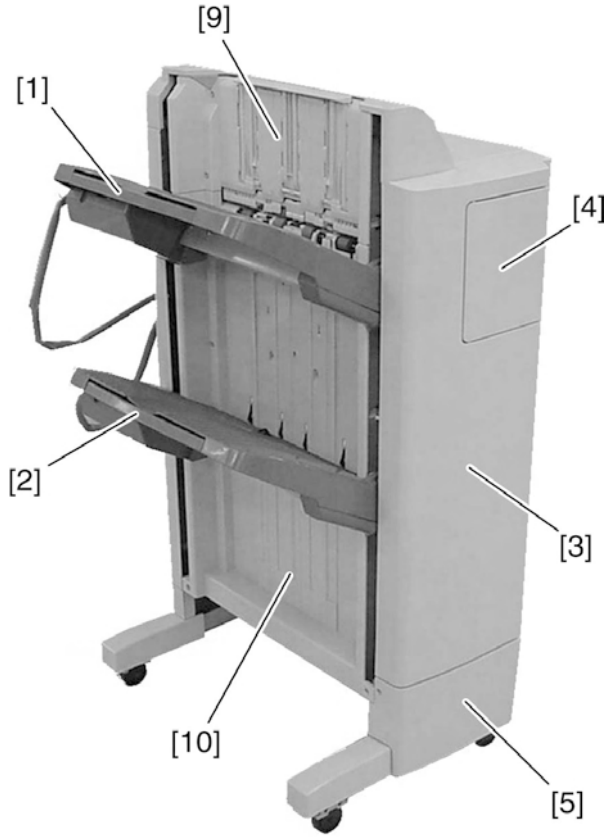
CHAPTER 6

MECHANICAL SYSTEMS

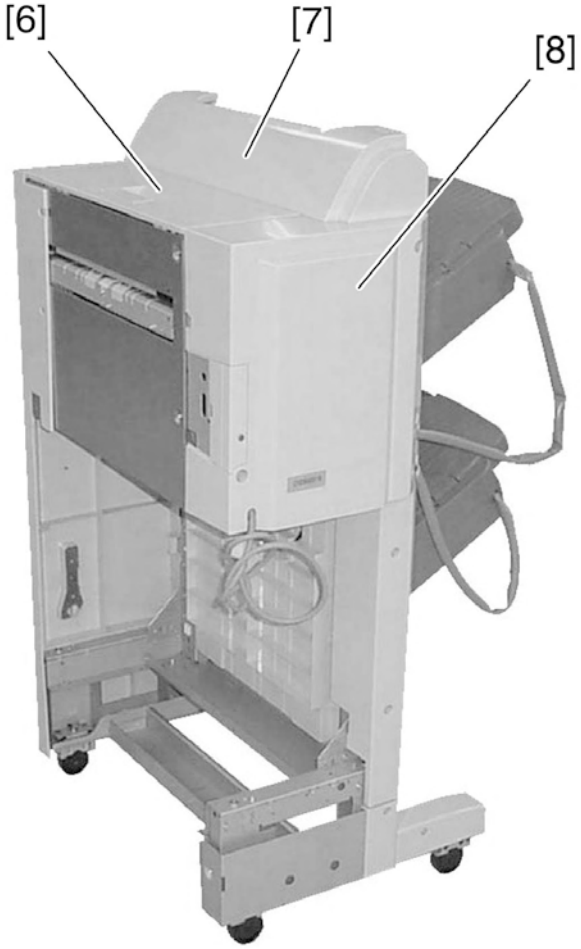
1 Finisher Unit

1.1 Externals and Controls

[1] Tray 1
[2] Tray 2
[3] Front cover
[4] Front door
[5] Front lower cover
[6] Upper cover
[7] Left upper cover
[8] Rear cover
[9] Grate-shaped upper guide
[10] Grate-shaped lower guide



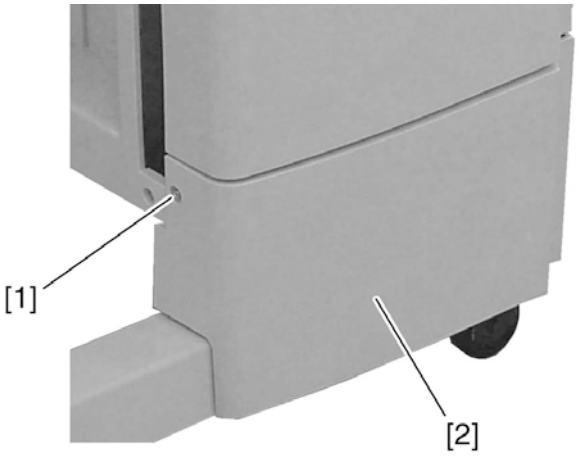
F06-101-01



F06-101-02

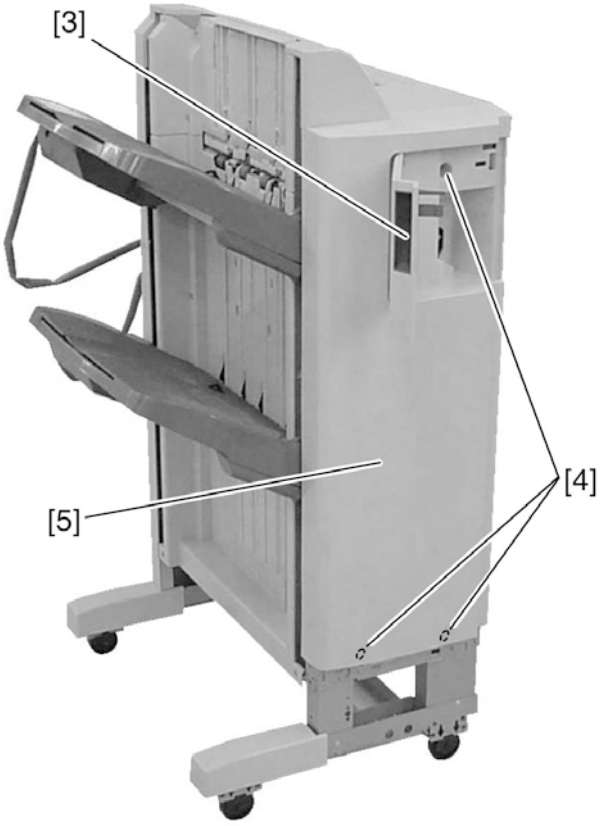
1.1.1 Removing the Front Cover

1) Remove screw [1] and remove the front lower cover [2].



F06-101-03

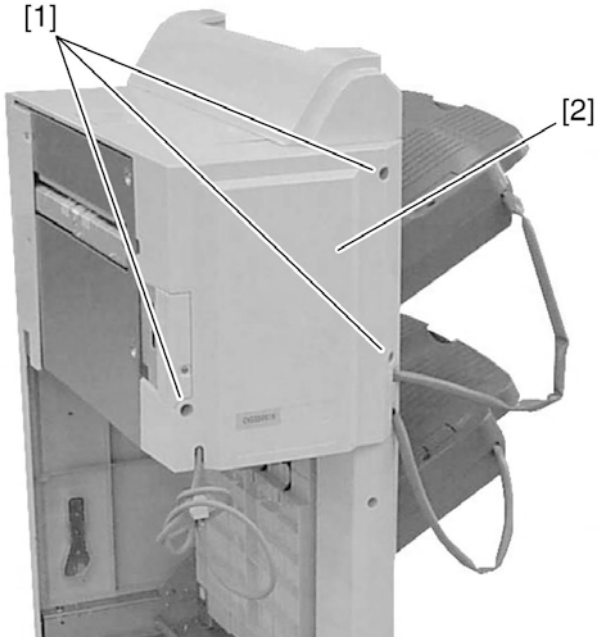
2) Open the front door [3] and remove three screws [4].
3) Remove the front cover [5].



F06-101-04

1.1.2 Removing the Rear Cover

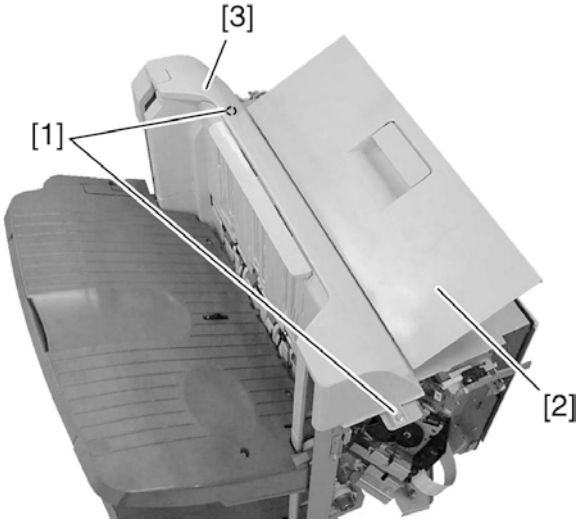
1) Remove three screws [1] and remove the rear cover [2].



F06-101-05

1.1.3 Removing the Left Upper Cover

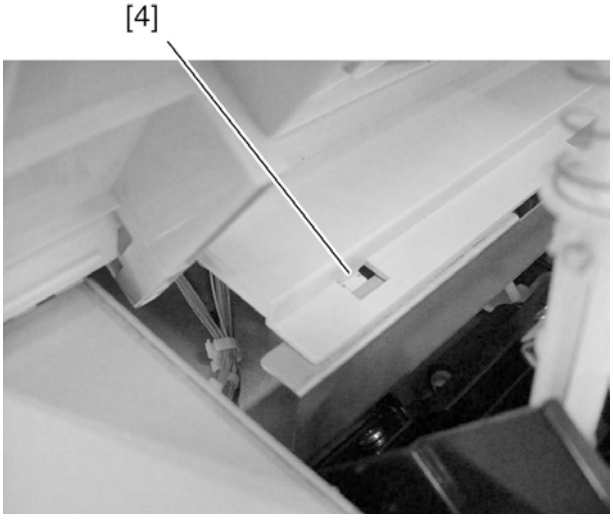
1) Remove the front cover (see 1.1.1).
2) Remove the rear cover (see 1.1.2).
3) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
4) Remove two screws [1].
5) With the upper cover [2] open, remove the left upper cover [3] by tilting to the right.



F06-101-06

Note:

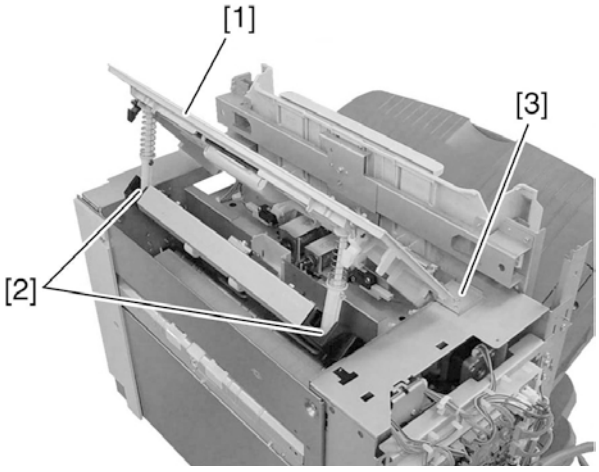
When replacing, hook the two claws [4] of the left upper cover to the steel plate.



F06-101-07

1.1.4 Removing the Upper Cover

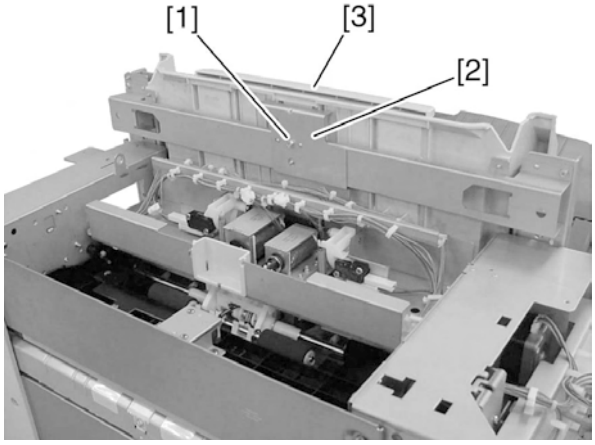
1) Remove the front cover (see 1.1.1).
2) Remove the rear cover (see 1.1.2).
3) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
4) Remove the left upper cover (see 1.1.3).
5) Open the upper cover [1] and unhook the two hooks [2].
6) Remove screw [3] and remove the upper cover [1].



F06-101-08

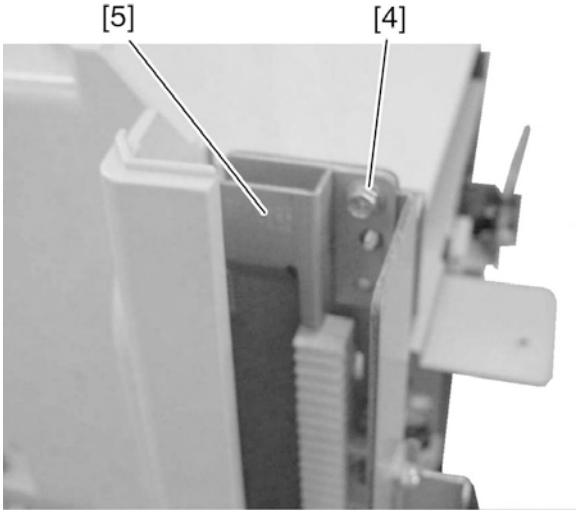
1.1.5 Removing Tray 1

1) Remove the front cover (see 1.1.1).
2) Remove the rear cover (see 1.1.2).
3) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
4) Remove the left upper cover (see 1.1.3).
5) Remove screw [1] and remove the steel plate [2] and slide guide [3]. However, if the grate-shaped upper guide is removed, this step is not necessary.



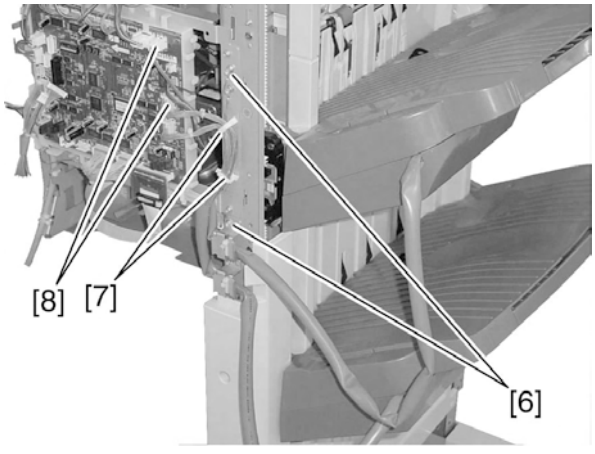
F06-101-09

6) Remove screw [4] and remove the stopper [5].



F06-101-10

7) Remove two screws [6], open two harness retainers [7] and disconnect two connectors [8].

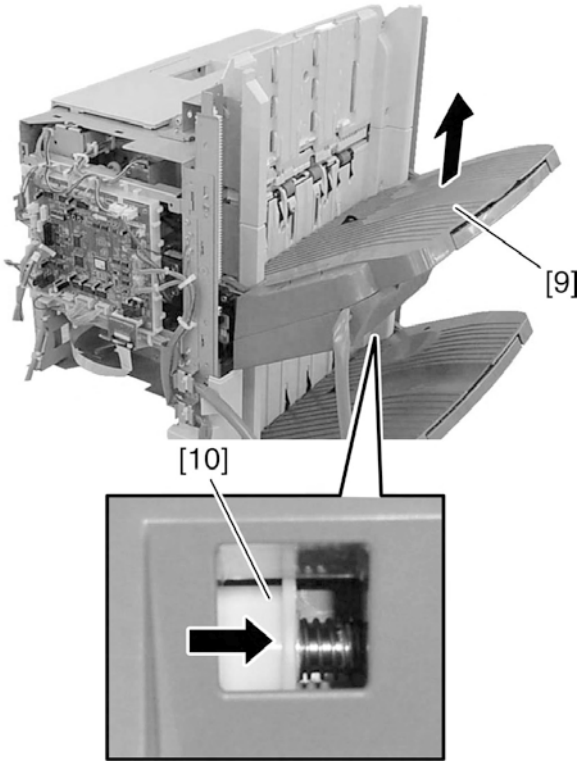


F06-101-11

8) Insert your finger in the hole at the rear side of tray 1 [9], push the tray lift motor gear [10] to the front to release the clutch and lift tray 1 [9].

Note:

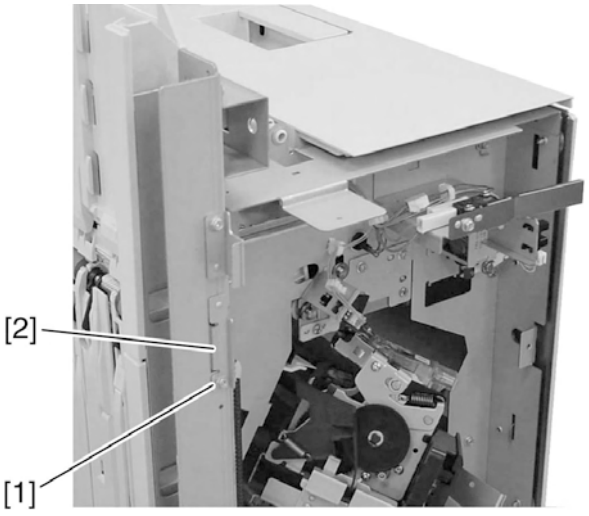
When the tray lift motor gear clutch is released, the tray drops by its own weight. Therefore, hold the tray with your hand when releasing the clutch. Also, be careful not to twist the tray cable when installing.



F06-101-12

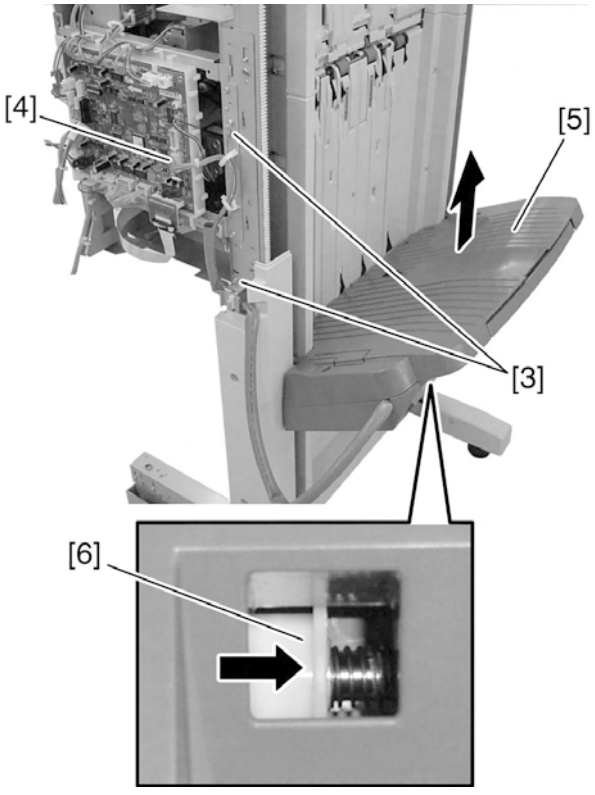
1.1.6 Removing Tray 2

1) Remove the front cover (see 1.1.1).
2) Remove the rear cover (see 1.1.2).
3) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
4) Remove the left upper cover (see 1.1.4).
5) Remove tray 1 (see 1.1.5).
6) Remove screw [1] and remove the stopper [2].



F06-101-13

7) Remove two screws [3] and disconnect one connector [4].
8) Insert your finger in the hole at the rear side of tray 2 [5], push the tray lift motor gear [6] to the front to release the clutch and lift tray 2 [5].



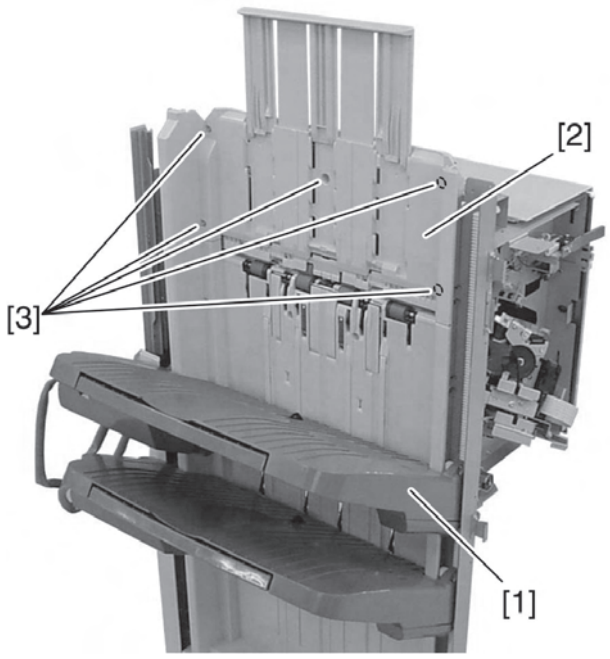
F06-101-14

Note:

When the tray lift motor gear clutch is released the tray drops by its own weight. Therefore, hold the tray with your hand when releasing the clutch. Also, be careful not to twist the tray cable when installing.

1.1.7 Removing the Grate-shaped Upper Guide

1) Remove the front cover (see 1.1.1).
2) Remove the rear cover (see 1.1.2).
3) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
4) Remove the left upper cover (see 1.1.4).
5) Lower the tray 1 [1] below the grate-shaped upper guide [2] (see 1.1.5 step 8).
6) Remove five screws [3] and remove the grate-shaped upper guide [2].



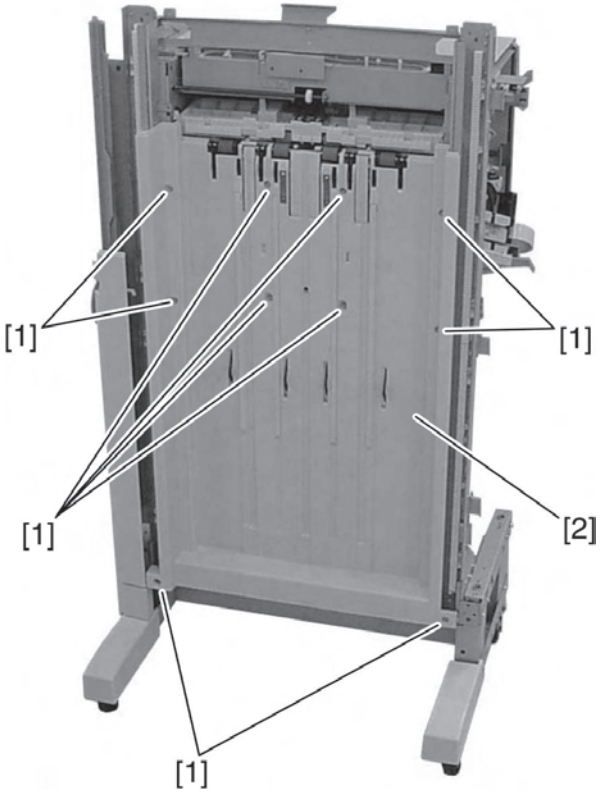
F06-101-15

1.1.8 Removing the Grate-shaped Lower Guide

1) Remove the front cover (see 1.1.1).
2) Remove the rear cover (see 1.1.2).
3) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
4) Remove the left upper cover (see 1.1.4).
5) Remove the grate-shaped upper guide (see 1.1.7).
6) Remove tray 1 (see 1.1.5).
7) Remove tray 2 (see 1.1.6).
8) Remove ten screws [1] and remove the grate-shaped lower guide [2].

Note:

When replacing, be careful not to hook the grate-shaped lower guide to the sensor flag arm on the delivery side.

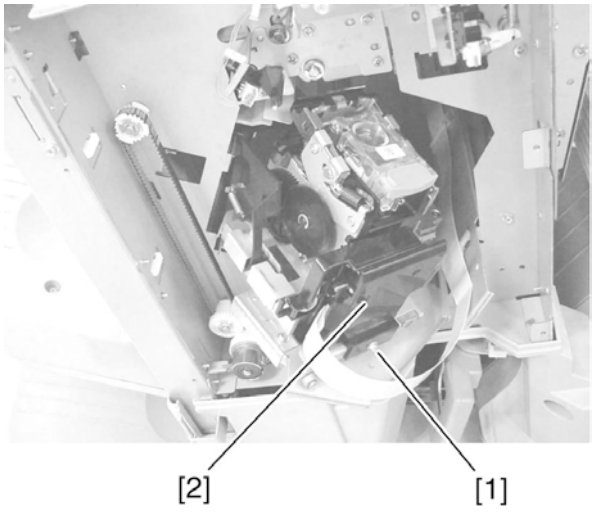


F06-101-16

1.2 Delivery System

1.2.1 Removing the Stapler

1) Remove the front cover (see 1.1.1).
2) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
3) Pull out the stapler, remove screw [1], and remove the PCB cover [2].

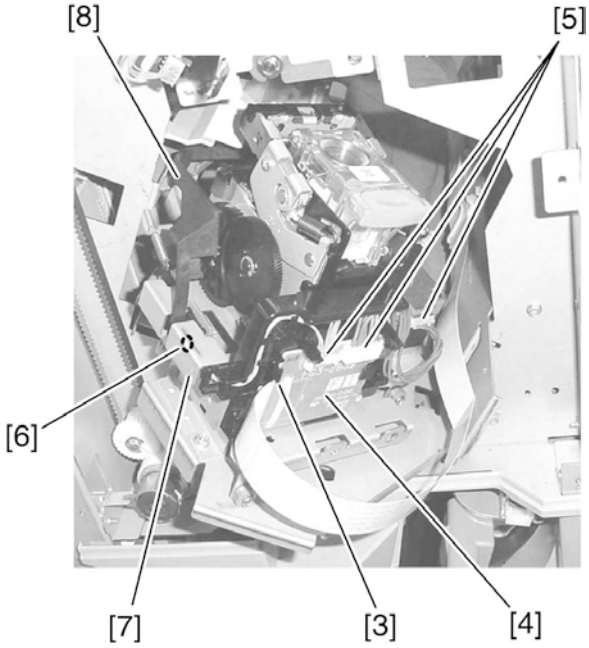


F06-102-01

4) Release the claw [3] and remove the PCB [4].
5) Disconnect three connectors [5].
6) Remove screw [6] and remove the stapler together with the stapler base [7].

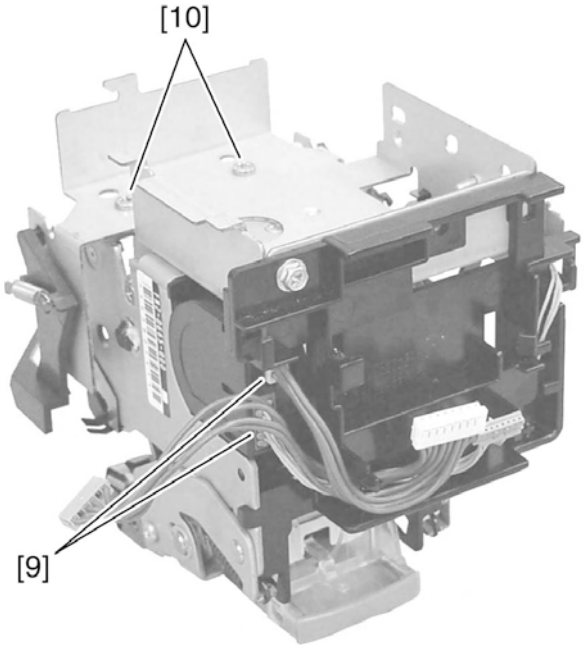
Note:

When removing, be careful not to damage the flag [8].



F06-102-02

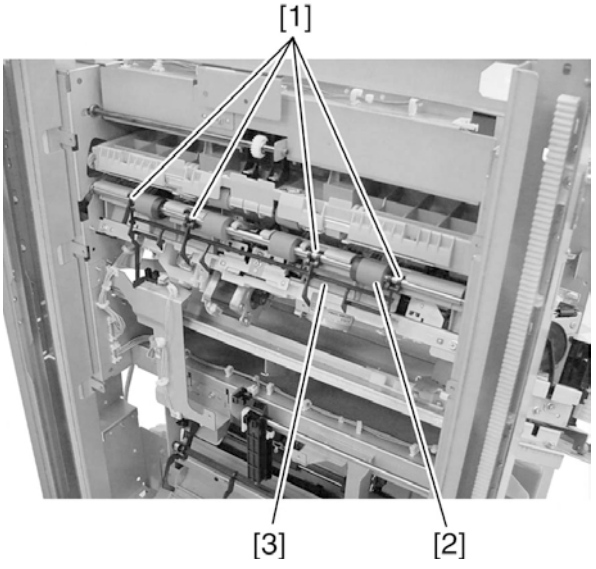
7) Turn the stapler over, disconnect two connectors [9], remove two screws [10], and remove the stapler from the stapler base.



F06-102-03

1.2.2 Removing the Processing Tray

1) Remove the front cover (see 1.1.1).
2) Remove the rear cover (see 1.1.2).
3) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
4) Remove the left upper cover (see 1.1.3).
5) Remove the grate-shaped upper guide (see 1.1.7).
6) Remove tray 1 (see 1.1.5).
7) Remove tray 2 (see 1.1.6).
8) Remove the grate-shaped lower guide (see 1.1.8).
9) Unfasten four snap fasteners [1] and remove the sensor flag [3] from the stack ejection roller [2].



F06-102-04

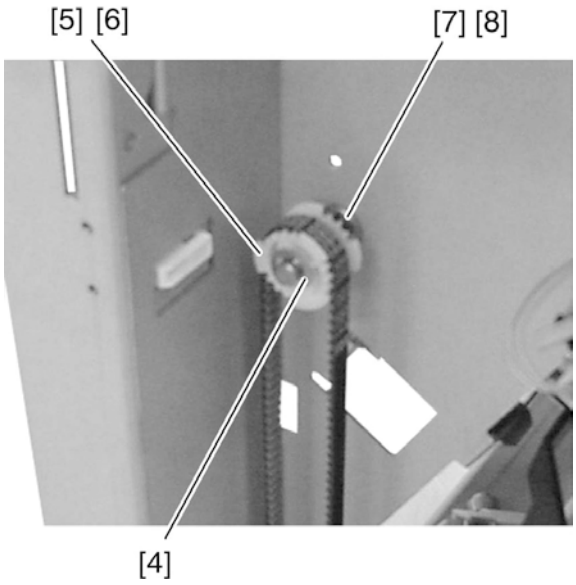
Note:

Hold the snap fastener at the base when unfastening because the sensor flag arm can break easily. When fastening, insert the boss of the sensor flag snap fastener in the hole on the processing tray side.

10) Remove the stack delivery roller front side E-ring [4], gear [5], parallel pin [6], E-ring [7], and bushing [8].

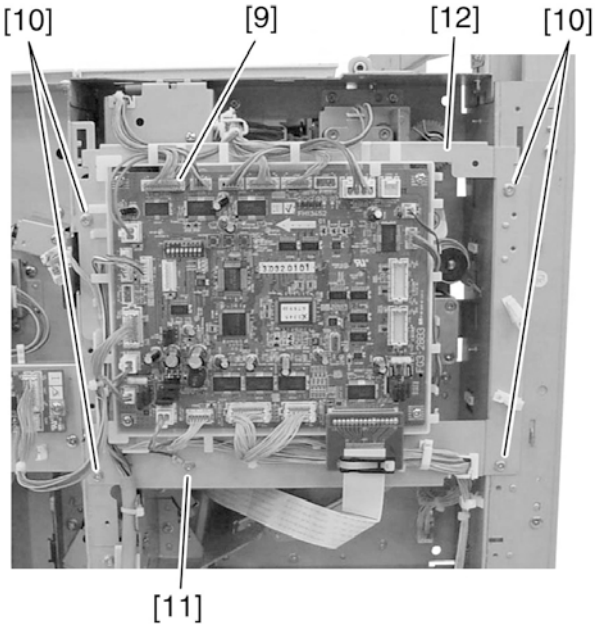
Note:

The parallel pin [6] drops when the gear [5] is removed. Be careful not to loose it.



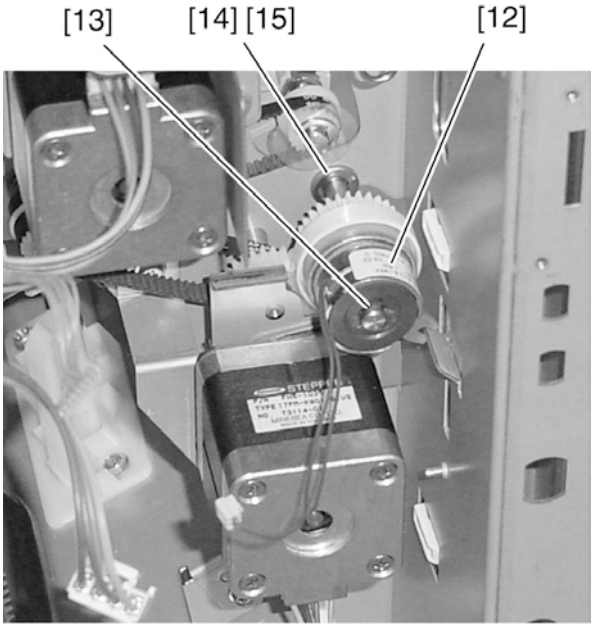
F06-102-05

11) Remove all finisher controller PCB connectors [9].
12) Remove four screws [10]. Remove the screw [11] securing the ground wire and remove the finisher controller PCB [12].



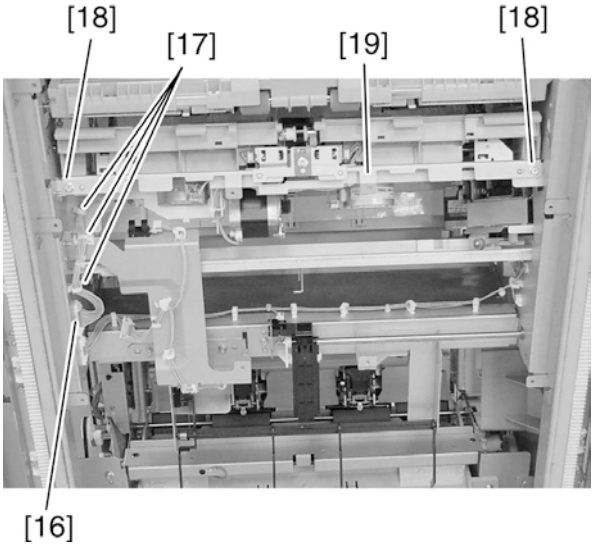
F06-102-06

13) Release the claw [13] of the stack delivery roller rear side clutch [12] and remove the clutch [12].
14) Remove the E-ring [14] and bushing [15] and remove the stack delivery roller.



F06-102-07

15) Disconnect the connector [16] and remove harness from the clamp and edge saddles [17].
16) Remove two screws [18] and pull out the processing tray [19] to the paper delivery direction.



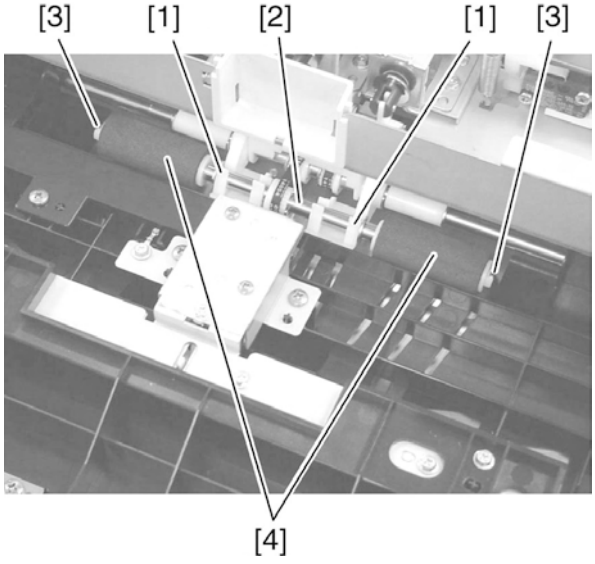
F06-102-08

Note:

When removing parts inside the processing tray, be careful not to exert force on the aligning plate (front/rear) or the rear end stopper plate.

1.2.3 Removing the Buffer Roller

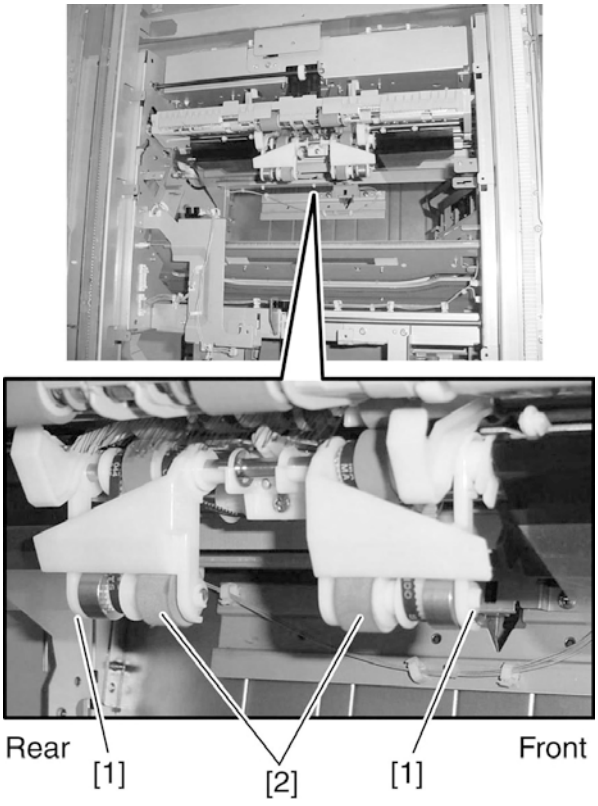
1) Remove the front cover (see 1.1.1).
2) Remove the rear cover (see 1.1.2).
3) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
4) Remove the left upper cover (see 1.1.3).
5) Remove the upper cover (see 1.1.4).
6) Remove the buffer roller axis [2] from two arms [1].
7) Remove two clips [3] and remove two buffer rollers [4].



F06-102-09

1.2.4 Removing the Return Roller

1) Remove the front cover (see 1.1.1).
2) Remove the rear cover (see 1.1.2).
3) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
4) Remove the left upper cover (see 1.1.3).
5) Remove the grate-shaped upper guide (see 1.1.7).
6) Remove tray 1 (see 1.1.5).
7) Remove tray 2 (see 1.1.6).
8) Remove the grate-shaped lower guide (see 1.1.8).
9) Remove the processing tray (see 1.2.2).
10) Remove two clips [1] of the return roller axis.
11) Pull out the return roller axis and remove two return rollers [2] together with collar.
12) Separate the return roller and collar.



F06-102-10

Note:

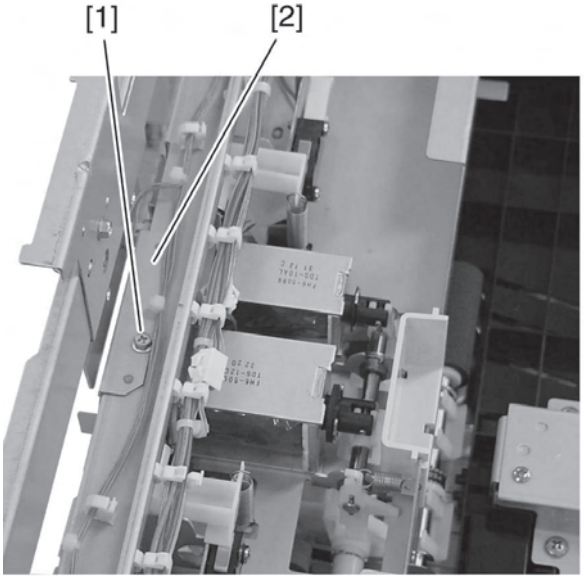
Note the direction when installing the return roller.

Front side : Black
Rear side : White

The paper will not stack properly if it is installed in the wrong direction.

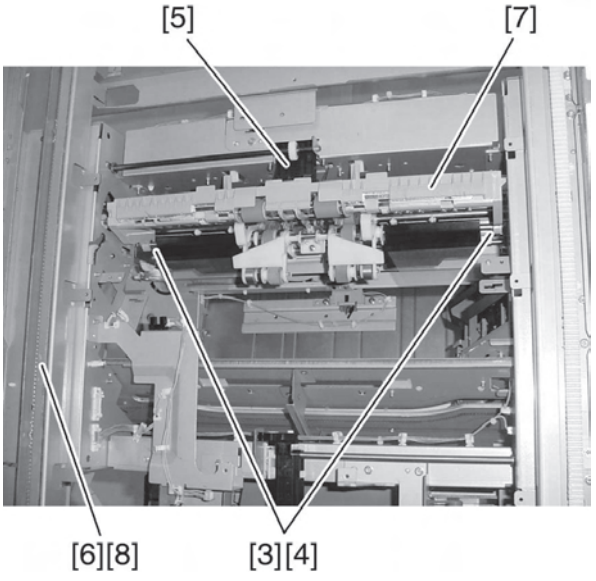
1.2.5 Removing the Swing Unit

1) Remove the front cover (see 1.1.1).
2) Remove the rear cover (see 1.1.2).
3) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
4) Remove the left upper cover (see 1.1.3).
5) Remove the grate-shaped upper guide (see 1.1.7).
6) Remove tray 1 (see 1.1.5).
7) Remove tray 2 (see 1.1.6).
8) Remove the grate-shaped lower guide (see 1.1.8).
9) Remove the processing tray (see 1.2.2).
10) Remove screw [1] and pull up the swing pressure guide [2].



F06-102-11

11) Remove two E-rings [3] at the joint between the swing unit and the return roller unit and then slide the two return roller unit collars [4] inside.
12) Unhook the swing pressure rack [5] from the swing unit center hook.
13) Remove the belt on the gear [6] at the rear side of the swing unit and then pull out the swing unit [7] to the delivery direction.



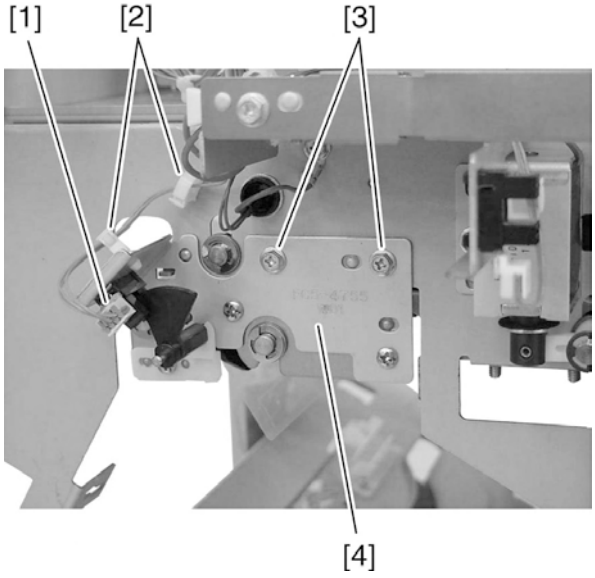
F06-102-12

Note:

The parallel pin [8] drops when the gear [6] is removed. Be careful not to loose it.

1.2.6 Removing the Return Roller Unit

1) Remove the front cover (see 1.1.1).
2) Remove the rear cover (see 1.1.2).
3) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
4) Remove the left upper cover (see 1.1.3).
5) Remove the grate-shaped upper guide (see 1.1.7).
6) Remove tray 1 (see 1.1.5).
7) Remove tray 2 (see 1.1.6).
8) Remove the grate-shaped lower guide (see 1.1.8).
9) Remove the stapler (see 1.2.1).
10) Remove the processing tray (see 1.2.2).
11) Remove the swing unit (see 1.2.5).
12) Remove the return roller unit front side connector [1] and remove the harness from the clamps [2].
13) Remove two screws [3] and pull out the return roller unit [4] to the front side.

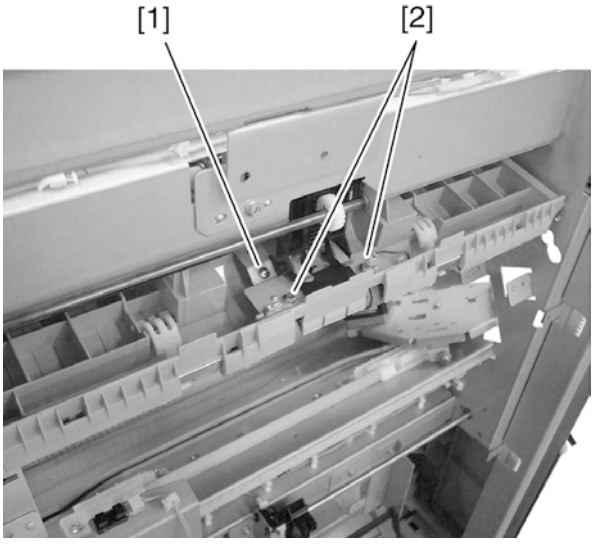


F06-102-13

1.2.7 Removing the Swing Unit Static Charge Eliminator

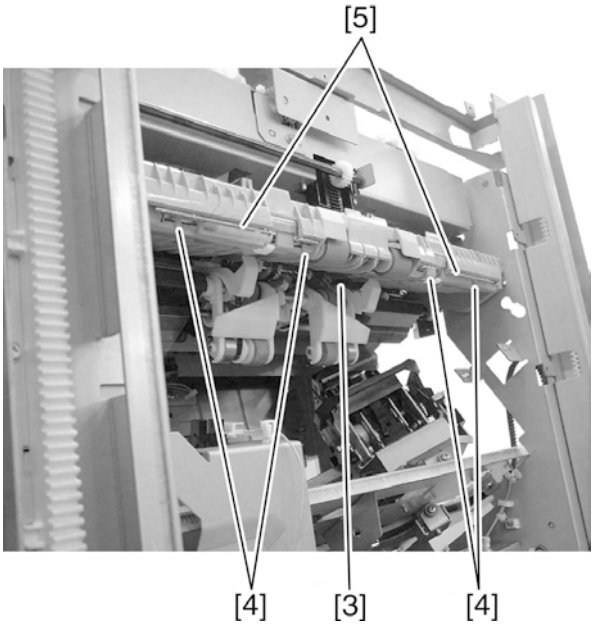
1) Remove the front cover (see 1.1.1).
2) Remove the rear cover (see 1.1.2).
3) Remove the front inside upper cover (Only on model with saddle unit) (see 2.1.3).
4) Remove the left upper cover (see 1.1.3).
5) Remove the grate-shaped upper guide (see 1.1.7).
6) Remove tray 1 (see 1.1.5).
7) Remove tray 2 (see 1.1.6).
8) Remove the grate-shaped lower guide (see 1.1.8).
9) Remove the stapler (see 1.2.1).
10) Remove the processing tray (see 1.2.2).

11) Remove the screw [1] securing the static charge eliminator at the center of the swing unit.
12) Remove two screws [2] securing the ground of the delivery side static charge eliminator.



F06-102-14

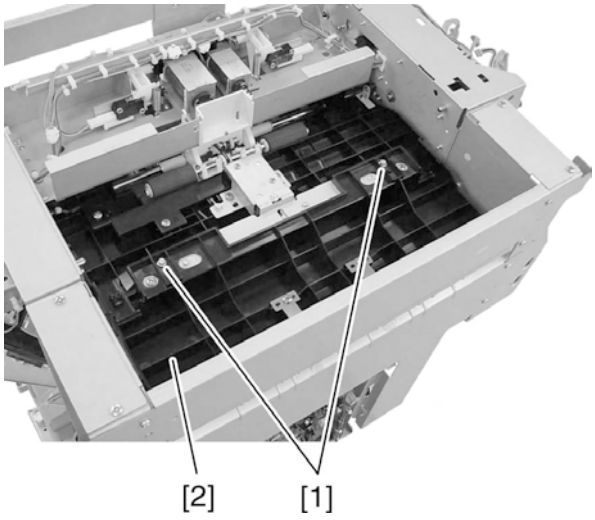
13) Pull out the static charge eliminator at the center of the swing unit from the bottom.
14) Remove the four claws [4] securing the delivery side static charge eliminator and remove the two static charge eliminators [5].



F06-102-15

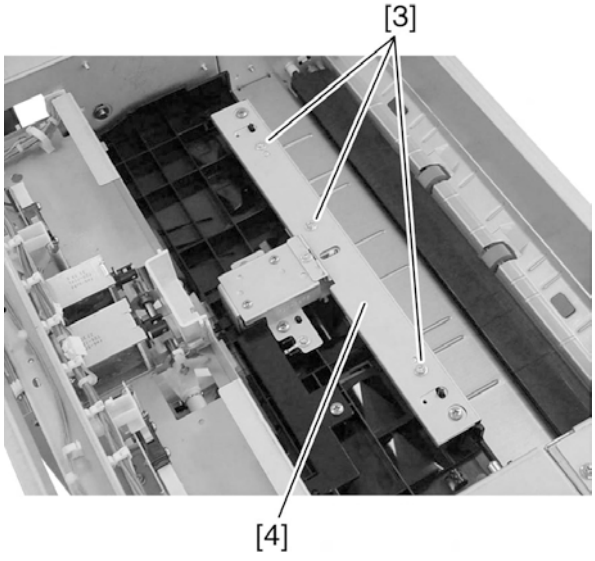
1.2.8 Removing the Inlet Static Charge Eliminator

1) Open the upper cover and unhook the hook linking the upper cover and inlet upper guide (see 1.1.4).
2) Remove two screws [1] and remove the right side section [2] of the inlet upper guide (Only on model with saddle unit).



F06-102-16

3) Remove three screws [3] and remove the inlet static charge eliminator [4].

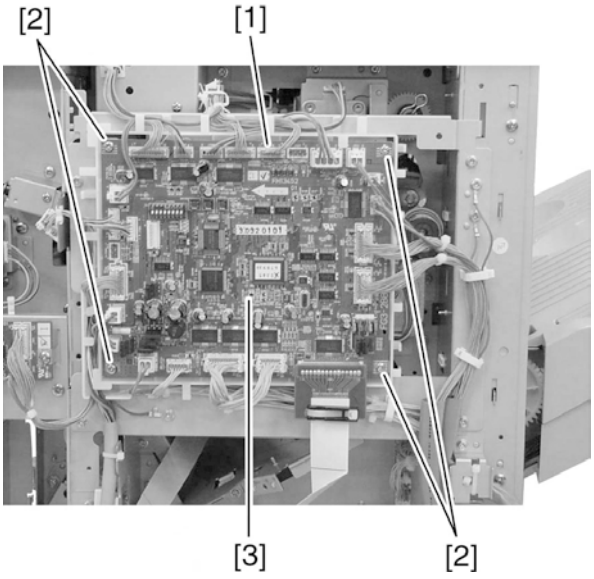


F06-102-17

1.3 PCB

1.3.1 Removing the Finisher Controller PCB

1) Remove the rear cover (see 1.1.2).
2) Disconnect all connectors [1] on the finisher controller PCB.
3) Remove four screws [2] and remove the finisher controller PCB [3].

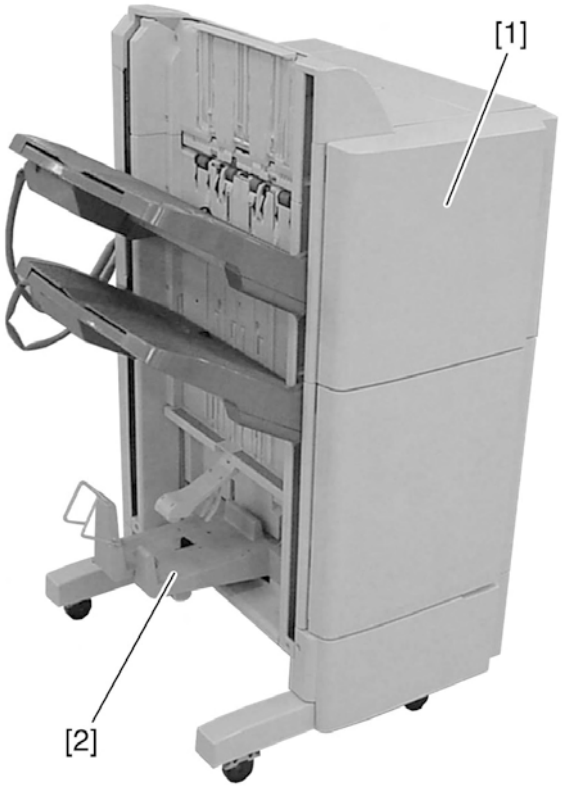


F06-103-01

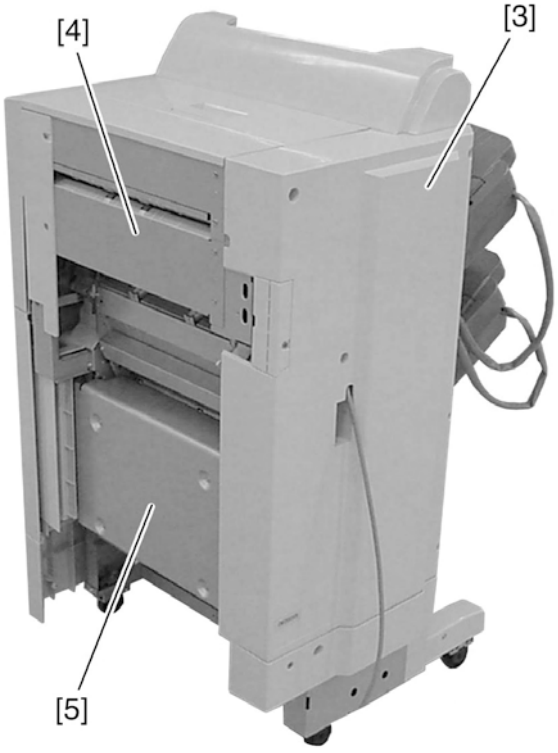
2. Saddle Stitcher Unit

2.1 Exterior Control Components

[1] Front cover
[2] Saddle delivery tray
[3] Rear cover
[4] Inlet delivery unit
[5] PCB cover



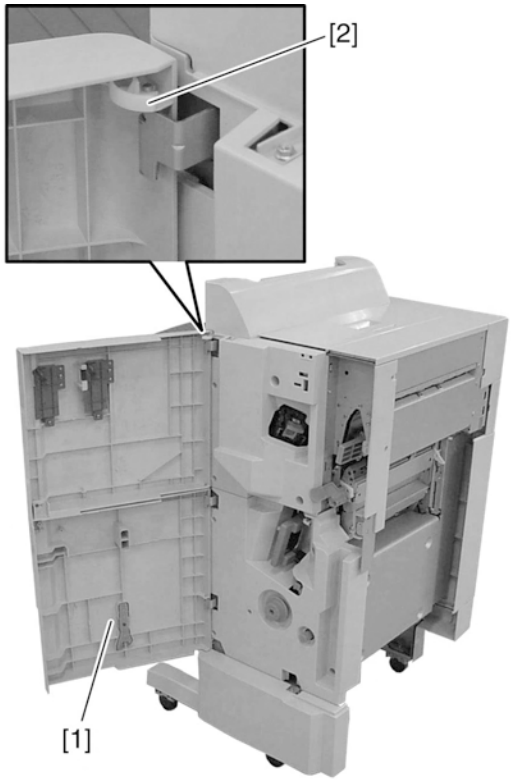
F06-201-01



F06-201-02

2.1.1 Removing the Front Cover

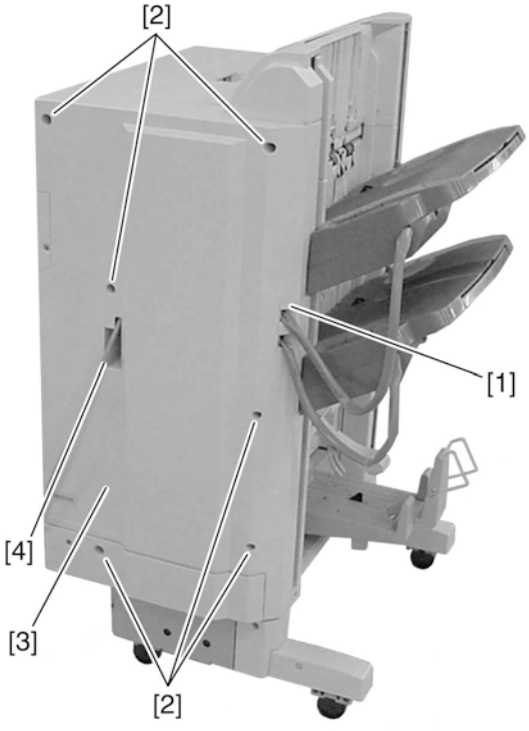
1) Open the front cover [1] and remove the clip [2].
2) Lift the front cover [1] to remove.



F06-201-03

2.1.2 Removing the Rear Cover

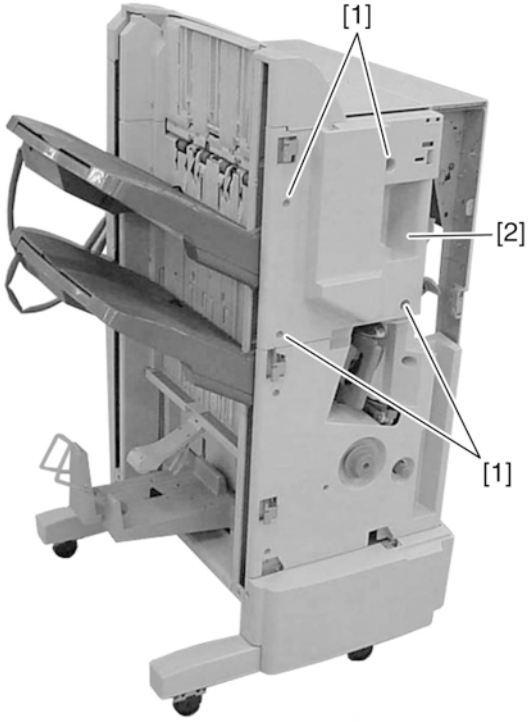
1) Shift the tray cable cover [1] toward the tray side to remove.
2) Remove six screws [2] and remove the rear cover [3].
3) Pull out the power supply cable from the hole [4].



F06-201-04

2.1.3 Removing the Front Inside Upper Cover

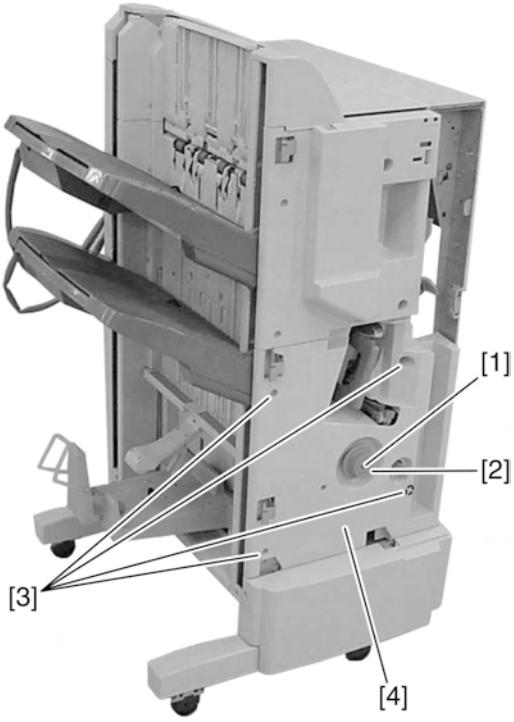
1) Remove the front cover (see 2.1.1).
2) Remove four screws [1] and remove the front inside upper cover [2].



F06-201-05

2.1.4 Removing the Front Inside Lower Cover

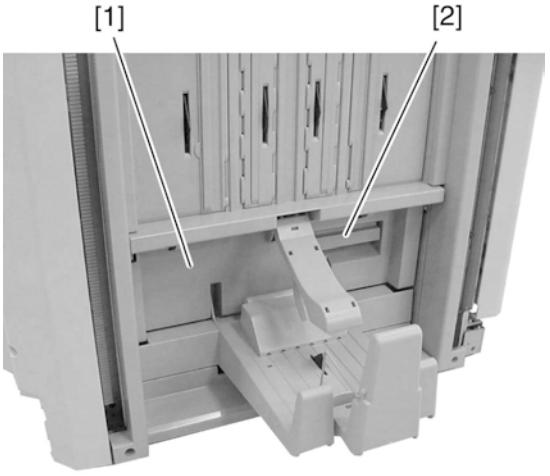
1) Remove the front cover (see 2.1.1).
2) Remove the front inside upper cover (see 2.1.3).
3) Remove screw [1] and then remove the roller knob [2].
4) Remove four screws [3] and remove the front inside lower cover [4].



F06-201-06

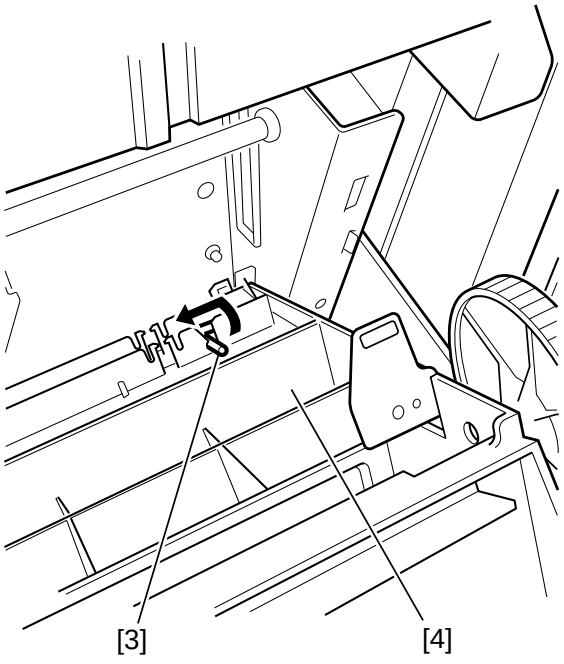
2.1.5 Removing the Saddle Delivery Tray Unit

1) Lift the saddle delivery tray unit open/close lever [2] and open the saddle delivery tray unit [1] .



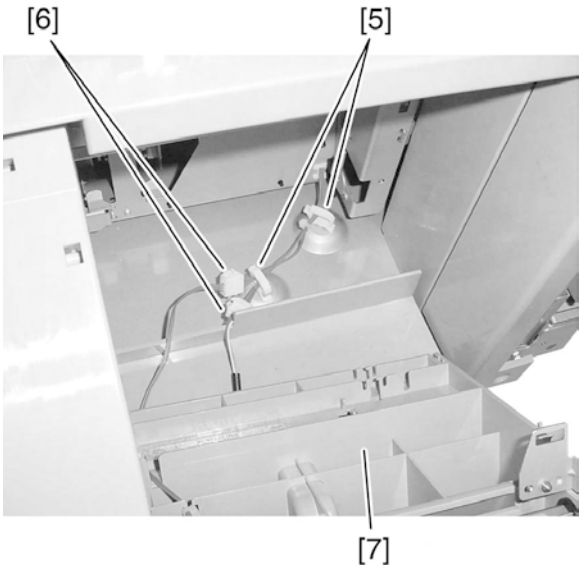
F06-201-07

2) Remove the door axis [3] in the direction of the arrow and pull out the saddle delivery tray unit [4] toward the delivery side.



F06-201-08

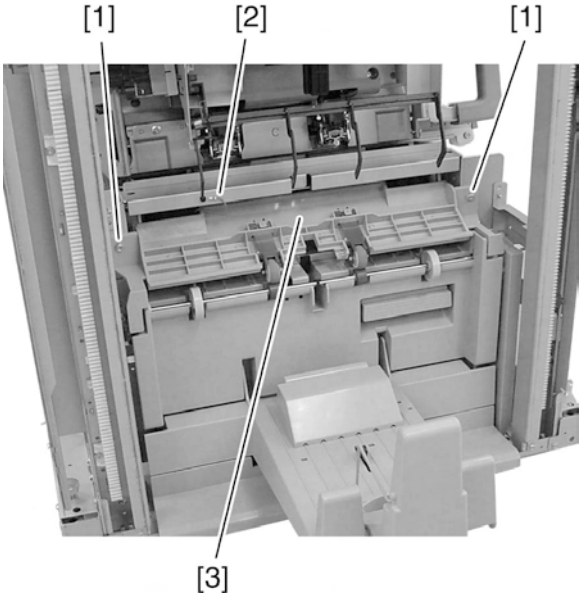
3) Remove the harness wire from the clamps [5].
4) Remove two connectors [6] and remove the saddle delivery tray unit [7].



F06-201-09

2.1.6 Removing the Upper Delivery Guide

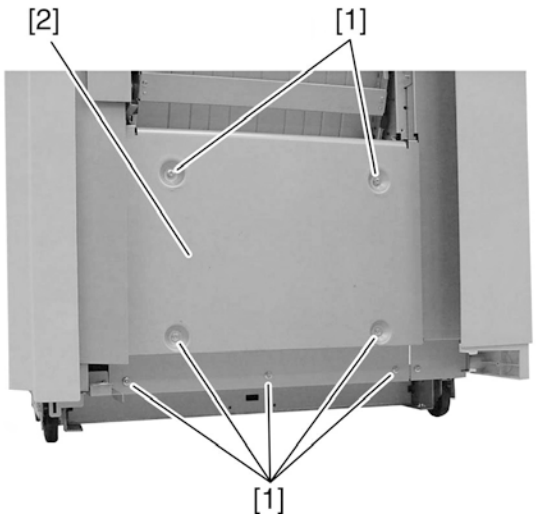
1) Remove the front cover (see 2.1.1).
2) Remove the rear cover (see 2.1.2).
3) Remove the front inside upper cover (see 2.1.3).
4) Remove the left upper cover (see 1.1.3).
5) Remove the grate-shaped upper guide (see 1.1.7).
6) Remove tray 1 (see 1.1.5).
7) Remove tray 2 (see 1.1.6).
8) Remove the grate-shaped lower guide (see 1.1.8).
9) Remove two screws [1] and ground wire [2] and remove the upper delivery guide [3].



F06-201-10

2.1.7 Removing the PCB Cover

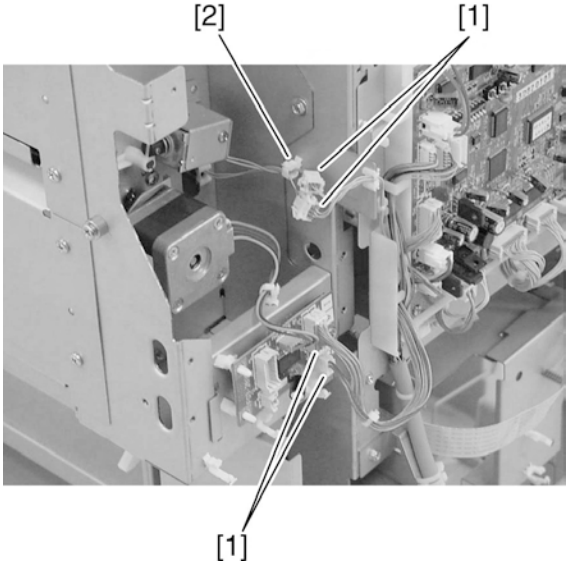
1) Remove seven screws [1] and remove the PCB cover [2].



F06-201-11

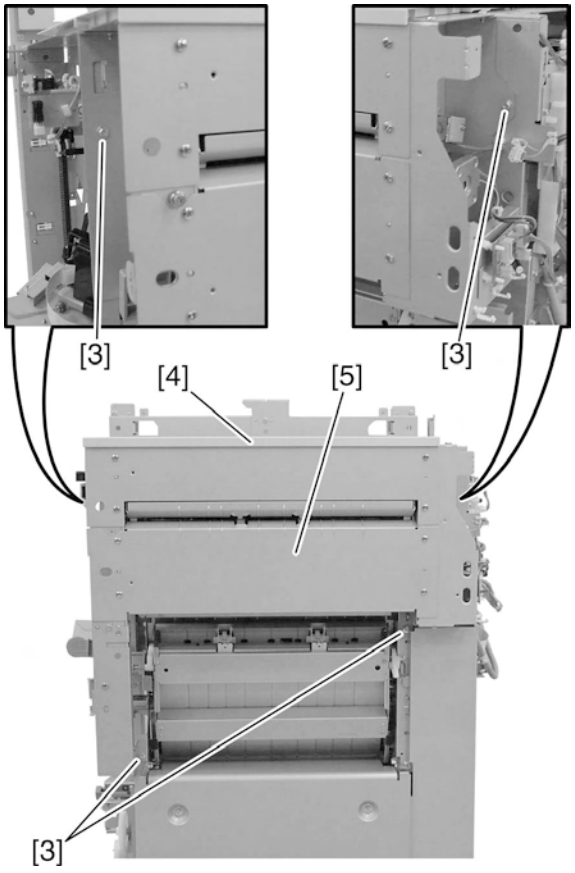
2.1.8 Removing the Inlet Delivery Unit

1) Remove the front cover (see 2.1.1).
2) Remove the rear cover (see 2.1.2).
3) Remove the front inside upper cover (see 2.1.3).
4) Disconnect four connectors [1] and remove the harness from clamp [2].



F06-201-12

5) Remove four screws [3].
6) Open the upper cover [4] and remove the inlet delivery unit [5].

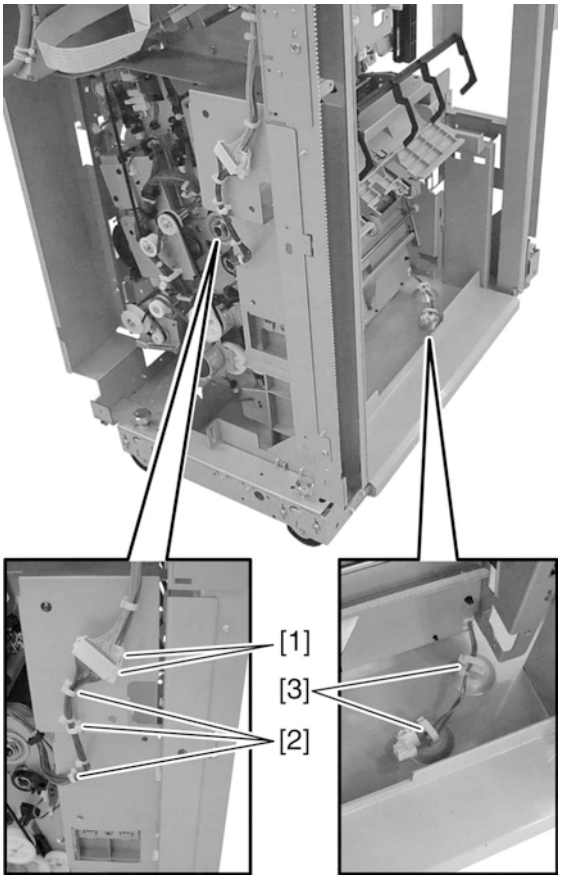


F06-201-13

2.2 Saddle Unit

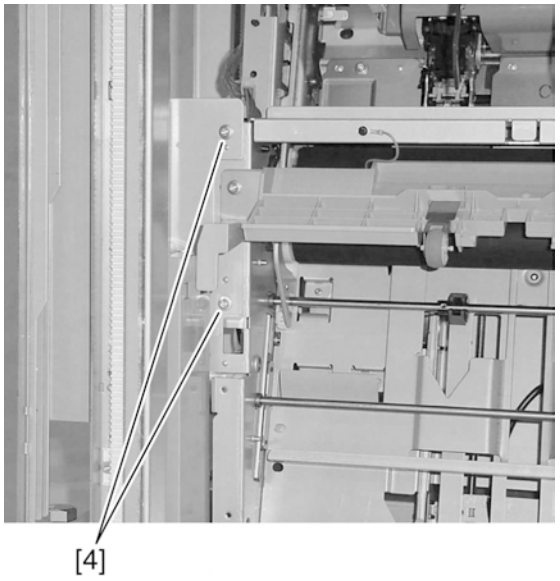
2.2.1 Removing the Saddle Unit

1) Remove the front cover (see 2.1.1).
2) Remove the rear cover (see 2.1.2).
3) Remove the front inside upper cover (see 2.1.3).
4) Remove the left upper cover (see 1.1.3).
5) Remove the grated-shaped upper guide (see 1.1.7).
6) Remove tray 1 (see 1.1.5).
7) Remove tray 2 (see 1.1.6).
8) Remove the grate-shaped lower guide (see 1.1.8).
9) Remove the saddle delivery tray unit (see 2.1.5).
10) Remove the PCB cover (see 2.1.7).
11) Remove the inlet delivery unit (see 2.1.8).
12) Disconnect two connectors [1] and remove the harness from three clamps [2].
13) Remove the harness from two clamps [3] at the bottom of the delivery side.



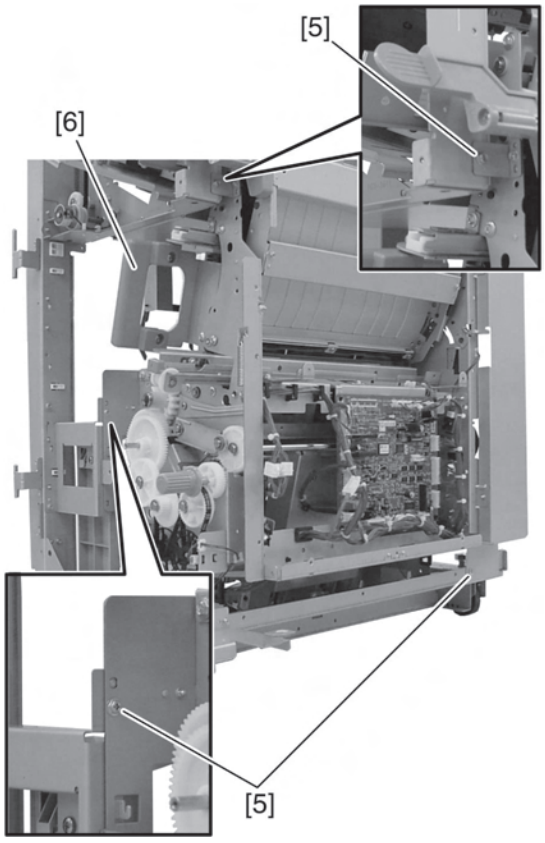
F06-202-01

14) Remove two screws [4].



F06-202-02

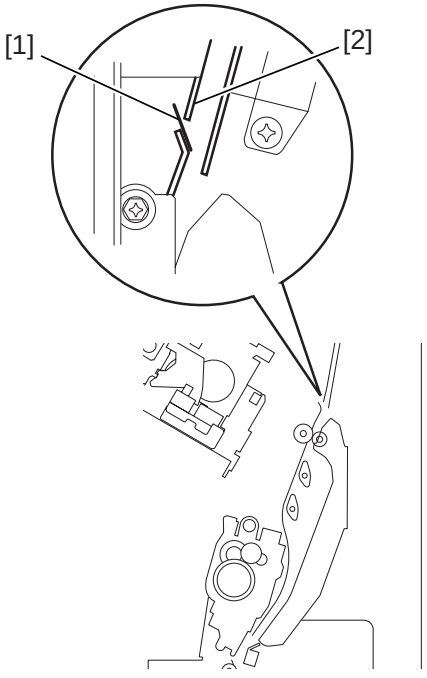
15) Remove three screws [5].
16) Remove the saddle unit [6] to the paper feeding side.



F06-202-03

Note:

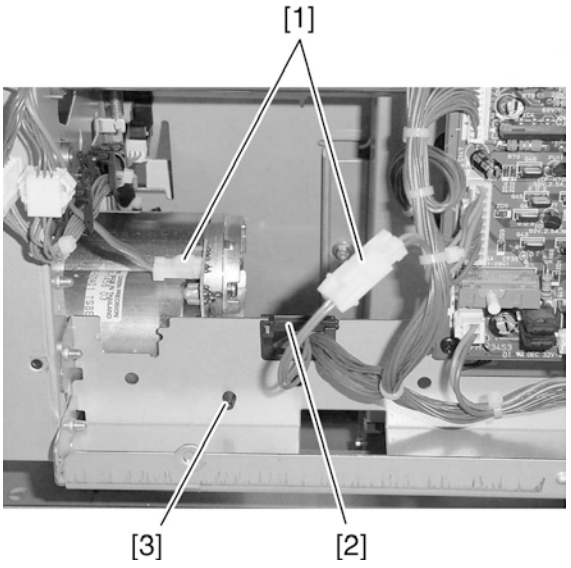
When installing the saddle unit, install so that the Mylar [1] at the front upper side of the saddle unit is on the outside of the delivery guide plate [2] as shown in the figure.
Delivery fault will occur if it goes inside.



F06-202-04

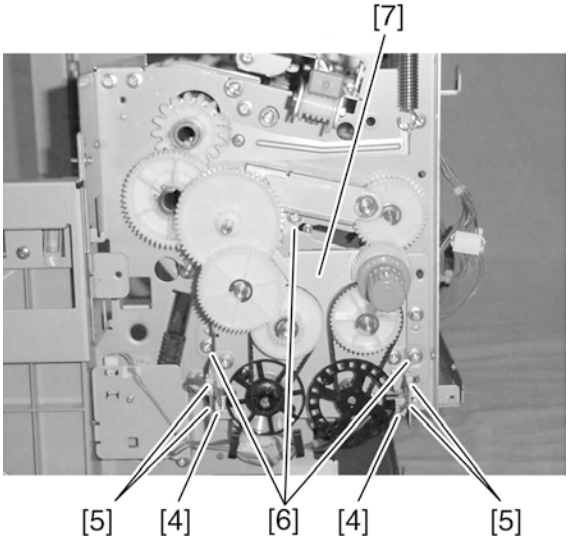
2.2.2 Removing the Paper Folding Roller

1) Remove the front cover (see 2.1.1).
2) Remove the rear cover (see 2.1.2).
3) Remove the front inside upper cover (see 2.1.3).
4) Remove the left upper cover (see 1.1.3).
5) Remove the grated-shaped upper guide (see 1.1.7).
6) Remove tray 1 (see 1.1.5).
7) Remove tray 2 (see 1.1.6).
8) Remove the upper delivery guide (see 2.1.6).
9) Disconnect two connectors [1] and remove the harness from edge saddle [2] and clamp [3].



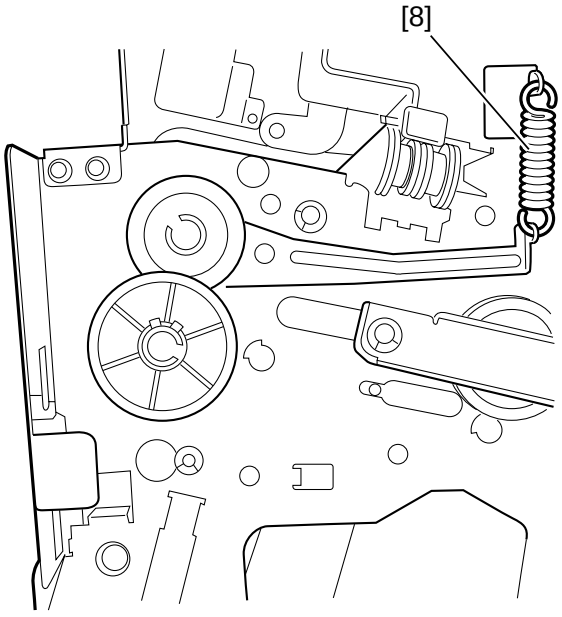
F06-202-05

10) Disconnect two connectors [4] and remove the harness from four edge saddles [5].
11) Remove three screws [6] and remove the paper folding/paper pushing motor base [7].

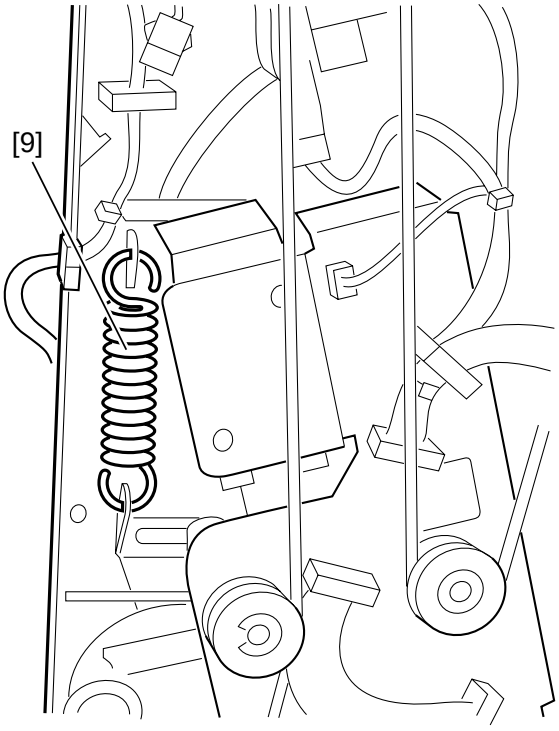


F06-202-06

12) Unhook the upper side of the front tension spring [8] and rear tension spring [9].

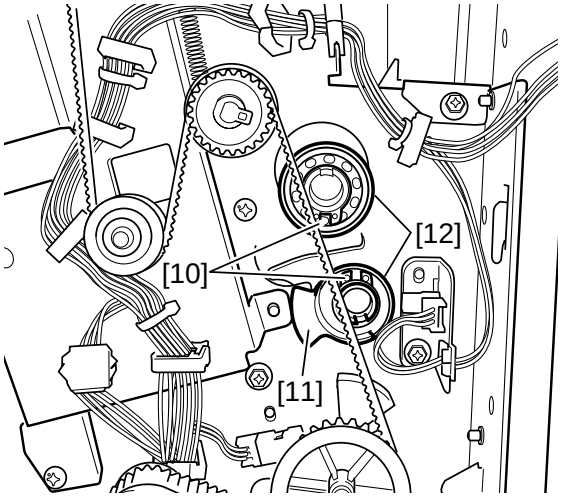


F06-202-07



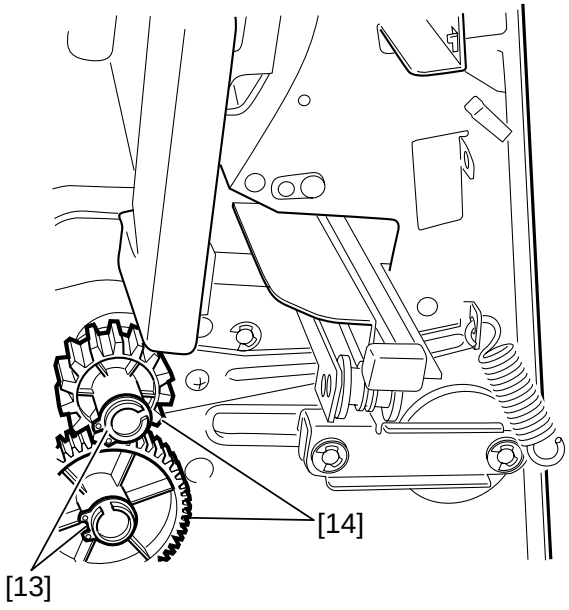
F06-202-08

13) Remove the two C-rings [10] at the rear, and remove the sensor flag [11] and two bearings [12].



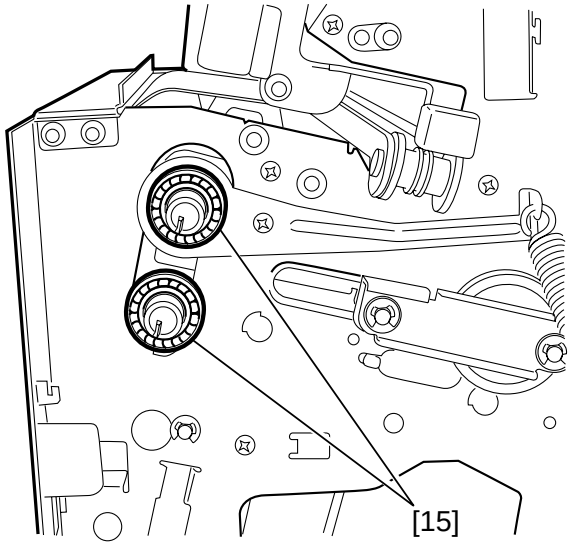
F06-202-09

14) Remove the two C-rings [13] at the front and remove the two gears [14].



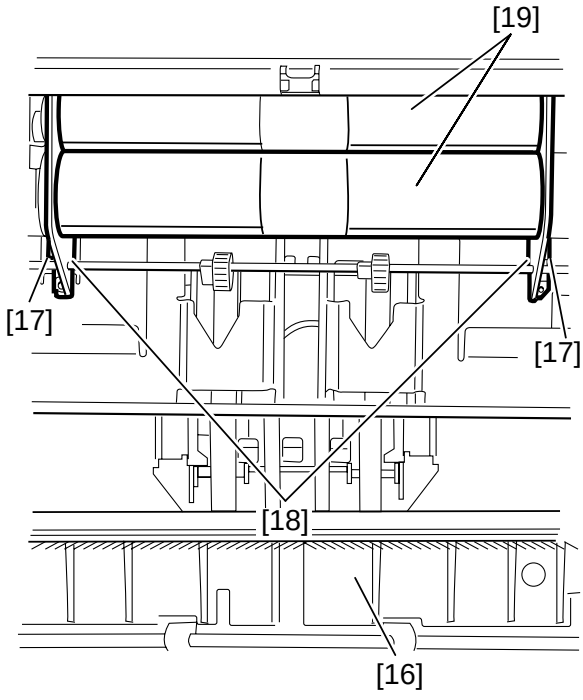
F06-202-10

15) Remove the two bearings [15].



F06-202-11

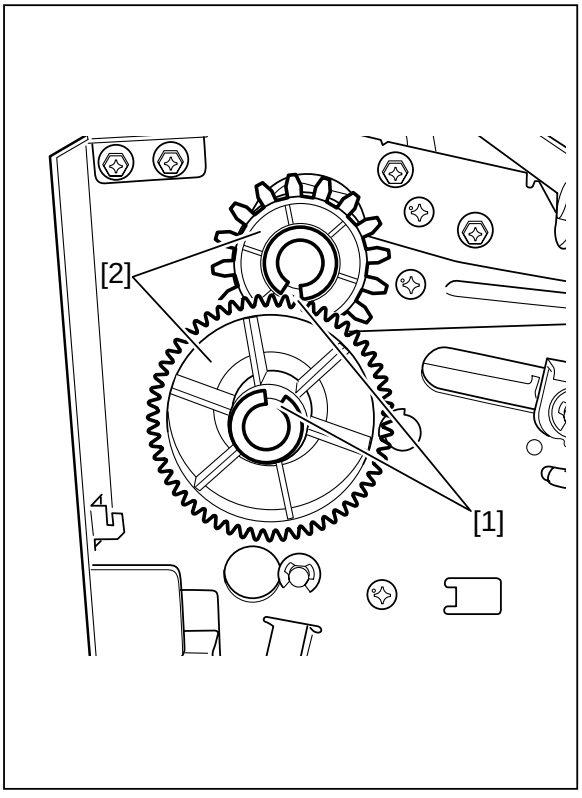
16) Open the saddle delivery tray [16].
17) Remove two screws [17] and remove the two aligning plates [18].
18) Slide the two paper folding rollers [19] to the front, and then pull it out in the delivery direction.



F06-202-12

Note:

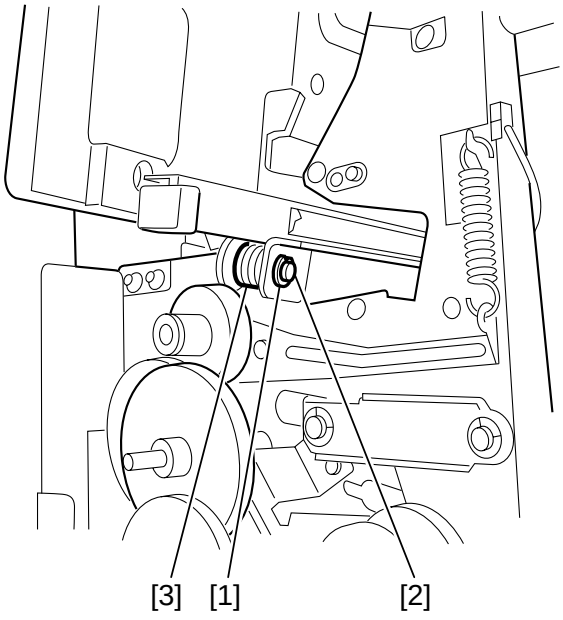
When installing, attach the gear [2] so that the grooves [1] of the paper folding rollers face each other and align the phase.



F06-202-13

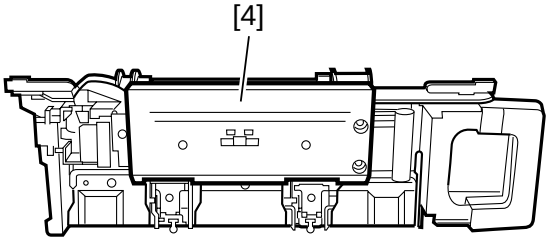
2.2.3 Removing the Stitcher Mount Unit

1) Remove the front cover (see 2.1.1).
2) Remove the front inside upper cover (see 2.1.3).
3) Remove the front inside lower cover (see 2.1.4).
4) Remove the E-ring [1], shaft [2], and roller [3].



F06-202-14

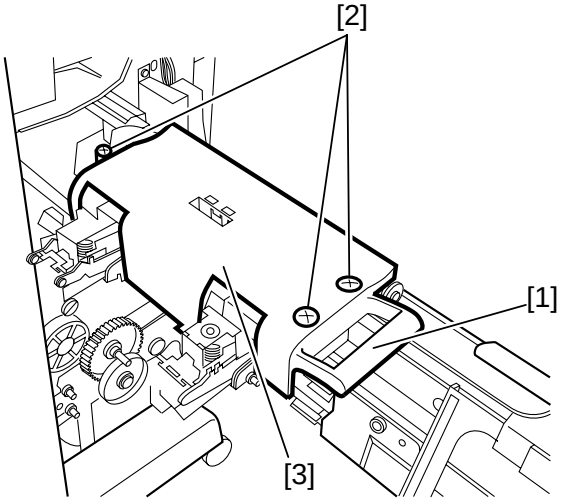
5) Pull out the stitcher mount unit [4] to the front.



F06-202-15

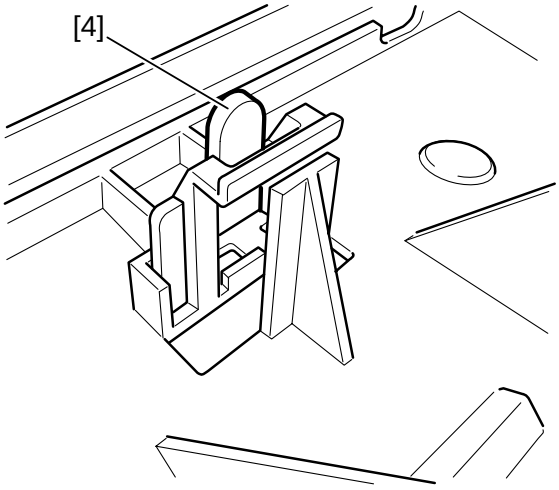
2.2.4 Adjusting the Stitcher Unit

1) Remove the front cover (see 2.1.1).
2) Pull out the stitcher mount unit to the front, then pull out the stitcher towards yourself and then pull up the stitcher.
3) Remove three screws [2] and remove the stitcher cover [3].



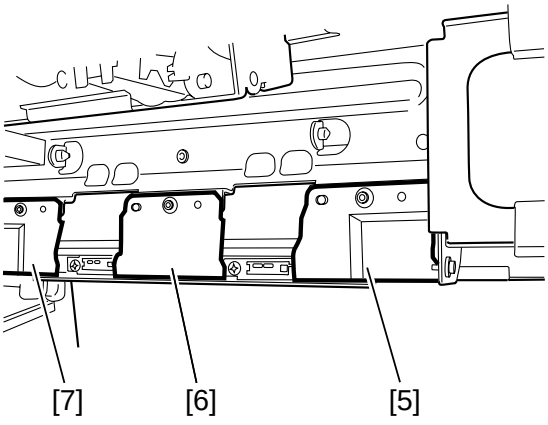
F06-202-16

4) Remove the stitcher positioning tool [4] from the back of the cover.



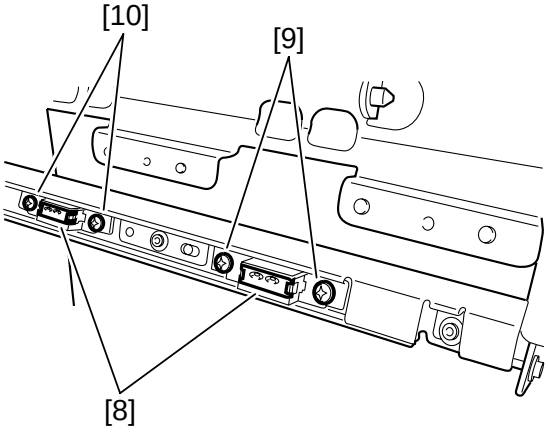
F06-202-17

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



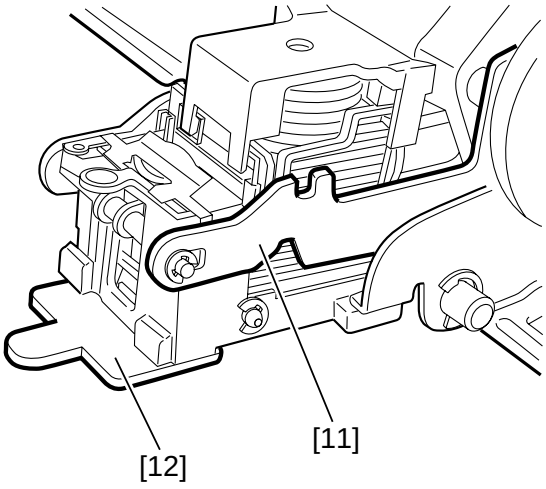
F06-202-18

6) To adjust the front stitcher, loosen the two screws [9] on the stitcher mount [8]. To adjust the rear stitcher, loosen the two screws [10] on the stitcher mount [8].



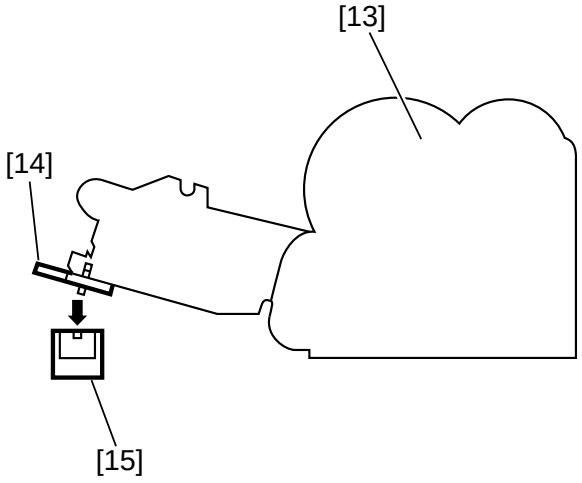
F06-202-19

7) Insert the tool [12] into the staple slot of the stitcher [11].



F06-202-20

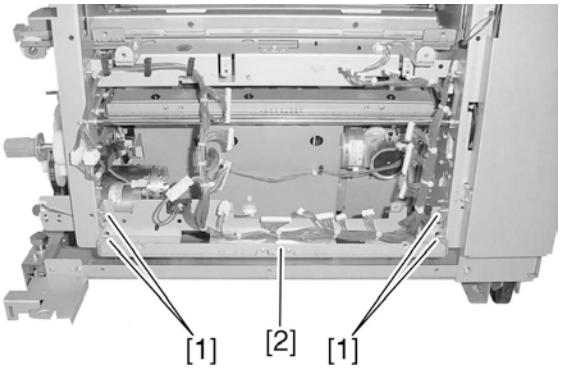
8) Tilt the stitcher, and turn the stitcher gear [13] to match the recess of the tool [14] and the mount [15] and then tighten the screws on the mount [15] to secure.



F06-202-21

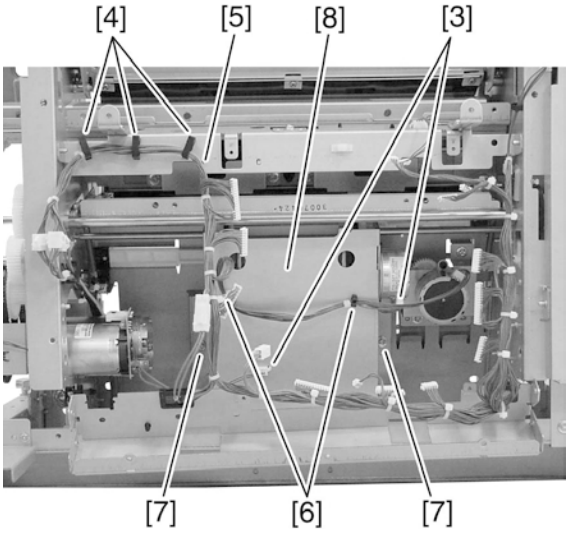
2.2.5 Removing the Positioning Plate Unit

1) Remove the front cover (see 2.1.1).
2) Remove the rear cover (see 2.1.2).
3) Remove the front inside upper cover (see 2.1.3).
4) Remove the front inside lower cover (see 2.1.4).
5) Remove the PCB cover (see 2.1.7).
6) Remove the saddle stitcher controller PCB (see 2.3.1).
7) Remove four screws [1] and remove the stay [2]. The clamped harness of edge saddle of the stay need not be removed.



F06-202-22

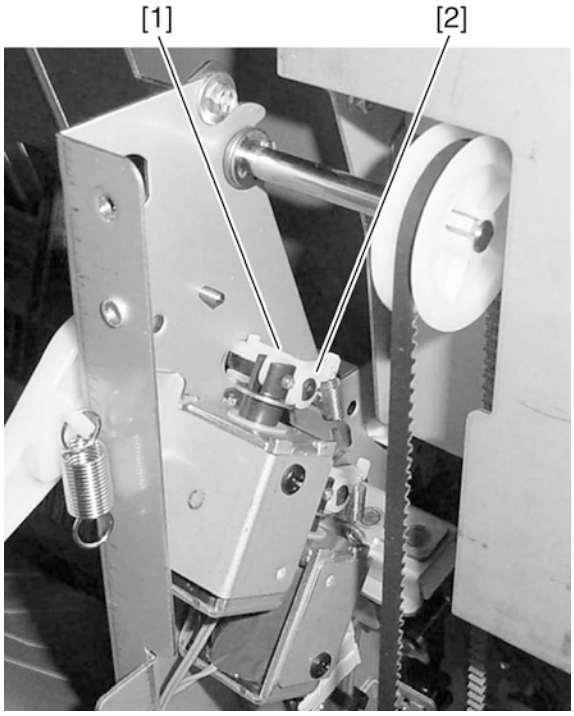
8) Disconnect two connectors [3], remove three clamps [4] and remove the harness [5] from two clamps [6].
9) Remove two screws [7], shift the positioning plate unit [8] forward once, and then pull it out from the paper feeding side.



F06-202-23

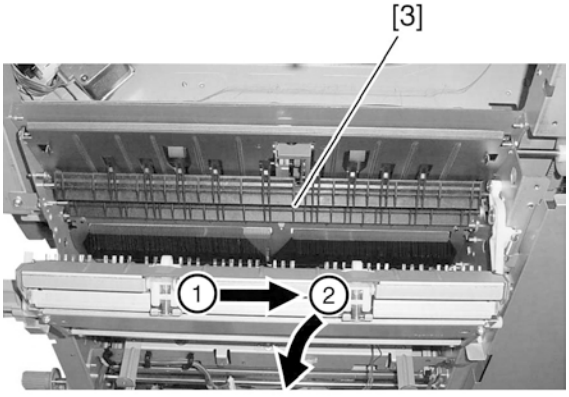
2.2.6 Removing the No.1 and No.2 Flappers

1) Remove the front cover (see 2.1.1).
2) Remove the rear cover (see 2.1.2).
3) Remove the front inside upper cover (see 2.1.3).
4) Remove the inlet delivery unit (see 2.1.8).
5) Remove the claw [1] of the No.1 flapper bushing, and pull out the No.1 flapper shaft [2] toward the rear. (The procedure is the same for the No.2 flapper.)



F06-202-24

6) After detaching the front shaft of the No.1 flapper [3] from the front side plate, remove the No.1 flapper.

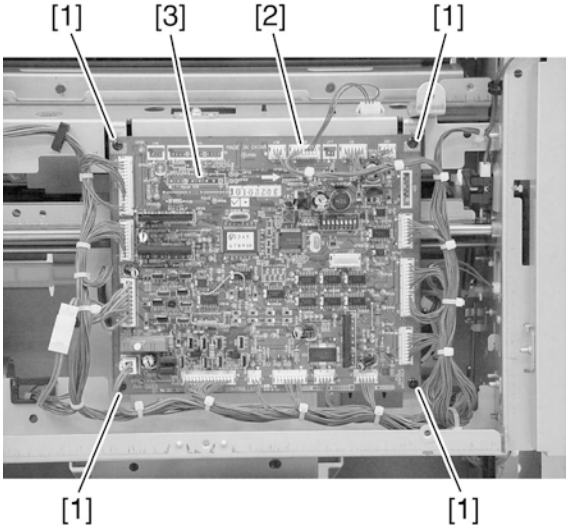


F06-202-25

2.3 PCBs

2.3.1 Removing the Saddle Stitcher Controller PCB

1) Remove the PCB cover (see 2.1.7).
2) Remove the four screws [1] and 16 connectors [2], and remove the saddle stitcher controller PCB [3].

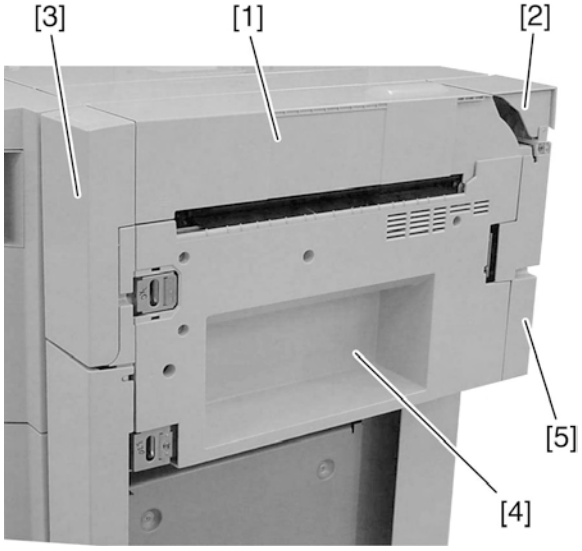


F06-203-01

3. Puncher Unit (Option)

3.1 Externals and Controls

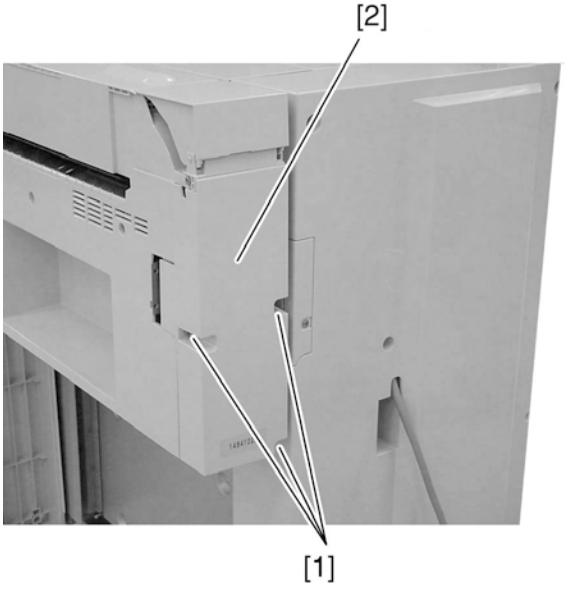
[1] Upper cover
[2] Upper cover 2
[3] Front door
[4] Right guide assembly
[5] Rear cover



F06-301-01

3.1.1 Removing the Rear Cover

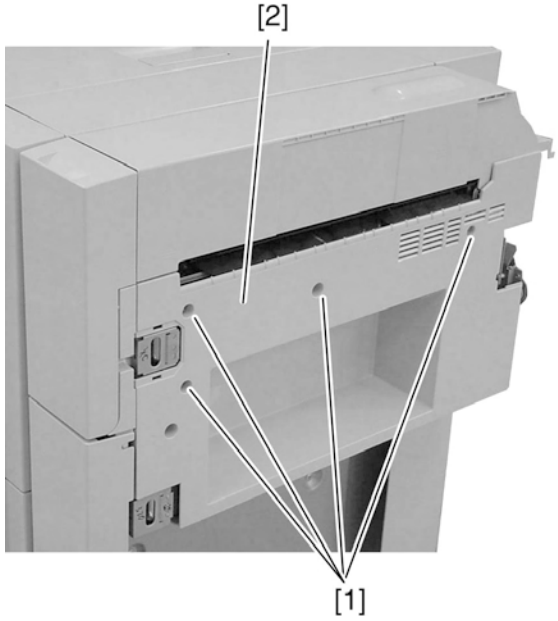
1) Remove three screws [1] and remove the rear cover [2].



F06-301-02

3.1.2 Removing the Right Guide Unit

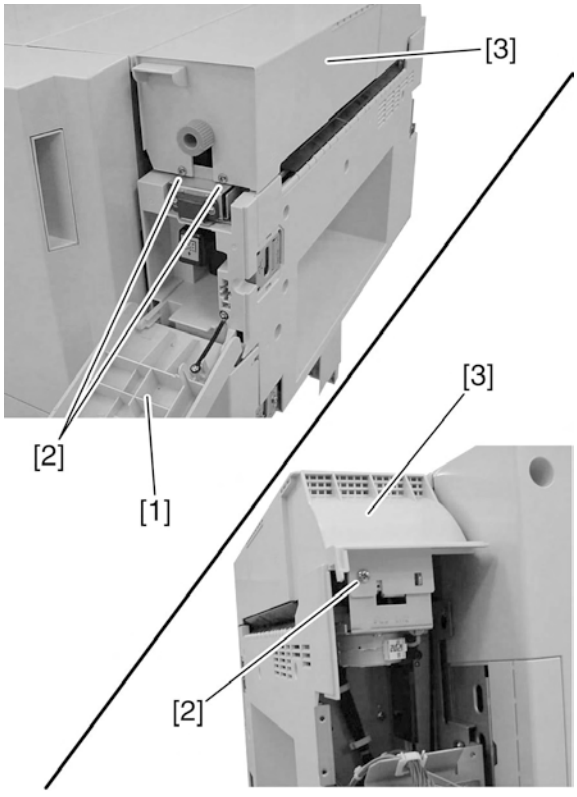
1) Remove four screws [1], and remove the right guide assembly [2].



F06-301-03

3.1.3 Removing the Upper Cover

1) Remove the rear cover (see 3.1.1).
2) Open the front door [1], remove three screws [2], and remove the upper cover [3].

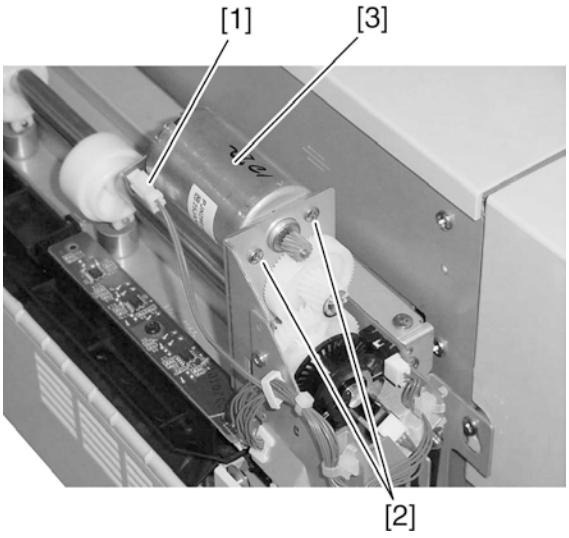


F06-301-04

3.2 Puncher Driver System

3.2.1 Removing the Punch Motor

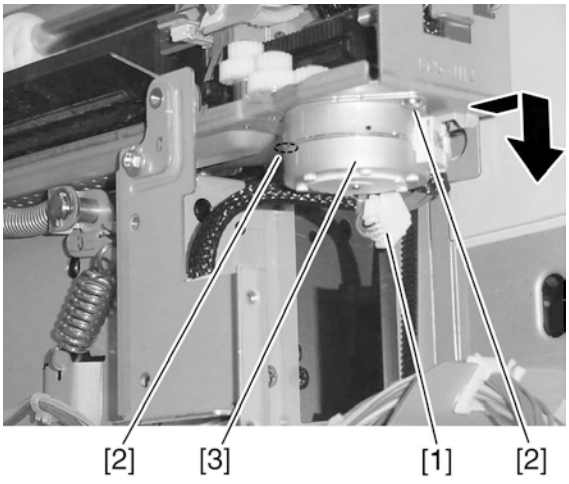
1) Remove the rear cover (see 3.1.1).
2) Remove the upper cover (see 3.1.3).
3) Disconnect the connector [1].
4) Remove two screws [2] and remove the punch motor [3].



F06-302-01

3.2.2 Removing the Horizontal Registration Motor

1) Remove the rear cover (see 3.1.1).
2) Remove the right guide assembly (see 3.1.2).
3) Disconnect the connector [1].
4) Remove two screws [2] and slide the horizontal registration motor [3] in the direction of the arrow to remove.



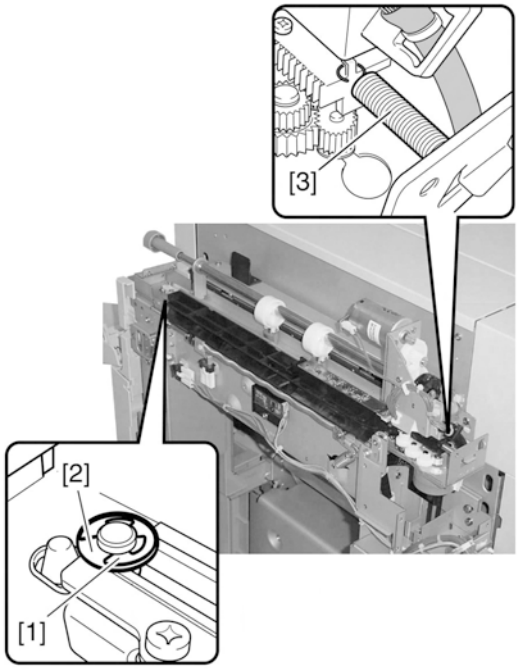
F06-302-02

3.2.3 Removing the Puncher Unit

Note:

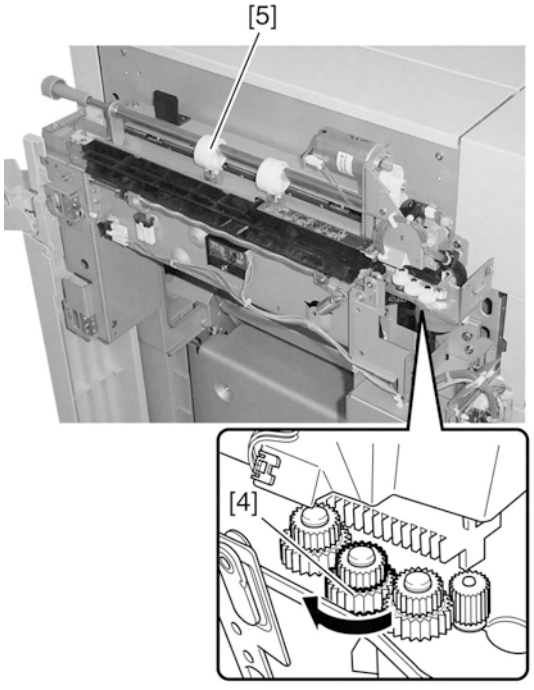
When removing the punch unit, the punch unit section sometimes opens. If necessary, perform work with the punch unit section in an open state.

1) Remove the rear cover (see 3.1.1).
2) Remove the right guide assembly (see 3.1.2).
3) Remove the upper cover (see 3.1.3).
4) Remove E-ring [1], washer [2], and puncher spring [3].



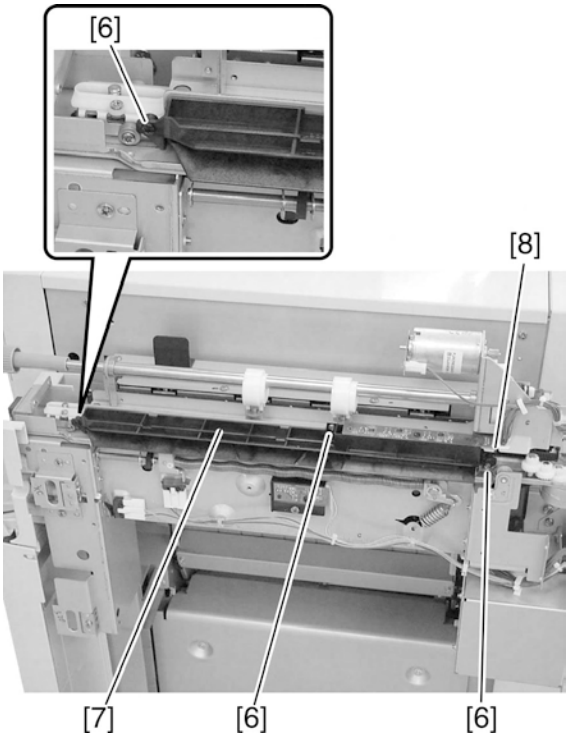
F06-302-03

5) Turn the gear [4] in the direction of the arrow, and move the punch unit section [5] to the front side.



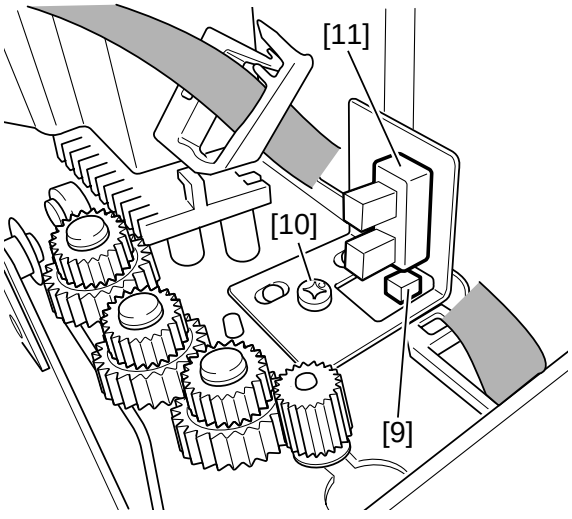
F06-302-04

6) Remove the three screws [6], and remove the sensor mount (upper) [7]. Then, remove the connector [8] on the LED PCB.



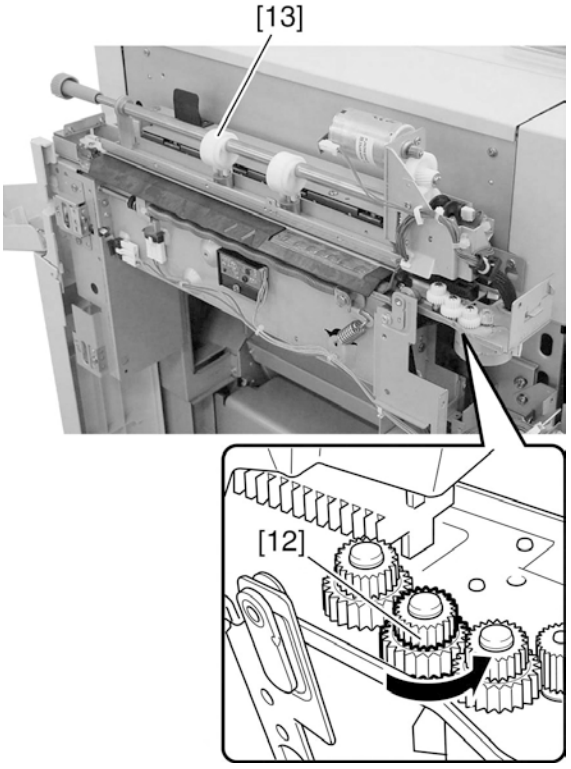
F06-302-05

7) Disconnect the connector [9] and remove the screw [10], and remove the horizontal registration home position sensor [11].



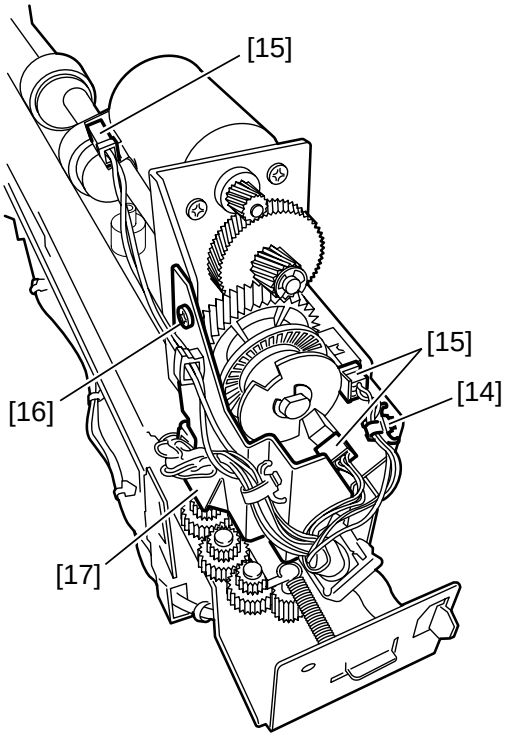
F06-302-06

8) Turn the gear [12] in the direction of the arrow, and move the punch unit section [13] to the rear side.



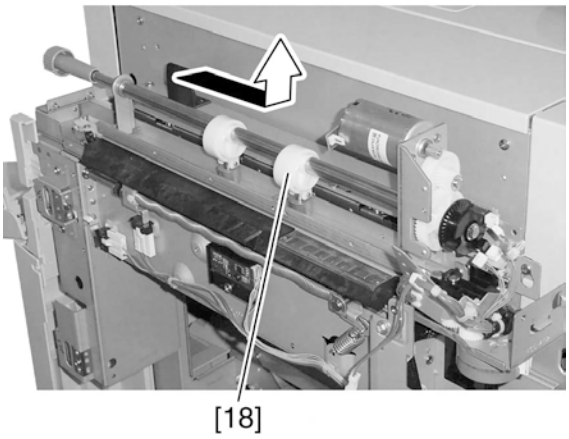
F06-302-07

9) Remove the binding band [14] while holding its claw between your fingers.
(The binding band must be removed without being cut.)
10) Disconnect the three connectors [15] and remove the screw [16], and remove the harness guide [17].



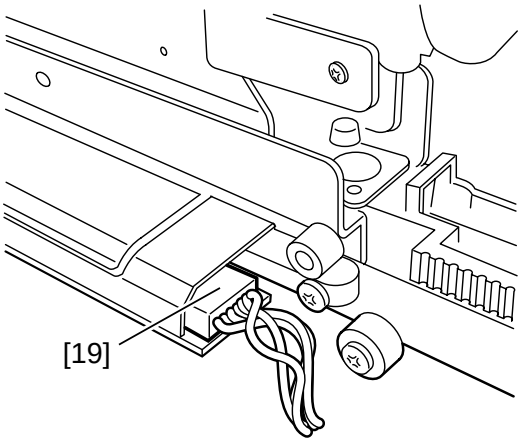
F06-302-08

11) Lift up the front side of the punch unit section [18] first, then move in the direction of the arrow to remove the punch unit section [18].



F06-302-09

12) Disconnect the connector [19] on LED PCB.

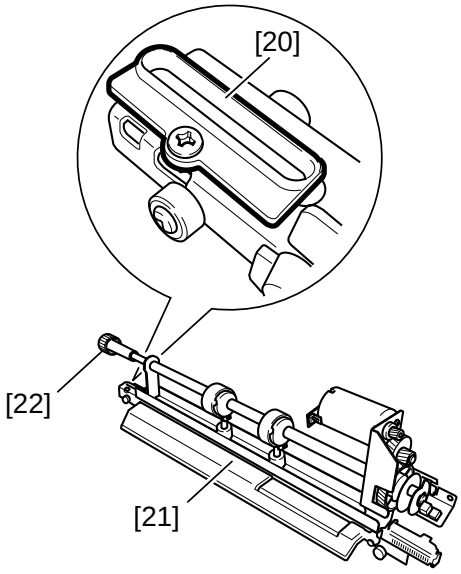


F06-302-10

13) Remove the slide shaft support [20], the sensor mount (lower) [21] and the puncher knob [22] from the punch unit section.

Note:

The slide shaft support [20] is not attached to punch unit section that are currently set as consumable parts.
When replacing the punch unit section, be sure to attach the slide shaft support that was in use beforehand.
If you forget to attach the slide shaft support, the machine may malfunction.



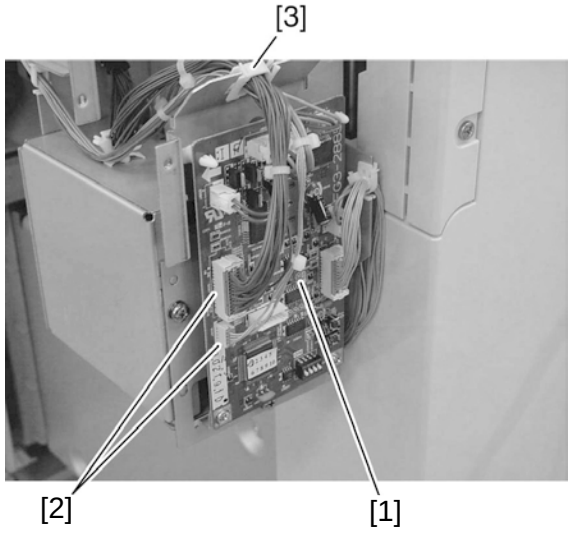
F06-302-11

3.2.4 Removing the Punch Unit Harness

Note:

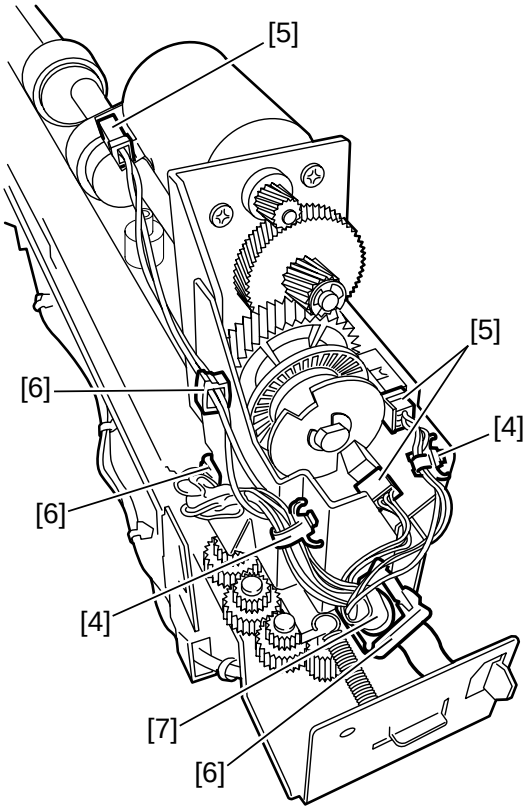
When removing the punch unit, the punch unit section sometimes opens. If necessary, perform work with the punch unit section in an open state.

1) Remove the rear cover (see 3.1.1).
2) Remove the right guide assembly (see 3.1.2).
3) Remove the upper cover (see 3.1.3).
4) Disconnect the two connectors [2] on the punch controller PCB [1] and remove the harness from the edge saddle [3].



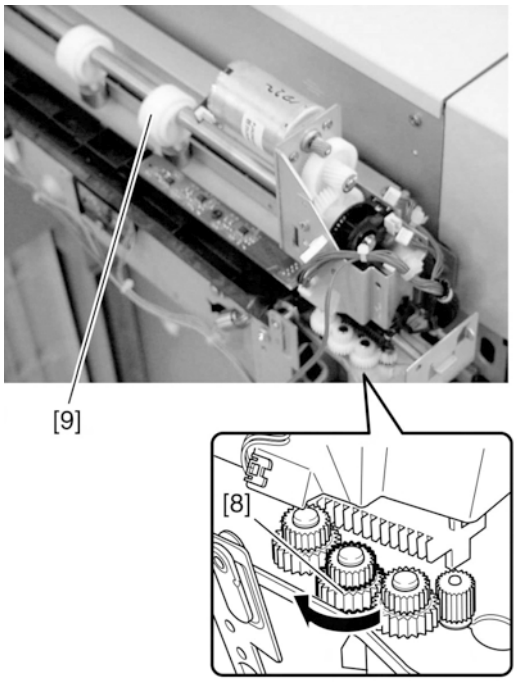
F06-302-12

5) Remove the two binding band [4] while holding its claw between your fingers. (The binding band must be removed without being cut.)
6) Disconnect the three connectors [5].
7) Remove the harness [7] from the three harness clamps [6].



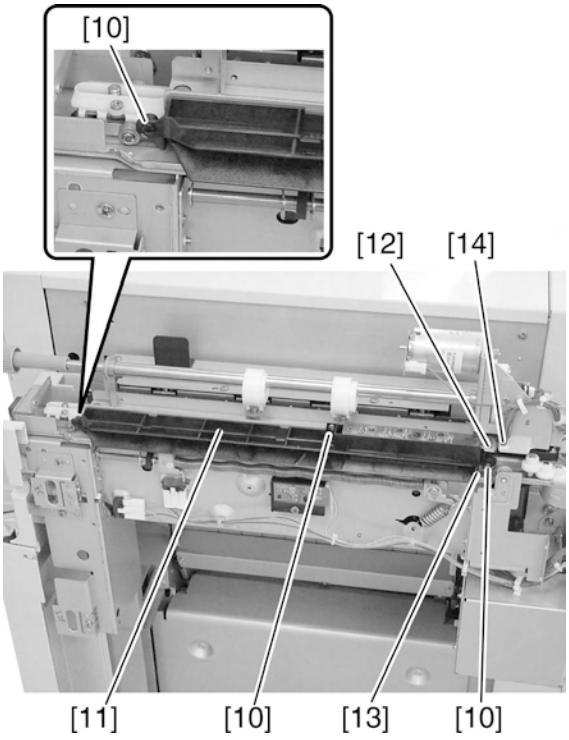
F06-302-13

8) Turn the gear [8] in the direction of the arrow, and move the punch unit section [9] to the front side.



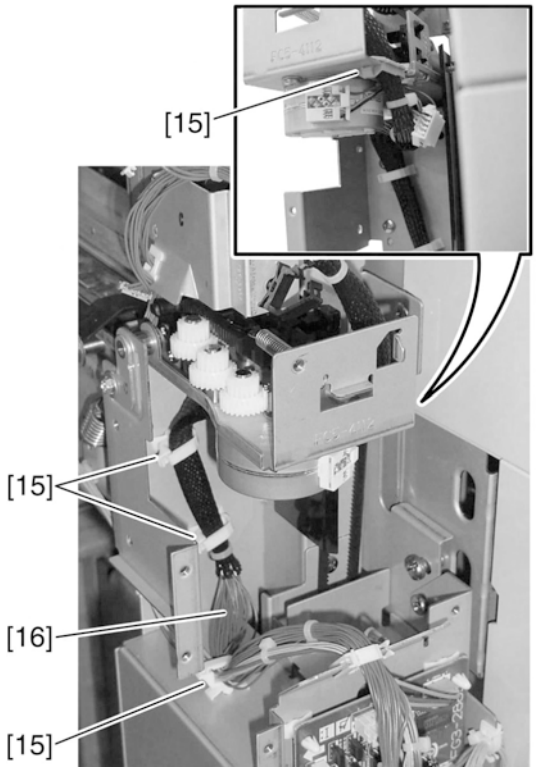
F06-302-14

9) Remove the three screws [10] and sensor mount (upper) [10].
10) Disconnect the connector [12] on the photosensor PCB and the connector [13] on the LED PCB and remove the harness from the edge saddle [14].



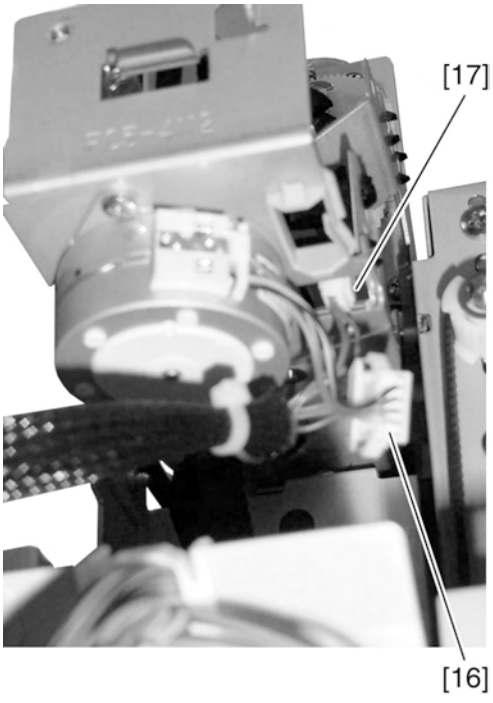
F06-302-15

11) Remove the harness [16] from the four harness clamps [15].



F06-302-16

12) Disconnect the connector [16] of the horizontal registration motor and the connector [17] of the horizontal registration home position sensor, and remove the punch unit harness.



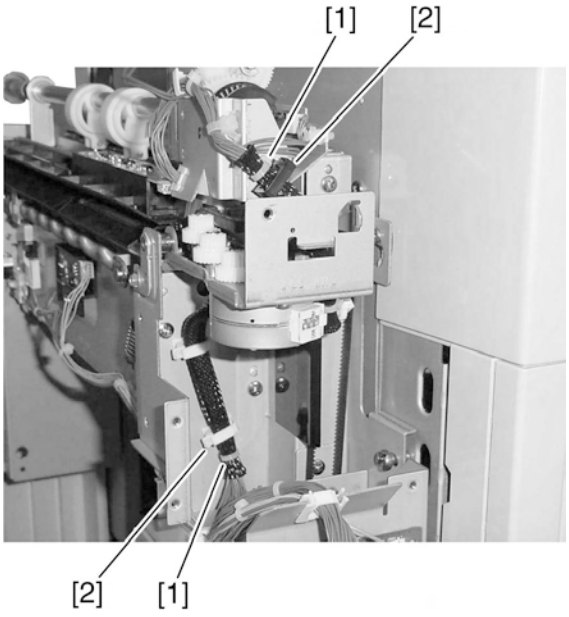
F06-302-17

3.2.5 Installing the Punch Unit Harness

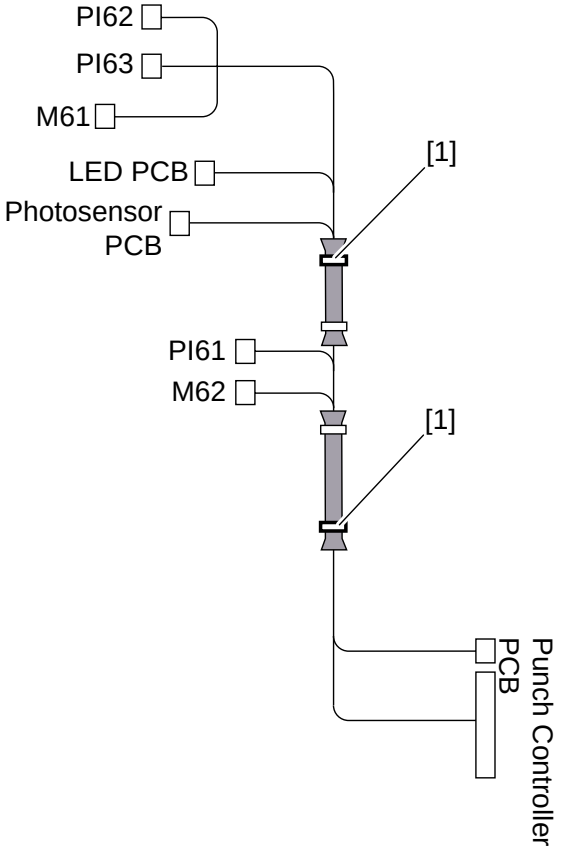
Note:

Offset punch unit harnesses can cause malfunction. The punch unit harnesses must be firmly installed at the positions described below.

1) Fasten the punch unit harnesses so that the two binding bands [1] of the punch unit harnesses are on the outside of the two harness clamps [2].



F06-302-18

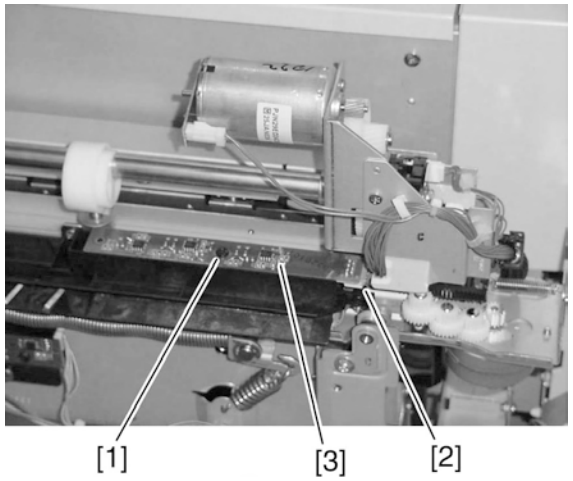


F06-302-19

3.3 PCBs

3.3.1 Removing the LED PCB

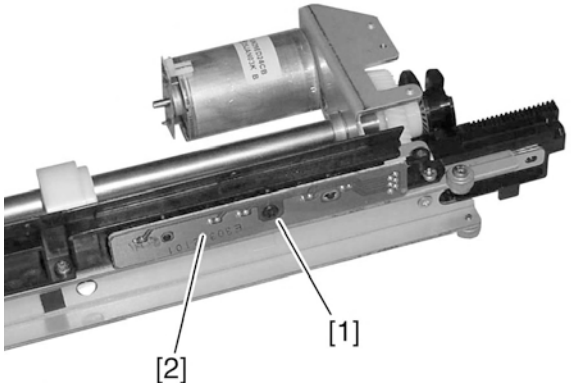
1) Remove the rear cover (see 3.1.1).
2) Remove the upper cover (see 3.1.3).
3) Remove the screw [1].
4) Disconnect the connector [2] and the remove the LED PCB [3].



F06-303-01

3.3.2 Removing the Photosensor PCB

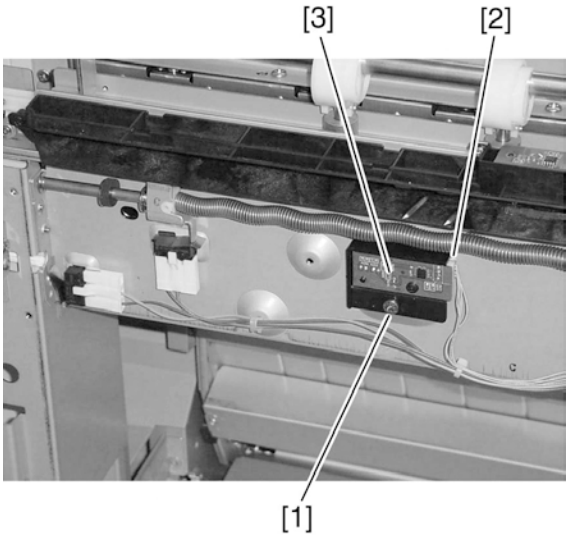
1) Remove the rear cover (see 3.1.1).
2) Remove the right guide assembly (see 3.1.2).
3) Remove the upper cover (see 3.1.3).
4) Remove the punch unit (see 3.2.3).
5) Remove the screw [1], and remove the photosensor PCB [2].



F06-303-02

3.3.3 Removing the Scrap Full Detector PCB Unit

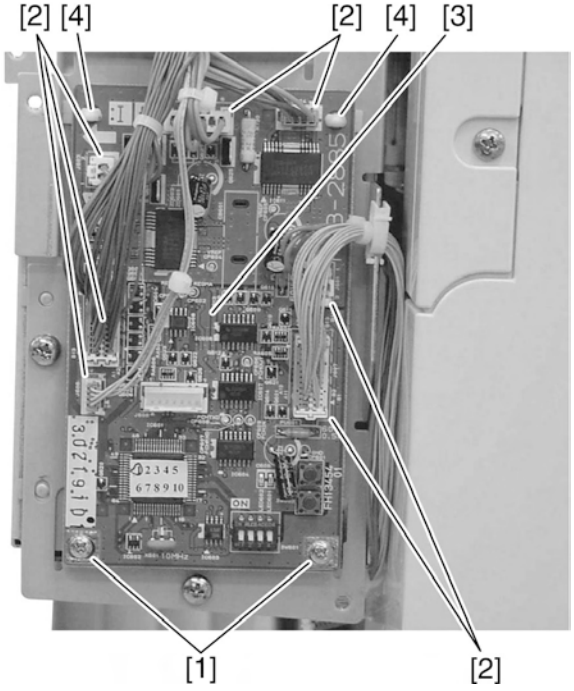
1) Remove the right guide assembly (see 3.1.2).
2) Remove the screw [1], disconnect the connector [2], and remove the scrap full detector PCB unit [3].



F06-303-03

3.3.4 Removing the Punch Controller PCB

1) Remove the puncher unit from the finisher.
2) Remove the rear cover (see 3.1.1).
3) Remove the two screws [1], two lock supports, disconnect seven connectors [2], and remove the punch controller PCB [3].



F06-303-04

CHAPTER 7

MAINTENANCE AND INSPECTION

1 Periodically Replaced Parts

1.1 Finisher Unit

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

1.2 Saddle Stitcher Unit

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

1.3 Puncher Unit (option)

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

2 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.

2.1 Finisher Unit

No.	Name	Quantity	Approx. life	Remark
1	Stapler	1	500,000 times	1 cartridge lasts approximately 5,000 times
2	Delivery side static charge eliminator (R)	1	1,000,000 times	
3	Delivery side static charge eliminator (F)	1	1,000,000 times	
4	Inlet static charge eliminator	1	1,000,000 times	
5	Swing unit center static charge eliminator	1	1,000,000 times	
6	Buffer roller	1	1,000,000 times	
7	Return roller	2	1,000,000 times	

T07-201-01

2.2 Saddle Stitcher Unit

No.	Name	Quantity	Approx. life	Remark
1	Stitcher	2	100,000 times	1 cartridge lasts approximately 2000 times

T07-202-01

2.3 Puncher Unit (option)

No.	Name	Quantity	Approx. life	Remark	
1	Puncher unit	1	1,000,000 times	2 hole model	(E)
2	Puncher unit	1	1,000,000 times	2/3 hole model	(N)
3	Puncher unit	1	1,000,000 times	4 hole model	(F)
4	Puncher unit	1	1,000,000 times	4 hole model	(S)
5	Punch unit harness	1	1,000,000 times		

T07-203-01

3 Periodic Maintenance

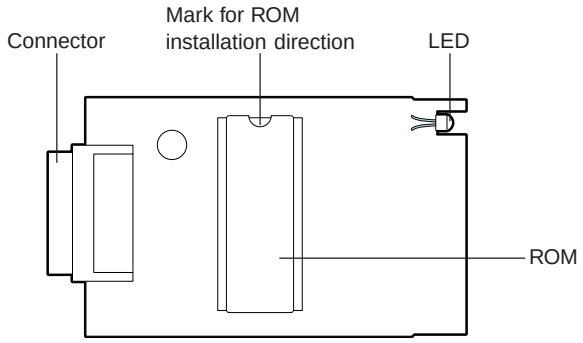
Item	Interval	Description	Remark
Transmittance sensor (puncher unit (option))	25 million sheets	Cleaning	Wipe with dry cloth

T07-300-01

3. Updating Finisher ROM

There are two types of finisher ROMs: the ROM with finisher firmware and the ROM with saddle stitcher firmware each written on. These two types of firmware can be updated individually by installing the download jig (K-PWA-DLM-320) to the finisher control PC board.

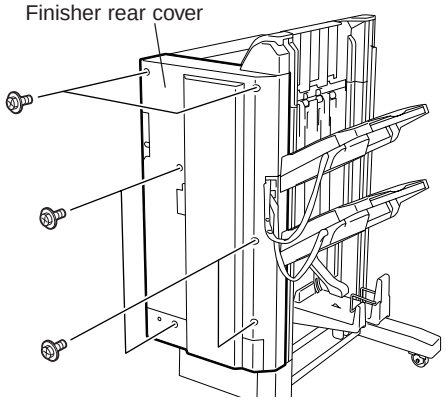
(1) Install the ROM to the download jig.
Make sure the applicable model, the direction and the type of ROM are correct.



[Jig board:K-PWA-DLM-320]

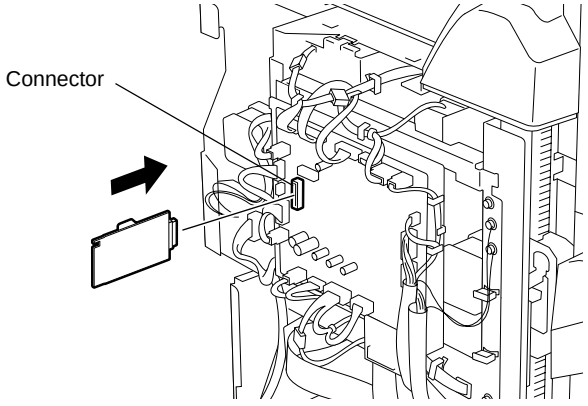
(2) Turn OFF the power of the equipment.

(3) Remove the finisher rear cover.



* Connect the finisher interface cable with the equipment after removing the finisher rear cover.

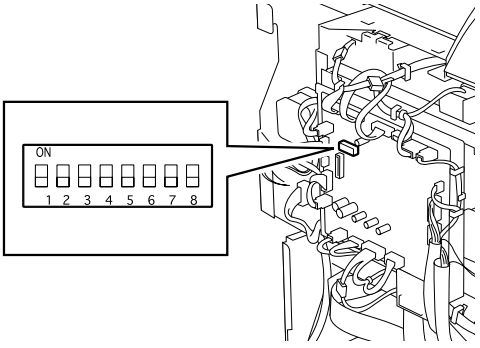
(4) Connect the download jig with the jig connector on the finisher control PC board.



(5) Change the setting of the DIP switch on the finisher contorol PC board.
Change the setting of the DIP switch as follows according to the firmware to be updated.

Note:

Record the current settings of the DIP switch before changing them. After the updating is completed, return the DIP switch to the status as record.



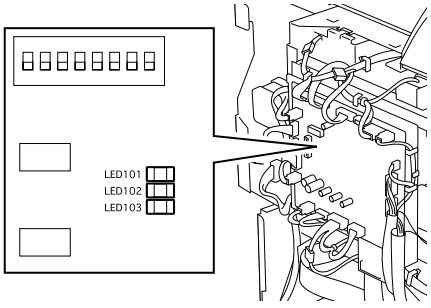
<Updating Finisher Firmware>
Change all the setting of the DIP switch (1 to 8) to OFF.

<Updating Saddle Stitcher Firmware>
Change the setting of the DIP switch (1 to 6) to OFF and (7 to 8) to ON.

(6) Turn ON the power while [0] and [8] button are pressed simultaneously.
Updating starts automatically and the LED on the download jig lights.

Tip:

The processing status can be confirmed by the lighting of the LED (LED 101 to 103) on the finisher control board.



Processing status	LED		
	LED103	LED102	LED101
0% or above	OFF	OFF	ON
15% or above	OFF	ON	OFF
30% or above	OFF	ON	ON
45% or above	ON	OFF	OFF
60% or above	ON	OFF	ON
75% or above	ON	ON	OFF
90% or above	ON	ON	ON

(7) After the update is completed properly, the LED on the download jig blinks slowly (at interval of 0.8 sec). The LED starts blinking in approx. 30 sec. (finisher section) or 2 min. 30 sec. (saddle stitcher section) since the update starts. It is assumed that the update is failed if it does not start blinking even though 1 min. has passed (finisher section) or 3 min. (saddle stitcher section), or LED blinks fast (at interval of 0.1 sec.). In this case, turn OFF the power and check the following items. Then, clear the problem and restart updating from the beginning.

- Is the download jig connected properly?
- Is the ROM installed to the download jig properly?
- Is the updating data written on the ROM of the download jig properly?
- Do the download jig and the copier operate properly?
- Is the DIP switch on the finisher control PC board set properly according to the download section (finisher or saddle stitcher)?

(8) Turn OFF the power, remove the download jig and return the DIP switch to the status before updating.

(9) Install the finisher rear cover.

CHAPTER 8

TROUBLESHOOTING

1 Adjustments

Note

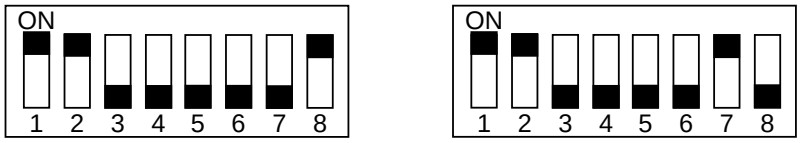
Before performing each adjustment, make sure that all covers (incl. those of the finisher and host machine) are closed. Otherwise, the power is not supplied to the finisher and the adjustment may not be performed properly.

1.1 Electrical System (finisher unit)

1.1.1 Adjusting the Alignment Position

Perform this adjustment after replacing the finisher controller PCB or when the alignment position must be changed for some reason.

1) Remove the rear cover of the finisher unit.
2) Check that the power of the host machine is off and set SW104 on the finisher controller PCB as follows according to the paper used for adjustment.



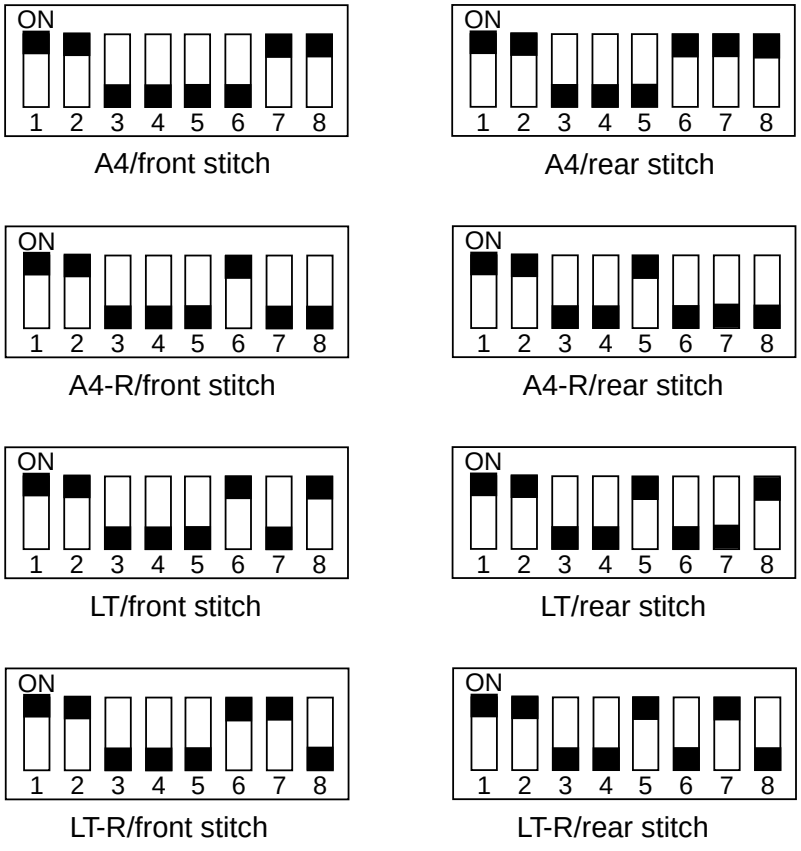
F08-101-01

3) Turn on the power of the host machine while [0] button and [8] button are pressed simultaneously.
4) Press SW103 on the finisher controller PCB.
   - When SW103 is pressed, the swing guide opens and the alignment plate moves to prescribed position.
5) Place ten sheets of A4/LT paper between the alignment plates and push them against the stopper.
6) Press SW101 or SW102 on the finisher controller PCB and push the alignment plate against the paper.
   - When SW101 is pressed, alignment plate moves 0.42 mm forward.
   - When SW102 is pressed, alignment plate moves 0.42 mm backward.
7) When adjustment is complete, remove paper and press SW103 on the finisher controller PCB once to store the adjustment in memory.
8) Turn off all bits of finisher controller PCB SW104.
9) Turn off the power of the host machine and install the rear cover of the finisher unit.

1.1.2 Adjusting the Staple Position

Perform this adjustment after replacing the finisher controller PCB or when the staple position must be changed for some reason. This adjustment adjusts the front/rear stitches with A4/A4-R when the paper used for adjustment is AB type and with LT/LT-R when the paper is INCH type.

1) Remove the rear cover of the finisher unit.
2) Check that the host machine power is off and set SW104 on the finisher controller PCB as follows according to paper/stitch position used for adjustment.



F08-101-02

3) Turn on the power of the host machine while [0] button and [8] button are pressed simultaneously.
4) Press SW103 on the finisher controller PCB.
   - When SW103 is pressed, the swing guide opens and the alignment plate moves to prescribed position.
5) Place a sheet of paper between the alignment plates. Push it against the stopper and push the rear edge of the paper against the rear alignment plate. If the gap between the front alignment plate and front edge of the paper is 1 mm or greater, stop the staple position adjustment and repeat the staple position adjustment after completing alignment plate adjustment.

6) Press SW103 on the finisher controller PCB once to staple. However, remove the stapled paper manually because the paper is not ejected. Press SW103 on the finisher controller PCB once again.
7) Verify the staple position. If any adjustment is needed, proceed to the step 8). If no adjustment is needed, proceed to the step 9).
8) Press SW101 or SW102 on the finisher controller PCB to adjust the staple position.
   - When SW101 is pressed, the staple position shifts 0.49 mm to the front side.
   - When SW102 is pressed, the staple position shifts 0.49 mm to the rear side.

   Repeat the steps 5) to 7).
9) After confirming that the staple position is adjusted correctly, place a sheet of paper between the alignment plates and push it against the stopper and push the rear edge of the paper against the rear alignment plate. Then press SW103 once. (Stapling is performed and the adjustment value is stored in memory.)
   - The staple position adjustment is completed.
10) Turn off all bits of SW104 on the finisher controller PCB.
11) Turn off the power of the host machine and install the rear cover of the finisher unit.

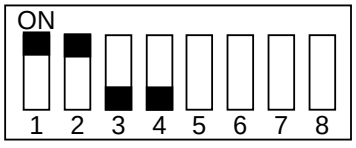
1.2 Electrical System (Saddle stitcher unit)

1.2.1 Adjusting the Folding Position

The folding position is adjusted by changing setting of bits 6 through 8 of SW504 on the saddle stitcher controller PCB to match the stitching position (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 SW504 so that the settings will be the same as those on the old SW504. Perform this adjustment if, for any reason, you must change the folding position.

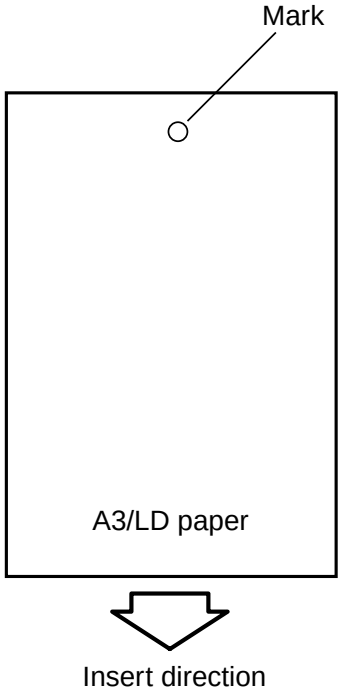
1) Check that the power of the host machine is off and separate the finisher from the host machine. If the optional puncher unit is installed, remove it from the finisher.
2) Remove the PCB cover and set bits 1 through 4 of SW504 on the saddle stitcher controller PCB as follows:



Do not change bits 5 through 8.

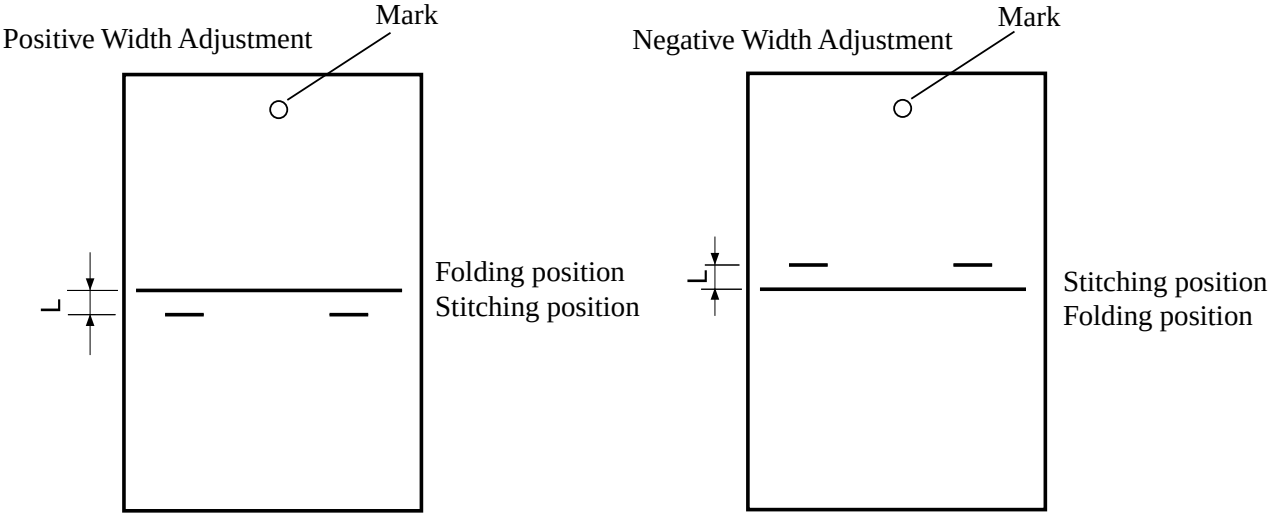
F08-102-01

3) Remove the rear cover, open the inlet cover of the saddle stitcher unit and tape the actuator of inlet cover sensor (PI9) and inlet door switch (SW1).
4) Before inserting the paper, mark the top of the paper. You will be using two sheets of A3 or LD paper.



F08-102-02

5) Turn on the power of the host machine while [0] button and [8] button are pressed simultaneously.
6) Press SW1 on the saddle stitcher controller PCB so that the feed motor (M1) starts to rotate. (Press SW1 three seconds or more if LD paper is used.)
7) Open the inlet cover and insert two sheets of paper. Push them in by hand until the front edge of the sheets push against the paper positioning plate.
8) Close the inlet cover.
9) Press SW1 on the saddle stitcher controller PCB.
   - The saddle stitcher unit will “stitch” the sheets, and fold and deliver the stack automatically.
10) 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.”



F08-102-03

11) Change the settings of bits 6 through 8 on SW504 referring to the following table.
- If the width adjustment is 0
  The stitching position and the folding position match, requiring no change.
- If for “positive width adjustment”
  Set SW504 so that the difference resulting from subtraction of the interval from the appropriate setting in T08-102-01 is provided.
  Example: If SW504 is currently set to +2 and the interval is +1 mm, set SW504 to reflect -2.
- If for “negative width adjustment”
  Set SW504 so that the sum resulting from addition of the interval from the appropriate setting in T08-102-01 is provided.
  Example: If SW504 is currently set to -1 and the interval is -0.5mm, set SW504 to reflect +1.

DIPSW1 bit settings			Setting
Bit 6	Bit 7	Bit 8	(in units of 0.5 mm)
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 use the following setting		
Bit 6	Bit 7	Bit 8
ON	OFF	OFF

T08-102-01

12) Set SW504 bits 1 to 4 to OFF.

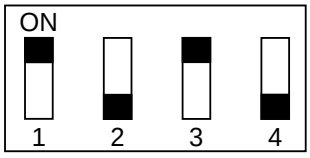
1.2.2 Adjusting the Stitching Position (adjusting center stitching)
Use the host machine adjustment mode to perform this adjustment.

1.3 Electrical System (Puncher unit(option))

1.3.1 Sensor Output Adjustment

Perform this adjustment when replacing the punch controller PCB, transmittance sensor (photosensor PCB/LED PCB), or deflection sensor (scrap full detector PCB unit).

1) Check that the power of the host machine is off and then remove the rear cover of the puncher.
2) Set SW601 on the punch controller PCB as shown below.



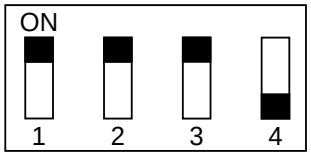
F08-103-01

3) Turn on the power of the host machine while [0] button and [8] button are pressed simultaneously.
4) Press SW602 on the punch controller PCB. Sensor output is adjusted automatically when the switch is pressed.
   - Adjustment is complete if LED601 and LED602 on the punch controller PCB blinks alternately.
5) Press SW602 or SW603 on the punch controller PCB to end the adjustment mode and set all bits of SW601 to OFF.
6) Turn off the power of the host machine.

1.3.2 Registering the Number of Punch Holes

This operation registers which puncher unit is attached to the IC on the punch driver PCB so that the puncher unit can be identified by the finisher. For this reason, this operation must be performed when the punch driver PCB has been replaced.

1) Check that the power of the host machine is off and then remove the rear cover of the puncher.
2) Set SW601 on the punch controller PCB as shown below.



F08-103-02

3) Turn on the power of the host machine while [0] button and [8] button are pressed simultaneously.
4) Press SW602 on the punch controller PCB to select the number of punch holes.
   - The items in the following table are displayed repeatedly from top to bottom each time SW602 is pressed.

Number of punch holes	LED601/LED602
2 hole (E)	Blinks 1 times per cycle
2/3 hole (N)	Blinks 2 times per cycle
4 hole (F)	Blinks 3 times per cycle
4 hole (S)	Blinks 4 times per cycle

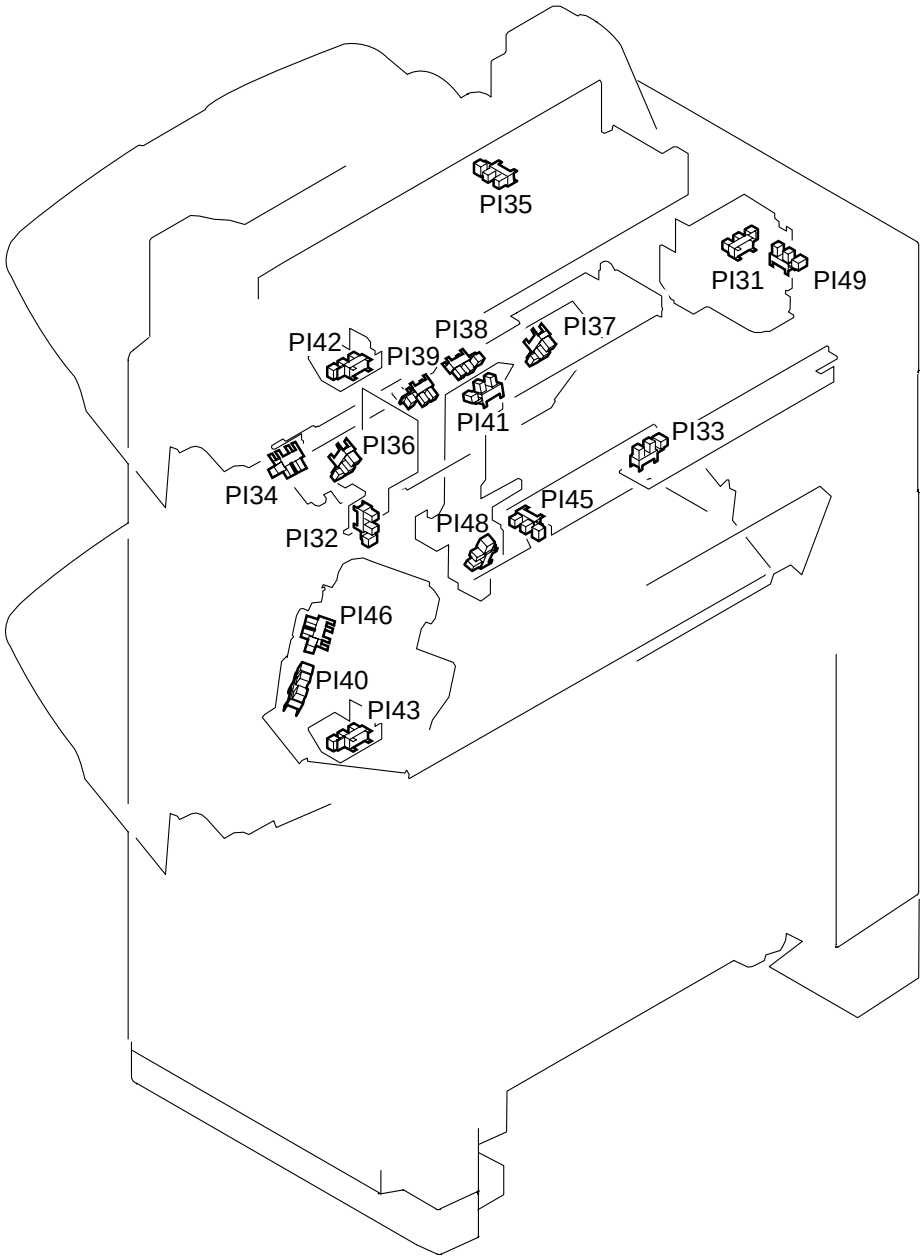
T08-103-01

5) Press SW603 on the punch controller PCB. The number of punch holes is registered to the punch controller PCB each time the switch is pressed.
   - Registration is complete if LED601 and LED602 on the punch controller PCB blinks alternately.
6) Press SW602 or SW603 on the punch controller PCB to end the adjustment mode and set all bits of SW601 to OFF.
7) Turn off the power of the host machine.

2 Arrangement of Electric Components

2.1 Finisher Unit

2.1.1 Sensors

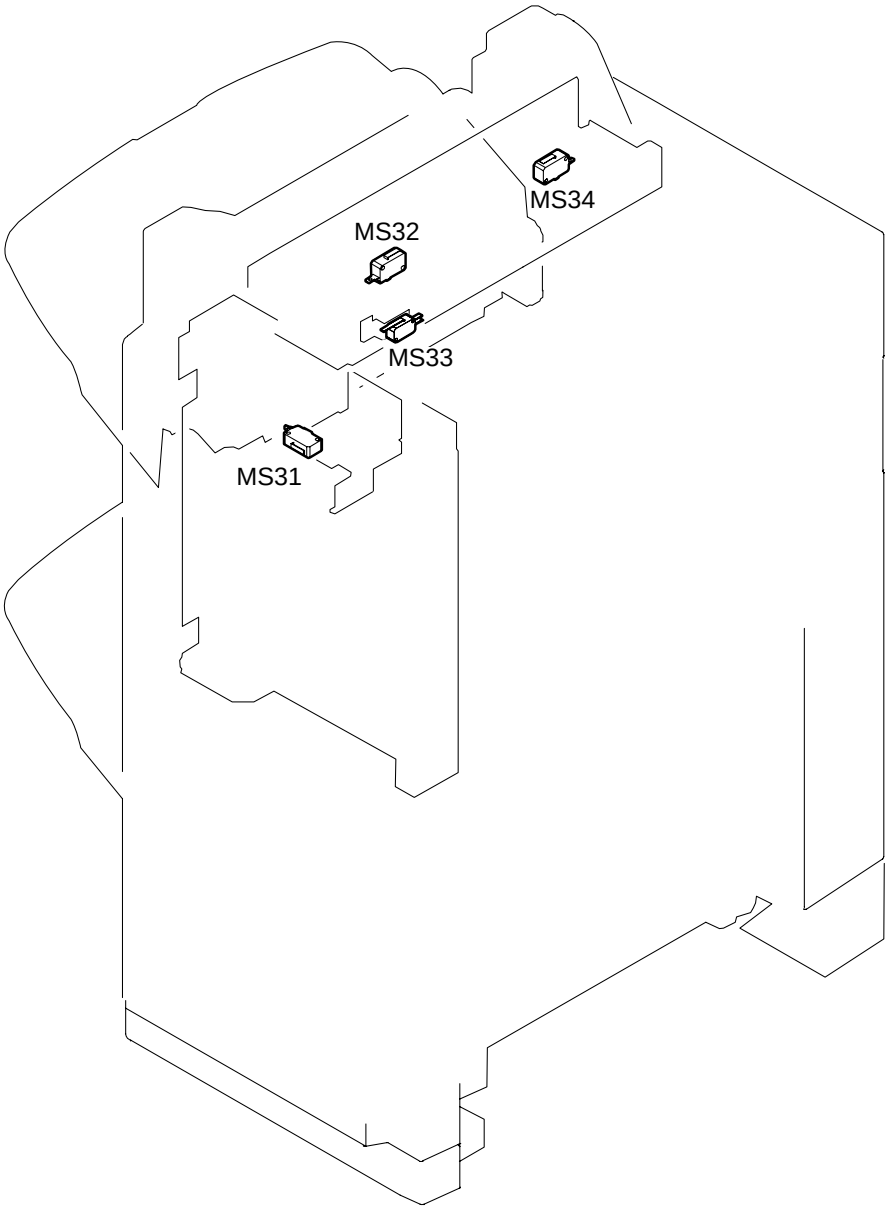


F08-201-01

Name	Notation	Function
Photo interrupter	PI31	Detects upper cover open/close
	PI32	Detects front cover open/close
	PI33	Detects paper in inlet
	PI34	Detects paper in vertical path
	PI35	Detects swing guide home position
	PI36	Detects front aligning plate home position
	PI37	Detects rear aligning plate home position
	PI38	Detects paper in processing tray
	PI39	Detects rear end assist home position
	PI40	Detects stapler home position
	PI41	Detects paper surface
	PI42	Detects paper on tray 1
	PI43	Detects paper on tray 2
	PI45	Detects shutter home position
	PI46	Detects stapler alignment interference
	PI48	Detects paper surface on tray 2
	PI49	Detects gear change home position

T08-201-01

2.1.2 Microswitches

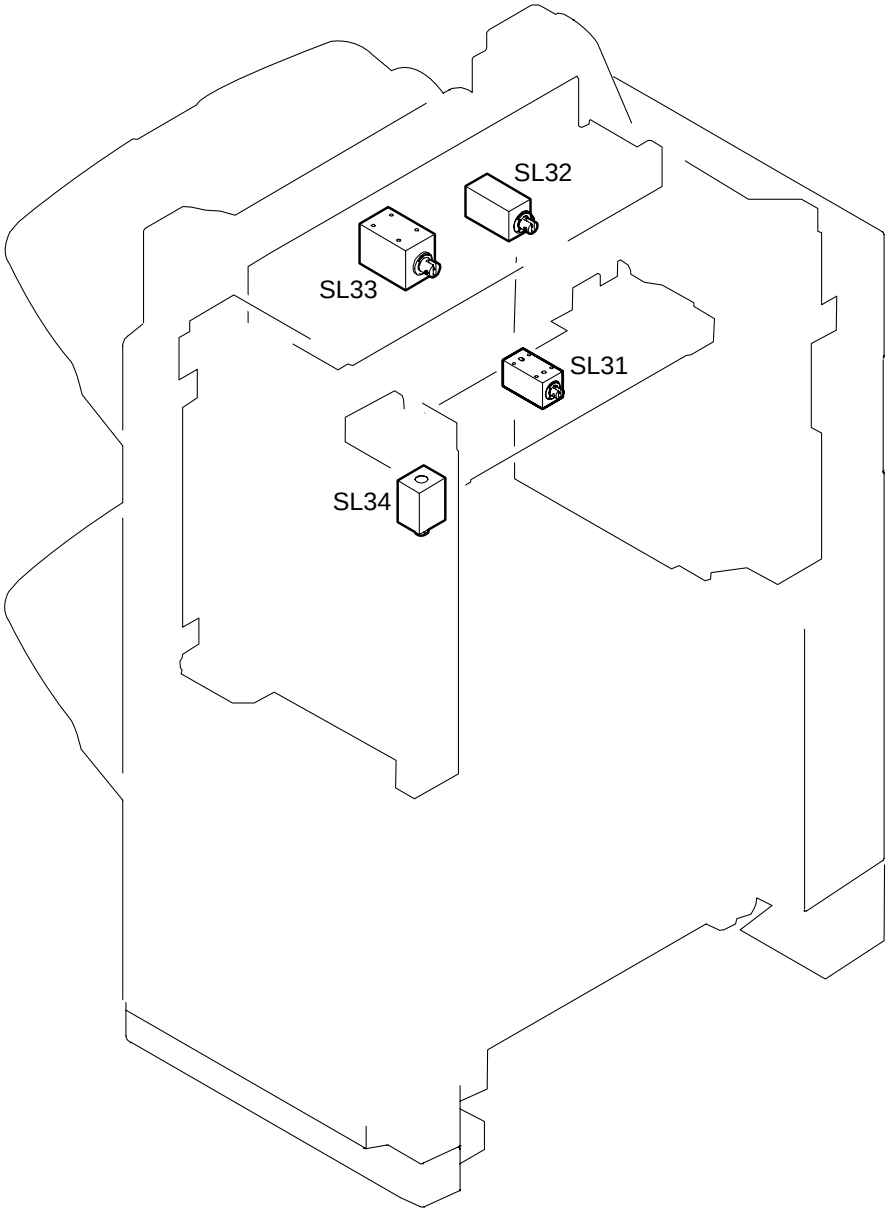


F08-201-02

Name	Notation	Function
Micro-switch	MS31	Detects front cover close
	MS32	Detects swing guide open
	MS33	Detects tray 1
	MS34	Detects swing guide open

T08-201-02

2.1.3 Solenoids

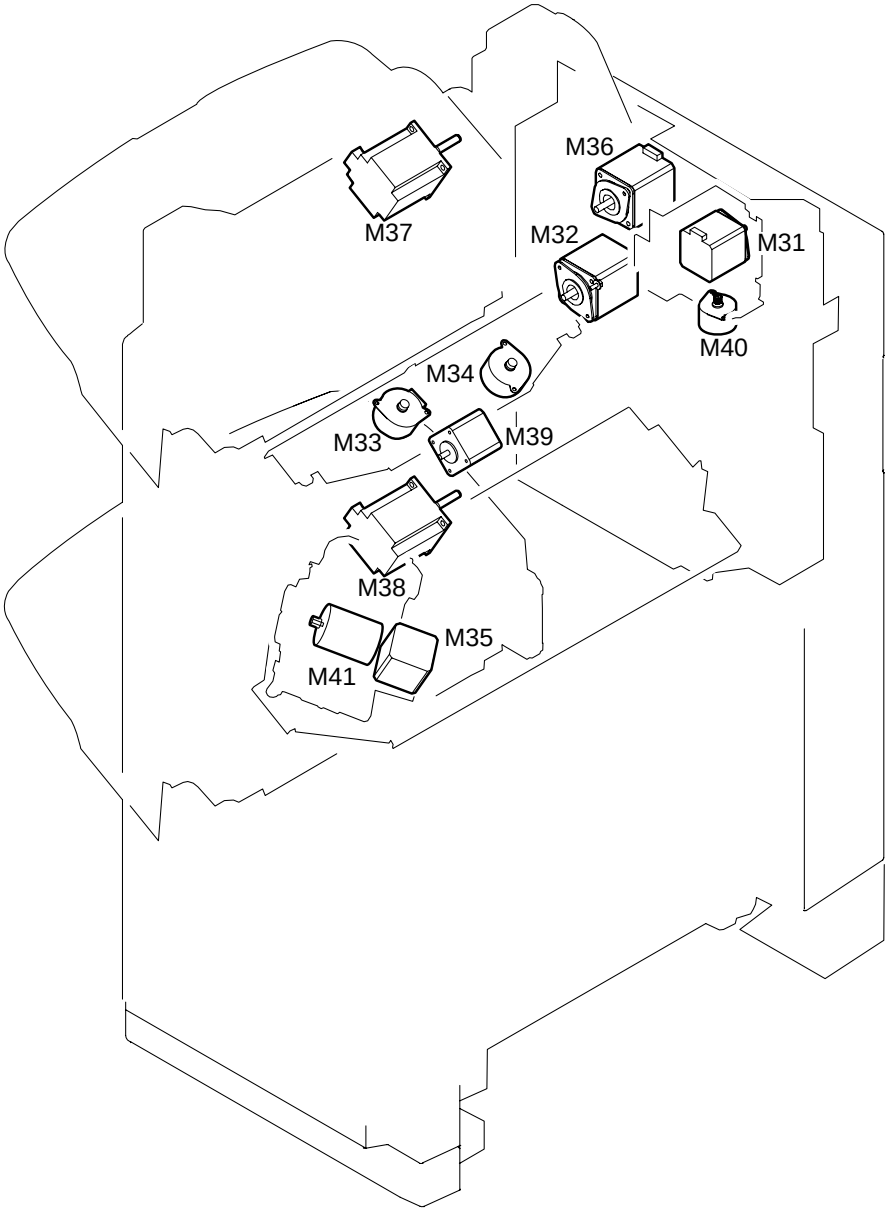


F08-201-03

Name	Notation	Function
Solenoid	SL31	Inlet roller separation solenoid
	SL32	Buffer roller separation solenoid
	SL33	1st delivery roller separation solenoid
	SL34	Buffer rear end holding solenoid

T08-201-03

2.1.4 Motors

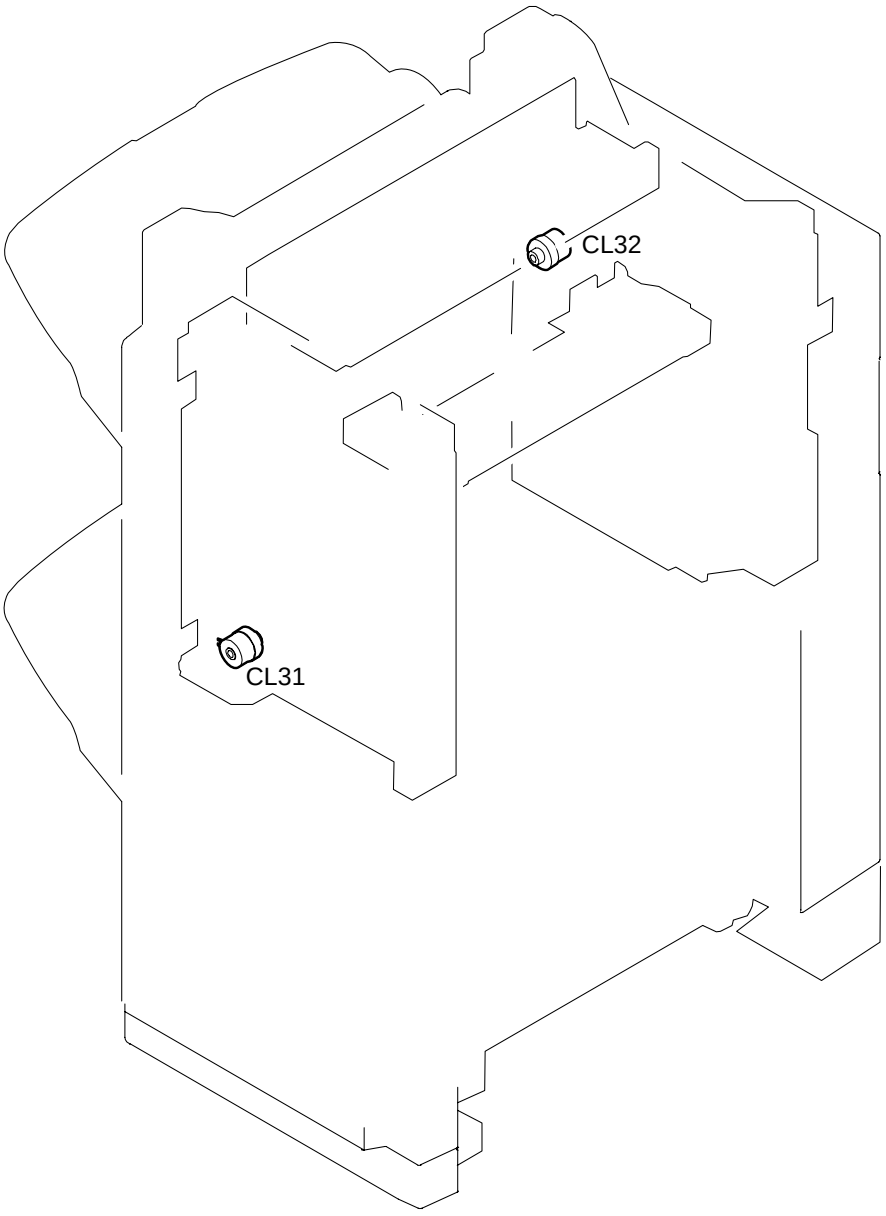


F08-201-04

Name	Notation	Function
Motor	M31	Inlet motor
	M32	Stack ejection motor
	M33	Front aligning plate motor
	M34	Rear aligning plate motor
	M35	Stapler shift motor
	M36	Swing motor
	M37	Tray 1 shift motor
	M38	Tray 2 shift motor
	M39	Rear end assist motor
	M40	Gear change motor
	M41	Staple motor

T08-201-04

2.1.5 Clutches

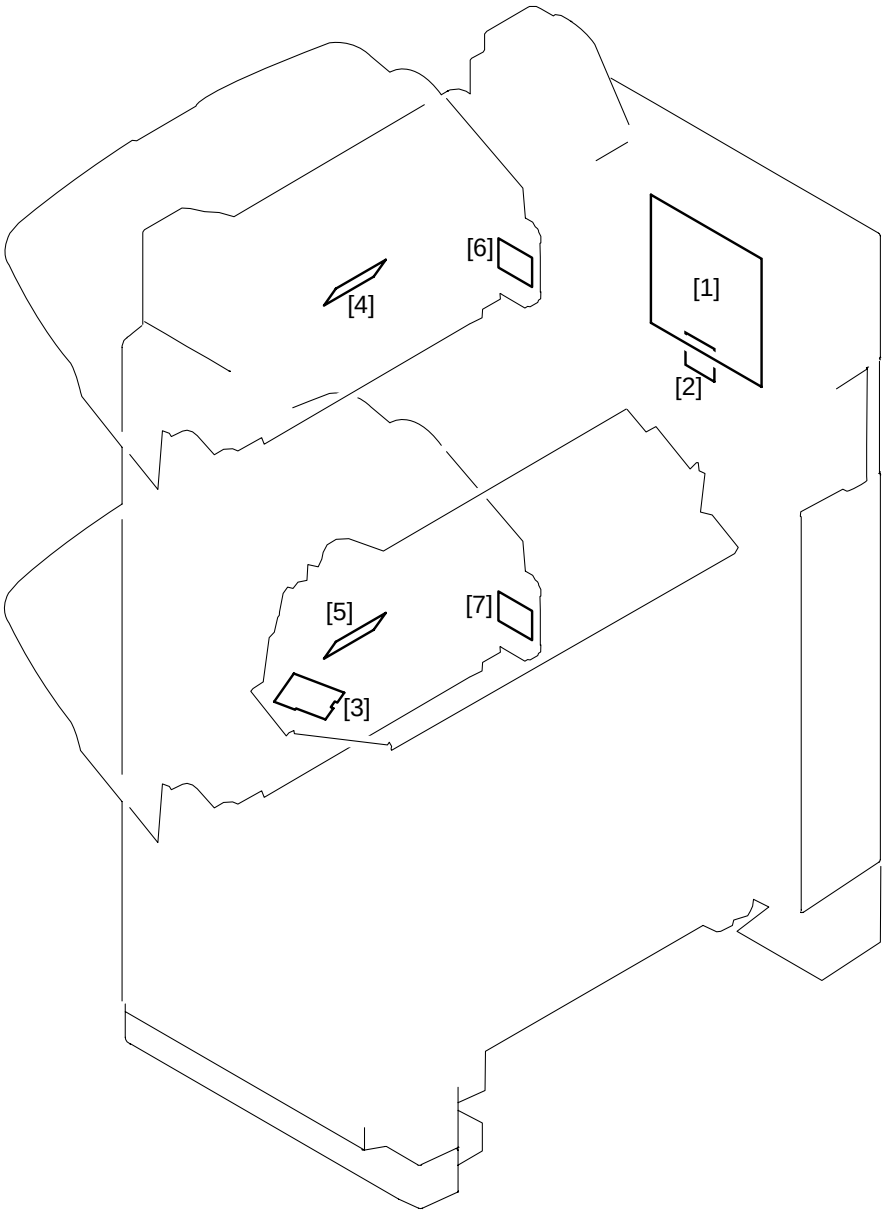


F08-201-05

Name	Notation	Function
Clutch	CL31	Shutter clutch
	CL32	Stack ejection lower roller clutch

T08-201-05

2.1.6 PCBs



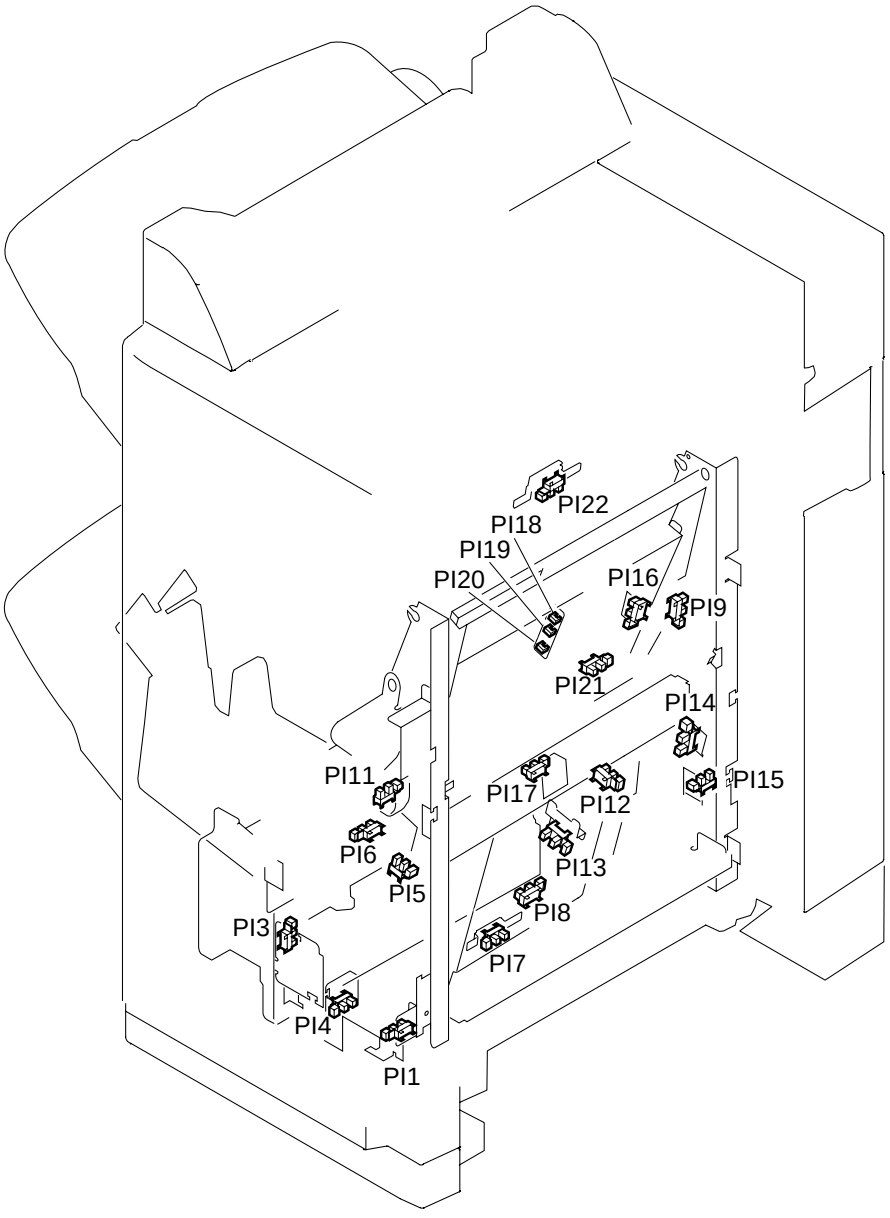
F08-201-06

Reference	Name
[1]	Finisher controller PCB
[2]	Stapler PCB1
[3]	Stapler PCB2
[4]	Tray1 driver PCB
[5]	Tray2 driver PCB
[6]	Tray1 shift area sensor PCB
[7]	Tray2 shift area sensor PCB

T08-201-06

2.2 Saddle Stitcher Unit

2.2.1 Sensors

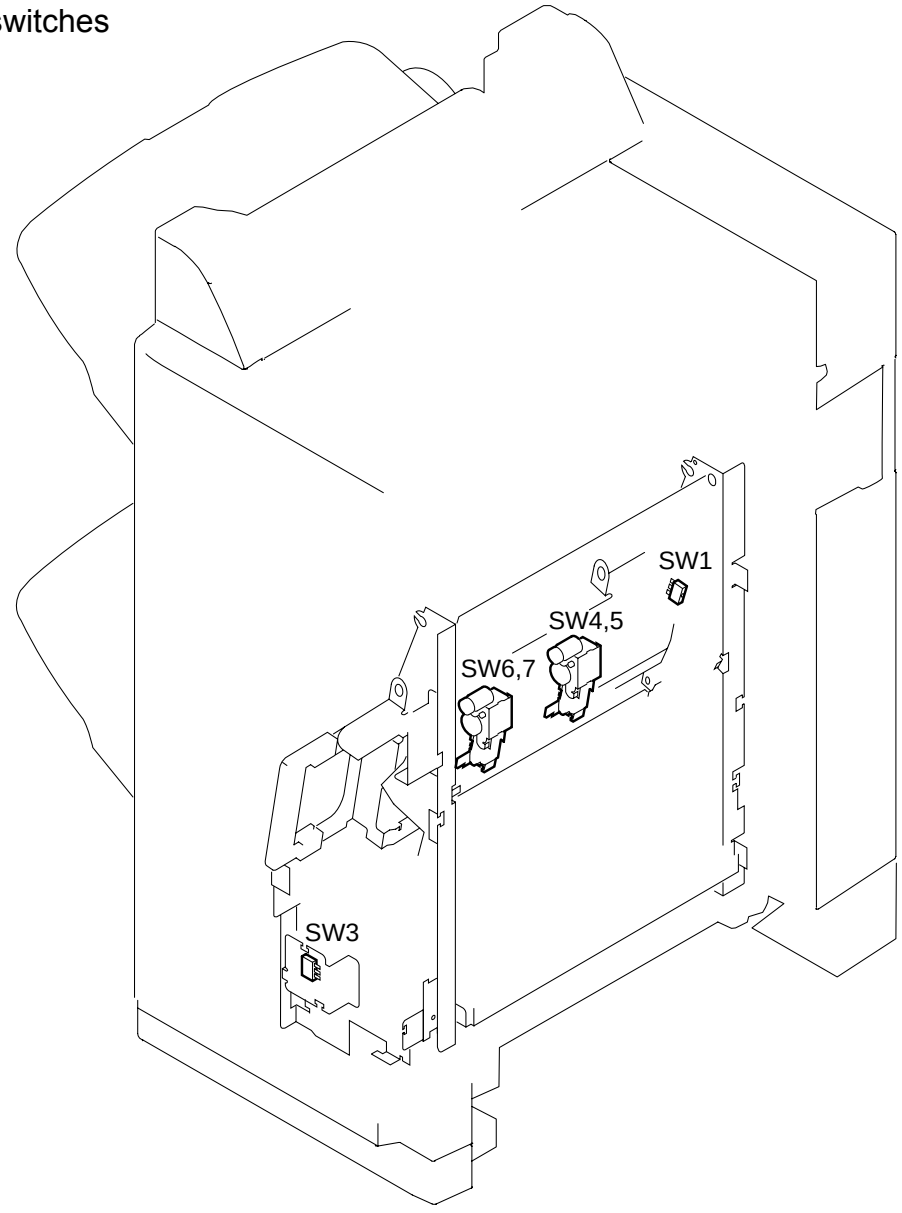


F08-202-01

Name	Notation	Function
Photo interrupter	PI1	Detects paper pushing plate motor clock
	PI3	Detects delivery cover open
	PI4	Detects paper folding motor clock
	PI5	Detects alignment plate home position
	PI6	Detects paper on tray
	PI7	Detects paper positioning plate home position
	PI8	Detects paper on paper positioning plate
	PI9	Detects inlet cover open
	PI11	Detects paper delivery
	PI12	Detects crescent roller phase
	PI13	Detects guide home position
	PI14	Detects paper pushing plate home position
	PI15	Detects paper pushing plate top position
	PI16	Detects stitcher unit storage
	PI17	Detects paper in vertical path
	PI18	Detects paper (No. 1; on paper sensor PCB)
	PI19	Detects paper (No. 2; on paper sensor PCB)
	PI20	Detects paper (No. 3; on paper sensor PCB)
	PI21	Detects paper folding home position
	PI22	Detects saddle inlet paper

T08-202-01

2.2.2 Microswitches

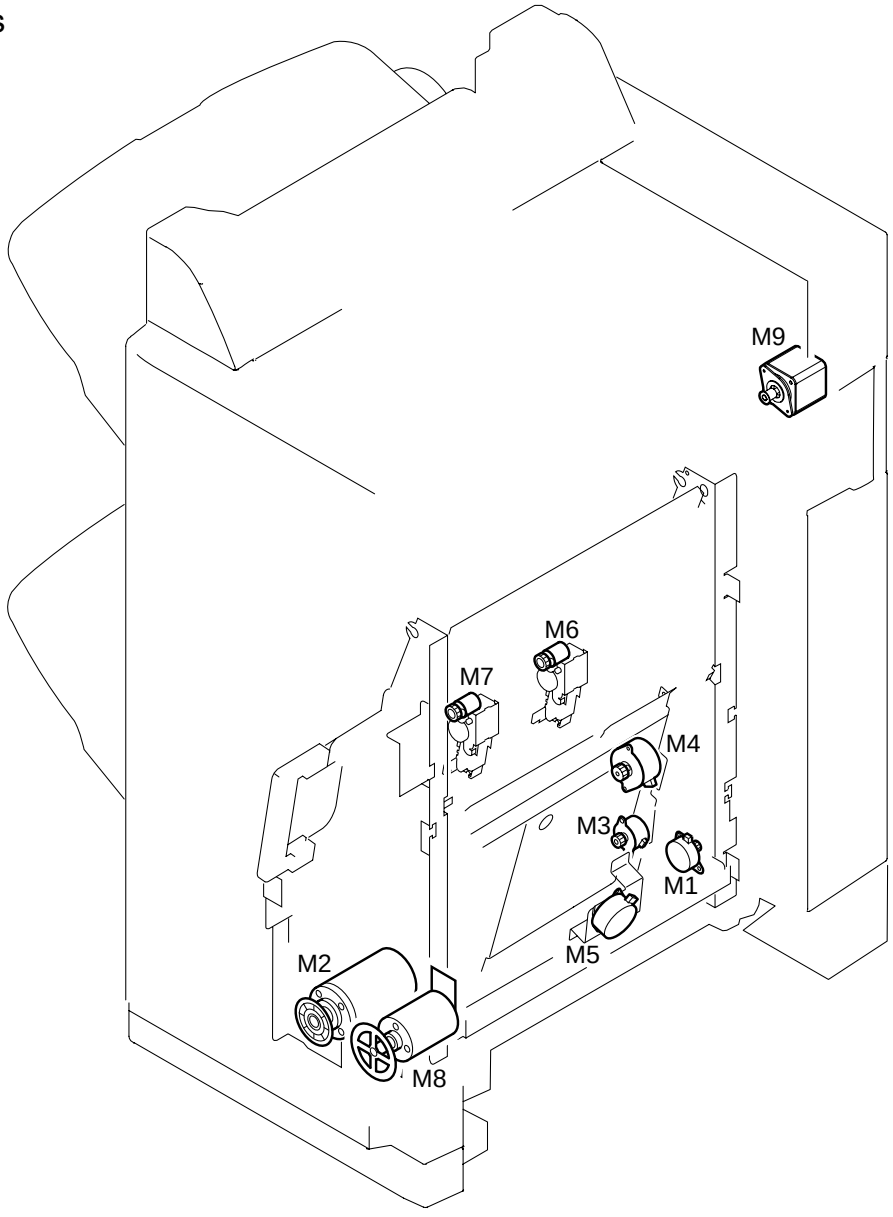


F08-202-02

Name	Notation	Function
Micro-switch	SW1	Detects inlet door open
	SW3	Detects delivery door open
	SW4	Detects presence of staples (rear)
	SW5	Detects stitcher home position (rear)
	SW6	Detects presence of staples (front)
	SW7	Detects stitcher home position (front)

T08-202-02

2.2.3 Motors

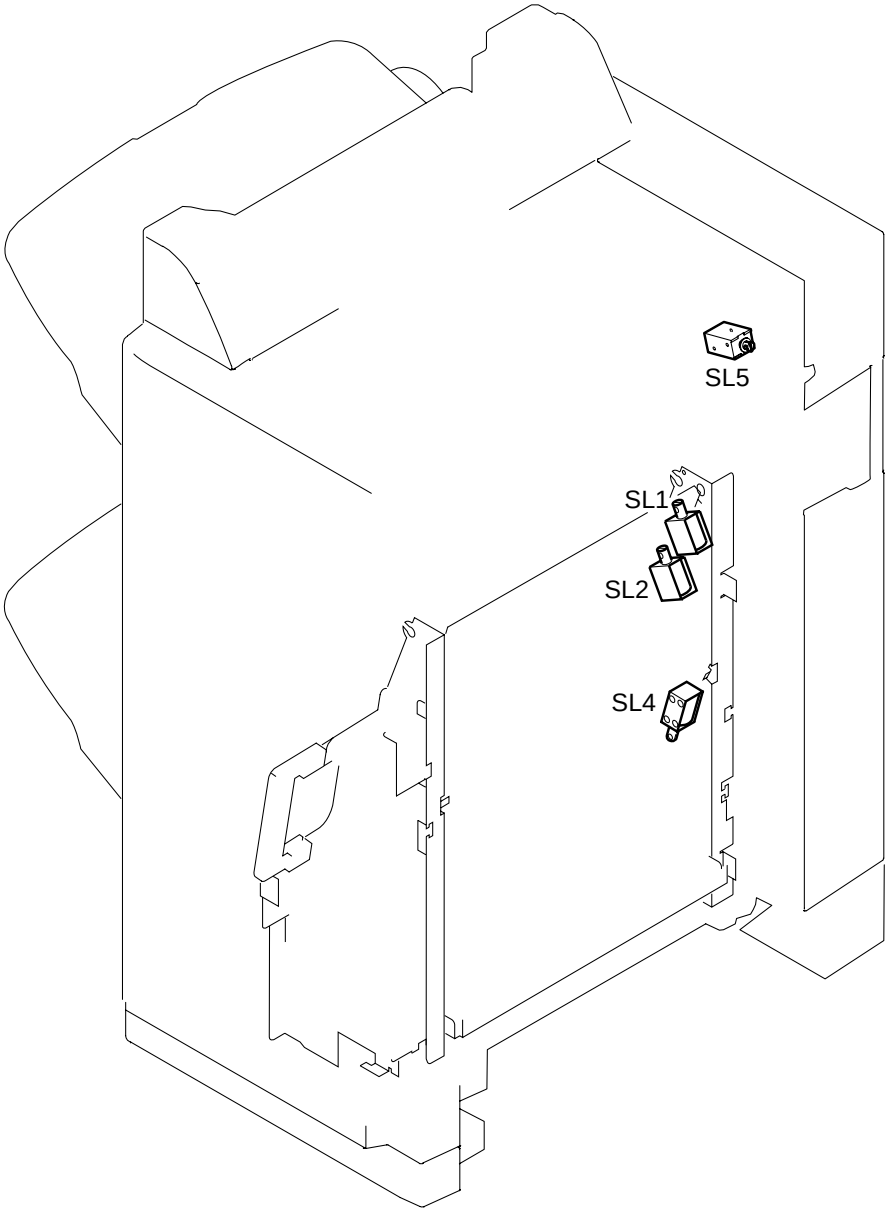


F08-202-03

Name	Notation	Function
Motor	M1	Feed motor
	M2	Paper folding motor
	M3	Guide motor
	M4	Paper positioning plate motor
	M5	Alignment motor
	M6	Stitcher motor (rear)
	M7	Stitcher motor (front)
	M8	Paper pushing plate motor
	M9	Saddle inlet motor

T08-202-03

2.2.4 Solenoids

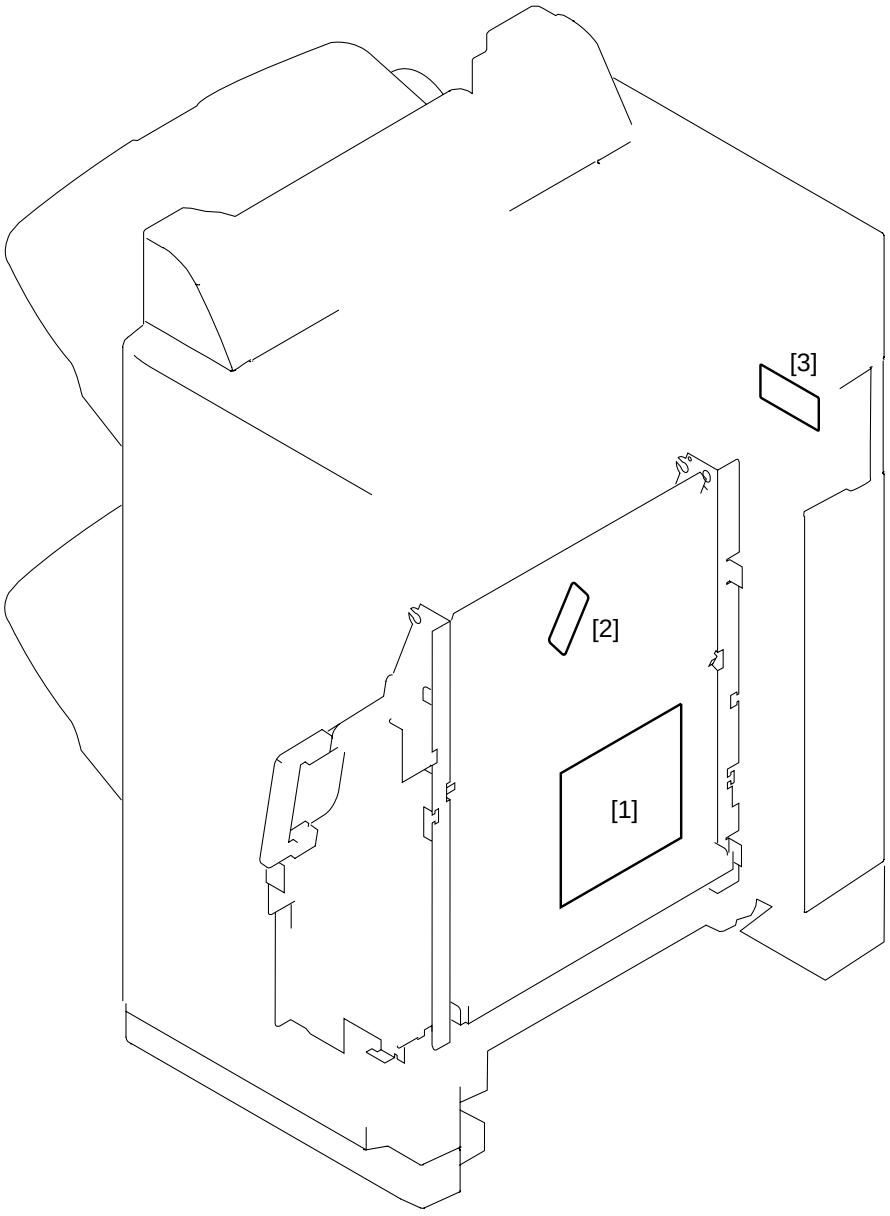


F08-202-04

Name	Notation	Function
Solenoid	SL1	No.1 flapper solenoid
	SL2	No.2 flapper solenoid
	SL4	Feed plate contact solenoid
	SL5	Saddle inlet solenoid

T08-202-04

2.2.5 PCBs



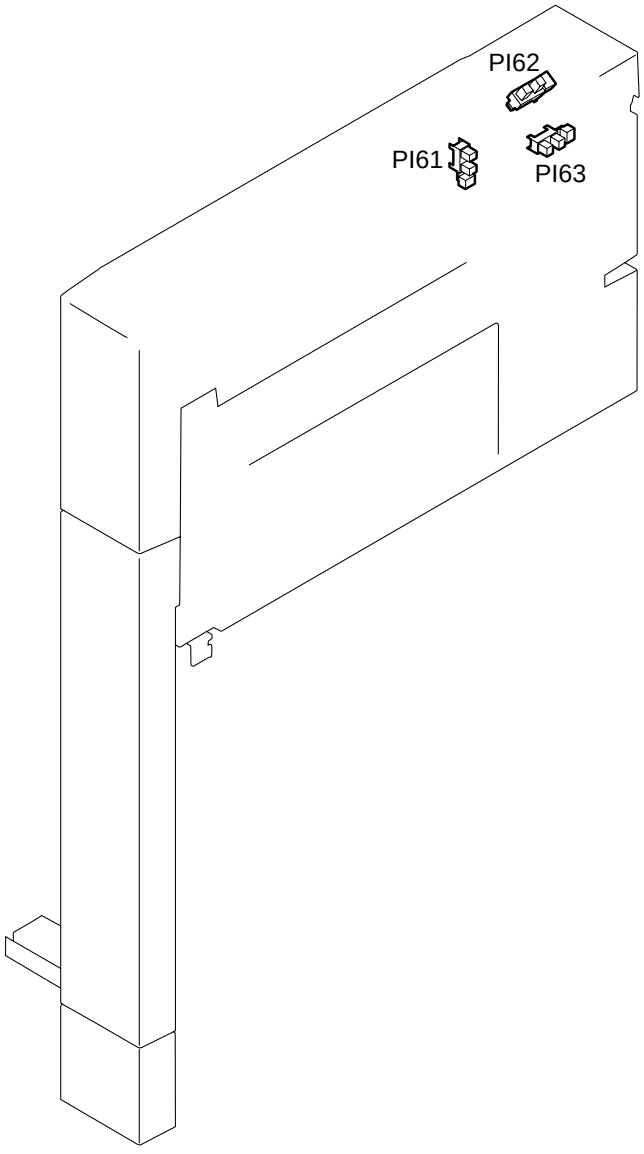
F08-202-05

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

T08-202-05

2.3 Punch Unit (option)

2.3.1 Sensors

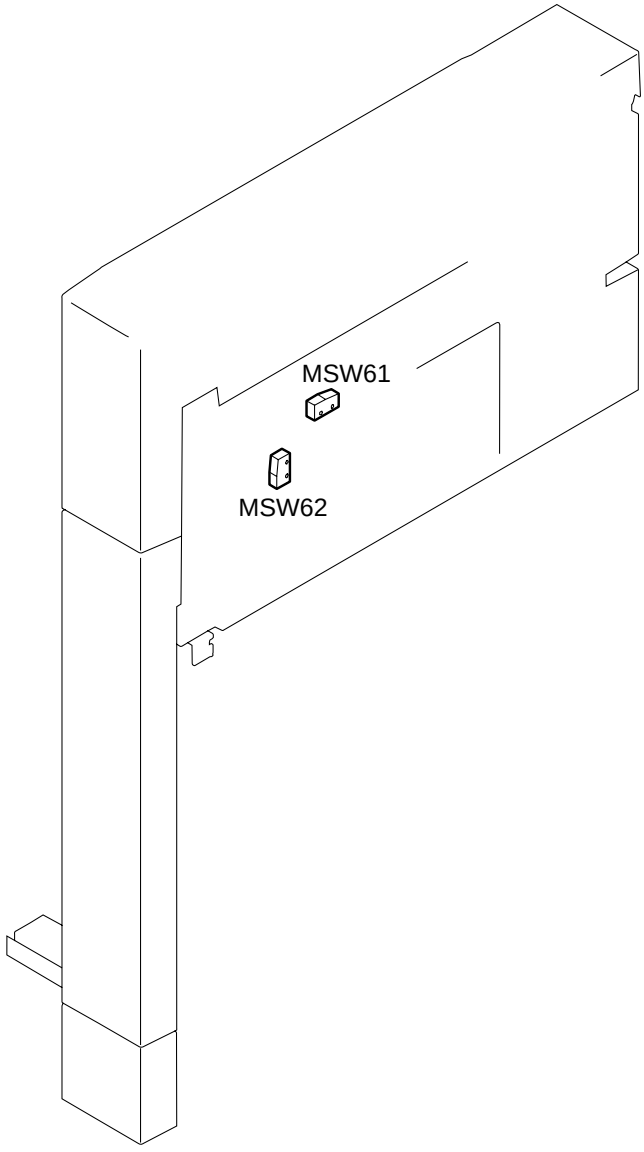


F08-203-01

Name	Notation	Function
Photo interrupter	PI61	Detects horizontal registration home position
	PI62	Detects punch motor clock
	PI63	Detects punch home position

T08-203-01

2.3.2 Microswitches

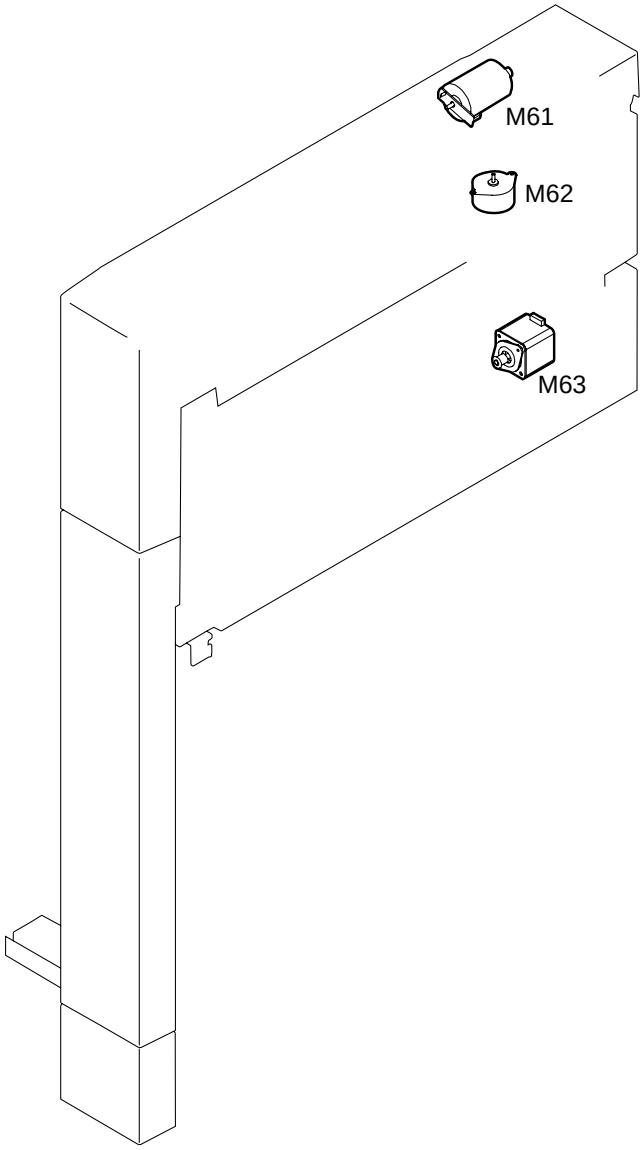


F08-203-02

Name	Notation	Function
Micro-switch	MSW61	Detects upper door open
	MSW62	Detects front door open

T08-203-02

2.3.3 Motors

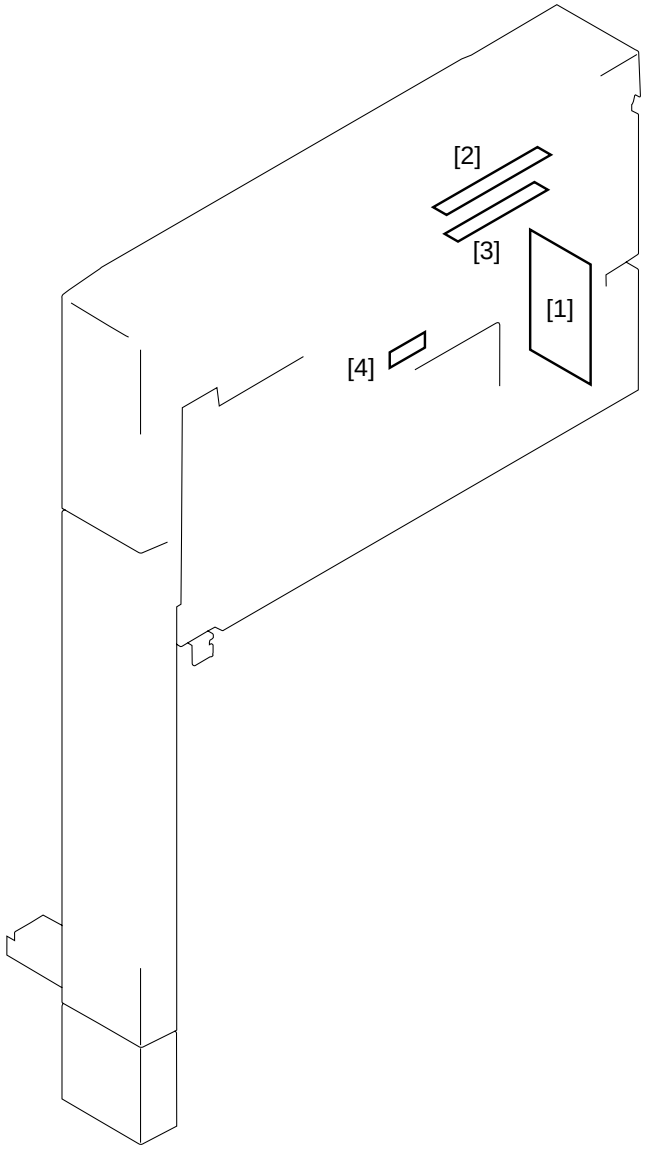


F08-203-03

Name	Notation	Function
Motor	M61	Punch motor
	M62	Horizontal registration motor
	M63	Punch feed motor

T08-203-03

2.3.4 PCBs



F08-203-04

Reference	Name
[1]	Punch controller PCB
[2]	Photosensor PCB
[3]	LED PCB
[4]	Scrap full detector PCB

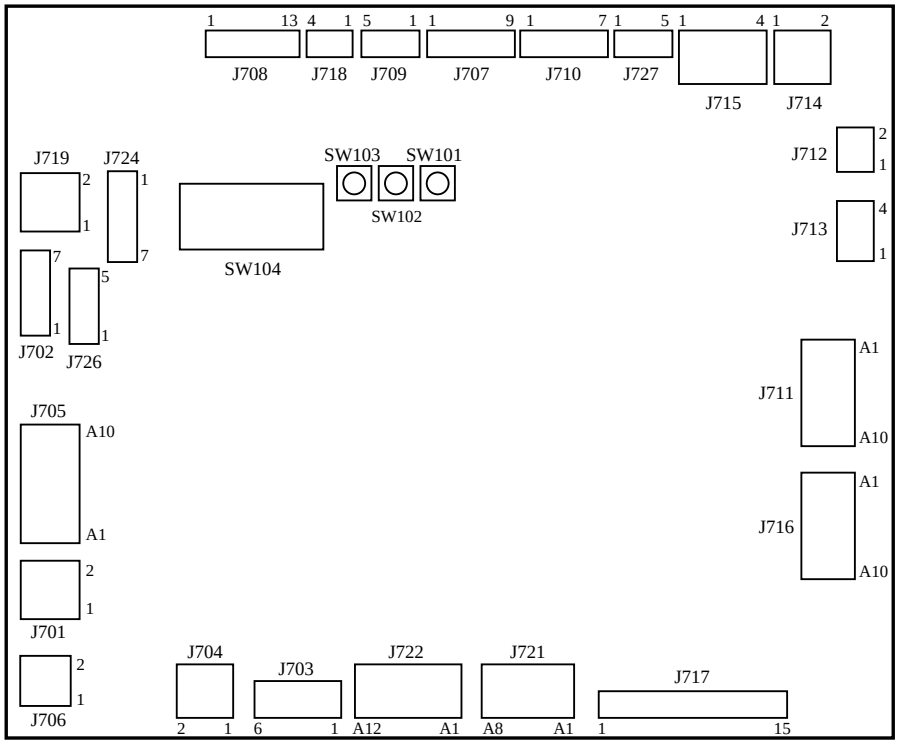
T08-203-04

3 LEDs and Check Pins by PCB

Of the LEDs and check pins used in the machine, those needed during servicing in the field are discussed.

Do not touch the check pins not found in the list herein. They are exclusively for factory use, and require special tools and a high degree of accuracy.

3.1 Finisher Controller PCB

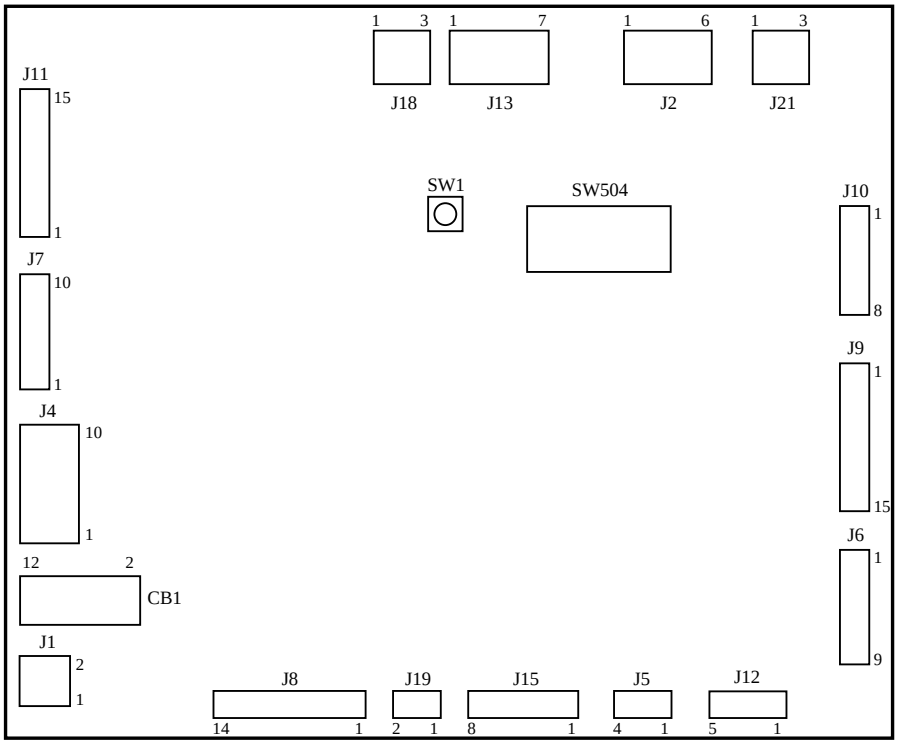


F08-301-01

Switch	Function
SW101	Adjust the alignment plate position/staple position, etc.
SW102	Adjust the alignment plate position/staple position, etc.
SW103	Adjust the alignment plate position/staple position, etc.
SW104	Adjust the alignment plate position/staple position, etc.

T08-301-01

3.2 Saddle Stitcher Controller PCB

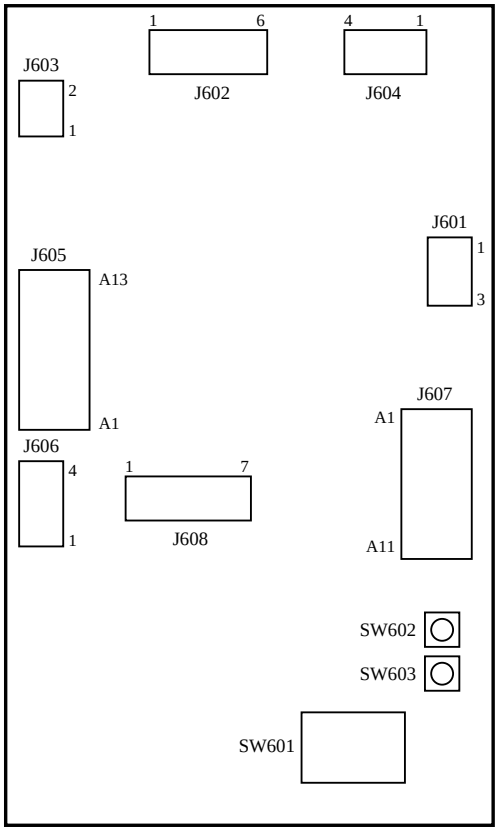


F08-302-01

Switch	Function
SW504 (bits 1-2)	Starts correction of discrepancy between stitching position and folding position.
SW504 (bits 6-8)	Stores corrected settings for stitching position and folding position.
SW1	Starts correction of discrepancy between stitching position and folding position.

T08-302-01

3.3 Punch Controller PCB



F08-303-01

Switch	Function
SW601	Punch hole count registration/sensor output adjustment etc.
SW602	Punch hole count registration/sensor output adjustment etc.
SW603	Punch hole count registration/sensor output adjustment etc.

T08-303-01

4 Troubleshooting

4.1 Troubleshooting (finisher unit)

4.1.1 Saddle stitcher controller PCB communication error

Finisher controller PCB/Saddle stitcher controller PCB	**1) Does it improve when the host machine power switch is turned OFF/ON?** YES : End NO : Next
Wiring	**2) Is the wiring between the finisher controller PCB and saddle stitcher controller PCB normal?** YES : Next NO : Repair the wiring.
Finisher controller PCB/Saddle stitcher controller PCB	**3) Does it improve when the finisher controller PCB and saddle stitcher controller PCB are replaced?** YES : End

T08-401-01

4.1.2 Puncher unit (option) communication error

Finisher controller PCB/Punch controller PCB	**1) Does it improve when the host machine power switch is turned OFF/ON?** YES : End NO : Next
Wiring	**2) Is the wiring between the finisher controller PCB and punch controller PCB normal?** YES : Next NO : Repair the wiring.
Finisher controller PCB/Punch driver PCB	**3) Does it improve when the finisher controller PCB and punch controller PCB are replaced?** YES : End

T08-401-02

4.1.3 Backup RAM error

Finisher controller PCB/Punch controller PCB

1) Does it improve when the host machine power switch is turned OFF/ON?

YES : End

NO : Next

2) Does it improve when the finisher controller PCB and punch controller PCB are replaced?

YES : End

T08-401-03

4.1.4 Front aligning plate motor error

Front aligning plate home position sensor (PI36)

1) Check the front aligning plate home position sensor. Does the sensor operate normally?

YES : Next

NO : Replace the sensor.

Wiring

2) Is the wiring between the finisher controller PCB and front aligning plate motor normal?

YES : Next

NO : Repair the wiring.

Front aligning plate

3) Is there any mechanical trapping in the path of the aligning plate?

YES : Repair the mechanism.

NO : Next

Front aligning plate motor (M33)/Finisher controller PCB

4) Does it improve when the front aligning plate motor is replaced?

YES : End

NO : Replace the finisher controller PCB.

T08-401-04

4.1.5 Rear aligning plate motor error

Rear aligning plate home position sensor (PI37)

1) Check the rear aligning plate home position sensor. Does the sensor operate normally?

YES : Next

NO : Replace the sensor.

Wiring

2) Is the wiring between the finisher controller PCB and rear aligning plate motor normal?

YES : Next

NO : Repair the wiring.

Rear aligning plate

3) Is there mechanical trapping in the path of the aligning plate?

YES : Repair the mechanism.

NO : Next

Rear aligning plate motor (M34)/Finisher controller PCB

4) Does it improve when the rear aligning plate motor is replaced?

YES : End

NO : Replace the finisher controller PCB.

T08-401-05

4.1.6 Staple motor error

Wiring

1) Is the wiring between the finisher controller PCB and stapler normal?

YES : Next

NO : Repair the wiring.

Stapler/Finisher controller PCB

2) Does it improve when the stapler is replaced?

YES : End

NO : Replace the finisher controller PCB.

T08-401-06

4.1.7 Stapler shift motor error

Stapler drive home position sensor (PI40)

1) Check the stapler drive home position sensor. Does it operate normally?

YES : Next

NO : Replace the sensor.

Wiring

2) Is the wiring between the finisher controller PCB and stapler shift motor normal?

YES : Next

NO : Repair the wiring.

Stapler shift base

3) Is there mechanical trapping in the path of the stapler shift base?

YES : Repair the mechanism.

NO : Next

Stapler shift motor (M35)/Finisher controller PCB

4) Does it improve when the stapler shift motor is replaced?

YES : End

NO : Replace the finisher controller PCB.

T08-401-07

4.1.8 Swing motor error

Swing guide home position sensor (PI35)

1) Check the swing home position sensor. Does the sensor operate normally?

YES : Next

NO : Replace the sensor.

Wiring

2) Is the wiring between the finisher controller PCB and swing motor normal?

YES : Next

NO : Repair the wiring.

Swing mechanism

3) Is there any abnormality in the swing machanism?

YES : Repair the swing mechanism.

NO : Next

Swing motor (M36)/Finisher controller PCB

4) Does it improve when the swing motor is replaced?

YES : End

NO : Replace the finisher controller PCB.

T08-401-08

4.1.9 Tray 1 shift motor error

Tray 1 shift area sensor PCB

1) Check the tray 1 shift area sensors 1 to 3. Do the sensors operate normally?

YES : Next

NO : Replace the tray 1 shift area sensor PCB.

Wiring

2) Is the wiring between the finisher controller PCB and tray 1 shift motor normal?

YES : Next

NO : Repair the wiring.

Tray up/down mechanism

3) Is there any abnormality in the tray up/down mechanism?

YES : Repair the tray up/down mechanism.

NO : Next

Tray 1 shift motor (M37)/Finisher controller PCB

4) Does it improve when the tray 1 shift motor is replaced?

YES : End

NO : Replace the finisher controller PCB.

T08-401-09

4.1.10 Tray 2 shift motor error

Tray 2 shift area sensor PCB

1) Check the tray 2 shift area sensors 1 to 3. Do the sensors operate normally?

YES : Next

NO : Replace the tray 2 shift area sensor PCB

Wiring

2) Is the wiring between the finisher controller PCB and tray 2 shift motor normal?

YES : Next

NO : Repair the wiring.

Tray up/down mechanism

3) Is there any abnormality in the tray up/down mechanism?

YES : Repair the tray up/down mechanism.

NO : Next

Tray 2 shift motor (M38)/Finisher controller PCB

4) Does it improve when the tray 2 shift motor is replaced?

YES : End

NO : Replace the finisher controller PCB.

T08-401-10

4.1.11 Stack ejection motor error

Shutter home position sensor (PI45)

1) Check the shutter home position sensor. Does the sensor operate normally?

YES : Next

NO : Replace the sensor.

Wiring

2) Is the wiring between the finisher controller PCB and stack ejection motor, and between the finisher controller PCB and shutter clutch normal?

YES : Next

NO : Repair the wiring.

Shutter mechanism

3) Is there any abnormality in the shutter mechanism?

YES : Repair the shutter mechanism.

NO : Next

Stack ejection motor (M32)/Shutter clutch (CL31)/Finisher controller PCB

4) Does it improve when the stack ejection motor and shutter clutch are replaced?

YES : End

NO : Replace the finisher controller PCB.

T08-401-11

4.1.12 Rear end assist motor error

Rear end assist guide home position sensor (PI39)

1) Check the rear end assist guide home position sensor. Does the sensor operate normally?

YES : Next

NO : Replace the sensor.

Wiring

2) Is the wiring between the finisher controller PCB and rear end assist motor normal?

YES : Next

NO : Repair the wiring.

Rear end assist mechanism

3) Is there any abnormality in the rear end assist mechanism?

YES : Repair the rear end assist mechanism.

NO : Next

Rear end assist motor (M39)/Finisher controller PCB

4) Does it improve when the rear end assist motor is replaced?

YES : End

NO : Replace the finisher controller PCB.

T08-401-12

4.1.13 Gear change motor error

Gear change home position sensor (PI49)	**1) Check the gear change home position sensor. Does the sensor operate normally?** YES : Next NO : Replace the sensor.
Wiring	**2) Is the wiring between the finisher controller PCB and Gear change motor normal?** YES : Next NO : Repair the wiring.
Gear change mechanism	**3) Is there any abnormality in the gear change mechanism?** YES : Repair the gear change mechanism. NO : Next
Gear change motor (M40)/Finisher controller PCB	**4) Does it improve when the gear change motor is replaced?** YES : End NO : Replace the finisher controller PCB.

T08-401-13

4.2 Troubleshooting Procedure (Saddle Stitcher Unit)

4.2.1 Paper positioning plate motor error

Paper positioning plate home position sensor (PI7)

1) Check the paper positioning plate home position sensor. Is the sensor normal?

YES : Next

NO : Replace sensor.

Positioning plate drive mechanism

2) Is there a problem with the positioning plate drive mechanism?

YES : Repair the positioning plate drive mechanism.

NO : Next

Paper positioning plate motor (M4)/Saddle stitcher controller PCB

3) Is the problem solved by replacing the paper positioning plate motor?

YES : END

NO : Replace saddle stitcher controller PCB.

T08-402-01

4.2.2 Paper folding motor error

Paper folding motor clock sensor (PI4)/Paper folding home position sensor (PI21)

1) Check the paper folding motor clock sensor and paper folding home position sensor. Are the sensors normal?

YES : Next

NO : Replace sensor.

Paper folding roller drive mechanism

2) Is there a problem with the paper folding roller drive mechanism?

YES : Repair the paper folding roller drive mechanism.

NO : Next

Paper folding motor (M2)/Saddle stitcher controller PCB

3) Is the problem solved by replacing the paper folding motor?

YES : Complete.

NO : Replace saddle stitcher controller PCB.

T08-402-02

4.2.3 Guide motor error

Guide home position sensor (PI13)

1) Check the guide home position sensor. Does the sensor operate normally?

YES : Next

NO : Replace the sensor.

Guide plate drive mechanism

2) Is there any abnormality in the guide plate drive machanism?

YES : Repair the guide plate drive mechanism.

NO : Next

Guide Motor (M3)/Saddle stitcher controller PCB

3) Does it improve when the guide motor is replaced?

YES : End

NO : Replace the saddle stitcher controller PCB.

T08-402-03

4.2.4 Aligning motor error

Aligning plate home position sensor (PI5)

1) Check the aligning plate home position sensor. Does the sensor operate normally?

YES : Next

NO : Replace the sensor.

Aligning plate drive mechanism

2) Is there any abnormality in the aligning plate drive mechanism?

YES : Repair the aligning plate drive mechanism.

NO : Next

Alignment motor (M5)/Saddle stitcher controller PCB

3) Does it improve when the aligning motor is replaced?

YES : End

NO : Replace the saddle stitcher controller PCB.

T08-402-04

4.2.5 Stitcher (rear) error

Installing the stitcher (rear)

1) Are the stitcher (rear) and mount installed properly?

YES : Next

NO : Install them properly.

Stitcher home position sensor (rear) (SW5)

2) Check the stitcher home position switch. Does the switch operate normally?

YES : Next

NO : Replace the stitcher.

Stitcher motor (rear) (M6) / Saddle stitcher controller PCB

3) Does it improve when the stitcher is replaced?

YES : End

NO : Replace the saddle stitcher controller PCB.

T08-402-05

4.2.6 Stitcher (front) error

Installing the stitcher (front)

1) Are the stitcher (front) and mount installed properly?

YES : Next

NO : Install them properly.

Stitcher home position sensor (front) (SW7)

2) Check the stitcher home position switch. Does the switch operate normally?

YES : Next

NO : Replace the stitcher.

Stitcher motor (front) (M7) / Saddle stitcher controller PCB

3) Does it improve when the stitcher is replaced?

YES : End

NO : Replace the saddle stitcher controller PCB.

T08-402-06

4.2.7 Paper pushing plate motor error

Paper pushing plate home position sensor (PI14)/Paper pushing plate top position sensor (PI15)/ Paper pushing plate motor clock sensor	**1) Check the sensors. Do the sensors operate normally?** YES : Next NO : Replace the sensors.
Paper pushing plate drive mechanism	**2) Is there any abnormality in the paper pushing plate drive mechanism?** YES : Repair the paper pushing plate drive mechanism. NO : Next
Paper pushing plate motor (M8)/Saddle stitcher controller PCB	**3) Does it improve when the paper pushing plate motor is replaced?** YES : End NO : Replace the saddle stitcher controller PCB.

T08-402-07

4.2.8 Sensor connector error

Disconnection of the connectors of guide home position sensor (PI13)/paper pushing plate home position sensor (PI14)/paper pushing plate top position sensor (PI15)	**1) Are the sensors' connectors and the saddle stitcher controller PCB connector connected properly?** YES : Next NO : Connect them properly.
Wiring	**2) Is the wiring between the sensors and saddle stitcher broken?** YES : Repair the wiring. NO : Next
Power supply	**3) Is 5VDC supplied from J9-7, J9-10, J9-13 of the saddle stitcher controller PCB?** YES : Next NO : Replace the saddle stitcher controller PCB.
Ground	**4) Is a ground for J9-8, J9-11, J9-14 of the saddle stitcher controller PC established properly?** NO : Replace the saddle stitcher controller PCB.

T08-402-08

4.2.9 Micro switch error

Front cover switch (MS31)/Inlet door switch (SW1)/Delivery door switch (SW3)

1) Check the switches. Do the switches operate normally?

YES : Next

NO : Replace the switches.

Power supply and wiring

2) Measure the voltage between J704-1 (+) and J704-2 (-) of the finisher controller PCB. Is the voltage 24V?

YES : Next

NO : Replace the finisher controller PCB.

3) Is the wiring between J704 of the finisher controller PCB and J1 of the saddle stitcher controller normal?

YES : Replace the saddle stitcher controller PCB.

NO : Repair the wiring.

T08-402-09

4.3 Troubleshooting Procedure (Puncher unit (option))

4.3.1 Puncher unit backup RAM error

Punch controller PCB

1) Does it improve when the host machine power switch is turned OFF/ON?

NO : Replace the punch controller PCB.

T08-403-01

4.3.2 Punch motor error

Punch home position sensor (PI63)

1) Check the punch home position sensor. Does the sensor operate normally?

YES : Next

NO : Replace the sensor.

Punch motor clock sensor (PI62)

2) Check the punch motor clock sensor. Does the sensor operate normally?

YES : Next

NO : Replace the sensor.

Wiring

3) Is the wiring between the punch controller PCB and sensors normal?

YES : Next

NO : Repair the wiring.

Punch mechanism/Punch motor (M61)

4) Is there any abnormality in the punch mechanism?

YES : Repair the punch mechanism.

NO : Replace the punch motor.

Punch controller PCB/Finisher controller PCB

5) Does it improve when the punch controller PCB is replaced?

YES : End

NO : Replace the finisher controller PCB.

T08-403-02

4.3.3 Horizontal registration motor error

Horizontal registration home position sensor (PI61)

1) Check the horizontal registration home position sensor. Does the sensor operate normally?

YES : Next

NO : Replace the sensor.

Wiring

2) Is the wiring between the punch controller PCB and the sensor normal?

YES : Next

NO : Repair the wiring.

Horizontal registration mechanism/ Horizontal registration motor (M62)

3) Is there any abnormality in the horizontal registration mechanism?

YES : Repair the horizontal registration mechanism.

NO : Replace the finisher controller PCB.

Punch controller PCB/Finisher controller PCB

4) Does it improve when the punch controller PCB is replaced?

YES : End

NO : Replace the finisher controller PCB.

T08-403-03

5 Self Diagnosis

5.1 Outline

The CPU on the machine's finisher controller PCB is equipped with a mechanism to check the machine condition as needed; when it detects a fault, the machine communicates the fact to the host machine in the form of a code and a detail code.

5.2 Errors

5.2.1 Finisher Unit

Error Description	Detection timing
• Communication error	• The communication with the saddle stitcher is interrupted.
	• The communication with the puncher unit (option) is interrupted.
• Backup RAM error	• The checksum for the finisher controller PCB has an error when the power is turned on.
	• The checksum for the punch controller PCB has an error when the power is turned on.
• Front aligning plate motor (M33) error • Front aligning plate home position sensor (PI36) error	• The aligning plate does not leave the aligning plate front home position sensor when the alignment plate front motor has been driven for 4 seconds.
	• The aligning plate does not return to aligning plate front home position sensor when the alignment plate front motor has been driven for 4 seconds.
• Rear aligning plate motor (M34) error • Rear aligning plate home position sensor (PI37) error	• The aligning plate does not leave the aligning plate rear home position sensor when the alignment plate rear motor has been driven for 4 seconds.
	• The aligning plate does not return to aligning plate rear home position sensor when the alignment plate rear motor has been driven for 4 seconds.

T08-502-01

Error Description	Detection timing
• Staple motor error • Staple home position detect switch error	• The stapler does not leave the staple home position when the staple motor has been driven for 0.4 sec.
	• The stapler does not return to the staple home position when the staple motor has been driven for 0.4 sec.
• Stapler shift motor (M35) error	• The stapler does not leave the stapler shift home position when the stapler shift motor has been driven for 5 seconds.
• Stapler shift home position sensor (P140) error	• The stapler does not return to the stapler shift home position when the stapler shift motor has been driven for 20 seconds.
• Swing motor (M36) error • Swing guide home position sensor (PI35) error	• The stapler does not leave the swing home position when the swing motor has been driven for 3 seconds.
	• The stapler does not return to the swing home position when the swing motor has been driven for 3 seconds.
• Tray 1 shift motor (M37) error • Tray 1 shift area sensor PCB error	• If the tray does not move to other area when tray 1 shift motor is driven for 4 seconds. • If the tray does not return to home position when the tray 1 shift motor is driven for 20 seconds.
• Tray 2 shift motor (M38) error • Tray 2 shift area sensor PCB error	• If the tray does not move to other area when tray 2 shift motor is driven for 4 seconds. • If the tray does not return to home position when the tray 2 shift motor is driven for 20 seconds.
• Stack ejection motor (M32) error • Shutter open/close clutch (CL31) error • Shutter home position sensor (PI45) error	• The stapler does not leave the shutter home position when the stack ejection motor has been driven for 3 seconds.
	• The stapler does not return to the shutter home position when the stack ejection motor has been driven for 3 seconds.
• Rear end assist motor (M39) error	• The stapler does not leave the rear end assist home position when the rear end assist motor has been driven for 3 seconds.
• Rear end assist home position sensor (PI39) error	• The stapler does not return to the rear end assist home position when the rear end assist motor has been driven for 3 seconds.

T08-502-02

Error Description	Detection timing
• Gear change motor (M40) error	• The stapler does not leave the gear change home position when the gear change motor has been drive for 387 pulses.
• Gear change home position sensor (PI49) error	• The stapler does not return to the gear change home position when the gear change motor has been drive for 387 pulses.

T08-502-03

5.2.2 Saddle Stitcher Unit

Error Description	Detection timing
• Paper positioning plate motor (M4) error • Paper positioning plate home position sensor (PI7) error	• The paper positioning plate home position sensor does not turn ON when the paper positioning plate motor has been driven for 300 pulses.
	• The paper positioning plate home position sensor does not turn OFF when the paper positioning plate motor has been driven for 1500 pulses.
• Paper fold motor (M2) error • Paper fold motor clock sensor (PI4) error • Paper fold home position sensor (PI21) error	• The number of pulses detected by the paper fold motor clock sensor is less than standard value.
	• The status of the paper fold home position sensor does not change when the paper fold motor has been driven for 3 seconds.
• Guide motor (M3) error • Guide home position sensor (PI3) error	• The guide home position sensor does not turn ON when the guide motor has been driven for 50 pulses.
	• The guide home position sensor does not turn OFF when the guide motor has been driven for 700 pulses.
• Aligning motor (M5) error • Aligning plate home position sensor (PI5) error	• The aligning plate home position sensor does not turn ON when the aligning plate motor has been driven for 50 pulses.
	• The aligning plate home position sensor does not turn OFF when the aligning plate motor has been driven for 500 pulses.
• Stitch motor (rear) (M6) error • Stitching home position sensor (rear) (SW5) error	• The stitching home position sensor does not turn OFF when the stitch motor (rear) has been driven forward for 0.5 sec.
	• The stitching home position sensor does not turn ON when the stitch motor (rear) has been driven backward for 0.5 sec.
• Stitch motor (front) (M7) error • Stitching home position sensor (front) (SW7) error	• The stitching home position sensor does not turn OFF when the stitch motor (front) has been driven forward for 0.5 sec.
	• The stitching home position sensor does not turn ON when the stitch motor (front) has been driven backward for 0.5 sec.

T08-502-04

5.2.3 Saddle Stitcher Unit

Error Description	Detection timing
• Paper pushing plate motor (M8) error	• The paper pushing plate home position sensor does not turn ON when the paper pushing plate motor has been driven for 0.3 sec.
• Paper pushing plate home position sensor (PI14) error	• The paper pushing plate home position sensor does not turn OFF when the paper pushing plate motor has been driven for 80 ms.
• Paper pushing plate leading edge position sensor (PI15) error	• The paper pushing plate leading edge position sensor does not turn OFF when the paper pushing plate motor has been driven for 80 ms.
• Paper pushing plate motor clock sensor (PI1) error	• The number of pulses detected by the paper pushing plate motor clock sensor is less than standard value.
	• The paper pushing plate leading edge position sensor does not turn ON when the paper pushing plate motor has been driven for 0.3 sec.
• Guide home position sensor (PI13) connector error	• Loose guide home position sensor connector is detected.
• Paper pushing plate home position sensor (PI14) connector error	• Loose paper pushing plate home position sensor connector is detected.
• Paper pushing plate leading edge position sensor (PI15) connector error	• Loose paper pushing plate leading edge position sensor connector is detected.
• Inlet door switch (SW1) error	• The inlet door switch is in open state when all covers are closed.
• Ejection door switch (SW3) error	• The ejection door switch is in open state when all covers are closed.
• Front cover close detect switch (MS31) error	• The front cover close detect door switch is in open state when all covers are closed.

T08-502-05

5.2.4 Puncher Unit (option)

Error Description	Detection timing
• Backup RAM error	• The checksum for the punch controller PCB has an error when the power is turned on.
• Punch motor (M61) error • Punch motor clock sensor (PI62) error • Punch home position sensor (PI63) error	• The puncher does not leave the puncher home position sensor when the punch motor has been driven for 200 ms.
	• The puncher does not return to the puncher home position sensor when the punch motor has been driven for 200 ms.
	• The punch motor clock sensor could not detect target clock count when starting operation.
	• No clock is detected by the punch motor clock sensor for 100 ms when the punch motor has been driven.
• Horizontal registration motor (M62) error • Horizontal registration home position sensor (PI61) error	• The puncher does not leave the horizontal registration home position sensor when the horizontal registration motor has been driven for 1000 msec.
	• The puncher does not return to the horizontal registration home position sensor when the horizontal registration motor has been driven for 1000 msec.

T08-502-06

5.3 Alarm

5.3.1 Finisher Unit

Alarm Description	Condition	Detection timing	Machine operation	Resetting
Stapler is absent	The stapler is not set.	Always monitored	The staple motor (M41) and stapler shift motor (M35) operation prohibited.	Set the stapler.
Staple is absent	The staple cartridge has run out of staples.	Always monitored	Normal operation can be continued. However, whether to operate or not depends on the instruction from the host machine.	Replace the staple cartridge; or, set it correctly.
Stapler safety protection function activated	Stapler safety protection function was activated.	When starting staple operation.	Stop staple motor (M41).	Check stapler mechanism and move the stapler to where the staple alignment interference sensor (PI46) goes off.
Stack tray overstacking	The number of sheets on the ejection tray has exceeded the stackable sheet or set count.	After ejecting the sheet/set exceeding the limit.	Normal operation will continue.	Remove paper from ejection tray.
Stapler staple jam	Staple could not be positioned correctly.	When positioning staple.	Normal operation can be continued. However, whether to operate or not depends on the instruction from the host machine.	Check staple cartridge and repeat staple positioning.

T08-503-01

5.3.2 Saddle Stitcher Unit

Alarm Description	Occurs when	Detection timing	Machine operation	Reset
Staple is absent	The staple cartridge has run out of staples.	Always monitored	Normal operation will continue. However, operation is subject to instruction from host machine.	Replace the staple cartridge; or, set it correctly.
Mixed paper sizes	Sheets of different sizes are output in the holding area.	When the sheet that causes the fault is output to the holding area.	Stitching is prohibited. Alignment is prohibited.	Remove the sheets from the holding area.
Stack exceeded	The stack of sheets on the output tray exceeds the maximum number of sheets that can be stacked.	When output of the sheet that cause an excess is output on the output tray.	Normal operation is continued.	Remove the stack of sheets from the tray.
Stitching capacity	The number of sheets in the holding area has exceeded 15.	When the sheet that causes an excess is output to the holding area.	Stitching is prohibited.	Remove the sheets from the holding area.

T08-503-02

5.3.3 Puncher Unit (option)

Alarm Description	Occurs when	Detection timing	Machine operation	Reset
Punch scrap full	The amount of punch scraps has reached the scrap container capacity.	During punching	Normal operation will continue.	Empty the scrap container.
Punch scrap overflow	The amount of punch scraps has exceeded the scrap container capacity.	During punching	Punching will be disabled.	Empty the scrap container.

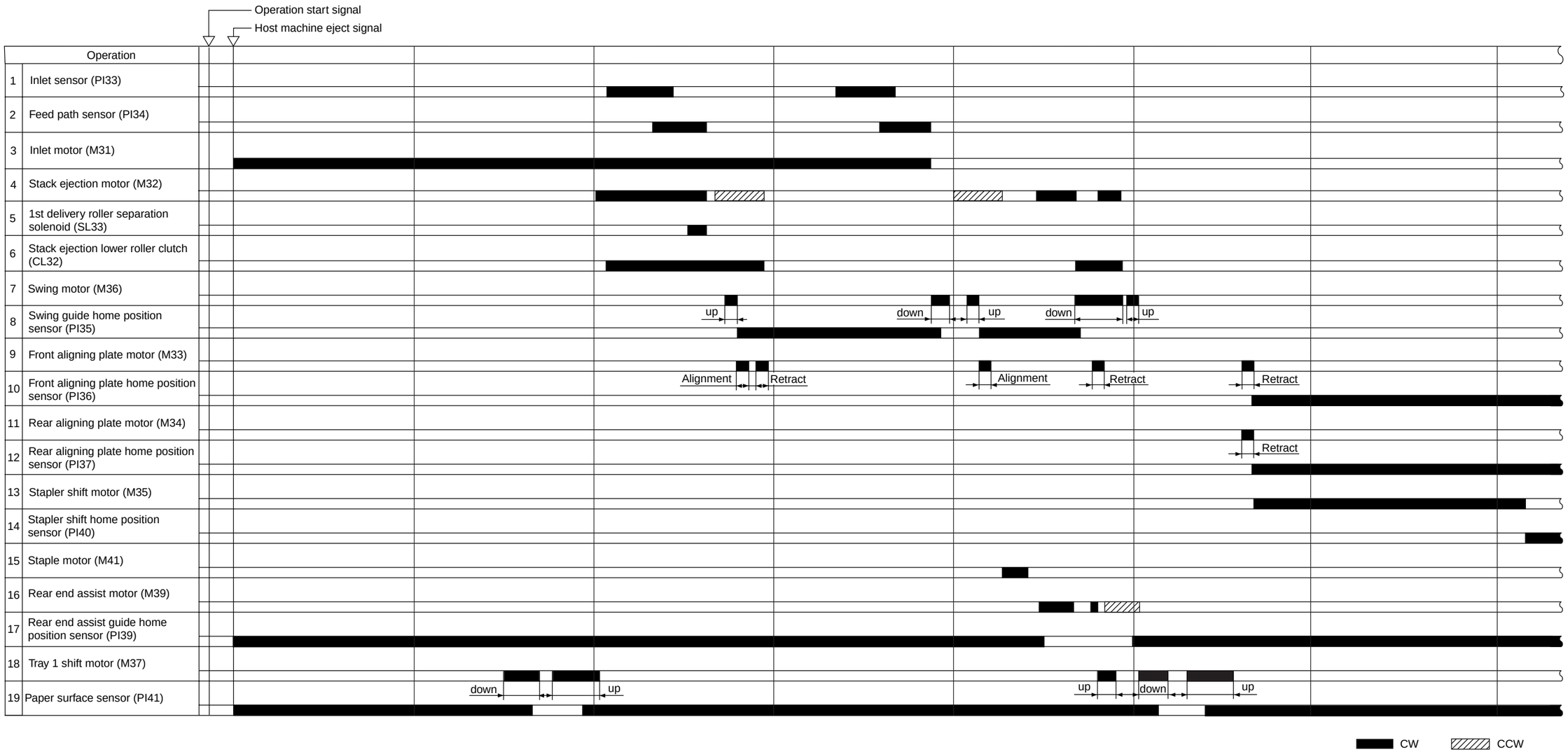
T08-503-03

APPENDIX

1 General Timing Chart

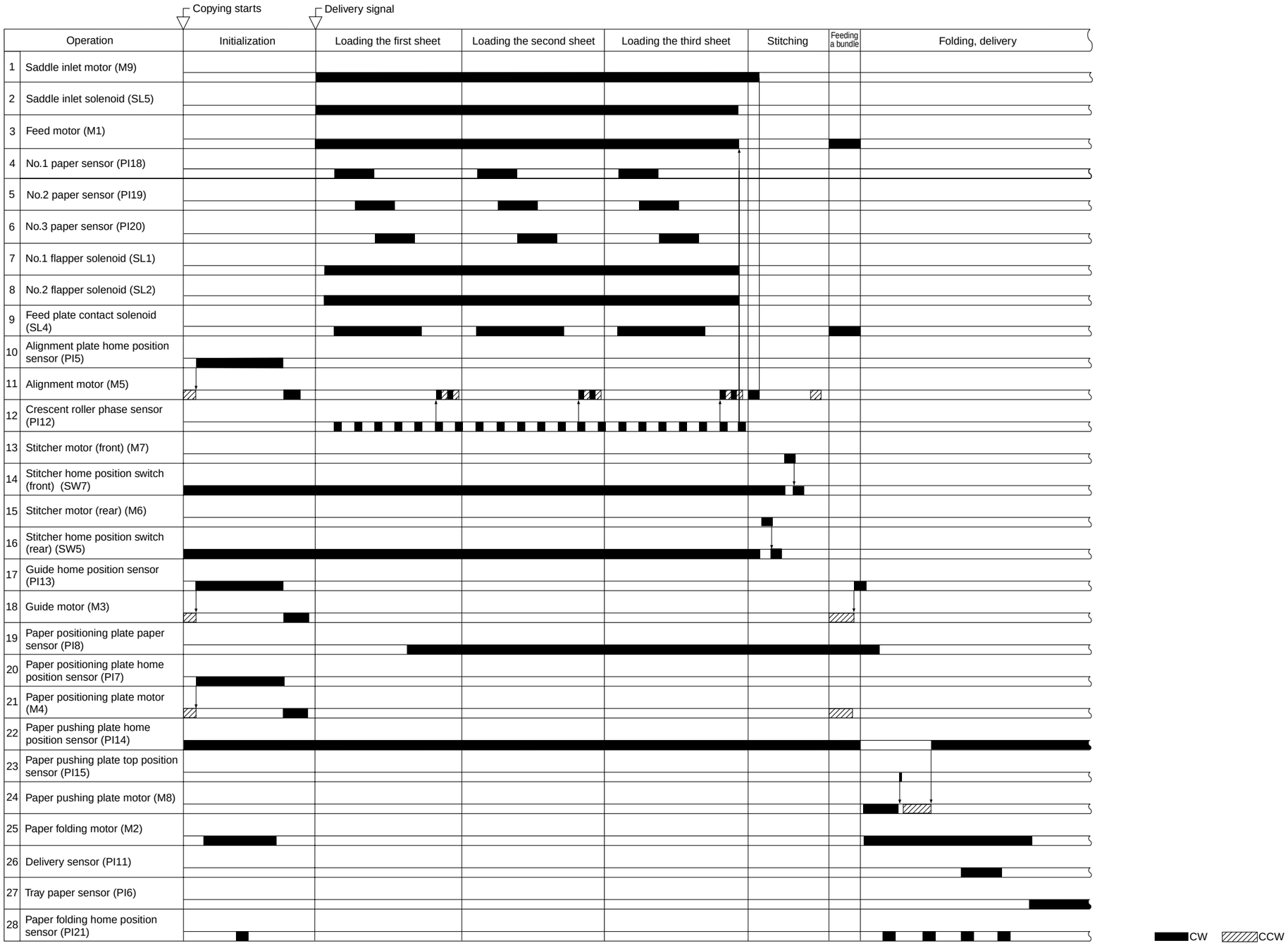
1.1 Finisher Unit

Stapling : A4 size paper, 2-sheet document, rear1-point stapling



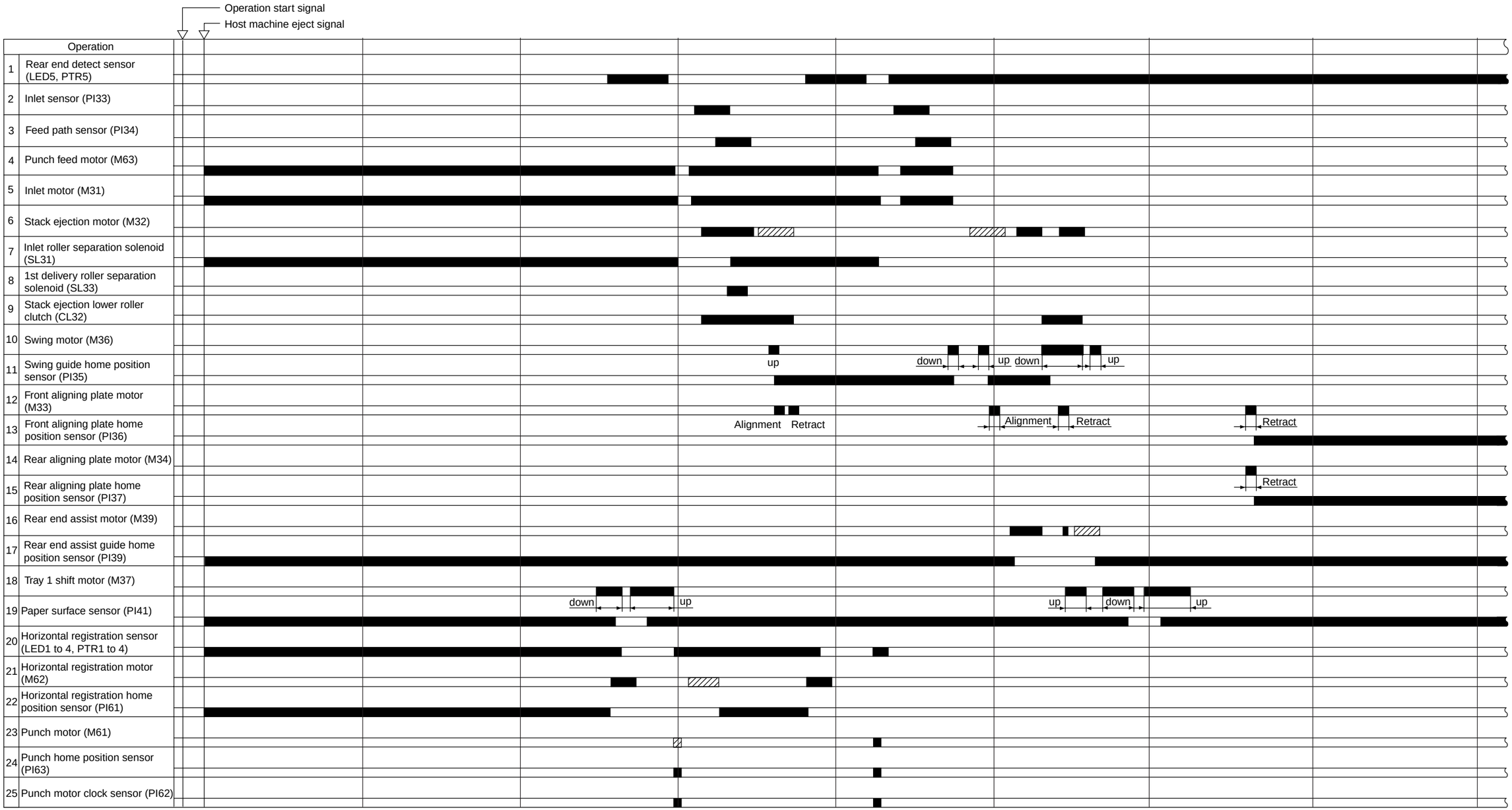
1.2 Saddle Stitcher Unit

Stitching : A4-R size paper, 3-sheet document, 1 set



1.3 Puncher Unit (option)

Punching : A4 size paper, 2-sheet document, job offset



2 List of Signal Names/Abbreviations

The following presents the abbreviations of signals used in this manual and in drawings, and the meaning 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.

2.1 Finisher Unit

ASSIST-HP	REAR END ASSIST GUIDE HP DETECT Signal
BIND-CL	STACK EJECTION LOWER ROLLER CLUTCH DRIVE Signal
BUFF-P-SL	BUFFER REAR END HOLDING SOLENOID DRIVE Signal
BUFF-ROL-SL	BUFFER ROLLER ALIENATE SOLENOID DRIVE Signal
DELIV-ROL-SL	1ST DELIVERY ROLLER ALIENATE SOLENOID DRIVE Signal
F-COVER	FRONTCOVER OPEN/CLOSE DETECT Signal
F-COVER-SW	FRONT DOOR CLOSED DETECT SWITCH Signal
FJOG-HP	FRONT ALIGNMNT PLATE HP DETECT Signal
G-CHANGE-HP	GEAR CHANGE HP DETECT Signal
INLET	INLET PAPER DETECT Signal
INLET-ROL-SL	INLET ROLLER ALIENATE SOLENOID DRIVE Signal
JOGTRY-P	PROCESSING TRAY PAPER DETECT Signal
RJOG-HP	REAR ALIGNMNT PLATE HP DETECT Signal
SHUT-CL	SHUYYER OPEN/CLOSE CLUTCH DRIVE Signal
SHUT-HP	SHUTTER HP DETECT Signal
STP-HP	STAPLER HP DETECT Signal
STP-INFERE	STAPLER ALIGNMENT INTERFERENCE DETECT Signal
STP-LS	HOOK EMPTY DETECT Signal
STP-READY	HOOK TOP POSITION DETECT Signal
STPSFT-HP	STAPLER SHIFT HP DETECT Signal
STP-SW	CARTRIDGE DETECT SWITCH Signal
SWG-HP	SWING GUIDE HP DETECT Signal
SWG-SW	SWING GUIDE CLOSED DETECT SWITCH Signal
TIMMING	FEED PLATE PASS PAPER DETECT Signal
TRY1-AREA1	TRAY 1 AREA DETECT Signal 1
TRY1-AREA2	TRAY 1 AREA DETECT Signal 2
TRY1-AREA3	TRAY 1 AREA DETECT Signal 3
TRY1-P	TRAY 1 PAPER DETECT Signal
TRY2-AREA1	TRAY 2 AREA DETECT Signal 1
TRY2-AREA2	TRAY 2 AREA DETECT Signal 2
TRY2-AREA3	TRAY 2 AREA DETECT Signal 3
TRY2-P	TRAY 2 PAPER DETECT Signal
TRYSFT2-P	TRAY 2 PAPER SURFACE DETECT Signal
UP-COVER	UPPER COVER OPEN/CLOSE DETECT Signal
UPPER-P	PAPER SURFACE DETECT Signal
UPPER-TRY	TRAY 1 CLOSED DETECT SWITCH Signal

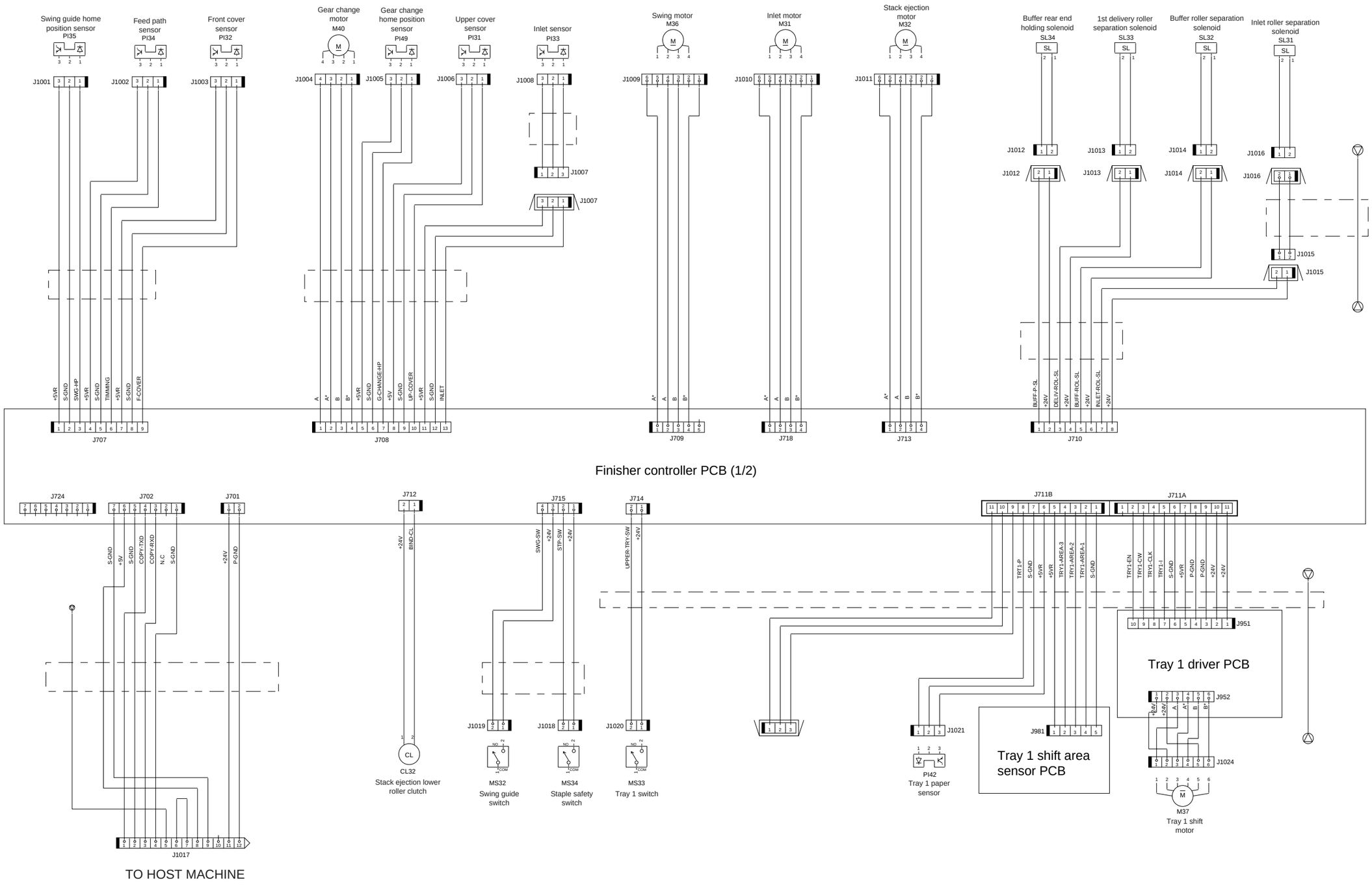
2.2 Saddle Stitcher Unit

1STPA	No.1 PAPER SENSOR DETECT Signal
2NDPA	No.2 PAPER SENSOR DETECT Signal
3RDPA	No.3 PAPER SENSOR DETECT Signal
DELV	DELIVERY DETECT Signal
DELVMS	DELIVERY DOOR OPEN DETECT SWITCH Signal
EJCVR	DELIVERY COVER OPEN DETECT Signal
FDRLHP	CRESCENT ROLLER PHASE DETECT Signal
FLDCLK	FOLD MOTOR CLOCK Signal
FLPSL1	FLAPPER DRIVE Signal 1
FLPSL2	FLAPPER DRIVE Signal 2
GIDHP	PAPER GUIDE HP DETECT Signal
HKEMP1	HOOK EMPTY DETECT Signal 1
HKEMP2	HOOK EMPTY DETECT Signal 2
INLET-ROLL	SADDLE INLET PAPER DETECT Signal
INLTCVR	INLET COVER OPEN DETECT Signal
INLTCVRMS	INLET COVER OPEN SWITCH Signal
LUNGECLK	LUNGE MOTOR CLOCK Signal
LUNGEHP	LUNGE HP DETECT Signal
LUNGETOP	LUNGE TOP POSITION DETECT Signal
PAFLDHP	PAPER FOLD HP DETECT Signal
PAPPOS	PAPER POSITION PLATE HP DETECT Signal
PPOSPAR	PAPER POSITIONING GUIDE PAPER DETECT Signal
RLNIPSL	FEED PLATE CONTACT SOLENOID DRIVE Signal
SDLINSL	SADDLE INLET 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

2.3 Puncher Unit (option)

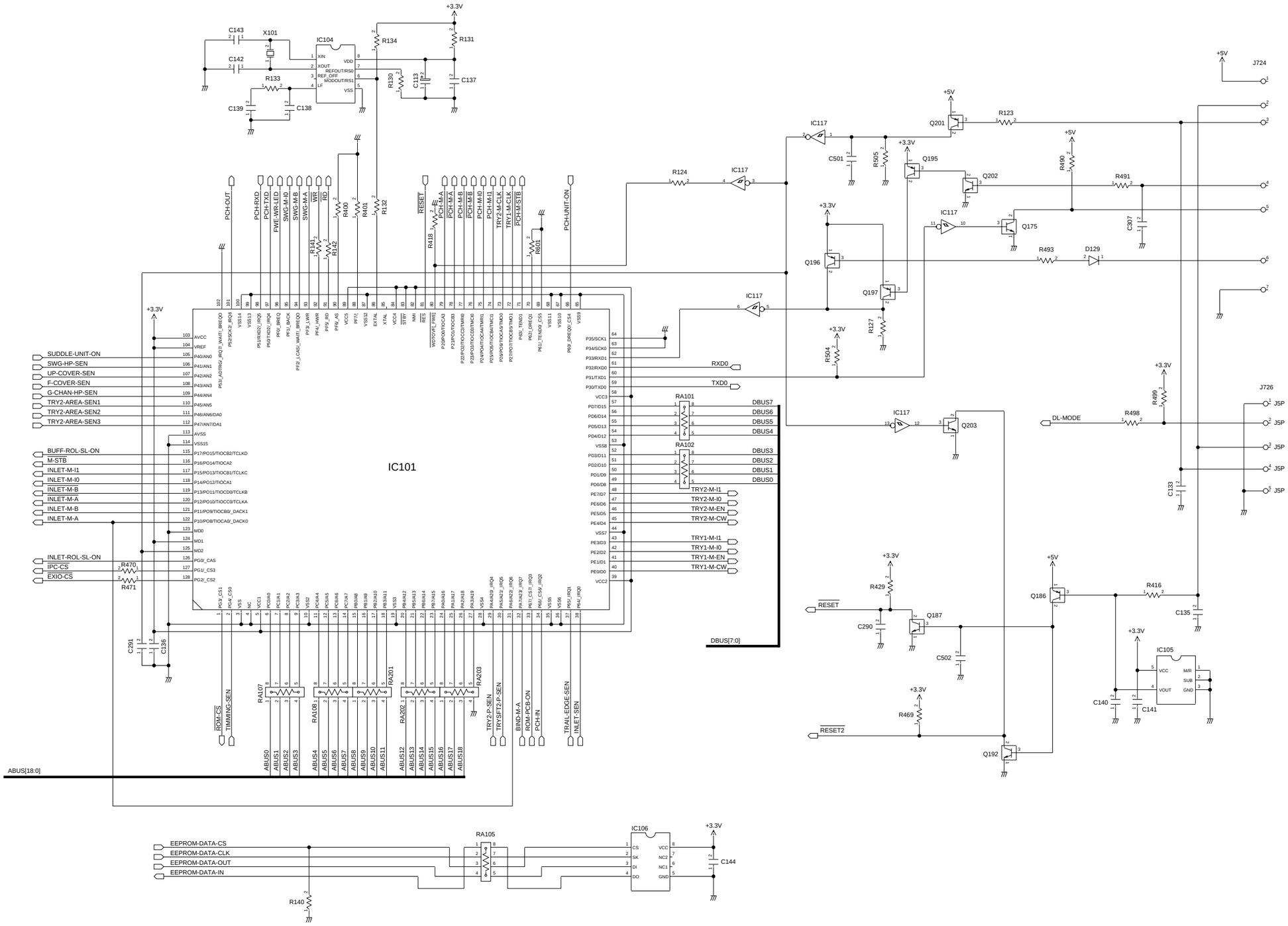
DFULL	DUST FULL DETECT Signal
FDROPN	FRONT DOOR OPEN DETECT SWICH Signal
LEDON	LED ON Signal
LEDON1	LED1 ON Signal
LEDON2	LED2 ON Signal
LEDON3	LED3 ON Signal
LEDON4	LED4 ON Signal
LEDON5	LED5 ON Signal
PAEND	PAPER END DETECT Signal
PUNCHCLK	PUNCH MOTOR CLOCK DETECT Signal
PUNCHHP	PUNCH HOME POSITION DETECT Signal
SREGHP	SIDE REGISTRATION HOMEPOSITION DETECT Signal
SRGE1	SIDE REGISTRATION DETECT Signal 1
SRGE2	SIDE REGISTRATION DETECT Signal 2
SRGE3	SIDE REGISTRATION DETECT Signal 3
SRGE4	SIDE REGISTRATION DETECT Signal 4
UDROPN	UPPER DOOR OPEN DETECT SWICH Signal

3 Finisher Unit General Circuit Diagram

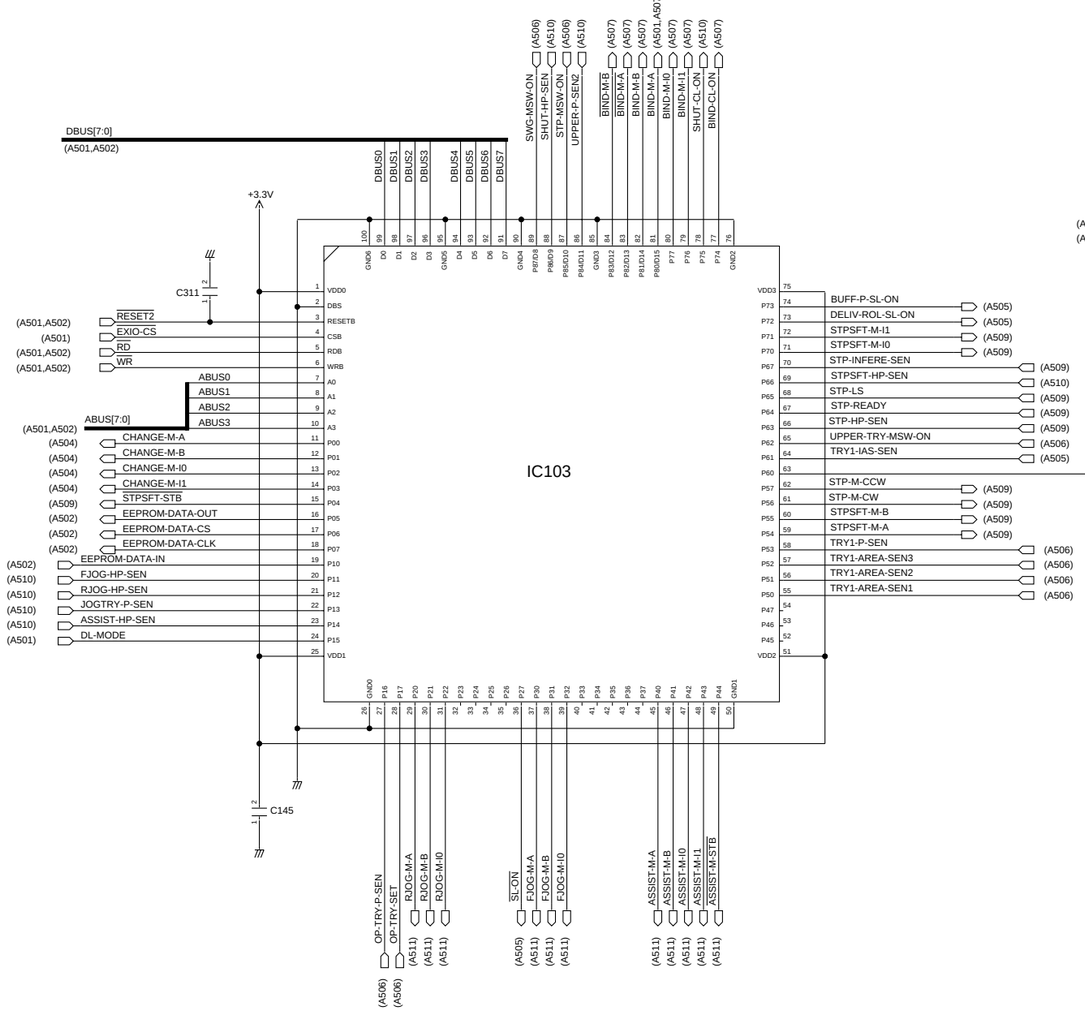


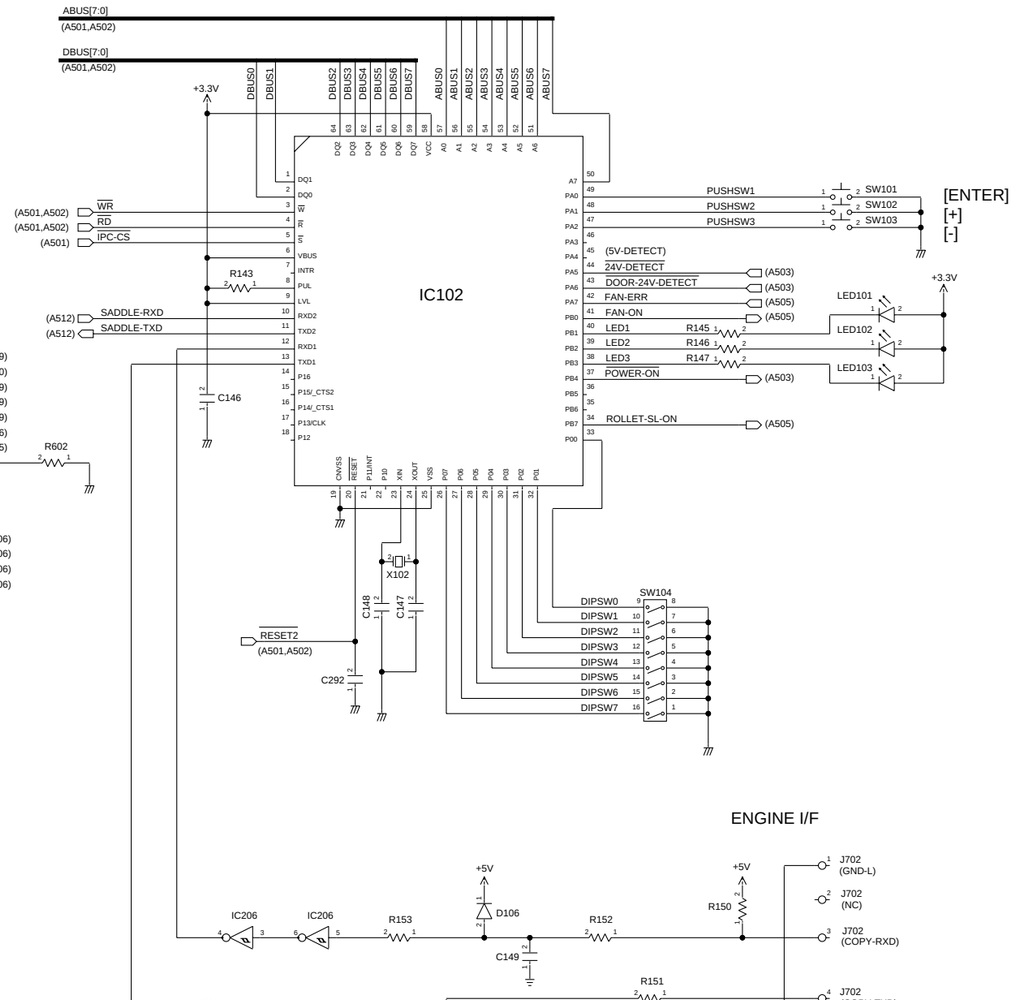
Tray 2 shift motor
M38
J1025
J1953
Tray 2 driver PCB
J1951
Tray 2 paper sensor
PI43
J1026
Tray 2 shift area sensor PCB
J1981
Stapler shift motor
M35
J1027
Staple motor
M41
J1028
J1030
Stapler alignment interference sensor
PI46
J1029
J993
J995
J994
Stapler PCB 2
J992
SMCD-19X875-C-P1.25-S(3)+(3)-M-N UL20624
Stapler PCB 1
J991
TO SADDLE STITCHER CONTROLER PCB
TO SADDLE DRIVER PCB
OR PUNCH CONTROLLER PCB
J716A
J716B
J717
J703
J704
J705A
J705B
J706
Finisher controller PCB (2/2)
J722B
J722A
J721B
J721A
J727
J719
J1032
J1040
J1041
J1046
J1039
J1038
J1037
J1036
J1035
J1034
J1033
J1045
J1044
J1043
J1042
J1031
PI38
Processing Tray sensor
PI36
Front aligning plate home position sensor
PI37
Rear aligning plate home position sensor
PI39
Rear end assist guide home position sensor
M33
Front aligning plate motor
M34
Rear aligning plate motor
M39
Rear end assist motor
CL31
Shutter clutch
PI40
Stapler shift home position sensor
PI45
Shutter home position sensor
PI41
Paper surface sensor
PI48
Tray 2 paper surface sensor
MS31
Front cover switch

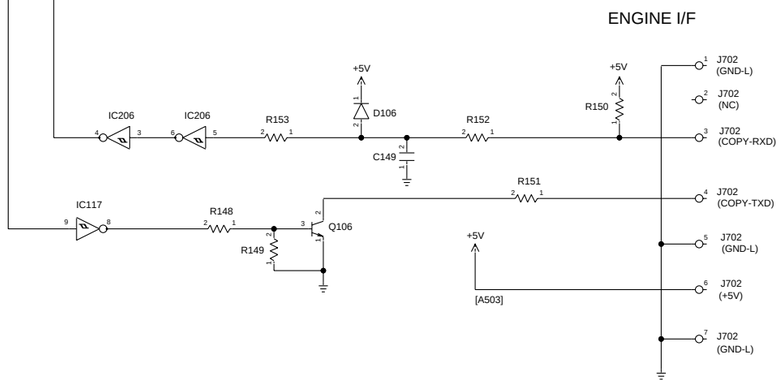
3.1 Finisher Controller PCB (A501)



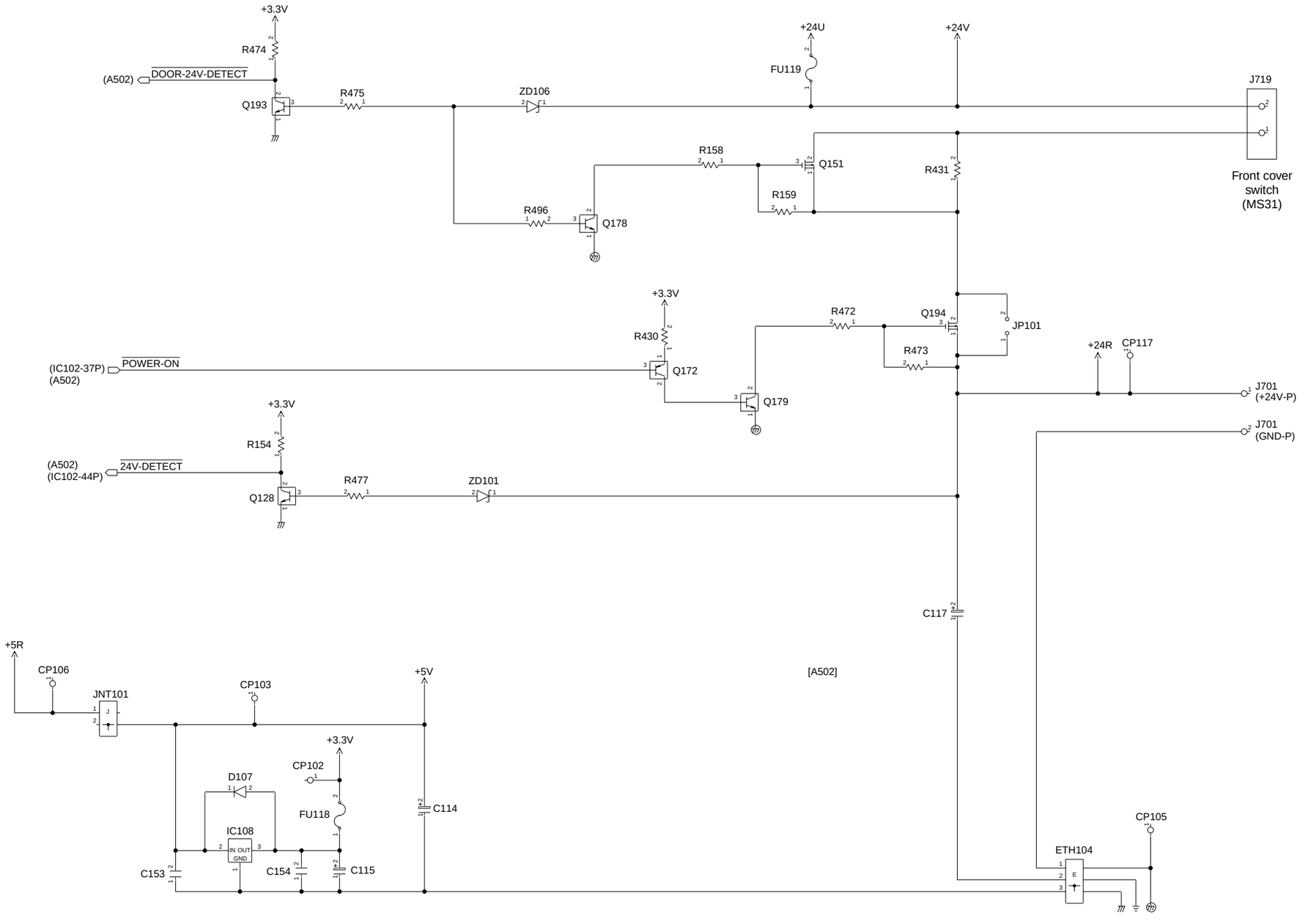
3.2 Finisher Controller PCB (A502)



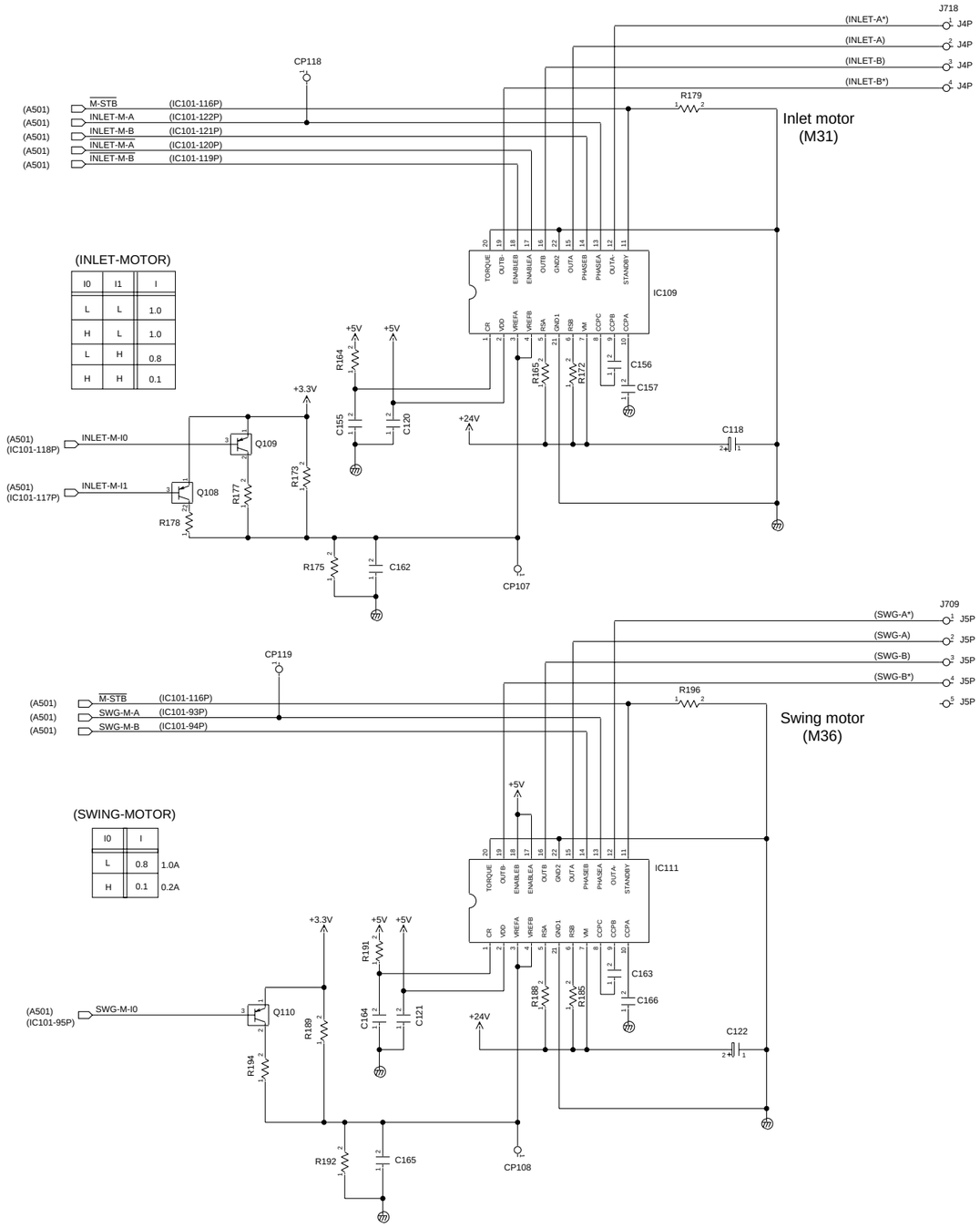




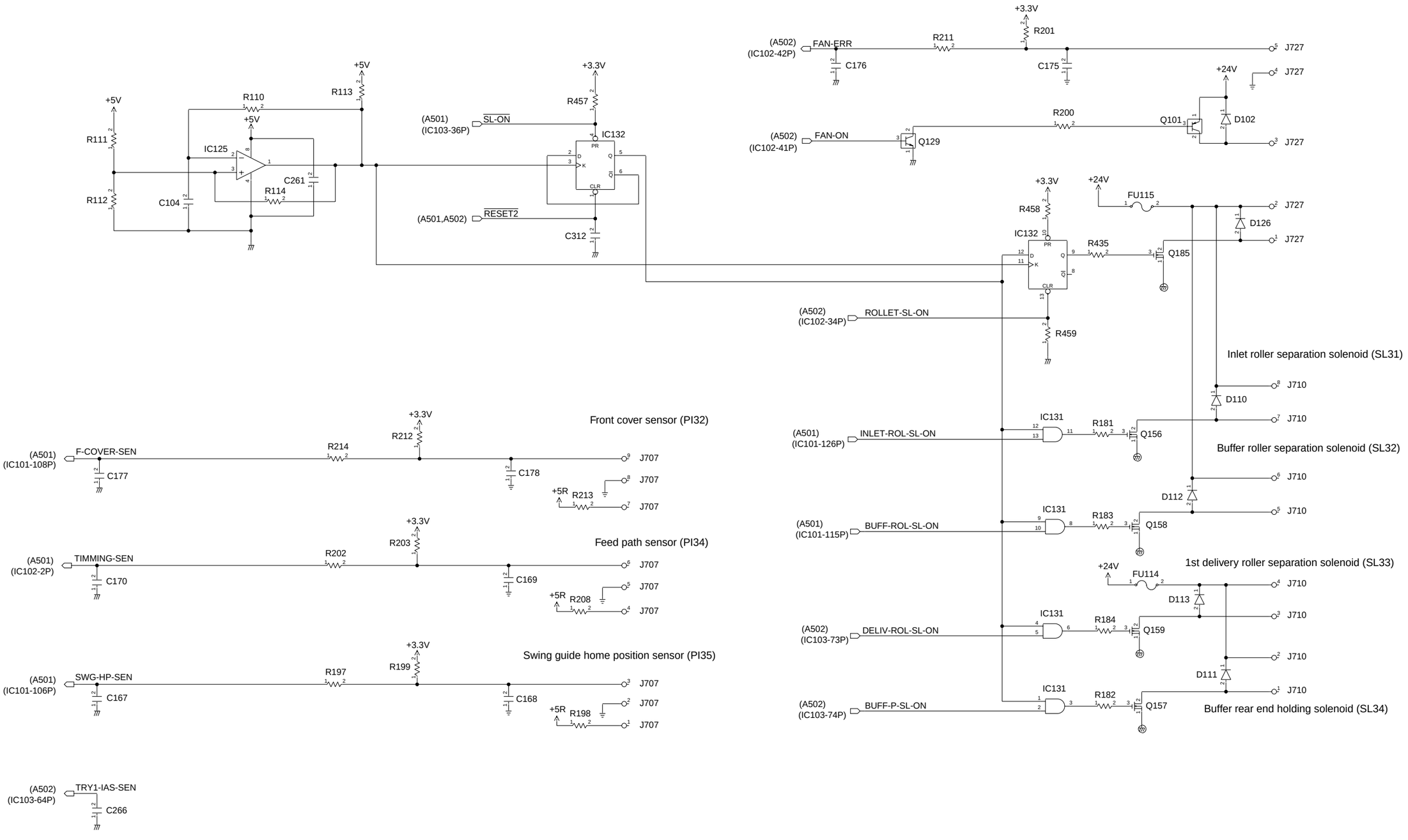
3.3 Finisher Controller PCB (A503)



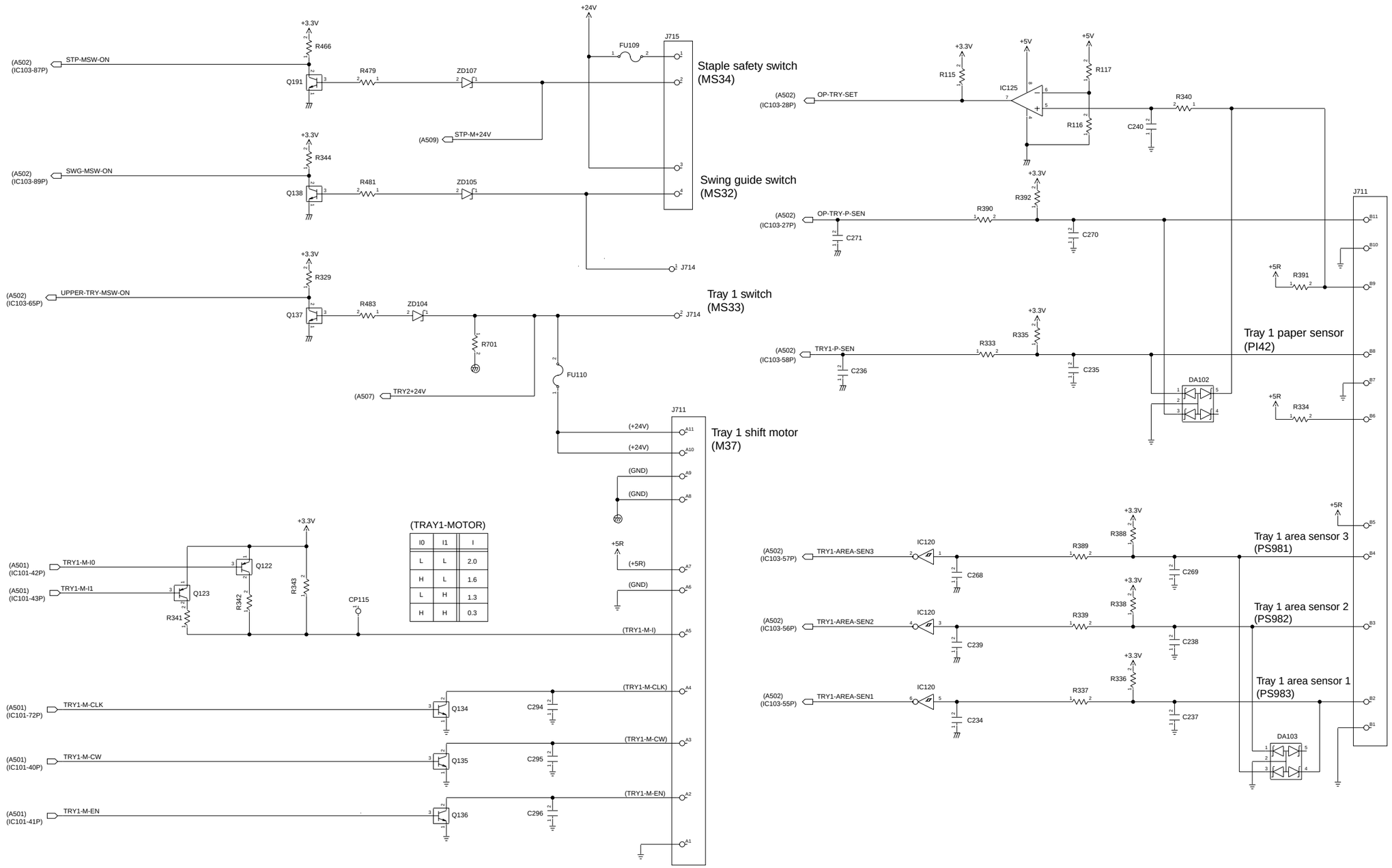
3.4 Finisher Controller PCB (A504)



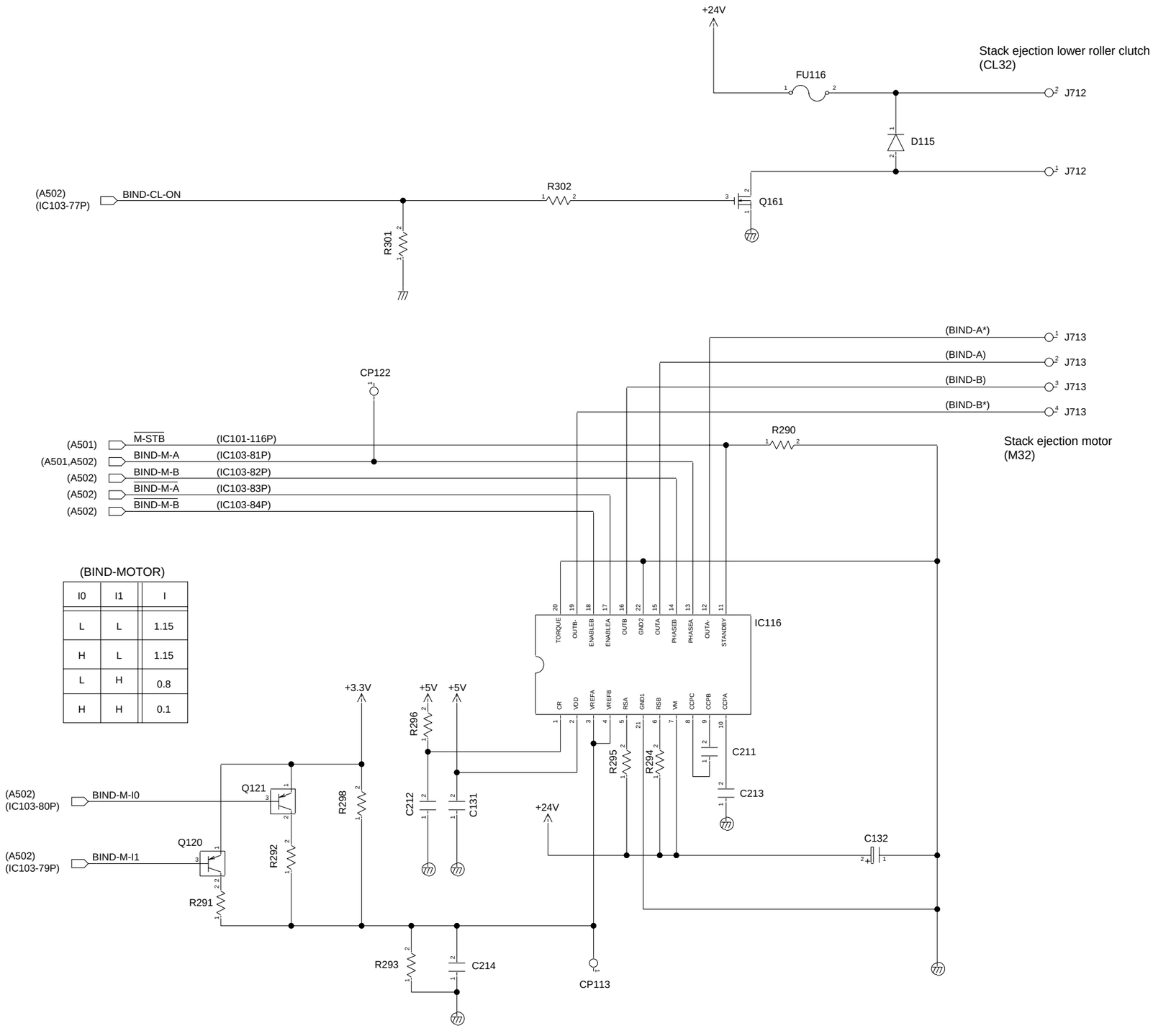
3.5 Finisher Controller PCB (A505)



3.6 Finisher Controller PCB (A506)

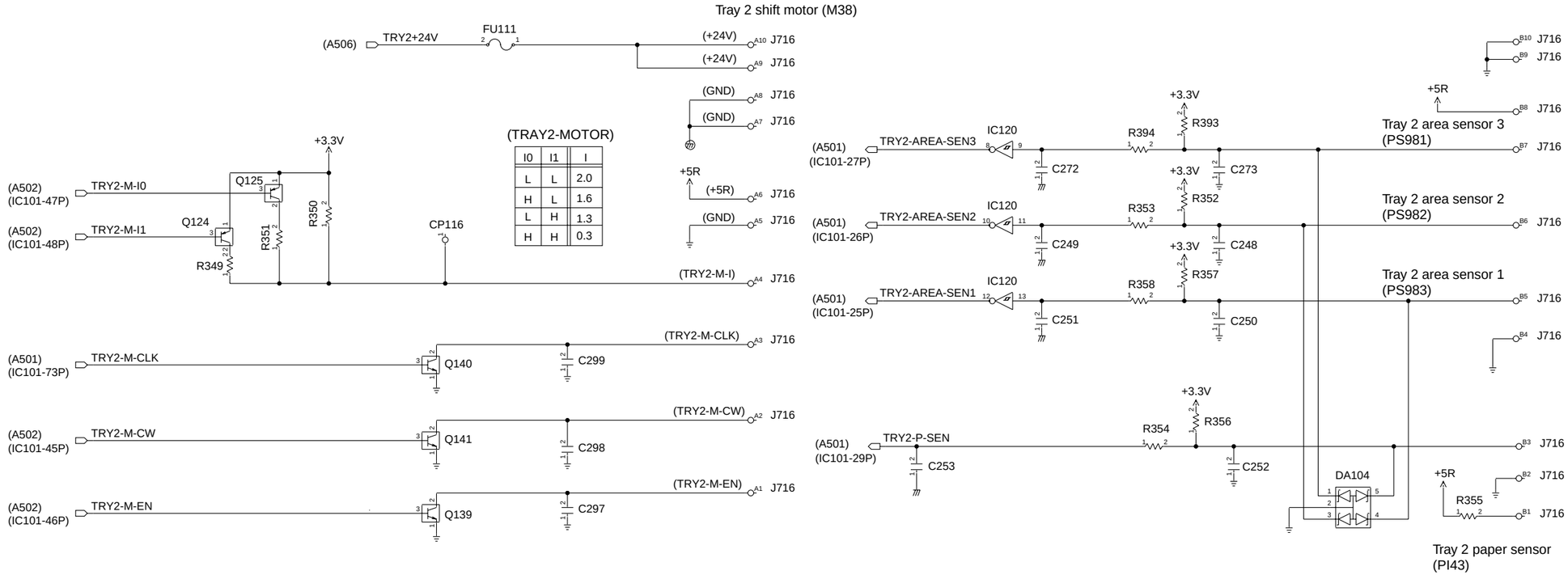


3.7 Finisher Controller PCB (A507)

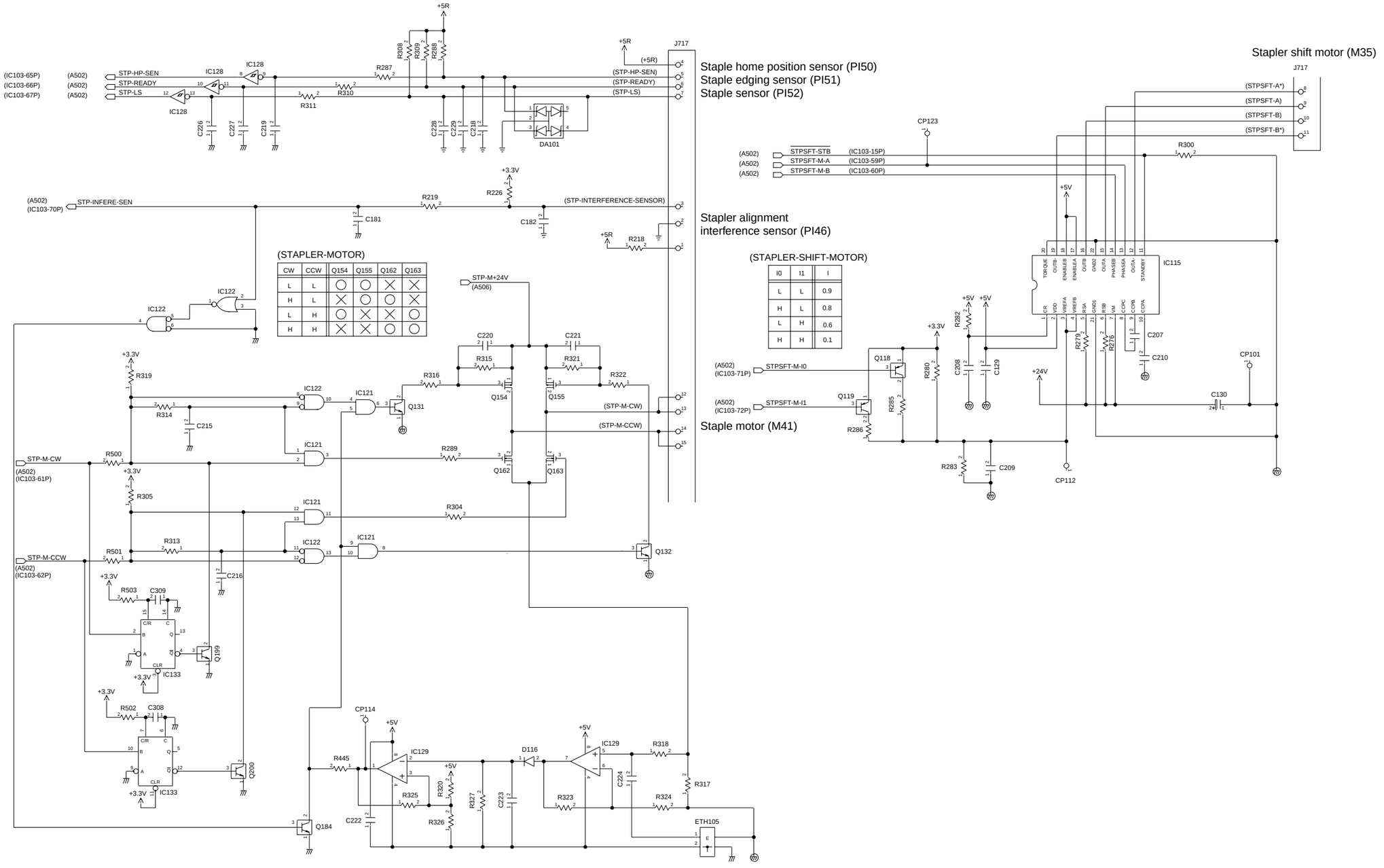


I0	I1	I
L	L	1.15
H	L	1.15
L	H	0.8
H	H	0.1

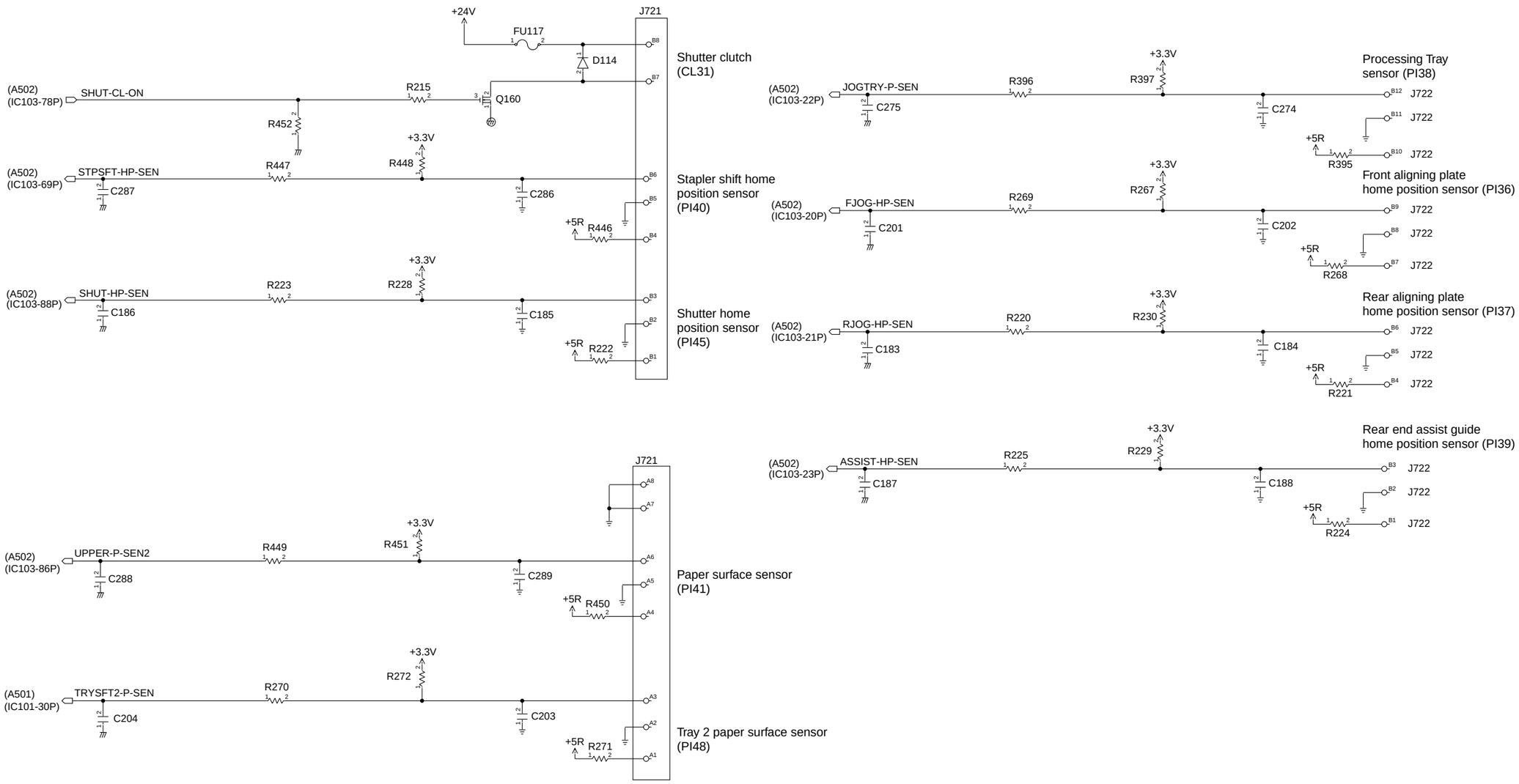
3.8 Finisher Controller PCB (A508)



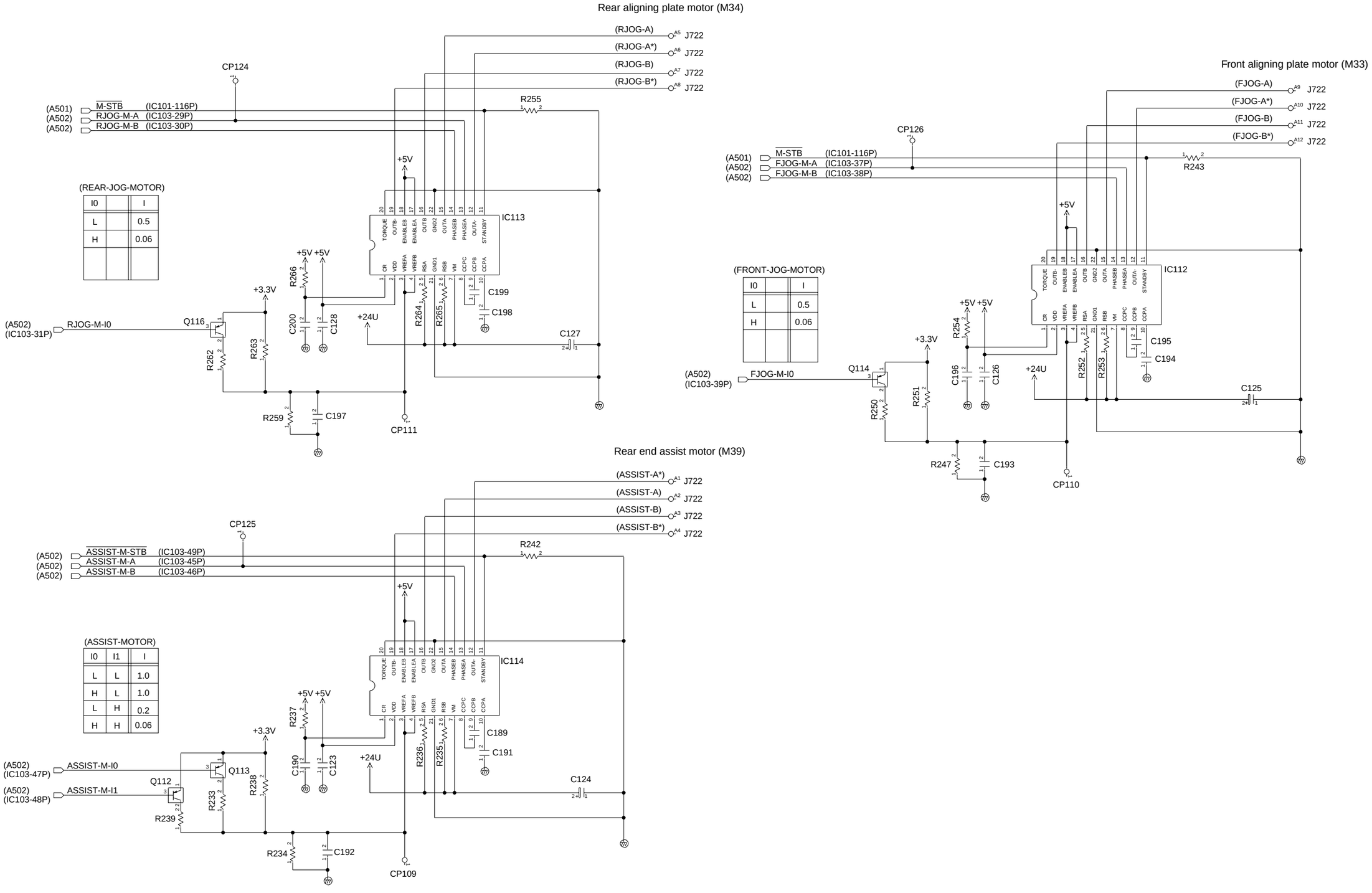
3.9 Finisher Controller PCB (A509)



3.10 Finisher Controller PCB (A510)

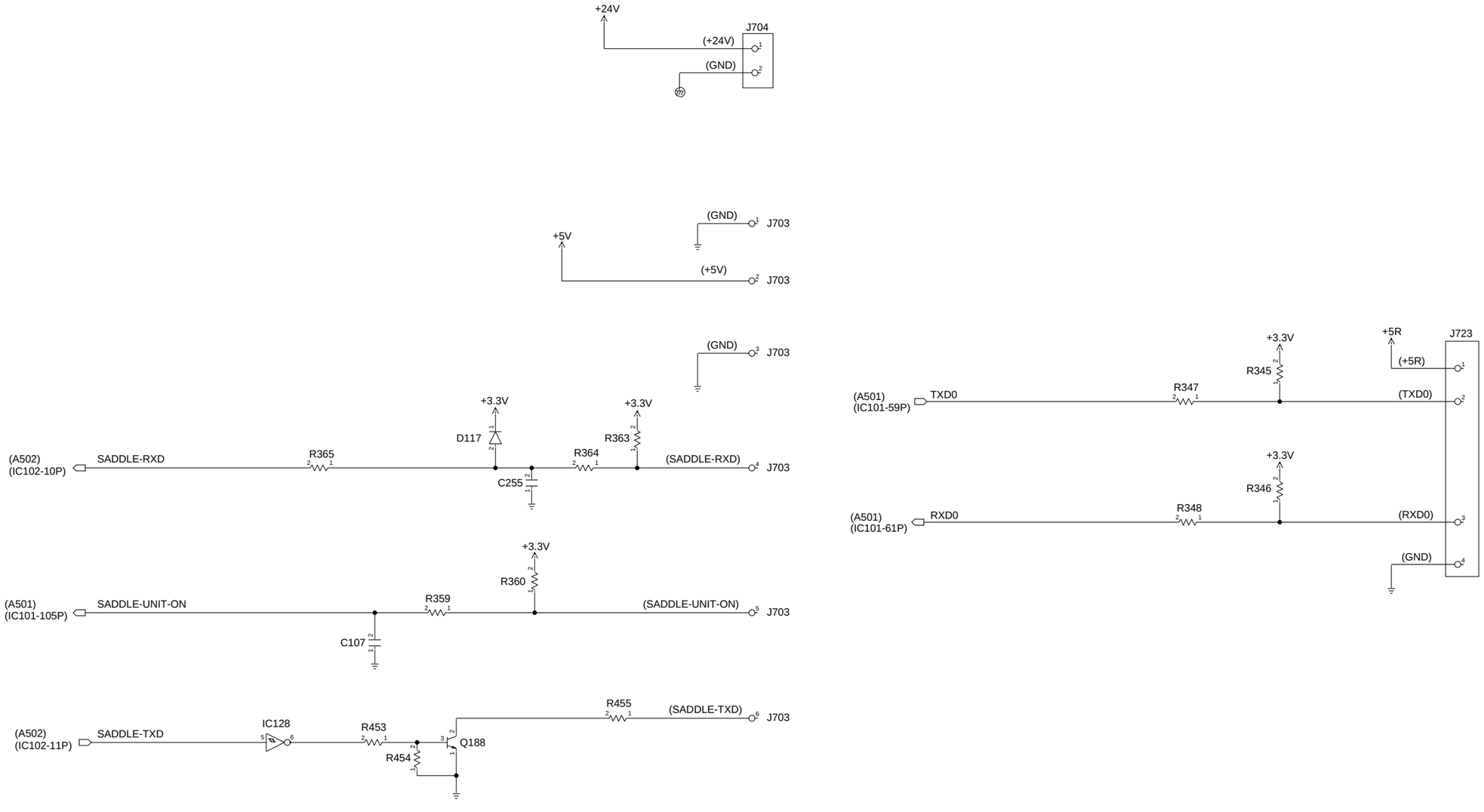


3.11 Finisher Controller PCB (A511)



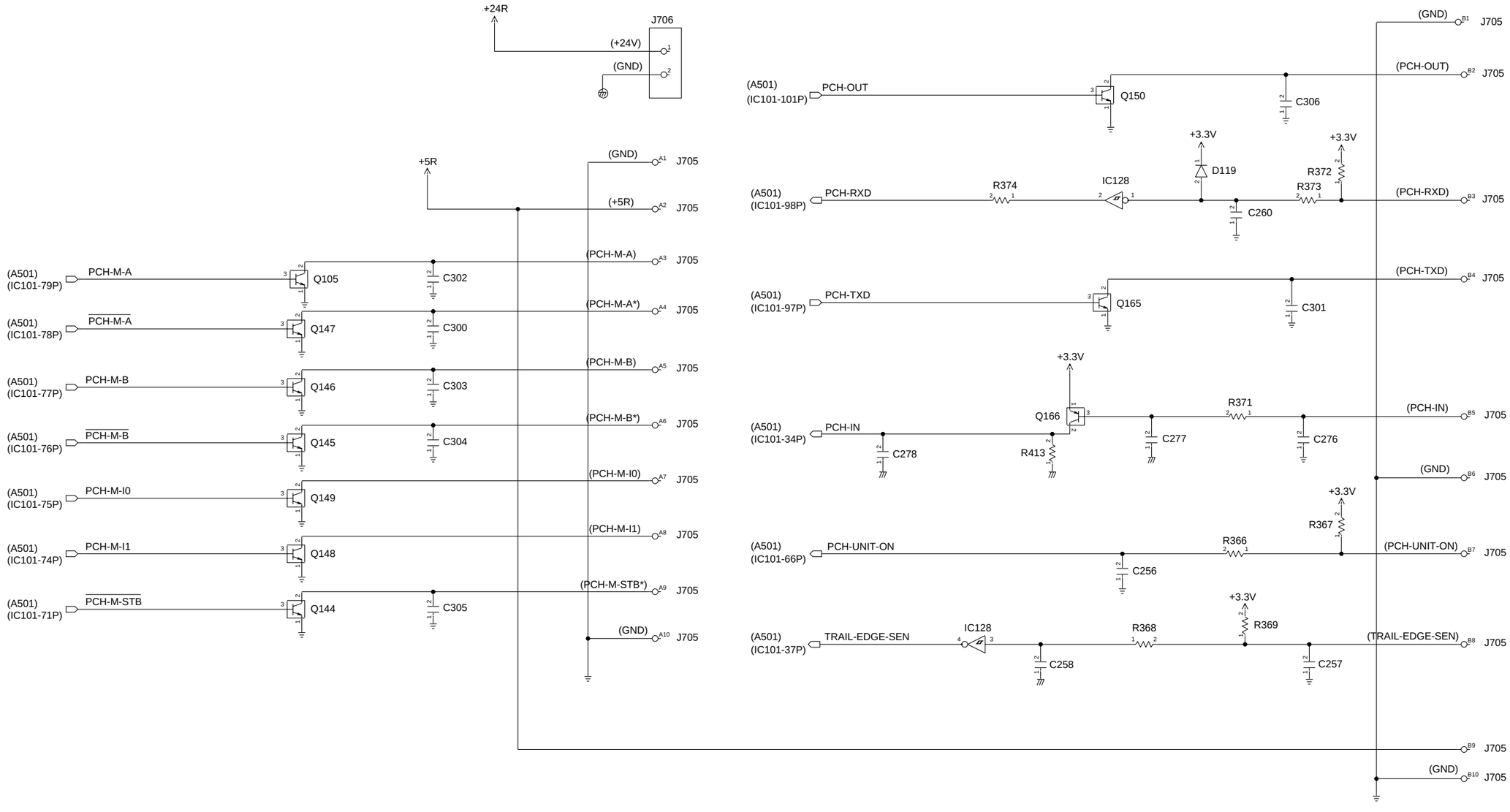
3.12 Finisher Controller PCB (A512)

SADDLE I/F

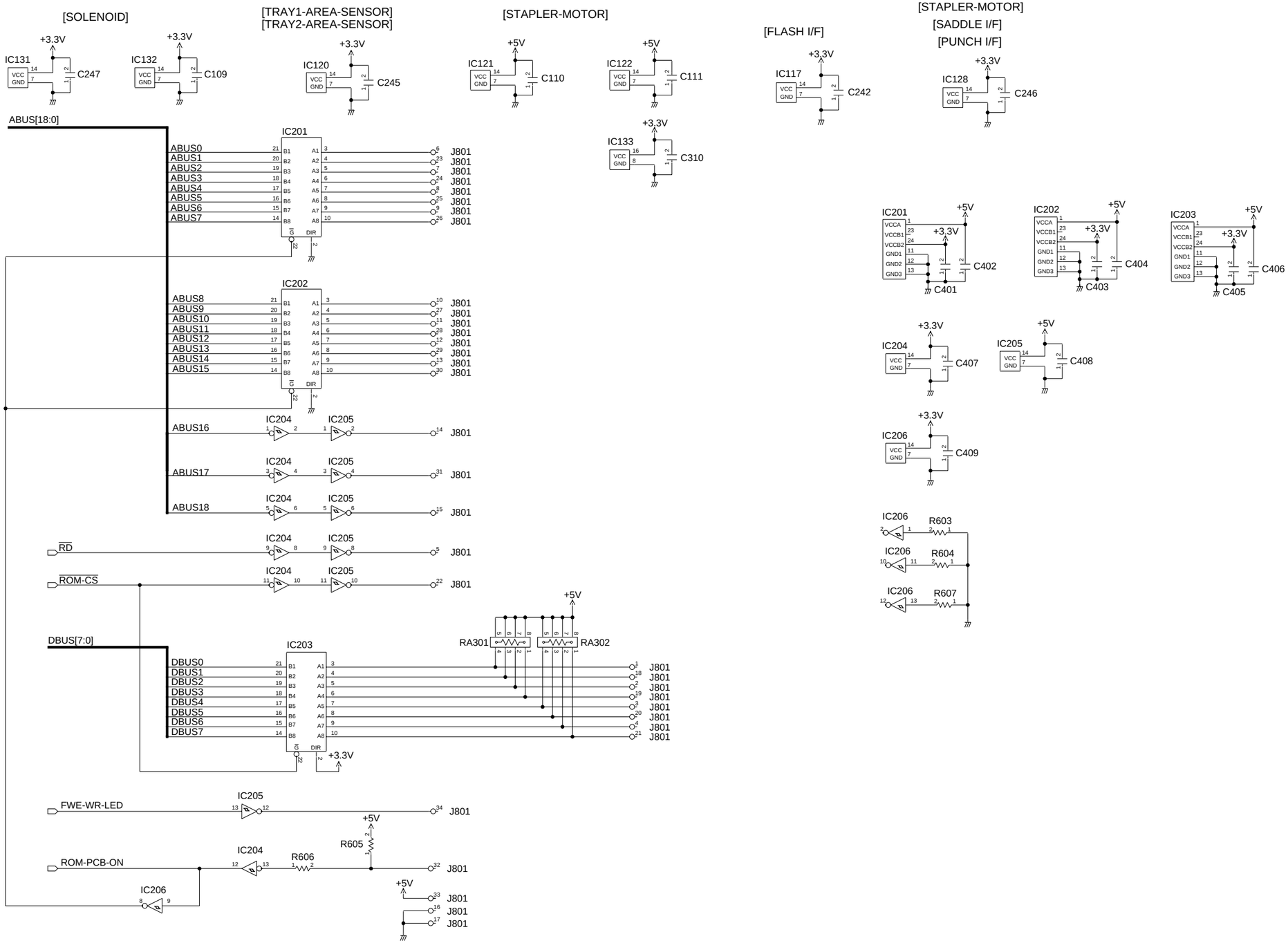


3.13 Finisher Controller PCB (A513)

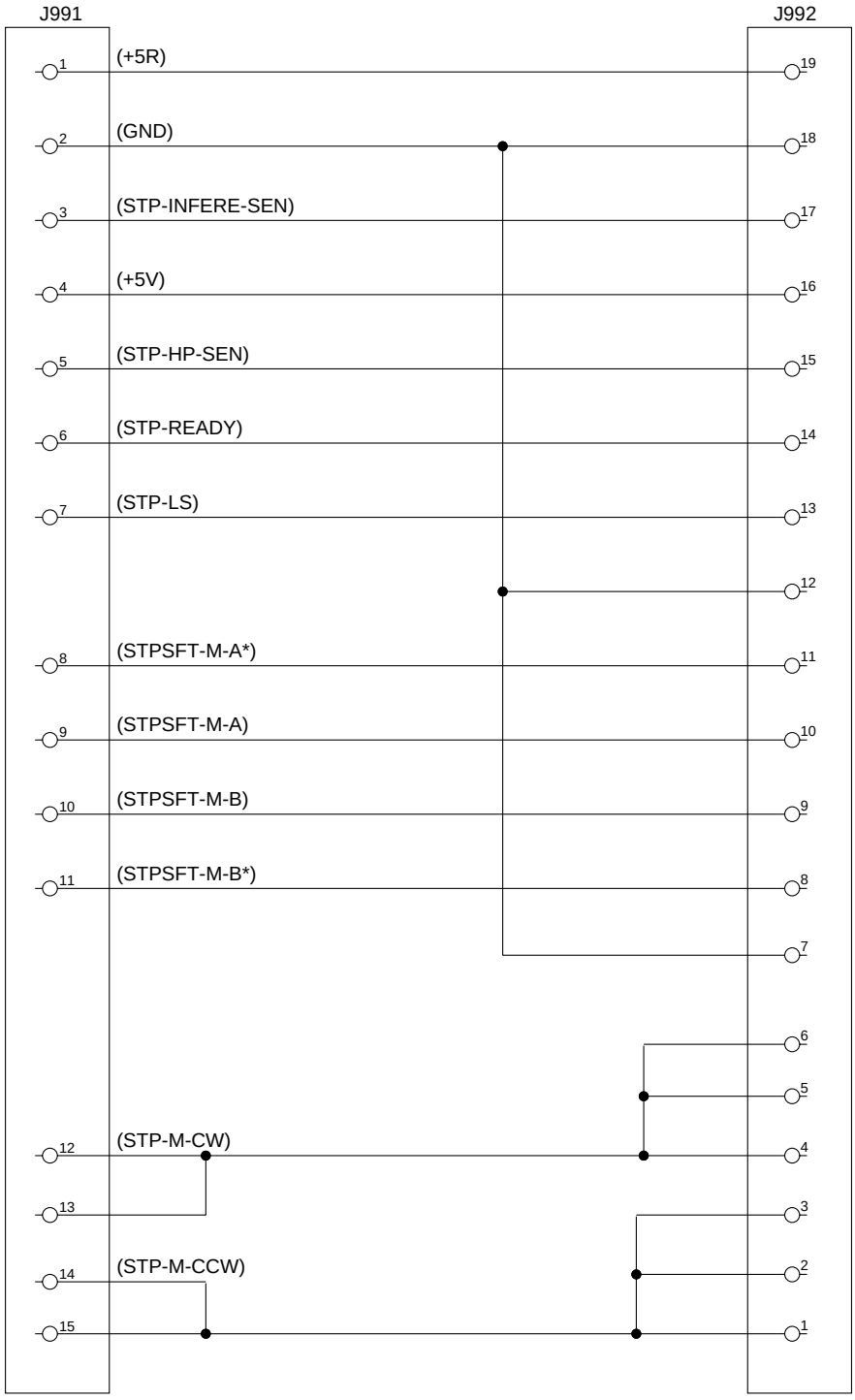
[SADDLE DRIVER PCB or PUNCH CONTROLLER PCB]



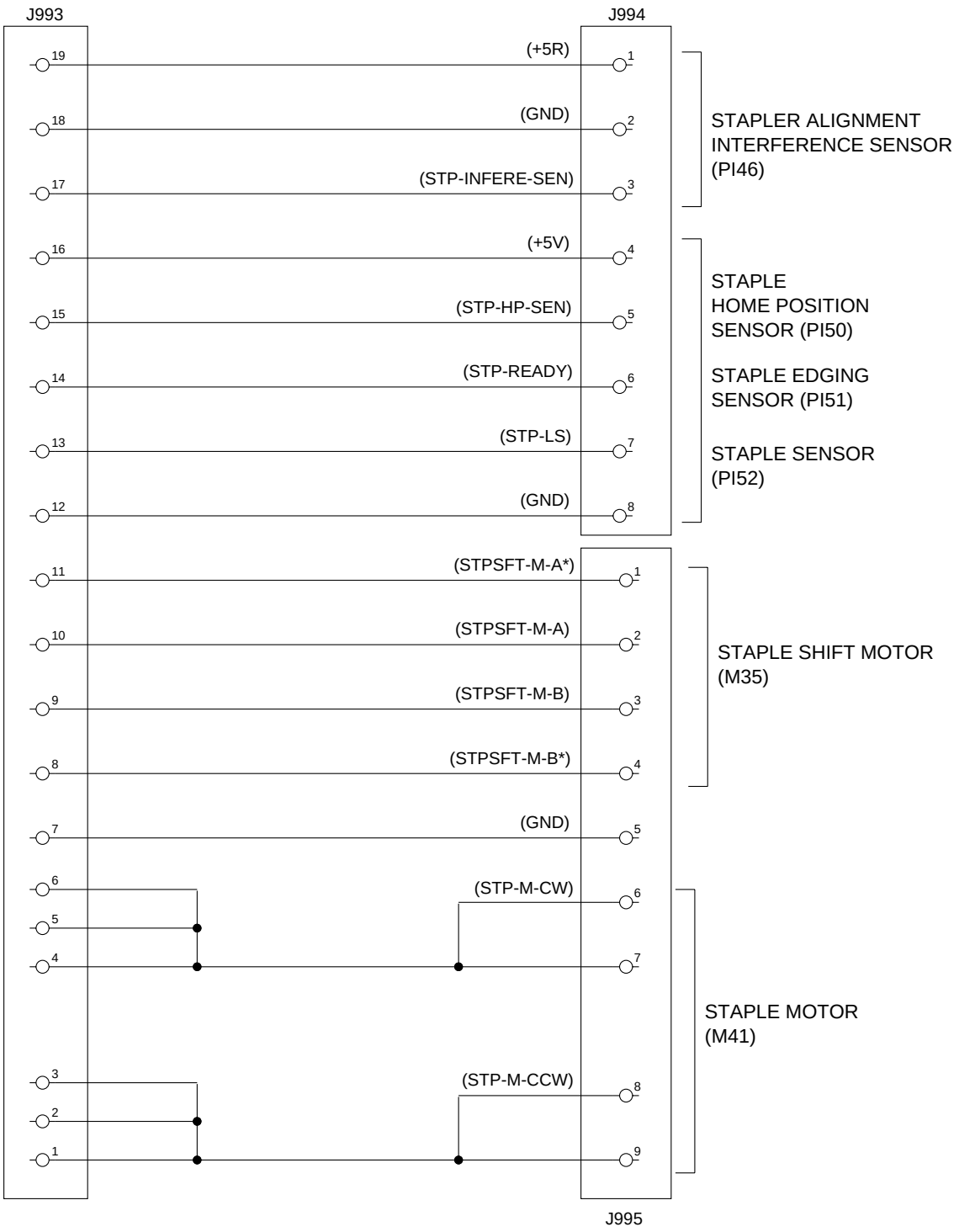
3.14 Finisher Controller PCB (A514)



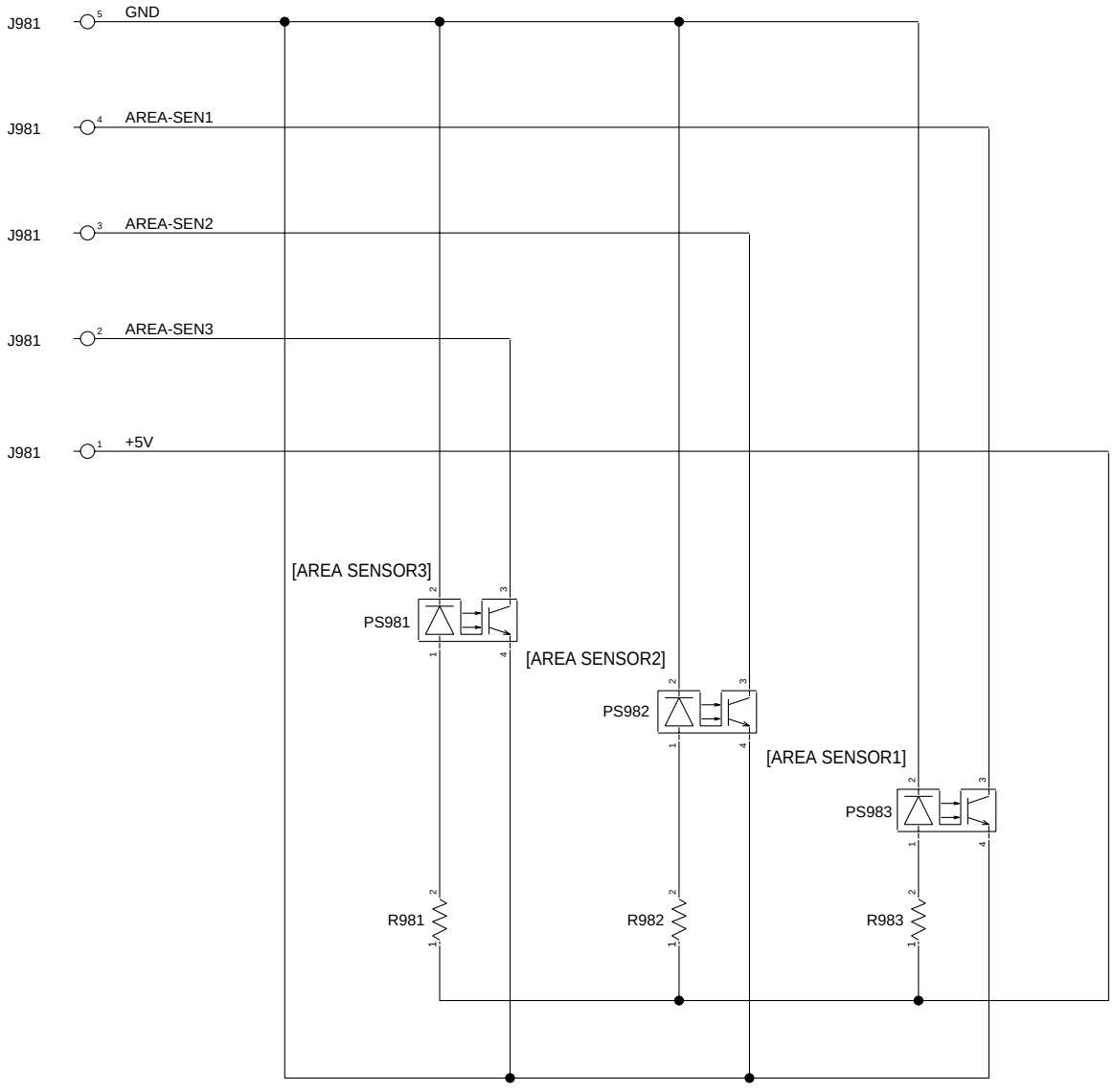
3.15 Stapler PCB1



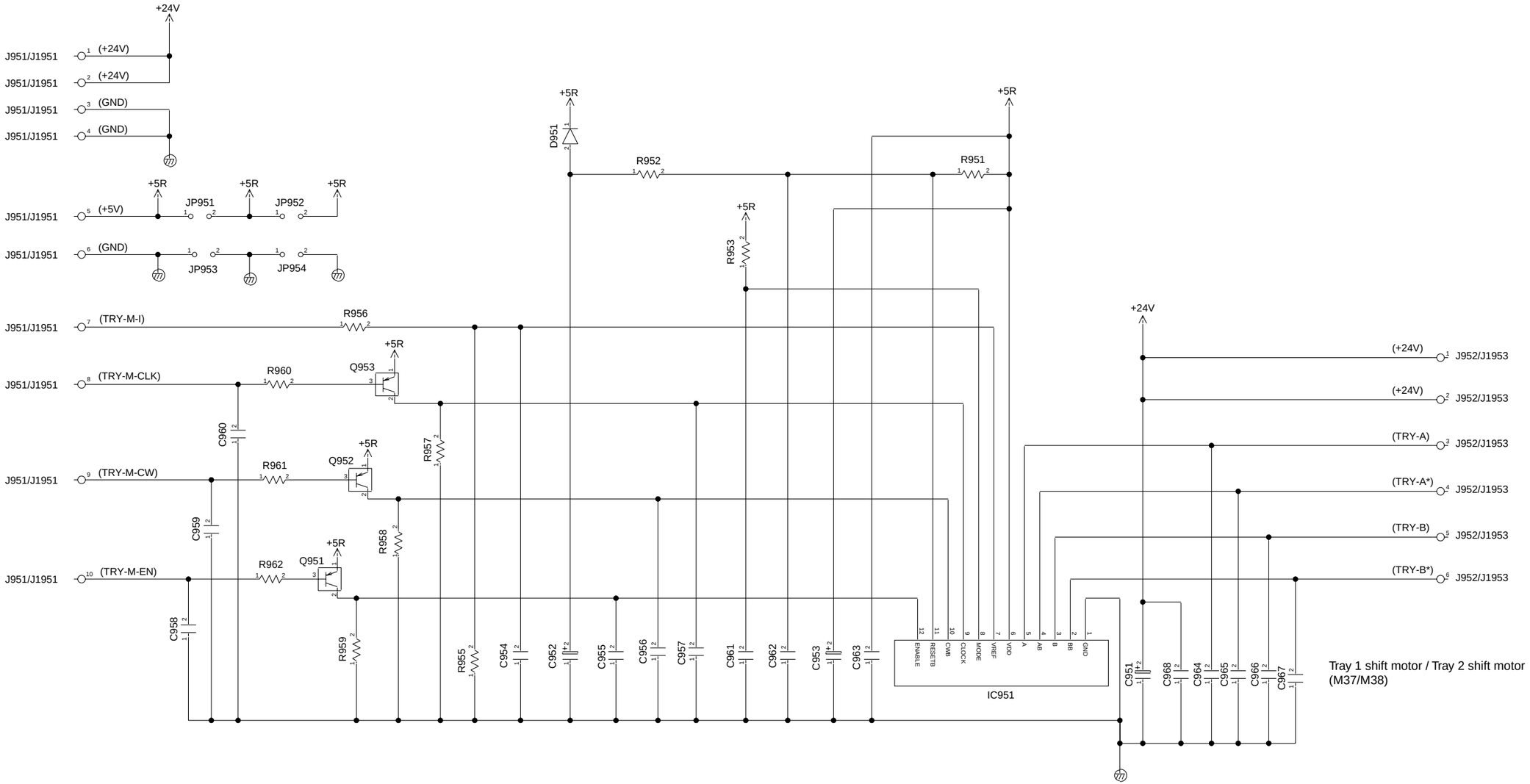
3.16 Stapler PCB2



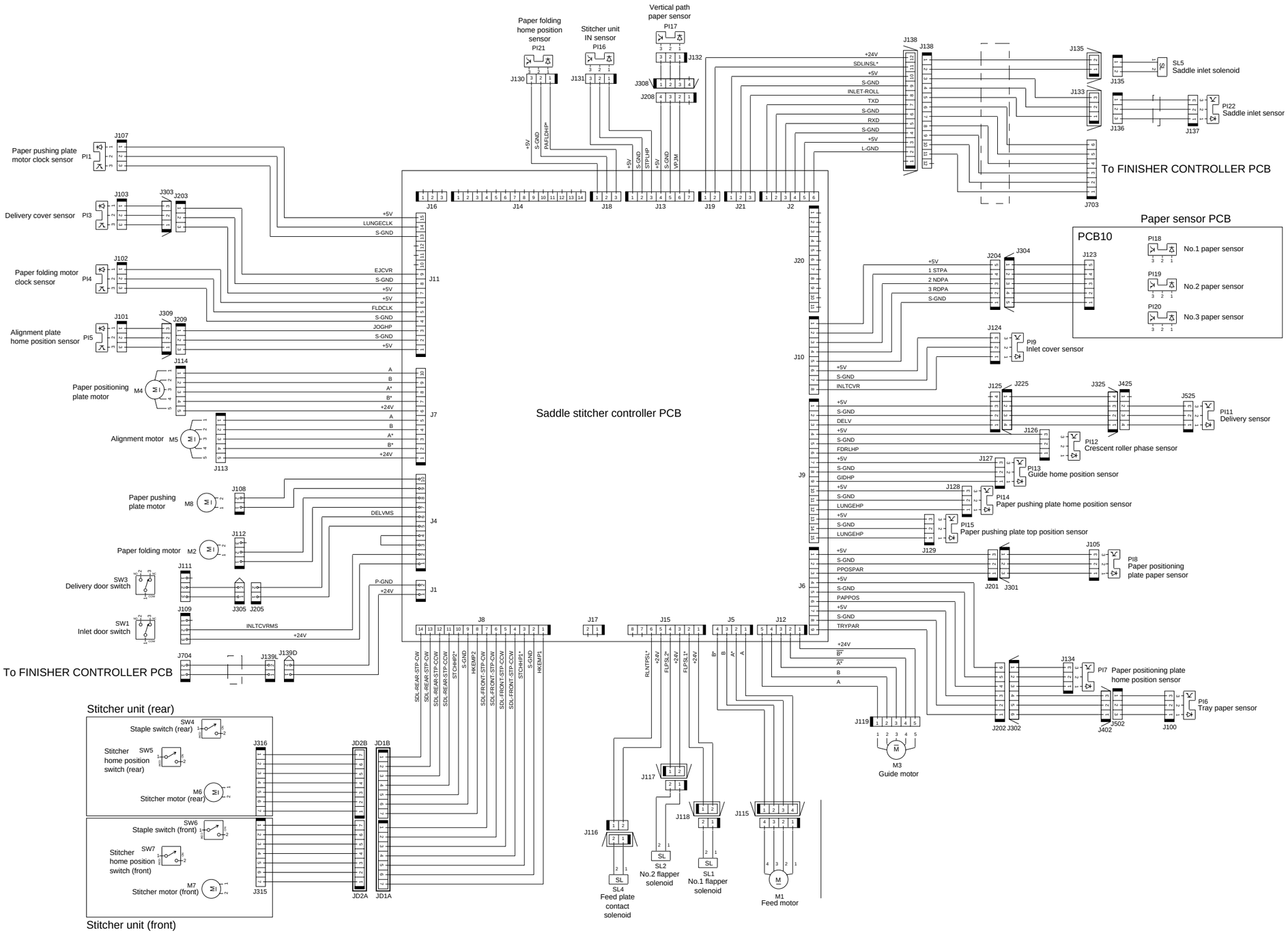
3.17 Tray1/Tray2 Shift Area Sensor PCB



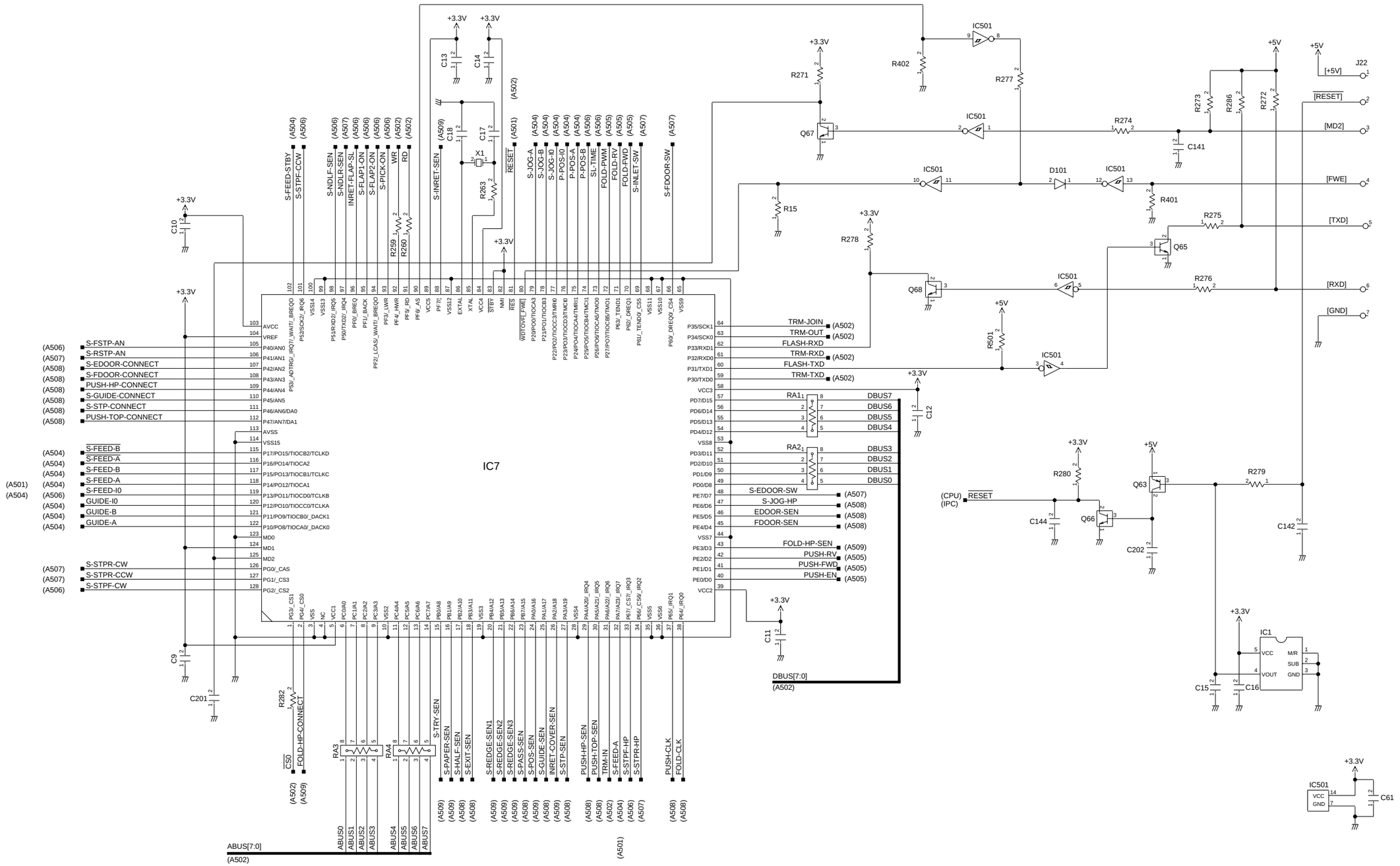
3.18 Tray1/Tray2 Driver PCB



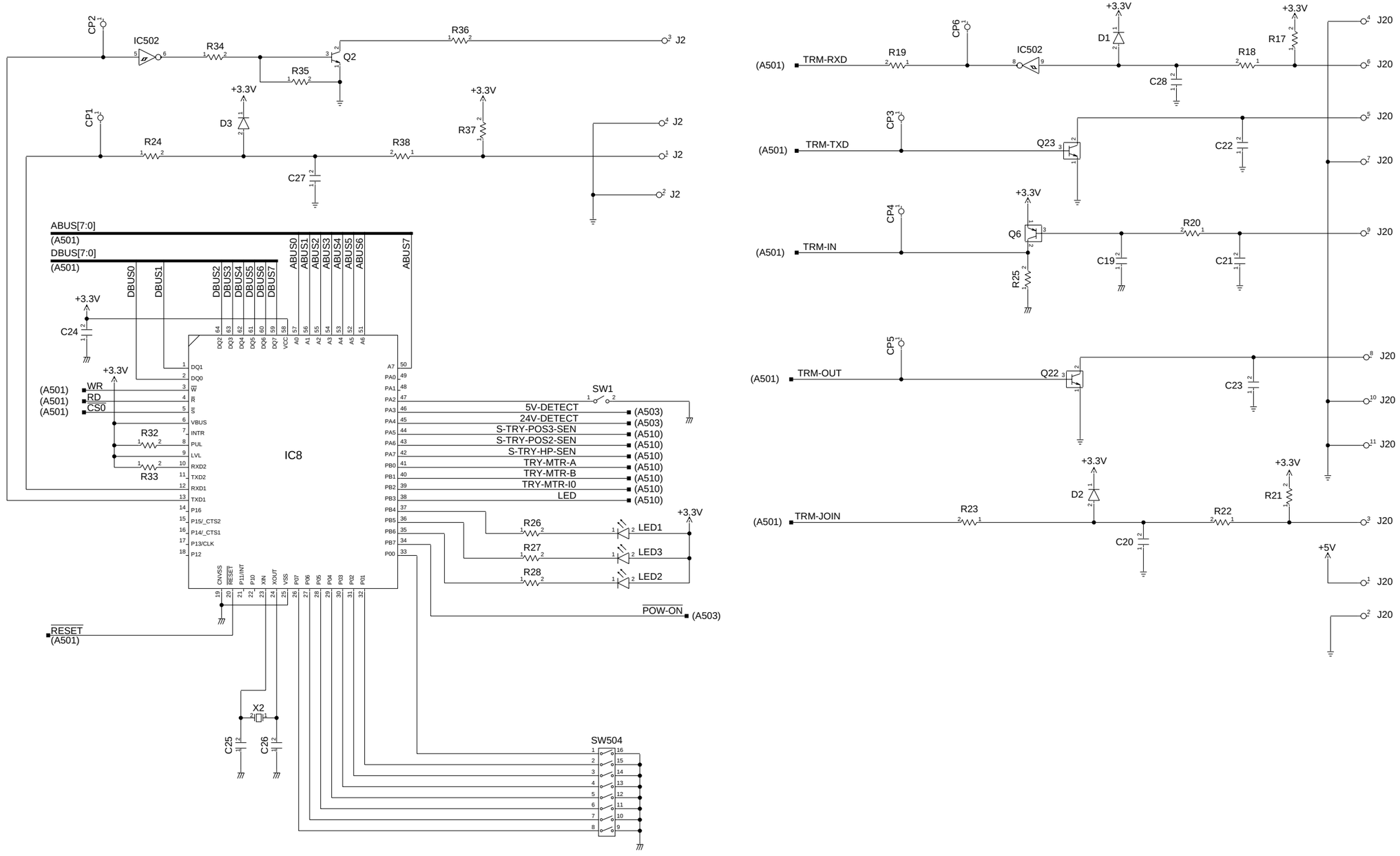
4 Saddle Stitcher Unit Circuit Diagram



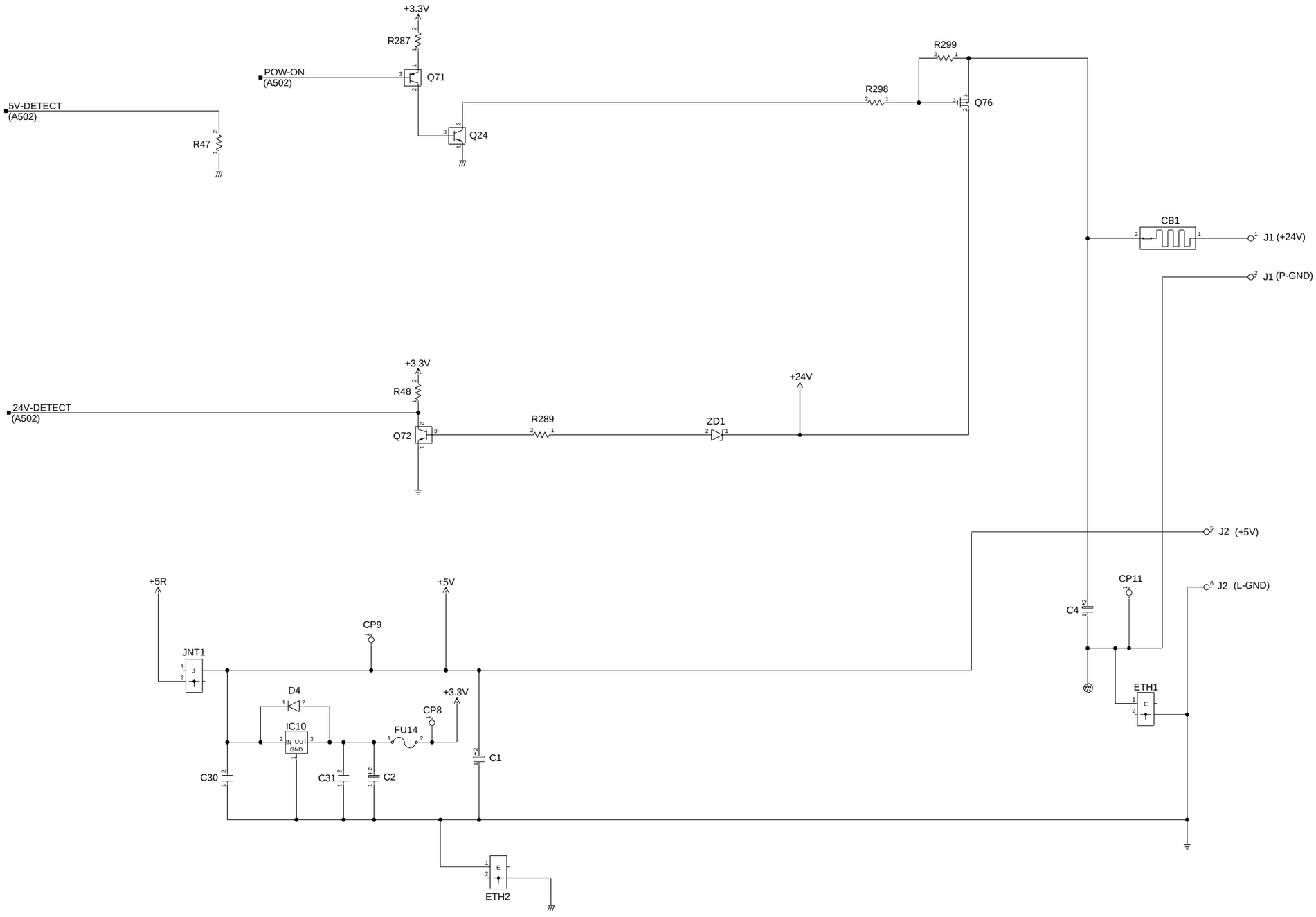
4.1 Saddle Stitcher Controller PCB (A501)



4.2 Saddle Stitcher Controller PCB (A502)

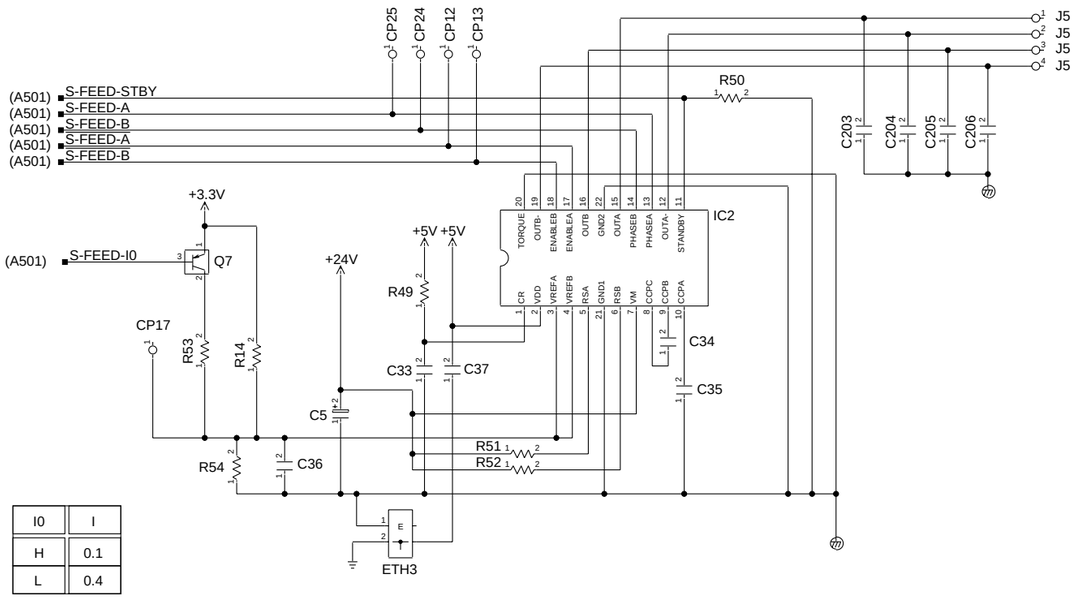


4.3 Saddle Stitcher Controller PCB (A503)

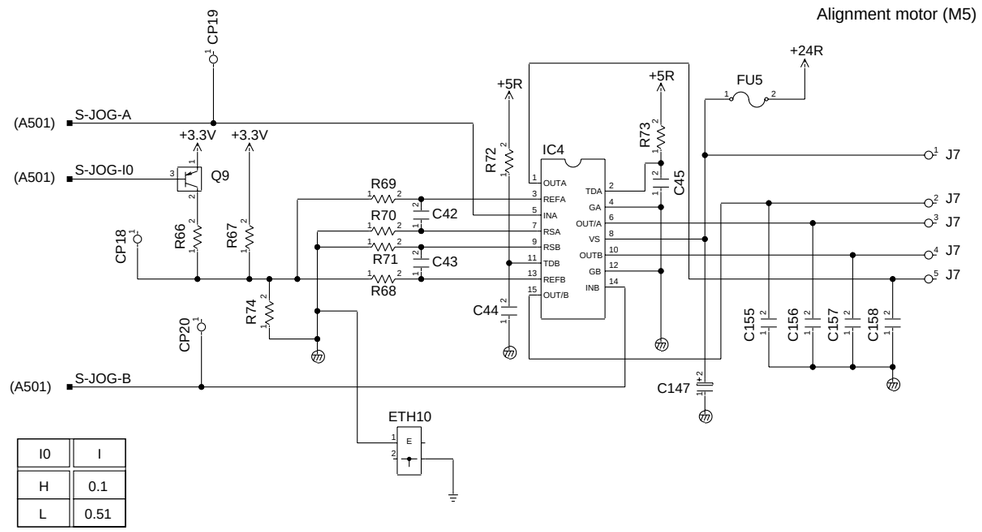


4.4 Saddle Stitcher Controller PCB (A504)

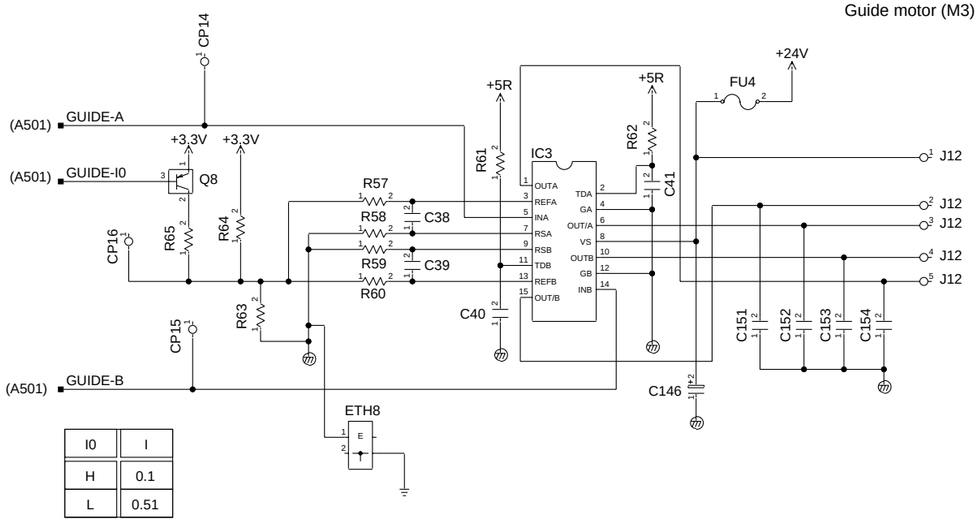
Feed motor (M1)



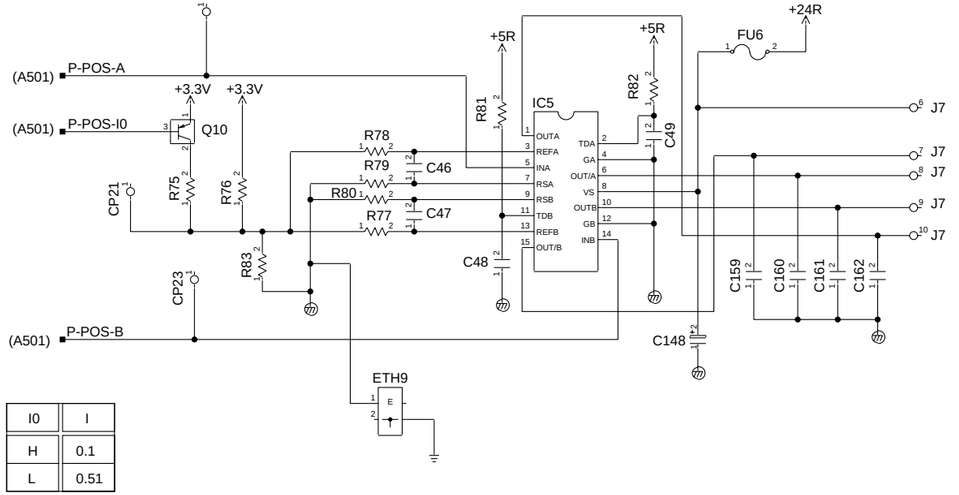
Alignment motor (M5)



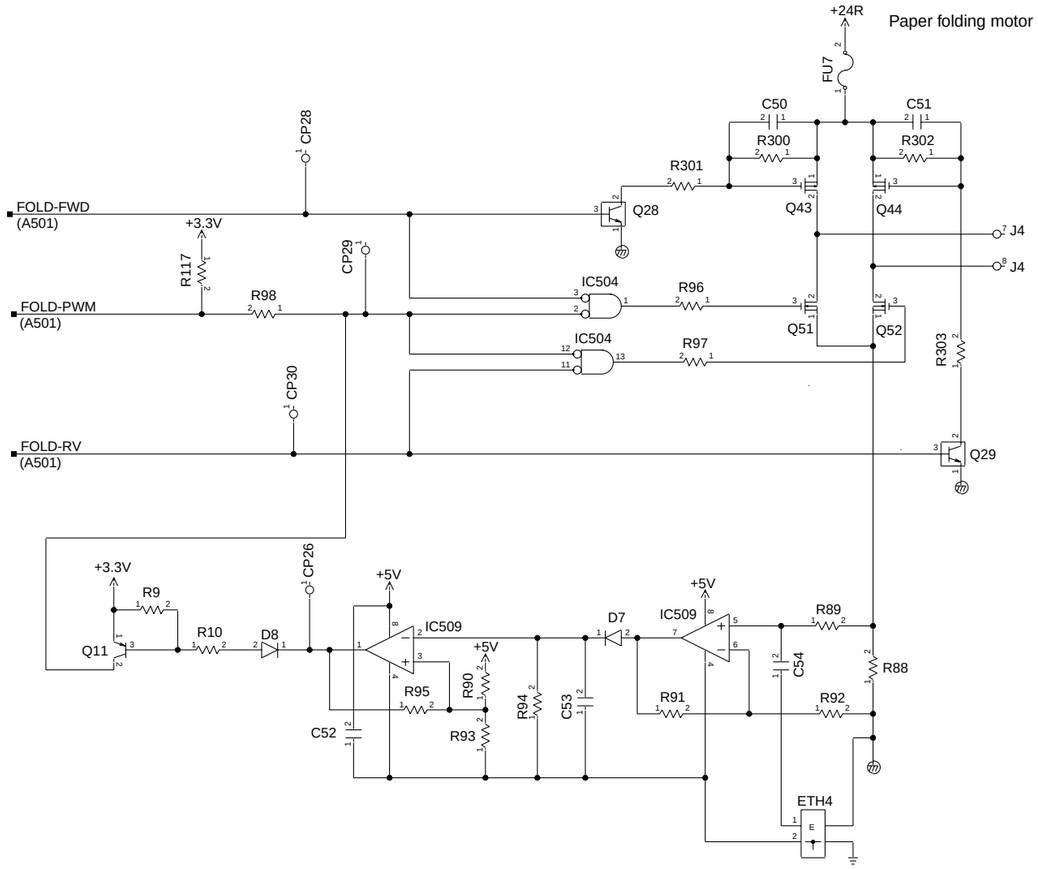
Guide motor (M3)

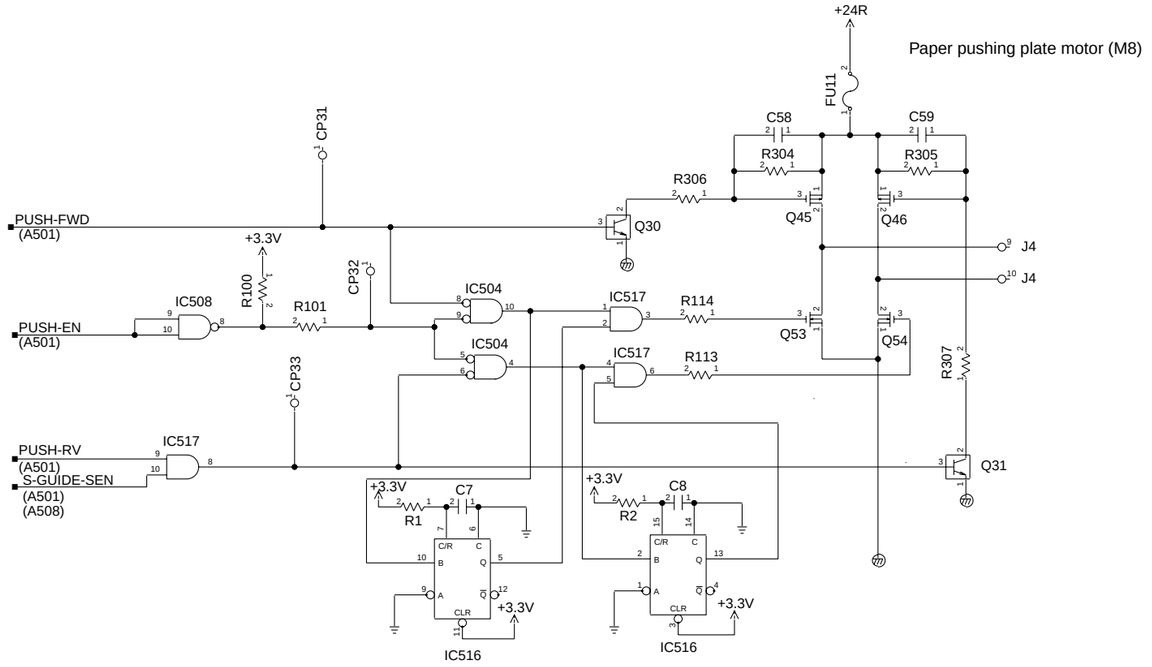


Paper positioning plate motor (M4)

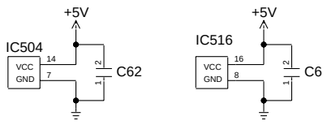


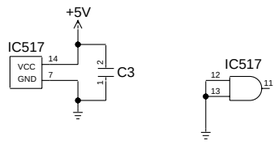
4.5 Saddle Stitcher Controller PCB (A505)





CW	CCW	PWM	Q534	Q535	Q542	Q543	
H	H	L	○	○	×	×	
H	H	H	○	○	×	×	
H	L	L	○	×	×	○	(CW)
H	L	H	○	×	×	×	(F.H)
L	H	L	×	○	○	×	(CCW)
L	H	H	×	○	×	×	(F.H)
L	L	L	×	×	○	○	
L	L	H	×	×	×	×	

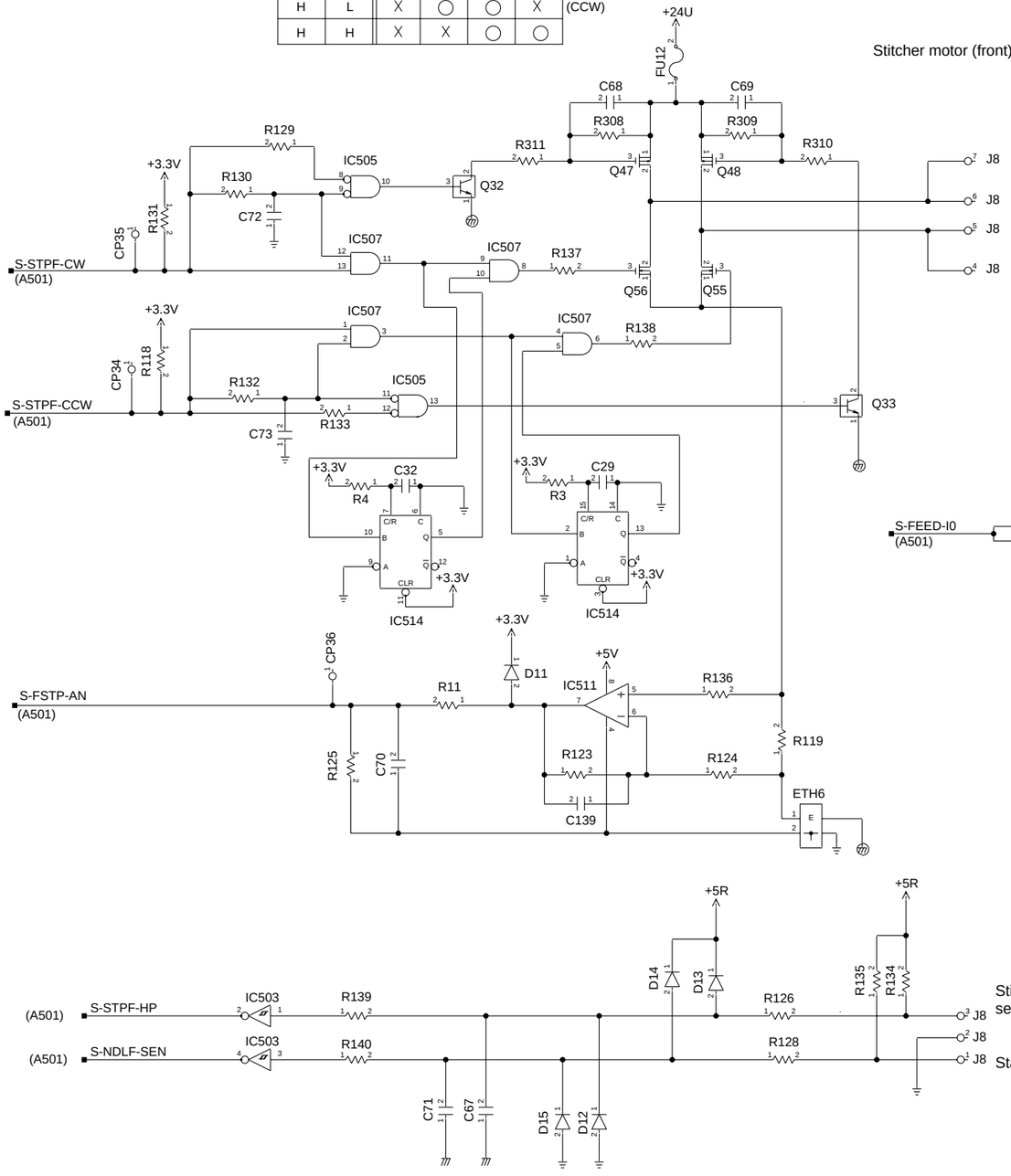




CW	CCW	EN	Q536	Q537	Q544	Q545	
H	H	H	○	○	×	×	
H	H	L	○	○	×	×	
H	L	H	○	×	×	○	(CW)
H	L	L	○	×	×	×	(F.H)
L	H	H	×	○	○	×	(CCW)
L	H	L	×	○	×	×	(F.H)
L	L	H	×	×	○	○	
L	L	L	×	×	×	×	

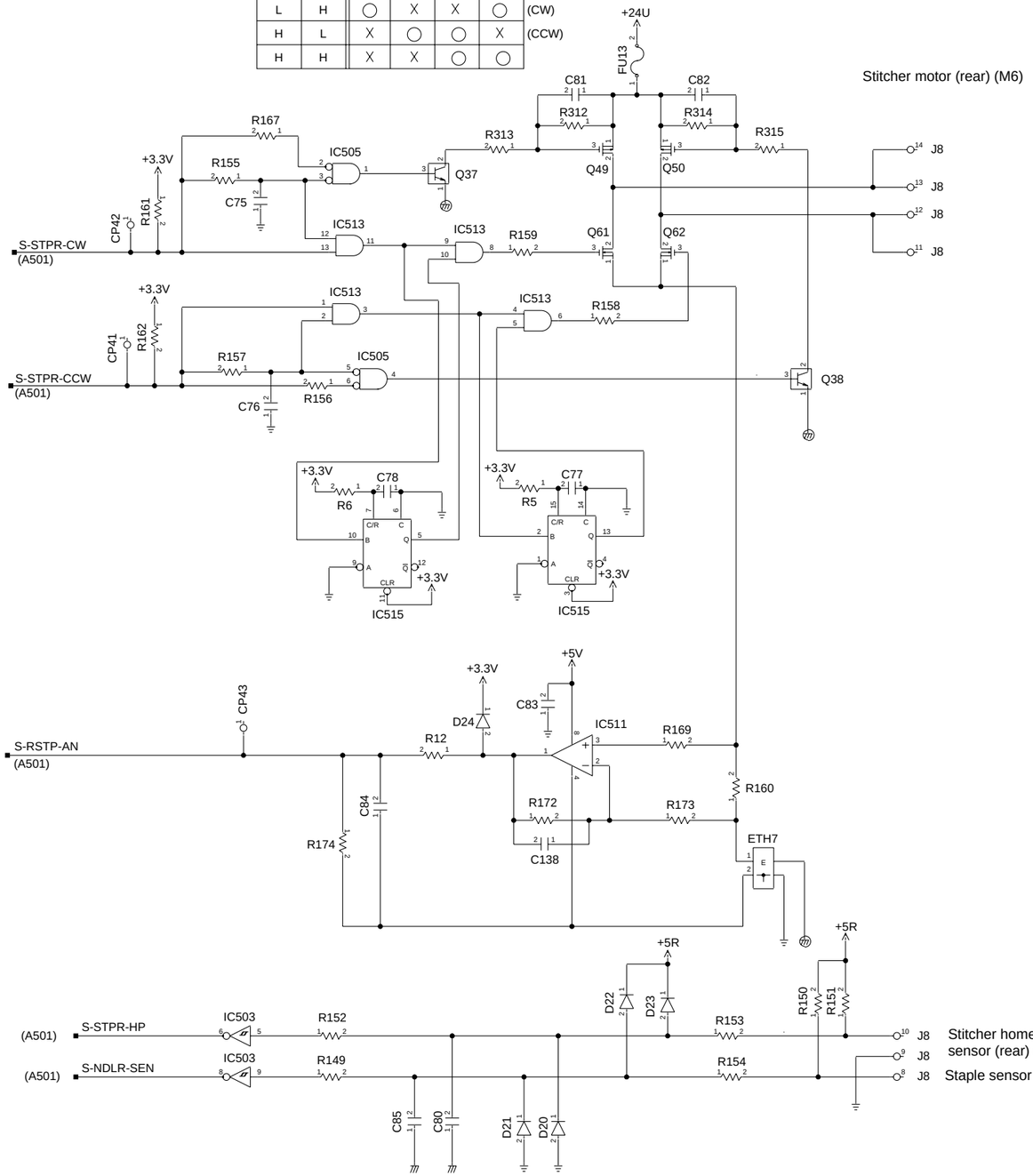
4.6 Saddle Stitcher Controller PCB (A506)

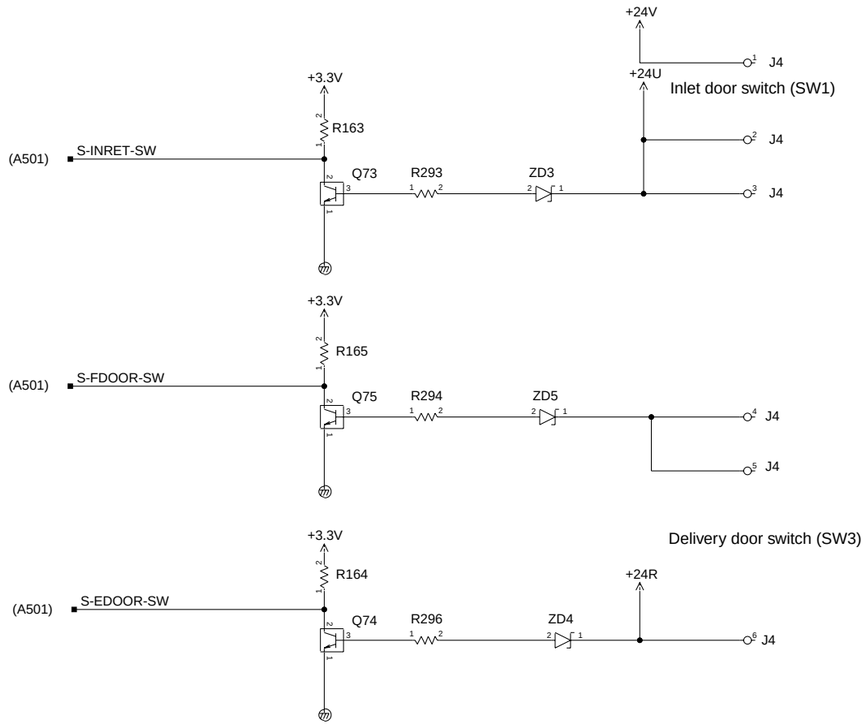
CW	CCW	Q540	Q541	Q548	Q549	
L	L	○	○	X	X	
L	H	○	X	X	○	(CW)
H	L	X	○	○	X	(CCW)
H	H	X	X	○	○	

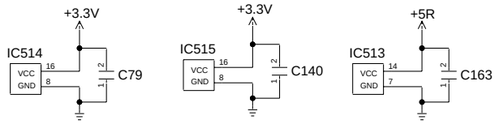


4.7 Saddle Stitcher Controller PCB (A507)

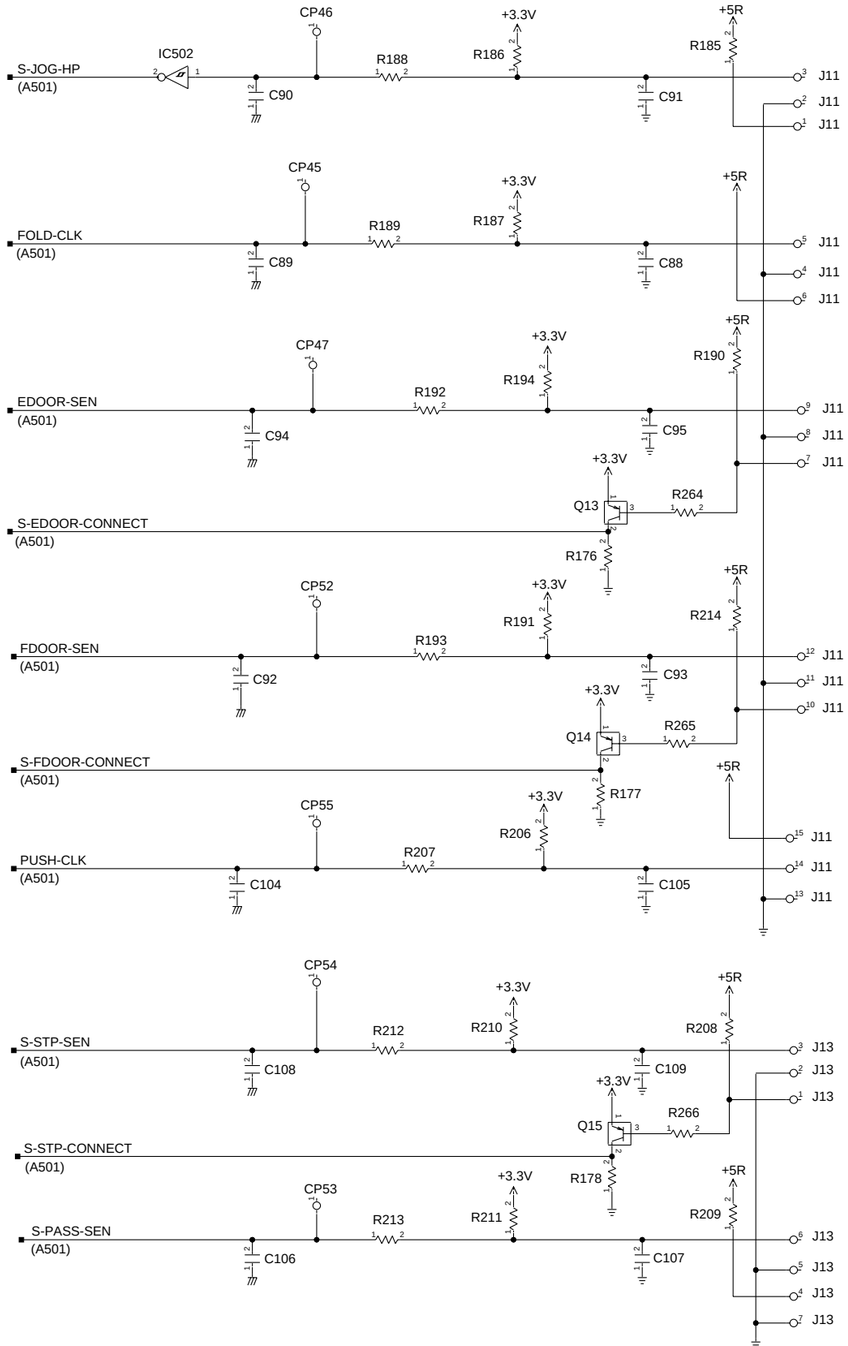
CW	CCW	Q540	Q541	Q548	Q549	
L	L	○	○	X	X	
L	H	○	X	X	○	(CW)
H	L	X	○	○	X	(CCW)
H	H	X	X	○	○	



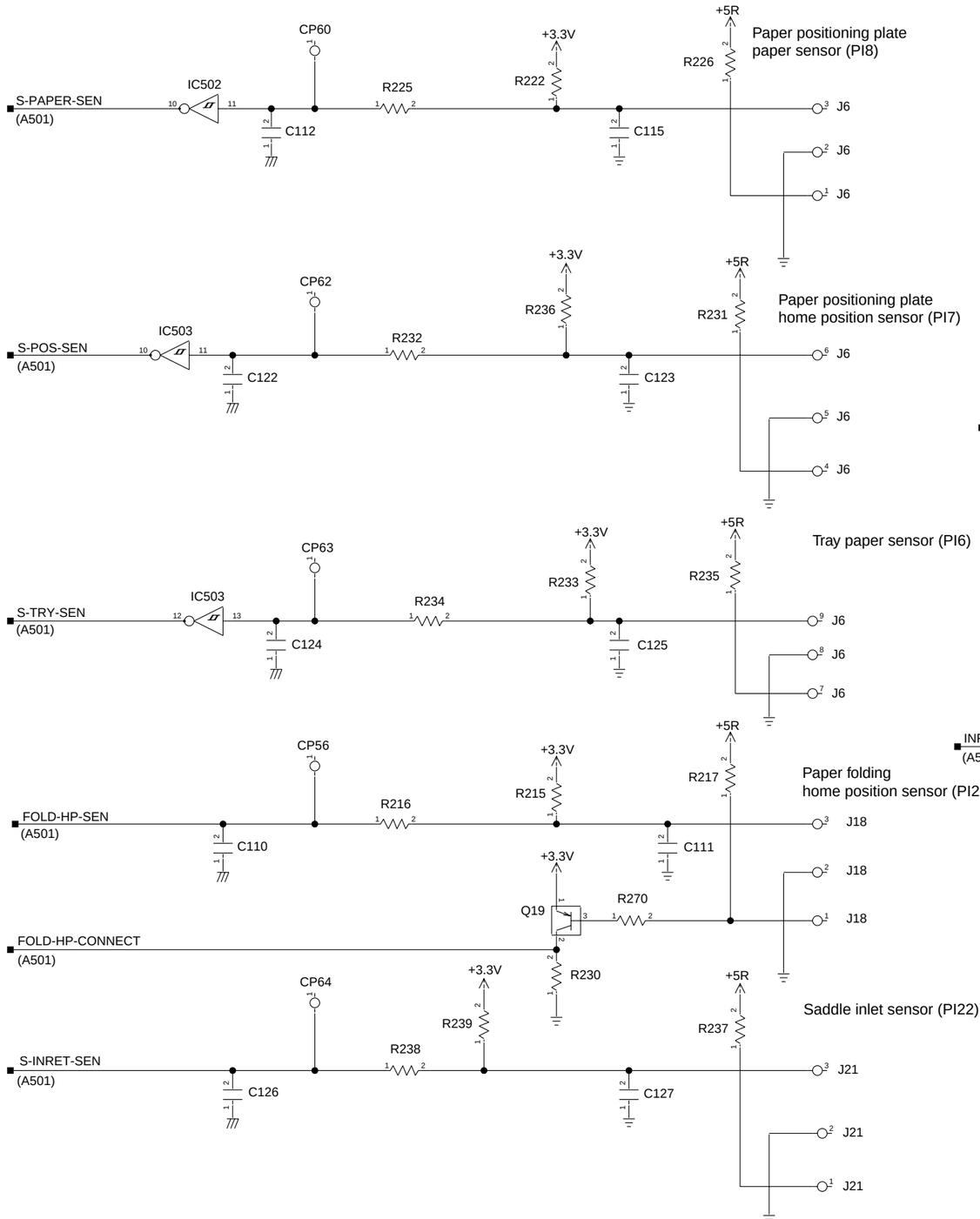




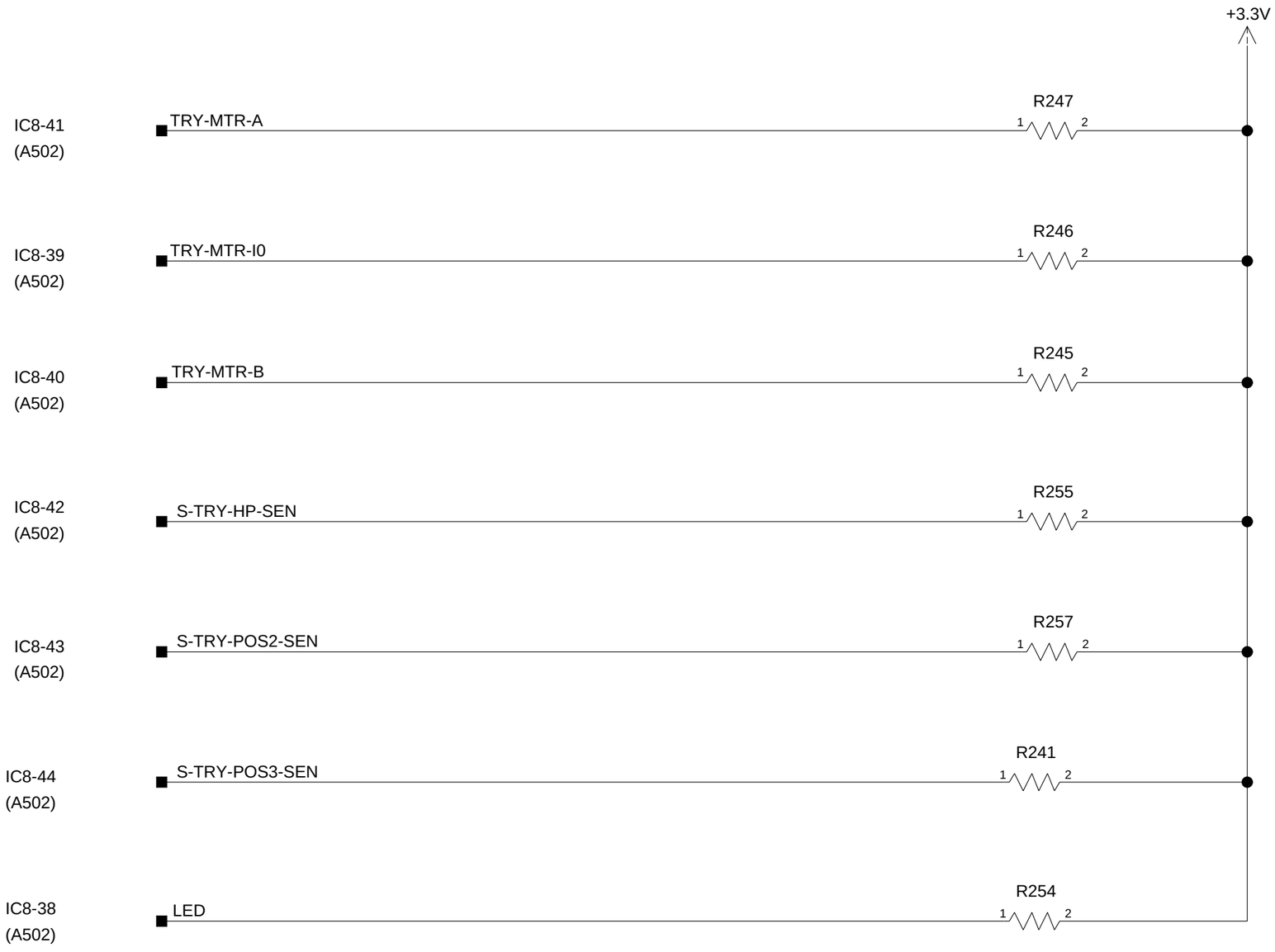
4.8 Saddle Stitcher Controller PCB (A508)



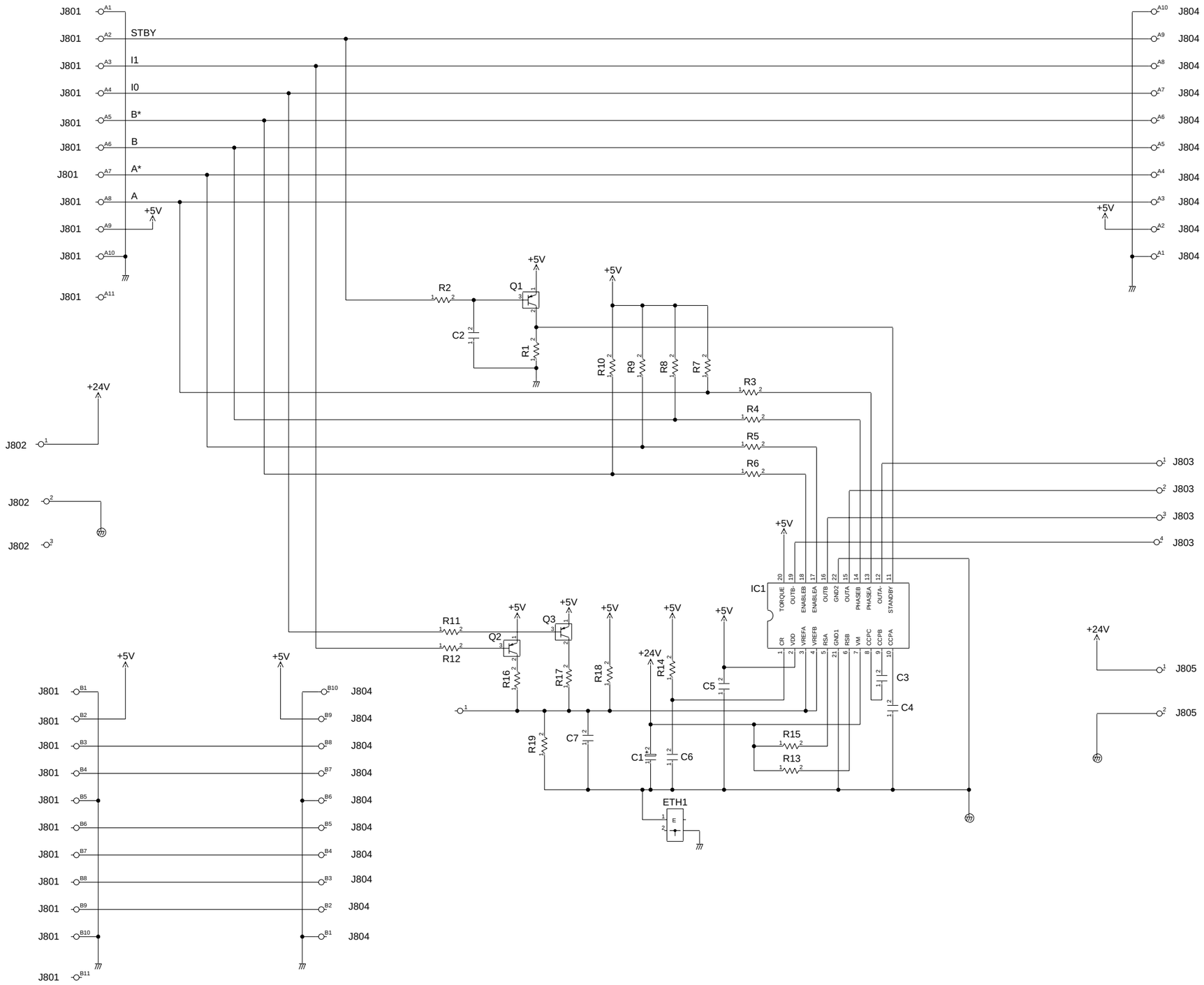
4.9 Saddle Stitcher Controller PCB (A509)



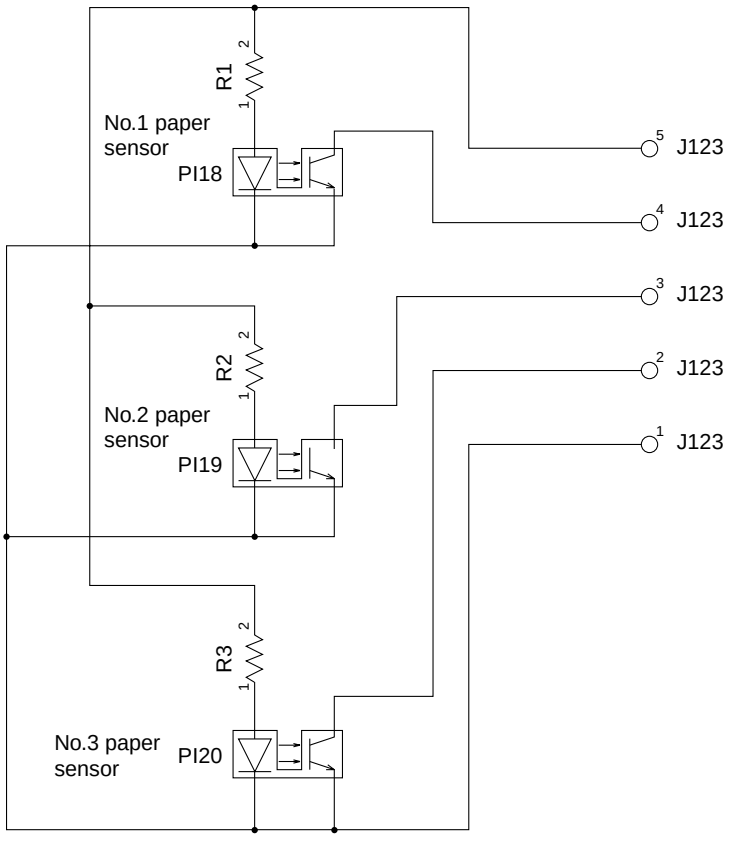
4.10 Saddle Stitcher Controller PCB (A510)



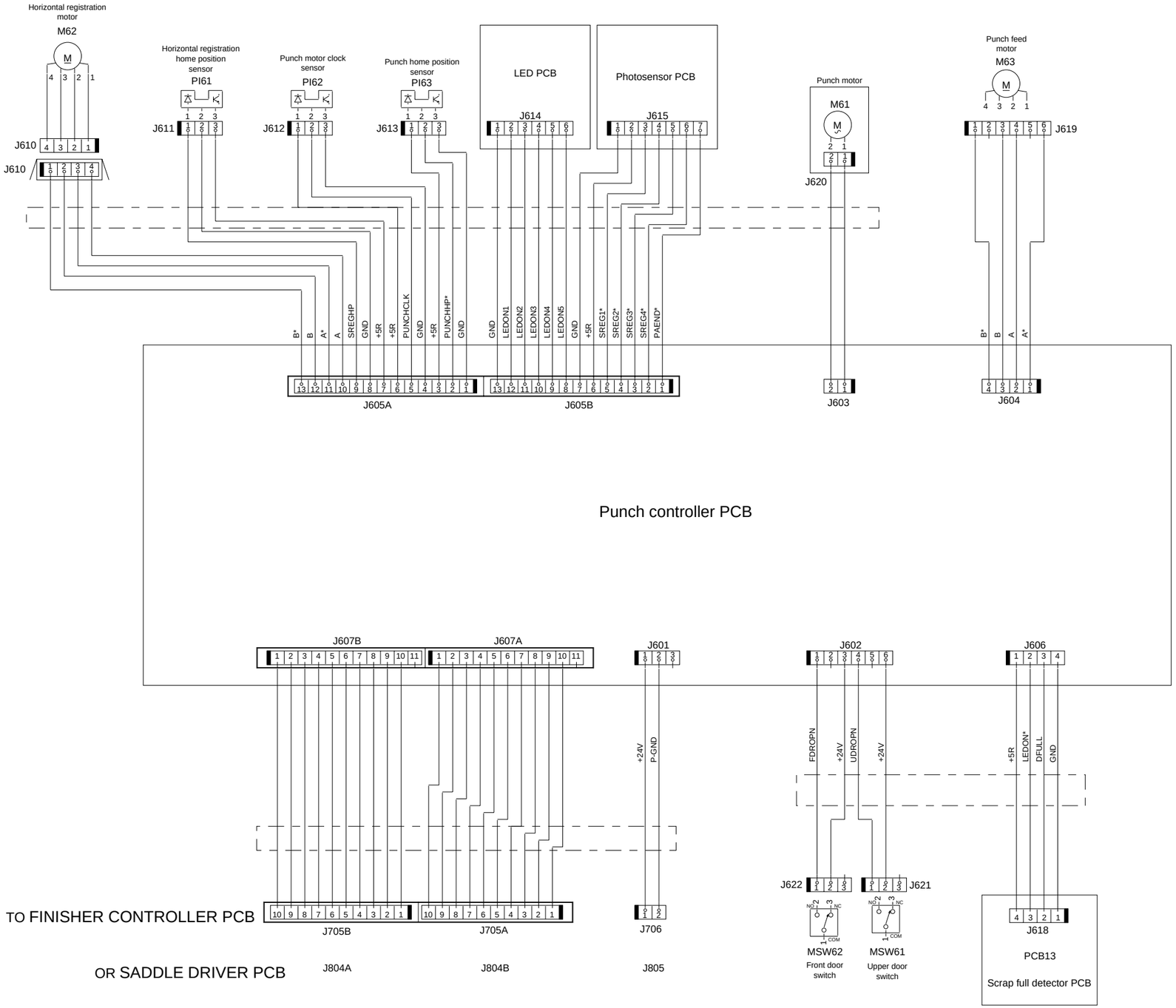
4.11 Saddle Driver PCB



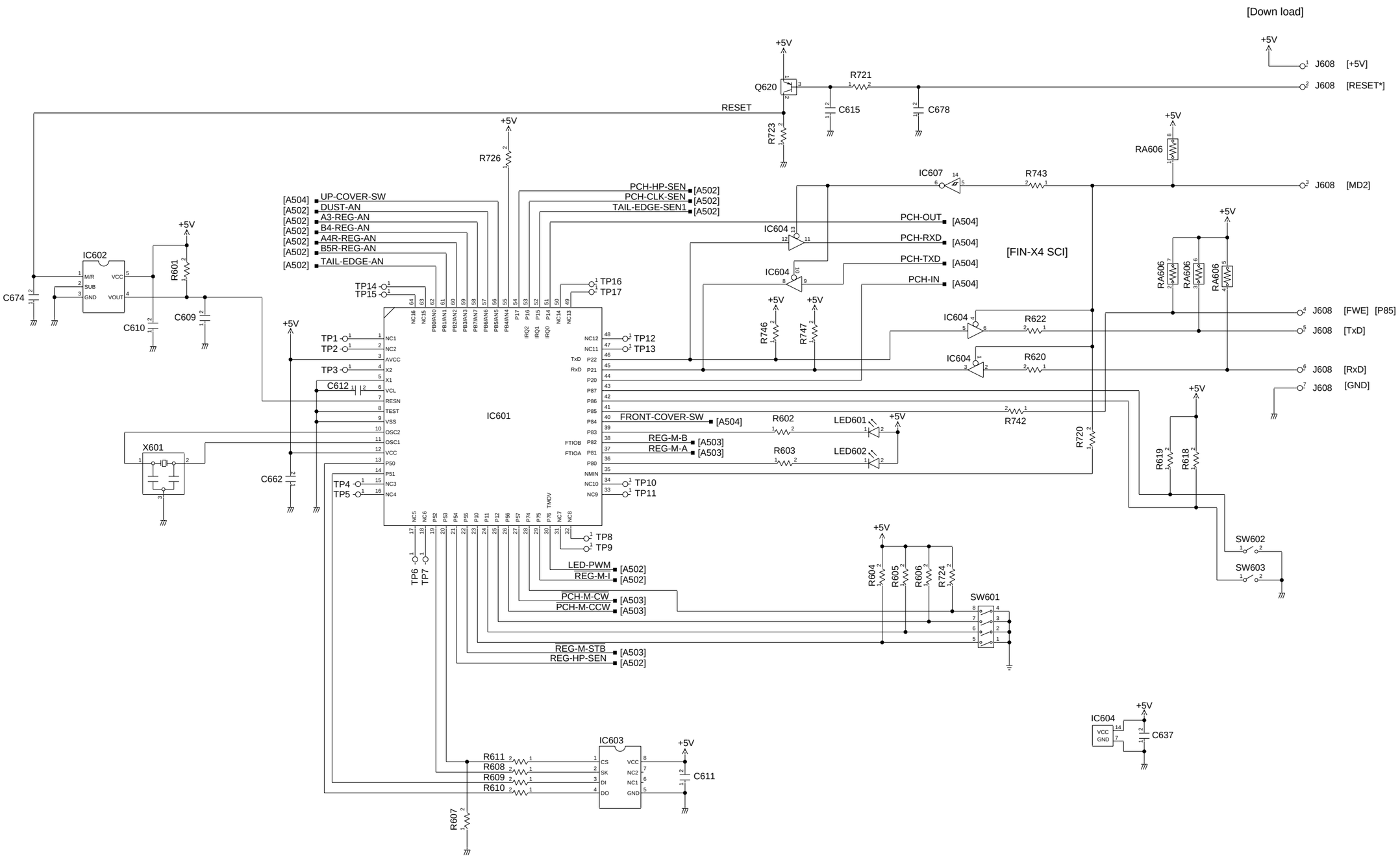
4.12 Paper Sensor PCB



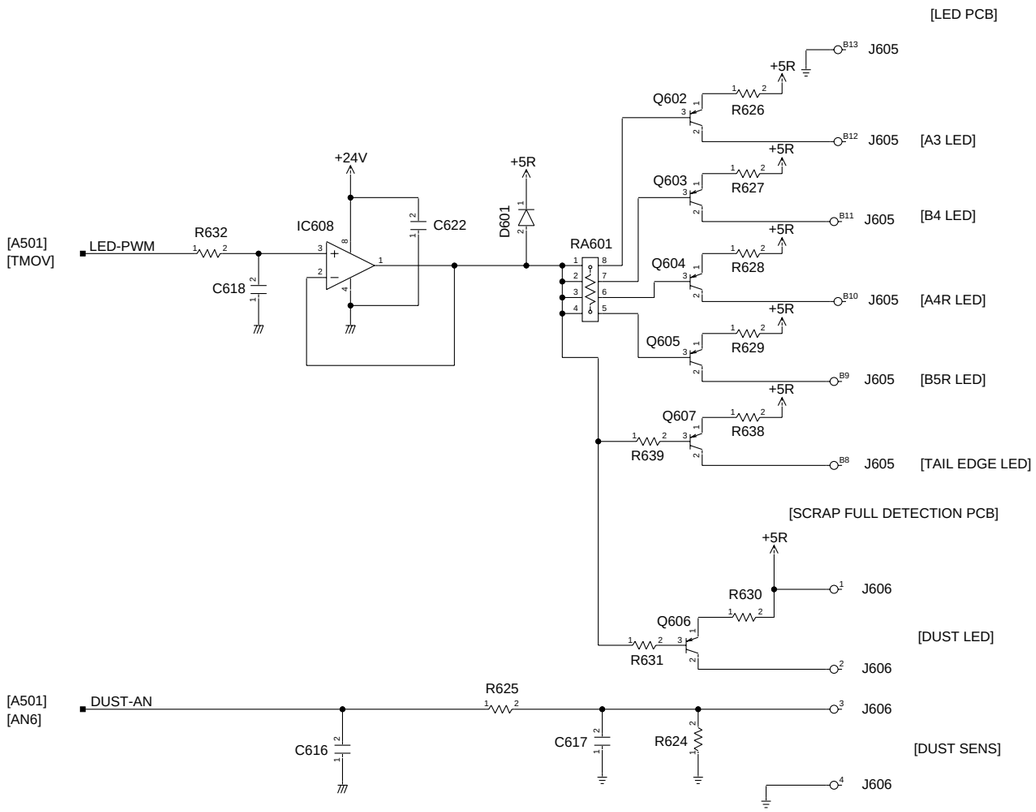
5 Puncher Unit General Circuit Diagram

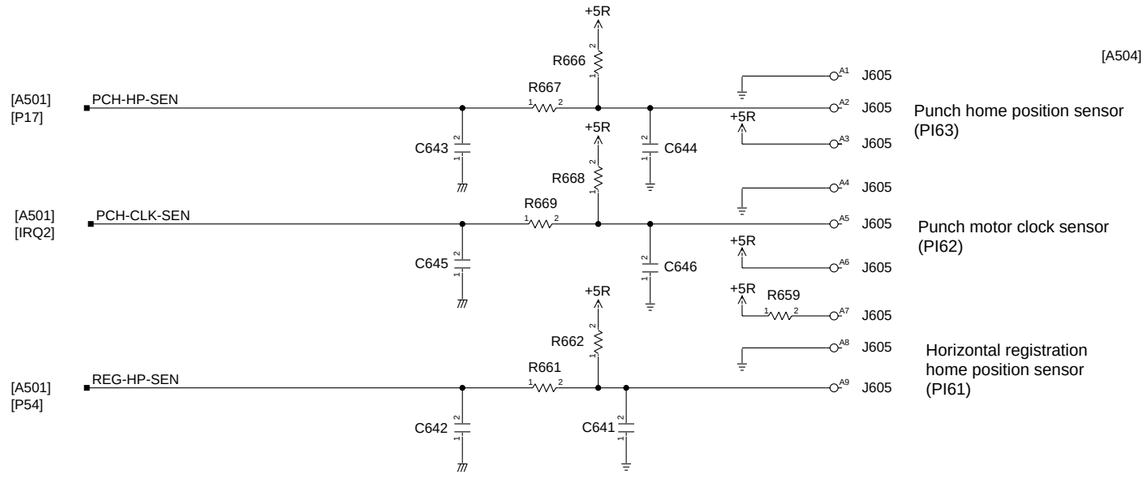


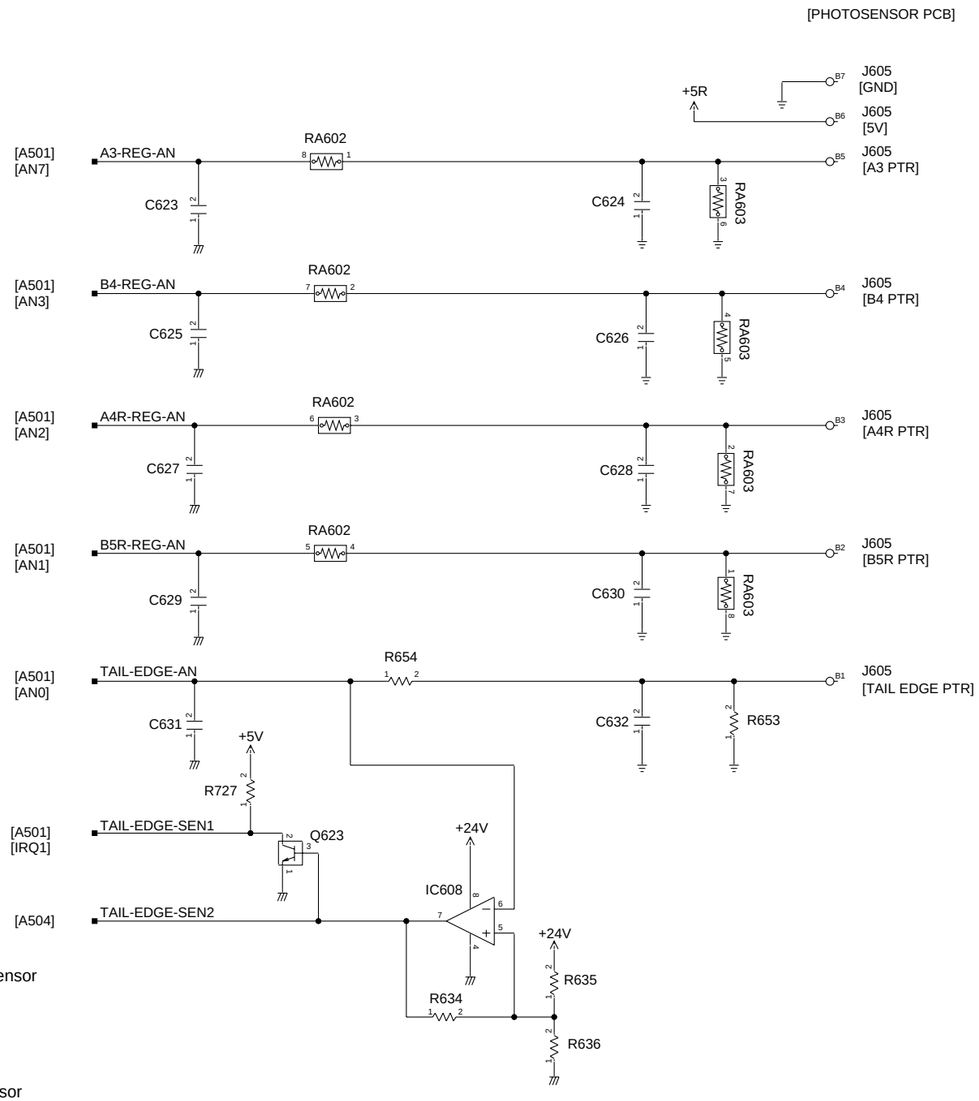
5.1 Punch Controller PCB (A501)



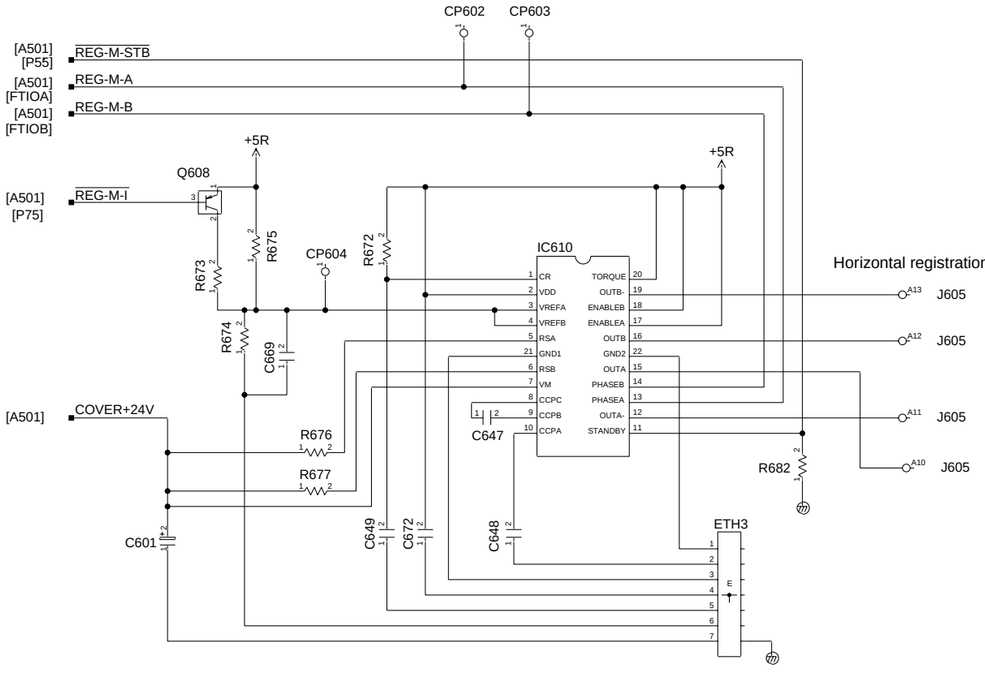
5.2 Punch Controller PCB (A502)

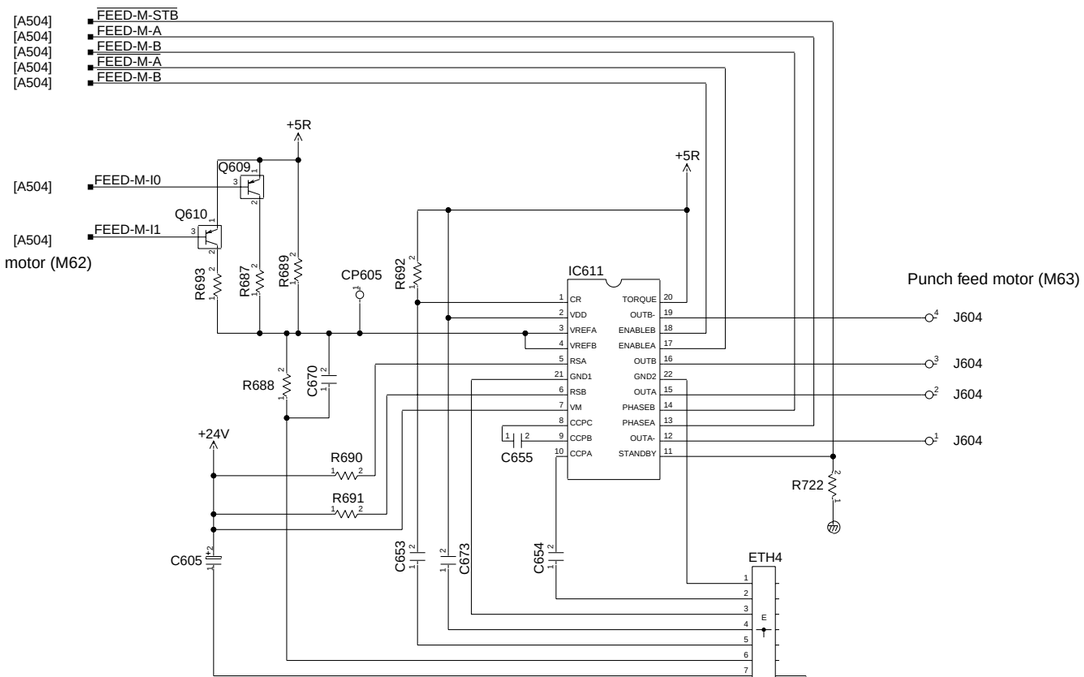






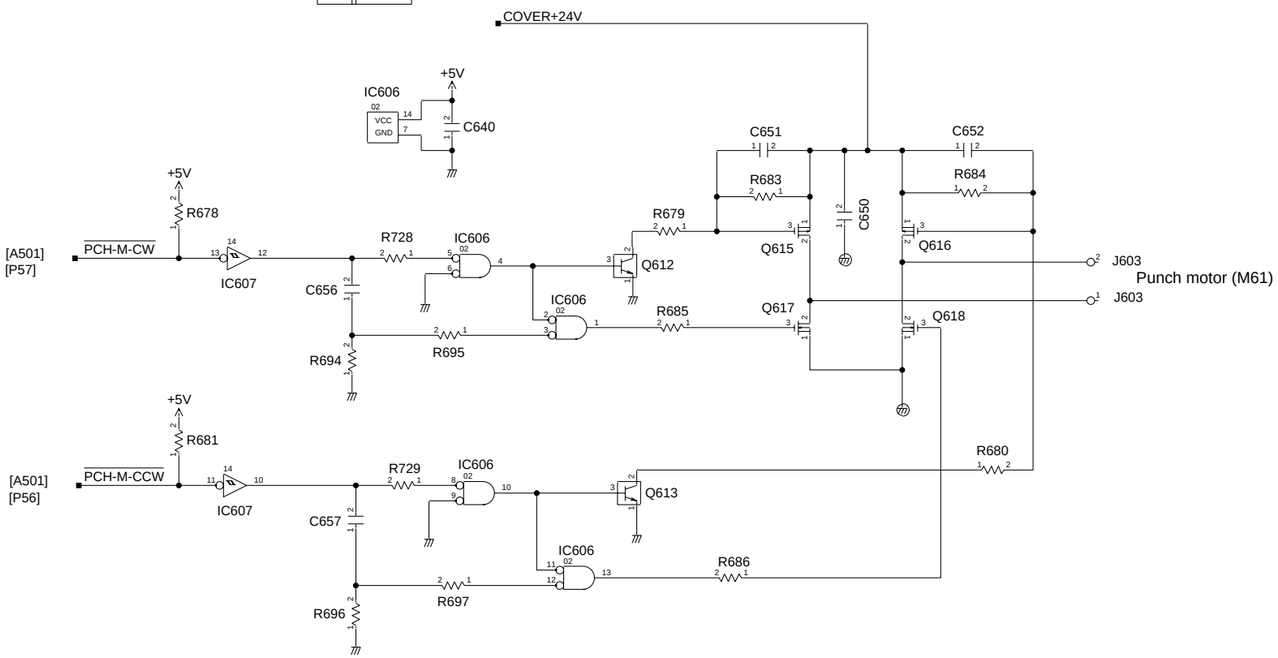
5.3 Punch Controller PCB (A503)





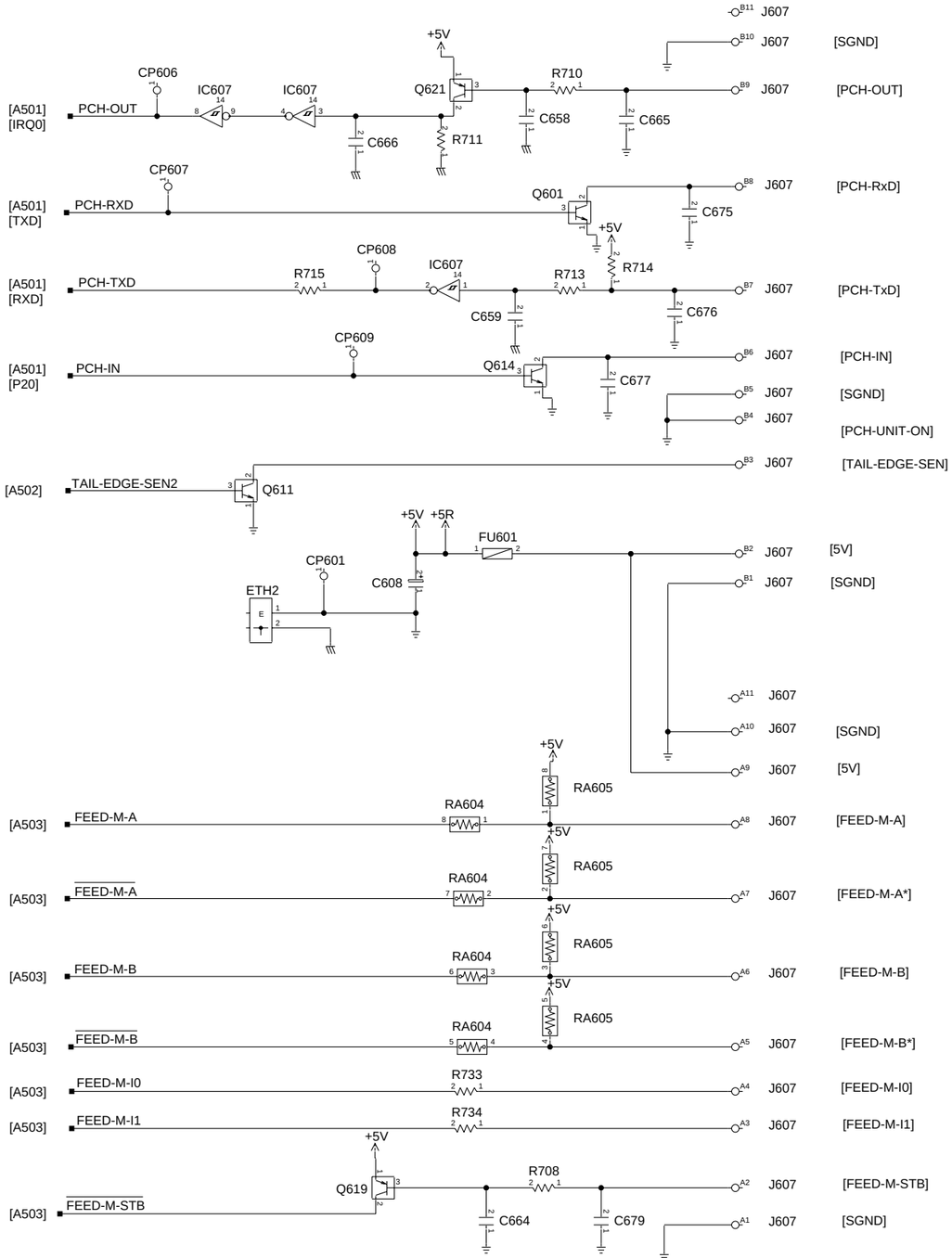
IO	I
L	628m A
H	97m A

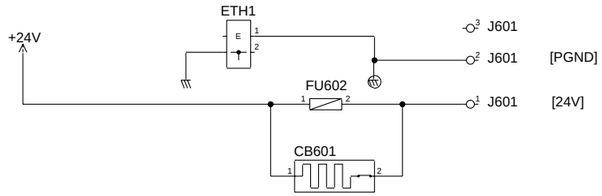
I1	I0	I
L	L	721m A
L	H	573m A
H	L	345m A
H	H	99m A

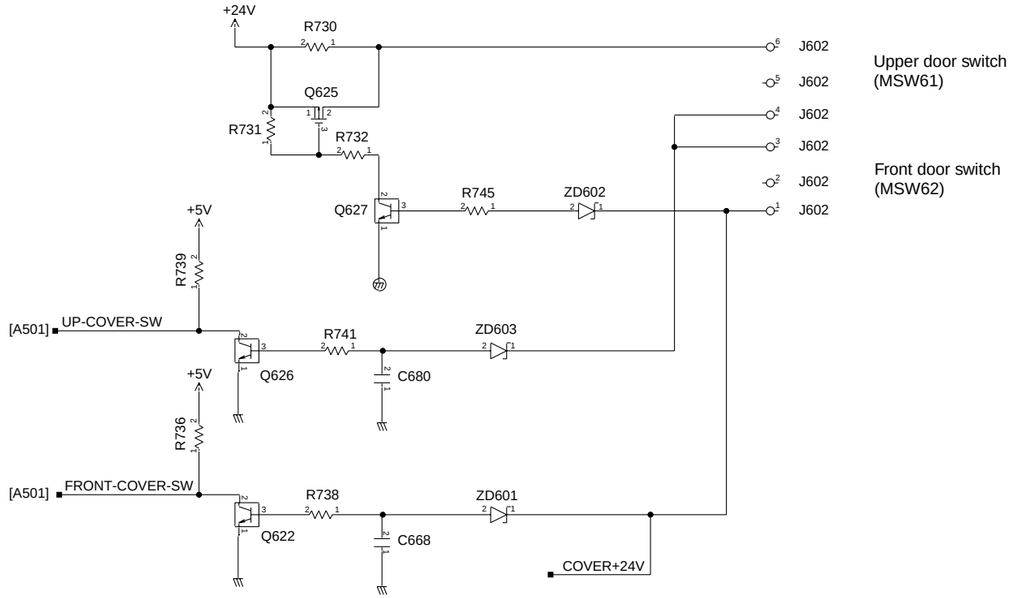


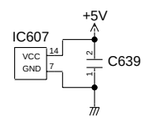
PCH-M-CW	PCH-M-CCW	Q615	Q616	Q617	Q618
L	H	○	×	○	×
H	L	×	○	×	○
H	H	○	○	×	×
L	L	×	×	○	○

5.4 Punch Controller PCB (A504)

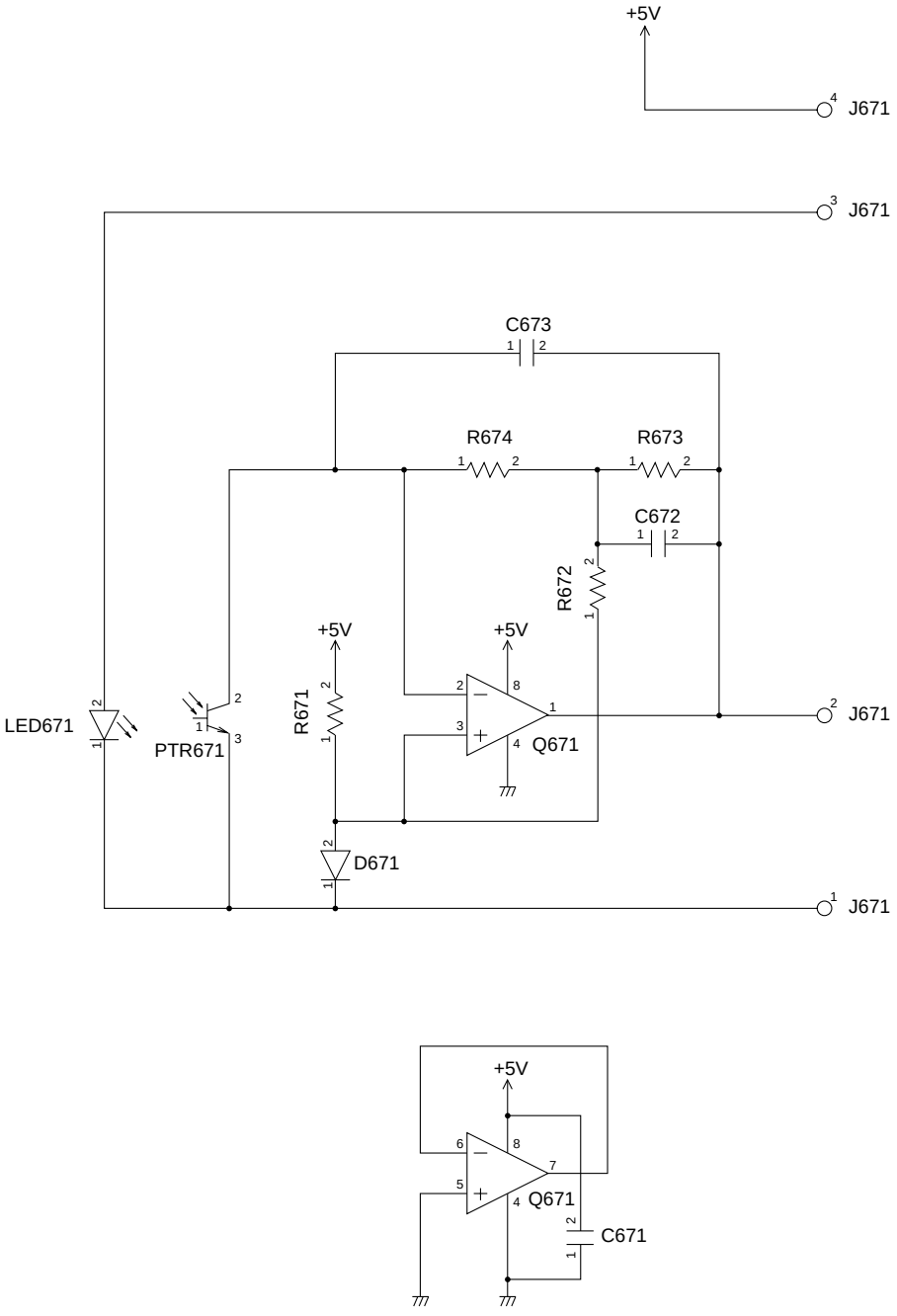




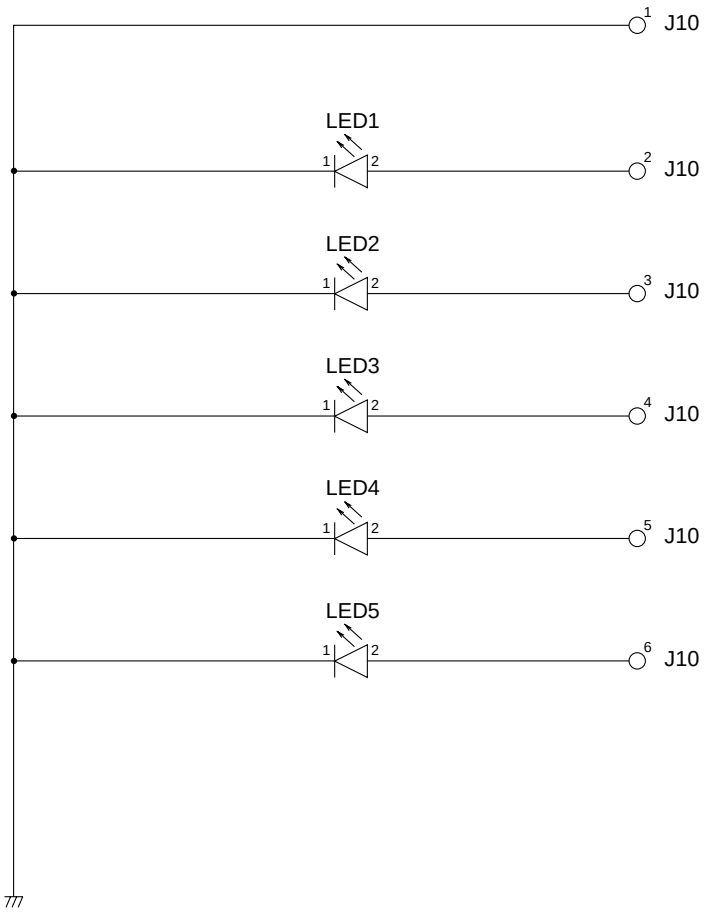




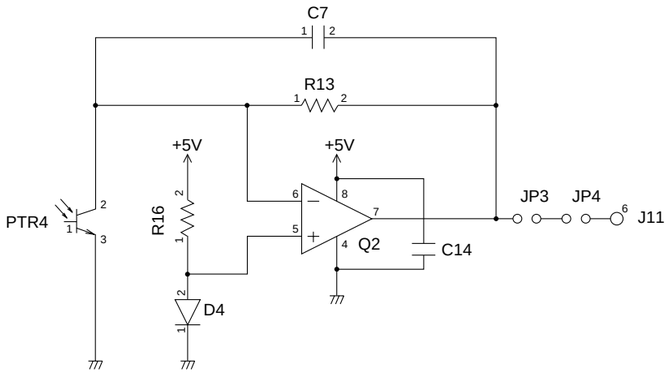
5.5 Scrap Full Detector PCB

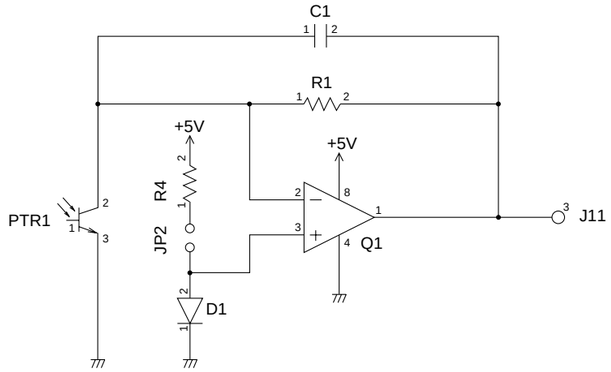


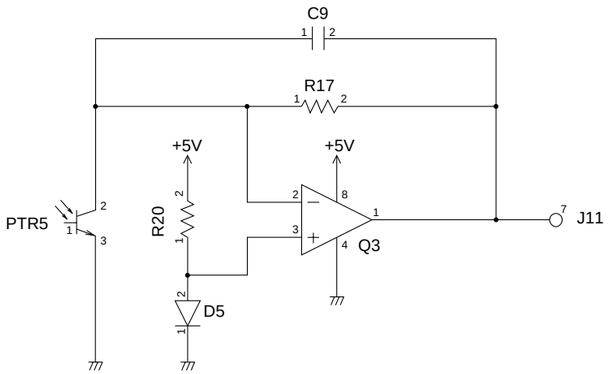
5.6 LED PCB

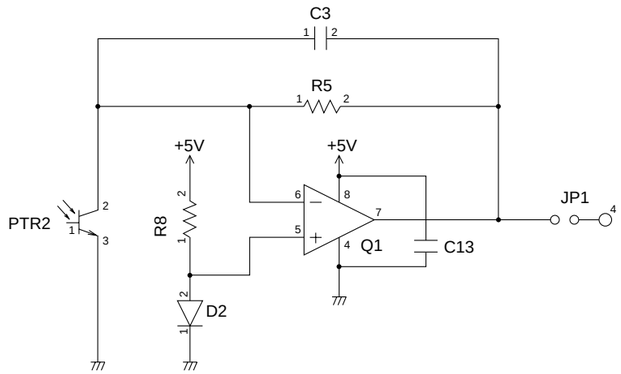

1
J10
LED1
1
2
2
J10
LED2
1
2
3
J10
LED3
1
2
4
J10
LED4
1
2
5
J10
LED5
1
2
6
J10

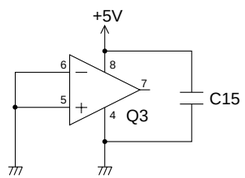
5.7 Photosensor PCB

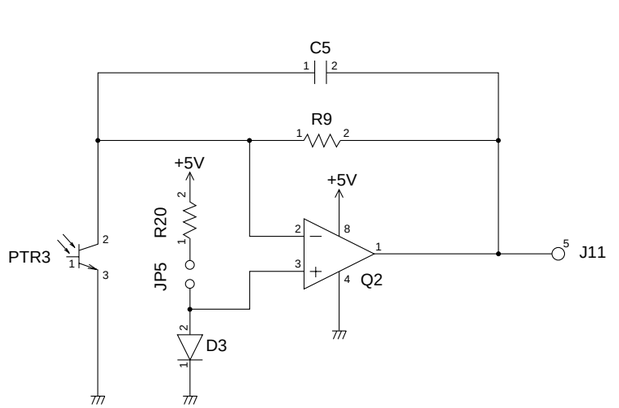


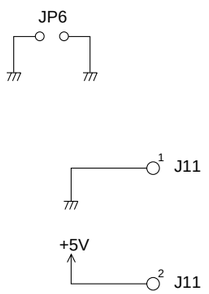












6 Solvents and Oils

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	Sliding units	Silicone oil	

TA-600-01

TOSHIBA

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