DUPLEXING UNIT
DU-82

SERVICE MANUAL

REVISION 0

Canon

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PREFACE

This Service Manual contains basic information required for after-sales service of the Duplexing unit DU-82. This information is vital to the service technician in maintaining the high print quality and performance of the duplexing unit.

This manual consists of the following chapters:

Chapter 1: Product information
Features, specifications, parts of the duplexing unit, and installation

Chapter 2: Operation and Timing
A description of the operating principles and timing sequences of the electrical and mechanical systems.

Chapter 3: The Mechanical System
Explanation of mechanical operation, disassembly, reassembly, and adjustment procedures

Chapter 4: Troubleshooting
Maintenance and servicing, measurement and adjustments, troubleshooting procedures, and location of electrical components

Appendix: General timing chart, general circuit diagram, and list of signals.

Information in this manual is subject to change as the product is improved or redesigned.
All relevant information in such cases will be supplied in Service Information Bulletins.
A thorough understanding of this unit, based on information in this Manual and Service Information Bulletins is required for maintaining its performance and for locating and repairing malfunctions.

DTP system

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CHAPTER 1

PRODUCT INFORMATION

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I. FEATURES

1. Optional built-in type duplexing unit

The duplexing unit is compact in size and can be installed inside the printer.

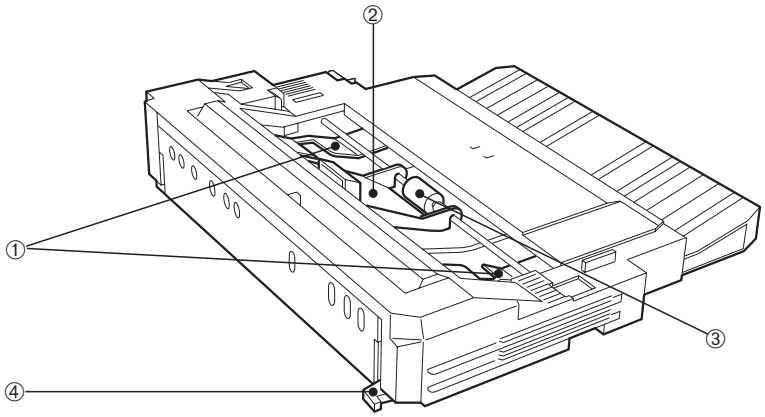
II. SPECIFICATIONS

1.	Print paper	A3, A4, B4, A5, B5, Ledger, Legal, Letter and Executive size plain paper (64g/m² - 105g/m² recommended paper)
2.	Power supply	DC24V (supplied from printer)
3.	Dimensions	379 (W) × 423 (D) × 82 (H) mm
4.	Weight	About 3.5kg

Specifications are subject to change with product modification.

III. PARTS OF THE DUPLEXING UNIT

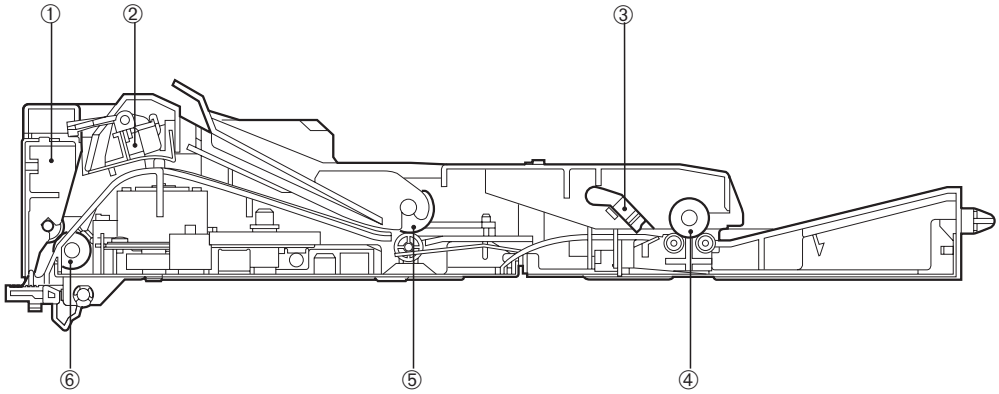
A. External Views



1: Side registration guide
2: Pick-up guide plate
3: Duplex feed roller 1
4: Duplexing unit removal lever

Figure 1-3-1

B. Cross Sectional Views



1: Reversing roller pressure release plate
2: Reversing sensor
3: Duplex pick-up sensor lever
4: Duplex feed roller 2
5: Duplex feed roller 1
6: Reversing roller

Figure 1-3-2

IV. INSTALLATION

Condensation will form on metal surfaces when brought into a warm room from the cold. Condensation in the duplexing unit can cause various troubles, such as paper feeding failure. Therefore, when moving the duplexing unit to a warm environment, leave it packed in its box for at least an hour to acclimatize to room temperature.

1) Open the duplexing unit packaging.
2) Take off the plastic bag and peel the tape off.
3) Remove the packing materials from the duplexing unit.
4) Open the delivery cover on the printer.
5) Holding the duplexing unit in both hands, install it into the printer.

CHAPTER 2

OPERATION AND TIMING

1. This chapter describes the duplexing unit functions, the relationships between mechanisms and circuits, and the timing of operations. Mechanical linkages are indicated by black and white lines (▬▬▬), the flow of control signals by solid arrows (⟶), and the flow of groups of signals by outline arrows (⟹).
2. An active-high signal is indicated by "H" or by a signal name without a slash in front of it, such as "PSNS." An active-low signal is indicated by "L" or by a signal name with a slash in front of, such as "/SCNON."

   A signal that is "H" or has a name without a slash is active at the supply voltage level (indicating that the signal is being output), and inactive at ground level (indicating that the signal is not being output).

   A signal that is "L" or has a slash in front of its name is active at ground level, and inactive at the supply voltage level.

   There is a microcomputer in this printer. But as the internal operation of the microcomputer cannot be checked, an explanation of the operation of the microcomputer has been left out.

   As it is assumed that no repair will be made to customer circuit boards, the explanation of board circuits is limited to an outline using block diagrams. So there are two types of circuit explanations; (1) everything from the sensor to the input sections of the major circuit boards, (2) everything from the output sections of the major circuit boards to the loads. These are explained with block diagrams according to the function.

I. BASIC OPERATION 2-1

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I. BASIC OPERATION

A. Outline of the Electrical System

The duplexing unit inverts the print paper and feeds it to the printer.

The duplexing unit is controlled with various commands sent from the DC controller PCB in the printer.

The duplexing driver PCB controls the sequence of duplexing unit operations. The duplexing driver PCB has a four-bit microcomputer (CPU, IC2002) which controls the sequence of duplexing unit operations and serially communicates with the DC controller PCB in the printer.

The CPU drives motors, solenoids, and a clutch according to the duplex unit specification command and the duplex pick-up command sent from the DC controller PCB.

The printer provides +24 VDC to the duplexing unit. The duplexing driver PCB generates +5 V for ICs and sensors from +24 V.

The flow of signals between the duplexing unit and printer is shown below.

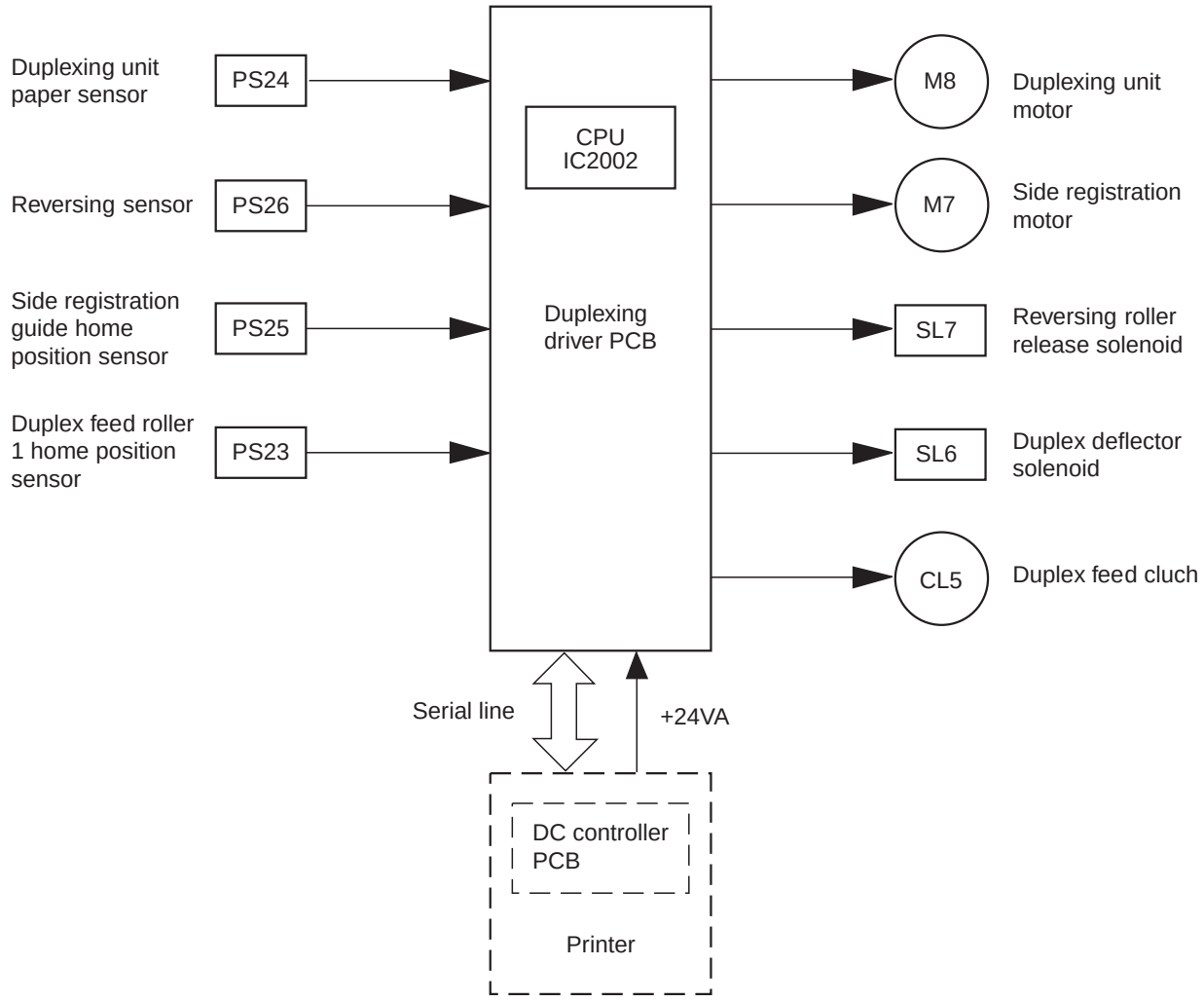


Figure 2-1-1

B. Duplexing Driver Input Signals

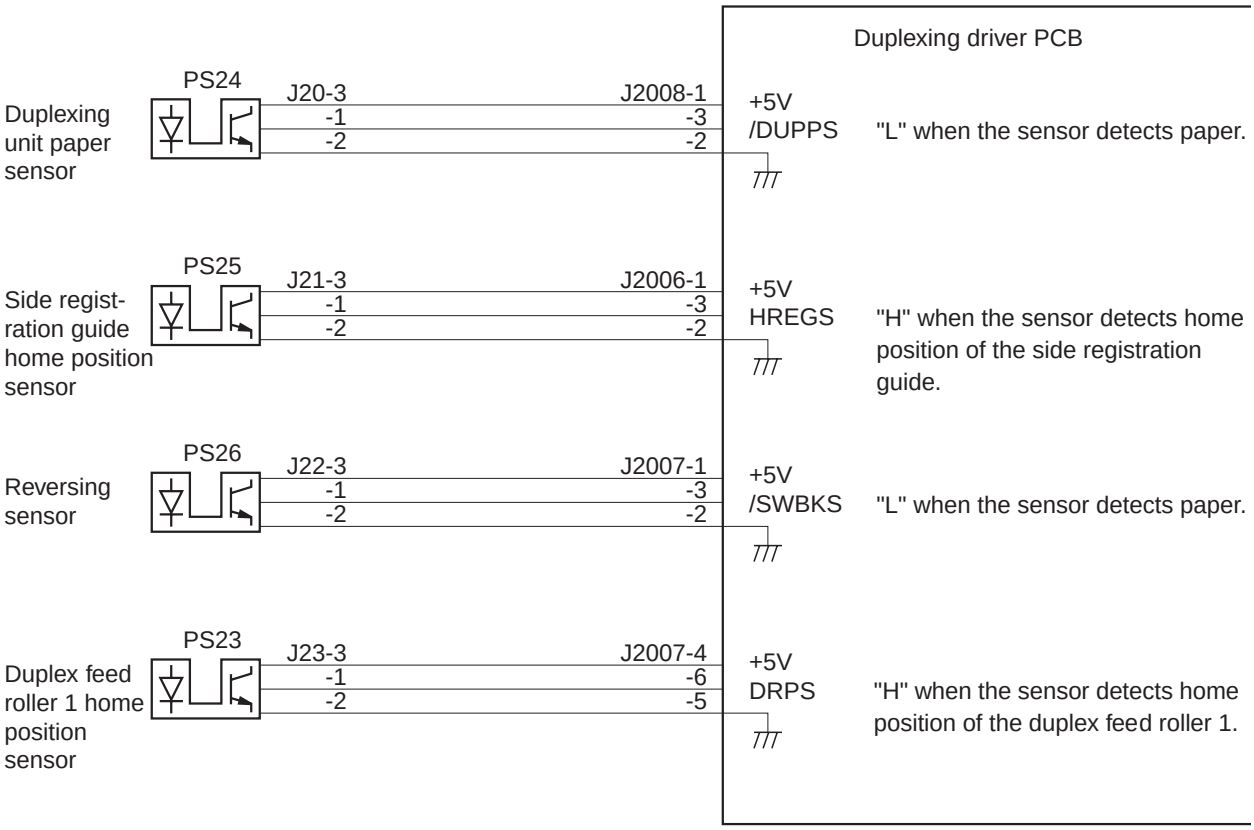


Figure 2-1-2

C. Duplexing Driver Output Signals

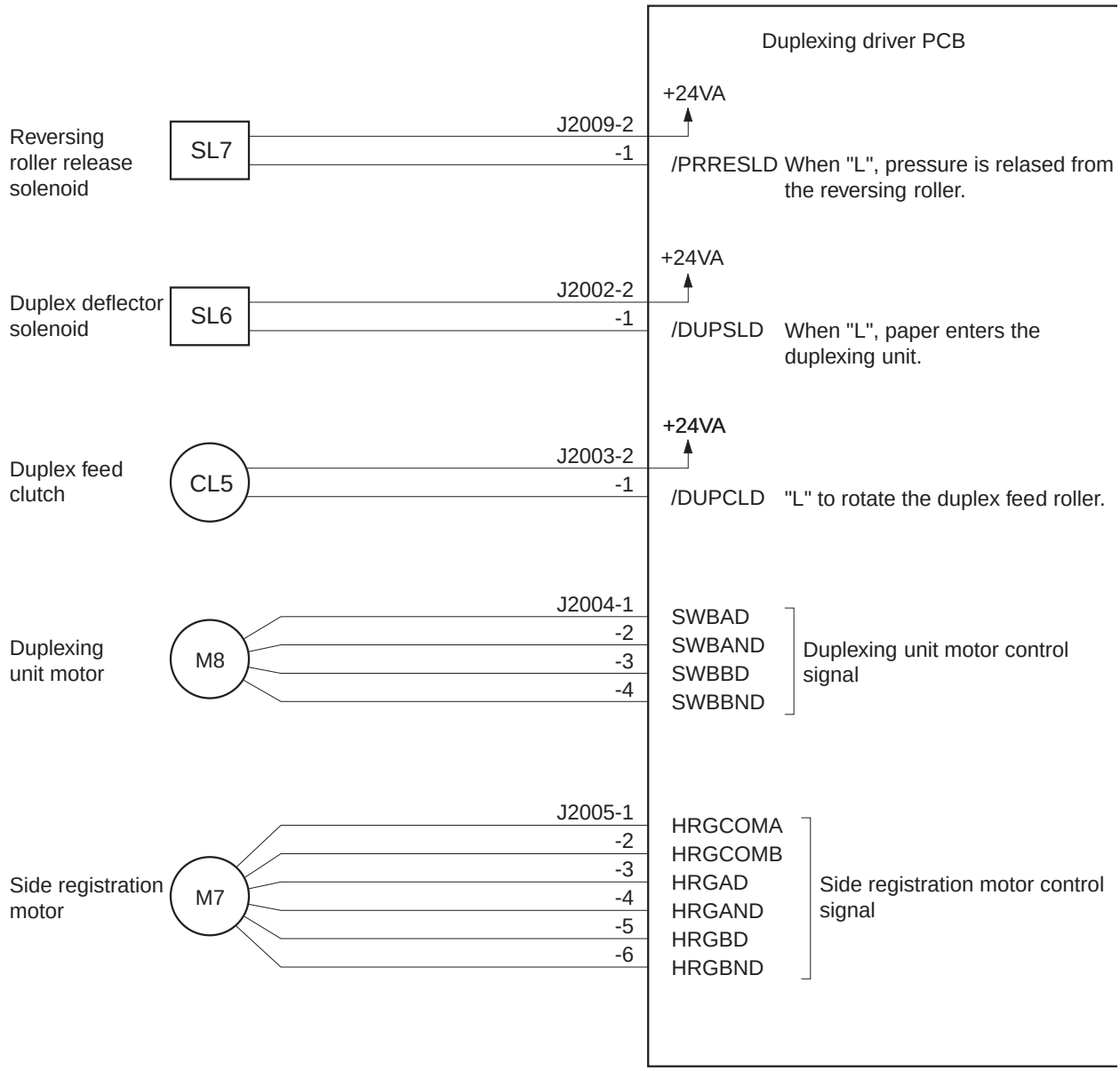


Figure 2-1-3

II. PAPER PICK-UP/FEED SYSTEM

A. Operation

1. Outline

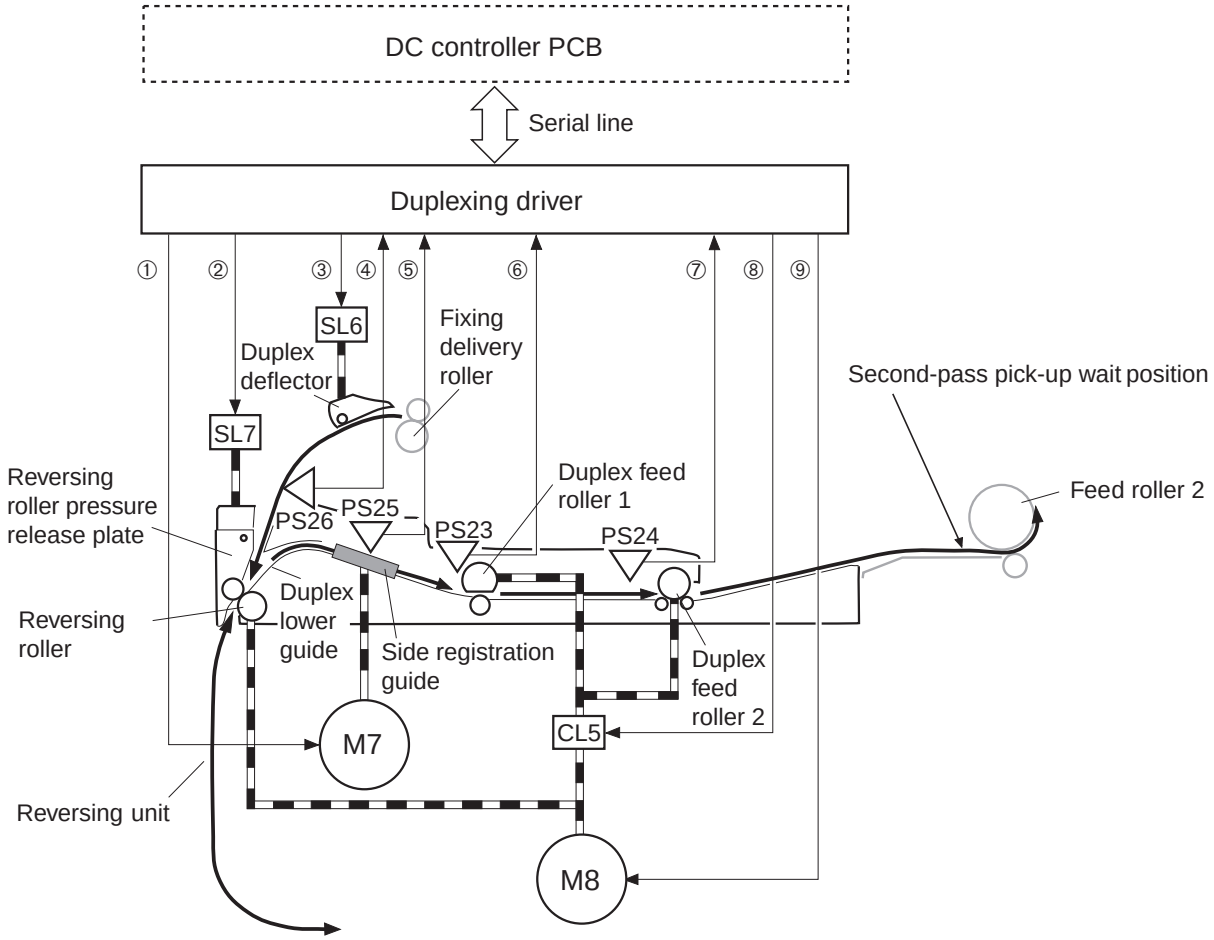
The print paper is guided to the reversing unit in the printer through the duplexing unit with the duplex deflector.

The paper fed to the reversing unit is transported to the duplexing unit by changing the feeding direction with the reversing roller. The side registration of the paper is adjusted by the side registration guide in the duplexing unit (see page 2-8). The paper is then transported to the printer with the duplex feed roller.

The reversing roller is rotated by the duplexing unit motor (M8). Duplex feed rollers 1 and 2 are turned by the duplexing unit motor (M8) through the duplex feed clutch.

The duplexing unit motor (M8) is a stepping motor that is run clockwise, counterclockwise, at normal or high speed by the microcomputer (CPU) on the duplex driver PCB.

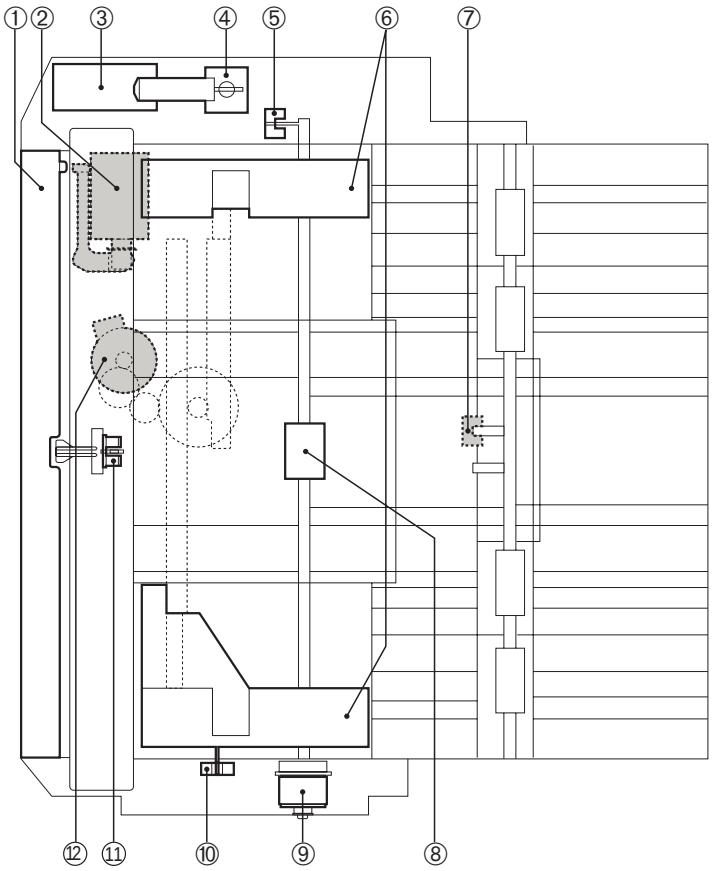
The side registration guide is driven by the side registration motor (M7) according to the print paper size.



① : SIDE REGISTRATION MOTOR DRIVE signal
② : REVERSING ROLLER RELEASE SOLENOID DRIVE signal (/PRRESLD)
③ : DUPLEX DEFLECTOR SOLENOID DRIVE signal (/DUPSLD)
④ : REVERSING PAPER DETECTION signal (/SWBKS)
⑤ : SIDE REGISTRATION GUIDE HOME POSITION DETECTION signal (HREGS)
⑥ : DUPLEX FEED ROLLER 1 HOME POSITION DETECTION signal (DRPS)
⑦ : DUPLEXING UNIT PAPER DETECTION signal (/DUPPS)
⑧ : DUPLEX FEED CLUTCH DRIVE signal (/DUPCLD)
⑨ : DUPLEXING UNIT MOTOR DRIVE signal

M7: Side registration motor
M8: Duplexing unit motor
SL6: Duplex deflector solenoid
SL7: Reversing roller release solenoid
CL5: Duplex feed clutch
PS23: Duplex feed roller 1 home position sensor
PS24: Duplexing unit paper sensor
PS25: Side registration guide home position sensor
PS26: Reversing sensor

Figure 2-2-1



1: Reversing roller pressure release plate
2: Reversing roller release solenoid
3: Duplexing unit motor
4: Duplex deflector solenoid
5: Duplex feed roller 1 home position sensor
6: Side registration guide
7: Duplexing unit paper sensor
8: Duplex feed roller 1
9: Duplex feed clutch
10: Side registration guide home position sensor
11: Reversing sensor
12: Side registration motor

Figure 2-2-2

2. Reversing Operation

When the duplexing driver receives a duplex unit specification command from the printer, it turns the duplex deflector solenoid (SL6) ON. This drives the printer duplex deflector to feed the print paper to the duplexing unit.

When the leading edge of the paper is detected by the reversing sensor (PS26), the duplexing driver turns the reversing motor (M8) counterclockwise (CCW) (Note) to feed the paper to the printer reversing unit. When the trailing edge of the paper is detected by the PS26, the duplexing driver turns the M8 clockwise (CW) after the prescribed period of time to change the feeding direction of the paper. The paper is fed along the lower duplex guide and goes to the feed roller in the duplexing unit.

Note: If the paper size is A4 or Letter, the duplexing driver increases the speed of paper feed to the reversing unit by increasing the speed of M8 in a prescribed period of time after it starts running M8. As a result, the distance between the papers is shortened.

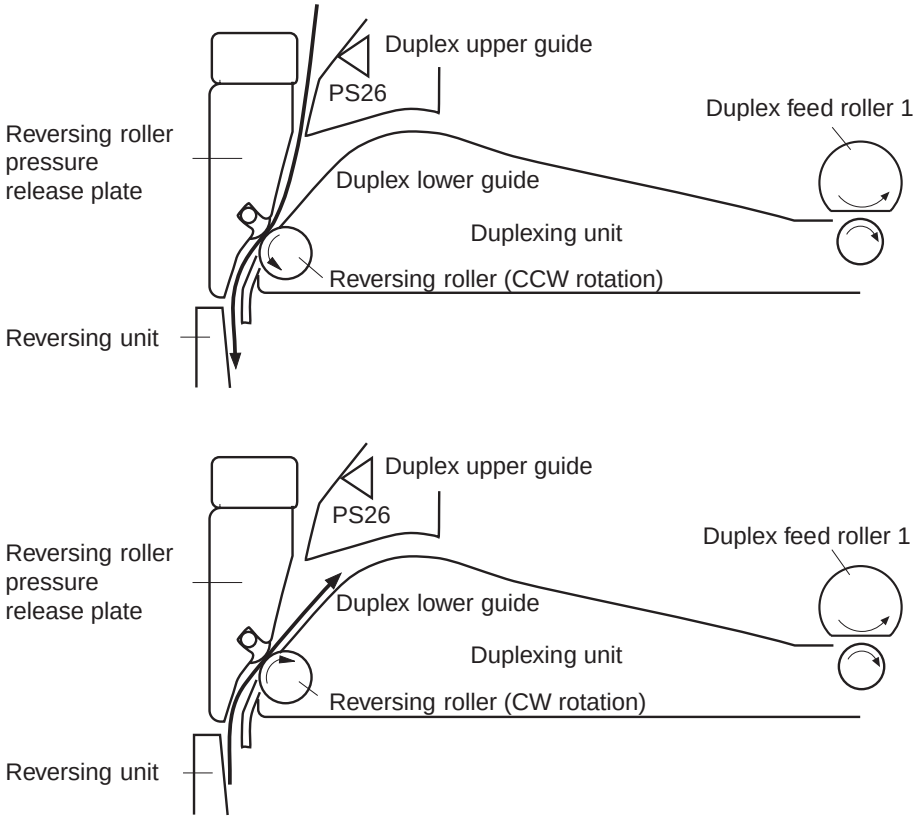


Figure 2-2-3

3. Side Registration Adjustment

This printer adjusts the side registration so that the center of the second page in the horizontal direction matches the center of the printable area on the drum during duplex printing. This adjustment is done by pushing the side registration guide to both sides of the print paper.
The side registration guide home position sensor (PS25) detects whether the side registration guide is at its home position.

When the power turns ON, the duplexing driver drives the side registration motor(M7) to return the side registration guide to its home position. If the side registration guide is already at its home position, it is moved from the home position, then returned to it.

When the reversing roller rotates clockwise(CW) and the print paper is fed to the duplexing unit, the duplexing driver checks the home position of the duplex feed roller 1. If the duplex feed roller 1 is not at its home position, the duplexing driver turns ON the duplex feed clutch (CL5) and rotates the duplex feed roller 1. When the home position of duplex feed roller 1 is detected, the duplexing driver turns OFF CL5 and stops duplex feed roller 1. Then, the duplexing driver turns ON CL5 in a specified period of time after the reversing roller begins rotating CW, and the duplex feed roller 1 rotates. When the home position of the duplex feed roller 1 is detected, the duplexing driver turns OFF CL5 and stops the duplex feed roller 1. The print paper stops without touching the duplex feed roller 1. When the print paper size is not A4(landscape), Letter(landscape), or A5, the duplexing driver turns ON the reversing roller release solenoid (SL7), releases the reversing roller pressure, sets the print paper completely free, and completes preparation for side registration adjustment.

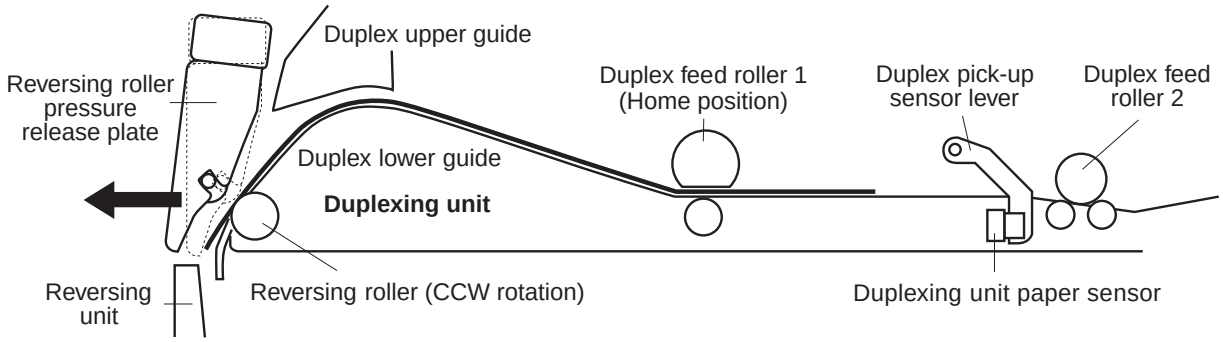


Figure 2-2-4

When the preparation ends, the duplexing driver runs the side registration motor (M7) for the prescribed number of pulses according to the paper size data from the DC controller and moves the side registration guide according to the paper size. Thus, the side registration of the paper is adjusted (Note).

When the paper is fed and its leading edge is detected by the duplex unit paper sensor (PS24), the side registration guide returns to its home position after the prescribed time. M7 is a stepping motor that can control the moving distance accurately.

If the distance the side registration guide makes after the start of its home position detection exceeds the maximum distance value stored in the duplexing driver, the side registration guide failure is assessed and reported to the video controller via the DC controller.

The duplexing driver assesses a duplex feed unit failure and reports it to the video controller via the DC controller, if the duplexing unit paper sensor cannot detect paper when the duplex feed roller 1 makes 2 rotations after the side registration.

Note: If the print paper size is not A3, Ledger, A4 (landscape), Letter (landscape), or B4, the moving distance of the side registration guide increases. The duplexing driver runs M7 while the reversing roller is turning counterclockwise (CCW), and moves the side registration guide to the appropriate position for the paper size.

---

4. Duplex Pick-UP Operation

The duplexing driver turns ON the duplex feed clutch (CL5) after it completes the side registration adjustment. When the paper size is not A4 (landscape), Letter (landscape) or A5, the duplexing driver turns OFF the reversing roller release solenoid (SL7) in a specified period of time after the duplexing unit paper sensor (PS24) detects the leading edge of the paper. It also turns OFF CL5 in a specified period of time after PS24 detects the leading edge of the paper. The duplexing driver stops the paper at the duplex pick-up standby position in the printer and waits for a duplex pick-up command input from the printer.

When the duplexing driver receives a duplex pick-up command from the printer, it controls the speed of the duplexing unit motor (M8) so that the speed equals the printer's paper feeding speed. The duplexing driver then turns ON CL5 to feed the paper into the printer.

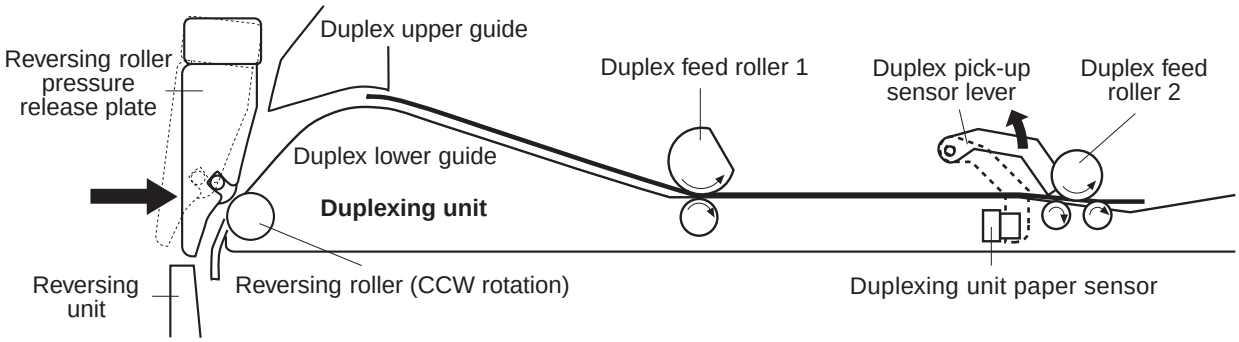


Figure 2-2-5

B. Paper Jam Detection

To detect presence of the paper and whether the paper has been correctly fed, the following paper sensors are provided:

- Duplexing unit paper sensor (PS24)
- Reversing sensor (PS26)

The microcomputer (CPU) on the duplexing driver PCB determines whether or not a paper jam has occurred by monitoring the paper at each of the sensors according to the pre-set 'check timing' in the memory.

When the CPU assesses that a jam has occurred, the duplex feed operation is stopped, and notification of the jam is sent to the DC controller.

1. Reversing unit delay jam

The duplexing driver detects a reversing unit delay jam if the print paper does not reach the reversing sensor (PS26) within about 1.5 seconds after the duplex deflector solenoid turns ON.

2. Reversing unit stationary jam

The duplexing driver detects a reversing unit stationary jam if the trailing edge of the paper does not pass through the reversing sensor (PS26) within the prescribed period of time (T1) after the duplex deflector solenoid turns ON.

T1=about 2.8 seconds (A4), about 5.1 seconds (Ladger)

3. Duplex feeding unit delay jam

The duplexing driver detects a duplex feeding unit delay jam if the leading edge of the paper does not reach the duplexing unit paper sensor (PS24) within the prescribed period of time (T2) after the leading edge of the paper is detected by the reversing sensor (PS26).

T2=about 1.5 seconds (A4), about 2.2 seconds (Ladger)

CHAPTER 3

THE MECHANICAL SYSTEM

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II. EXTERNALS 3-2
III. SENSORS 3-5
IV. CLUTCH/SOLENOIDS 3-8
V. MOTORS 3-12
VI. ELECTRICAL PARTS 3-14

I. PREFACE

This chapter describes the disassembly and reassembly procedures of the duplexing unit.

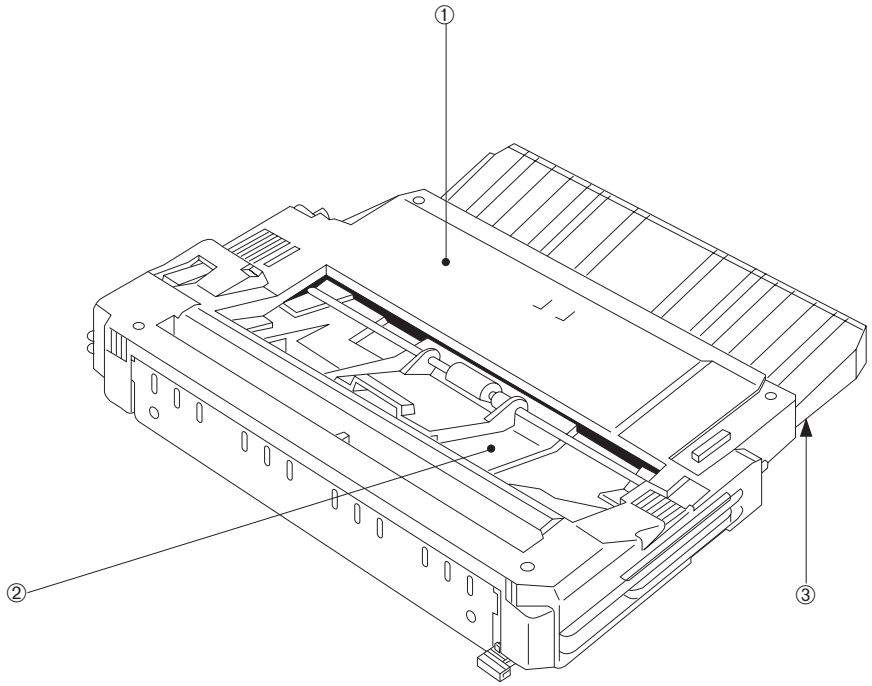
The service technician is to identify the cause of malfunction according to "Chapter 4 Troubleshooting" and to replace the defective part(s) following the disassembly procedure of each part.

Note the following precautions when working on the duplexing unit.

1. **⚠CAUTION: Before servicing the duplexing unit, disconnect its power cord from the electrical outlet.**
2. Assembly is the reverse of disassembly unless otherwise specified.
3. Note the lengths, diameters, and locations of screws as you remove them. When reassembling the duplexing unit, be sure to use them in their original locations.
4. Do not operate the duplexing unit with any parts removed.
5. Discharge electrical static from your body by touching the metal frame of the duplexing unit prior to handling the PCB in order to avoid causing damage by the difference in static charge at that time.

II. EXTERNALS

A. Locations



① Upper guide
② Lower guide
③ PCB cover

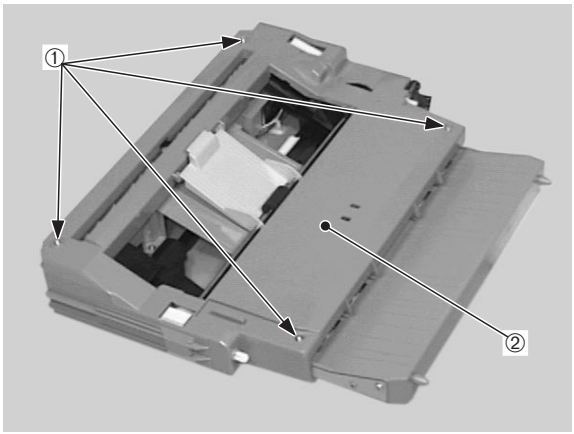
Figure 3-2-1

Following the procedures described in this section, remove the covers when cleaning or checking inside the duplexing unit.

B. External Covers

1. Upper guide

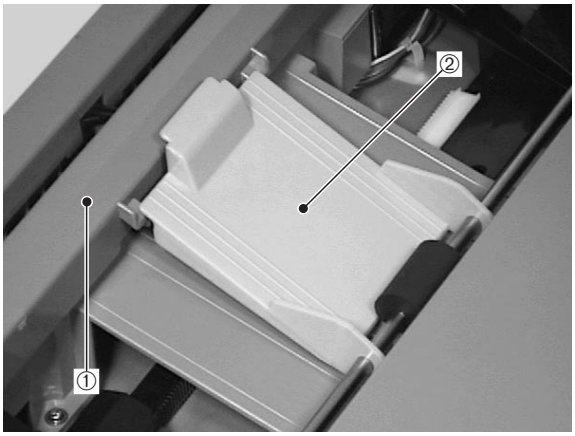
1) Remove the 4 screws, then the upper guide.



① Screws ② Upper guide

Figure 3-2-2

Note: When installing the upper guide, ensure that the pick-up guide plate is on the outside.

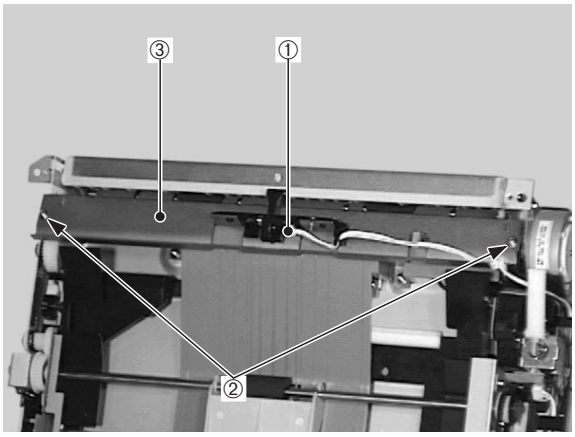


① Upper guide ② Pick-up guide plate

Figure 3-2-3

2. Lower guide

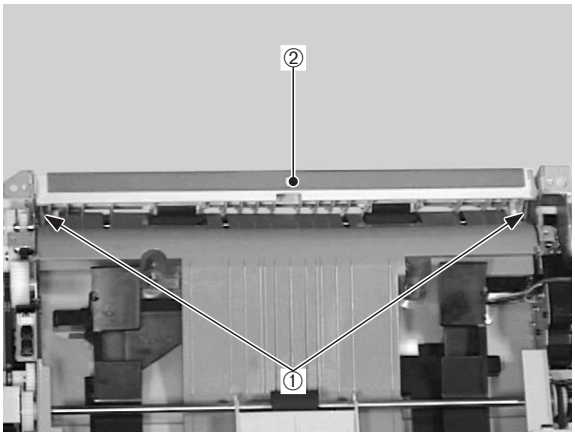
1) Remove the upper guide.
2) Remove the connector, and take out the 2 screws, then the guide.



① Connector ② Screws
③ Guide

Figure 3-2-4

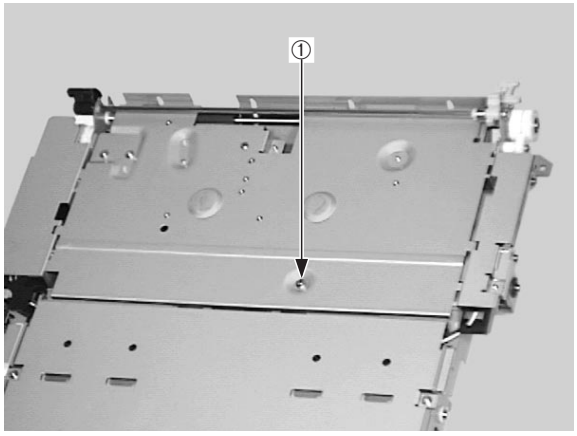
3) Remove the 2 springs **(Note)**, then the reversing roller pressure release plate.



① Springs
② Reversing roller pressure release plate

Figure 3-2-5

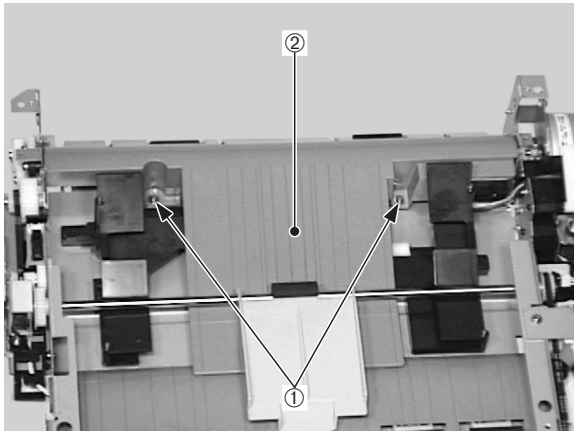
4) Remove the screw.



① Screw

Figure 3-2-6

5) Remove the 2 screws, then the lower guide.



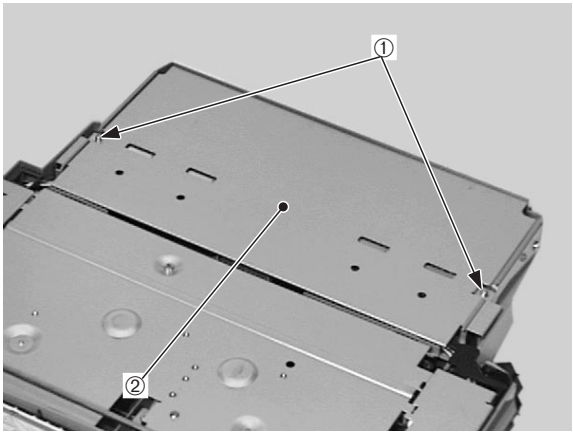
① Screws ② Lower guide

Figure 3-2-7

Note: The 2 springs differ from each other in terms of tension and color. When attaching the springs, be sure to attach them in their correct positions.
In the picture, the spring on the left is gold and the one on the right is silver.

3. PCB cover

1) Remove the 2 screws and then the PCB cover.

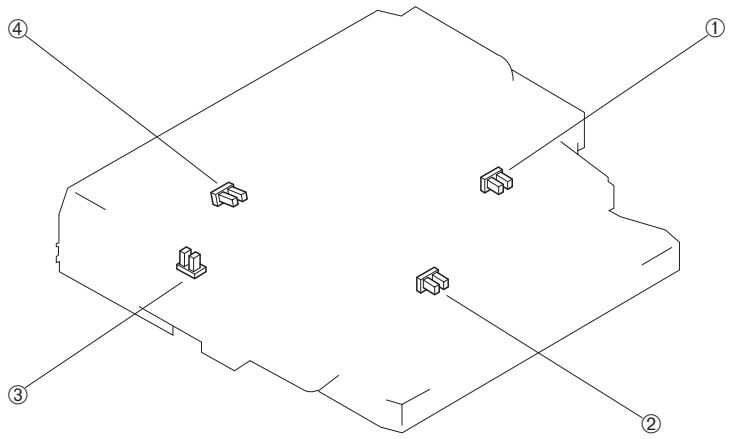


① Screws ② PCB cover

Figure 3-2-8

III. SENSORS

A. Locations

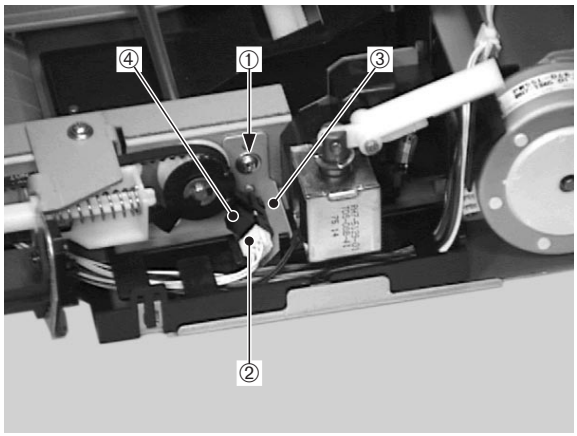


① Duplex feed roller 1 home position sensor
② Duplexing unit paper sensor
③ Side registration guide home position sensor
④ Reversing sensor

Figure 3-3-1

B. Duplex Feed Roller 1 Home Position Sensor

1) Performing Step 1) on Page 3-3, remove the upper guide.
2) Remove the sensor mounting plate after taking out the screw and disconnecting the connector, and then remove the duplex feed roller 1 home position sensor.

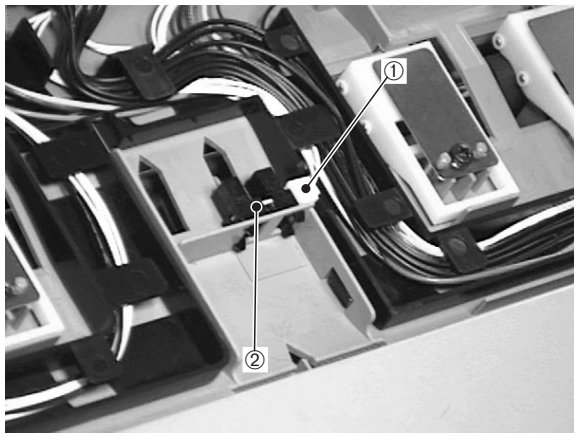


① Screw
② Connector
③ Sensor mounting plate
④ Duplex feed roller 1 home position sensor

Figure 3-3-2

C. Duplexing Unit Paper Sensor

1) Performing Step 1) on Page 3-4, remove the PCB cover.
2) Disconnect the connector, and then remove the duplexing unit paper sensor.

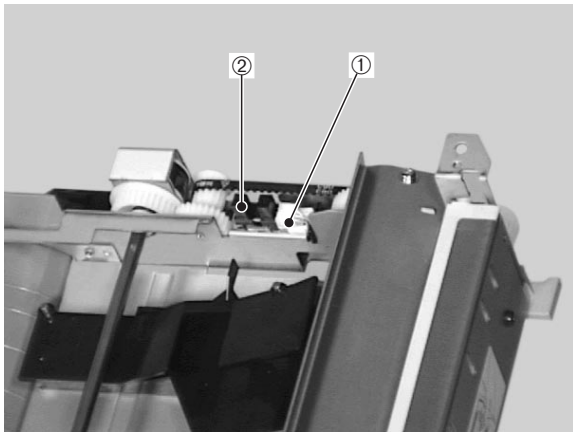


① Connector
② Duplexing unit paper sensor

Figure 3-3-3

D. Side Registration Guide Home Position Sensor

1) Performing Step 1) on Page 3-3, remove the upper guide.
2) Disconnect the connector, and then remove the side registration guide home position sensor.

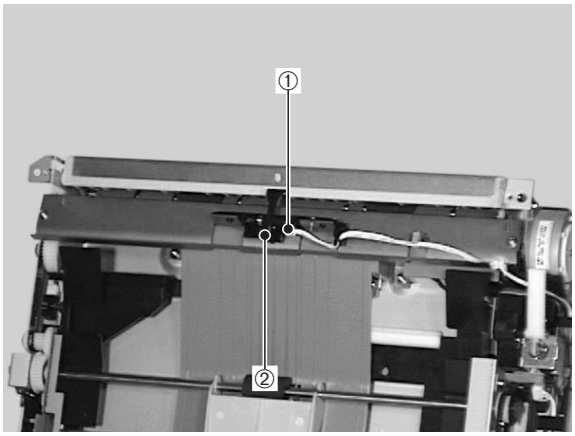


① Connector
② Side registration guide home position sensor

Figure 3-3-4

E. Reversing Sensor

1) Performing Step 1) on Page 3-3, remove the upper guide.
2) Disconnect the connector, and then remove the reversing sensor.

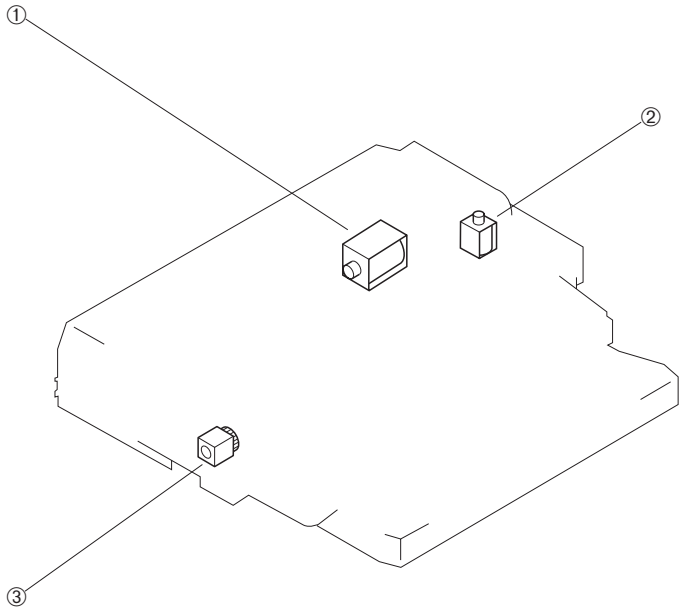


① Connector ② Reversing sensor

Figure 3-3-5

IV. CLUTCH/SOLENOIDS

A. Locations

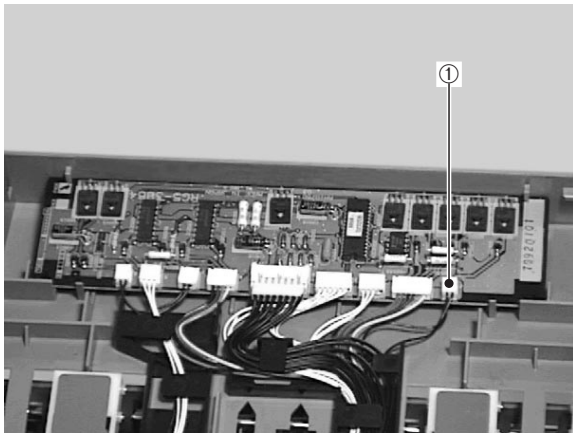


① Reversing roller release solenoid
② Duplex deflector solenoid
③ Duplex feed clutch

Figure 3-4-1

B. Reversing Roller Release Solenoid

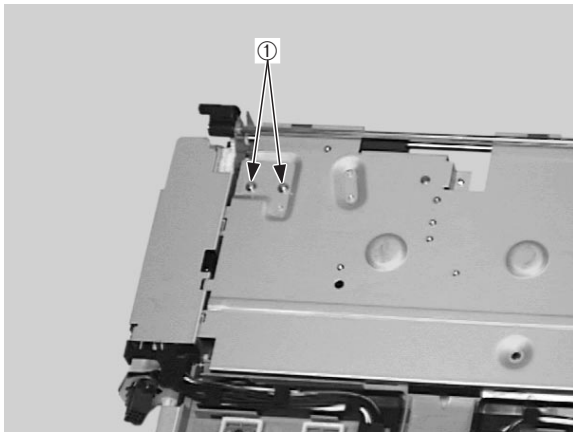
1) Performing Step 1) to 5) on Page 3-3, remove the lower guide.
2) Take out the PCB cover.
3) Remove the connector.



① Connector

Figure 3-4-2

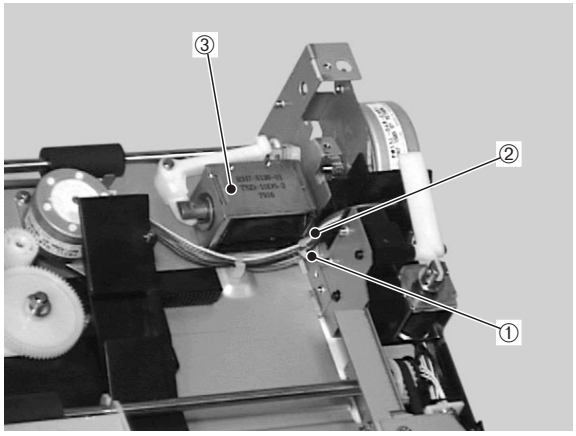
4) Remove the 2 screws.



① Screws

Figure 3-4-3

5) Remove the cable from the cable guide, and then take out the reversing roller release solenoid.

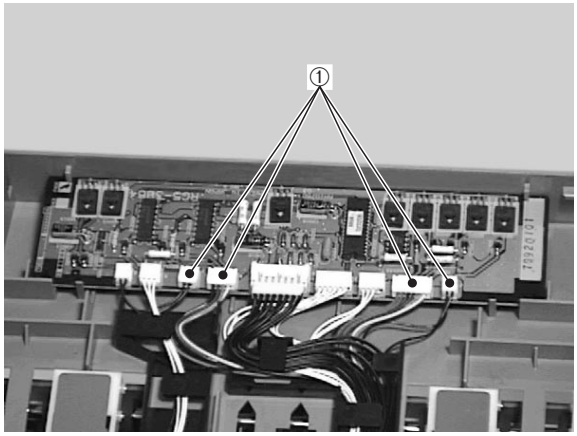


① Cable guide
② Cable
③ Reversing roller release solenoid

Figure 3-4-4

C. Duplex Deflector Solenoid

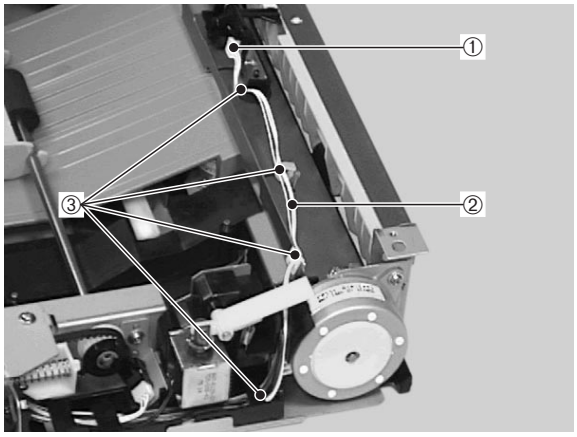
1) Performing Step 1) on Page 3-3, remove the upper guide.
2) Remove the PCB cover, and the 4 connectors.



① Connectors

Figure 3-4-5

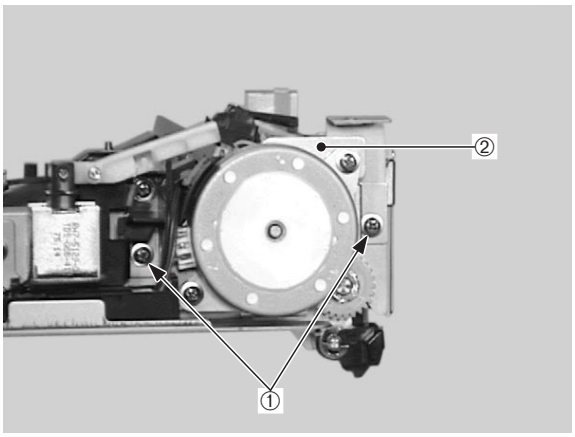
3) Remove the connector.
4) Remove the cable from the guide.



① Connector ② Cable
③ Cable guide

Figure 3-4-6

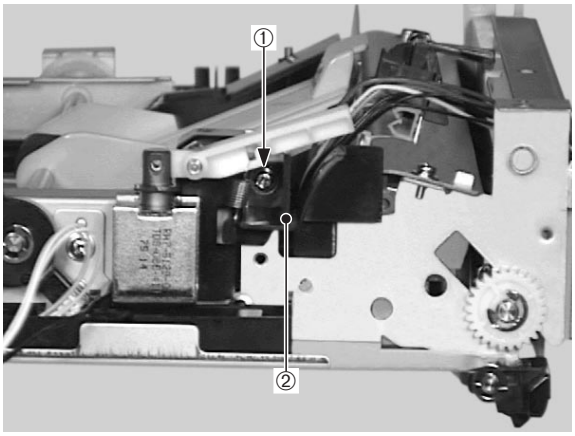
5) Remove the 2 screws, and take off the motor fixing plate.



① Screws ② Motor fixing plate

Figure 3-4-7

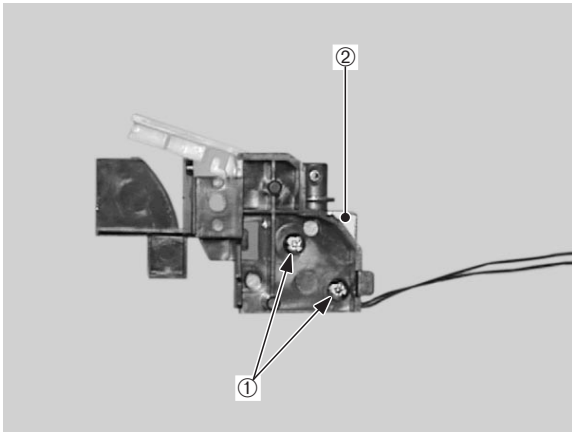
6) Remove the screw and take off the solenoid cover.



① Screw ② Solenoid cover

Figure 3-4-8

7) Remove the 2 screws and take off the duplex deflector solenoid.

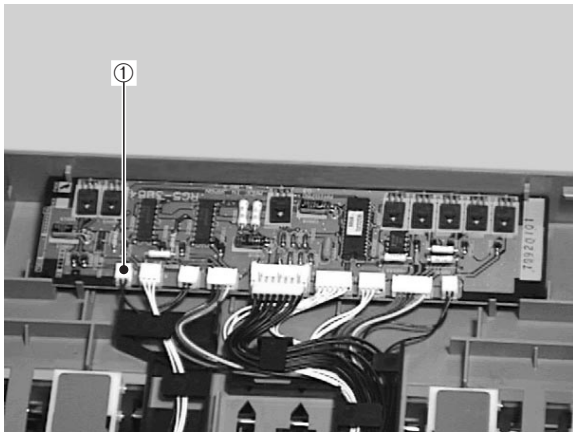


① Screws
② Duplex deflector solenoid

Figure 3-4-9

D. Duplex Feed Clutch

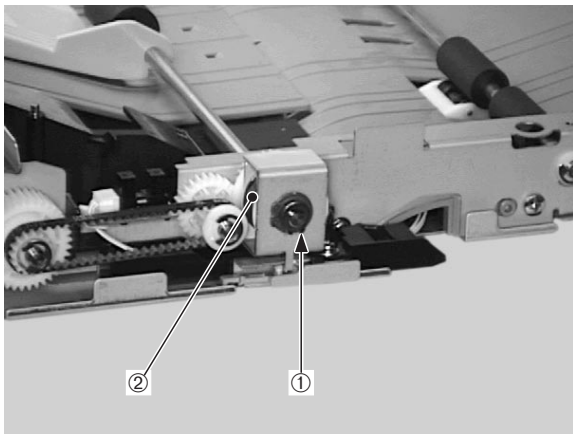
1) Performing Step 1) on Page 3-3, remove the upper guide.
2) Take off the PCB cover and undo the connector.



① Connector

Figure 3-4-10

3) Remove the C-ring and take out the duplex feed clutch.

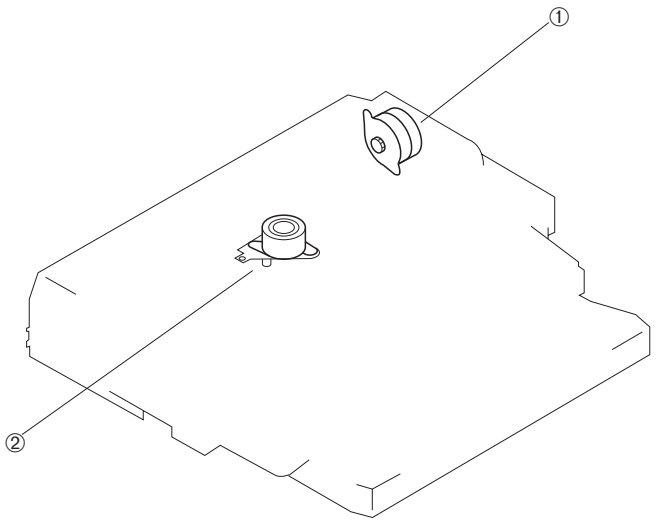


① C-ring ② Duplex feed clutch

Figure 3-4-11

V. MOTORS

A. Locations



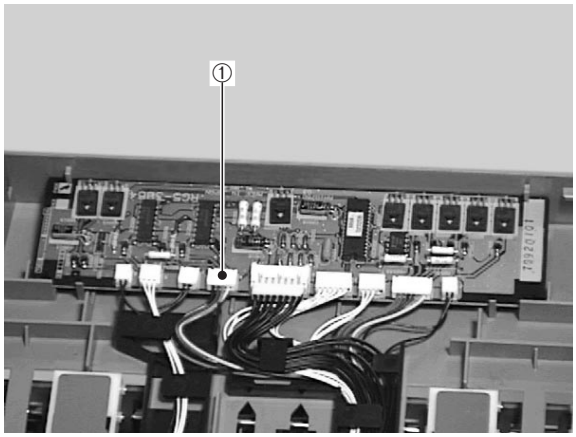
① Duplexing unit motor

② Side registration motor

Figure 3-5-1

B. Duplexing Unit Motor

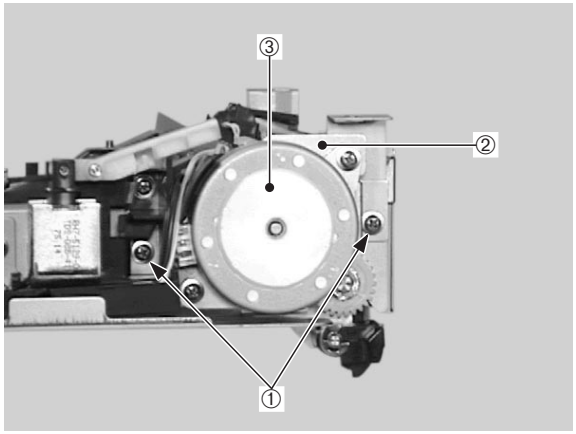
1) Performing Step 1) on Page 3-3, remove the upper guide.
2) Take off the PCB cover and remove the connector.



① Connector

Figure 3-5-2

3) Remove the 2 screws, and then the motor fixing plate.



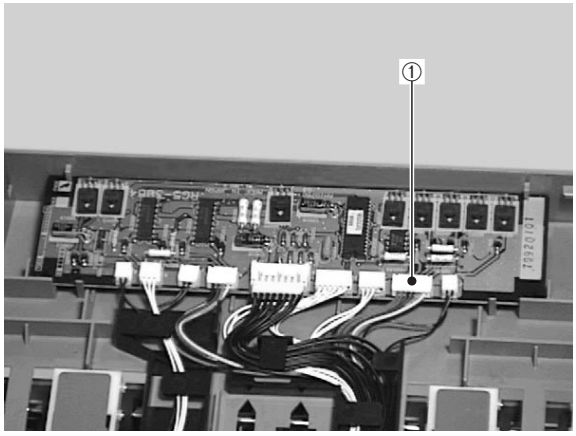
① Screws
② Motor fixing plate
③ Duplexing unit motor

Figure 3-5-3

4) Take out the 2 screws, then the duplexing unit motor.

C. Side Registration Motor

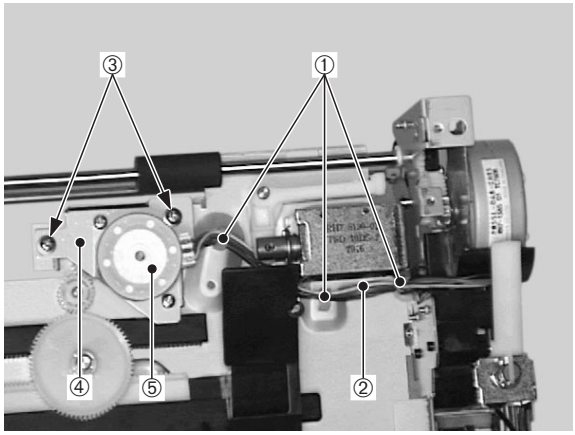
1) Performing Step 1) to 5) on Page 3-3, remove the lower guide.
2) Take off the PCB cover, then remove the connector.



① Connector

Figure 3-5-4

3) Remove the cable from the cable guide.
4) Remove the two screws and then the motor fixing plate.



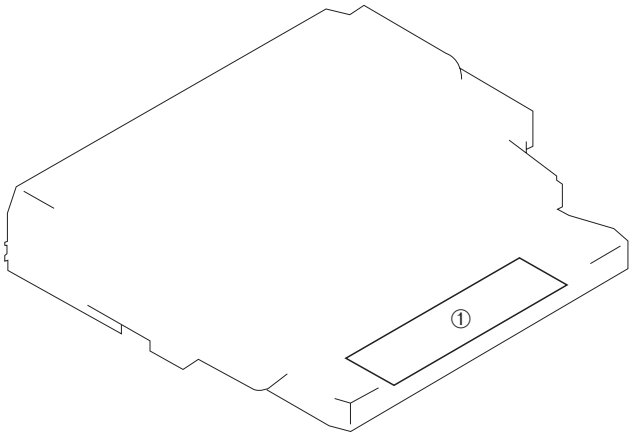
① Cable guides
② Cable
③ Screws
④ Motor fixing plate
⑤ Side registration motor

Figure 3-5-5

5) Take out the 2 screws, then the side registration motor.

VI. ELECTRICAL PARTS

A. Locations

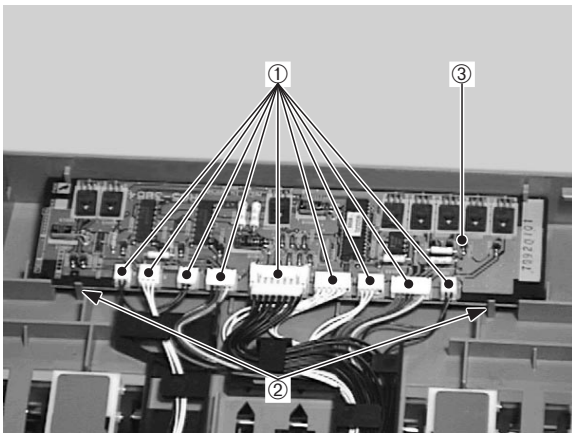


① Duplexing driver PCB

Figure 3-6-1

B. Duplexing Driver PCB

1) Performing Step 1) on Page 3-4, remove the PCB cover.
2) Disconnect the 9 connectors, unhook the 2 claws, and then remove the duplexing driver PCB.



① Connectors
② Claws
③ Duplexing driver PCB

Figure 3-6-2

CHAPTER 4

TROUBLESHOOTING

I. PREFACE 4-1
II. IMAGE DEFECTS 4-4
III. PAPER JAMS 4-5
IV. PAPER TRANSPORT MALFUNCTION 4-6
V. MALFUNCTION TROUBLESHOOTING 4-7
VI. MALFUNCTION STATUS TROUBLESHOOTING 4-9
VII. MEASUREMENT AND ADJUSTMENT 4-11
VIII. MAINTENANCE AND SERVICING 4-12
IX. LOCATION OF CONNECTORS . 4-13

I. PREFACE

A. Malfunction Diagnosis Flowchart

The malfunctions that occur in the duplexing unit are classified into five types; "image defects", "paper jams", "paper transport malfunction", "operation malfunction", and "malfunction status".

If a malfunction occurred in the duplexing unit, the service technician is to find which type the malfunction falls into using the malfunction diagnosis flowchart and to clear the problem according to the troubleshooting procedures for each malfunction type.

Make sure the following points at the execution of troubleshooting.

- Be sure that the connector has no poor contact when measuring the voltage at the specified terminal of the connector.
- Before handling PCBs, be sure to touch a metal part of the printer to discharge static electricity, as it can cause damage to the PCBs.

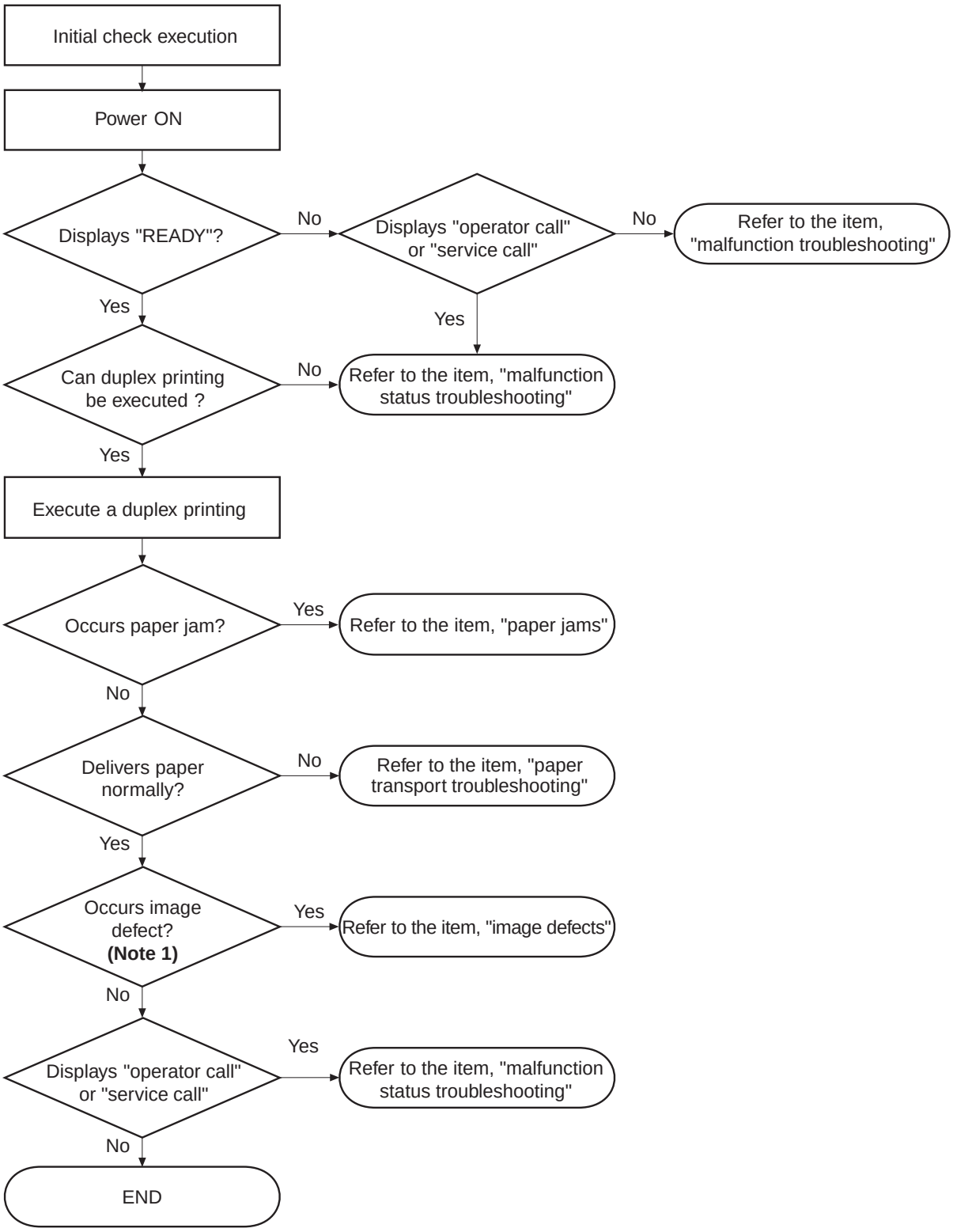


Figure 4-1-1

Note : The image defect occurred at the user side might not re-occur on its test print. In this case, make a print from external device and infer the defective part by the output image. Then, find the defective part according to the item, "image defects".

B. Initial Checks

1. Installation environment

The same as that of the printer.

2. Paper checks

a. The paper recommended for the duplexing unit is used.
b. The paper is not damp.

3. Others

During winter, particularly when moving the duplexing unit into a warm room from a cold location such as warehouse, condensation can appear in the duplexing unit. The condensation can cause various problems.

If condensation appeared, wipe each part with a dry-cloth or leave the duplexing unit with the printer power ON for 10 to 20 minutes.

II. IMAGE DEFECTS

I-1 Dirt

<Possible causes>

1. The duplex feed roller 1 is dirty
   Action: Clean the duplex feed roller 1.

2. The feed guide is dirty
   Action: Clean the feed guide.

3. The reversing roller and the duplex feed roller 2 are dirty
   Action: Clean the dirty rollers.

III. PAPER JAMS

<Possible causes>

1. Paper particles or dust is on each roller.
   Action: Remove the paper particles or dust.

2. Foreign substances or burrs are on the feed guide.
   Action: Remove the foreign substances. If the feed guide suffers from burr, replace it.

3. The reversing roller or the duplexing feed roller is worn or deformed.
   Action: Replace it.

4. Gears are worn or cracked.
   Action: Replace it.

5. Sensor levers do not move smoothly or are damaged.
   Action: Re-install them to move smoothly or replace if damaged.

IV. PAPER TRANSPORT MALFUNCTION

T-1 Wrinkles

<Possible causes>

1. The feed roller unit or the side registration guide has paper particles or dust.
   Action: Clean the dirty place.

2. Rollers are worn or deformed.
   Action: Check the rollers and replace if any roll is worn or deformed.

3. The paper guide is cracked or deformed.
   Action: Check the paper feed path and replace if the guide is cracked or deformed.

V. MALFUNCTION TROUBLESHOOTING

N-1 Power ON failure

<Possible causes>

1. The duplexing unit is not set correctly.
   Action: Re-set it.

2. Poor connection with the connector of 24 V supply line.
   Action: Reconnect the connector J2001 on the duplexing driver PCB correctly.

3. The duplexing driver PCB failure
   Action: Replace it.

N-2 Side registration motor failure

<Possible causes>

1. Poor connection with the connector of the SIDE REGISTRATION MOTOR DRIVE signal line.
   Action: Reconnect the connector J2005 on the duplexing driver PCB correctly.

2. The side registration motor failure
   Action: Replace it.

3. The duplexing driver PCB failure
   Action: Replace it.

N-3 Duplexing unit motor failure

<Possible causes>

1. Poor connection with the connector of the DUPLEXING MOTOR DRIVE signal line.
   Action: Reconnect the connector J2004 on the duplexing driver PCB correctly.

2. The duplexing unit motor failure
   Action: Replace it.

3. The duplexing driver PCB failure
   Action: Replace it.

N-4 Reversing roller release solenoid failure

<Possible causes>

1. Poor connection with the connector of the REVERSING ROLLER RELEASE SOLENOID DRIVE signal line.
   Action: Reconnect the connector J2009 on the duplexing driver PCB correctly.

2. The reversing roller release solenoid failure
   Action: Disconnect the connector J2009 on the reversing roller release solenoid. Measure the resistance between the connector J2009-1 and J2009-2 of the cable.
   If it is not about 50 Ω, replace the reversing roller release solenoid.

3. The duplexing driver PCB failure
   Action: Replace it.

N-5 The duplex deflector solenoid failure

<Possible causes>

1. Poor connection with the connector of the DUPLEX DEFLECTOR SOLENOID DRIVE signal line.
   Action: Reconnect the connector J2002 of the duplexing driver PCB correctly.

2. The duplex deflector solenoid failure
   Action: Disconnect the connector J2002 of the duplex deflector solenoid. Measure resistance between the connector J2002-1 and the J2002-1 located cable side. Replace the duplex deflector solenoid if the resistance is not about 130 Ω.

3. The duplexing driver PCB failure
   Action: Replace it.

VI. MALFUNCTION STATUS TROUBLESHOOTING

M-1 Side registration guide failure

<Possible causes>

1. The side registration guide installation failure
   Action: Re-install the side registration guide correctly.

2. The side registration guide home position sensor lever is damaged.
   Action: Replace it.

3. Gears are damaged.
   Action: Replace it if any gear is damaged.

4. Poor connection with the connectors of the SIDE REGISTRATION GUIDE HOME POSITION DETECTION signal line and of the SIDE REGISTRATION MOTOR DRIVE signal line.
   Action: Reconnect the connector J2006 and the J2005 on the duplexing driver PCB.

5. The side registration guide home position sensor failure
   Action: Replace it.

6. The side registration motor failure
   Action: Replace it.

7. The duplexing driver PCB failure
   Action: Replace it.

M-2 Duplex feed unit failure

<Possible causes>

1. The duplex feed roller 1 home position sensor lever is damaged.
   Action: Replace it.

2. Gears are damaged.
   Action: Replace it if any gear is damaged.

3. Poor connection with the connectors of the DUPLEX FEED ROLLER 1 HOME POSITION DETECTION signal line, of the DUPLEXING UNIT MOTOR DRIVE signal line and of the DUPLEX FEED CLUTCH DRIVE signal line.
   Action: Reconnect the connector J2007, J2004, and J2003 on the duplexing driver PCB.

4. The duplex feed roller 1 home position sensor failure.
   Action: Replace it.

5. The duplex feed clutch failure.
   Action: Disconnect the connector J2003 of the duplex feed clutch. Measure the resistance between the connector J2003-1 and J2003-2 on the cable. If it is not about 140 Ω, replace the duplex feed clutch.

6. The duplexing unit motor failure
   Action: Replace it.

7. The duplexing driver PCB failure
   Action: Replace it.

M-3 "Duplexing unit installation failure status" is output when the duplexing unit is installed in the printer.

<Possible causes>

1. Poor connection in the connector.
   Action: Reconnect the connector J2001 on the duplexing driver PCB.

2. Duplexing driver PCB failure
   Action: Replace it.

VII. MEASUREMENT AND ADJUSTMENT

A. Mechanical Adjustment
This duplexing unit has no item for mechanical adjustment.

B. Electrical Adjustment
This duplexing unit has no item for electrical adjustment.

C. Variable resistors, LEDs, test pins, jumpers, and switches on PCB
This duplexing unit has no variable resistors, LEDs, test pins, jumpers, and switches that are required for after-sales-service of the unit.

VIII. MAINTENANCE AND SERVICING

A. Periodic Replacement Parts

This duplexing unit has no periodic replacement parts.

Note: Periodic replacement parts are the parts that must be replaced at regular intervals, even if they are functioning properly and show no signs of wear. (Failure of these parts can seriously affect printer performance.) These parts should be replaced during a regular service visit closest to the end of the parts expected life.

B. Expected Lives of Consumable Parts

This duplexing unit has no consumable parts.

Note: Consumable parts are the parts that have possibility of requiring replacement due to the deterioration or damages at least once during the warranty period and that can be used until failures occur.

C. Regular Servicing Schedule

No parts need regular service.

D. Standard Tools

Required standard tools for the duplexing unit service are the same as for the printer.

E. Special Tools

This duplexing unit has no special tools for service.

F. List of Lubricants and Cleaners

Table 4-8-1

No.	Material name	Use	Components	Remarks
1	Alcohol: ethyl (pure or denatured) or isopropyl (pure or denatured)	Cleaning: plastic, rubber, external parts	C_2H_5OH, $(CH_3)_2CHOH$	• Purchase locally • Flammable: keep away from flame
2	Lubricating oil	Apply between gear and shaft	Petroleum mineral oil	• Tool No. CK- 8003 (100 ml bottle)
3	Lubricating agent	Apply to gears	Special oil Special solid lubricating material Lithium soap	• Tool No. HY9-0007 (20 g tube)

IX. LOCATION OF CONNECTORS

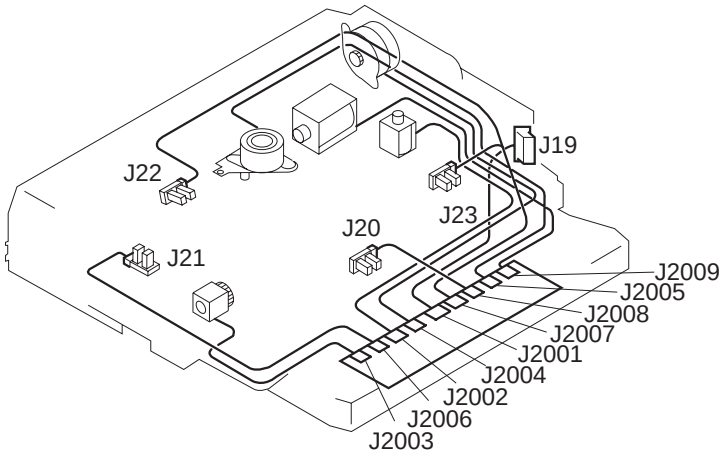


Figure 4-9-1

APPENDIX

I. GENERAL TIMING CHART A-1

II. GENERAL CIRCUIT DIAGRAM A-2

III. LIST OF SIGNALS A-3

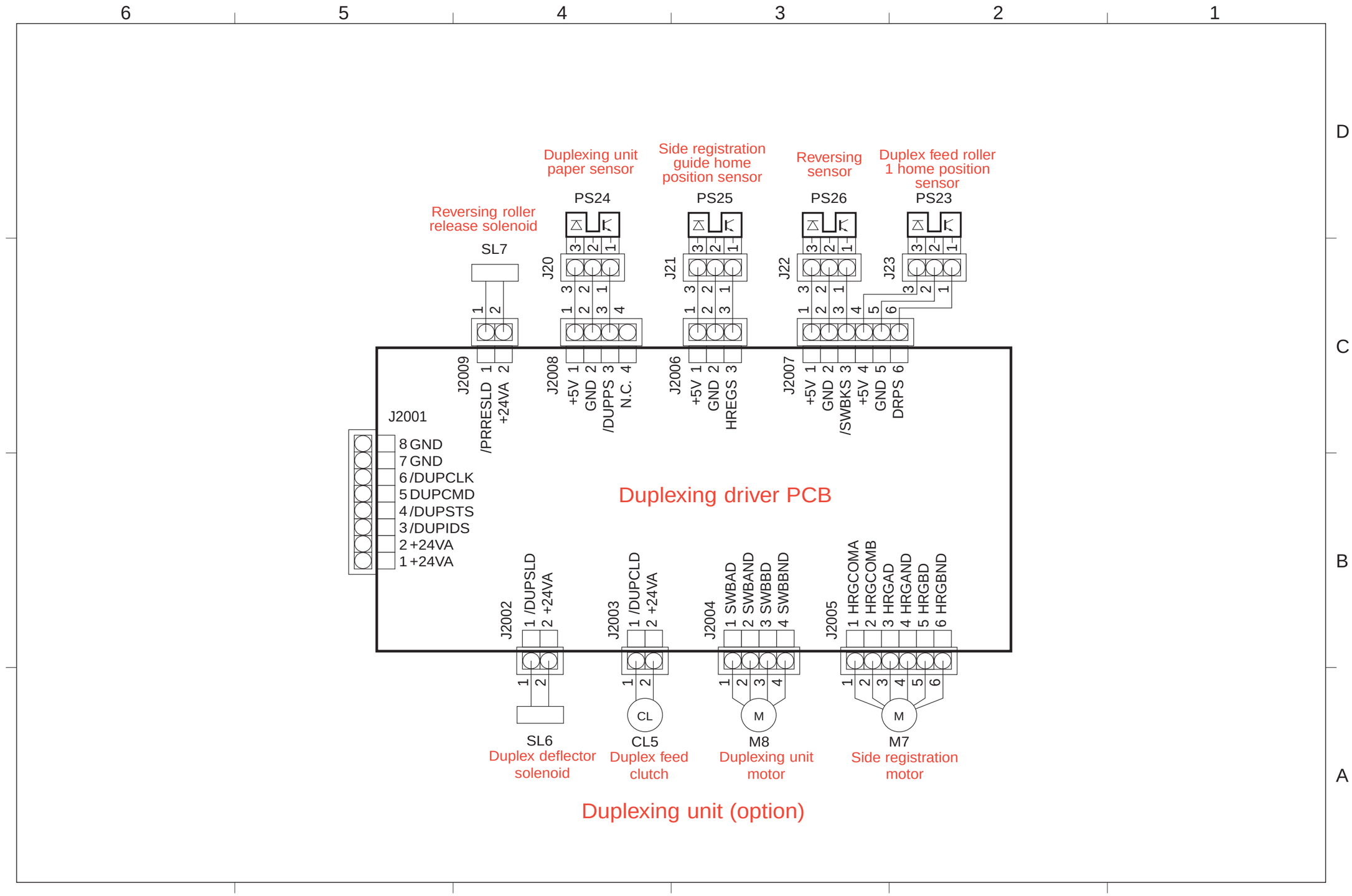
• Timing chart for two consecutive prints on A4 landscape paper

(Unit: Seconds)

Sequence		PRINT
1	PRINT signal (/PRNT)	
2	Duplexing unit motor (M8)	About 0.9, Normal speed, High speed
3	Duplex deflector solenoid (SL6)	CCW, CW, CW, CCW, CW, CW
4	Duplex feed clutch (CL5)	About 2.7
5	Fixing unit delivery sensor **(Note)**	About 0.1
6	Reversing sensor (PS26)	About 0.9
7	Duplexing unit paper sensor (PS24)	About 3.3
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Note: The fixing unit delivery sensor is a part of the printer.

II. GENERAL CIRCUIT DIAGRAM



III. LIST OF SIGNALS

A. Input/Output Signals for the Duplexing Driver PCB

Connector	Pin	Code	I/O	Logic	Signal name
J2001	1	+24VA	Input		
	2	+24VA	Input		
	3	/DUPIDS	Output	L	Duplexing unit detection signal
	4	/DUPSTS	Output	L	Duplexing unit status signal
	5	DUPCMD	Input	H	Duplexing unit command signal
	6	/DUPCLK	Input	L	Status clock signal
	7	GND			
	8	GND			
J2002	1	/DUPSLD	Output	L	Duplex deflector solenoid drive signal
	2	+24VA			
J2003	1	/DUPCLD	Input		Duplex feed clutch drive signal
	2	+24VA			
J2004	1	SWBAD	Output		Duplexing unit motor control signal
	2	SWBAND	Output		Duplexing unit motor control signal
	3	SWBBD	Output		Duplexing unit motor control signal
	4	SWBBND	Output		Duplexing unit motor control signal
J2005	1	HRGCOMA	Output		Side registration motor control signal
	2	HRGCOMB	Output		Side registration motor control signal
	3	HRGAD	Output		Side registration motor control signal
	4	HRGAND	Output		Side registration motor control signal
	5	HRGBD	Output		Side registration motor control signal
	6	HRGBND	Output		Side registration motor control signal
J2006	1	+5V			
	2	GND			
	3	HREGS	Input	H	Side registration guide home position detection signal
J2007	1	+5V			
	2	GND			
	3	/SWBKS	Input	L	Reversing paper detection signal
	4	+5V			
	5	GND			
	6	DRPS	Input	H	Duplex feed roller 1 home position detection signal
J2008	1	+5V			
	2	GND			
	3	/DUPPS	Input	L	Duplexing unit paper detection signal
	4	N.C.			
J2009	1	/PRRESLD	Output	L	Reversing roller release solenoid drive signal
	2	+24V			

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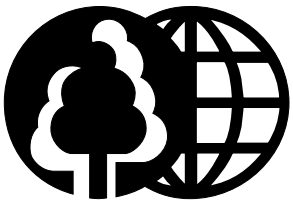

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