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SERVICE MANUAL

for

Tabletop Paper Collator

FC-10



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APRIL.25.2005

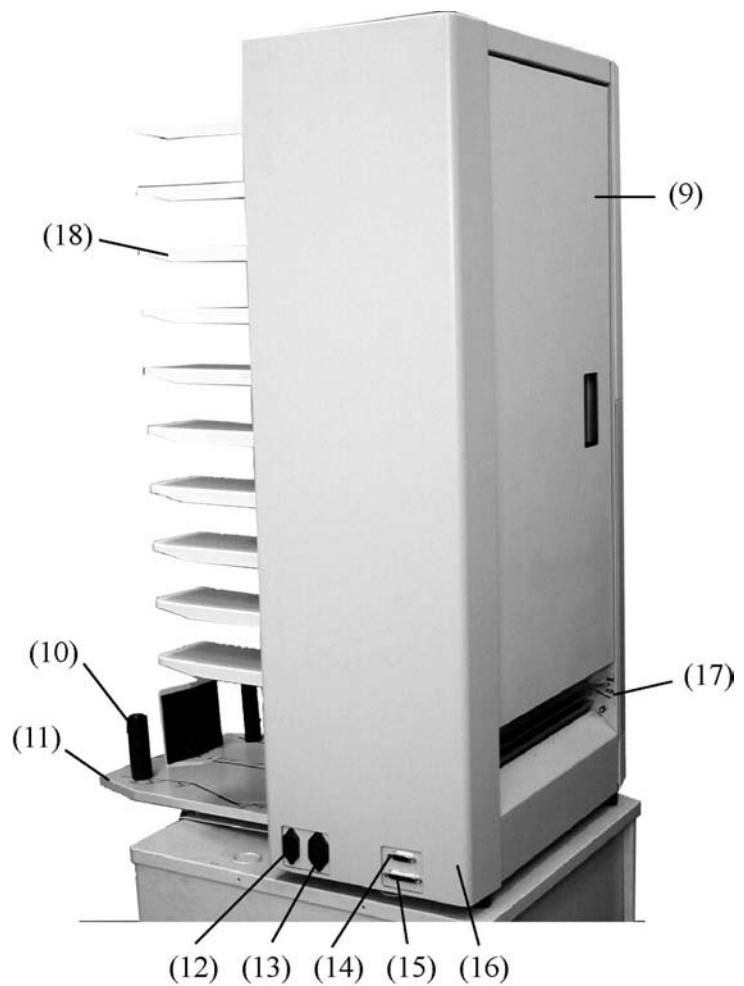
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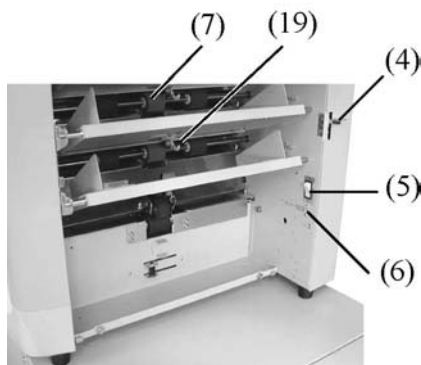
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1. COMPONENTS

1.1 Overview

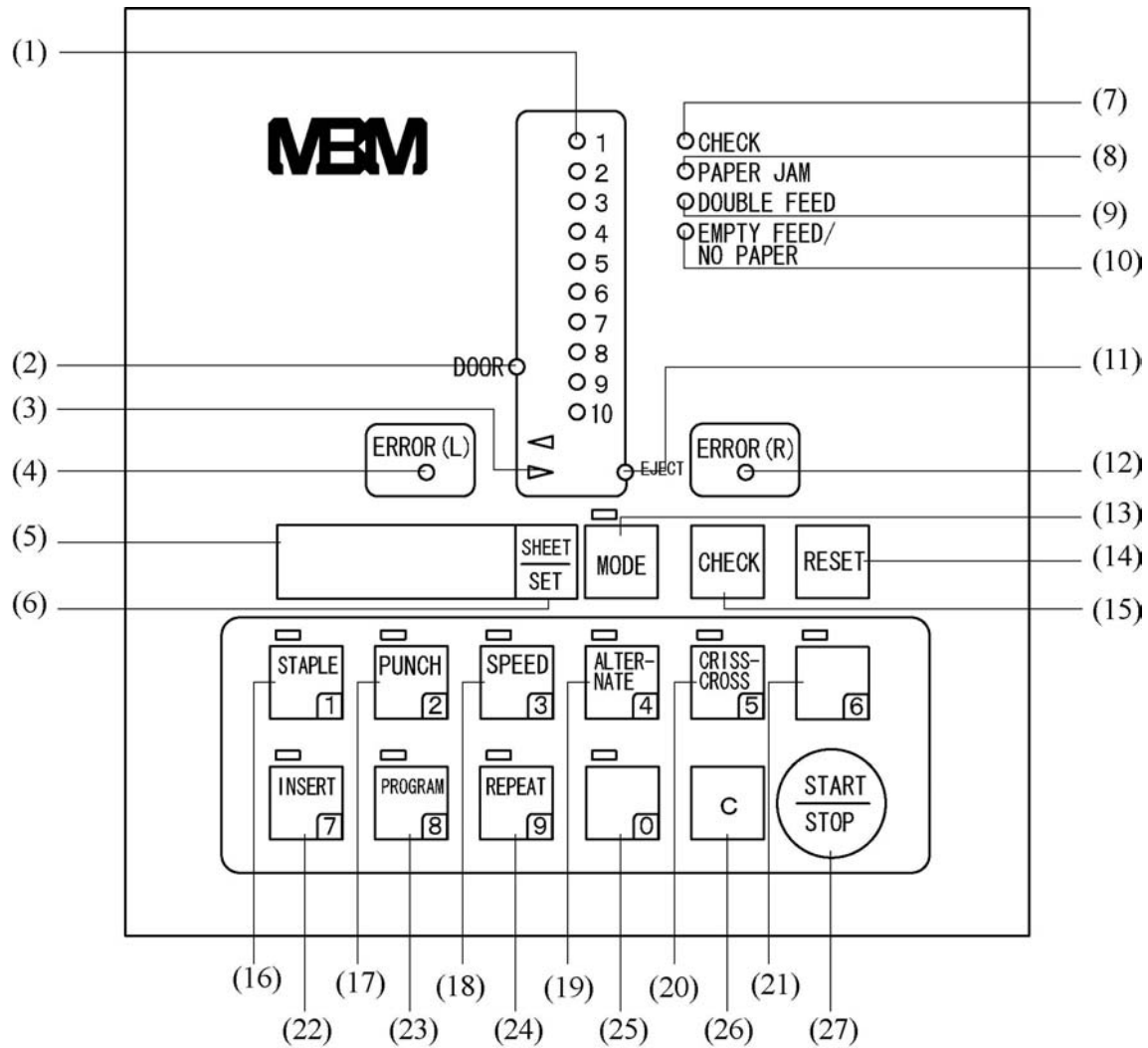


Right Connector (14) and left Connector (15) are non-limited power circuit.



No.	Name
(1)	Operation Panel
(2)	Paper guide
(3)	Paper feed table
(4)	Paper feed pressure shifting lever
(5)	Power switch
(6)	Circuit breaker
(7)	Paper feed roller
(8)	Left cover
(9)	Back door
(10)	Stacking pole
(11)	Stacking table
(12)	Inlet
(13)	Outlet (to connect optional stapler puncher and stacker)
(14)	Right connector (Connect to right tower)
(15)	Light connector (Connect to left tower / option)
(16)	Right cover
(17)	Shift lever for paper direction
(18)	Auxiliary table
(19)	Paper detection wire

1.2 Operation Panel



No.	Name	Function
(1)	Station LED lamp	Shows the collating status of each station 1 through 10.
(2)	DOOR lamp	Lights up when the back door is open.
(3)		Shows direction of paper ejection when lighted green.
(4)	ERROR (L) lamp	Indicates an error in the left side collator when lighted red.
(5)	COUNTER	Displays the number of collated sheets. “Err” is displayed in the event of an error.
(6)	SHEET/SET	Press the key to change the number of collated sets and the number of batches in Insert and Programmed Insert modes.
(7)	CHECK lamp	Lights green to when trial feed is complete.
(8)	PAPER JAM lamp	Lights red should a paper jam occur.
(9)	DOUBLE FEED lamp	Flashes red should double feed occur.

No.	Name	Function
(10)	EMPTY FEE/NO PAPER lamp	Flashes green in the event of no paper or no feed. In case of no paper, the lamp for the relevant station blinks slowly. If empty feed, the lamp for the relevant station blinks quickly.
(11)	EJECT lamp	Lights should a paper ejection jam occur or when the stacking table is full.
(12)	ERROR(R) lamp	Lighted red, this key warns of an error in the right side collator.
(13)	Mode key	When lighted green, various functions can be programmed. When using function keys, press this key first to light it green (goes out after five seconds).
(14)	RESET key	Press to reset error. When pressed for three seconds, the paper feed table lowers. Pressed for three seconds while the machine is in stand-by mode, the main motor will idle.
(15)	CHECK key	Press for trial paper feed so the machine will memorize stations to be used and the thickness of paper.
(16)	STAPLE/1 key	When lighted green, staple processing will occur; when not lit, stapling will not occur. Also used to input number “1” for the pre-set counter.
(17)	PUNCH/2 key	When lighted green, paper will be punched; when not lit, no punching will occur. Also used to input number “2” for the pre-set counter.
(18)	SPEED/3 key	When lighted green, high-speed collation occurs; when not lit, collation will be slow. Also used to input number “3” for the pre-set counter.
(19)	ALTERNATE/4 key	When lighted green, Alternate collation is selected; when not lit, Normal collation is selected. Also used to input number “4” for the pre-set counter.
(20)	CRISSCROSS/5 key	When lighted green, Crisscross stacking is selected; when not lit, straight stacking is selected. Also used to input number “5” for the pre-set counter.
(21)	6 key	When lighted green, it shows 2 towers are connected; when not lit, a single (light) tower collation is done. Used to input number “6” for the pre-set counter.
(22)	INSERT/7 key	When lighted green, Insert mode is selected. Also used to input number “7” for the pre-set counter.
(23)	PROGRAM/8 key	When lighted green, Programmed insert mode is selected. Also used to input number “8” for the pre-set counter.
(24)	REPEAT/9 key	When lighted green, Crisscross stacker continuously moves each time pre-programmed number of collated sets are ejected. Also used to input number “9” for the pre-set counter.
(25)	O key	Used to set the counter to O.
(26)	C key	Press to return the counter to zero. It also turns off the “Mode” lamp.
(27)	START/STOP key	Press to start or stop collator operation.

2. PRECAUTION FOR MAINTENANCE AND INSPECTION

- Before starting maintenance and inspection work, be sure to turn the power off and remove the power cord from the outlet.
- Photo sensors are used in various parts of this machine. Be sure to clean them when maintenance work is conducted.
- Thin wires are used for wiring in circuit boards. Be sure to grip the socket when setting or removing the connector.

Also, when setting the connector, take care that wires are not stretched too tight and slack wires are not in contact with the drive units and insert the socket into the end. Should the wires are in contact with the drive units, it may cause a disconnection.

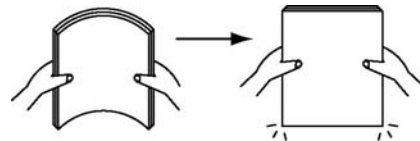
3. SETTING PAPER

3.1 Precautions for setting paper

- (1) Use the fill line on the paper guide as the loading capacity. In case of printed paper, do not load too much as it tends to swell.
- (2) Fan out sheets well and then load them on the feed table. Failure to properly fan sheets may lead to trouble.

[How to fan out sheets]

- 1) Pinch the sheets of paper at both ends.
- 2) Bend them to admit air.
(Loosen the force lightly and pinch them again after bending)
- 3) Jog and align the sheets vertically.



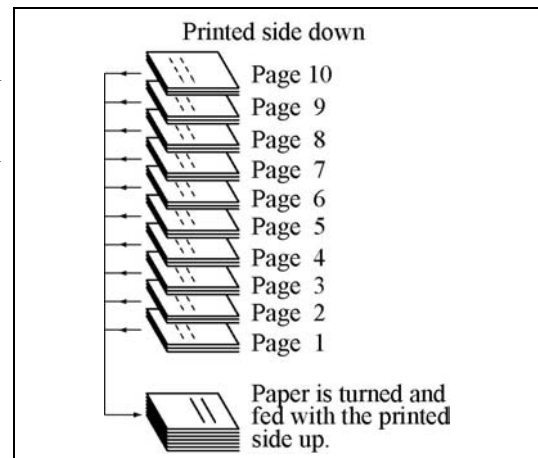
- (3) Align sheets at the edges and insert them until they lightly strike the forward guide. Failure to properly align sheets may lead to double feed or no feed.
- (4) Make sure any ink on the paper is dry. Let ink dry before loading paper. Wet ink soils the feed rollers and the separator rubbers. It can lead to malfunction, such as double feed or no feed.
- (5) Copied sheets may cause wrong feed or stacking error owing to electrostatic charge. Static electricity can be controlled by spraying a retail static eliminator on the feed rollers and the front edge of the paper. Too, since copied sheets are apt to curl at the edges; straighten or invert them before feed table loading.
- (6) Be sure to load no-carbon-required paper (general quality) with the color developing side (usually the print side) down, otherwise the side coated with color former will probably be marked with rubbed traces when contacting the feed roller.
- (7) Front and back sides of ejected paper change according to ejected direction (with independent use or when connected). Be very careful when the collator is operated with after-processing equipment such as the booklet maker.

3.2 Order of loading paper

(1) Paper with the printed side down

Load the paper on the feed tables from bottom to top in ascending order of pages.

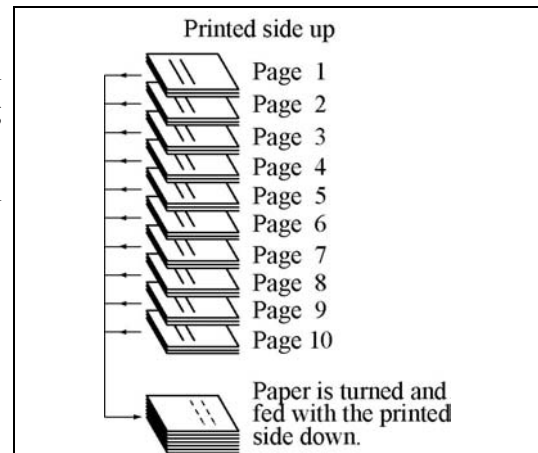
In this case Page 1 appears at the top of collated sheets on the stacking table.



(2) Paper with the printed side up

Load the paper on the feed tables from top to bottom in ascending order of pages. Paper is fed to the stacking table turned over.

In this case Page 1 is at the bottom of collated sheets on the stacking table.



Note

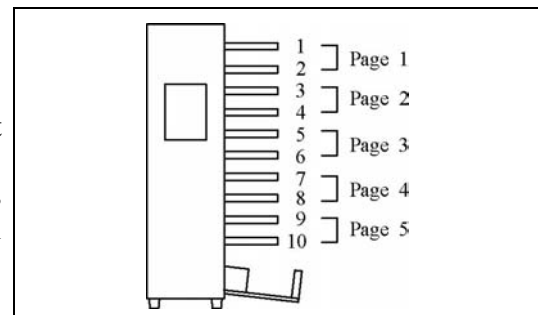
How to load a paper with a small number of pages (using less than 10 stations)

- In case the collator is used independently or a staple is connected with it, load the paper in order from the bottom (10th station). This way prevents disorder in paper ejection and facilitates the processing speed.
- In case optional machines are connected with the collator (such as two towers of the collator are connected with a large-capacity stacker or a booklet maker.), load the paper in order from the top (1st station). This way prevents paper jam.

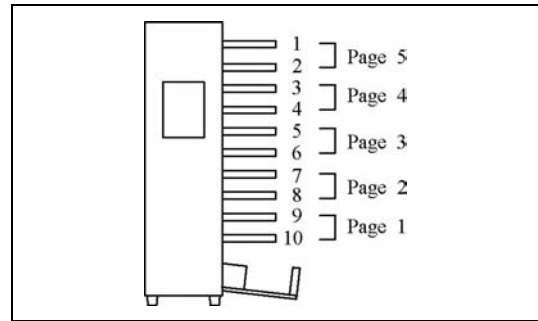
3.3 Loading paper in Alternate mode

- Loading paper with the printed side up in Alternate mode

Load same pages on odd and even-numbered stations, that is, Stations 1 and 2, 3 and 4, 5 and 6, 7 and 8, 9 and 10. Paper feed starts with the odd-numbered station; if it runs out of paper, the neighboring even-numbered station will automatically start feeding.



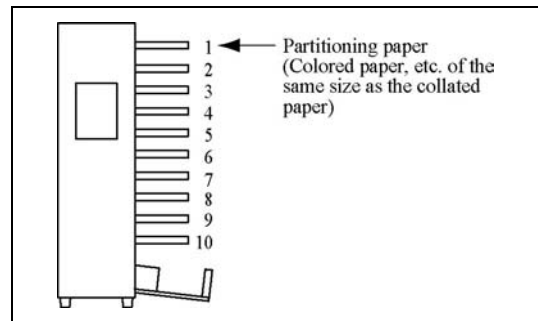
- Loading paper with the printed side down in Alternate mode



3.4 Loading paper in Insert and Program mode

(1) Insert mode

Load partitioning paper on the top station to be used. For instance, if 10 stations are used continuously top to bottom, partitioning paper should be loaded on Station 1.

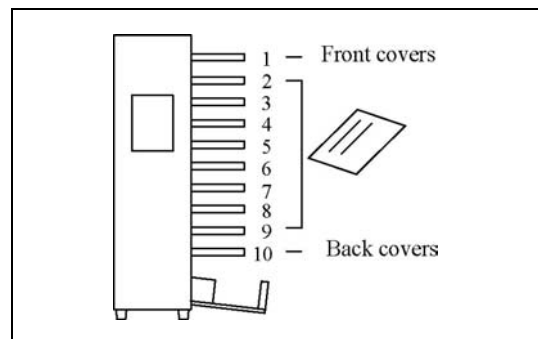


(2) Program mode

Be sure to load paper with the printed side up.

For example, when 10 stations to be used continuously top to bottom, front covers should be loaded on Station 1, back covers on Station 10.

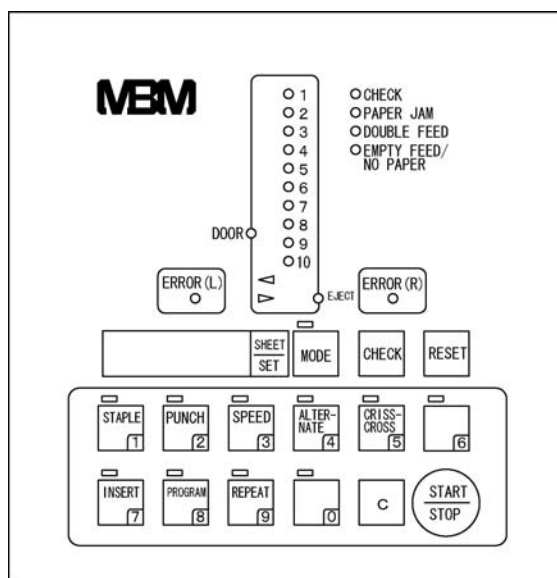
If fewer than 10 stations are used, load front covers on the top station, back covers on the lowest of those to be used.



4. RESPONSE TO LIT AND FLASHING LAMPS (ERROR MESSAGE)

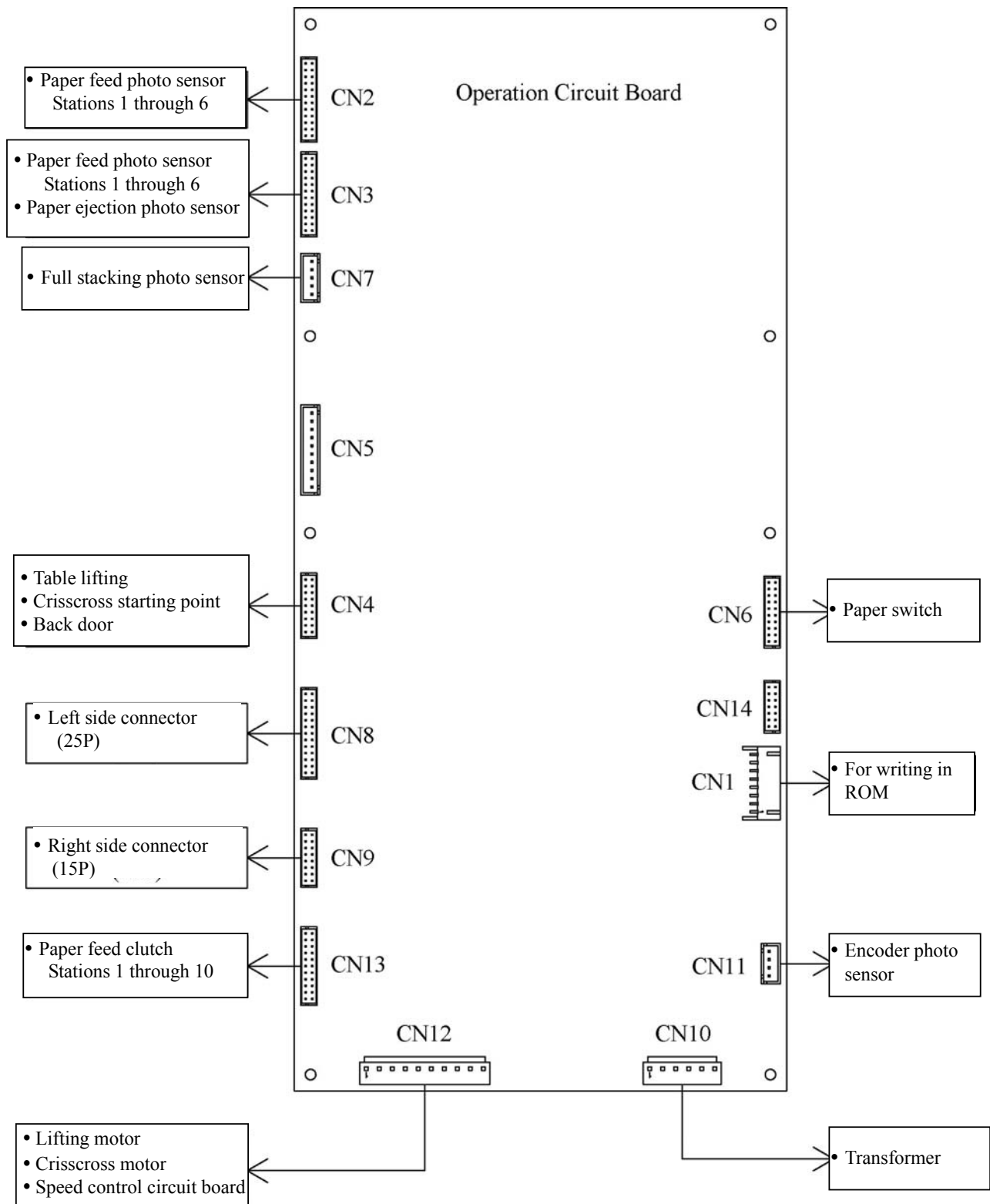
Counter display	Other display	Possible cause	Corrective Action
Number of count or Err	CHECK lamp and the relevant station lamp light green	They light when checking is completed.	Use the machine as they are.
	Station lamp lights red. JAM lamp and the relevant station lamp light flashes red.	Paper remains in the paper feed photo sensor.	Remove the paper shielding the photo sensor.
	EJECT lamp lights/flashes red.	Paper remains in the paper stacking photo and full stacking photo sensor.	Remove the paper shielding the photo sensor.
	DOOR lamp lights red/flashes red.	Back door is open.	Close the back door.
	ERROR(L) lamp lights red/flashed red.	Trouble is occurring at the left side optional equipment.	Remove the trouble at the left side equipment.
	ERROR(R) lamp lights red/flashed red.	Trouble is occurring at the equipment connected at the right side.	Remove the trouble at the right side equipment.

Counter display	Other display	Possible cause	Corrective Action
Err	EJECT lamp flashes red.	Paper ejection jam has occurred.	Remove the jammed paper.
	Station lamp only flashes red when checking is conducted.	Paper feed photo sensor of luminescence intensity is not fit for the paper used.	Repeat checking several times. Then, the luminescence intensity will be adjusted to be fit for the paper.
	DOUBLE FEED and the relevant station lamp flash red.	Double feed has occurred.	Remove the ejected paper and continue collation.
	NO PAPER lamp and the relevant station lamp light.	Empty feed has occurred.	If double feed or empty feed still frequently occurs, refer to "Troubleshooting".
End	NO PAPER lamp and the relevant station lamp light green.	Paper to be fed has run out.	Load paper on station.
	EJECT lamp flashes red.	Stacking table is full.	Remove the paper in stacking table and continue collation.
Err0	—	Error has occurred at nonvolatile memory.	Stored values are deleted, however, the machine can be used as it is. If it occurs frequently, it will be necessary to replace the operation circuit board.
Err1	ERROR(R) or (L) flashes red.	Communication error occurs.	Make sure that connectors of connecting cable are engaged.
Err3		Luminescence intensity cannot be set since the paper not specified in the specifications is used.	Restart collation after canceling the double feed detecting function. (Refer to page 23.)
Err4	—	While optional stapler-puncher is connected, neither PUNCH or STAPLE is not selected.	After selecting PUNCH or STAPLE, start feeding paper.
Lock	Stations lamps flashes red like flowing up and down.	Table lifting motor is locked.	Refer to "Troubleshooting".
	CRISSCROSS lamp flashed.	Crisscross motor is locked.	

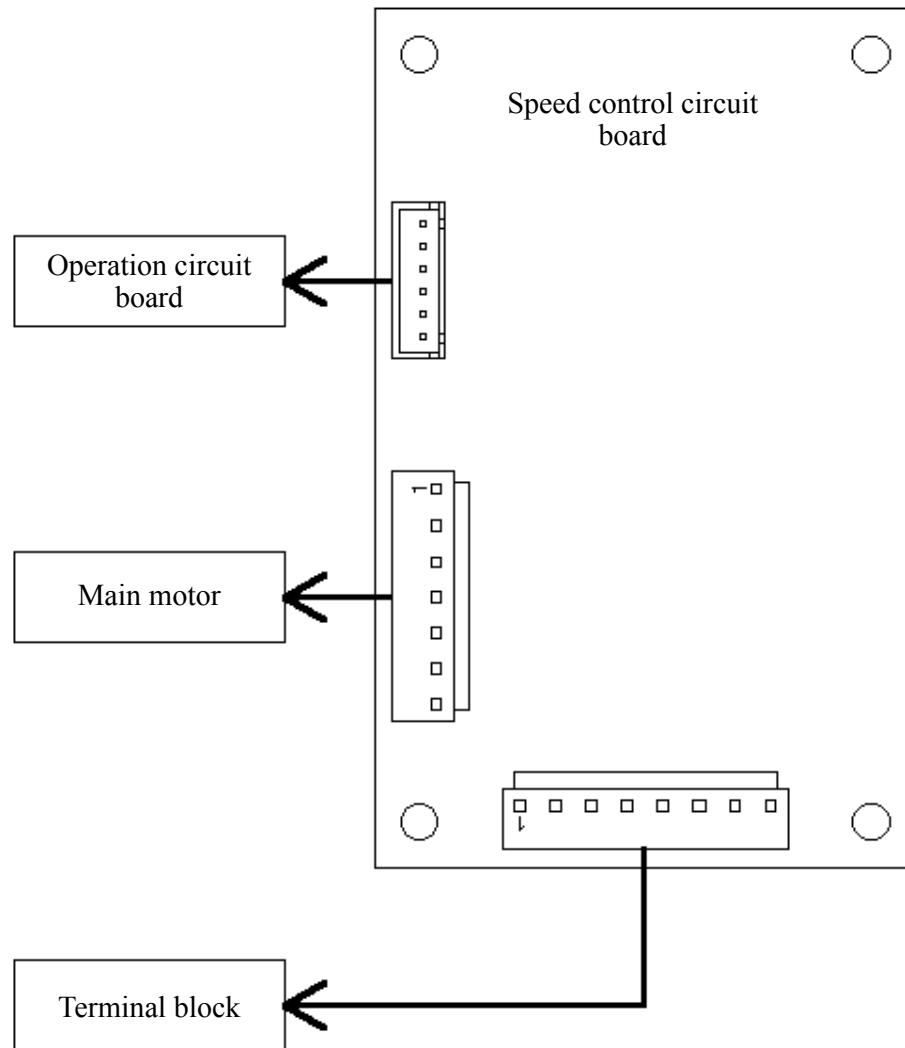


5. ELECTRIC CIRCUIT BLOCK DIAGRAM

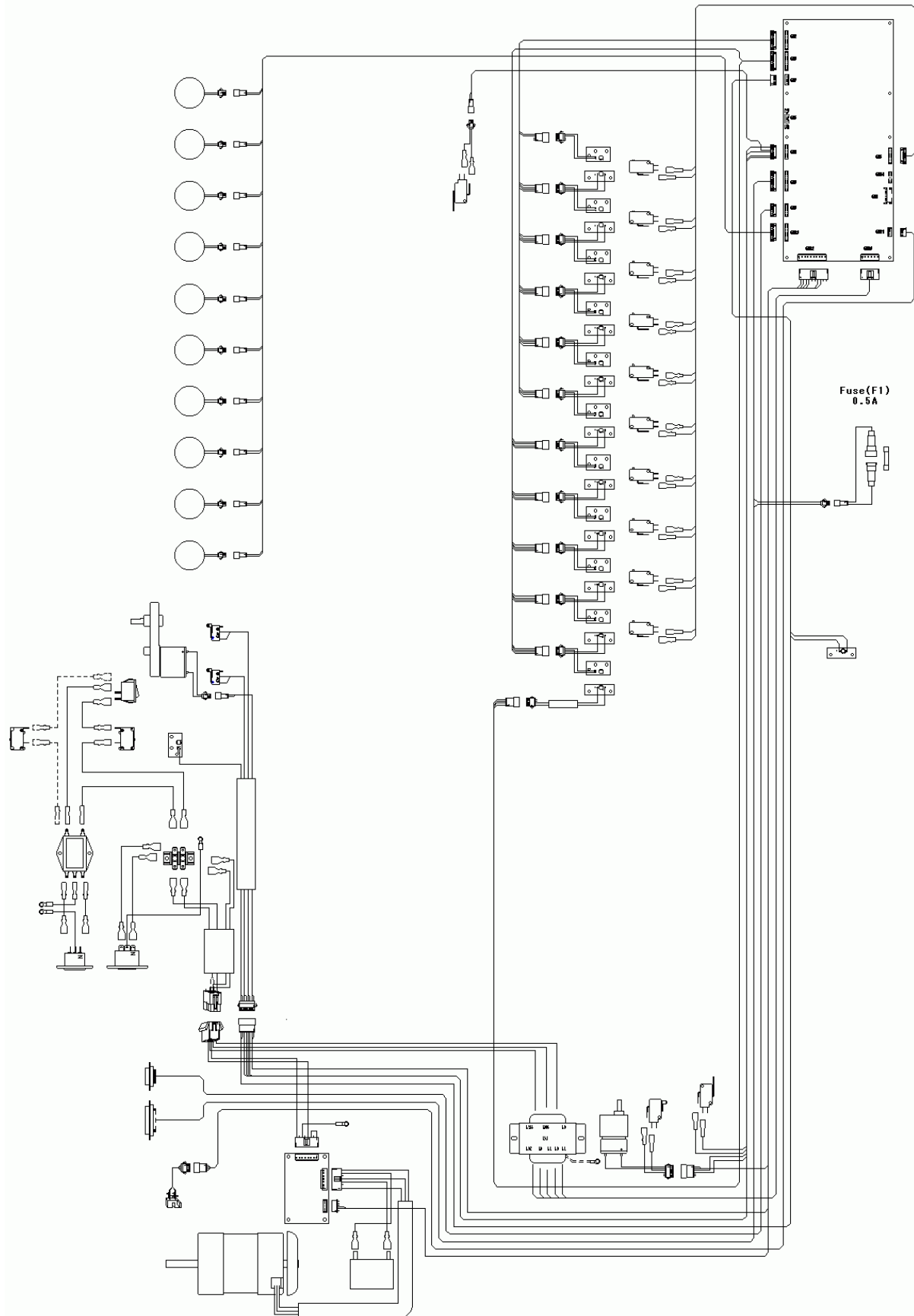
5.1 Operation circuit board



5.2 Speed control circuit board

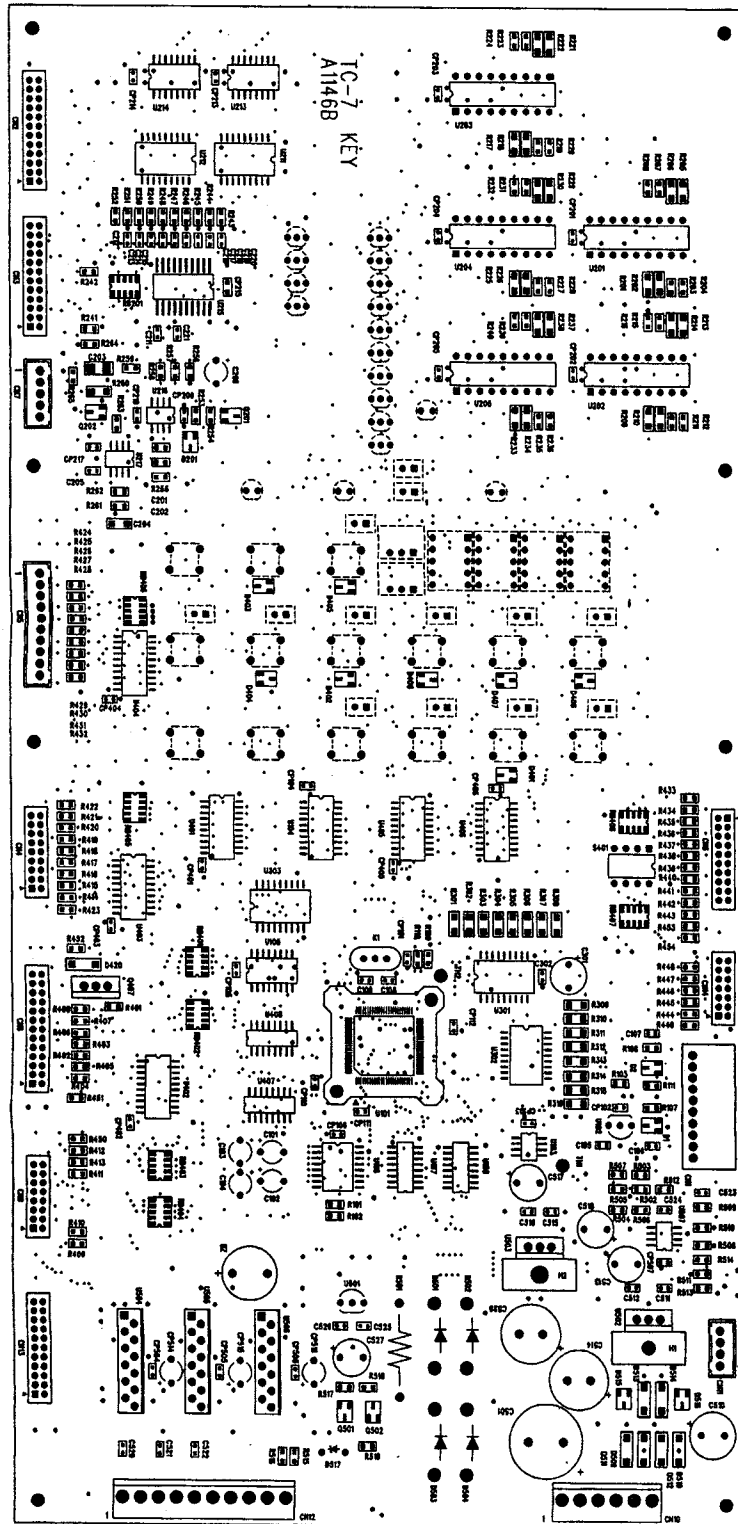


6. WIRING DIAGRAM

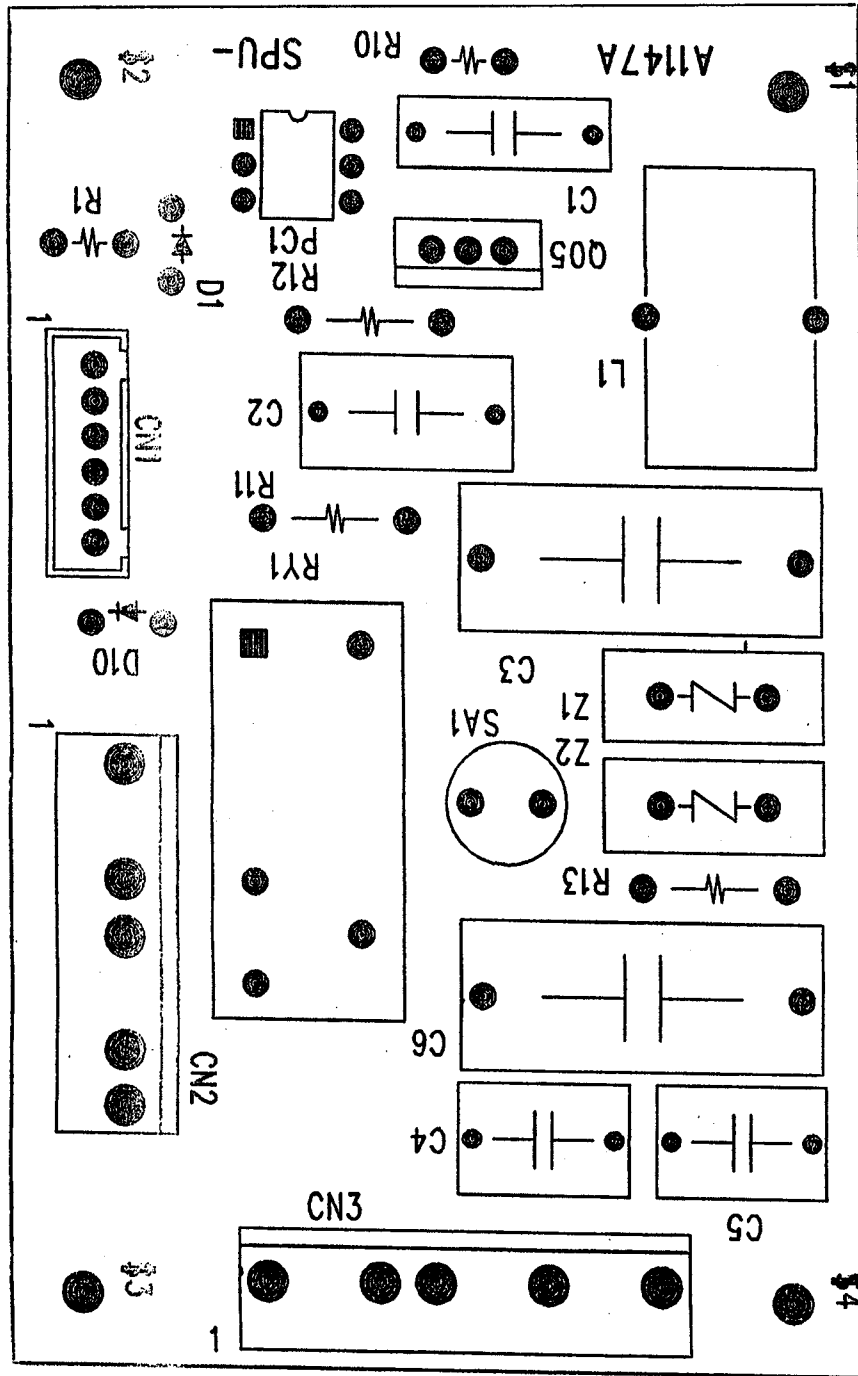


7. CIRCUIT BOARD DIAGRAM

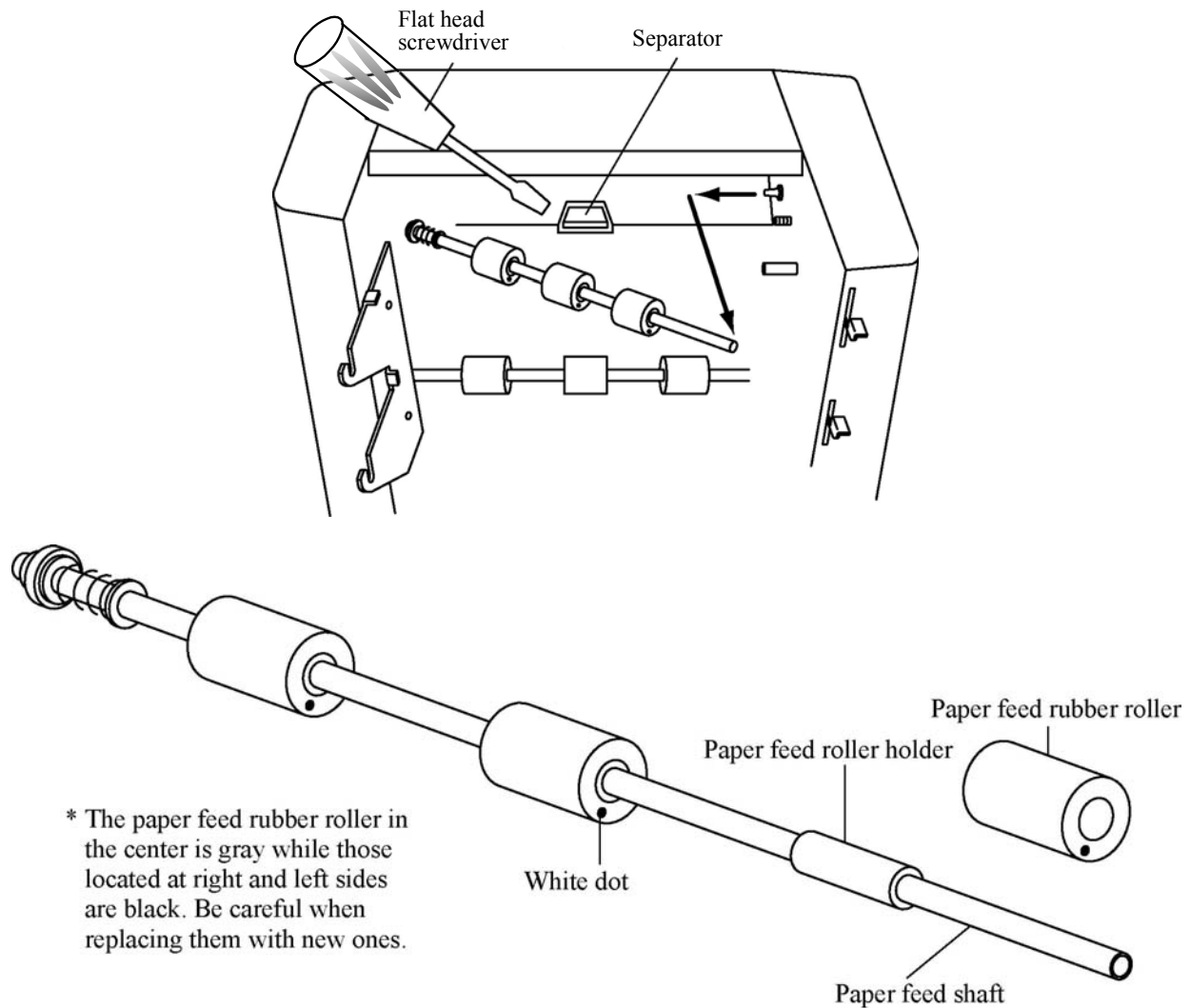
7.1 Operation board



7.2 Speed control circuit board



8. REPLACEMENT OF PAPER FEED RUBBER ROLLER AND SEPARATOR



- Replacement of paper feed rubber rollers

Remove the paper feed tables. While holding the paper feed shaft, push it into the left, then pull it toward you. If the paper feed rollers are dislocated, correct their positions; the center rubber roller should be located at the center of the separator.

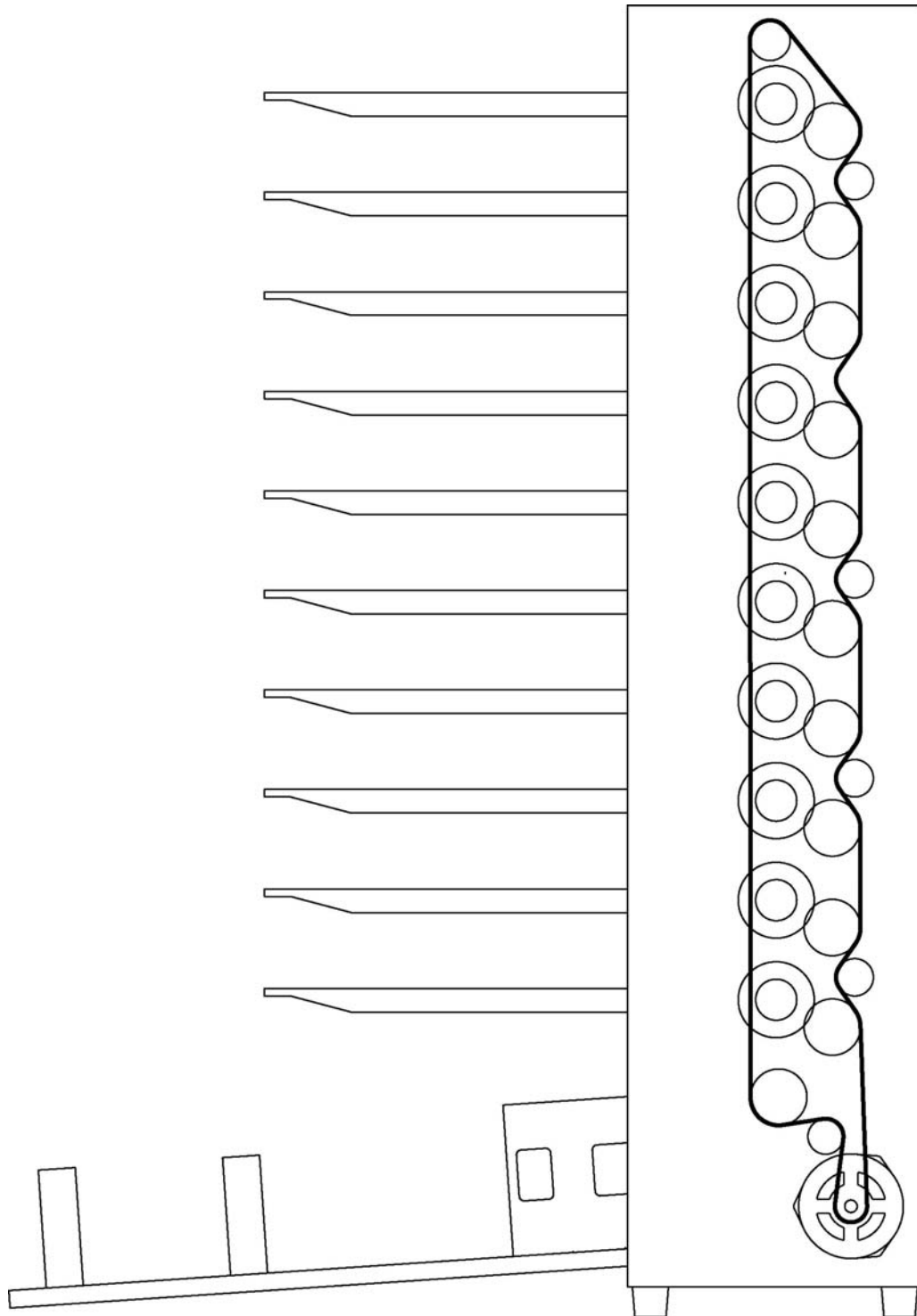
Caution!

When the paper feed rubber rollers are replaced, mount them on the paper feed rollers holders so that the white dot of the rubber rollers is on the right-hand side. In addition, after mounting the paper feed rollers on their holders, roll them on a flat surface such as a desktop to make sure they are mounted horizontally. If mounted askew, problems like paper feed failure or double feed may occur.

- Replacement of separators

After removing the paper feed shaft, remove only the rubber portion of the separator by stripping it off with a flat head screwdriver or the like.

9. DIAGRAM FOR BELT INSTALLATION



10. TEST MODE

10.1 How to set test mode

Test mode is aimed at checking various machine functions individually.

- (1) Turn the power on while pressing the **RESET** and **CHECK** keys simultaneously.
- (2) The counter displays [C-] and the test mode is set.

10.2 Test mode functions

While the test mode is on, the following six modes can be selected by pressing the MODE key. This manual explains only where checking can be made concerning the collator machine body.

Mode	Content	Remarks
C	Checking the collator machine body	
L	Checking the function of the left side connector	
r	Checking the function of the right side connector	
P	Checking the stapler-puncher	Cannot be used when stapler-puncher is not connected.
S	Test sequence mode	Do not use this mode.
T	Durability operation mode	Do not use this mode

10.3 Checking the operation

Key operation	Function	Display	Remarks
SPEED/3	Changeover between high and low speeds	SPEED lamp lights /lights out	
CRISSCROSS/5	Crisscross operation	(CRISSCROSS lamp)	
PROGRAM/8	Main motor rotation	The counter displays revolution values.	
REPEAT/9	Transfer to the photo sensor check mode	—	
0	Setting of system constant	—	Refer to “System Constant” on pages 20-21.
CLEAR	All LEDs light.	All LEDs light.	
CHECK	Raising or lowering of paper feed table	— mark on. Third digit of the counter moves up and down.	
START	Paper feed clutch operation	—	
RESET	Main motor rotation	No change in display	
MODE	Checking the left side connector	—	

10.4 Check on sensor function

Display	Function	Remarks
Station 1 to 10 (Green lamp)	Status of paper switch at each station	The lamp of the station where paper is loaded lights.
Station 1 to 10 (Red lamp)	Status of paper feed photo sensor at each station	The lamp of the station where paper jam occurs lights.
DOOR lamp	State of the back door	It lights when the back door is open.
EJECT lamp	Status of paper ejection photo sensor	It lights when paper ejection photo-sensor is shut.
	Status of paper ejection direction	It lights when the ejection direction is set to the left.
ERROR (L) lamp	Status of the left side equipment	It lights when there is an error in the left side equipment.
ERROR (R) lamp	Status of the right side collator	It lights when there is an error in the right side equipment.
1000 LED	Display of the current mode	
100 LED	Status of the paper feed table	It shows "—" when it is at the upper limit. It shows "_" when it is at the lower limit. It shows "-" while it is halfway.
MODE lamp	Status of full stacking	It lights when paper is fully stacked.
SPEED lamp	Display of collation speed	It lights when high-speed collation is set.
CRISSCROSS lamp	Status of crisscross starting point switch	It lights when the switch is set at crisscross starting point.

10.5 Photo sensor check mode

While the photo sensor check mode is set, the status of the paper feed photo-sensor can be checked in details with the data displayed on the counter.

• Counter display

Counter	Display	What is meant	Remarks
Number in the fourth digit	Number of station	1 – 9: Paper feed photo for Stations 1 to 9 A: Paper feed photo for Station 10 b: Full stacking photo	
Number in the third digit	Photo-sensor light intensity	(Weak)1 – 9, A, b, C, d, E, F (strong)	It will not display while full stacking photo status is checked.
Number in the second and first digits	Photo-sensor output value	(Shading) 00 – FF (Penetration)	

• Key operation

Key	Function
1	Increase the number of station by one
7	Reduce the number of station by one
2	Increase light intensity by one
8	Reduce light intensity by one
MODE CHECK RESET START	Return to the CHECK mode of the main functions.

11. CHANGING THE SYSTEM CONSTANTS

System constants are aimed at allowing users to adjust the values required for operating the collator by themselves. While, taking advantage of them, users may optimize the machine operation according to the environment in which it is used, erroneous setting will cause the machine to malfunction.

Closest care should be taken when system constants are changed. .

11.1 Facts about system constants

(1) In order to move to system constants setting mode,

- 1) Start based on the normal mode
- 2) Keep pressing [0] key for three seconds
Then, the counter displays [P x] (x represents the current set value)
- 3)
 - Press the MODE key to move to next item.
 - Press the RESET key to move back to the previous item
 - Press the CHECK key to make a tentative setting
(The set value will return to the initial value when the power supply is cut off).
 - Press the START key to memorize the set value
(The altered value will be stored even if the power supply is cut off).

(2) List of system constants

Item	Function	Initial value	Contents
P	Adjustment of paper feed photo luminescence intensity 1 (All station adjustment)		Paper feed photo luminescence intensity can be set at 15 levels as: (Weak) 1 through 9, A, b, c, d, E, F (Strong) Adjustment applicable to all stations 1 through 10.
A	Double feed detection ON/OFF	A111	Changeover ON/OFF of double feed detection
L	Waiting time after paper is fed	L 3.0 *1	Setting of waiting time until next paper feed when post-processing equipment is connected.
n	Waiting time for response of paper ejection	n 5.0 *1	Setting of waiting time for response of paper ejection confirmation signal at collator side when post-processing equipment is connected.
b	Adjustment of paper feed photo luminescence intensity 2 (Each station adjustment)		Paper feed photo luminescence intensity can be set at 15 levels. It can be set at each station separately. Display of power frequency. (In case 60 Hz is used, a decimal point lights on the third digit)
C	Right side ejection SOL ON time	C448	Time in which paper feed roller is rotating for feeding paper (when paper is ejected to right side).
d	SOL ON Interval 1	d180	Interval until the clutch placed at lower level starts to move (when paper is ejected to right side).
E	SOL ON Interval 2	E230	Not used
F	Left side ejection SOL On time	F448	Time in which paper feed roller is rotating for feeding paper (when paper is ejected to left side).
G	SOL ON Interval 1	G180 *1	Interval until the clutch placed at lower level starts to move (when paper is ejected to left side).
H	SOL ON Interval 2	H230 *1	Not used
S	Paper feed time lag 1 when two collators are connected	S170	Interval until the right tower starts paper feed and the left tower does the same when two collators are collated.
U	Time lag 2	U120	Not used
o	Paper feed photo light-receipt sensitivity	o 11	No alteration allowed
r	Initial value of photo check time	r358	No alteration allowed
SH	—	SH30	Not used
SL	Set value for low speed	SL20	No alteration allowed
J	Left side ejection when there is no cable connected with the post-processing equipment	J000	J000 ⇒ Ejection not allowed J010 ⇒ Ejection allowed
Y	Error logic	y000	(Refer to the relevant page)

*1: Four system constants as L, n, G, H vary according to the type of post-processing equipment.

System constant	Post-processing equipment		
	None	SP-21	Stacker
L	L 3.0	L 0.0	L 0.7
n	n 5.0	n 3.0	n 3.0
G	G180	G230	G190
H	H230	H230	H230

11.2 Adjustment of the paper feed photo luminescence intensity

Adjustment will be required if the followings occur when the CHECK key is pressed to feed paper.

- (A) The station lamp flashes red (due to excess or lack of luminescence intensity)
- (B) The EMPTY FEED lamp lights though the paper is fed.

In case of (A),

Remove the error display and press the CHECK key again. Then, the collator will automatically adjust the luminescence intensity. This check operation may be repeated several times according to the luminescence intensity and the type of paper to be used.

In case the red lamp flashes every time, it is recommended to reset the luminescence intensity. In such case, the following procedures should be taken.

- 1) Repeat checking procedures until error does not occur (luminescence intensity)
- 2) Press 0 key for three seconds to set the system constants setting mode. ([P x] will be displayed)
- 3) Press the START key to memorize the amended value of luminescence intensity.

In case of (B),

In case luminescence intensity is too strong against the paper thickness, it may occur that the light penetrates the paper, resulting in empty feed error. In this case, luminescence intensity must be reduced manually. The following procedures should be taken.

- 1) Press [0] key for three seconds to set the system constants setting mode ([P x] will be displayed)
- 2) Lower the value of luminescence intensity on display.

Press the [4] key to increase the value by one.

Press the [0] key to reduce the value by one.

*1: The appropriate value of luminescence intensity is 3 to 4 (in case 64kg/m² paper is used). Use this value for standard. Take care as the value varies according to the sensitivity of paper feed photo, quality of paper used, and printing condition.

*2: The value of luminescence intensity indicated herein is that for Station 1. The right value for Station 1 may not always be appropriate for other stations. If the value of P is altered, the same value will be set at all other stations.

- 3) Press the START key to memorize the amended value of luminescence intensity.

Press the CHECK key for temporary setting (The set value will return to the initial value when the power supply is cut off).

Press the START key to memorize the set value (The altered value will be stored even if the power supply is cut off).

11.3 Releasing double feed detecting function

In case double feed cannot be detected since paper used is too thick (Err3), collation can be continued by canceling double feed detection function.

- (1) Press [0] key for three seconds ([P x] will be displayed).
- (2) Press the [MODE] key to display [A xxx] (xxx represents the current set value).
- (3) Press the [1] key to display “0” in the third digital figure.
- (4) Press the CHECK key or START key to reflect the change.

Press the CHECK key for temporary setting

(The set value will return to the initial value when the power supply is cut off).

Press the START key to memorize the set value

(The altered value will be stored even if the power supply is cut off).

11.4 Initializing the system constant (return to factory-set value)

In case the machine work becomes unstable after the system constants are altered for adjustment, the system constant can be returned to the factory-set values.

- (1) Turn off the power of the collator.
- (2) While pressing the CLEAR key, turn on the power.

Caution!

With this initializing procedures, all set values including those for Insert and Chit modes are deleted and returned to the factory-set values.

Necessary data should be jotted down before deletion and used for re-setting.

11.5 Supplementary explanation of system constants by purpose

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Explanation of System Constant Setting by Symptom and Purpose

1. The station lamp blinks in red at check (System constant P)

Double feed detection cannot be performed at check. Accordingly, the lamp blinks in red at check when the sensitivity of the paper feed photo sensor does not match the applied paper.

The red lamp blinking condition is classified into 2 cases by paper quality and sensor sensitivity.

1. The sensor sensitivity is weak for paper thickness

In this case, the station lamp blinks more slowly than blinking counter [Err].

- (1) Clear the error and make a check again. With this, the collator adjusts the sensitivity automatically.
- (2) Set the system constant P value to a stronger value so that this value may be proper.

The above 2 countermeasures are available.

2. The sensor sensitivity is stronger for paper thickness.

In this case, the station lamp repeats 3-time blinking. (This is slightly faster than blinking counter [Err].)

- (1) Clear the error and make a check again. With this, the collator adjusts the sensitivity automatically.
- (2) Set the system constant P value to a weaker value so that this value may be proper.

The above 2 countermeasures are available.

When the sensor sensitivity is too strong for paper thickness, the presence of paper may not be detected. In this case, the only countermeasure to be taken is to manually set the system constant P value to a weak value.

The system constant P adjusts the sensor sensitivity by operating the output of the luminous side of the paper feed photo sensor. For the system constant P, 15 different values can be set as below.

1, 2, 3, 4, 5, 6, 7, 8, 9, A, b, c, d, E, F
(Weak ←—————→ Strong)

Indication		Operation	Remarks
Counter	Contents of indication		
1000 digit	P	—	
1 digit	Current luminous intensity	Increment by 1 with the “4” key. Decrement by 1 with the “0” key.	

2. Canceling double feed detection (System constant A)

There is a rare possibility that the sensitivity of the paper feed photo sensor may not be fitted to paper by adjusting the paper feed photo sensor with the system constant P. At this time, cancel double feed detection to attain a paper feed as a temporary measure.

Double feed detection can be canceled by setting the system constant A.

Indication		Operation	Remarks
Counter	Contents of indication		
1000 digit	A	—	
100 digit	All-station double feed detection ON/OFF	Switch with the “1” key.	“1”: Double feed detection ON “0”: Double feed detection OFF
10 digit	Individual station indication	Increment the station by 1 with the “2” key Decrement the station by 1 with the “8” key	
1 digit	Individual-station double feed detection ON/OFF	Switch with the “3” key.	“-“ is indicated at whole double feed detection OFF.

3. Changing the paper feed wait time at connection of an option (System constant L)

When a post-process machine such as a booklet maker is connected, the paper feed cycle of collator may be made shorter or longer in some cases. In these cases, the time from the passage of paper through the paper feed photo sensor at the end till the execution of the next paper feed (*1) at collator side can be adjusted in the range of 0 to 60 seconds by operating the system constant L.

*1: In case of paper ejection to the booklet maker (in case of connection with KAS or Plockmatic booklet maker) without control, the electric signal is not communicated between the collator and the booklet maker. Therefore, the paper feed waiting time (L value) is directly reflected. On the other hand, in case of paper ejection to the booklet maker with electric signal Communication (in case of Foldnak booklet maker), the time after a paper eject response signal output from Foldnak until the next paper feeding starts is set as the paper feed waiting time (L value).

Indication		Operation	Remarks
Counter	Contents of indication		
1000 digit	L	—	
100 digit	Paper feed wait time	Ten-key	Ten-key
10 digit			
1 digit			

4. A left error occurs though a normal process has been performed when using a large-capacity stacker or Foldnak. (System constant n)

In a machine such as a large-capacity stacker and Foldnak that returns a paper ejection response to the collator, a left (option device) error may be caused to the collator though the paper process has been normally performed.

In such a case, the occurrence of an error may be suppressed by adjusting the system constant n.

Indication		Operation	Remarks
Counter	Contents of indication		
1000 digit	n	—	
100 digit	Paper ejection response wait time	Ten-key	
10 digit			
1 digit			

Note:

When the system constant L to adjust the paper feed interval is set to a large value, the wait time for the next paper feed (system constant L) may exceed the paper ejection response wait time (system constant n). In such a case, a left error will occur though the paper process has been normally performed. Set the system constant n value to “System constant L + 1.0” or more.

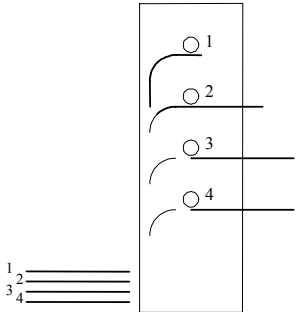
The system constant n varies depending on the connected device.

- Basic value: [n 5.0].
- When a stapler-puncher or large-capacity stacker is connected: [n 3.0]

5. Changing the paper interval between stations at connection with after processing machine (System constant G)

When the booklet maker is connected, the interval of paper feed timing with the next station can be changed. In some case, it may be necessary to determine which should first come out, the paper from the top station or the paper from the bottom station. In this case, it may be attained by operating the system constant G.

1 Aligning the paper ends

When the system constant G is set to 180 for the 60 Hz regions, paper will come out with the paper ends almost aligned.	
--	--

2. Causing the upper-station paper to first come out (*)

When the system constant G is set to a larger value than 180, the upper-station paper will first come out. To feed paper to an after processing machine such as booklet maker in which a transfer roller/belt is placed under the paper, use the above setting.	
--	--

* Note: For the right paper ejection, the same setting can be performed by the d value. The paper stacked on the first-station shelf comes out first but is ejected to the bottom of an ejected collation set on crisscross stacker.

3. Causing the lower-station paper to first come out (*)

When the system constant G is set to a smaller value than 180, the lower-station paper will first come out. For such an after processing machine in which paper alignment is performed by paper jumping as a large-capacity stacker or a jogger, use this setting. However, note that when the system constant G is set to 0, a paper feed cannot be normally performed.	
---	--

* Note: For the right paper ejection, the same setting can be performed by the d value. The paper stacked on the bottom-station shelf comes out first but is ejected to the bottom of a collated set on crisscross stacker.

Indication		Operation	Remarks
Counter	Contents of indication		
1000 digit	G	—	
100 digit	Paper feed interval for right paper ejection	Ten-key	
10 digit			
1 digit			

Note: How much does the ejected sheet-to-sheet distance shift if the system constant G is incremented or decremented by 1?

The space of the paper feed table of the collator is a distance of 3.1" for each station. Aligning paper ends delays a paper feed by 3.1" each for each station.

From calculation with the G value (160/180) at a paper feed with the paper ends aligned, the following shift amount is caused by incrementing or decrementing the system constant G by 1.

$$\text{For the 60 Hz region: } 3.1" \div 180 = 0.02"$$

However, the ejected sheet-to-sheet distance varies greatly depending on the paper feed condition.

- Wear of the paper feed roller/separator
- Feed paper slip amount
- Feed paper collapse amount

Due to the above factors, the ejected sheet-to-sheet distance may be different from what is calculated. Make an adjustment referring to this numeric value.

6. Adjusting the paper feed timing between the left and right towers at 2-tower connection (System constant S)

When 2 collators are connected, it may be necessary to adjust the paper feed timing of the right tower and the left tower. After adjusting the ejected sheet-to-sheet distance of each station of each tower (refer to the system constant G), adjust the system constant S. With this, the paper feed timing can be adjusted between the left and right towers. Operating only by the left tower is enabled.

1. Align the paper heads of a collated set from each tower

Set the system constant S value to 170 to align the paper heads from the left and right towers.

2. Causing the paper of the left tower to first come out

Set the system constant S value to a small value to cause the paper of the left tower to come out earlier than the right tower.

3. Causing the paper of the left tower to later come out

Set the system constant S value to a large value to cause the paper of the left tower to come out later than the right tower.

Indication		Operation	Remarks
Counter	Contents of indication		
1000 digit	S	—	
100 digit	Paper feed timing of the left tower at 2-tower connection	Ten-key	
10 digit			
1 digit			

Note: How much does the feed timing of one collated set from the left tower shift if the system constant S is shifted by 1?

A ten-fold value of the reference value of the system constant G is used for the system constant S value. Accordingly, when the numeric value is shifted by 1, the following shift is caused.

For the 60 Hz region: $0.02" \times 10 = 0.2"$

Regarding this value, an error will be caused depending on the paper feed condition like the system constant G.

However, the shift amount of paper feed-out timing changes greatly depending on the paper feed condition.

- Wear of the paper feed roller/separator
- Feed paper slip amount
- Feed paper collapse amount
- Transfer speed difference between the left and right towers
- Slip at seizure of the connected transfer section

Due to the above factors, the shift amount may be different from what is calculated. Make an adjustment referring to this numeric value.

7. Ejecting paper to the left side without an external connector (System constant J)

If the paper ejection side is switched over to the left side in the status where a connecting cable for the post-process machine is not connected, the collator does not eject paper. The above specification is intended to prevent a misoperation. However, operating the system constant J permits ejecting paper to the left side without an external connector.

Indication		Operation	Remarks
Counter	Contents of indication		
1000 digit	J	—	
10 digit	Paper ejection to the left enabled/disabled without connector	“3” key	“1”: Paper ejection to the left is enabled. “0”: Paper ejection to the left is disabled.

8. Changing the error output method (System constant y-1)

The collator changes the error output of the left connector at occurrence of an error. In some cases, however, it may be necessary to reverse this ON/OFF operation depending on the device including the booklet maker. Operating the system constant y permits reversing the ON/OFF operation of error output.

Indication		Operation	Remarks
Counter	Contents of indication		
1000 digit	y	—	
100 digit	Paper ejection response input method	“2” key	
10 digit	Error input method	“3” key	
1 digit	Error output method	“4” key	“1”: OPEN at occurrence of an error “0”: 0 V at occurrence of an error

Note: The error output of the collator is a transistor output.

Transistor operation	Voltage output	Current	Remarks
ON	0 V	Flow	A current of up to 50 mA can be caused to flow.
OFF	OPEN	No flow	A voltage of up to 30 V can be applied.

9. Changing the error input method (System constant y-2)

When various after processing machines including a booklet maker are connected, there is the case that it may be necessary to reverse the error input method of the collator side depending on the after processing machine because the error output operation is fixed. Operating the system constant y permits reversing the error input method of the collator.

Indication		Operation	Remarks
Counter	Contents of indication		
1000 digit	y	—	
100 digit	Paper ejection response input method	“2” key	
10 digit	Error input method	“3” key	
1 digit	Error output method	“4” key	“1”: Error at 5 V “0”: Error at 0 V

Note: The error input of the collator is pulled up to 5 V. Accordingly, when no device is connected, 5 V is input.

10. Changing the paper ejection response method (System constant y-3)

When the after processing machine is connected, there is the case that it may be necessary to reverse the paper ejection response input method of the collator side depending on the after processing machine because the paper ejection output operation is fixed. Operating the system constant y permits reversing the paper ejection response input method of the collator.

Indication		Operation	Remarks
Counter	Contents of indication		
1000 digit	y	—	
100 digit	Paper ejection response input method	“2” key	“1”: Ready at 5 V “0”: Ready at 0 V
10 digit	Error input method	“3” key	
1 digit	Error output method	“4” key	

Note: The paper ejection response input of the collator is pulled up to 5 V. Accordingly, when no device is connected, 5 V is input.

11.6 System constant table when a post-process machine is connected (1/2)

System constant	Function	Initial value	USF -2300	Foldnak 4	Foldnak 6,8	Kas 2000/5000	PL-61	ST-31	Effect of system constant	
									Reducing the value	Increasing the value
P	Paper feed photo sensor luminous intensity (All stations)	P 3or4	*	*	*	*	*	*	Working with thin paper	Working with thick paper
A	Double feed detection ON/OFF	A 111	*	*	*	*	*	*	Double feed detection OFF at "0"	Double feed detection ON at "1"
L	Wait time after paper is fed	L 3.0	L 2.0	L 1.0	L .0	*	L 2.0	L 0.5 (☆1)	Shortening the paper feed interval	Elongating the paper feed interval
n	Wait time for response of paper ejection	n 5.0	*	*	*	*	*	n 3.0 (※1)	Shortening the paper ejection response wait time	Elongating the paper ejection response wait time
b	Paper feed photo sensor luminous intensity (All stations)	b1xx	*	*	*	*	*	*	Working with thin paper	Working with thick paper
C	Paper feed clutch ON time (Right paper ejection)	C448	*	*	*	*	*	*	Shortening the paper feed clutch ON time	Elongating the paper feed clutch ON time
d	Paper feed clutch ON Interval (Right paper ejection)	d 180	*	*	*	*	*	*	Shortening the paper feed clutch ON interval	Elongating the paper feed clutch ON interval
E	Unused	E 230	*	*	*	*	*	*	—	—
F	Paper feed clutch ON time (Left paper ejection)	F 448	*	*	*	*	*	*	Shortening the paper feed clutch ON time	Elongating the paper feed clutch ON time
G	Paper feed clutch ON interval (Left paper ejection)	G 180	*	*	*	*	*	*	Shortening the paper feed clutch ON interval	Elongating the paper feed clutch ON interval
H	Unused	H 230	*	*	*	*	*	*	—	—

11.6 System constant table when a post-process machine is connected (2/2)

S	Left-tower paper feed interval	S 170	*	*	*	*	*	*	Making left-tower paper feed faster at 2-unit connection	Making left-tower paper feed slower at 2-unit connection
U	Unused	U 120	*	*	*	*	*	*	—	—
o	Paper feed photo sensor light receiving sensitivity	o 11	*	*	*	*	*	*	Lowering the paper feed sensitivity at “0”	Raising the paper feed sensitivity at “1”
r	Initial value of paper feed photo sensor check time	r 420	*	*	*	*	*	*	Shortening the paper feed photo sensor check time at check	Elongating the paper feed photo sensor check time at check
SH	Unused	SH 30	*	*	*	*	*	*	—	—
SL	Unused	SL 20	*	*	*	*	*	*	—	—
J	Left paper ejection without connector	J 000	*	*	*	*	*	*	Disabling left paper ejection without connector at J000	Enabling left paper ejection without connector at J010
y	Error output logic	y 000	*	*	*	*	*	*	—	—

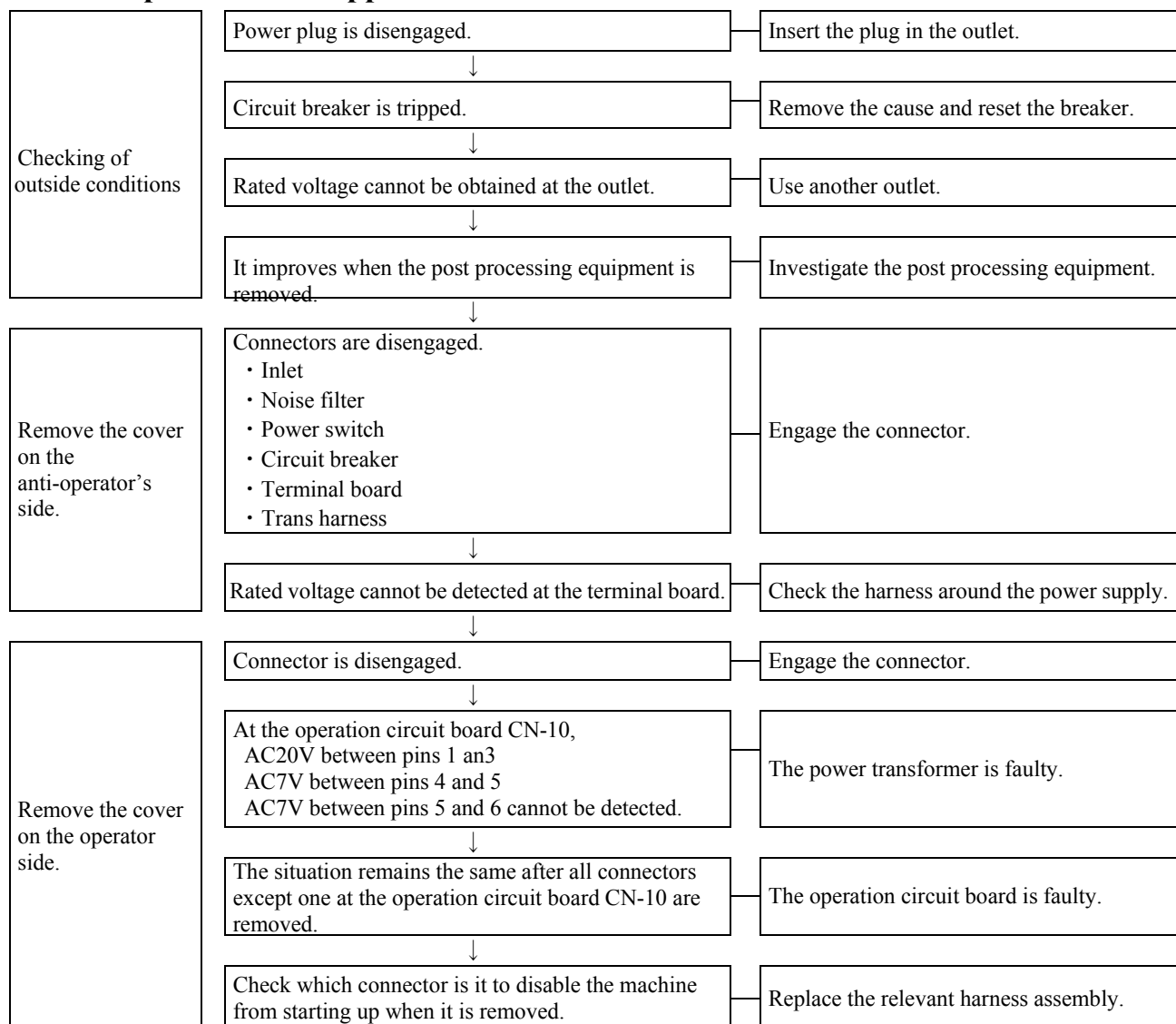
Notes:

Do not change the set point marked *.

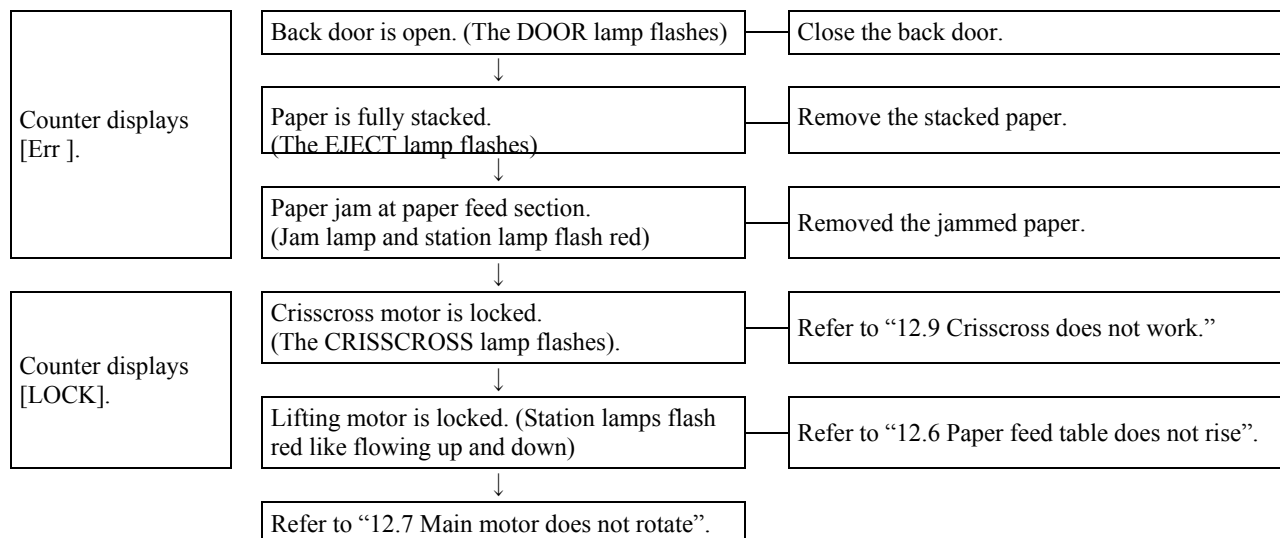
☆1: The set point is automatically changed.

12. TROUBLESHOOTING

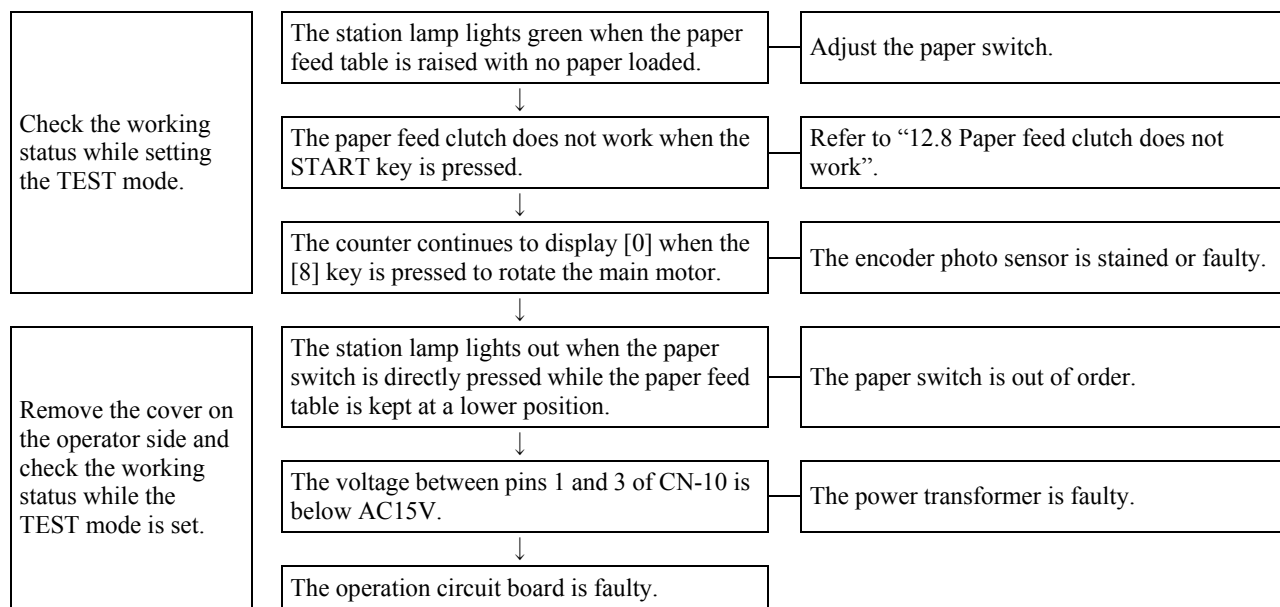
12.1 The power is not supplied.



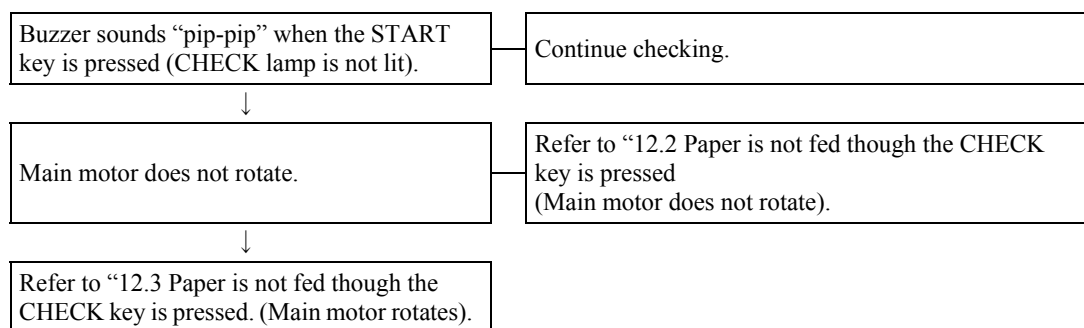
12.2 Paper is not fed though the CHECK key is pressed (Main motor does not rotate).



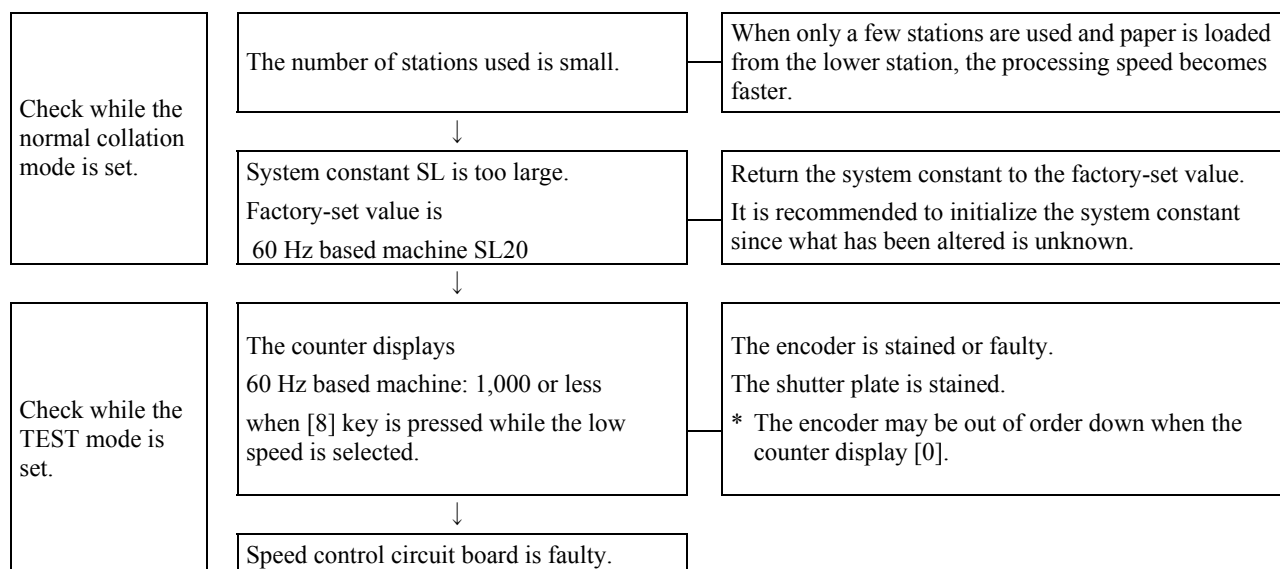
12.3 Paper is not fed though the CHECK key is pressed (Main motor rotates).



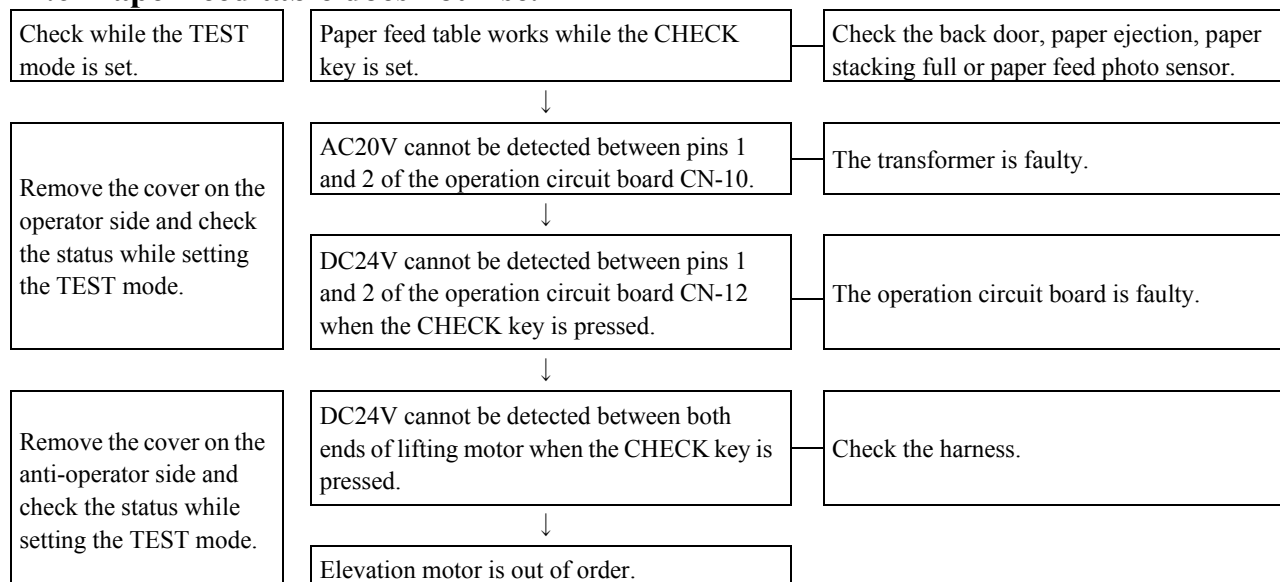
12.4 Paper is not fed though the START key is pressed.



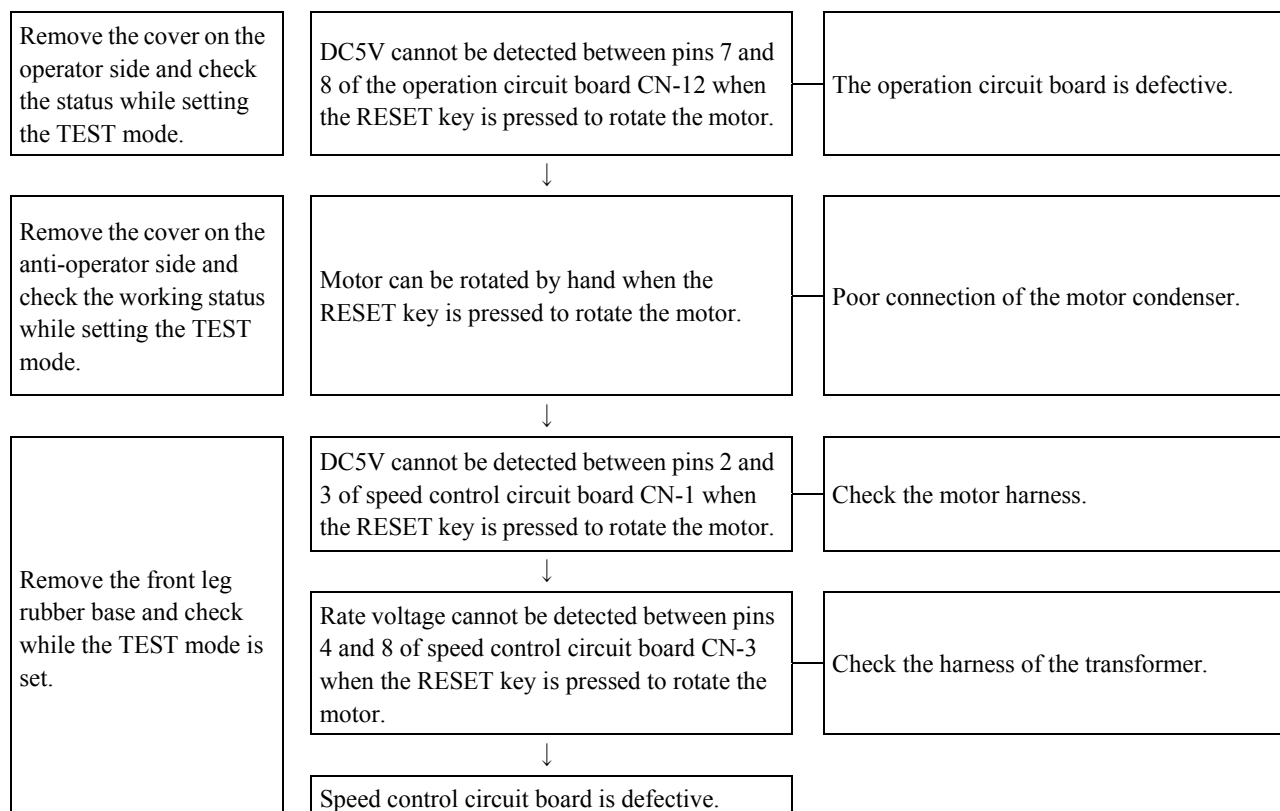
12.5 Processing speed does not reduce while the low speed is selected.



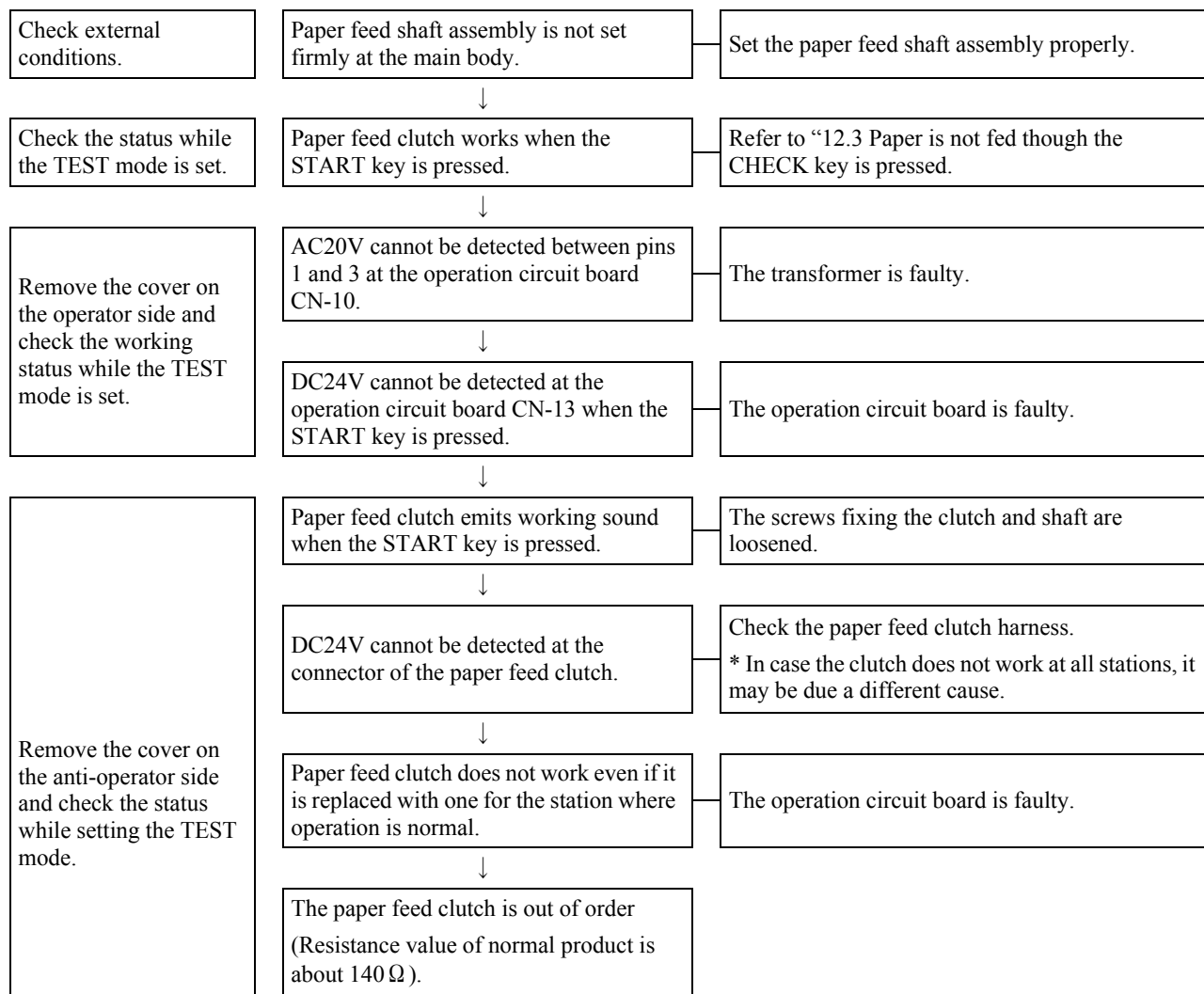
12.6 Paper feed table does not rise.



12.7 Main motor does not rotate.



12.8 Paper feed roller does not rotate.



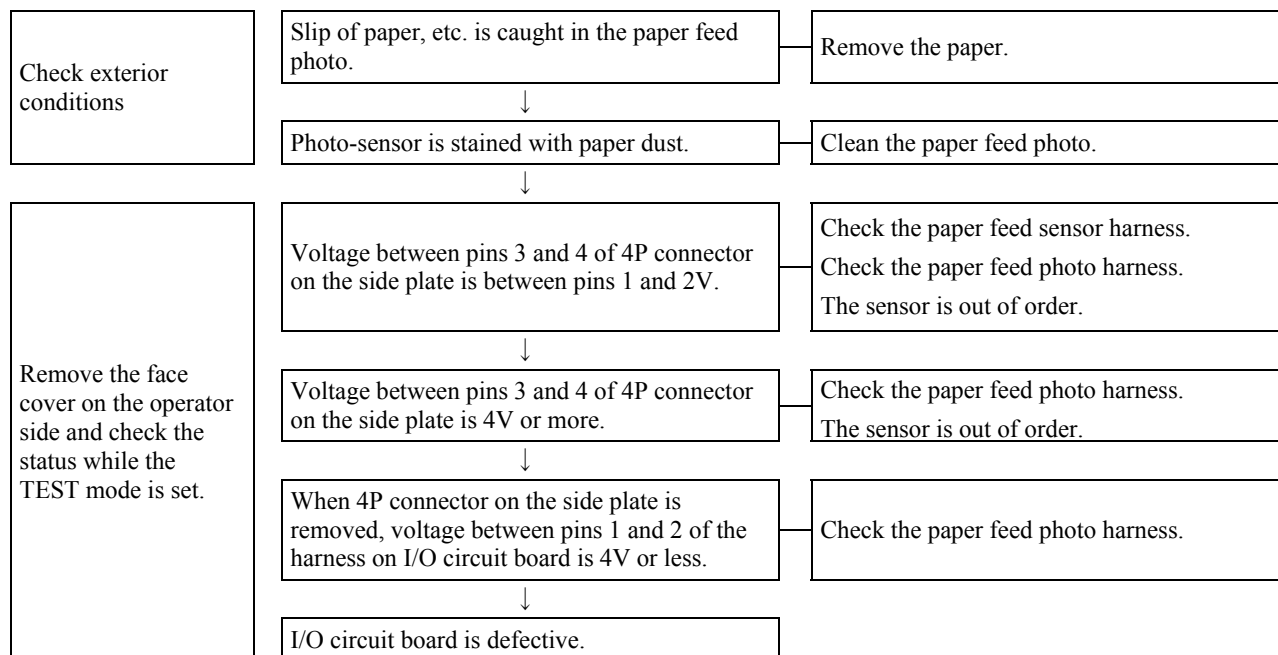
12.9 Crisscross does not work.

Check external conditions	CRISSCROSS lamp is not lit.	Set the crisscross mode ON.
	It works if stacking table is removed.	Set the stacking table properly.
Remove the cover on the operator side and check the working status while setting the TEST mode.	AC20V cannot be detected between pins 1 and 3 of the operation circuit board CN-10.	The transformer is faulty.
	Motor emits sound when the CRISSCROSS key is pressed.	Loosening of mechanical part.
	DC24V cannot be detected between pins 3 and 4 of the operation circuit board CN-12 while the CRISSCROSS key is	The operation circuit board is faulty.
	DC24V cannot be detected between pins 1 and 2 of the crisscross relay connector while the CRISSCROSS key is pressed.	Check the motor harness.
	Resistance value of crisscross motor is between 50 and 150 Ω .	The operation circuit board is faulty.
	Crisscross motor is out of order.	

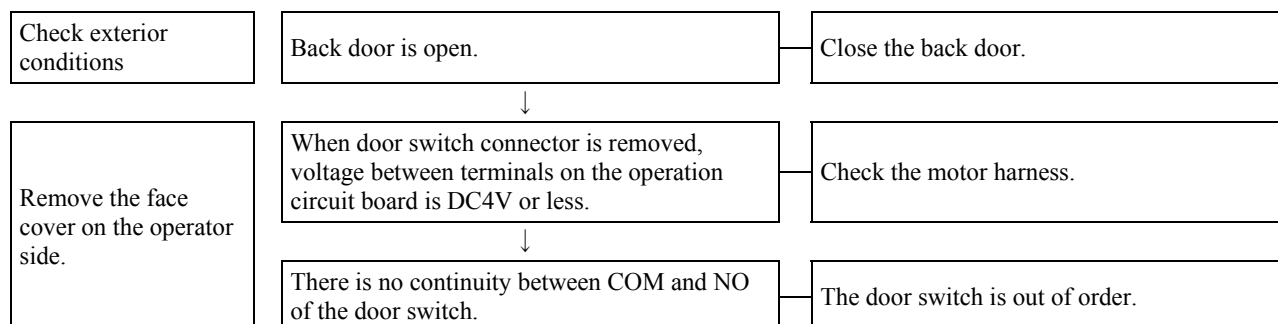
12.10 EJECT lamp remains lit.

Check exterior conditions	Stacking table is full.	Remove the paper.
	It lights out if the stacking table is removed.	The stacking table is not properly set. Check if the machine is installed on a level floor.
	The machine is exposed to direct sunlight.	Place the machine at a different place. Take an appropriate measure to shield it against the direct sunlight.
Check the status while the TEST mode is set.	EJECT lamp lights while the TEST mode is set.	Clean the paper stacking (ejection) sensor. The paper stacking (ejection) sensor is defective.
	The value of photo check mode b is 0 or less.	Clean the full stacking sensor. Full stacking sensor is defective.

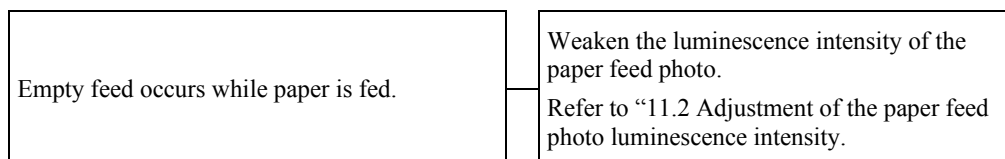
12.11 Station lamp lights red.



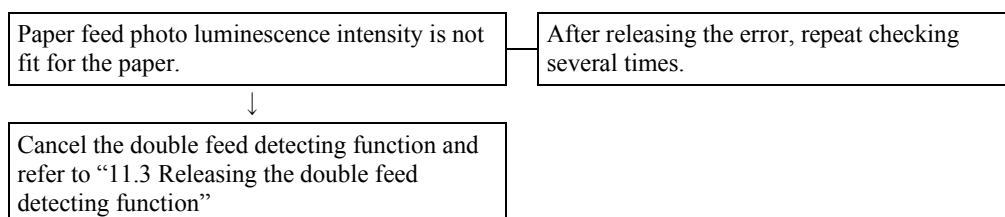
12.12 DOOR lamp remains lit.



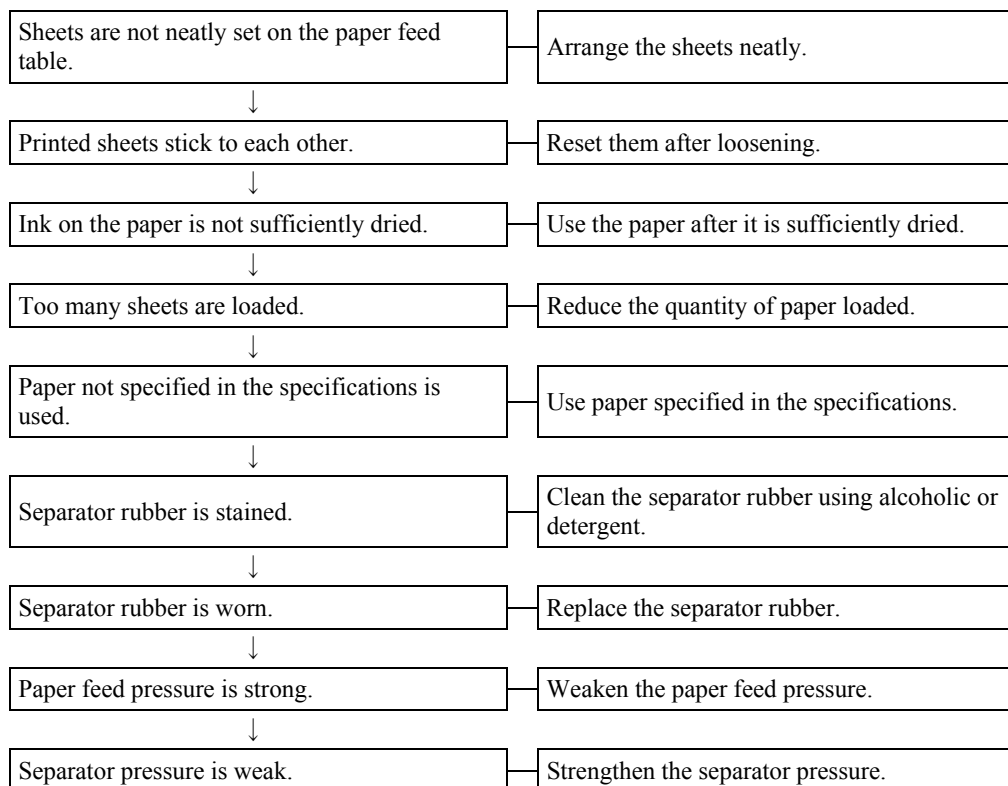
12.13 Empty feed occurs while paper is fed.



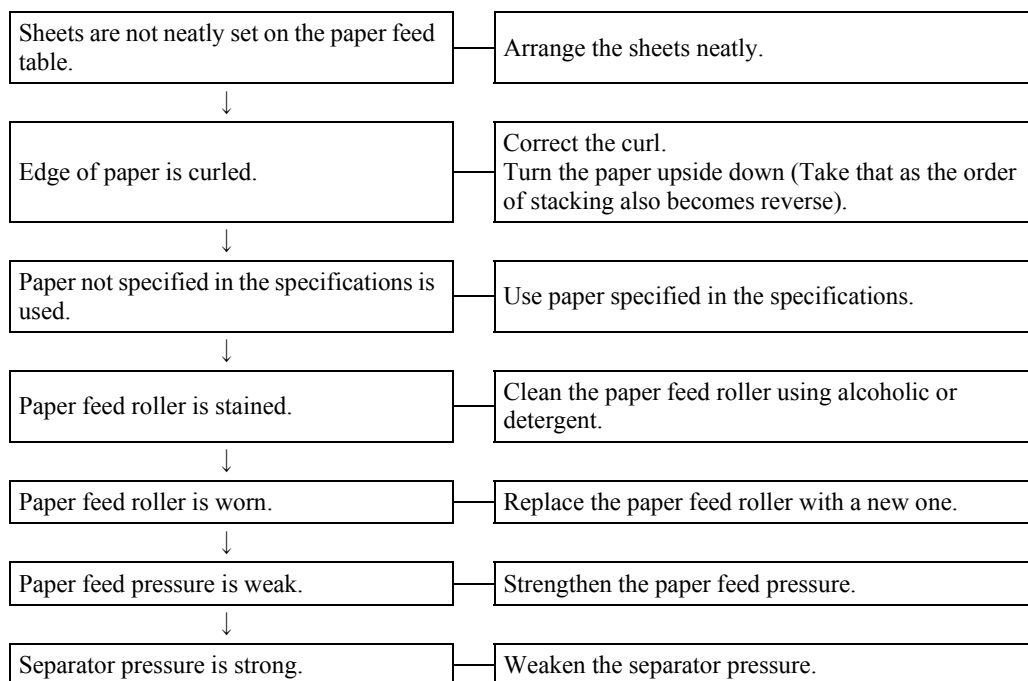
12.14 Station lamp flashes red while checking.



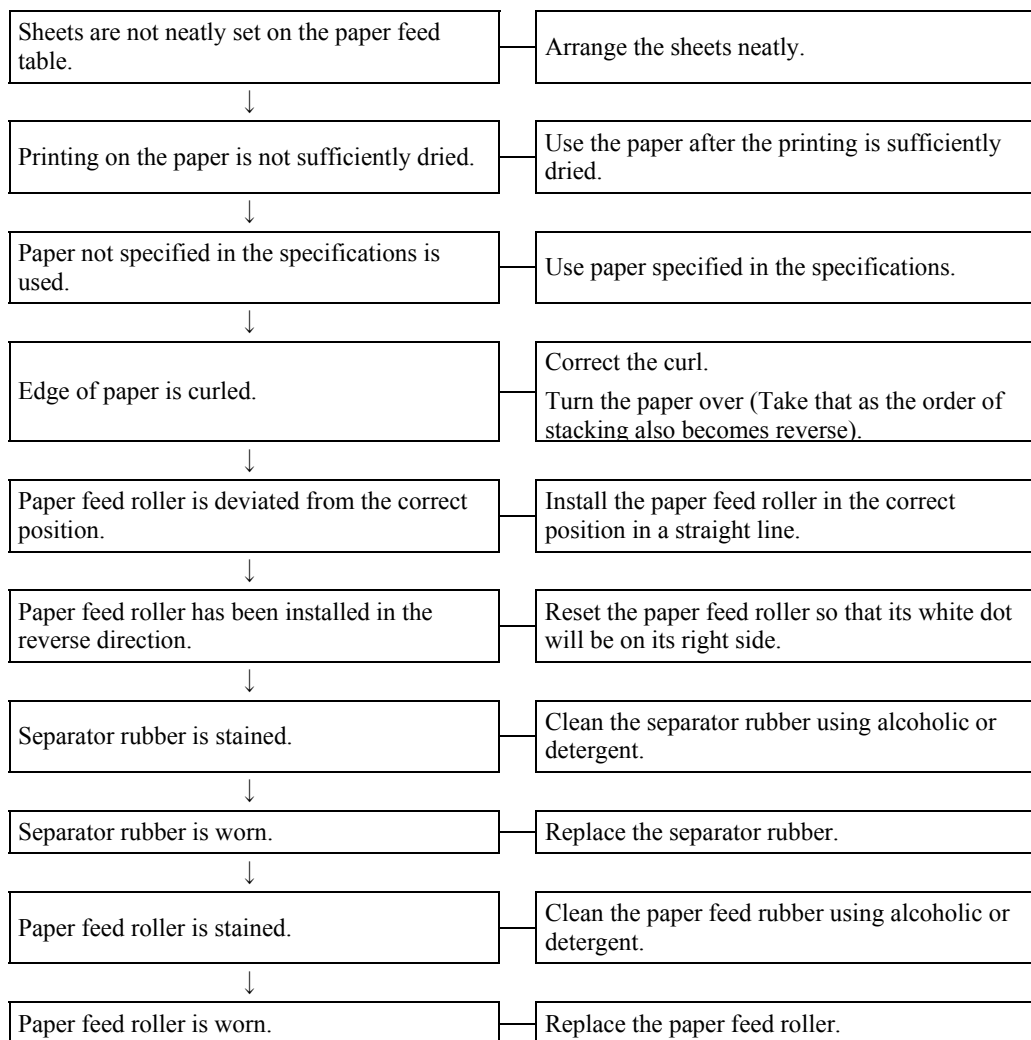
12.15 Double feed frequently occurs.



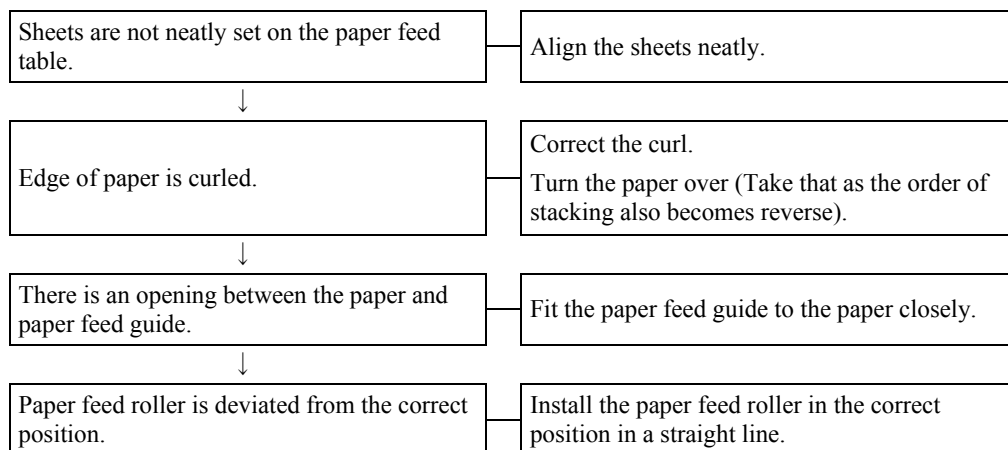
12.16 Empty feed frequently occurs.



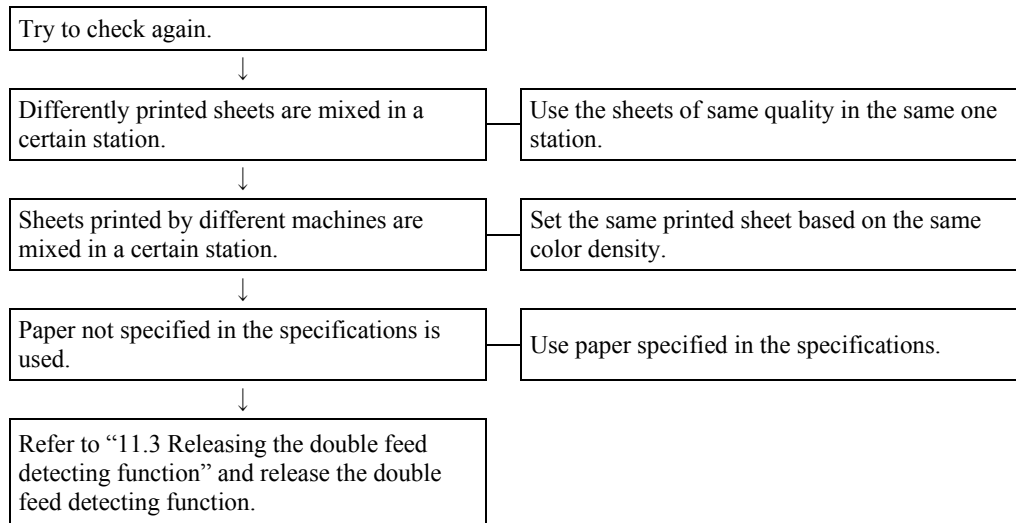
12.17 Empty feed or jam frequently occurs.



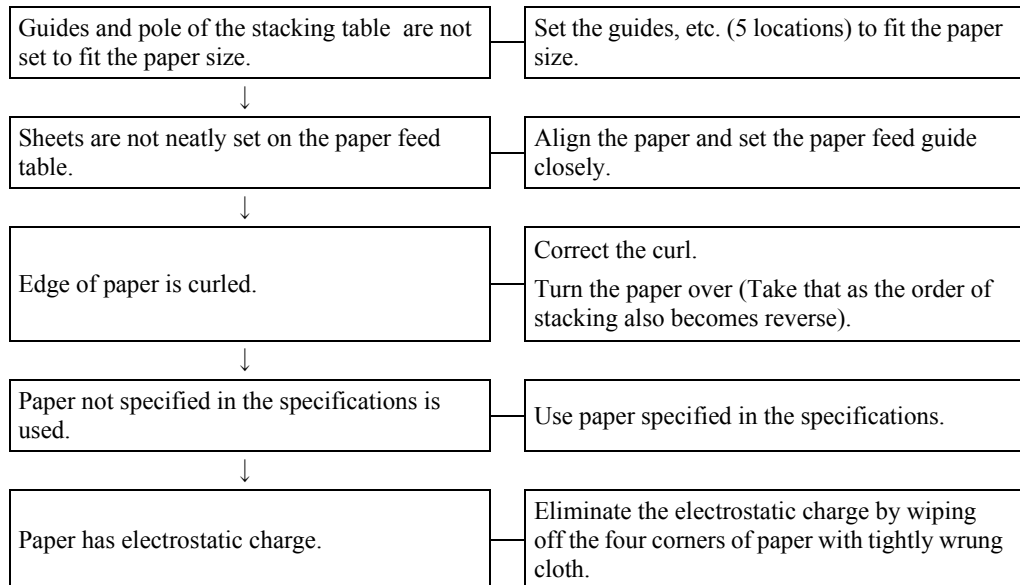
12.18 Paper is fed aslant.



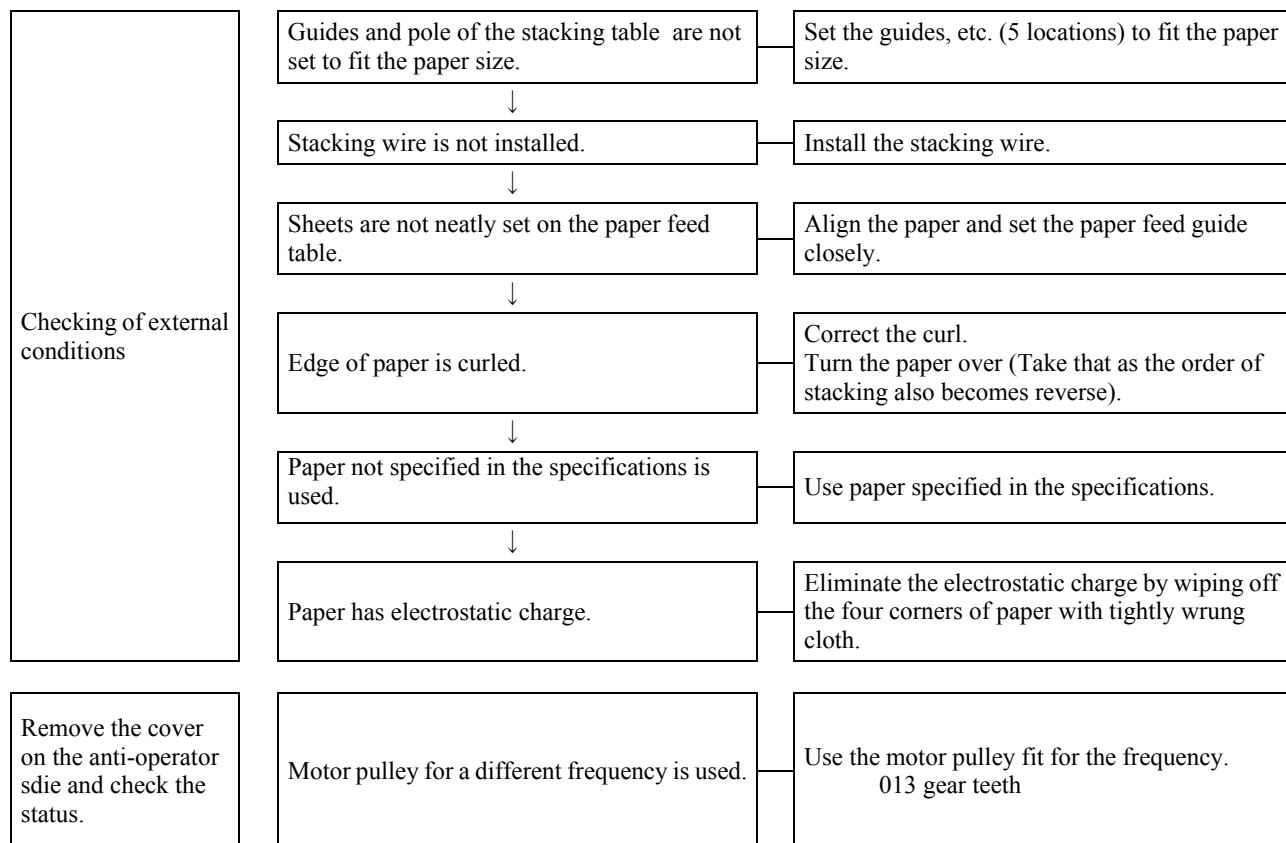
12.19 DOUBLE FEED lamp lights though a single sheet is fed.



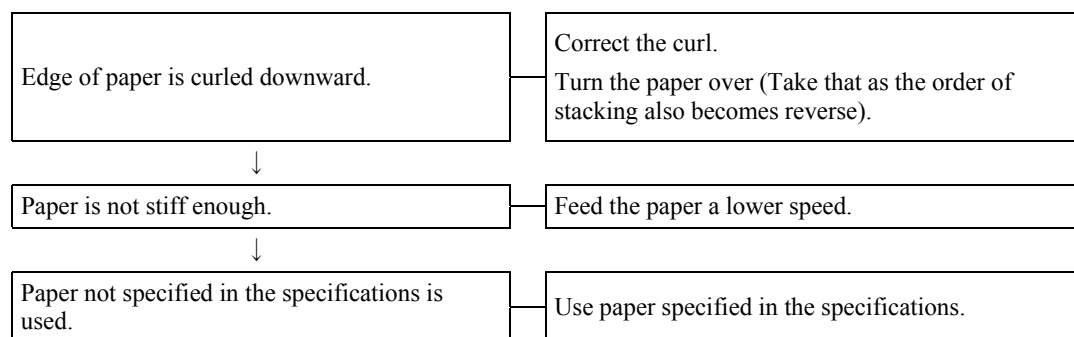
12.20 Paper jam frequently occurs.



12.21 Stacked paper is not neatly aligned.



12.22 Ejected paper edge is curled.



12.23 Ejected paper is stained.

