STAPLER SORTER-F1/ SORTER-D1

SERVICE MANUAL

REVISION 1

Canon

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CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

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

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INTRODUCTION

This manual is compiled to provide the service technician with basic facts and figures about the Stapler Sorter-F1 and the Sorter-D1, thereby ensuring the machine's quality and performance through servicing in the field.

This SERVICE MANUAL consists of the following chapters:

CHAPTER 1, "General Description," gives the Stapler Sorter-E1's features, specifications, names of parts, and an outline of how to operate it.

CHAPTER 2, "Operations and Timing," explains the Stapler Sorter-E1's mechanical and electrical mechanisms by function.

CHAPTER 3, "Mechanical System," discusses the Stapler Sorter-E1's mechanical construction, and shows how to disassemble, assemble, and adjust it.

CHAPTER 4, "Maintenance and Servicing," contains tables of periodically replaced parts and tables of durables and consumables; the chapter also contains a scheduled servicing chart.

CHAPTER 5, "Troubleshooting," sets forth steps used to troubleshoot possible faults in the Stapler Sorter-E1 organized in a tabular format.

For installation, see the Installation Procedure, which comes with the machine.

The contents of this manual may be updated from time to time to reflect improvements rendered to the machine; a Service Information bulletin will be issued as necessary to cover major changes.

All service technicians are expected to be thoroughly familiar with the information contained in this manual and Service Information bulletins for quick response to the user's needs.

CONTENTS

CHAPTER 1 GENERAL DESCRIPTION

CHAPTER 2 OPERATIONS AND TIMING

CHAPTER 3 MECHANICAL SYSTEM

CHAPTER 4 MAINTENANCE AND SERVICING

CHAPTER 5 TROUBLESHOOTING MALFUNCTIONS

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

APPENDIX

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

CHAPTER 1

GENERAL DESCRIPTION

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

APPENDIX

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

I. FEATURES

1. **Simple removal of jams.**
   - You can move the bins up and down by operating the keys on the machine's control panel, as when removing a jam between a bin and the feeding assembly.

2. **Three types of auto stapling. (Stapler Sorter-F1)**
   - If you select staple sort mode, the machine will automatically staple the copies—the copies will be stapled at front and rear (one location each or two locations each), and as many as 50 copies max. (105 g/m^2 equivalent; or about 5.5 mm high max.) may be stapled as a set.

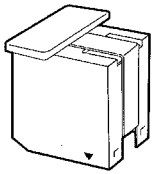
CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

II. SPECIFICATIONS

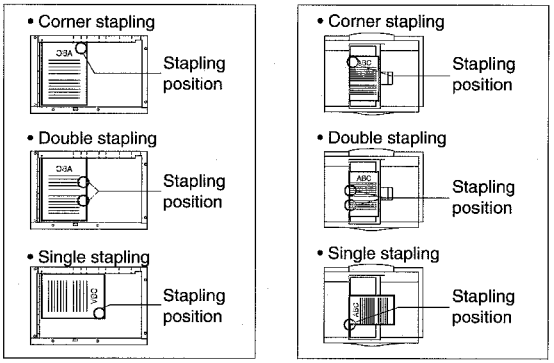
A. Stapler Sorter-F1/Sorter-D1

Item \ Model	Stapler Sorter-F1	Sorter-D1
Stacking	Face up Moving bins	
Copy paper	Plain (64 to 209 g/m^2; 64 g/m^2 paper only for non-sort mode)	Plain paper (80 to 163 g/m^2)
Number of bins	20 bins + non-sort bin	
Stacking per bin Stapler Sorter (105 g/m^2 equivalent) Sorter (80 g/m^2 equivalent)	Non-sort mode : 250 sheets Sort mode : 50 sheets (A4,LTR,B5,A5*,STMT*,A4R,LTR-R,B5R) : 25 sheets (A3,11"×17",B4,LGL) Staple sort mode: 30 sheets (A4,LTR,B5,A5,STMT,A4R,LTR-R) (Stapler Sorter -F1 only): 25 sheets (A3,11"×17",B4,LGL) Group mode : 30 sheets (A4,LTR,B5,A5,STMT) 25 sheets (A4R,LTR-R,B5R,A3,11"×17",B4,LGL) *: Stapler sorter only.	
Bin return time (from 20th to 1st bin)	11.5 sec (approx.; book copy) 16 sec (approx.; others)	
Limitless function	No	No
Bin selection	Yes (from copier)	
Control panel	Stapling Position key Stapling start/Stop key Bin Shift key	Bin Shift key
Display	Stapling Ready indicator Stapling Position indicator (5 pcs.) Add Staple indicator	———
Stapling	Punching by rotary cam	———
Auto staple copy paper size	A3,A4,B4,B5,A4R,11"×17",LGL, LTR,LTR-R	———

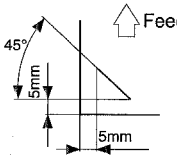
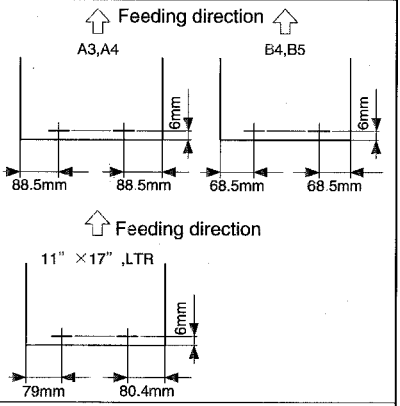
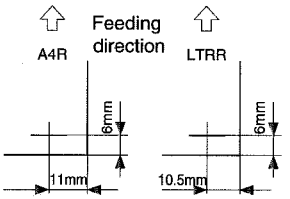
CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

Item \ Model		Stapler Sorter-F1	Sorter-D1
Manual stapling copy paper size (stapling by key operation immediately after copying)		A3,A4,B4,B5,A4R,11"×17",LGL, LTR,LTR-R	———
Manual insert stapling copy paper size (stapling by insertion of paper)		All sizes (excluding single stapling)	———
Stapling stack (105 g/m^2 equivalent)	Auto stapling	30 sheets (A4,LTR,B5,A4R,LTR-R) 25 sheets (A3,11"×17",B4,LGL)	———
	Manual stapling	30 sheets (A4,LTR,B5,A4R,LTR-R) 25 sheets (A3,11"×17",B4,LGL)	———
	Manual insert stapling	30 sheets (all sizes)	———
Staples		Special (replacement type; 5,000 staples) 	———
Staple detection		Yes (indicator turns on if 40 staples or less after stapling)	———
Operating environment	Temperature	Same as copier	
	Humidity	Same as copier	
Power supply		Exclusive AC power;	
Maximum power consumption		200 W or less	
Serial number	115V	NFSxxxxx	NEMxxxxx
	230V	PFSxxxxx	PEMxxxxx
	240V (UK)	QFSxxxxx	QEMxxxxx
	240V (CA)	RFSxxxxx	REMxxxxx
Weight		56 kg (approx.)	50 kg (approx.)
Dimensions (W×D×H)		564×609×966 mm	

Item	Stapler Sorter-F1
Stapling position	〈Without DF〉 〈With DF〉

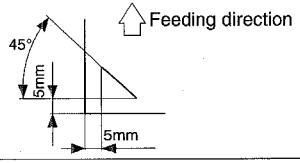
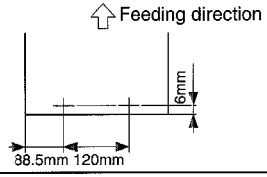


〈Staple sort/Sort Mode〉

Staple mode	Stapling
Corner stapling paper size (A3,B4,A4,A4R, B5/ 11"×17", LGL., LTR,LTR R)	
Double stapling paper size (A3,A4,B4,B5, 11"×17",LTR)	
Single stapling paper size (A4R,LTR R)	

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

Item	Stapler Sorter-F1
Stapling position	〈Manual insert stapling〉

Staple mode	Stapling
Corner stapling paper size (A3,B4,A4,A4R, B5/ 11"×17", LGL., LTR,LTR R)	
Double stapling paper size (A3,A4,B4,B5, 11"×17",LTR)	

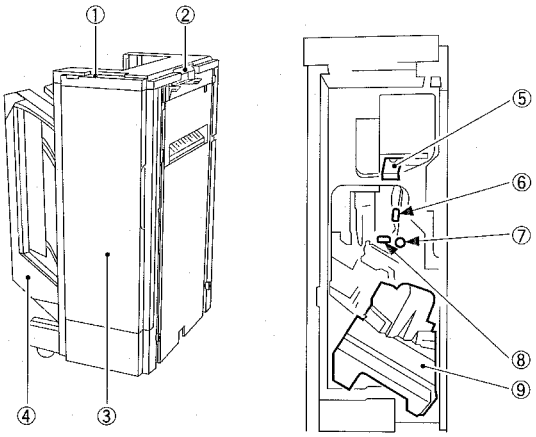
B. CLC Buffer Pass Unit 1

Item \ Model		CLC Buffer Pass Unit 1
Copy paper		Plain paper (64 to 209 g/m^2)
De-curling switch		Yes (3 steps)
Operating environment	Temperature	Same as copier
	Humidity	Same as copier
Power supply		24 V (from sorter)
Maximum power consumption		40 W or less
Serial number		ZCLxxxxx
Weight		24 kg (approx.)
Dimensions (W×D×H)		246×609×958 mm

III. NAMES OF PARTS

A. Exterior View

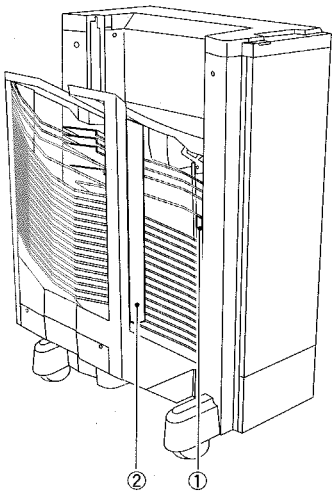
1. Sorter



① Control panel
② Latch
③ Front door
④ Bin unit
⑤ Upper feeding guide
⑥ Intermediate feeding guide
⑦ Paper feeding knob
⑧ Lower feeding guide
⑨ Stapler unit*

*Stapler sorter only.

Figure 1-301



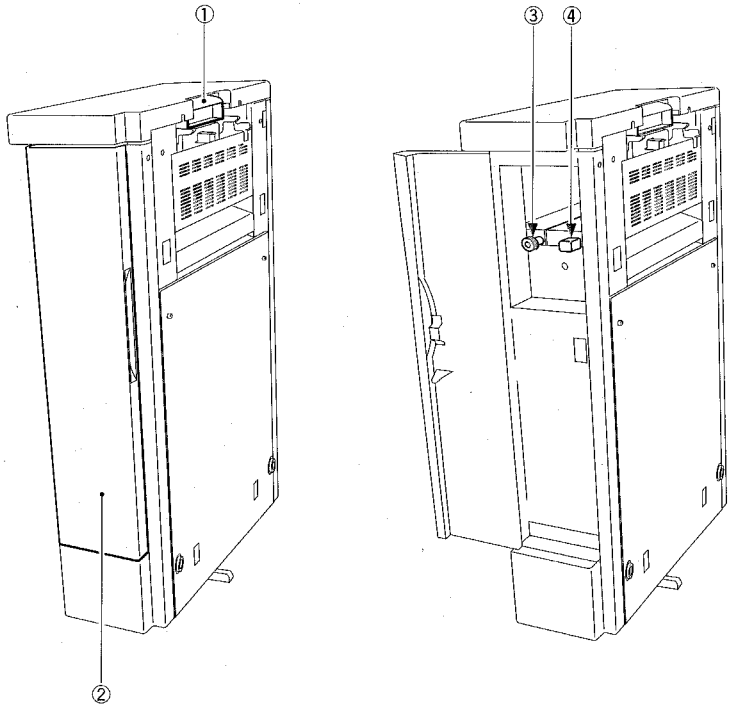
① Push bar*
② Multiple guide*

*Stapler sorter only.

Figure 1-302

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

2. CLC Buffer Pass Unit 1

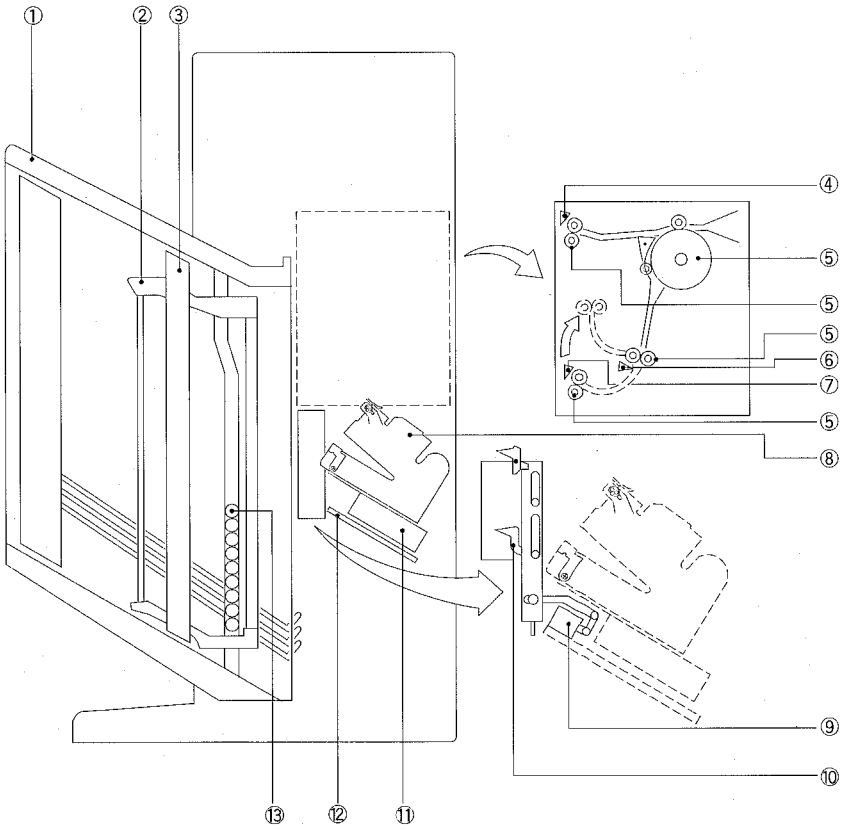


① Latch
② Front door
③ Paper feeding knob
④ Feeding guide

Figure 1-303

B. Cross Section

1. Sorter

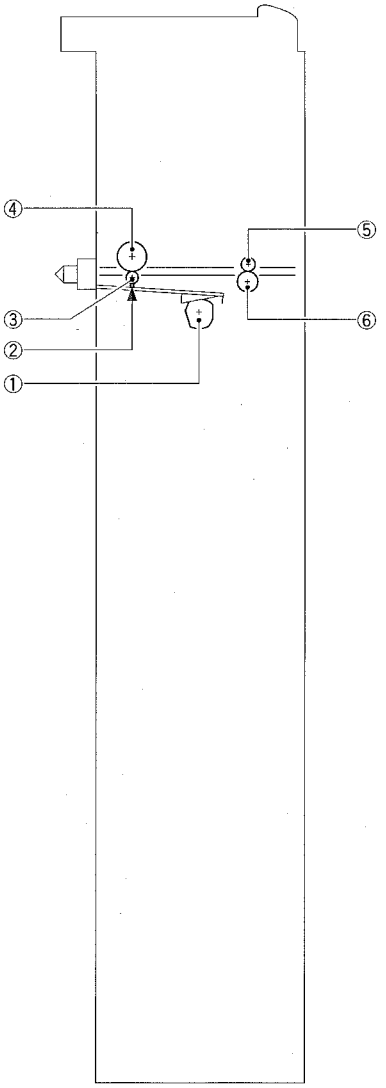


① Non-sort bin
② Guide bar*
③ Push bar*
④ Static eliminating brush 3
⑤ Feeding roller
⑥ Static eliminating brush 5
⑦ Static eliminating brush 4
⑧ Stapler unit*
⑨ Paper holding solenoid (SL3)
⑩ Paper holding arm
⑪ Stapler swinging unit*
⑫ Stapler drive unit*
⑬ Roll

*Stapler sorter only.

Figure 1-304

2. Buffer Pass Unit 1



① Pressure cam
② Pressure roller back up
③ Pressure roller
④ Sponge roller
⑤ Feeding roll
⑥ Feeding roller

Figure 1-305

IV. OPERATING THE MACHINE

A. Control Panel

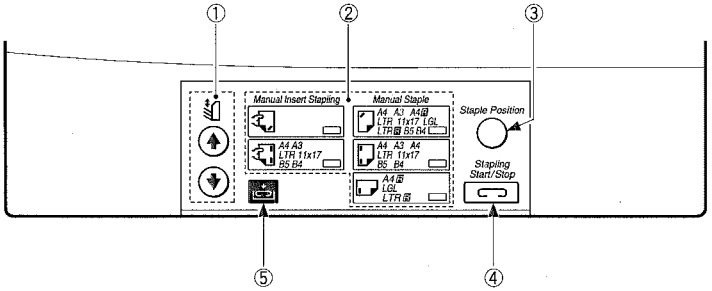


Figure 1-401

Ref.	Key	Description	Remarks
1	Bin Shift key	Each press on the key moves the bins up or down by a single bin position.	
2	Staple Position indicator	Indicates the stapling position.	Stapler sorter only.
3	Staple Position key	Press it to select a stapling position when stapling in manual insert staple mode.	Stapler sorter only.
4	Stapling Start/Stop key	Press it to start manual stapling or manual insert staple mode. A press during stapling operation will stop the operation.	You cannot stop the operation during manual insert stapling. Stapler sorter only.
5	Load Staples indicator	Turns on when staples are running out.	Turns on if no more than 40 staples remain after stapling operation. Stapler sorter only.

Table 1-401

  CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

B. Stapling Operation (Stapler sorter only)

Depending on the mode selected on the copier and how copies are made, the copies delivered to the bins are stapled as follows:

MODE	Non sort	Sort	Group	Staple Sort
With DF	—	Manual Stapling	—	Auto Stapling
Without DF	—	Manual Stapling	—	Manual Stapling

Table 1-402

1. Auto Stapling

This mode uses a DF, and the copies delivered to the bins are stapled automatically.

- If the original is set on the copyboard, the copies may be stapled manually.

Either of the following three stapling modes may be selected on the copier:

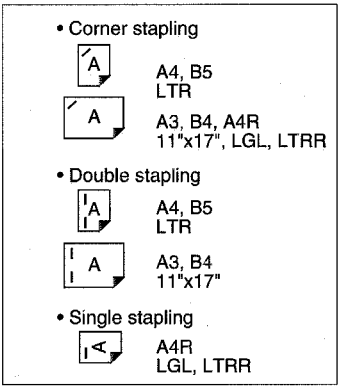


Figure 1-402

2. Manual Stapling

When copies are made after selecting sort mode, the Staple Start/Stop key turns on. If you want to staple the copies, press the Staple Start/Stop key. (The copies in the bins will be stapled in sequence.)

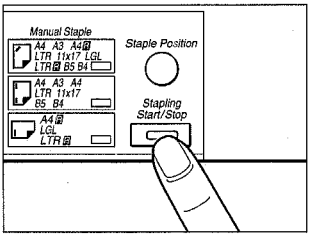


Figure 1-403

Reference:

If you want to stop stapling, press the Staple Start/Stop key once again.

3. Manual Insert Stapling

In addition to stapling copies delivered by the sorter, you can staple sheets placed from outside the bin.

1) Remove all sheets from the bin.
   - The bin unit will return to the home position.
2) Check to make sure that the bin unit is at the home position.
   - If the bin unit is not at the home position, turn off and then on the copier. (Or, operate the Bin Shift key to return the bin unit to home position.)

3) Put paper into the No. 1 bin (the bin under the non-sort bin) while butting the paper against the guide plate at the front.
   - The Staple Start/Stop key will turn on.

■ Limit the number of sheets to 30 (max.; of 105 g/m² paper).

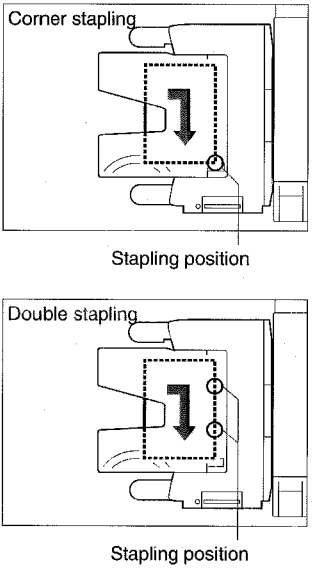


Figure 1-404

4) Select a stapling position by the Staple Position key.

■ Paper Sizes for Stapling
   - if corner stapling, A3, B4, A4, B5, A5, A4R, B5R, 11"×17", LGL, LTR, STMT, LTR-R
   - if double stapling, A3, B4, A4, B5, A5, A4R, B5R, 11"×17", LGL, LTR, STMT, LTR-R

■ You cannot select single stapling.

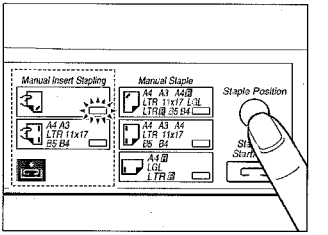


Figure 1-405

5) Press the Staple Start/Stop key.

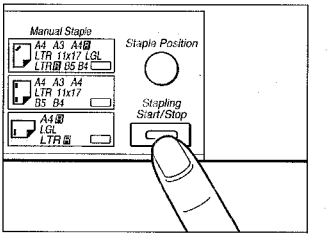


Figure 1-406

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

C. Replenishing the Stapler with Staples (Stapler sorter only)

The Add Staple LED will turn on when the staple cartridge starts to run out of staples. Go through the following steps to replenish it with staples:

Caution:
Repeated removal/installation of the staple cartridge can lead to staple jams. Advise the user not to repeat it except when replenishing the stapler unit with staples or when removing a staple jam.

1) Open the machine's front door.
2) Hold the grip, and draw out the stapler unit.

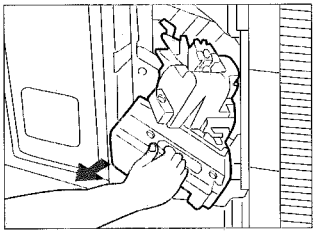


Figure 1-407

3) Remove the empty staple cartridge.

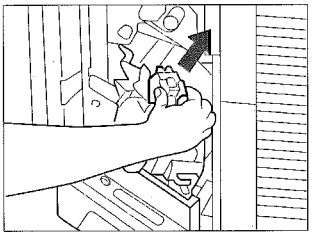


Figure 1-408

4) Press the green button, and remove the empty staple case.

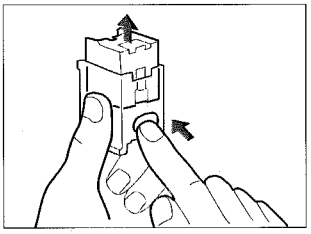


Figure 1-409

5) Set new staples in the cartridge securely.

■ Do not peel the sticker used to hold the staples before setting the staples into the cartridge.

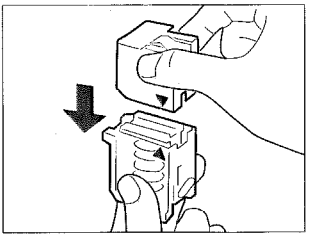


Figure 1-410

6) Pull straight out the seal used to hold the staples together.

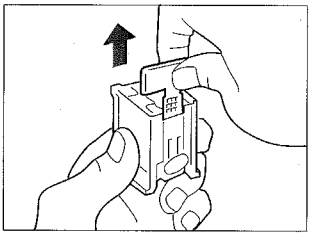


Figure 1-411

7) Set the staple cartridge.

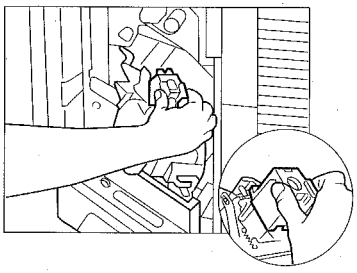


Figure 1-412

8) Push in the stapler unit until it stops.

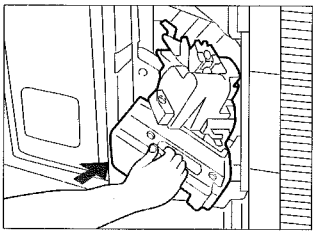


Figure 1-413

9) Close the front door.

D. Removing a Staple Jam from the Stapler (Stapler sorter only)

If a staple jam occurs in the stapler, go through the following to remove it:

1) Turn off the copier, and disconnect the power plug.
2) Open the machine's front door.
3) Hold the grip, and draw out the stapler unit.

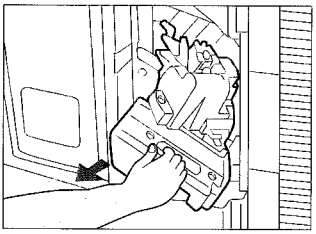


Figure 1-414

4) Push the green button to release the stapler assembly.

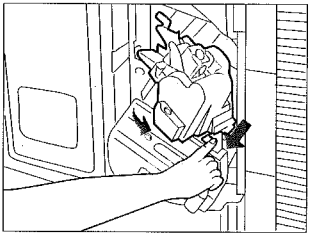


Figure 1-415

  CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

5) Release the stopper, and open the staple cover.

■ While releasing the stopper with the forefinger, push up the metal knob slowly with the thumb to open the staple cover.

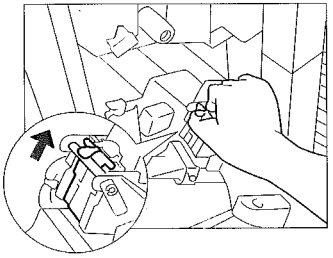


Figure 1-416

6) Remove all jammed staples.

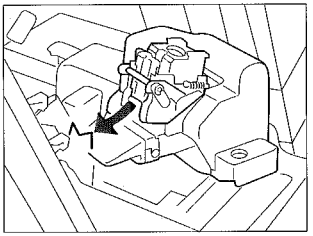


Figure 1-417

7) Push down the metal knob to close the staple cover.

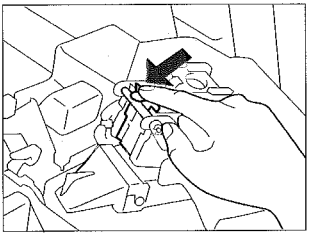


Figure 1-418

8) Push in the stapler unit until it stops.

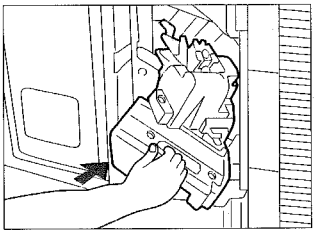


Figure 1-419

9) Close the front door.

E. Removing Paper Jams

1. Inside the Sorter

a. Feeding Assembly

1) Open the machine's front door.

2) Open the upper feeding unit, and remove the paper jam.

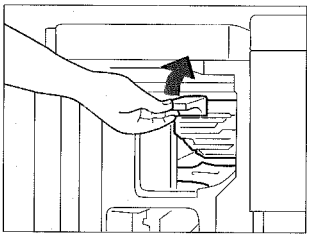
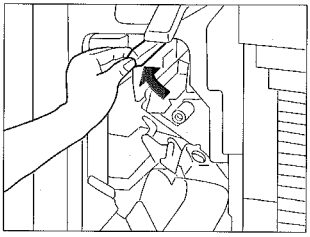


Figure 1-420

3) Open the middle feeding guide and the lower feeding guide; then, remove the paper jam.



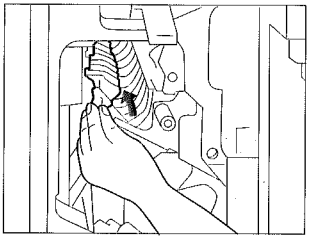


Figure 1-421

■ If you cannot see the paper or find it difficult to remove, turn the green paper feeding knob counterclockwise until you have access to the paper.

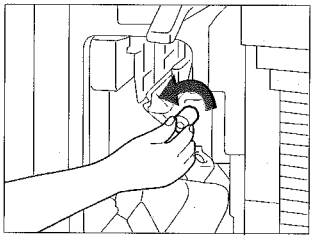


Figure 1-422

4) Close the front door.

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b. Between a Bin and the Feeding Assembly

At times, paper can become trapped at the rear of a bin and cannot be removed; if this is the case, go through the following:

1) Close the front door securely.
2) Check the bin intervals and the location of the paper jam.

If the paper is trapped on a bin above the two bins with the largest interval,

- Open the machine's control cover.
- Press the Down key (⊙; Bin Shift key) so that the bin with the trapped paper lowers to the delivery position.

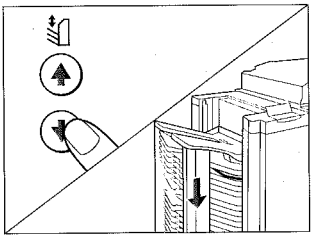

Figure 1-423

If the paper is trapped on a bin below the two bins with the largest interval,

- Open the machine's control cover.
- Press the Up key (⊙; Bin Shift key) so that the bin with the trapped paper rises to the delivery position.

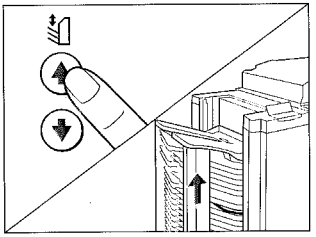

Figure 1-424

3) Remove the paper from outside the bin.

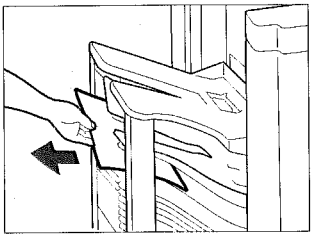

Figure 1-425

2. Inside the Buffer Pass Unit

1) Open the front doors of the copier and the buffer pass unit.
2) Open the upper feeder guide, and turn the copier's paper feeding knob to remove the jam.

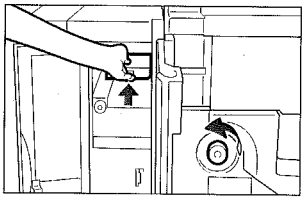

Figure 1-426

- If the jam is difficult to remove because of its location, open the front door of the sorter, and turn the paper feeding knob counterclockwise so that it may be removed inside the sorter.

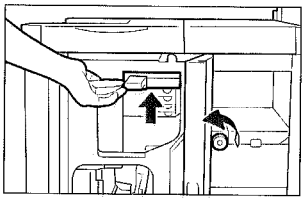

Figure 1-427

3) Close the front doors of the copier, the buffer pass unit and the sorter.

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CHAPTER 2

OPERATIONS AND TIMING

In outline diagrams, ▮▮▮ represents mechanical drive paths, and ⟶ indicates electrical signal paths.

Signals in digital circuits are identified as '1' for High and '0' for Low. The voltage of signals, however, depends on the circuit.

Nearly all operations of the product are controlled by a microprocessor, and the internal workings of the processor are not relevant to the serviceman's work and, therefore, are left out of the discussions. By the same token, no repairs are prescribed for the PCBs at the user's premises; for this reason, PCBs are discussed by means of block diagrams rather than circuit diagrams.

For the purpose of explanation, discussions are divided into the following: from sensors to DC controller PCB input ports; from DC controller output ports to loads; and minor control circuits and functions.

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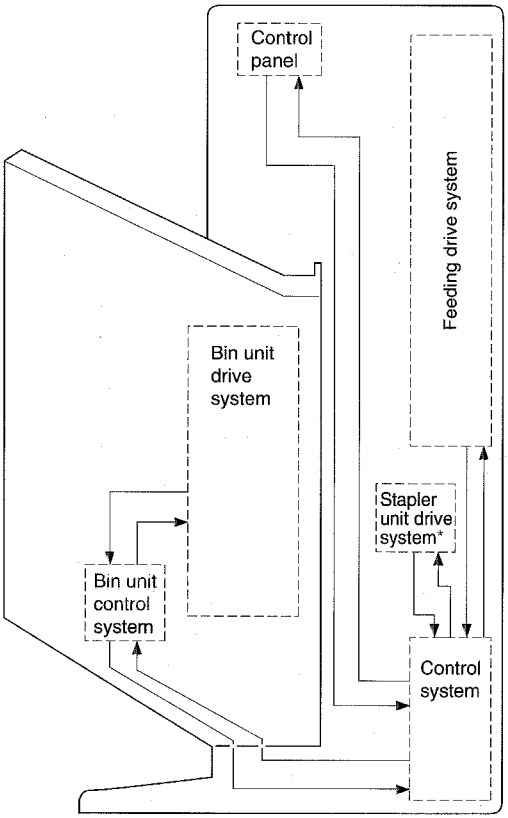
I. BASIC CONSTRUCTION

A. Functional Construction

The machine consists of six functional blocks: namely, control panel, feeding drive system, bin unit drive system, stapler unit drive system, bin unit control system, and control system.



*Stapler sorter only

Figure 2-101

B. Outline of the Electrical Circuitry

The machine's electrical mechanisms are controlled by its sorter controller. The ICs on the sorter controller have the following functions:

Notation	Description
Q1	controls sequence
Q3	controls sensor adjustment values, operation modes
Q4	contains the sequence program
Q7	controls communication with the copier

Table 2-101

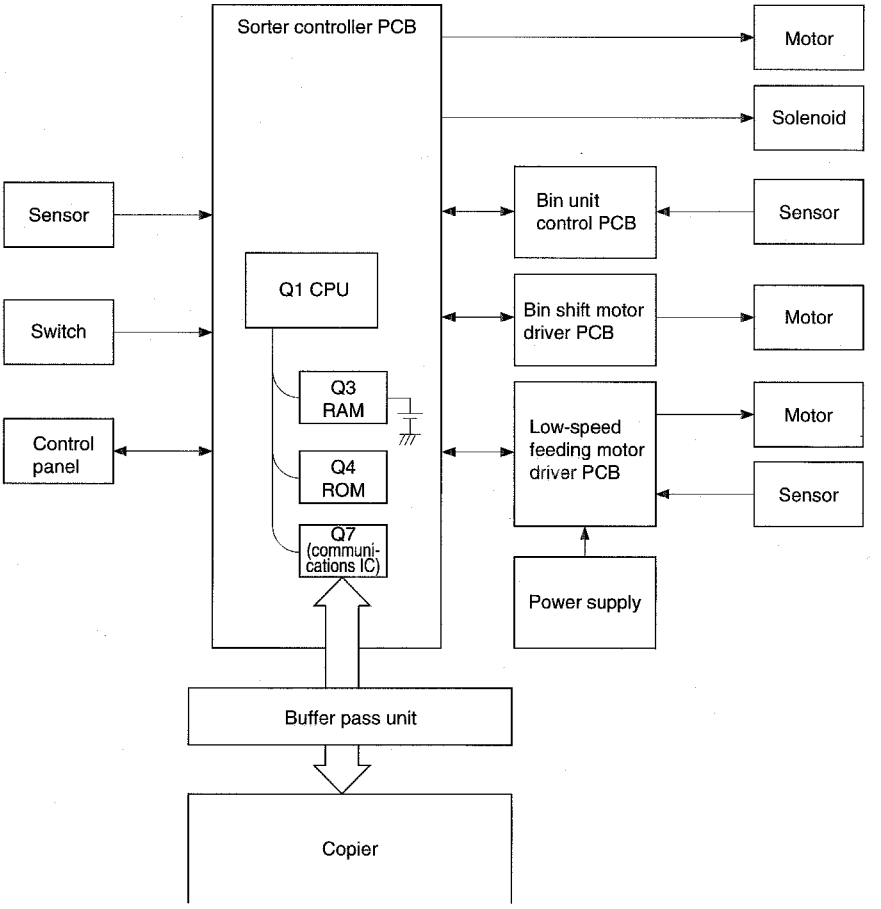


Figure 2-102

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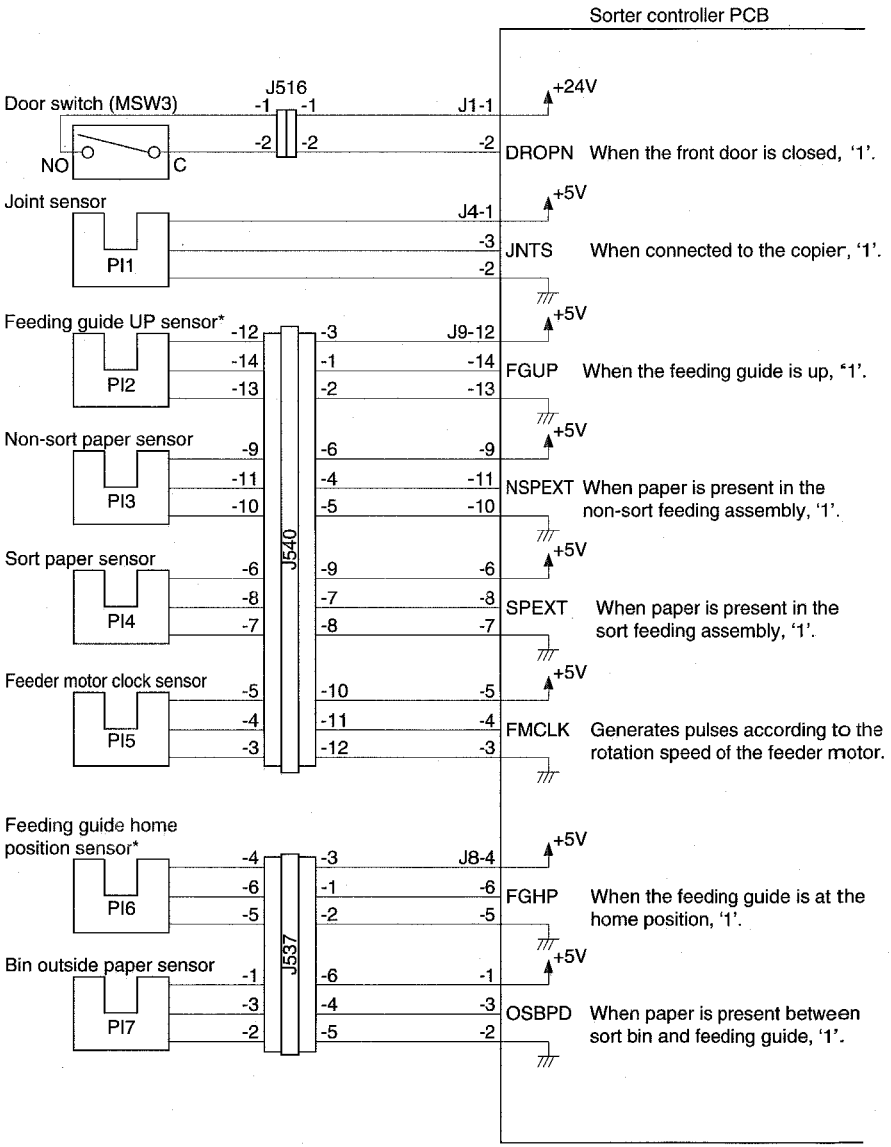
C. Inputs to the Sorter Controller

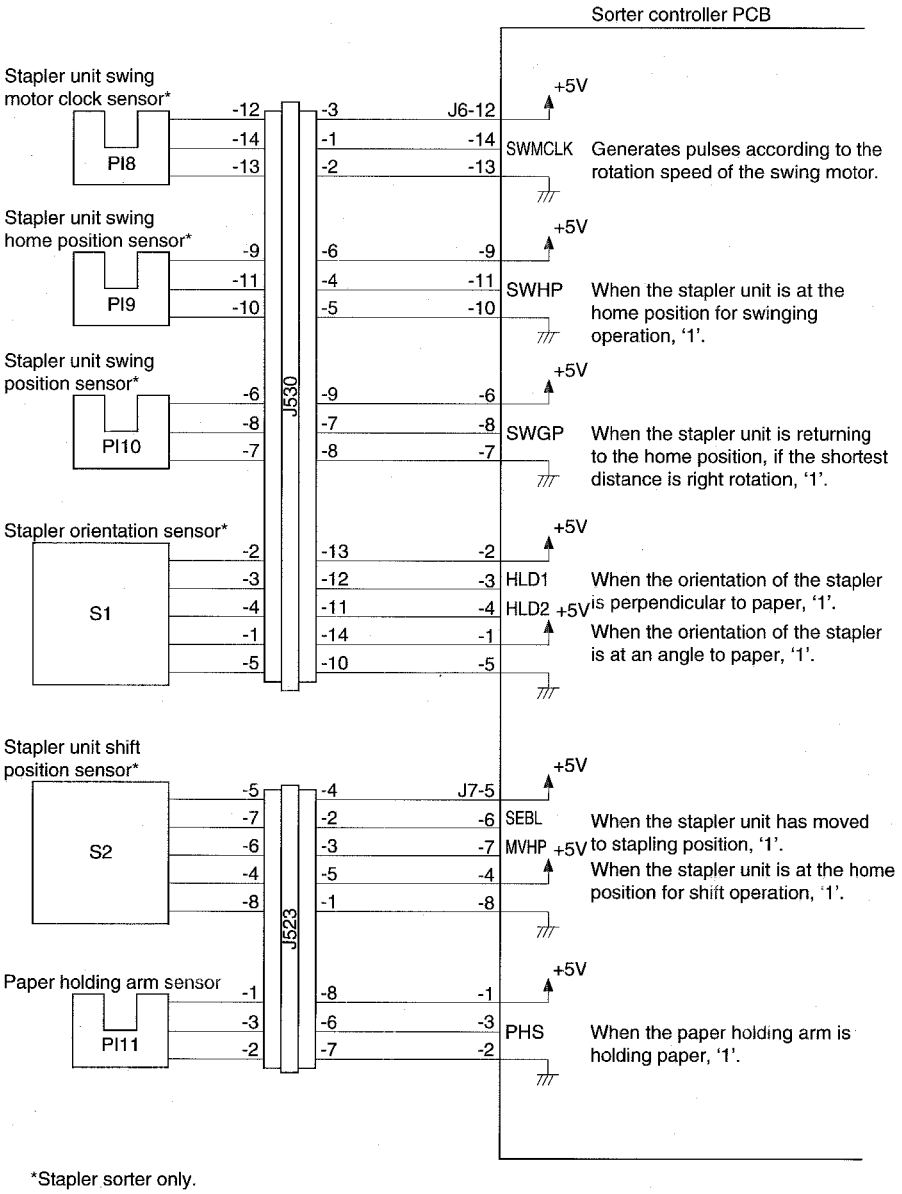
Inputs to the Sorter Controller (1/5)



*Stapler sorter only.

Figure 2-103

Inputs to the Sorter Controller (2/5)



*Stapler sorter only.

Figure 2-104

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

Inputs to the Sorter Controller (3/5)

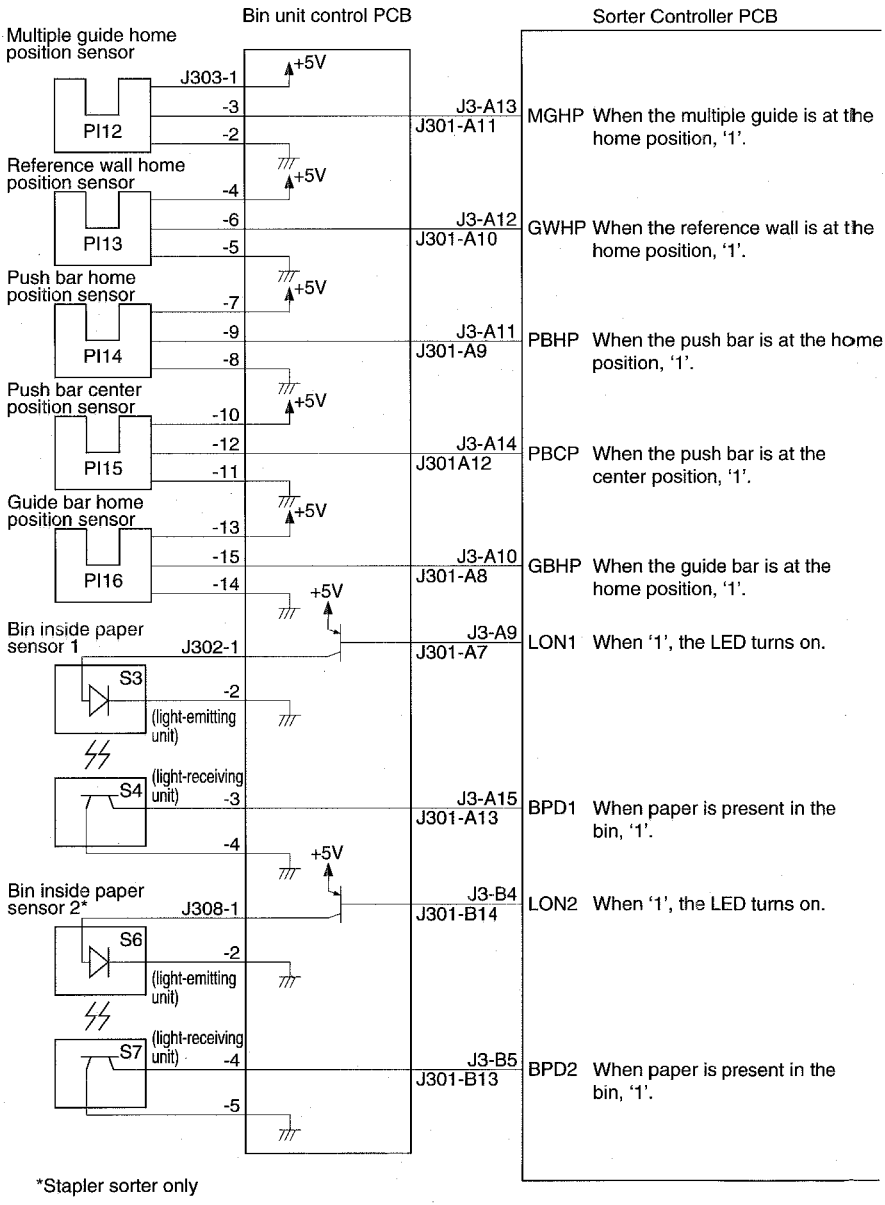
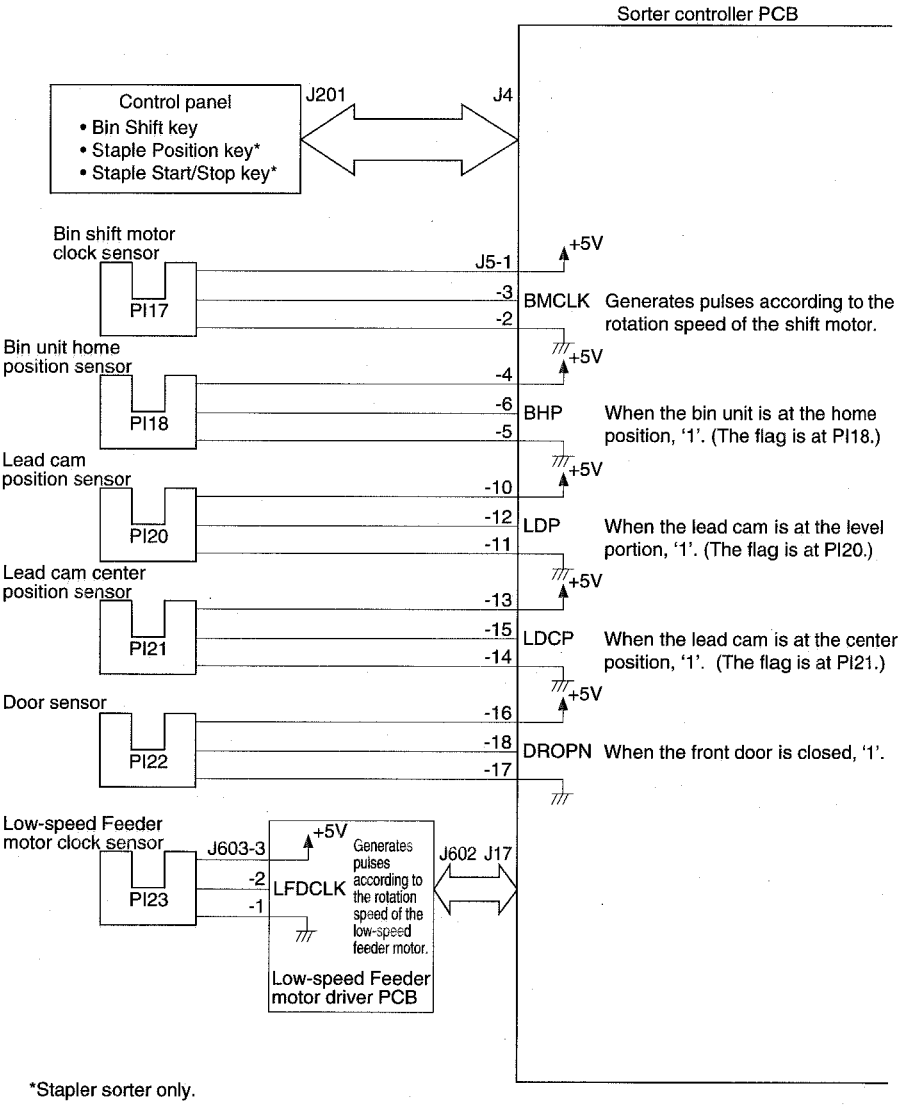


Figure 2-105

Inputs to the Sorter Controller (4/5)



*Stapler sorter only.

Figure 2-106

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

Inputs to the Sorter Controller (5/5)

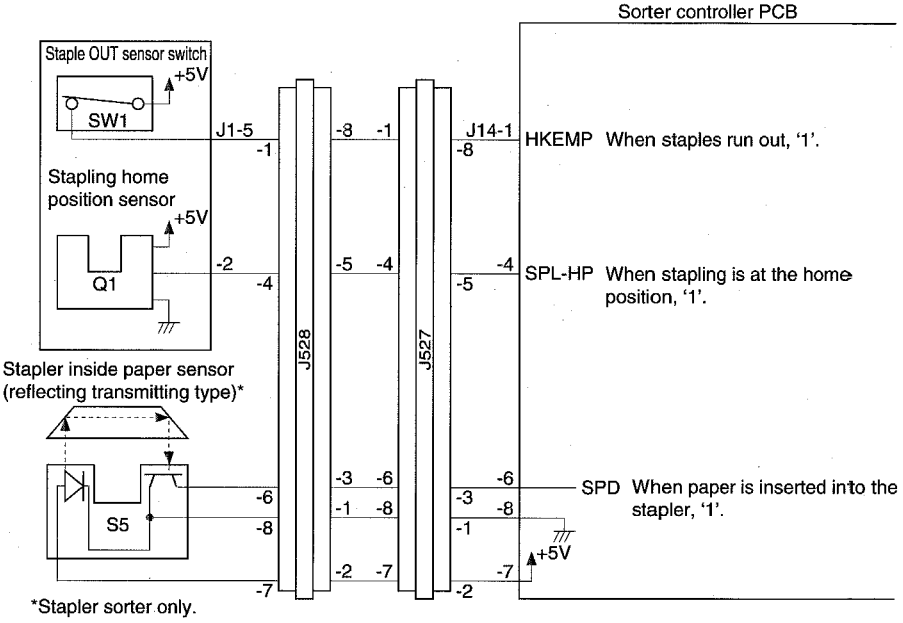


Figure 2-107

Outputs to the Sorter Controller (1/3)

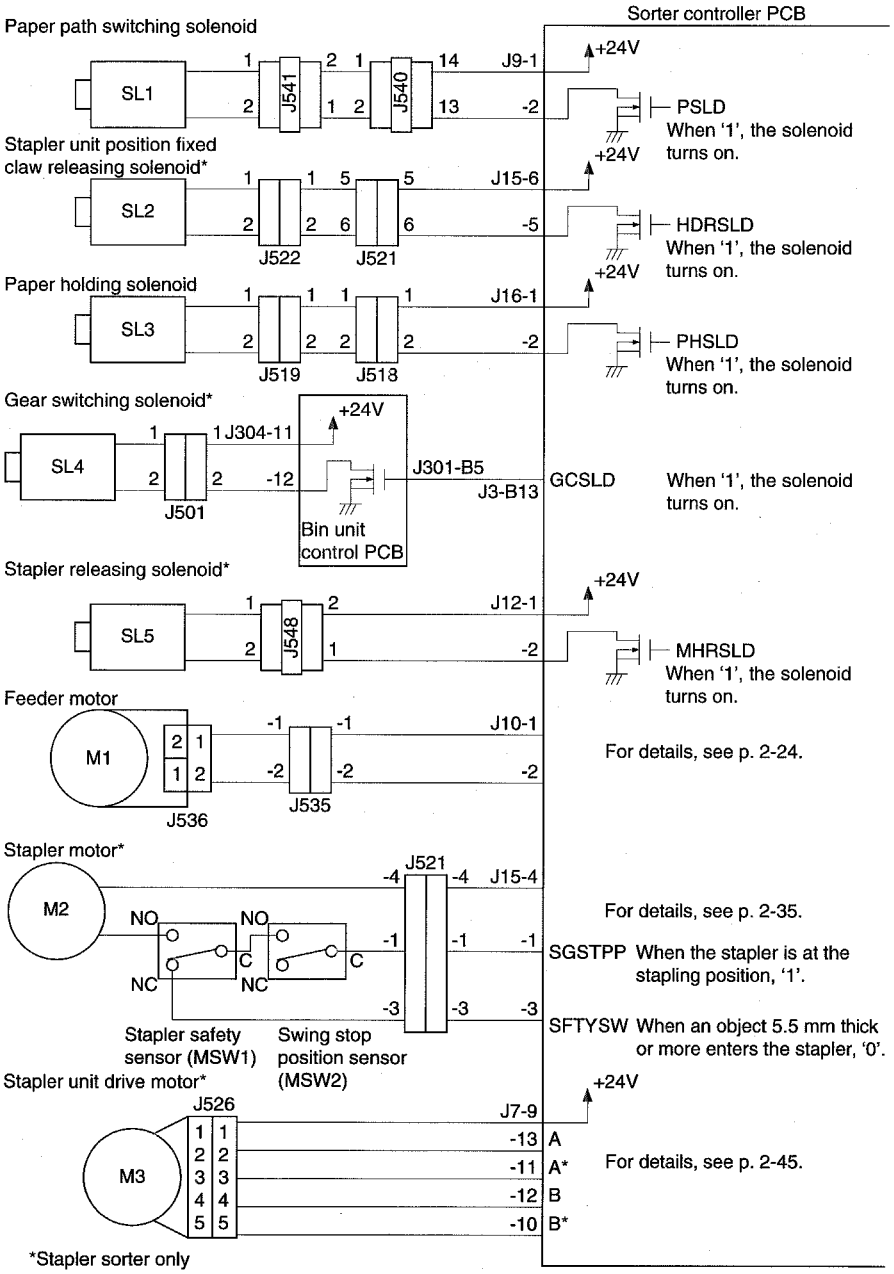
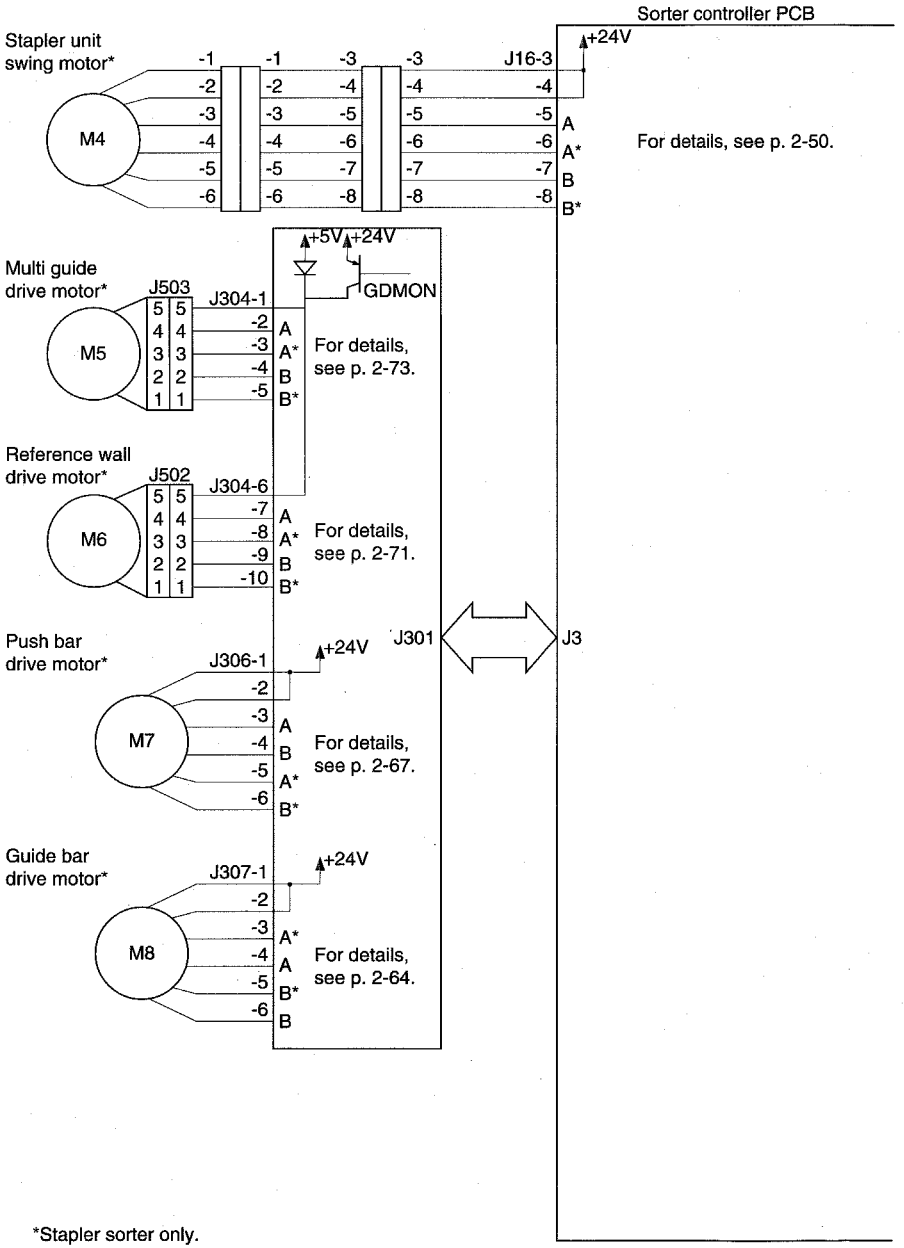


Figure 2-108

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

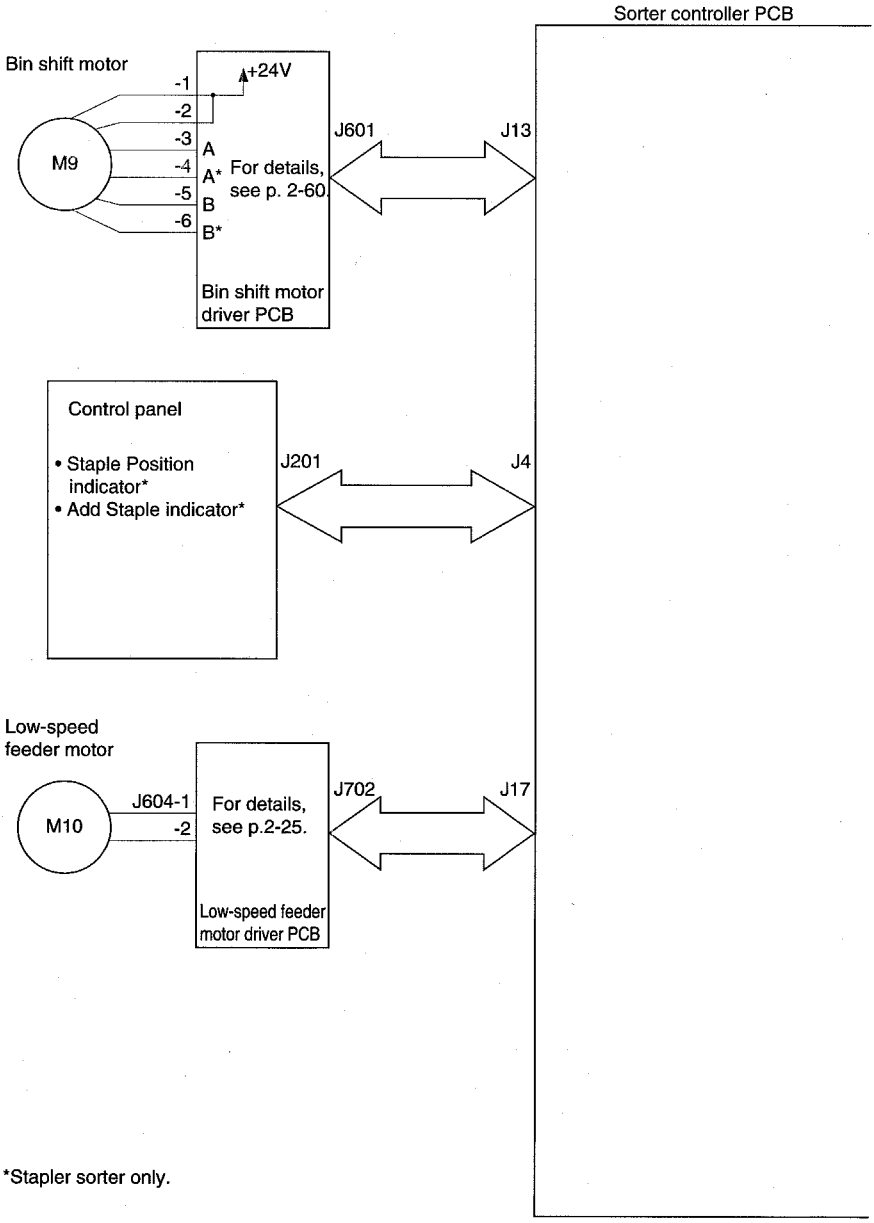
Outputs to the Sorter Controller (2/3)



*Stapler sorter only.

Figure 2-109

Outputs to the Sorter Controller (3/3)



*Stapler sorter only.

Figure 2-110

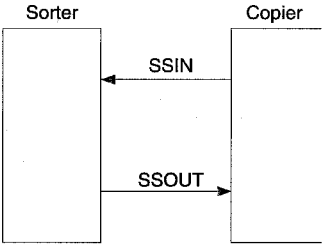
D. Communication between Copier and Sorter

1. Outline

The copier and the sorter exchange status signals using IPC (communications IC) communication mode.

The status signals are first written to the RAM on the sorter controller PCB and sent out in response to control signals from the CPU (Q1).

These signals cannot be checked in the field for correct transmission; however, an error in transmission will activate the copier's self diagnosis and will be identified by an error code on the copier's control panel.



SSIN: signals from copier received by sorter
SSOUT: signals sent by sorter to copier

Figure 2-111

II. BASIC OPERATION

A. Outline

The machine sorts or staples delivered copies according to the operation modes selected on the copier.

Using the keys on the machine's control panel, you may specify how the copies should be stapled.

The machine provides the following six operation modes:

1. non-sort mode
2. sort mode
3. group mode
4. staple sort mode*

*Stapler sorter only.

1. Non-Sort Mode

The copies are delivered to the non-sort bin. (In this mode, sorting will not take place.)

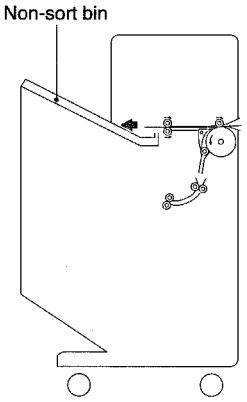


Figure 2-201

2. Sort, Group, Staple Sort* Modes
***Stapler sorter only**

The copies are delivered to the sort bin.

In these modes, the bin unit move up and down to sort the copies.

If desired, the copies delivered to each bin will be stapled.

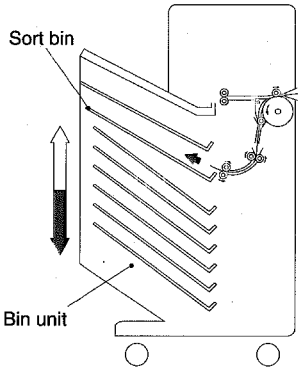


Figure 2-202

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

B. Basic Operation

Go through the following for an idea of how operations are executed in each mode:

1. Non-Sort Mode

① The copier's Copy Start key is pressed.

⇩

② The copy is delivered to the non-sort bin.

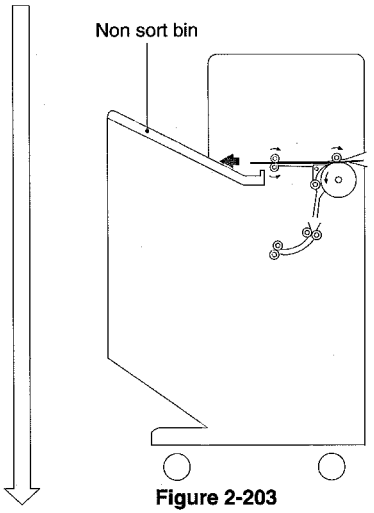


Figure 2-203

③ As many copies as specified are delivered and the operation ends.

2. Sort Mode

① The copier's Copy Start key is pressed.

② The guide bar moves to a position '1/2 paper size + 6 mm' from the center of delivery. (stapler sorter only)

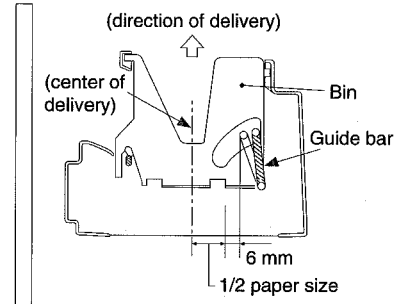


Figure 2-204

③ In the case of the stapler sorter, each time delivery is made, the guide bar swings to butt the stack against the guide plate, thereby putting it into order; then, the bins shift by a single bin.
In the case of the sorter, the bins shift by one upon each delivery.

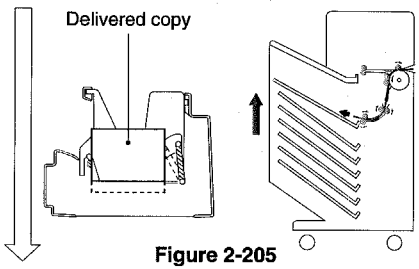


Figure 2-205

④ As many copies as specified are made.

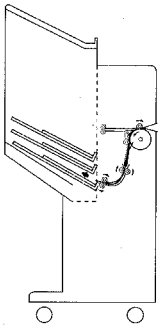


Figure 2-206

⑤ The original is replaced, and reverse sorting is executed.

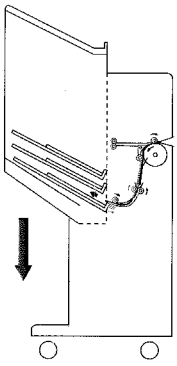


Figure 2-207

⑥ The operation is repeated for as many times as there are originals.

⑦ When copying is finished, the guide bar returns to the home position. (stapler sorter only)

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Note:
If the DF is not used, the bin unit returns to the home position for each press on the Copy Start key, and reverse sorting is not executed.

Reference:
The copy will be delivered to the non-sort bin if you set the copy count to '1'.

3. Group Mode

① The copier's Copy Start key is pressed.

② The guide bar moves to a position '1/2 paper size + 6 mm' from the center of delivery. (stapler sorter only)

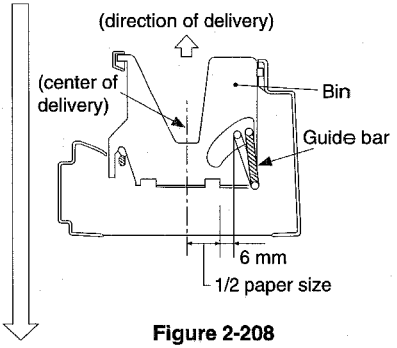

Figure 2-208

③ Each time delivery is made, the guide bar swings to butt the copies against the guide plate, thereby putting it into order. (stapler sorter only)

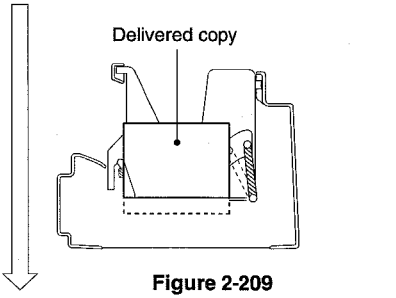

Figure 2-209

④ As many copies as set are made.

⑤ The original is replaced, and the bin units shift by a single bin.

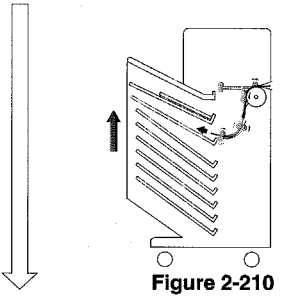

Figure 2-210

⑥ The operation is repeated for as many times as there are originals.

⑦ When copying is finished, the guide bar returns to the home position. (stapler sorter only)

Reference:

If you set the copy count to '1', the copy will be delivered to the non-sort tray.

4. Staple Sort Mode (stapler sorter only)

① The same operations as in sort mode are executed, and all copies are delivered to the bins.

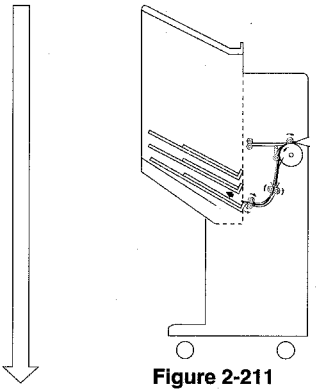

Figure 2-211

② The guide bar swings three times.

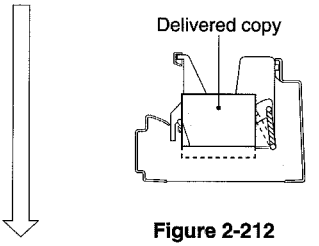

Figure 2-212

③ The guide bar puts the copies in order. The paper holding arm pushes off the paper. The stapler unit moves to the stapling position.

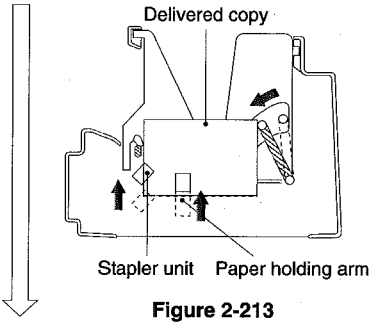

Figure 2-213

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

④ The stapler unit staples the copies.

⑤ The guide bar and the paper holding arm move away from the paper.

⑥ The bin units shift by a single bin.

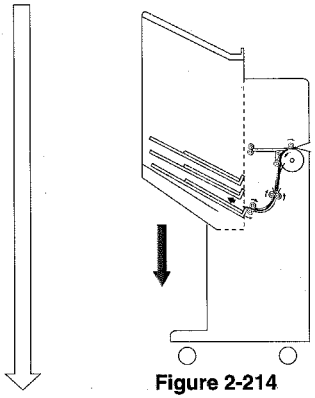

Figure 2-214

⑦ Operations ③ through ⑥ are repeated for all copies inside the bins, and the mode ends.

Reference:

You can execute staple sort mode only when you are using the DF.
In book mode, you can select staple mode but cannot execute auto stapling.

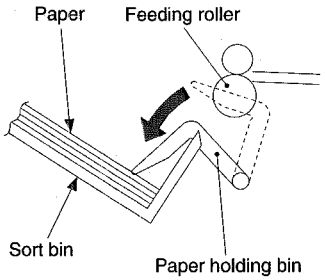

Figure 2-215

III. FEEDING DRIVE SYSTEM

A. Outline

The feeding system serves to move copies from the copier to the bins using its feeding roller driven by the feeder motor (M1) and the low-speed feeding motor (M10).

The feeder motor (M1) is used to feed paper at 170 mm/sec or higher, and the low-speed feeding motor (M10) is used to feed paper at lower than 170 mm/sec.

The feeder motor (M1) rotates clockwise when feeding copy paper. The feeding guide is designed to shift up when the feeder motor (M10) rotates counterclockwise. (stapler sorter only)

The appropriate feeding path is formed by turning on/off the paper path solenoid (SL1) according to the mode selected on the copier.

In non-sort mode, paper is detected by the non-sort paper sensor (PI3); in sort mode, paper is detected by the sort paper sensor (PI4).

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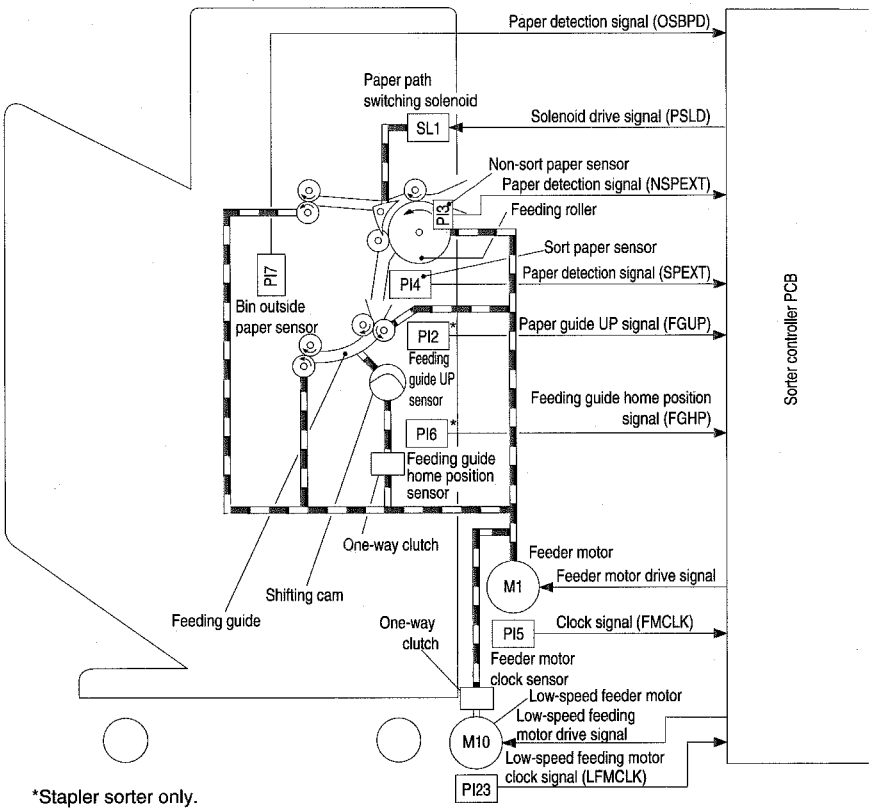

Paper detection signal (OSBPD)
Paper path switching solenoid
SL1
Solenoid drive signal (PSLD)
Non-sort paper sensor
Paper detection signal (NSPEXT)
PI3
Feeding roller
Sort paper sensor
PI7
PI4*
Paper detection signal (SPEXT)
Bin outside paper sensor
PI2*
Paper guide UP signal (FGUP)
Feeding guide UP sensor
Feeding guide home position signal (FGHP)
PI6*
Feeding guide home position sensor
Sorter controller PCB
One-way clutch
Feeder motor
M1
Feeder motor drive signal
Shifting cam
Feeding guide
One-way clutch
PI5
Clock signal (FMCLK)
Feeder motor clock sensor
Low-speed feeder motor
Low-speed feeding motor drive signal
M10
Low-speed feeding motor clock signal (LFMCLK)
PI23
*Stapler sorter only.

Figure 2-301

B. Feeding Path

The feeding path for copies changes as follows to suit each mode:

1. Non-Sort Mode

The copies are delivered to the non-sort bin.

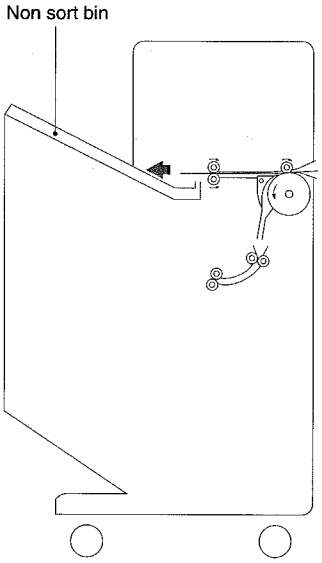


Figure 2-302

2. Sort, Group, and Staple Sort Mode

The copies are delivered to a sort bin.

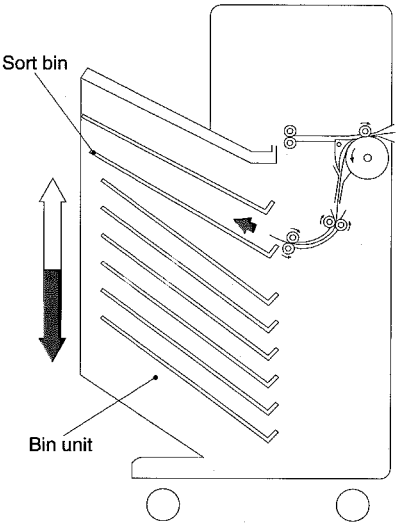


Figure 2-303

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

C. Controlling the Feeding Speed

1. Outline

The speed of feeding paper is controlled by the feeder motor (M1) and the low-speed feeding motor (M10).

Both feeding motor (M1) and low-speed feeding motor (M10) are located in the same drive system; a one-way clutch is used between the low-speed motor and the drive system to prevent interference that otherwise would be caused by the rotation of the two motors.

Copies are moved at either of the following three speeds:

a. Process Speed
   This is the speed used to cover from when a copy is received from the copier to when it is fully drawn into the sorter.
b. Draw-In Speed
   This is the speed used when moving copies inside the sorter.
c. Delivery Speed
   This is the speed used to deliver copies from the sorter.

The feeding motor (M1) and the low-speed feeding motor (M10) have different ranges for controlling feeding speed and feeding period; for specifics, see Table 2-301.

Motor	Range of speed control	Period of speed control
Low-speed feeding motor (M10)	between 30 and 170 mm/sec	• process speed
Feeding motor (M1)	between 170 and 1300 mm/sec	• draw-in speed • delivery speed

Table 2-301

2. Process Speed

The term is given because copies are moved at the copier's process speed.

The machine's process speed is controlled by controlling the low-speed feeding motor (M10).

While the low-speed motor is being controlled, a voltage that suits the revolution of the low-speed motor is applied to the feeding motor (M1), thereby rotating the feeding motor in conjunction and, ultimately, reducing the load imposed on the low-speed feeding motor.

3. Draw-In Speed

When a copy leaves the copier's last roller, the feeding speed is increased to increase the gap between sheets. (The feeding speed remains constant at 1200 mm/sec at all times.)

The draw-in speed is always controlled by the feeding motor (M1). While the feeding motor is being controlled, a voltage that suits the revolution of the feeding motor is applied to the low-speed feeding motor (M10), thereby rotating the low-speed feeding motor in conjunction and, ultimately, reducing the load imposed on the feeding motor.

4. Delivery Speed

When a copy leaves the sort paper sensor (PI4), the feeding speed is decreased to deliver the copy slowly to the sort bin.

The delivery speed is always controlled by the feeding motor (M1). While the feeding motor is being controlled, a voltage that suits the revolution of the feeding motor is applied to the low-speed feeding motor (M10), thereby rotating the low-speed feeding motor in conjunction and, ultimately, reducing the load imposed on the feeding motor.

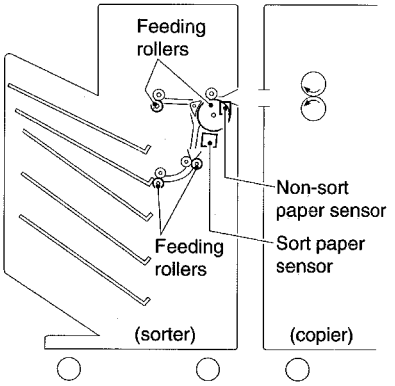


Figure 2-304

5. Feeding in Non-Sort Mode

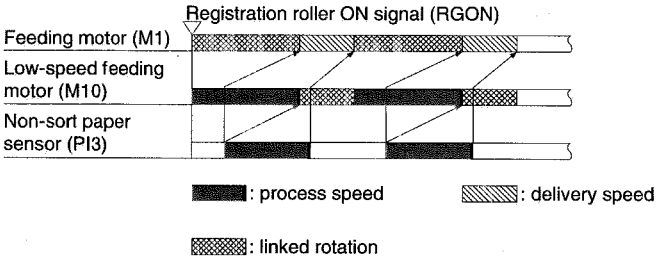


Figure 2-305

6. Feeding in Sort/Group Mode

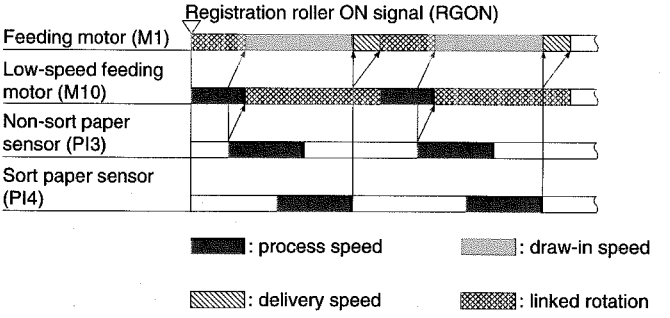


Figure 2-306

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

D. Shifting Up the Feeding Guide (stapler sorter only)

1. Outline

When double stapling or single stapling is executed, the stapler unit is moved to the rear.

The feeding guide is located in the path taken by the stapler unit when it moves to the rear.

The machine shifts up the feeding guide when the stapler unit moves to the rear to prevent the feeding guide from interfering with the stapler unit.

2. Operation

The feeding guide is shifted up by the feeder motor (M1). The drive of the feeder motor (M1) is transmitted to the feeder drive system when the motor is rotating clockwise; the drive is transmitted to the shift-up drive system of the feeding guide when the motor rotates counterclockwise. (While M1 is operating, the low speed motor (M10) rotates in link.)

When the feeder motor (M1) rotates counterclockwise, its drive is transmitted to the shift-up cam through a one-way clutch. The feeding guide shifts up in response to the rotation of the shift-up cam.

The feeding guide UP sensor (PI2) and the feeding guide home position sensor are used to monitor the position of the feeding guide.

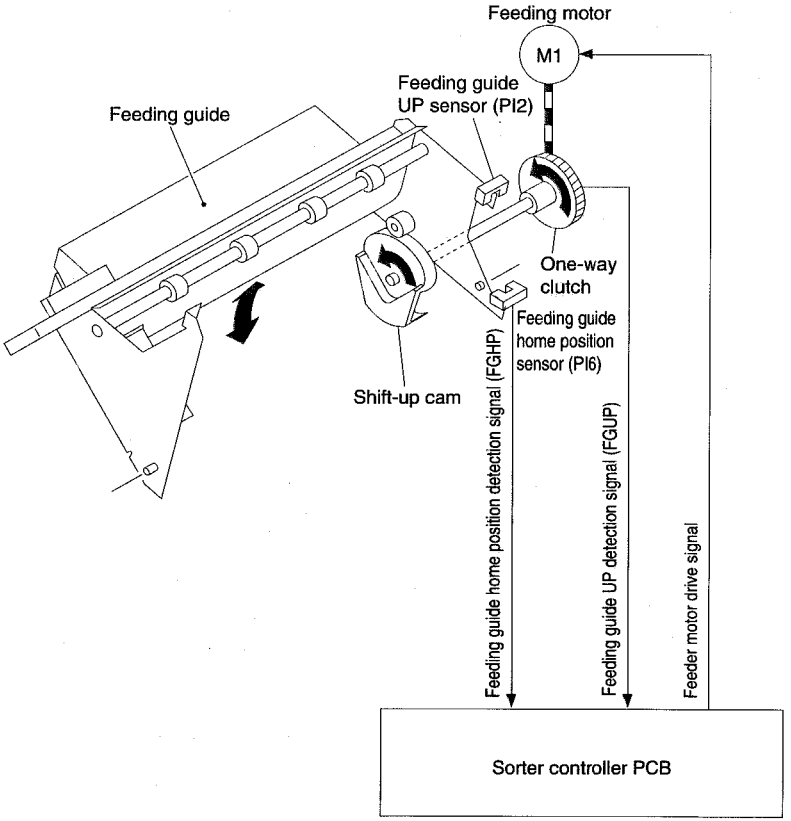


Figure 2-307

E. Controlling the Feeder Motor

Figure 2-308 is a diagram of the circuit used to control the feeder motor.

The feeder motor is a DC motor.

The microprocessor (Q1) on the sorter controller PCB sends the feeder motor control signal (FDPWM*) and the rotation direction signal (FDMCW*/FDMCCW*) to the drive circuit assembly and the speed control start signal (PLLON*) and the rotation speed reference value signal (FDREF) to the speed control circuit assembly.

When the feeder motor (M1) rotates, the feeder motor clock sensor (PI5) sends the clock signal (FMCLK) to the speed control circuit assembly. The speed control circuit, on the other hand, sends the feeder motor speed change signal (FDMVC) to the microprocessor (Q1) on the sorter controller PCB after comparing the rotation speed reference value signal (FDREF) and the clock signal (FMCLK).

The microprocessor (Q1), in turn, changes the feeder motor control signal (FDPWM*) based on the feeder motor speed change signal (FDMVC) to maintain the rotation speed of the feeder motor constant at all times.

LED8 remains on when feeder motor control is performed normally; it will go off in response to an error in feeder motor control.

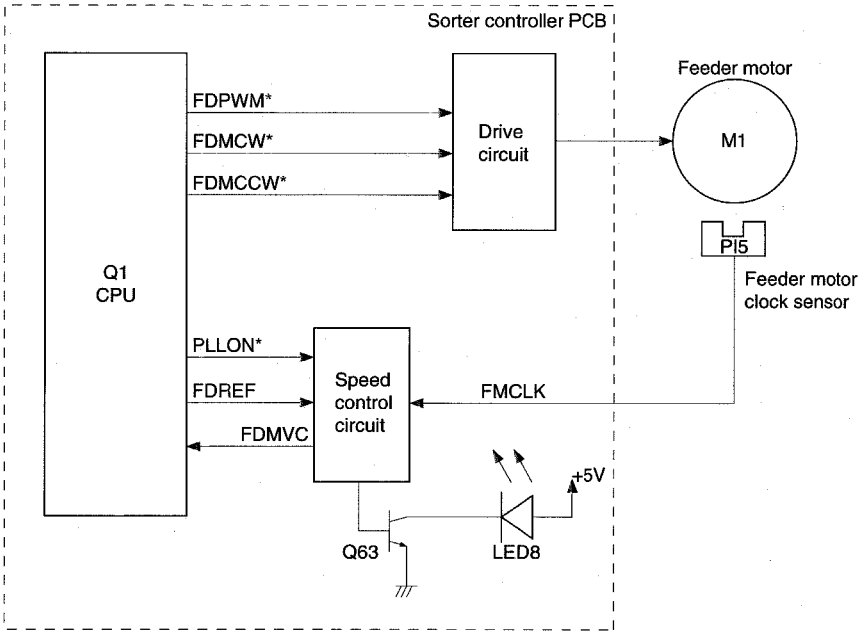


Figure 2-308

F. Controlling the Low-speed Feeder Motor

Figure 2-309 is a diagram of the circuit used to control the low-speed feeder motor. The low-speed feeder motor is a DC motor.

The microprocessor (Q1) on the sorter controller PCB sends the feeding motor control signal (LFDPWM*) and the rotation direction signal (LFDCW*/LFDCCW*) to the drive circuit assembly and the speed control start signal (PLLON*) and the rotation speed reference value signal (LFDREF) to the speed control circuit assembly.

When the low-speed feeder motor (M10) rotates, the feeder motor clock sensor (PI23) sends the clock signal (LFDCLK) to the speed control circuit assembly. The speed control circuit, on the other hand, sends the low-speed feeder motor speed change signal (LFDVC) to the microprocessor (Q1) on the sorter controller PCB after comparing the rotation speed reference value signal (LFDREF) and the clock signal (LFDCLK).

The microprocessor (Q1), in turn, changes the low-speed feeder motor control signal (LFDPWM*) based on the low-speed feeder motor speed change signal (LFDVC) to maintain the rotation speed of the low-speed feeder motor constant at all times.

LED601 remains on when low-speed feeder motor control is performed normally; it will go off in response to an error in low-speed feeder motor control.

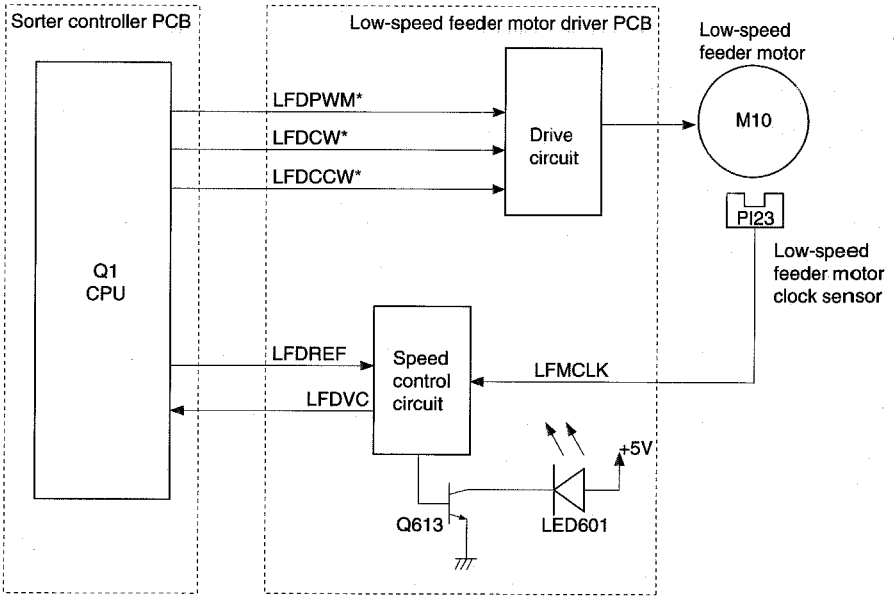


Figure 2-309

G. Overstacking

1. Outline

The number of copies that can be stacked in the bins for each mode is limited as shown in Table 2-302,303. The term overstacking refers to a condition in which these limits are exceeded.

a. Stapler Sorter-F1

Non-sort mode	Maximum stack
All sizes	250 sheets

Staple sort mode	Maximum stack
A3,B4,11"×17";LGL	25 sheets
A4,B5,A4R;LTR,LTRR	30 sheets

Sort mode	Maximum stack
A3,B4,11"×17",LGL	25 sheets
A4,B5,A4R,B5R,LTR,LTRR	50 sheets

Group mode	Maximum stack
A3,B4,A4R,B5R,11"×17",LGL,LTRR	25 sheets
A4,B5,A5,LTR,STMT	30 sheets

Table 2-302

b. Sorter-D1

Non-sort mode	Maximum stack
All sizes	250 sheets

Sort mode	Maximum stack
A3,B4,11"×17",LGL	25 sheets
A4,B5,A4R,B5R,LTR,LTRR	50 sheets

Group mode	Maximum stack
A3,B4,A4R,B5R,11"×17",LGL,LTRR	25 sheets
A4,B5,LTR	30 sheets

Table 2-303

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

2. Operation in Overstacking Condition

The machine operates as follows if the bin stacking limit for each mode is exceeded:

a. Non-Sort Mode

Mode

- DF used
- small-size paper
- 6 originals
- copy count '50'

① The above modes are selected, and the Copy Start key is pressed.

⇩

② For each original, as many as 50 copies are delivered to the non-sort bin.

⇩

③ Operation stops upon delivering the 251st copy into the non-sort bin.

⇩

④ When the Copy Start key is pressed once again, the remaining copies are made (49) and delivered to the non-sort bin.

b. Sort Mode

The Copy Start key becomes valid or invalid depending on the specifications of the copier.

c. Group Mode

The Copy Start key becomes valid or invalid depending on the specifications of the copier.

■ DF in Use

If the number of originals is greater than the number of bins, operation stops after delivery to the last bin. When all copies are removed from the bins and the Copy Start key is pressed, the remaining originals are copied.

■ DF Not in Use

If delivery was made all the way to the bottommost bin, the Copy Start key will not become valid unless all copies are removed from the bins.

H. Jams

The machine sends the jam signal (SJAM) to the copier under any of the following conditions:

In response, the copier stops operation and, at the same time, turns on the message 'Jam' on its control panel.

1. Delay Jam

The non-sort paper sensor (PI3) does not turn on during feeding equivalent of 250 mm* after the machine has received the delivery signal from the copier.

*Differs depending on the type of copier.

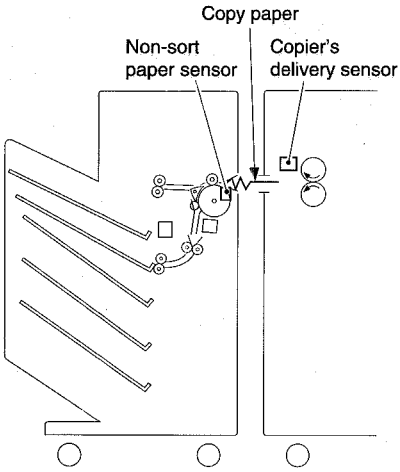
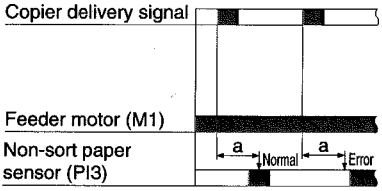


Figure 2-310



a: time equivalent to 250 mm of feeding.

Figure 2-311

2. Stationary Jam

a. Delivery to Non-Sort Bin

The non-sort paper sensor does not turn off within a period of time equivalent of feeding "paper length + 80 mm" after the non-sort paper sensor has turned on.

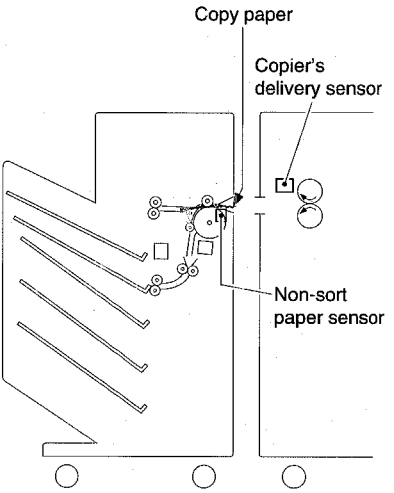
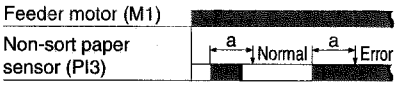


Figure 2-312



a: time equivalent to "paper length + 80 mm" of feeding.

Figure 2-313

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

b. Sorter Internal Stationary Jam

① Timing at Sort Paper Sensor

After the non-sort sensor has turned on, the sort paper sensor does not turn on upon passage of time equivalent of twice the time paper is expected to take reaching the sort paper sensor.

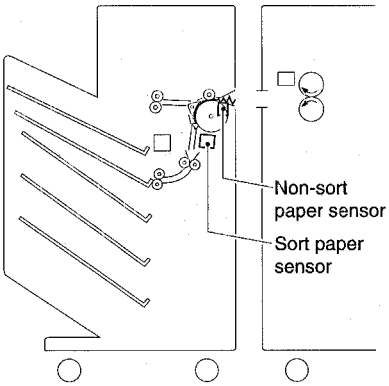
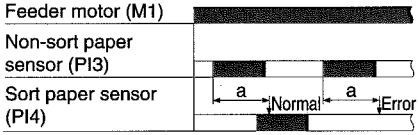


Figure 2-314



a: twice the time paper is expected to reach the sort paper sensor.

Figure 2-315

② Timing at Sort Paper Sensor

After the sort paper sensor has turned on, it does not turn off after passage of time equivalent to feeding "paper length + 80 mm".

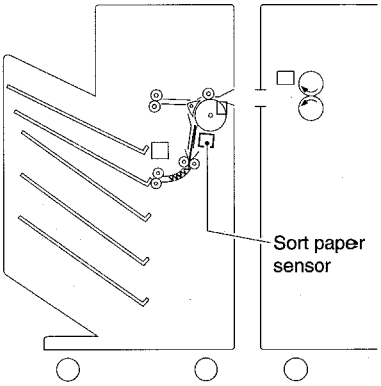
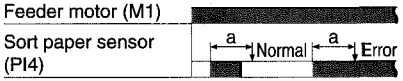


Figure 2-316



a: time equivalent to "paper length + 80 mm" of feeding.

Figure 2-317

3. Bin Outside Jam

After the non-sort paper sensor has turned on, the bin outside paper sensor turns on within the period in which paper is expected to be fed.

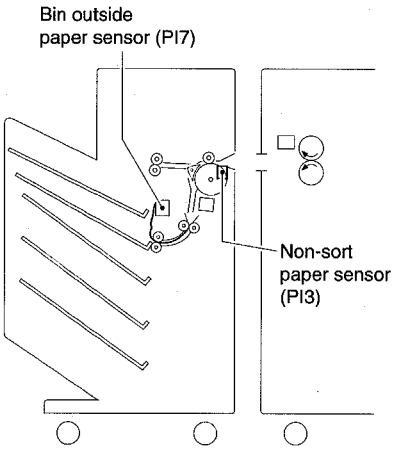
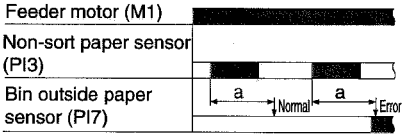


Figure 2-318



a: feeding period.

Figure 2-319

4. Power-On Jam

Any of the paper sensors (PI3, PI4, PI7) is on at power-on.

5. Door Open Jam

The front door is opened when the machine is operating.

■ When the respective jam is removed and the Copy Start key is pressed, the jam correction function turns on to make the remaining number of copies automatically (except, however, bin outside jams).
If a jam occurs inside the copier, on the other hand, all copies moving through the sorter are discharged to specific bins and the sorter stops operation.

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IV. STAPLER UNIT DRIVE SYSTEM (Stapler sorter only)

A. Outline

The stapler unit is used to staple sheets delivered to the bins. Stapling may be corner stapling, double stapling, or single stapling, and the stapler unit executes the following four operations:

- stapling
- stapler unit shifting
- stapler unit swinging

Stapling is driven by the stapler motor (M2).

The orientation of the stapler unit is changed at the same time as shifting the stapler unit and, therefore, is not supported by a separate drive system.

The stapler unit is shifted by the stapler unit drive motor (M3). The stapler unit position sensor (PI2) is used to detect the position of the stapler unit.

The stapler unit is swung by the stapler unit swing motor, and the swinging position is monitored by the stapler unit swing position sensor (PI10) and the stapler unit swing home position (PI9).

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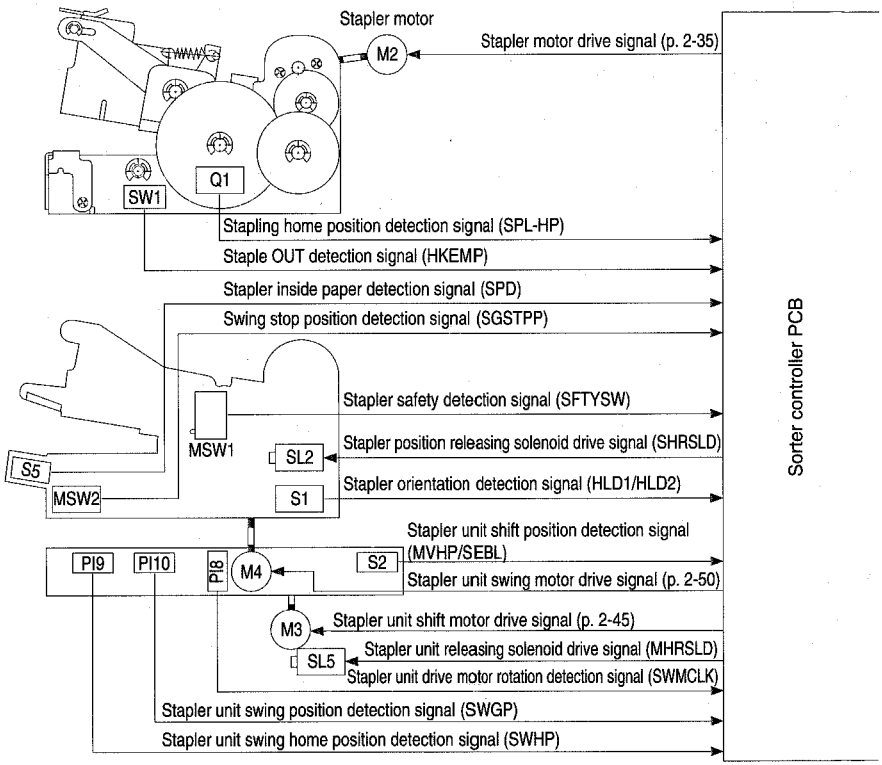

Figure 2-401

B. Stapler Unit

1. Outline

Figure 2-402 is a diagram showing how the stapler unit is constructed.

Stapling is driven by the stapler motor (M2). Specifically, stapling is driven by the rotation of a cam, and the stapling home position sensor (Q1) detects each stapling operation.

The staple sensor (SW1) serves to check the presence/absence of staples inside the staple cartridge.

The stapler inside paper sensor (S5) serves to detect the insertion of paper into the stapler assembly, thus preventing problems caused by idle punching.

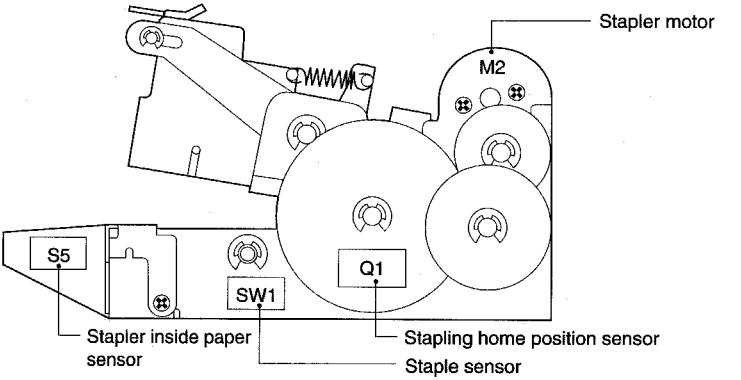

Figure 2-402

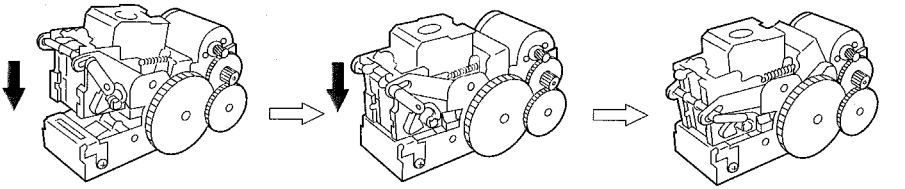

Figure 2-403 Stapler Unit Dive System

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2. Controlling the Stapler Motor (M2)

a. Outline

Figure 2-404 is a block diagram showing the staple motor control circuit. The stapler motor (M2) is a DC motor, and the circuit has the following functions:

- turns on and off the stapler motor.
- controls the direction of rotation of the stapler motor.
- protects the stapler motor from overcurrent.

The path through which power is supplied to the stapler motor (M2) is equipped with two microswitches.

- stapler safety switch (MSW1)
- swing stop position sensor (MSW2)

The stapler safety switch (MSW1) serves to cut the power used to drive the stapler motor when an object about 5.5 mm thick or more enters the stapler assembly.

The swing stop position sensor serves to supply the stapler motor (M2) with drive power only when the stapler unit is at a specific stapling position.

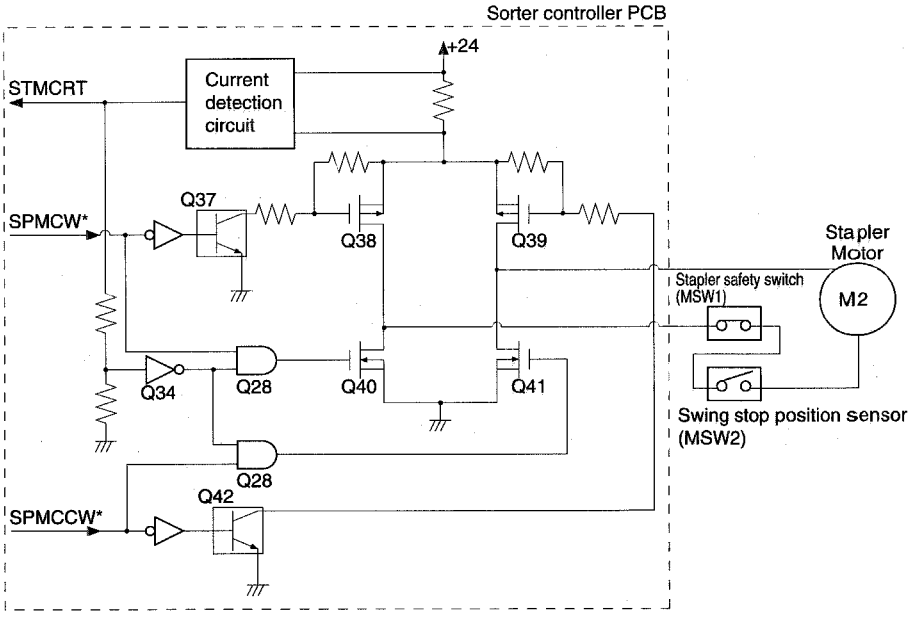

Figure 2-404

b. Turning On and Off the Stapler Motor

The stapler motor is turned on/off and its direction of rotation are controlled based on combinations of the following two control signals:

1. stapler motor clockwise rotation signal (SPMCW*)
2. stapler motor counterclockwise rotation signal (SPMCCW*)

Stapler motor rotation	SPMCW*	SPMCCW*
Clockwise rotation	0	1
Counterclockwise rotation	1	0
Stop rotation	1	1

Table 2-401

c. Protecting the Stapler Motor from Overcurrent

The current detection circuit monitors the current flowing into the stapler motor as long as the stapler motor is rotating. The data it collects is sent to the microprocessor (Q1) on the sorter controller PCB as the stapler motor state signal (STMCRT).

The stapler motor state signal (STMCRT) goes '1' when the current limit is exceeded, and the state is communicated to the gate circuit (Q28) through an inverter (Q34). The gate circuit (Q28), in response to the stapler motor state signal (STMCRT), causes the stapler motor CW signal (SPMCW*) and the stapler motor CCW signal (SPMCCW*) to go '0'; and, as a result, the stapler motor stops.

3. Controlling the Stapler Motor for a Staple Jam

When a staple jam or an error is detected in the stapler unit, the stapler motor (M2) is controlled as follows:

① An excess load is imposed on the stapler motor because of a staple jam.

⇩

② The stapler cannot return to the home position within 1 sec after it has started punching operation.

⇩

③ The stapler motor rotates counterclockwise to return the stapler to the stapling home position.

⇩

④ An error signal is sent to the copier.

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4. Safety Switch (MSW1)

If a finger or an object is inserted over the stapling position inside a bin, the actuator will be lifted to turn off the safety switch 2.

When the safety switch 2 turns off, the drive power (24 V) to the stapler motor (M2) is cut off to prevent stapling operation.

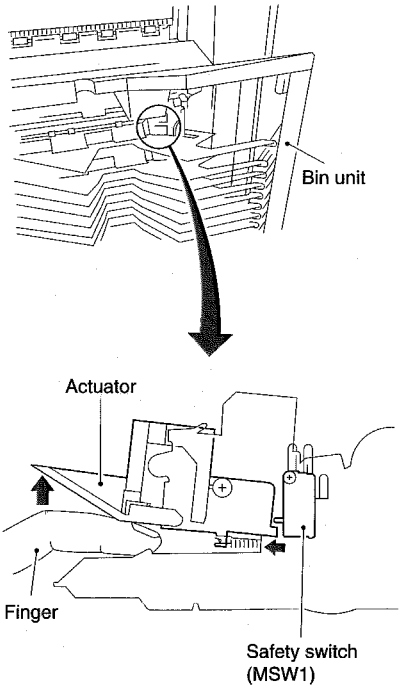


Figure 2-405

5. Swing Stop Position Sensor (MSW2)

When the stapler unit reaches a specific stapling position as part of its swing operation, the swing stop position sensor turns on.

When the swing stop position sensor turns on, the drive power (24 V) for the stapler motor (M2) is supplied to enable stapling operation.

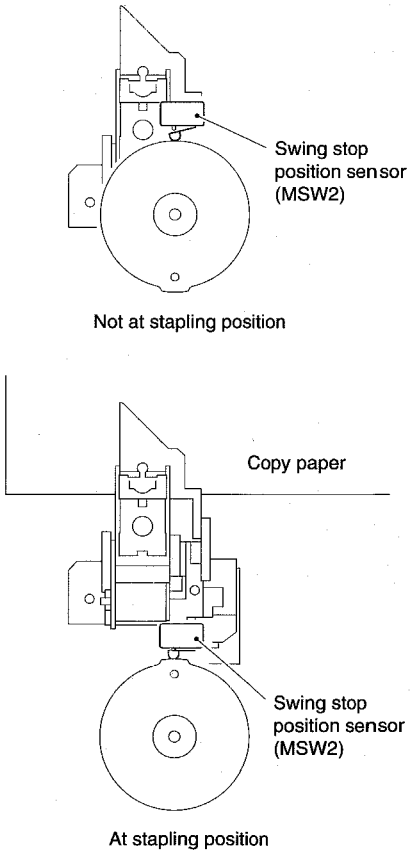


Figure 2-406

6. Stapler Inside Paper Sensor (S5)

The stapler inside paper sensor (S5) is located at the stapling assembly of the stapler unit, serving to check the presence/absence of paper.

The stapler inside paper sensor (S5) is a reflecting/transmitting type sensor that uses a prism. The sensor serves to detect the presence/absence of paper and sends the result of detection to the microprocessor (Q1) on the sorter controller PCB.

The microprocessor drives the stapler motor (M2) only when the result indicates the presence of paper.

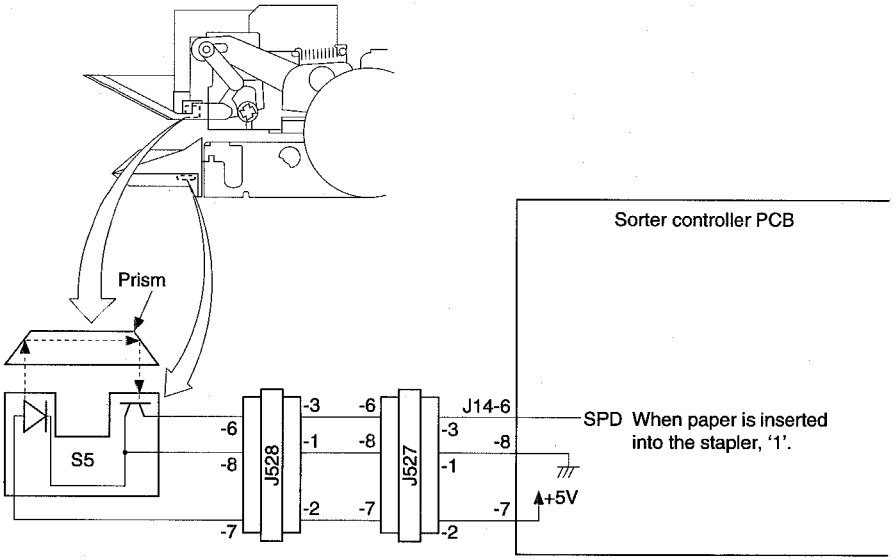


Figure 2-407

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

7. Absence of Staples

The presence/absence of staples inside the staple cartridge is checked by the staple switch (SW1) built on the bottom of the stapler.

The staples inside the staple cartridge is pushed down by the work of a spring and a middle plate; and the staples are sent to the tip of the stapler by the staple feeding roller.

When staples exist, the staple switch (SW1) is pushed by the staples, and the sorter controller recognizes the presence of staples.

When staples start to run out (about 40 staples), the staple switch (SW1) opens (normally, closed), and the sorter controller recognizes the absence of staples; at this time, the sorter controller indicates the message Add Staple.

When the absence of staples is detected, no further stapling will be executed; however, if the absence is detected during continuous stapling, stapling will continue until all stacks are stapled.

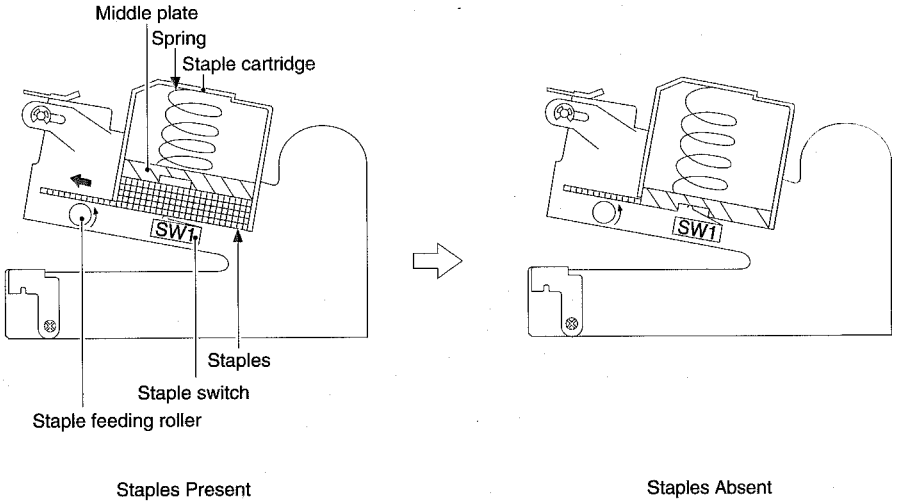


Figure 2-408

C. Controlling the Orientation of the Stapler Unit

1. Outline

The stapler unit changes its orientation according to the orientation of stapling in one of the two ways explained in Table 2-402.

The orientation of the stapler unit is changed by the orientation shifting lever when the stapler unit moves to the rear.

At the home position, the stapler unit is positioned at a 45° angle in relation to copy paper. It is positioned parallel to the copy paper when it moves about 100 mm or more toward the rear away from the home position.

The stapler unit is fixed in place in each position by the positioning claw, which is operated by the positioning claw releasing solenoid (SL2).

The orientation of the stapler unit is checked by the stapler orientation sensor (S1).

Reference	1	2	
Punching	At a 45° angle to paper	Parallel to paper	
Diagram	Delivery Copy paper 45° Staple Corner Stapling	Delivery Copy paper Parallel Staples Double Stapling	Delivery Copy paper Parallel Staple Single Stapling

Table 2-402

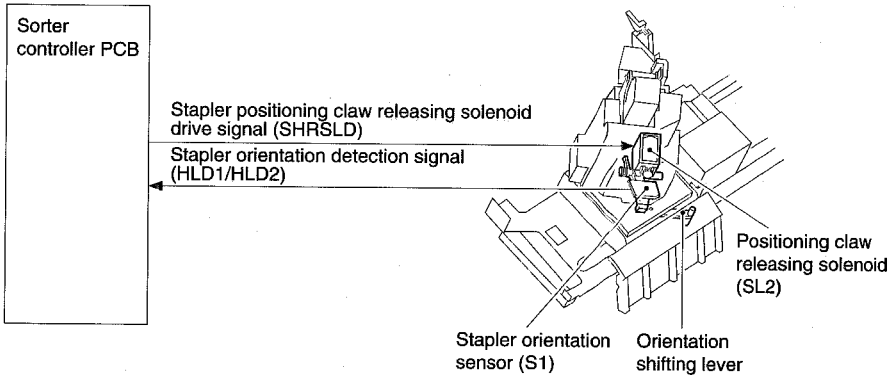


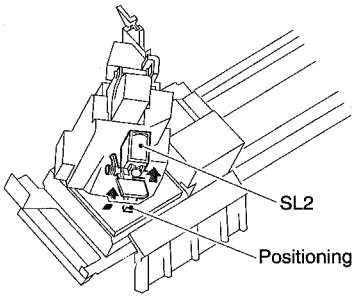
Figure 2-409

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

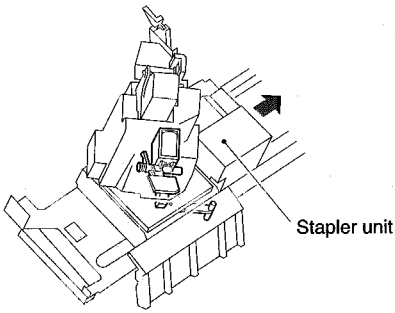
2. Operation

The sorter controller PCB sends the drive signal (HLDSLD) to the positioning claw releasing solenoid (SL2) to unlock the positioning claw; thereafter, the stapler unit starts to move toward the rear. When the stapler unit starts moving toward the rear, the orientation shifting lever becomes free from the rail, turning the stapler unit counterclockwise 45° for double or single stapling operation.

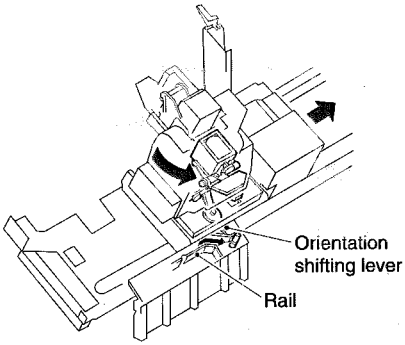
The positioning claw locks the stapler unit in position automatically after the stapler unit is positioned for a specific orientation.



① The positioning claw releasing solenoid (SL2) turns on, and the positioning claw becomes disengaged.



② The stapler unit starts to move toward the rear.



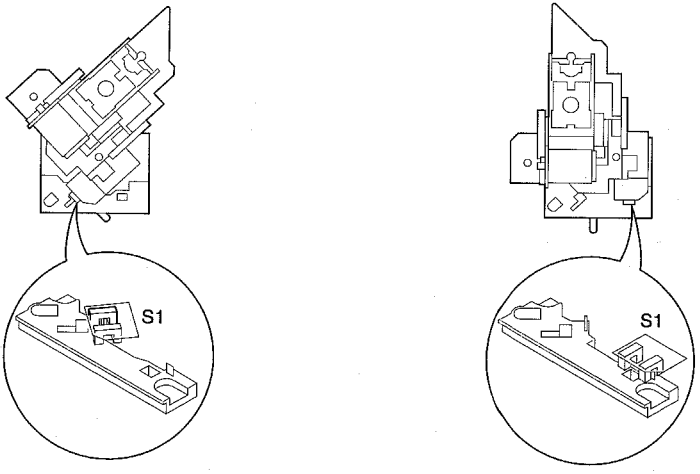
③ The orientation shifting lever becomes free of the rail, and the stapler unit turns 45° counterclockwise.

Figure 2-410

3. Detecting the Orientation of the Stapler Unit

The stapler orientation sensor (S1) serves to detect the orientation of the stapler unit.

The stapler orientation sensor (S1) consists of two photointerrupters. Each photointerrupter serves to identify that the stapler unit is at 45° (corner stapling) in relation to copy paper or 90° (double/single stapling) and sends the result to the microprocessor on the sorter controller PCB.



Corner Stapling

Double/Single Stapling

Figure 2-411

4. Sequence of Operations (double stapling; changing the orientation of the stapler unit)

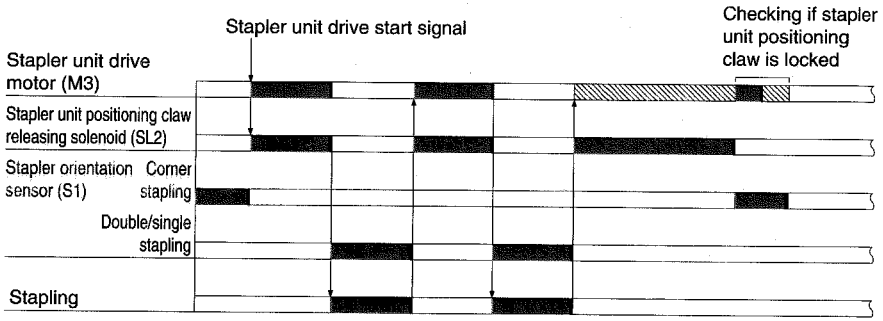


Figure 2-412

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

D. Controlling the Stapler Unit Movement

1. Outline

The stapler unit is moved for single and double stapling.

The movement is driven by the stapler drive motor (M3). The stapler unit position sensor (S2) is used to detect the home position for stapler movement and stapling position.

The stapler unit is locked in position by the stapler unit positioning claw whenever it is at its home position for movement. When it moves, the positioning claw releasing solenoid (SL5) turns on to unlock the positioning claw.

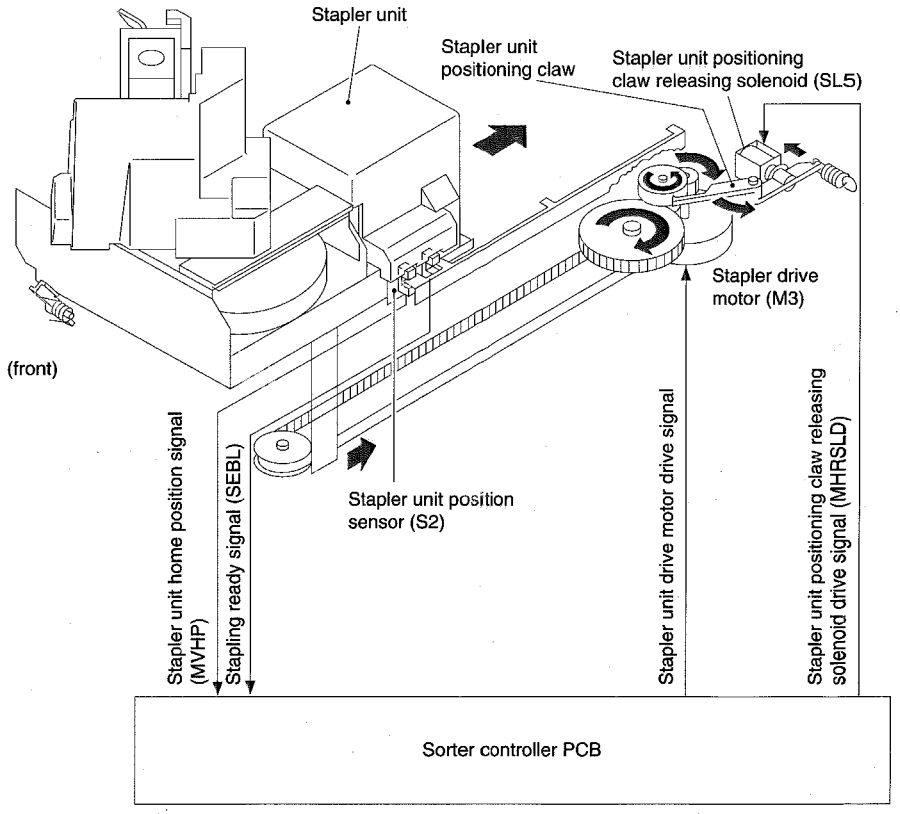


Figure 2-413

2. Operation

The stapler unit changes its position for single stapling and double stapling but not for corner stapling.

The stapler unit drive motor (M3) moves the stapler unit to a specific position in response to signals from the sorter controller PCB. The stapler unit may be stopped at two locations in addition to its home position.

Stop position	Distance from home position
Stop position 1	142 mm (approx.)
Stop position 2	262 mm (approx.)

Table 2-403

3. Detecting the Stop Position

The stop position of the stapler unit is determined by controlling the pulses from the stapler drive motor (M3) and the stapler unit position sensor (S2). The stapler unit position sensor (S2) consists of two photointerrupters, and each interrupter detects the home position or the stapling position.

The above arrangement is to ensure that stapling is executed only at the correct position. When the stapler unit position sensor (S2) turns on, the stapling enable signal (SEBL) is generated making the stapler unit ready for stapling.

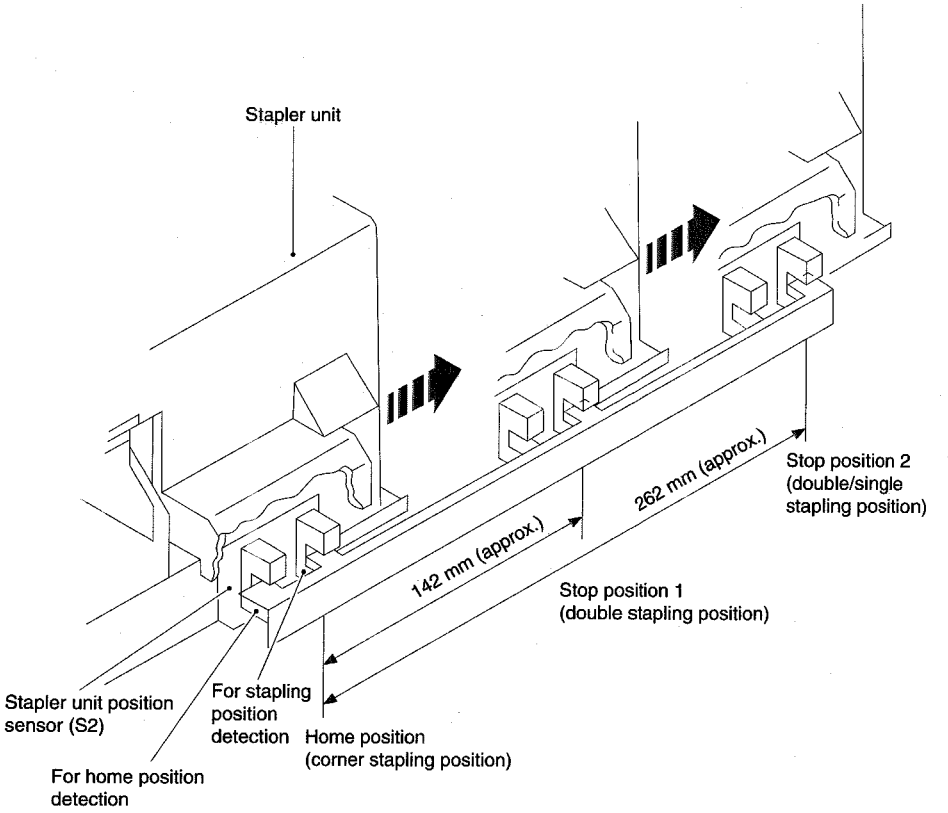


Figure 2-414

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

4. Controlling the Stapler Unit Drive Motor

a. Outline

The circuit shown in Figure 2-415 is the stapler unit drive motor (M3) control circuit.

The stapler unit drive motor is a 4-phase control stepping motor, which is turned on or off and whose direction of rotation is changed by controlling the output timing of the pulse signals A, A*, B, and B*.

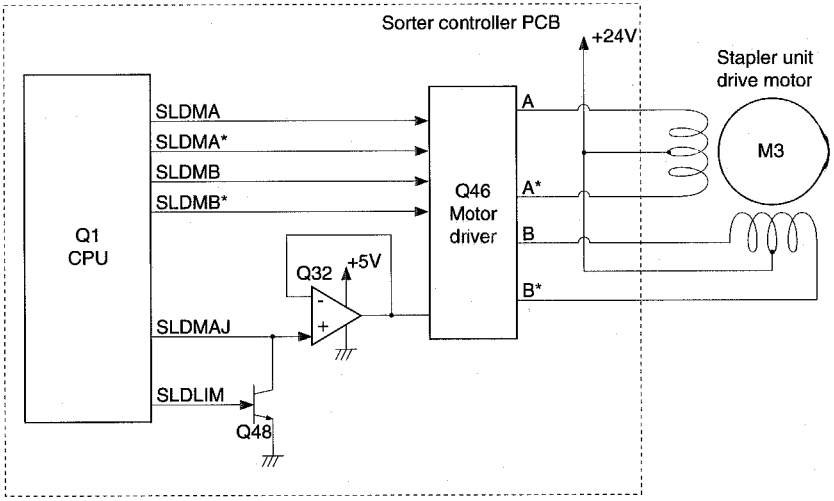


Figure 2-415

b. Operation

The microprocessor (Q1) on the sorter controller PCB receives instructions on staple mode from the copier and sends the drive pulses (SLDMA, SLDMA*, SLDMB, SLDMB*) and the reference current level signal (SLDMAJ) to the motor driver circuit.

The motor driver circuit drives the stapler unit drive motor (M3) based on each set of signals.

To hold the stapler unit drive motor (M3), the output timing for the pulse signals (A, A*, B, B*) is fixed while changing the level of the reference current level signal (SLDMAJ) for the purpose.

The stapler unit drive prohibit signal (SLDLIM) is used to cause the reference current level signal (SLDMAJ) to go '0'; when the signal goes '0', the stapler unit drive motor is kept at rest.

When the drive prohibit signal (SLDLIM) is generated, LED4 on the sorter controller PCB turns on and, at the same time, 'E532' turns on the copier's control panel. The drive prohibit signal (SLDLIM) is generated when any of the following conditions is true:

No.	Description	Sensor
1	The feeding guide does not move up to a specific position.	Feeding guide UP sensor (PI2)
2	The stapler unit is not at the home position for swinging.	Stapler unit swing home position sensor (PI9)
3	The paper holding arm is not at the home position.	Paper holding sensor (PI11)
4	The push bar is not at the home position or the center position.	Push bar home position sensor (PI14) Push bar center position sensor (PI15)

Table 2-404

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

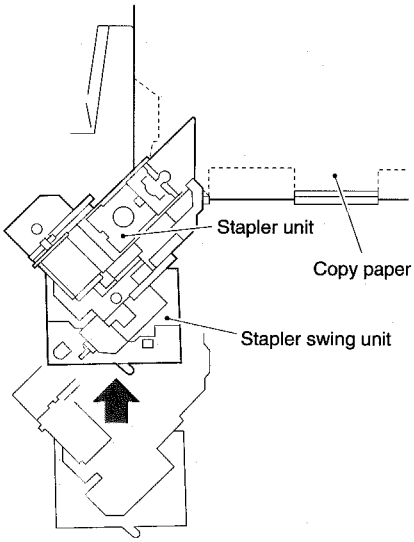
E. Controlling the Stapler Unit Swinging Operation

1. Outline

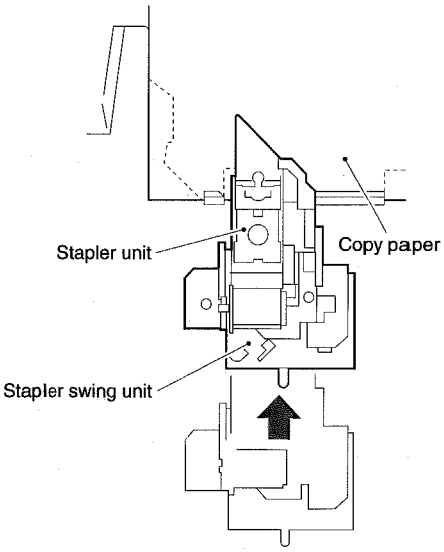
When the bins shift, the stapler unit swings so that the stapler unit will not come into contact with the paper inside the bin.

The swinging operation is driven by the stapler unit swing motor (M4). When the stapler unit reaches the stapling position, the swing stop position sensor (MSW2) turns on to supply the stapler motor with power. (For details, see p. 2-35.)

The stapler unit swing home position sensor (PI9) and the stapler unit swing position sensor (PI10) are used to detect the swinging position.



(swinging for corner stapling)



(swinging for single/double stapling)

Figure 2-416 (top view)

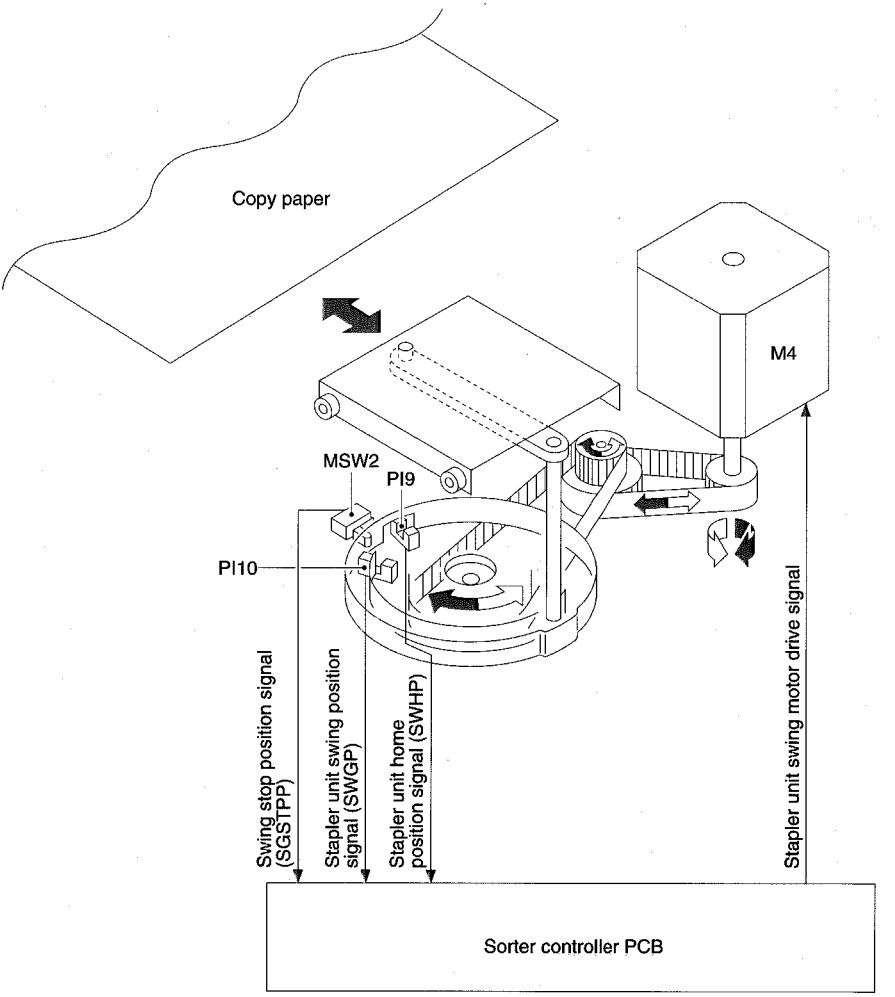


Figure 2-417

  CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

2. Detecting the Position of the Stapler Unit

The position of the stapler unit is detected by the stapler swing home position sensor (PI9) and the stapler swing position sensor (PI10).

The stapler swing home position sensor (PI9) is used to detect the presence of the stapler unit at the home position.

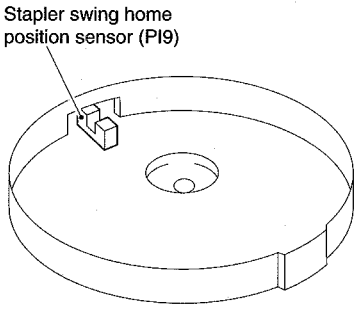


Figure 2-418

The stapler swing position sensor (PI10) checks the position of the stapler unit and communicates to the sorter controller PCB the shortest path that can be taken to the home position. The sorter controller PCB rotates the stapler unit swing motor (M4) clockwise or counterclockwise based on the signal from the stapler swing position sensor (PI10).

The swing disk rotates in the direction of ⇨ when the light-blocking plate is over the stapler swing position sensor (PI10); it rotates in the direction of ➡ when the light-blocking plate is not over the stapler swing position sensor (PI10).

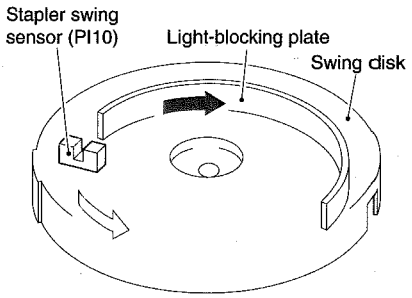


Figure 2-419

3. Controlling the Stapler Unit Swing Motor

a. Outline

Figure 2-420 shows the control circuit for the stapler unit swing motor (M4).

The stapler unit swing motor is a 4-phase control stepping motor, which is turned on and off or whose direction of rotation is changed by controlling the output timing of the pulse signals (A, A*, B, B*).

The stapler unit swing motor is driven in response to the swing enable signal (SWEBL).

LED10 turns off when the staple enable signal (STPEBL) is generated, and turns on if the signal is absent.

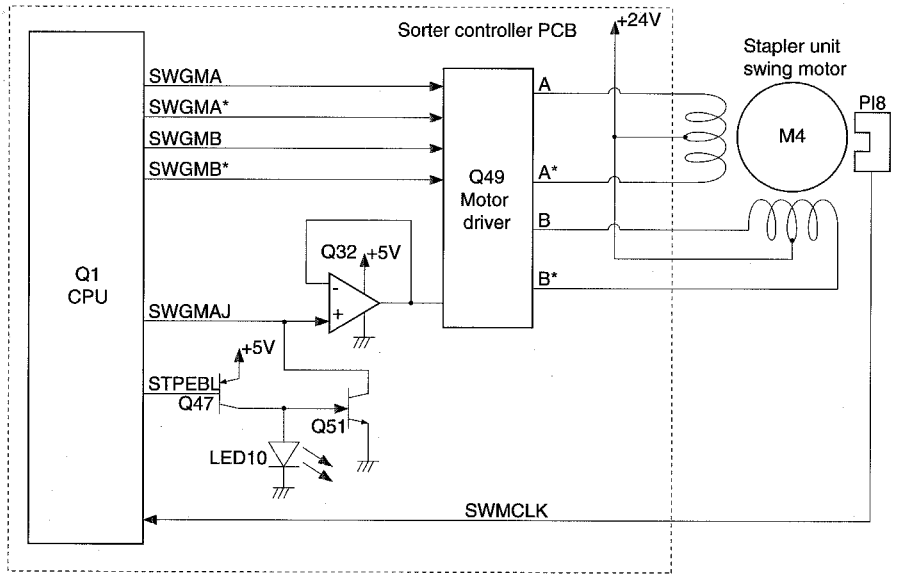


Figure 2-420

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

b. Operation

The microprocessor (Q1) on the sorter controller PCB receives instructions for staple modes from the copier and sends drive pulses (SWGMA, SWGMA*, SWGMB, SWGMB*) and the reference current level signal (SWGMAJ) to the motor driver circuit.

The motor driver circuit drives the stapler unit drive motor (M4) based on these signals.

To hold the stapler unit swing motor (M4), the output timing of the pulse signals (A, A*, B, B*) is fixed while varying the level of the reference current level signal (SWGMAJ) for the purpose.

The reference current level signal (SWGMAJ) is caused to go '1' and sent to the motor driver only when the staple enable (STPEBL) is being generated. When the reference current level signal (SWGMAJ) goes '0', the stapler unit swing motor (M4) remains at rest.

The staple enable signal (STPEBL) is generated when the staple unit position sensor (S2) turns on. LED10 on the sorter controller PCB turns on when the staple enable signal (STPEBL) is generated.

F. Smooth Stapling Operation

1. Outline

In conventional stapling operation, the bin unit is kept stationary while the stapler is swinging.

The machine's smooth stapling operation is executed by synchronizing the swinging operation of the stapler and the shifting operation of the bin unit, thereby shortening the overall stapling operation. (This has resulted in about 30% shorter stapling operation.)

What is referred to as smooth stapling is executed under the following conditions:

a In auto stapling or manual stapling, stacks of sheets to be stapled are in two or more bins.

2. Operation

Step 1

The stapler unit swing motor is driven to move the stapler unit to the stapling position.

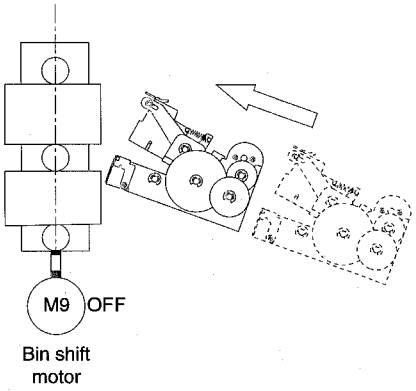


Figure 2-421

Step 2

Stapling is executed.

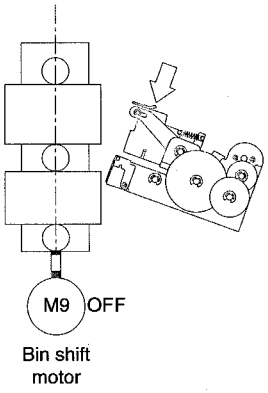


Figure 2-422

Step 3

When stapling is done, the stapler unit swing motor and the bin shift motor are driven at the same time.

- The stapler unit moves to the stapling position for stapling by moving in reverse.
- The bin unit moves up or down for the next stapling operation.

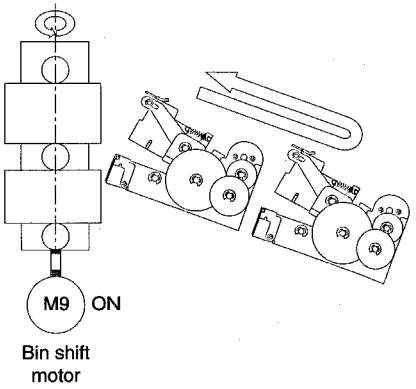


Figure 2-423

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

Step 4

The stapler unit swing motor stops as soon as the bin shift motor stops the lead cam at the level portion, and the stapler unit starts stapling.

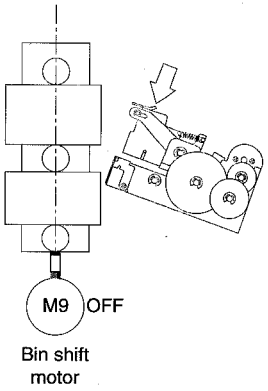


Figure 2-424

Step 5

After stapling is done, the stapler unit swing motor and the bin shift motor are driven at the same time.

- The stapler unit moves to the stapling position for the next stapling operation by moving in reverse.
- The bin unit moves up or down for the next stapling operation.

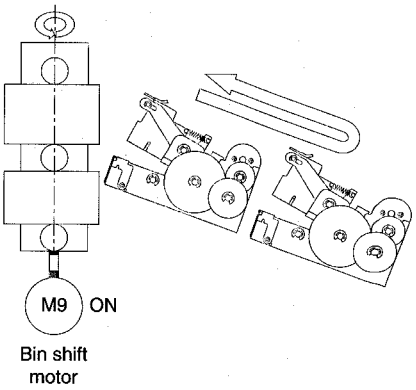


Figure 2-425

Step 6

When all stapling work is done, the stapler unit returns to the home position for swinging.

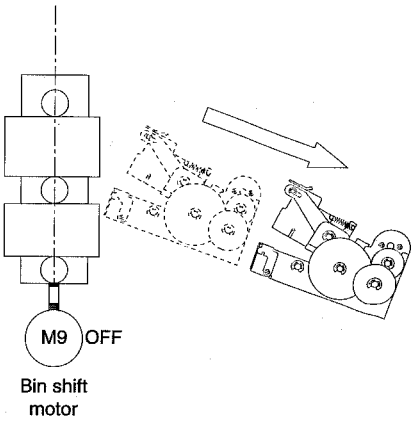


Figure 2-426

G. Holding Paper

1. Outline

The operation to hold down paper is executed each time copy paper is delivered to the bin. In this operation, the paper holding arm holds copy paper from above immediately it has been delivered, thereby shortening the time in which paper is accommodated into the bin.

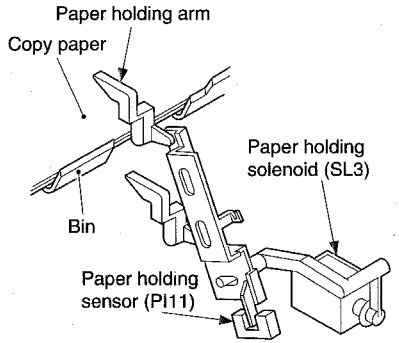


Figure 2-427 (SL3 off)

2. Paper Holding Solenoid

When the paper holding solenoid (SL3) turns on, the paper holding arm is driven to hold the sheets in the bin in place.

If the bin was shifted with the paper holding arm on, the arm would be likely to be damaged. To avoid the problem, the paper holding sensor (PI11) turns off while the paper holding arm is above the bin and the bin shift motor drive prohibit signal (SFTLIM) is generated. The bin shift motor cannot operate as long as the bin shift motor drive prohibit signal (SFTLIM) is being generated.

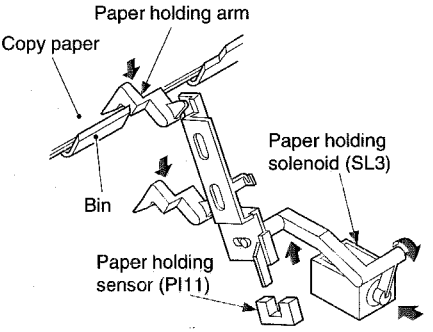


Figure 2-428 (SL3 on)

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H. Sequence of Operations (stapling; 2 originals, double stapling)

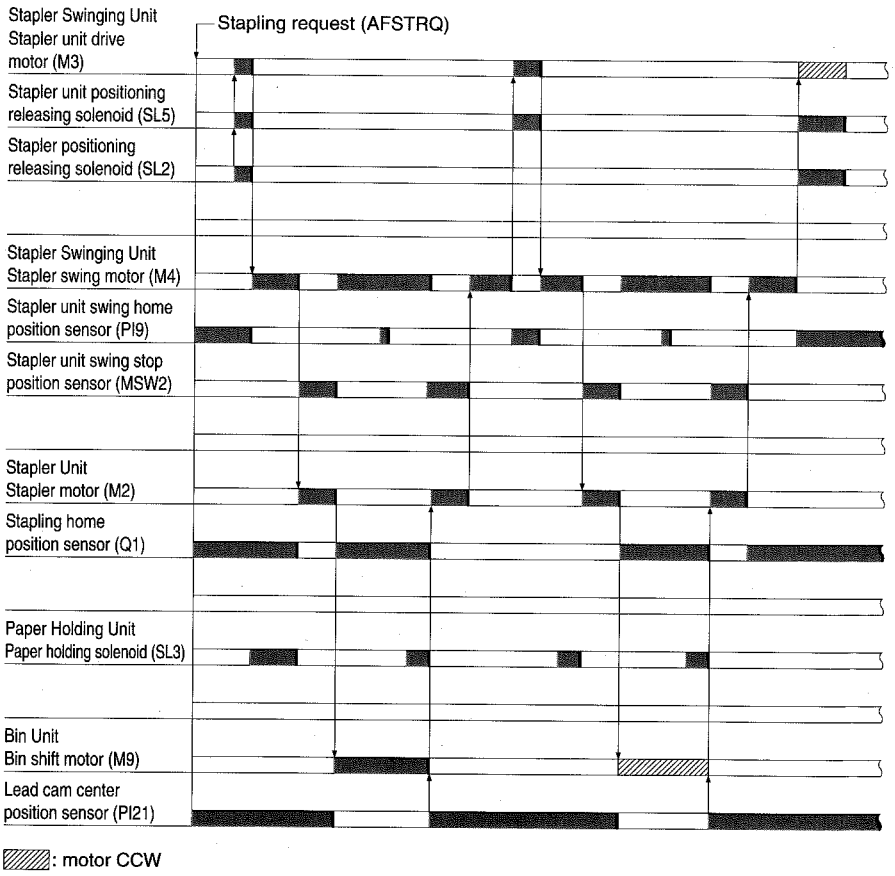


Figure 2-429

V. BIN UNIT DRIVE SYSTEM

A. Outline

The bin unit drive system consists of the following drive systems:

- bin drive system
- guide bar drive system
- push bar drive system
- guide plate drive system

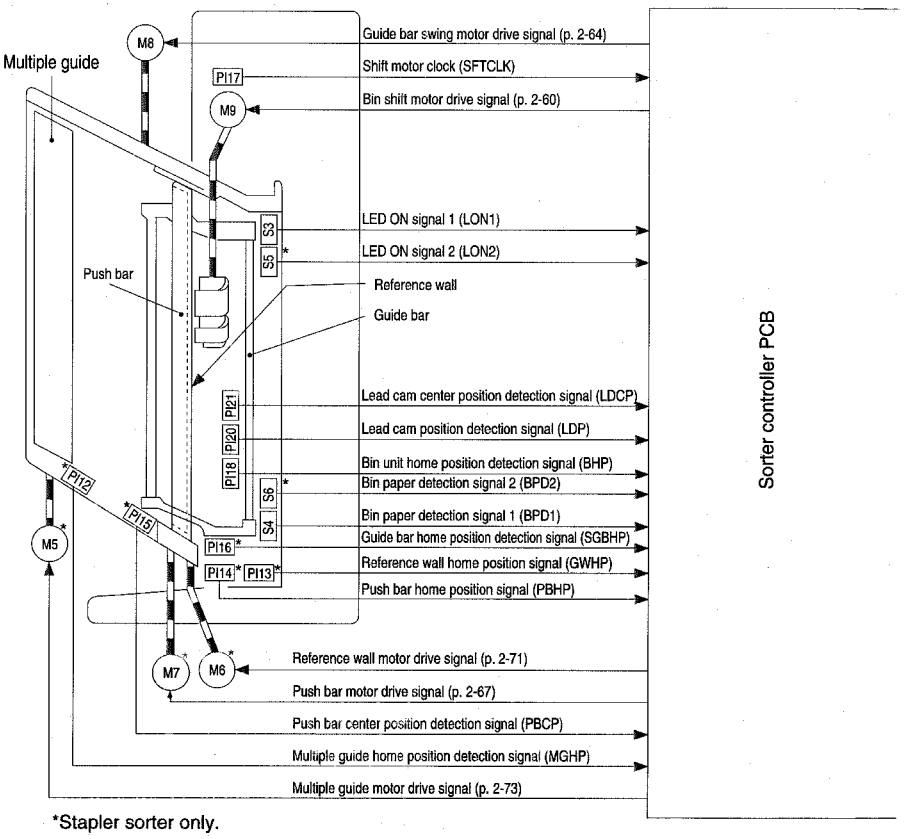
The bin moves up and down by the drive from the bin shift motor (M9).

The guide bar is driven by the guide bar motor (M8), serving to keep the delivered copies in order.

The push bar is driven by the push bar motor (M7), serving to move the copies according to size for arrangement at the front.

The guide plate drive system consists of the reference wall drive system and the multiple guide drive system. The reference wall is driven by the reference wall motor (M6), and the multiple guide is driven by the multiple guide motor (M5).

  CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)



*Stapler sorter only.

Figure 2-501

B. Bin Unit

1. Construction of the Bin Unit

The bin unit is constructed as shown in Figure 2-502.

On both ends of each bin are found rolls attached from outside the bin frame.

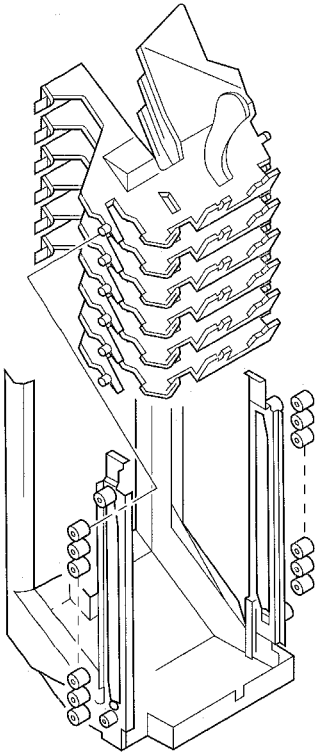


Figure 2-502

The bin unit is suspended by the sorter unit by two springs as shown in Figure 2-503 and is fixed in position by the engagement of the rolls and the lead cams attached to both front and rear of the bin frame.

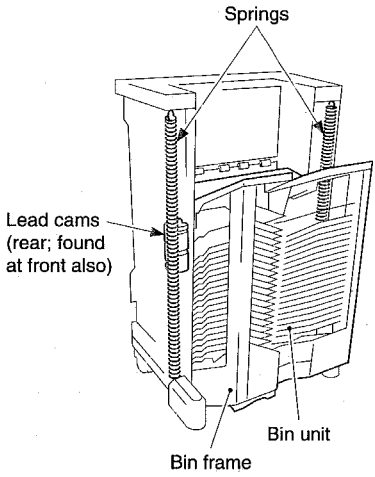


Figure 2-503

Reference:

The function of the springs found at the front and the rear of the bin unit is to limit the load imposed on the lead cam. (The bin unit weights about 17 kg in the stapler sorter and about 15 kg in the sorter.)

2. Lead Cams

The lead cam is installed so that it engages with the rolls of the bin unit. The lead cam is driven by the bin shift motor (M9), which is capable of rotating both clockwise and counterclockwise.

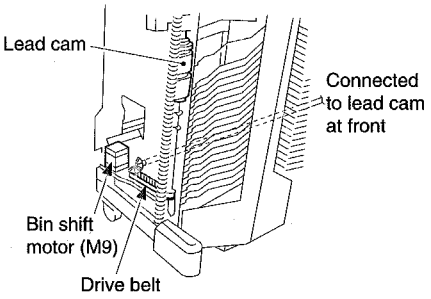


Figure 2-504

When the lead cam rotates and the rolls move up and down along the slope of the lead cam, the bins connected to the rolls and the bin frame move up or down.

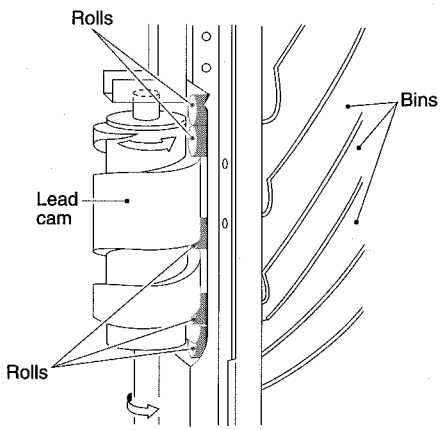


Figure 2-505

If the groove of the lead cam was sloping all the way through, the weight of the bin unit when the bins are at rest would cause the lead cam to rotate. To prevent such a problem, the groove of the lead cam is given a level portion as shown in Figure 2-507. The lead cam position sensor (PI20) serves to make sure that the rolls are at level portions when the bin unit is at rest.

The lead cam center position sensor (PI21) is used to detect the level portion of the lead cam to ensure correct synchronization of stapling operation and for smooth stapling. (For details, see p. 2-51.)

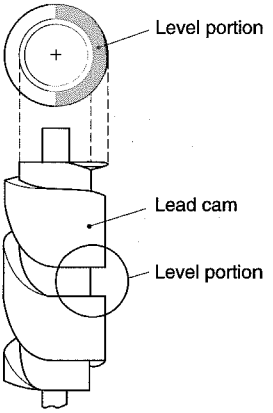


Figure 2-506

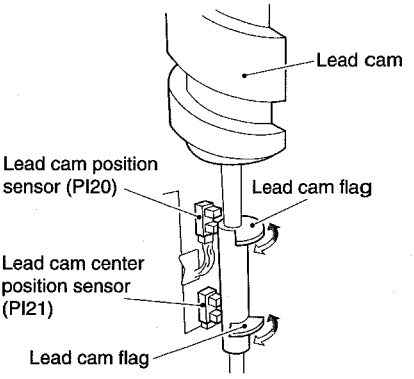


Figure 2-507

3. Controlling the Bin Shift Motor

Figure 2-508 shows the control circuit for the bin shift motor.

The bin shift motor (M9) is a 4-phase control stepping motor. The bin shift motor (M9) is controlled so that it is turned on or off and its direction of rotation changes when the output timing of the pulse signals A, A*, B, B* is varied.

To hold the bin shift motor (M9), the output timing of the pulse signals A, A*, B, and B* is fixed while varying the level of the reference current level signal (SFTAJ).

The bin shift motor (M9) cannot start to operate when the bin shift drive prohibit signal (SFTLIM) is generated; the bin shift drive prohibit signal (SFTLIM) is generated when the paper holding sensor (PI11) turns off.

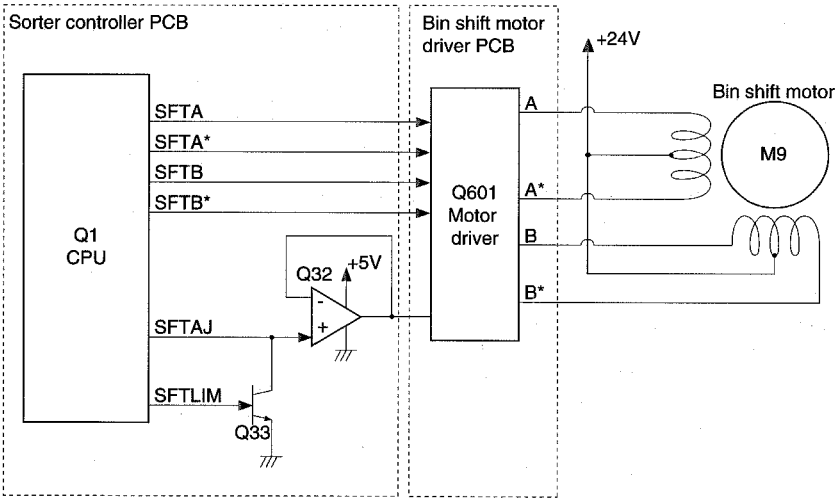


Figure 2-508

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

4. Controlling the Rotation of the Bin Shift Motor

The bin shift motor used to drive the lead cam is controlled based on the copy speed data from the copier so that it rotates continuously or intermittently.

- continuous rotation: copying speed 20 cpm or higher
- intermittent rotation: copying speed lower than 20 cpm

For continuous rotation, the microprocessor on the sorter controller PCB controls the revolution of the bin shift motor so that a single bin shift may be executed within the gap between two sheets of copy paper.

For intermittent rotation, the microprocessor on the sorter controller controls the bin shift motor as follows:

- delivery: moves the rolls of the bin to the middle of the level section of the lead cam.
- feeding: executes a single bin shift.

a. Continuous Rotation (copying speed 20 cpm or higher)

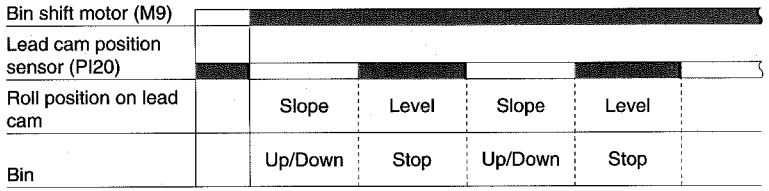


Figure 2-509

b. Intermittent Rotation (copying speed lower than 20 cpm)

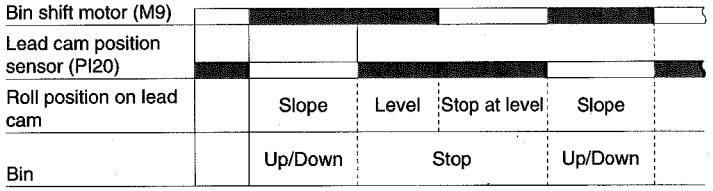


Figure 2-510

C. Controlling the Guide Bar (Stapler sorter only)

1. Outline

The guide bar is found inside the bin unit and is designed to swing as shown in Figure 2-511.

The guide bar has the following functions:

1. arranges copies into order

The guide bar is driven by the guide bar swing motor (M8).

The guide bar home position sensor (PI16) is used to detect the presence of guide bar at its home position.

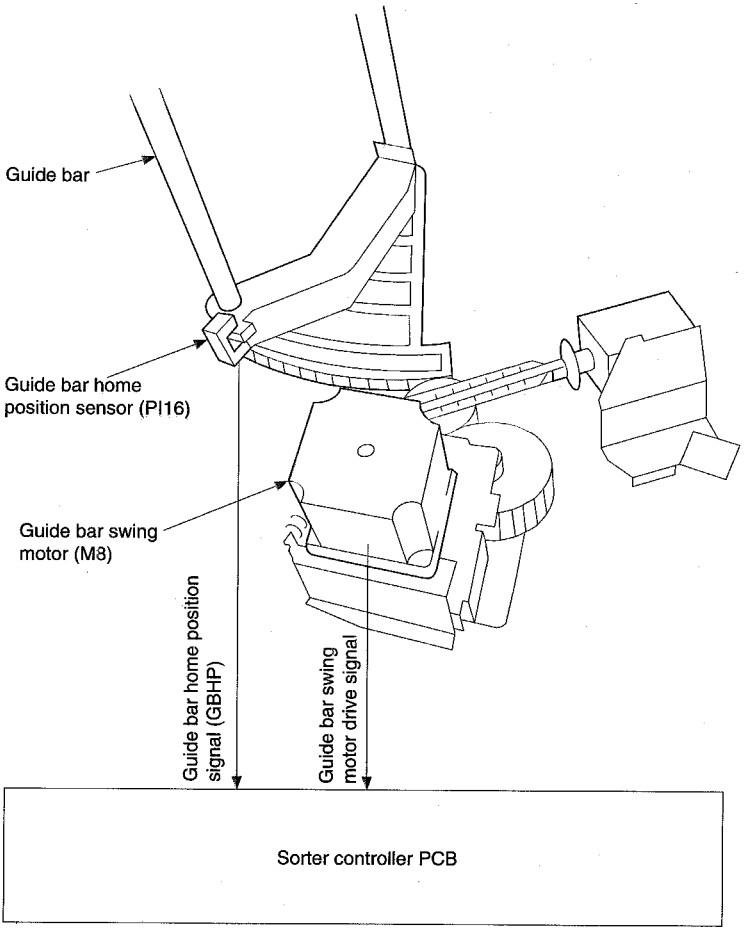


Figure 2-511

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

2. Putting Copies into Order

The guide bar operates to put copies into order each time a copy is delivered. It also serves to hold the copies in place at time of stapling.

The swing width of the guide bar is determined based on the paper size signal from the copier (paper size being between 210 to 297 mm).

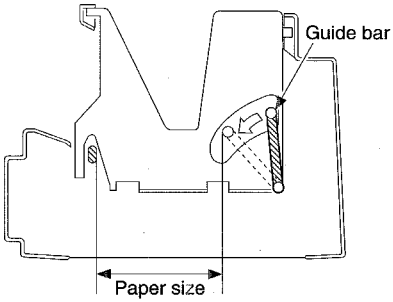


Figure 2-512

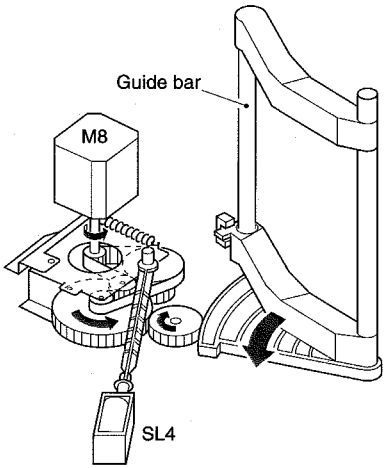


Figure 2-513

3. Controlling the Guide Bar Swing Motor (M8)

Figure 2-514 shows the circuit that controls the guide bar swing motor (M8).

The guide bar swing motor is a 4-phase control stepping motor.

The sorter controller PCB sends drive pulses (GBMA, GBMA*, GBMB, GBMB*) and the reference current level signal (GBMAJ) to the motor driver.

The motor driver controls the output timing of the pulse signals A, A*, B, and B* to turn on and off the guide bar swing motor (M8) and to change its direction of rotation.

To hold the guide bar swing motor (M8), the output timing of the pulse signals A, A*, B, and B* is fixed while varying the level of the reference current level signal (GBMAJ) for the purpose.

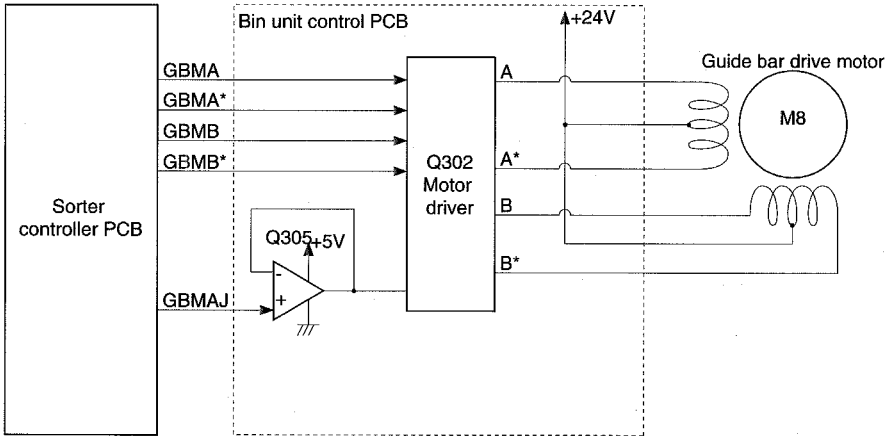


Figure 2-514

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

D. Controlling the Push Bar (Stapler sorter only)

1. Outline

The push bar is found inside the bin unit. The push bar moves delivered paper according to size for arrangement at the front.

The push bar is driven by the push bar motor (M7). To ensure the position of the push bar, the following two sensors are used:

- push bar home position sensor (PI14)
- push bar center position sensor (PI15)

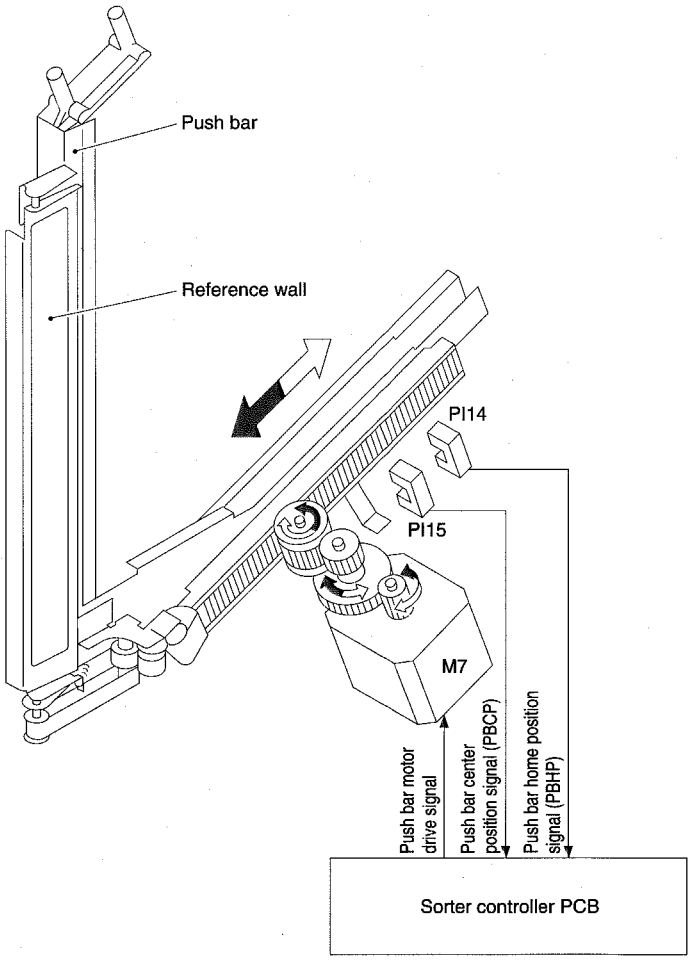


Figure 2-515

2. Operation

a. Outline

The push bar moves copies along the delivery direction inside the bin unit by the drive of the push bar motor (M7).

The push bar is positioned at either of two positions for copying according to paper size.

The push bar is positioned at any of these positions by controlling the pulses from the push bar motor (M7).

Stop Positions

Stop position	Distance from home position	Copy paper delivered	
Home position (copying ⓑ)	0mm	Single stapling or double stapling	LTR-R, LGL
		Corner stapling	A4, B5, A3, B4, A4R, LTR, 11"x17"
		Non-staple sort mode	LTR-R, LGL
Push-up position (copying ⓐ)	26.4mm	Single stapling or double stapling	B5, B4, A4, A3, LTR, 11"x17", A4R
		Non-staple sort mode	LTR-R, LGL

Table 2-501

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

3. Controlling the Push Bar Motor (M7)

Figure 2-516 is a circuit diagram of the circuit used to control the push bar motor (M7).

The push bar motor is a 4-phase control stepping motor.

The sorter controller PCB sends drive pulses (PBMA, PBMA*, PBMB, PBMB*) and the reference current level signal (PBMAJ) to the motor driver. In response to these signals, the motor driver controls the output timing of the pulse signals (A, A*, B, B*) to turn off the push bar motor and change its direction of rotation.

To hold the push bar motor (M7), the output timing of pulse signals A, A*, B, and B* is fixed while varying the level of the reference current level signal (PBMAJ) for the purpose.

The reference current level signal (PBMAJ) goes '0' when the reference wall home position sensor (PI13) turns off. The push bar motor cannot start to operate when the reference current level signal (PBMAJ) is '0'.

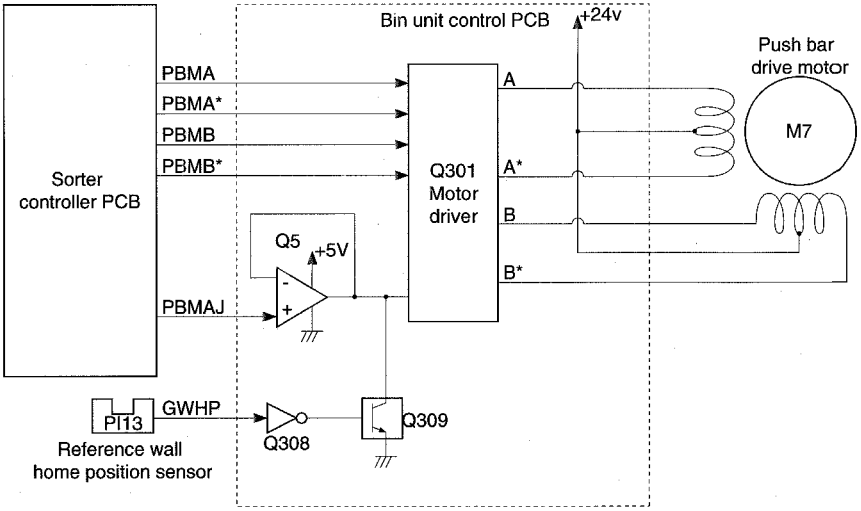


Figure 2-516

F. Controlling the Guide Plate (Stapler sorter only)

1. Outline

The guide plate shifts its position to suit copy paper size and copying mode.

The guide plate consists of a reference wall and a multiple guide.

The reference wall is located inside the push bar and is driven by the reference wall motor (M6).

The reference wall home position sensor (PI13) is used to detect the position of the reference wall.

The multiple guide is driven by the multiple guide motor (M5). The multiple guide home position sensor (PI12) is used to detect the position of the multiple guide.

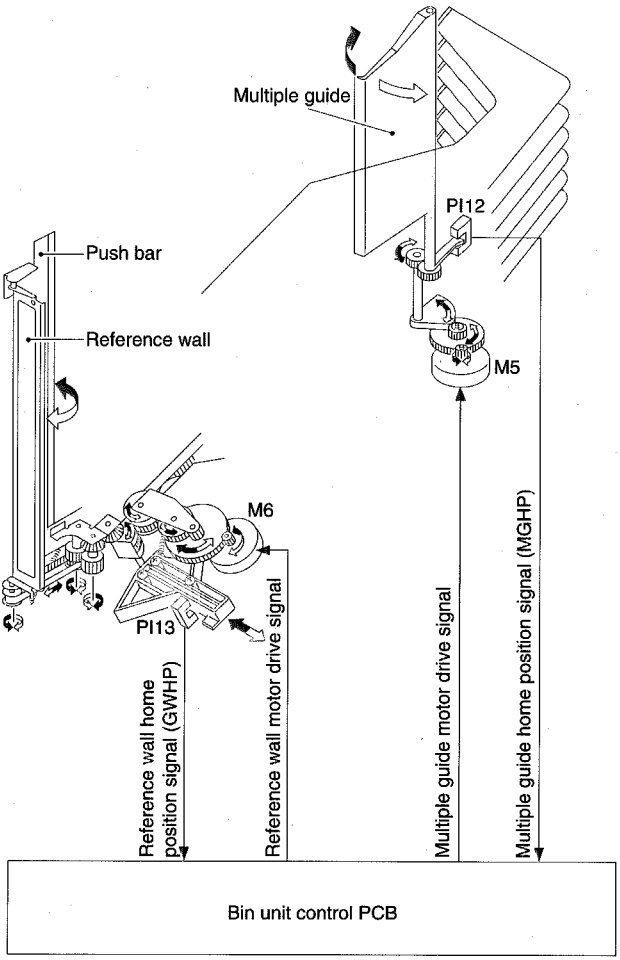


Figure 2-517

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

2. Movement of the Reference Wall

The reference wall is built into the push bar, and it opens to different angles according to paper size and copying mode to change the stop position of copies at the front. The reference wall operates only when the push bar is at the center position, i.e., when it is keeping the push bar center position sensor (PI15).

The degree of angles the reference wall opens to is determined based on the paper size data from the copier. Depending on the degree of such angles, the position of double stapling is executed while the front and the rear stapling positions are more or less symmetry.

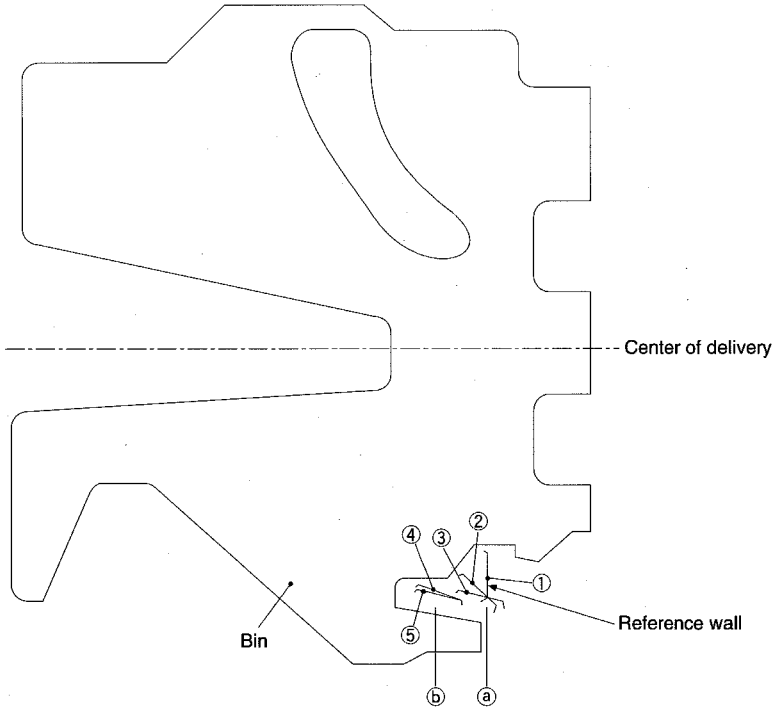


Figure 2-518 (top view)

ⓐ: position of the push bar 26.4 mm away from the home position
ⓑ: home position of the push bar

Copying mode	Paper size	Reference wall position	Push bar position	Distance from center of delivery (mm)
Single or double stapling	B5,B4	①	ⓐ	136
	LTR,11"X17",A4R	②		146.5
	A4,A3	③		156
	LTRR,LGL	④	ⓑ	153
Corner stapling	A4,B5,A3,B4,A4R,LTR,11"X17"	⑤		156
Non-staple sort mode	B5,B4	①	ⓐ	136
	LTR,11"X17",A4R	②		146.5
	A4,A3	③		156
	LTRR,LGL	④	ⓑ	153
	Other	③	ⓐ	156

Table 2-502

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

3. Controlling the Reference Wall Motor (M6)

Figure 2-519 shows the control circuit used to control the reference wall motor (M6). The reference wall motor is a 4-phase stepping motor.

The sorter controller PCB sends the reference wall motor ON signal (GWMON) and control signals (GWMA, GWMB) for each phase to the bin unit control PCB. The motor driver (Q304) controls the output timing of pulse signals (A, A*, B, B*) according to the control signals (GWMA, GWMB) of each phase to switch the direction of rotation of the reference wall motor (M6).

When the reference wall motor ON signal (GWMON) is not being generated (motor at rest), a voltage of +5 V is applied to each phase of the reference wall motor to keep the reference motor from rotating.

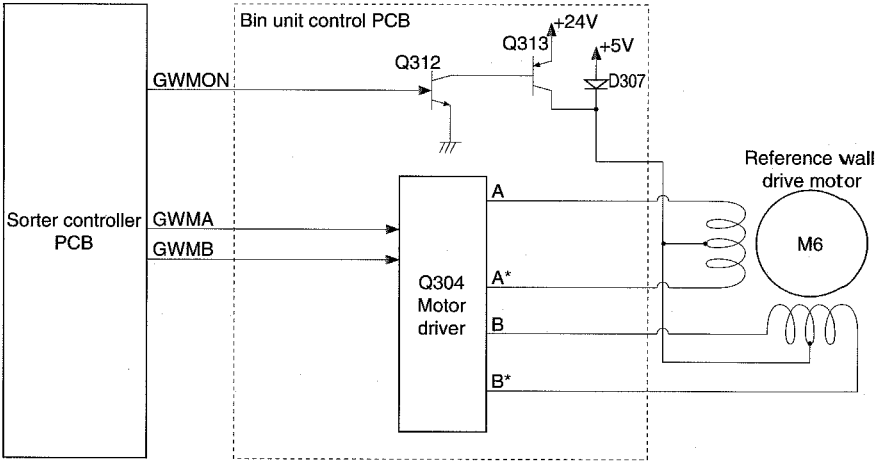


Figure 2-519

4. Movement of the Multiple Guide

The multiple guide opens to different degrees of angles according to paper size and copying modes, thereby changing the stop position for copies at the front. A specific angle is determined based on the paper size data and copying modes communicated from the copier.

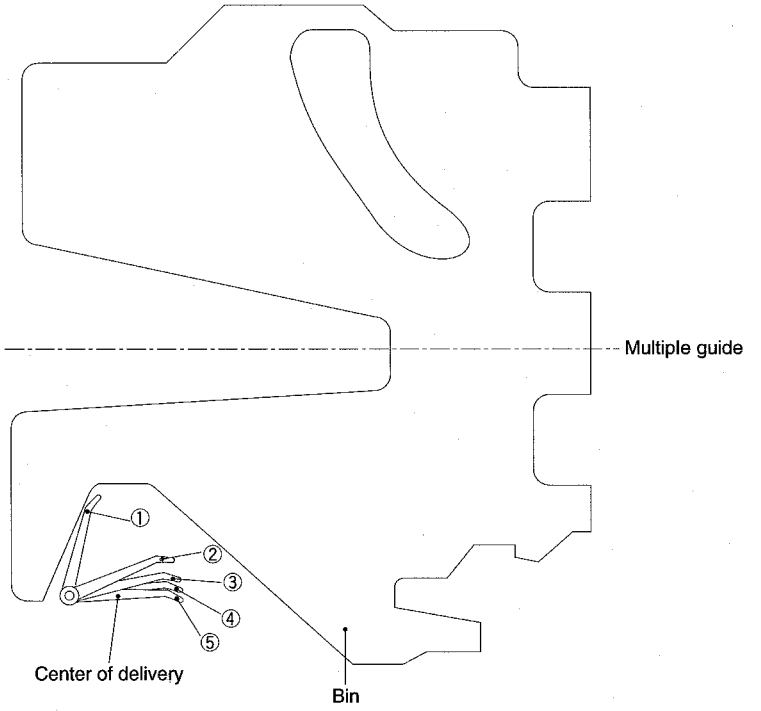


Figure 2-520 (top view)

Copying mode	Paper size	Position	Distance from center of delivery (mm)
Single or double stapling	A4,B5.LTR	①	95
	B4	②	136
	11"X17",A4R	③	146.5
	LGL,LTR-R	④	153
	A3	⑤	156
Corner stapling	A4,B5,LTR	①	95
	A3,B4,A4-R,11"X17",LGL	⑤	156
Non-staple sort mode	All sizes	⑤	156

Table 2-503

5. Controlling the Multiple Guide Motor (M5)

Figure 2-521 shows the control circuit for the multiple guide motor (M5). The multiple guide motor is a 4-phase stepping motor.

The sorter controller PCB sends the multiple guide motor ON signal (GDMON) and control signals (MGMA, MGMB) of each phase to the bin unit control PCB. The motor driver (Q303) controls the output timing of the pulse signals (A, A*, B, B*) based the control signal (MGMA, MGMB) of each signal to switch the direction of rotation of the reference wall motor (M5).

When the multiple guide motor ON signal (GDMON) is not being generated (motor at rest), a voltage of +5 V is imposed on each phase of the reference wall motor to prevent the multiple guide motor from rotating.

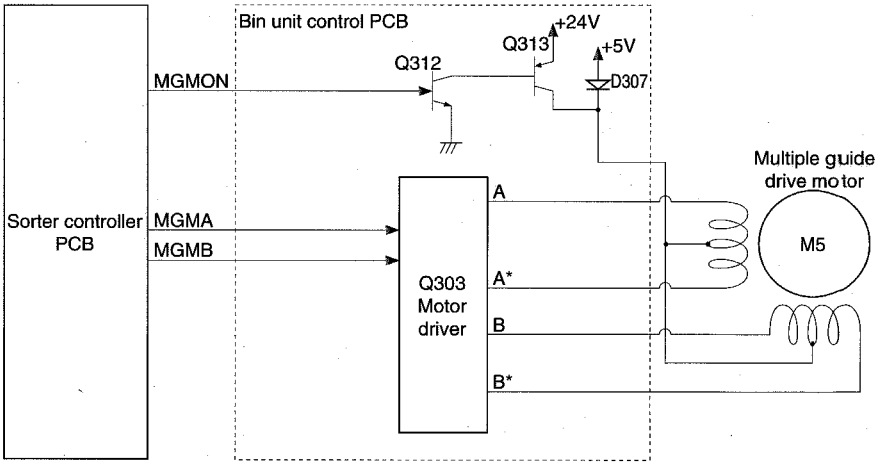


Figure 2-521

G. Closing the Bins

1. Outline

Copy paper tends to curl more and more as time passes. When curling reaches a specific degree in the bin, subsequent paper delivered into the bin hits against the paper, possibly causing delivery faults.

To prevent curling of paper in the sort bin, the bin unit is designed to close the until the next delivery.

2. Operation

a. Outline

The bin is closed in response to a signal coming from the copier. When the bin close request signal (ECSREQ) arrives, the sorter moves up by a single bin; when the bin close release signal (RETREQ) arrives, on the other hand, it moves the bins to a specific position before delivery of paper.

b. Closing the Bin

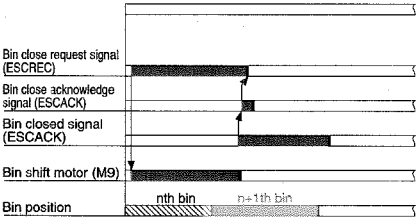


Figure 2-522

c. Releasing the Bins

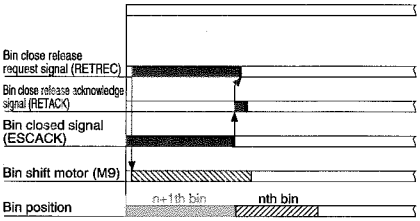


Figure 2-523

d. Sorting 3 Sets

1 Delivers copy paper

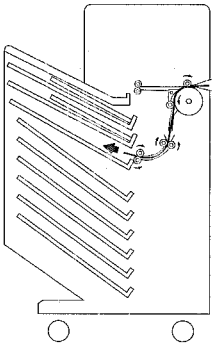


Figure 2-524

2 Closing the bin

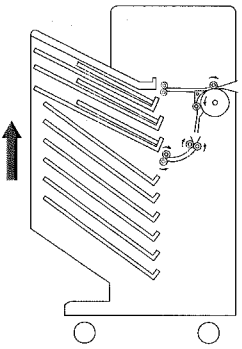


Figure 2-525

3 Releasing the bin and delivery

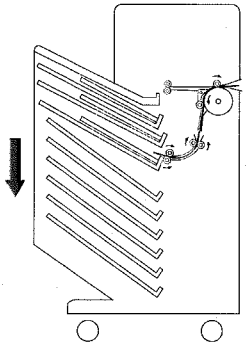


Figure 2-526

H. Bin Inside Paper Sensor

1. Outline

The bin inside paper sensor consists of a LED and a phototransistor and is used to detect the presence/absence of paper inside the bin. The machine is equipped with two pairs of bin sensors, servicing to detect paper at the delivery position.

- bin paper sensor 1 (S3/S4)
- bin paper sensor 2 (S6/S7)*

The machine automatically corrects the paper detection level at specific intervals to prevent malfunction caused by fluctuations in the intensity of each sensor.

Caution:

An incorrect correction value will be stored in memory if the light-receiving face of the sensor (S4, S7) is subjected to strong rays of light (e.g., outside light) while the paper detection level is being corrected, causing 'E525' or 'E526' to appear on the copier's display.

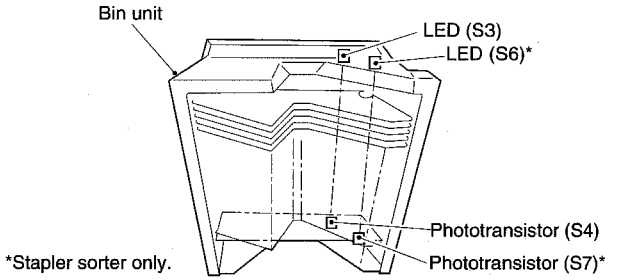


Figure 2-527

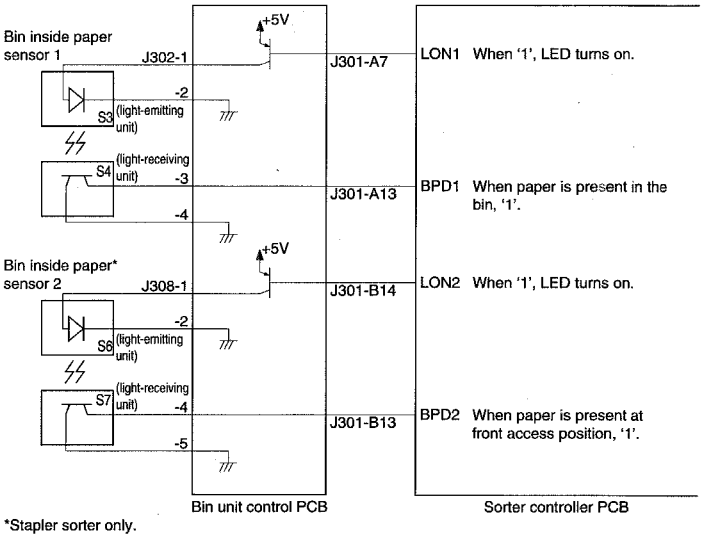


Figure 2-528

I. Other Sensors

1. Bin Unit Home Position Sensor (PI18)

When the Copy Start key is pressed or when all copies delivered to the bins are removed, the bin unit returns to the home position.

At this time, the actuator A blocks the bin unit home position sensor (PI18) and, as a result, the microprocessor on the sorter controller PCB recognizes that the bin unit is at the home position.

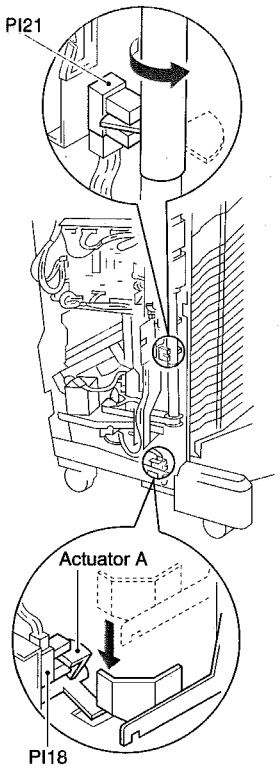


Figure 2-529

2. Detecting the Lower Limit

The lower limit is detected by the bin unit home position sensor (PI18) and the lead cam center position sensor (PI21).

If some error lets the bin unit move down from the home position with the lead cam rotating in the direction of moving down the bin unit past the lead cam center position, the microprocessor on the sorter controller PCB immediately cuts the drive of the bin shift motor (M9). At this time, 'E540' is indicated on the copier's control panel. At this time, the copier's control panel indicates error code "E540".

■ Resetting

Turn off and then on the copier.

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VI. POWER SUPPLY

A. Outline of Power Distribution

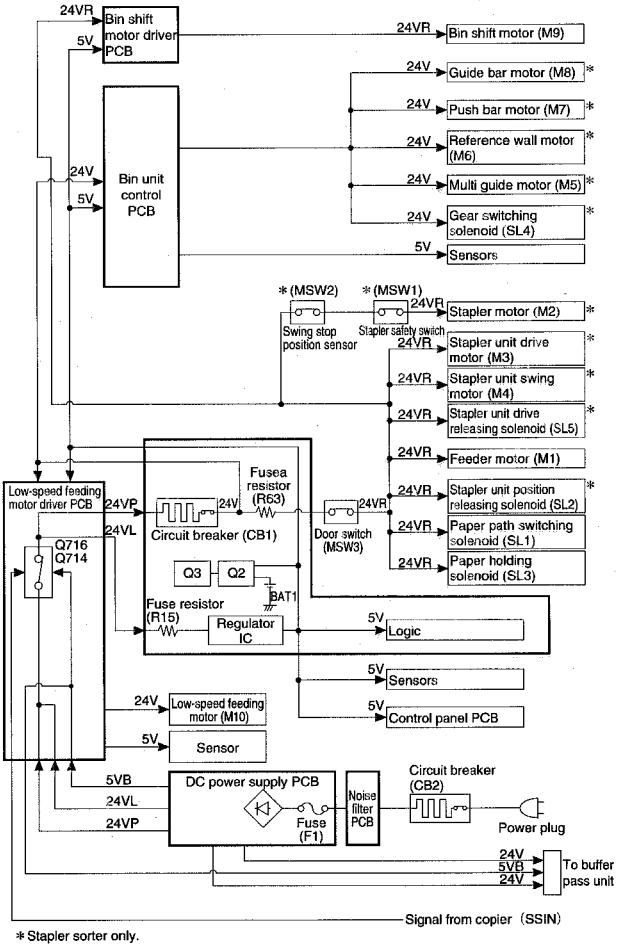

Figure 2-601

B. Power Supply Circuit

The machine's DC power supply PCB generates three channels of power: 24 VP, 24 VL, and 5 V. The outputs of these three channels are sent to the switching circuit of the low-speed feeding motor driver PCB; 24 VP and 24 VL are connected to the switches Q701 and Q714 and 5V is used to drive the switches Q714.

When the SSIN signal (always on while the copier is in operation) is received, the switches (Q701, Q714) on the low-speed feeding motor driver PCB close, thereby supplying the sorter controller PCB with 24 VP and 24 VL.

24 VP is used to drive the motors and solenoids. 24 VL is converted into 5 V by the regulator IC on the sorter controller PCB and is used for logic and sensor systems.

24 VR is cut off when the machine's front door is opened; 24 V, on the other hand, operates independently of the opening/closing of the front door.

The AC power supplied to the DC power supply PCB is input when the power plug is connected to the outlet.

The machine is designed to be deprived of DC power to the sorter controller when the power plug is disconnected or the copier is turned off and, therefore, is equipped with a lithium battery (BAT1) for backing up the RAM (Q3) on the sorter controller PCB.

C. Protecting the Power Supply circuit

The DC power supply PCB is equipped with an overcurrent protection circuit; the protective mechanism turns on if any of the loads short-circuits because of an error to cut off the output.

If the output is cut off, disconnect the power plug from the outlet, correct the load, and connect the power plug once again to return it. Note, however, that repeated short-circuiting and resetting can blow the built-in fuse.

⚠ CAUTION:
Replace the lithium battery only with the one listed in the Parts Catalog. Use of a different battery may present a risk of fire or explosion. The battery may present a fire or chemical burn hazard if mistreated. Do not recharge, disassemble, or dispose of it in fire.
Keep the battery out of reach of children and discard any used barrery promptly.

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VII. BUFFER PASS UNIT

A. Outline

The buffer pass unit serves to remove curling from copy paper delivered by the copier before forwarding it to the sorter.

Copy paper tends to curl because of contraction caused by heating of toner in the fixing assembly and cooling. Curling, if left alone, can adversely affect feeding inside the sorter and stacking.

To prevent such a problem, the buffer pass unit is located between the copier and the sorter and is used to remove curling from copy paper delivered by the copier before forwarding it to the sorter.

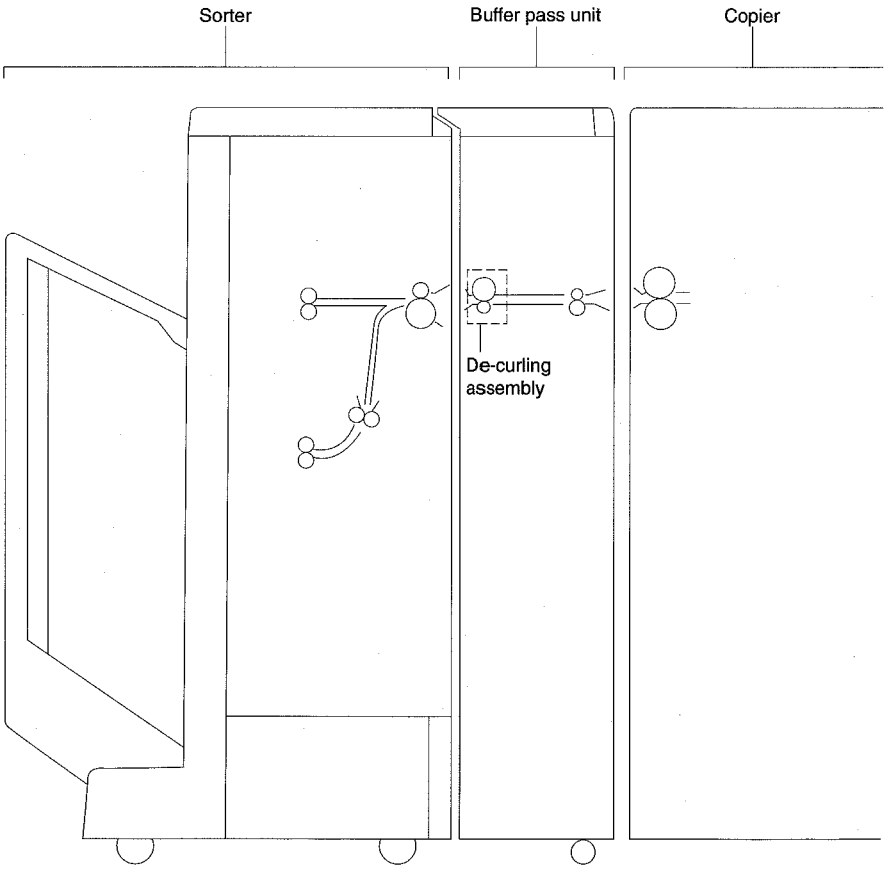


Figure 2-701

B. Electrical Circuitry

Most electrical mechanisms of the buffer pass unit are controlled by the copier connected to it, and for this reason the unit is not equipped with a controller PCB. The signals from the copier are received by the buffer pass unit driver PCB, which drives the motor, solenoid, and the clutch accordingly.

The communication signals between the copier and the sorter are relayed by way of the buffer pass unit driver PCB.

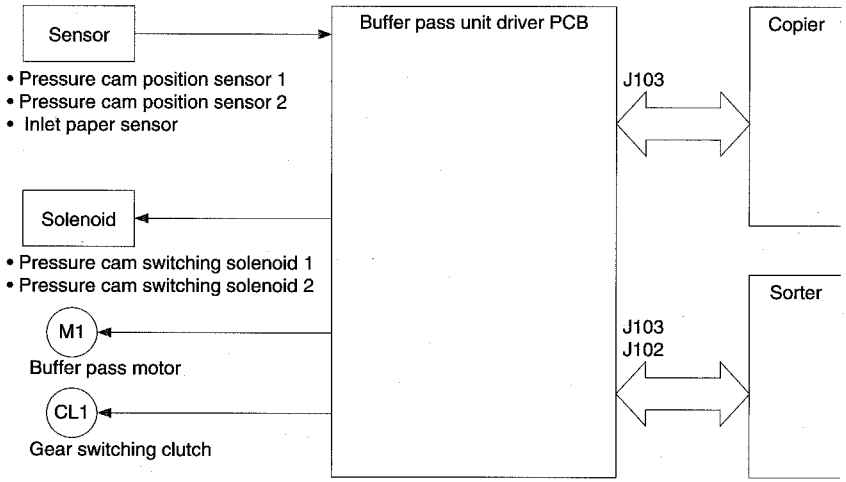


Figure 2-702

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

C. Inputs to and Outputs from the Buffer Pass Unit Driver

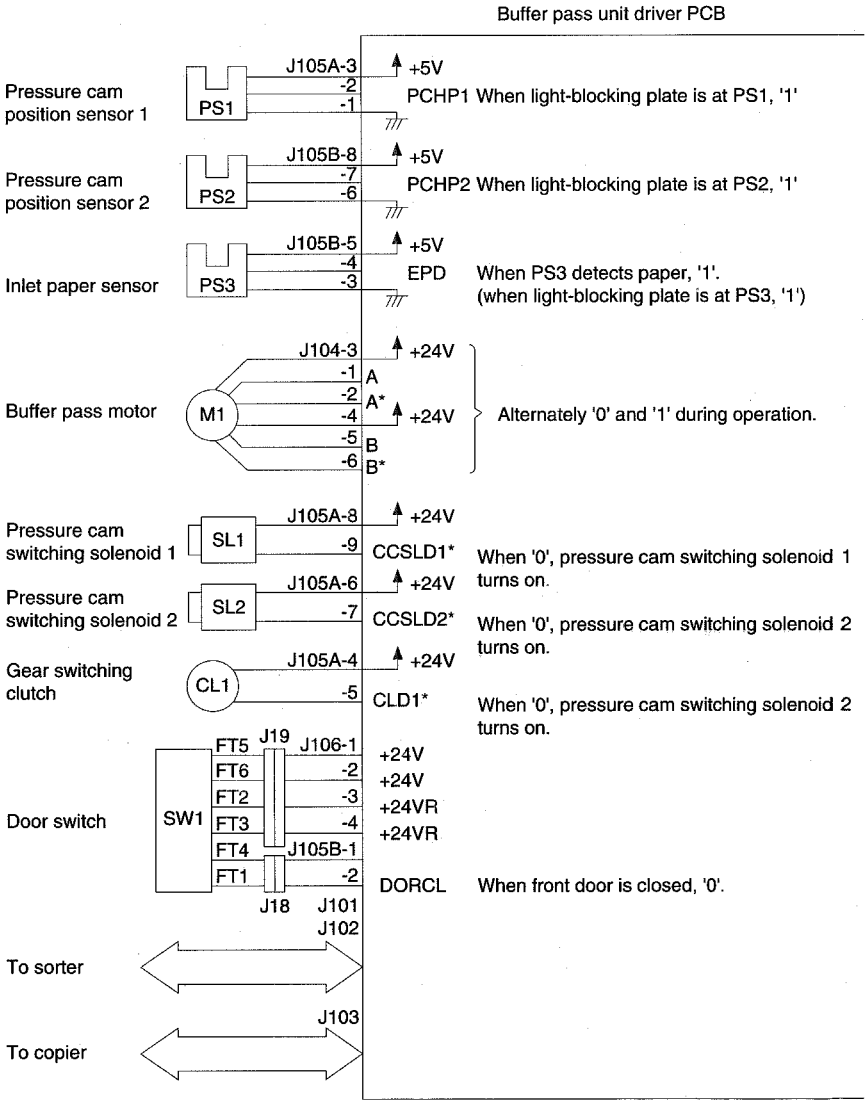


Figure 2-703

D. Feeding Unit

1. Outline

The feeding unit is used to forward copy paper from the copier to the sorter by means of a feeding roller and a sponge roller.

The feeding roller and the sponge roller are driven by the buffer pass motor (M1).

The sponge roller and the pressure roller are used to sandwich copy paper to remove curling.

The gear switching solenoid (SL1) is used to change the speed of feeding driven by the buffer pass motor by switching the drive gear.

The presence/absence of paper inside the buffer pass unit is checked by the inlet paper sensor (PS3).

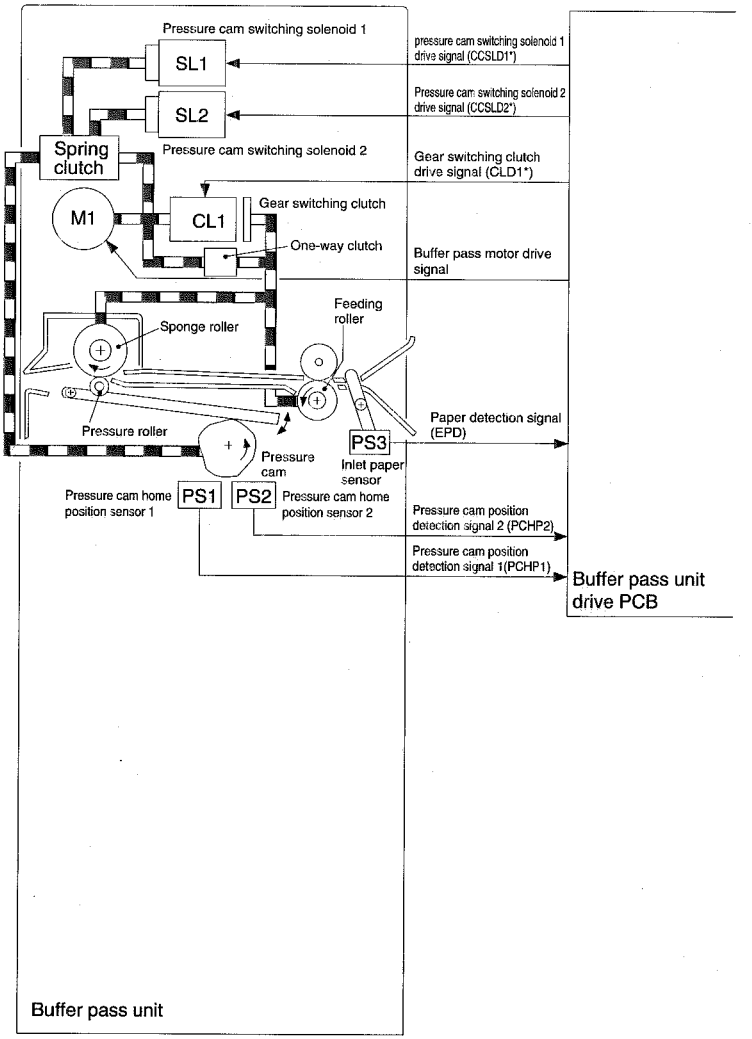


Figure 2-704

E. Controlling the Feeding Speed

a. Outline

The speed of feeding is controlled by the buffer pass motor (M1) and the gear switching clutch (CL1).

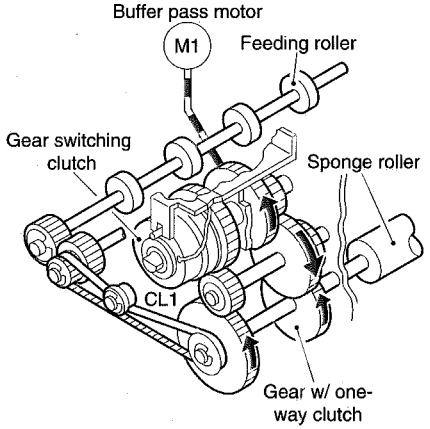
The speed is coordinated with the copier's fixing speed according to the signals coming from the copier.

b. Controlling the Feeding Speed

The speed of feeding is varied by controlling the revolution of the buffer pass motor and controlling the gear switching clutch. For the speed range over which control by the buffer pass motor revolution is not possible, the gear switching clutch is operated.

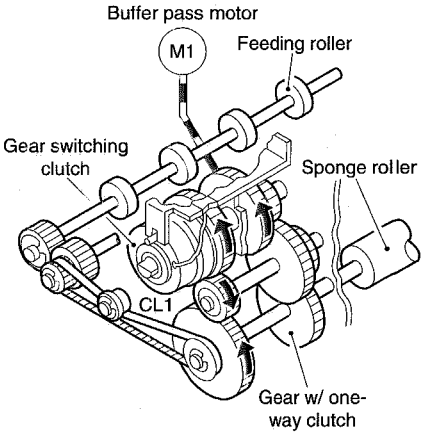
The gear ratio of the drive transmission system changes between the gear switching clutch is on and when it is off. When the gear switching clutch is on, the gear ratio is higher, about twice that of when the feeding roller rotation is off.

The gear switching clutch turns on when the copier's fixing speed exceeds 68 mm/s.



Gear Switching Clutch OFF

Figure 2-705



Gear Switching Clutch ON

Figure 2-706

F. Removing Curling

1. Outline

To remove curling, copy paper is sandwiched between the sponge roller and the pressure roller, canceling out the curling by applying curling in the opposite direction.

The degree of curling may be any of three degrees, varied by rotating the pressure cam by the buffer pass motor.

The pressure cam position sensors 1 and 2 are used to detect the position of the pressure cam.

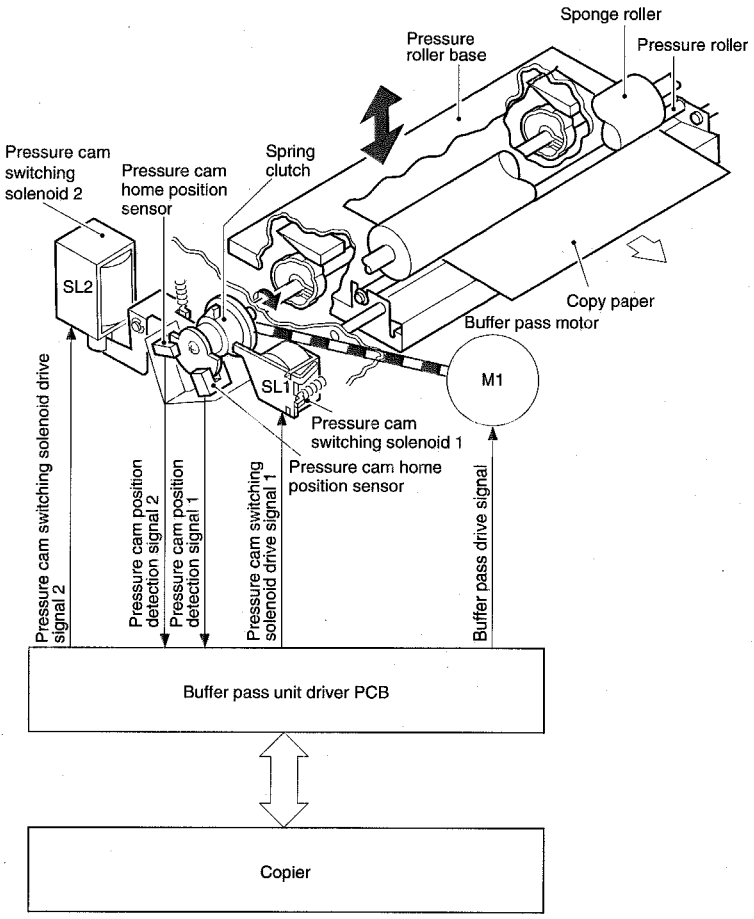


Figure 2-707

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

2. Operation

When the buffer pass motor (M1) rotates, the drive is transmitted to the pressure cam by way of the spring clutch. When the pressure cam rotates, the pressure roller base moves up and down to vary the pressure applied by the pressure roller to the sponge roller.

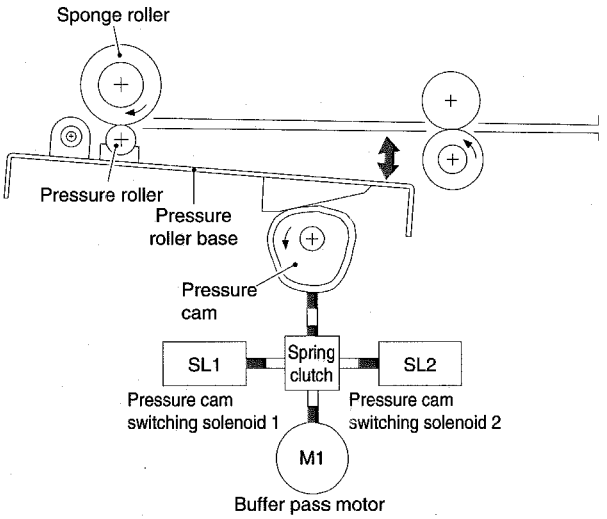


Figure 2-708

The pressure cam stops at any of four points, determined by two solenoids (SL1, SL2) that control the spring clutch. The position at which the pressure cam is stopped is changed according to the condition of copy paper delivered by the copier based on the following two factors:

- type of copy paper
- density of copy original

The copier checks the above conditions and instructs the buffer pass unit to position the pressure roller at a specific location. The signal used to communicate these positions is sent by the copier for each delivery.

The pressure cam position sensors 1 (PS1) and 2 (PS2) are used to detect the position of the pressure cam. When the copier's power switch is turned on, operations to locate the home position of the pressure cam, i. e., minimum de-curling position, are executed immediately; if the home position cannot be located, the copier indicates error code 'E517'.

The pressure cam is always set to its home position in standby, thereby preventing the pressure roller from deforming (dents) the sponge roller.

Relationship between Sponge Roller and Pressure Roller According to Pressure Cam Stop Position

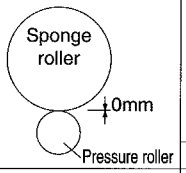
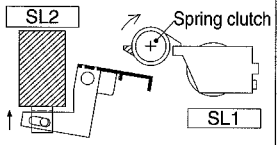
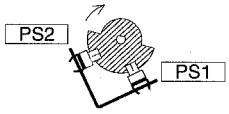
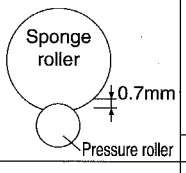
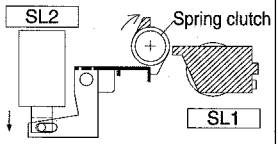
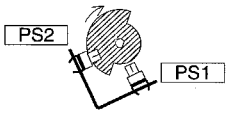
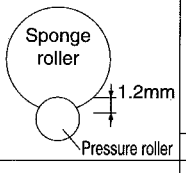
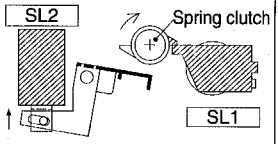
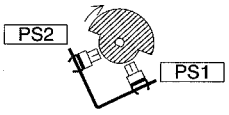
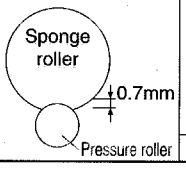
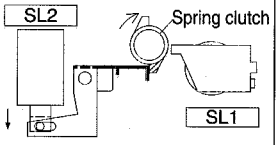
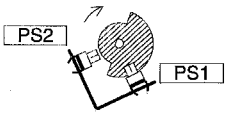
Stop position	Spatial relationship	Pressure cam switching solenoid (SL1, SL2)	Pressure cam position sensor (PS1, PS2)
0° (home position)			
		SL2:ON / SL1:OFF	PS2:ON / PS1:OFF
90°			
		SL2:OFF / SL1:ON	PS2:OFF / PS1:ON
180°			
		SL2:ON / SL1:ON	PS2:ON / PS1:ON
270°			
		SL2:OFF / SL1:OFF	PS2:OFF / PS1:OFF

Figure 2-709

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

G. Controlling the Buffer Pass Motor

1. Outline

The buffer pass motor (M1) is a 4-phase control stepping motor. The buffer pass motor is turned on/off, and its revolution is changed by controlling the output timing of the pulse signals A, A*, B, B*.

2. Operation

The following three signals are sent to the copier to the buffer unit driver PCB as control signals for the buffer pass motor (M1):

- motor drive signal (BPMON)
- motor rotation speed signal (BPMCLK)
- motor rotation enable signal (ENB)

The motor drive clock generation circuit receives the above three signals to send the control signals (BPMA, BPMA*, BPMB, BPMB*) to the motor driver after determining the revolution of the motor.

The motor driver, in response, drives the buffer motor according to the control signals.

	Motor state			
Signal	Rotation	Stationary		Hold
MON	HI	LO	HI	LO
ENB	HI	LO	LO	HI

: reserved.

Table 2-701

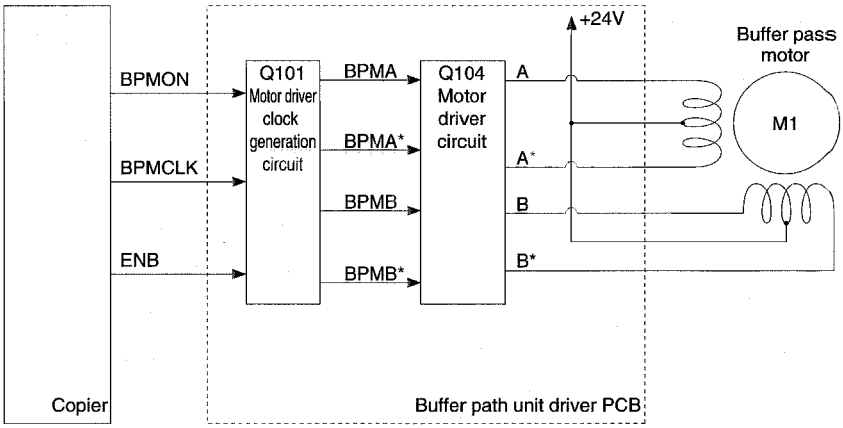


Figure 2-710

H. Detecting Jams

1. Outline

The unit is equipped with a copy paper sensor used to check the presence/absence of copy paper and whether copy paper is fed normally.

- Inlet Paper Sensor (PS3)

The presence/absence of copy paper or jam is checked in reference to the presence/absence of paper at the sensor at such times as programmed in the copier's microprocessor.

Jams that may occur inside the unit may be either of the following two types, and a jam is identified also when the sensor detects copy paper at time of power-on.

2. Delay Jam

The inlet paper sensor (PS3) does not detect copy paper within a period of time equivalent to 'specific time + time needed to feed copy paper for 20 mm' after copy paper has reached the copier's delivery sensor. In this case, the buffer motor stops, and the copier indicates the message JAM.

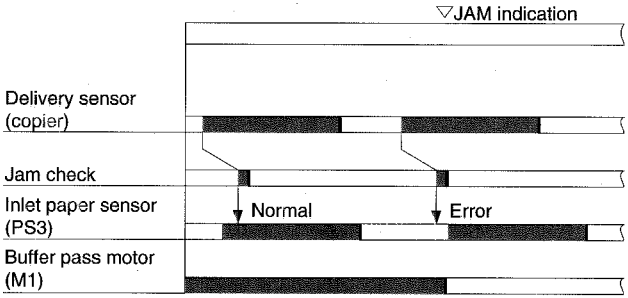


Figure 2-711

3. Delay Jam

The inlet paper sensor (PS3) remains on over a period of time equivalent to 'specific time + time needed to feed copy paper for 20 mm' after copy paper has reached the inlet sensor. In this case, the buffer motor stops, and the copier indicates the message JAM.

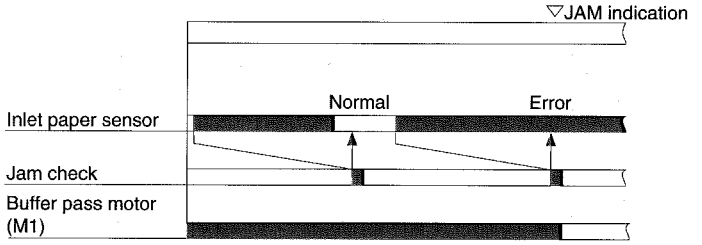


Figure 2-712

  CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

I. Power Supply

1. Outline

Figure 2-713 shows the unit's route of power supply.

The buffer pass unit is supplied with +5V and +24V power by the sorter. The +24V power is sent to the loads as +24VR power by way of the door switch (SW1); +24VR power, on the other hand, is cut when the unit's front door is opened and the door switch is turned off.

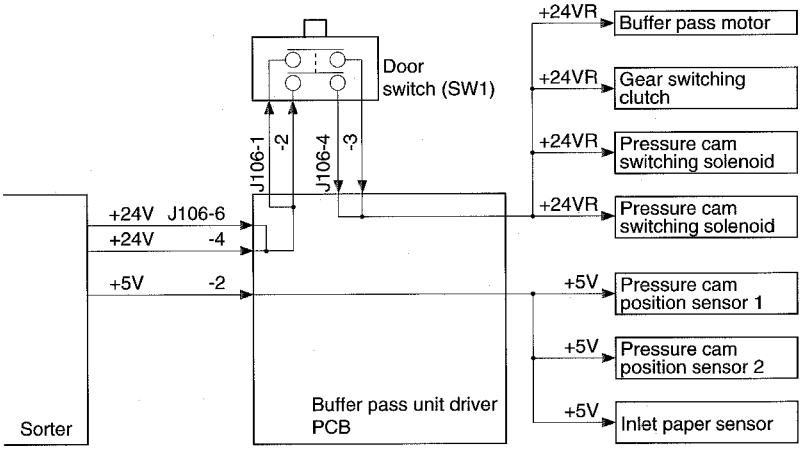


Figure 2-713

CHAPTER 3

MECHANICAL SYSTEM

1. ⚠ Disconnect the power cord for safety before disassembly or reassembly work.
2. Group the screws by type (length and diameter) and location.
3. The fixing screw for the grounding wire and varistors is fitted with a washer to ensure electric continuity; be sure to use the washer for reassembly.
4. If possible, avoid operating the machine with any of its parts removed.
5. Unless otherwise noted, reassembly is the reverse of disassembly.

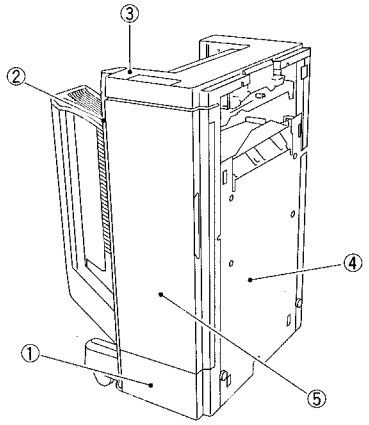
CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

I. EXTERNALS

A. External Covers

Remove the covers as necessary to clean, inspect, or repair the inside of the machine.

Those cowers that can be removed simply by removing mounting screws are omitted from the discussions.



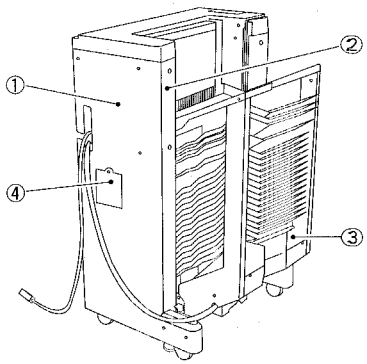
① Front cover (6)
② Front support cover (2)
③ Upper cover (4)
④ Lower right cover (4)
⑤ Front door

Figure 3-101

The number in parentheses indicates the number of mounting screws used.

Caution:

Connectors are attached behind the control panel; take extra care not to damage them when removing the upper cover.



① Rear cover (4)
② Rear support cover (5)
③ Bin unit cover (2)
④ Sorter controller cover (1)

Figure 3-102

II. BIN UNIT

A. Removing the Bin Unit

1) Turn on the copier, and press the bin shift key (UP) to move the bins to the upper limit.
2) Turn off the copier.
3) Remove the front cover, front support cover, rear cover, and rear support cover.
4) Remove the spring ① from the front/rear of the bin unit.

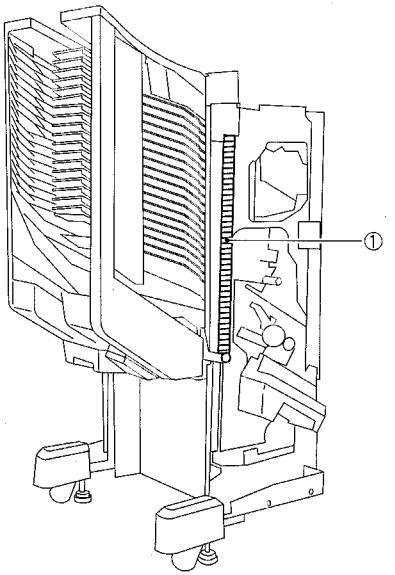


Figure 3-201

5) Remove the screw ③, and remove the frame holder ② from the front/rear of the bin unit.

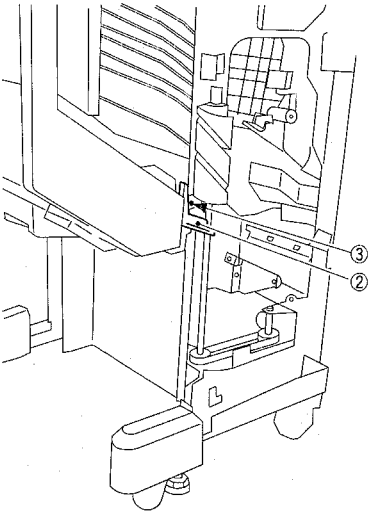


Figure 3-202a (front)

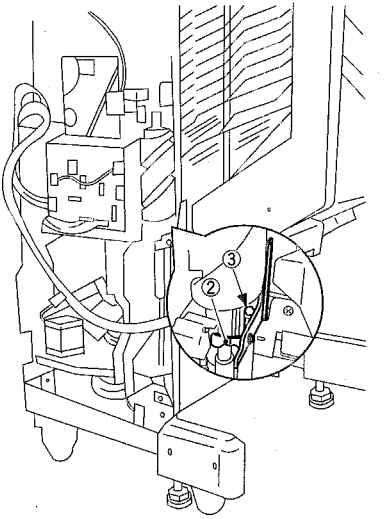


Figure 3-202b (rear)

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6) Remove the two grounding wires ④, and disconnect the five connectors ⑤.

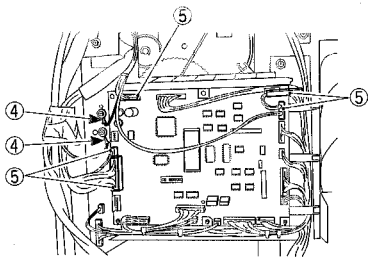


Figure 3-203

7) Remove the two screws ⑦, and remove the signal cord plate ⑥.

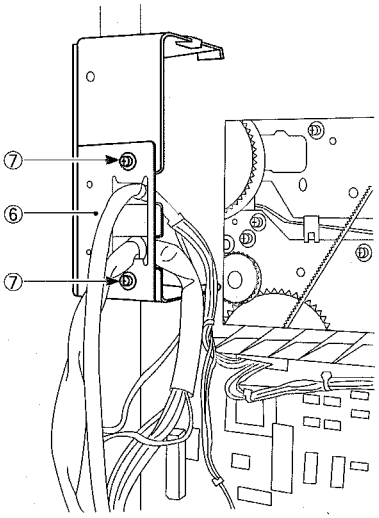


Figure 3-204

8) While lifting the bin unit, turn the shaft of the bin shift motor ⑧ to move all rolls ⑨ above the lead cam ⑩.

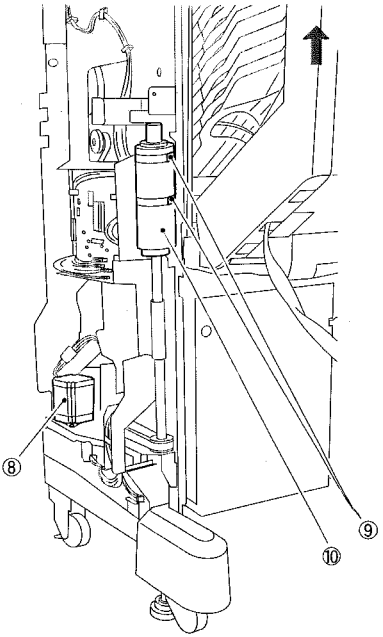


Figure 3-205

9) Lift the bin unit ⑪ to remove.

Caution:
Keep in mind that the bin unit weighs about 17 kg in the stapler sorter and about 15 kg in the sorter.

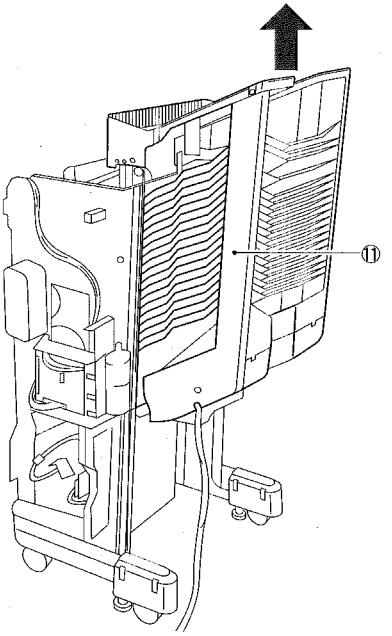


Figure 3-206

Caution:
When installing the bin unit, pay attention to where the rolls on both sides of the bin unit are.

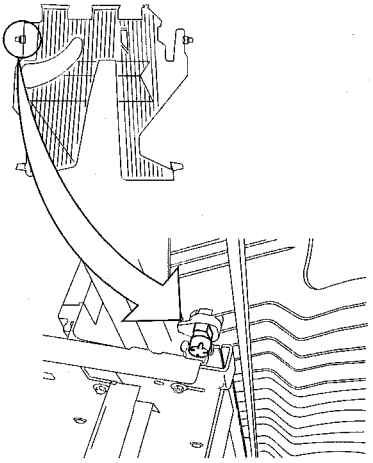


Figure 3-207

  CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

B. Removing the Bins

1) Remove the bin unit from the sorter.
2) Remove the six screws ①, and remove the non-sort bin ②.

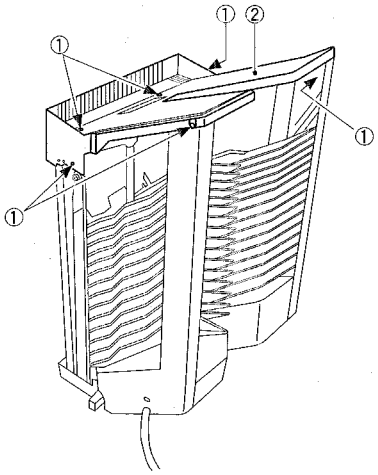


Figure 3-208

3) Remove the screw ④, and remove the guide holder ③ (Stapler sorter only).

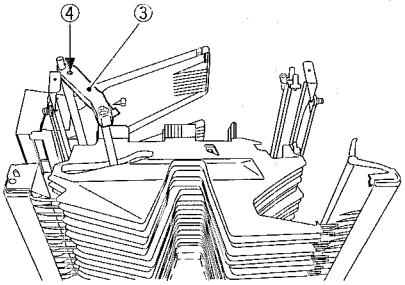


Figure 3-209

4) Remove the bins while paying attention to the bin unit frame.

C. Removing the Guide Bar Unit (stapler sorter only)

1) Remove the bin unit from the sorter.
2) Remove the no-sort bin.
3) Remove the screw ②, and remove the guide holder ①.

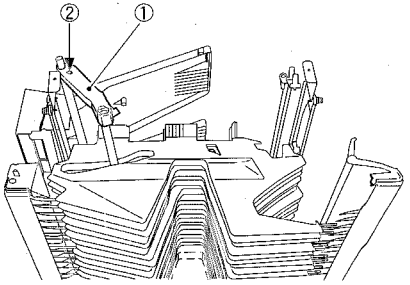


Figure 3-210

4) Pull out the guide bar ③ by pulling it up.

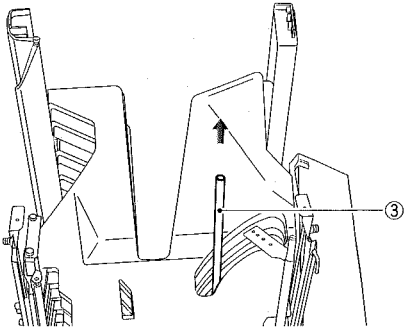


Figure 3-211

5) While lifting the bin ④ slightly, remove the holder ⑤.

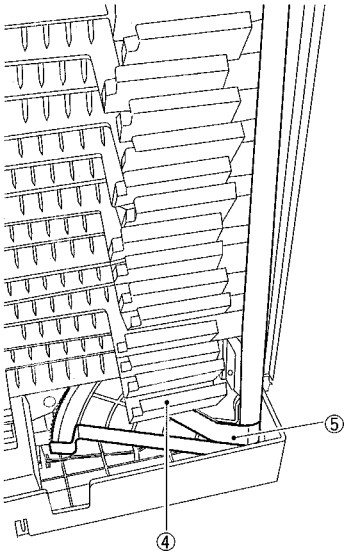


Figure 3-212

D. Removing the Bin Shift Motor (M9)

1) Remove the upper cover and the rear cover.
2) Remove the two screws ②, and disconnect the connector ①; then, remove the bin shift motor ③.

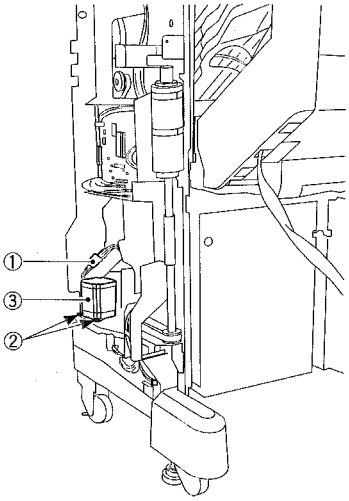


Figure 3-213

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

E. Lead Cam

1. Removing the Lead Cam

1) Turn on the copier, and press the bin shift key (DOWN) to move the bin unit to the lower limit.

> **Caution:**
> Be sure to remove the lead cam on one side and the other; removing them (front, rear) at the same time will let the bin unit fall on its own weight.

2) Turn off the copier.
3) Remove the E-ring ② and the screw ③, and remove the lead cam holder 1; then, remove the lead cam ④.

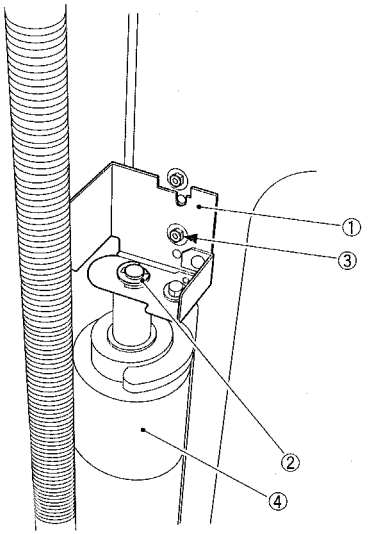


Figure 3-214a (front)

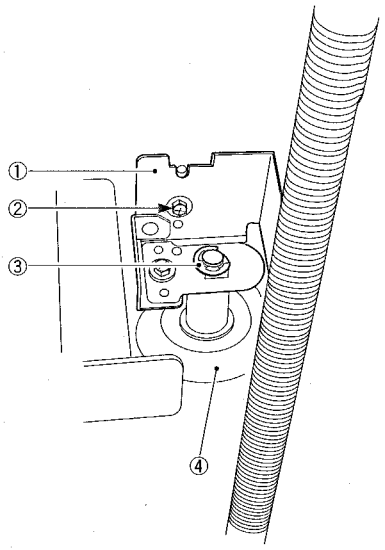


Figure 3-214b (rear)

2. Adjusting the Position of the Lead Cam

1) Remove the E-ring ②, and remove the flange ① from the front lead cam shaft gear.

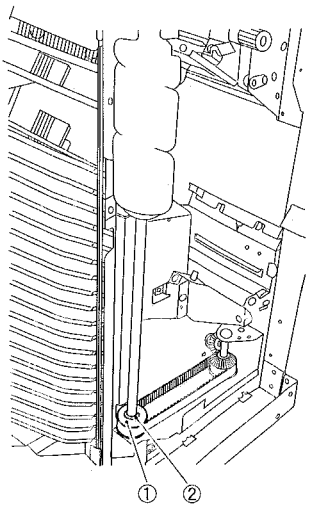


Figure 3-215

2) Detach the belt ④ from the gear ③; rotate the lead cam ⑤ so that the position of the front lead cam matches the position of the lead cam at the rear.

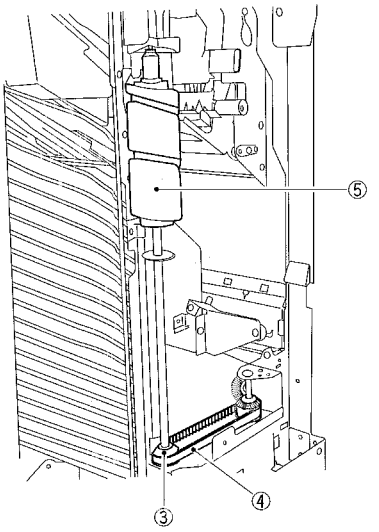


Figure 3-216

3) Set the two holes of the lead cams as indicated in Figure 3-217.

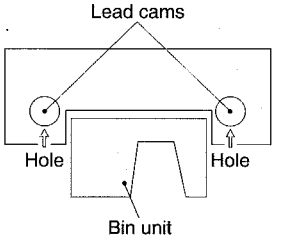


Figure 3-217 (top view)

4) While keeping the unit as in step 3), attach the belt ④ on the gear ③; then, return the flange ① to its original position and fix it in place with the E-ring ②.

F. Removing the Push Bar Motor (M7; stapler sorter only)

1) Turn on the copier, and press the bin shift key so that the gap between the bottommost bin and the bottom of the bin unit is maximum.

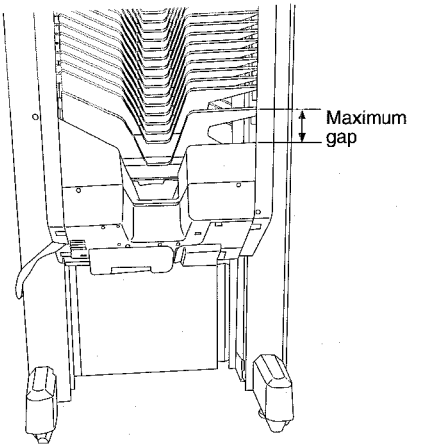


Figure 3-218

2) Turn off the copier.
3) Remove the two screws ①, and remove the bin unit cover ②.

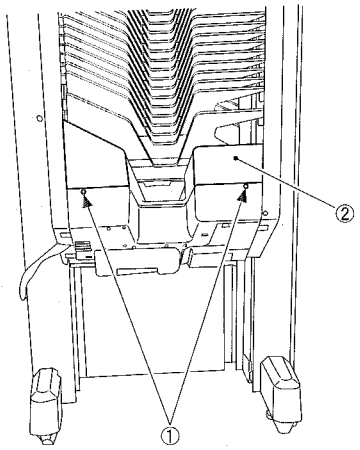


Figure 3-219

4) Disconnect the connector J306 ④ from the bin unit control PCB ③.

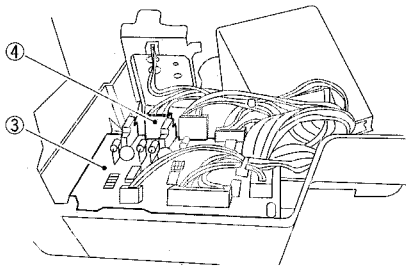


Figure 3-220

5) Remove the screw ⑤, and remove the motor cover ⑥.

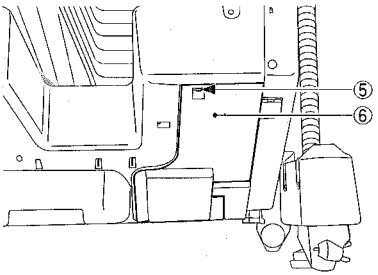


Figure 3-221

6) Remove the two screws ⑦, and remove the push bar motor ⑧.

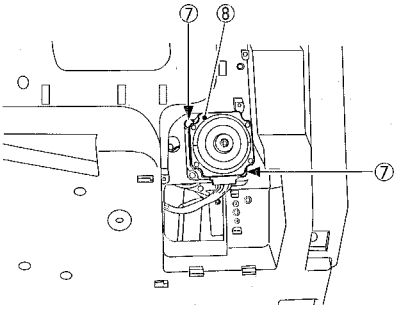


Figure 3-222

G. Removing the Reference Wall Motor (M6; stapler sorter only)

1) Turn on the copier, and press the bin shift key so that the gap between the bottommost bin and the bottom of the bin unit is maximum.

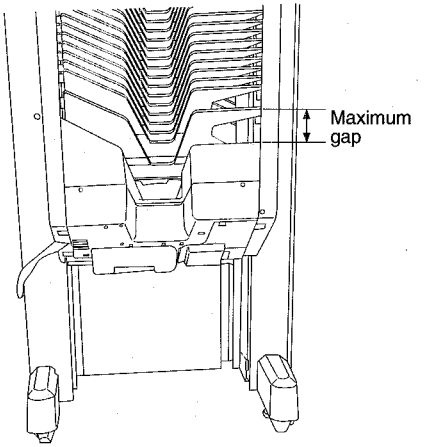


Figure 3-223

2) Turn off the copier.
3) Remove the two screws ①, and remove the bin unit cover ②.

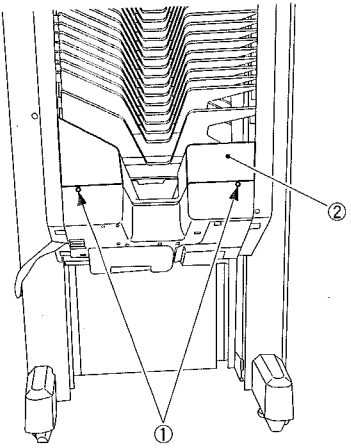


Figure 3-224

4) Disconnect the reference wall motor connector ③.

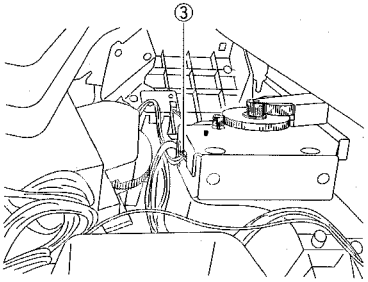


Figure 3-225

  CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

5) Remove the screw ④, and remove the motor cover ⑤.

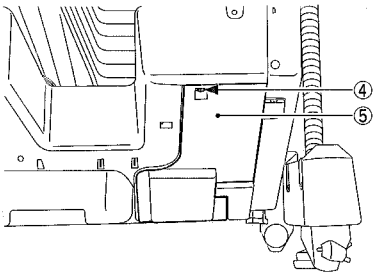


Figure 3-226

6) Remove the two screws ⑥, and remove the push bar motor ⑦.

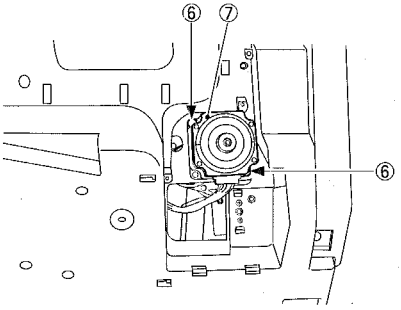


Figure 3-227

7) Remove the two screws ⑧, and remove the reference wall motor ⑨.

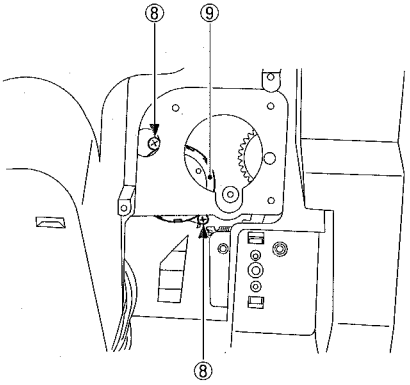


Figure 3-228

H. Removing the Multiple Guide Motor (M5; stapler sorter only)

1) Remove the screw ①, and remove the motor cover ②.

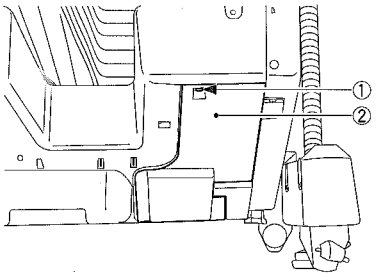


Figure 3-229

2) Disconnect the multiple guide motor connector ③, and remove the two screws ④ to remove the multiple guide motor ⑤.

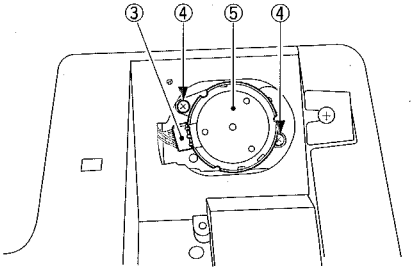


Figure 3-230

I. Removing the Guide Bar Motor (M8; stapler sorter only)

1) Turn on the copier, and press the bin shift key so that the gap between the bottommost bin and the bottom of the bin unit is maximum.

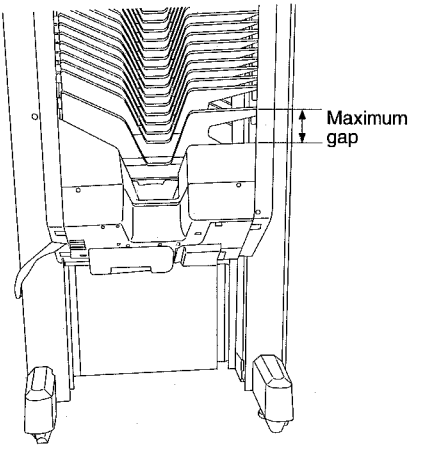


Figure 3-231

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

2) Turn off the copier.
3) Remove the two screws ①, and remove the bin unit cover ②.

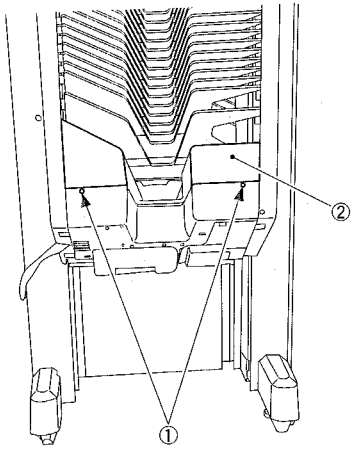


Figure 3-232

4) Disconnect the connector J307 ③ from the bin unit control PCB.

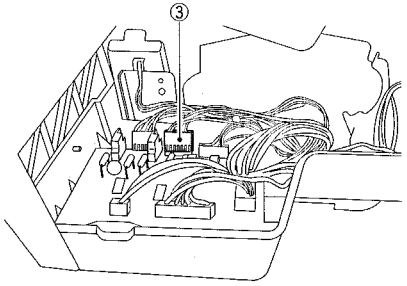


Figure 3-233

5) Remove the two screws ④, and remove the guide bar motor cover ⑤.

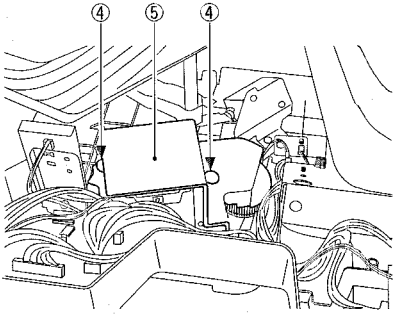


Figure 3-234

6) Remove the two screws ⑥, and remove the guide bar motor ⑦.

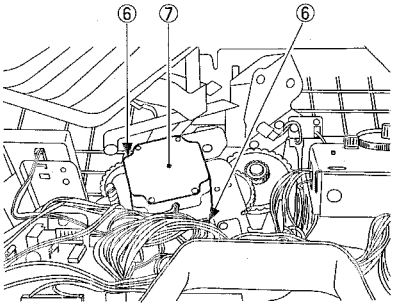


Figure 3-235

J. Adjusting the Gear Switching Solenoid (SL4; stapler sorter only)

1) Loosen the two screws ①.

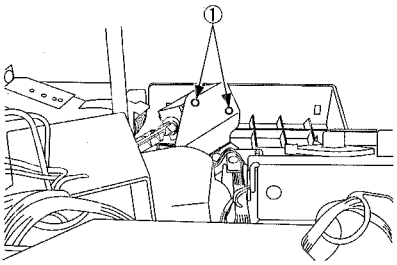


Figure 3-236

2) Move the gear unit ② by hand fully in the direction of ➡.

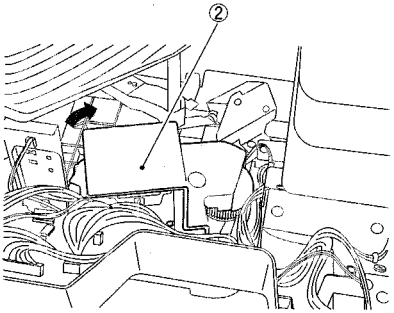


Figure 3-237

3) Move the solenoid ③ until the plunger ② of the gear switching solenoid is fully inside the solenoid in the condition achieved in step 2); then, tighten the two screws ① to fix it in place.

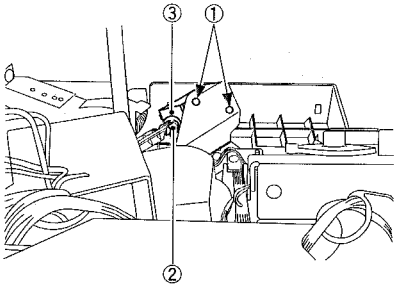


Figure 3-238

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

III. FEEDING UNIT

A. Removing the Feeding Unit

1) Open the front door, and remove the screw ② to remove the grip ①.

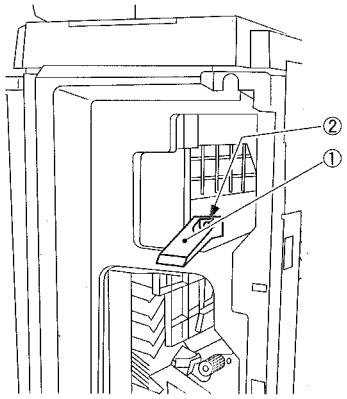


Figure 3-301

2) Remove the four screws ③, and remove the lower right cover ④.

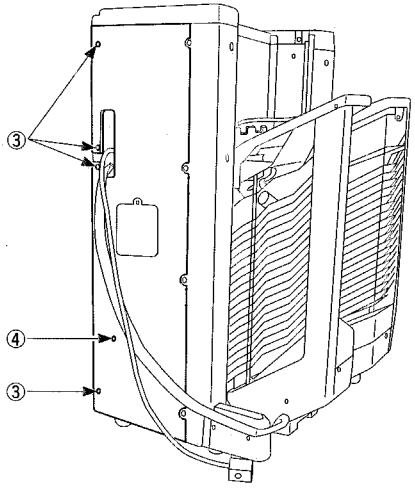


Figure 3-302

3) Disconnect the two connectors ⑤ (J601, J602), remove the three screws ⑥; then, remove the low-speed feeding motor unit ⑦.

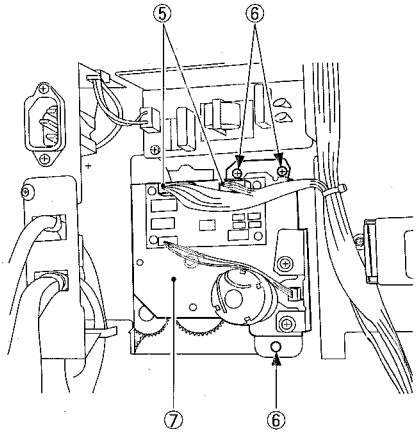


Figure 3-303

4) Remove the two screws ⑧, and remove the upper right cover ⑨; then, remove the four screws ⑩, and remove the lower right cover ⑪.

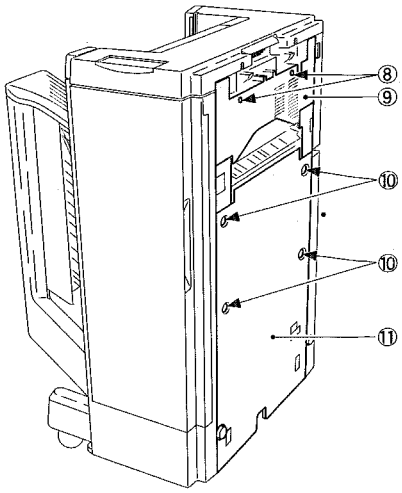


Figure 3-304

5) Disconnect the three connectors ⑫, and remove the four screws ⑬ to remove the feeding unit ⑭.

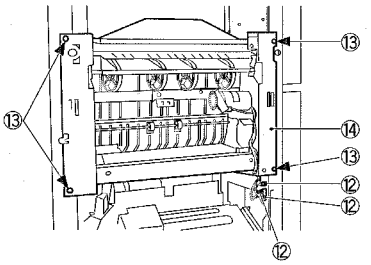


Figure 3-305

B. Removing the Feeding Motor (M1)

1) Remove the feeding unit.
2) Disconnect the connector ① from the feeding motor assembly.

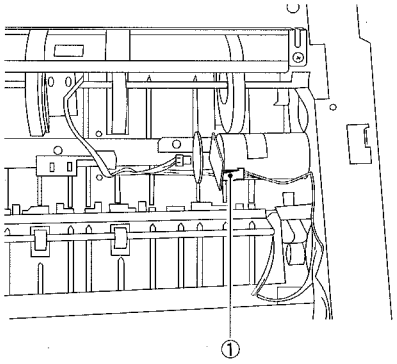


Figure 3-306

3) Remove the tensioner fixing screw ②, and detach the drive belt ③.

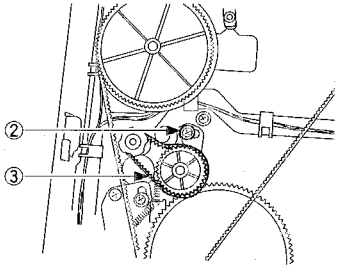


Figure 3-307

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

4) Remove the two screws ④, and remove the feeder motor ⑤.

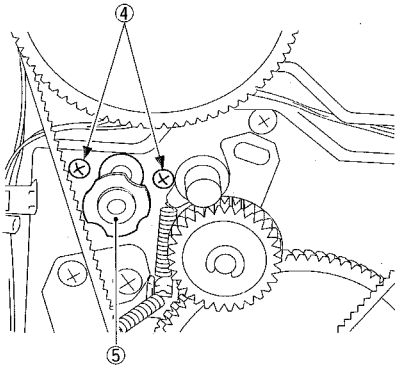


Figure 3-308

C. Removing the Low-Speed Feeding Motor (M10)

1) Disconnect the two connectors ① (J601, J602), and remove the three screws ②; then, remove the low-speed feeder motor.

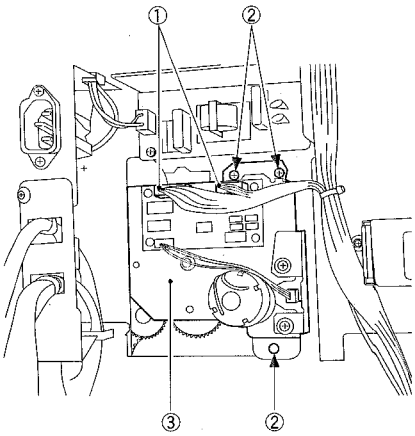


Figure 3-309

2) Remove the two screws ④, and remove the sensor mount ⑤.

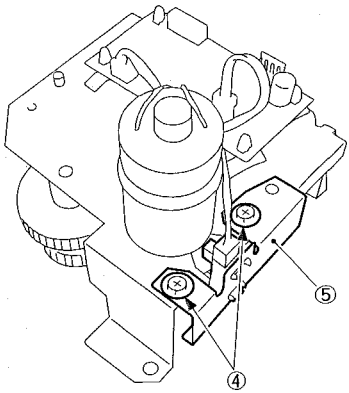


Figure 3-310

3) Remove the two screws ⑥, and remove the low-speed feeding motor ⑧ while detaching the belt ⑦.

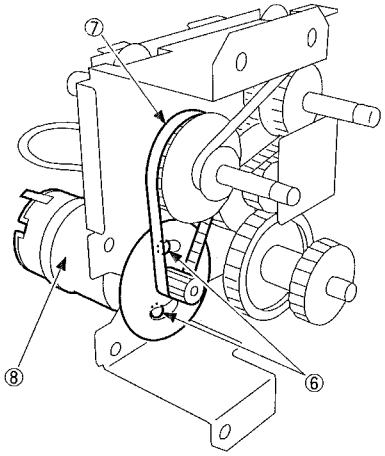


Figure 3-311

D. Adjusting the Tensioner

1. Tensioner 1

1) Loosen the tensioner fixing screw ①, and tighten it when the tensioner 1 ② stops because of the tension of the spring ③.

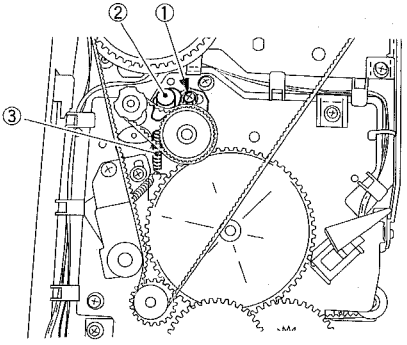


Figure 3-312

2. Tensioner 2

1) Loosen the tensioner fixing screw ①, and tighten it when the tensioner 2 ② stops because of the tension of the spring ③.

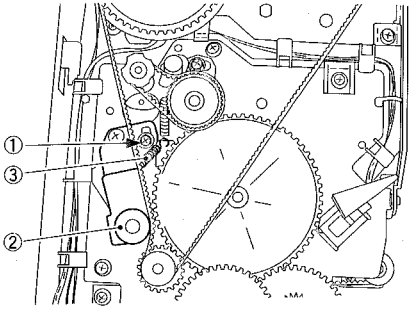


Figure 3-313

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

IV. STAPLER DRIVE UNIT (stapler sorter only)

A. Removing the Stapler Drive Unit

1) Remove the four screws ①, and remove the lower right cover ②.

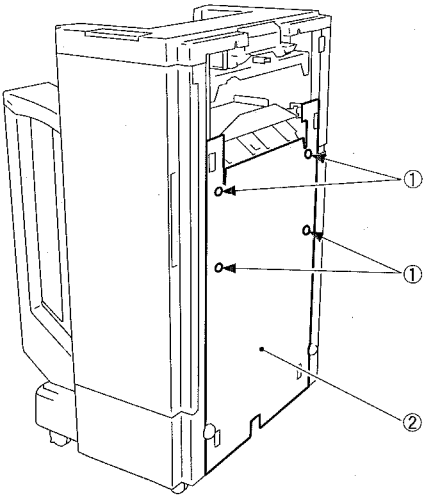


Figure 3-401

2) Disconnect the seven connectors ③, and remove the screw ④ to remove the three grounding cables ⑤.

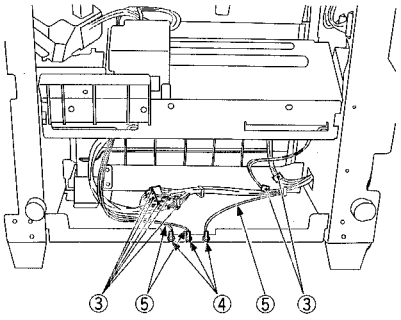


Figure 3-402

3) Remove the screw ⑥, and remove the stopper ⑦.

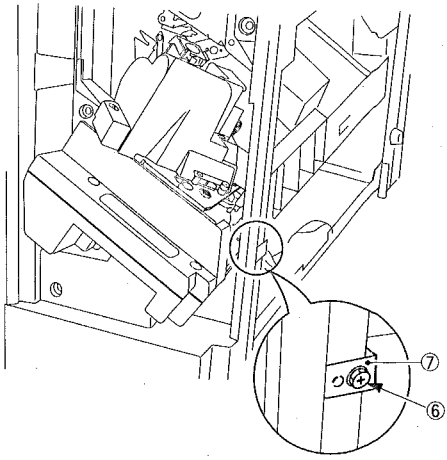


Figure 3-403

4) Draw out the stapler drive unit ⑦ to the front to remove.

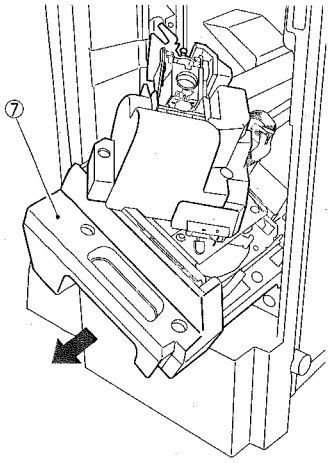


Figure 3-404

B. Removing the Stapler Unit Drive Motor

1) Remove the stapler drive unit.
2) Remove the two screws ①, and remove the stapler unit drive motor ②.

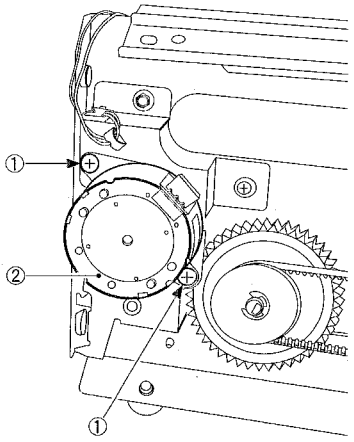


Figure 3-405

  CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

C. Adjusting the Tension of the Stapler Unit Drive Belt

1) Loosen the tensioner fixing screw ①, and tighten it when the tensioner ② stops because of the tension of the spring ③.

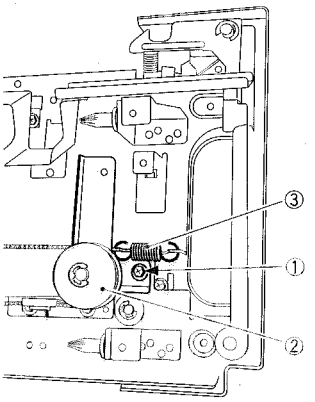


Figure 3-406

D. Adjusting the Stapler Unit Home Position

1) Loosen the two screws ①, and move the flag plate ② back and forth to adjust the home position of the stapler unit.

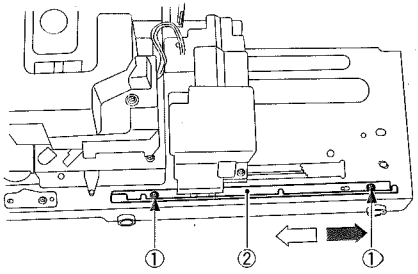


Figure 3-407

2) Make adjustments so that the stapler is positioned as indicated when executing corner stapling.

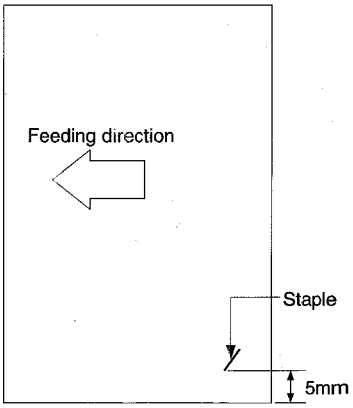


Figure 3-408

V. STAPLER ORIENTATION SWITCHING UNIT (stapler sorter only)

A. Removing the Stapler Orientation Switching Unit

1) Remove the stapler drive unit.
2) Remove the two screws ①, and remove the stapler unit cover ②.

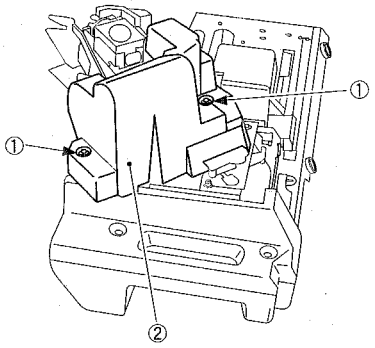


Figure 3-501

3) Remove the screw ③, and remove the stopper ④.

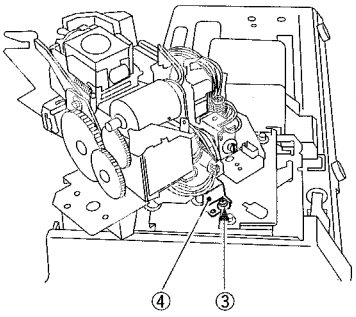


Figure 3-502

4) Lift the stapler unit to remove.

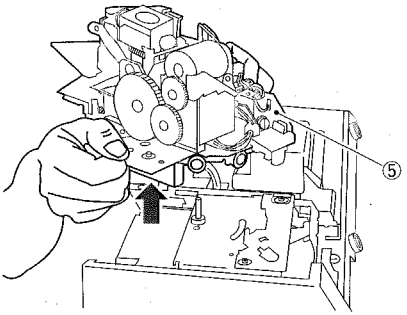


Figure 3-503

Caution:
When installing the stapler unit, make sure that the arm and the pin are connected securely.

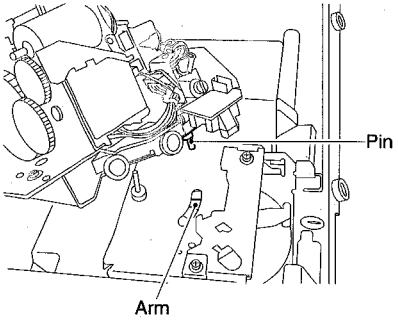


Figure 3-504

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

VI. STAPLER SWING UNIT (stapler sorter only)

A. Removing the Stapler Unit Swing Motor (M4)

1) Remove the stapler drive unit.
2) Remove the two screws ①, and remove the motor cover ②.

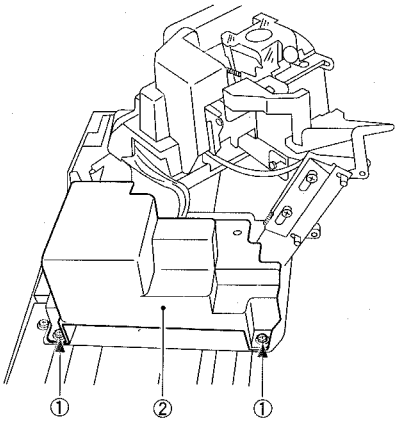


Figure 3-601

3) Disconnect the connector ③, and remove the two screws ④ to remove the sensor mount ⑤.

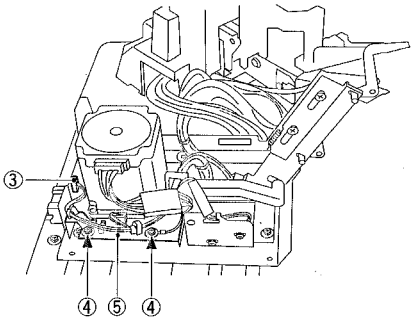


Figure 3-602

4) Disconnect the connector ⑥, and remove the two screws ⑦; then, remove the stapler unit swing motor ⑧.

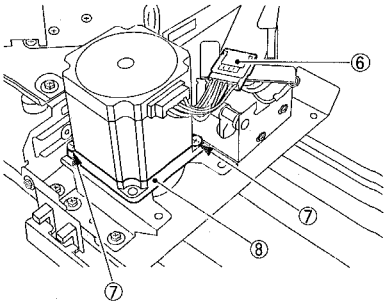


Figure 3-603

B. Removing the Stapler Swing Unit

1) Remove the stapler drive unit.
2) Remove the two screws ①, and remove the stapler unit cover ②.

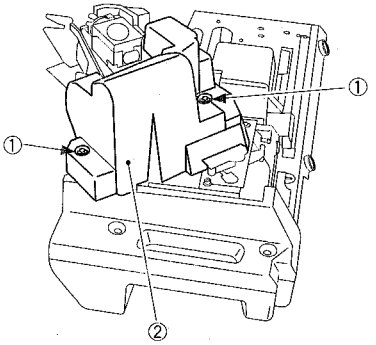


Figure 3-604

3) Remove the stapler swing motor.
4) Swing the stapler, and move it to the stapling position.

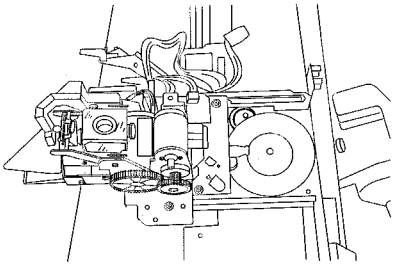


Figure 3-605 (stapling position)

5) Remove the four screws ③, and remove the rear rail ④.

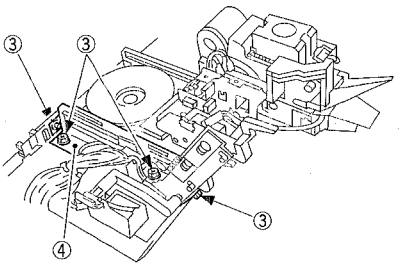


Figure 3-606

6) Remove the two screws ⑤, and remove the rail guide ⑥.

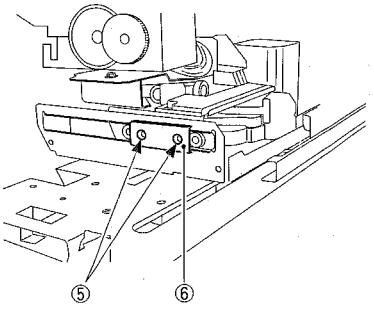


Figure 3-607

7) Remove the E-ring ⑦ and the two claws ⑧; then, remove the swing disk ⑨ and the stapler unit mount ⑩.

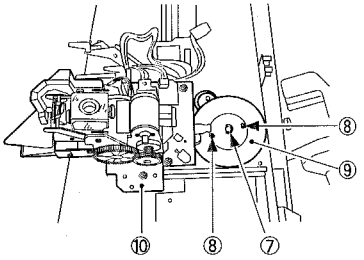


Figure 3-608

VII. STAPLER UNIT (stapler sorter only)

A. Removing the Stapler Unit

1) Open the front door, and draw out the stapler unit to the front.
2) Remove the two screws ①, and remove the stapler unit cover ②.

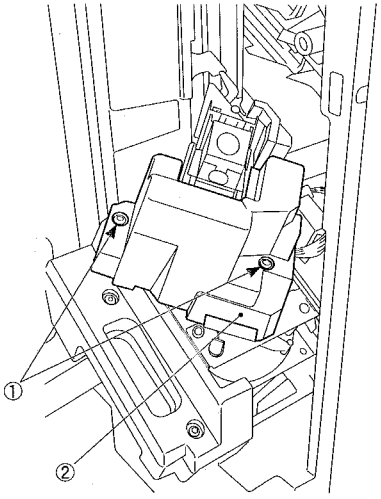


Figure 3-701

3) Remove the four connectors ③, grounding wire ④, and two screws ⑤; then, remove the stapler unit.

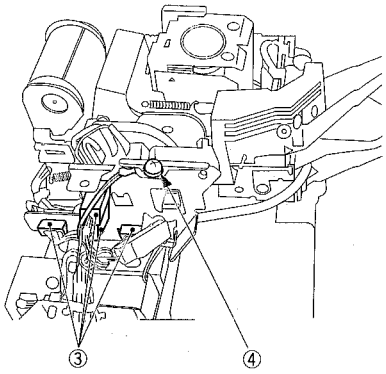


Figure 3-702a

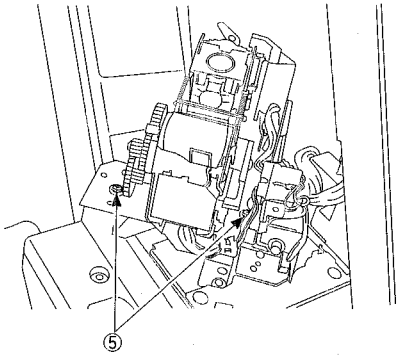


Figure 3-702b

B. Adjusting the Stapling Position

1) Loosen the two stapler unit fixing screws ①, and move the stapler unit in the direction of the arrow to adjust.

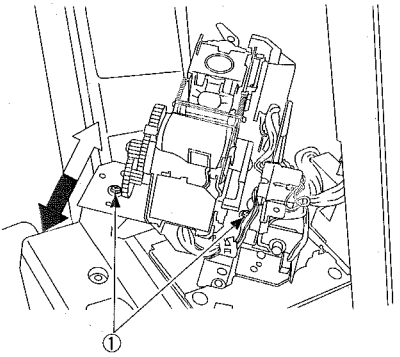


Figure 3-703

2) When making adjustments, make sure that the stapler is positioned as shown in Figure 3-704 for corner stapling.

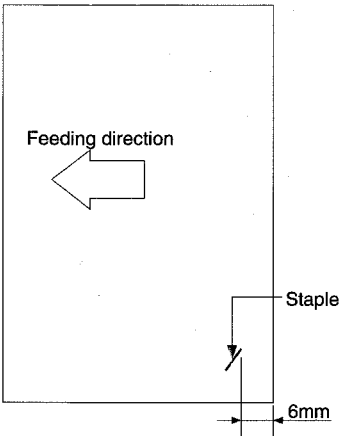


Figure 3-704

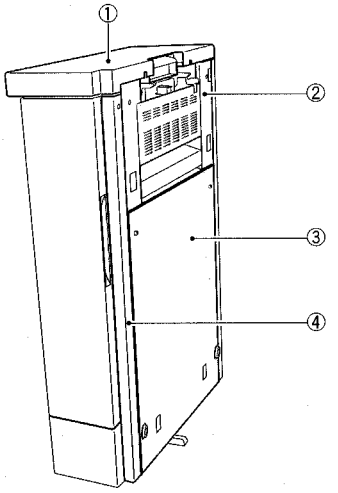
  CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

VIII. BUFFER PASS UNIT

A. External Covers

Remove the covers as necessary when cleaning, inspecting, or repairing the inside of the machine.

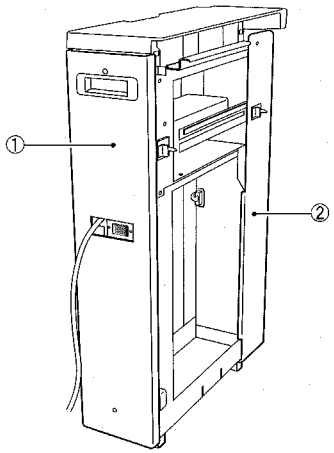
Those covers that can be detached by mere removal of the mounting screws are omitted from the discussions.



① Upper cover (2)
② Upper right cover (3)
③ Lower right cover (3)
④ Front right cover (2)

Figure 3-801

The number in parentheses indicates the number of mounting screws used.



① Rear cover (2)
② Front left cover (2)

Figure 3-802

B. Removing the Feeding Roller

1) Remove the upper right cover and the rear cover.
2) Remove the two screws ①, and remove the inlet guide ②.

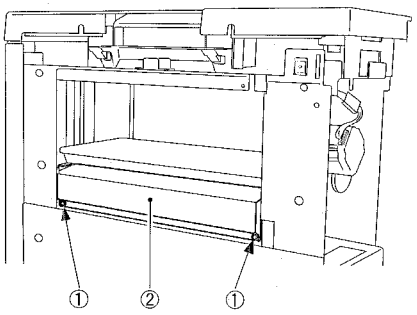


Figure 3-803

3) Remove the screw ③, and remove the inlet paper sensor unit ④.

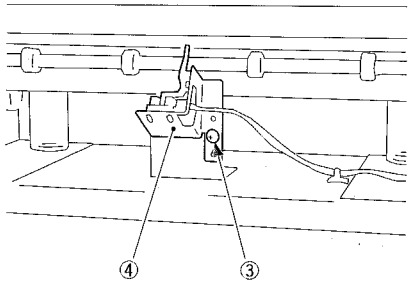


Figure 3-804

4) Open the front cover, and remove the E-ring ⑤ and the bushing ⑥ at the front.

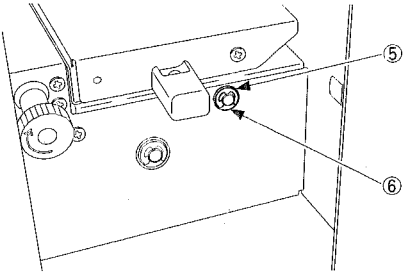


Figure 3-805

5) Remove the E-ring ⑦ at the rear, and shift the bushing ⑧ toward the gear ⑨.

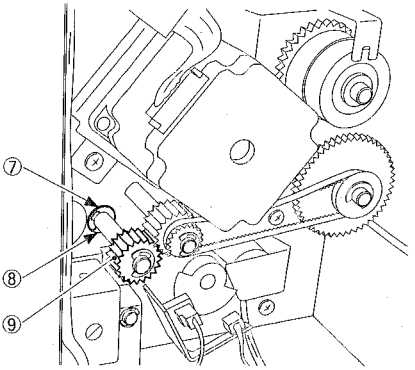


Figure 3-806

6) While taking care not to damage the gear ⑨, remove the feeding roller ⑩.

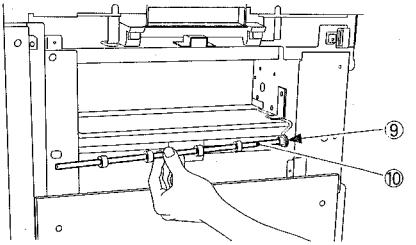


Figure 3-807

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

C. Removing the Sponge Roller

1) Remove the rear cover.
2) Remove the screw ①, and remove the sponge roller cover ②.

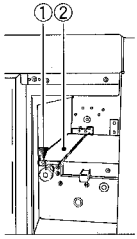


Figure 3-808

3) Open the front door, and remove the feeding knob ③ and the E-ring ④; then, remove the bushing ⑤.

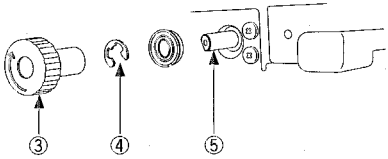


Figure 3-809

4) Loosen the fixing screw ⑦ of the belt tensioner ⑥; then, detach the belt ⑧.

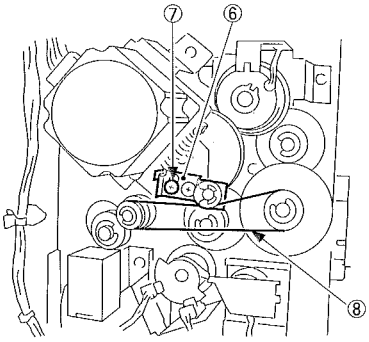


Figure 3-810

5) Remove the three screws ⑨, and remove the bushing retainer ⑩.

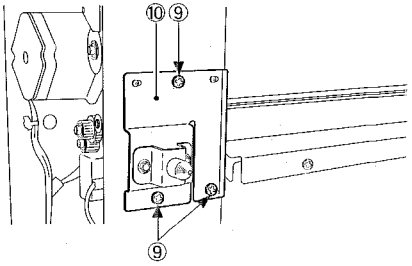


Figure 3-811

6) While taking care not to damage the gear ⑪, remove the sponge roller unit ⑫.

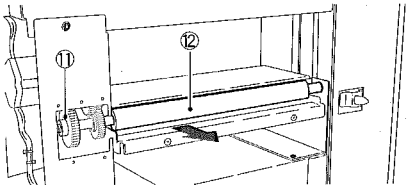


Figure 3-812

7) Remove the two E-rings ⑬ from the sponge roller unit ⑫, and remove the three gears ⑭.

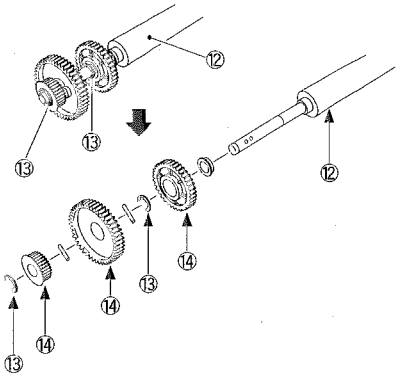


Figure 3-813

D. Adjusting the Tensioner

1) Loosen the tentioner fixing screw ①, and tighten the tensioner fixing screw ① when the tentioner ② has stopped by the work of the spring ③.

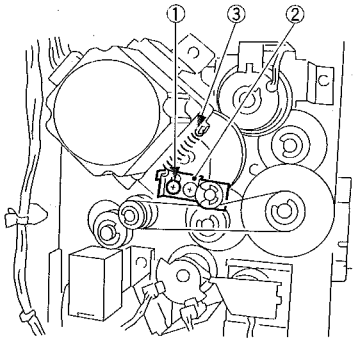


Figure 3-814

E. Removing the Pressure Roller

1) Remove the two springs ①.

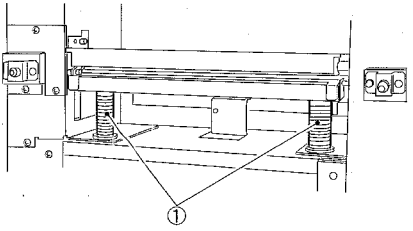


Figure 3-815

2) Remove the screw ②, and remove the pressure roller mount retaining pin ③.

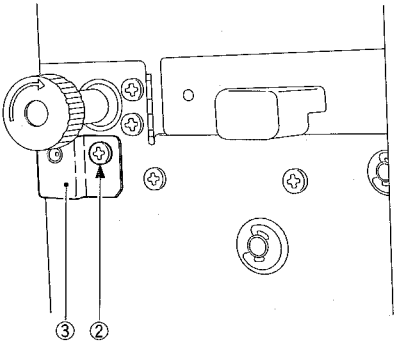


Figure 3-816

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

3) Remove the pressure roller mount ④ by slipping it off the pin ⑤ at the rear.

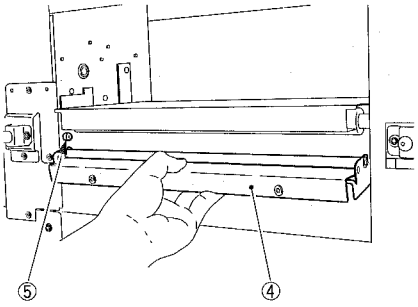


Figure 3-817

4) Remove the two E-rings ⑥ from the front and the rear; and remove the two bushings ⑦; then, remove the pressure roller ⑧.

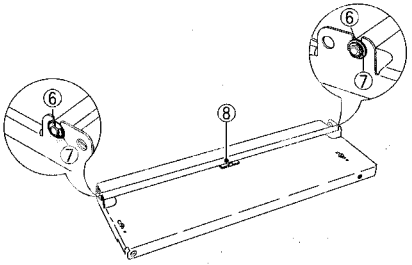


Figure 3-818

F. Adjusting the Pressure Roller

1) Remove the upper cover, upper right cover, and rear cover.
2) Remove the two screws ①, and remove the inlet guide ②.

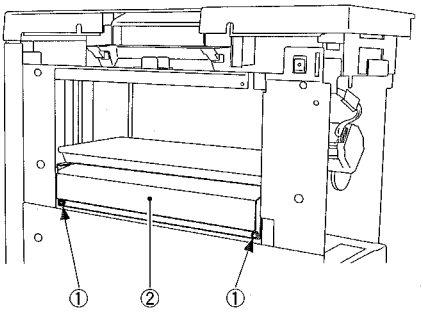


Figure 3-819

3) Remove the screw ③; then, remove the feeding guide hinge ④ and feeding guide ⑤.

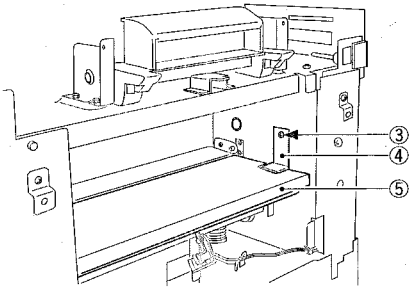


Figure 3-820

4) Make sure that the pressure cam shaft ⑦ is stationary at its home position.
If the pressure cam shaft ⑦ is not at its home position, turn the solenoids 1 ⑧ and 2 ⑨ by hand thereby returning the pressure cam shaft ⑦ to the home position.
- The front claw Ⓐ of the spring clutch is positioned in contact with the claw Ⓑ of solenoid 1.

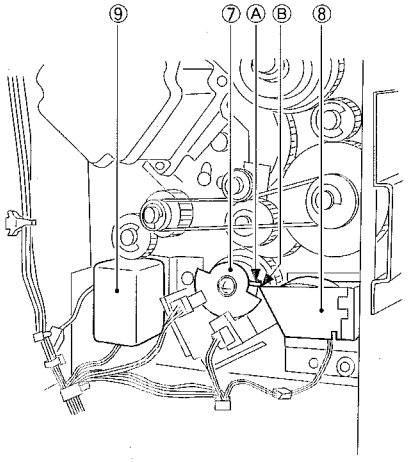


Figure 3-821

5) Loosen the two slider fixing screws ⑩ at the rear and the front.

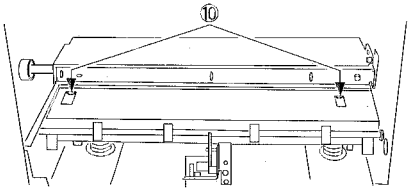


Figure 3-822

6) Give the paper feeding knob (green) ⑪ and check to make sure that the pressure cam ⑫ and the slider ⑬ are not in contact with each other at the rear and the front.

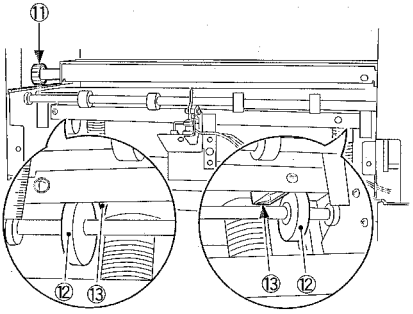


Figure 3-823

If the pressure cam and the slider are in contact, turn the pressure adjusting screw ⑭ counterclockwise to break the contact.

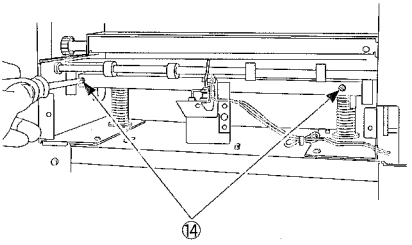


figure 3-824

7) While turning the paper feeding knob (green) ⑪, check the position of the pressure roller mount ⑮ in reference to the ruler marks at the rear and the front; use the position as the reference point.
   • The reference point should be the center of displacement of the pressure roller ⑮ occurring when the paper feeding knob (green) ⑪ has been given a full turn.

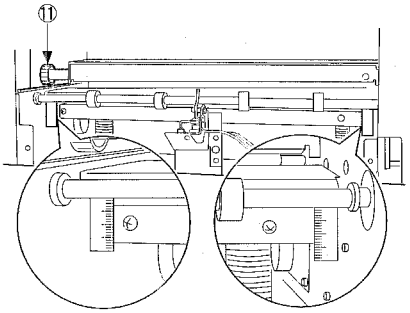


Figure 3-825

8) Operate the solenoids 1 ⑧ and 2 ⑨ by hand, and turn the pressure cam shaft ⑦ so that it is positioned as indicated.
   • The rear claw Ⓐ of the spring clutch is in contact with the claw Ⓑ of the solenoid 1.

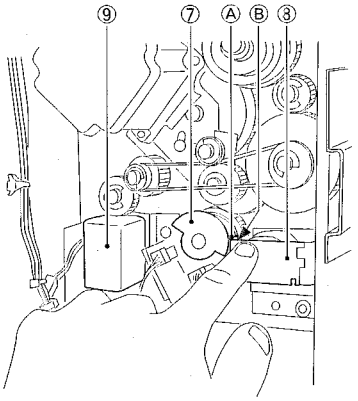


Figure 3-826

9) Turn the pressure adjusting screw ⑭ so that the pressure roller mount ⑮ is 8.0 ±0.5 mm above the reference point identified in step 7).

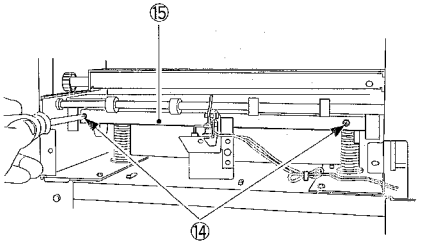


Figure 3-827

Rotation of pressure adjusting screw	Direction of pressure roller mount
Clockwise	Up
Counterclockwise	Down

Table 3-801

10) Tighten the slider fixing screw ⑩ at the rear and the front, and glue it in place; perform the same on the pressure adjusting screw ⑭.

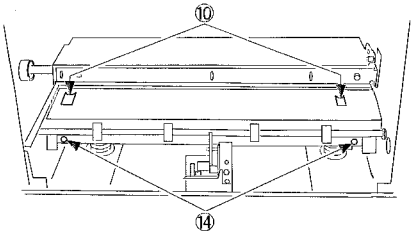


Figure 3-828

11) Operate the solenoids 1 ⑧ and 2 ⑨ and turn the pressure cam shaft ⑦ until it is at home position.
    - The rear claw Ⓐ of the spring clutch is in contact with the claw Ⓑ of the solenoid 1.

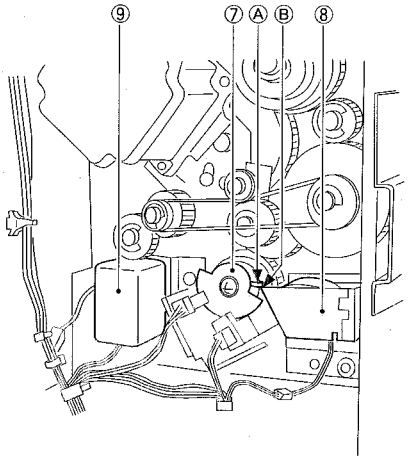


Figure 3-829

G. Removing the Pressure Roller Back-Up

1) Remove the pressure roller. (See "E. Removing the Pressure Roller.")
2) Remove the pressure roller back-up ①.

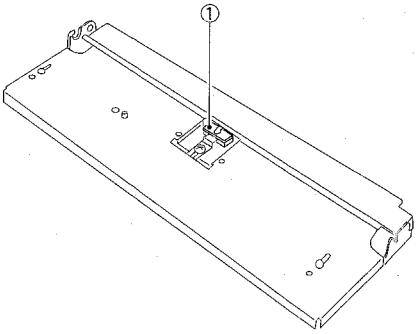


Figure 3-830

Caution:
You must adjust the pressure roller back-up pressure whenever you have replaced the pressure roller back-up.

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

H. Adjustment of the pressure roller back-up pressure

1) Remove the pressure roller mount. (Perform up to step 3) under "E. Removing the Pressure Roller.")
2) Loosen the slider fixing screw ①, and tighten it where the slider stops.

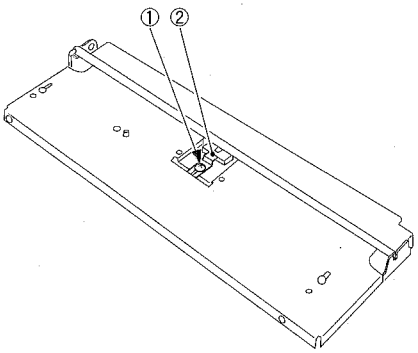


Figure 3-831

I. Lubricating the Spring Clutch

1) Remove the rear cover.
2) Apply a drop each of lubricant to two locations Ⓐ of the spring clutch indicated.

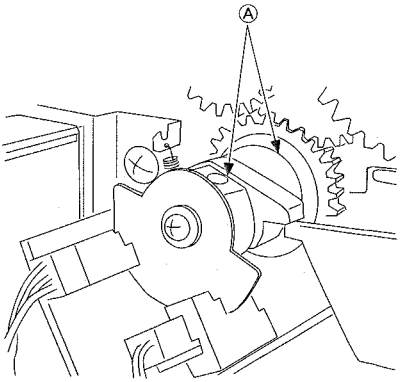


Figure 3-832

CHAPTER 4

MAINTENANCE AND SERVICING

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

I. PERIODICALLY REPLACED PARTS

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

II. DURABLES AND CONSUMABLES

Some parts of the machine may have to be replaced once or more over the period of its warranty. Replace them when they are found to be faulty.

A. Stapler Sorter-F1

as of JUNE 1995

No.	Parts name	Parts number	Q'ty	Life	Remarks
1	Stapler	FB2-9999-000	1	200,000*	About 5,000 stapling operations per staple cartridge.
2	Static eliminating brush 3	FB3-0099-000	1	1,000,000	
3	Static eliminating brush 4	FB3-1806-000	1	1,000,000	
4	Static eliminating brush 5	FB3-4200-000	1	1,000,000	

*Stapling operations.

B. Sorter-D1

The Sorter-D1 does not have items classified as consumables.

C. Buffer Pass Unit 1

as of JUNE 1995

No.	Parts name	Parts number	Q'ty	Life	Remarks
1	Sponge roller	FB3-1129-000	1	200,000	

III. PERIODICAL SERVICING

A. Stapler Sorter-F1/Sorter D1

△ : clean ● : replace × : lubricate □ : adjust ◎ : inspect

No.	Item	Maintenance intervals		Remarks
		Stapler Sorter-F1 (see Note)	Sorter-D1 (see Note)	
1	Feeding roller, roll	△	△	
2	Feeding guide	△	△	
3	Static eliminating brush 3, 4, 5	△	△	
4	Bin paper sensor (S3, S4, S6*, S7*)	△	△	*Stapler sorter only
5	Stapler inside paper sensor (S5)	△	—	
6	Staple sensor (SW1)	△	—	
7	Punching assembly	△	—	
8	Bin	△	△	
9	Lead cam	×	×	Lubricant (PermaLube G-2, CK-0551)

Note:
Provide maintenance at intervals used for the host copier (counter reading) and the minimum maintenance intervals for the machine.

B. Buffer Pass Unit 1

△ : clean ● : replace × : lubricate □ : adjust ◎ : inspect

No.	Item	Maintenance intervals			Remarks
		(see Note 1)	(see Note 2)	Every 400,000 copies	
1	Feeding guide	△			
2	Spring clutch		×		Lubricant (CK-0451)
3	Pressure roller back-up			□	

Note 1:
Provide maintenance at intervals used for the host copier (counter reading) and the minimum maintenance intervals for the machine.

Note 2:
Follow the intervals specified for lubricating the spring clutch of the connected copier.

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

CHAPTER 5

TROUBLESHOOTING MALFUNCTIONS

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

I. STANDARDS AND ADJUSTMENTS

A. Electrical

1. When Replacing the Major Parts

Major parts	Work
• Sorter controller PCB	① Adjustment of the bin inside paper sensor sensitivity ② Adjustment of the stapler inside paper sensor sensitivity ③ Adjustment of the guide bar swing range ④ Adjustment of the reference wall stop position*
• Bin unit control PCB	① Adjustment of the bin inside paper sensor sensitivity
• Bin inside paper sensor (S3, S4, S6*, S7*)	① Adjustment of the bin inside paper sensor sensitivity
• Stapler inside paper sensor (S5)*	① Stapler inside paper sensor sensitivity
• Stapler unit*	① Adjustment of the stapler inside paper sensor sensitivity
• Guide bar home position sensor (PI16)*	① Adjustment of the guide bar swing range
• Guide bar swing motor (M8)*	① Adjustment of the guide bar swing range
• Reference wall home position sensor (PI13)*	① Adjustment of the reference wall stop position
• Reference wall drive motor (M6)*	① Adjustment of the reference wall stop position

*Stapler sorter only.

Table 5-101

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

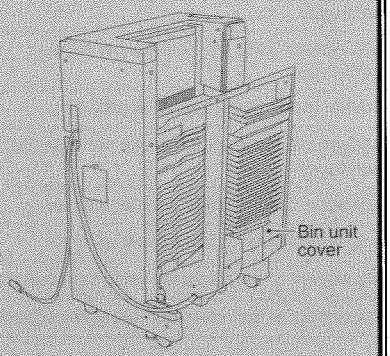
2. Adjusting the Bin Inside Paper Sensor Sensitivity

Make the following adjustments whenever you have replaced the following parts:

- sorter controller PCB
- bin inside paper sensor (S3, S4/S6, S7)
- bin unit control PCB

Caution:

Make the adjustment with the bin unit cover installed; otherwise, the sensor would be exposed to light, making correct adjustment difficult.



Making Adjustments

■ Stapler Sorter

1) Remove all paper from the bin.
2) Remove the sorter controller cover, and set the bits of the DIP switch (DIPSW1) on the sorter controller PCB as follows:

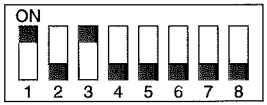


Figure 5-101

3) Press the Stapling Start/Stop key on the control panel.

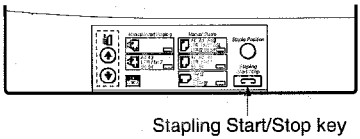


Figure 5-102

4) Check the state of the Stapling Start/Stop key:
   on: adjustment done
   flashing: adjustment error
   If an adjustment error occurs, the copier indicates 'E525' or 'E526' on its control panel.
   E525: faulty S3, S4
   E526: faulty S6, S7
5) If the Stapling Start/Stop key is flashing, turn off and then on the copier; then, check the bin inside paper sensor that corresponds to the error code in question (light-emitting side, light-receiving side), and go back to step 1).
6) After adjustment, return the bits of the DIP switch (DIPSW1) to their initial positions.

■ Sorter-D1

1) Remove all paper from the bin.
2) Remove the sorter controller cover, and set the bits of the DIP switch (DIPSW1) on the sorter controller PCB as follows:

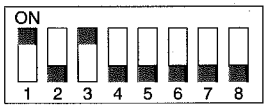


Figure 5-103

3) Press the Bin Shift (UP) key on the control panel.

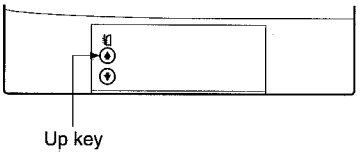


Figure 5-104

4) Check the state of LED2 on the sorter controller PCB:
   on: adjustment done
   flashing: adjustment error
   If an adjustment error occurs, the copier indicates 'E525' on its control panel.
5) If LED2 on the sorter controller PCB is flashing, turn off and then on the copier; then, check the bin inside paper sensor (light-emitting side, light-receiving side), and go back to step 1).
6) After adjustment, return the bits of the DIP switch (DIPSW1) to their initial positions.

3. Adjusting the Stapler Inside Paper Sensor (S5; stapler sorter only)

Make the following adjustments whenever you have replaced the following parts:

- sorter controller PCB
- stapler inside paper sensor (S5)
- stapler unit

Making Adjustments

1) Remove all paper from the stapler.
2) Remove the sorter controller cover, and set the bits of the DIP switch (DIPSW1) on the sorter controller PCB as follows:

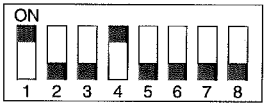


Figure 5-105

3) Press the Stapling Start/Stop key on the control panel.

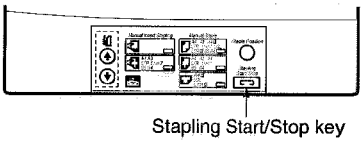


Figure 5-106

4) Check the state of the Stapling Start/Stop key on the control panel:
   on: adjustment done
   flashing: adjustment error
   If an adjustment error occurs, 'E533' will be indicated on the copier's control panel.
5) If the Stapling Start/Stop key is flashing, turn off and then on the copier; then, check the stapler inside paper sensor, and go back to step 1).
6) After making the adjustments, return the bits of the DIP switch (DIPSW1) on the sorter controller PCB to their initial positions.

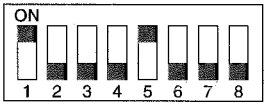
4. Adjusting the Guide Bar Swing Range (stapler sorter only)

Make the following adjustments whenever you have replaced the following parts:

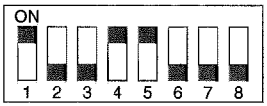
- sorter controller PCB
- guide bar home position sensor (PI16)
- guide bar swing motor (M8)

Making Adjustments

1) Obtain a single sheet of A4 or LTR copy paper.
2) Remove all paper from the bins.
3) Remove the sorter controller cover, and set the bits of the DIP switch (DIPSW1) on the sorter controller PCB as follows; be careful, as the setting differs depending on the size of the copy paper being used:



(for A4 copy paper)



(for LTR copy paper)

Figure 5-107

4) Press the Stapling Position key on the control panel.
   - The push bar returns to the home position and then moves to the A4 or LTR index position.
   - The multiple guide, reference wall, and guide bar return to the home position.
   - The stapler unit moves to the home position.

   When all above operations are done, the all five Stapling Position indicator LEDs will turn on.

   If an error occurs during the above operations, the copier will indicate 'E510', 'E522', 'E523', 'E524', 'E530', or 'E540'.

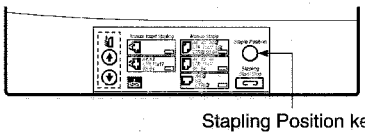


Figure 5-108

5) Place about a single sheet of A4 or LTR copy paper in the bin as shown in Figure 5-109.

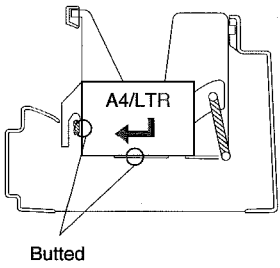


Figure 5-109 (top view)

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

6) After making sure that the all five Stapling Position indicator LEDs have turned on, press the bin shift key to move the guide bar against the stack of copy paper.
   UP key: to move the guide bar closer to the stack.
   DOWN key: to move the guide bar away from the stack.

Reference:
The first press on the UP key will move the guide bar about 20 mm closer to the stack of copy paper; the second and subsequent presses will move it about 0.5 mm each.

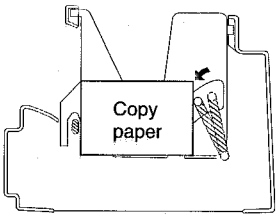


Figure 5-110 (top view)

7) While maintaining the condition in step 6), press the Stapling Start/Stop key on the control panel.
   • The guide bar moves to the home position.

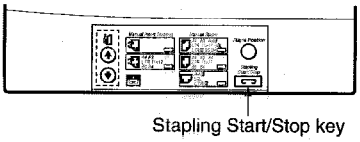


Figure 5-111

8) Check the state of the Stapling Start/Stop key.
   on: adjustment done
   flashing: adjustment error (guide bar stop position faulty)
9) If the Stapling Start/Stop key is flashing, check the guide bar home position sensor, and go back to step 4).
10) After making the adjustments, return the bits of the DIP switch (DIPSW1) on the sorter controller PCB to their initial positions.

5. Adjusting the Reference Wall Stop Position (stapler sorter only)

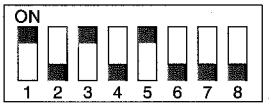
You must make the following adjustments only after adjusting the guide bar swing range.

Make the following adjustments whenever you have replaced the following parts:

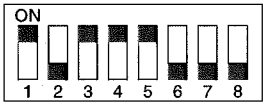
- sorter controller PCB
- reference wall home position sensor (PI13)
- reference drive motor (M6)

Making Adjustments

1) Obtain a single sheet of copy paper.
2) Remove all paper from the bins.
3) Remove the sorter controller cover, and set the bits of the DIP switch (DIPSW1) on the sorter controller PCB as follows; be careful, as the setting differs depending on the size of the copy paper used:



(for A4 copy paper)



(for LTR copy paper)

Figure 5-112

4) Press the Stapling Position key.

> **Caution:**
> Do not press down the Stapling Position key for 1 sec or more.

- The guide bar moves to a specific location.
- The multiple guide, stapler unit, and reference wall move to the home position.
- The push bar returns to the home position then moves to the A4 or LTR index position.

When the above operations are done, all five Stapling Position indicator LEDs will turn on. If an error occurs during the above operations, the copier will indicate 'E510', 'E533', 'E523', 'E524', 'E530', or 'E540' on its control panel.

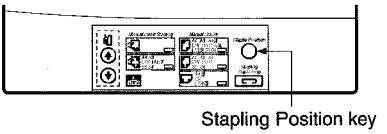


Figure 5-113

5) Place a single sheet of copy paper of the size identified in step 3) as shown.

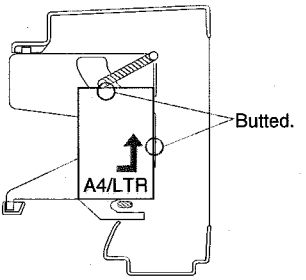


Figure 5-114 (top view)

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6) After checking that all five Stapling Position indicator LEDs have turned on, press the bin shift key so that the reference wall comes lightly in contact with the copy paper. (A single press on the key will move the reference wall about 0.15 mm.)
   UP key: moves the reference wall closer to the copy paper.
   DOWN key: moves the reference wall away from the copy paper.

Caution:
You will be using both UP and DOWN keys to move the reference wall; be sure, however, your last press is on the UP key to position the reference wall.

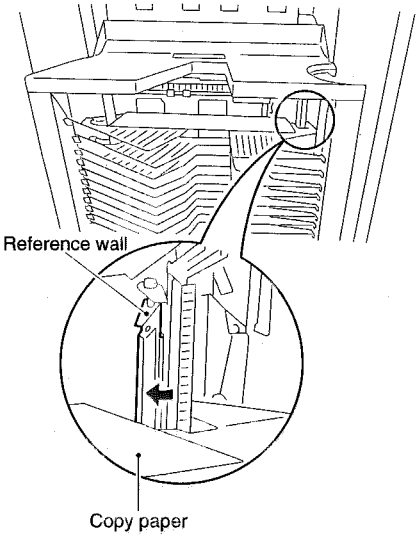


Figure 5-115

7) While maintaining the condition in step 6), press the Stapling Start/Stop key.

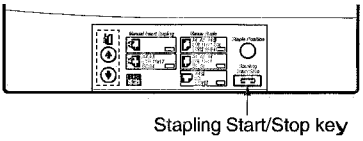


Figure 5-116

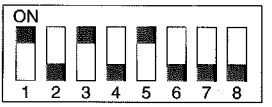
8) Check the state of the Stapling Start/Stop key.
   on: adjustment done
   flashing: adjustment error (reference wall stop position fault)
9) If the Stapling Start/Stop key is flashing, check the reference wall home position sensor, and go back to step 4).
10) After making the adjustments, return the bits of the DIP switch (DIPSW1) on the sorter controller PCB to their initial positions.

6. Checking the Guide Bar Swing Range and the Reference Wall Stop Position (stapler sorter only)

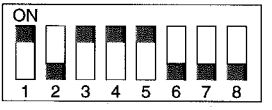
You must first perform "guide bar swing range adjustment" and "reference wall stop position adjustment" before performing the following steps; check the results of adjustments using the delivered copies.

Making Adjustments

1) Obtain a single sheet of A4 or LTR copy paper.
2) Remove all paper from the bins.
3) Remove the sorter controller cover, and set the DIP switch (DIPSW1) on the sorter controller PCB as follows; be sure to use the appropriate settings for different paper sizes.



(using A4 copy paper)



(using LTR copy paper)

Figure 5-117

4) Hold down the Stapling Position key on the control panel, for 2 sec or more.
   - The guide bar and the reference wall will move to specific locations to suit the paper size selected in step 3).

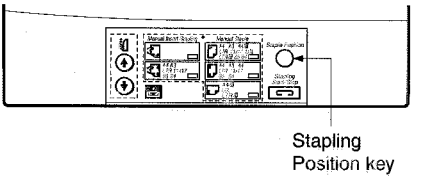
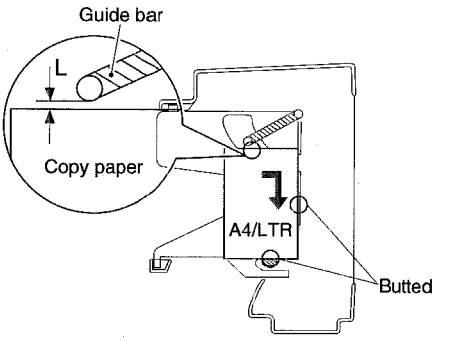


Figure 5-118

5) Place a sheet of copy paper of the size selected in the bin as indicated, and check the distance between the guide bar and the copy paper.



standard: L = 0 ±0.5 mm

Figure 5-119 (top view)

6) If the distance (L) between the guide bar and the copy paper is outside the specification, perform "guide bar swing range adjustment" and "reference wall stop position adjustment" once again.

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B. Mechanical

1. When Replacing Major Parts

Major parts	Work
• Sponge roller	1) Adjustment of the pressure roller
• Pressure roller back-up	1) Adjustment of the pressure roller back-up pressure
• Pressure roller	1) Adjustment of the pressure roller back-up pressure

Table 5-102

2. Adjusting the Pressure Roller

1) Remove the upper cover, upper right cover, and rear cover.
2) Remove the two screws ①, and remove the inlet guide ②.

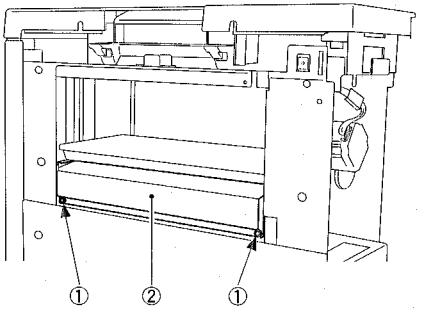

Figure 5-120

3) Remove the screw ③; then, remove the feeding guide hinge ④ and feeding guide ⑤.

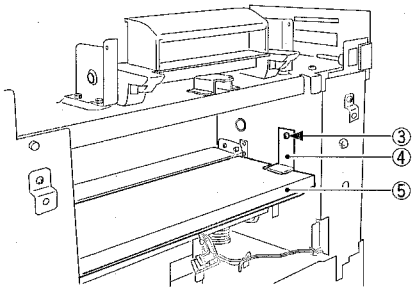

Figure 5-121

4) Make sure that the pressure cam shaft ⑦ is stationary at its home position.
If the pressure cam shaft ⑦ is not at its home position, turn the solenoids 1 ⑧ and 2 ⑨ by hand thereby returning the pressure cam shaft ⑦ to the home position.
- The front claw Ⓐ of the spring clutch is positioned in contact with the claw Ⓑ of solenoid 1.

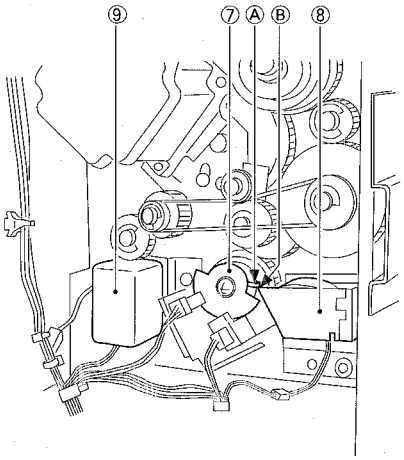

Figure 5-122

5) Loosen the two slider fixing screws ⑩ at the rear and the front.

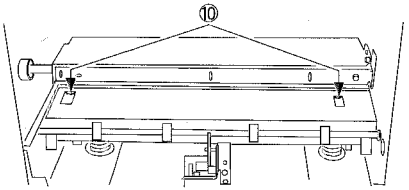

Figure 5-123

6) Give the paper feeding knob (green) ⑪ and check to make sure that the pressure cam ⑫ and the slider ⑬ are not in contact with each other at the rear and the front.

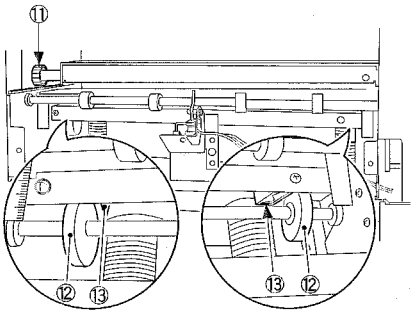

Figure 5-124

If the pressure cam and the slider are in contact, turn the pressure adjusting screw ⑭ counterclockwise to break the contact.

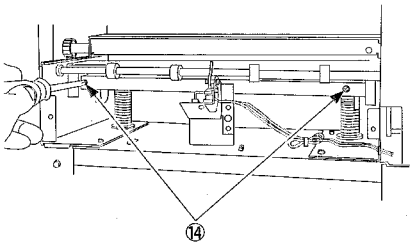

figure 5-125

7) While turning the paper feeding knob (green) ⑪, check the position of the pressure roller mount ⑮ in reference to the ruler marks at the rear and the front; use the position as the reference point.
   - The reference point should be the center of displacement of the pressure roller ⑮ occurring when the paper feeding knob (green) ⑪ has been given a full turn.

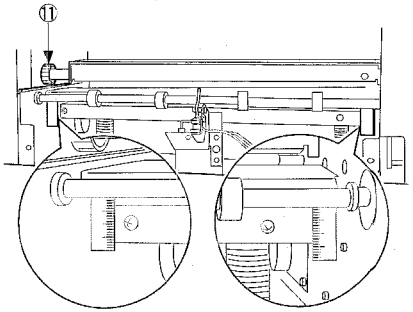

Figure 5-126

8) Operate the solenoids 1 ⑧ and 2 ⑨ by hand, and turn the pressure cam shaft ⑦ so that it is positioned as indicated.
   - The rear claw Ⓐ of the spring clutch is in contact with the claw Ⓑ of the solenoid 1.

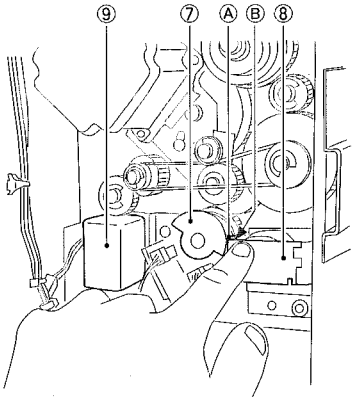

Figure 5-127

9) Turn the pressure adjusting screw ⑭ so that the pressure roller mount ⑮ is 8.0 ±0.5 mm above the reference point identified in step 7).

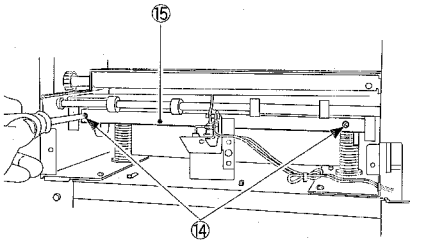

Figure 5-128

Rotation of pressure adjusting screw	Direction of pressure roller mount
Clockwise	Up
Counterclockwise	Down

Table 5-103

10) Tighten the slider fixing screw ⑩ at the rear and the front, and glue it in place; perform the same on the pressure adjusting screw ⑭.

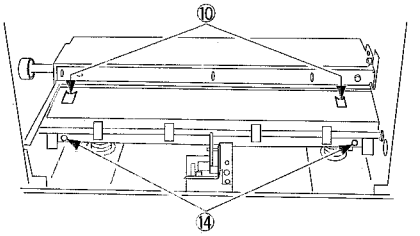

Figure 5-129

11) Operate the solenoids 1 ⑧ and 2 ⑨ and turn the pressure cam shaft ⑦ until it is at home position.
- The rear claw Ⓐ of the spring clutch is in contact with the claw Ⓑ of the solenoid 1.

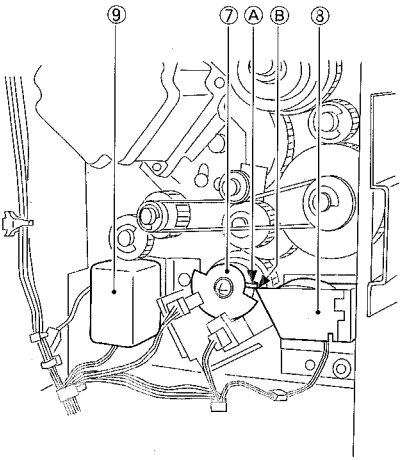

Figure 5-130

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3. Adjustment of the pressure roller back-up pressure

1) Remove the pressure roller mount. (Perform up to step 3) under "E. Removing the Pressure Roller.")
2) Loosen the slider fixing screw ①, and tighten it where the slider stops.

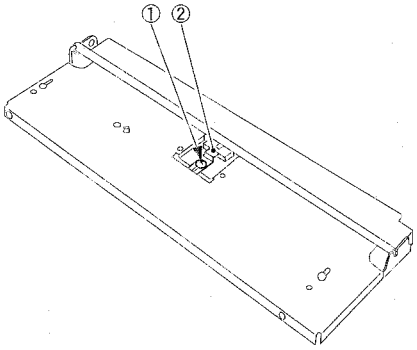


Figure 5-131

II. TROUBLESHOOTING

A. Troubleshooting Malfunctions

1. E510

Cause	Step	Checks	Results	Action
Circuit breaker	1	Has the circuit breaker (CB1) on the sorter controller PCB operated?	NO	Connect the power plug.
24V supply	2	Set the meter to the 50VDC range. Is the voltage between J1-4 (+) and J1-3 (-) on the sorter controller PCB about 24 V?	NO	Check the door switch (MSW3) and the cable between the sorter controller PCB and the door switch.
			NO	See "DC power is absent."
Feeder motor (M1)	3	Set the meter to the ×1 Ω range, and disconnect the connector J10 from the sorter controller PCB. Is the resistance between J10-1 and -2 on the harness side about 80 Ω?	NO	Check the wiring to the feeder motor; if normal, replace the feeder motor.
Feeder motor clock sensor (PI5)	4	Set the meter to the 10VDC range. Does the voltage between the connectors J5-3 (+) add J5-2 (-) on the sorter controller PCB alternate between 0 and 5 V when the feeder motor is rotated by hand?	NO	Replace the feeder motor clock sensor (PI5).
Sorter controller PCB			YES	Replace the sorter controller PCB.

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

2. E516

Cause	Step	Checks	Results	Action
Cable	1	Is the cable between the sorter controller PCB and the low-speed feeder motor driver PCB connected correctly?	NO	Re-connect it.
Circuit breaker	2	Has the circuit breaker (CB1) on the sorter controller PCB operated?	YES	Connect the power plug.
24V supply	3	Set the meter to the 50VDC range. Is the voltage between J1-4 (+) and J1-3 (-) on the sorter controller PCB about 24 V?	NO	Check the door switch (MSW3) and the cable between the sorter controller PCB and the door switch.
			NO	See "DC power is absent."
Low-Speed feeder motor (M10)	4	Set the meter to the x1 Ω range, and disconnect the connector J604 from the low-speed feeder motor driver PCB. Is the resistance between J604-1 and -2 on the harness side about 80 Ω?	NO	Check the wiring up to the low-speed feeder motor; if normal, replace the feeding motor.
Low-speed feeder motor clock sensor (PI23)	5	Set the meter to the 10VDC range. Does the voltage between the connectors J5-3 (+) and J5-2 (-) on the sorter controller PCB alternate between 0 and 5 V when the low-speed feeder motor is rotated by hand?	YES	Replace the low-speed feeder motor clock sensor (PI23).
Low-speed feeder motor driver PCB			NO	Replace the low-speed feeder motor driver PCB.
Sorter controller PCB	6	Replace the sorter controller PCB. Is the problem corrected?	YES	Replace the sorter controller PCB.

3. E517

Cause	Step	Checks	Results	Action
Cable	1	Are the connectors J101, J102, and J103 on the buffer pass driver PCB connected properly?	NO	Connect them properly.
Cable	2	Is the cable between the pressure cam position sensors PS1 and PS2 and the buffer pass driver PCB connected properly?	NO	Connect them properly.
Pressure cam switching solenoid (SL1, SL2)	3	Disconnect the pressure cam switching solenoids SL1 and SL2, and check the solenoid for electrical continuity. Is there any continuity?	NO	Replace the pressure cam switching solenoid that lacks electrical continuity.
			NO	See "DC power is absent."
Buffer pass motor (M1)	4	Does the buffer pass motor (M1) rotate when the Copier's power switch is turned on?	YES	Replace the buffer pass motor (M1).
Spring clutch			YES	Replace the spring clutch.
Buffer pass driver PCB	5	Replace the buffer pass driver PCB. Is the problem corrected?	YES	Replace the buffer pass driver PCB.

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

4. E522

Cause	Step	Checks	Results	Action
Cable	1	Is the cable between the sorter controller PCB and the bin unit control PCB connected correctly?	NO	Connect it correctly.
Circuit breaker	2	Is the circuit breaker (CB1) on the sorter controller PCB on?	YES	Remove the cause that activated the circuit breaker; then, press the circuit breaker.
24V power supply	3	Set the meter to the 50VDC range. Is the voltage between J1-4 (+) and J1-3 (-) on the controller PCB about 24 V?	NO	Check the copier's 24V power supply.
	4	Is the voltage between J2-2 (+) and J2-1 (-) on the sorter controller about 24 V?	NO	Check the copier's 24V power supply.
Push bar motor (M7)	5	Is pulse output present at connectors J306-3 through-6 on the bin unit control PCB in response to the activation of the push bar motor?	YES	Check the wiring to the push bar motor; if normal, replace the push bar motor.
Bin unit control PCB	6	Replace the bin unit control PCB. Is the problem corrected?	YES	Replace the bin unit control PCB.
Sorter controller PCB			NO	Replace the sorter controller PCB.

5. E523

Cause	Step	Checks	Results	Action
Cable	1	Is the cable between the sorter controller PCB and the bin unit control PCB connected correctly?	NO	Connect it correctly.
Circuit breaker	2	Is the circuit breaker (CB1) on the sorter controller PCB on?	YES	Remove the cause that activated the circuit breaker, and press the circuit breaker.
24V power supply	3	Set the meter to the 50VDC range. Is the voltage between J1-4 (+) and J2-1 (-) on the sorter controller PCB about 24 V?	NO	Check the copier's 24V power supply.
	4	Is the voltage between J2-2 (+) and J2-1 (-) on the sorter controller PCB about 24 V?	NO	Check the copier's 24V power supply.
Reference wall motor (M6)	5	Is there pulse output on the connectors J304-7 through -10 on the bin unit control PCB in response to the activation of the reference wall motor? Moreover, is the voltage at J304-6 +24 V?	YES	Check the wiring to the reference wall motor; if normal, replace the reference wall motor. Adjust the reference wall stop position after replacing the motor. (For details, see p. 5-5.)
Bin unit control PCB	6	Replace the bin unit control PCB; is the problem corrected?	YES	Replace the bin unit control PCB.
Sorter controller PCB			NO	Replace the sorter controller PCB. Adjust the reference wall stop position after replacing the sorter controller PCB. (For details, see p. 5-5.)

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

6. E524

Cause	Step	Checks	Results	Action
Cable	1	Is the cable between the sorter controller PCB and the bin unit control PCB connected correctly?	NO	Connect it correctly.
Circuit breaker	2	Is the circuit breaker (CB1) on the sorter controller PCB on?	YES	Remove the cause that activated the circuit breaker, and press the circuit breaker.
24V power supply	3	Set the meter to the 50VDC range. Is the voltage between J1-4 (+) and J1-3 (-) on the sorter controller about 24 V?	NO	Check the copier's 24V power supply.
	4	Is the voltage between J2-2 (+) and J2-1 (-) on the sorter controller PCB about 24 V?	NO	Check the copier's 24V power supply.
Multiple guide motor (M6)	5	Is there pulse output at the connectors J304-2 through -5 on the bin unit control PCB in response to the activation of the multiple guide motor? Moreover, is the voltage at J304-1 +24 V?	YES	Check the wiring to the multiple guide motor; if normal, replace the multiple guide motor.
Bin unit control PCB	6	Replace the bin unit control PCB. Is the problem corrected?	YES	Replace the bin unit control PCB.
Sorter controller PCB			NO	Replace the sorter controller PCB.

7. E525

Cause	Step	Checks	Results	Action
Cable	1	Is the cable between the sorter controller PCB and the bin unit control PCB connected correctly?	NO	Connect it correctly.
Cable	2	Is the cable of the bin inside sensor light-emitting unit (S3) and light-receiving unit (S4) connected to the bin unit controller PCB correctly? (connector J302, J308)	NO	Connect it correctly.
Bin inside sensor light-emitting unit (S3) and light-receiving unit (S4)	3	Are the bin inside paper light-emitting side (S3) and light-receiving side (S4) correctly installed?	NO	Install them correctly. If you have replaced the bin inside paper sensor light-emitting unit (S3) or light-receiving unit (S4), be sure to adjust the bin inside paper sensor sensitivity. (See p. 5-2 for details.)
Bin inside sensor light-emitting unit (S3) and light-receiving unit (S4)	4	Replace the bin inside paper sensor light-emitting unit (S3) and light-receiving unit (S4), and adjust the bin inside paper sensor sensitivity (p 5-2). Is the problem corrected?	YES	Replace the bin inside paper sensor light-emitting unit (S3) and light-receiving unit (S4), and adjust the bin inside sensor sensitivity. (See p. 5-2 for details.)
Bin unit control PCB	5	Replace the bin unit control PCB, and adjust the bin inside paper sensor sensitivity (p. 5-2). Is the problem corrected?	YES	Replace the bin unit control PCB, and adjust the bin inside paper sensor sensitivity. (See p. 5-2 for details.)
Sorter controller PCB			NO	Replace the sorter controller PCB, and adjust the bin inside paper sensor sensitivity. (See p. 5-2 for details.)

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

8. E526

Cause	Step	Checks	Results	Action
Cable	1	Is the cable between the sorter controller PCB and the bin unit control PCB connected correctly?	NO	Connect it correctly.
Cable	2	Is the cable of the bin inside sensor light-emitting unit (S6) and light-receiving unit (S7) connected to the bin unit controller PCB correctly? (connector J302, J308)	NO	Connect it correctly.
Bin inside sensor light-emitting unit (S6) and light-receiving unit (S7)	3	Are the bin inside paper light-emitting side (S6) and light-receiving side (S7) correctly installed?	NO	Install them correctly. If you have replaced the bin inside paper sensor light-emitting unit (S6) or light-receiving unit (S7), be sure to adjust the bin inside paper sensor sensitivity. (See p. 5-2 for details.)
Bin inside sensor light-emitting unit (S6) and light-receiving unit (S7)	4	Replace the bin inside paper sensor light-emitting unit (S6) and light-receiving unit (S7), and adjust the bin inside paper sensor sensitivity (p 5-2). Is the problem corrected?	YES	Replace the bin inside paper sensor light-emitting unit (S6) and light-receiving unit (S7), and adjust the bin inside sensor sensitivity. (See p. 5-2 for details.)
Bin unit control PCB	5	Replace the bin unit control PCB, and adjust the bin inside paper sensor sensitivity (p. 5-2). Is the problem corrected?	YES	Replace the bin unit control PCB, and adjust the bin inside paper sensor sensitivity. (See p. 5-2 for details.)
Sorter controller PCB			NO	Replace the sorter controller PCB, and adjust the bin inside paper sensor sensitivity. (See p. 5-2 for details.)

9. E530

Cause	Step	Checks	Results	Action
Cable	1	Is the cable between the sorter controller PCB and the bin unit control PCB connected correctly?	NO	Connect it correctly.
Circuit breaker	2	Is the circuit breaker (CB1) on the sorter controller PCB on?	YES	Remove the cause that activated the circuit breaker, and press the circuit breaker.
24V power supply	3	Set the meter to the 50VDC range. Is the voltage between J1-4 (+) and J1-3 (-) on the sorter controller PCB about 24V?	NO	Check the copier's power supply.
	4	Check the voltage between J2-2 (+) and J2-1 (-) on the sorter controller PCB. Is it about 24 V?	NO	Check the copier's 24V power supply.
Guide bar motor (M8)	5	Is there pulse output at the connectors J307-3 through -6 on the bin unit control PCB in response to the activation of the guide bar motor? Moreover, is the voltage at J307-1 and -2 +24V?	YES	Check the wiring to the guide bar motor; if normal replace the guide bar motor.
Bin unit control PCB	6	Replace the bin unit control PCB. Is the problem corrected?	YES	Replace the bin unit control PCB.
Sorter controller PCB			NO	Replace the sorter controller PCB.

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

10. E531

Cause	Step	Checks	Results	Action
Circuit breaker	1	Is the circuit breaker (CB1) on the sorter controller PCB on?	YES	Remove the cause that activated the circuit breaker, and press the circuit breaker.
24V power supply	2	Set the meter to the 50VDC range. Is the voltage between J1-4 (+) and J1-3 (-) on the sorter controller PCB about 24 V?	NO	Check the copier's 24V power supply.
	3	Is the voltage between J2-2 (+) and J2-1 (-) on the sorter controller PCB about 24 V?	NO	Check the copier's 24V power supply.
Stapler unit swing motor (M4)	4	Is there pulse output at the connectors J16-5 through -8 on the sorter controller PCB in response to the activation of the stapler unit swing motor? Moreover, is the voltage at J16-3 and -4 +24 V?	YES	Check the wiring to the stapler unit swing motor; if normal, replace the stapler unit swing motor.
Stapler unit swing motor clock sensor (PI8)	5	Set the meter to the 10VDC range. Does the voltage between J6-14 (+) and J6-13 (-) the sorter controller PCB alternate between 0 and 5 V when the stapler unit swing motor is turned by hand?	NO	Replace the stapler unit swing motor clock sensor (PI8).
Stapler unit swing motor home position sensor (PI9)	6	Set the meter to the 10VDC range. Is the voltage between J6-11 (+) and J6-10 (-) on the sorter controller PCB about 5 V when the stapler unit swing motor home position sensor (PI9) is blocked and about 0 V when not blocked?	NO	Replace the stapler unit swing motor home position sensor (PI9).
Sorter controller PCB			YES	Replace the sorter controller PCB.

11. E532

Cause	Step	Checks	Results	Action
Circuit breaker	1	Is the circuit breaker (CB1) on the sorter controller on?	YES	Remove the cause of the circuit breaker, and press the circuit breaker.
24V power supply	2	Set the meter to the 50VDC range. Is the voltage between J1-4 (+) and J1-3 (-) on the sorter controller PCB about 24 V?	NO	Check the copier's power supply.
	3	Is the voltage between J2-2 (+) and J1-3 (-) on the sorter controller PCB about 24 V?	NO	Check the copier's 24V power supply.
Stapler unit swing motor (M3)	4	Is there pulse output at the connectors J7-9 through -12 on the sorter controller PCB in response to the activation of the stapler unit swing motor? Moreover, is the voltage at J7-13, -4 +24 V?	YES	Check the wiring to the stapler unit swing motor; if normal, replace the stapler unit swing motor.
Sorter controller PCB			NO	Replace the sorter controller PCB.

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

12. E533

Cause	Step	Checks	Results	Action
Cable	1	Is the cable of the stapler inside paper sensor (S5) connected correctly to the sorter controller PCB? (connectors J14-6, -7, -8)	NO	Connect it correctly.
Stapler inside paper sensor (S5)	2	Is the stapler inside paper sensor installed properly?	NO	Install it properly. If you have re-installed the stapler inside paper sensor (S5), adjust the stapler inside paper sensor sensitivity. (For details, see p. 5-3.)
Stapler inside paper sensor (S5)	3	Replace the stapler inside paper sensor (S5), and adjust the stapler inside paper sensor sensitivity (p. 5-3). Is the problem corrected?	YES	Replace the stapler inside paper sensor (S5), and adjust the stapler inside paper sensor sensitivity. (See p. 5-3 for details.)
Sorter controller PCB			NO	Replace the sorter controller PCB, and adjust the stapler inside paper sensor sensitivity. (See p. 5-3 for details.)

13. E540

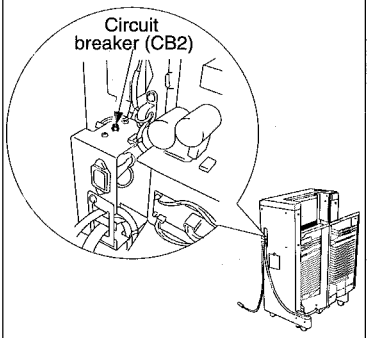
Cause	Step	Checks	Results	Action
Cable	1	Is the cable between the bin drive motor driver PCB and the sorter controller PCB connected correctly?	NO	Connect it correctly.
Circuit breaker	2	Is the circuit breaker (CB1) on the sorter controller on?	YES	Remove the cause that activated the circuit breaker, and press the circuit breaker.
24V power supply	3	Set the tester to the 50VDC range. Is the voltage between J1-4 (+) and J1-3 (-) on the sorter controller PCB about 24 V?	NO	Check the copier's 24V power supply.
	4	Is the voltage between J2-2 (+) and J2-1 (-) on the sorter controller PCB about 24 V?	NO	Check the copier's 24V power supply.
Bin drive motor (M9)	5	Is there pulse output at the connectors J602-2 through -6 on the bin drive motor driver PCB in response to the activation of the bin drive motor (M9)? Moreover, is the voltage at J602-1 and -2 +24 V?	NO	Check the wiring to the bin drive motor; if normal, replace the bin drive motor.
Bin drive motor driver PCB	6	Replace the bin drive motor driver PCB. Is the problem corrected?	YES	Replace the bin drive motor driver PCB.
Sorter controller PCB			NO	Replace the sorter controller PCB.

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

14. E550

Cause	Step	Checks	Results	Action
Door switch (MSW1)	1	Is the door switch (MSW1) on while the sorter's front door is securely closed?	NO	Make adjustments so that the door switch (MSW1) turns on when the sorter's front door is securely closed.
			YES	Replace the door switch (MSW1).
Circuit breaker (CB1)	2	Does the circuit breaker (CB1) on the sorter controller PCB operate?	YES	Remove the cause that activated the circuit breaker (CB); then, press the circuit breaker.
			NO	Replace the sorter controller PCB.
Fuse resistor (R63)	3	Has the fuse resistor (R63) on the sorter controller PCB blown?	YES	Remove the cause that blew the fuse resistor (R63); then, replace the sorter controller PCB.
Sorter controller PCB			NO	Replace the sorter controller PCB.

15. AC power is absent.

Cause	Step	Checks	Results	Action
Power plug	1	Is the power plug connected to the power outlet?	NO	Connect the power plug.
Power source	2	Is the rated voltage present at the power outlet?	NO	The problem is not the copier'; advise the user.
Circuit breaker	3	Has the circuit breaker (CB2) on the machine operated? 	YES	Remove the cause that activated the circuit breaker, and press the circuit breaker.
Power cord, Noise filter	4	Is the rated voltage present between terminals 1 and 2 of the noise filter?	NO	Check, and replace if necessary, the power cord.
			YES	Check, or replace if necessary, the noise filter.

16. DC power is absent.

Cause	Step	Checks	Results	Action
AC power supply	1	Is AC power present between J01-1 and J01-3 on the DC power supply PCB.	NO	See "AC power is absent."
Sorter cable (disconnected)	2	Is the sorter cable connected to the copier properly?	NO	Connect the sorter cable to the copier properly.
Wiring, DC load	3	Turn off the power switch, and disconnect J02 and J03 from the DC power supply PCB. Set the meter to the 30 VDC range, and measure the voltage between the terminals shown in Table 5-201 Is the voltage as indicated?	NO	Turn off the power switch, and connect one of the connectors that have been disconnected; then, turn on the power switch. Repeat the operation for all connectors to identify the connector that activates the protection circuit; then, check the wiring from that connector and the DC load.
Fuse, Wiring	4	Is the fuse (F1) on the DC power supply PCB blown?	YES	Replace the fuse. Check the DC load and the wiring.
DC power supply PCB			NO	Replace the DC power supply PCB.
Low-speed feeder motor driver PCB	5	Check if the copier's power supply and the connection of the sorter cable; then, measure the voltage between the following terminals. Is the voltage as indicated? • low-speed feeder motor driver PCB J607-1: +24 V J607-2: +24 V	NO	Replace the low-speed feeder motor driver PCB.

Connector	Pin	Output	Remarks
J02	1	GND	
	2	GND	
	3	+24V	
	4	+24V	
J03	1	GND	
	2	+5V	
	3	GND	
	4	GND	
	5	+24V	
	6	+24V	

Table 5-201

III. ARRANGEMENT OF ELECTRICAL PARTS

A. Sensors

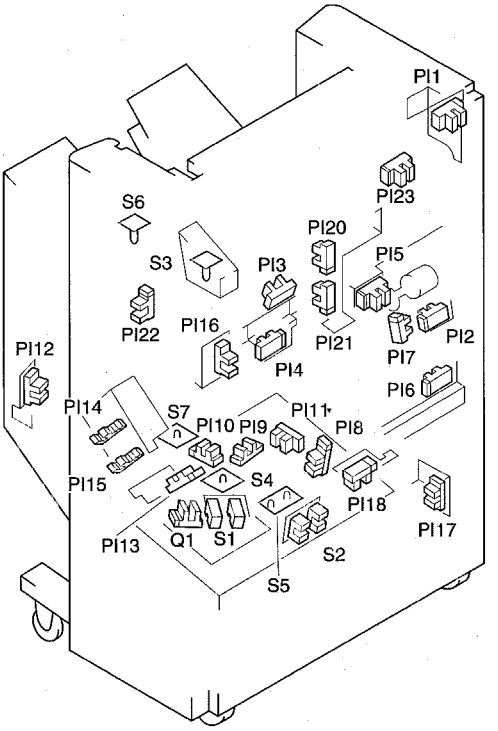


Figure 5-301

  CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

Sensors

Symbol	Name	Notation	Description
	Photointerrupter	PI 1	joint detection
		PI 2*	feeding guide UP detection
		PI 3	non-sort paper detection
		PI 4	sort paper detection
		PI 5	feeder motor clock detection
		PI 6*	feeding guide home position detection
		PI 7	bin outside paper detection
		PI 8*	stapler unit wing motor clock detection
		PI 9*	stapler unit swing motor home position detection
		PI 10*	stapler unit swing position detection
		PI 11	paper holding detection
		PI 12*	multiple guide home position detection
		PI 13*	reference wall home position detection
		PI 14*	push bar home position detection
		PI 15*	push bar center position detection
		PI 16*	guide bar home position detection
		PI 17	bin drive motor lock detection
		PI 18	bin unit home position detection
		PI 20	lead cam position detection
		PI 21	lead cam center position detection
		PI 22	front door open/close detection
		PI 23	low-speed feeding motor clock detection
		Q1*	stapling home position detection
		S 1*	stapler unit orientation detection
		S 2*	stapler unit shift position detection
		S 3	bin unit inside paper detection (light-emitting unit)
		S 4	bin unit inside paper detection (light-receiving unit)
		S 5	stapler unit paper detection
		S6*	bin unit inside paper detection (light-emitting unit)
		S7*	bin unit inside paper detection (light-receiving unit)

*Stapler sorter only.

Table 5-301

B. Motors, Switches, and Solenoids

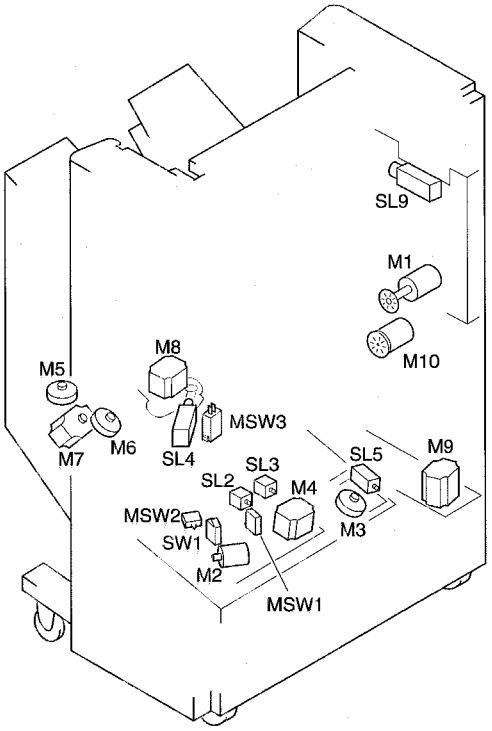
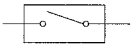
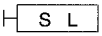


Figure 5-302

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

Symbol	Name	Notation	Description
	Motor	M1	feeder motor
		M2*	stapler motor
		M3*	stapler unit drive motor
		M4*	stapler unit swing motor
		M5*	multiple guide motor
		M6*	reference wall motor
		M7*	push bar motor
		M8*	guide bar motor
		M9	bin drive motor
	Microswitch	M10	low-speed feeding motor
		MSW1*	stapler safety detection
		MSW2*	swing stop position detection
		MSW3	front door open/closed detection
	Solenoid	SW1*	staple OUT detection
		SL1	paper path switching solenoid
		SL2*	stapler positioning claw releasing solenoid
		SL3	paper holding solenoid
		SL4*	gear switching solenoid
		SL5*	stapler unit releasing solenoid

*Stapler sorter only.

Table 5-302

C. PCBs

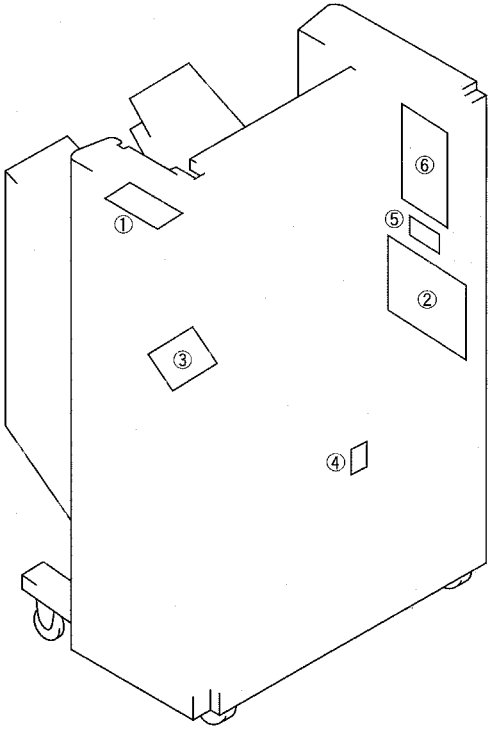


Figure 5-303

Ref.	Name
1	control panel PCB
2	sorter controller PCB
3	bin unit control PCB
4	bin drive motor driver
5	low-speed feeding motor driver PCB
6	DC power supply PCB

Table 5-303

D Buffer Pass Unit

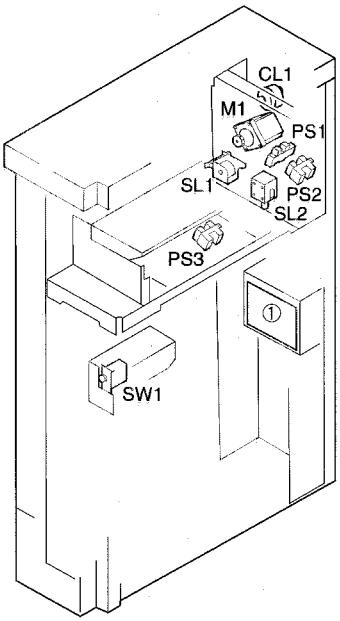


Figure 5-304

Symbol	Name	Notation	Description
CL	Clutch	CL1	gear switching clutch
M	Motor	M1	buffer pass motor
	Photointerrupter	PS1	pressure cam position sensor 1
		PS2	pressure cam position sensor 2
		PS3	inlet paper sensor
S L	Solenoid	SL1	pressure cam switching solenoid 1
		SL2	pressure cam switching solenoid 2
	Microswitch	SW1	front door open/closed detection
①	Buffer pass unit driver PCB		buffer pass unit drive

Table 5-304

IV. VARIABLE RESISTORS (VR), LIGHT-EMITTING DIODES, AND CHECK PINS BY PCB

Of those LEDs and check pins used in the machine, those that are need in the field are discussed.

Caution:

Those check pins that are not covered herein are for factory use only and must not be used in the field; they require special tools and instruments and must be adjusted to high accuracy.

A. Sorter Controller PCB

Caution:

Some LEDS emit faint light even when off; this is a normal condition and should be kept in mind.

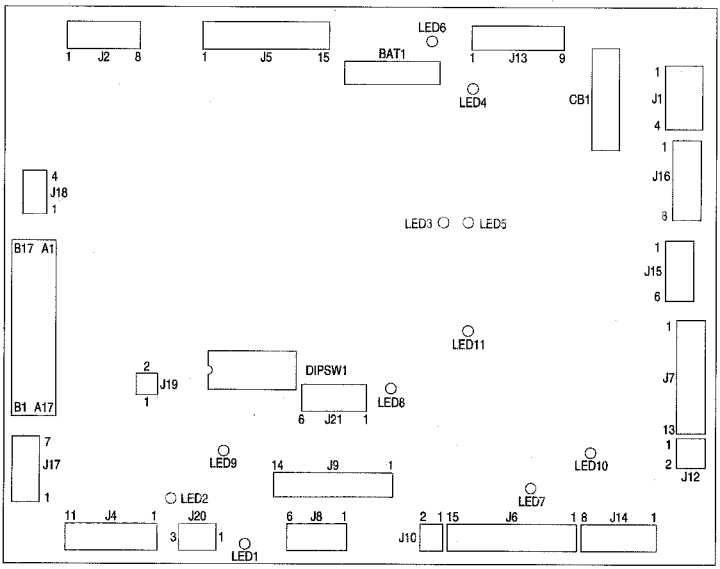


Figure 5-401

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

B. Bin Unit Control PCB

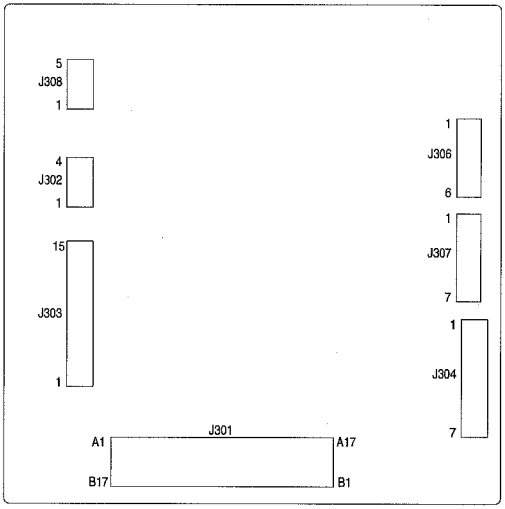


Figure 5-402

C. Bin Drive Motor Driver PCB

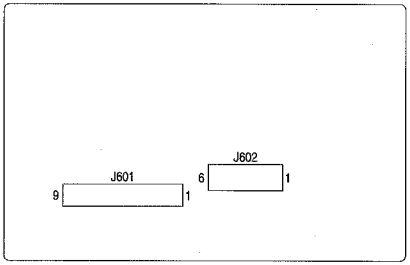


Figure 5-403

D. Low-Speed Feeding Motor Driver PCB

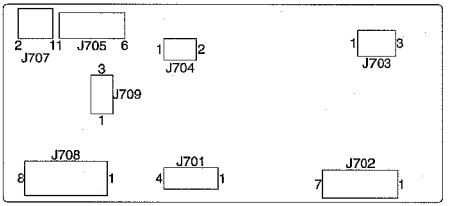


Figure 5-404

E. Buffer Pass Unit Driver PCB

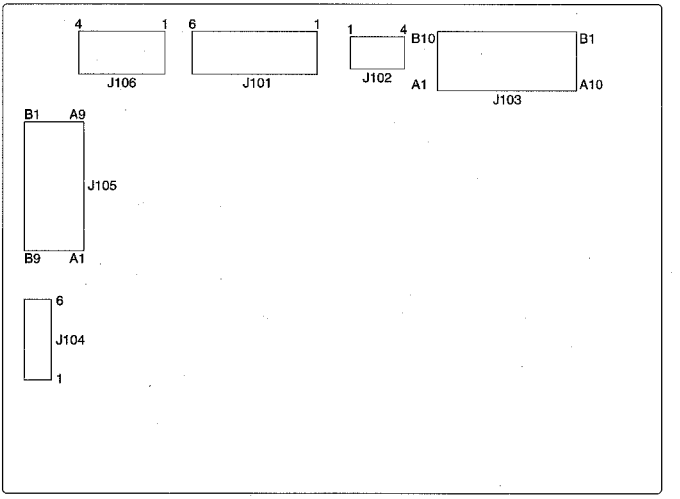
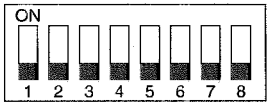
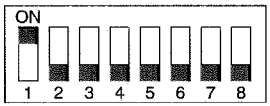


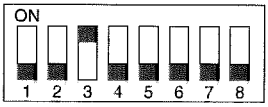
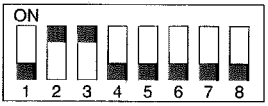
Figure 5-405

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

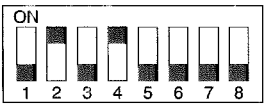
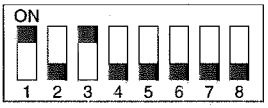
F. DIP Switch Functions

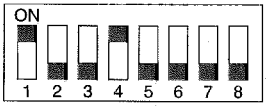
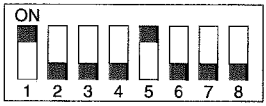
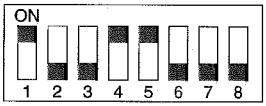
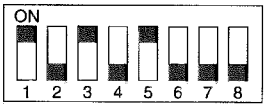
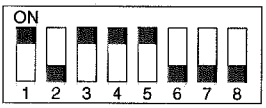
See the table for the functions of the DIP switch (DIPSW1) on the sorter controller PCB; you may keep the copier's power on when changing the switch configuration.

Item	Configuration	Description
Normal copying		• With all bits at OFF, the machine will be in normal copying state.
Feeding motor (M1)/low-speed feeding motor (M10) operation mode		Stapler Sorter-F1 1. Feeding Motor (M1) • A press on the Stapling Start/Stop key ([▭]) causes the feeding motor (M1) to rotate clockwise (in feeding direction). To stop, press the Stapling Start/Stop key ([▭]) once again. • A press on the Bin Down key (⊕) causes the feeding motor (M1) to rotate counterclockwise and to stop after moving up the feeding guide. A press again on the Bin Down key (⊕) causes the feeding motor to rotate counterclockwise and to stop after returning the feeding guide to the home position. 2. Low-Speed Feeding Motor (M10) • A press on the Bin Up key (⊕) causes the low-speed feeding motor (M10) to rotate. To stop it, press the Bin Up key (⊕) once again. Sorter-D1 1. Low-Speed Feeding Motor (M10) • A press on the Bin Up key (⊕) causes the low-speed feeding motor (M10) to rotate. A press again on the Up key (⊕) stops the low-speed feeding motor. 2. Feeding Motor (M1) • A press on the Bin Down key (⊕) causes the feeding motor (M1) to rotate. A press again on the Bin Down key (⊕) stops the feeding motor.

Item	Configuration	Description
Sort operation mode		Stapler Sorter-F1 • A press on the Stapling Start/Stop key ([▭]) causes the feeding motor (M1) to rotate. When paper is inserted into the pick-up assembly, the paper will be delivered to the sort bin, and the bins will shift by one bin. Thereafter, the same operation takes place each time paper is inserted. To stop, press the Stapling Start/Stop key ([▭]) once again. Sorter-D1 • A press on the Bin Up key (Ⓐ) causes the feeding motor (M1) to rotate. When paper is inserted into the pick-up assembly, the paper will be delivered to the sort bin, and the bins will shift by one bin. Thereafter, the same operation takes place each time paper is inserted. To stop, press the Bin Down key (Ⓑ) once again.
Switch check mode		1) If the DIP switch is set to 'switch check mode', the Corner Stapling indicator (manual stapling) will turn on. • While the Stapling Position is being held down, the Corner Stapling indicator (manual stapling) remains off and the Double Stapling indicator (manual stapling) remains on. • While the Stapling Start/Stop key is being held down, the Corner Stapling indicator (manual stapling) remains off and the Single Stapling indicator (manual stapling) remains on. • While the Up key (bins shift) is being held down, the Corner Stapling indicator (manual stapling) remains off and the Corner Stapling indicator (manual insert stapling) remains on. • While the Down key (bins shift) is being held down, the Corner Stapling (manual stapling) remains off and the Double Stapling indictor (manual insert stapling) remains on.

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

Item	Configuration	Description
Back-up RAM clear		Stapler Sorter-F1 • A press on the Stapling Start/Stop key ([▭]) initializes the back-up RAM. • After initialization, the Sapling Start/Stop key ([▭]) remains on for 3 sec. Caution: You must perform the following whenever you have initialized the back-up RAM. 1. bin inside paper sensor sensitivity adjustment (p. 5-2) 2. stapler inside paper sensor sensitivity adjustment (p. 5-3) 3. guide bar motor swing range adjustment (p. 5-4) 4. reference wall stop position adjustment (p. 5-6) Sorter-D1 • A press on the Up key (⬆) (bin shift) initializes the back-up RAM. After initialization, LED2 on he sorter controller PCB turns on. Caution: You must perform the following whenever you have initialized the back-up RAM. 1. bin inside paper sensor sensitivity adjustment (p. 5-2)
Sensor adjustment mode (bin paper sensor)		Stapler Sorter-F1 • A press on the Stapling Start/Stop key ([▭]) executes bin paper sensor (S3, S4) adjustment mode; see p. 5-2. adjustment successful: Stapling Start/Stop key ([▭]) on adjustment error: Stapling Start/Stop key ([▭]) flashes If adjustment ends in error,You can find out which sensor is faulty by referring to the error code: E525: faulty S3, S4 E526: faulty S6, S7 Sorter-D1 • A press on the Up key (⬆) (bin shift) executes bin paper sensor (S3, S4) adjustment mode; see p. 5-2. If adjustment ends in error, the copier's control panel will indicate error code 'E525'.

Item	Configuration	Description
Sensor adjustment mode (stapler inside paper sensor)		• A press on the Stapling Start/Stop key ([▭]) executes stapler paper sensor (S5); see p.5-3. adjustment successful: Stapling Start/Stop key ([▭]) on adjustment error: Stapling Start/Stop key ([▭]) flashes
Guide bar swing range adjustment mode (using A4)		For details, see p. 5-4.
Guide bar range adjustment mode (using LTR)		For details, see p. 5-4.
Reference wall stop position adjustment mode/Guide bar swing range, reference walls top position check mode (using A4)		For details, see p. 5-6/8.
Reference wall stop position adjustment mode/Guide bar swing range, reference walls top position check mode (using LTR)		For details, see p. 5-6/8.

  CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

G. Functions of the LEDs

The LEDs on the sorter controller PCB remain on, flash, or remain off to indicate a specific sate of the machine.

LED	On	Flashing	Off	Remarks
LED1				For factory use.
LED2	There is an error in the operation of the sorter controller PCB.	There is an error in the operation of the sorter controller PCB.	The operation has stopped.	
LED3	The stapler unit is not at a stapling position (home position, front, rear).		The stapler unit is at a stapling position (home position, front, rear).	Stapler sorter only.
LED4	The stapler unit move prohibit signal has been generated, i.e., the staple is not allowed to move.		The stapler unit is allowed to move.	Stapler sorter only.
LED5	The bin drive motor drive prohibit signal has been generated, i.e., the bin drive motor is not allowed to move.		The bin drive motor is allowed to move.	
LED6	The paper holding arm is not positioned correctly.		The paper holding arm is positioned correctly.	
LED7	The connector of the feeding guide UP sensor, feeding guide home position sensor, or push bar home position sensor is disconnected.		The connector of the feeding guide UP sensor, feeding guide home position sensor, or push bar home position sensor is connected properly.	Stapler sorter only.
LED8	The feeding motor is rotating normally.	The feeder motor rotation speed switching signal has been generated.	The feeder motor has stopped or there is an error in the rotation.	
LED9	The connector of the sort paper sensor or the non-sort paper sensor is disconnected.		The connector of the sort paper sensor or the non-sort paper sensor is connected properly.	
LED10	The connector of the stapler unit orientation sensor or the stapler unit shift position sensor is disconnected.		The connector of the stapler unit orientation sensor or the stapler unit drive position sensor is connected properly.	Stapler sorter only.
LED11	The stapler unit swing motor is not able to rotate.		The stapler unit swing motor is able to rotate.	Stapler sorter only.

V. SELF DIAGNOSIS

The CPU (Q1) on the machine's sorter controller PC is equipped with a self diagnosis mechanism that checks the state of the machine and issues an error code to the copier in response to an error.

You can check these codes in the copier's service mode to obtain a good idea of any error that may have occurred.

A. Overstacking Alarm (p. 2-26)

Code	Error	Option	Copier	Resetting
02H	Overstacking (The number of stacked sheets has exceeded the capacity of the bin.)	Stops.	• Enters PAUSE state.	Remove all copies from the bin.

B. Stapler Alarm

Code	Error	Option	Copier	Resetting
02H	Staple jam	The stapler unit stops.	• If in staple sort mode, a press on the Copy Start key will issue an alarm. No copying is permitted. • If in other mode, operates normally.	Remove the staple jam, and close the front door.
03H	The stapler safety mechanism has turned on, i.e., an object 6 mm or more in thickness has been inserted into the stapler.	Disables stapling operation.	• If in staple sort mode, a press on the Copy Start key will issue an alarm. No copying is permitted. • If in other mode, operates normally.	Open and close the front door.
05H	More sheets than can be stapled (50) have been placed in a single bin in staple sort mode.	Disables stapling operation.	• If in staple sort mode, a press on the Copy Start key will issue an alarm. No copying is permitted. • If in other mode, operates normally.	Remove all copies from the bin.

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

Code	Error	Option	Copier	Resetting
07H	Mixed paper sizes (horizontal direction)	• The guide bar will not swing. • Stapling will not occur.	• If in staple sort mode, a press on the Copy Start key will issue an alarm. No copying is permitted. • If in other mode, operates normally.	Remove all copies from the bin.
0AH	No staple	• Stapling will not occur.	• If in staple sort mode, a press on the Copy Start key will issue an alarm. No copying is permitted. • If in other mode, operates normally.	Set a new staple cartridge.

C. Jam

Code	Error	Option	Copier
03H	Feeding delay jam (p. 2-28)	Stops operation.	Stops operation.
04H	Feeding stationary jam (p. 2-28)	Stops operation.	Stops operation.
07H	Power-on jam (p. 2-30)	Will not operation.	Will not operate.
08H	Door open jam (while feeding; i.e., the joint sensor (PI1) or the door switch (MSW3) was turned off during operation.	Stops operation.	Stops operation.
09H	Door open jam (while not feeding; the joint sensor (PI1) or the door switch (MSW3) was turned off during operation.	Stops operation.	Stops operation.

■ Resetting
After removing the jam, turn on the door switch (MSW3).

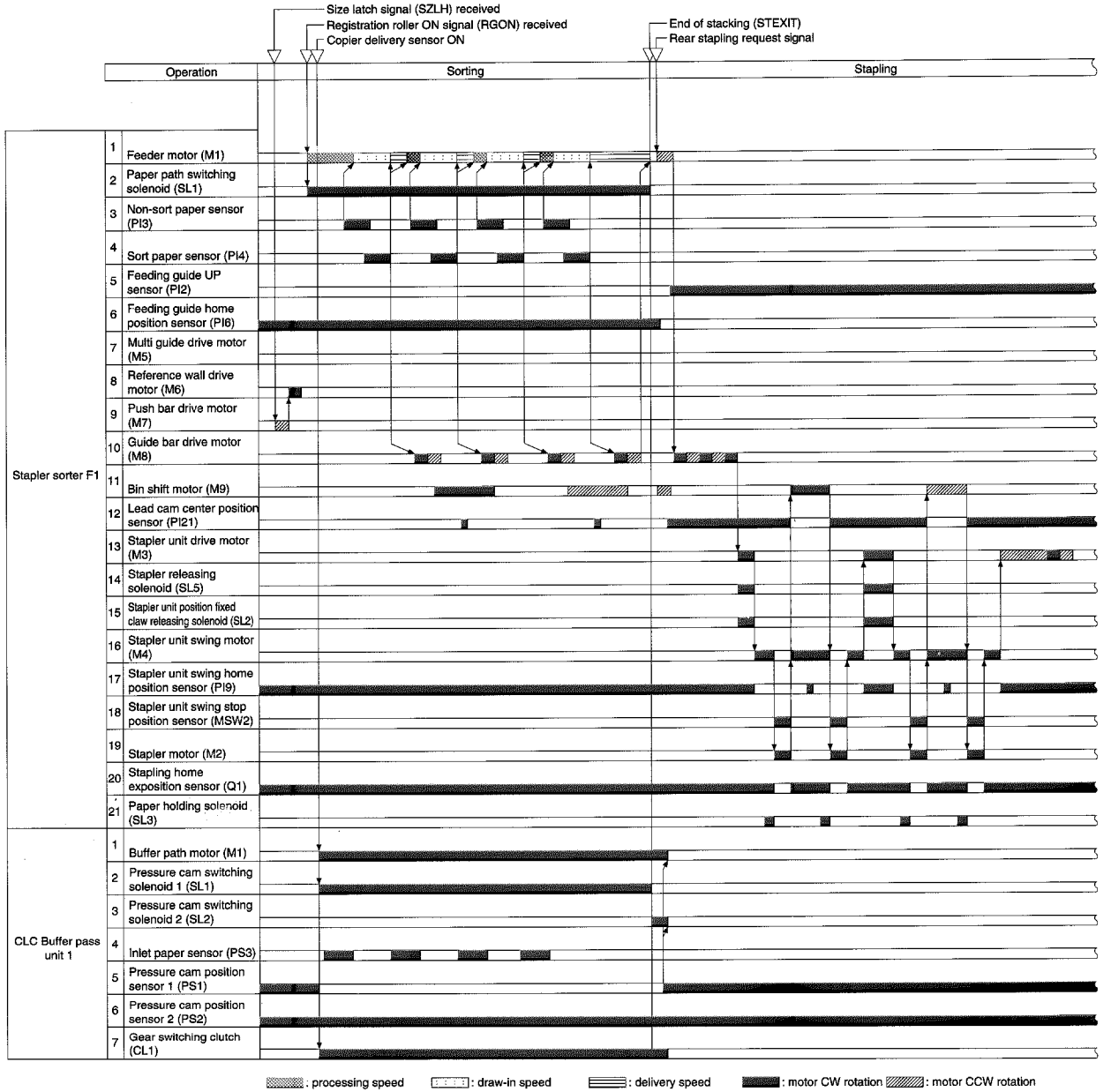
D. Errors

Code	Error	Description
E510 (10H)	• The feeding motor (M1) fails to rotate.	• The clock signal from the clock sensor (PI5) of the feeder motor is absent for 250 ms or more.
E516 (16H)	• The low-speed feeding motor (M10) fails to rotate.	• The clock sensor (PI23) of the low-speed feeding motor does not generate clock signals for 250 ms or more.
E517 (17H)	The pressure cam of the buffer pass unit does not detect home position.	• The home position is not detected within a specific period of time* after a press on the Copy Start key. *Varies depending on the copier.
E522 (22H)	• The push bar motor (M7) fails to rotate.	• The operation does not end within 2000 ms after the motor drive signal has been generated.
E523 (23H)	• The reference wall motor (M6) fails to rotate.	• The operation does not end within 2000 ms after the motor drive signal has been generated.
E524 (24H)	• The multiple guide motor (M5) fails to rotate.	• The operation does not end within 2000 ms after the motor drive signal has been generated.
E525 (25H)	• The automatic adjustment mechanism for the bin inside paper sensor 1 (S3, S4) has failed.	• The bin inside paper sensor 1 (S3, S4) cannot be adjusted automatically or an error exists in the automatic adjustment value.
E526 (26H)	• The automatic adjustment mechanism for the bin inside paper sensor 2 (S6, S7) has failed.	• The bin inside paper sensor 2 (S6, S7) cannot be adjusted automatically or an error exists in the automatic adjustment value.
E530 (30H)	• The guide bar motor (M8) fails to rotate.	• The operation does not end within a specific period of time after the motor drive signal has been generated. time: 5000 ms for front retrieval mode 2000 ms In other mode

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

Code	Error	Description
E531 (31H)	• The stapler unit swing motor (M4) fails to rotate.	• The operation does not end within 2000 ms after the motor drive signal has been generated. • The clock signal from the clock sensor (PI8) of the motor is absent for 250 ms or more. • The input signal from the swing home position sensor (PI9) does not change for 1000 ms or more.
E532 (32H)	• The stapler unit drive motor (M3) fails to rotate.	• The operation does not end within 5000 ms after the motor drive signal has been generated.
E533 (33H)	• The automatic adjustment mechanism for the stapler inside paper sensor has failed.	• The stapler inside paper sensor cannot be adjusted automatically or an error exists in the automatic adjustment value.
E540 (40H)	• The bin drive motor (M9) fails to rotate.	• The operation does not end within a specific period of time after the motor drive signal has been generated. time: 20000 ms for initialization 2000 ms for others • The clock signal from the clock plate sensor of the motor is absent for 250 ms or more. • The input signal from the lead cam position sensor (PI20) does not change for 2000 ms.
E550 (50H)	• The DC output from the sorter controller PCB is faulty.	• An error has occurred in the DC output (24VL, 24VP) of the sorter controller PCB.

A. GENERAL TIMING CHART



CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

B. SIGNALS AND ABBREVIATIONS

BHP	BIN HOME POSITION signal
BMCLK	BIN SHIFT MOTOR CLOCK signal
BPD	PAPER DETECTION (BIN UNIT)
BPMA	BUFFER PASS MOTOR PULSE signal A
BPMB	BUFFER PASS MOTOR PULSE signal B
BPMCLK	BUFFER PASS MOTOR ROTATION SPEED
BPMON	BUFFER PASS MOTOR DRIVE command
BUL	BIN UPPER LIMIT signal
CCSLD1	LOCKING CAM SWITCHING SOLENOID 1 DRIVE command
CCSLD2	LOCKING CAM SWITCHING SOLENOID 2 DRIVE command
CLD1	GEAR SWITCHING CLUTCH DRIVE command
DORCL	FRONT DOOR CLOSED signal
DROPN	DOOR OPEN signal
EPD	INLET PAPER SENSOR signa
FDMCCW	FEEDER MOTOR CONTROL command
FDMCW	FEEDER MOTOR CONTROL command
FDMVC	FEEDER MOTOR SPEED VARY command
FDPWM	FEEDER MOTOR CONTROL command
FDREF	FEEDER MOTOR SPEED REFERENCE command
*FGUP	FEEDING GUIDE UP signal
FGHP	FEEDING GUIDE HOME POSITION signal
FMCLK	FEED MOTOR CLOCK signal
*GBMA	GUIDE BAR MOTOR (A) DRIVE command
*GBMAJ	GUIDE BAR MOTOR DRIVE REFERENCE CURRENT signal
*GBMB	GUIDE BAR MOTOR (B) DRIVE command
*GCSLD	GEAR CHANGE SOLENOID DRIVE commnad
*GWHP	GUIDE WALL HOME POSITION signal
*GWMA	GUIDE WALL MOTOR (A) DRIVE command
*GWMB	GUIDE WALL MOTOR (B) DRIVE command
*GWMON	GUIDE WALL MOTOR DRIVE command
*HDRSLD	STAPLER UNIT UP HOLD CLAW RELEASE SOLENOID DRIVE commnad
*HKEMP	HOOK EMPTY command
*HLD1	STAPLER UNIT DIRECTION HOLD POSITION 1 signal
*HLD2	STAPLER UNIT DIRECTION HOLD POSITION 2 signal
JNTS	JOINT signal
LDCP	LEAD CAM CENTER POSITION signal
LDP	LEAD CAM HOME POSITION signal
LFDCLK	LOW SPEED FEED MOTOR CLOCK signal
LFDCCW	LOW SPEED FEEDER MOTOR CONTROL command
LFDCW	LOW SPEED FEEDER MOTOR CONTROL command
LFDPWM	LOW SPEED FEEDER MOTOR CONTROL command
LFDREF	LOW SPEED FEEDER MOTOR SPEED REFERENCE command
LFDVC	LOW SPEED FEEDER MOTOR SPEED VARY command
LON	LED DRIVE commnad
*MGHP	MULTI GUIDE HOME POSITION signal
*MGMA	MULTI GUIDE MOTOR (A) DRIVE command
*MGMB	MULTI GUIDE MOTOR (B) DRIVE command
*MGMON	MULTI GUIDE MOTOR DRIVE commnad
*MHRSLD	STAPLER UNIT MOVE HOLD CLAW RELEASE SOLENOID DRIVE command
*MVHP	STAPLER UNIT MOVE HOME POSITION signal
NSPEXT	PAPER DETECTION (NON-SORT PATH EXIT) signal
OSBPD	BIN OUTSIDE PAPER DETECTION signal
*PBCP	PUSH BAR CENTER POSITION signal
*PBHP	PUSH BAR HOME POSITION signal
*PBMA	PUSH BAR MOTOR (A) DRIVE command
*PBMAJ	PUSH BAR MOTOR DRIVE REFERENCE CURRENT signal
*PBMB	PUSH BAR MOTOR (B) DRIVE command
PCP1	LOCKING CAM POSITION SENSOR signal 1
PCP2	LOCKING CAM POSITION SENSOR signal 2
PHS	PAPER HOLD signal
PHSLD	PAPER HOLD SOLENOID DRIVE command
PLLON	SPEED CONTROL START command
PSLD	PAPER PATH SOLENOID DRIVE command
*SEBL	STAPLING ENABLE signal
SFTA	BIN SHIFT MOTOR (A) DRIVE command
SFTAJ	BIN SHIFT MOVE MOTOR DRIVE REFERENCE CURRENT signal
SFTB	BIN SHIFT MOTOR (B) DRIVE command
SFTLIM	BIN SHIFT MOVE DISABLE signal
*SGBHP	GUIDE BAR HOME POSITION signal
*SGSTPP	STAPLER UNIT SWING STOP POSITION command
*SLDLIM	STAPLER UNIT MOVE DISABLE signal
*SLDMA	STAPLER UNIT MOVE MOTOR (A) DRIVE command
*SLDMAJ	STAPLER UNIT MOVE MOTOR DRIVE REFERENCE CURRENT signal
*SLDMB	STAPLER UNIT MOVE MOTOR (B) DRIVE command
*SPD	STAPLING POSITION PAPER DETECTION signal
SPEXT	PAPER DETECTION (SORT PATH EXIT) signal
*SPL-HP	STAPLE HOME POSITION signal
*SPMCCW	STAPLER MOTOR DIRECTION command
*SPMCW	STAPLER MOTOR DIRECTION command
*SWGMA	STAPLER UNIT SWING MOTOR (A) DRIVE command
*SWGMAJ	STAPLER UNIT SWING MOTOR DRIVE REFERENCE CURRENT signal
*SWGMB	STAPLER UNIT SWING MOTOR (B) DRIVE command
*SWGP	STAPLER UNIT SWING POSITION signal
*SWHP	STAPLER UNIT SWING HOME POSITION signal
*SWMCLK	STAPLER UNIT SWING MOTOR CLOCK signa

*Not used in this model.

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

C. DATA AND SIGNALS (COMMUNICATION WITH THE COPIER)

Signals from the Copier to the Sorter

Signal	Description	Setting	Resetting
Delivery signal (CEJCT)	• Communicates the copier's delivery timing.	• When the copier's delivery sensor is turned on.	• When the copier's delivery sensor is turned off.
Registration roller ON signal (RGON)	• Communicates the copier's registration ON timing.	• When the copier's registration roller turns on.	• When the copier's registration roller turns off.
Sorter start signal (SST)	• Instructs the sorter to execute an operation. • Remains on during copying operation.	• When the Copy Start key is pressed.	• When all commands to the sorter have been finished.
Rear staple request signal (AFSTRQ)	• Serves to start stapling for the paper delivered to the bin.	• When stacking operation is finished.	• When stapling operation is finished.
Size latching signal (SZLH)	• Communicates the latching timing for information on paper.	• When the copier's pick-up roller is turned on.	• When the sorter responded to the copier for size latching.

Data from the Copier to the Sorter

Signal	Description	Setting
Size code data	• Indicates the size of paper.	• "SZLH" = 
Size data	• Indicates the length and width of paper in mm.	
Delivery speed data	• Indicates the delivery speed of the copier's delivery roller.	
Operation mode data	• Indicates stacking mode (non-sort, sort group)	• "SST" = 

Signals from the Sorter to the Copier

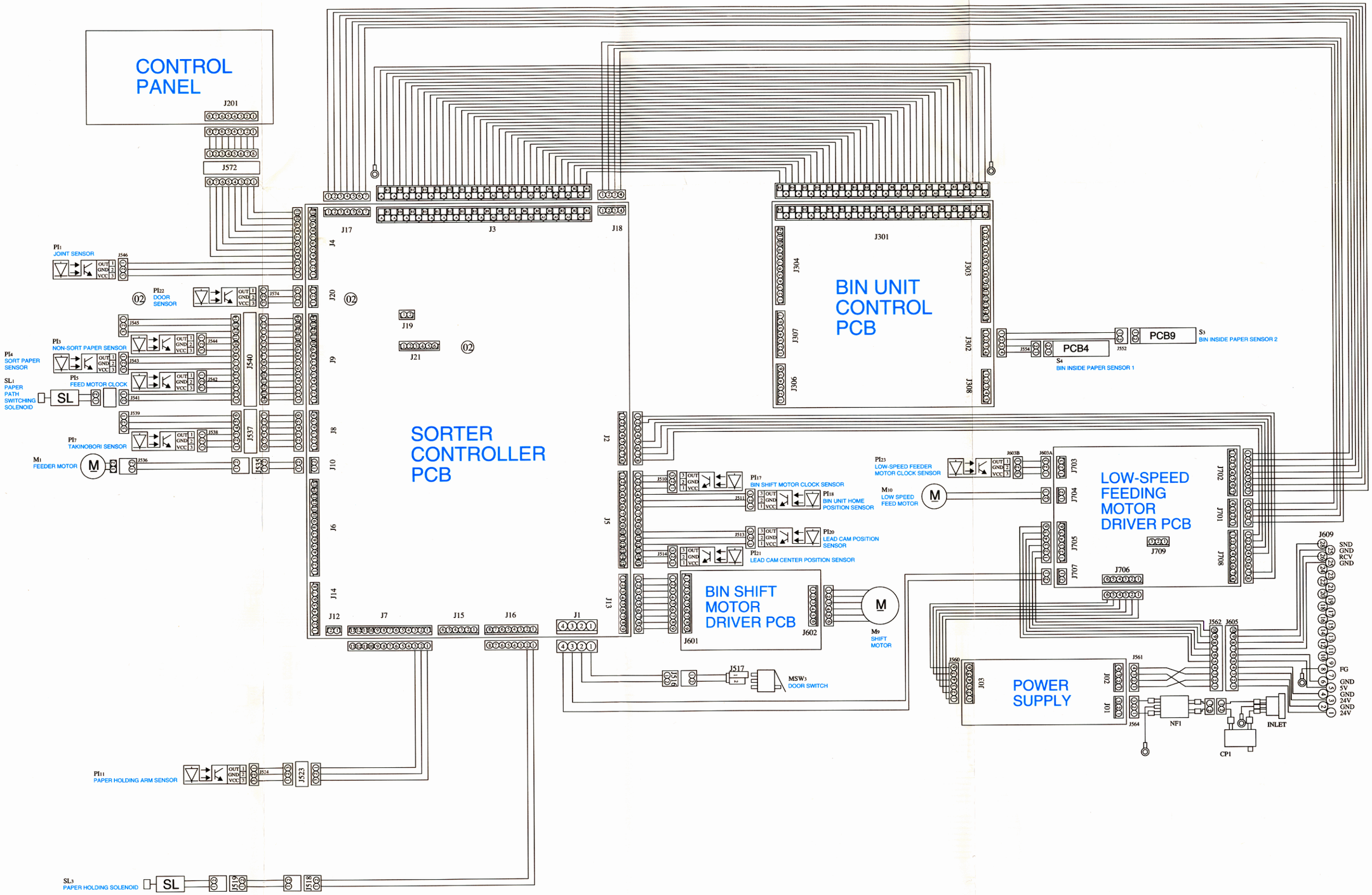
Signal	Description	Setting	Ressetting
Stacking and signal (STEXT)	• Communicates that paper has been delivered to the bin.	• When the last sorter paper sensor is off.	• After informing the copier of the end of delivery.
Alarm (ALRM)	• Communicates that a tray alarm/staple alarm has occurred in the sorter.	• A tray alarm/staple alarm has occurred in the sorter.	• When the alarm has been cleared.
Bin inside paper signal (PPRSTY)	• Communicates that paper exists in the bin.	• Paper exists i the bin.	• When paper is removed.
Door open signal (OPEN)	• Communicates that the sorter front door is open.	• When the sorter front door is open.	• When the sorter front door is closed.
Stapling signal (STPL-ON)	• Communicates that stapling is taking place.	• When stapling starts.	• When stapling ends.
Down signal (DOWN)	• Communicates that the sorter is not ready for operation.	• When the sorter becomes unable to operate.	• When the power switch is turned off.
Jam signal (SJAM)	• Communicates that a jam has occurred in the sorter.	• When a jam has occurred in the sorter.	• When the jam is removed and the front door switch (MSW4) is turned on.
Joint open signal (SOP)	• Communicates that the joint assembly between the copier and the sorter is open.	• When the joint is open.	• When the joint sensor (PI1) is turned off.
Stapler door open signal (DROPN)	• Communicates that the front door is open.	• The front door is open.	• When the front door switch (MSW4) is turned off.
Bin Close Acknowledge signal (ESCACK)	• Communicates to the copier that it acknowledges a request for closing the bin.	• After the sorter has moved up the bins by a single bin.	• When the signal from the copier requesting closing of the bin turns off.
Bin Close End Acknowledge signal (RETACK)	• Communicates to the copier that it acknowledges a request for an end to closing of the bin.	• After the sorter has moved down the bins by a single bin.	• When the signal from the copier requesting an end to closing of the bin turns off.
Bin State signal (ESCSTS)	• Communicates to the copier that the bin is closed.	• After the sorter has moved up the bins by a single bin.	• When the sorter has moved down the bins by a single bin.
Paper Stack End signal (STEXT)	• Communicates that paper has been delivered to the bin.	• When the sorter's last sensor turns off.	• After informing the copier of the end of delivery operation.

CANON STAPLER SORTER-F1/SORTER-D1 REV.1 JUN. 1995 PRINTED IN JAPAN (IMPRIMÉ AU JAPON)

Data from the sorter to the Copier

Signal	Description	Setting
Down/error info data	• Indicates that location and nature of the down/error condition occurring in the sorter.	• When the down signal or the error signal is turned on.
Jam info data	• Indicates the nature of the jam occurring in the sorter.	• When the jam signal is turned on.
Tray alarm info data	• Indicates the nature of the current tray alarm.	• When the tray alarm signal is turned on.
Stacker alarm info data	• Indicates the nature of the current stapler alarm.	• When the stapler alarm signal is turned on.

GENERAL CIRCUIT DIAGRAM (2/2)



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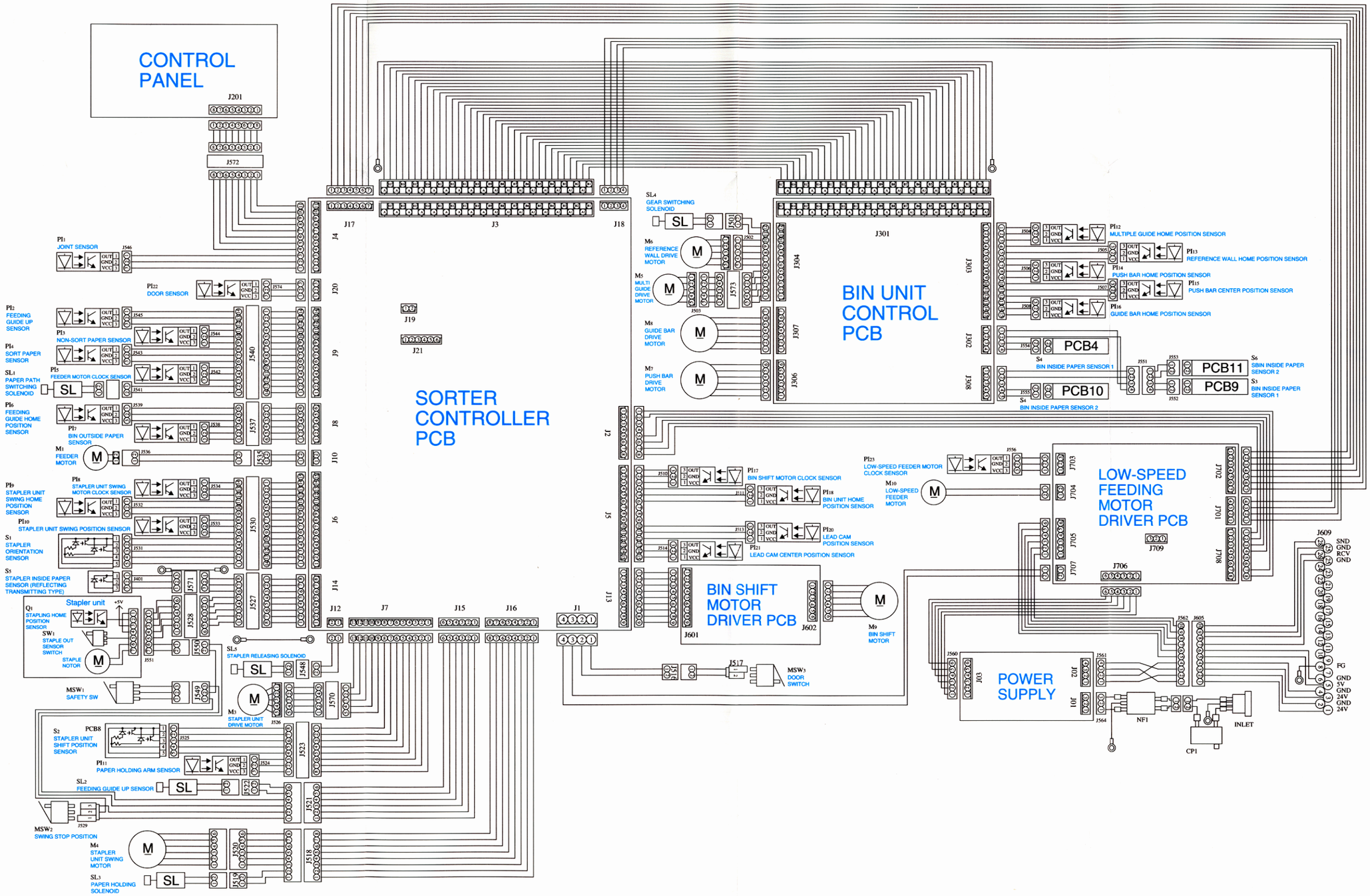
GENERAL CIRCUIT DIAGRAM (1/2)



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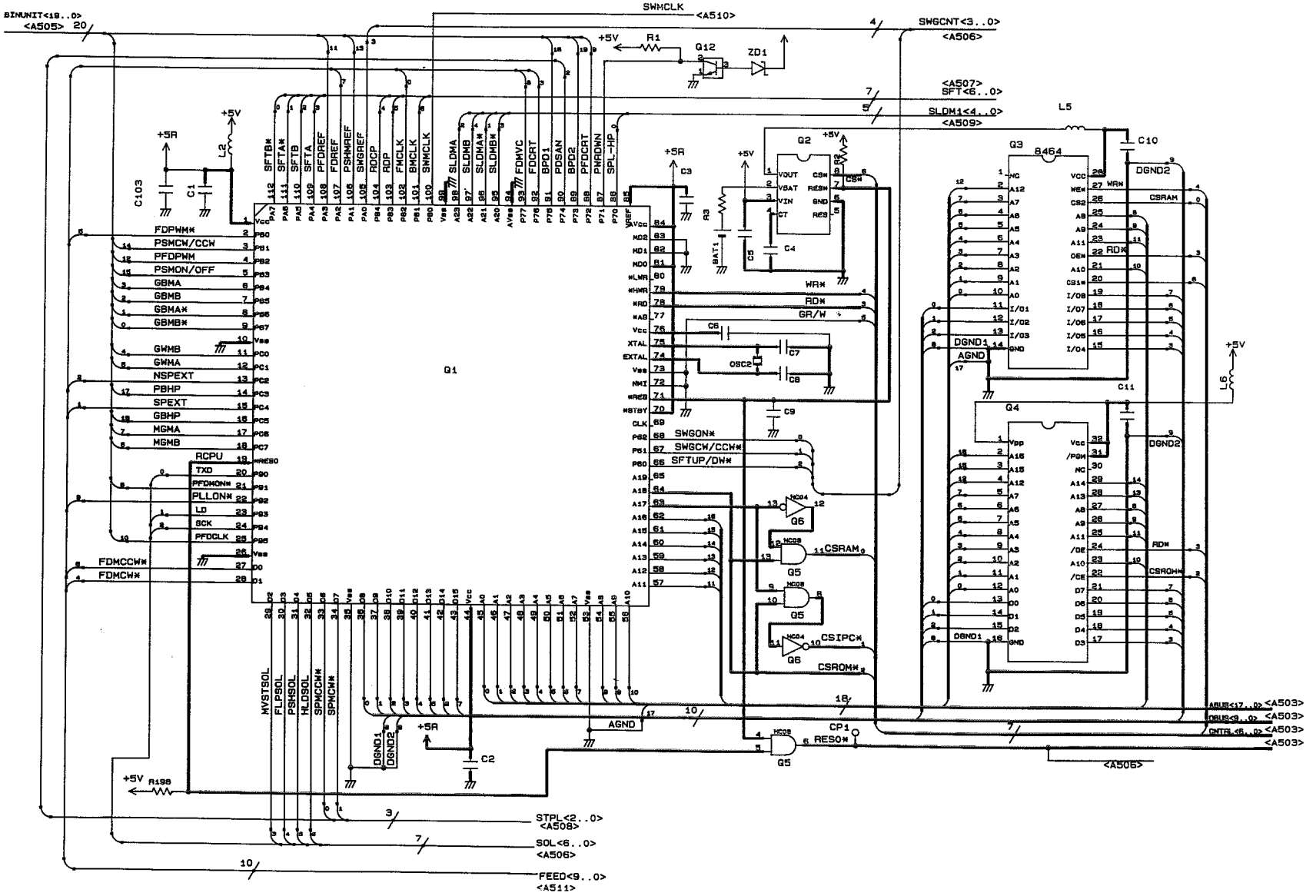
E. SORTER CONTROLLER CIRCUIT DIAGRAM

Sorter Controller Circuit Diagram (1/10)



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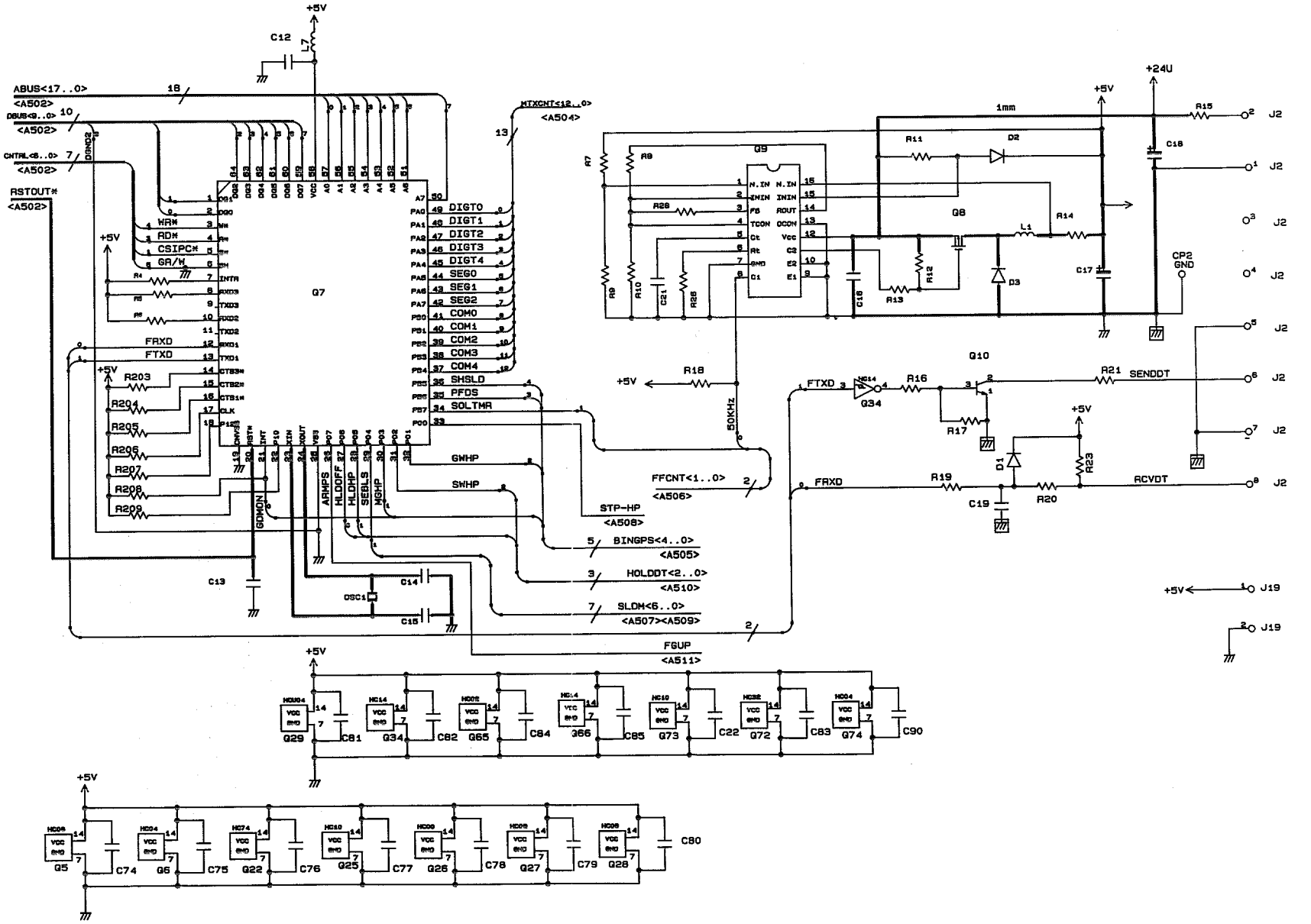
Sorter Controller Circuit Diagram (2/10)



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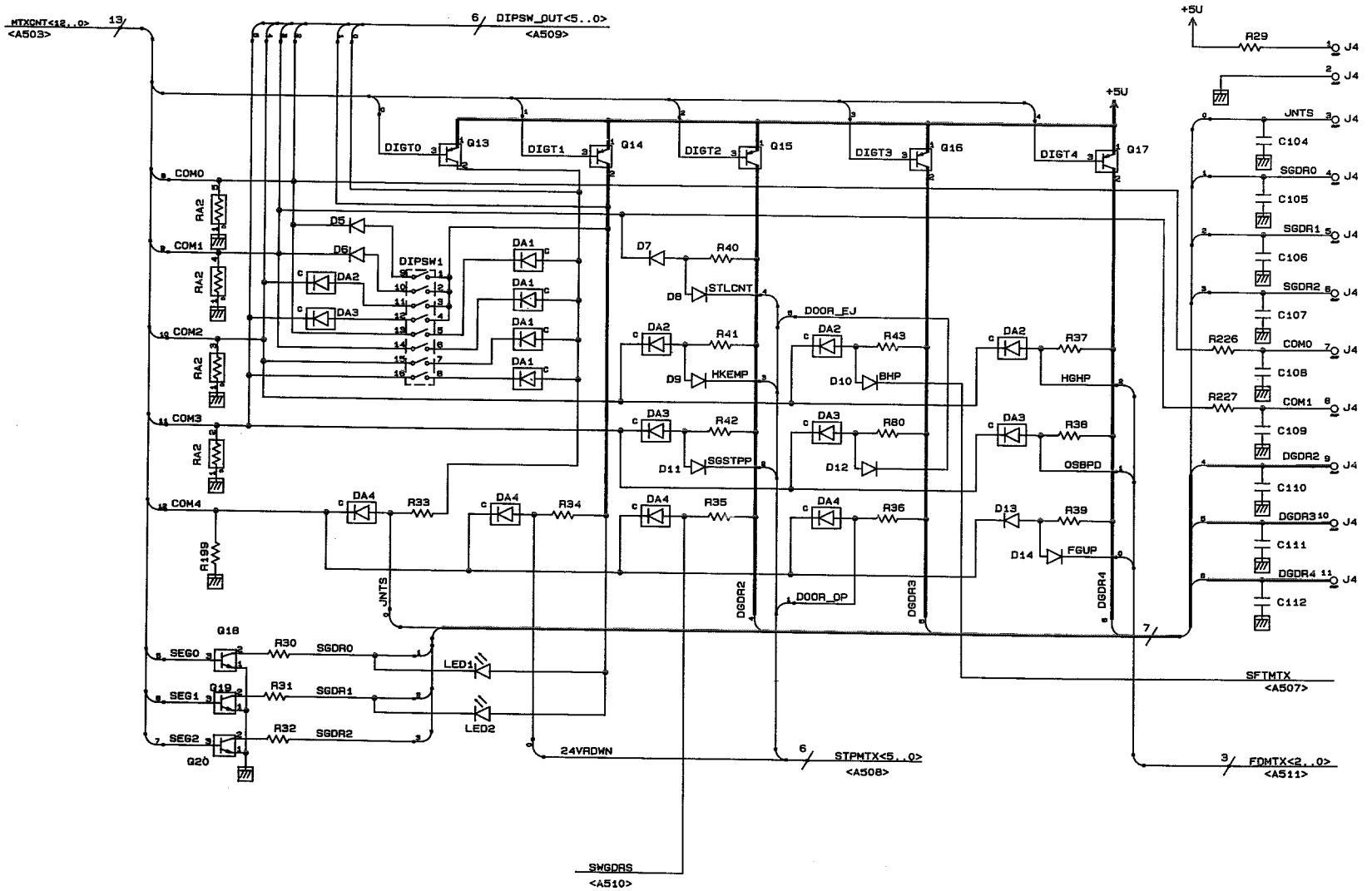

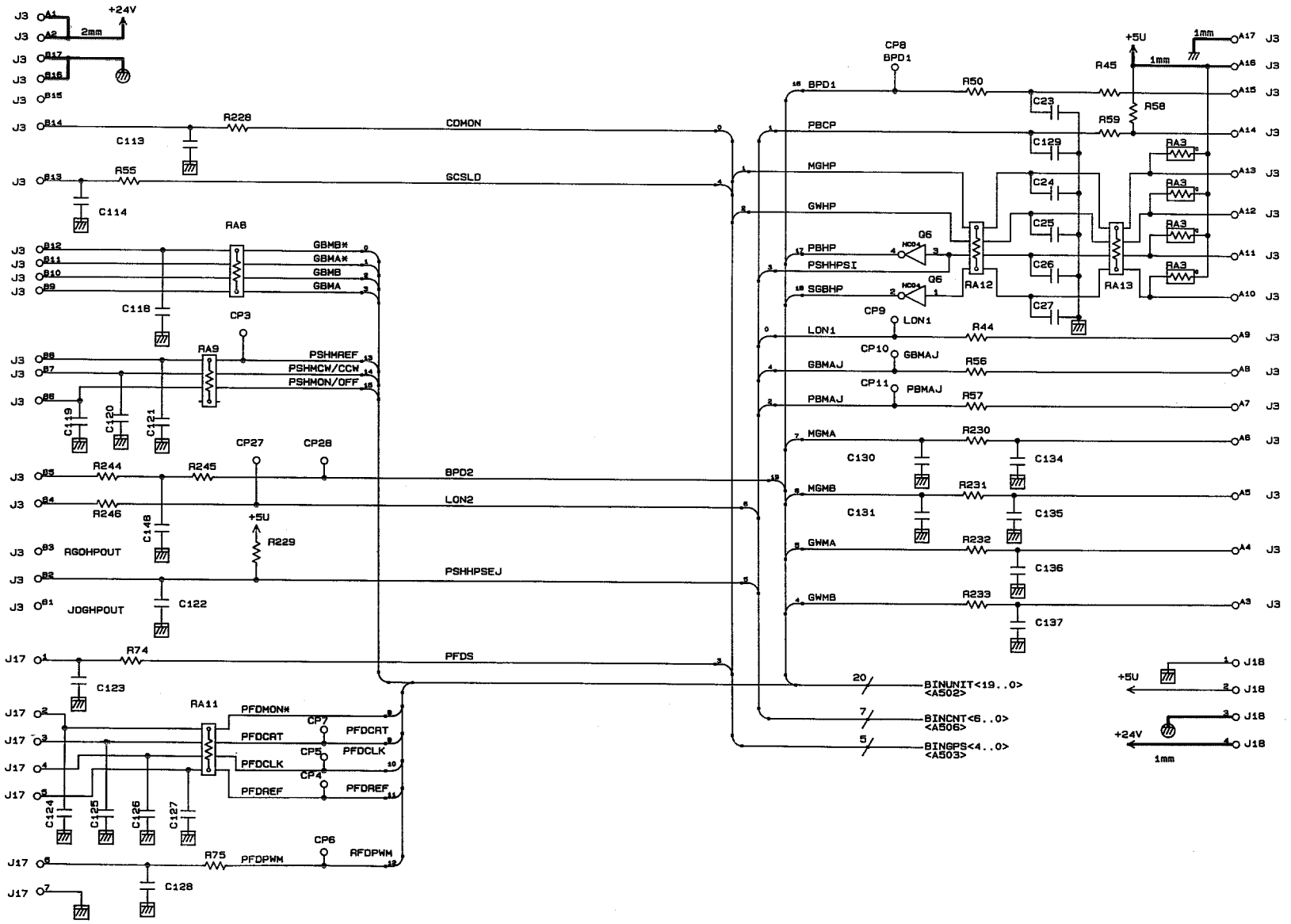

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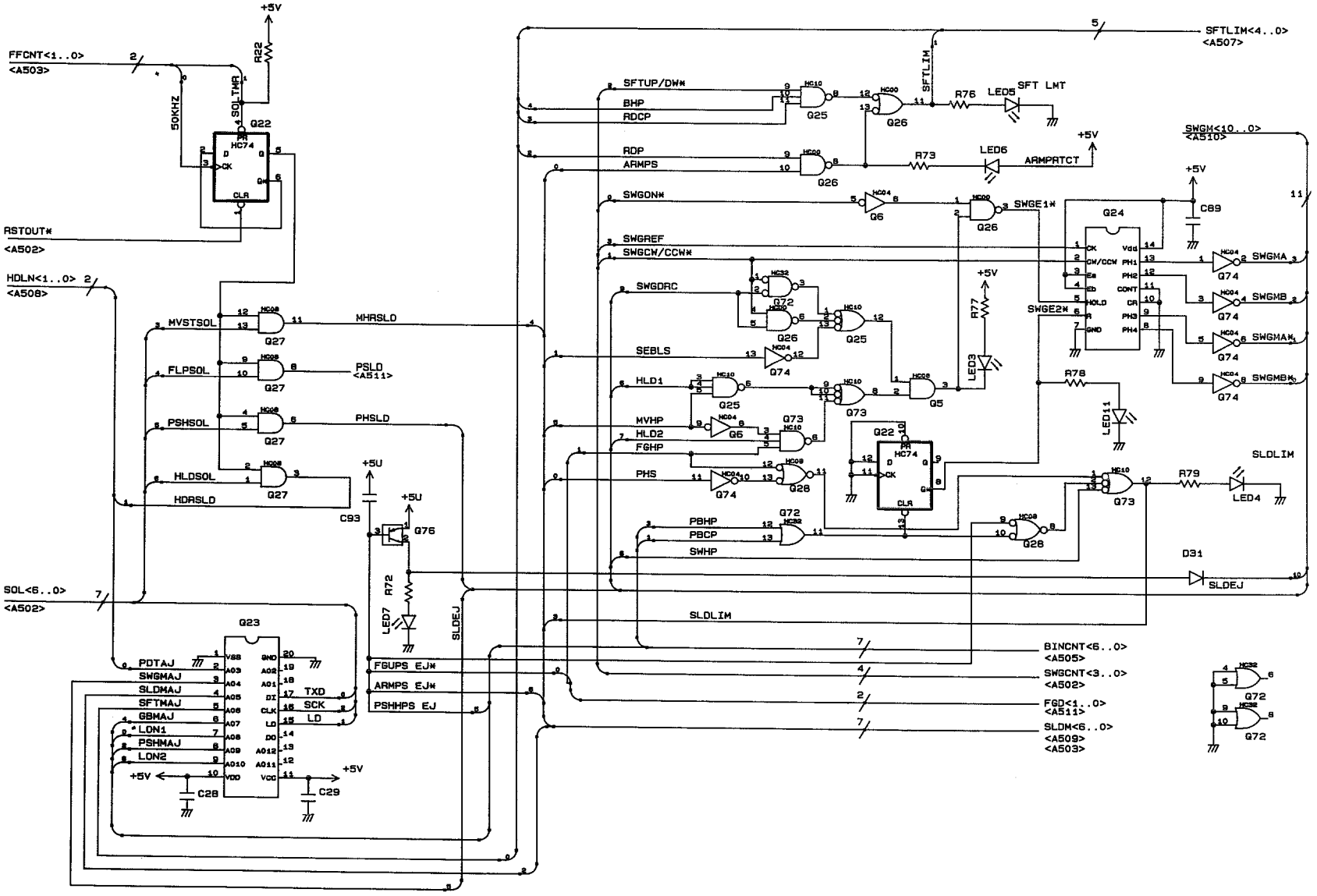

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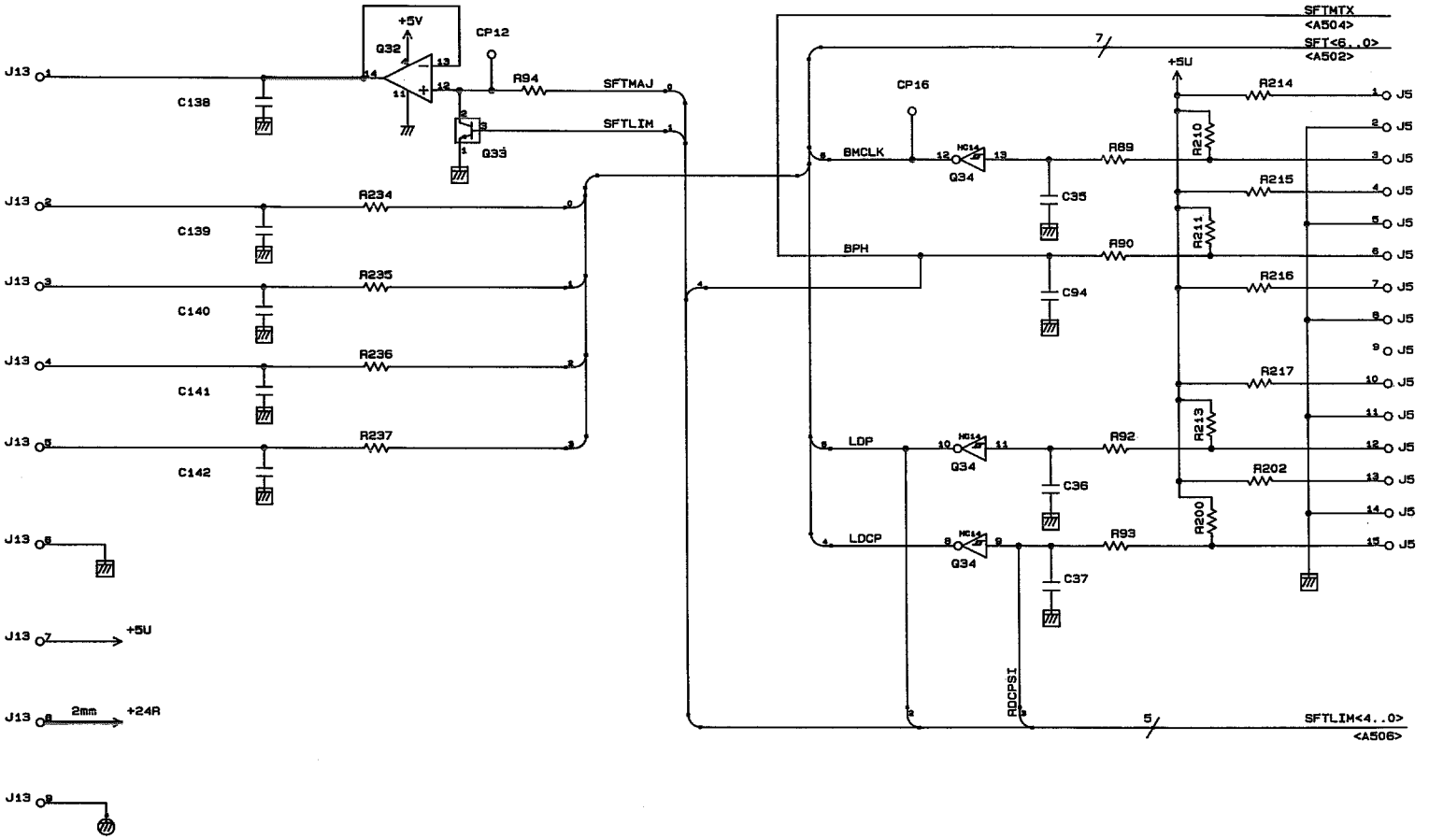
Sorter Controller Circuit Diagram (6/10)



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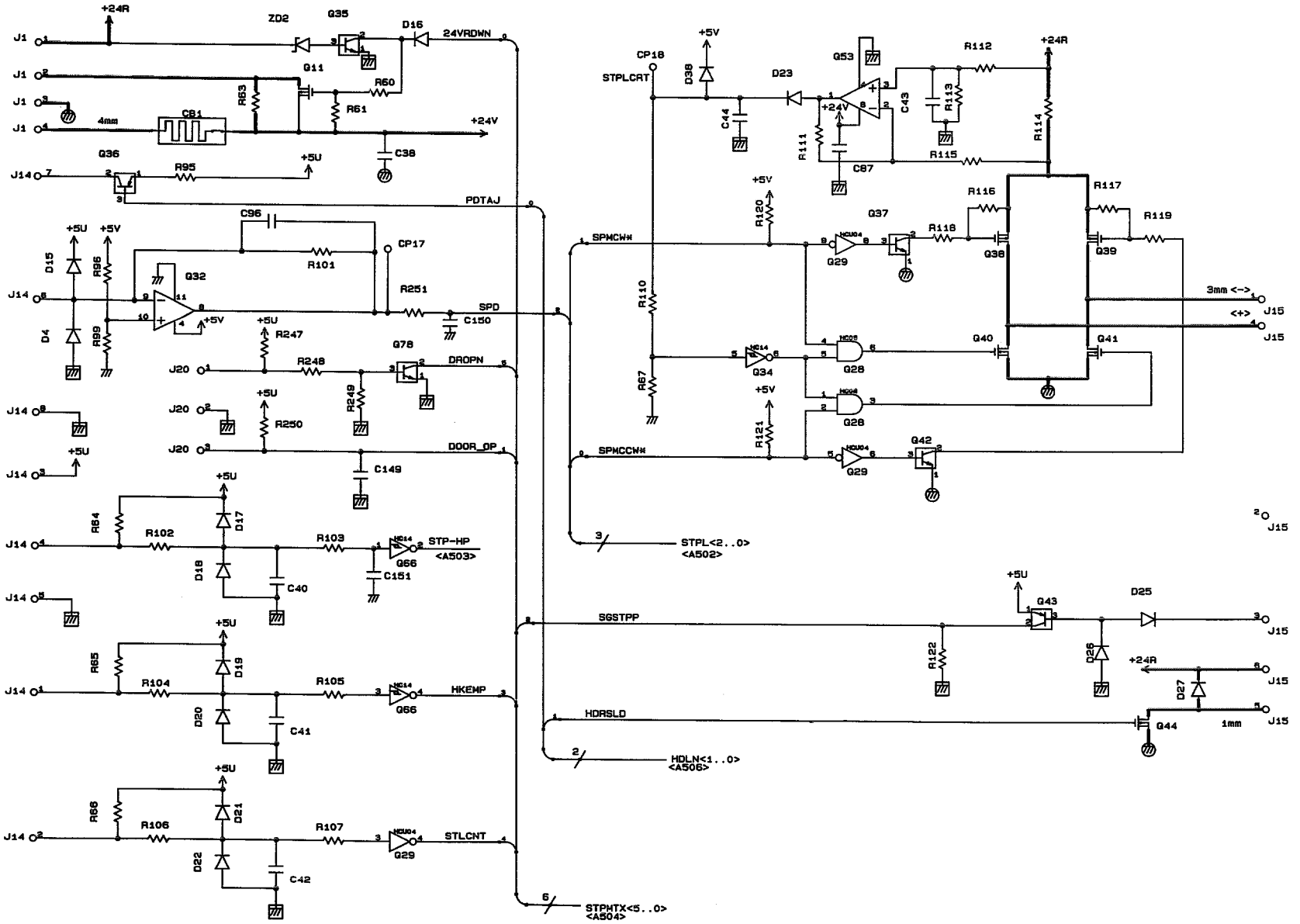
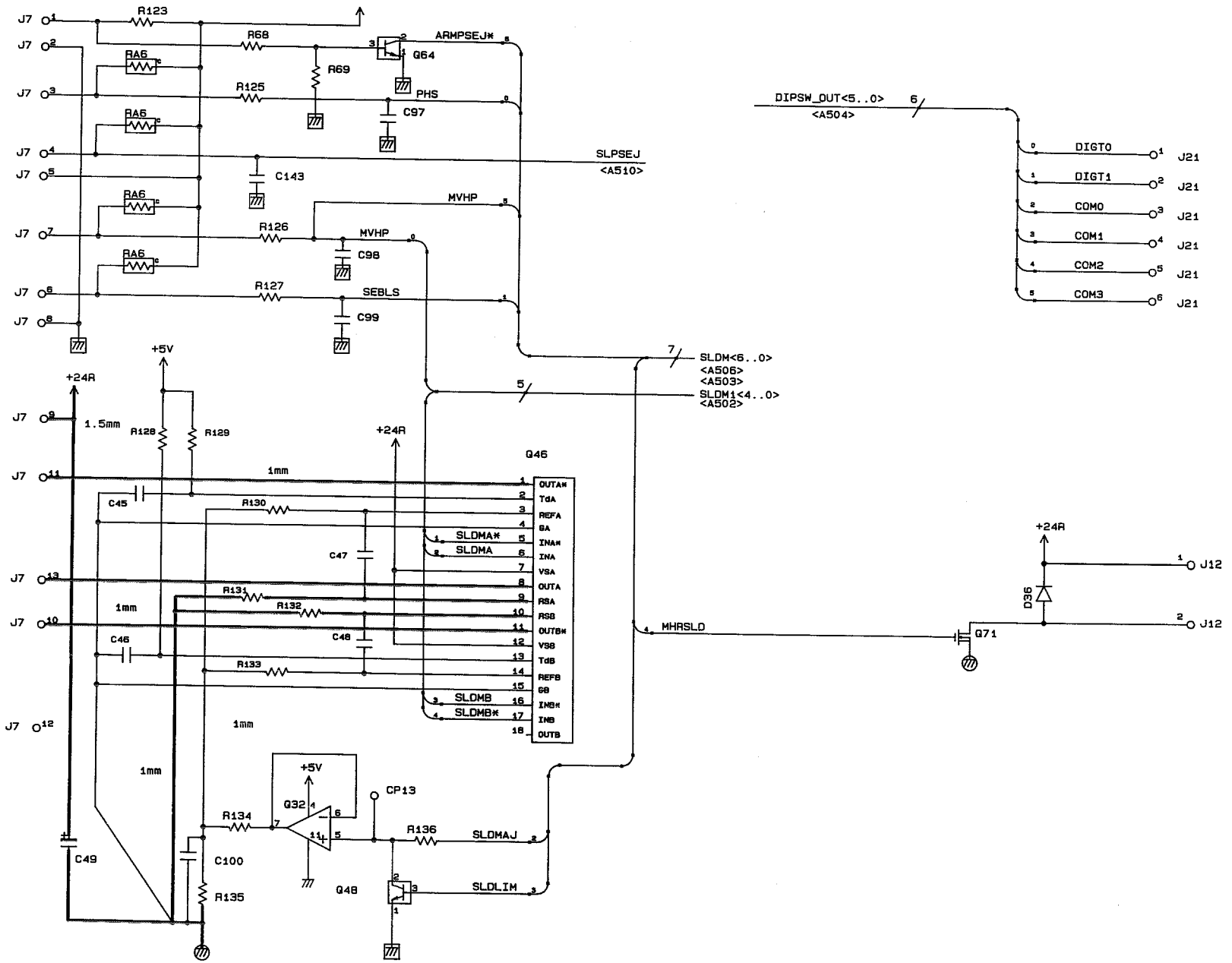


Sorter Controller Circuit Diagram (8/10)



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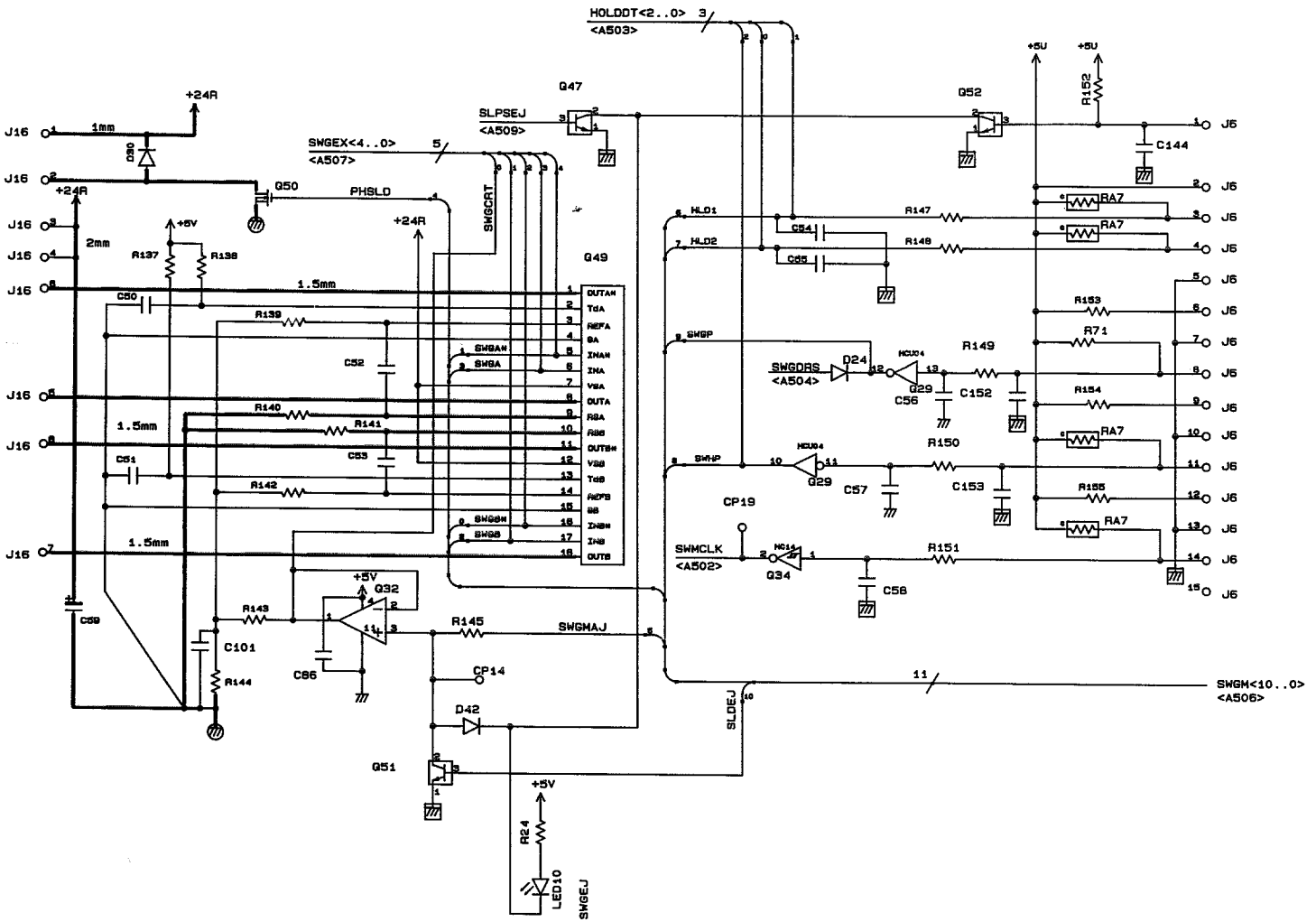

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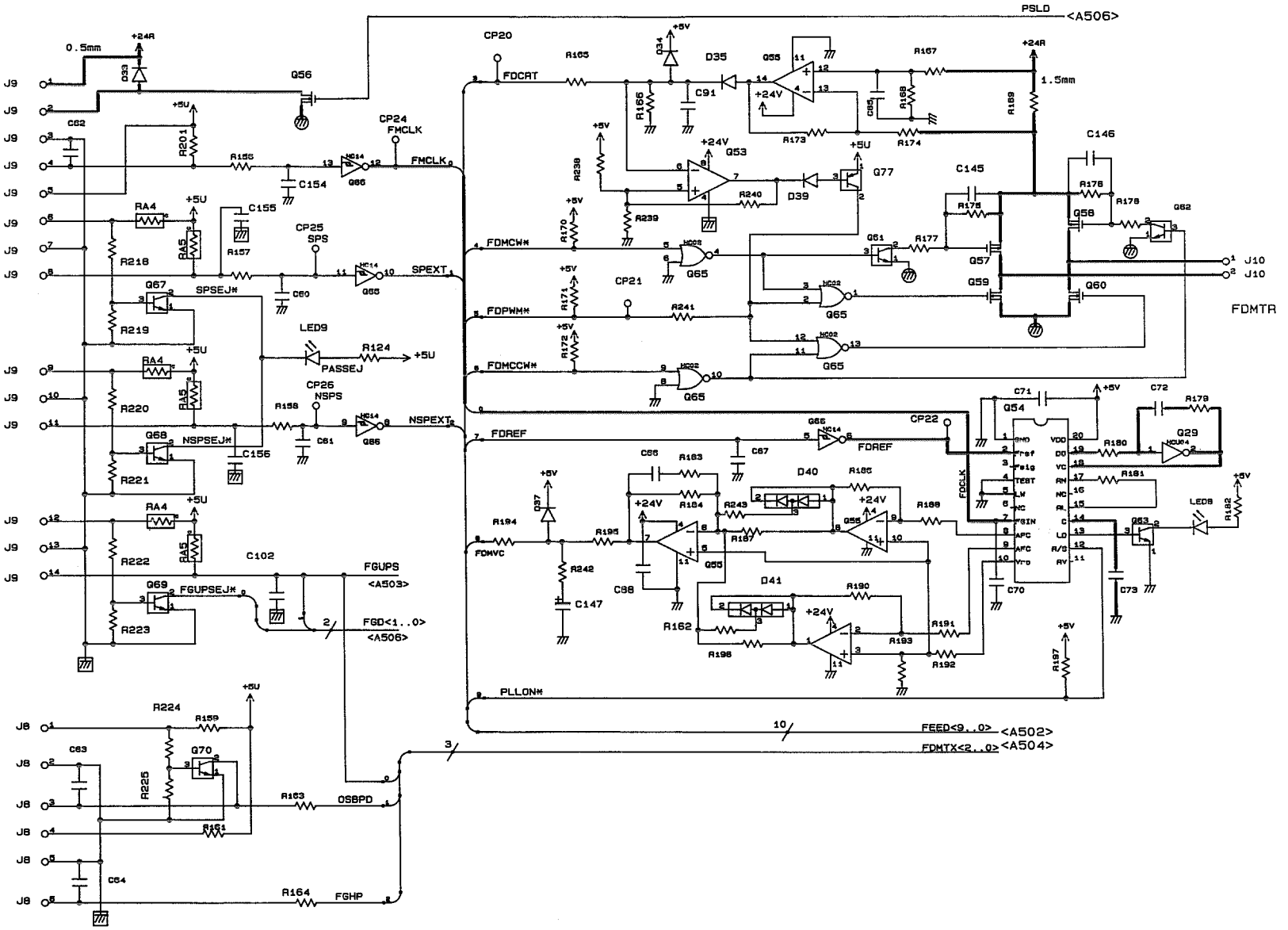
Sorter Controller Circuit Diagram (10/10)



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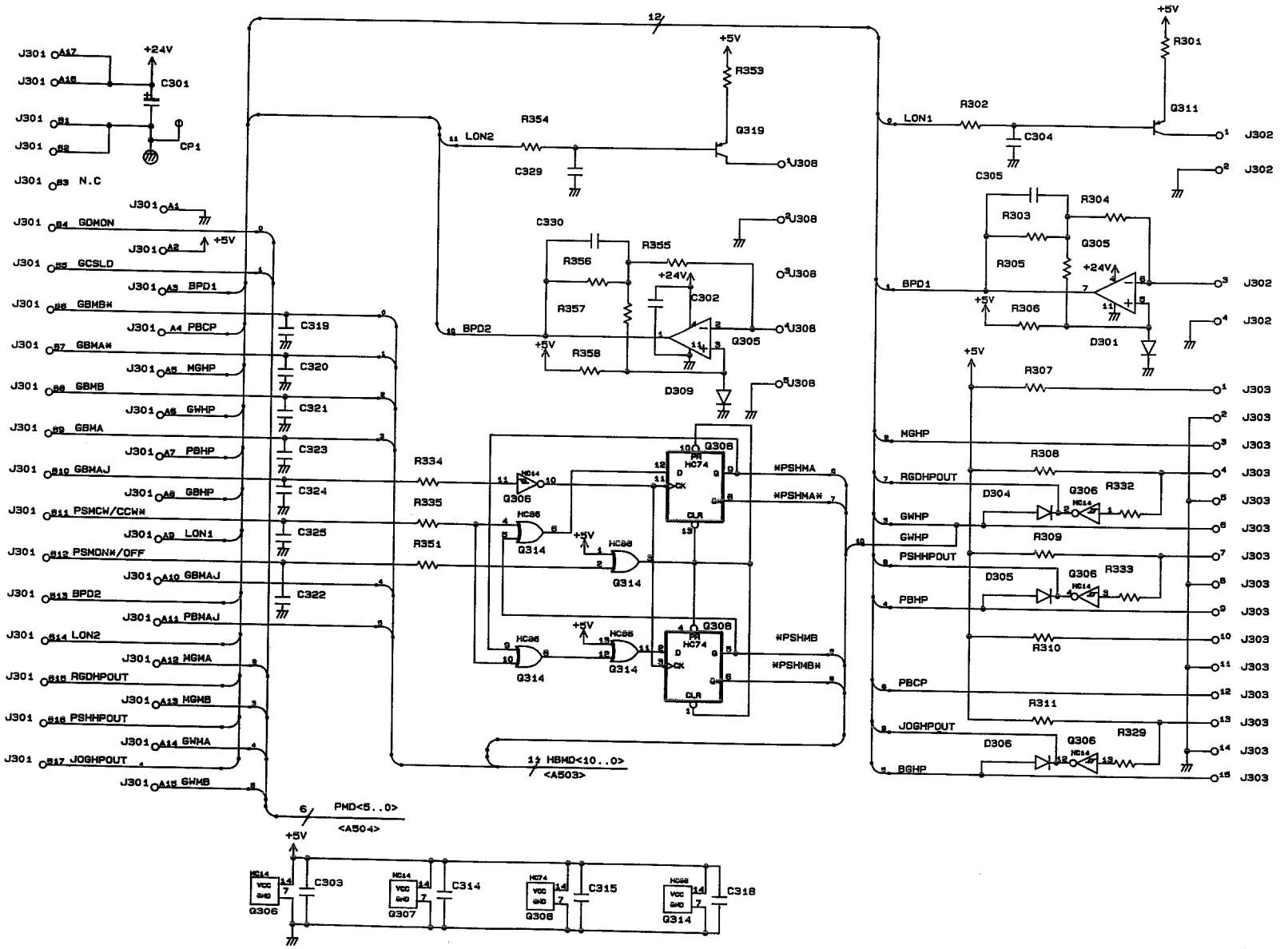
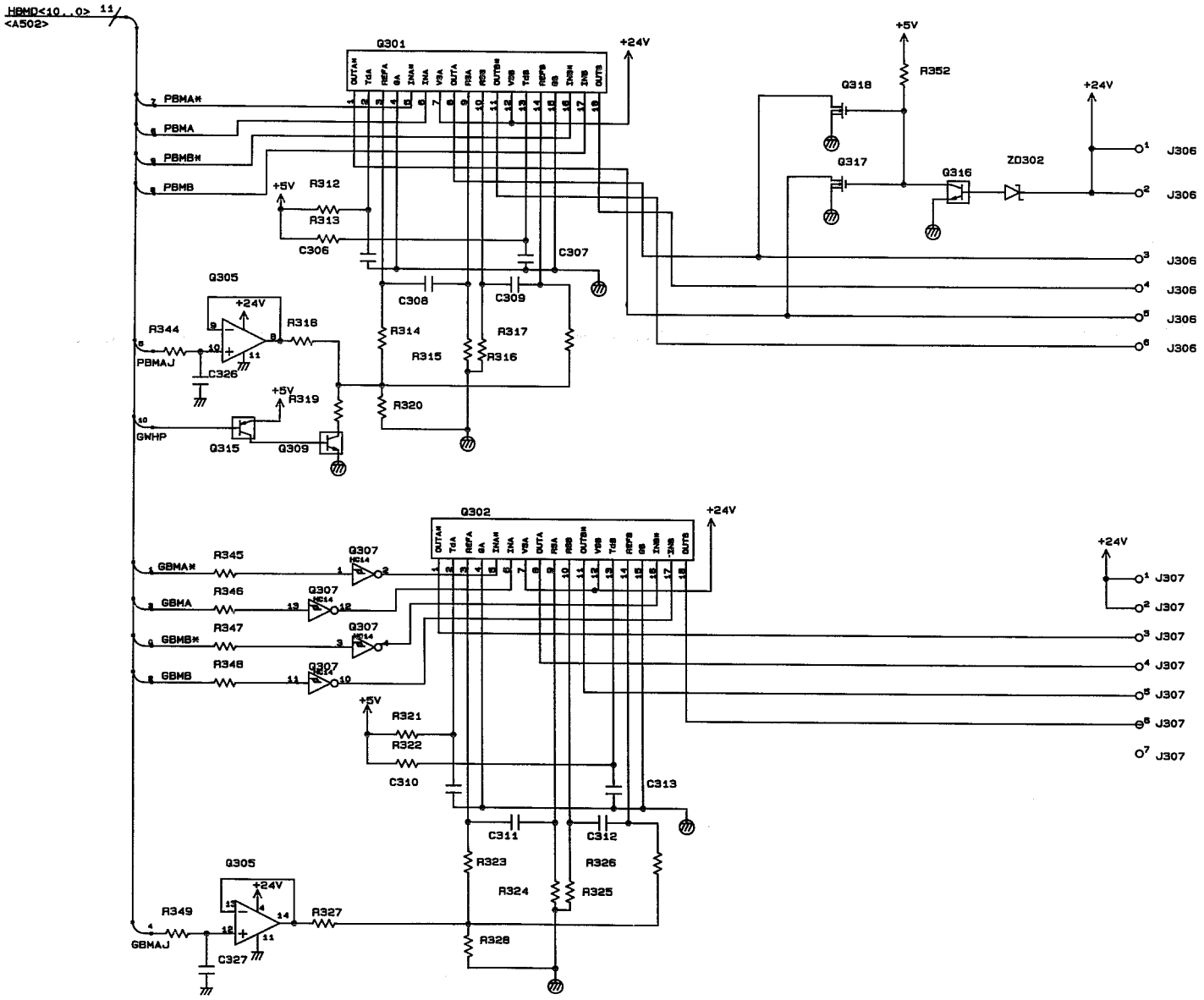
Bin Unit Control Circuit Diagram (1/3)





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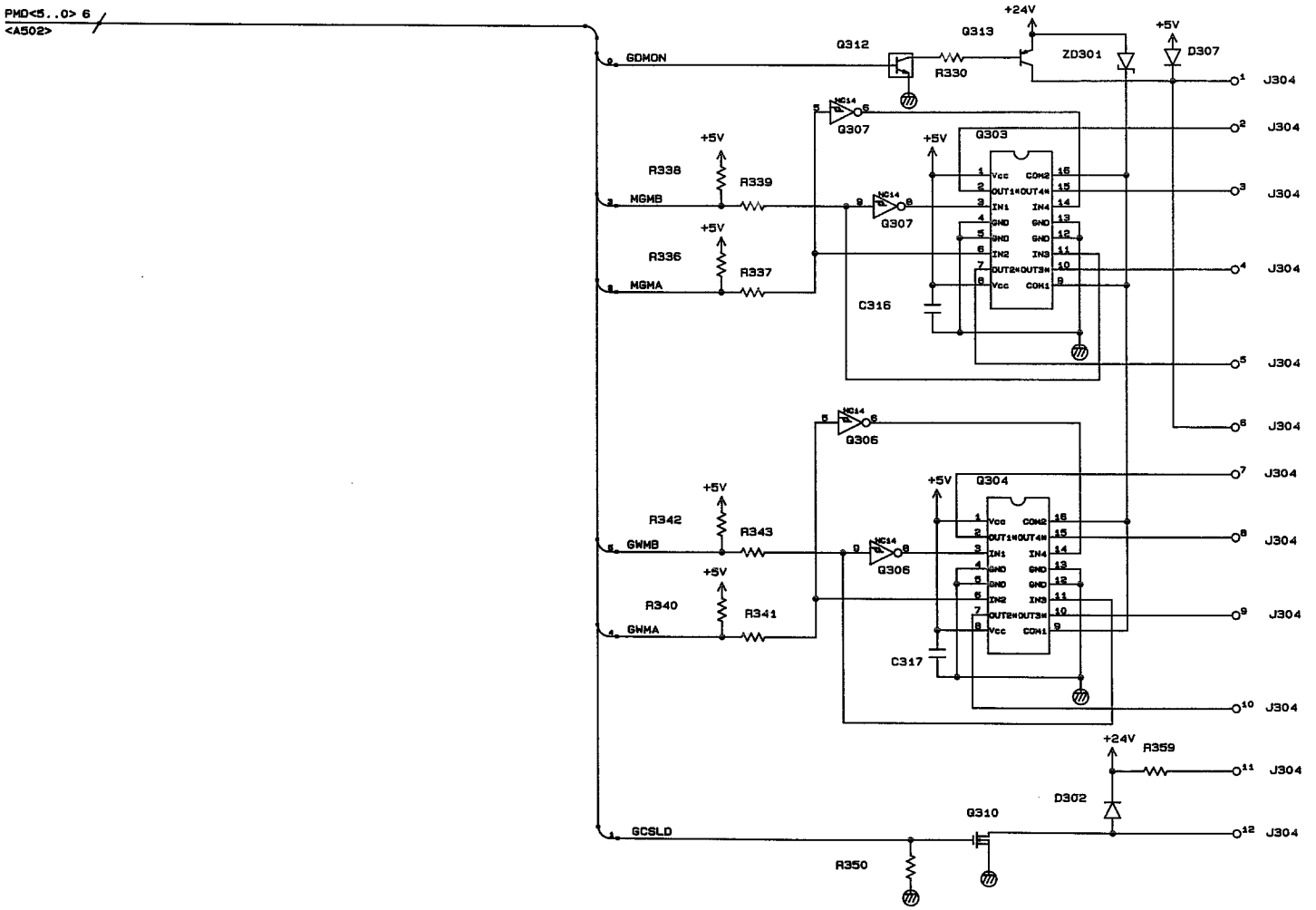

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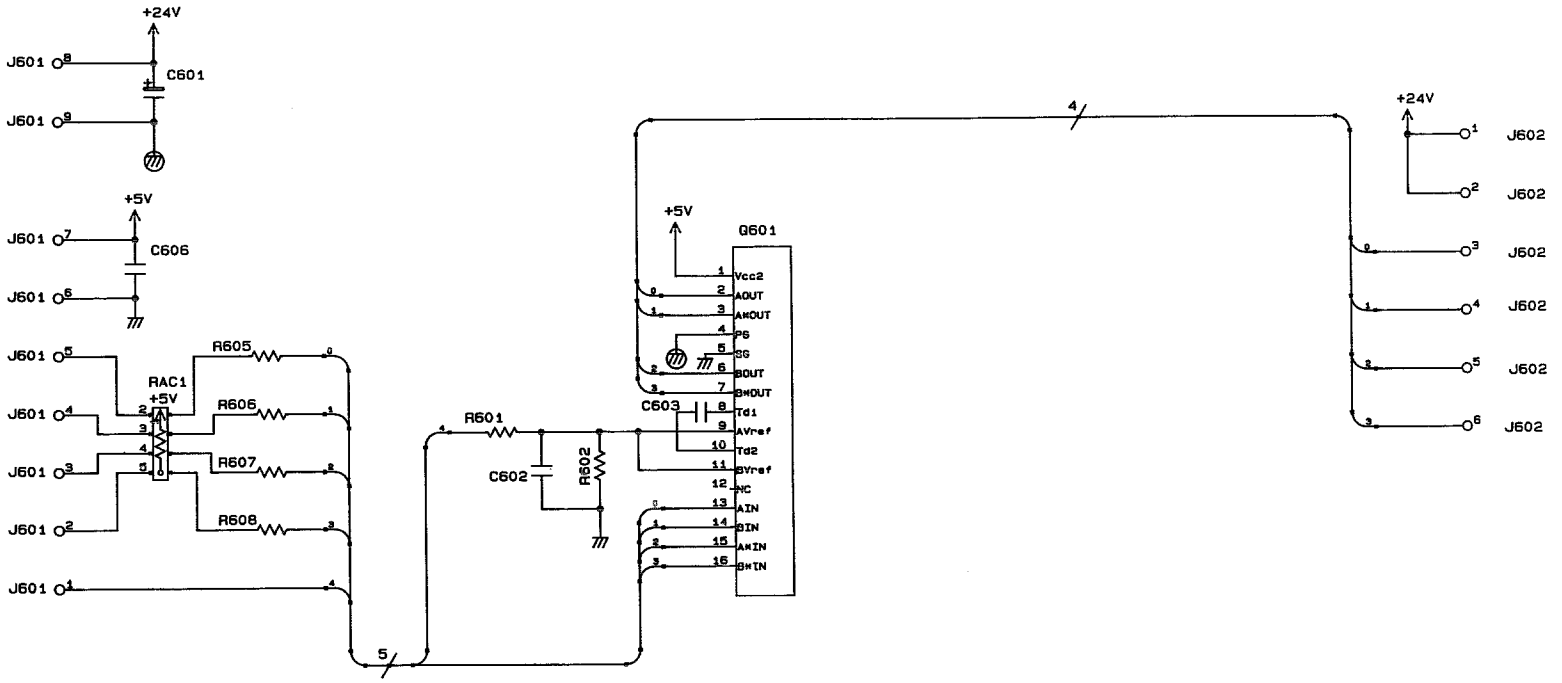
G. BIN DRIVE MOTOR DRIVER CIRCUIT DIAGRAM

Bin Drive motor Circuit Diagram



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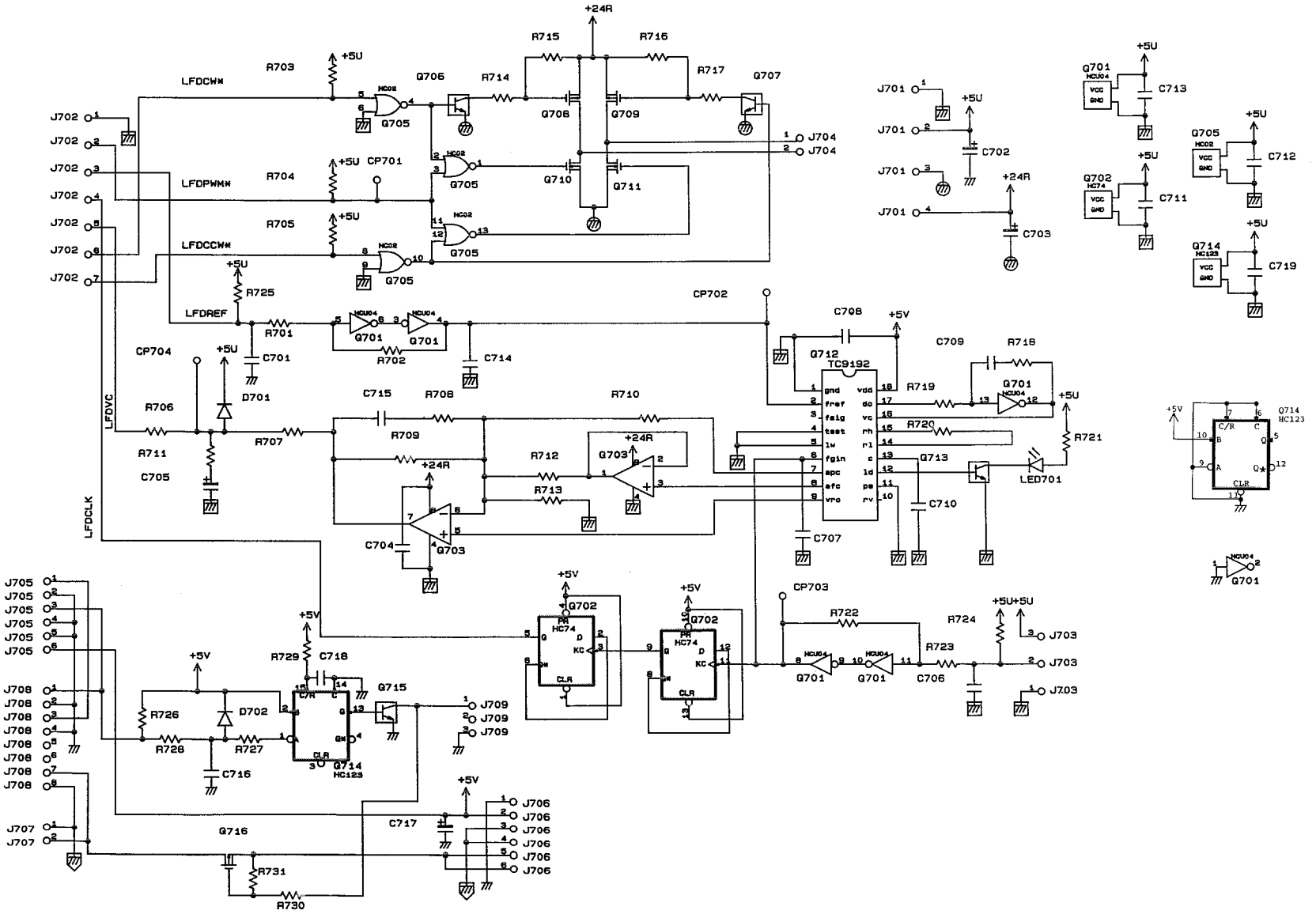
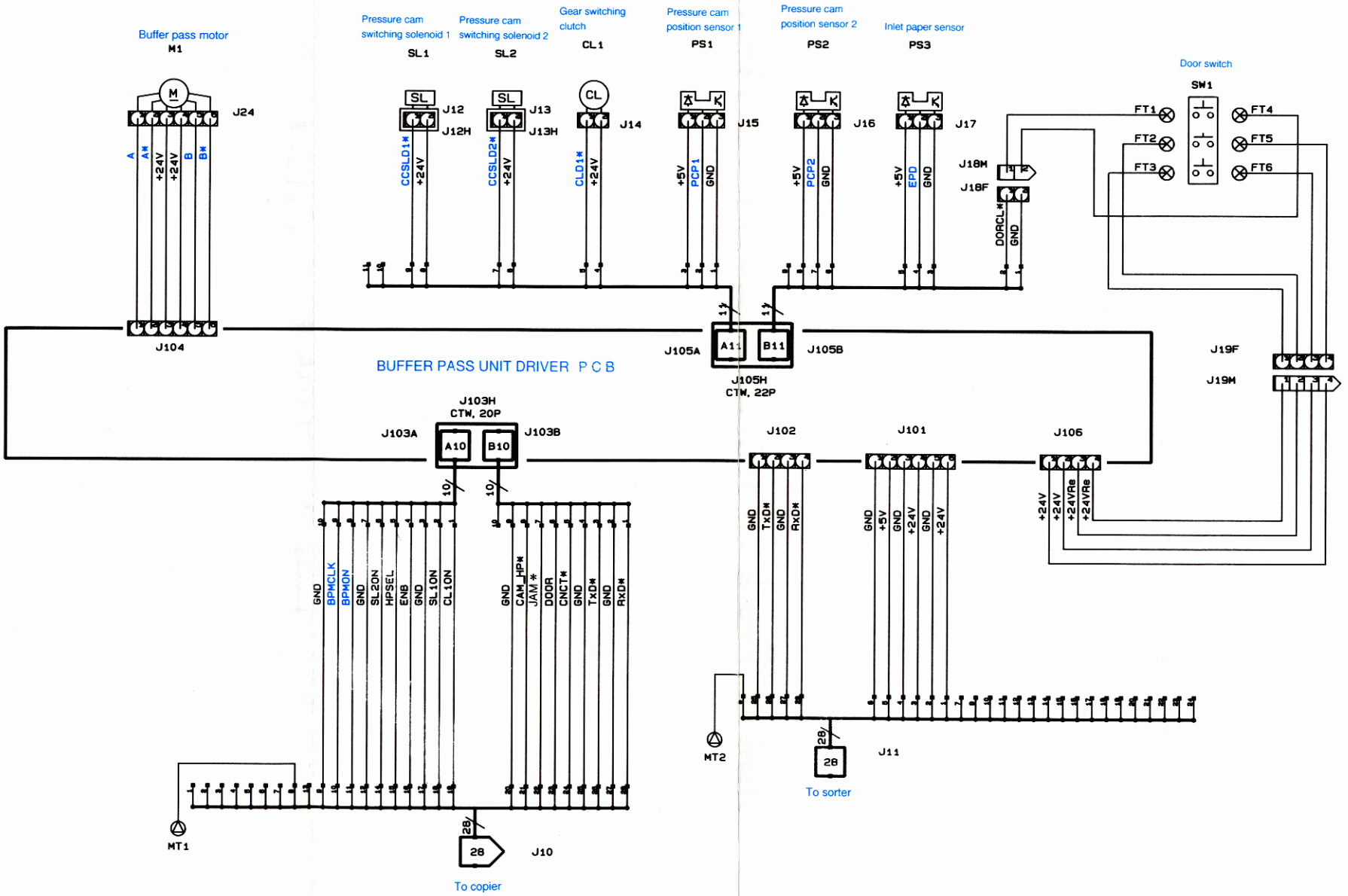
H. LOW SPEED FEEDING MOTOR DRIVER CIRCUIT DIAGRAM



I BUFFER PASS UNIT CIRCUIT DIAGRAM

Buffer Pass Unit Circuit Diagram (1/2)



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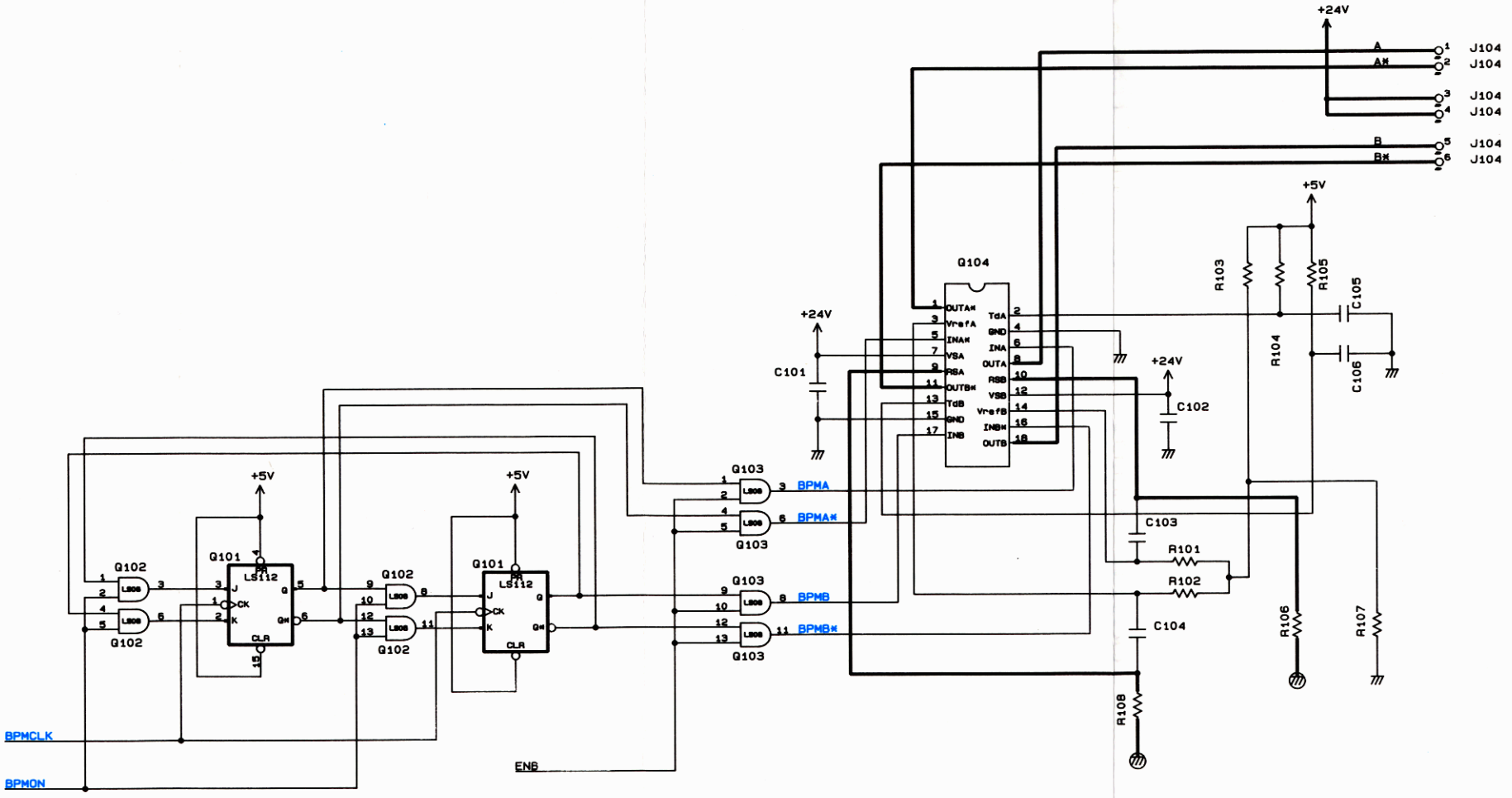
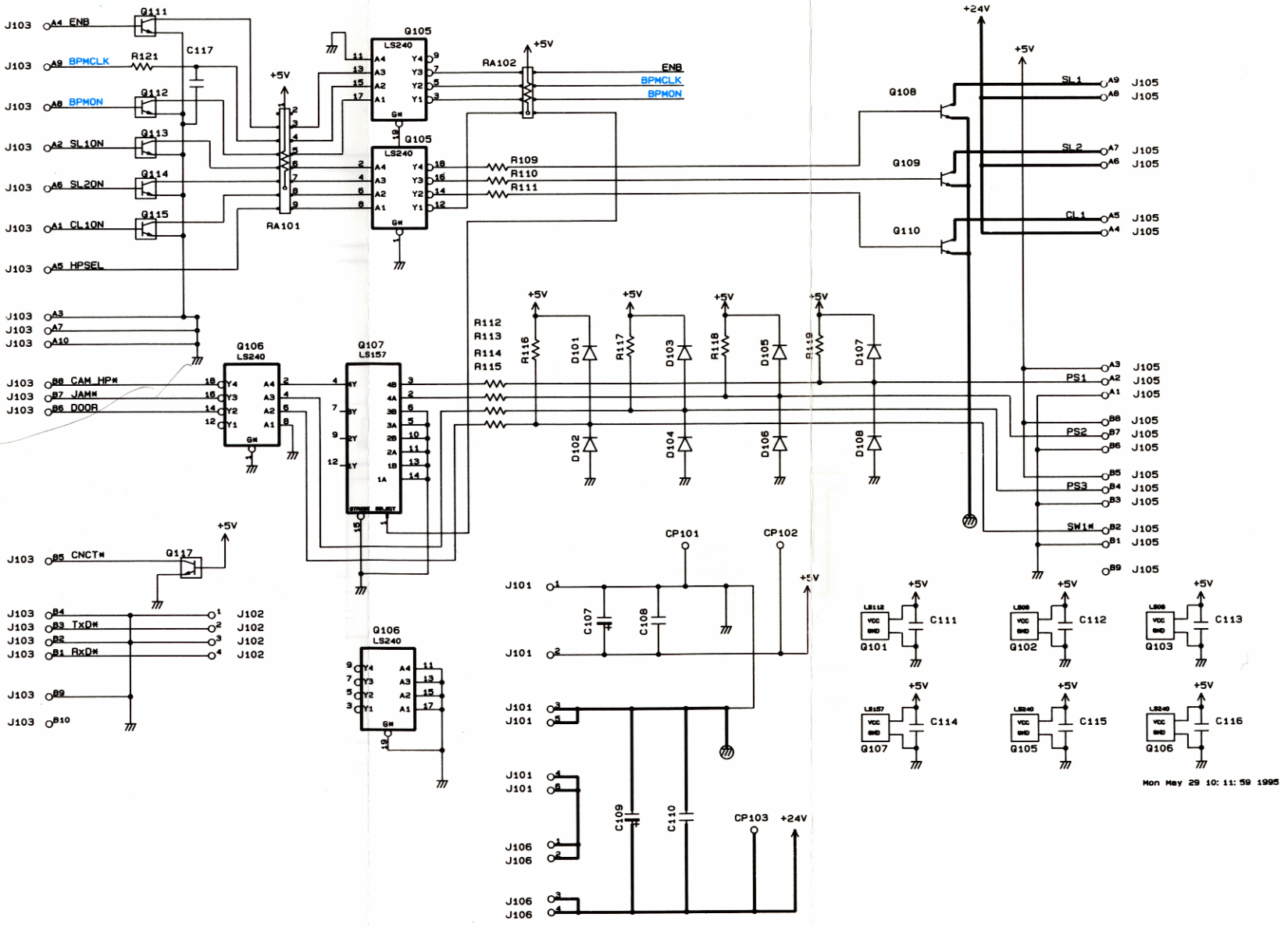
J BUFFER PASS UNIT DRIVER CIRCUIT DIAGRAM

Buffer Pass Unit Driver Ciruit Diagram (1/2)



Buffer Pass Unit Driver Ciruit Diagram (2/2)



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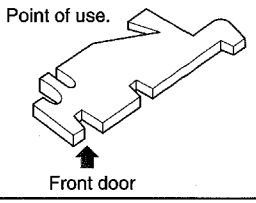
K. SPECIAL TOOLS TABLE

What follows below is a table of special tools used for servicing the machine in addition to the standard tools set.

No.	Tool name	Tool No.	Shape	Rank*	Remarks
1	Door switch actuator	TKN-0093		A	Use it when replacing the illuminating lamp or when the cover is kept open.

L. SOLVENTS/OILS TABLE

No.	Name	Use	Composition	Remarks
1	Alcohol	Cleaning;e.g.,glass, plastic, or rubber used in covers.	• Hydrogen carbide (fluorine family) • Alcohol • Surface activator • Water	• Keep away from open fire. • Procure locally. • Substitute: C1,IPA (isopropyl alcohol)
2	Lubricating oil	Lubrication points: friction parts lead cam, gear, etc.	Silicone Oil	Tool No. : CK-0551 (20g)
3	Lubricating oil	Lubrication points: spring clutch	ISO VG 68oil ESSO Feibs K68 MOBIL Vactra oil No. 2 SHELL Tonna oil T68	Eqivalent oil can be used. Tool No. : CK-0451 (100cc)

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