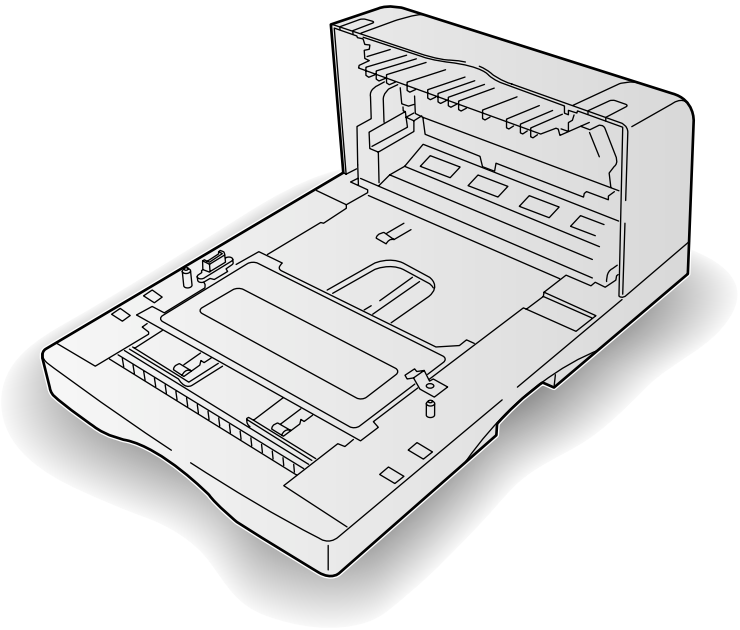
Service manual

KYOCERA mita



Duplexer DU-60

Conventions

Throughout this manual, the following conventions are used:

Italic letters refer related chapters or sections or documentations.

This symbol followed by **WARNING** denotes that the following paragraph(s) includes precautions which, if ignored, could result in personal injury, and/or irrevocable damage to the duplexer.
When followed by **CAUTION** this symbol denotes that the following paragraph(s) include the precautions which, if ignored, could result in damage to the duplexer.

About the chapters

The manual is comprised of the following chapters:

Chapter 1:	Product Information
Chapter 2:	Installation
Chapter 3:	Maintenance
Chapter 4:	Operation Overview
Chapter 5:	Disassembly
Chapter 6:	Troubleshooting
Appendix A:	Diagrams

REVISION HISTORY

Version	Date	Replaced Pages	Remarks
1.00	2-Apr-2001	-	

TO OBTAIN THE LATEST PRINTER DRIVERS AND UTILITIES, VISIT US AT OUR INTERNET HOME PAGE: http://www.kyocera.com/w2k

KYOCERA

Chapter 1 Product Information

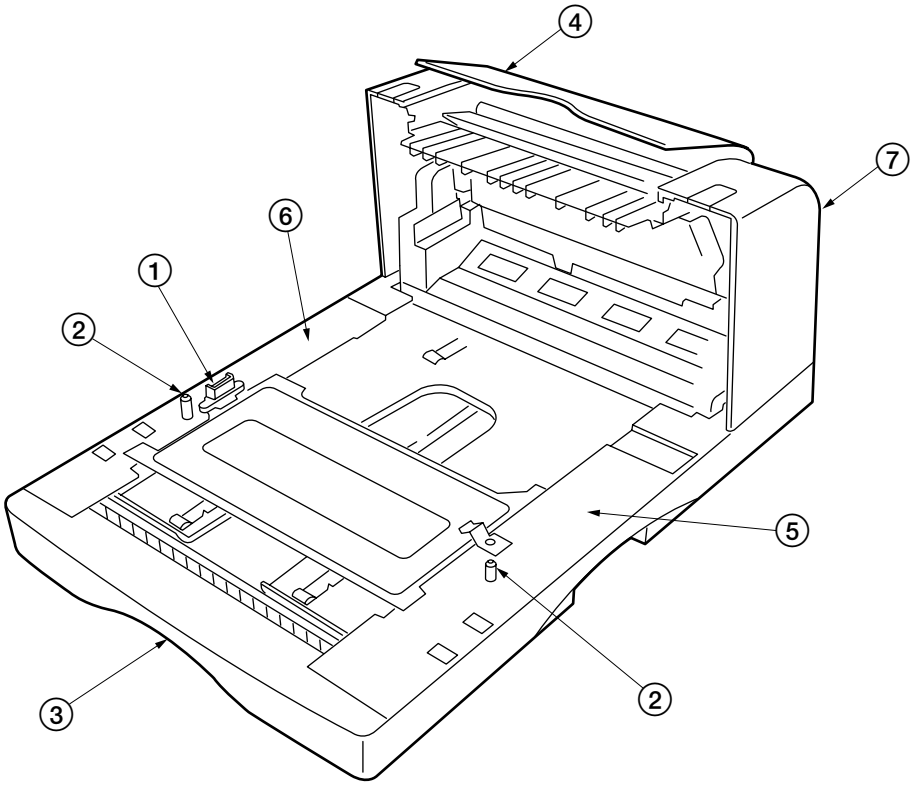
Chapter 1 Contents

1-1 Specifications

Table 1-1-1 Specifications

Item	Description
Compatible printer	Kyocera Mita Page Printers FS-1800/1800N and FS-3800/3800N
Loadable paper sizes	Legal size and A5 to A4/letter universal cassette 14.8 to 21.0 cm × 21.6 to 29.7 cm (5-13/16 to 8-1/2 × 8-1/4 to 11-11/16 inches)
Environmental requirements	Temperature: 10 to 32.5°C (50 to 90.5°F)
	Humidity: 20 to 80 % RH
	Ideal conditions are 20°C/65 % RH, altitude under 2000 m.
Dimensions	Width: 34.5 cm (13-9/16 inches)
	Height: 10.5 cm (4-1/8 inches)
	Depth: 52.0 cm (20-1/2 inches)
Weight	4.6 kg (10-1/8 lb.)
Power supply	Supplied from printer

1-2 Names of parts



① Interface connector
② Positioning pins
③ Duplex drawer
④ Rear cover
⑤ Right cover
⑥ Left cover
⑦ Vertical path assembly

Figure 1-2-1 Names of parts

Chapter 2 Installation

Chapter 2 Contents

2-1 Installing the duplexer

1. Remove the nine tapes ① and pad ② from the duplexer.

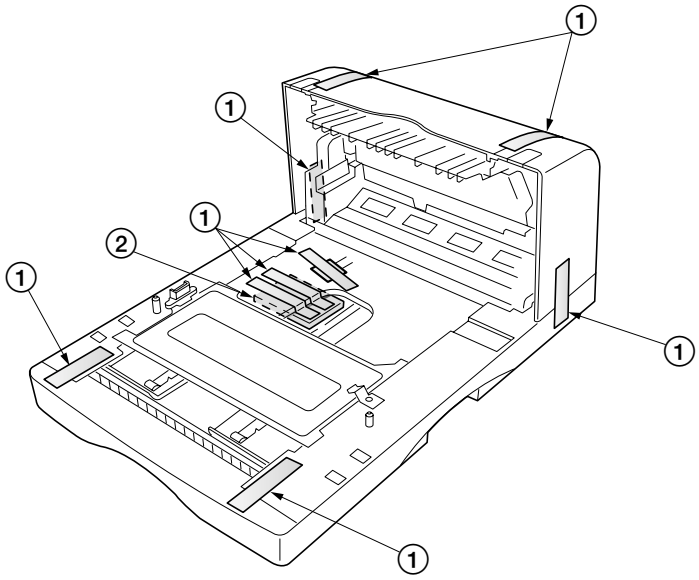


Figure 2-1-1 Remove the tapes and pad

2. While pushing the release lever ③ inward, remove the vertical path assembly ④.

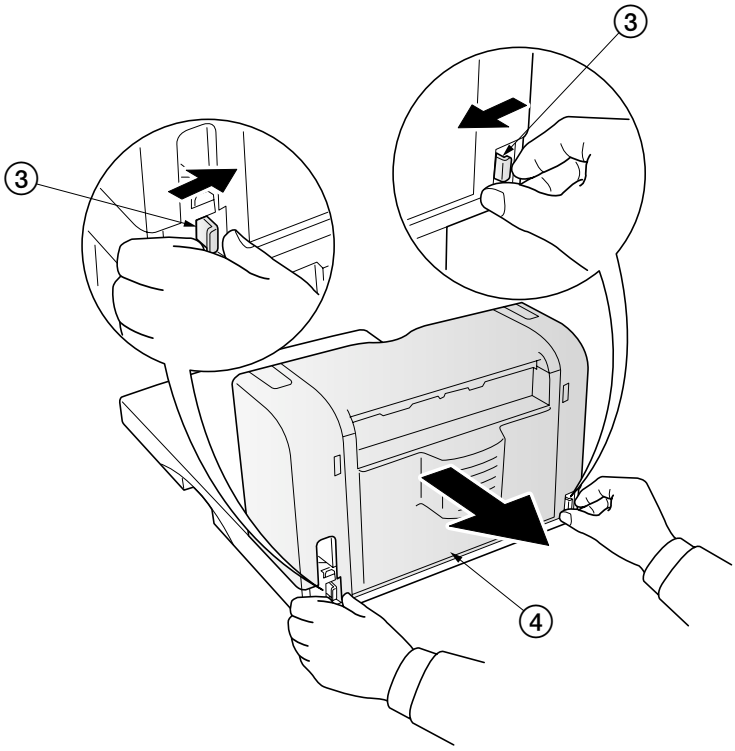


Figure 2-1-2 Remove the vertical path assembly

3. Turn off the printer and disconnect the power cord and printer cable. Gently place the printer on top of the duplexer.

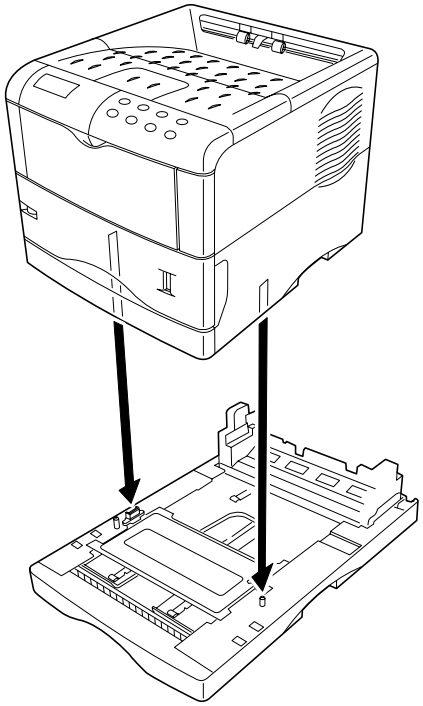


Figure 2-1-3 Place the printer

4. Connect the printer cable ⑤ according to operation enveronment.

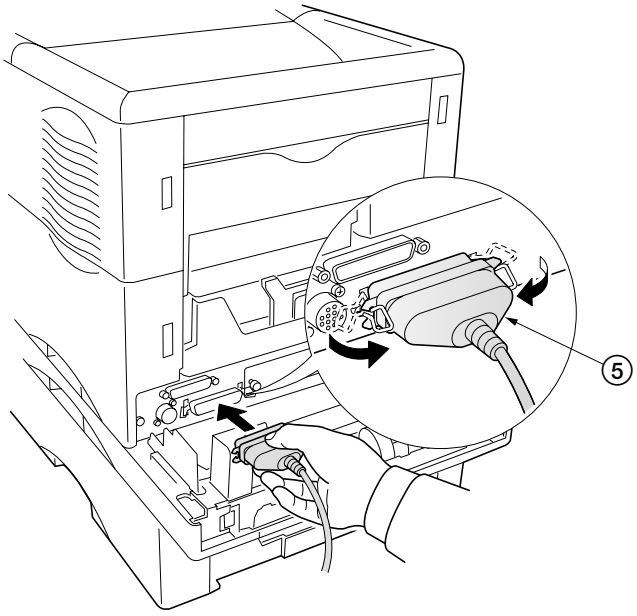


Figure 2-1-4 Connect the printer cable

Chapter 3 Maintenance

Chapter 3 Contents

3-1 Maintenance

3-1-1 Cleaning the switchback roller

Remove the vertical path assembly. See page 5-4. Using the cleaning cloth, wipe the switchback roller ①.

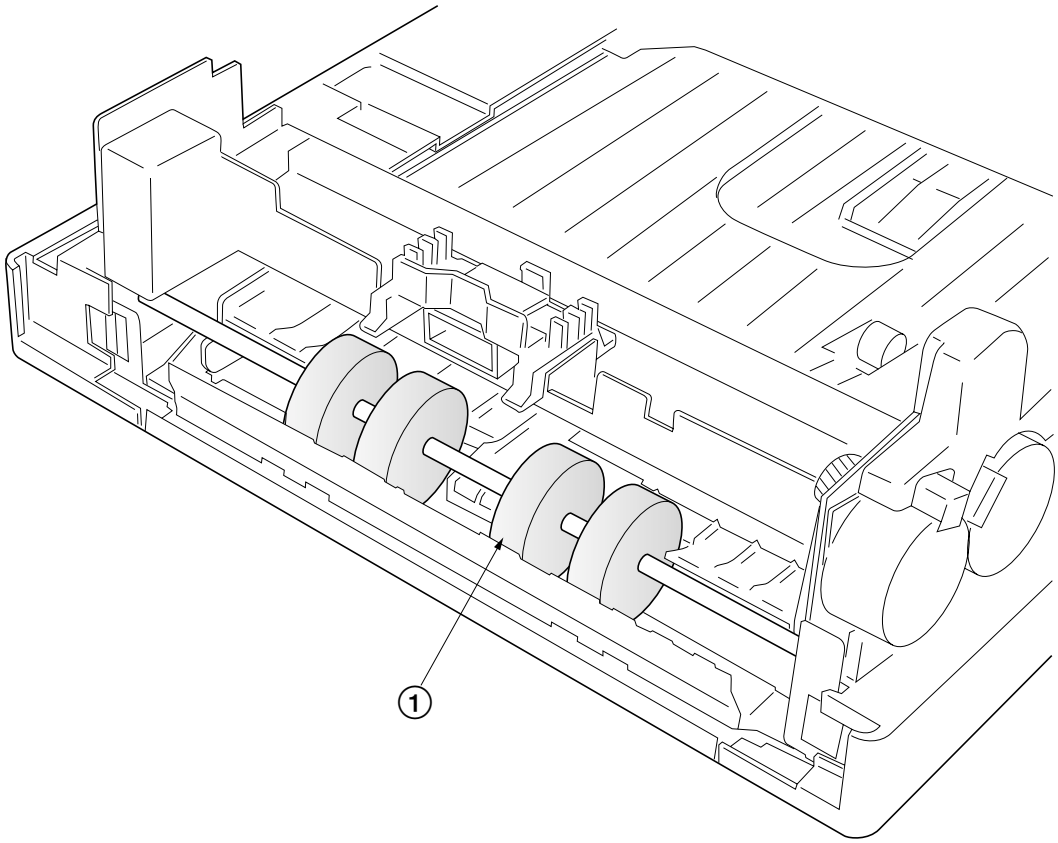


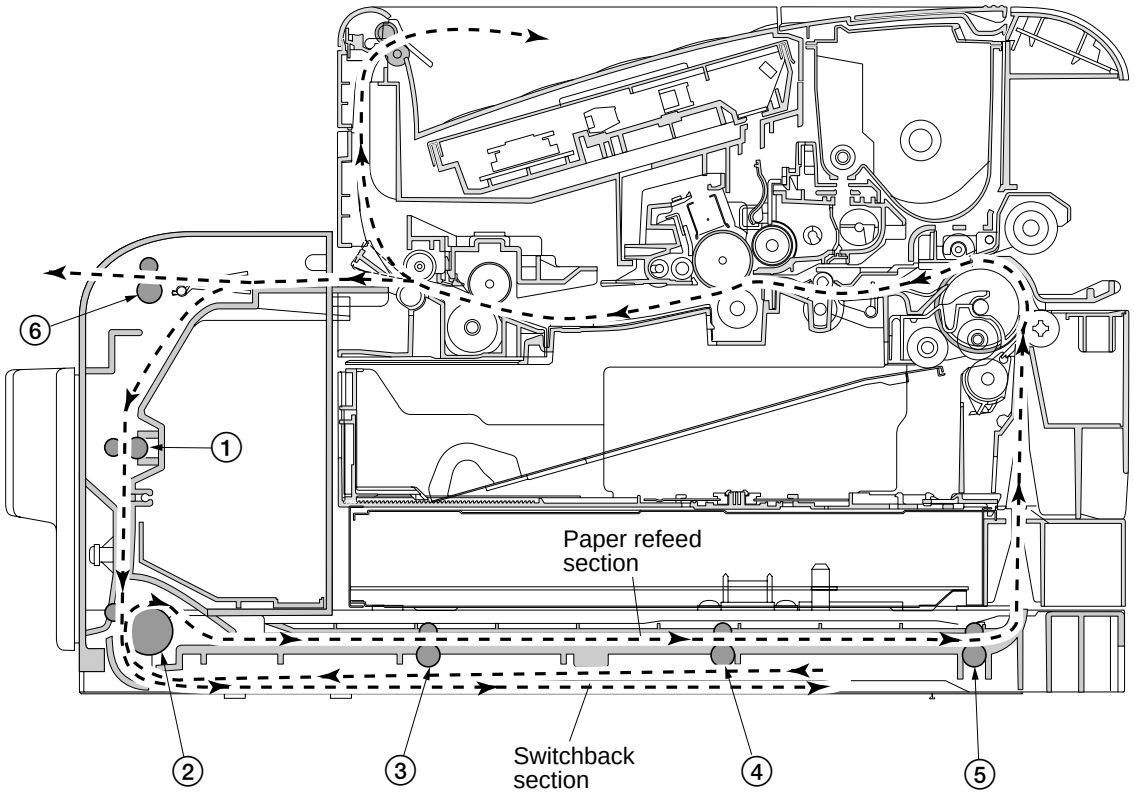
Figure 3-1-1 Cleaning the switchback roller

Chapter 4 Operation Overview

Chapter 4 Contents

4-1 Paper feeding system of duplexer

The figure below shows the components in the duplexer and the paths through which the paper travels. The sensors, solenoid, motors etc., are described in the following pages.



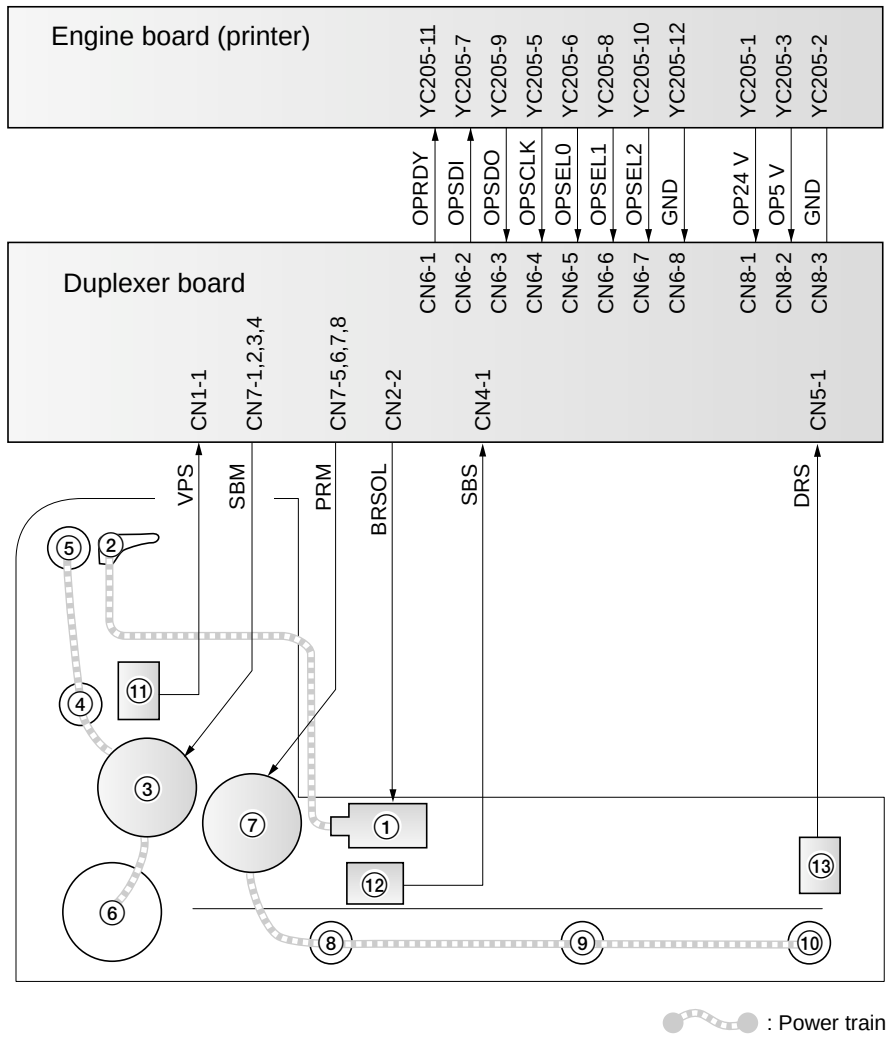
① Vertical path roller
② Switchback roller
③ Conveying roller 1
④ Conveying roller 2
⑤ Duplex refeed roller
⑥ Face-up roller

Figure 4-1-1 Paper feeding path

4-1-1 Paper feed control of duplexer

The following diagram shows interconnectivity of the feeding system components including the sensors and rollers.

The duplexer board controls paper conveying operation in the duplexer. Upon reception of a control signal from the engine board of the printer, it drives the motors and the solenoid to operate the rollers and the guide.



① Branch solenoid
② Branch guide
③ Switchback motor
④ Vertical path roller
⑤ Face-up roller
⑥ Switchback roller
⑦ Paper refeed motor
⑧ Conveying roller 1
⑨ Conveying roller 2
⑩ Duplex refeed roller
⑪ Vertical path sensor
⑫ Switchback sensor
⑬ Duplex refeed sensor

Figure 4-1-2 Paper feed control

4-1-2 Paper feeding mechanism of duplexer

Swichback section

After printing onto the first face, the change guide of the printer switches the paper path to the face-up ejection side, to convey the paper into the duplexer. When the paper enters the duplexer, the switchback motor ① rotates forward to drive the vertical path roller ② and switchback roller ③, to convey the paper to the switchback section. The switchback motor ① then rotates in the reverse direction reversing the switchback roller ③, to convey paper to the paper refeed section.

The vertical path sensor ④ and switchback sensor ⑤ detect the paper conveying status and paper jams in the switchback section.

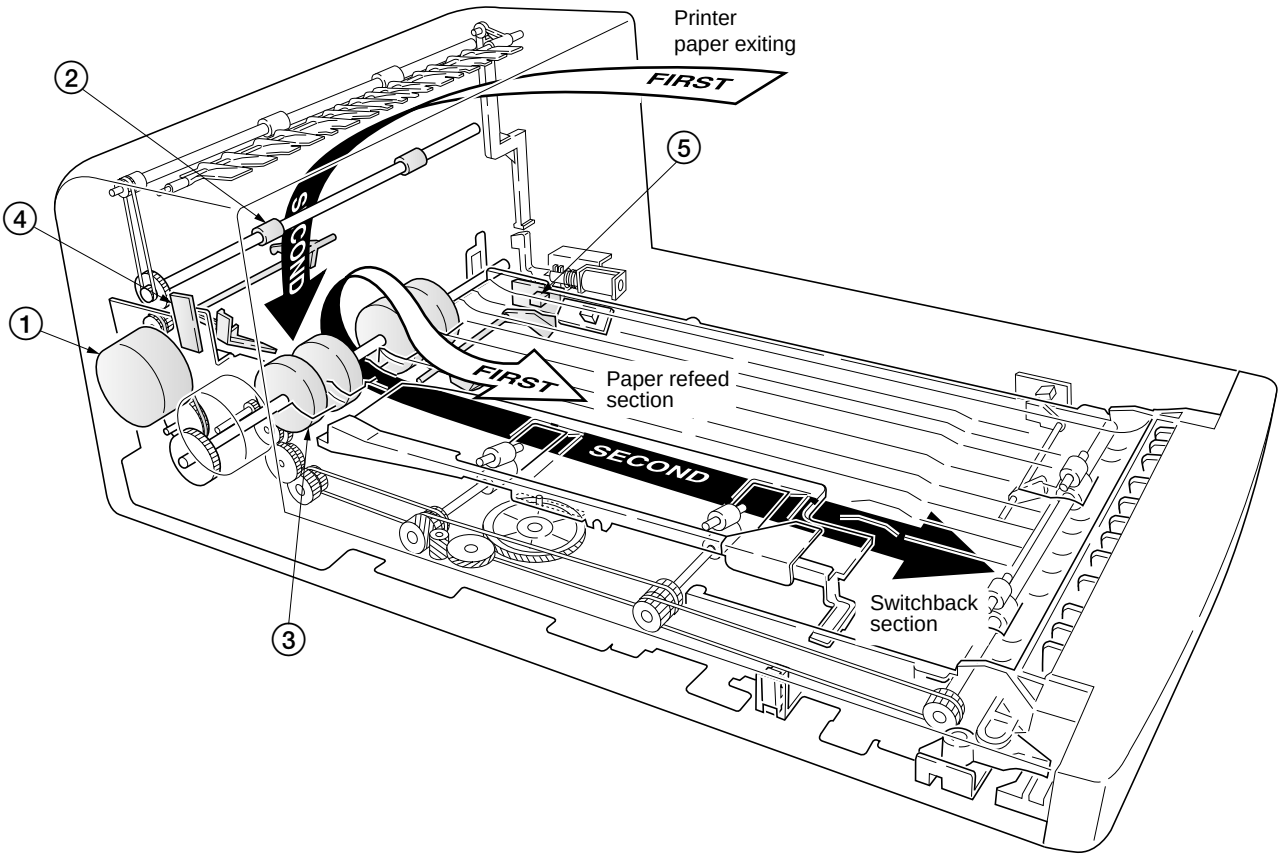


Figure 4-1-3 Switchback section

Paper refeed section

The paper refeed motor ⑥ rotates conveying roller 1 ⑦, conveying roller 2 ⑧ and the duplex refeed roller ⑨, to convey the paper entering the paper refeed section back into the printer. During this operation, the paper refeed motor ⑥ moves the side registration guide ⑩ to the size of the paper by rotating in the reverse direction as support to the paper conveying operation.

The duplex refeed sensor ⑪ detects the paper conveying status and paper jams in the paper refeed section.

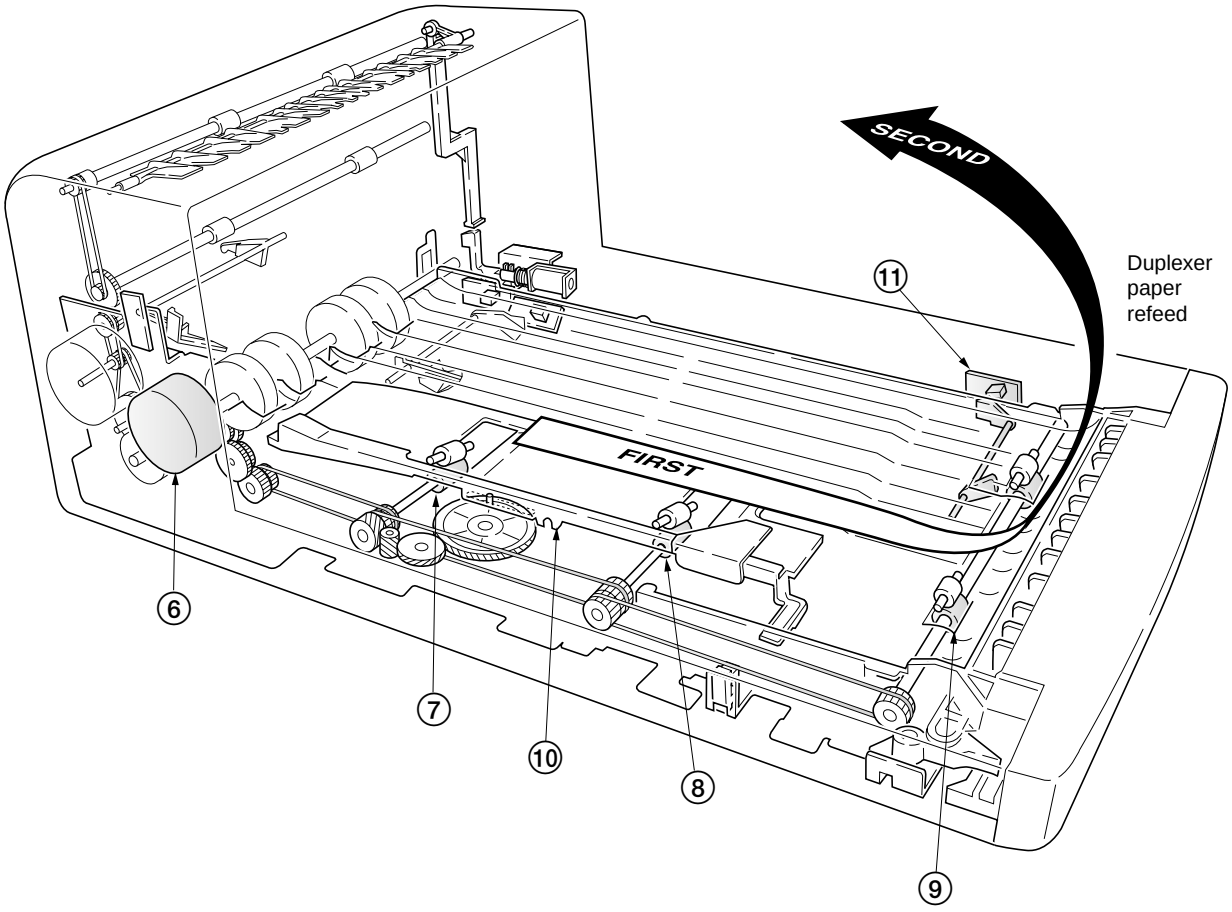
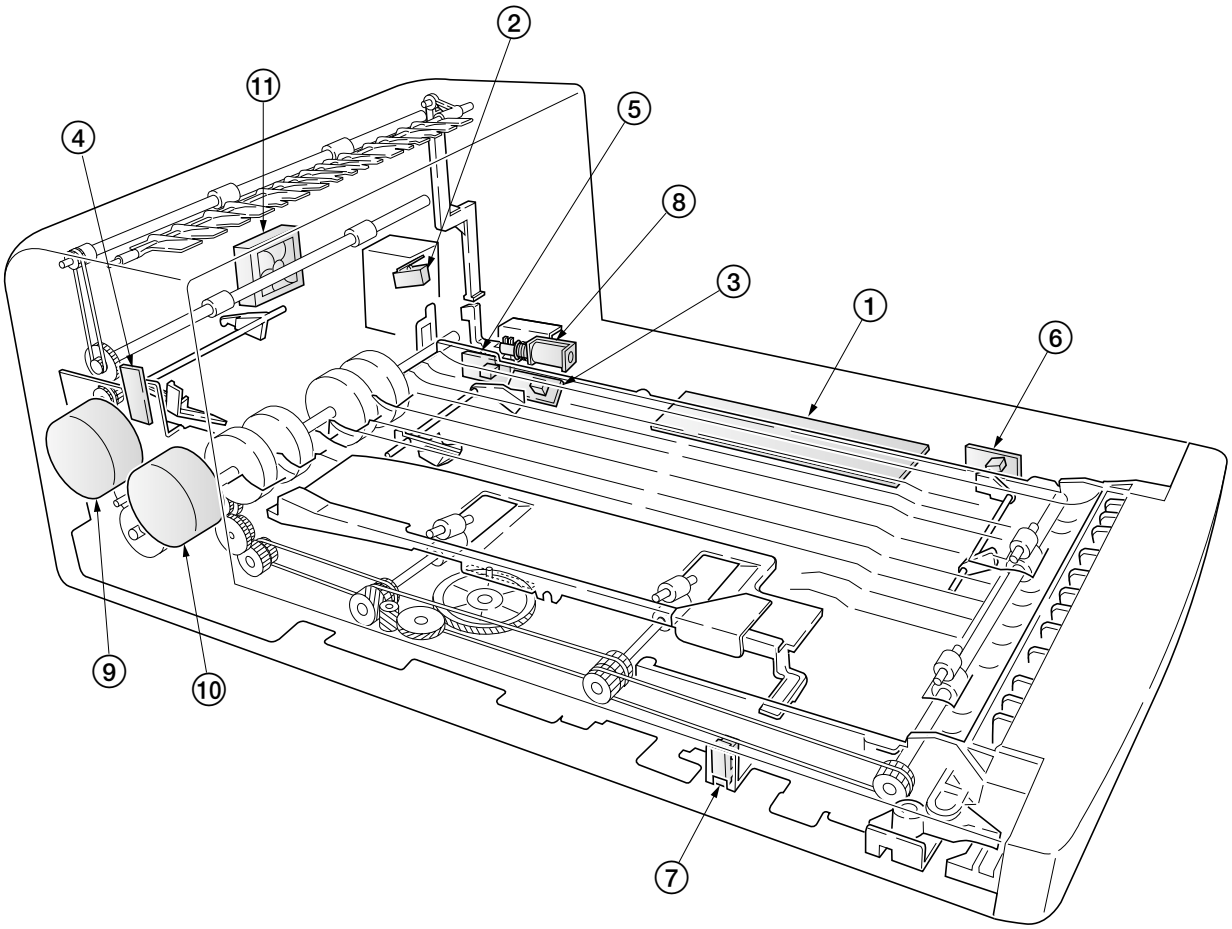


Figure 4-1-4 Paper refeed section

4-2 Electrical control system

4-2-1 Electrical parts layout



① Duplexer board
② Rear cover interlock switch
③ Drawer detection sensor
④ Vertical path sensor
⑤ Switchback sensor
⑥ Duplex refeed sensor
⑦ Side registration sensor
⑧ Branch solenoid
⑨ Switchback motor
⑩ Paper refeed motor
⑪ Cooling fan motor

Figure 4-2-1 Electrical parts layout

4-2-2 Operation of circuit board

(1) Duplexer board

The duplexer board serially communicates with the engine board of the printer to exchange control signals.

In the duplex mode, upon reception of a control signal from the engine board of the printer, CPU IC4 controls the paper conveying operation in the duplexer by operating the motors and the solenoid while detecting the paper conveying status via the sensors.

The motor drive circuit consists mainly of motor driver IC2 and IC3. It drives the switchback motor and paper refeed motor based on the control signals (SBM, PRM) from CPU IC4.

The reset circuit consists mainly of reset IC7. It monitors the 5 V DC supply voltage. When the power is turned on or when the power supply becomes low, it outputs a RESET signal to CPU IC4, to prevent system malfunction or runaway.

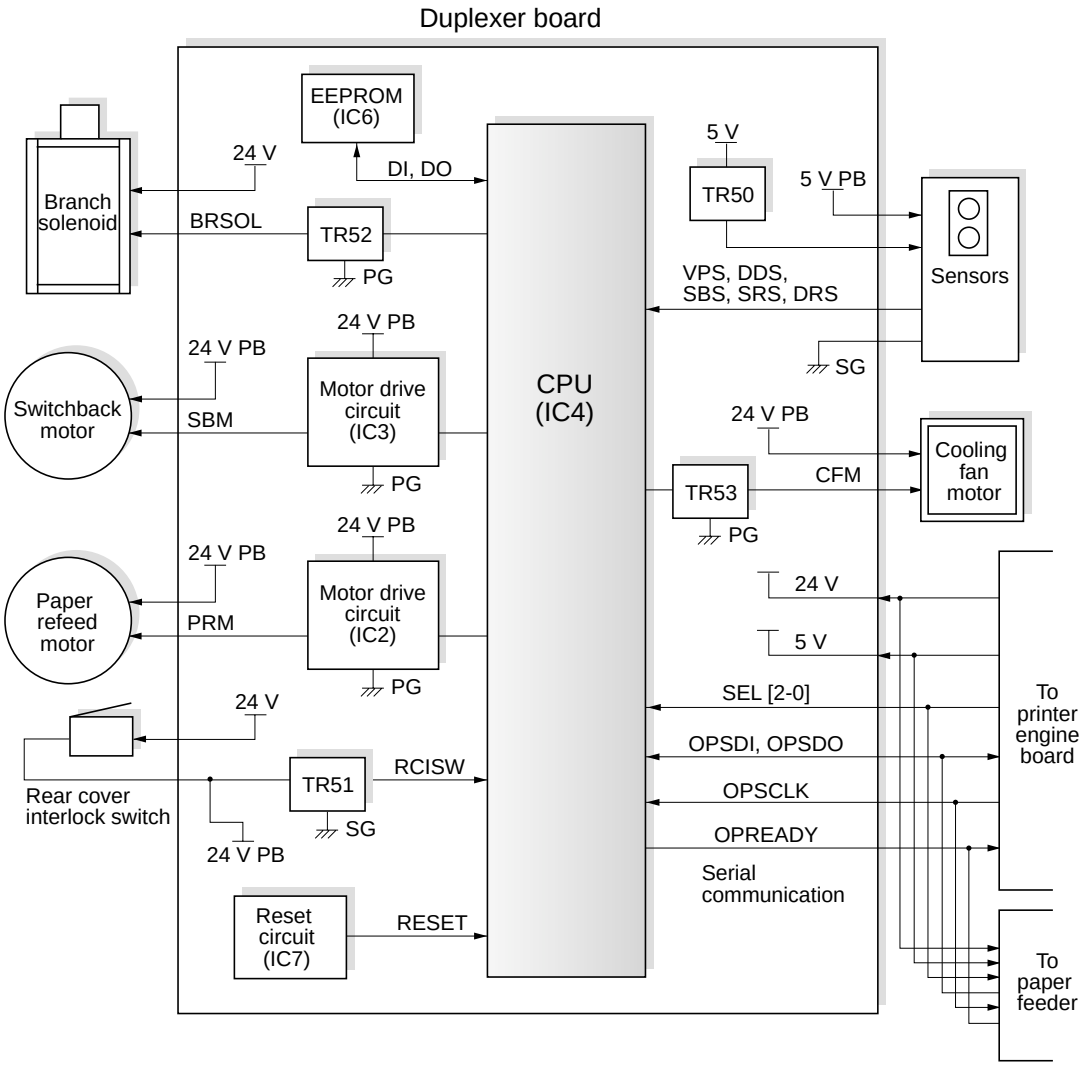


Figure 4-2-2 Duplexer board circuit block diagram

Chapter 5 Disassembly

Chapter 5 Contents

5-1 General instructions

This chapter provides the procedure for removal and replacement of field replacement components. For other components not explained in this chapter, the diagrams in the *Parts Catalog*. It is recommended that your refer to diagrams in the Parts Catalog as a supplemental reference to this chapter. It features all the part drawings and help you disassemble or refit the parts in the duplexer. When replacing of a component, reverse the procedure for the removal procedure explained in this chapter.

WARNING To avoid injury electric shock, make sure that AC power is removed and the power cord is unplugged from both the power line and the printer.

5-1-1 Screw/hardware

Screws and hardware used in the printer are listed in the *Ecosys Screw catalog*. These screw symbol numbers are universal to most Ecosys printers.

CAUTION When securing a self-tapping screws, align it with the thread carefully. First turn it counterclockwise, then slowly clockwise. Do not overtighten. In case the self-tapped thread is damaged, the whole part may have to be replaced with a new part.

5-1-2 Before starting disassembly

Before proceeding, unplug the power cord from the printer and the power supply.

WARNING Never attempt to operate the printer with components removed.

CAUTION The duplexer use electrostatic sensitive parts inside (circuit boards, etc.). Provide an antistatic (discharging) device, such as a wrist strap, that can effectively discharge your body before touching those components.

5-2 Disassembly

5-2-1 Removing the vertical path assembly

1. While pushing the release lever ① inward, remove the vertical path assembly ②.

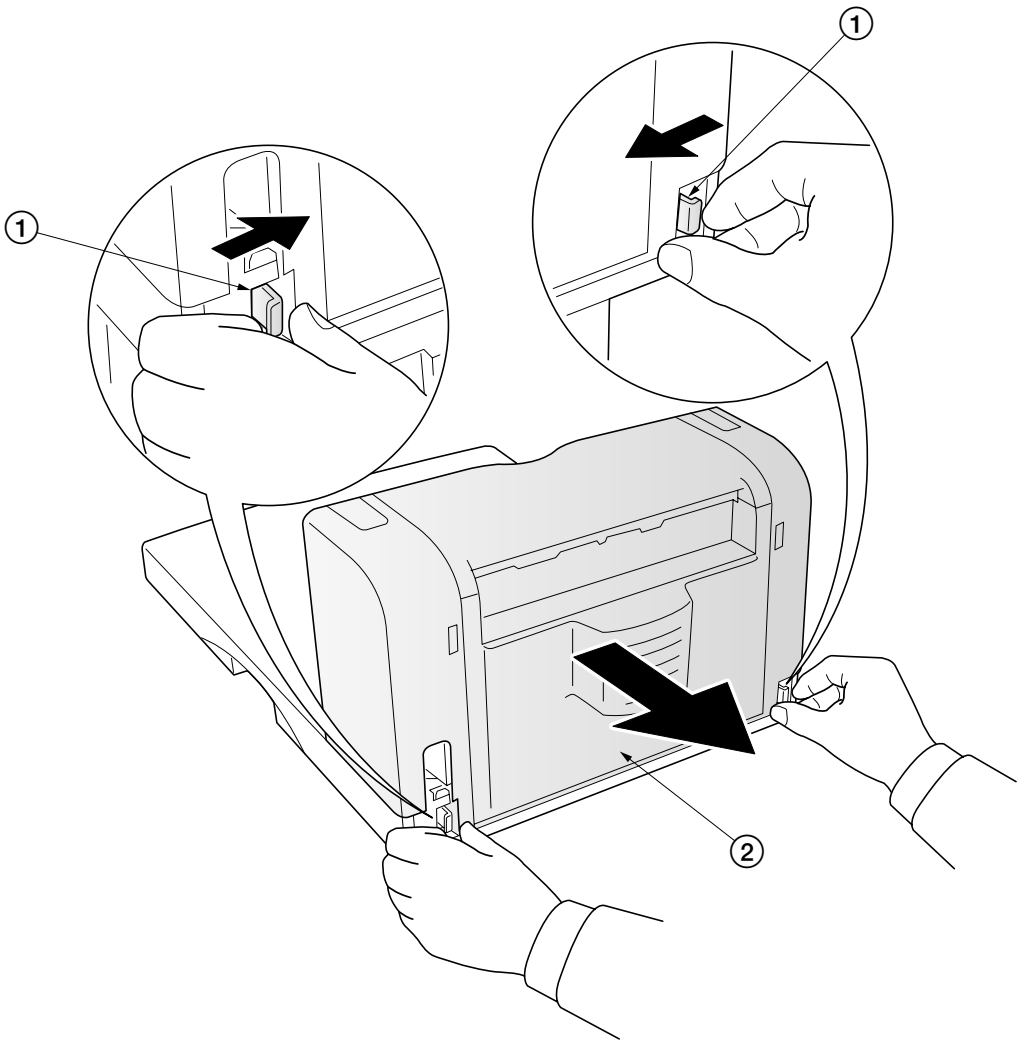


Figure 5-2-1 Removing the vertical path assembly

5-2-2 Removing the right and left cover

1. Remove the vertical path assembly. See page 5-4.
2. Pull out the duplex drawer.
3. Remove three screws ①. To remove the right cover ② and earth plate ③.
4. Remove four screws ④. To remove the left cover ⑤.

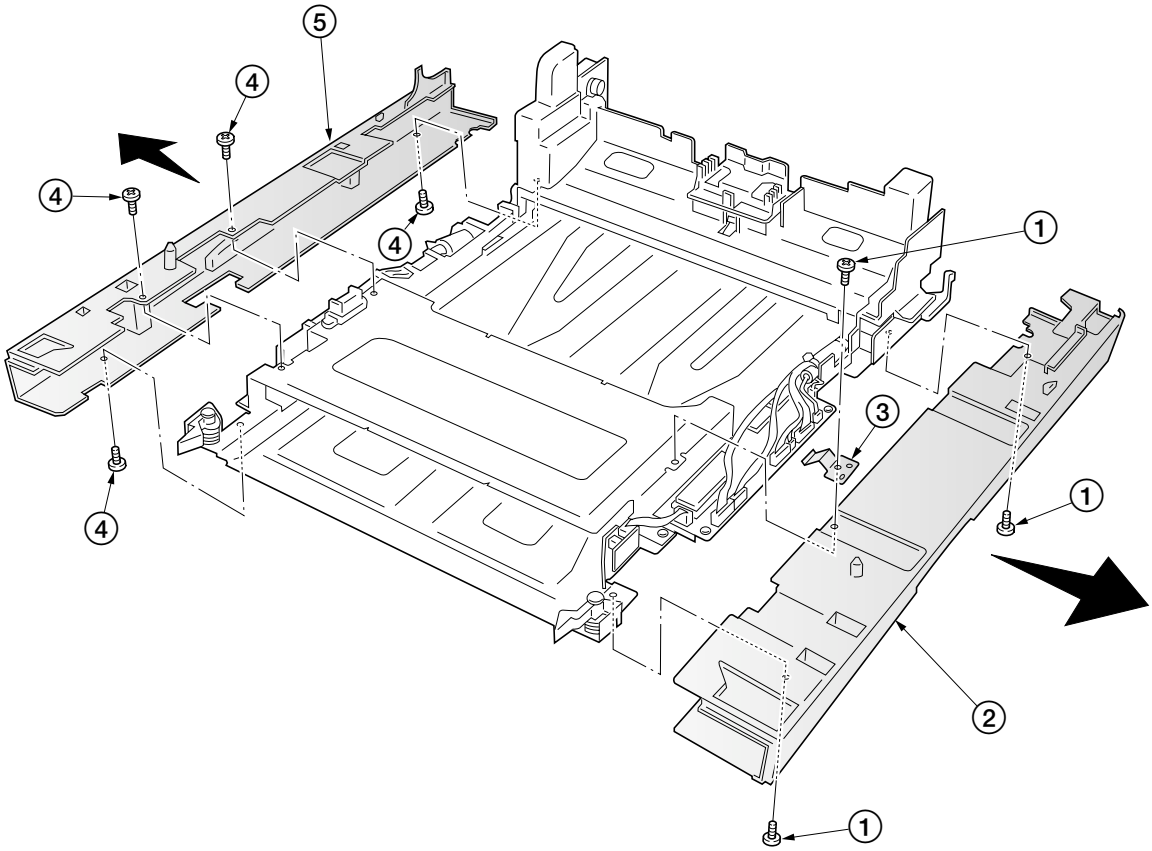


Figure 5-2-2 Removing the right and left cover

5-2-3 Removeing the duplexer board

1. Remove the vertical path assembly. See pape 5-4.
2. Pull out the duplex drawer.
3. Remove the right cover. See pape 5-5.
4. Remove nine connectors from duplexer board ①. Remove three screws ②. To remove the duplexer board ①.

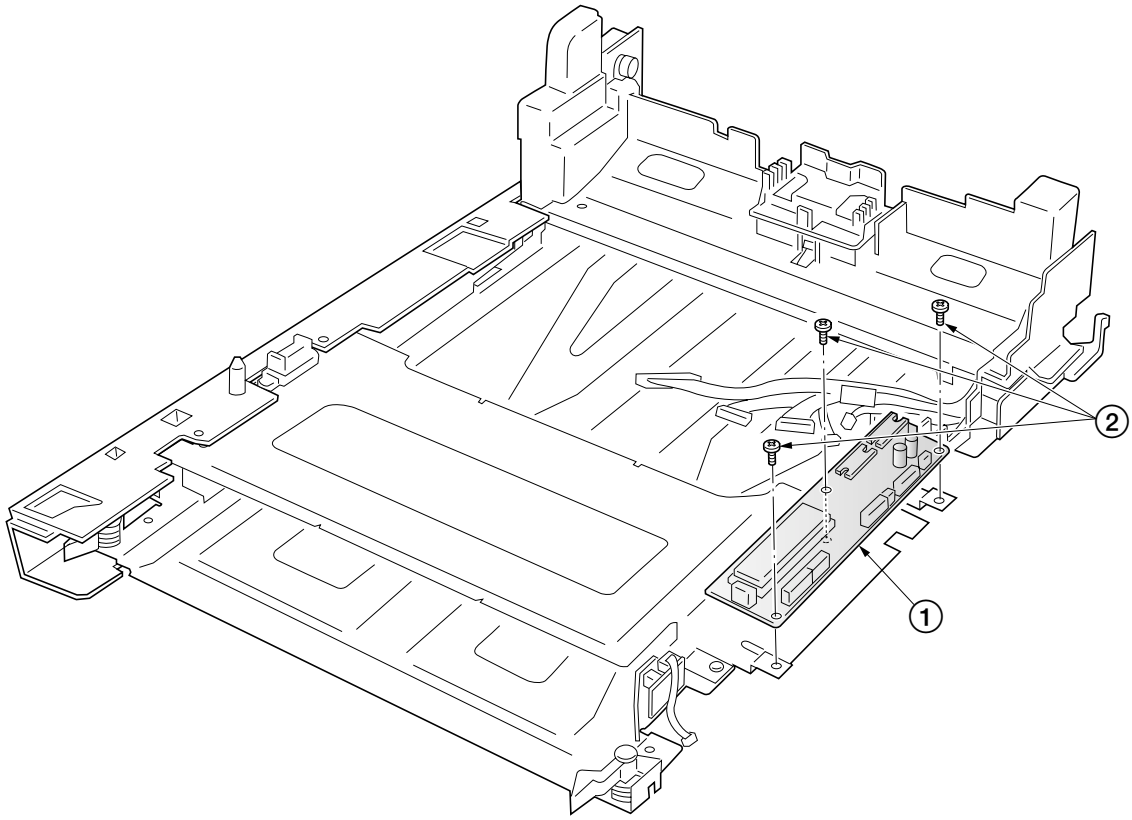


Figure 5-2-3 Removing the duplexer board

Chapter 6 Troubleshooting

Chapter 6 Contents

6-1 Troubleshooting

6-1-1 General error handling

(1) Maintenance messages

Message	Corrective action
`Duplexer rear cover open`	Open the rear cover of duplexer, then close tightly.
`Missing duplex drawer`	The duplex drawer is either not installed or incorrectly inserted. Insert the duplex drawer securely.

6-1-2 Diagnostic (Service error messages)

The printer does not operate when a message is displayed. The message is categorized as follows:

(1) C1 —Duplexer communication error

Meaning	Suggested causes	Corrective action
Communication error between duplexer and printer's engine board.	• Defective duplexer board.	Replace duplexer board . See page 5-6.
	• Improper installation between duplexer and printer.	Follow installation instruction carefully again.
	• Improper connector insertion.	Remedy.
	• Defective gate array U204 on the printer's engine board (KP-864).	Refer to printer's *Service Manual*.
	• Blown-out fuse (F202) on the printer's engine board.	
	• Defective harness between duplexer interface connector and printer's engine board.	Replace harness.

(2) C2 —Side registration error

Meaning	Suggested causes	Corrective action
Side registration home position error of duplexer.	• Defective duplexer board.	Replace duplexer board . See page 5-6.
	• Improper installation between duplexer and printer.	Follow installation instruction carefully again.
	• Improper connector insertion.	Remedy.
	• Defective gate array U204 on the printer's engine board (KP-864).	Refer to printer's *Service Manual*.
	• Defective harness between duplexer interface connector and printer's engine board.	Replace harness.

6-1-3 Circuit board terminal voltages

(1) Duplexer board

Connector	Pin#	Signal	I/O	Voltage	Function
(CN1)	1	VPS	I	5 V/0 V DC	Vertical pass sensor, On/Off
	2	GND	–	–	Signal ground
	3	5 V	O	5 V DC	Power supply
	4	5 V	O	5 V DC	Power supply
(CN2)	1	BRSOL	O	0 V/24 V DC	Branch solenoid, On/Off
	2	24 V	O	24 V DC	Power supply
(CN3)	1	RCISW	I	0 V/24 V DC	Rear cover interlock switch, On/Off
	2	24 V	O	24 V DC	Power supply
(CN4)	1	SBS	I	5 V/0 V DC	Switchback sensor, On/Off
	2	GND	–	–	Signal ground
	3	5 V	O	5 V DC	Power supply
	4	5 V	O	5 V DC	Power supply
	5	DDS	I	5 V/0 V DC	Drawer detection sensor, On/Off
	6	GND	–	–	Signal ground
	7	5 V	O	5 V DC	Power supply
	8	5 V	O	5 V DC	Power supply
(CN5)	1	DRS	I	5 V/0 V DC	Duplex refeed sensor, On/Off
	2	GND	–	–	Signal ground
	3	5 V	O	5 V DC	Power supply
	4	5 V	O	5 V DC	Power supply
	5	5 V	O	5 V DC	Power supply
	6	GND	–	–	Signal ground
	7	SRS	I	5 V/0 V DC	Side registration sensor, On/Off
(CN6)	1	OPRDY	O	0 V/5 V DC	Duplexer, Ready/Not ready
	2	OPSDI	O	5 V/0 V DC	Serial communication data signal with printer
	3	OPSDO	I	5 V/0 V DC	Serial communication data signal with printer
	4	OPSCLK	I	5 V/0 V DC (Pulse)	Serical communication clock signal
	5	OPSEL0	I	0 V/5 V DC	Duplexer identifying signal 0
	6	OPSEL1	I	0 V/5 V DC	Duplexer identifying signal 1
	7	OPSEL2	I	0 V/5 V DC	Duplexer identifying signal 2
	8	GND	–	–	Power ground

Connector	Pin#	Signal	I/O	Voltage	Function
(CN7)	1	SBM_A	O	0 V/24 V DC (Pulse)	Switchback motor coil energization pulse (_A)
	2	SBM A	O	0 V/24 V DC (Pulse)	Switchback motor coil energization pulse (A)
	3	SBM_B	O	0 V/24 V DC (Pulse)	Switchback motor coil energization pulse (_B)
	4	SBM B	O	0 V/24 V DC (Pulse)	Switchback motor coil energization pulse (B)
	5	PRM A	O	0 V/24 V DC (Pulse)	Paper refeed motor coil energization pulse (A)
	6	PRM_A	O	0 V/24 V DC (Pulse)	Paper refeed motor coil energization pulse (_A)
	7	PRM B	O	0 V/24 V DC (Pulse)	Paper refeed motor coil energization pulse (B)
	8	PRM_B	O	0 V/24 V DC (Pulse)	Paper refeed motor coil energization pulse (_B)
(CN8)	1	24 V	I	24 V DC	Power supply from printer
	2	5 V	I	5 V DC	Power supply from printer
	3	GND	–	–	Signal/Power ground
(CN9)	1	24 V	O	24 V DC	Power supply
	2	CFM	O	0 V/24 V DC	Cooling fan motor, On/Off

6-1-4 Correcting a paper jam

If a paper jam occurs in the duplexer, remove the jammed paper as described below. After you have removed the jammed paper, open and close the printer's top cover to clear the error message from the message display.

(1) Jam in the rear cover

1. Open the rear cover ① of the duplexer and remove the jammed paper.

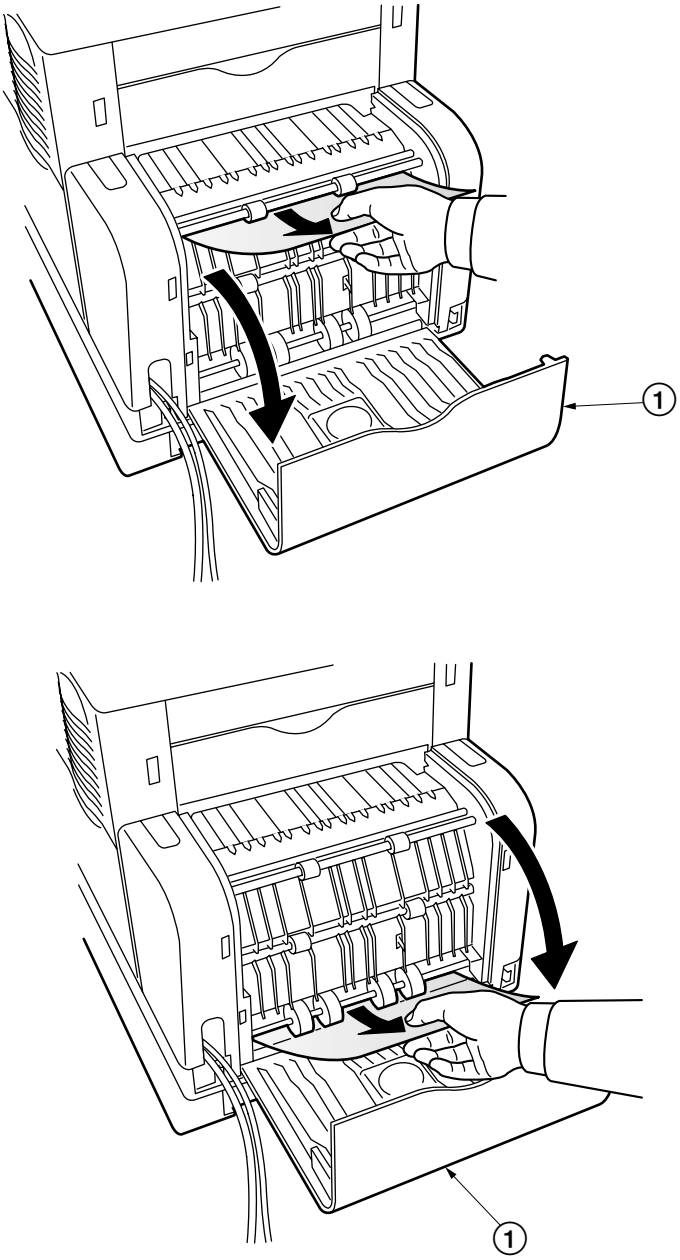


Figure 6-1-4 Jam in the rear cover

(2) Jam in the duplex drawer

1. Pull out the duplex drawer ②. Remove the jammed paper.

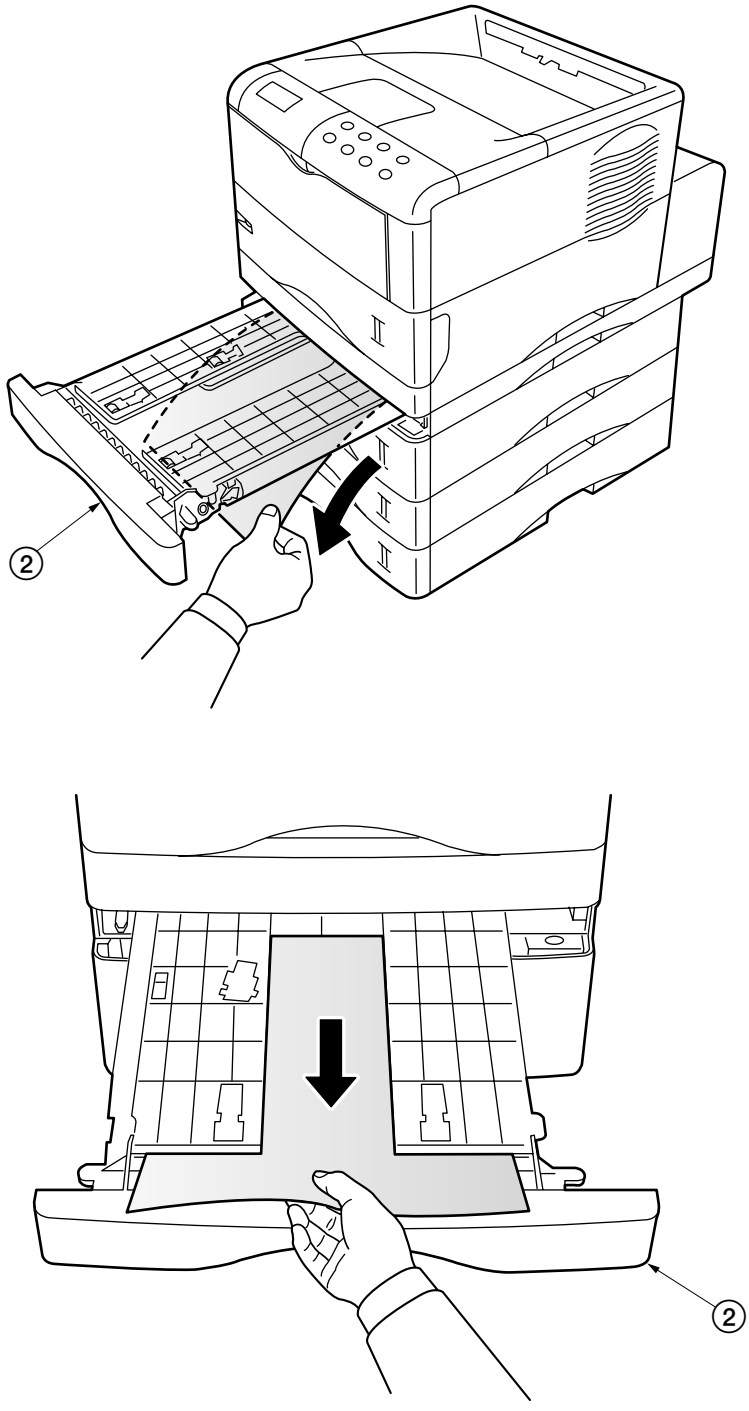
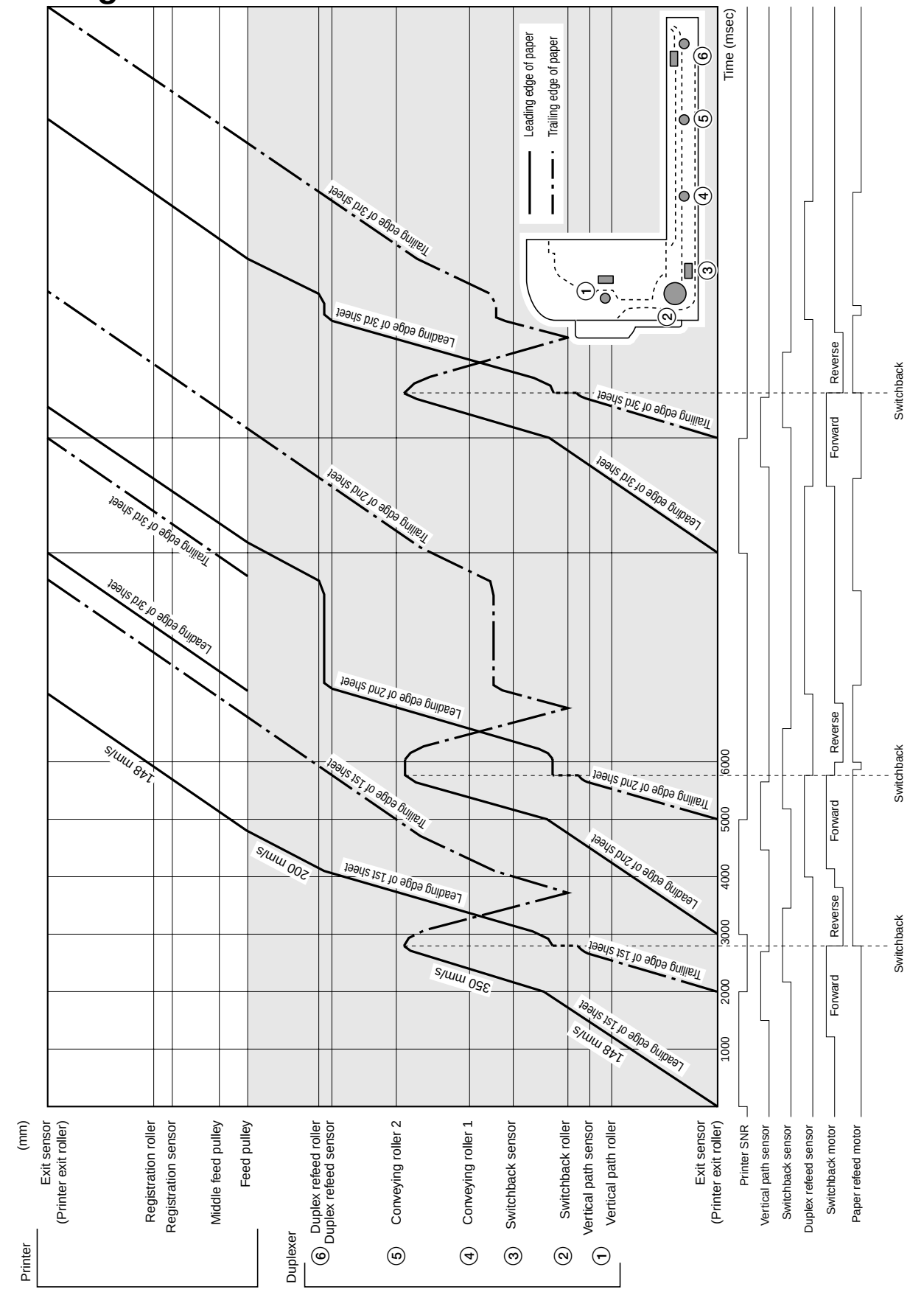


Figure 6-1-4 Jam in the duplex drawer

Appendix A Diagrams

Appendix A Contents

Timing chart



Wiring diagram