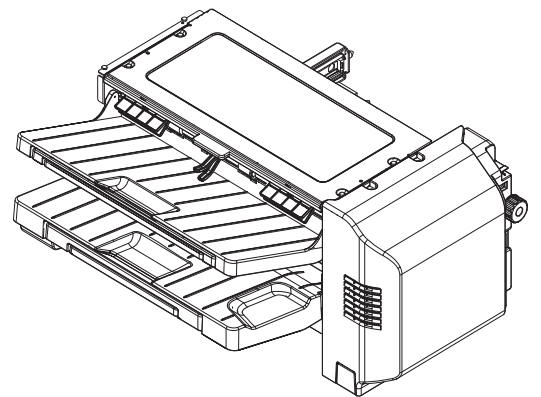


# TOSHIBA

# SERVICE MANUAL

## Inner Finisher / Hole Punch Unit

# MJ-1048 / MJ-6011



Model: MJ-1048/MJ-6011  
Publish Date: December, 2021  
File No. SME21002700  
R210221X3100-TTEC  
Ver00 F1 2022-03

## Trademarks

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# General Precautions for Installation, Servicing and Maintenance for this Option

**The installation and service shall be done by a qualified service technician.**

1. When installing this option to the MFP, be sure to follow the instructions described in the "Unpacking/Set-Up Procedure for the Equipment" booklet which comes with this option.
2. This option shall be installed by an authorized or qualified person.
3. The weight of MJ-1048 is approx. 15.3 kg(33.73 lb.) and MJ-6011 is approx. 3.4 kg(7.50 lb.), therefore pay full attention when handling them.
4. Before starting installation, servicing or maintenance work, be sure unplug the power cable of the MFP first.
5. The MFP with this option connected shall be installed near the socket outlet and shall be easily accessible.
6. Be sure to fix and plug in the power cable securely after the installation so that no one trips over it.
7. Unplug the power cable and clean the area around the prongs of the plug and socket outlet once a year or more. A fire may occur when dust lies on this area.
8. This option shall be grounded to the specified positions on the MFP frame.
9. When servicing or maintaining the MFP with this option connected, be careful about the rotating or operating sections such as gears, pulleys, sprockets, cams, belts, etc.
10. When the parts of this option are disassembled, reassembly is the reverse of disassembly unless otherwise noted in this manual or other related documents.  
Be careful not to install small parts such as screws, washers, pins, E-rings, star washers, harnesses in the wrong places.
11. Basically, the MFP with this option connected should not be operated with any parts removed or disassembled.
12. When servicing the MFP with this option connected while the power is turned ON, be sure not to touch live sections and rotating/operating sections.
13. Delicate parts for preventing safety hazard problems (such as fuses, thermofuses, door switches, sensors, etc. if any) should be handled, installed and adjusted correctly.
14. Tools and instruments
  - Use designated jigs and tools.
  - Use recommended measuring instruments or equivalents.
15. During servicing or maintenance work, be sure to check the nameplate and other cautionary labels (if any) to see if they are clean and firmly stuck. If not, take appropriate actions.
16. The ICs on the PC boards tend to be damaged by static electricity. Therefore, the PC boards must be stored in an anti-electrostatic bag and handled carefully using a wristband. Before using the antistatic wrist strap, unplug the power cable of the MFP and make sure that there are no charged objects which are not insulated in the vicinity.

- 17.Regarding the recovery and disposal of the MFP with this option connected, supplies, packing materials, follow the relevant local regulations or rules.
- 18.Return the MFP with this option connected to the original state and check the operation when the service is finished.
- 19.When this option is removed from the MFP due to malfunction or other reasons but no substitute one is to be installed, be sure to remove all the installation hardware from the MFP as well.
- 20.When the MFP is used after this option is removed, be sure to install the parts or the covers which have been taken off so that the inside of the MFP is not exposed.
- 21.Check the procedures and perform them as described in the Service Manual.
- 22.Make sure you do not lose your balance.
- 23.Avoid exposure to your skin and wear protective gloves as needed.
- 24.Do not leave plastic bags where children can get at them. This may cause an accident such as suffocation if a child puts his/her head into a bag. Plastic bags of options or service parts must be brought back.



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# 1. SPECIFICATIONS, ACCESSORIES AND CONSUMABLES

## 1.1 Specifications

### 1.1.1 Finisher section

Item		MJ-1048
Type		Inner finisher (2 trays)
Paper loading tray		Stationary tray, movable tray
Paper size	Standard size	A3, A4, A4-R, A5-R, A6-R, B4, B5, B5-R, FOLIO, LD, LG, LT, LT-R, ST-R, COMPUTER, 13"LG, 8.5"SQ, 8K, 16K, 16K-R, Special paper (transparency, label sheet, postcard, envelope, tab paper, tracing paper)
	Non-standard size	Long size (305 mm x 1200 mm), 320 mm x 460 mm, SRA3 (320 mm x 450 mm), A3 wide (305 mm x 457 mm), Full Bleed (12" x 18"), Cho-3 (120 mm x 235 mm), You-4 (235 mm x 105 mm), DL (110 mm x 220 mm), COM10 (4 1/8" x 9 1/2"), Monarch (3 7/8" x 7 1/2"), tab paper (A4, LT: tab width 10 mm to 20 mm)
Paper weight	Thin, Plain, Thick	52 g/m <sup>2</sup> to 280 g/m <sup>2</sup> , 16 lb. Bond - 150 lb. Index
Stacking mode		Simple, Job Offset, Staple, Composite <ul style="list-style-type: none"> <li>Mixed-size in the sort mode or offset mode: Same width only</li> <li>Mixed-size in the staple mode: Same width only</li> </ul>
Dimensions	With the sub tray retracted:	481.6 (W) x 507.5 (D) x 232.1 (H) mm
	With the sub tray pulled out:	686.8 (W) x 507.5 (D) x 232.1 (H) mm
Weight	Finisher section	Approx. 13.0 kg (28.66 lb.)
	Paper receiving section	Approx. 2.3 kg (5.07 lb.)
Power supply		DC 24 V ±10 % and DC 5 V ± 5 % supplied from the MFP
Power consumption	DC 24 V	With no hole punch unit installed: 53 W (6 A) or less, With the hole punch unit installed: 58 W (7 A) or less
	DC 5 V	With no hole punch unit installed: 3.0 W or less, With the hole punch unit installed: 3.5 W or less
Appearance color		Jet black
Stacking direction		Face-down

- Stacking height  
<Stationary tray>

Paper size		Stacking height*	Number of sheets (reference)		
			60 g/m <sup>2</sup> to 80 g/m <sup>2</sup> 16 lb. Bond to 21.3 lb. Bond	81 g/m <sup>2</sup> to 90 g/m <sup>2</sup> 22 lb. Bond to 23.9 lb. Bond	91 g/m <sup>2</sup> to 105 g/m <sup>2</sup> 24 lb. Bond to 28 lb. Bond
Plain, Thick	A4, A4-R, A5-R, A6-R, B5, B5-R, LT, LT-R, ST-R, 8.5"SQ, 16K, 16K-R	14 mm	100	89	76
	A3, B4, FOLIO, LD, LG, COMPUTER, 13"LG, 8K	7 mm	50	45	38

\* The maximum height is 7 mm for mixed-size paper stacking.

<Movable tray (Except for the staple stack mode)>

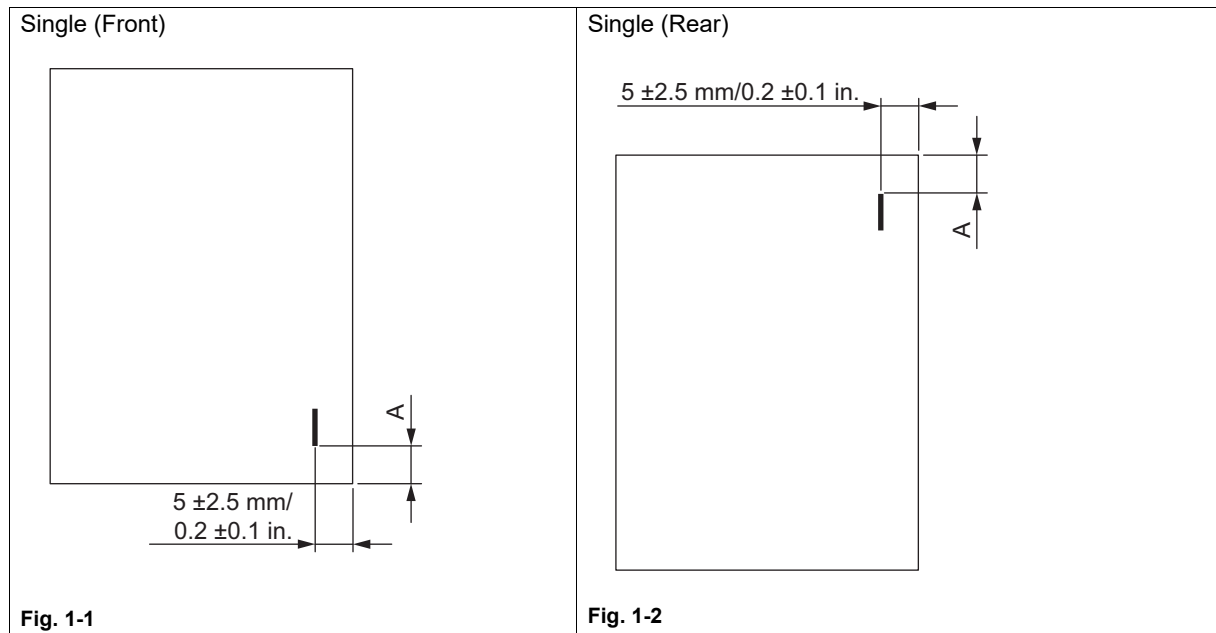
Paper size		Stacking height*	Number of sheets (reference)		
			60 g/m <sup>2</sup> to 80 g/m <sup>2</sup> 16 lb. Bond to 21.3 lb. Bond	81 g/m <sup>2</sup> to 90 g/m <sup>2</sup> 22 lb. Bond to 23.9 lb. Bond	91 g/m <sup>2</sup> to 105 g/m <sup>2</sup> 24 lb. Bond to 28 lb. Bond
Plain, Thick	A4, A4-R, A5-R, A6-R, B5, B5-R, LT, LT-R, ST-R, 8.5"SQ, 16K, 16K-R	73 mm	500	444	381
	A3, B4, FOLIO, LD, LG, COMPUTER, 13"LG, 8K	36 mm	250	222	191

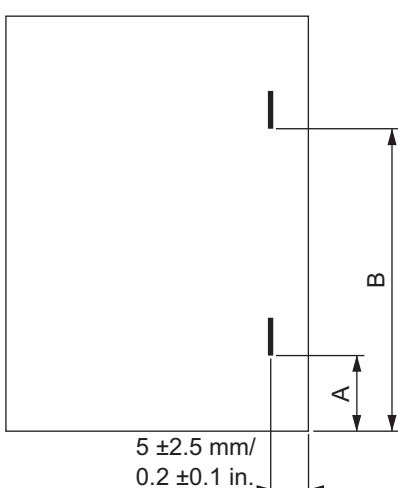
\* The maximum height is 36 mm for mixed-size paper stacking.

<Movable tray (For the staple stack mode)>

Paper size		Stacking height	Number of sheets (reference)
			60 g/m <sup>2</sup> to 80 g/m <sup>2</sup> 16 lb. Bond to 21.3 lb. Bond
Plain, Thick	A4, A4-R, A5-R, A6-R, B5, B5-R, LT, LT-R, ST-R, 8.5"SQ, 16K, 16K-R	73 mm	When reaching 500 sheets or 50 sets
	A3, B4, FOLIO, LD, LG, COMPUTER, 13"LG, 8K	36 mm	When reaching 250 sheets or 25 sets

- Stapling position



<p>Two-position stapling</p>  <p style="text-align: center;"><math>5 \pm 2.5 \text{ mm} / 0.2 \pm 0.1 \text{ in.}</math></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Paper size</th> <th>Distance</th> <th>Single (Front), Single (Rear)</th> <th>Two-position stapling</th> </tr> </thead> <tbody> <tr> <td rowspan="2">A3 A4</td> <td>A</td> <td>4.5 mm ± 2.5 mm</td> <td>90.0 mm ± 4 mm</td> </tr> <tr> <td>B</td> <td>-</td> <td>196.0 mm ± 4 mm</td> </tr> <tr> <td rowspan="2">A4-R FOLIO</td> <td>A</td> <td>4.5 mm ± 2.5 mm</td> <td>46.5 mm ± 4 mm</td> </tr> <tr> <td>B</td> <td>-</td> <td>152.5 mm ± 4 mm</td> </tr> <tr> <td rowspan="2">B4 B5</td> <td>A</td> <td>4.5 mm ± 2.5 mm</td> <td>70.0 mm ± 4 mm</td> </tr> <tr> <td>B</td> <td>-</td> <td>176.0 mm ± 4 mm</td> </tr> <tr> <td rowspan="2">B5-R</td> <td>A</td> <td>4.5 mm ± 2.5 mm</td> <td>32.5 mm ± 4 mm</td> </tr> <tr> <td>B</td> <td>-</td> <td>138.5 mm ± 4 mm</td> </tr> <tr> <td rowspan="2">LD LT</td> <td>A</td> <td>4.5 mm ± 2.5 mm</td> <td>81.2 mm ± 4 mm</td> </tr> <tr> <td>B</td> <td>-</td> <td>187.2 mm ± 4 mm</td> </tr> <tr> <td rowspan="2">LG LT-R 8.5"SQ 13"LG</td> <td>A</td> <td>4.5 mm ± 2.5 mm</td> <td>49.4 mm ± 4 mm</td> </tr> <tr> <td>B</td> <td>-</td> <td>155.5 mm ± 4 mm</td> </tr> <tr> <td rowspan="2">COMPUTER</td> <td>A</td> <td>4.5 mm ± 2.5 mm</td> <td>70.1 mm ± 4 mm</td> </tr> <tr> <td>B</td> <td>-</td> <td>176.1 mm ± 4 mm</td> </tr> <tr> <td rowspan="2">8K 16K</td> <td>A</td> <td>4.5 mm ± 2.5 mm</td> <td>76.5 mm ± 4 mm</td> </tr> <tr> <td>B</td> <td>-</td> <td>182.5 mm ± 4 mm</td> </tr> <tr> <td rowspan="2">16K-R</td> <td>A</td> <td>4.5 mm ± 2.5 mm</td> <td>39.0 mm ± 4 mm</td> </tr> <tr> <td>B</td> <td>-</td> <td>145.0 mm ± 4 mm</td> </tr> </tbody> </table>	Paper size	Distance	Single (Front), Single (Rear)	Two-position stapling	A3 A4	A	4.5 mm ± 2.5 mm	90.0 mm ± 4 mm	B	-	196.0 mm ± 4 mm	A4-R FOLIO	A	4.5 mm ± 2.5 mm	46.5 mm ± 4 mm	B	-	152.5 mm ± 4 mm	B4 B5	A	4.5 mm ± 2.5 mm	70.0 mm ± 4 mm	B	-	176.0 mm ± 4 mm	B5-R	A	4.5 mm ± 2.5 mm	32.5 mm ± 4 mm	B	-	138.5 mm ± 4 mm	LD LT	A	4.5 mm ± 2.5 mm	81.2 mm ± 4 mm	B	-	187.2 mm ± 4 mm	LG LT-R 8.5"SQ 13"LG	A	4.5 mm ± 2.5 mm	49.4 mm ± 4 mm	B	-	155.5 mm ± 4 mm	COMPUTER	A	4.5 mm ± 2.5 mm	70.1 mm ± 4 mm	B	-	176.1 mm ± 4 mm	8K 16K	A	4.5 mm ± 2.5 mm	76.5 mm ± 4 mm	B	-	182.5 mm ± 4 mm	16K-R	A	4.5 mm ± 2.5 mm	39.0 mm ± 4 mm	B	-	145.0 mm ± 4 mm
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<b>Fig. 1-3</b>																																																																				

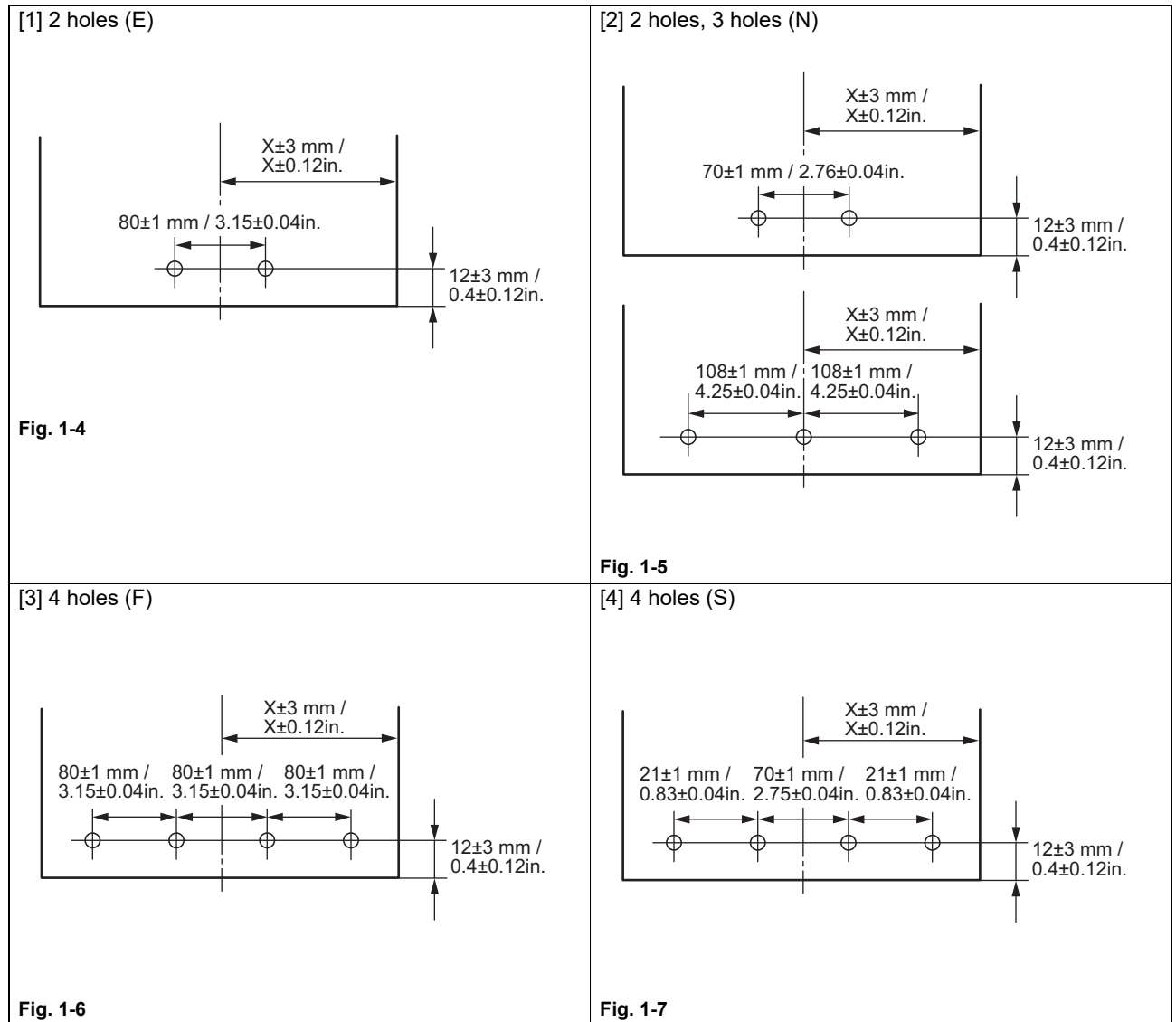
	Item	MJ-1048	Remarks
Acceptable paper size for stapling	Single (Front)	A3, A4, A4-R, B4, B5, B5-R, FOLIO, LD, LG, LT, LT-R, COMPUTER, 13"LG, 8.5"SQ, 8K, 16K, 16K-R	Stapling is not available for paper in sizes other than listed in the left column.
	Single (Rear)	A3, A4, A4-R, B4, B5, B5-R, FOLIO, LD, LG, LT, LT-R, COMPUTER, 13"LG, 8.5"SQ, 8K, 16K, 16K-R	
	Two-position stapling	A3, A4, A4-R, B4, B5, B5-R, FOLIO, LD, LG, LT, LT-R, COMPUTER, 13"LG, 8.5"SQ, 8K, 16K, 16K-R	

Item			MJ-1048	Remarks
Acceptable paper weight for stapling			60 to 105g/m <sup>2</sup> 16 lb. Bond to 28 lb.Bond	
Acceptable number of sheets for stapling	A4, A4-R, B5, B5-R, LT, LT-R, 8.5"SQ, 16K, 16K-R	60 g/m <sup>2</sup> to 80 g/m <sup>2</sup> 16 lb. Bond to 21.3 lb.Bond	50	Two sheets of the cover page (106 g/m <sup>2</sup> to 209 g/m <sup>2</sup> , 28 lb. Bond to 77.3 lb. Cover) can be included.
		81 g/m <sup>2</sup> to 90 g/m <sup>2</sup> 21.4 lb. Bond to 23.9 lb.Bond	50	
		91 g/m <sup>2</sup> to 105 g/m <sup>2</sup> 24 lb. Bond to 28 lb.Bond	30	
	A3, B4, FOLIO, LD, LG, COMPUTER, 13"LG, 8K	60 g/m <sup>2</sup> to 80 g/m <sup>2</sup> 16 lb. Bond to 21.3 lb.Bond	30	
		81 g/m <sup>2</sup> to 90 g/m <sup>2</sup> 21.4 lb. Bond to 23.9 lb.Bond	30	
		91 g/m <sup>2</sup> to 105 g/m <sup>2</sup> 24 lb. Bond to 28 lb.Bond	15	
Staple loading			Exclusive cartridge	
Manual stapling			Function not included	

## 1.1.2 Hole punch section

Item	MJ-6011		Remarks
Destination	E	2 holes	Europe, Japan, China
	N	2 holes and 3 holes automatically switched	North America
	F	4 holes	France
	S	4 holes	Sweden
Punching method	Sequential punching		
Hole position correction system	Provided		
Paper size	E	A3, A4, A4-R, B4, B5, B5-R, FOLIO, LD, LG, LT, LT-R, COMPUTER, 13"LG, 8.5"SQ, 8K, 16K, 16K-R	
	N	2 holes: A4-R, B4, B5, B5-R, FOLIO, LG, LT-R, COMPUTER, 13"LG, 8.5"SQ, 16K-R	
		3 holes: A3, A4, LD, LT, 8K, 16K	
	F	A3, A4, LD, LT, 8K, 16K	
	S	A3, A4, A4-R, B4, B5, B5-R, FOLIO, LD, LG, LT, LT-R, COMPUTER, 13"LG, 8.5"SQ, 8K, 16K, 16K-R	
Paper weight	64 g/m <sup>2</sup> to 128 g/m <sup>2</sup> (17 lb. Bond to 34 lb. Bond)		Punching is not available for transparency, label sheet, postcard, envelope, tab paper and tracing paper.
Punched hole diameter	E	φ6.5 mm (φ0.256 in.)	
	N	φ8.0 mm (φ0.315 in.)	
	F	φ6.5 mm (φ0.256 in.)	
	S	φ6.5 mm (φ0.256 in.)	
Punch waste container capacity	Approx. 1,000 sheets		80 g/m <sup>2</sup> (21.3 lb. Bond) or equivalent
Dimensions	126.3 (W) x 463.3 (D) x 174.1 (H) mm		
Weight	Approx. 3.4 kg (7.50 lb.)		
Power supply	DC 24 V ±10 %, DC 5 V ±5 % supplied from the Finisher		
Appearance color	Jet black		

- Hole position



X:

A3, A4	148.5 mm / 5.85 in.
B4, B5	128.5 mm / 5.06 in.
A4-R, FOLIO	105 mm / 4.13 in.
B5-R	91 mm / 3.58 in.
LD, LT	139.5 mm / 5.5 in.
LG, LT-R, 13"LG, 8.5"SQ	108 mm / 4.25 in.
COMPUTER	128.5 mm / 5.06 in.
8K, 16K	135 mm / 5.31 in.
16K-R	97.5 mm / 3.84 in.



## 1.2 Accessories

### 1.2.1 Finisher section

	MJ-1048
Unpacking/Setup Instructions	1 set
Paper receiving section	1 pc.
Paper receiving section position fixing bracket	1 pc.
Rail	1 pc.
Rail fixing bracket	1 pc.
Rail stopper (paper feeding side)	1 pc.
Rail stopper (paper exiting side)	1 pc.
Inner Finisher installation cover	1 pc.
Inner Finisher installation rear cover	1 pc.
Support bracket	1 pc.
Stabilizer	2 pcs.
Harness cover	1 pc.
Front cover	1 pc.
Screw: BID M3x4	12 pcs.
Screw: BID M3x17	1 pc.
Screw: TPAN M3x10	3 pcs.
Clip	1 pc.

### 1.2.2 Hole punch section

	MJ-6011
Unpacking/Setup Instructions	1 set
Bridge transport unit	1 pc.
Finisher front cover	1 pc.
Finisher rear cover	1 pc.
Locking bracket	1 pc.
Drawer bracket	1 pc.
Screw: BID M3x4	8 pcs.
Harness clamp	1 pc.

## 1.3 Consumables

Staple cartridge for the finisher section

\* Exclusive cartridge (STAPLE-2400: 5,000 staples x 3 cartridges per 1 box)



## 2. OVERVIEW

### 2.1 Main Components

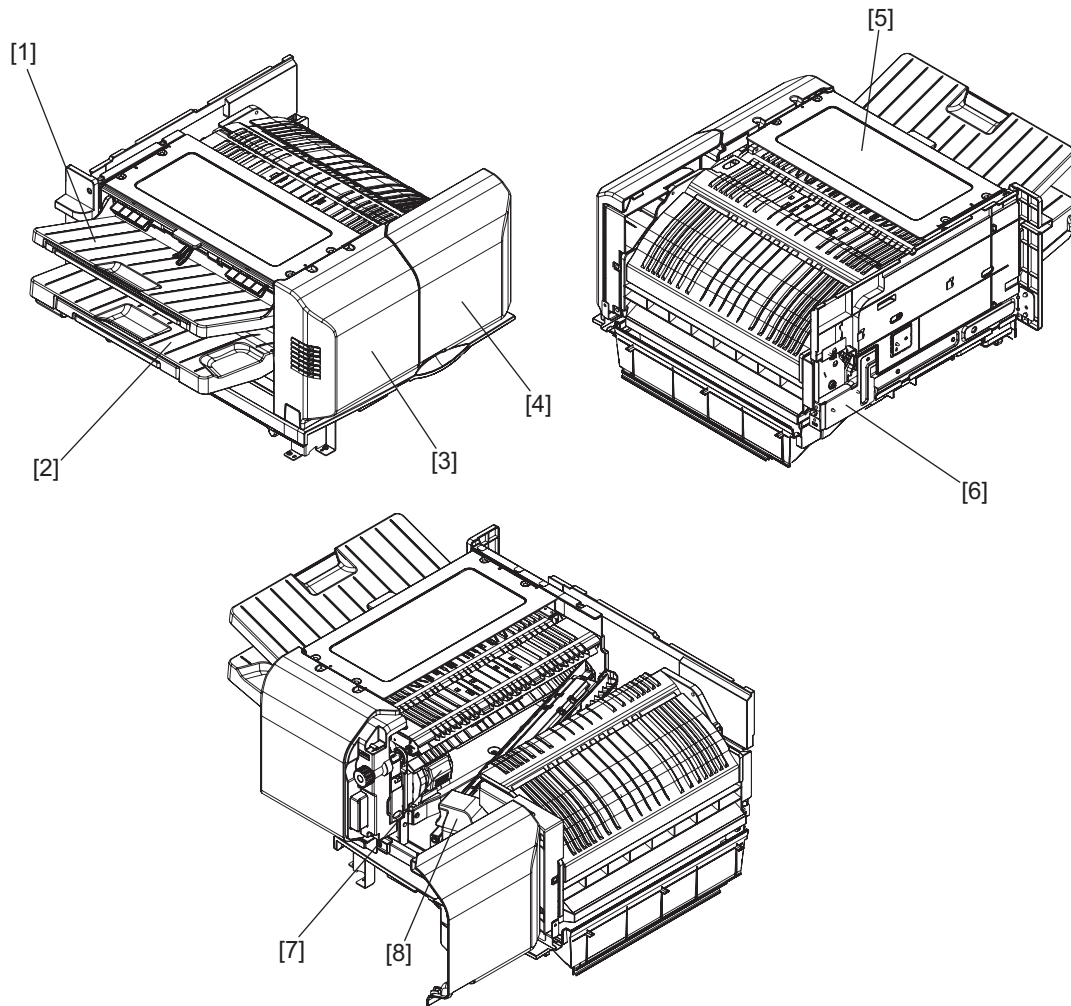


Fig. 2-1

1	Stationary tray	5	Top cover
2	Movable tray	6	Rail
3	Front left cover	7	Stapler unit
4	Front cover	8	Hole Punch Unit

## 2.2 Sectional View

This option consists of three sections: Inner Finisher [1], Hole Punch Unit [2] and a paper receiving section [3].

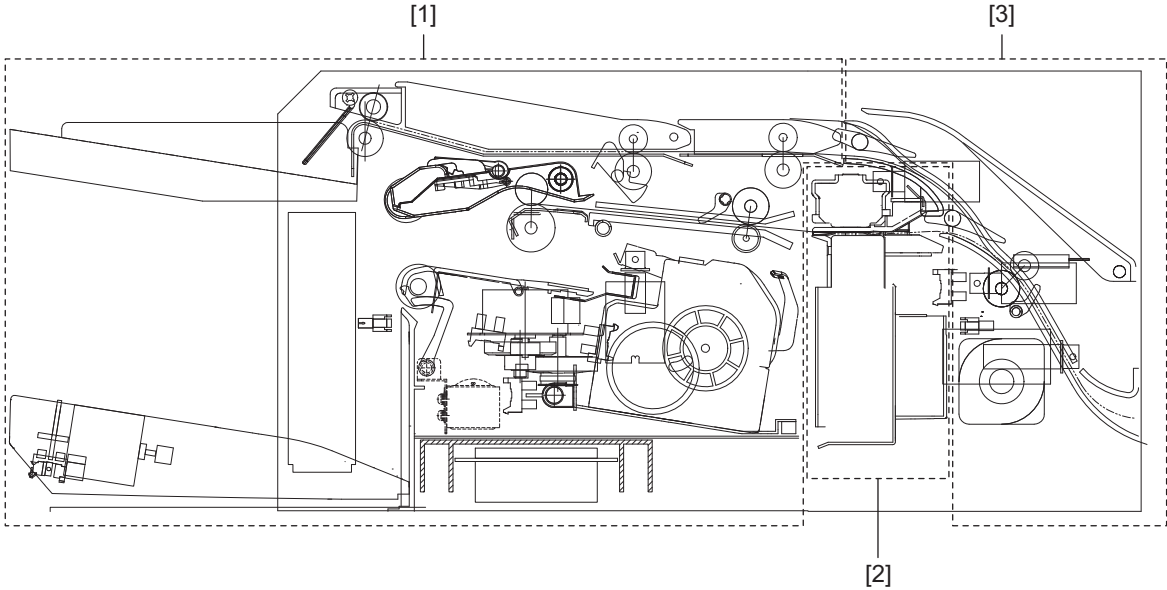


Fig. 2-2

[A] Center sectional View

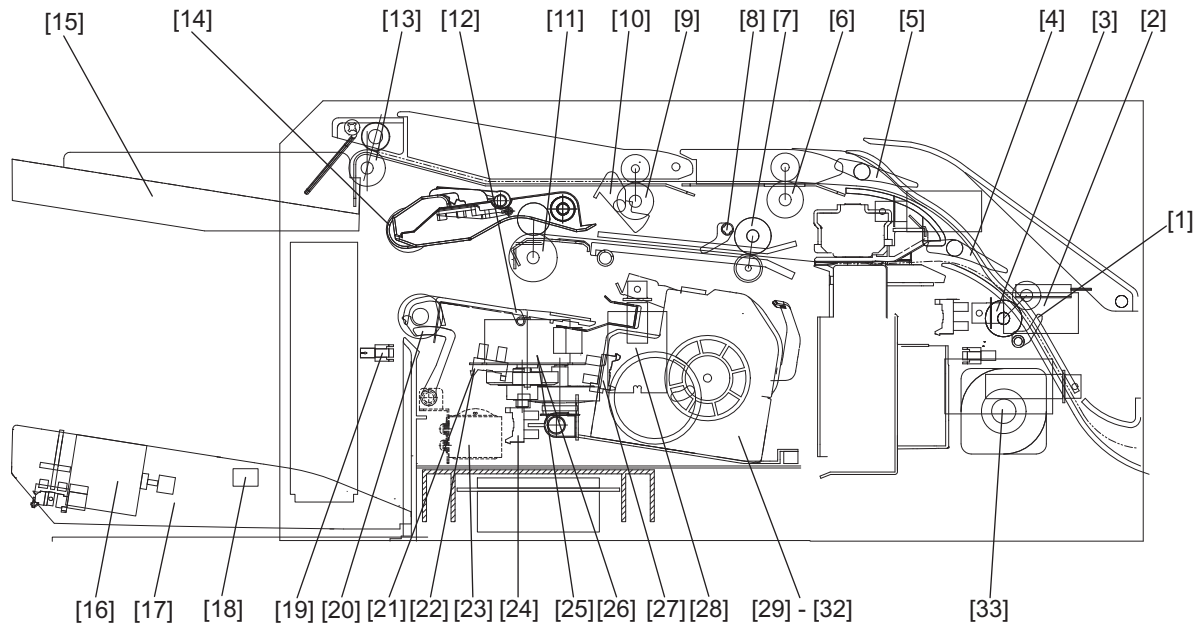
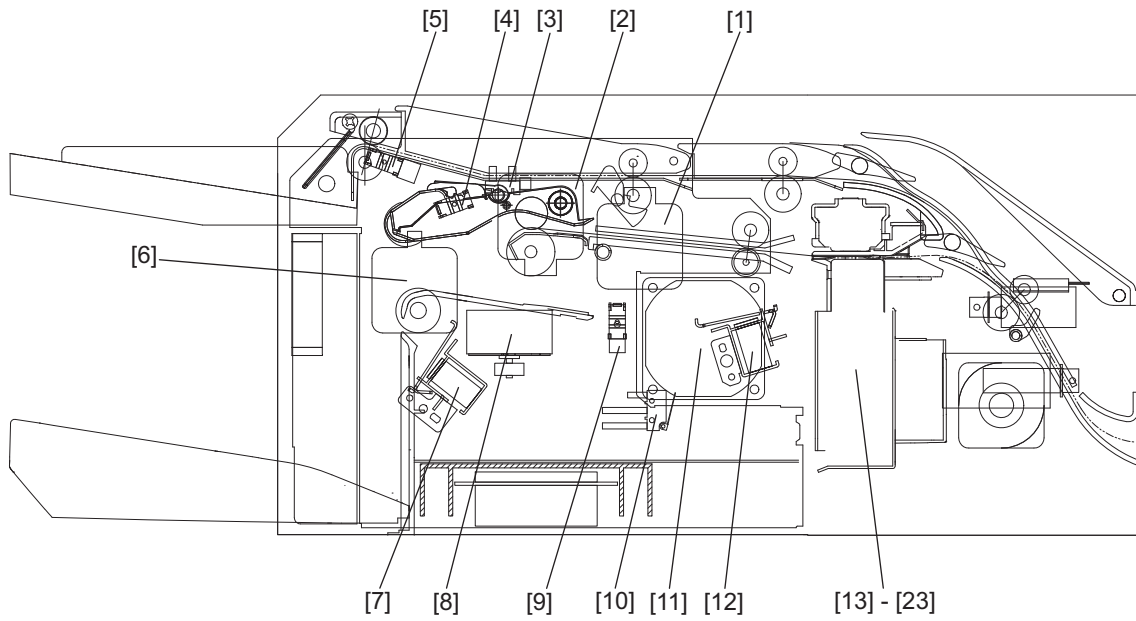


Fig. 2-3

1	Entrance path sensor	18	Movable tray paper sensor
2	1st flapper solenoid	19	Movable tray lower limit sensor
3	Entrance transport roller	20	Stack top detection lever
4	1st flapper	21	Front alignment plate home position sensor
5	2nd flapper	22	Rear alignment plate home position sensor
6	1st sub-path roller	23	Stack top detection solenoid
7	Middle transport roller	24	Stapler unit sliding home position sensor
8	Middle path sensor	25	Front alignment motor
9	2nd sub-path roller	26	Rear alignment motor
10	Sub-path sensor	27	Staple unit improper clinching prevention sensor
11	Paper exit roller	28	Trailing edge holding solenoid
12	Finishing tray sensor	29	Stapler motor
13	Sub-path paper exit roller	30	Stapler unit clinching home position sensor
14	Stack exit roller	31	Staple top position sensor
15	Stationary tray	32	Staple empty sensor
16	Movable tray shift motor	33	1st transport motor
17	Movable tray		

**[B] Front Sectional View**



**Fig. 2-4**

1	2nd transport motor	13	Punch motor
2	Stack exit motor	14	Punch motor clock sensor
3	Sub-path opening/closing sensor	15	Punch shaft home position sensor
4	Stack exit roller home position sensor	16	Rear punch shaft home position sensor
5	Stationary tray full detection sensor	17	Punch waste full sensor
6	Stack exit roller shift motor	18	Punch unit sliding motor
7	Paddle solenoid	19	Paper detection sensor
8	Stapler unit sliding motor	20	Punch sliding unit home position sensor
9	Knurled roller home position sensor	21	Hole punch unit setting sensor
10	Front cover switch	22	Hole punch unit destination detection sensor-1
11	Fan motor	23	Hole punch unit destination detection sensor-2
12	Knurled roller shift solenoid		

## 2.3 Electric Parts Layout

### 2.3.1 Inner Finisher

#### [A] Sensor and switch

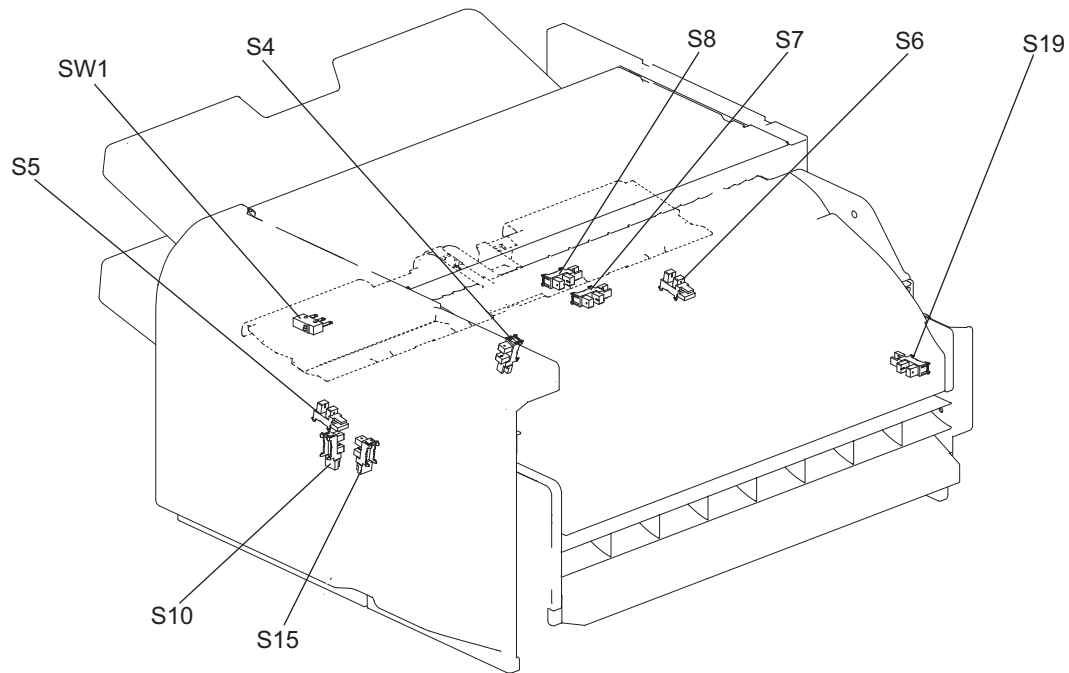


Fig. 2-5

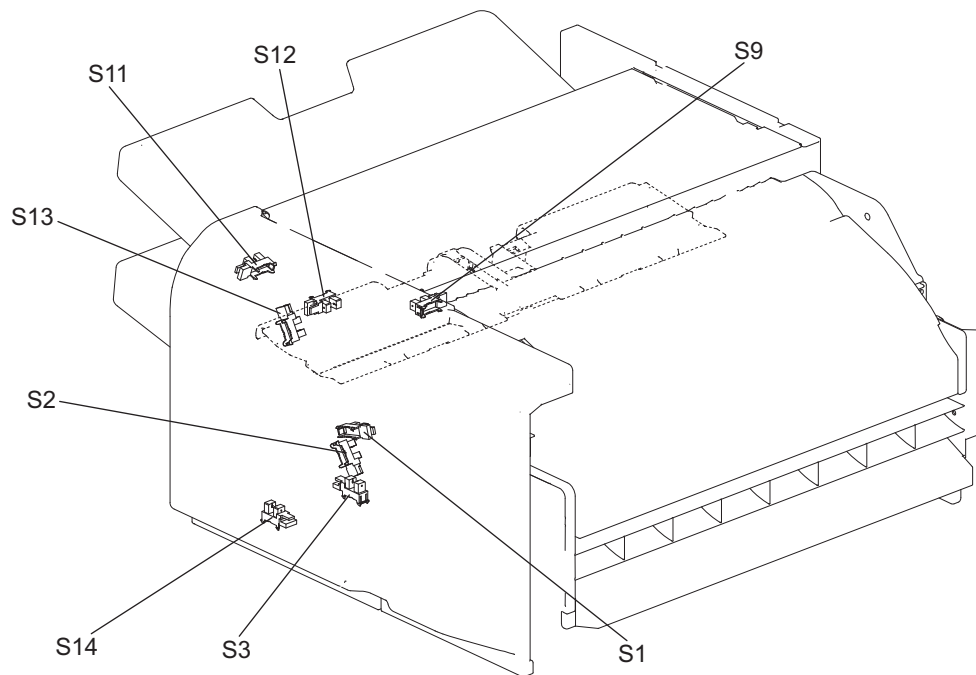
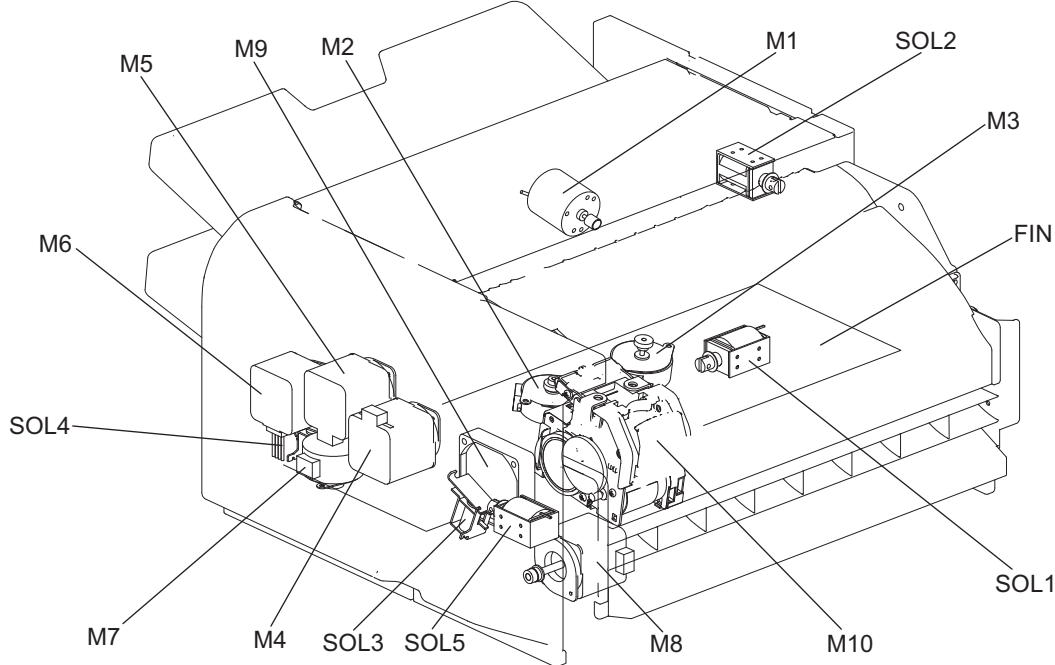


Fig. 2-6

**[B] Motor, Solenoid and PC board**



**Fig. 2-7**



## 2.3.2 Hole Punch Unit

### [A] Sensor

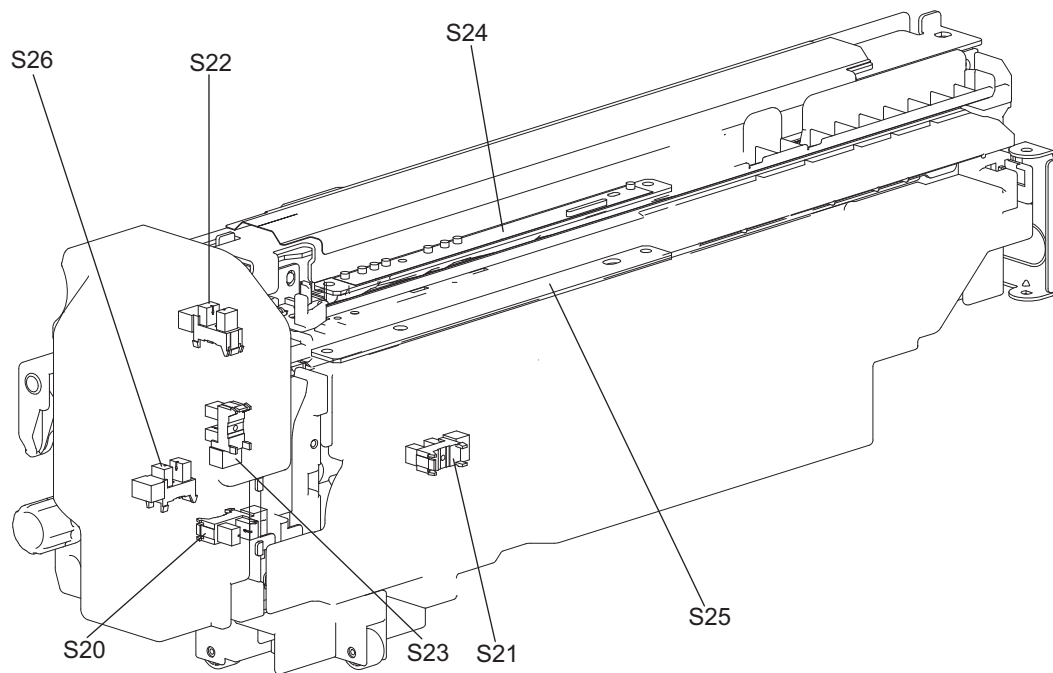


Fig. 2-8

### [B] Motor and PC board

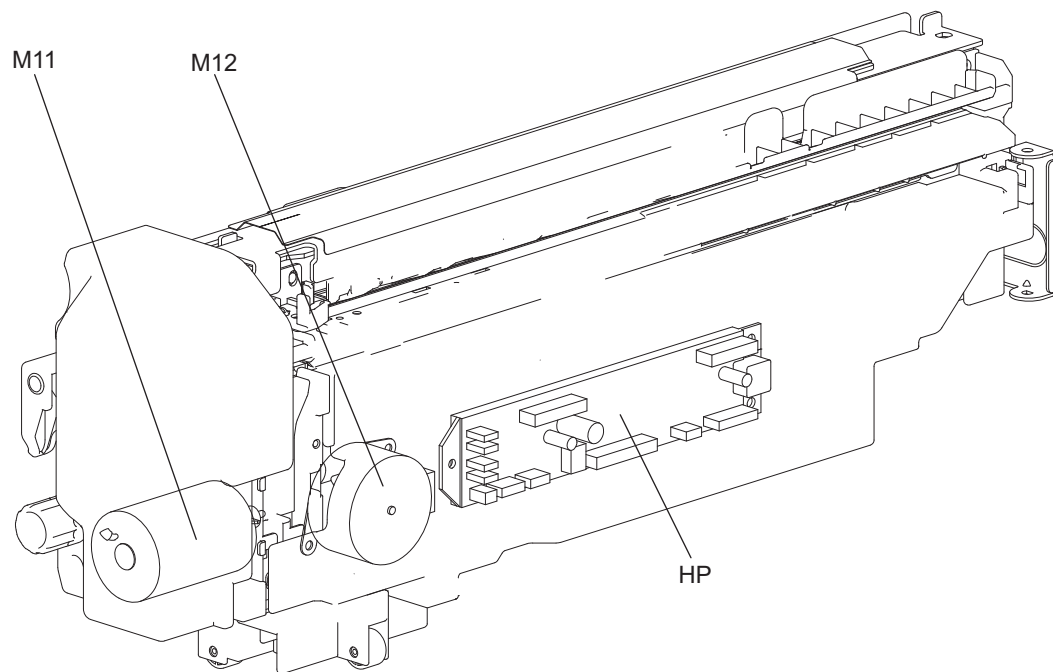


Fig. 2-9

## 2.4 Symbols and Functions of Various Components

The column “P-I” shows the page and item number in the parts list.

- Motor (Inner Finisher)

Symbol	Name	Function	P-I	Remarks
M1	Movable tray shift motor	Drives the movable tray upward and downward.	2-20	
M2	Front alignment motor	Drives the front alignment plate.	13-13	
M3	Rear alignment motor	Drives the rear alignment plate.	13-14	
M4	2nd transport motor	Drives the middle transport roller.	4-29	
M5	Stack exit motor	Drives the stack exit roller.	4-29	
M6	Stack exit roller shift motor	Drives the stack exit roller upward and downward.	4-22	
M7	Stapler unit sliding motor	Moves the stapler unit to the front and rear.	4-5	
M8	1st transport motor	Drives the entrance transport roller.	17-20	
M9	Fan motor	Drives the fan.	15-19	
M10	Stapler motor	Drives the stapler.	14-24	

- Motor (Hole Punch Unit)

Symbol	Name	Function	P-I	Remarks
M11	Punch motor	Drives the punch head to punch holes on paper.	5-18	
M12	Punch unit sliding motor	Drives the punch head to the front and rear.	4-13	

- Solenoid (Inner Finisher)

Symbol	Name	Function	P-I	Remarks
SOL1	Stack top detection solenoid	Drives the stack top detection lever.	10-24	
SOL2	Trailing edge holding solenoid	Drives the paper trailing edge holder.	7-4	
SOL3	Knurled roller shift solenoid	Drives the knurled roller upward and downward.	15-18	
SOL4	Paddle rotation solenoid	Rotates the paddle.	9-6	
SOL5	1st flapper solenoid	Drives the 1st flapper to switch the transport path.	17-13	

- Sensor, Switch (Inner Finisher)

Symbol	Name	Function	P-I	Remarks
S1	Stack top detection sensor-1	Detect the top of the paper stacked on the movable tray by the combined outputs of stack top detection sensor-1 and -2.	10-16	
S2	Stack top detection sensor-2	Detect the top of the paper stacked on the movable tray by the combined outputs of stack top detection sensor-1 and -2.	10-16	
S3	Stapler unit sliding home position sensor	Detects the home position of the stapler unit when it is moved to the front and rear.	10-1	
S4	Finishing tray sensor	Detects whether there is paper on the finishing tray or not.	13-26	
S5	Front alignment plate home position sensor	Detects the home position of the front alignment plate.	13-26	
S6	Rear alignment plate home position sensor	Detects the home position of the rear alignment plate.	13-26	
S7	Middle path sensor	Detects whether there is paper in the middle transport roller section or not.	8-1	
S8	Sub-path sensor	Detects whether there is paper in the 2nd sub-path roller section or not.	8-1	
S9	Movable tray paper sensor	Detects whether there is paper on the movable tray or not.	1-5	
S10	Knurled roller home position sensor	Detects the home position of the knurled roller.	4-10	
S11	Stationary tray full detection sensor	Detects the paper-full state of the stationary tray.	15-4	
S12	Sub-path opening/closing sensor	Detects the opening and closing status of the top cover.	8-1	
S13	Stack exit roller home position sensor	Detects the home position of the stack exit roller.	4-10	
S14	Movable tray lower limit sensor	Detects the lower limit of the movable area for the movable tray.	15-24	
S15	Staple unit improper clinching prevention sensor	Detects the interference between the stapler unit clincher section and the finishing tray stopper.	14-18	
S16	Stapler unit clinching home position sensor	Detects the home position of the stapling operation. (Built-in sensor in the stapler unit)	14-24	
S17	Staple top position sensor	Detects the top position of a staple. (Built-in sensor in the stapler unit)	14-24	
S18	Staple empty sensor	Detects the remaining level of staples in a staple cartridge. (Built-in sensor in the stapler unit)	14-24	
S19	Entrance path sensor	Detects the paper at the entrance of the Inner Finisher.	18-1	
SW1	Front cover switch	Cuts off the drive current (24 V) when the opening status of the front cover is detected.	14-15	

- Sensor and switch (Hole Punch Unit)

Symb ol	Name	Function	P-I	Remarks
S20	Punch motor clock sensor	Detects the timing for stopping the punch motor.	5-2	
S21	Punch waste full sensor	Detects the punches full state.	4-3	
S22	Rear punch shaft home position sensor	Detects the home position of the punch hole puncher.	3-1	
S23	Punch sliding unit home position sensor	Detects the home position of the punch sliding unit.	4-3	
S24	Paper detection sensor (SEN)	Detects the side and trailing edges of the paper. (Light receiving part)	6-5	
S25	Paper detection sensor (LED)	Detects the side and trailing edges of the paper. (Light emitting part)	6-3	
S26	Punch shaft home position sensor	Detects the home position of the 3-hole puncher.	5-3	MJ-6011N only

- PC board (Inner Finisher)

Symb ol	Name	Function	P-I	Remarks
FIN	Finisher control PC board	Controls the Inner Finisher.	10-28	

- PC board (Hole Punch Unit)

Symb ol	Name	Function	P-I	Remarks
HP	Hole punch control PC board	Controls the Hole Punch Unit.	4-21	

## 2.5 Signal Block Diagram

The operational sequence of the Inner Finisher is controlled by the finisher control PC board (FIN). A 32-bit CPU (with a flash memory) is embedded in the finisher control PC board (FIN). This board controls paper transportation and serial communication between the Inner Finisher and the MFP or the Hole Punch Unit.

The major functions of the ICs mounted on the finisher control PC board (FIN) are as follows:

- IC1 (CPU)  
Controls the operational sequence.  
Communicates with the MFP and other options.  
Incorporates sequence programs.
- IC23 (EEPROM)  
Backs up adjustment values.

The figure below shows the flow of signals between the Inner Finisher and the Hole Punch Unit.

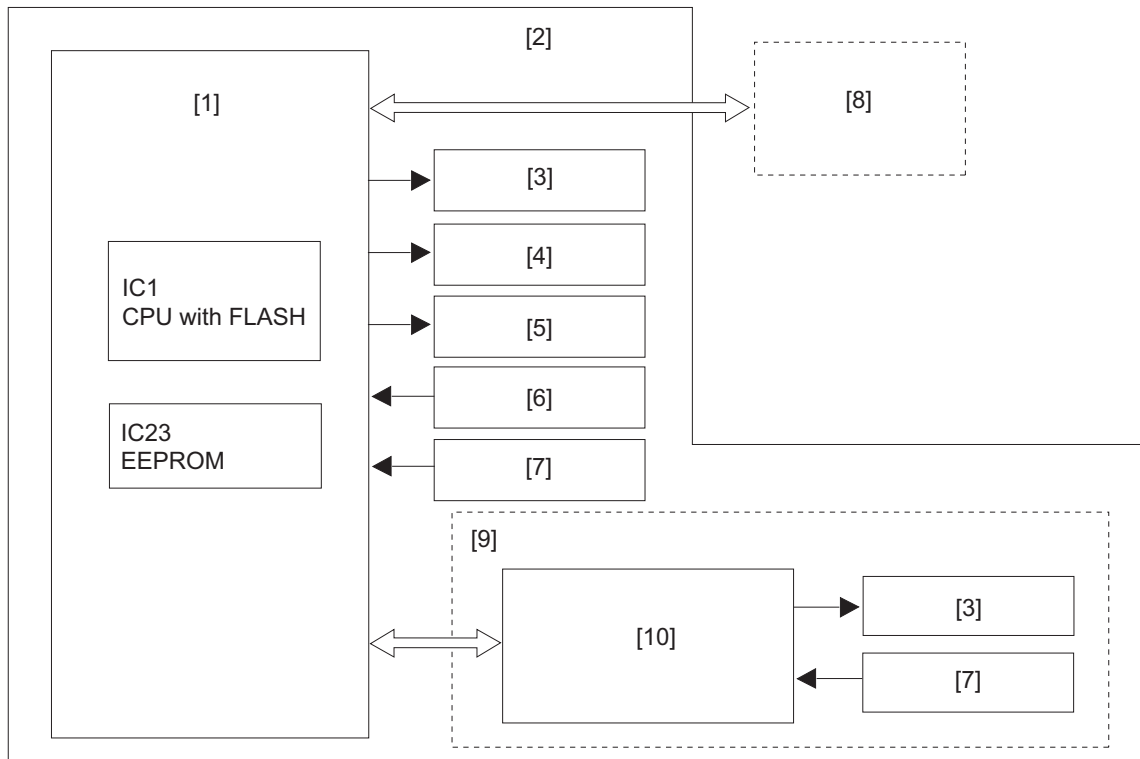


Fig. 2-10

1	Finisher control PC board	6	Switch
2	Inner Finisher	7	Sensor
3	Motor	8	Converter board (CNV)
4	Solenoid	9	Hole Punch Unit
5	Fan	10	Hole punch control PC board



### 3. OPERATION DESCRIPTION

#### 3.1 Basic Operations

##### 3.1.1 Specifications

The Inner Finisher exits paper transported from the MFP. Paper exit modes available are; the simple stack (straight-through paper exit) mode, job offset mode\* and staple stack mode.

The Hole Punch Unit is designed to be installed in the feeding section of the Inner Finisher in order to punch a stack of paper transported from the MFP.

The operations noted above are controlled by the finisher control PC board (FIN) in accordance with commands from the MFP.

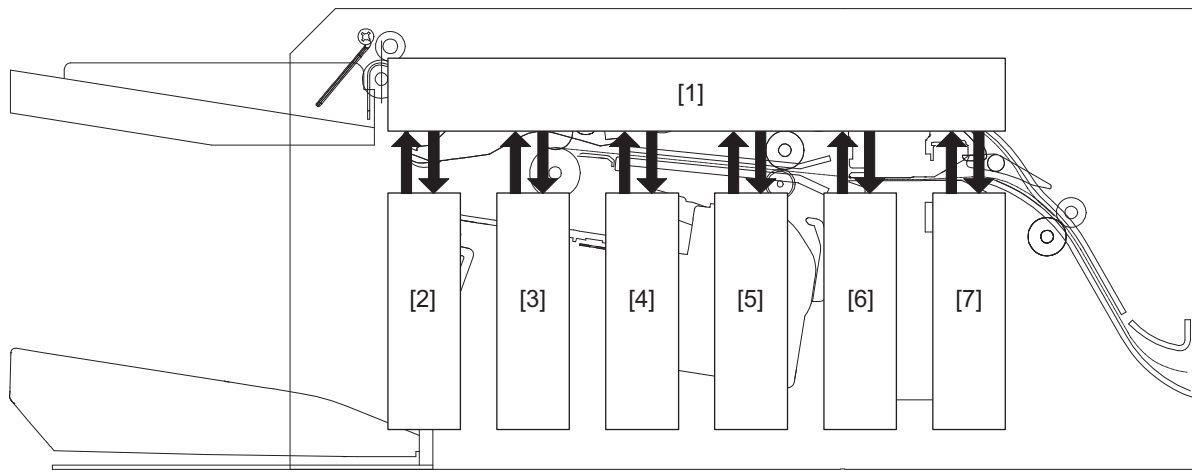


Fig. 3-1

1	Control system	5	Paper exit drive system
2	Transport drive system	6	Tray drive system
3	Alignment drive system	7	Hole Punch Unit drive system
4	Stapler unit drive system		

\* “Job offset” refers to an operation by which one stack of paper is slid forward and then the next stack is slid backward alternately before being exited so that the exited stacks will be easily sorted.

### 3.1.2 Transport drive system

The Inner Finisher selects an appropriate exiting mode among the simple stack (straight-through paper exit) mode, job offset mode and staple stack mode in accordance with commands from the MFP, and then exits the finished paper onto a tray.

If the Hole Punch Unit is installed, punching on a stack of paper is carried out and punched stack of paper exits onto the movable tray.

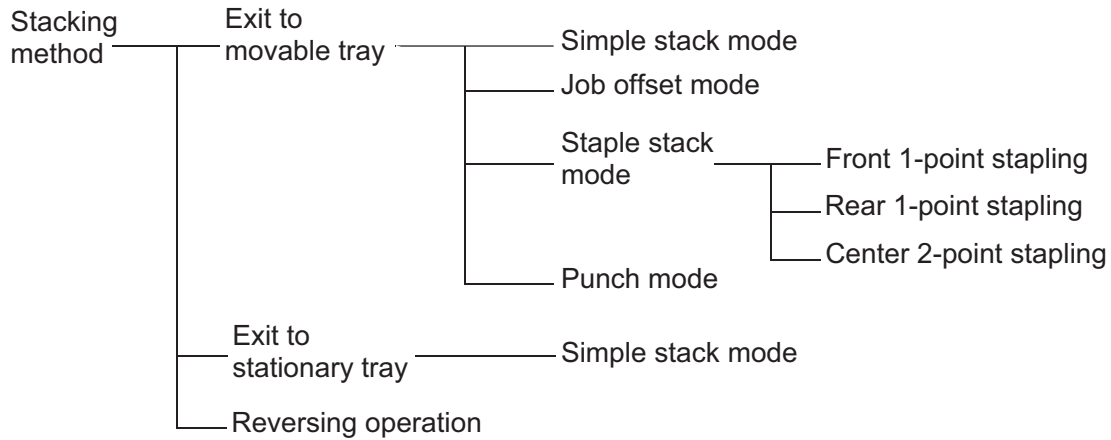


Fig. 3-2

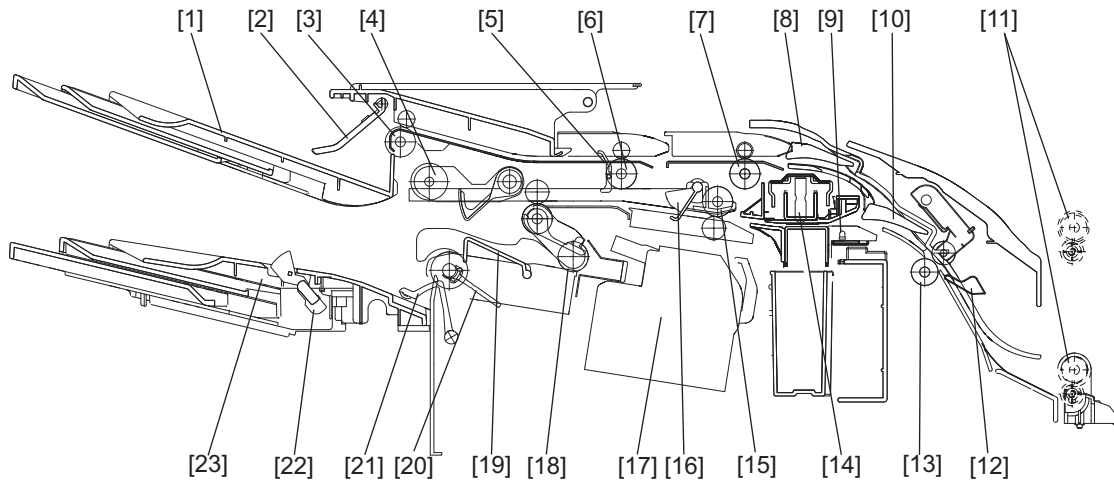


Fig. 3-3

1	Stationary tray	13	Entrance transport roller
2	Stationary tray full detection sensor	14	Hole puncher
3	Sub-path paper exit roller	15	Middle transport roller
4	Stack exit roller	16	Middle path sensor
5	Sub-path sensor	17	Stapler unit
6	2nd sub-path roller	18	Knurled roller
7	1st sub-path roller	19	Finishing tray sensor
8	2nd flapper	20	Paddle
9	Punch waste full sensor	21	Stack top detection lever
10	1st flapper	22	Movable tray paper sensor
11	Paper exit roller (MFP)	23	Movable tray
12	Entrance path sensor		



### 3.1.3 Paper exiting to the movable tray

#### [A] Simple stack (straight-through paper exit) mode

- (1) The 1st transport motor (M8) and the 2nd transport motor (M4) are driven at the same as the exiting speed of the MFP so that the Inner Finisher can receive paper [1] exiting from the MFP.

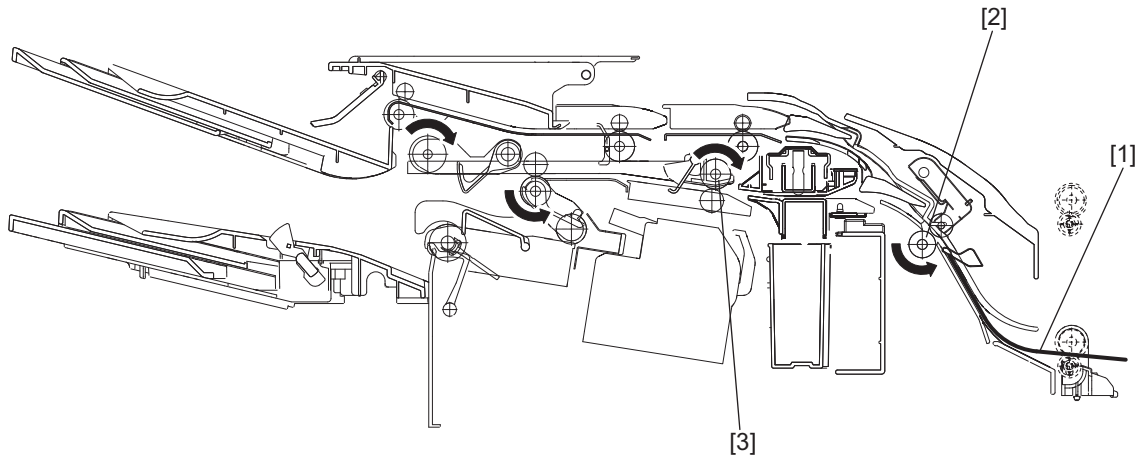


Fig. 3-4

- [2] Entrance transport roller
- [3] Middle transport roller

- (2) After the middle path sensor (S7) [4] is turned ON and the paper [1] is transported to the specified position, the speed of the 1st transport motor (M8) and the 2nd transport motor (M4) are changed to the same as the copying speed of the MFP. Then the stack exit roller [5] is lowered while it is being driven to the paper exiting direction after the leading edge of the paper [1] has passed through the specified position.

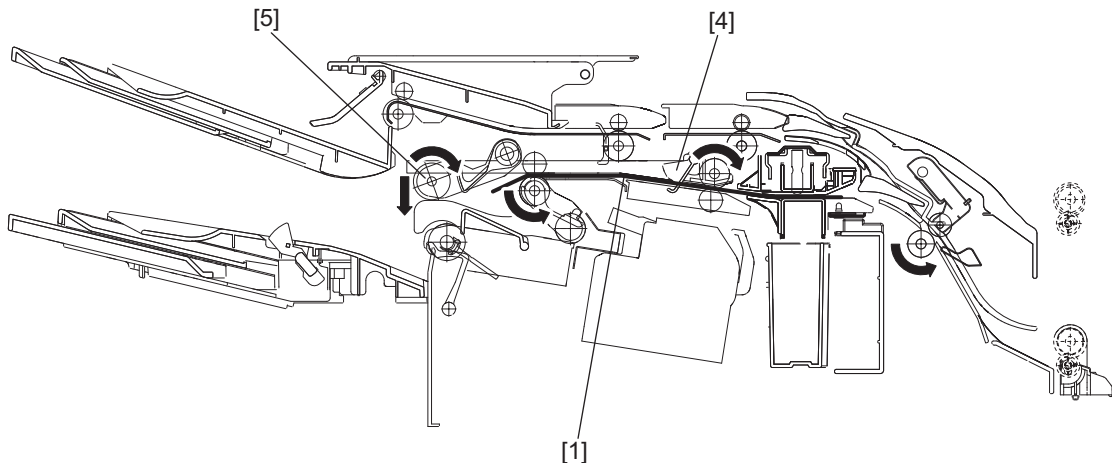


Fig. 3-5

- (3) The speed of the 1st transport motor (M8) is changed to the same as the exiting speed of the MFP after the trailing edge of the paper [1] has passed through the entrance transport roller [2].
- (4) The speed of the 2nd transport motor (M4) is changed to the same as the exiting speed of the MFP after the trailing edge of the paper [1] has passed through the paper exit roller [6].
- (5) The stack exit motor (M5) is driven at the same speed as the copying speed of the MFP until the trailing edge of the paper [1] has passed through the stack exit roller [5]. Moreover, the stack top detecting lever is stored.

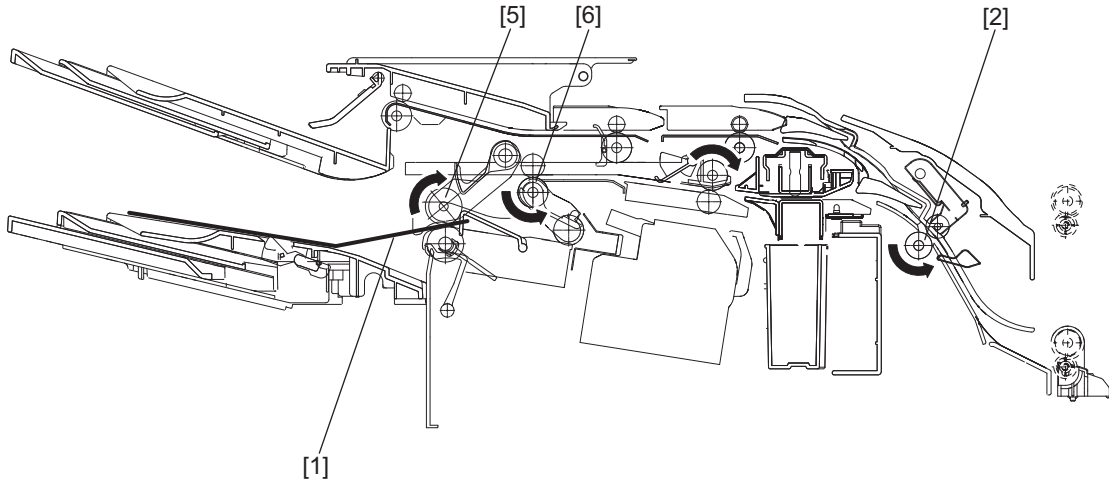


Fig. 3-6

- (6) The stack exit roller [5] is raised after the trailing edge of the paper [1] has passed through this roller.
- (7) After a specified period of time has passed from the start of the raising of the stack exit roller [5], the paddle [7] is rotated to scrape together paper [1] falling onto the movable tray [8]. The stack exit motor (M5) is stopped after the one rotation of the paddle [7].

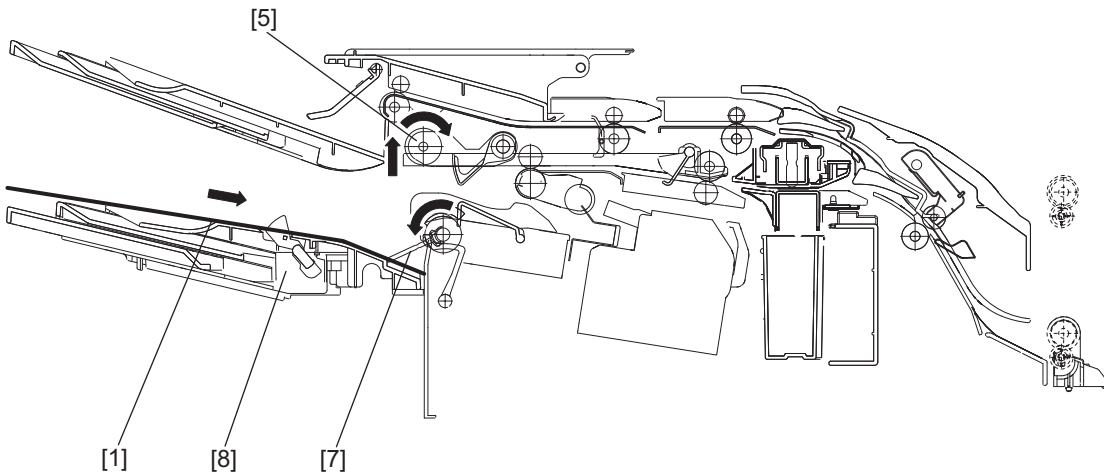


Fig. 3-7

- (8) The stack top detection lever [9] is ejected and the movable tray [8] is moved in accordance with the stack height.

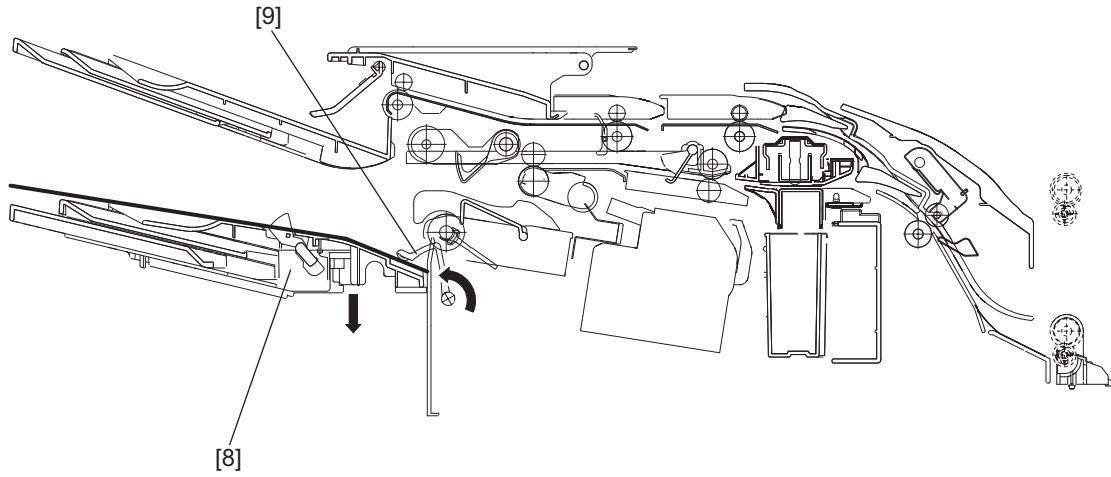
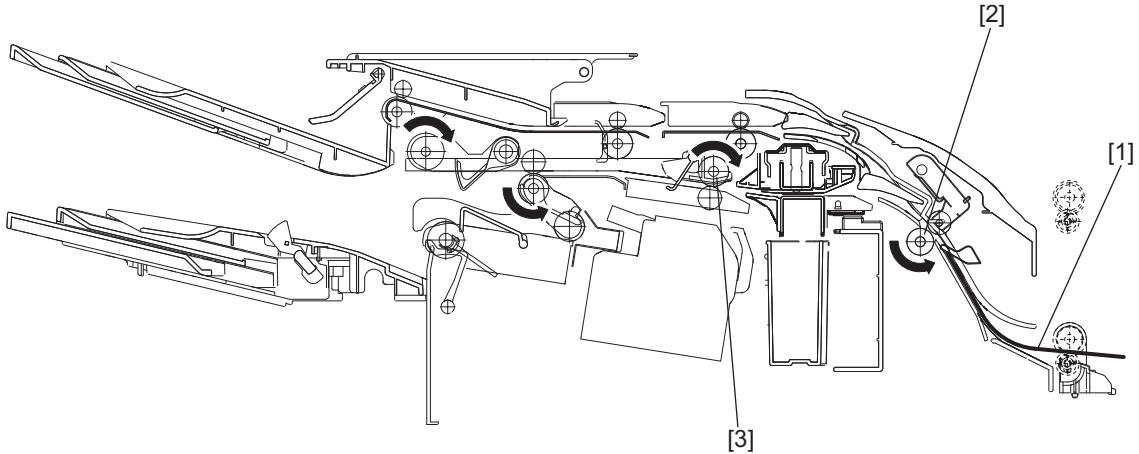


Fig. 3-8

**[B] Job offset mode**

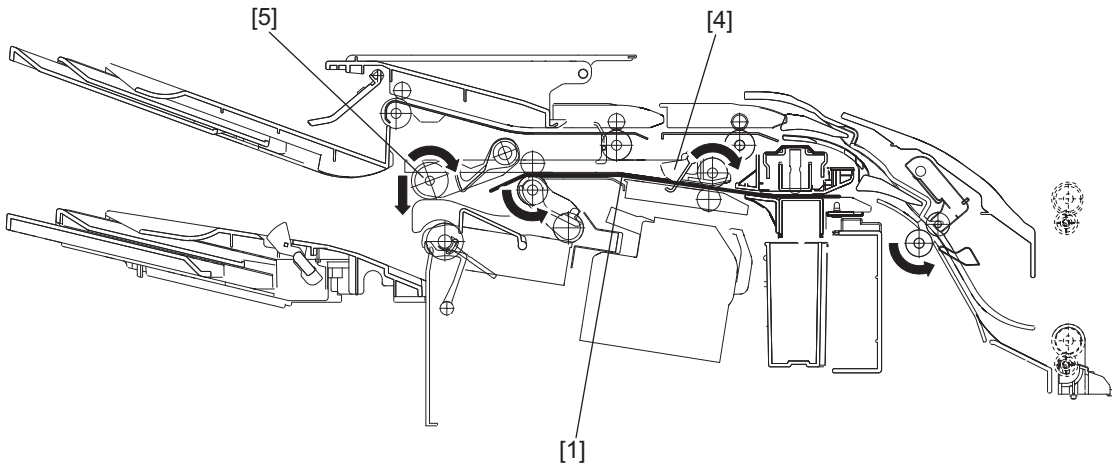
- (1) The 1st transport motor (M8) and the 2nd transport motor (M4) are driven at the same as the exiting speed of the MFP so that the Inner Finisher can receive paper [1] exiting from the MFP.



**Fig. 3-9**

- [2] Entrance transport roller  
[3] Middle transport roller

- (2) After the middle path sensor (S7) [4] is turned ON and the paper [1] is transported to the specified position, the speed of the 1st transport motor (M8) and the 2nd transport motor (M4) are changed to the same as the copying speed of the MFP. Then after the leading edge of the paper [1] has passed through the specified position, the alignment plate is moved to a point where the paper [1] is received. Then the stack exit roller [5] is lowered while it is being driven to the paper exiting direction.



**Fig. 3-10**

- (3) The speed of the 1st transport motor (M8) is changed to the same as the exiting speed of the MFP after the trailing edge of the paper [1] has passed through the entrance transport roller [2].
- (4) The speed of the 2nd transport motor (M4) is changed to the same as the exiting speed of the MFP after the trailing edge of the paper [1] has passed through the paper exit roller [6]. Moreover, the stack exit motor (M5) is stopped.
- (5) The stack exit motor (M5) is driven to the scraping direction to scrape paper [1] together into the finishing tray [7].

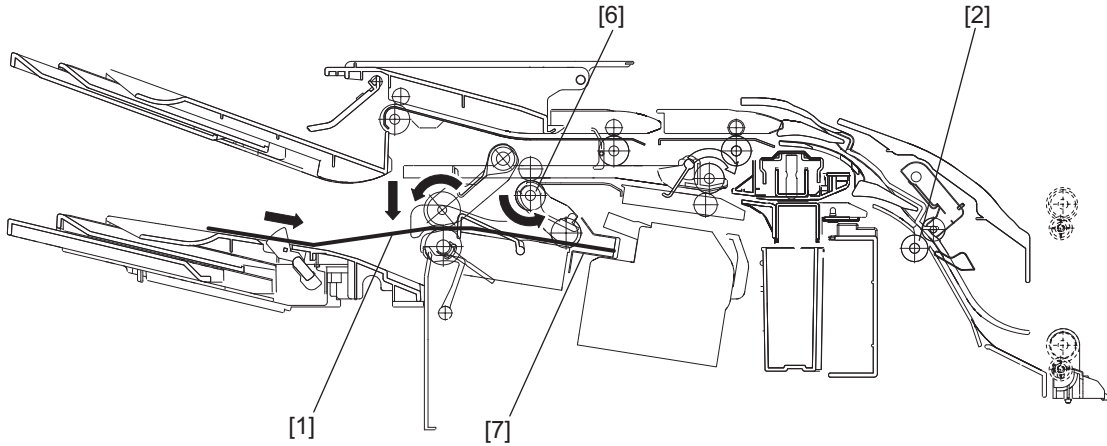


Fig. 3-11

- (6) The stack exit roller [5] is raised after the trailing edge of the paper [1] has reached the knurled roller [8].
- (7) After a specified period of time has passed from the start of the raising of the stack exit roller [5], the paper [1] is moved to the specified offsetting position and then the sheets of the paper [1] are aligned as a stack by the alignment plate.
- (8) Steps 2 to 7 are repeated until the number of stacks [1] on the finishing tray [7] reaches the specified number or three\*.

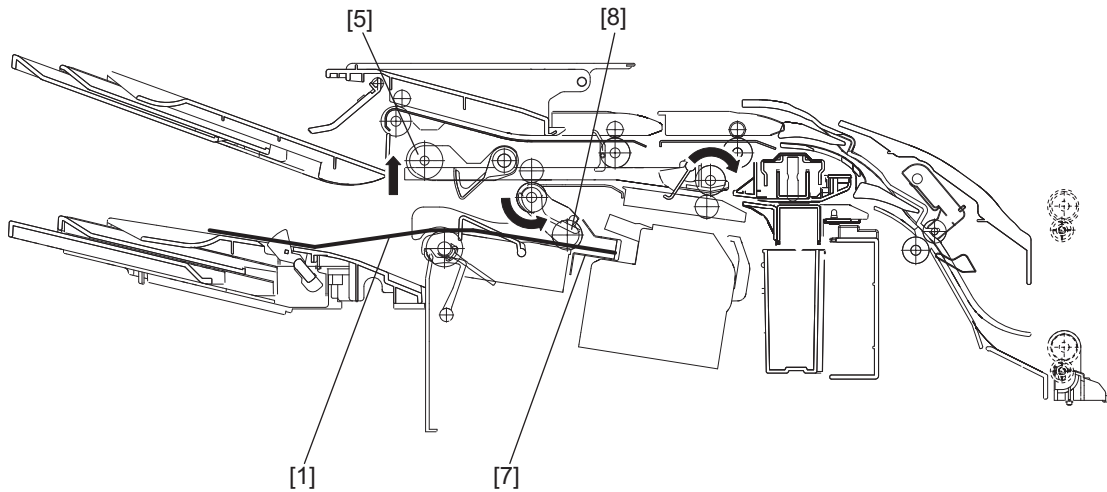


Fig. 3-12

- \* If the remainder is one after the specified number is divided by three, the last four sheets of paper exit as one stack.  
 E.g.: If the specified number is ten, three sheets are exited as one stack, then the next three sheets are exited as one stack, and the last four sheets are exited as one stack (not three stacks of three sheets and one extra sheet).

(9) After the number of stacks [1] on the finishing tray [7] has reached the specified number or three, the stack exit roller [5] is lowered\*. Moreover, the alignment plate is escaped to the outside.

\* The alignment plate may be escaped before the stack exit roller is lowered depending on the paper width.

(10) The stack exit roller [5] is moved to the paper exiting direction while it keeps nipping the stack [1].

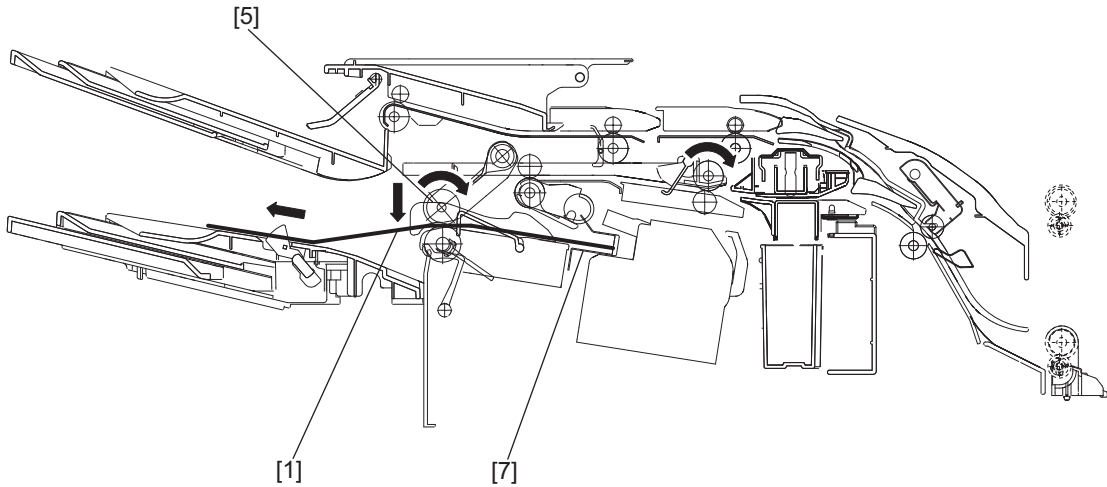


Fig. 3-13

(11) The stack exit roller [5] is raised after the trailing edge of the paper [1] has passed through this roller.

(12) After a specified period of time has passed from the start of the raising of the stack exit roller [5], the paddle [9] is rotated to scrape together paper [1] falling onto the movable tray [10]. The stack exit motor (M5) is stopped after the one rotation of the paddle [9].

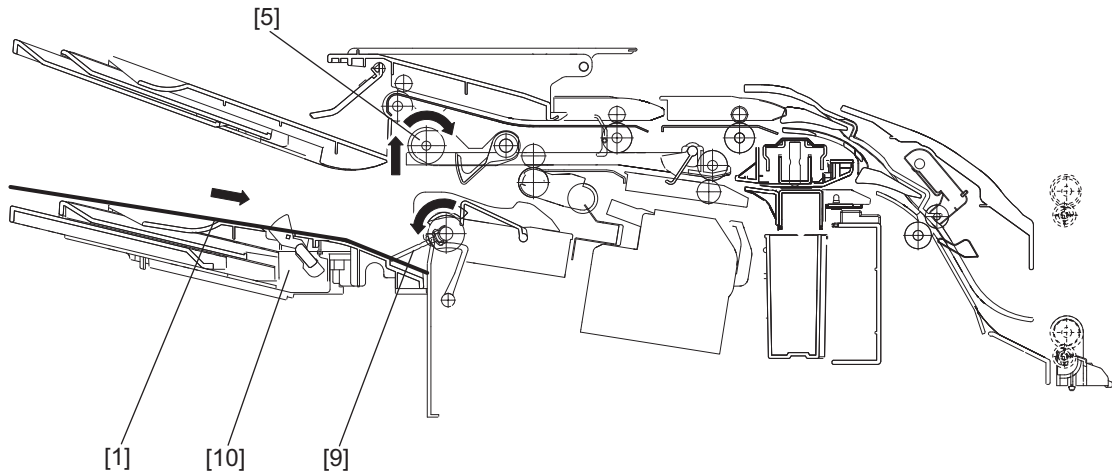


Fig. 3-14

(13) The stack top detection lever [11] is ejected and the movable tray [10] is moved in accordance with the stack height.

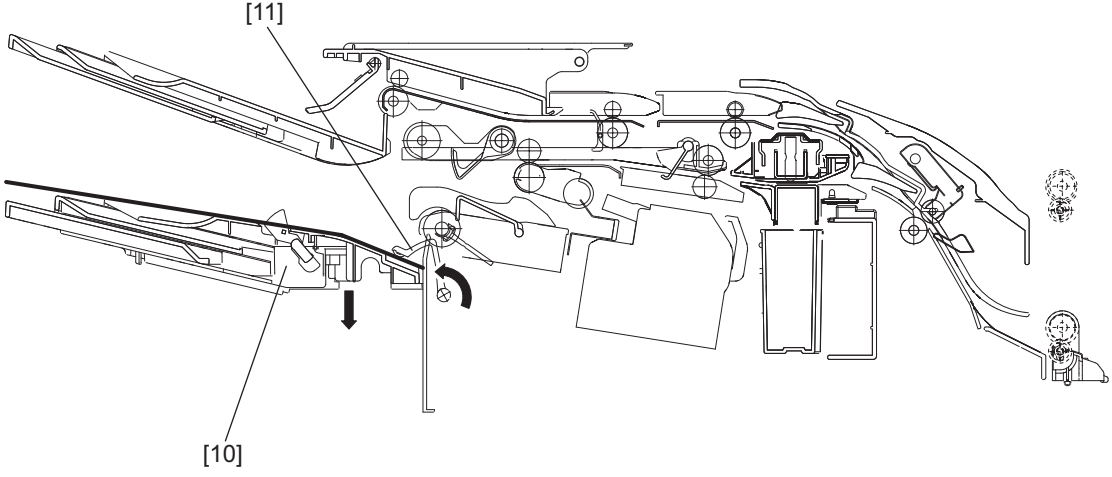


Fig. 3-15



**[C] Stapling**

- (1) The 1st transport motor (M8) and the 2nd transport motor (M4) are driven at the same as the exiting speed of the MFP so that the Inner Finisher can receive paper [1] exiting from the MFP.

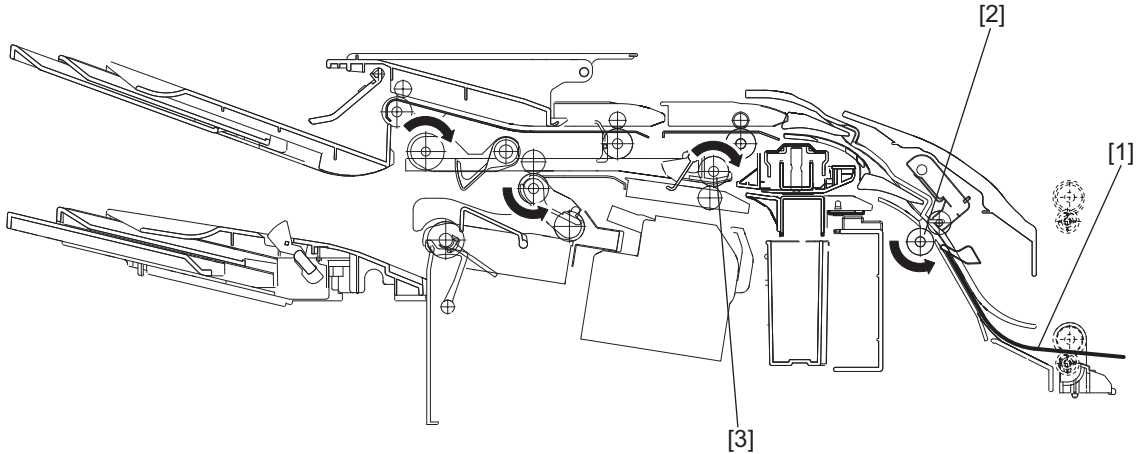


Fig. 3-16

- (2) After the middle path sensor (S7) [4] is turned ON and the paper [1] is transported to the specified position, the speed of the 1st transport motor (M8) and the 2nd transport motor (M4) are changed to the same as the copying speed of the MFP. Then after the leading edge of the paper [1] has passed through the specified position, the alignment plate is moved to a point where the paper [1] is received. Then the stack exit roller [5] is lowered while it is being driven to the paper exiting direction.

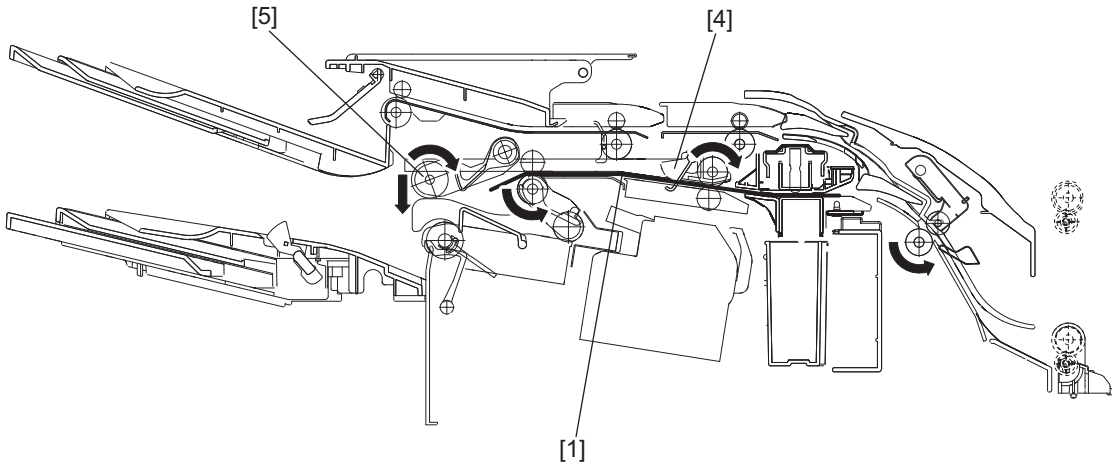


Fig. 3-17

1	Paper	4	Middle path sensor
2	Entrance transport roller	5	Stack exit roller
3	Middle transport roller		

- (3) The speed of the 1st transport motor (M8) is changed to the same as the exiting speed of the MFP after the trailing edge of the paper [1] has passed through the entrance transport roller [2].
- (4) The speed of the 2nd transport motor (M4) is changed to the same as the exiting speed of the MFP after the trailing edge of the paper [1] has passed through the paper exit roller [6]. Moreover, the stack exit motor (M5) is stopped.
- (5) The stack exit motor (M5) is driven to the scraping direction to scrape paper [1] together into the finishing tray [7].

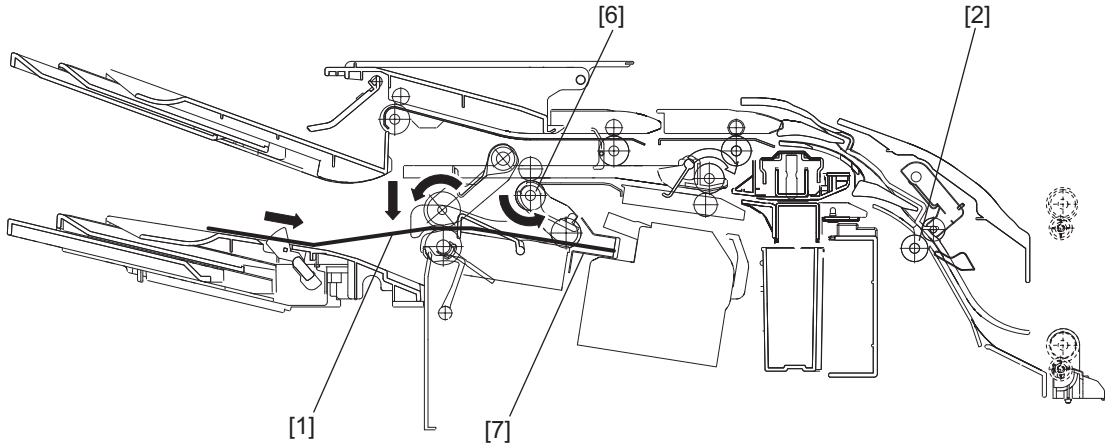


Fig. 3-18

- (6) The stack exit roller [5] is raised after the trailing edge of the paper [1] has reached the knurled roller [8].
- (7) After a specified period of time has passed from the start of the raising of the stack exit roller [5], the paper [1] is moved to the specified offsetting position. Then the sheets of the paper [1] are aligned as a stack by the alignment plate.
- (8) Steps 2 to 7 are repeated until the number of stacks [1] on the finishing tray [7] reaches the specified number.

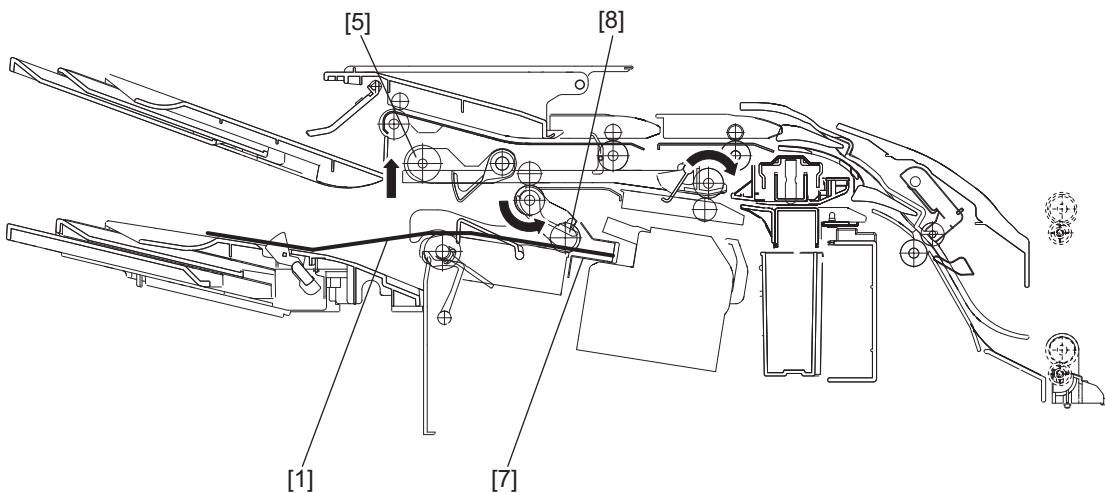


Fig. 3-19

(9) After the number of stacks [1] on the finishing tray [7] has reached the specified number, the stack exit roller [5] is lowered\*. Moreover, the alignment plate is escaped to the outside.

\* The alignment plate may be escaped before the stack exit roller is lowered depending on the paper width.

(10) After the lowering of the stack exit roller [5] is finished, stapling is performed. In case of 2-point stapling, the stapler unit [9] is moved to the second stapling position after stapling at the first position is finished.

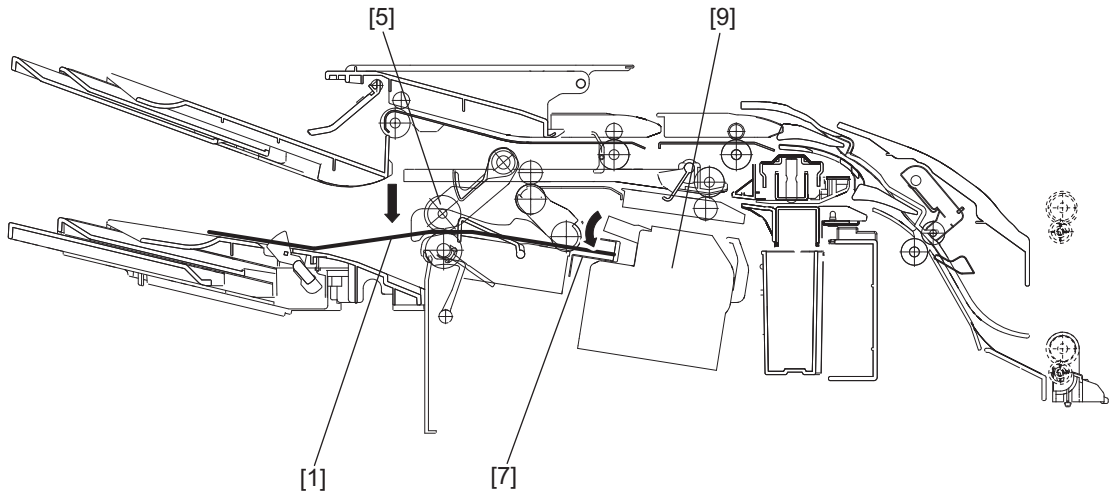


Fig. 3-20

(11) The stack exit roller [5] is moved to the paper exiting direction while it keeps nipping the stack [1].

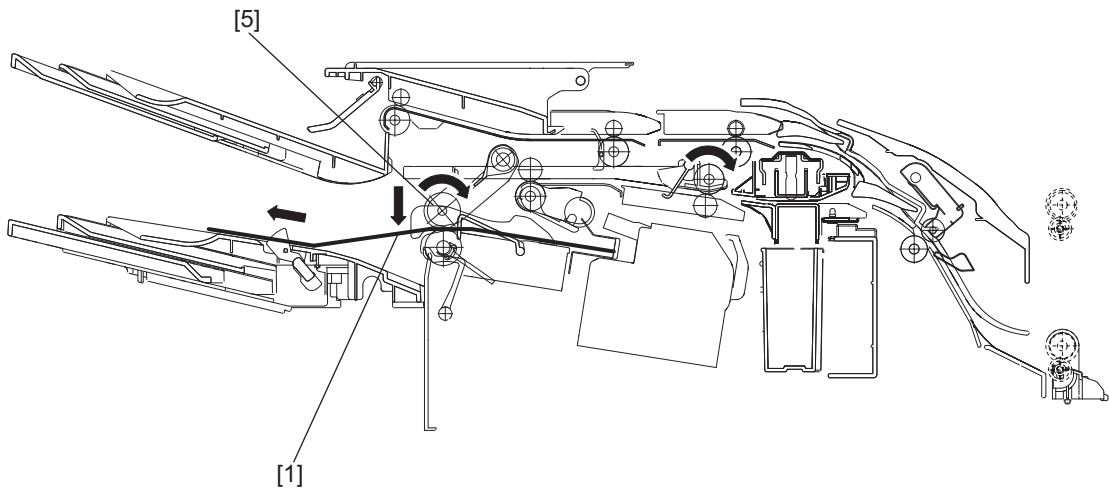


Fig. 3-21

- (12) The stack exit roller [5] is raised after the trailing edge of the paper [1] has passed through this roller.
- (13) After a specified period of time has passed from the start of the raising of the stack exit roller [5], the paddle [10] is rotated to scrape together paper [1] falling onto the movable tray [11]. The stack exit motor (M5) is stopped after the one rotation of the paddle [10].

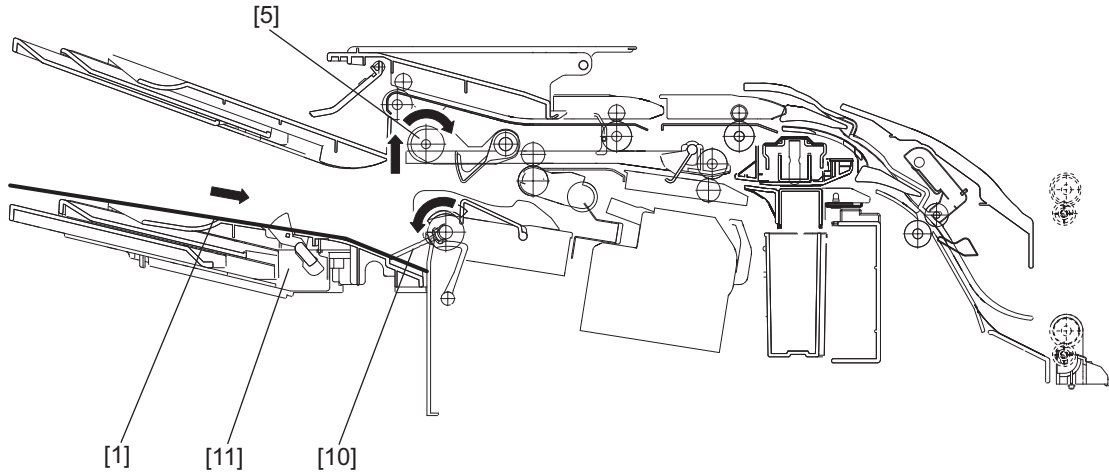


Fig. 3-22

- (14) The stack top detection lever [12] is ejected and the movable tray [11] is moved in accordance with the stack height.

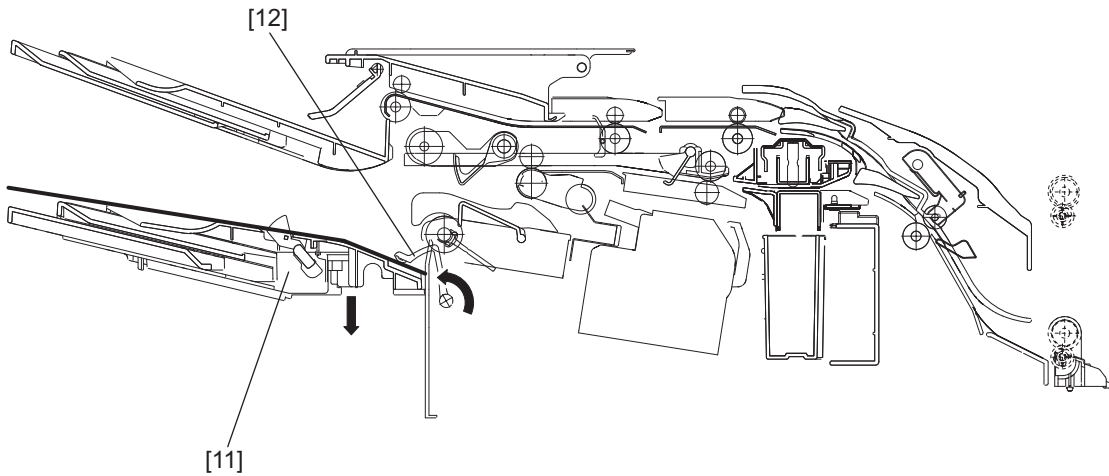


Fig. 3-23

### 3.1.4 Paper exiting to the stationary tray

#### [A] Simple stack mode

- (1) The 1st flapper solenoid (SOL5) pulls the 1st flapper [1] in order to switch the transport path.

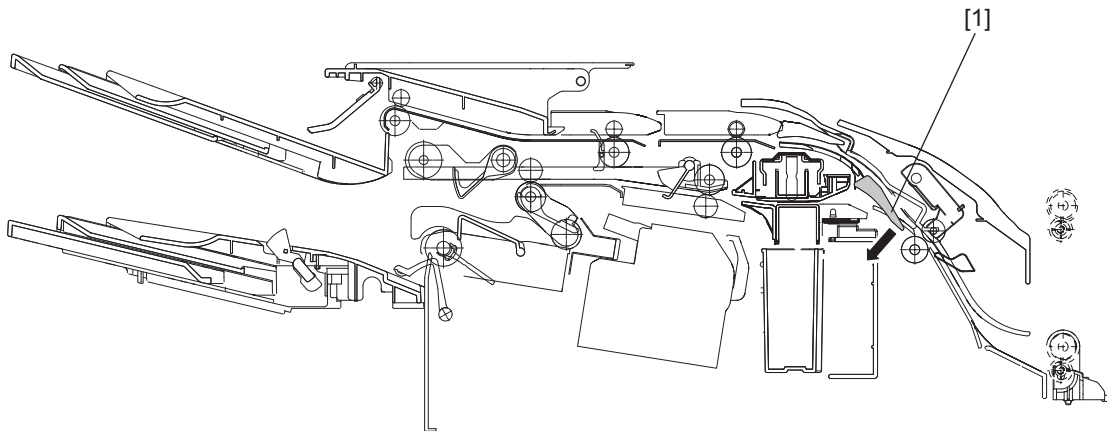


Fig. 3-24

- (2) The 1st transport motor (M8) and the 2nd transport motor (M4) are driven at the same as the exiting speed of the MFP so that the Inner Finisher can receive paper [2] exiting from the MFP.

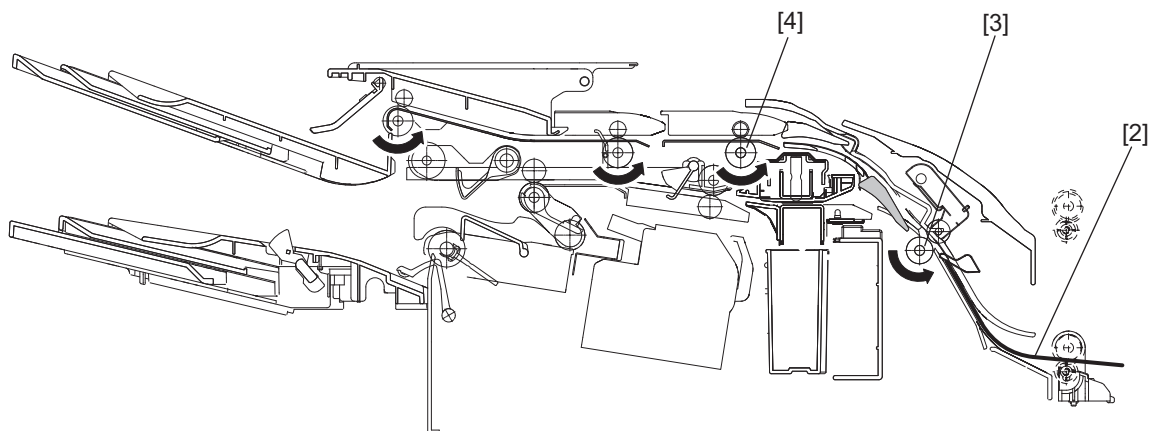


Fig. 3-25

1	1st flapper
2	Paper
3	Entrance transport roller
4	1st sub-path roller

- (3) After the trailing edge of paper [2] has passed through the last roller in the MFP, the speeds of the 1st transport motor (M8) and the 2nd transport motor (M4) are changed to the same as the copying speed of the MFP.
- (4) The speed of the 1st transport motor (M8) is changed to the same as the exiting speed of the MFP after the trailing edge of the paper [2] has passed through the entrance transport roller [3].

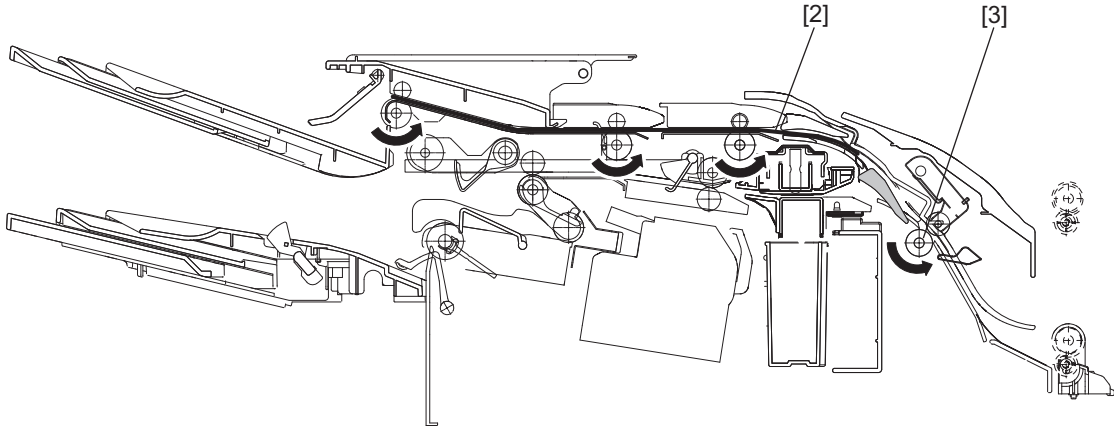


Fig. 3-26

- (5) The stack exit motor (M5) is driven at the same as the copying speed of the MFP until the trailing edge of the paper [2] has passed through the sub-path exit roller [5].

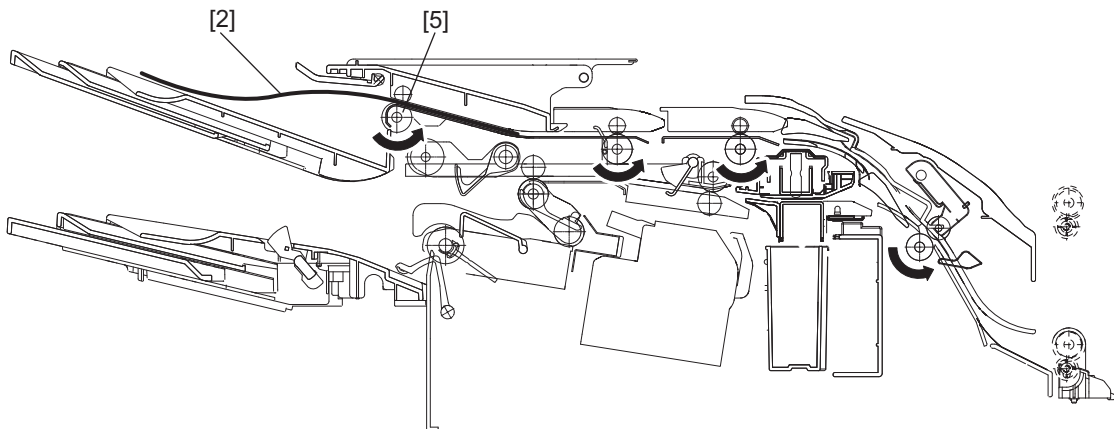


Fig. 3-27

- (6) The speed of the 2nd transport motor (M4) is changed to the same as the exiting speed of the MFP after the trailing edge of the paper [2] has passed through the sub-path exit roller [5].

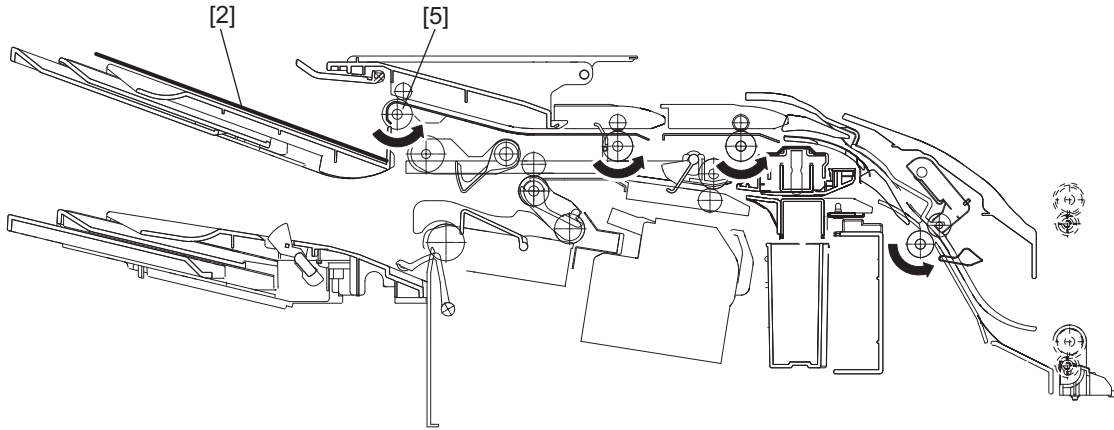


Fig. 3-28

### 3.1.5 Reversing operation

- (1) The 1st flapper solenoid (SOL5) pulls the 1st flapper [1] in order to switch the transport path.
- (2) The 1st transport motor (M8) is driven in a reverse rotation to release the entrance transport roller [2] and switch the 2nd flapper [3] so that the Inner Finisher can receive paper [4].

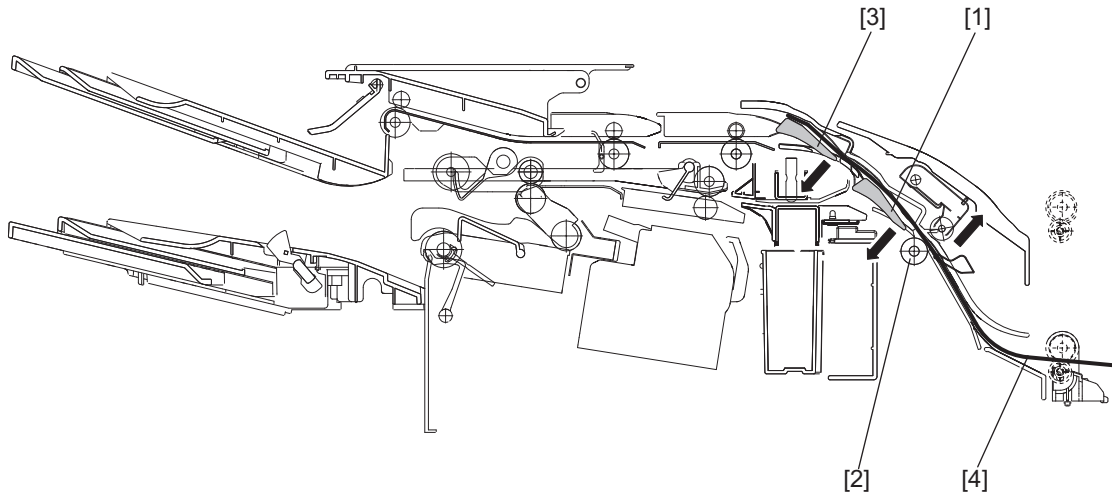


Fig. 3-29

- (3) The 1st transport motor (M8) is stopped after the Inner Finisher receives the switchback command.

\* The paper is returned by the MFP.

- (4) The 1st flapper [1] is returned to its original position after the leading edge of the paper [4] has passed through the entrance transport roller [2].

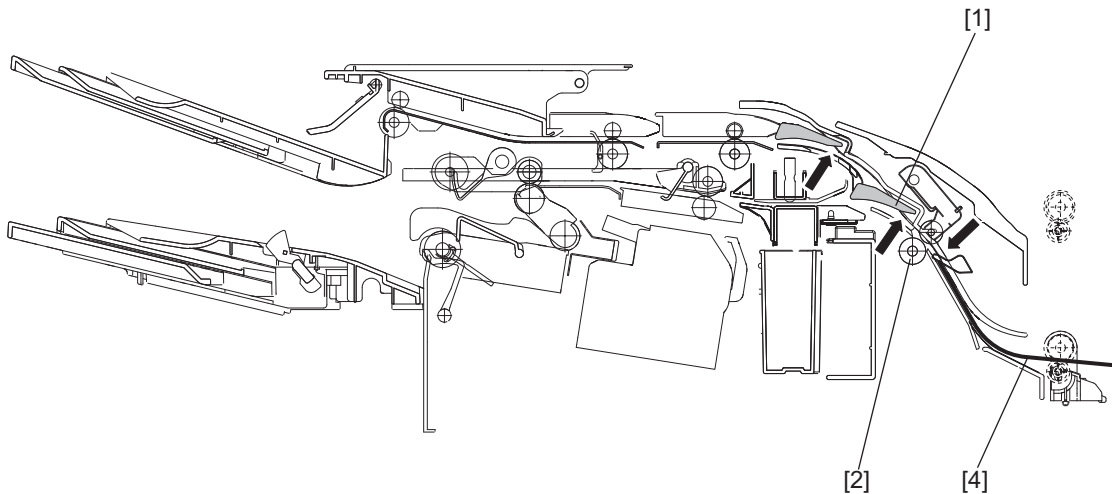


Fig. 3-30



### 3.1.6 Stapling operation

The stapling operation is to staple sheets of paper [1] in the specified number with the stapler unit [2]. Stapling positions differ depending on the selected mode and paper size. When any of the covers and doors is opened or closed, or immediately after power-ON, the finisher control PC board (FIN) drives the staple unit sliding motor (M7) [3] in order to move the stapler unit [2] to its home position. Then the stapler unit [2] is moved to the front side and stopped at a position where the staple unit sliding home position sensor (S3) [4] is turned ON.

Symbol	Sensor	Function	Reference
S3	Stapler unit sliding home position sensor [4]	Detects the home position of the stapler unit when it is moved to the front and rear.	-
S15	Staple unit improper clinching prevention sensor [5]	Detects the interference between the stapler unit clincher section and the finishing tray stopper.	-
S16	Stapler unit clinching home position sensor	Detects the home position of the stapling operation.	In the stapler
S17	Staple top position sensor	Detects the top position of a staple.	In the stapler
S18	Staple empty sensor	Detects the staples in the cartridge.	In the stapler

Symbol	Motor	Function	Reference
M7	Stapler unit sliding motor [3]	Drives the movement of the stapler unit.	-
M10	Stapler motor	Drives the stapler unit operation.	-

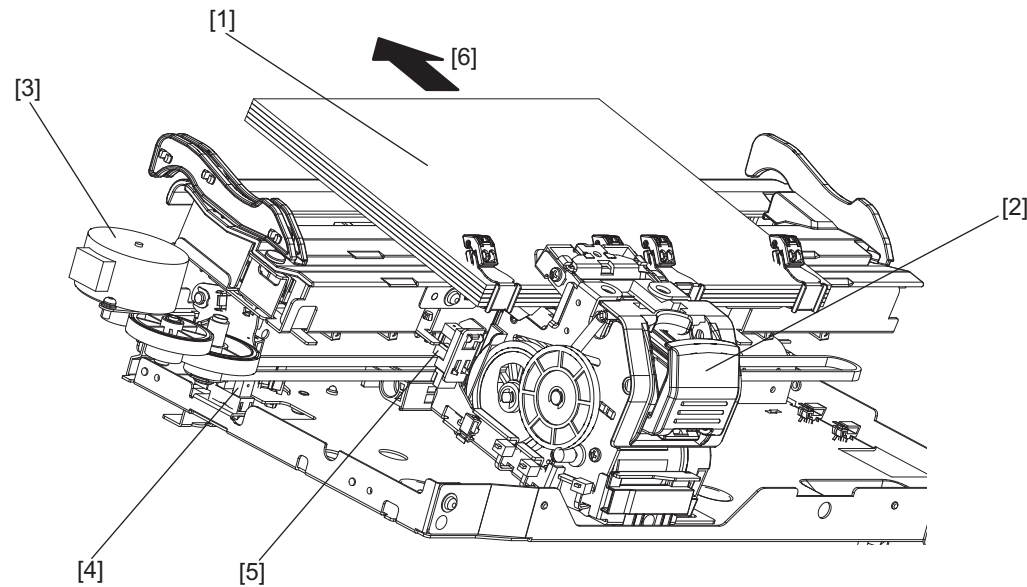
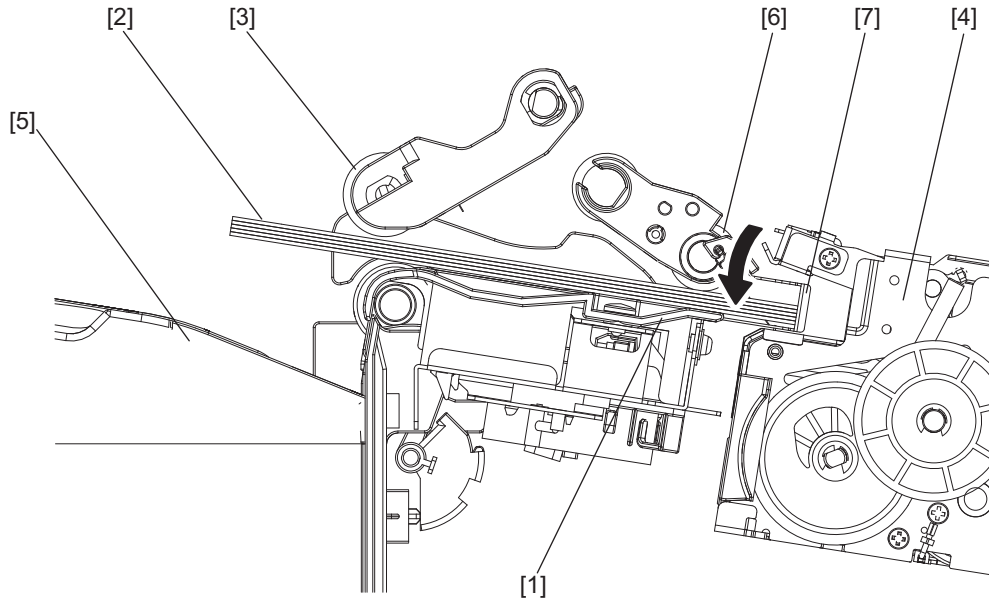


Fig. 3-31

[6] Paper exiting direction

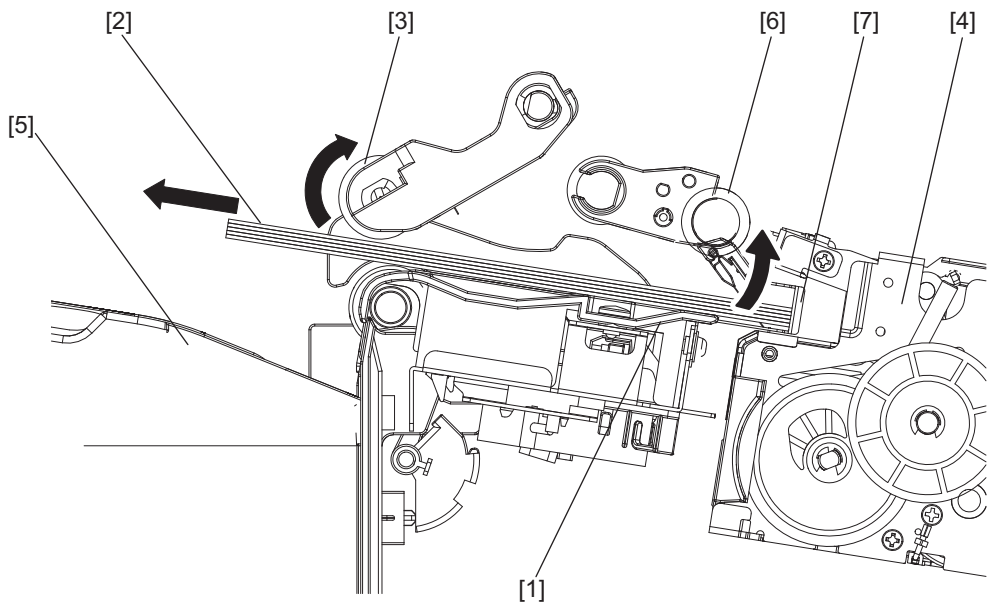
**[A] Stapling operation**

When the stacking of paper [2] on the finishing tray [1] and alignment are finished, the finisher control PC board (FIN) drives the stack exit roller shift motor (M6) to lower the stack exit roller [3]. The lowered stack exit roller [3] nips the stack. Then the finisher control PC board (FIN) moves the stapler unit [4] to have it staple at the specified stapling position.



**Fig. 3-32**

- [5] Movable tray
- [6] Knurled roller
- [7] Trailing edge stopper



**Fig. 3-33**

**[B] Stapler unit**

The stapler motor (M10) performs the stapling operation. One rotation of the cam of the stapler motor (M10) performs one stapling. The staple unit clinching home position sensor (S16) detects the home position of this cam.

A microcomputer (IC1) on the finisher control PC board (FIN) controls whether the stapler motor (M10) is rotated in a normal or a reverse direction.

When the staple unit clinching home position sensor (S16) is turned OFF, the finisher control PC board (FIN) drives the stapler motor (M10) to rotate in a normal direction until this sensor is turned ON, and returns the staple cam to its home position.

The staple empty sensor (S18) detects the presence or the absence of a staple cartridge and staples in the staple cartridge.

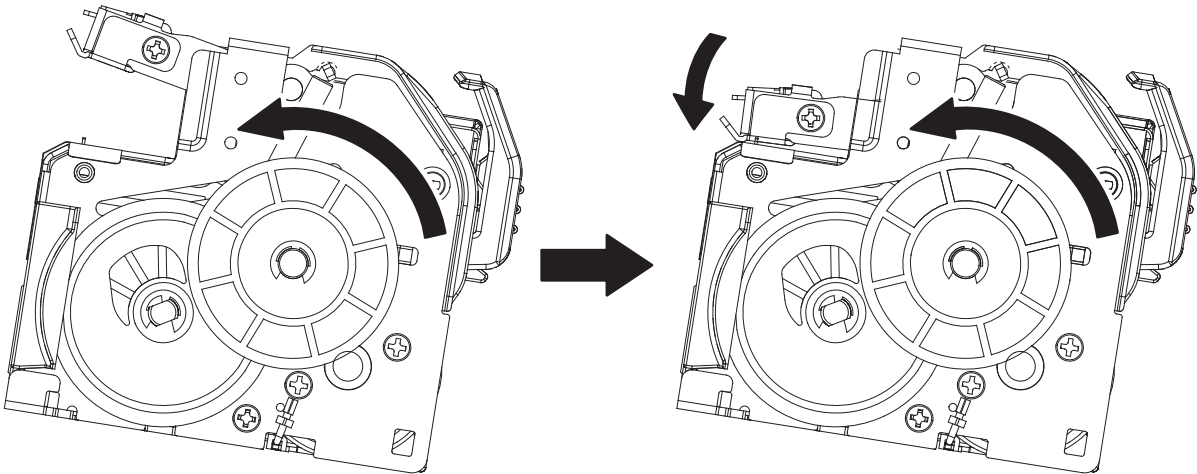


Fig. 3-34

### [C] Stapler unit shift control

The staple unit sliding motor (M7) moves the stapler unit [1]. Its home position is detected by the staple unit sliding home position sensor (S3). When the staple unit receives signals for a stapling mode and a paper size from the MFP, it moves the stapler unit [1] to the specified stapling position accordingly. The figure below shows the stapling positions in each mode.

#### [C-1] Single (front) stapling (paper width: Larger than LT)

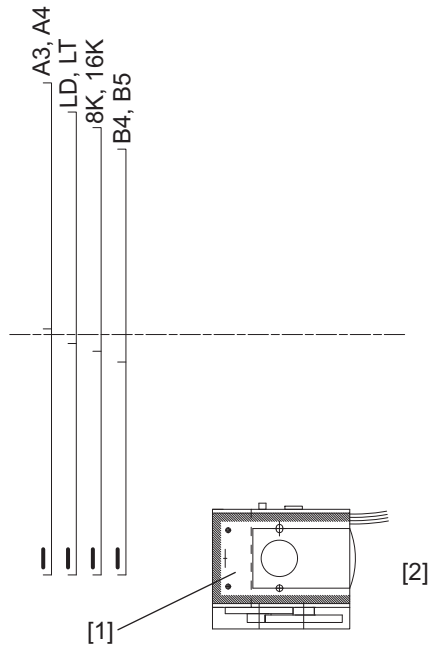


Fig. 3-35

[1] Stapler unit

[2] The stapling position is the same as the stapler waiting one.

[C-2] Single (front) stapling (Paper width: Same or smaller than LT)

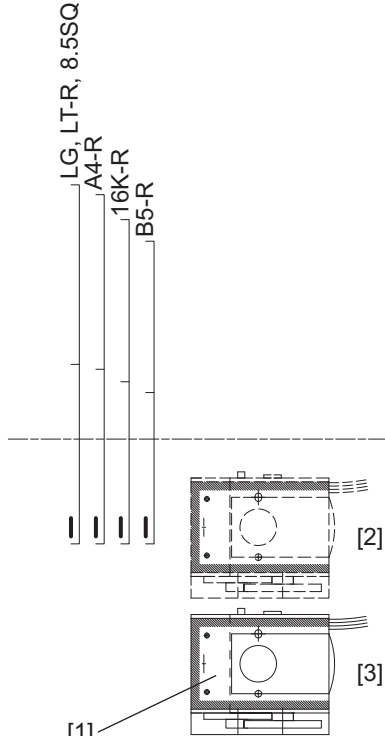
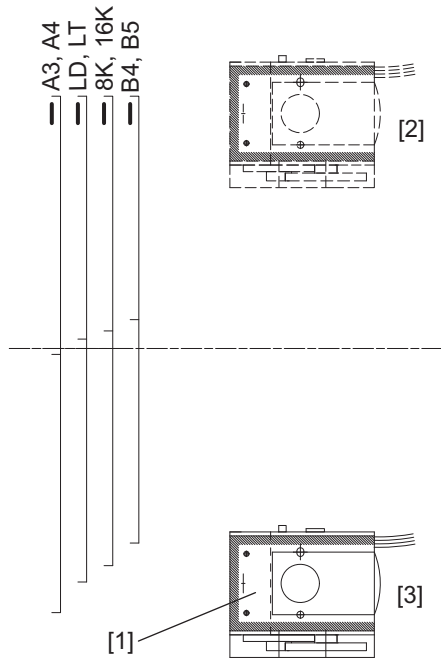


Fig. 3-36

- [1] Stapler unit
- [2] Stapling position
- [3] Stapler waiting position

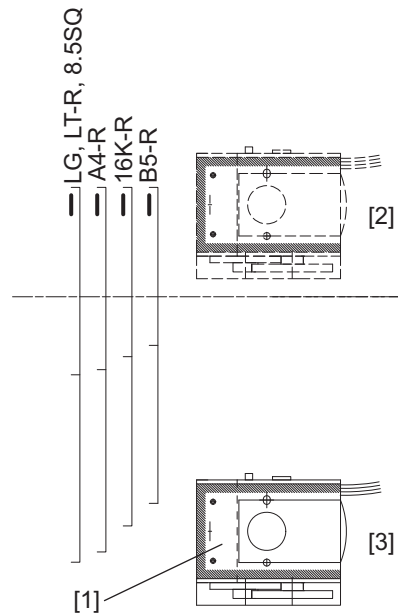
**[C-3] Single (rear) stapling (paper width: Larger than LT)**



**Fig. 3-37**

- [1] Stapler unit
- [2] Stapling position
- [3] Stapler waiting position

**[C-4] Single (rear) stapling (Paper width: Same or smaller than LT)**



**Fig. 3-38**

- [1] Stapler unit
- [2] Stapling position
- [3] Stapler waiting position

### [C-5] Two-position stapling

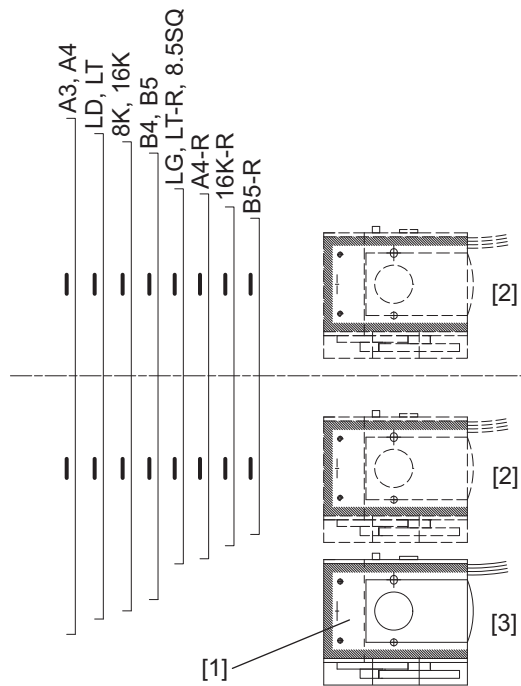


Fig. 3-39

- [1] Stapler unit
- [2] Stapling position
- [3] Stapler waiting position

### 3.1.7 Tray operation

The Inner Finisher has the movable and stationary trays.  
Every sheet of paper transported to the sub-path is exiting to the stationary tray.  
The stationary tray full detection sensor (S11) [1] is mounted on the stationary tray to detect the full status of paper.

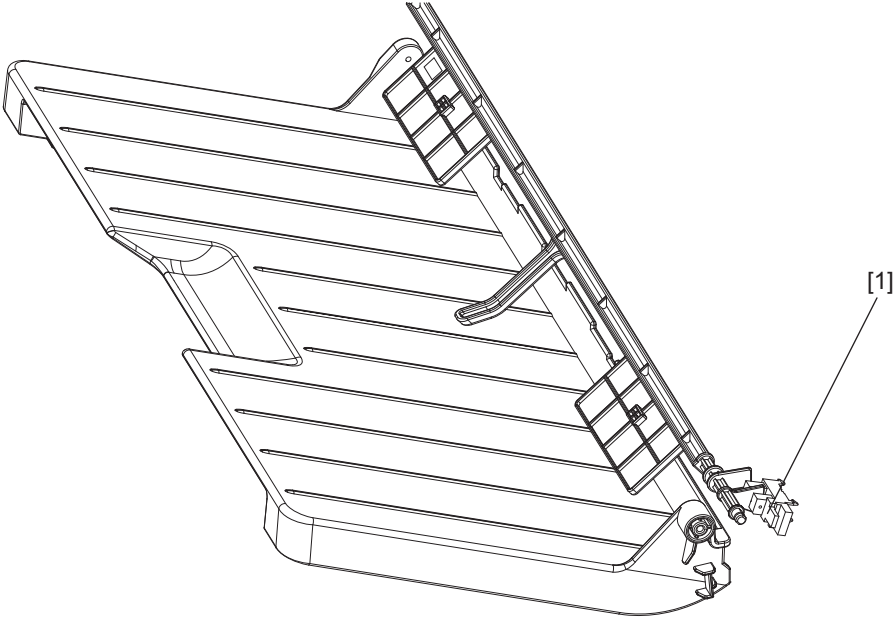


Fig. 3-40



The movable tray lifts itself up and down with the drive of the movable tray shift motor (M1) [2]. The movable tray paper exist sensor (S9) [3] is mounted on the movable tray to detect if there is any paper on this tray. The home position of the movable tray is detected by the movable tray lower limit sensor (S14) [4]. When the power is turned ON or a job is finished, the movable tray shift motor (M1) [2] is driven to return the movable tray to its home position. The stack top detection sensor-1 (S1) [5] and the stack top detection sensor-2 (S2) [6] are mounted on the movable tray to detect the stack top position. Turning ON or OFF of these sensors is switched with the inclination angle of the stack top detecting lever [8]. The position of the movable tray is detected by the combination of ON and OFF of these sensors. When a job is sent, the stack top detection solenoid (SOL1) [7] controls the stack top detecting lever [8] and the movable tray shift motor (M1) is driven to lift up the movable tray. When the stack top is detected by the stack top detection sensor-1 (S1) [5] and the stack top detection sensor-2 (S2) [6], the movable tray shift motor (M1) [2] is stopped. When the stacks of paper exiting from the finishing tray are loaded on the movable tray, the stack top detection sensors detect the stack top and then the movable tray shift motor (M1) [2] is driven to lower the movable tray.

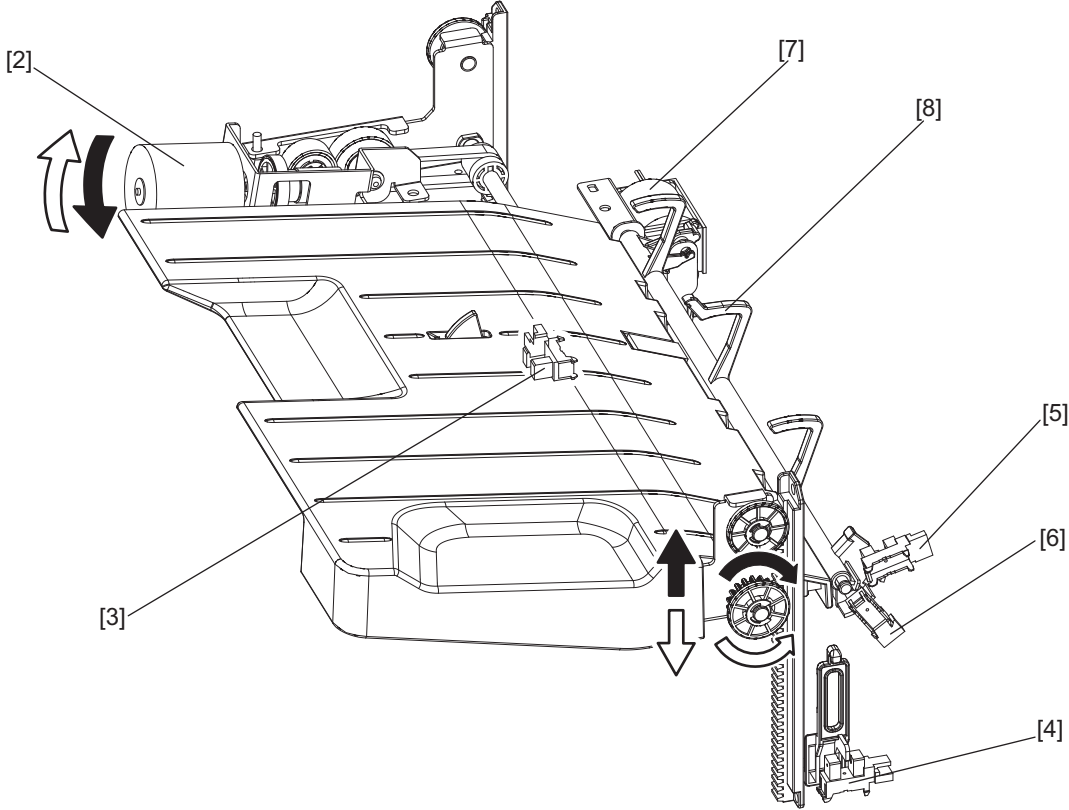


Fig. 3-41

### 3.1.8 Hole Punch Unit

The Hole Punch Unit is designed to be installed in the paper feeding section of the Inner Finisher. The Hole Punch Unit is not equipped with a paper feeding mechanism. Paper from the MFP passes through the Hole Punch Unit and then it is transported in the transport system of the Inner Finisher. When the trailing edge of the paper from the MFP reaches the Hole Punch Unit, the paper is stopped once and the punch motor (M11) is rotated to punch a hole along the trailing edge. These operations are controlled with various commands from the finisher control PC board (FIN) in accordance with commands from the hole punch control PC board (HP).

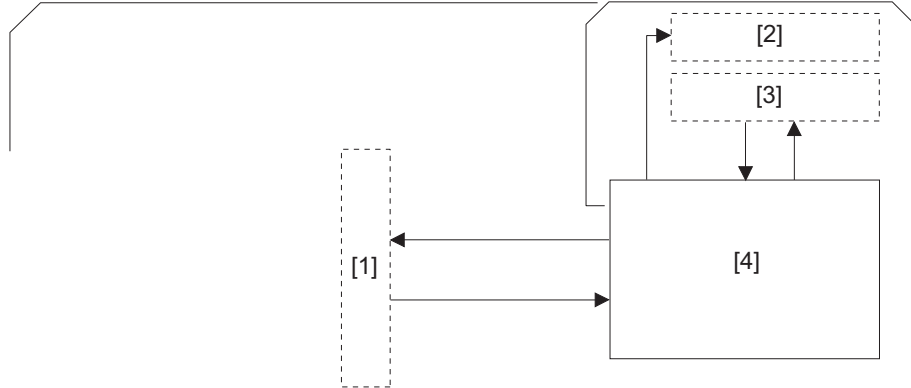


Fig. 3-42

1	Finisher control PC board
2	Hole Punch Unit drive system
3	Horizontal registration drive system
4	Hole punch control PC board

#### [A] Hole Punch Unit operation

The Hole Punch Unit is designed to be installed in the feeding section of the Inner Finisher and punches paper successively when the paper transported from the MFP is paused. When the trailing edge of the paper reaches the Hole Punch Unit, the paper is temporarily stopped by the middle transport roller of the Inner Finisher to be punched along its trailing edge.

The Hole Punch Unit consists of a die and a hole puncher (blade).

The hole puncher is driven by the punch motor (M11). The spiral and slide cams of the hole puncher convert the rotation of the punch motor (M11) to reciprocating movement and thus punching is performed.

The punch motor (M11) is a DC motor. The home position of the hole puncher is detected by the rear punch shaft home position sensor (S22). To stop the punch motor (M11) precisely, the punch motor clock sensor (S20) counts the specified number of clocks. One punching is performed by rotating the spiral cam.

Eight light-receiving transistors (light-receiving PC boards) are mounted over the entrance path of the punch unit, and eight light-emitting LEDs (light-emitting PC boards) are mounted under the entrance path. Each transistor and LED work as a sensor in combination. At the front end, a combination of the transistor and LED work as the trailing edge detection sensors to detect the trailing edge of paper.

Other seven combinations work as the horizontal registration detection sensors detecting the rear side of the paper for determining punching positions.

The punch motor (M11), Hole Punch Unit and sensors above compose the punch sliding unit which is slid forward and backward according to the paper size. This forward and backward movement is driven by the punch unit sliding motor (M12). The home position of the punch sliding unit is detected by the punch sliding unit home position sensor (S23). The punch unit sliding motor (M12) is a stepping motor. Drives of the punch motor (M11) and the punch unit sliding motor (M12) are controlled by the hole punch control PC board (HP) in accordance with commands from the finisher control PC board (FIN).

Punches generated by punching is accumulated in a punch waste case. The full status of the punch waste case is detected by the punch waste full sensor (S21) with the rotation of the flag driven by the punch motor (M11).

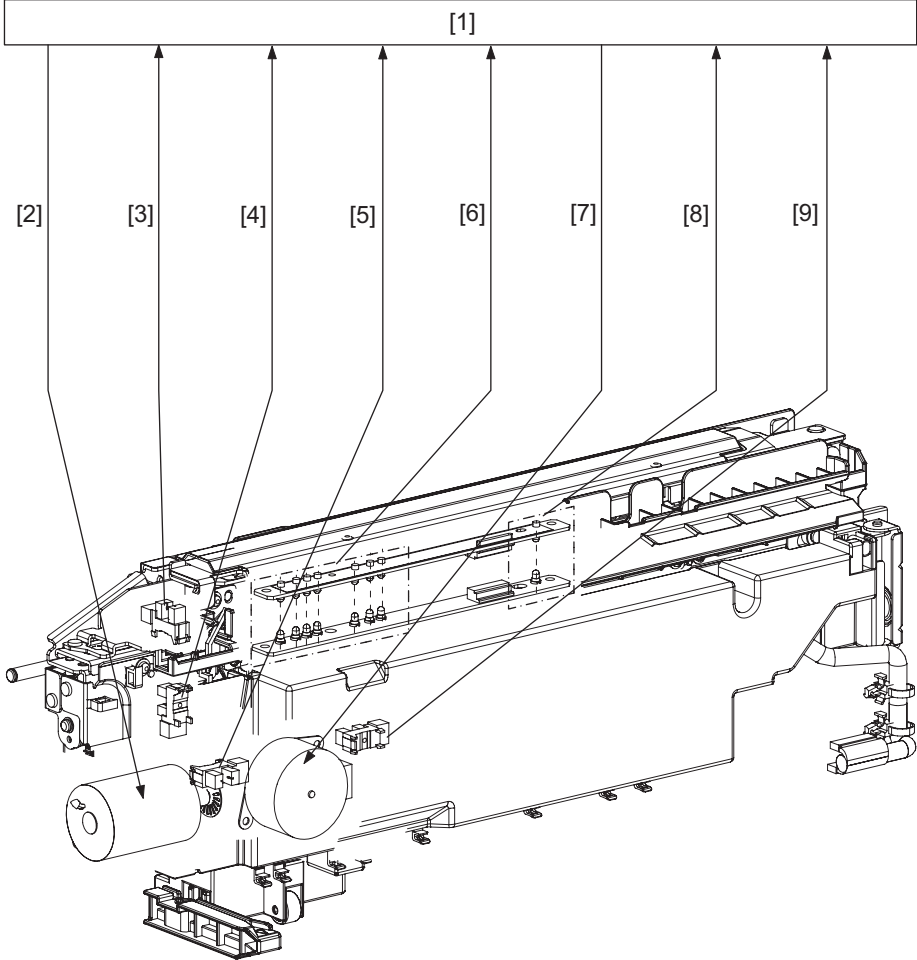


Fig. 3-43

1	Hole punch control PC board	6	Horizontal registration detection signal
2	Punch motor drive signal	7	Punch unit sliding motor drive signal
3	Rear punch shaft home position signal	8	Paper trailing edge detection signal
4	Punch sliding unit home position detection signal	9	Punches full detection signal
5	Punch motor clock detection signal		

**[B] Punching operation**

The hole puncher is driven by the punch motor (M11). Its home position is detected by the rear punch shaft home position sensor (S22).

There are four punching types of the Hole Punch Unit according to destinations; 2-hole, 2- and 3-hole and two 4-hole types.

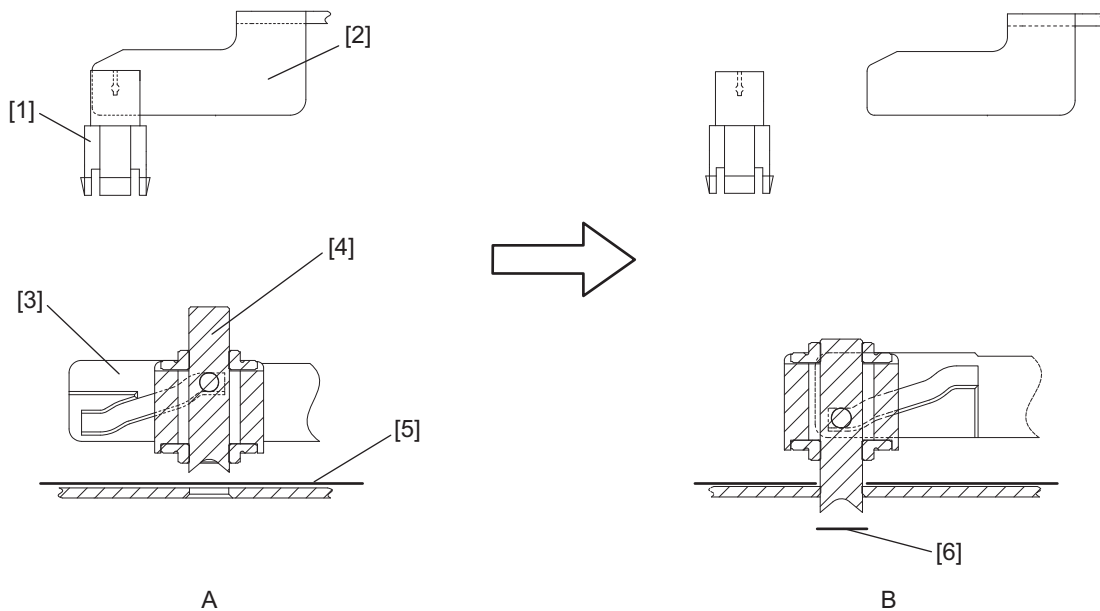
As for the 2-hole and 4-hole types, the spiral cam is rotated 180 degrees in the normal and reverse directions so that the hole puncher will punch with its one reciprocating movement. In the 2- and 3-hole type Hole Punch Unit, the spiral cam is rotated 360 degrees in a normal direction so that the hole puncher will punch two holes with its one reciprocating movement, and if it is a 3-hole type, the spiral cam is further rotated 180 degrees in a normal direction to punch the third hole.

**[B-1] 2-hole and 4-hole types**

When the rear punch shaft home position sensor (S22) is OFF, the hole puncher is at its home position. The punching operation is finished when the spiral cam is rotated 180 degrees in the normal and reverse directions and the rear punch shaft home position sensor (S22) is turned OFF from ON.

The overview of 2-hole and 4-hole type punching operation is shown below.

- (1) A hole is punched along the trailing edge of paper.



**Fig. 3-44**

A: Spiral cam at reset (home position)

B: Spiral cam rotates 180 degrees in normal direction (hole punched)

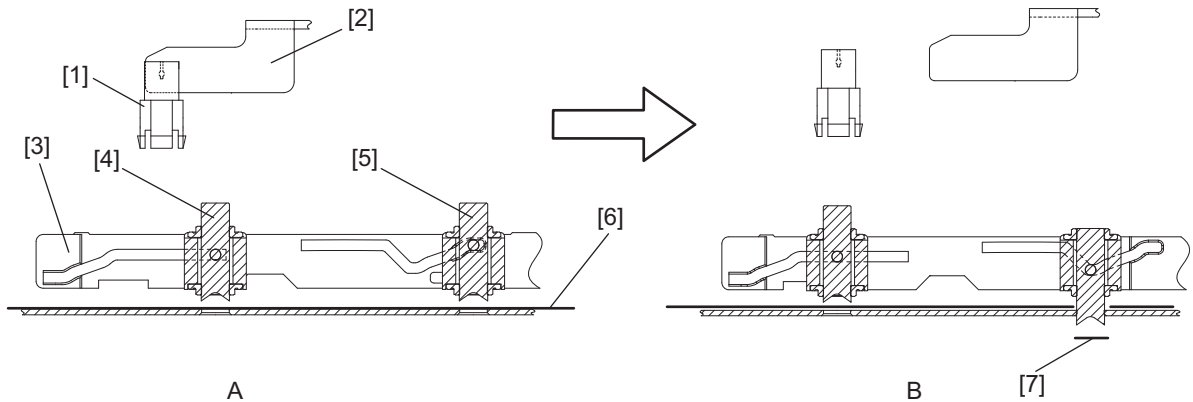
1	Rear punch shaft home position sensor	4	Hole puncher
2	Sensor flag	5	Paper
3	Slide cam	6	Punches

**[B-2] 2-hole and 3-hole types**

When the rear punch shaft home position sensor (S22) is OFF, the hole puncher is at its home position. In a case of 2-hole type, the punching of two holes is finished when the spiral cam is rotated 131.7 degrees in the normal and reverse directions and the rear punch shaft home position sensor (S22) is turned OFF from ON. At this time, the hole puncher for the 3-hole type remains unmoved. A waiting position in a case of 3-hole type is a point where the punch shaft home position sensor (S26) is turned OFF from ON and the spiral cam is rotated 177.3 degrees from the home position in the normal direction. Punching is started after the spiral cam is rotated in the normal and reverse directions 360 degrees from the waiting position, and punching is finished when the punch shaft home position sensor (S26) is turned OFF from ON.

The overview of a 2- and 3-hole type punching operation is shown below.

- (1) Two holes are made along the trailing edge of paper.



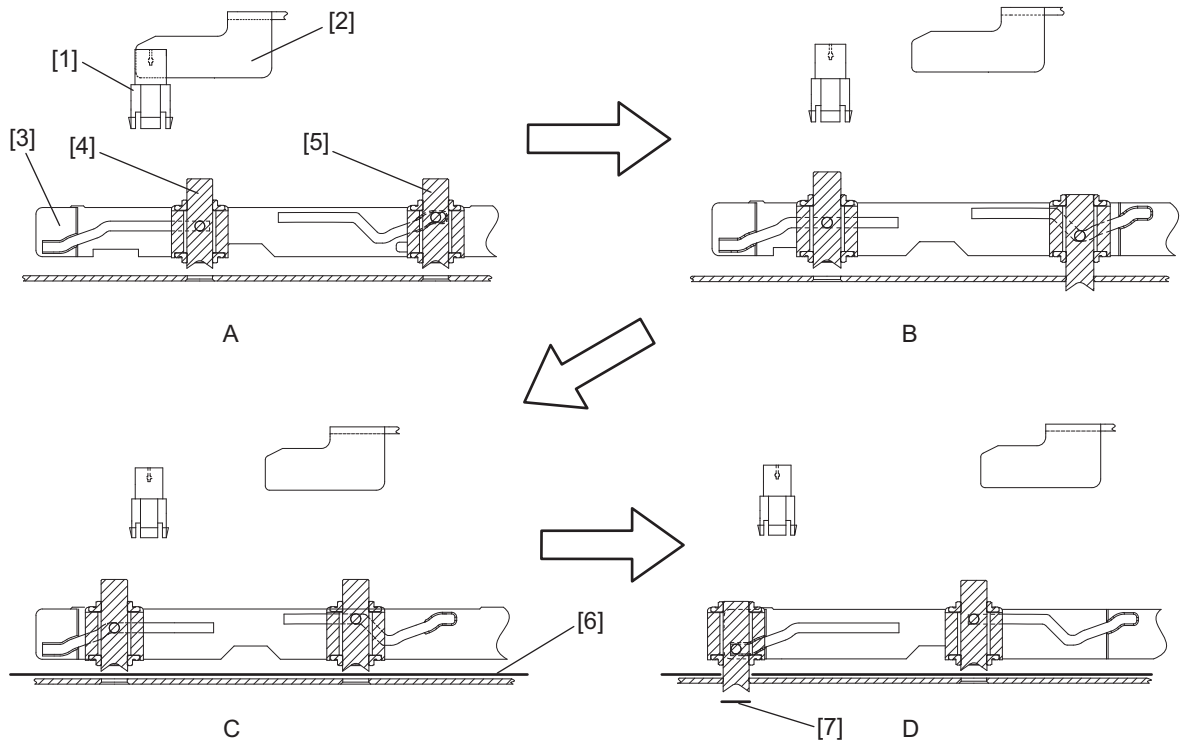
**Fig. 3-45**

A: Spiral cam at reset (home position)

B: Spiral cam rotates 131.7 degrees in normal direction (hole puncher for 2-hole type lowered)

1	Rear punch shaft home position sensor	5	Hole puncher for 2-hole type
2	Sensor flag	6	Paper
3	Slide cam	7	Punches
4	Hole puncher for 3-hole type		

(2) Three holes are made along the trailing edge of paper.



**Fig. 3-46**

A: Spiral cam at reset (home position)

B: Spiral cam rotates 131.7 degrees in normal direction (hole puncher for 2-hole type lowered)

C: Spiral cam rotates 131.7 degrees in normal direction (hole puncher for 2-hole type raised, hole puncher for 3-hole type moved to its home position)

D: Spiral cam rotates 360 degrees in normal direction (hole puncher for 3-hole type lowered)

1	Rear punch shaft home position sensor	5	Hole puncher for 2-hole type
2	Sensor flag	6	Paper
3	Slide cam	7	Punches
4	Hole puncher for 3-hole type		

**[C] Horizontal registration operation**

The horizontal registration movement of the punch sliding unit [1] is performed by the punch unit sliding motor (M12) [2]. The home position of the punch sliding unit [1] is detected by the punch sliding unit home position sensor (S23) [3]. The punch sliding unit [1] detects the trailing edge of paper with the trailing edge detection section [4] and the horizontal registration detection section [5] of the paper detection sensors (S24/S25) so that this unit can be moved to the proper trailing edge position according to the paper size.

The horizontal registration operation is shown below.

- (1) When the trailing edge of paper transported from the MFP is detected by the trailing edge detection section [4], the punch unit sliding motor (M12) [2] starts moving the punch sliding unit [1] to the front side.

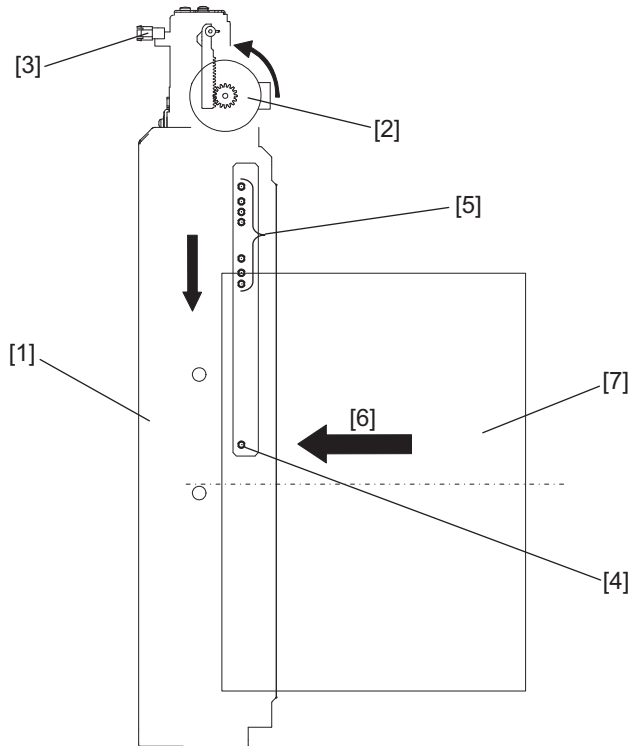


Fig. 3-47

1	Punch sliding unit	5	Horizontal registration detection section (S25)
2	Punch unit sliding motor (M12)	6	Paper exiting direction
3	Punch sliding unit home position sensor (S23)	7	Paper
4	Paper trailing edge detection signal (S24)		

- (2) The horizontal registration detection section selected in accordance with a paper size signal from the MFP detect the trailing edge of the paper on the rear side. Then the punch unit sliding motor (M12) moves the punch sliding unit [1] until it reaches to the specified position to the front side, and then stops this unit.

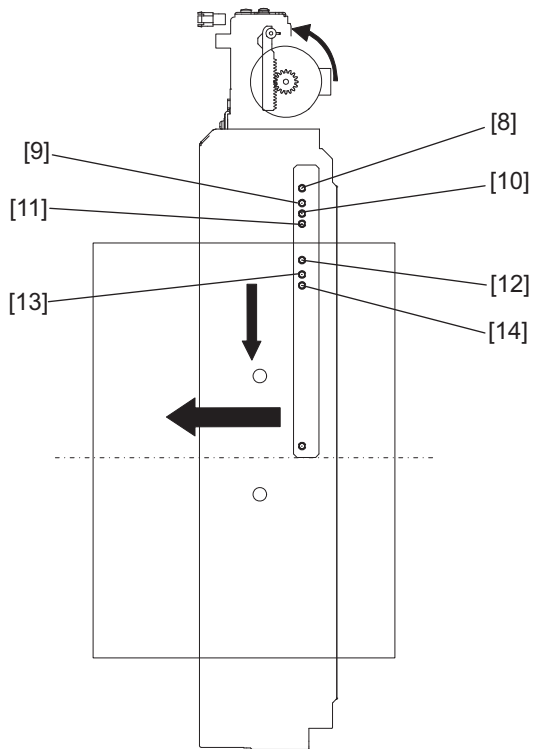


Fig. 3-48

8	Horizontal registration detection sensor (A3, A4)
9	Horizontal registration detection sensor (LD, LT)
10	Horizontal registration detection sensor (8K, 16K)
11	Horizontal registration detection sensor (B4, B5)
12	Horizontal registration detection sensor (LG, LT-R, A4-R)
13	Horizontal registration detection sensor (16K-R)
14	Horizontal registration detection sensor (B5-R)



- (3) When the trailing edge detection sensors (S24-1 and S24-2) [4] detect the trailing edge of the paper, the transport motor of the Inner Finisher is stopped to stop the transport of the paper. Then the punch motor (M11) is driven to punch the paper [15].

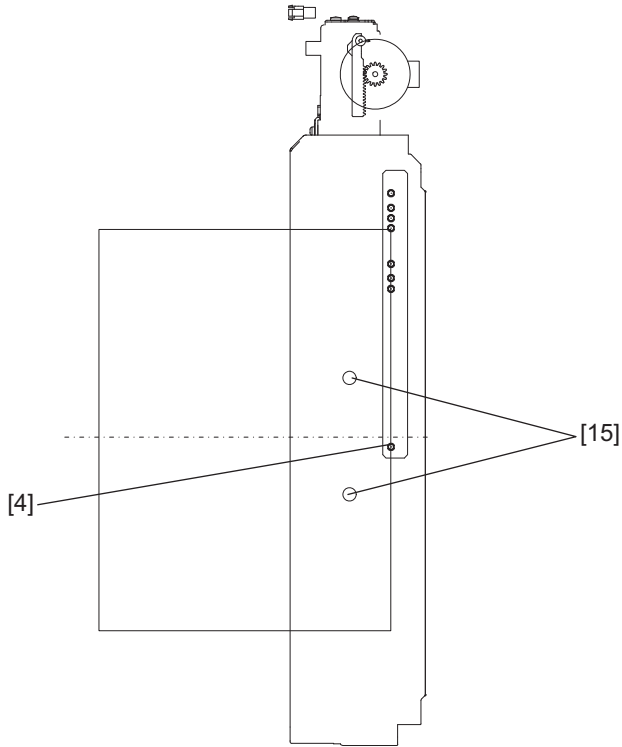


Fig. 3-49

- (4) After punching is finished, the transport motor of the Inner Finisher starts driving, and at the same time, the punch unit sliding motor (M12) starts a reverse rotation to return the punch sliding unit to its home position and stop it.
- (5) The punch sliding unit returns to its home position and repeats steps 1 through 4 every time a sheet of paper is arrived, even if the sheets are transported continuously.

### 3.1.9 Paper misfeeding detection

Timing for checking paper jams in the Inner Finisher and the Hole Punch Unit is programmed in a microcomputer (CPU) on the finisher control PC board (FIN) in advance. It checks paper jams at the set timing in accordance with whether paper exists in the sensor section or not. When a paper jam occurs, the finisher control PC board (FIN) sends the data of the jam to the MFP in a form of a self-diagnostic code, so that a user can identify the jam in the self-diagnostic mode on the control panel of the MFP.

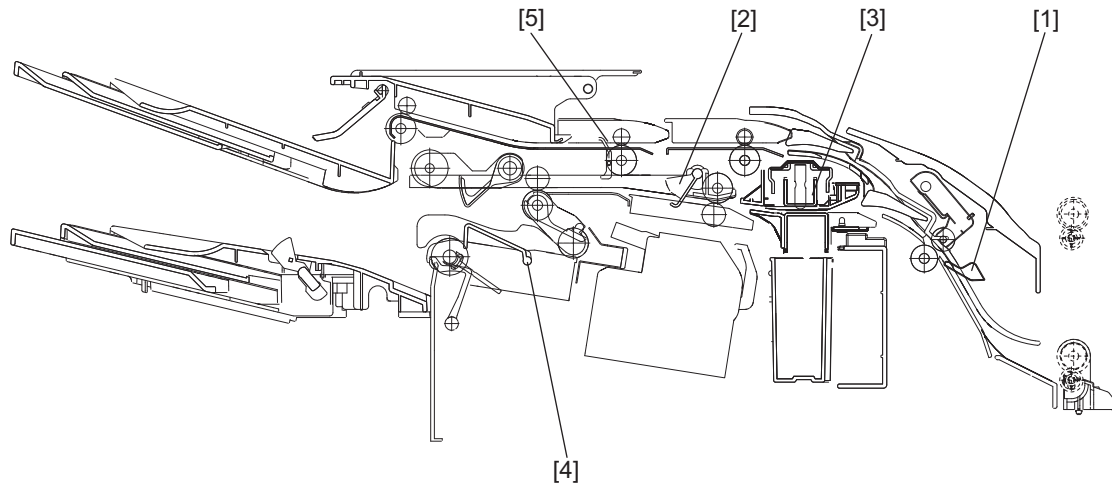


Fig. 3-50

1	Entrance path sensor
2	Middle path sensor
3	Paper detection sensor
4	Finishing tray sensor
5	Sub-path sensor

**[A] Paper remaining jam (Inner Finisher transport path)**

Either of the entrance path sensor (S19) and the middle path sensor (S7) detects paper after power-ON or when the jam access front cover is closed.

The paper detection sensor (S24) detects paper after power-ON or the closing of the jam access front cover when the Hole Punch Unit is installed.

**[B] Paper remaining jam (Inner Finisher exit outlet)**

The finishing tray sensor (S4) detects paper after power-ON.

**[C] Paper not reaching the entrance path sensor**

The entrance path sensor (S19) does not detect paper after the specified period of time has passed since a signal was received from the MFP.

**[D] Paper stopping jam at the entrance path sensor**

The entrance path sensor (S19) does not detect the removal of paper after it detects the paper and the 1st transport motor (M8) is driven at the specified pulses.

**[E] Front cover open jam**

Either of the front cover switch (SW1) and the sub-path opening/closing sensor (S12) detects the opening status during the operation of the Inner Finisher.

The Hole Punch Unit connection signal informs the opening status when the Hole Punch Unit is installed.

**[F] Stapling jam**

The staple unit improper clinching prevention sensor (S15) detects that stapling is impossible.

The opening status of the stapler is not detected by the staple unit clinching home position sensor (S16) during stapling within specified period of time after this sensor detects the closing status, and also this sensor detects the opening status in a reverse rotation after stapling is stopped.

The stapling start position sensor (S17) does not detect the ejection-ready status of a staple during staple ejection.

**[G] Stack exit jam**

The finishing tray sensor (S4) does not detect the removal of a stack of paper after the exiting of this stack is started and the stack exit motor (M5) is driven at a specified pulses in the paper exiting direction.

**[H] Paper not reaching the middle path sensor**

The middle path sensor (S7) does not detect paper after the entrance path sensor (S19) detects the paper and the 1st transport motor (M8) is driven at the specified pulses.

**[I] Paper stopping jam at the middle path sensor**

The middle path sensor (S7) does not detect the removal of paper after it detects the paper and the 2nd transport motor (M4) is driven at the specified pulses.

**[J] Paper not reaching the sub-path sensor**

The sub-path sensor (S8) does not detect paper after the entrance path sensor (S19) detects the paper and the 1st transport motor (M8) and the 2nd transport motor (M4) are driven at a specified period of time.

**[K] Paper stopping jam at the sub-path sensor**

The sub-path sensor (S8) does not detect the removal of paper after it detects the paper and the 2nd transport motor (M4) is driven at the specified pulses.

**[L] Paper remaining jam at the sub-path**

The sub-path sensor (S8) detects paper after power-ON or the closing of the front cover.

**[M] Punching jam**

The rear punch shaft home position sensor (S22) detects that the hole puncher is not at its home position because paper does not reach this sensor or overrunning occurs after punching is finished. An error occurs on the punch unit sliding motor (M12) during paper feeding.

**[N] Staple unit sliding motor error**

An error occurs on the staple unit sliding motor (M7) during paper feeding.

**[O] Stack exit roller shift motor error**

An error occurs on the stack exit roller shift motor (M6) during paper feeding.

### 3.1.10 Power supply system (Inner Finisher section)

#### [A] Overview

When the power of the MFP is turned ON, it supplies 5 V and 24 V power to the finisher control PC board (FIN). 24 V power is supplied for driving motors and solenoids, while 5 V power is for driving sensors. The ICs on the circuit generate 3.3 V power from 5 V power to be supplied for driving the ICs on the finisher control PC board (FIN).

If the Hole Punch Unit is installed, power divided in the Inner Finisher is also supplied to the hole punch control PC board (HP).

A part of 24 V power for driving motors and solenoids is cut off when the front cover switch (SW1) is opened.

Fig. 3-51 shows a block diagram of the power supply system.

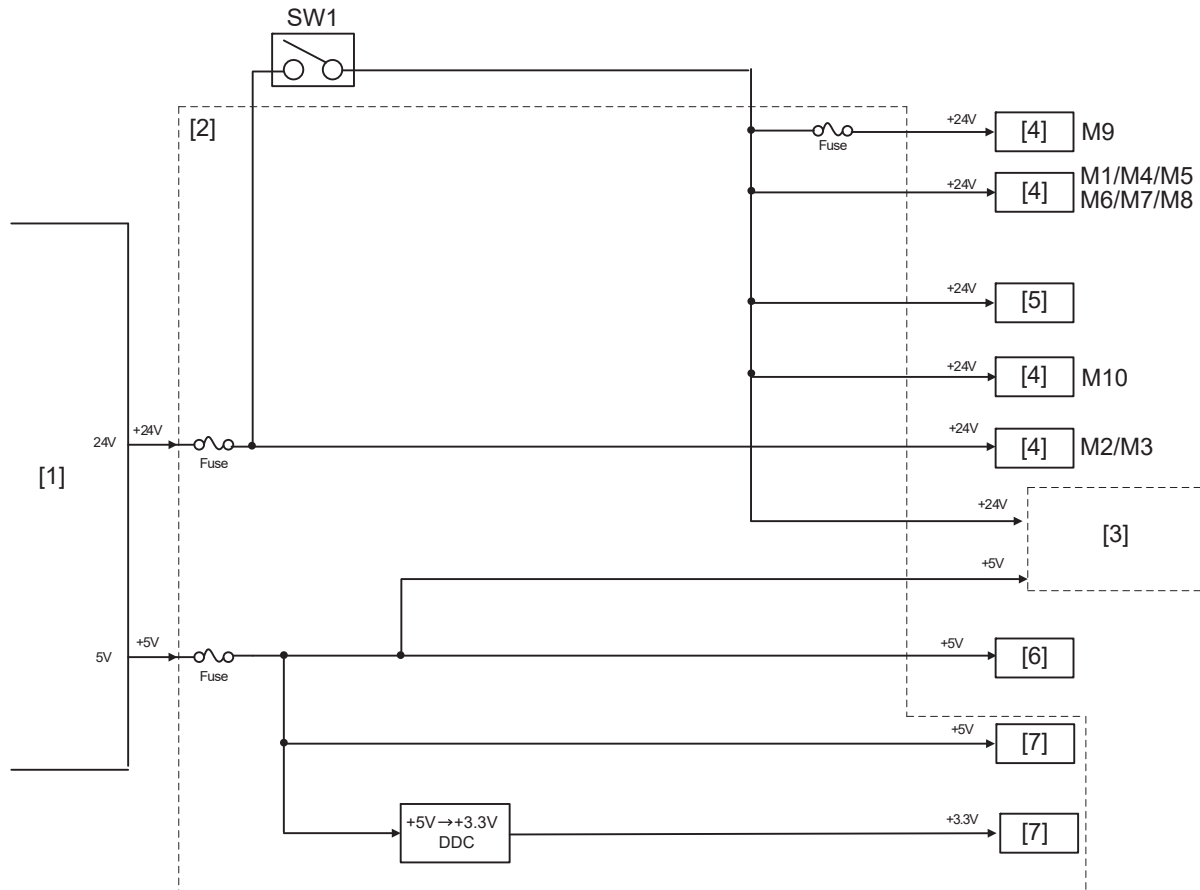


Fig. 3-51

1	MFP	5	Solenoid
2	Finisher control PC board (FIN)	6	Sensor
3	Hole punch control PC board (HP)	7	Logic system
4	Motor		

#### [B] Protective mechanism

A fuse is mounted in 24 V and 5 V power supply on the joint of the Inner Finisher and the MFP as a protective mechanism against overcurrent.

Moreover, a protection device is mounted in 24 V power supply for driving each motor and solenoid for overcurrent protection. It is fused in an overcurrent state.

### 3.1.11 Power supply system (Hole Punch Unit)

**[A] Overview**

When the power of the MFP is turned ON, 24 V and 5 V power are supplied to the Hole Punch Unit through the finisher control PC board (FIN).

24 V power is supplied for driving motors and solenoids, while 5 V power is for driving sensors. 24 V power for driving motors is cut off when the front cover switch (SW1) in the Inner Finisher is opened.

Fig. 3-52 shows a block diagram of the power supply system.

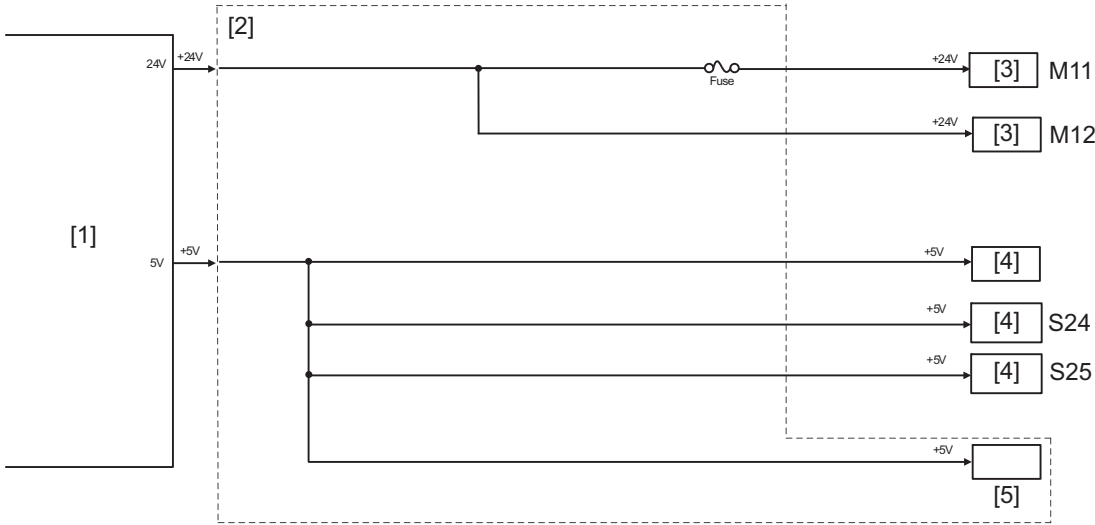


Fig. 3-52

1	Finisher control PC board (FIN)
2	Hole punch control PC board (HP)
3	Motor
4	Sensor
5	Logic system

**[B] Protective mechanism**

A protection device is mounted in 24 V power supply for driving the punch motor (M11) and the punch unit sliding motor (M12) for overcurrent protection. It is fused in an overcurrent state.

## 4. DISASSEMBLY AND REASSEMBLY

### 4.1 Inner Finisher Section

#### 4.1.1 Externals

	Part name	Number of screws (pieces)
1	Movable tray	-
2	Stationary tray	1
3	Rear cover	4
4	Front left cover	3
5	Top cover	4
6	Finishing section bottom cover	2
7	Jam access knob	1

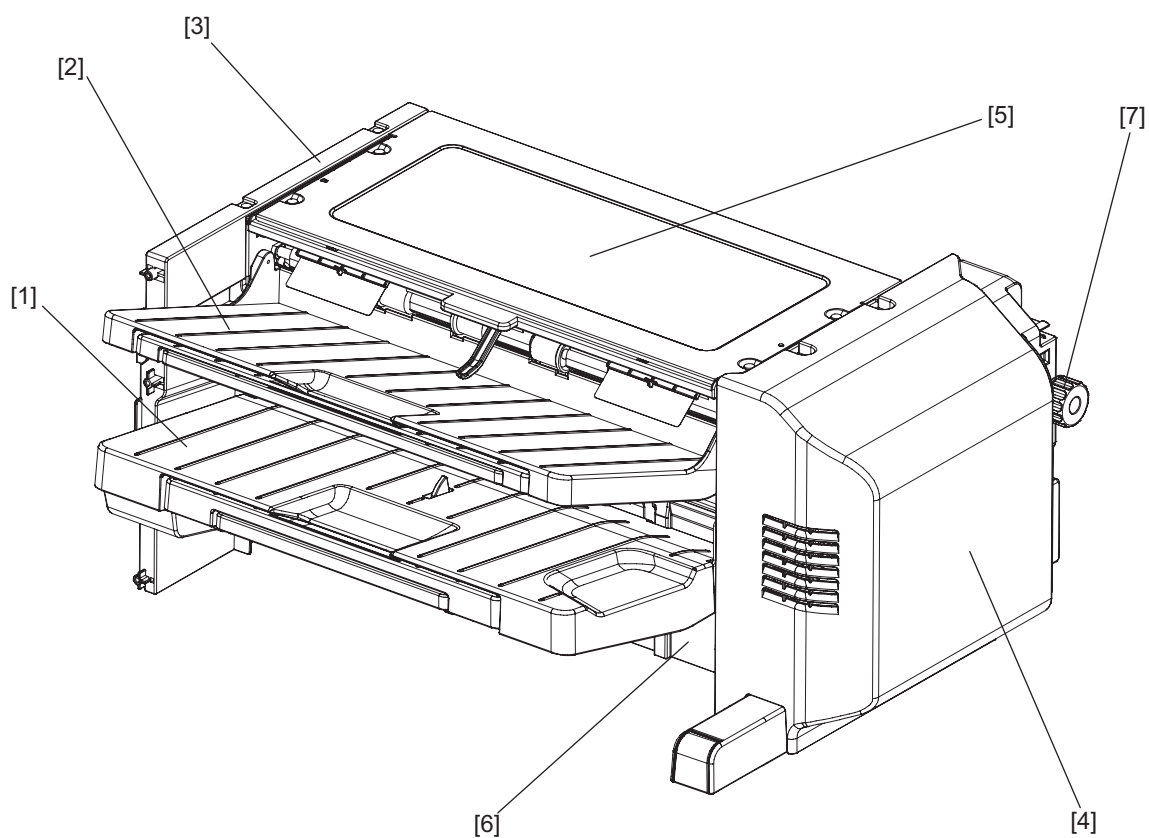


Fig. 4-1

**[A] Front left cover**

- (1) Remove 1 screw [1] and take off the jam access knob [2].

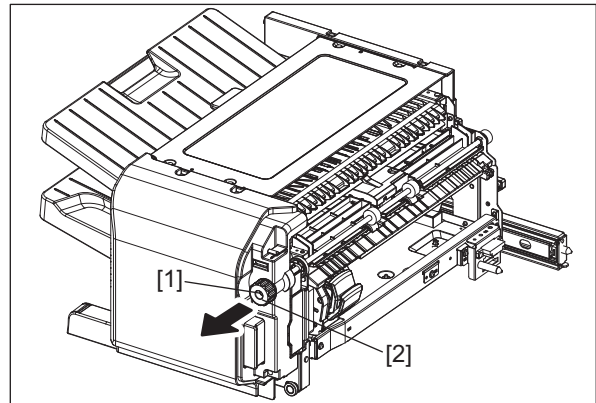


Fig. 4-2

- (2) Remove 3 screws [3] and take off the front left cover [4] by releasing 2 hooks [7].

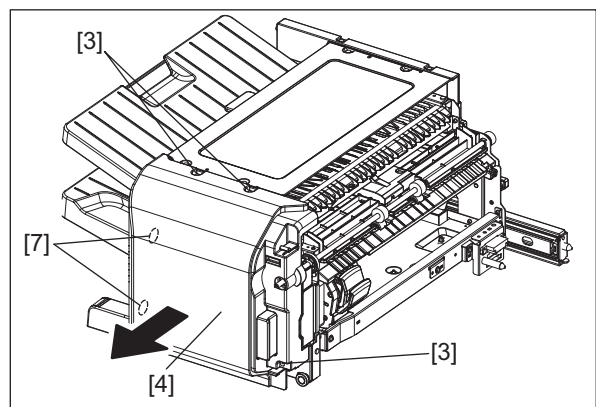


Fig. 4-3

- (3) Remove 1 screw [5] and take off the inner cover [6].

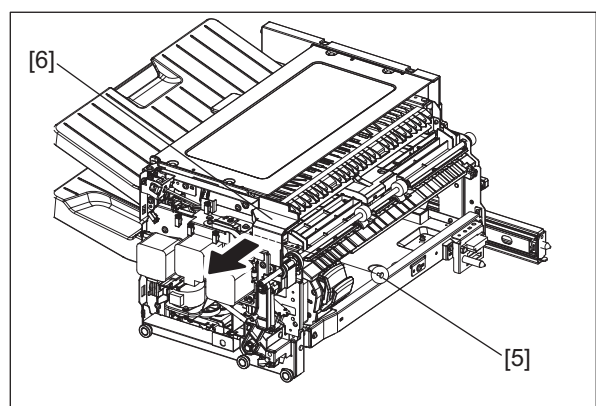


Fig. 4-4



## [B] Rear cover

- (1) Slide the rail [1].  
Remove 4 screws. Then cut off the binding band [2] and take off the rear cover [3].

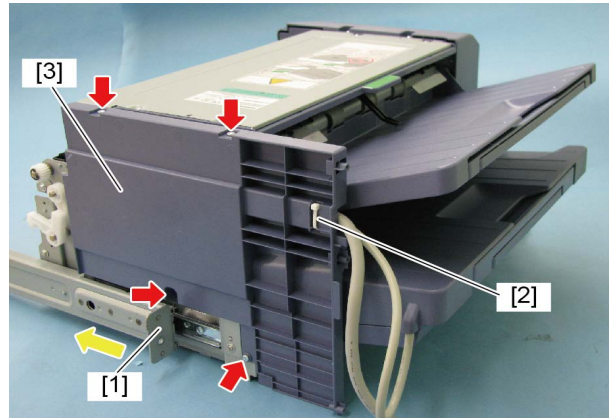


Fig. 4-5

## [C] Sub-path upper guide

- (1) Take off the front left cover.  
( P. 4-2 “[A] Front left cover”)
- (2) Take off the rear cover.  
( P. 4-3 “[B] Rear cover”)
- (3) Open the sub-path upper guide [1].
- (4) Remove 2 screws [2] and take off 2 caulking stud assemblies [3].

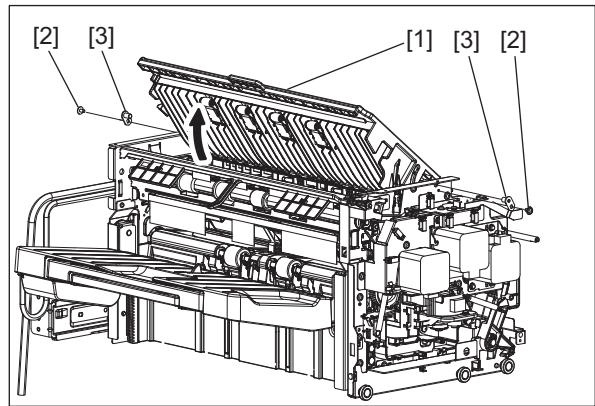


Fig. 4-6

- (5) Take off the sub-path upper guide [1].

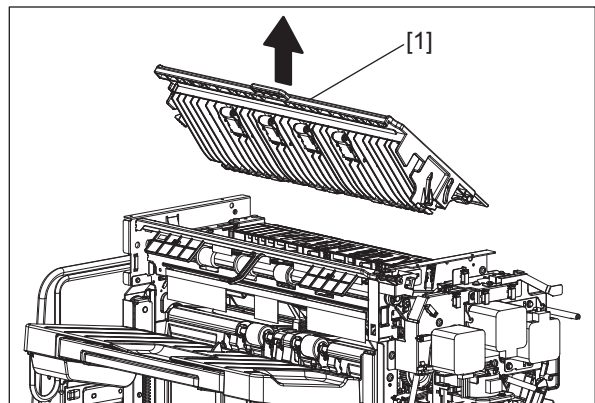



Fig. 4-7

**[D] Movable tray**

- (1) Take off the rear cover.  
( P. 4-3 “[B] Rear cover”)
- (2) Cut off the binding band [1], remove 1 screw [2] and disconnect the grounding terminal. Disconnect the relay connector [3] and release the harnesses from 2 harness clamps [8].

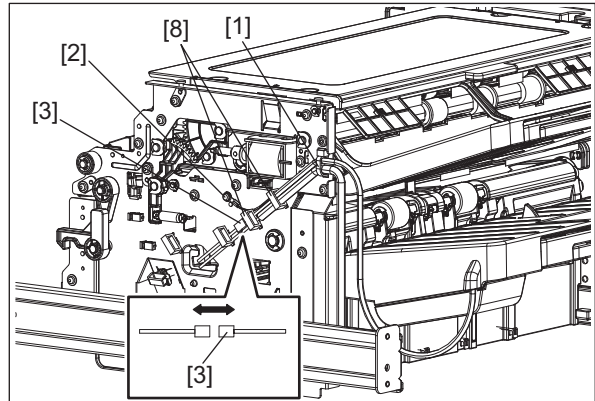


Fig. 4-8

- (3) Place the Inner Finisher upside down.

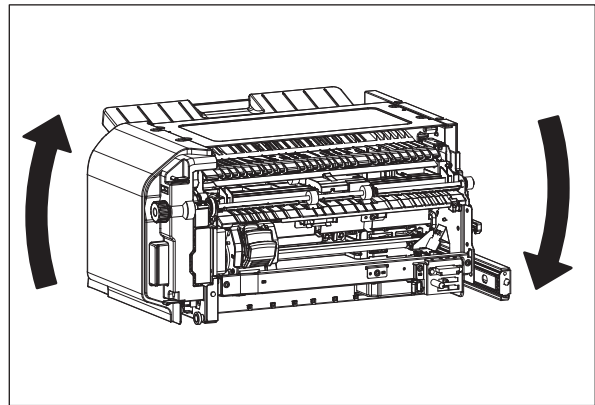


Fig. 4-9

- (4) Remove 4 screws [4] and take off 2 tray covers [5].

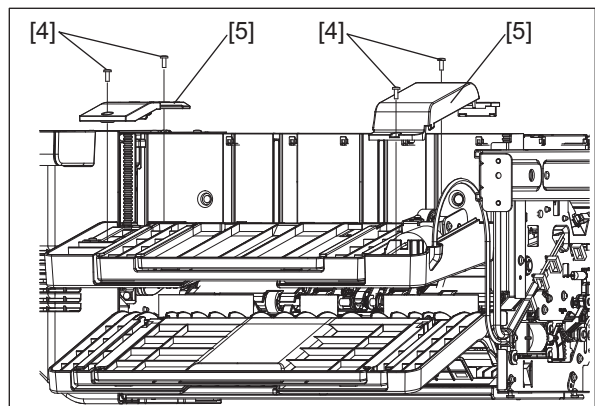


Fig. 4-10

- (5) Slide a ratchet gear [6] to unlock the tray. Then take off the tray [7] by lifting it upward.

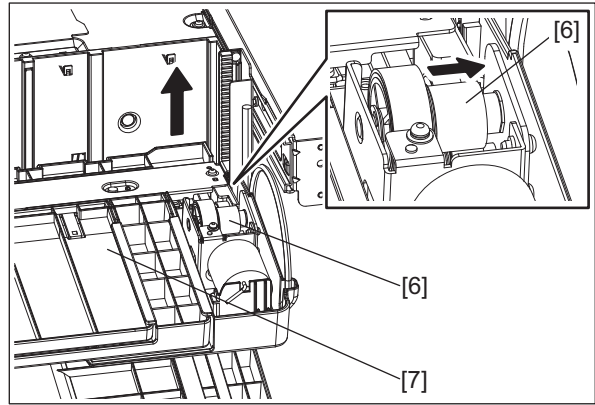



Fig. 4-11

**[E] Stationary tray**

- (1) Take off the front left cover.  
( P. 4-2 “[A] Front left cover”)
- (2) Remove 1 screw [1] and take off 1 caulking stud assembly [3].  
Remove 1 shoulder screw [4] and take off the stationary tray [2].

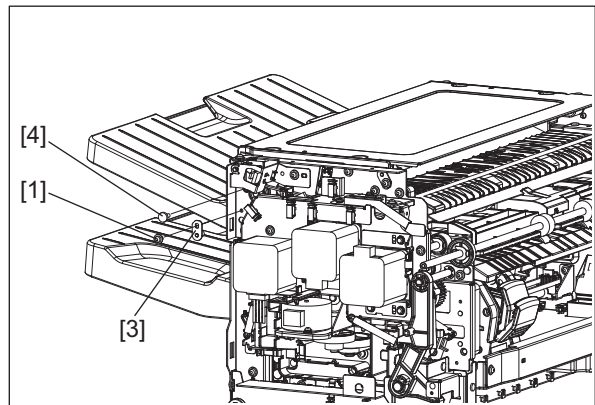


Fig. 4-12

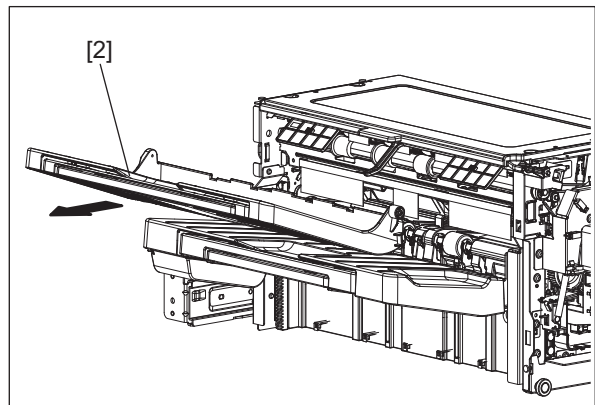


Fig. 4-13

## [F] Finishing section bottom cover

- (1) Take off the rear cover.  
(📖 P. 4-3 “[B] Rear cover”)
- (2) Take off the movable tray.  
(📖 P. 4-4 “[D] Movable tray”)
- (3) Remove 3 screws [1] and take off the rack assembly on the rear side [2].
- (4) Remove 2 shoulder screws [3] and take off the finishing section bottom cover [4].

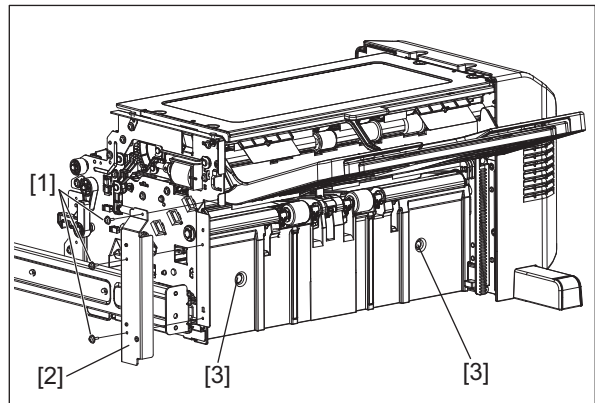


Fig. 4-14

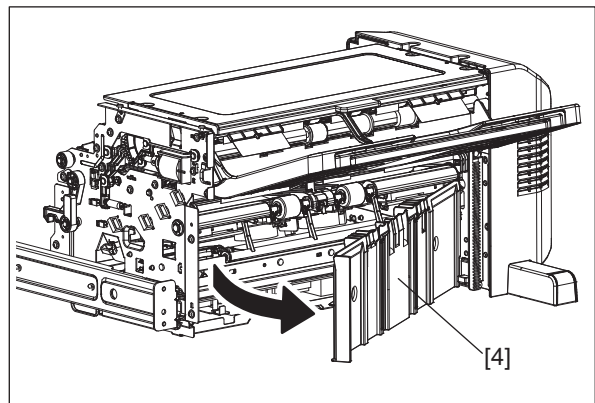



Fig. 4-15

## 4.1.2 Transport system

### [A] Stapler

- (1) If the Hole Punch Unit is installed, take it off.  
( P. 4-33 “[A] Hole Punch Unit”)
- (2) Move the stapler [1] to the front end and place the Inner Finisher upside down.

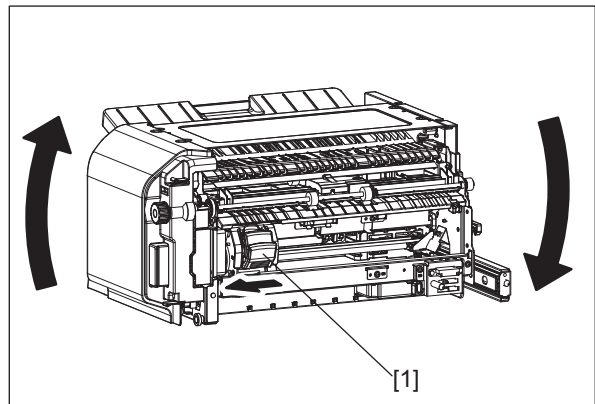


Fig. 4-16

- (3) Remove 4 screws [2] and take off the board cover [3].

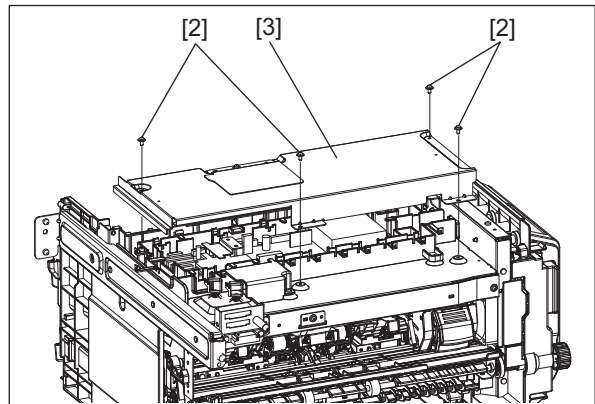


Fig. 4-17

- (4) Remove 2 screws [4] fixing the stapler through 2 access holes.

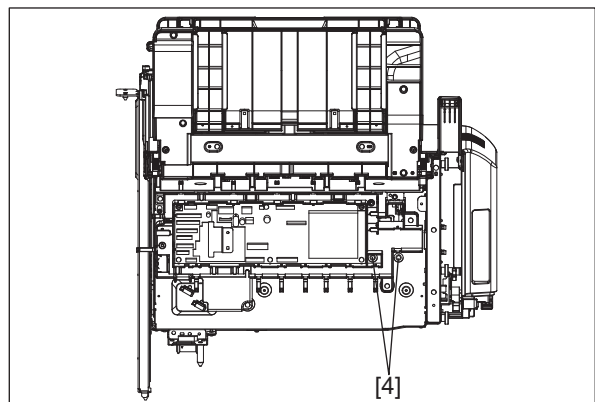


Fig. 4-18

- (5) Remove 2 screws [5] and take off the drawer bracket [6].

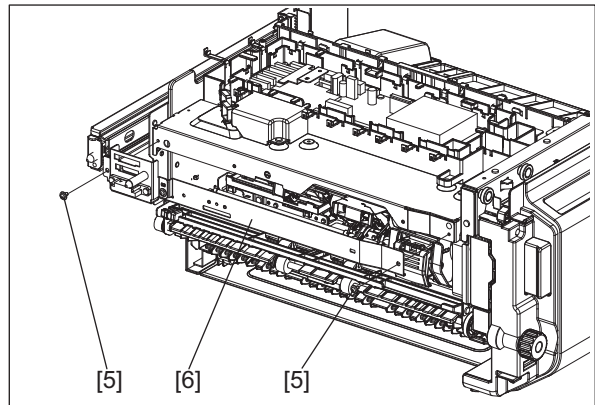


Fig. 4-19

- (6) Disconnect 2 connectors from the stapler [1]. Then slide the stapler [1] to the rear side to take it off.

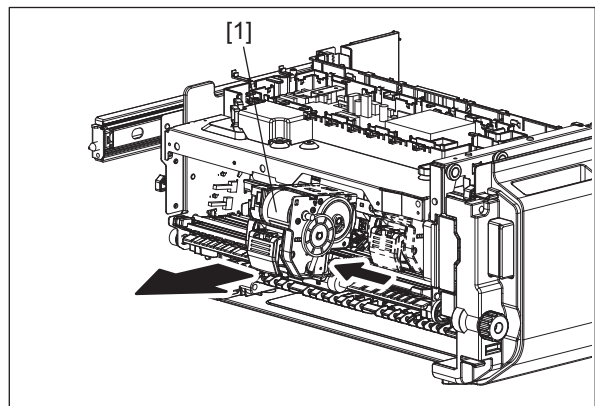


Fig. 4-20

### [B] Stack exit unit

- (1) Take off the front left cover.  
(📖 P. 4-2 “[A] Front left cover”)
- (2) Take off the rear cover.  
(📖 P. 4-3 “[B] Rear cover”)
- (3) Take off the stationary tray.  
(📖 P. 4-5 “[E] Stationary tray”)
- (4) Take off the sub-path upper guide.  
(📖 P. 4-3 “[C] Sub-path upper guide”)

- (5) Remove 2 screws [1] and take off the discharge brush bracket [2] of the stationary tray.

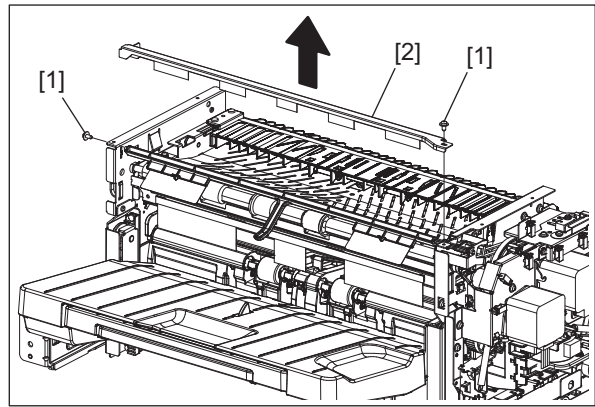


Fig. 4-21

- (6) Remove 2 screws [62] and disconnect the connector from the sensor bracket [63].  
 (7) Remove 2 clips [3]. Then take off the stationary tray full detection lever [4] and the sensor bracket [63].

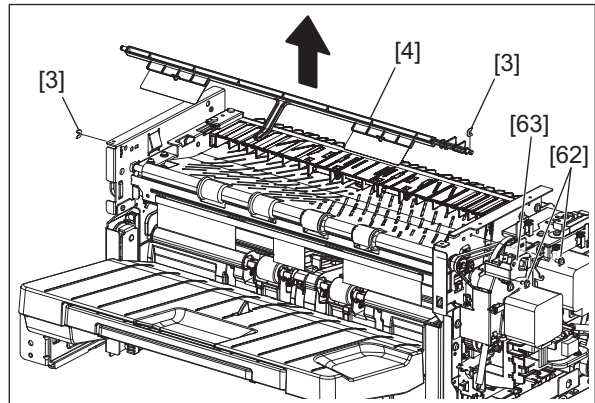


Fig. 4-22

- (8) Release the harnesses of the front cover switch (SW1) assembly [6] from 5 harness clamps [64] and disconnect the relay connector [65].  
 Remove 2 screws [5] and take off the front cover switch (SW1) assembly [6].  
 (9) Remove 2 each of: pan head screws [7] and flange screws [66]. Then take off the sub-path guide assembly [8].

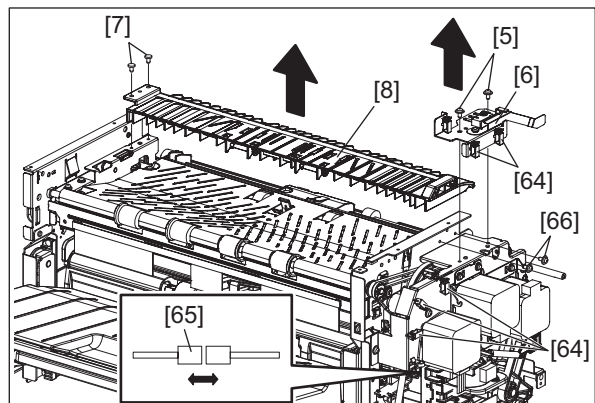


Fig. 4-23



(10) Remove 4 screws [9] and take off the sub-path guide bracket [10].

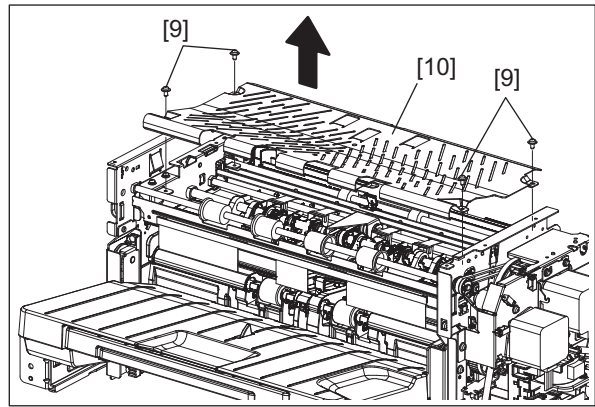


Fig. 4-24

(11) Remove 2 screws [11] and take off the nip-roller assembly [12].

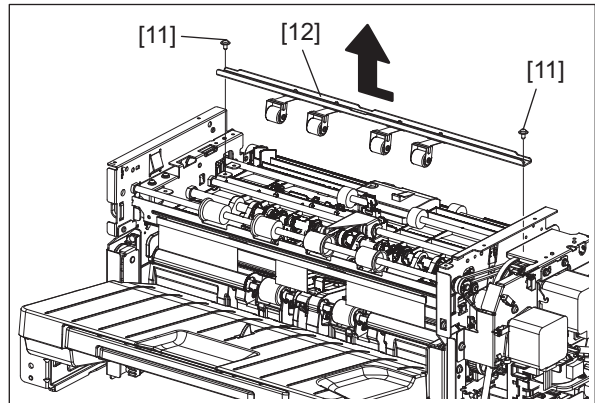


Fig. 4-25

(12) Remove 1 spring [13] and 3 screws [14]. Then disconnect 1 connector and take off the 2nd transfer motor (M4) [15].

(13) Remove 1 spring [16] and 3 screws [17]. Then disconnect 1 connector and take off the stack exit motor (M5) [18].

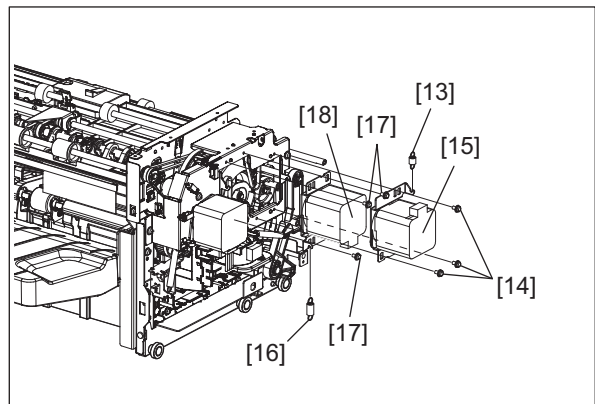


Fig. 4-26

**Notes:**

- When assembling, be sure that the timing belt is hooked to the pulley of the motor.
- When assembling, be sure that tension to the timing belt is applied by the spring, and then the screws are tightened.

(14) Remove 1 spring [19] to take off the finisher locking lever [20].

(15) Disconnect 1 connector from the sensor [67].

Disconnect 1 connector from the motor [68].



Release the harnesses from 4 harness clamps [69].  
Take off 1 harness clamp [70] from the bracket [22].  
Remove 6 screws [21] and take off the bracket [22].

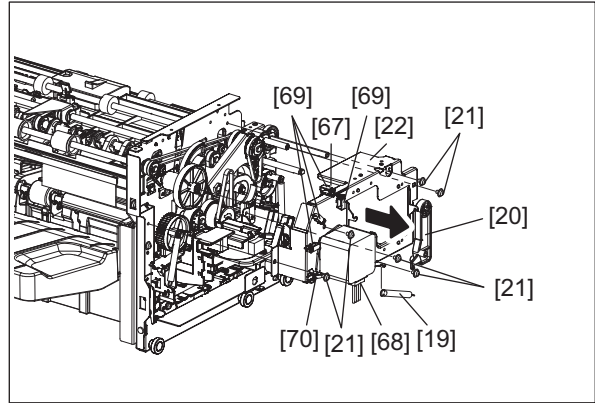


Fig. 4-27

(16) Remove 1 each of: stack exit roller shift gear 1 [23], gear 2 [24], E-ring [25] and bushing [26].

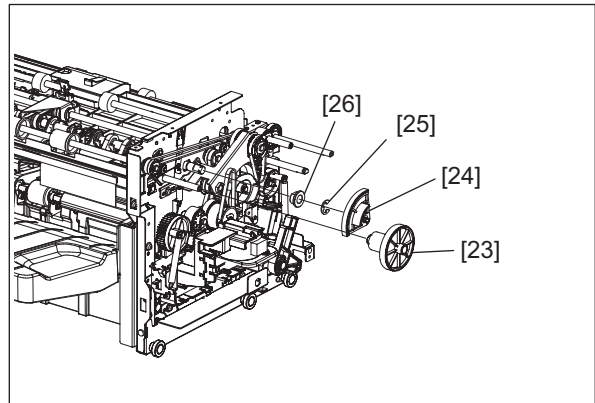


Fig. 4-28

- (17) Remove 1 each of: clip [27], timing belt [28], pulley [29] and parallel pin [30].
- (18) Remove 1 each of: clip [31], bushing [32] and screw [33]. Then take off the bracket [34].
- (19) Remove 1 each of: clip [35], timing belt [36], flange [37], pulley [38], parallel pin [39], timing belt [40], flange [41] and clip [42].

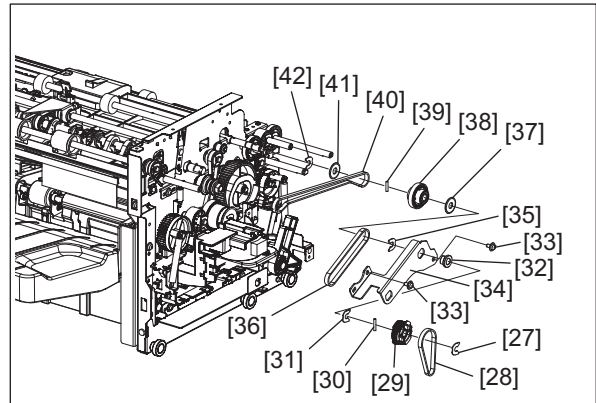


Fig. 4-29

**Notes:**

When assembling, be sure that 1 screw is loosened and then tightened again as shown in the figure, in order to apply tension to the timing belt [40].

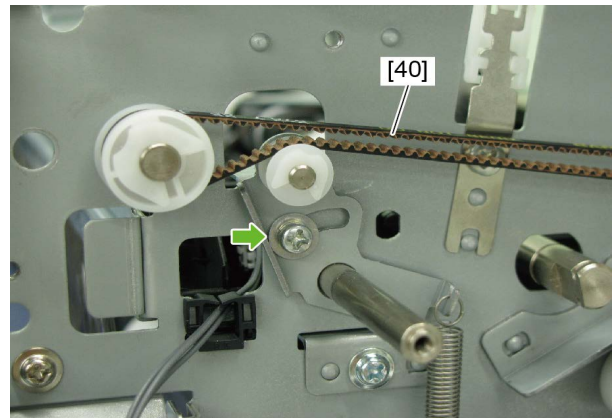


Fig. 4-30

- (20) Remove 1 each of: clip [43], flange [44], pulley [45], parallel pin [46], clip [47] and bushing [48].

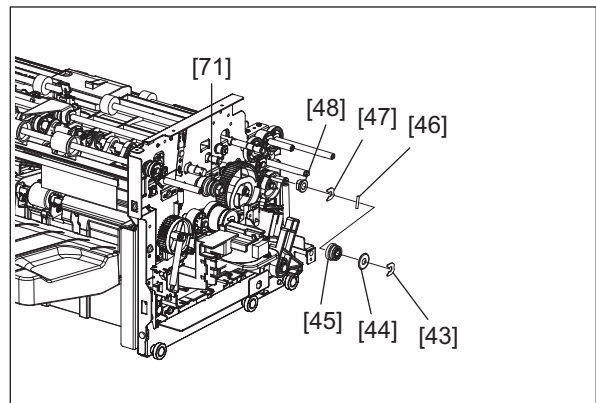


Fig. 4-31

**Notes:**

Never lose the part [71] because it may come off after the pulley [45] is removed.

- (21) Remove 2 screws [49] and disconnect the joint connector. Then take off the trailing edge holding solenoid (SOL2) [50].
- (22) Remove 1 each of: clip [51] and trailing edge holding gear [52].

- (23) Remove 1 each of: E-ring [53] and bushing [54].
- (24) Remove 1 each of: clip [55] and bushing [56].

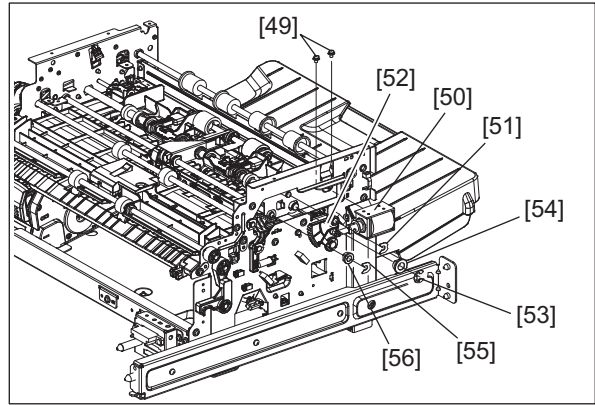


Fig. 4-32

**Notes:**

When assembling, be sure that the trailing edge holding gear [52] is aligned with the gear [72] at the position marked in the figure.

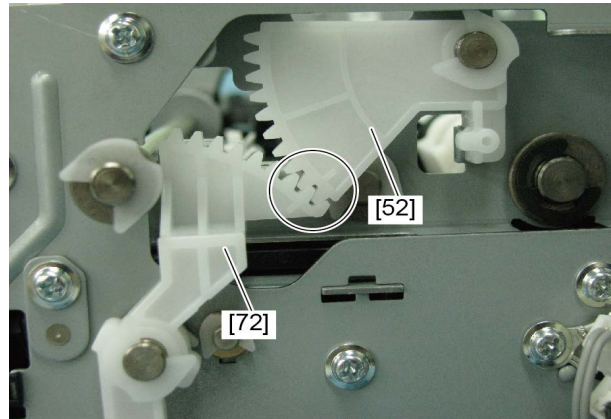


Fig. 4-33

- (25) Remove 2 clips [57] and shift 2 bushings [58].
- (26) Remove 1 clip [59] and shift 1 bushing [60].
- (27) Take off the bearing bracket [61].

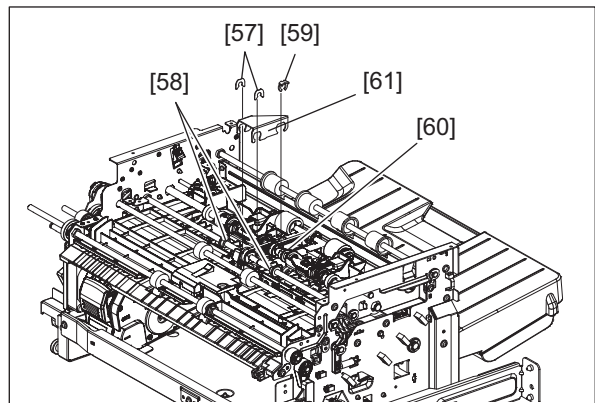


Fig. 4-34

(28) Remove 2 clips [73]. Then remove 2 parallel pins [74] from the stack exit unit [62].

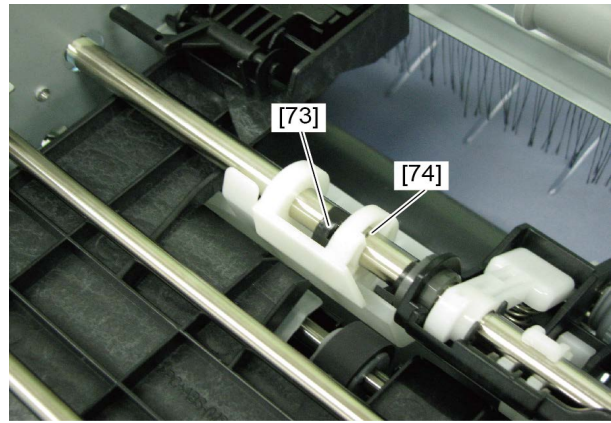


Fig. 4-35

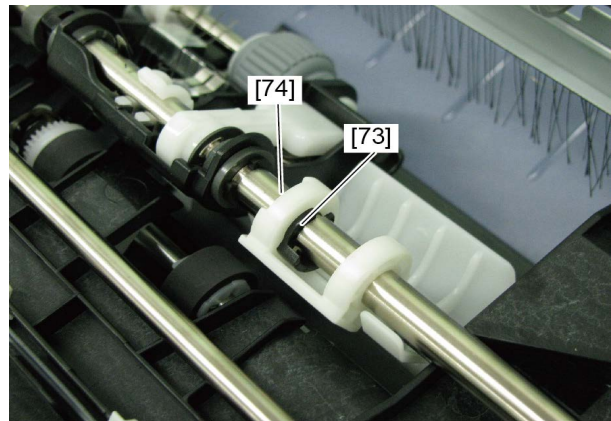


Fig. 4-36

(29) Take off the stack exit unit [62].

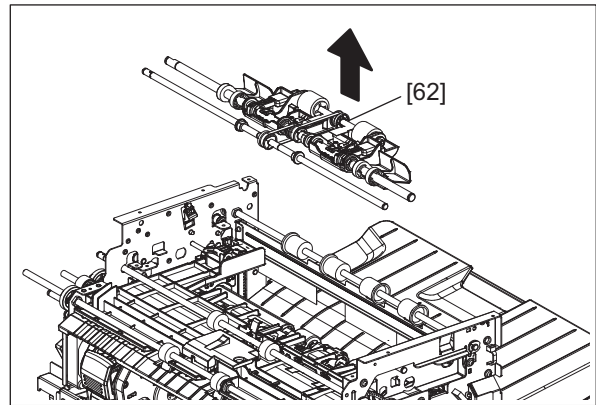


Fig. 4-37

**[C] Transport unit in the finishing section**

- (1) Take off the front left cover.  
(📖 P. 4-2 “[A] Front left cover”)
- (2) Take off the rear cover.  
(📖 P. 4-3 “[B] Rear cover”)
- (3) Take off the stationary tray.  
(📖 P. 4-5 “[E] Stationary tray”)
- (4) Take off the sub-path upper guide.  
(📖 P. 4-3 “[C] Sub-path upper guide”)
- (5) Take off the stack exit unit.  
(📖 P. 4-8 “[B] Stack exit unit”)
- (6) Remove 1 each of: clip [1] and bushing [2].
- (7) Remove 4 screws [3].
- (8) Remove 1 each of: E-ring [4], gear [5], parallel pin [6], clip [7] and bushing [8].

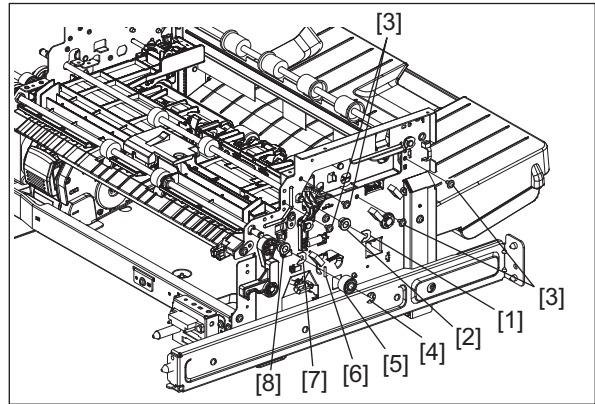


Fig. 4-38

- (9) Remove 1 each of: clip [9], gear [10], parallel pin [11], clip [12] and bushing [13].
- (10) Remove 1 screw [14] and take off the sensor cover [15].
- (11) Take off the transport rollers [16] and [17].

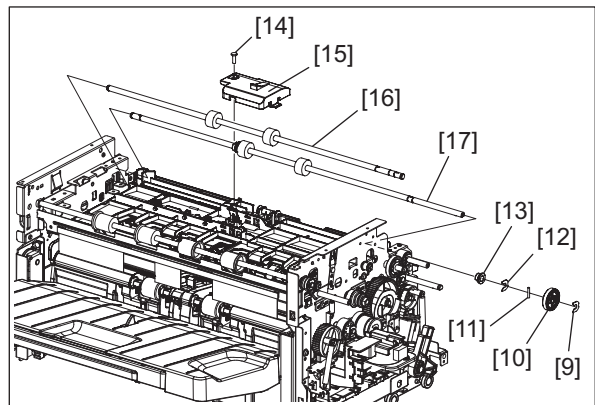


Fig. 4-39

(12) Take off the rear sub frame [18].

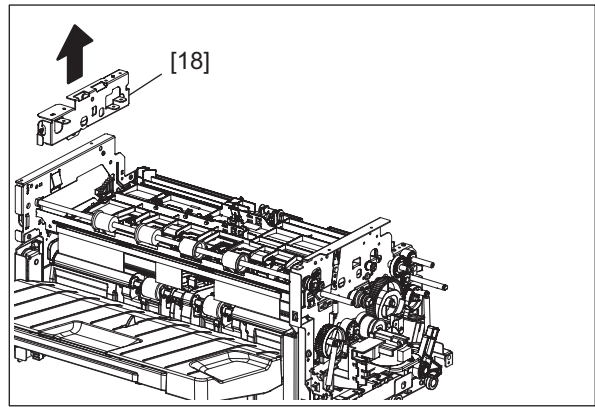


Fig. 4-40

(13) Disconnect the connectors from the sensors [47], [48] and [49]. Then release the sensor harnesses [19], [20] and [21] from the harness guides.

(14) Remove 2 shoulder screws [22].

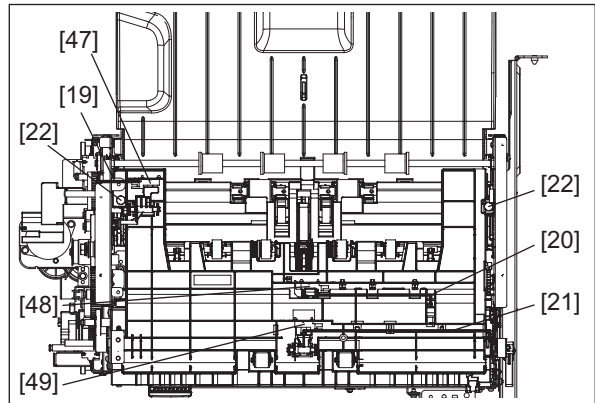


Fig. 4-41

(15) Take off the transport guide [23] in the finishing section.

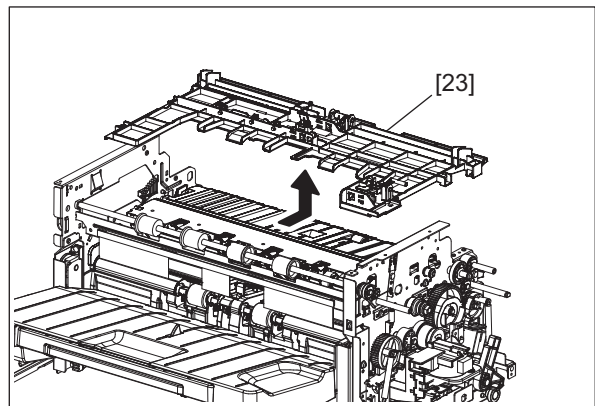


Fig. 4-42



- (16) Remove 1 each of: clip [24] and gear [25].
- (17) Remove 1 screw [26], disconnect the connector, and then take off the sensor bracket [27].
- (18) Remove the gear [28].
- (19) Remove the E-ring [29].

**Notes:**

- When assembling, be sure that the MFP link section [50] is aligned with the groove on the back side of the gear [28].

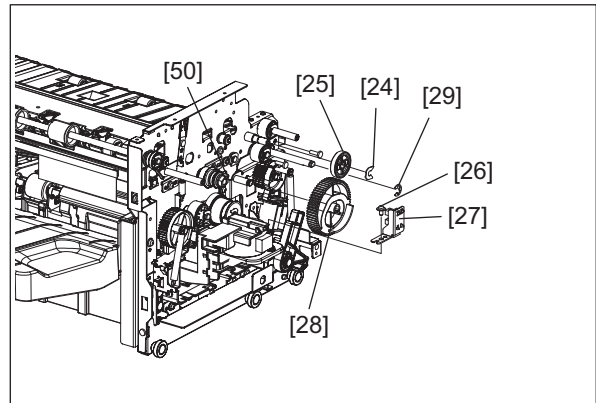


Fig. 4-43

- When assembling the gear [28], align its rib to the protrusion as shown in the figure.

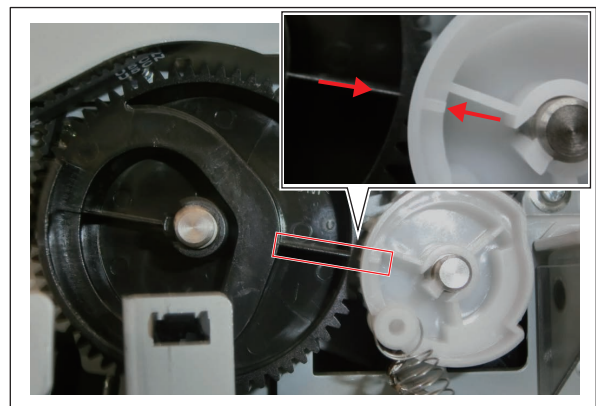


Fig. 4-44

- (20) Take off finisher locking lever 1 [30].

**Notes:**

When assembling, be sure that the link section of the finisher lock lever 2 [31] is inserted into the square hole on the back side of the finisher lock lever 1 [30].

- (21) Take off finisher locking lever 2 [31] and remove 1 E-ring [32]. Then take off the shaft [33].

**Notes:**

Do not lose the bushing [34] when taking off the shaft [33].

- (22) Remove 2 screws [51].
- (23) Remove 2 screws [35] and take off 2 caulking stud assemblies [36].

(24) Take off the transport guide assembly [37] in the finishing section.

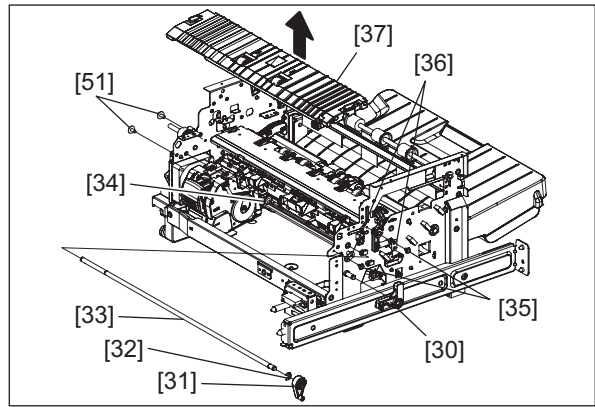


Fig. 4-45

(25) Remove 1 screw [38] and take off the trailing edge alignment plate [39].

(26) Remove 2 each of: clips [40] and knurled roller shift links [41].

(27) Remove the screw [42].

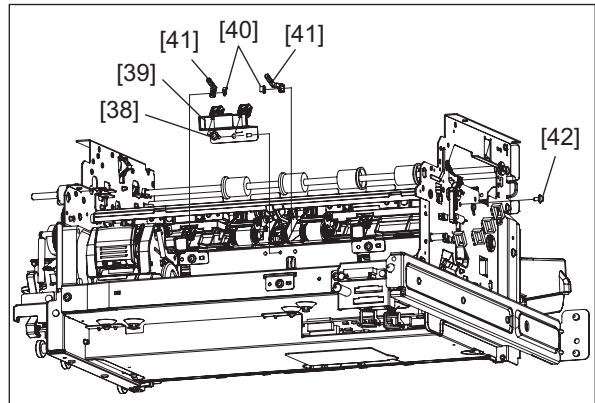


Fig. 4-46

(28) Remove 1 screw [43] and take off the guide installation bracket [44].

(29) Remove 1 screw [45] and take off the transport unit [46] in the finishing section.

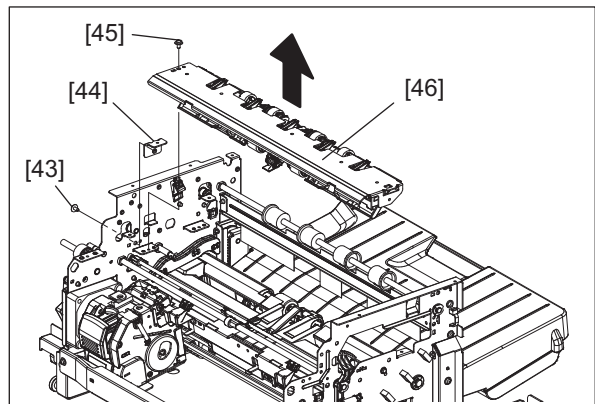
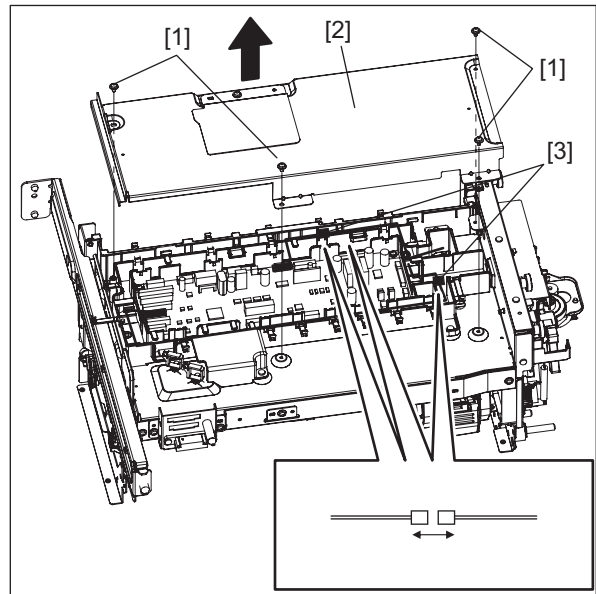


Fig. 4-47



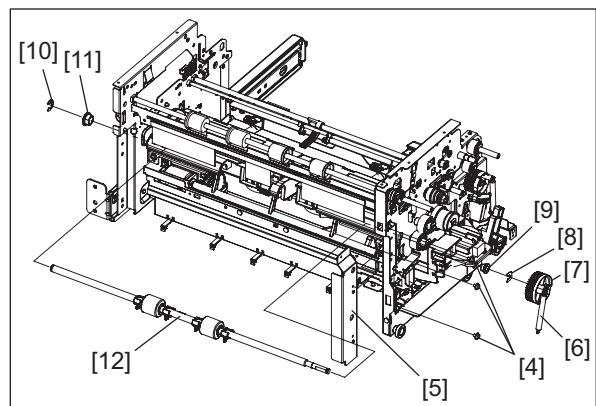
**[D] Finishing tray**

- (1) Take off the front left cover.  
(📖 P. 4-2 “[A] Front left cover”)
- (2) Take off the rear cover.  
(📖 P. 4-3 “[B] Rear cover”)
- (3) Take off the transport unit in the finishing section.  
(📖 P. 4-15 “[C] Transport unit in the finishing section”)
- (4) Take off the movable tray.  
(📖 P. 4-4 “[D] Movable tray”)
- (5) Remove 4 screws [1] and take off the board cover [2].
- (6) Disconnect 3 joint connectors [3] of the finishing tray harness and then release it from the harness duct.



**Fig. 4-48**

- (7) Place the Inner Finisher with its upper surface facing up so that it returns to its original condition.
- (8) Take off the lower cover in the finishing section.  
(📖 P. 4-6 “[F] Finishing section bottom cover”)
- (9) Remove 3 screws [4] and take off the rack assembly on the front side [5].
- (10) Remove 1 each of: spring [6], gear [7], clip [8] and bushing [9].
- (11) Remove the E-ring [10] and bushing [11].
- (12) Take off the exit roller assembly [12].



**Fig. 4-49**

(13) Remove 2 screws [13] and take off the finishing tray unit [14].

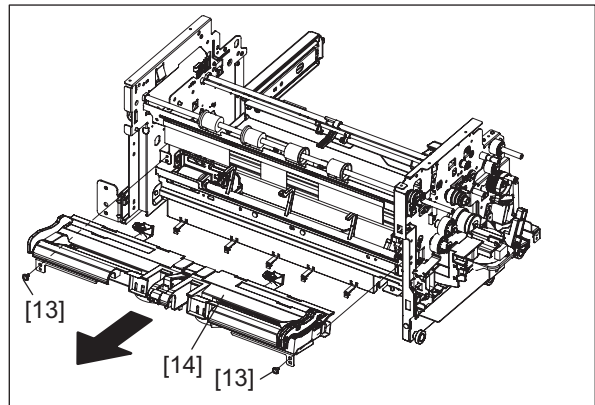


Fig. 4-50

**[E] Stack top detection lever**

- (1) Take off the front left cover.  
( P. 4-2 “[A] Front left cover”)
- (2) Take off the rear cover.  
( P. 4-3 “[B] Rear cover”)
- (3) Take off the transport unit in the finishing section.  
( P. 4-15 “[C] Transport unit in the finishing section”)
- (4) Take off the movable tray.  
( P. 4-4 “[D] Movable tray”)
- (5) Take off the finishing tray.  
( P. 4-19 “[D] Finishing tray”)
- (6) Remove 1 each of: clip [1], spring [2] and screw [3]. Disconnect 2 connectors and release the harnesses from the harness clamp. Then take off the sensor installation bracket [4] and the stack top detecting lever [5].

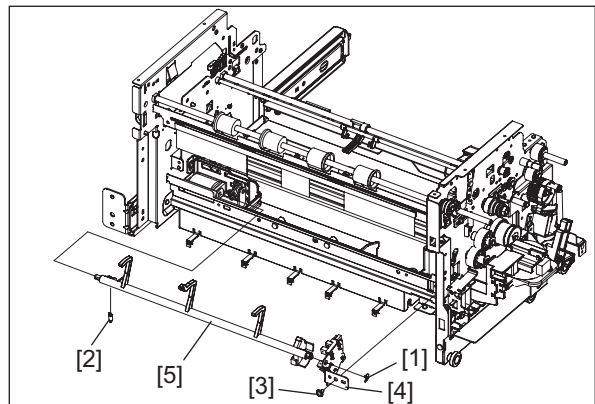


Fig. 4-51

### 4.1.3 PC Board

- (1) Place the Inner Finisher upside down.

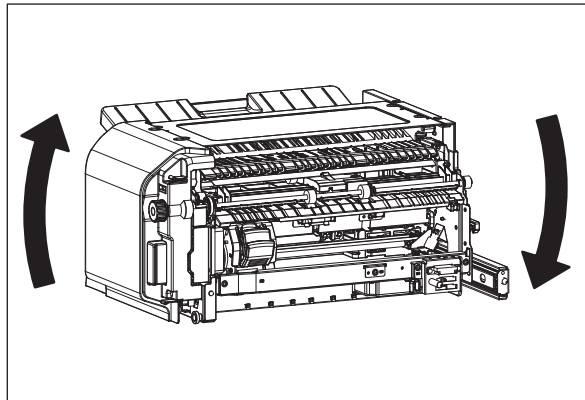


Fig. 4-52

- (2) Remove 4 screws [1] and take off the board cover [2].

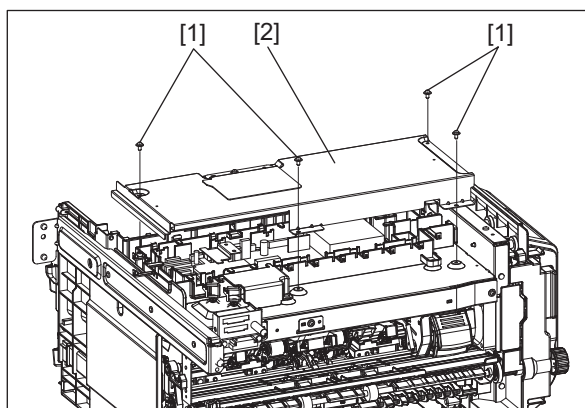


Fig. 4-53

- (3) Disconnect 19 connectors from the finisher control PC board (FIN) [3].
- (4) Remove 6 screws [4] and take off the finisher control PC board (FIN) [3].

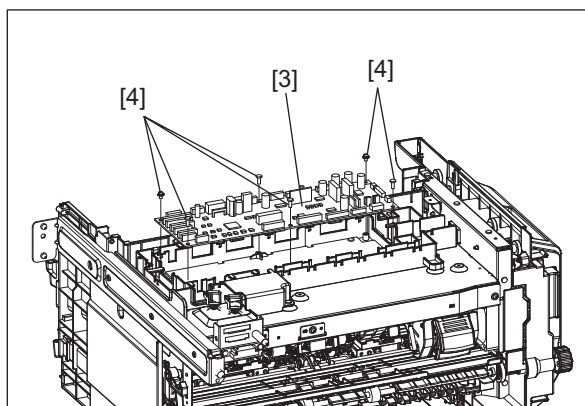


Fig. 4-54

## 4.2 Receiving Section

### 4.2.1 Externals

	Part name	Number of screws (pieces)
1	Front cover	-
2	Receiving section inner cover	3
3	Reverse path guide	2

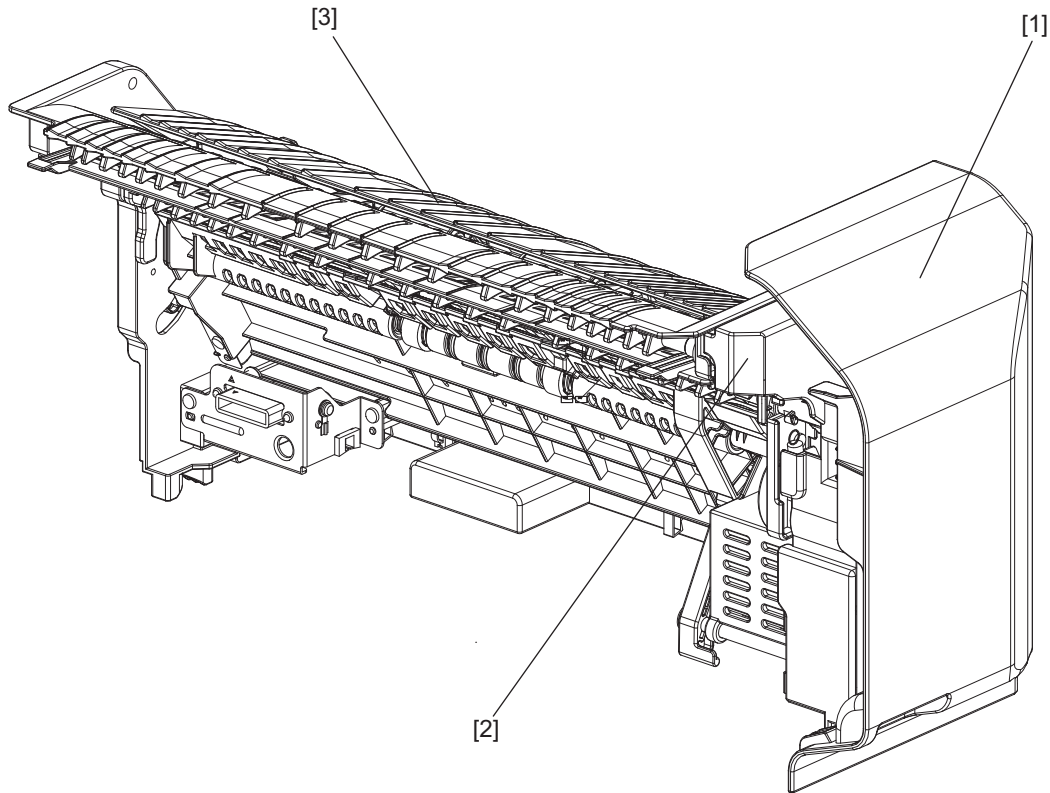


Fig. 4-55

**[A] Front cover**

- (1) Open the front cover [1] and remove 1 clip [2].

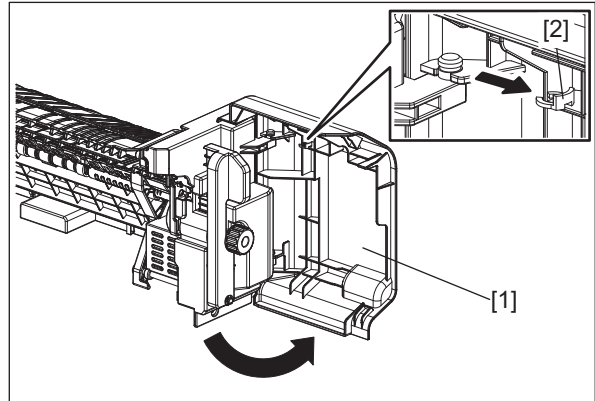


Fig. 4-56

- (2) Take off the front cover [1] by lifting it upward.

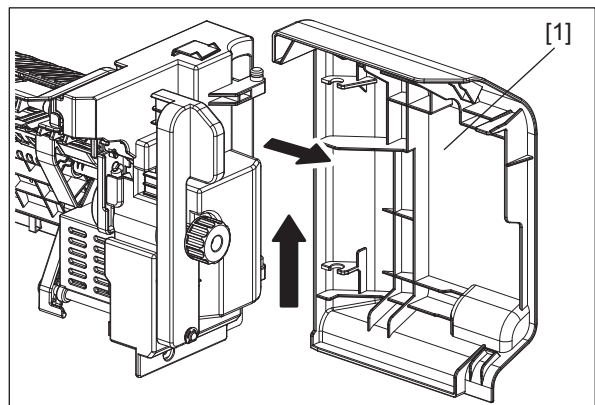


Fig. 4-57

- (3) Remove 1 screw [3] and jam access knob [4].

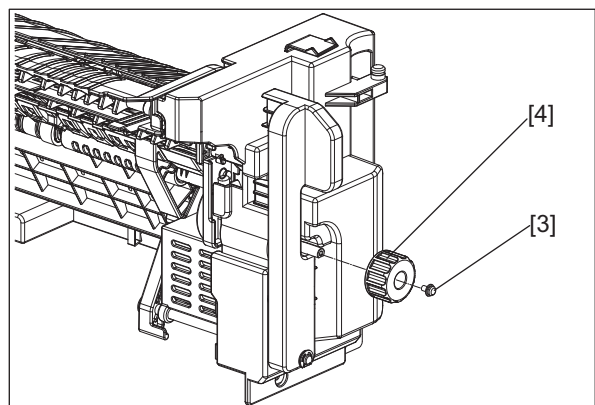


Fig. 4-58

(4) Remove the E-ring [5] and take off the jam access lever [6].

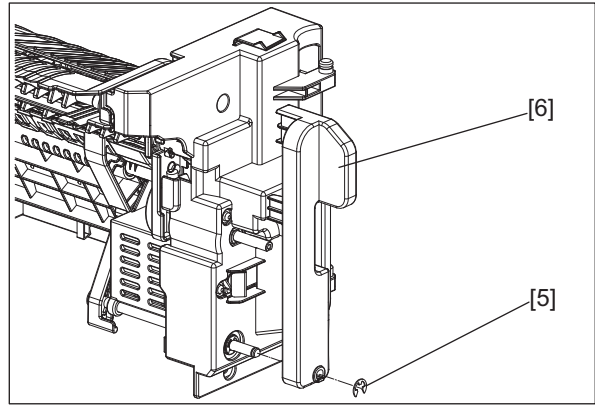


Fig. 4-59

(5) Remove 3 screws [7] and take off the inner cover [9] by releasing 2 hooks [8].

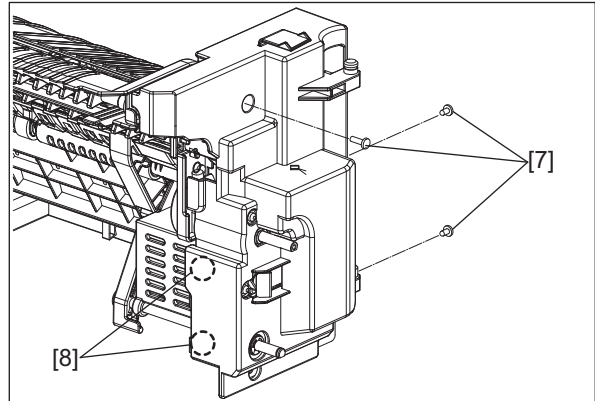


Fig. 4-60

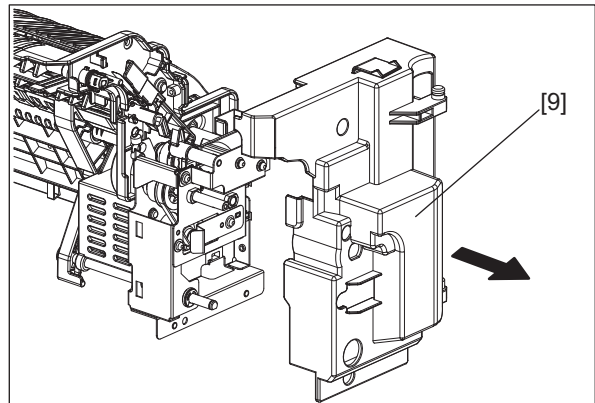



Fig. 4-61

## 4.2.2 Sensor

### [A] Entrance path sensor (S19)

- (1) Take off the front cover.  
( P. 4-23 “[A] Front cover”)
- (2) Remove 2 screws [1] and take off the reverse path guide [2].

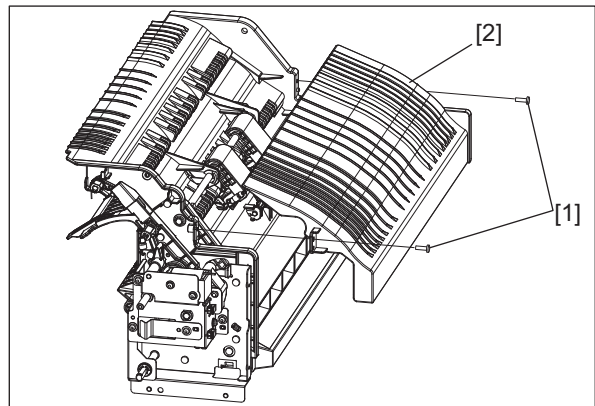


Fig. 4-62

- (3) Disconnect the connector and take off the entrance path sensor [3].

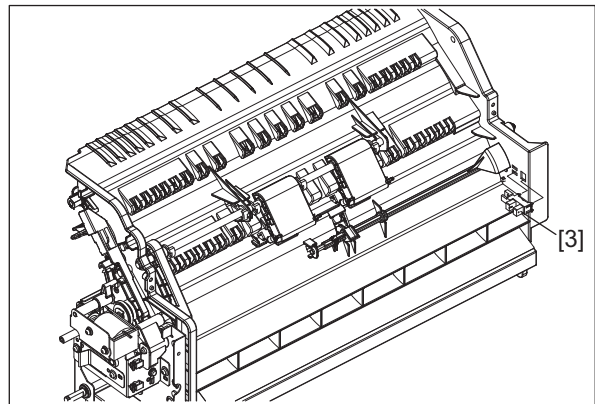



Fig. 4-63

## 4.2.3 Motor and Solenoid

### [A] 1st flapper solenoid (SOL5)

- (1) Take off the front cover.  
( P. 4-23 “[A] Front cover”)
- (2) Remove 1 screw [1] and disconnect the relay connector [2]. Then release the harnesses from 2 harness clamps [13].

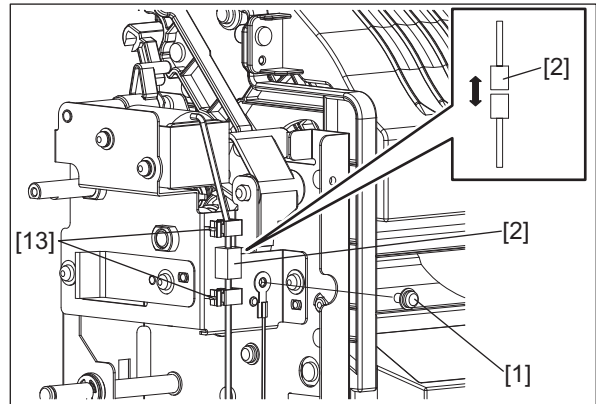


Fig. 4-64

- (3) Remove 3 screws [3] and take off the solenoid bracket [4].

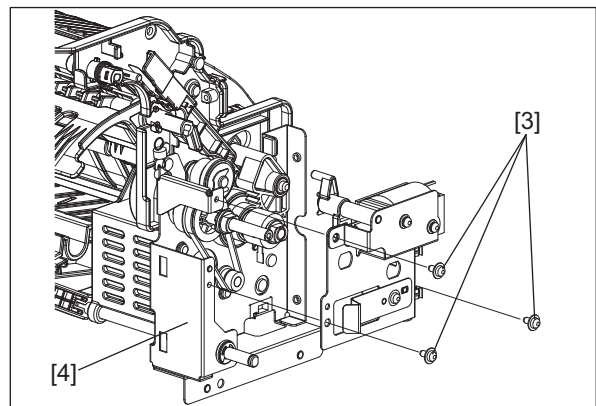


Fig. 4-65

- (4) Remove 2 screws [5]. Remove 1 clip [14] and the lever [6]. Then take off the 1st flapper solenoid [7].

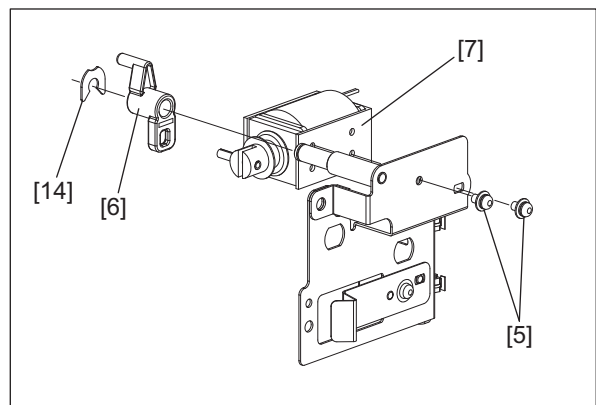


Fig. 4-66

#### Notes:

- When assembling, be sure that the arm [8] of the lever is mounted on the right side of the arm [9] of the 1st flapper lever.



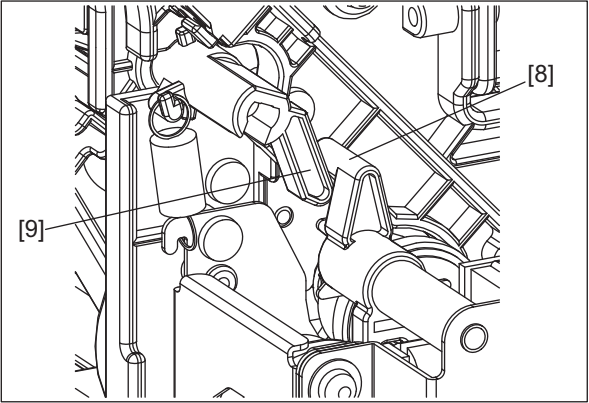


Fig. 4-67

- When assembling, be sure that the link lever [10] is mounted beneath the nip releasing link [11].
- When assembling, be sure that the link lever [10] is inserted into the square hole of the 2nd flapper link [12].

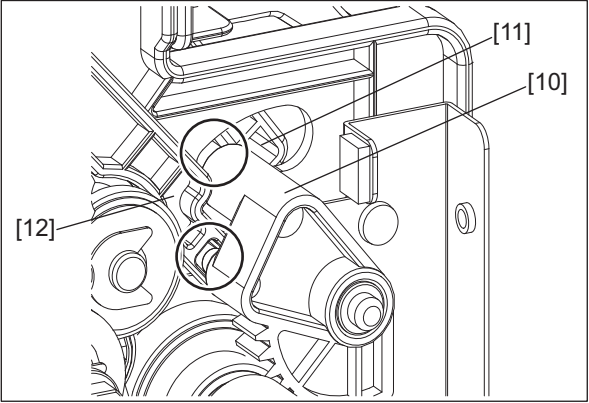



Fig. 4-68

**[B] 1st transport motor (M8)**

- (1) Take off the front cover.  
( P. 4-23 “[A] Front cover”)
- (2) Remove 2 E-rings [1] and take off the jam access control arm [2]. Then remove 1 bushing [18].

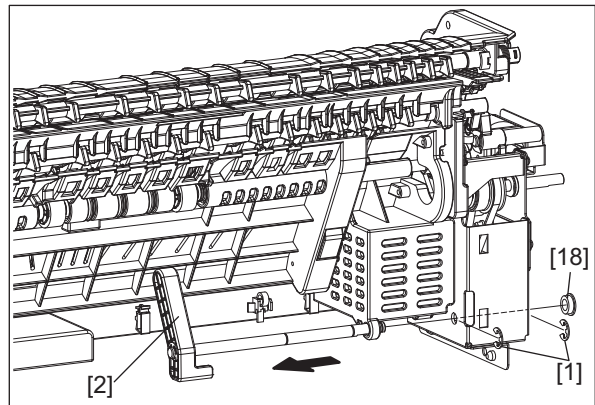


Fig. 4-69

- (3) Remove 1 screw [3] and disconnect the relay connector [4]. Then release the harnesses from 2 harness clamps [19].

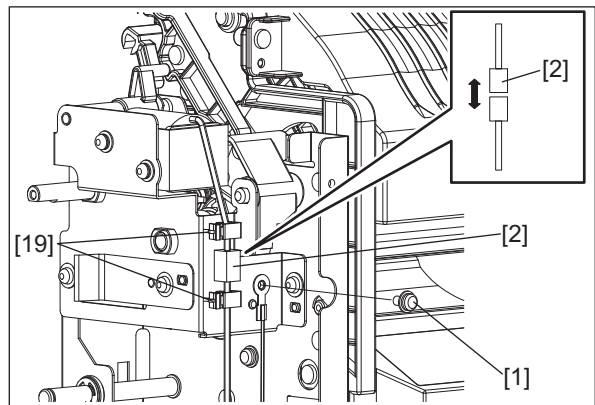


Fig. 4-70

- (4) Remove 4 screws [5] and the spring [6]. Then release the harnesses from the harness clamp [20] and pull out the motor unit [7].

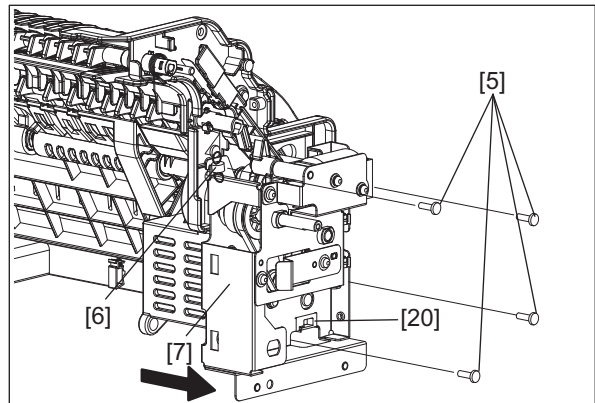


Fig. 4-71

(5) Disconnect the connector from the motor unit [7]. Then take off the motor unit [7].

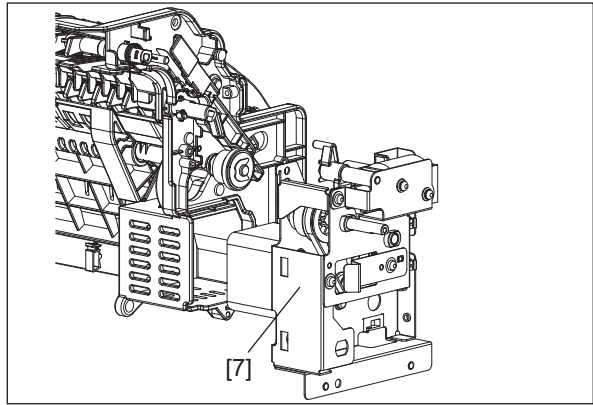


Fig. 4-72

(6) Remove 3 screws [8] and take off the solenoid bracket [9].

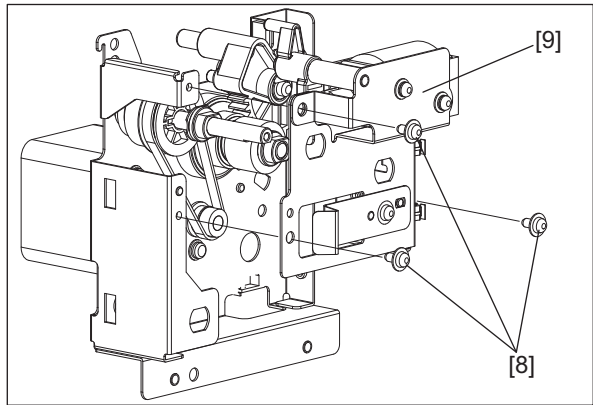


Fig. 4-73

(7) Remove 2 screws [10] and the belt [11]. Then take off the 1st transport motor [12].

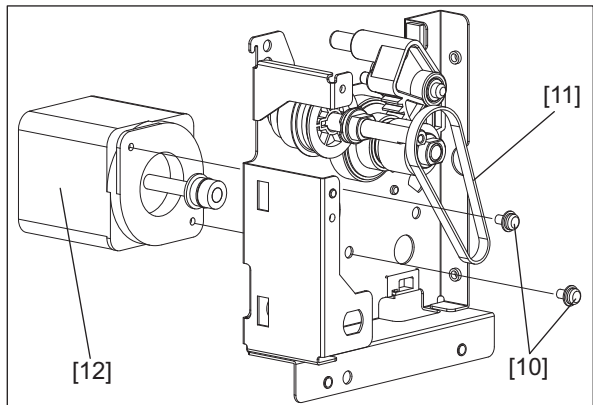
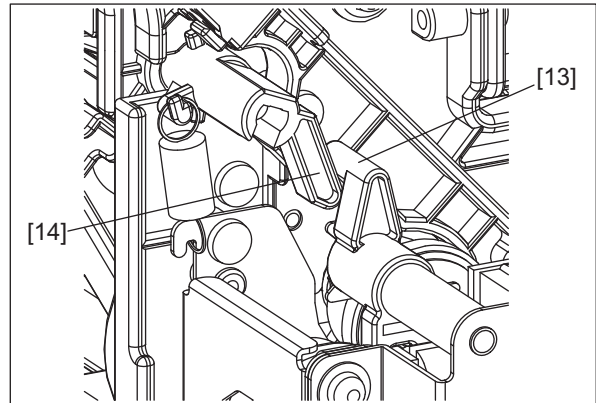


Fig. 4-74

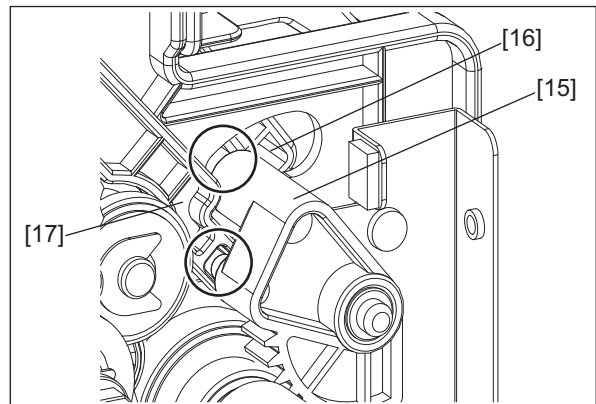
**Notes:**

- When assembling, be sure that the arm [13] of the lever is mounted on the right side of the arm [14] of the 1st flapper lever.



**Fig. 4-75**

- When assembling, be sure that the link lever [15] is mounted beneath the nip releasing link [16].
- When assembling, be sure that the link lever [15] is inserted into the square hole of the 2nd flapper link [17].



**Fig. 4-76**

## 4.2.4 Roller

### [A] Receiving roller

- (1) Take off the front cover.  
(📖 P. 4-23 “[A] Front cover”)
- (2) Take off the 1st transport motor.  
(📖 P. 4-28 “[B] 1st transport motor (M8)”)
- (3) Remove the clip [1], the gear [2], the parallel pin [3] and the bearing [4].
- (4) Remove 2 clips [5] and the bearing [6].

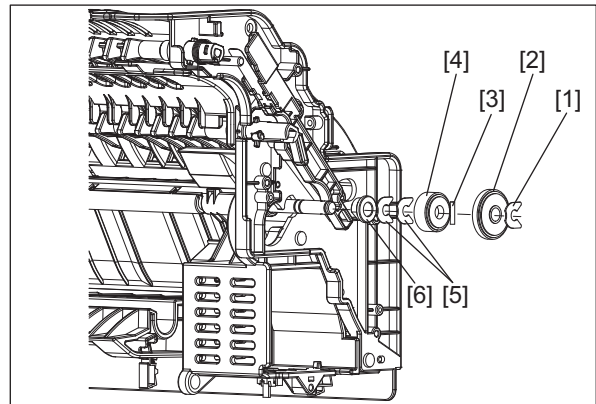


Fig. 4-77

- (5) Remove 1 screw [7], the plate [8] and the bearing [9].
- (6) Remove 2 clips [10] and the bearing [11].

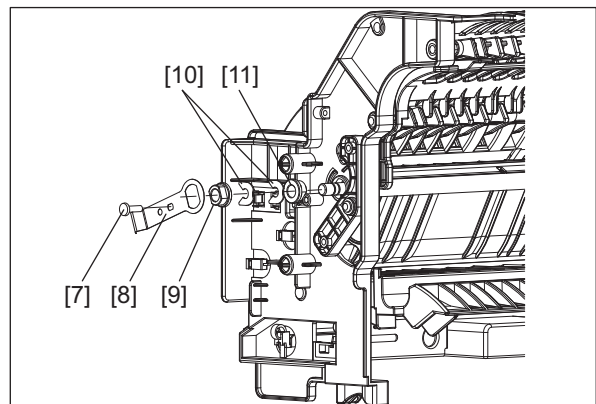


Fig. 4-78

- (7) Take off the roller unit [12].

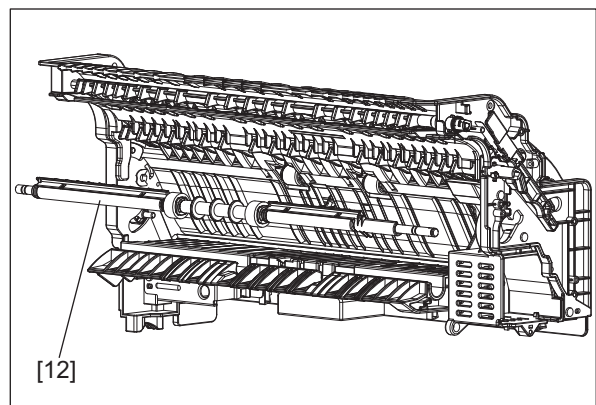


Fig. 4-79

- (8) Take off the sub guide (front) [13], the roller cover (front) [14], the sub guide (rear) [15], and the roller cover (rear) [16]. Remove 2 each of: E-rings [17] and parallel pins [18]. Then take off the roller cover (center) [19] from the roller shaft [20], and 2 receiving rollers [21].

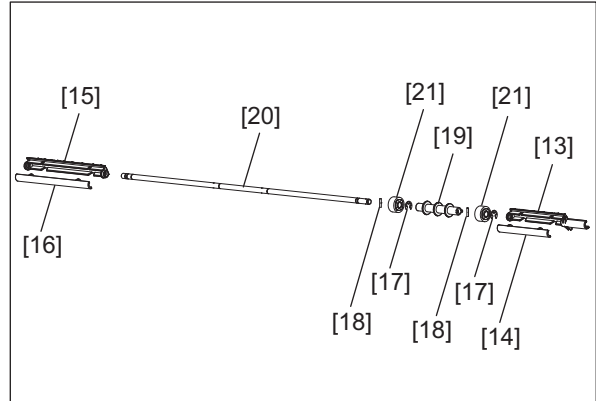


Fig. 4-80

## 4.3 Hole Punch Unit Section

### 4.3.1 Externals

#### [A] Hole Punch Unit

- (1) Disconnect 2 connectors [1] and remove 2 binding bands [2] and 1 clamp [3].
- (2) Remove 2 screws [4].

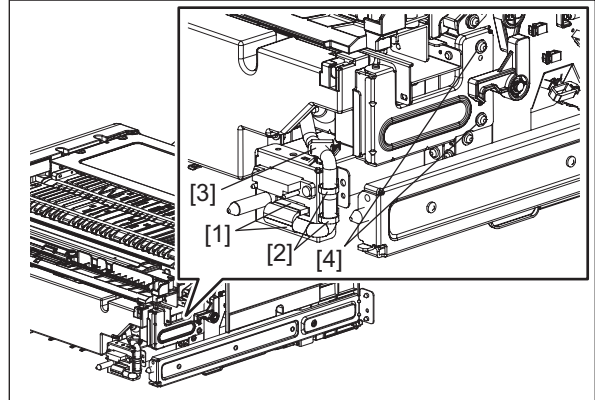


Fig. 4-81

- (3) Move the Hole Punch Unit opening lever [5] to take off the Hole Punch Unit [6].

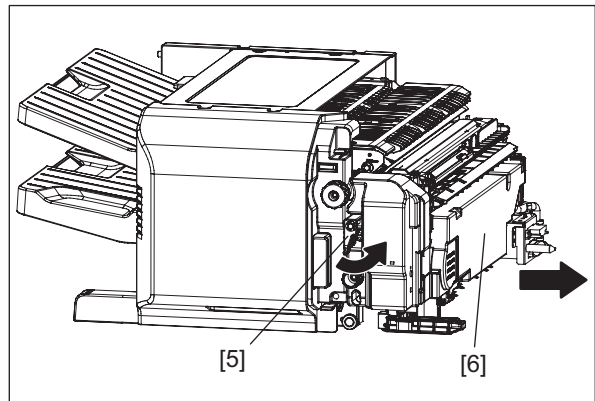
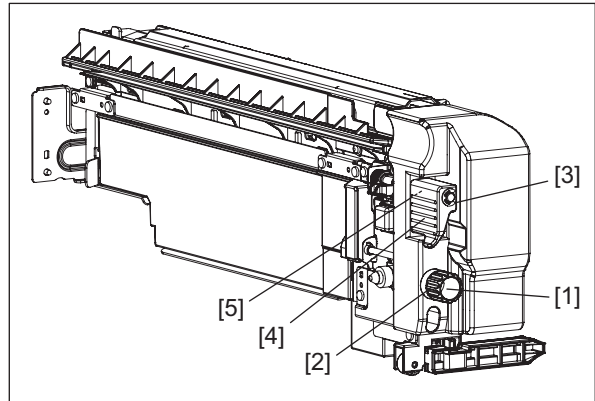


Fig. 4-82

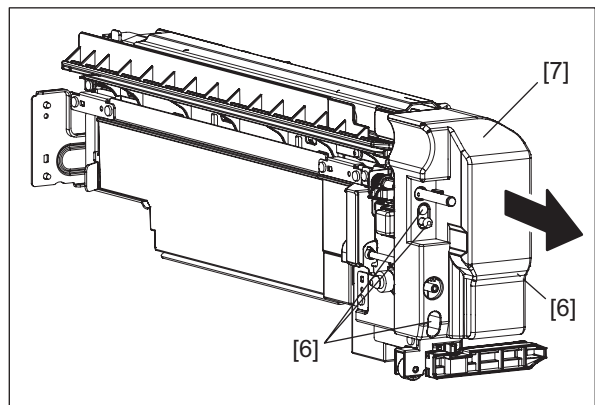
**[B] Inner cover**

- (1) Remove 1 screw [1] and jam access knob [2].
- (2) Remove 1 E-ring [3], the Hold Punch Unit opening lever [4] and parallel pin [5].



**Fig. 4-83**

- (3) Remove 4 screws [6] and take off the inner cover [7].





**Fig. 4-84**



## 4.3.2 Drive section

### [A] Punch sliding unit

- (1) Take off the Hole Punch Unit.  
( P. 4-33 “[A] Hole Punch Unit”)
- (2) Take off the inner cover.  
( P. 4-34 “[B] Inner cover”)
- (3) Take off the punch waste case.
- (4) Remove 2 screws [1] and take off the cover [2] of the hole punch control PC board.

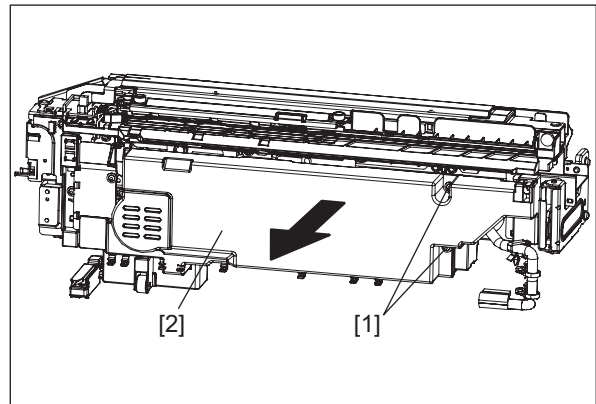


Fig. 4-85

- (5) Remove 1 screw [3] and take off the harness fixing cover [4].
- (6) Disconnect 8 clamps [5] of the harness guide.
- (7) Disconnect 4 connectors [6] and 1 connector [7] and release the harness from the harness guide.

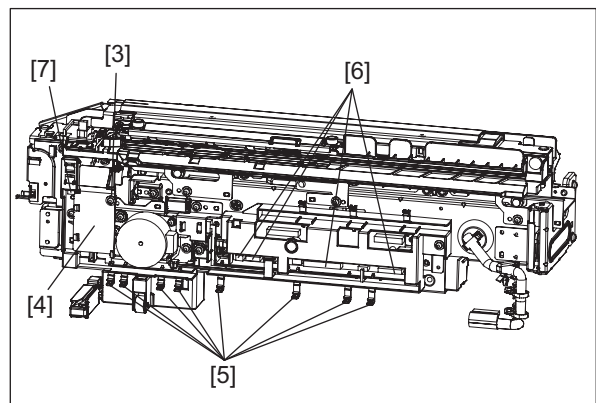


Fig. 4-86

(8) Remove 1 spring [8] and 2 screws [9]. Then take off 2 fixing brackets [10] of the slide-roller.

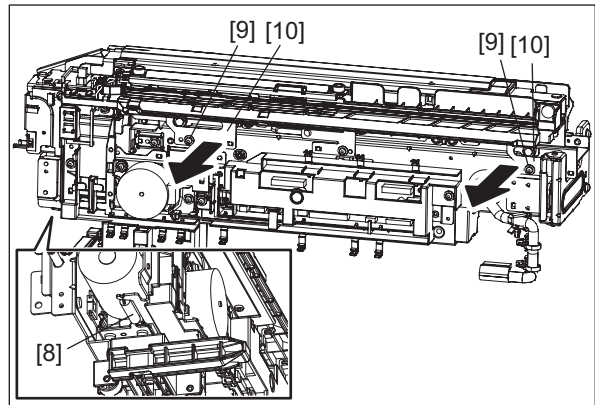


Fig. 4-87

(9) Remove 4 screws [11] and take off 2 fixing brackets [12] of the slide-roller.

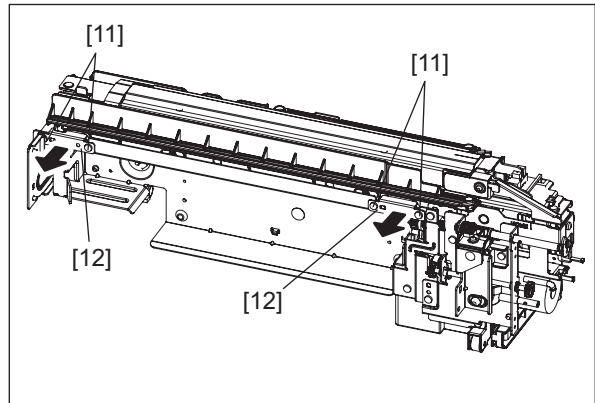


Fig. 4-88

(10) Take off the punch sliding unit [13].

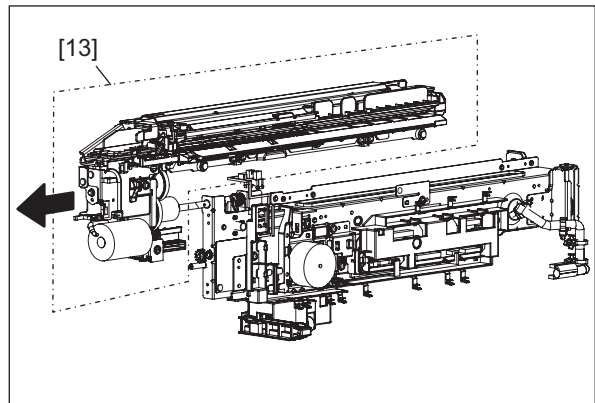



Fig. 4-89

### 4.3.3 PC Board

#### [A] Hole punch control PC board (HP)

- (1) Take off the Hole Punch Unit.  
( P. 4-33 “[A] Hole Punch Unit”)
- (2) Remove 2 screws [1] and take off the cover [2] of the hole punch control PC board.

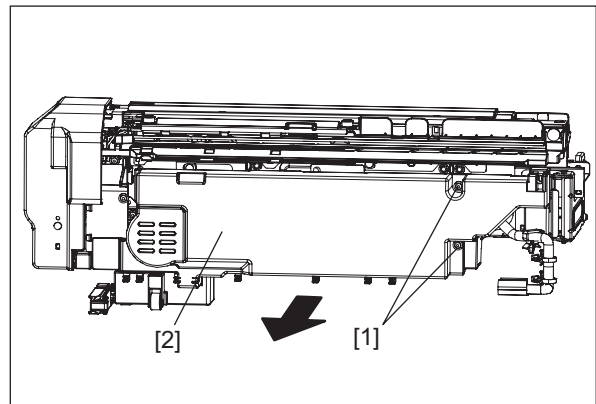


Fig. 4-90

- (3) Remove 8 harness guide clamps [3] and disconnect 8 connectors.
- (4) Remove 2 screws [4] and take off the harness guide [5].

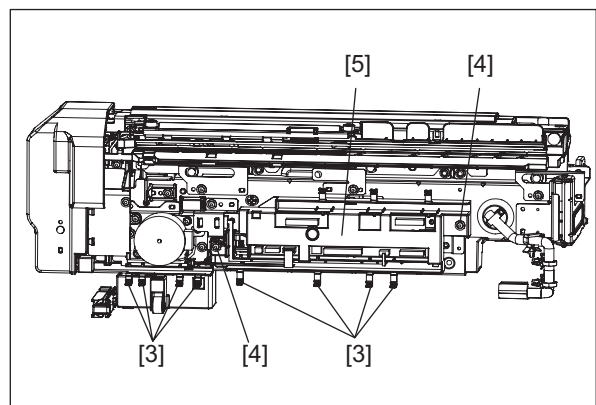


Fig. 4-91

- (5) Remove 1 screw [6] and take off the hole punch control PC board (HP) [7].

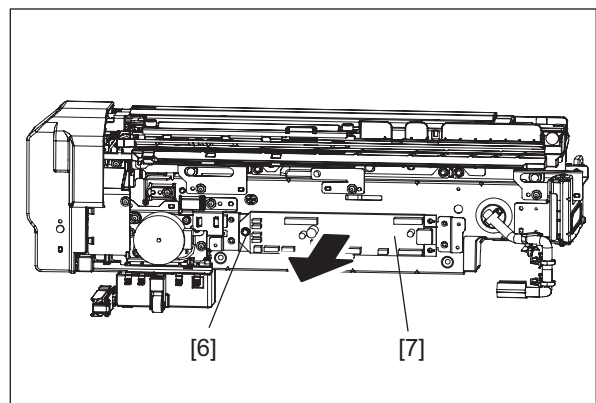



Fig. 4-92

**[B] Paper detection sensor (SEN) PC board (S24)**

- (1) Take off the Hole Punch Unit.  
( P. 4-33 “[A] Hole Punch Unit”)
- (2) Remove 2 each of: screws [1] and screw covers [2]. Then take off the cover [3] of the paper detection sensor (SEN) PC board.
- (3) Take off the paper detection sensor (SEN) PC board [4] and disconnect 1 connector.

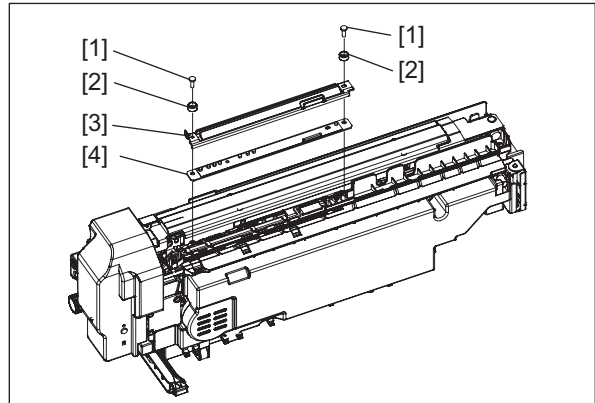





Fig. 4-93

**[C] Paper detection sensor (LED) PC board (S25)**

- (1) Take off the Hole Punch Unit.  
( P. 4-33 “[A] Hole Punch Unit”)
- (2) Take off the inner cover.  
( P. 4-34 “[B] Inner cover”)
- (3) Take off the punch waste case.
- (4) Take off the punch sliding unit.  
( P. 4-35 “[A] Punch sliding unit”)
- (5) Remove 2 screw [1] and take off the cover [2] of the paper detection sensor (LED) PC board.
- (6) Take off the paper detection sensor (LED) PC board [3] and disconnect 1 connector.

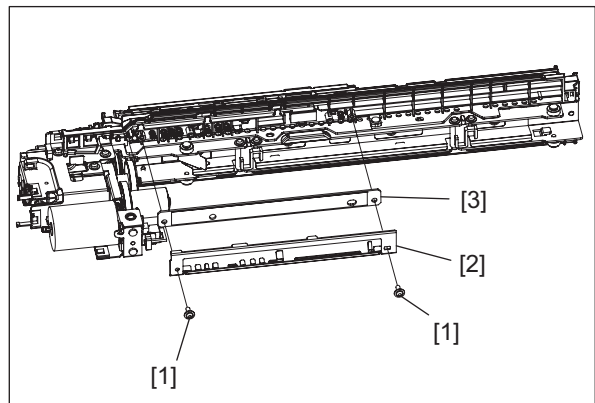


Fig. 4-94

## 5. ADJUSTMENT

### 5.1 Electrical System (Inner Finisher Section)

#### Notes:

- Before performing each adjustment, make sure that all covers are closed. Otherwise, the power is not supplied to the Inner Finisher and the adjustment may not be performed properly.
- Do not enter a value which exceeds the range of the adjustment value. Although such value can be entered depending on the models, adjustment will be performed with the default value.

#### 5.1.1 Alignment position adjustment

##### [A] Alignment position adjustment (front)

This adjustment is performed by 05-4822-0 (Adjustment Mode) of the MFP.

Adjustment scale	0.2 mm	
Adjustable range	-3.4 mm to 3.4 mm	
Adjustment value	-17 to 17 (Default: 0)	
Adjustment direction	Increasing the value	The alignment plate moves to the center.
	Decreasing the value	The alignment plate moves to the edge of paper.

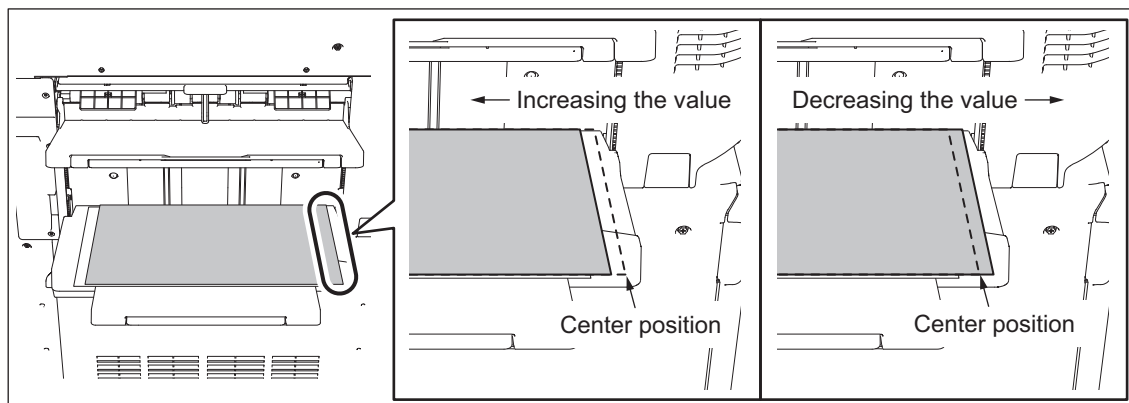


Fig.5-1

## [B] Alignment position adjustment (rear)

This adjustment is performed by 05-4822-1 (Adjustment Mode) of the MFP.

Adjustment scale	0.2 mm	
Adjustable range	-3.4 mm to 3.4 mm	
Adjustment value	-17 to 17 (Default: 0)	
Adjustment direction	Increasing the value	The alignment plate moves to the center.
	Decreasing the value	The alignment plate moves to the edge of paper.

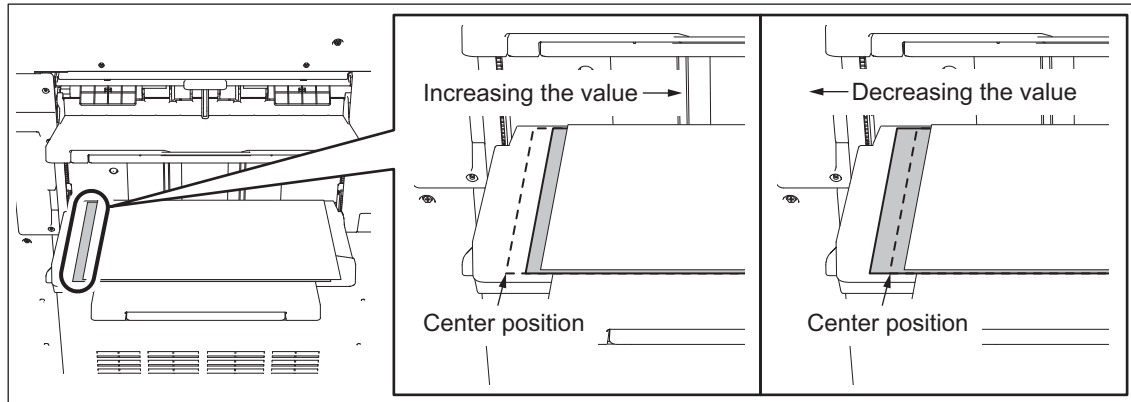


Fig.5-2

## 5.1.2 Stapling position adjustment

### [A] Stapling position adjustment (rear) (paper output direction: portrait)

This adjustment is performed by 05-4823-0 (Adjustment Mode) of the MFP.

Adjustment scale	0.2 mm	
Adjustable range	-3.4 mm to 3.4 mm	
Adjustment value	-17 to 17 (Default: 0)	
Adjustment direction	Increasing the value	The distance between the stapling position and the edge of the paper becomes longer.
	Decreasing the value	The distance between the stapling position and the edge of the paper becomes shorter.

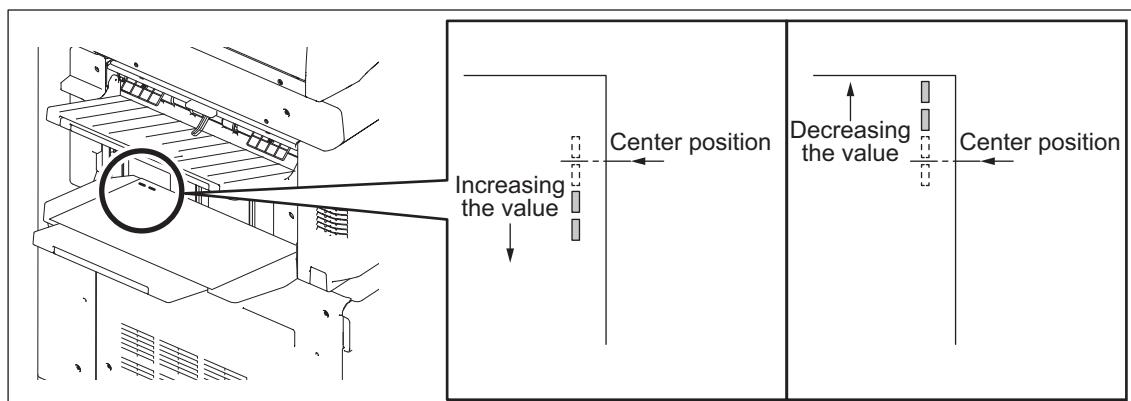


Fig.5-3

**[B] Stapling position adjustment (rear) (paper output direction: landscape)**

This adjustment is performed by 05-4823-1 (Adjustment Mode) of the MFP.

Adjustment scale	0.2 mm	
Adjustable range	-3.4 mm to 3.4 mm	
Adjustment value	-17 to 17 (Default: 0)	
Adjustment direction	Increasing the value	The distance between the stapling position and the edge of the paper becomes longer.
	Decreasing the value	The distance between the stapling position and the edge of the paper becomes shorter.

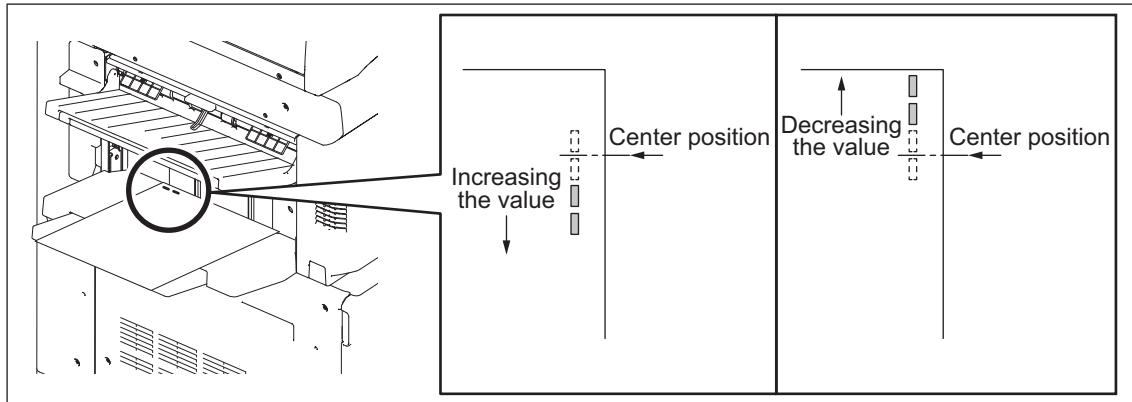


Fig.5-4

**[C] Stapling position adjustment (front) (paper output direction: portrait)**

This adjustment is performed by 05-4823-2 (Adjustment Mode) of the MFP.

Adjustment scale	0.2 mm	
Adjustable range	-3.4 mm to 3.4 mm	
Adjustment value	-17 to 17 (Default: 0)	
Adjustment direction	Increasing the value	The distance between the stapling position and the edge of the paper becomes shorter.
	Decreasing the value	The distance between the stapling position and the edge of the paper becomes longer.

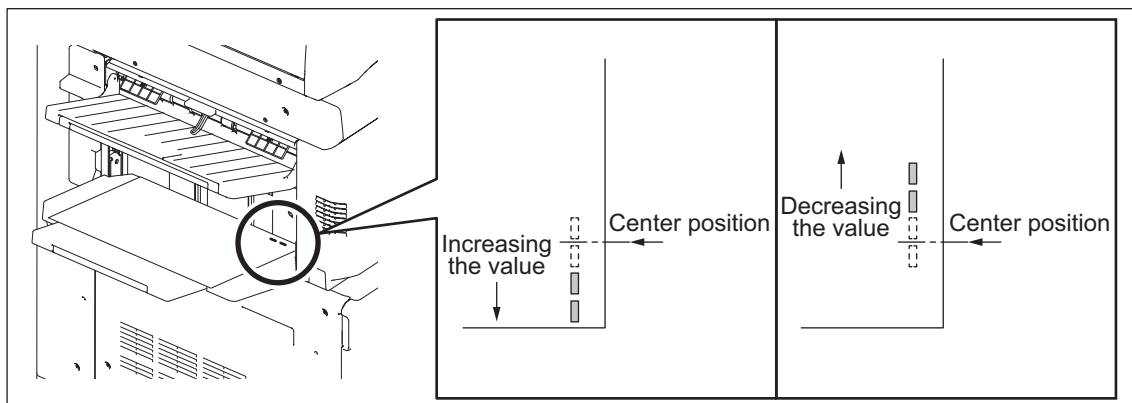


Fig.5-5

**[D] Stapling position adjustment (front) (paper output direction: landscape)**

This adjustment is performed by 05-4823-3 (Adjustment Mode) of the MFP.

Adjustment scale	0.2 mm	
Adjustable range	-3.4 mm to 3.4 mm	
Adjustment value	-17 to 17 (Default: 0)	
Adjustment direction	Increasing the value	The distance between the stapling position and the edge of the paper becomes shorter.
	Decreasing the value	The distance between the stapling position and the edge of the paper becomes longer.

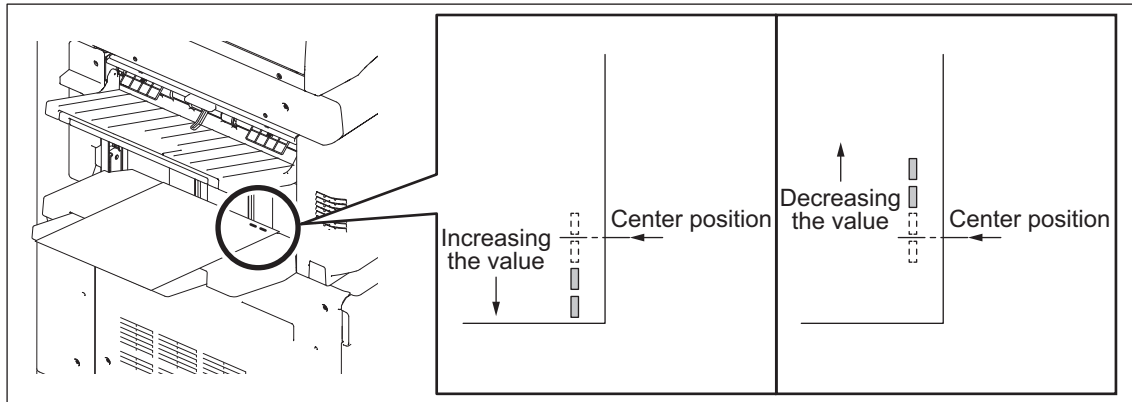


Fig.5-6

**[E] Stapling position adjustment (2-point stapling) (center)**

This adjustment is performed by 05-4823-4 (Adjustment Mode) of the MFP.

Adjustment scale	0.2 mm	
Adjustable range	-3.4 mm to 3.4 mm	
Adjustment value	-17 to 17 (Default: 0)	
Adjustment direction	Increasing the value	The stapling position moves farther to the front side from the center position.
	Decreasing the value	The stapling position moves farther to the rear side from the center position.

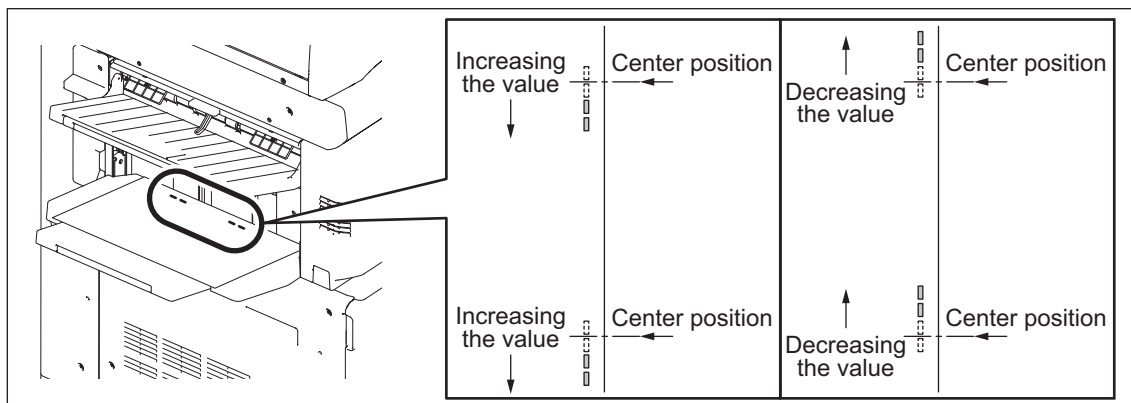


Fig.5-7



### 5.1.3 Hole punch position adjustment

This adjustment is performed by 05-4825 (Adjustment Mode) of the MFP.

Adjustment scale	0.2 mm	
Adjustable range	-3.4 mm to 2.4 mm	
Adjustment value	-17 to 12 (Default: 0)	
Adjustment direction	Increasing the value	The distance between the punch hole and the edge of the paper becomes longer.
	Decreasing the value	The distance between the punch hole and the edge of the paper becomes shorter.

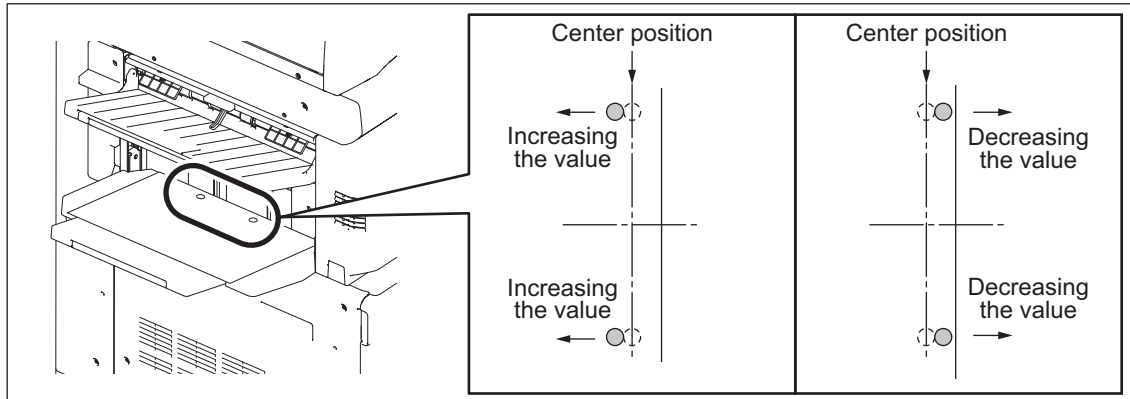


Fig.5-8

## 5.2 Electrical System (Hole Punch Unit Section)

### 5.2.1 Destination setting of the hole punch control PC board

This setting is performed when the hole punch control PC board (HP) [1] is replaced with a DIP switch [2] on it.

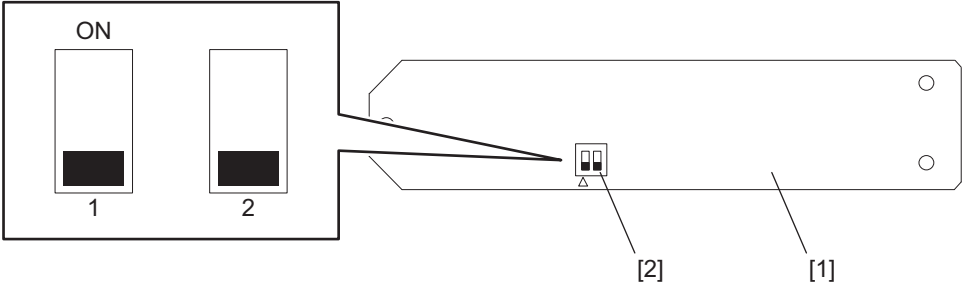


Fig.5-9

Refer to the table below for the destination settings.

Destination	Number of punch holes	DIP switch	
		1	2
E	2 holes	OFF	OFF
N	2 holes, 3 holes	ON	OFF
F	4 holes	OFF	ON
S	4 holes	ON	ON

## 6. TROUBLESHOOTING

For details about the troubleshooting for this option, refer to “ERROR CODE AND TROUBLESHOOTING” in the Service Manual for the MFP.



## 7. PREVENTIVE MAINTENANCE (PM) AND FIRMWARE UPDATING

### 7.1 PM Parts

#### 7.1.1 Inner Finisher section

Staple unit: 300,000 operations (equivalent to the life of the staple unit)

#### 7.1.2 Hole Punch Unit section

This unit does not have components that require preventative maintenance.

### 7.2 Consumables and Duration

Some components of the units may require replacement once or more over the period of the MFP warranty because of deterioration or damage. Replace them as needed.

#### 7.2.1 Inner Finisher section

No.	Name	Q'ty	Expected life	Remarks
1	Stapler	1	300,000 operations	A single cartridge is good for about 5,000 operations.

### 7.3 Maintenance by Customers

No.	Item	Remarks
1	Replacement of the staple cartridge for the Inner Finisher section	When the symbol is displayed (on the control panel of the MFP)
2	Disposal of punches	When the symbol is displayed (on the control panel of the MFP)

### 7.4 Maintenance and Inspection Points

Item	Interval	Contents	Remarks
Transport roller	Every 30,000 of paper feeding times	Cleaning	Wipe with a dry cloth or alcohol
Small rollers in the paper transport section			
Transport path and guides			
Transport path sensor			
Grease application to drive unit	As needed	Applying grease	EM-50L
Paper detection sensor	Minimum maintenance interval set for the MFP	Cleaning	Wipe with a dry cloth or alcohol

## 7.5 Firmware Updating

### Notes:

For updating firmware, refer to “FIRMWARE UPDATING” in the Service Manual for the MFP.

## 7.6 List of Solvents and Grease

### 7.6.1 Solvents

No.	Name	Use purpose	Components	Remarks
1	IIPA (isopropyl alcohol)	Cleaning	Alcohol	Keep away from fire
2	Synthetic alcohol (ethanol)	Cleaning	Alcohol	Keep away from fire

### 7.6.2 Greases

No.	Name	Use purpose	Components	Remarks
1	EM-50L (Molykote)	Lubrication and sound-deadening for driving and sliding sections	Synthetic oil	
2	TSF451-1M (GE Toshiba silicon)	Lubrication and sound-deadening for driving and sliding sections	Dimethyl silicon oil	





# 8. ELECTRIC CIRCUIT

## 8.1 Harness Diagram

### [A] Inner Finisher section (1)

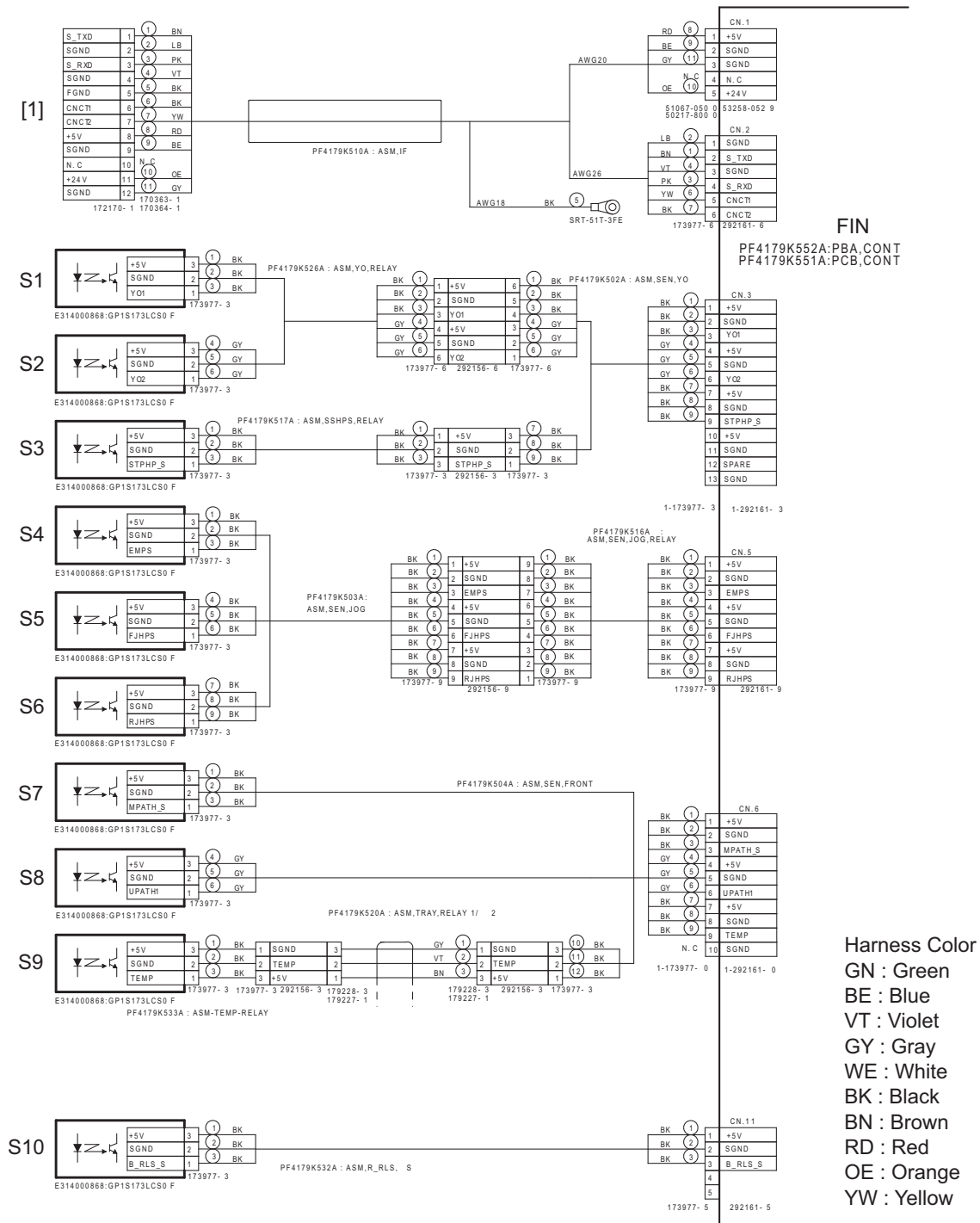


Fig.8-1

1	MFP interface	S5	Front alignment plate home position sensor
FIN	Finisher control PC board	S6	Rear alignment plate home position sensor
S1	Stack top detection sensor-1	S7	Middle path sensor
S2	Stack top detection sensor-2	S8	Sub-path sensor
S3	Stapler unit sliding home position sensor	S9	Movable tray paper sensor
S4	Finishing tray sensor	S10	Knurled roller home position sensor

## [B] Inner Finisher section (2)

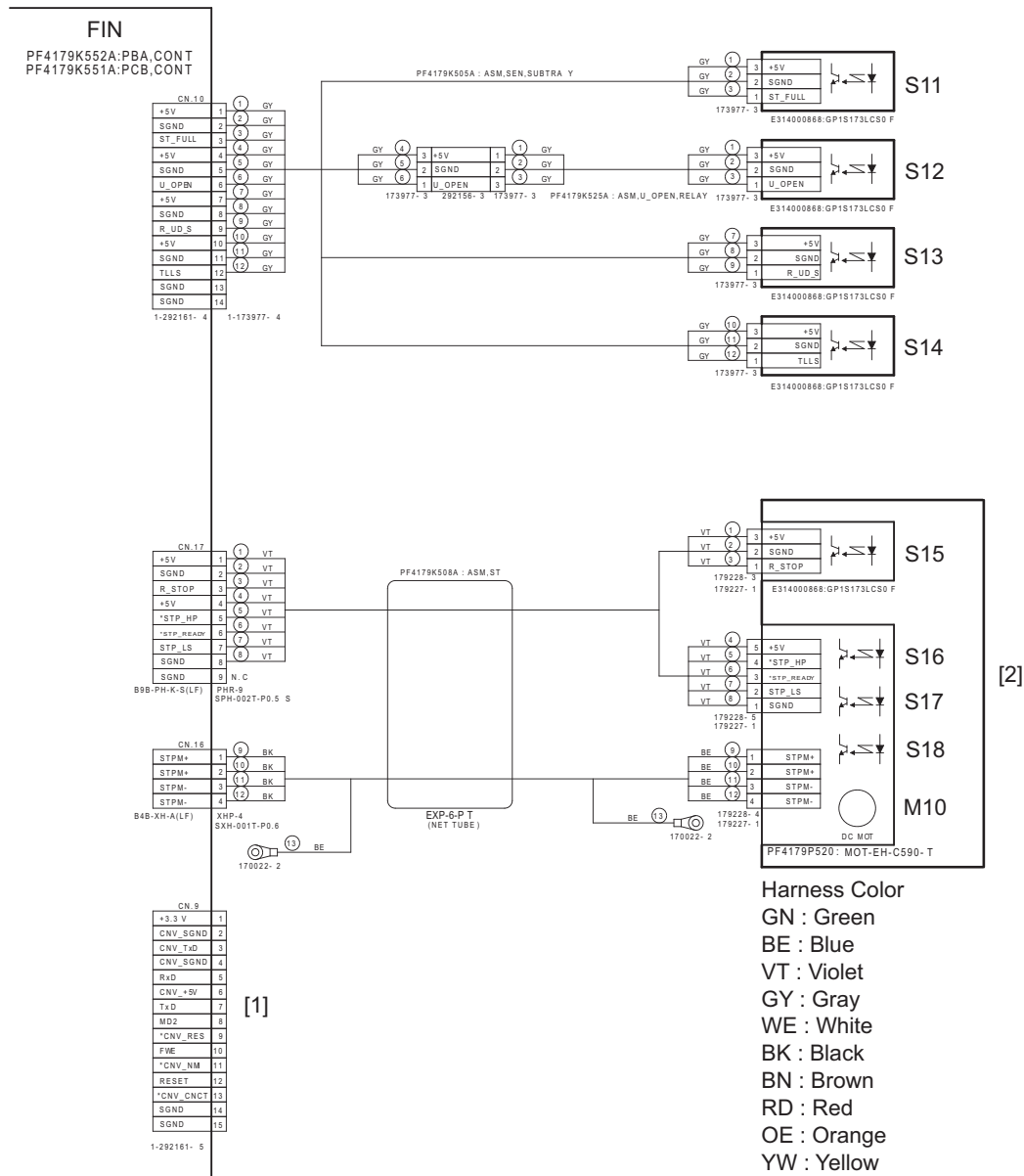
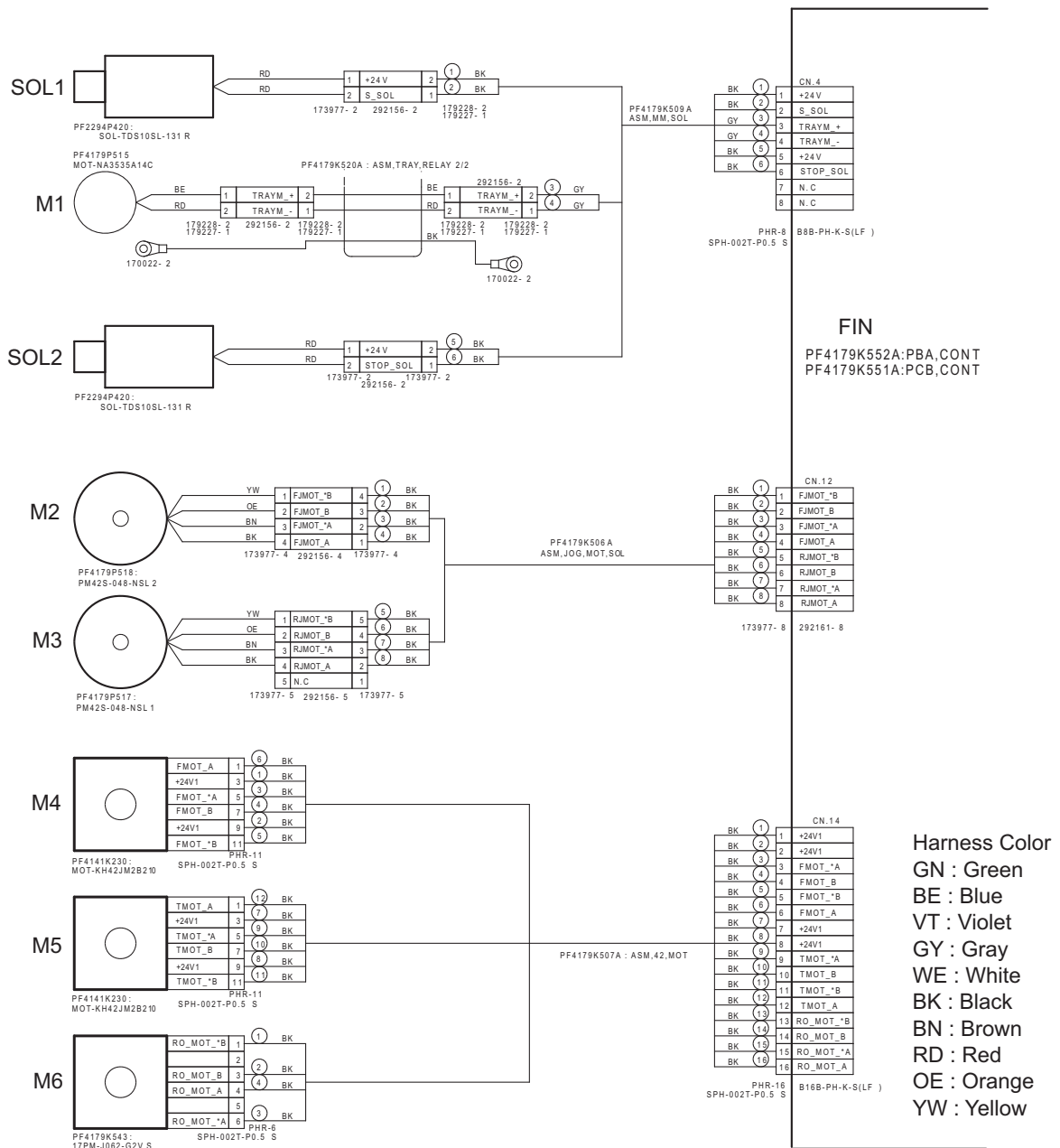


Fig.8-2

1	Converter board rewriting output	S14	Movable tray lower limit sensor
2	Stapler unit	S15	Staple unit improper clinching prevention sensor
FIN	Finisher control PC board	S16	Stapler unit clinching home position sensor
S11	Stationary tray full detection sensor	S17	Staple top position sensor
S12	Sub-path opening/closing sensor	S18	Staple empty sensor
S13	Stack exit roller home position sensor	M10	Stapler motor

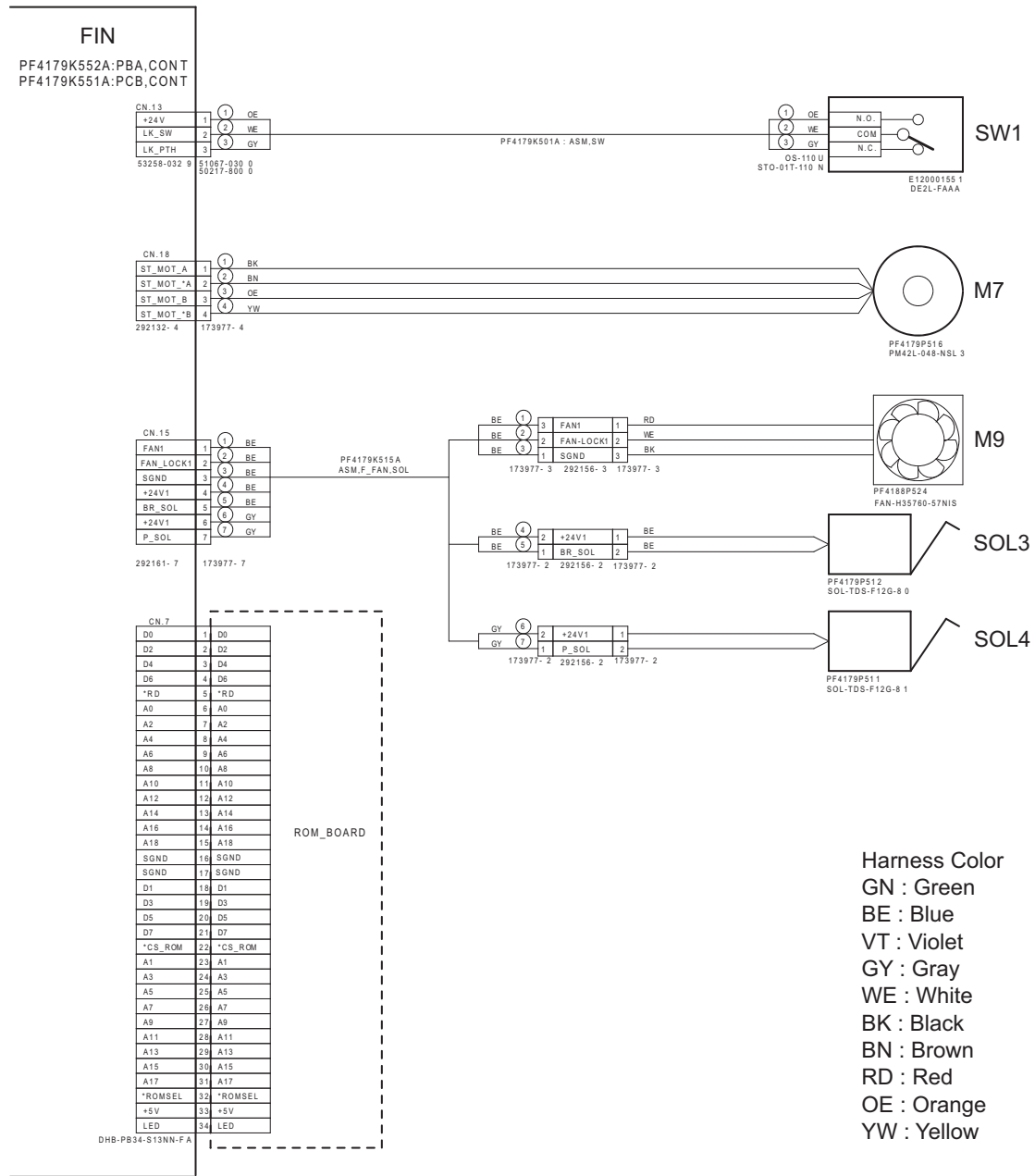
**[C] Inner Finisher section (3)**



**Fig.8-3**

FIN	Finisher control PC board	M3	Rear alignment motor
SOL1	Stack top detection solenoid	M4	2nd transport motor
SOL2	Trailing edge holding solenoid	M5	Stack exit motor
M1	Movable tray shift motor	M6	Stack exit roller shift motor
M2	Front alignment motor		

**[D] Inner Finisher section (4)**



**Fig.8-4**

FIN	Finisher control PC board	M9	Fan motor
SW1	Front cover switch	SOL3	Knurled roller shift solenoid
M7	Stapler unit sliding motor	SOL4	Paddle rotation solenoid



[F] Hole Punch Unit section (1)

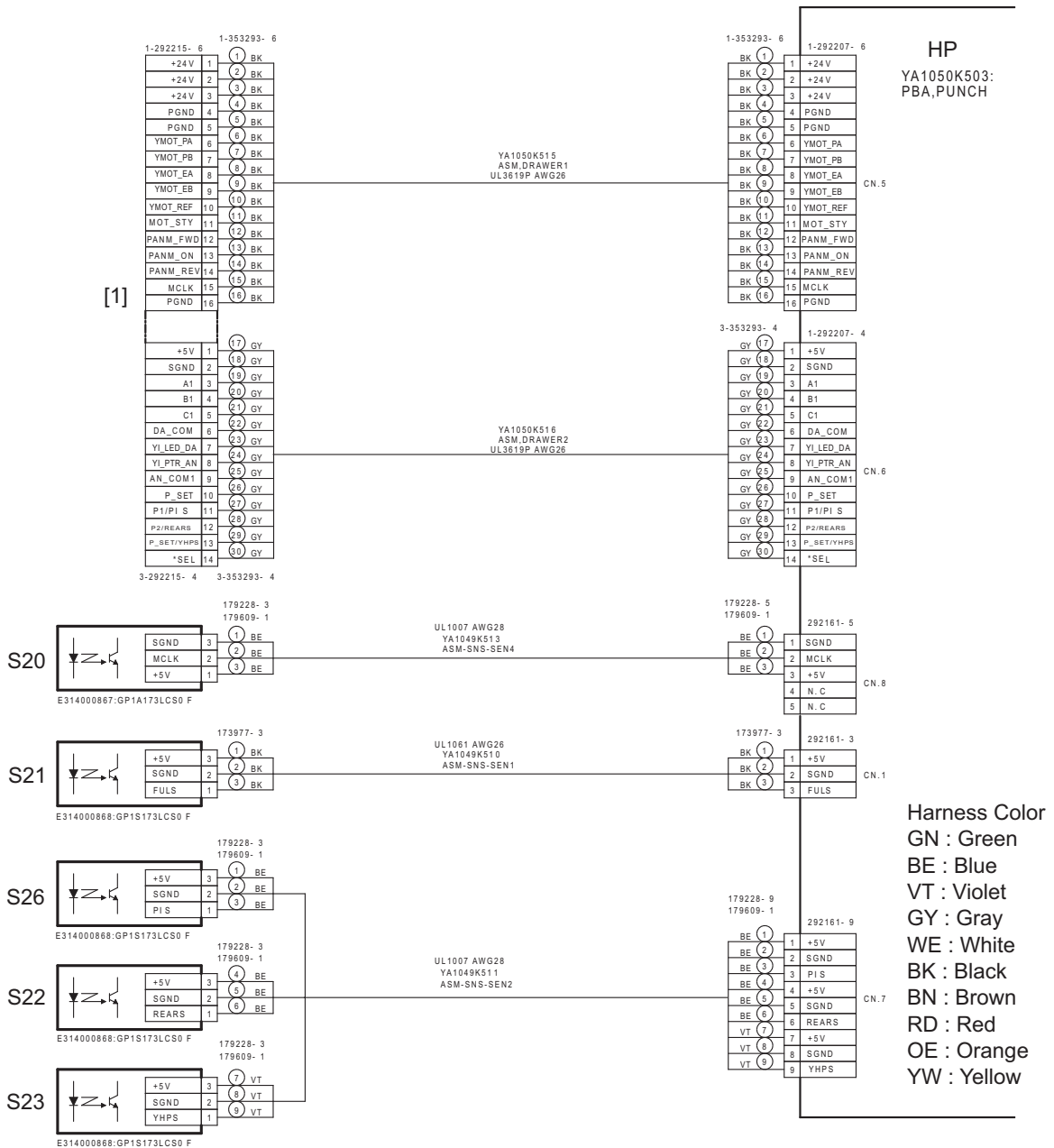
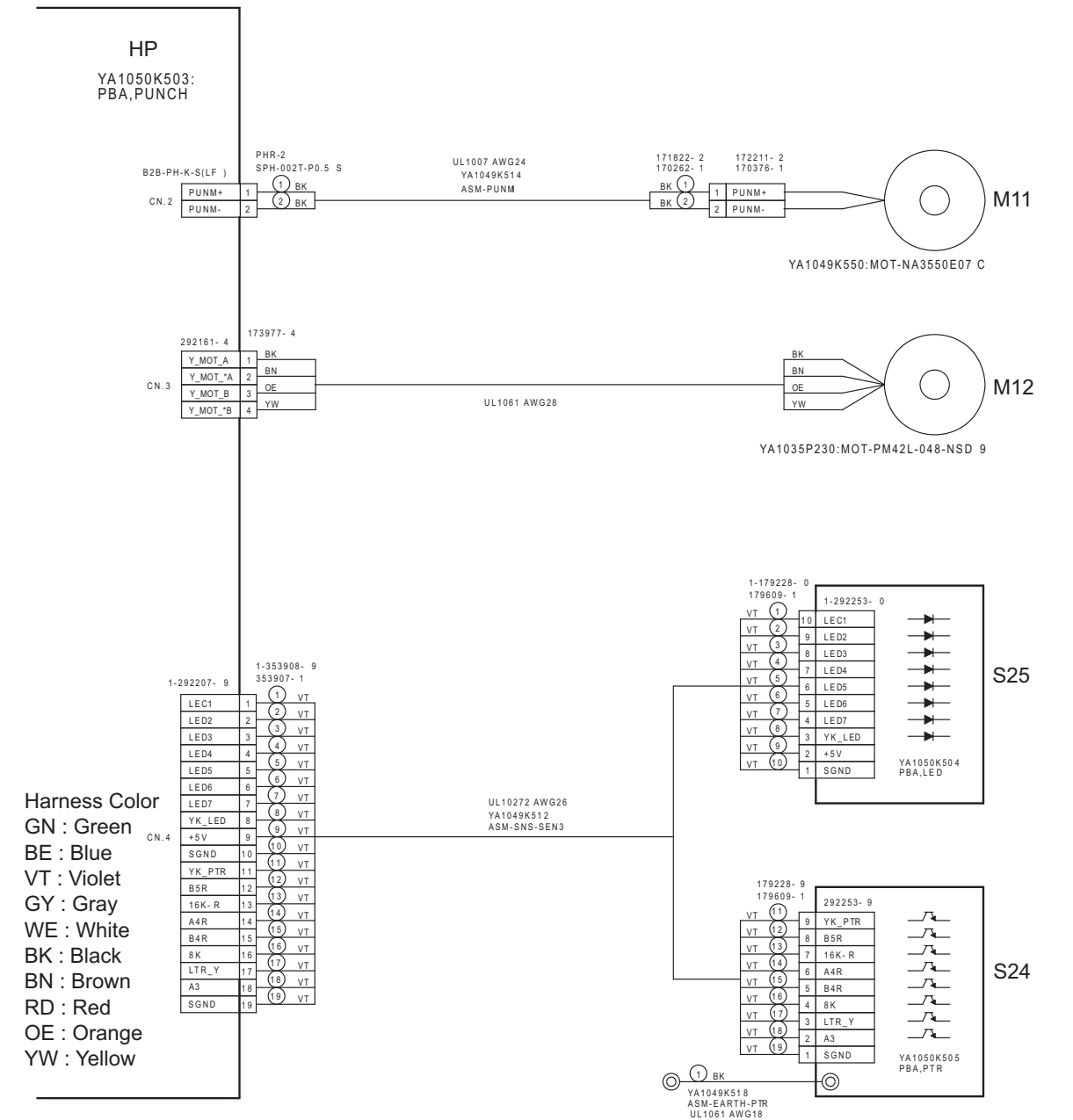


Fig.8-6

1	Inner Finisher	S22	Rear punch shaft home position sensor
HP	Hole punch control PC board	S23	Punch sliding unit home position sensor
S20	Punch motor clock sensor	S26	Punch shaft home position sensor (For "N" only)
S21	Punch waste full sensor		

**[G] Hole Punch Unit section (2)**



**Fig.8-7**

HP	Hole punch control PC board	M11	Punch motor
S24	Paper detection sensor (SEN)	M12	Punch unit sliding motor
S25	Paper detection sensor (LED)		



# REVISION RECORD

Ver00

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