brother

FACSIMILE EQUIPMENT

SERVICE MANUAL

MODEL: MFC5200C/MFC890

PREFACE

This publication is a Service Manual covering the specifications, construction, theory of operation, and maintenance of the Brother facsimile equipment. It includes information required for field troubleshooting and repair--disassembly, reassembly, and lubrication--so that service personnel will be able to understand equipment function, to rapidly repair the equipment and order any necessary spare parts.

To perform appropriate maintenance so that the facsimile equipment is always in best condition for the customer, the service personnel must adequately understand and apply this manual.

This manual is made up of eight chapters and appendices.

This manual describes the models and their versions to be destined for major countries. The specifications and functions are subject to change depending upon each destination.

SAFETY INSTRUCTIONS

SAFETY PRINCIPLE

1) Before starting any operations, read this manual thoroughly. Especially read the safety instructions in this section carefully and ensure that you understand the contents.
2) Perform all the operations by following the procedures described in this manual. Follow all the cautions and warnings set out in the procedures and on safety labels affixed to the machine. Failure to do so may result in human injury or equipment damage.
3) Perform only the procedures explained in this manual. Refrain from opening or touching any portions that are not related to your required operation(s).
4) Repair and replacement of parts should be performed by trained and qualified persons only.

   Operators should not attempt to do such repair or replacement work.
5) It must be appreciated that the above-mentioned cautions and warnings do not cover everything because it is impossible to evaluate all the circumstances of repair situations.

SPECIAL SAFETY INFORMATION

Cautions and warnings are made clear by following the 'Safety Alert Symbols' or 'Signal Words' such as DANGER, WARNING and CAUTION.

1) SAFETY ALERT SYMBOL

   This is the safety alert. When you find this symbol placed on the equipment or marked in this manual, be aware of the potential of human injuries. Follow the recommended precautions and safety operation practices.
2) Understanding Signal Words

   DANGER is used to indicate the presence of a hazard which will cause severe human injuries or a fatal accident if the warning is ignored.

   WARNING is used to indicate the presence of a hazard or unsafe practices which may cause severe human injuries or a fatal accident if the warning is ignored.

   CAUTION is used to indicate the presence of a hazard or unsafe practices which may cause minor human injuries if the warning is ignored. CAUTION also calls your attention to safety messages in this manual.

3) Follow Safely Instructions

Carefully read all the safety messages set out in this manual and also in the safety warning signs placed on the equipment. In this manual, the safety instructions (safety alert symbols and signal words) are enclosed in a rectangular enclosure to bring them to your attention.

Keep the safety signs on the equipment in good condition and ensure none are missing or damaged. Replace the safety signs if unreadable or damaged. Learn how to operate the equipment and how to use the controls properly. Do not let anyone operate this equipment without following the instructions. Keep the equipment in proper working condition.

Unauthorized modification to the equipment may impair the function & safety and affect the life of the equipment.

Listed below are the various kinds of "WARNING" messages contained in this manual.

4) Caution for the battery

There is a danger of explosion if the battery is incorrectly replaced. Do not replace the battery. Do not disassemble, recharge or dispose of in fire.

Used battery should be disposed of according to local regulations.

WARNING

HAZARDOUS VOLTAGE

May cause serious injuries or fatal accidents. Voltage is now applied from the power supply of machine. There is a danger of electrical shock if you touch the active area inside the machine.

Be sure to turn the power supply switch OFF and pull the plug out from the power outlet before starting maintenance work on the machine.

CAUTION

ROTATING PARTS

Be aware of the potential danger of various rollers and take care not to get your fingers or hand caught into the machine, this can cause serious injuries. Note that the exit roller that ejects the printed paper is rotating while printing.

Be careful not to get your hair, fingers, hands, sleeve or necktie caught in the machine while operating the machine.

CAUTION

POWER CORDS & PLUGS

This machine is equipped with a 3-wire power cord fitted with a 3-pronged plug (bi-polar plug with grounding) for the user's safety.

Use these power cords in conjunction with a properly grounded electrical outlet to avoid an electrical shock.

CAUTION

SAFETY INTERLOCK

The scanner unit of this machine have electrical safety interlocks to turn the power off whenever they are opened.

CHAPTER 1

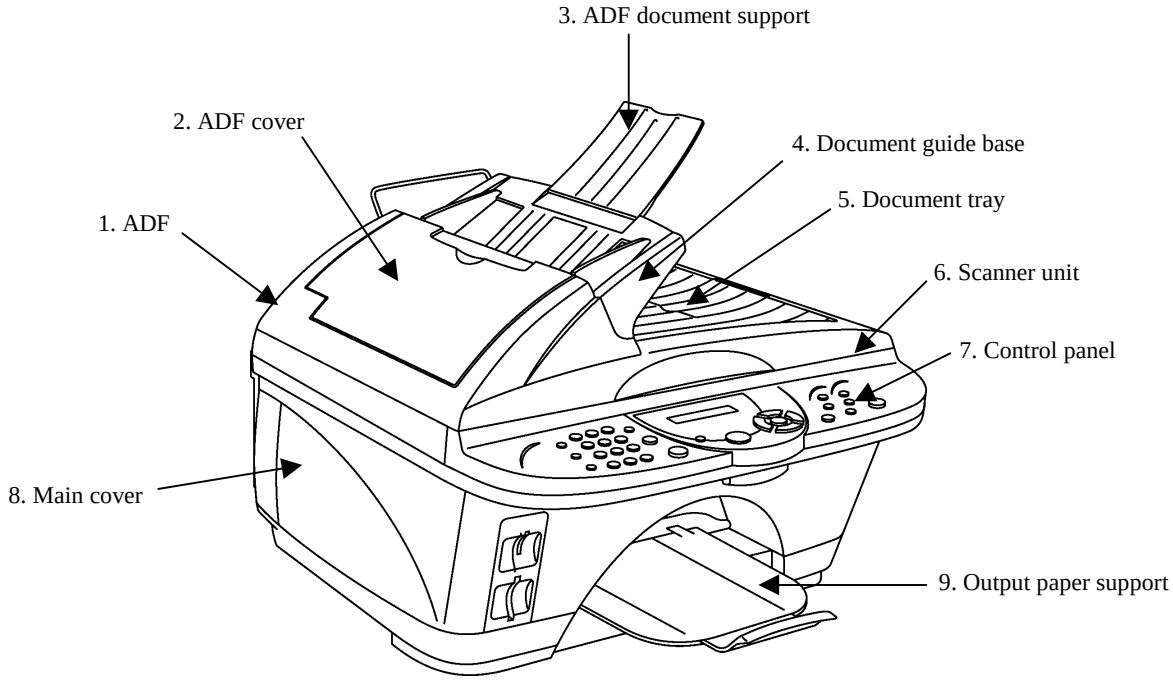
PARTS NAMES & FUNCTIONS

CHAPTER 1 PARTS NAMES & FUNCTIONS

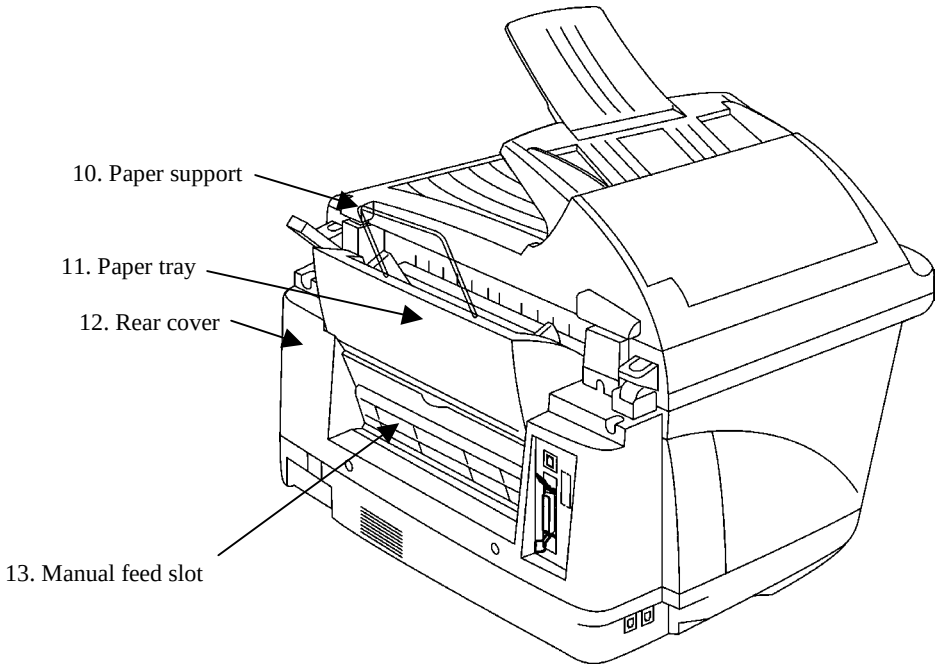
CONTENTS

1.1 EQUIPMENT OUTLINE

Front view

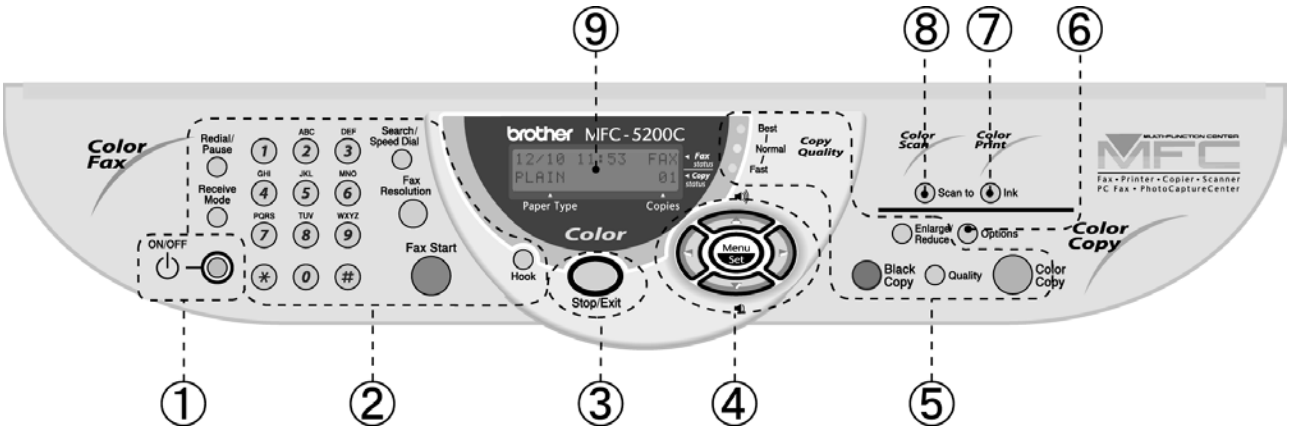


Rear view



No.	Part name	Outline of functions
1	ADF	Automatically feeds the document sheet by sheet to the reading unit.
2	ADF cover	Open this cover when removing jammed documents from the ADF.
3	ADF document support	Supports the documents fitted to the ADF so that they do not bend.
4	Document guide base	Adjusts the document position to the center of ADF.
5	Document tray	Stores the read documents.
6	Scanner unit	Indicates the whole reading unit including the control panel. Open this unit when changing the ink cartridge.
7	Control panel	Displays the machine operation status and is used to operate the machine.
8	Main cover	Indicates the whole enclosure of the machine.
9	Output paper support	Stores the printed sheets of paper.
10	Paper support	Supports the paper fitted to the paper tray so that they do not bend.
11	Paper tray	Automatically feeds the paper sheet by sheet to the printing unit.
12	Rear cover	Indicates the rear enclosure. Open this cover when doing maintenance work.
13	Manual feed slot	Used to feed the paper sheet by sheet manually. Open the slot cover when removing jammed paper from the machine.

1.2 CONTROL PANEL



① ON/OFF

You can turn the MFC on or off.

② Fax and telephone keys:

Redial/Pause

Redials the last number you called.
It also inserts a pause in auto dial numbers.

Receive Mode

Use to select how the MFC will handle incoming calls.

Dial Pad

Use this to dial telephone and fax numbers and as a keyboard for entering information into the MFC.
The # key lets you switch the dialing type during a telephone call from Tone to Pulse

Search/Speed Dial

Lets you look up numbers that are stored in the Dialing memory. It also lets you dial stored numbers by pressing # and a two-digit number.

Fax Resolution

Sets the resolution when you send a fax.

Fax Start

Starts an operation, such as sending a fax.

Hook

Lets you dial numbers without picking up the handset.

③ Stop/Exit

Stops a fax, cancels an operation or exits from the Menu.

④ Navigation keys:

Menu/Set

Lets you access the Menu to program and store your settings in the MFC.
Press to scroll forward or backward to a menu selection.
Also, you can use these keys to do an alphabetical search for the names of stored numbers.

Volume

Press to scroll through the menus and options.
When using the speaker, you can press these keys to adjust the volume.

⑤ Copy keys (Temporary settings):

Quality

Use this key to temporarily change the quality for Copying.

Quality indicator lights

These lights show the copy quality you selected with the Quality key.

Enlarge/Reduce

Lets you enlarge or reduce copies depending on the ratio you select.

Black Copy

Makes a black-and-white copy.

Color Copy

Makes a full-color copy.

⑥ Options

You can quickly and easily select temporary settings for copying or Photo Capture Center™.

⑦ Color Print key:

Ink

Lets you clean the print heads, replace an ink cartridge and check the available ink volume.

⑧ Scan key:

Scan to

Lets you scan the next original and select the destination in your computer.
(Such as a Word processing, graphics or E-mail application, Media card or on a Network.)

⑨ Liquid Crystal Display (LCD)

Displays messages on the screen to help you set up and use your MFC.

CHAPTER 2

SPECIFICATIONS

CHAPTER 2 SPECIFICATIONS

CONTENTS

2.1 GENERAL

2.1.1 General Specification

Memory Capacity	8MB
Automatic Document Feeder (ADF)	up to 30 sheets (20 lb)
Paper Tray	100 Sheets (20 lb)
Printer Type	Ink Jet
Print Method Configuration	Piezoelectric ceramic drive with 150 x 4 nozzles
LCD (Liquid Crystal Display)	16 characters x 2 Lines
Operating Environment	50-95ºF (10-35ºC)
Best Print Quality	68-91ºF (20-33ºC)
Power Source	120VAC 50/60Hz (U.S.A., Canadian Version Only) 240VAC 50/60HZ(Except U.S.A., Canadian Version)
Power Consumption	Minimum: under 5 watts (When Power Switch (ON/OFF) is turned off.) Standby: under 15 watts Operating: under 50 watts
Dimensions	19.4 x 18.3 x 14.9 (inches) 492 x 466 x 378 (mm)
Weight	28.6 1b/13 kg

2.1.2 Paper Specification

Recommended paper

Plain Paper:	Xerox 4200
Inkjet Paper:	KODAK® Premium Inkjet Paper (Matte)
Glossy Paper:	JETPRINT PHOTO® Graphic image paper - Gloss Finish
Transparencies:	3M Transparency Film (CG3410)

Paper capacity and specifications of the Paper Tray

Paper Type		Number of sheets	Paper Weight	Paper Thickness
Plain Paper	Letter Executive	100 of 20 lb (80 g/m 2)	17 to 32 lb (64 to 120 g/m 2)	0.003 to 0.006 in. (0.08 to 0.15 mm)
	Legal	50 of 20 lb (80 g/m 2)		
Inkjet Paper (Letter)		20	17 to 32 lb (64 to 120 g/m 2)	0.003 to 0.006 in. (0.08 to 0.15 mm)
Glossy Paper (Letter)		20	Up to 40 lb (150 g/m 2)	Up to 0.007 in. (0.18 mm)
Transparencies (Letter)		10		
Envelopes (DL, COM-10, C5, Monarch)		10		Up to 0.02 in. (0.52mm)
Postcard 4" x 6"		30	Up to 45 lb (170 g/m 2)	Up to 0.009 in. (0.23 mm)
Index Card 5" x 8"		30	Up to 32 lb (120 g/m 2)	Up to 0.006 in. (0.15 mm)

Paper stack specifications for the Paper Tray

Paper tray	Up to 0.39 in. (10 mm) Up to 100 sheets of 20 lb (80 g/m 2)	
Output paper support	Up to 50 sheets of 20 lb (80 g/m 2)	(Transparencies and glossy paper must be picked up from the output paper support one page at a time to avoid smudging.)

Paper specifications for the manual feed slot

Paper Width	3.5 to 8.5 in. (89 to 216 mm)
Paper Height	4 to 14 in. (102 to 356 mm)
Paper Thickness	0.005 to 0.01 in. (0.12 to 0.25 mm)

You have to remove paper from the paper tray and load one sheet at a time.

2.1.3 Printable Area

The printable area depends on the settings in the application you are using. The figures below show the unprintable areas on cut sheet paper and envelopes.

Paper	Paper size		Top	Bottom	Left	Right
Cut sheet	Letter, Legal	Fax	0.12	0.47	0.25	0.25
		Printer	0.12	0.47 (0.12)*	0.23	0.23
		Copy	0.12	0.47 (0.12)*	0.23 (0.12)*	0.23 (0.12)*
	Executive	Printer	0.12	0.47 (0.12)*	0.12	0.12
Post card	4" x 6"	Printer	0.12	0.47 (0.12)*	0.12	0.12
Envelopes	DL,C5,COM10 Monarch	Printer	0.39	0.79	0.12	0.12

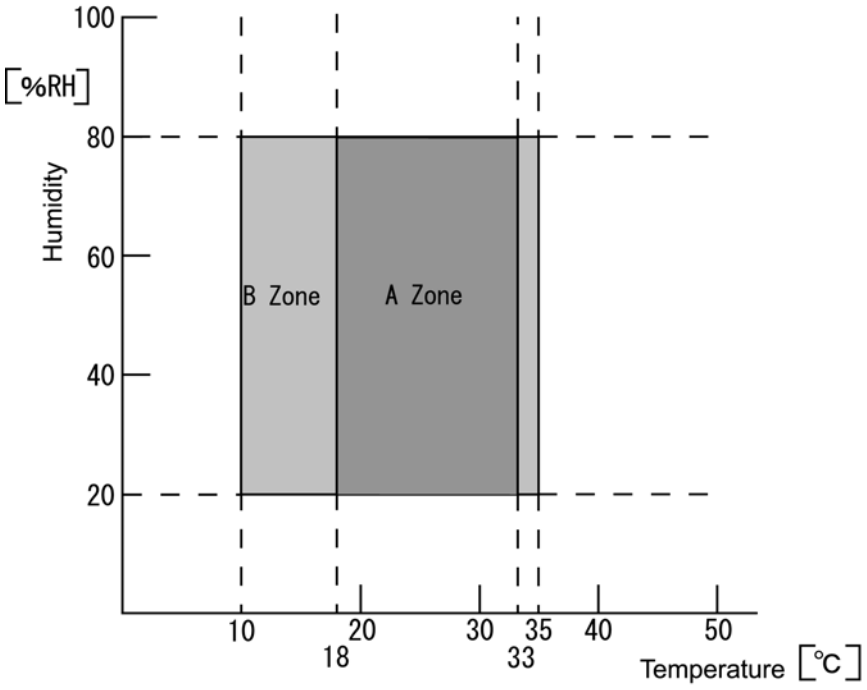
* When you set the Near Edge feature to ON.

Printer depends on the Printer driver.

The figures above are approximate and the printable area may vary depending on the type of cut sheet paper you are using.

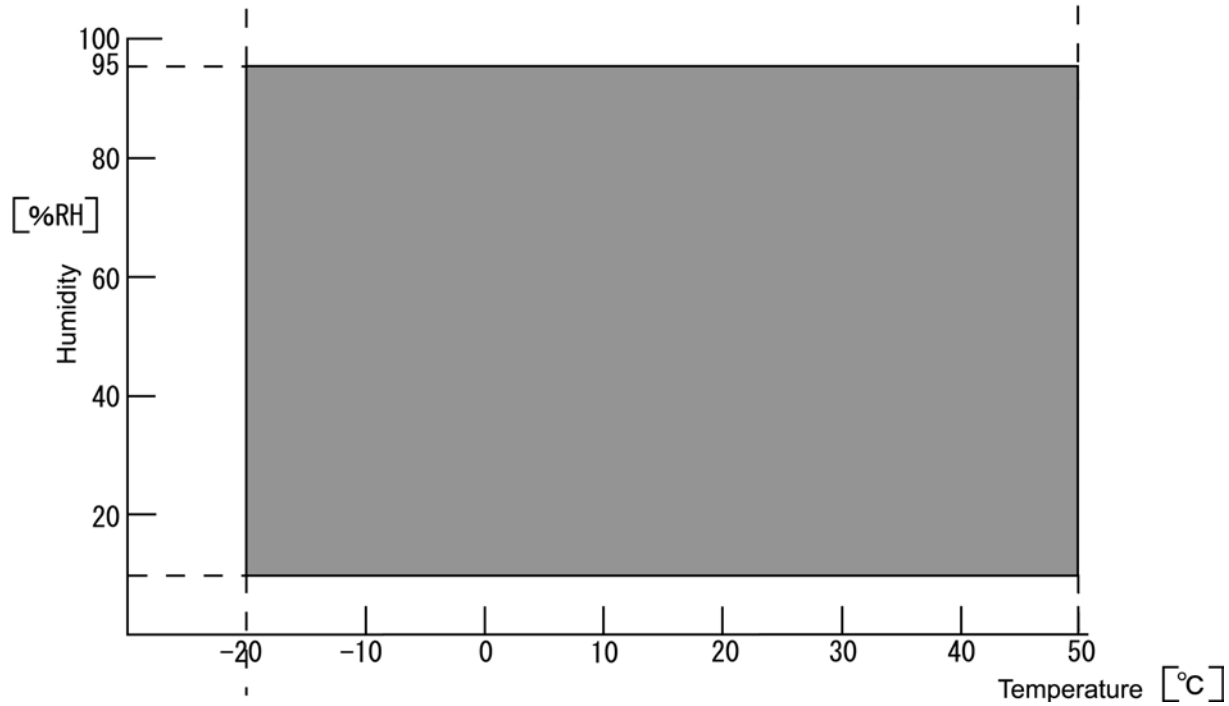
2.1.4 Environmental Condition

Under operational conditions : 10℃ to 35℃/20% to 80%



A Zone : Recommended condition
B Zone : Operation Area

Under non operational conditions : -20℃ to 50℃/10% to 95%



2.2 OTHERS

(1/4)

Model Name	MFC-5200C	MFC-890
TELEPHONE		
Automatic Redial	Yes(once)	Yes
Handset	No	No
One-Touch Dial	0	0
Speed Dial	Max 100	Max 100
Figures of One-Touch & Speed Dial	20 digits	20 digits
Resisterable Number Of Characters	15 char	15 char
Telephone Index	Yes(Normal) (TBD)	Yes(Normal)
Speaker Phone	No(Only Speaker)	No(Only Speaker)
Chain Dialing	Yes	Yes
Caller ID	No	No
Call Waiting Caller ID	No	No
Distinctive Ringing	Yes	Yes
Hold/Mute Key	No	No
Hook Key	Yes	TEL/R key (TBD)
Power Failure Dialing	No	No
Speaker Volume	Yes (3 steps + OFF)	Yes (3 steps + OFF)
Ring Volume	Yes (3 steps + OFF)	Yes (3 steps + OFF)
HandSet Volume	No	No
PBX Feature	No	Yes
Transfer Method	No	flash
FAX		
Internet FAX	LAN Option	LAN Option
Data Modem	N/A	N/A
Easy Receive/Fax Detect	Yes	Yes
Fax/Tel Switch	Yes	Yes
Super Fine	Yes (Only for Black)	Yes (Only for Black)
300dpi Transmission	No	No
Gray Scale	256	256
Contrast	Yes (Auto/S.Light/S.Dark)	Yes (Auto/Light/Dark)
Smoothing	No	No
Call Reservation Over Auto TX	No	No
Password Check	No	No
Enhanced Remote Activate	Yes	Yes
Multi Resolution Transmission	No	No
Multi Transmission	No	No
Next-Fax Reservation	Yes (Dual Access)	Yes (Dual Access)
Delayed Timer	Yes (50 Timer/50 Job)	Yes (50 Timer/50 Job)
Polling	Yes (Std/Seq) RX/TX	Yes (Std/Seq) RX/TX
Quick-Scan key	(Memory TX w/o key)	(Memory TX w/o key)
Scan Speed (A4:Standard)	Approx. 3 sec./page (A4:standard)	Approx. 3 sec./page (A4:standard)
Memory Transmission(Brother#1 Chart)	Yes (480:MMR)	Yes (480:MMR)
Memory Transmission(ITU-T Chart)	Yes (400:MMR)	Yes (400:MMR)
Broadcasting	Yes (150 locations)	Yes (150 locations)
Batch Transmission	Yes	Yes
Auto Reduction	Yes	Yes
Out-of-Paper Reception (Brother #1 Chart)	Yes (480:MMR)	Yes (480:MMR)
Out-of-Paper Reception (ITU-T Chart)	Yes (400:MMR)	Yes (400:MMR)
Dual Access	Yes (B&W Only)	Yes (B&W Only)
ECM(Error Correction Mode)	Yes	Yes
ITU SUB Addressing	No	No
Group Dial	Yes (6)	Yes (6)
Error Re-Transmission	No	No
Station ID	1 (20digits/20char)	1 (20digits/20char)
Off Hook Alarm	No	No
Remote Maintenance	Yes	Yes
Call Reservation Over Manual TX	No	No
RX Mode Indication	Yes:LCD	Yes:LCD
Resolution Indication	Yes:LCD	Yes:LCD
Memory Security	N/A	TX Lock
Color FAX (Document nd/Receive)	Yes/Yes	Yes/Yes
Color FAX (Memory end/Receive)	No/Yes	No/Yes
Manual Broadcasting	Yes	Yes
LCD Language	English	English
Call Manage	N/A	N/A
E-MAIL FAX(Share Media ervice)	N/A	N/A

Model Name	MFC-5200C	MFC-890
LIST/REPORT		
Activity Report/Journal Report	Yes (up to 200)	Yes (up to 200)
Transmission Verification Report	Yes	Yes
Coverpage	Yes	Yes
Help List	Yes	Yes (From MENU)
Call Back Message	No	No
Caller ID List	No	No
Auto Dial List	Yes(From Menu)	Yes (From MENU)
Tel Index List	N/A	N/A
Order Form (from MFC)	N/A	YES(FROM MENU)
INTERFACE		
External TAD Interface	Yes	Yes
Missing Link/PC Interface	No	No
Host Interface (Serial)	No	No
Host Interface (IEEE1284)	Yes	Yes
Host Interface (USB)	Yes	Yes
LAN Interface	Option (10Base-T/100Base-TX)	Option (10Base-T/100Base-TX)
Acceptable Media Card Slot	Smart Media/Compact Flash/Memory Stick	Smart Media/Compact Flash/Memory Stick
Analog Video Port	No	No
PRINTER		
Color/Mono	Color/Mono	Color/Mono
Engine Type	Piezo Ink Jet (4 head BH: 150 nozzles/color)	Piezo Ink Jet (4 head BH: 150 nozzles/color)
Resolution(dpi)	2400x1200 /2400x1200 (Mono/Color)	1200x1200 /2400x1200 (Mono/Color)
Speed(ppm)	20/16 (Mono/Color: 450*150) '10/7 (Mono/Color: 600*300) '3.5/2.5 (Mono/Color: 600*600) '1.2/0.9 (Mono/Color: 1200*1200) '0.6/'0.4(Mono/Color:2400*1200)	20/16 (Mono/Color: 450*150) '10/7 (Mono/Color: 600*300) '3.5/2.5 (Mono/Color: 600*600) '1.2/0.9 (Mono/Color: 1200*1200) '0.4(Color:2400*1200)
Paper Capacity(sheets)	100 (80gsm)	100(80gsm)
Additional Paper Capacity(sheets)	No	No
Output Paper Capacity(sheets)	50	50
Standard Print Language	Windows GDI	Windows GDI
Emulation	N/A	N/A
Resident Fonts	Yes	Yes
Fonts Disk Based	Yes	Yes
Paper Handling Size	LTR, LGL, A4, A5, EXE, Post Card, Photo, Index card	LTR, LGL, A4, A5, EXE, Post Card, Photo, Index card
Manual Feed Slot	Yes (1 sheet feeder)	Yes (1 paper feeder)
Other Paper Type	OHP, Envelopes	OHP, Envelopes
Sheet Weight (Paper Cassette) (Manual Slot)	64-120 g/m2 (17 - 32 lb) 105-185g/m2 (28-49.3 lb)	64-240 g/m2 (17 - 64 lb) Yes
Printer Driver	Win95/98/98SE/Me/2000Professinal/ NT4.0/XP MacOS 8.5.1-10.1	Win95/98/98SE/Me/2000Professinal/NT4.0/XP MacOS 8.5.1-10.1
Utility Software	N/A	N/A
Bundled Cable	No	No
Variable Dot Print	Yes (3 sizes, Min. 5pl)	Yes (3 sizes, Min. 5pl)
Shingling Print	Yes	NO
Color Enhancement	Yes (True2Life)	Yes (True2Life)
COPY		
Color/Mono	Color/Mono	Color/Mono
Speed(ppm)	15/12 (Multiple copies) 12/8 (Multiple documents)	15/12 (Multiple copies) 12/8 (Multiple documents)
Multi Copy(Stack)	Yes (Color) or Via PC	Yes (Color) or Via PC
Multi Copy(Sort)	Yes (Color) or Via PC	Yes (Color) or Via PC
Reduction/Enlargement(%)	25 -- 400 in 1% increments	25 -- 400 in 1% increments
Resolution(dpi)	Max. 1200x1200	Max. 1200x1200
Resolution Indication	LED (Green) -Fast, Normal, Best	LED (Green) -Fast, Normal, Best
N in 1	2in1, 4in1/ B&W, Color: A4, LTR only	2in1, 4in1/ B&W,color: A4, LTR only
Poster	Yes	Yes
Clone	N/A	N/A
Image Enhancement	N/A	N/A
Book Copy Supporter	N/A	N/A

Model Name	MFC-5200C	MFC-890
SCANNER		
Color/Mono	Color/Mono	Color/Mono
Resolution(dpi)(Phisical)	CCD: 600x2400(Opt.)	CCD: 600x2400(Opt.)
Resolution(dpi) (Logical)	9600(Int.)	9600(Int.)
Speed(ppm)	Max. 3sec	Max. 3sec
Gray Scale	256	256
TWAIN Compliant&Operating System	Win95/98/98SE/Me/2000Professinal/ NT4.0/XP(WIA) MacOS 8.6-9.2	Win95/98/98SE/Me/2000Professinal/NT4.0/ XP (WIA)/MacOS 8.6-9.2
PCI Scanner (Parallel/Serial)	Parallel/ USB	Parallel/ USB
E-MAIL Scan Key	No	No
OCR Scan Key	No	No
Scan Key	Yes (Windows Only) + Scan-to-Image/OCR/ E-mail/Card	Yes(Windows Only)+scan-to-Image/ OCR/E-mail/Card/LAN
Color Depth	36bit-color processing (24bit external)	36bit-color processing (24bit external)
Pre Feeding	No	No
Consecutive feeding on ADF	Yes (Windows&Mac)	Yes (Windows&Mac)
MESSAGE CENTER/MESSAGE MANAGER		
ICM Recording Time	N/A	N/A
Page Memory	N/A	N/A
OGM (MC;MC Pro;Paging;F/T)	N/A	N/A
TAD Type	N/A	N/A
Memo/Recording Conversation	N/A	N/A
Fax Forwarding	Yes (B&W only)	Yes (B&W only)
Fax Retrieval	Yes (B&W only)	Yes (B&W only)
Paging	Yes	Yes
Remote Access	Yes	Yes
Toll Saver	N/A	N/A
MESSAGE CENTER Pro/MESSAGE MANAGER Pro		
Fax/Voice Mail Box	N/A	N/A
Fax/Voice on Demand	N/A	N/A
MESSAGE CENTER (PC MC)		
Fax Forwarding	N/A	N/A
Paging	N/A	N/A
ICM Recording Time	N/A	N/A
OGM MC;MC Pro;Paging	N/A	N/A
Fax/Voice Mail Box	N/A	N/A
Fax/Voice on Demand	N/A	N/A
VIDEO CAPTURE		
Video Capture	N/A	N/A
Video Print	N/A	N/A
Video Format	N/A	N/A
Video Fax	N/A	N/A
PHOTOCAPTURE CENTER		
Acceptable Media	Smart Media (3.3V) Compact Flash (Type-1/2) Memory Stick	Smart Media (3.3V) Compact Flash (Type-1/2) Memory Stick
Print	Yes(Color)	Yes(Color)
Media format	DPOF, Exif, DCF	DPOF, Exif, DCF
Image format	TIFF/JPEG/PDF (Scan-to-Card)	TIFF,JPEG,PDF(scan-to-card)
Color Enhancement	Yes	Yes
Media Drive	Yes (USB Only)	Yes (USB Only) Win98/98Se/ME/ 2000/XP/Mac9.0-10.1

Model Name	MFC-5200C	MFC-890
Network Specifications		
Standard/Option	Option	Option
Model Name	NC-8100h	NC-8100h
Support OS version	Win95/98/98SE/Me,WinNT4.0/2K	Win95/98/98SE/Me,WinNT4.0/ 2000Professional/XP
Support OS version	Novell NetWare 3.X,4.X,5.X	Novell NetWare 3.X,4.X,5.X
Network connection	Ethernet 10/100BASE-TX Auto Negotiation	Ethernet 10/100BASE-TX Auto Negotiation
Support Protocols	TCP/IP, IPX/SPX, AppleTalk, DLC/LLC	TCP/IP, IPX/SPX, AppleTalk, DLC/LLC
TCP/IP Protocols	RARP, BOOTP, DHCP, NetBIOS, WINS	RARP, BOOTP, DHCP, NetBIOS, WINS
TCP/IP Protocols	LPR/LPD, Port9100, SMTP/POP3	LPR/LPD, Port9100, SMTP/POP3
TCP/IP Protocols	SMB(NetBIOS/ IP), IPP, FTP	SMB(NetBIOS/ IP), IPP, FTP
TCP/IP Protocols	TELNET, SNMP, HTTP, TFTP	TELNET, SNMP, HTTP, TFTP
Network Management	BRAdmin Professional	BRAdmin Professional
Network Management	Web Based Management (Reading)	Web Based Management (Reading)
Network Management	MIB-II as well as Brother private MIB	MIB-II as well as Brother private MIB
Format (Scan to LAN)	JPEG/PDF/TIFF	JPEG/PDF/TIFF
BUNDLED SOFTWARE (For Windows)		
Printer Driver	Brother	Brother
TWAIN	Brother	Brother
Veiwer	Scan Soft	Scan Soft Paper Port 8.0 (Win95-XP)
PC Fax	Brother PC Fax (B&W Sending/Receiving) Win95/98/98SE/Me/2000Professinal/NT4.0/XP	Brother PC Fax (B&W Sending/Receiving) Win95/98/98SE/Me/2000Professinal/NT4.0/ XP(Microsoft PC-Fax)
Others	N/A	N/A
Formats(Import)	MAX/BMP/PCX/DCX/JPG/TIF/PNG/FPX	MAX/BMP/PCX/DCX/JPG/TIF/PNG/FPX
Formats(Export)	MAX/HTM/BMP/PCX/DCX/JPG/TIF/PNG/FPX	MAX/HTM/BMP/PCX/DCX/JPG/TIF/PNG/FPX
OCR	Yes(ScanSoft TextBridge)	Yes(ScanSoft TextBridge)
Pop Up Menu	Yes	Yes
Remote Setup	Yes	Yes
PC Diagnostics	Yes	Yes
BUNDLED SOFTWARE (For iMAC/iBook/G3/G4)		
Printer Driver	Brother	Brother
TWAIN	Brother	Brother Mac OS 8.6-9.2
Veiwer	Scan Soft (Mac OS8.6)	No
PC Fax	Brother PC Fax (B&W Sending) MacOS 8.5.1-9.2	Brother PC Fax (B&W Sending) MacOS 8.5.1-9.2
Others	No	No
Formats(Import)	-	-
Formats(Export)	-	-
OCR	MacOS 8.6	No
Pop Up Menu	No	No
Remote Setup	Yes(MacOS Xv.10.1)	Yse (OS Xv.10.1)
PC Diagnostics	No	No
ACCESSORY		
Cartridge	4 colors (each separate tank)	4 colors (each separate tank)
Life / Yield (Draft, 5% Coverage)	BK: 950, CL: 450	BK: 950, CL: 450
cable	No	No

CHAPTER 3

INSTALLATION

CHAPTER 3 INSTALLATION

CONTENTS

3.1 CONDITIONS REQUIRED FOR INSTALLATION

Any machine is likely to be influenced by the environment of the set-up location. If the machine is set-up in an inappropriate location, the machine may not perform as expected. Therefore, the following factors should be taken into consideration before deciding where to set-up the machine.

3.1.1 Environmental Conditions

The machine should not be set up in the locations referred to in the following items (a) through (d) which specify inappropriate locations for set-up.

(a) Where it is likely to receive direct sunlight or similar light. (For example, next to a window)

(b) Where it is likely to suffer a big difference in temperature and humidity between the maximum and minimum levels. (Normal operation environment is within 10 ˚C to 35 ˚C, 20 to 80%RH and without any condensation.)

(c) Where it is likely to be in a draft of cold air from an air-conditioner or warm air from a heater, or to receive direct radiant heat.

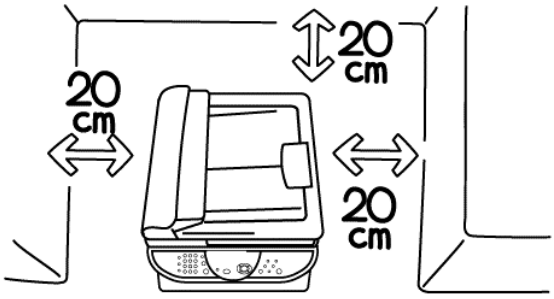
(d) Where it is likely to be excessively dusty or be subject to corrosive gases such as ammonia.

(e) Users should select a location with good ventilation and set the machine on a flat surface.

(f) Users should check that the maximum angle of the set-up location is horizontal to within 1 ˚ .

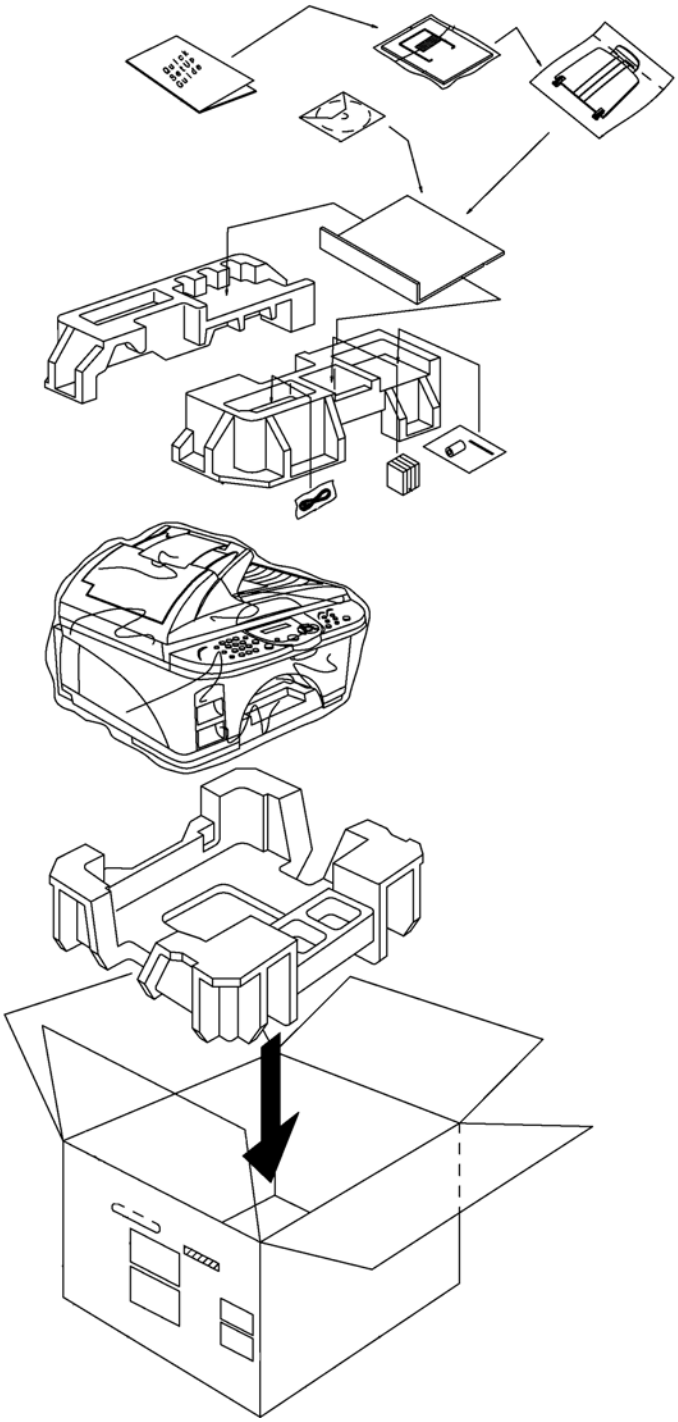
3.1.2 Basic Layout of machine Set-up Location

Shows the basic layout of the machine set-up location that is suitable for smooth.



3.2 UNPACKING THE MACHINE

The equipment consists of the following major components:

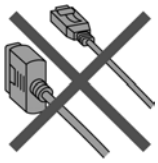


3.3 INSTALLATION WORK

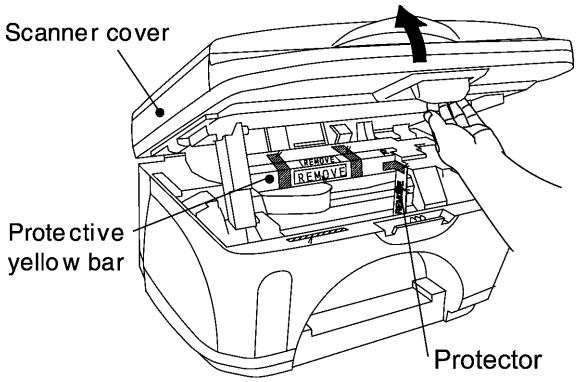
3.3.1 Removing the Protective Parts

Do NOT connect the interface cable.

Connecting the interface cable is done when installing the driver.

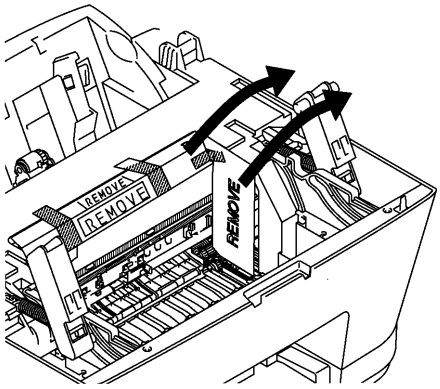


(1) Remove the protective seals.



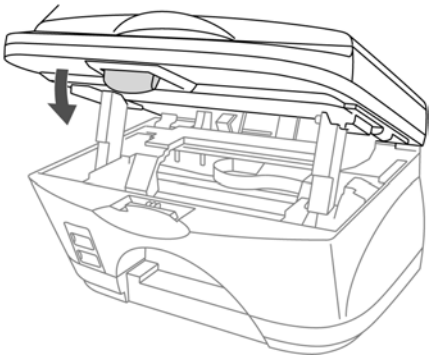
(2) Open the scanner cover by pulling the release lever towards you.

(3) Remove the protector and the protective yellow bar.



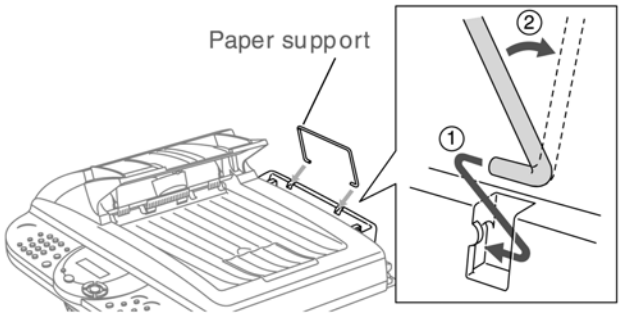
Do not throw away the protective yellow bar. You will need it in the future to transport the machine.

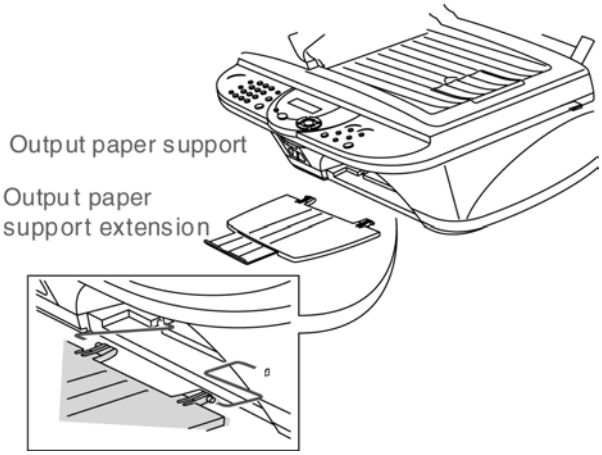
(4) Close the scanner cover.



3.3.2 Attaching the Paper Supports

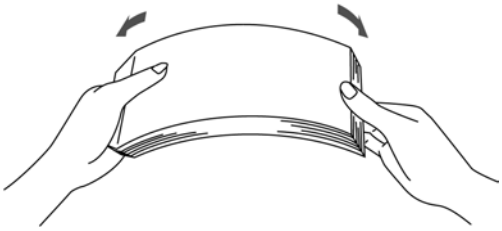
(1) Attach the paper support to the paper tray.





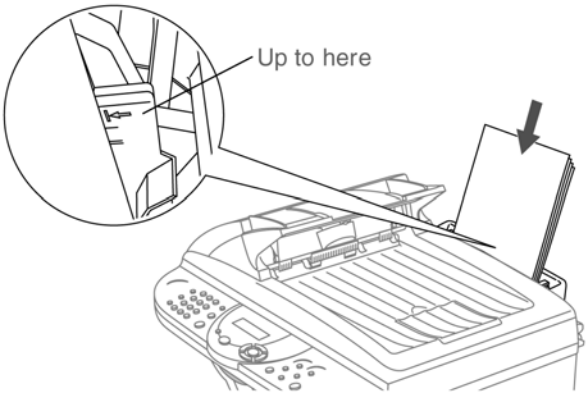
(2) Attach the output paper support to the paper output slot, and then pull out the extension.

3.3.3 Load Paper



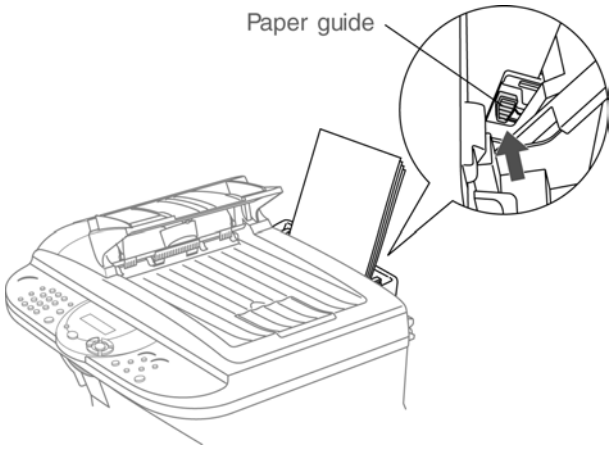
(1) Fan the stack of paper well to avoid paper jams and misfeeds.

(2) Gently insert the paper.



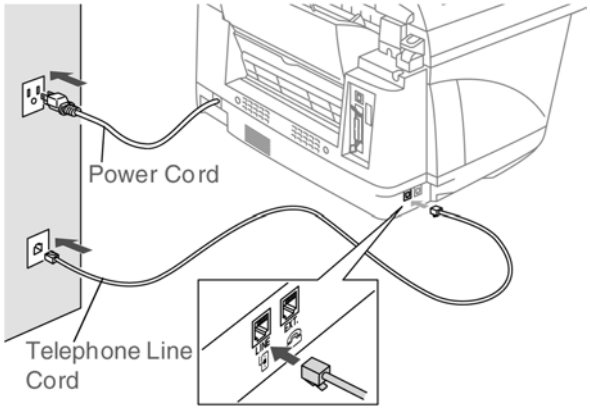
Make sure the print side is towards you and the paper is below the maximum paper mark.

(3) Press and slide the paper guide to fit the paper width.



3.3.4 Install Phone Line and Power Cord

(1) Connect the power cord.



(2) Connect one end of the telephone line cord to the jack on the machine marked **LINE** and the other end to a modular wall jack.

3.3.5 Installing the Ink Cartridges

⚠ WARNING

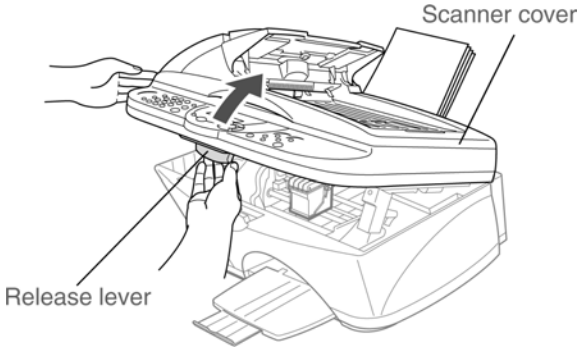
If ink gets in your eyes irrigate them with water immediately, and if irritation occurs consult a doctor.

(1) Make sure that the power is turned on.

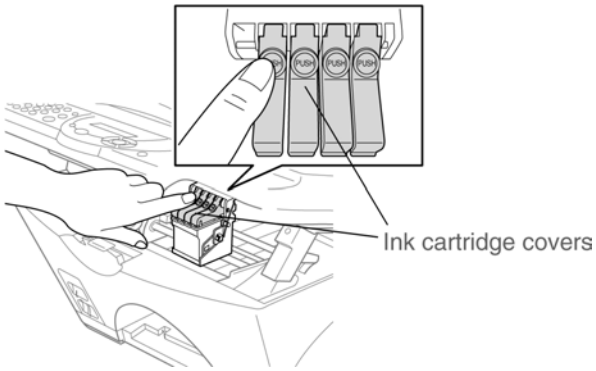
The LCD shows;

CHECK CARTRIDGE Open cover, then...

(2) Open the scanner cover by pulling the release lever towards you.

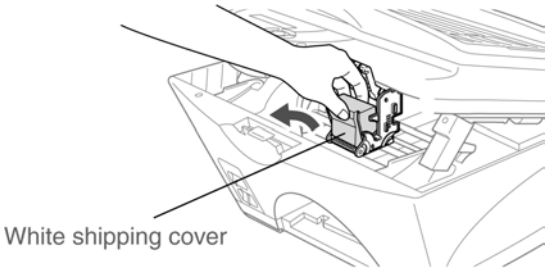


The print heads will move to the ink replacement position.



(3) Push the four colored ink cartridge covers one at a time so they pop up.

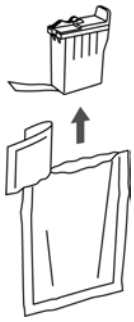
(4) Remove the white shipping cover by pulling it towards you.



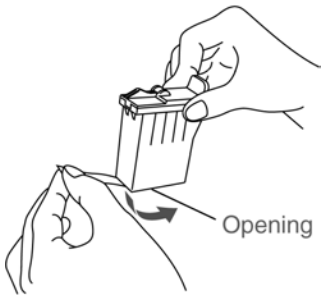
The bottom of the white shipping cover is wet with ink that will cause stains, so wipe it clean before you place it down.

Do not throw away the white shipping cover. You will need it when you transport the machine.

(5) Take out black ink cartridge.

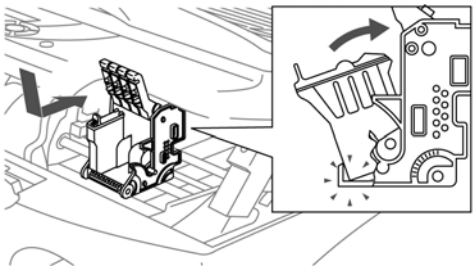


(6) Carefully remove the sealing tape from the bottom of the ink cartridge.



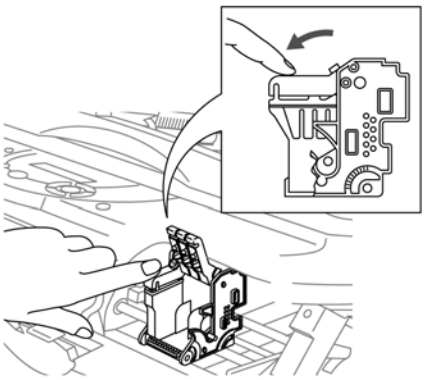
To prevent spilling ink and staining your hands and clothing, peel the sealing tape gently and slowly.

Do not touch the ink opening on the cartridge or removed tape.



(7) Gently insert the black ink cartridge in the black ink position.

(8) Press the cover down until it clicks.



(9) Repeat Steps 5 to 8 to install each color ink cartridge. Match the colors of the ink cartridge covers.

(10) Close the scanner cover. The MFC will enter a head cleaning cycle for approximately six minutes.

CLEANING PLEASE WAIT

- DO NOT remove ink cartridges if you do not need to replace them.

  If you do so, it may reduce the ink quantity and the MFC will not know the quantity of ink left in the cartridge.

- DO NOT shake the ink cartridges.

  If you do so, the ink may spill when you take off the sealing tape. If ink stains your body or clothing, wash with soap or detergent immediately.

- DO NOT refill the ink cartridges.

  Attempting to use refilled cartridges and using incompatible inks may cause damage to the print head in this machine and such damage will not be covered by warranty.

  Warranty coverage does not apply to problems caused by the use of 3rd party ink or 3rd party ink cartridges. Use only genuine Brother ink cartridges.

If you mix the colors by installing an ink cartridge in the wrong color position, you must clean the print head several times after correcting the cartridge installation and before you start printing.

Once you open an ink cartridge, install it in the machine and use it up within six months of installation. Use unopened ink cartridges by the expiration date written on the cartridge package.

If INK EMPTY shows on the LCD after you install the ink cartridges, check to make sure the ink cartridges are installed correctly.

3.3.6 Color Block Quality and Alignment Check

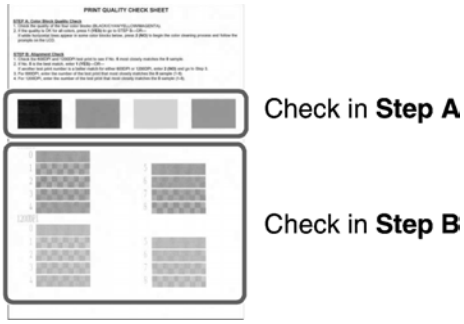
(1) After the cleaning cycle is finished, the LCD shows;

SET PAPER AND PRESS FAX START

(2) Make sure the paper is loaded in the paper tray.

Press the Fax Start key.

(3) The MFC starts printing the PRINT QUALITY CHECK SHEET (only during initial ink cartridge installation).



Step A: Color Block Quality Check

1. The LCD shows:

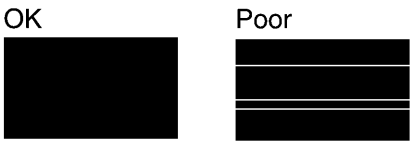
IS STEP "A"OK? 1. YES 2.NO

Check the quality of the four color blocks printed on the sheet. (BLACK/CYAN/YELLOW/ MAGENTA)

2. If the quality is OK for all colors, press the "1" key on the dial pad to go to **STEP B: Alignment Chec**k.

---OR---

If white horizontal lines appear in some of the color blocks, press the "2" key on the dial pad and go to 3.



3. The LCD asks you if the print quality is OK for each color. Press the "1" key or "2" key on the dial pad.

2 BLACK OK? 1.YES 2.NO

When you have finished selecting the "1" key (YES) or the "2" key (NO) for magenta, the LCD shows:

START CLEANING? 1.YES 2.NO

Press the "1" key (YES), and then machine starts cleaning the colors.

After cleaning is finished, press the **Fax**

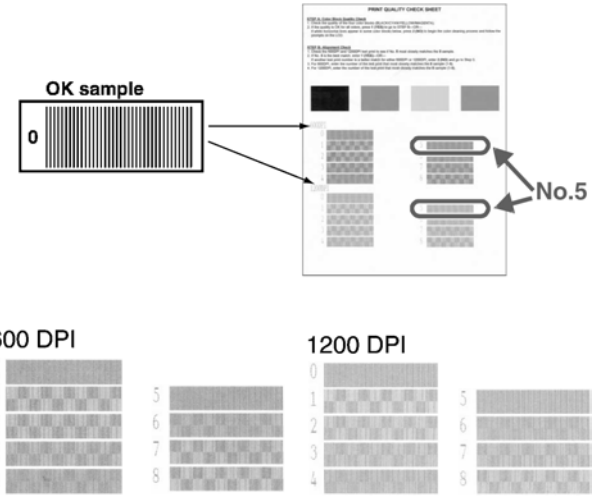
Start key. The machine starts printing PRINT QUALITY CHECK SHEET again and goes back to the first step of STAP A.

Step B: Alignment Check

The LCD shows:

IS STEP "B"OK? 1. YES 2.NO

Check the 600 DPI and 1200 DPI test print to see if **No.5** most closely matches the OK sample **(No.0**). Press the "1" key if **No.5** matches it.



If another test print number is a better match for either 600 DPI or 1200 DPI, press the "2" key to select NO and go to 2.

2. For 600 DPI, select the number from 1 to 8 that most closely matches the **No.0** sample and enter it using the dial pad.

600DPI ADJUST SELECT BEST #

3. For 1200 DPI, enter the number from 1 to 8 that most closely matches the **No.0** sample.

1200DPI ADJUST SELECT BEST #

The quality check is now complete.

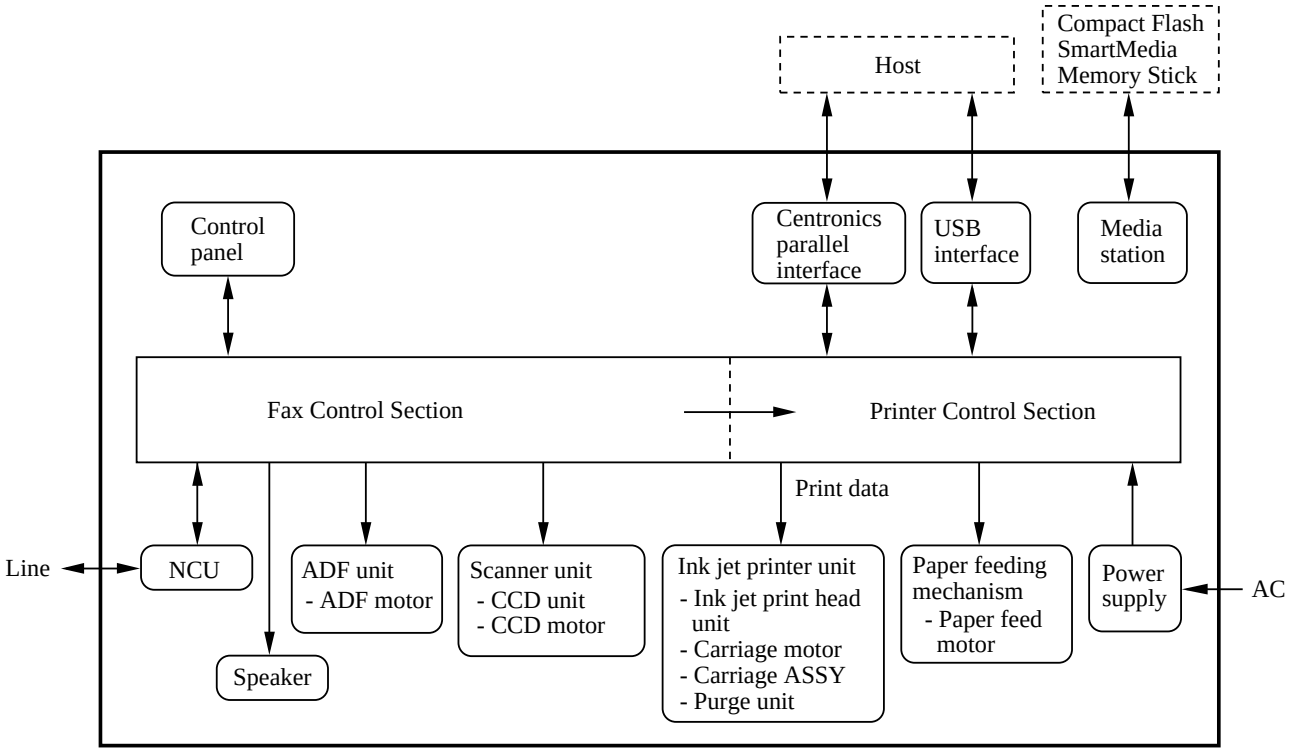
CHAPTER 4

THEORY OF OPERATION

CHAPTER 4 THEORY OF OPERATION

CONTENTS

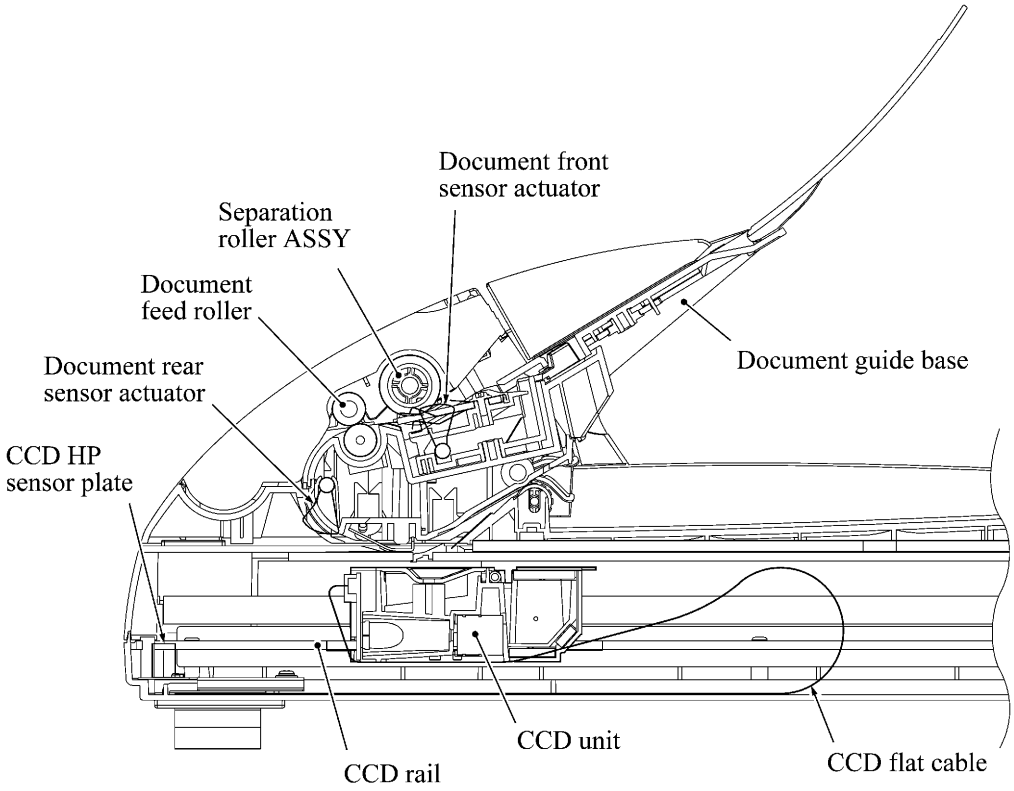
4.1 OVERVIEW


Host
Compact Flash
SmartMedia
Memory Stick
Control panel
Centronics parallel interface
USB interface
Media station
Fax Control Section
Printer Control Section
Print data
Line
NCU
ADF unit
- ADF motor
Scanner unit
- CCD unit
- CCD motor
Ink jet printer unit
- Ink jet print head unit
- Carriage motor
- Carriage ASSY
- Purge unit
Paper feeding mechanism
- Paper feed motor
Power supply
AC
Speaker

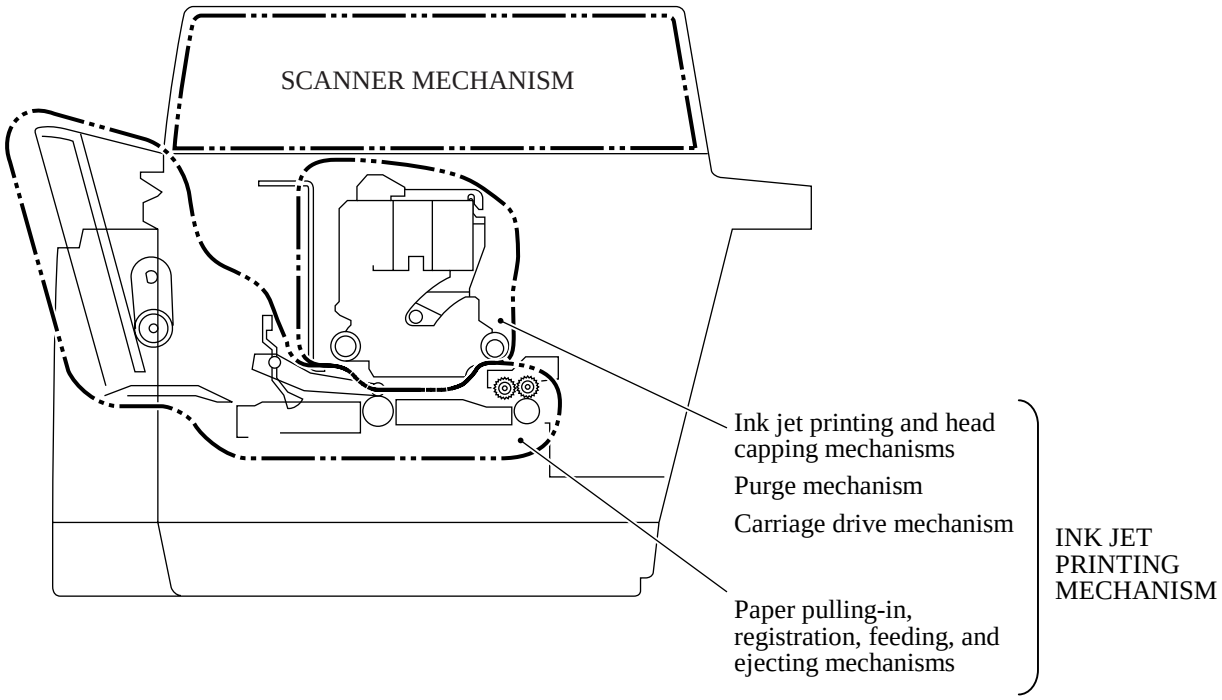
4.2 MECHANISMS

The facsimile machine is classified into the following mechanisms:

- SCANNER MECHANISM
  - ADF mechanism
  - Document scanning mechanism
- INK JET PRINTING MECHANISM
  - Paper pulling-in, registration, feeding, and ejecting mechanisms
  - Ink jet printing and head capping mechanisms
  - Purging mechanism
  - Carriage drive mechanism
- SENSORS AND ACTUATORS



SCANNER MECHANISM (Viewed from the front)



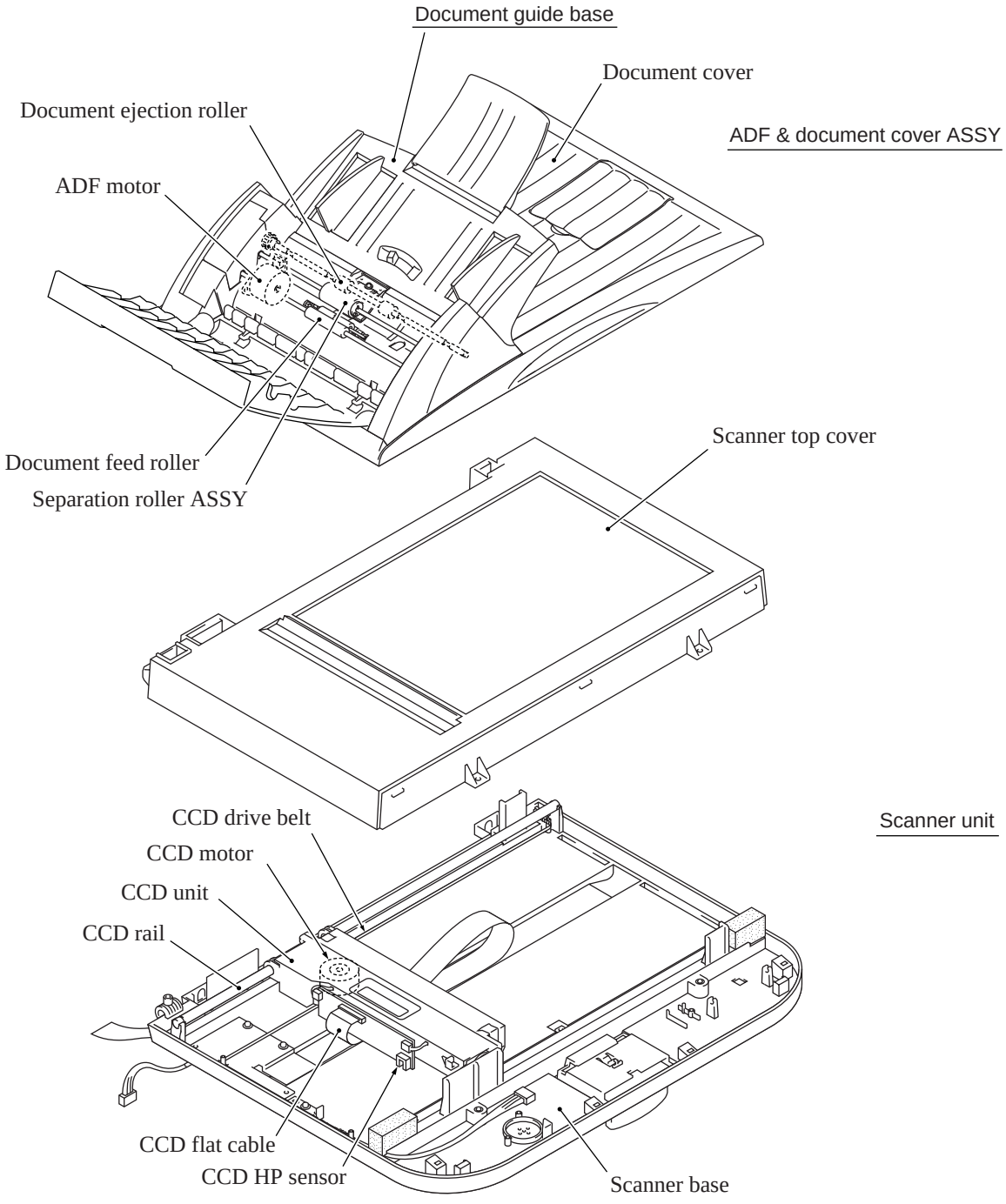
4.2.1 Scanner Mechanism

This mechanism consists of the document guide base, ADF & document cover ASSY and scanner unit.

The ADF (automatic document feeder) unit contains a separation roller ASSY, document feed roller ASSY, document ejection roller, ADF motor, and document front and rear sensors.

The scanner unit consists of a scanner top cover, CCD unit, CCD drive mechanism, CCD HP sensor, and scanner base.

For details about the sensors, refer to Subsection 4.2.3.



This scanner mechanism supports a dual scanning system.

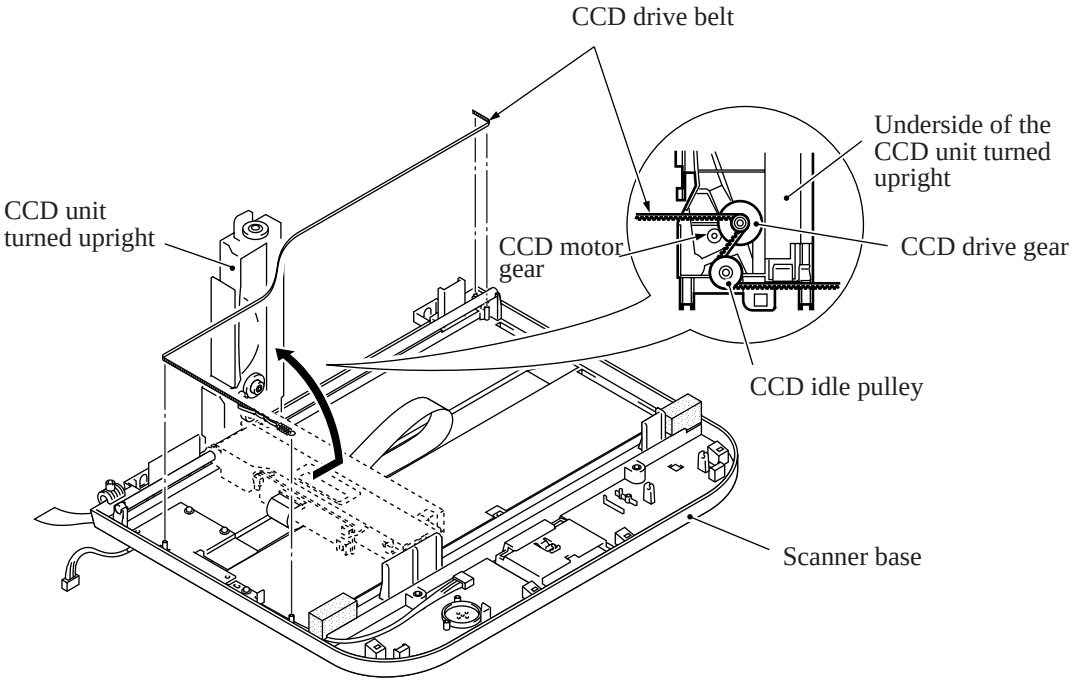
(1) If you set documents on the document guide base with their faces up and start the scanning operation, then the ADF motor rotates to pull in those documents into the ADF unit, starting from the top sheet to the bottom, page by page. Each document curves downwards and turns to the right with the document feed roller so as to advance above the CCD unit, and then it is fed out to the document cover with the document ejection roller ASSY.

    This way, documents move above the CCD unit being kept in a stationary position.

(2) If you open the ADF & document cover ASSY, put a sheet of document with its face down (or put a bound book opened) on the glass of the scanner top cover, close the ADF & document cover ASSY, and start the scanning operation, then the CCD drive mechanism will be driven.

    The CCD motor built in the CCD unit rotates. As illustrated below, the CCD drive gear and idle pulley carry the CCD drive belt on the underside of the CCD unit, so clockwise and counterclockwise rotations of the CCD motor move the CCD unit to the right and left, respectively.

    In this scanning system, the CCD unit moves horizontally beneath a document being kept in stationary position.



The CCD unit contains a charge coupled device (CCD) image sensor. The cold-cathode fluorescent lamp illuminates a document and the reflected light of the scanned image data is transmitted via the mirrors into the lens which reduces the scanned data so as to form the image on the CCD.

4.2.2 Ink Jet Printing Mechanism

4.2.2.1 Paper pulling-in, registration, feeding, and ejecting mechanisms

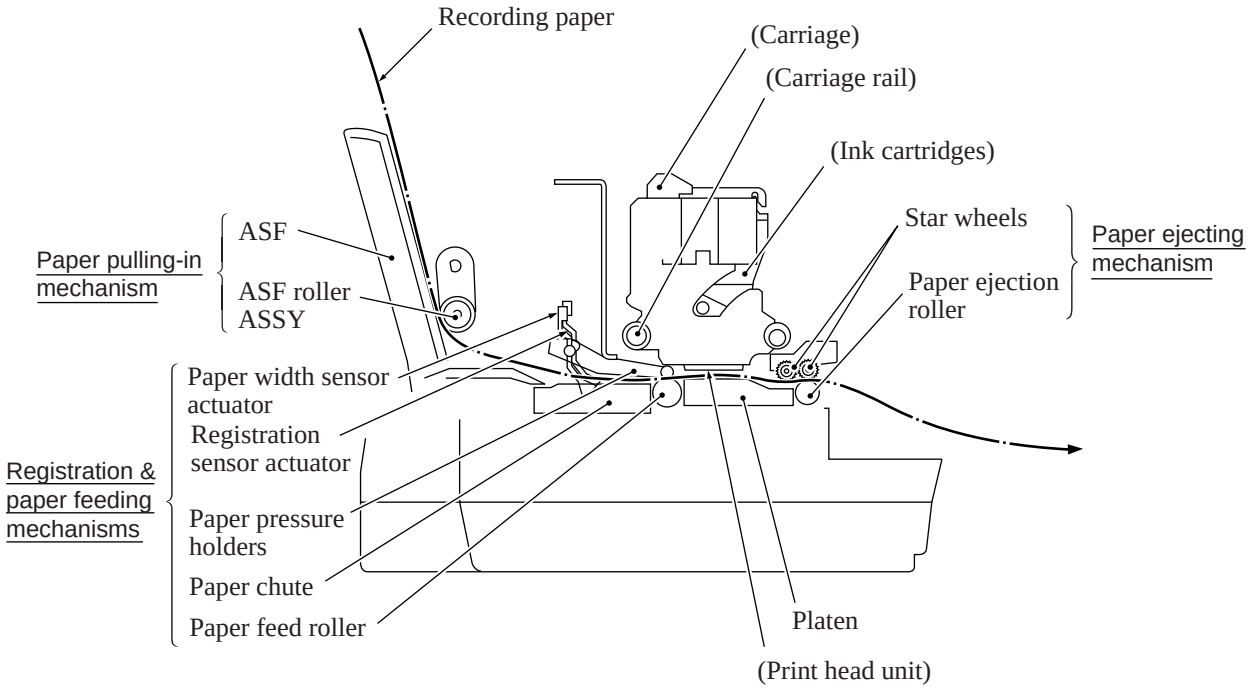
The paper pulling-in, registration, feeding, and ejecting mechanisms are driven by a single paper feed motor located at the left side of the main chassis via the two PF timing belts and gear train. (See the illustration given on the next page.)

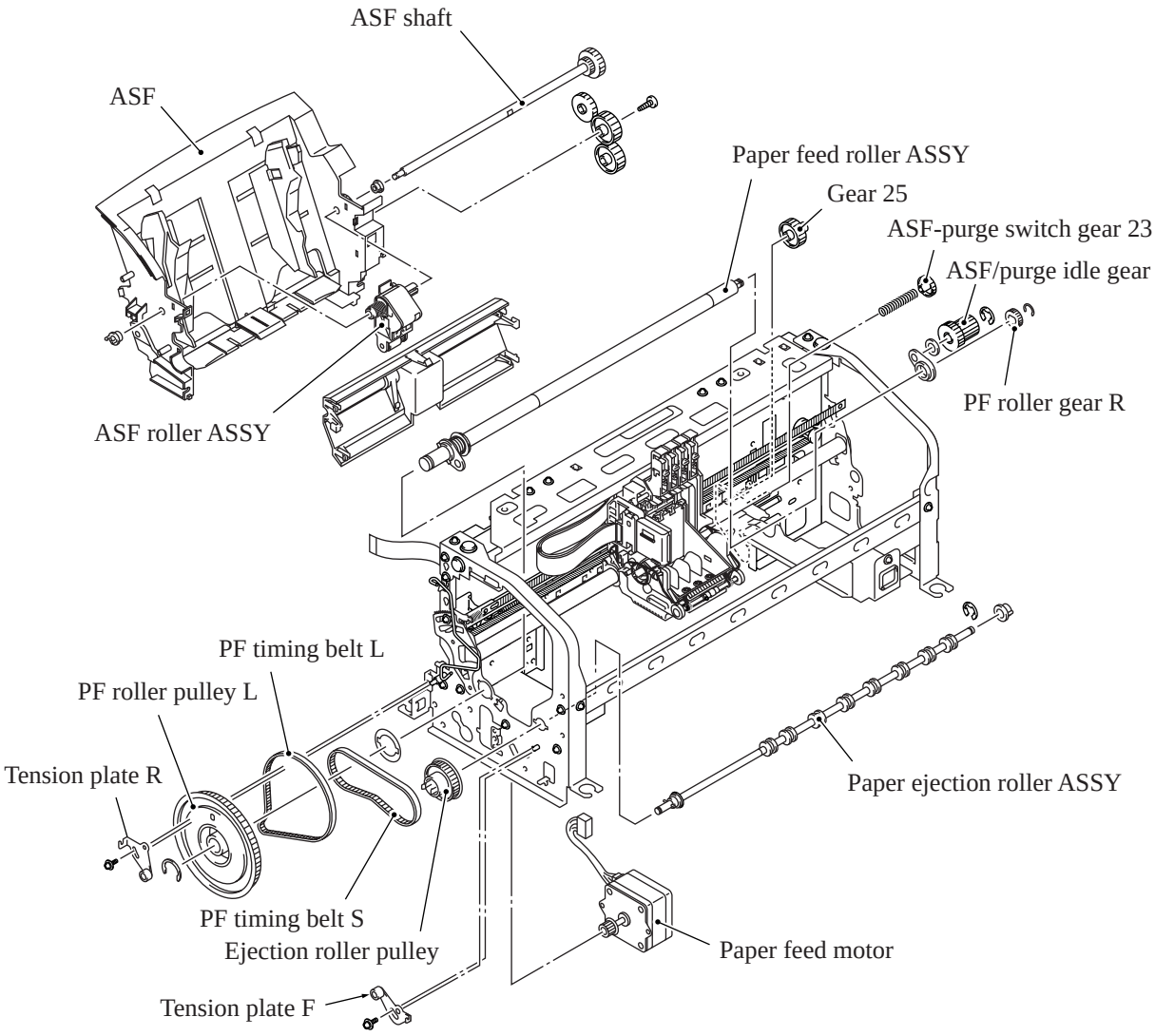
First, the paper feed motor rotates counterclockwise (when viewed from the output gear). The rotation is transmitted via the PF timing belt L to the PF roller pulley that rotates the paper feed roller. At the right end of the paper feed roller is the PF roller gear R which is always engaged with the ASF/purge idle gear. Engaged with the ASF/purge idle gear, the ASF-purge switching gear 23 transmits the rotation via gear 25 and ASF gear train to the ASF roller ASSY. This way, the ASF roller will pull in paper.

When the ASF roller is pulling in paper, the paper feed roller rotates in the backward direction to register the leading edge of the pulled-in paper.

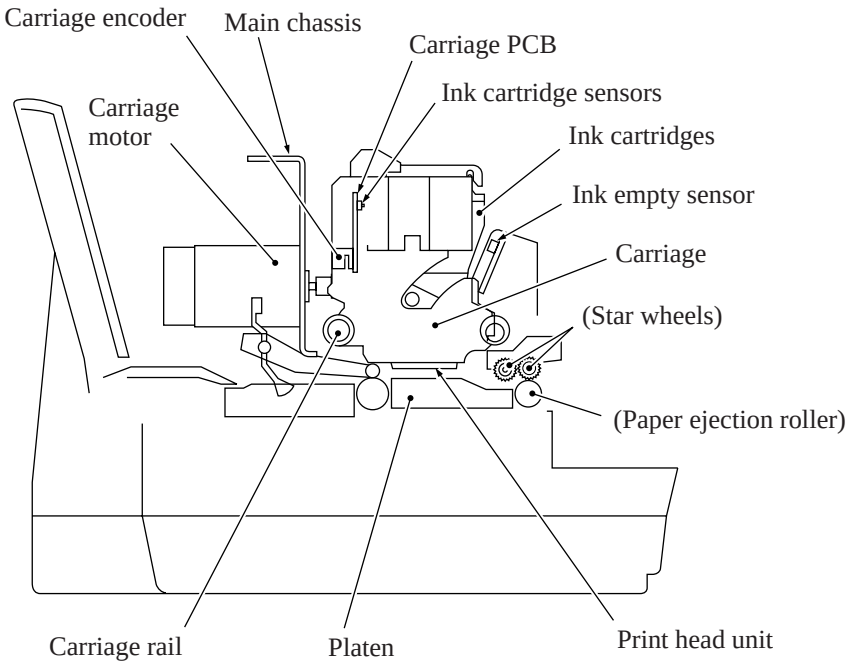
Next, the paper feed motor rotates clockwise to rotate the paper feed roller in the forward direction. The paper will advance through the paper path. During the paper feeding operation, no rotation is transmitted to the ASF roller because of the planetary gear system built in the ASF roller ASSY.

The above paper pulling-in and feeding operations take place when the carriage is in printing operation. If the carriage reaches the purge position, the ASF-purge switching gear 23 will be disengaged from the gear 25 and engaged with purge bevel gear A. For the purging mechanism, refer to Subsection 4.2.2.3.



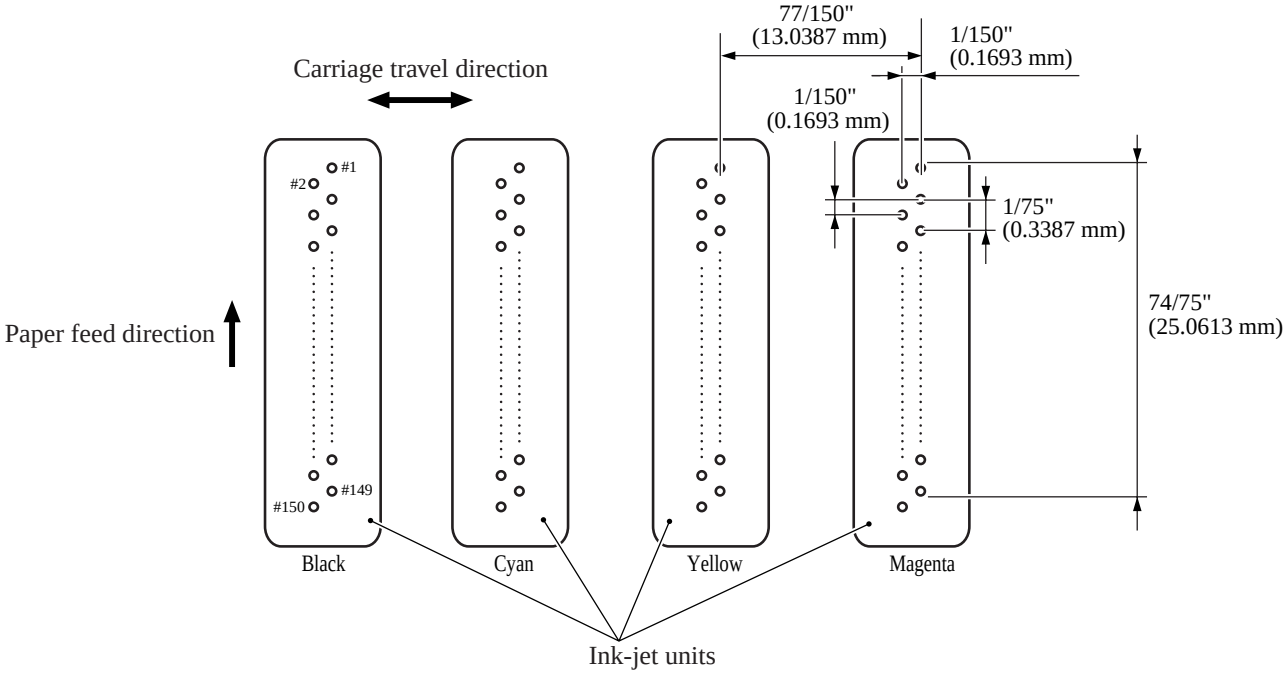

ASF shaft
ASF
Paper feed roller ASSY
Gear 25
ASF-purge switch gear 23
ASF/purge idle gear
PF roller gear R
ASF roller ASSY
PF timing belt L
PF roller pulley L
Tension plate R
Paper ejection roller ASSY
PF timing belt S
Ejection roller pulley
Paper feed motor
Tension plate F

4.2.2.2 Ink jet printing and capping mechanisms



(1) Print head unit

This machine uses drop-on-demand ink jet printing. The print head has four ink-jet units for four color inks. Each of those units consists of 150 nozzles, 150 channels covered with piezoelectric ceramic (PZT), a manifold, and filter. As illustrated below, the pair of nozzle columns is staggered.

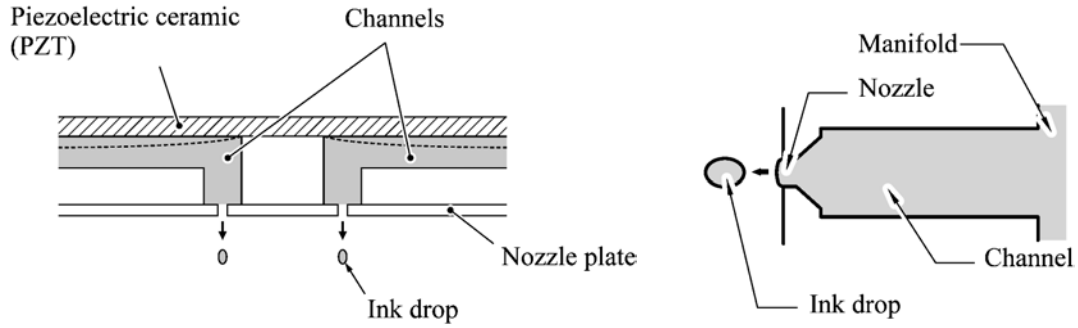


Nozzle Layout (viewed from the bottom)

If the controller issues a print command, a biased voltage will be applied to all electrodes formed on the surface of the piezoelectric ceramic so that each actuator will be distorted as shown with broken lines.

If the electrodes on a target channel are deenergized according to drive signals, then the associated piezoelectric ceramic actuator returns to the previous form so that the ink in the manifold will be vacuumed out to the channel.

If the voltage is applied again, the piezoelectric ceramic actuator will be distorted again to apply pressure to the ink in the channel, causing the ink to jet out through the nozzle. The jetted-out ink drop will be splashed and produce a dot on paper held by the platen.

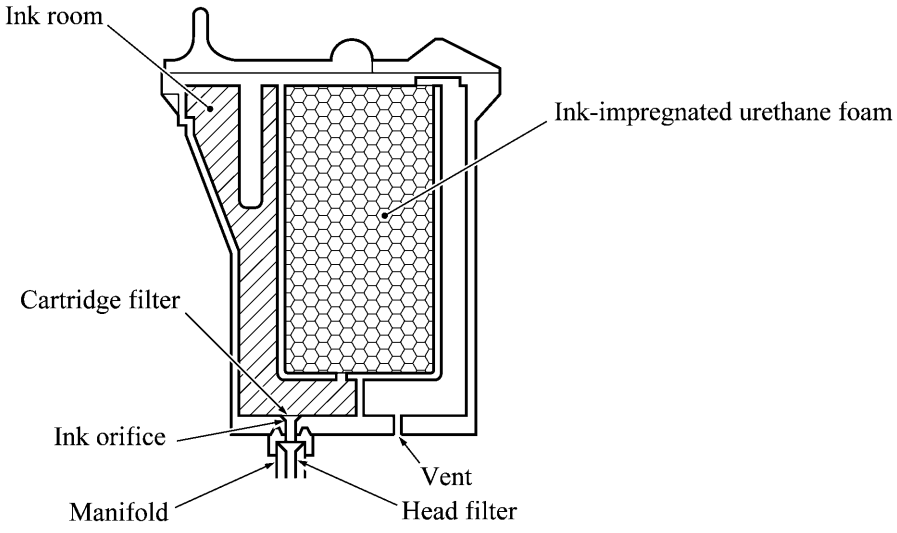


As the carriage holding the print head unit travels at the printing speed, the controller sends print command pulses to the piezoelectric actuator driver circuit embedded in the print head unit.

(2) Ink cartridges

The machine uses four ink cartridges (black, cyan, yellow, and magenta) of disposable type to supply ink to the print head unit. As shown below, an ink cartridge contains an ink-impregnated urethane foam. If ink-jet print operation or purging operation takes place, ink comes out of the urethane foam and is supplied to the print head unit through the ink room, filters, and manifold.

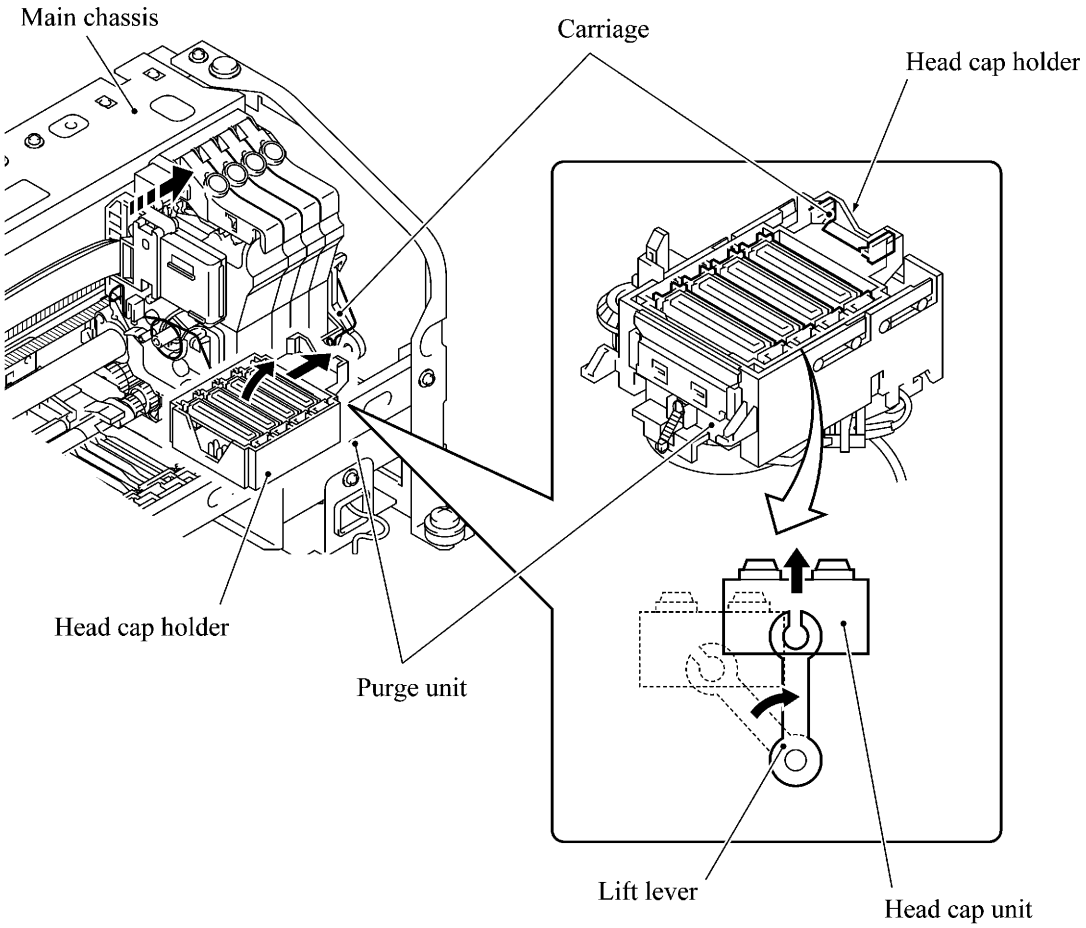
For the ink cartridge sensors on the carriage PCB, refer to Subsection 4.2.3.



(3) Head caps

Shown below is a head cap mechanism that prevents the nozzles of the print heads from drying up when they are not in use.

Upon completion of printing, the carriage travels to the right and moves the head cap holder provided on the purge unit to the right together. In the head cap holder is a head cap unit which is supported with a lift lever. The rightward movement of the head cap holder turns the lift lever and pushes up the head cap unit to the position where the head caps come into tight contact with the print heads. This way, the nozzles will be capped.



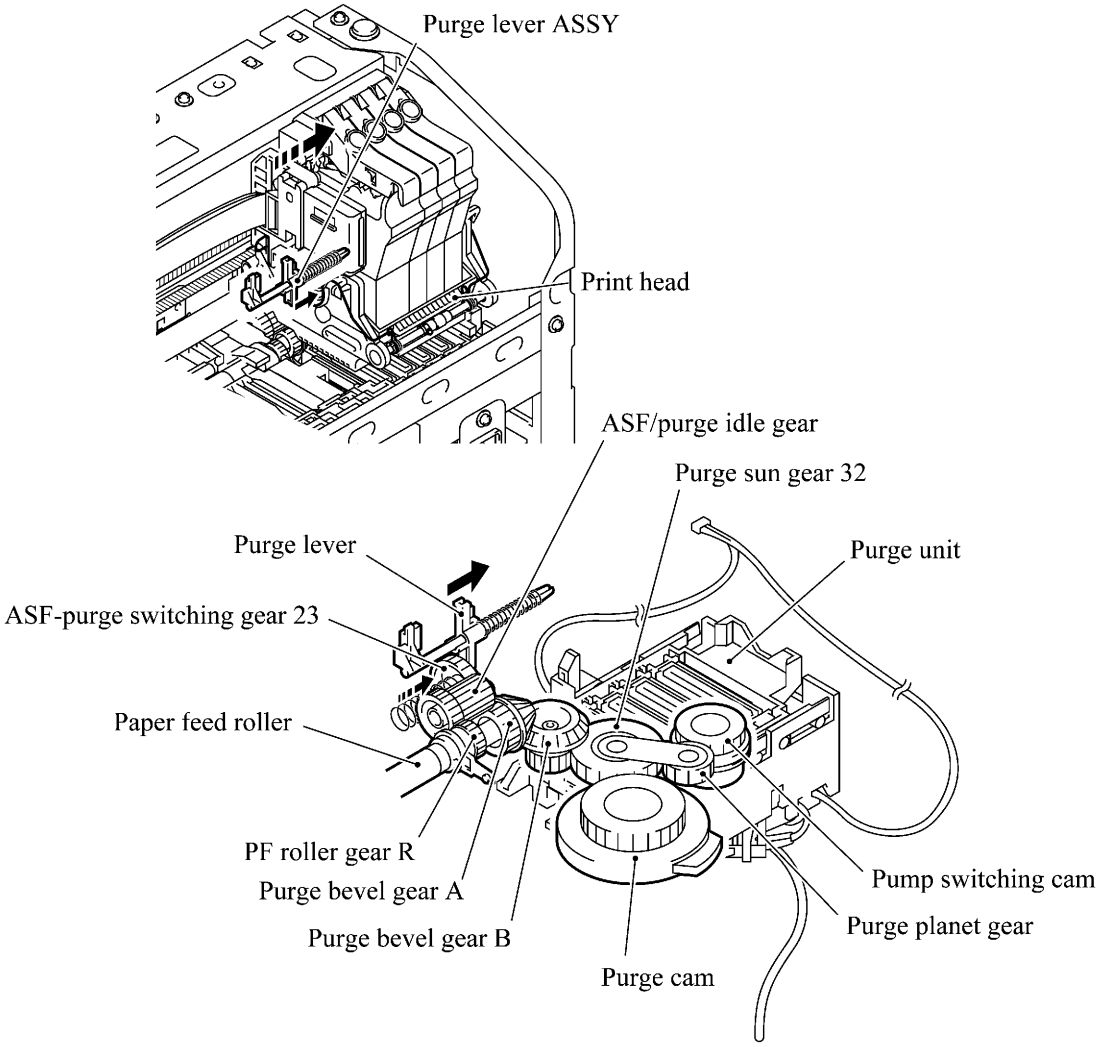
4.2.2.3 Purging mechanism

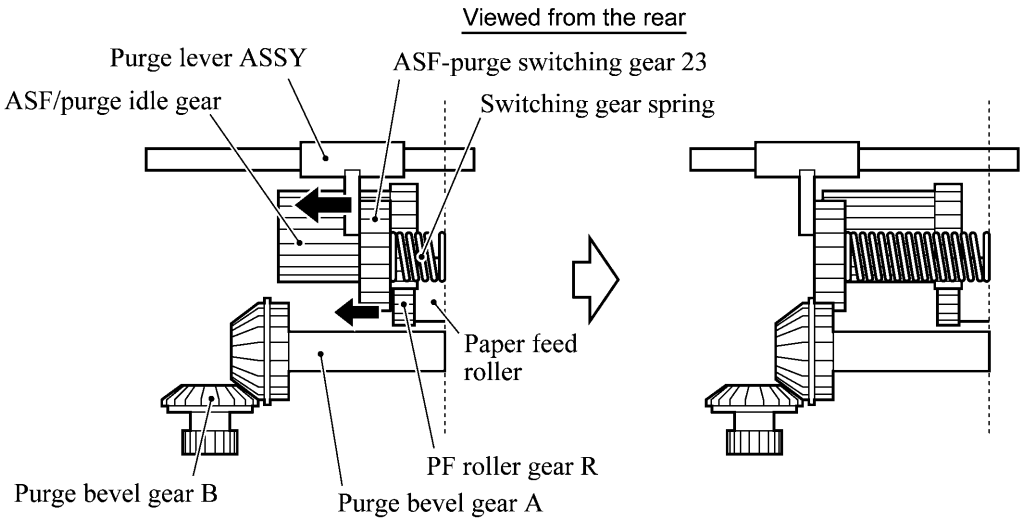
The purge mechanism is driven by the paper feed motor located at the left side of the main chassis.

As described in Subsection 4.2.2.1, the motor rotation is transmitted to the ASF/purge idle gear at the right side of the main chassis. Engaged with the ASF/purge idle gear, the ASF-purge switching gear 23 works as a clutch gear.

When the carriage travels from the left to right to reach the purge position, the tab provided on the back of the carriage pushes the purge lever on the main chassis to the right (see the illustration below). Accordingly, the ASF-purge switching gear 23 (which was shifted to the left by the purge lever) will move to the right by the switching gear spring so as to become disengaged from the gear 25 and engaged with the purge bevel gear A. (See the illustration given on the next page.) This engagement will transmit the motor rotation to the purge bevel gear B on the purge unit. This way, when the carriage is in the purge position, the motor rotation is transmitted to the purge unit.

On the contrary, if the carriage travels from the purge position to the left, the tab on the back of the carriage releases the purge lever which will be pulled back to the left. The ASF-purge switching gear 23 will be disengaged from the purge bevel gear A.

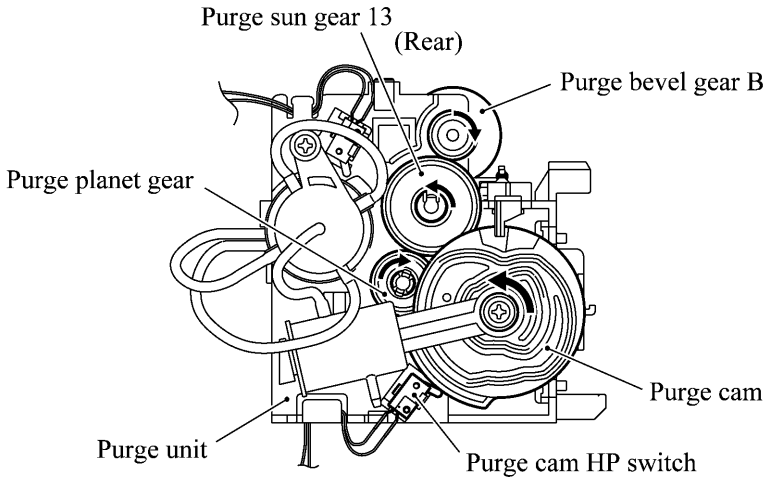




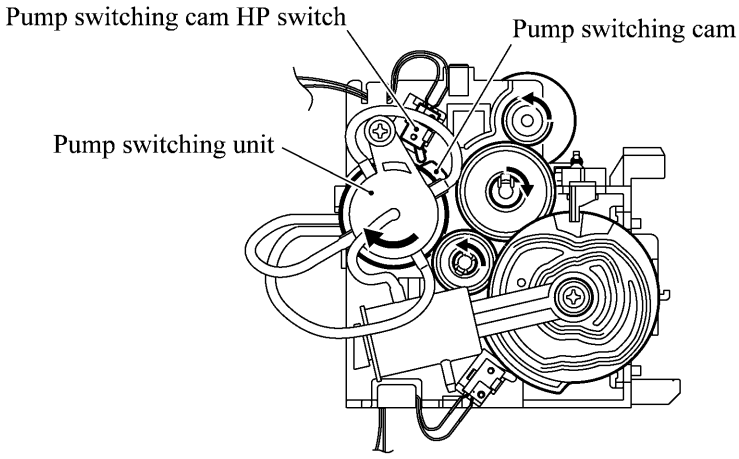
During printing: The ASF-purge switching gear 23 is not engaged with purge bevel gear A (but engaged with gear 25 in the ASF gear train).

During purging: The ASF-purge switching gear 23 is engaged with purge bevel gear A.

When the motor rotation is transmitted to the purge unit, its counterclockwise rotation will drive the purge cam and its clockwise rotation, the pump switching unit (when viewed from the output gear of the motor).



When the paper feed motor rotates counterclockwise



When the paper feed motor rotates clockwise

The purge cam is so designed that:

- the carriage lock pops out to lock the carriage before purging and pops in before cleaning with the head wiper (see the illustration below),
- the pump works to draw out ink from each of the four head nozzles and drain it to the ink absorber felts, and
- the head wiper comes out to clean the nozzle surface (see the illustration below).

The pump switching cam is so designed that:

- the pump switching unit switches application of the pump's negative pressure between the four head nozzles in the order of black, cyan, yellow, and magenta nozzles. When the pump switching cam is in the home position, normal atmospheric pressure will be restored.

The home position of the purge cam and pump switching cam are detected by their HP switches. For those switches, refer to Subsection 4.2.3.

(1) Carriage lock

If the purge cam is driven, the carriage lock of the purge unit pops out and locks the carriage to align ink-jet units with the mating head caps during purge operation. After purging but before cleaning with the head wiper, it pops in to release the carriage. When the power is off, the carriage lock keeps the print heads pressed against the head caps.

(2) Purging

If activated, the pump draws out ink to purge air bubbles or dust from the inside of the head nozzles and channels. As the purge cam rotates by one turn, the piston of the pump reciprocates two strokes. To complete purging of all four nozzles and channels, the purge cam rotates by two turns ad the piston reciprocates four strokes.

(3) Draining

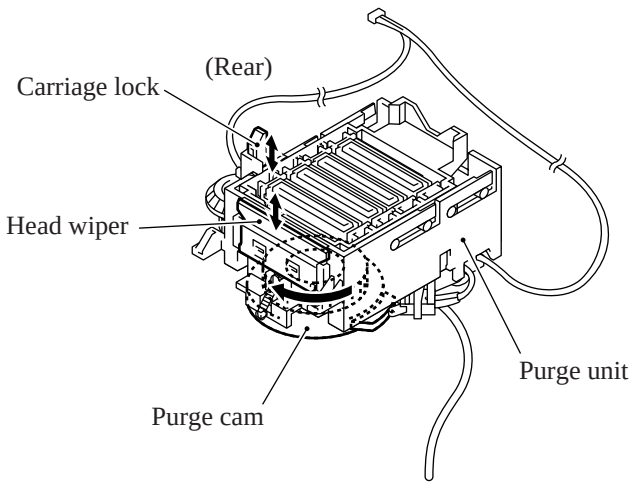
The pump drains drawn ink into the ink absorber felts.

(4) Cleaning with the head wiper

After purging operation, the head wiper comes out and the carriage moves from the right to left so as to clean ink remaining on the heads' surface.

(5) Restoring the pump's pressure to normal atmospheric pressure

When the pump switching cam is in the home position, the controller stops to produce negative pressure and restore the pump's pressure to normal atmospheric pressure.

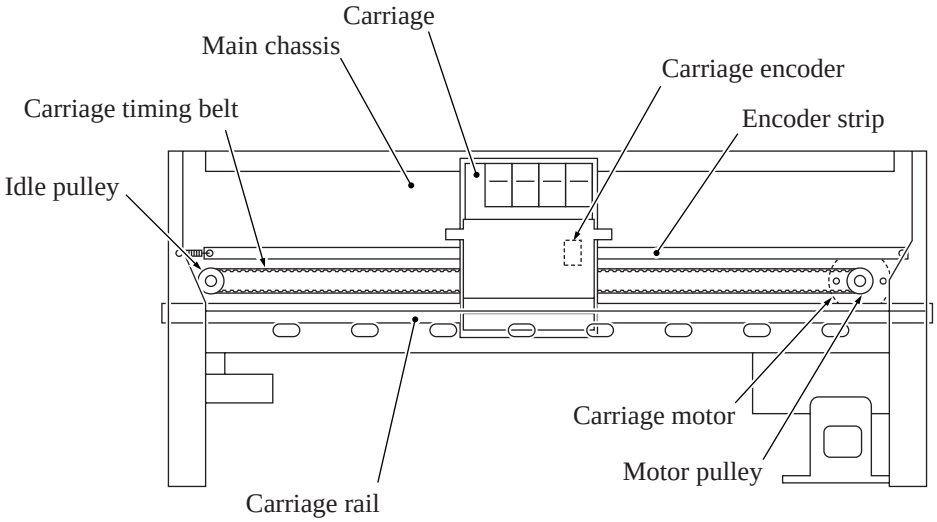


4.2.2.4 Carriage drive mechanism

The carriage motor controls horizontal motion. The motor rotation is transmitted via the motor pulley to the carriage timing belt.

The carriage, which is supported and guided by the carriage rail, is secured to the timing belt. Clockwise and counterclockwise rotations of the carriage motor move the carriage to the right and left, respectively.

On the back of the carriage is the carriage encoder which tells the control circuitry the current carriage position counted based on the carriage motor position by using the encoder strip attached to the main chassis.



4.2.3 Sensors and Actuators

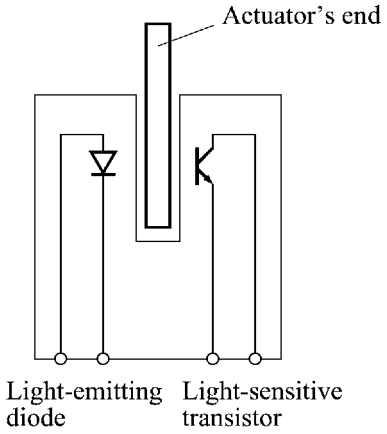
This machine has the following sensors and thermister.

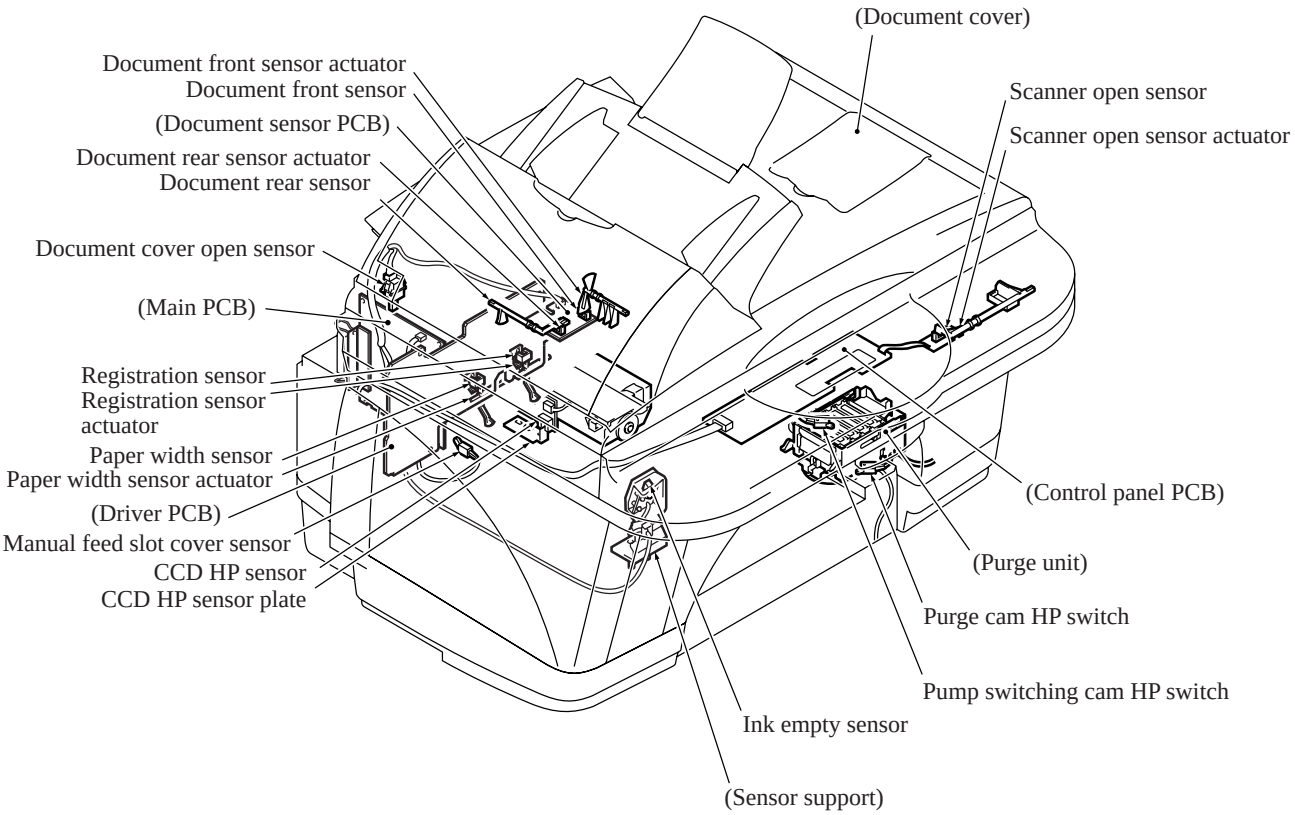
Sensor name	Type	Located on
Document front sensor	Photosensor	Document sensor PCB in the ADF
Document rear sensor	Photosensor	
Document cover open sensor	Mechanical switch	Document cover
Scanner open sensor	Photosensor	Control panel PCB ASSY
Registration sensor	Photosensor	Driver PCB
Paper width sensor	Photosensor	Driver PCB
Manual feed slot cover sensor	Mechanical switch	ASF
CCD HP sensor	Photosensor	CCD PCB on the CCD unit
Ink empty sensor	Photosensor	Sensor support
Ink cartridge sensors	Mechanical switches	Carriage PCB
Carriage encoder	Photosensor	
Head thermister	Thermister	
Purge cam HP switch	Mechanical switch	Purge unit
Pump switching cam HP switch	Mechanical switch	

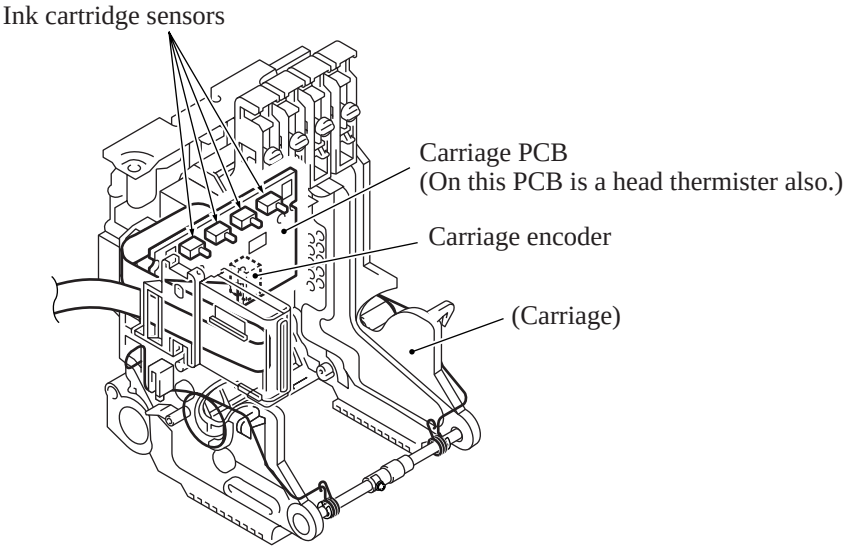
- Document front sensor which detects the presence of documents.
- Document rear sensor which detects the leading and trailing edges of pages to tell the control circuitry when the leading edge of a new page has reached the starting position and when the scan for that page is over.
- Document cover open sensor which detects whether the document cover is closed.
- Scanner open sensor which detects whether the scanner unit is closed.
- Registration sensor which detects the leading and trailing edges of paper, which allows the controller to determine the registration timing and check paper jam.
- Paper width sensor which detects whether the paper width is "A4-size or wider" or "narrower than A4-size."
- Manual feed slot cover sensor which detects whether the manual feed slot cover is closed.
- CCD HP sensor which detects whether the CCD unit is placed in the home position.
- Ink empty sensor which detects at the start of printing whether any of the four ink cartridges is near empty. According to this sensor signal, the controller may display "NEAR EMPTY XXX" message.
- Ink cartridge sensors, each of which detects whether an ink cartridge is loaded.
- Carriage encoder which detects the current carriage position and carriage travel speed. If the carriage travels speed varies abnormally, the controller regards it as a paper jam.

- Head thermister which allows the controller to control the temperature of the print heads. According to the change of the thermister's internal resistance monitored, the control circuitry regulates the drive voltage applied to the piezoelectric ceramic actuators on each print head since the viscosity of the ink varies depending upon the temperature.
- Purge cam HP switch which detects whether the purge cam is in the home position.
- Pump switching cam HP switch which detects whether the pump switching cam is in the home position.

These photosensors (except the ink empty sensor that is a reflection type) are a photointerrupter consisting of a light-emitting diode and a light-sensitive transistor. Each of them has an actuator separately arranged as shown on the next page.





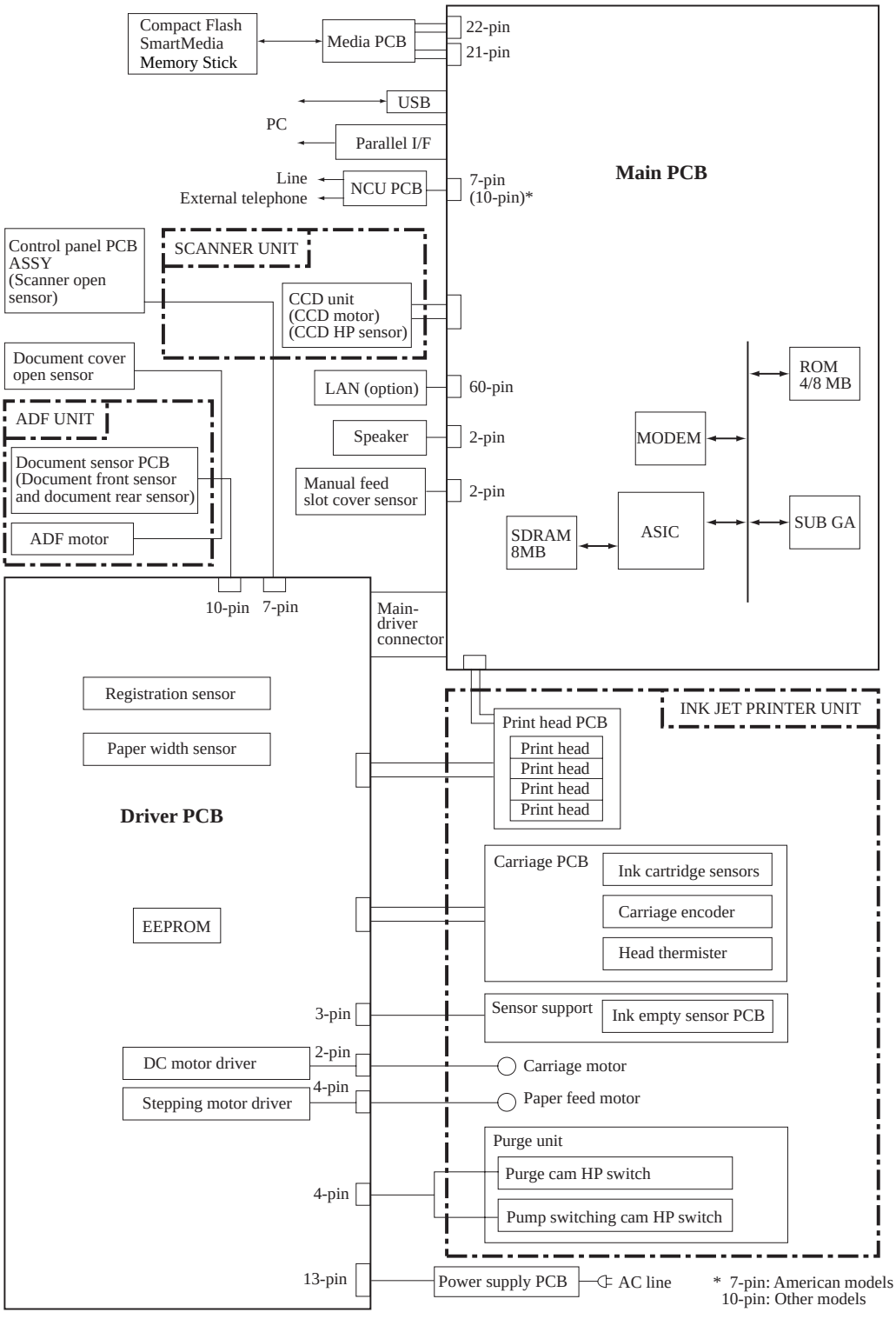


Location of Sensors and Actuators

4.3 CONTROL ELECTRONICS

4.3.1 Configuration

The hardware configuration of the facsimile machine is shown below. The wiring diagram is given in Appendix 6.



Configuration of Facsimile Machine

CHAPTER 5

MAINTENANCE

CHAPTER 5 MAINTENANCE

CONTENTS

5.1 CLEANING

5.1.1 Cleaning the purge unit

(1) Unplug the machine's power cord from the wall socket.

(2) Plug the power cord again. When you hear the carriage moving out of the home position for initialization, then unplug the power cord again. The carriage will stop at the middle of the travel.

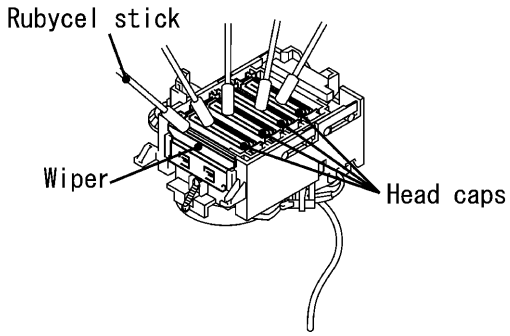
(3) Open the scanner unit.

(4) Clean the four head caps and wiper of the purge unit with a "Rubycel" stick that is a head cleaner stick provided as a spare part.

NOTE: Do not use a cotton swab that may leave lint on the cleaned sections. Lint left on the purge unit will affect the print performance.

NOTE: Use a new Rubycel stick and do not use the used one for any other purge units.

NOTE: During the cleaning jobs, take care not to touch the head caps or wiper directly by hand or scratch their surfaces. Do not remove them from the head cap holder.



5.1.2 Cleaning the print head unit

(1) Remove the print head unit from the carriage.

(2) Soak a Rubycel stick in "Glycerol cleaner."

(3) Clean the printing surface of the print head unit by rolling the Rubycel stick lightly on the printing surface.

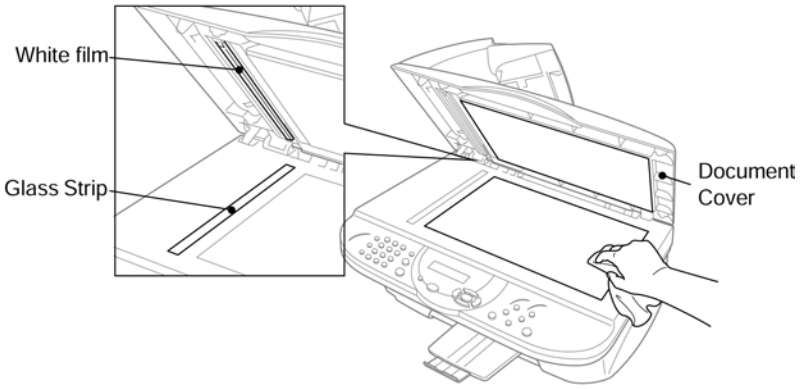
NOTE: Do not use a cotton swab that may leave lint on the cleaned sections. Lint left on the purge unit will affect the print performance.

NOTE: Use a new Rubycel stick and do not use the used one for any other print heads.

NOTE: During the cleaning jobs, take care not to scratch the surface of the print head.

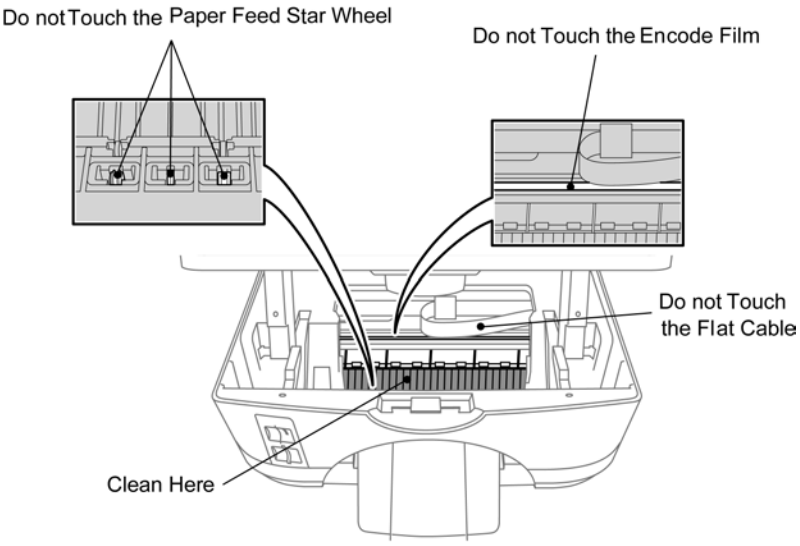
5.1.3 Cleaning the scanner glass

Unplug the machine and lift the document cover. Open the document cover. Clean the scanner glass, the glass strip under the film and the white film with isopropyl alcohol on a soft lint-free cloth.



5.1.4 Cleaning the printer platen

Unplug the machine from the AC power outlet before cleaning the printer platen.



Clean your machine printer platen, wipe it with a soft lint free cloth that is dry.

5.2 REPLACING THE INK CARTRIDGE

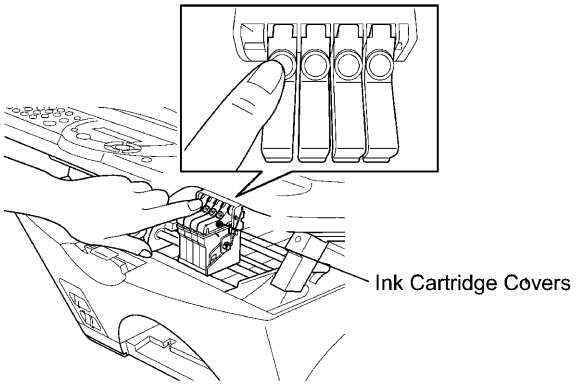
Your machine is equipped with an optical sensor that automatically monitors the ink level in each color cartridge. When the sensor detects an ink cartridge is running out of ink, the machine will notify you with a message on the LCD.

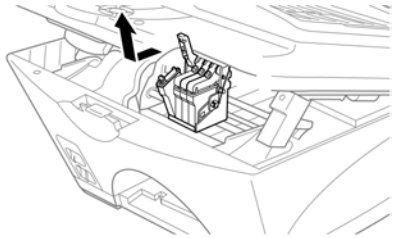
The LCD shows you which color cartridges are low or empty. Be sure to follow the LCD prompts so you replace the color cartridges in the appropriate order.

When the ink cartridges are running low, you must use the Ink key to begin the cartridge replacement (Steps 1 to 3). If the ink is empty, skip to Step 4.

1. Press Ink key.
2. Press ◄ or ► to choose "2.REPLACE INK".
3. Press Menu/Set key.

   If one or more ink cartridges are empty, for example Black, the LCD shows "INK EMPTY BLACK" and "PLS OPEN COVER".
4. Pull the Scanner cover release lever and lift the Scanner cover.
5. Press the appropriate colored ink cartridge cover to open it, and then remove the ink cartridge.





6. Open the new ink cartridge bag for the color shown on the LCD, and then take out the ink cartridge.
7. Hold the new ink cartridge as shown in the illustration, and then peel the sealing tape from the side of the ink cartridge. Carefully peel the tape in the direction away from you.

   To prevent spilling ink and staining your hands and clothing, remove the sealing tape gently.

8. Each color has its own correct position. Insert the new ink cartridge into its carriage, and then close the ink cartridge cover by pressing until it clicks.

9. After installing the ink cartridges, close the Scanner cover. Your machine prepares for a "head cleaning" and goes online. The LCD prompts you to verify a new ink cartridge was inserted for each color you removed.

   Example: "DID YOU CHANGE BLCK? 1.YES 2.NO". If the ink cartridge you installed is not a brand new one, please make sure to select 2.

10. For each new cartridge, press 1 on the dial pad to reset the ink dot counter for that color automatically.

    The machine will enter a cleaning cycle for approximately 3 minutes for each replaced cartridge. The LCD alternately shows CLEANING and PLEASE WAIT.

    When the machine completes the cleaning cycle, the LCD returns to Standby mode (date and time).

CHAPTER 6

DISASSEMBLY/REASSEMBLY, LUBRICATION, AND ADJUSTMENT

CHAPTER 6 DISASSEMBLY/REASSEMBLY, LUBRICATION, ADJUSTMENT

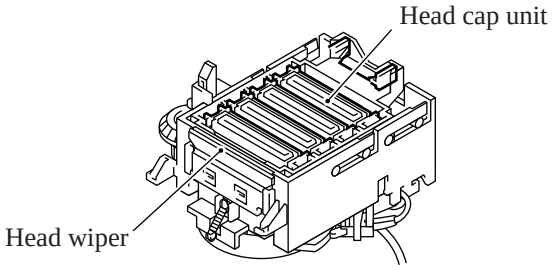
CONTENTS

6.1 DISASSEMBLY/REASSEMBLY

■ Safety Precautions

To prevent the creation of secondary problems by mishandling, observe the following precautions for maintenance work.

(1) If you unpack the package sent from the user, first check that the top edge of the head wiper is flush with that of the head cap unit before turning on the machine. If the head wiper protrudes or is out of place, lightly pull up the head wiper and move it towards the head cap unit to retract it.



(2) Unplug the power cord from the power outlet before replacing parts or units. When having access to the power supply, be sure to unplug the power cord from the power outlet.

(3) Be careful not to lose screws, washers, or other parts removed for parts replacement.

(4) Do not remove gears from the document feed roller ASSY (shown on page 6-14) or document ejection roller ASSY (shown on page 6-19) if at all possible. Once removed, they will become unusable and new gears will have to be put back in.

(5) When using soldering irons and other heat-generating tools, take care not to damage the resin parts such as wires, PCBs, and covers.

(6) Before handling the PCBs, touch a metal portion of the machine to discharge static electricity; otherwise, the electronic parts may be damaged due to the electricity charged in your body.

(7) When transporting PCBs, be sure to wrap them in conductive sheets such as aluminum foil.

(8) Be sure to reinsert self-tapping screws correctly, if removed.

(9) Tighten screws to the torque values listed on the following pages.

(10) When connecting or disconnecting cable connectors, hold the connector bodies not the cables. If the connector has a lock, always slide the connector lock to unlock it.

(11) Before reassembly, apply the specified lubricant to the specified points. (Refer to Subsection 6.2 in this chapter.)

(12) After repairs, check not only the repaired portion but also that the connectors and other related portions function properly before operation checks.

(13) Once the print head unit prints, it will start head locking operation after five seconds from the end of printing. The head locking operation will take 5 to 10 seconds. NEVER unplug the power cord before the machine completes the head locking operation; doing so will make the print head unit unusable and require replacement with a new print head unit.

When you receive the machine from the user or when you pack it for sending it back to the user, check the head locking state.

Tightening Torque List

Location	Screw type	Q'ty	Tightening torque N•m (kgf•cm)
ADF thickness adjuster	Taptite, pan B M3x6	1	0.39 ±0.10 (4 ±1)
Upper ADF chute	Taptite, cup B M3x10	2	0.69 ±0.10 (7 ±1)
Lower ADF chute	Taptite, cup B M3x10	2	0.69 ±0.10 (7 ±1)
Grounding wire	Taptite, cup B M3x10	1	0.69 ±0.10 (7 ±1)
ADF drive unit	Taptite, cup B M3x8	2	0.69 ±0.10 (7 ±1)
ADF motor	Screw, pan (s/p washer) M3x6	1	0.69 ±0.10 (7 ±1)
Rear cover	Screw, bind B tite 4x12	4	0.98 ±0.10 (10 ±1)
Main PCB shield case	Taptite, cup B M3x10	1	0.59 ±0.10 (6 ±1)
	Taptite, cup S M3x6	1	0.78 ±0.10 (8 ±1)
Grounding wire (from the scanner unit)	Taptite, cup S M3x6	1*	0.59 ±0.10 (6 ±1)
CCD flat cable guide film	Taptite, cup B M3x10	1	0.59 ±0.10 (6 ±1)
Document cover	Taptite, bind B M4x12	2	0.98 ±0.20 (10 ±2)
Hinge base R	Taptite, cup B M3x10	3	0.69 ±0.10 (7 ±1)
Hinge L	Taptite, cup B M3x10	3	0.59 ±0.10 (6 ±1)
Control panel ASSY	Taptite, cup B M3x12	6	0.39 ±0.10 (4 ±1)
Scanner open sensor PCB	Taptite, cup B M3x8	1	0.49 ±0.10 (5 ±1)
Reinforcement plate	Taptite, cup B M3x6	7	0.39 ±0.10 (4 ±1)
Control panel PCB	Taptite, cup B M3x6	2	0.39 ±0.10 (4 ±1)
Scanner top cover	Taptite, cup B M4x12	4	0.98 ±0.20 (10 ±2)
Guide plate	Taptite, cup B M3x8	3	0.69 ±0.10 (7 ±1)
CCD HP sensor plate	Taptite, cup B M3x8	1	0.69 ±0.10 (7 ±1)
Flat cable clamp	Taptite, cup B M3x8	2	0.69 ±0.10 (7 ±1)
Edge cover	Taptite, cup B M3x10	4	0.59 ±0.10 (6 ±1)
Scanner link guides	Taptite, cup B M3x10	2	0.59 ±0.10 (6 ±1)
Main cover	Screw, bind B tite M4x12	3	0.98 ±0.10 (10 ±1)
	Taptite, cup B M3x10	1	0.59 ±0.10 (6 ±1)
Media PCB frame (To main chassis)	Taptite, cup S M3x6	2	0.78 ±0.10 (8 ±1)
Media cover (To lower cover)	Taptite, cup B M3x10	1	0.59 ±0.10 (6 ±1)
Media PCB frame (To media cover)	Taptite, cup B M3x10	2	0.59 ±0.10 (6 ±1)
Media PCB	Taptite, cup S M3x6	3	0.59 ±0.10 (6 ±1)
Main PCB shield frame	Taptite, cup S M3x6	3	0.78 ±0.10 (8 ±1)
Centronics interface	Screw, pan M3x6	2	0.39 ±0.05 (4 ±0.5)
USB	Screw, pan M3x6	1	0.39 ±0.05 (4 ±0.5)
Main PCB	Taptite, cup S M3x6	4	0.78 ±0.10 (8 ±1)
ASF	Taptite, cup S M3x6	5	0.78 ±0.10 (8 ±1)
Separation pad ASSY	Taptite, bind B M3x10	2	0.59 ±0.10 (6 ±1)
Manual feed slot cover sensor	Taptite, cup B M3x8	1	0.59 ±0.10 (6 ±1)
FG plate R (To main chassis)	Taptite, cup S M3x6	1	0.78 ±0.10 (8 ±1)
(To NCU/PS shield)	Taptite, cup S M3x6	1	0.59 ±0.10 (6 ±1)
FG plate L (To main chassis)	Taptite, cup S M3x6	1 (2)*	0.78 ±0.10 (8 ±1)
NCU/PS shield box	Taptite, cup B M3x10	2	0.59 ±0.10 (6 ±1)
Upper NCU/PS shield	Taptite, cup S M3x6	3	0.59 ±0.10 (6 ±1)
AC cord grounding wire	Screw, pan (washer) M4x8DB	1	0.59 ±0.10 (6 ±1)
Power supply PCB	Taptite cup S M3x6	4	0.59 ±0.10 (6 ±1)
NCU PCB	Taptite, cup S M3x6	1	0.59 ±0.10 (6 ±1)

* The FG plate L is secured with two screws together with the grounding wire coming from the scanner unit.

Location	Screw type	Q'ty	Tightening torque N•m (kgf•cm)	
Purge unit support	Taptite, cup B M3x10	1	0.59 ±0.10	(6 ±1)
Purge unit	Taptite, cup B M3x8	2	0.59 ±0.10	(6 ±1)
Purge unit stopper	Taptite, cup B M3x8	1	0.59 ±0.10	(6 ±1)
Driver PCB	Taptite, cup S M3x6	4	0.78 ±0.10	(8 ±1)
Idle pulley holder	Screw, pan (s/p washer) M3x6	1	0.69 ±0.10	(7 ±1)
	Shoulder screw	1	0.78 ±0.10	(8 ±1)
	Taptite, cup S, M3x6	1	0.78 ±0.10	(8 ±1)
Carriage motor	Screw, pan (s/p washer) M3x6	2	0.69 ±0.10	(7 ±1)
Paper chute	Shoulder screw	1	0.78 ±0.10	(8 ±1)
	Taptite, cup S M3x6	1	0.78 ±0.10	(8 ±1)
Sensor support (Ink empty sensor)	Taptite, cup S M3x6	1	0.78 ±0.10	(8 ±1)
Star wheel support	Taptite, pan B M3x10	2	0.59 ±0.10	(6 ±1)
Main chassis	Screw, bind B tite M4x12	4	0.98 ±0.10	(10 ±1)
Ink empty sensor PCB	Taptite, cup B M3x8	1	0.59 ±0.10	(6 ±1)
Tension plate R	Screw, pan (s/p washer) M3x6	1	0.69 ±0.10	(7 ±1)
Paper feed motor	Screw, pan (s/p washer) M3x6	2	0.69 ±0.10	(7 ±1)
Tension plate F	Screw, pan (s/p washer) M3x6	1	0.69 ±0.10	(7 ±1)

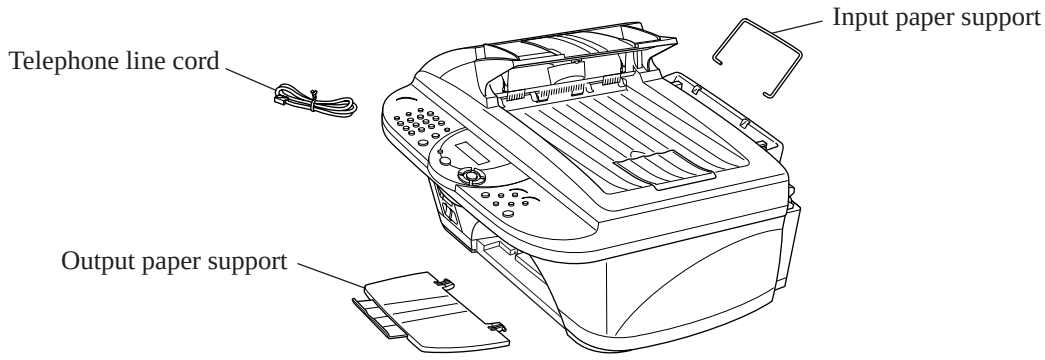
■ Preparation

Prior to proceeding to the disassembly procedure,

(1) Unplug
- the modular jack of the telephone line,
- the PC interface cable if connected (Not shown below), and
- the modular jack of an external telephone set if connected (Not shown below).

(2) Remove
- the input paper support and
- the output paper support.

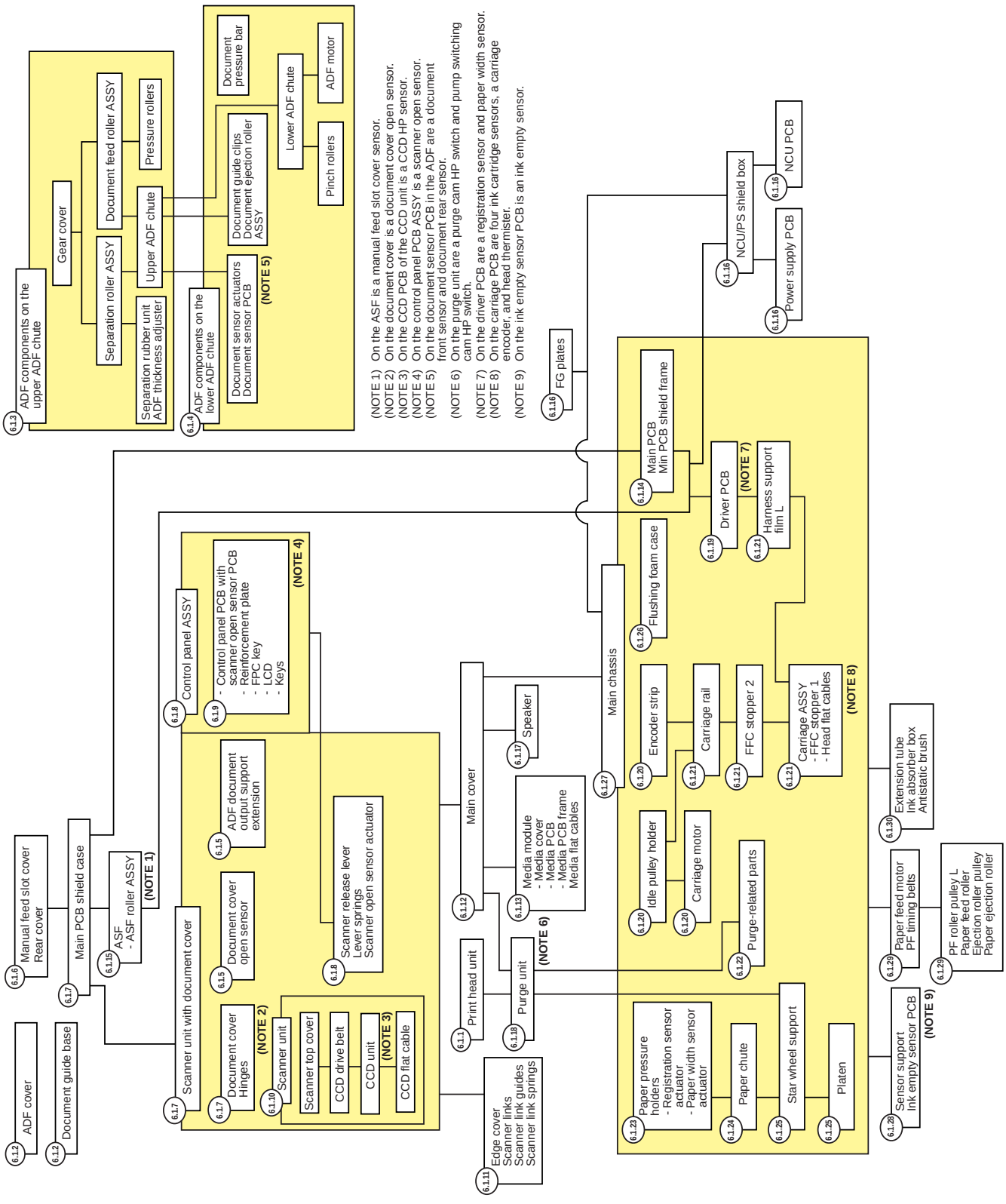
NOTE: Do not remove the ink cartridges when disassembling the machine except when removing the print head unit.



■ How to Access the Object Component

- On the next page is a disassembly order flow which helps you access the object components. To remove the purge unit, for example, first find it on the flow and learn its number (6.1.18 in this case). You need to remove parts numbered 6.1.1, 6.1.6, 6.1.7, and 6.1.12 so as to access the purge unit.
- Unless otherwise specified, the disassembled parts or components should be reassembled in the reverse order of removal.

■ Disassembly Order Flow



6.1.1 Print Head Unit

During disassembly jobs (except when removing the purge unit, carriage rail, or carriage ASSY), the print head unit and all the four ink cartridges should be kept in place.

NOTE: To replace the print head unit with a new one, you need to move the carriage to the ink replacement position by placing the machine in the ink replacement mode. Do not move the carriage by hand when the machine is turned off.

NOTE: If you replace the print head unit with a new one, replace also the ink absorber box and ink cartridges with new ones.

Removal procedure

(1) Plug the power cord into a wall socket.

(2) Press the **Ink** key to place the machine in the ink management mode.

(3) Press the **2** key to choose "2. REPLACE INK."

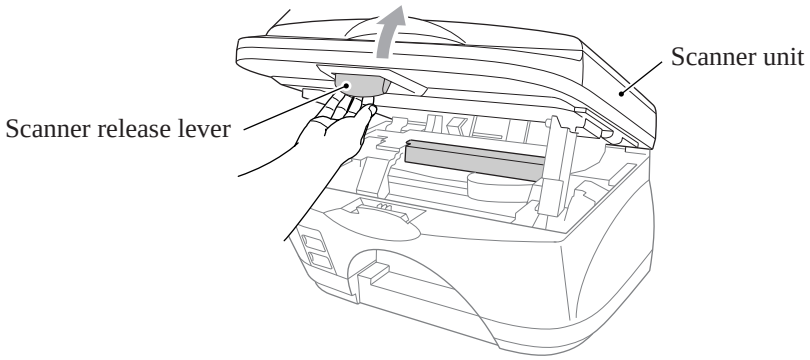
The "PLS OPEN COVER" will appear on the LCD.

(4) Open the scanner unit.

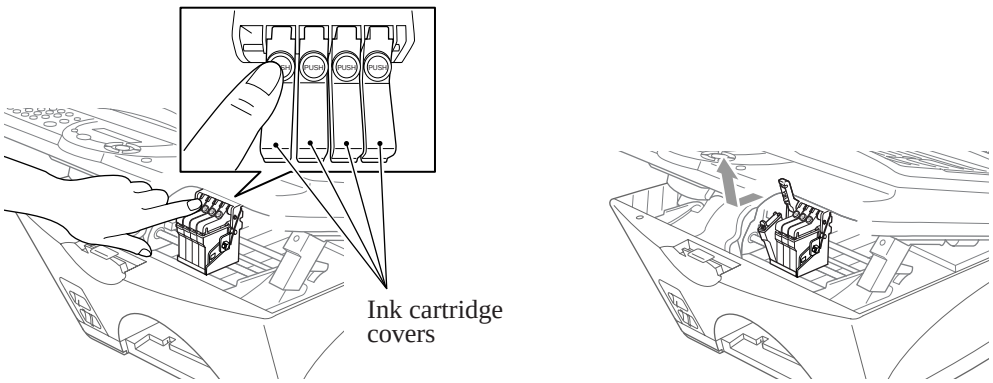
The carriage automatically moves left to the ink replacement position.

(5) Unplug the power cord from the wall socket.

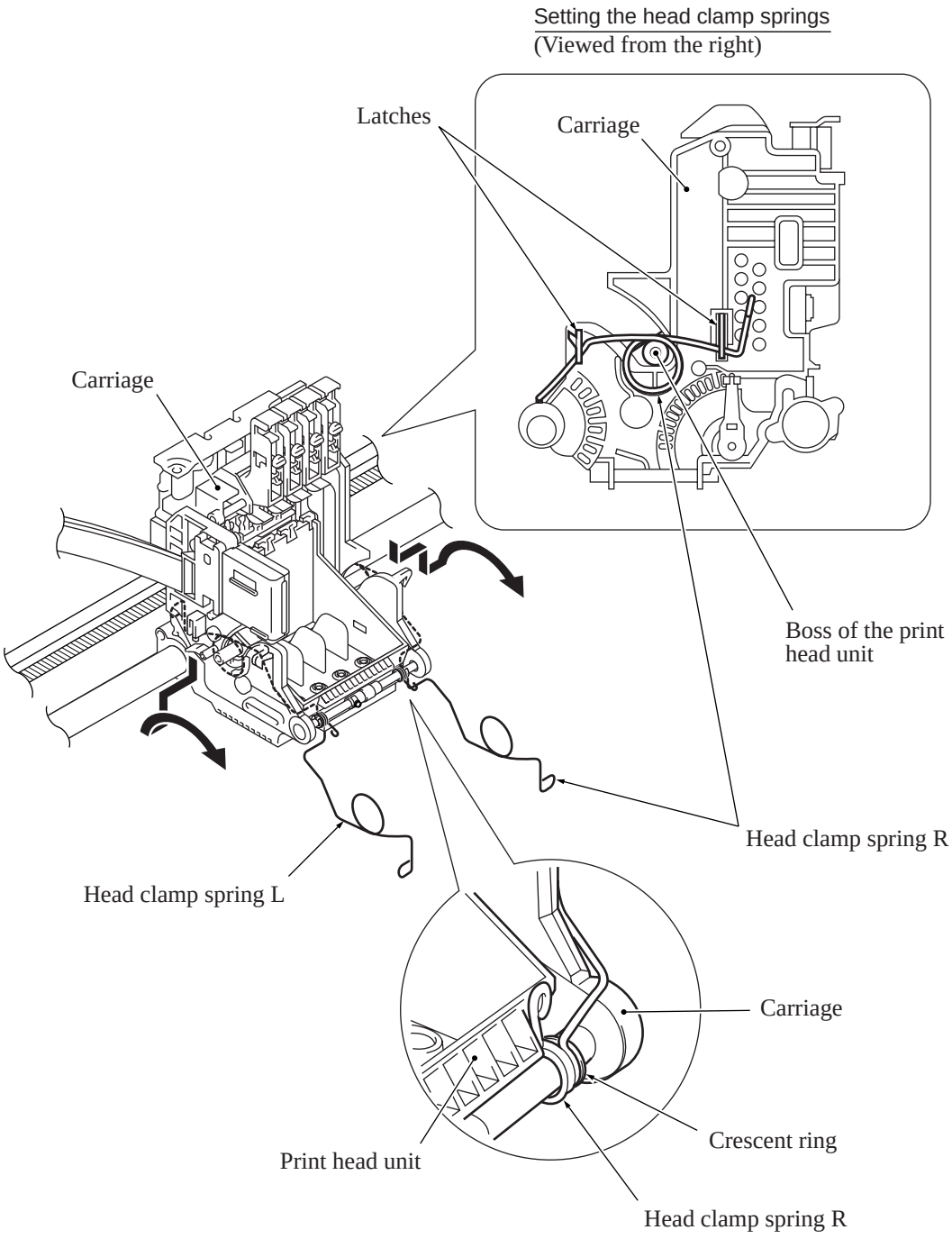
(6) Pull the scanner release lever towards you and open the scanner unit.



(7) Push the colored ink cartridge covers and remove all ink cartridges. (Or, remove the shipping cover.)



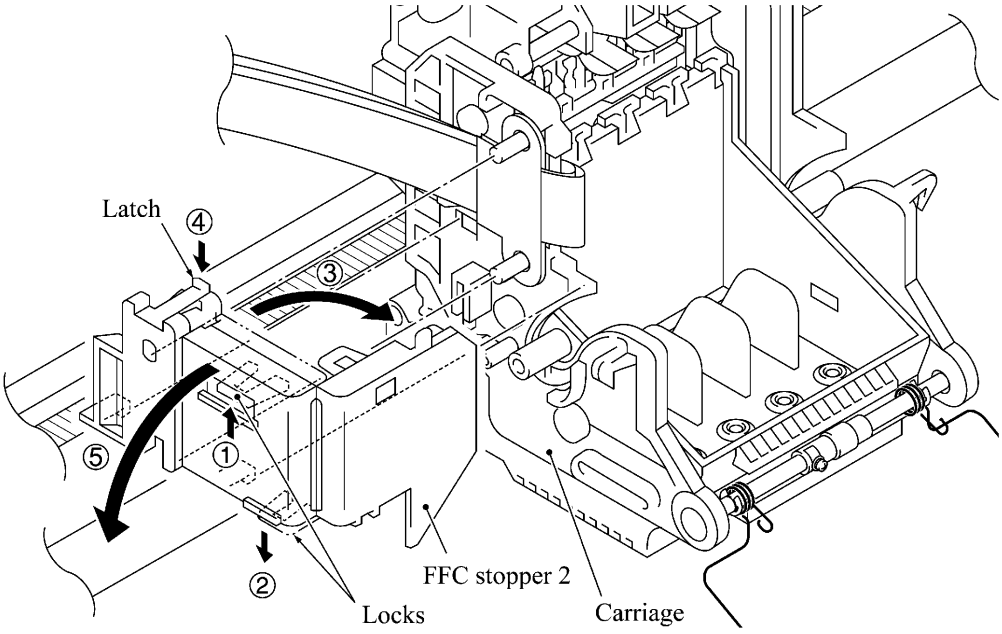
(8) Pull each of the head clamp springs in the direction of the arrow shown below to release it from the two latches on the carriage and the boss of the print head unit.



(9) Remove the FFC stopper 2 that secures the two head flat cables to the carriage according to the following steps:

First, pull up and down the upper and lower locks (in the direction of arrows ① and ②), respectively, and then open the FFC stopper 2 in the direction of arrow ③.

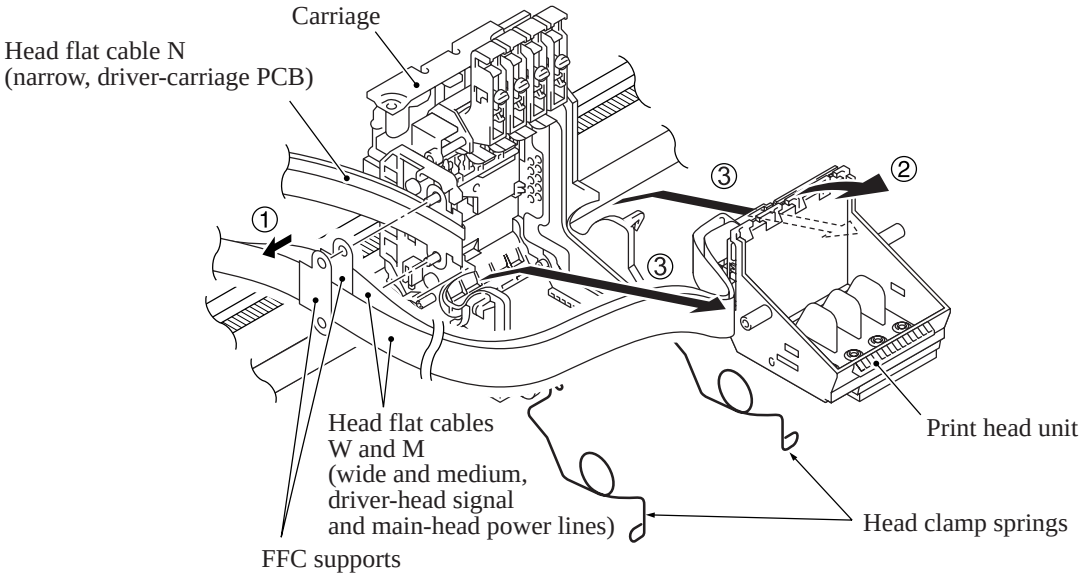
Then push down the latch (arrow ④) and release the FFC stopper 2 from the carriage.



(10) Pull out the FFC supports of the head flat cables W (driver-head signal line) and M (main-head power line) from the bosses provided on the left side of the chassis in the direction of arrow ① as shown below.

NOTE: There are three head flat cables--wide (W), medium (M), and narrow (N). To remove the print head, you need to disconnect the head flat cables W and M from the print head unit in steps (13) and (14). The head flat cable N is connected to the carriage PCB.

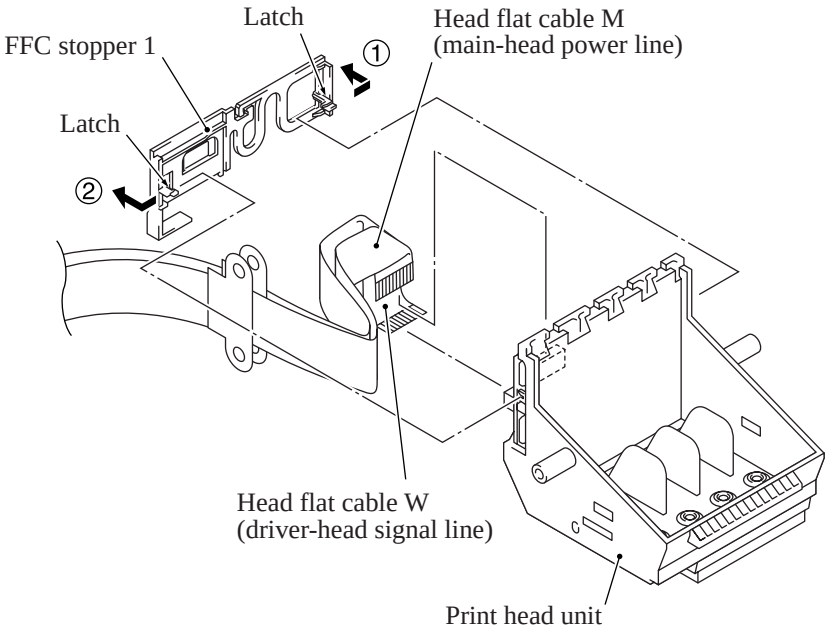
(11) Tilt the print head unit towards you (arrow ②) and lift it out of the carriage (arrow ③).



(12) Remove the FFC stopper 1 from the rear side of the print head unit in the order of ① and ② as shown below.

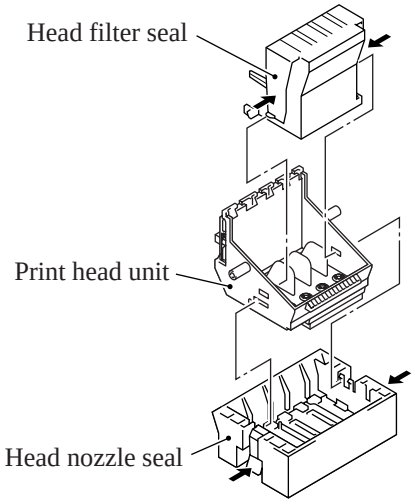
(13) Disconnect the head flat cable W (driver-head signal line) towards the rear.

(14) Unlock the connector of the head flat cable M (main-head power line) and disconnect it upwards.



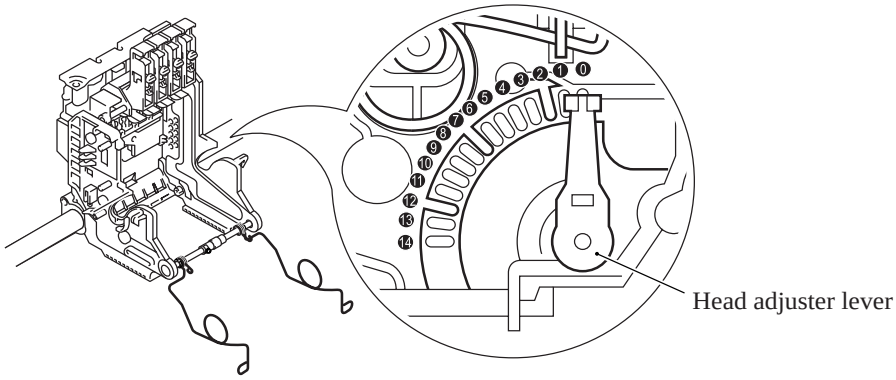
NOTE: Do not touch the printing ends (nozzles) of the print head unit or the ink orifices of the ink cartridges; doing so will not only stain your hands with ink but result in an ink jet-out failure. Once you touch them, clean them with a dedicated cleaning stick and liquid.

NOTE: Be sure to put a head nozzle seal and filter seal on the print head unit as shown below. Leaving the print head unit without those seals will dry up its printing ends and filters, resulting in a damaged head.



Installation procedure

(15) Turn the head adjuster lever located on the right side of the carriage to position 0 (rearmost position).

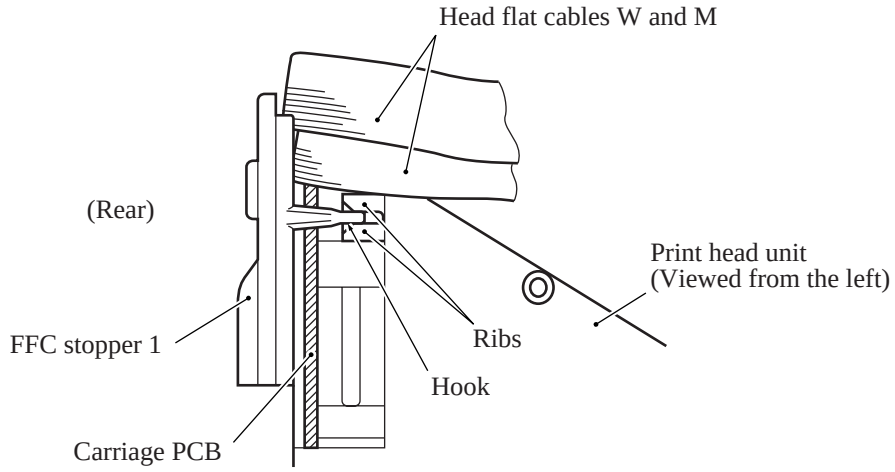


(16) Connect the head flat cable M (main-head power line) to a new (removed) print head unit and lock the connector.

NOTE: At this stage, the print head unit should have both the head filter seal and head nozzle seal being attached.

(17) Connect the head flat cable W (driver-head signal line) to the print head unit.

(18) Set the FFC stopper 1 to the rear side of the print head unit to fix the head flat cables M and W, taking care not to bend the head flat cable W.



(19) Remove the head nozzle seal.

(20) Tilt the print head unit towards you and put it into the carriage, taking care not to bump the printing face of the print head unit against the carriage components or others.

(21) Fit the FFC supports of the head flat cables M and W over the bosses provided on the left side of the chassis.

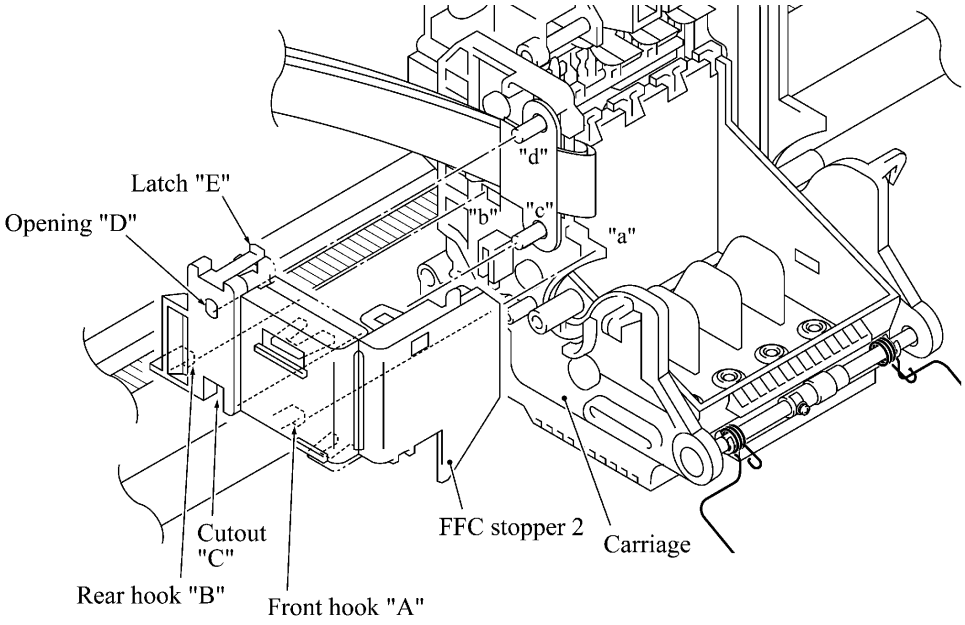
(22) Secure the print head unit to the carriage with the head clamp springs.

(23) Remove the head filter seal.

(24) Set the FFC stopper 2 to the carriage according to the following steps:

First, fit front and rear hooks "A" and "B" over section "a" and into hole "b," respectively Fit cutout "C" and opening "D" over bosses "c" and "d," respectively. Then press the upper edge of the FFC stopper 2 against the carriage so that latch "E" catches the carriage.

Close the FFC stopper 2.



(25) Set new ink cartridges into the print head unit.

(26) Close the scanner unit.

(27) Plug the power cord into a wall socket.

The carriage automatically moves to the right-end home position.

(28) Follow the instructions shown on the LCD.

NOTE: The machine enters a "head cleaning" cycle that takes approx. 2 minutes for each ink cartridge.

(29) Update the head property information stored in the EEPROM of the driver PCB, referring to Appendix 2, A2.3.

(30) Load paper into the paper tray of the ASF.

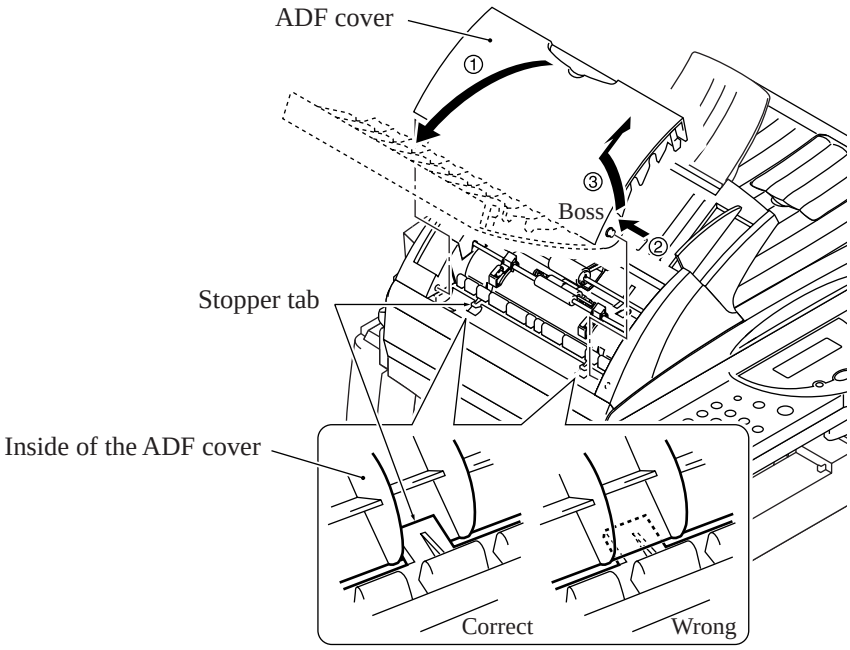
(31) Correct the positioning error of the print head unit, referring to Section 6.3 "ADJUSTMENT."

(32) If the print head unit is replaced with a new one, be sure to update the paper feeding correction value stored in the EEPROM. Refer to Appendix A, A2.5 and CHAPTER 7, Subsection 7.5.14.

(33) Adjust the alignment of vertical print lines, referring to CHAPTER 7, Subsection 7.5.13.

6.1.2 ADF Cover and Document Guide Base

(1) Open the ADF cover, press its front end to release the boss, and take it off (in the direction of arrows ①, ②, and ③).

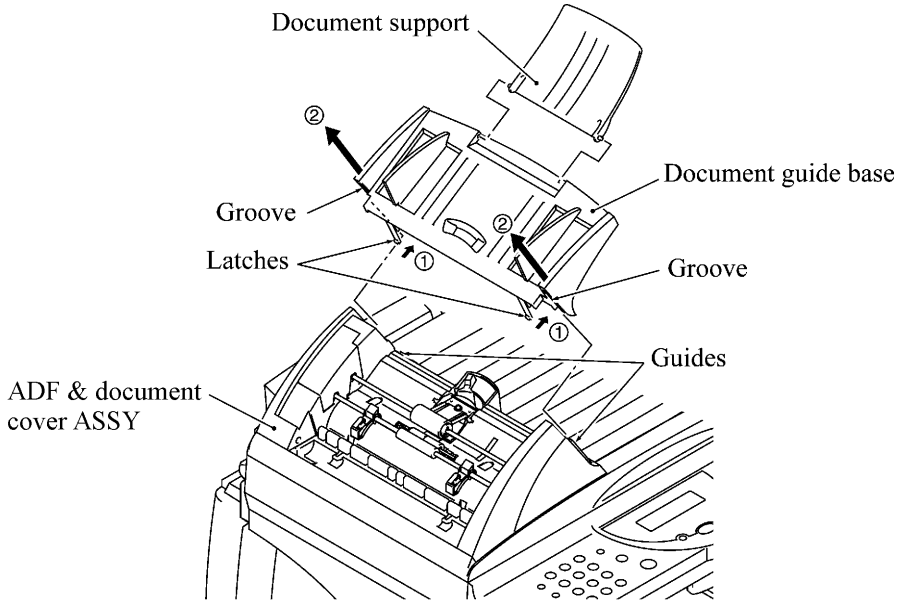


Setting the ADF cover back into place

(2) Remove the document support.

(3) Release the two latches of the document guide base and slide it up *straight along the guides*.

NOTE: Do not turn it to the left. Doing so will break the groove sections of the document guide base.



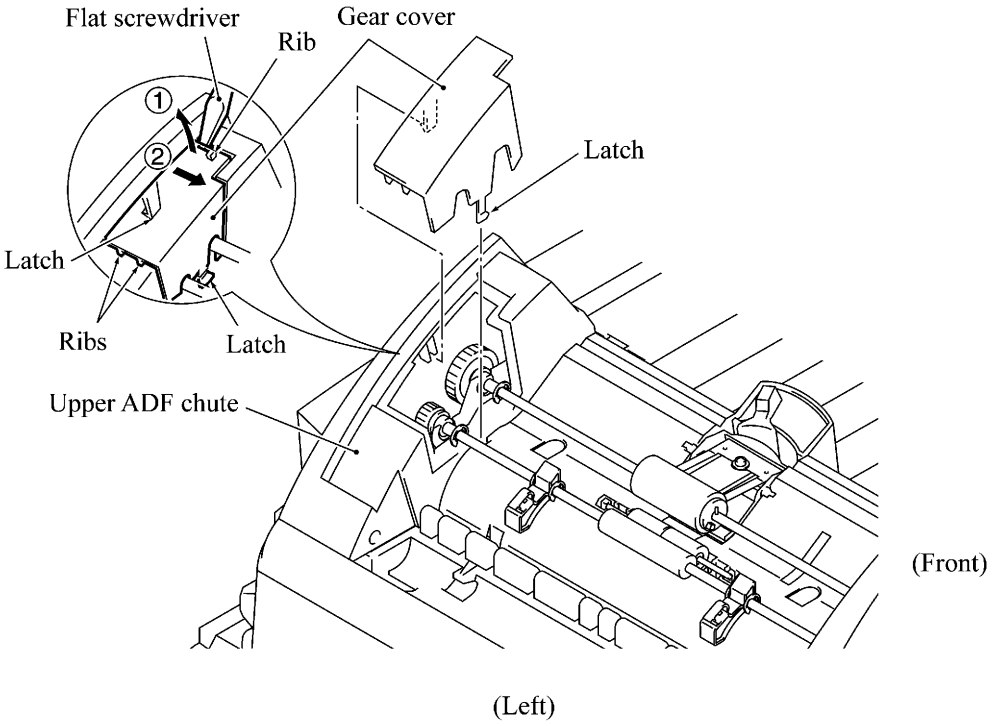
■ Reassembling Notes

- When setting the ADF cover back into place, fit its bottom edge under the stopper tabs as illustrated above.

6.1.3 ADF Components on the Upper ADF Chute

Gear cover

(1) As illustrated below, insert the tip of a flat screwdriver into the slot and lift up the right edge of the gear cover (arrow ①) and move the gear cover to the front (arrow ②).

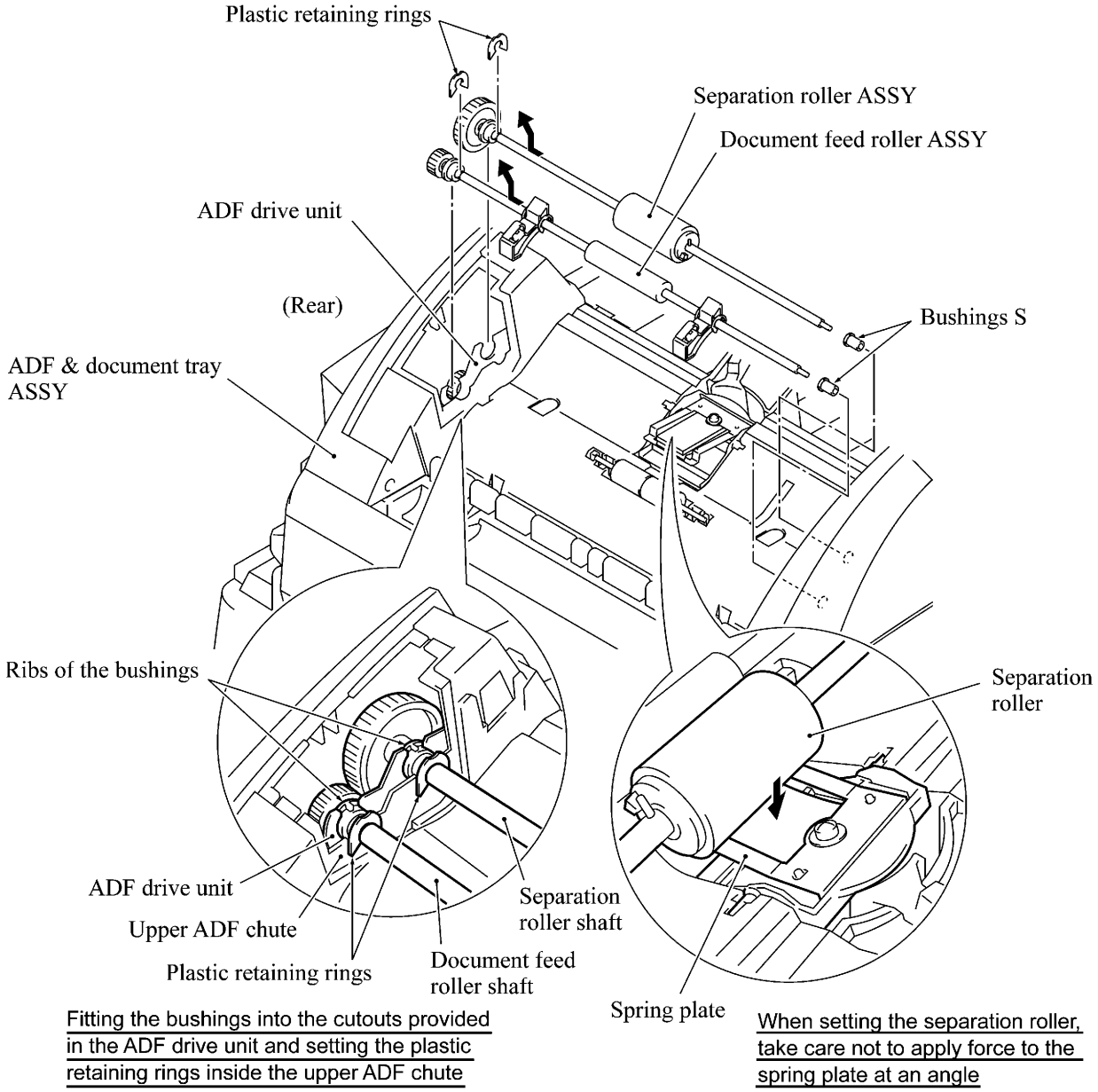


Separation roller ASSY and document feed roller ASSY

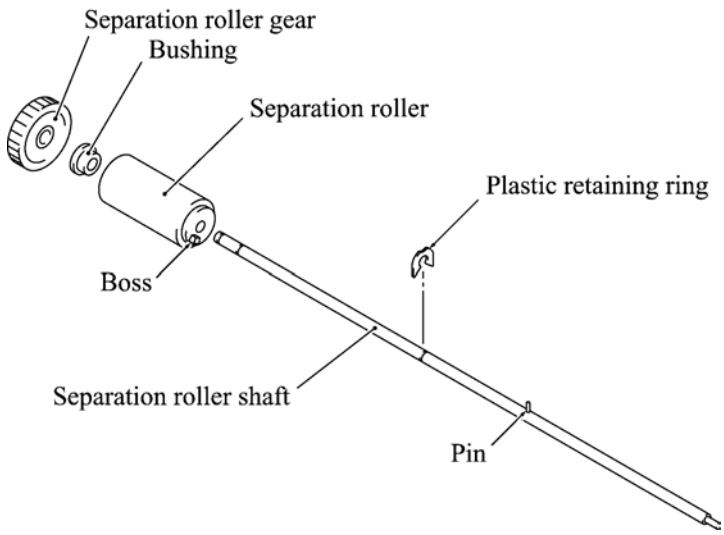
(2) From the rear end of each of the separation roller ASSY and document feed roller ASSY, remove the plastic retaining ring. Lift up the rear ends of them and take them out together with bushings S.

NOTE: Take care not to drop bushings S.

NOTE: Do not remove the gear from the rear end of the document feed roller ASSY. Once removed, the gear will become unusable and a new gear will have to be put back in.



Reassembling Note: If you have disassembled the separation roller ASSY, set the separation roller on its shaft with the boss facing towards the pin and then snap the plastic retaining ring into place, as illustrated below.



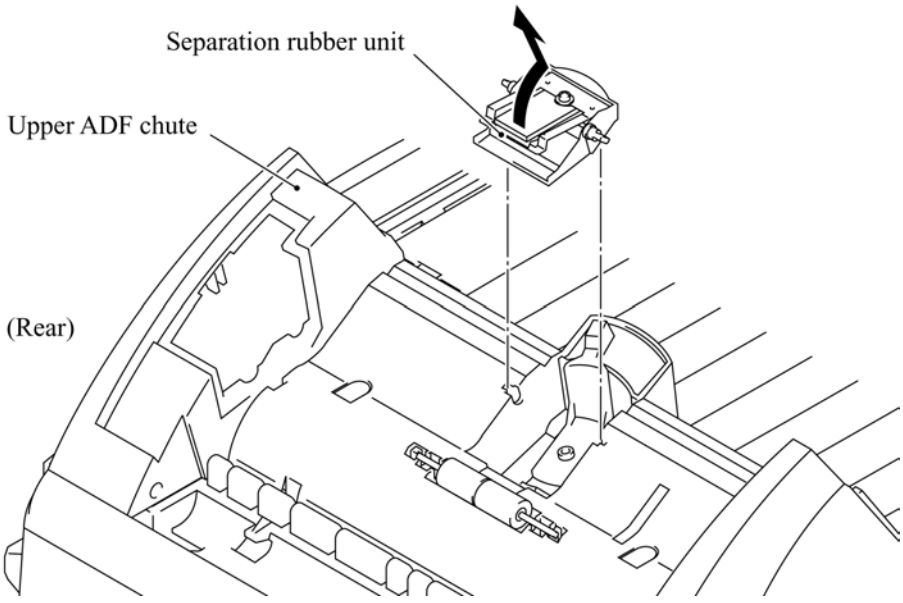
Reassembling Note: When setting the separation roller ASSY, take care not to apply force to the spring plate at an angle, as illustrated on the previous page.

Reassembling Note: After setting the rear end of the separation roller ASSY or document feed roller to the ADF drive unit, fit its bushing into the cutout provided in the ADF drive unit with its rib facing up. Then set the plastic retaining ring inside the upper ADF chute, as illustrated on the previous page.

Separation rubber unit, ADF thickness adjuster, and pressure rollers

(3) Turn the separation rubber unit as shown below and lift it up.

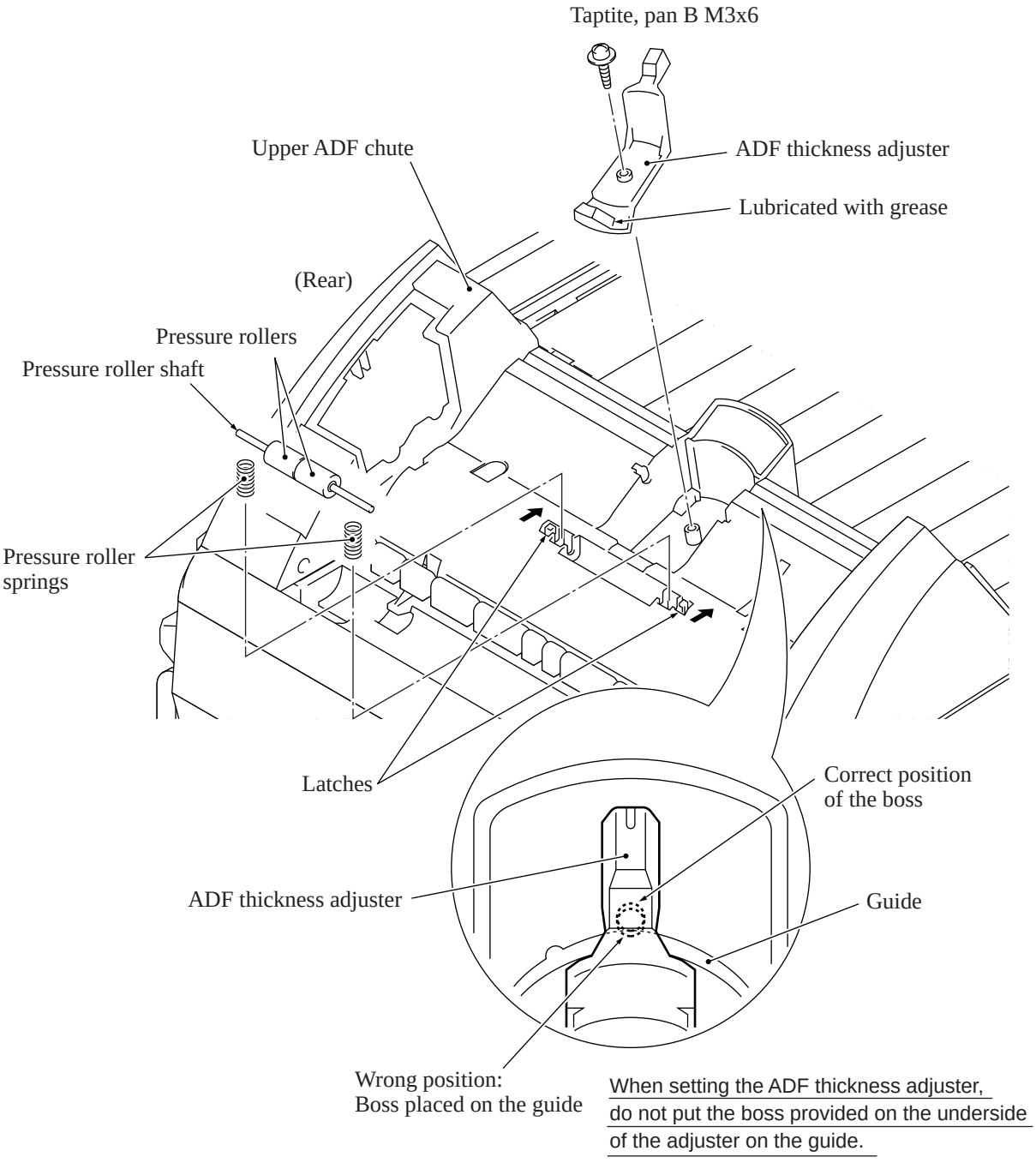
NOTE: Keep the separation rubber away from dust, dirt, or oil.



(4) Remove the screw and take the ADF thickness adjuster out of the upper ADF chute.

NOTE: The ADF thickness adjuster is lubricated with grease, so take care not to smear surrounding parts with the grease when handing the ADF thickness adjuster.

(5) At either end of the pressure roller shaft, press the latch to the right and take out the pressure rollers and their shaft. Then remove their springs.

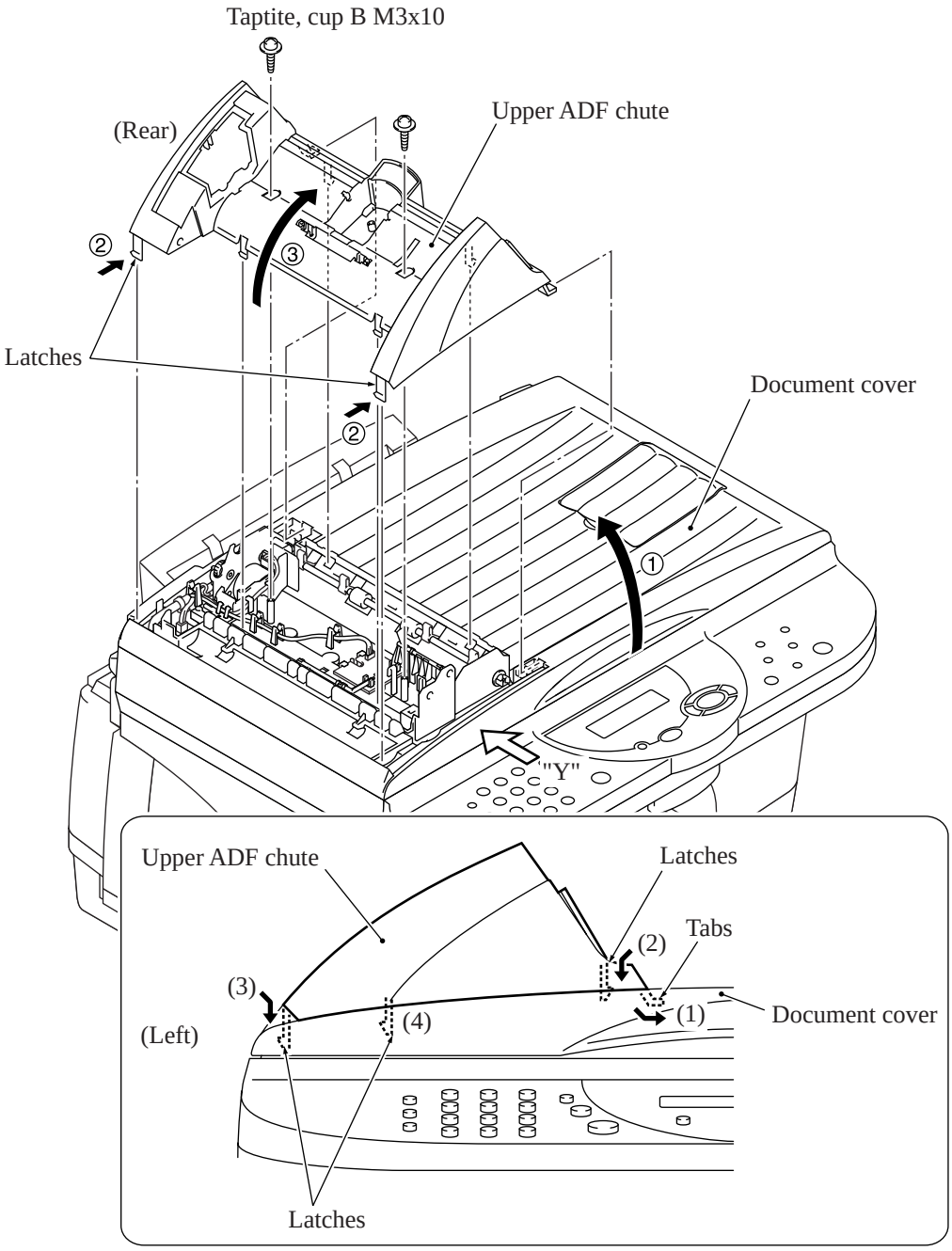


Upper ADF chute

(6) Remove the two screws from the upper ADF chute.

(7) Open the document cover (①).

(8) From the underside of the document cover, release the two leftmost latches (②) and then pull up the left end of the upper ADF chute (③).



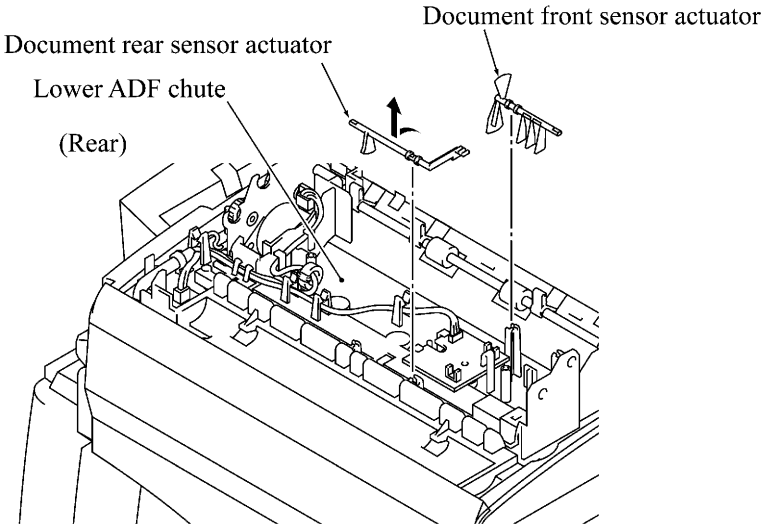
Latching the upper ADF chute (Viewed from "Y")

Reassembling Note: When latching the upper ADF chute, first fit tabs (1) of the right end into the openings provided in the document cover, then press latches (2), (3), and (4) into place in this order as shown above.

6.1.4 ADF Components on the Lower ADF Chute

Document front and rear sensor actuators

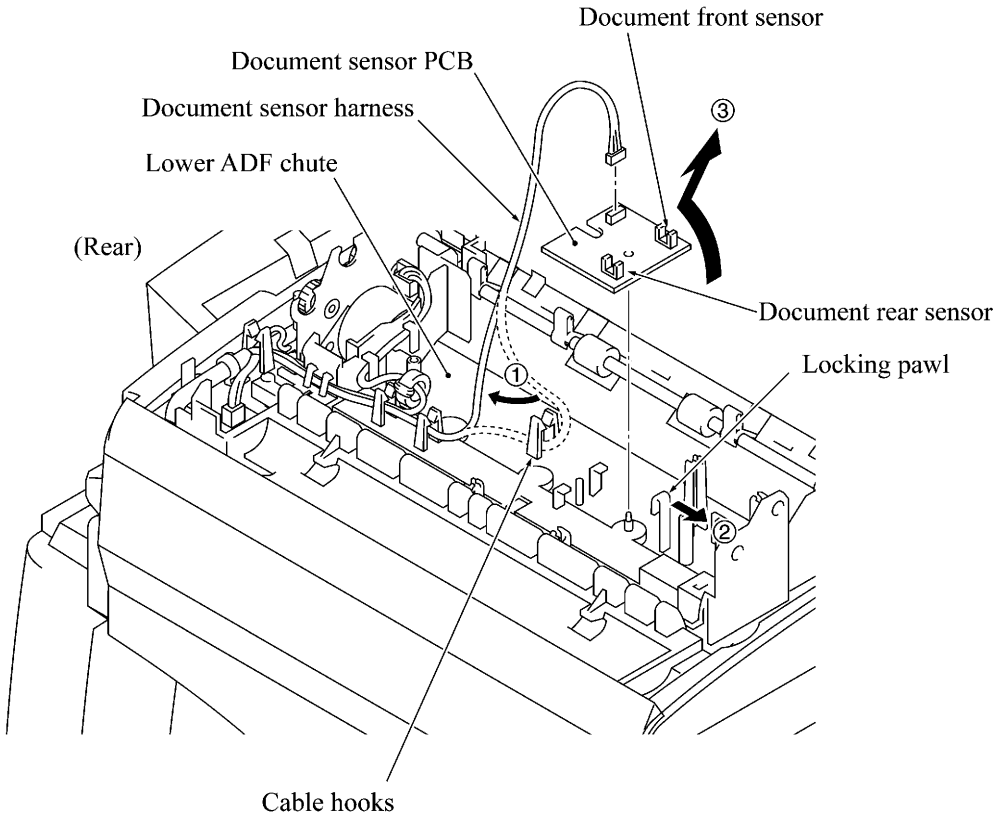
(1) Lift up the document front sensor actuator. Fully turn the document rear sensor actuator counterclockwise, then lift it up.



Document sensor PCB

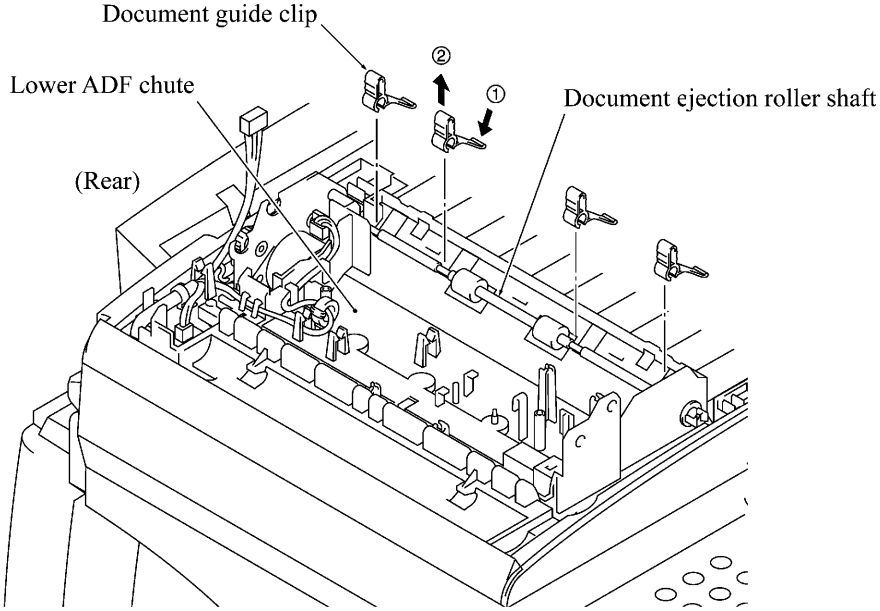
(2) Take the document sensor harness out of the cable hooks, then disconnect it from the document sensor PCB.

(3) Press the locking pawl to the front and take out the document sensor PCB.



Document guide clips

(4) Press the tab of each document guide clip. Each clip will snap out of the document ejection roller shaft.

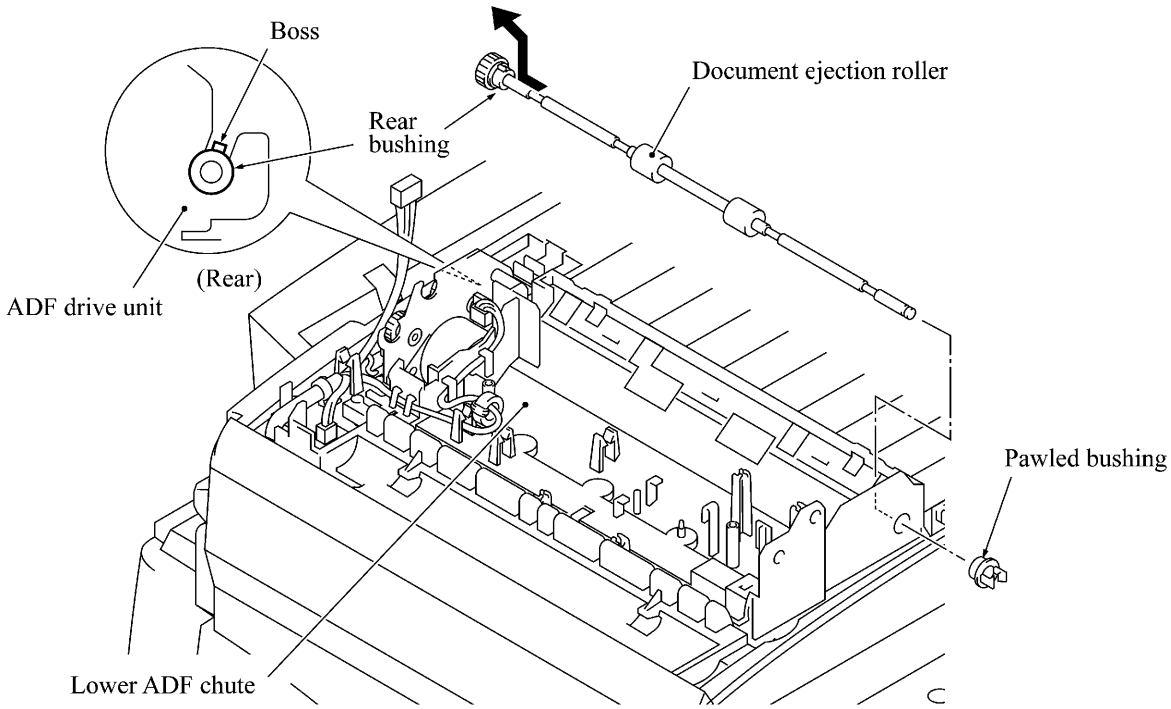


Document ejection roller ASSY

(5) Remove the pawled bushing from the front end of the document ejection roller shaft by pulling its pawls outwards.

(6) Slide the rear bushing to the rear and then lift up the document ejection roller ASSY.

NOTE: Do not remove the gear from the rear end of the document ejection roller ASSY. Once removed, the gear will become unusable and a new gear will have to be put back in.

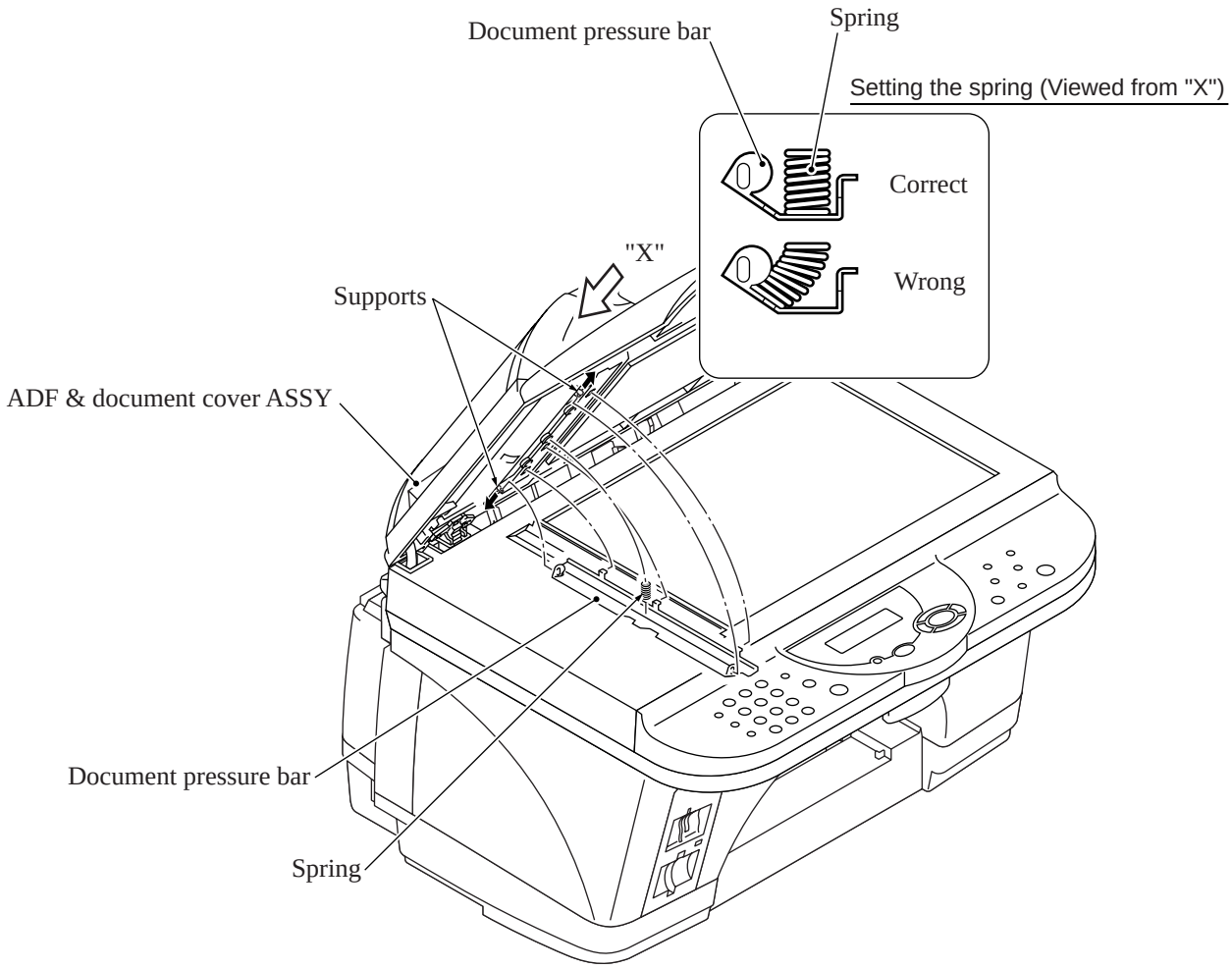


Reassembling Note: When fitting the rear bushing of the document ejection roller into the cutout of the ADF drive unit, orient the boss as illustrated on the previous page.

Document pressure bar

(7) Open the ADF & document cover ASSY.

(8) Pull either of the front and rear supports of the document pressure bar outwards and remove the document pressure bar. The spring also comes off.



Reassembling Note: After setting the document pressure bar, check in the direction of arrow "X" that the spring is into place as illustrated above.

Lower ADF chute, pinch rollers, and ADF motor

(9) Take the document sensor harness out of cable hooks provided on the lower ADF chute.

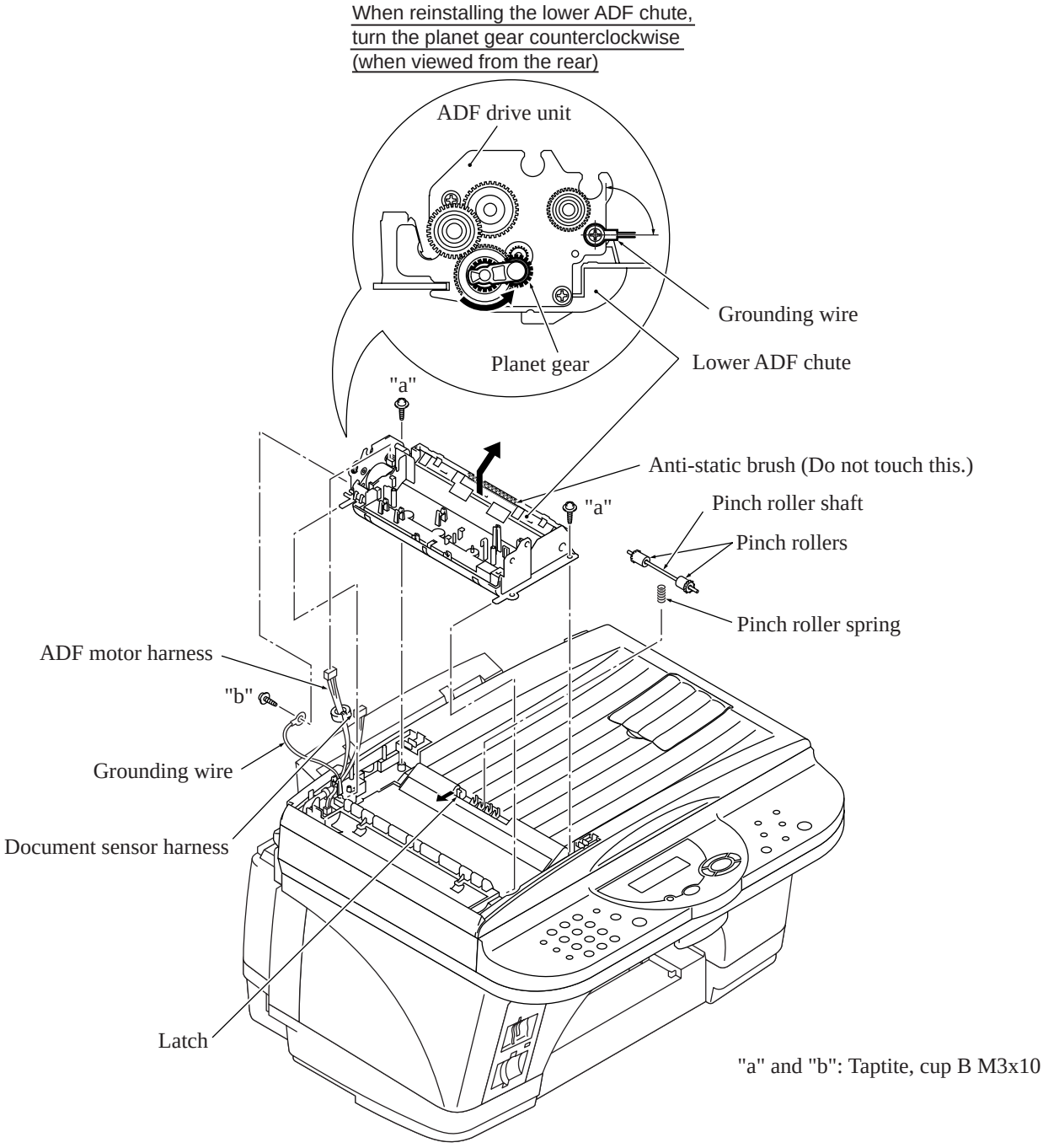
(10) Disconnect the ADF motor harness from the motor, then take its harness out of the cable guides and hooks.

(11) Release the grounding wire from the ADF drive unit by removing screw "b."

(12) Remove two screws "a" from the lower ADF chute.

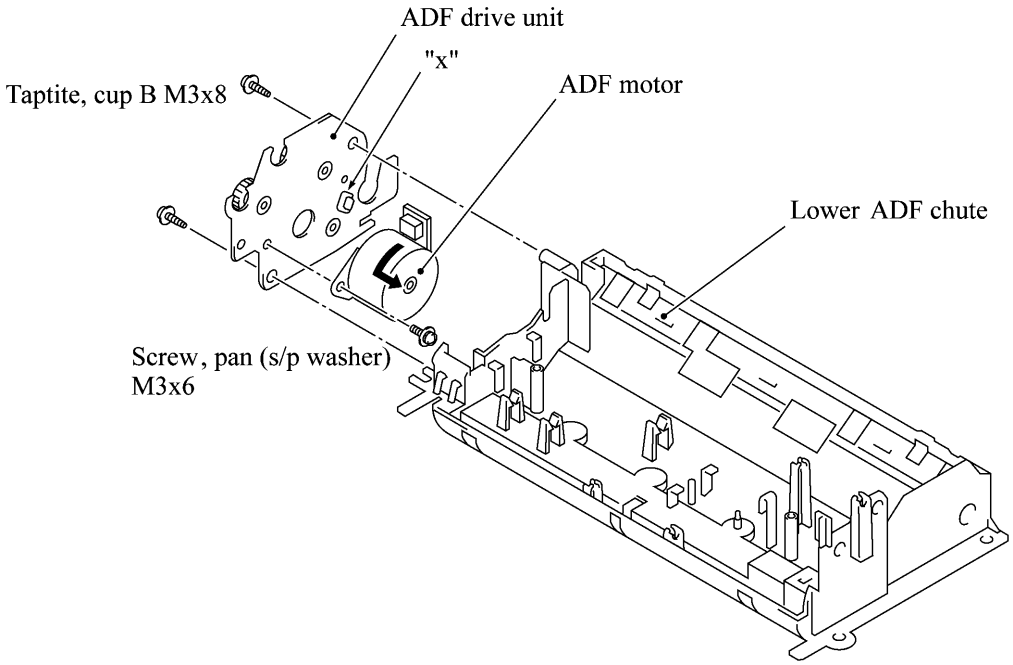
(13) Lift up the lower ADF chute in the direction of the arrow shown below, taking care not to touch the anti-static brush.

(14) Press the latch to the left and remove the pinch rollers and its shaft.



(15) Remove the two screws from the ADF drive unit and release the ADF motor.

NOTE: When using a screwdriver, take care not to scratch or damage gears on the ADF drive unit.



Reassembling Note: When setting the ADF motor, hook the non-screw side of the flange on section "x" (shown above) and secure it with the screw.

Reassembling Note: Before reinstalling the lower ADF chute to the document cover, be sure to turn the planet gear on the ADF drive unit counterclockwise when viewed from the rear, as illustrated on the previous page.

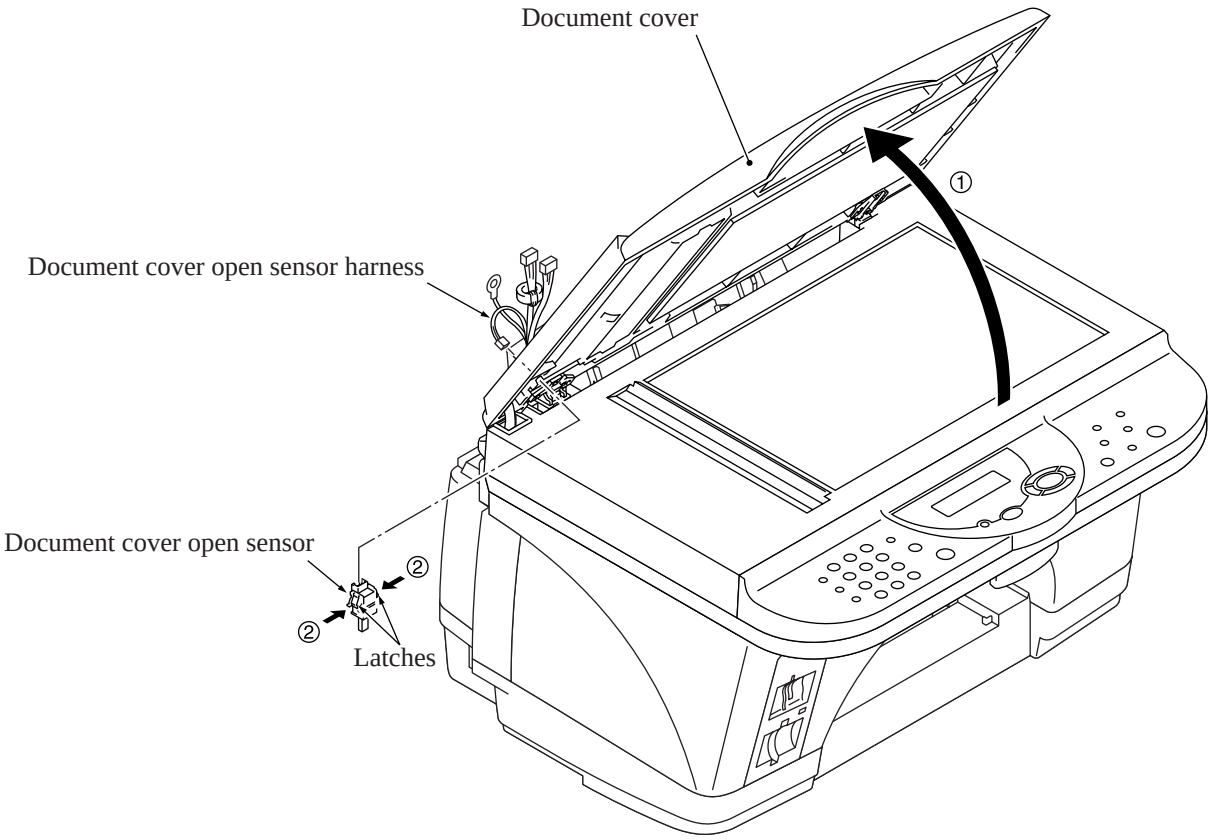
Reassembling Note: For routing the ADF motor harness, document sensor harness, and grounding wire, refer to Subsection 6.1.31, "Harness routing A." Secure the grounding wire at the angle shown on the previous page and let it hold down the ADF motor harness and document sensor harness as shown in "Harness routing A."

6.1.5 Document Cover Open Sensor and ADF Document Output Support Extension

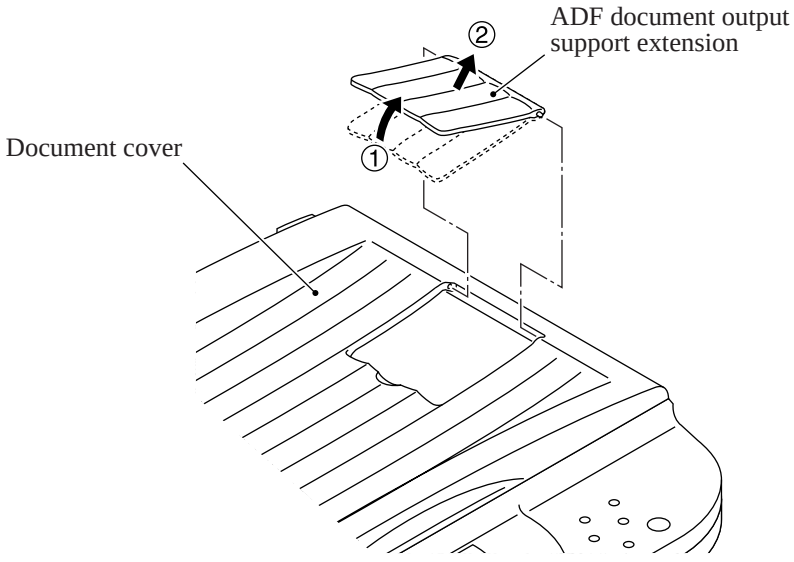
(1) Disconnect the document cover open sensor harness from the sensor.

(2) Open the document cover.

(3) Press the right and left latches of the document cover open sensor with the tip of a flat screwdriver as shown below and push it down.



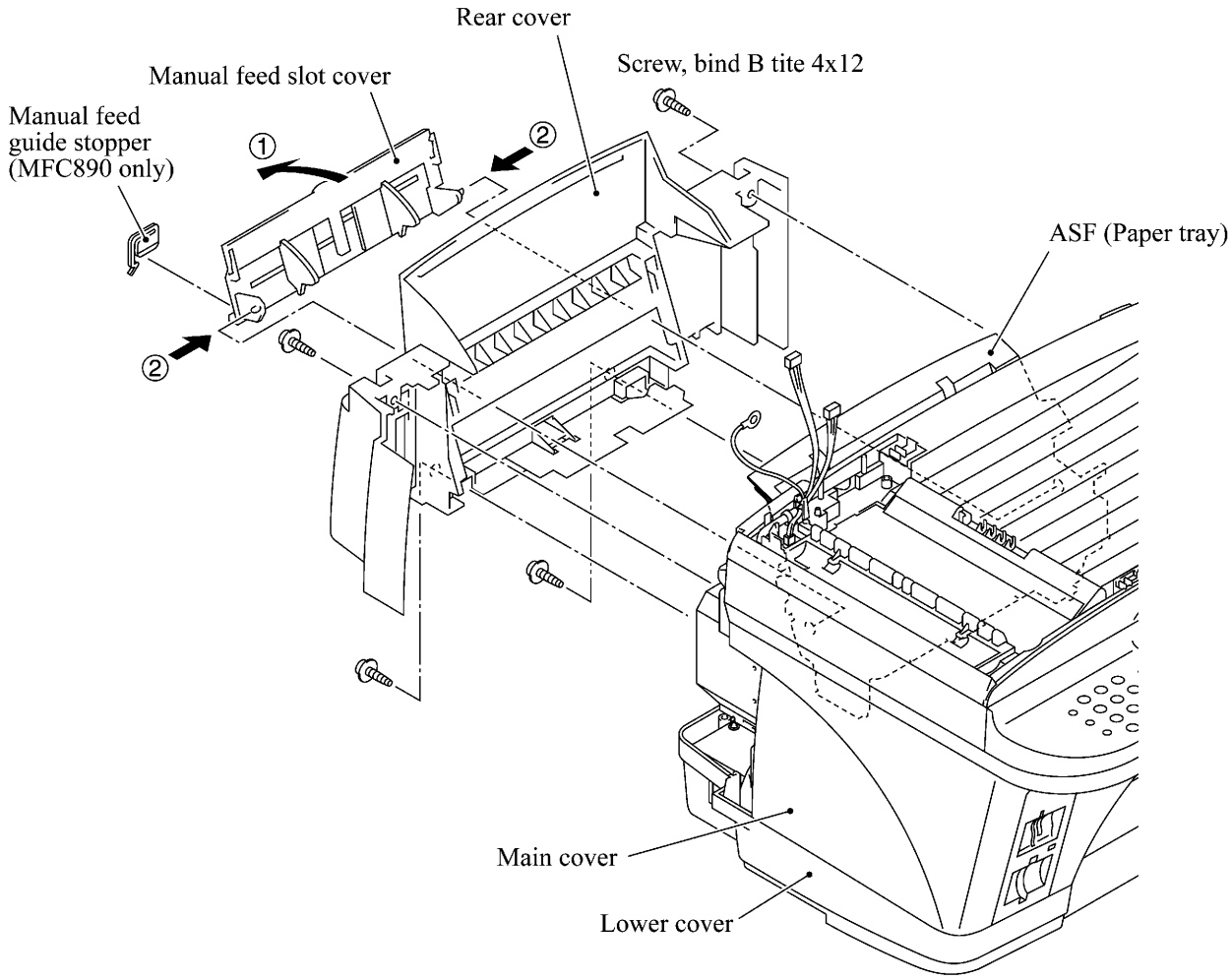
(4) Slightly open the ADF document output support extension and remove it while warping it.



6.1.6 Manual Feed Slot Cover and Rear Cover

(1) Open the manual feed slot cover (arrow ①), then release both of the bosses from the holes provided in the paper tray (arrow ②), using the tip of a flat screwdriver.

(2) Remove the four screws and pull out the rear cover to the rear.

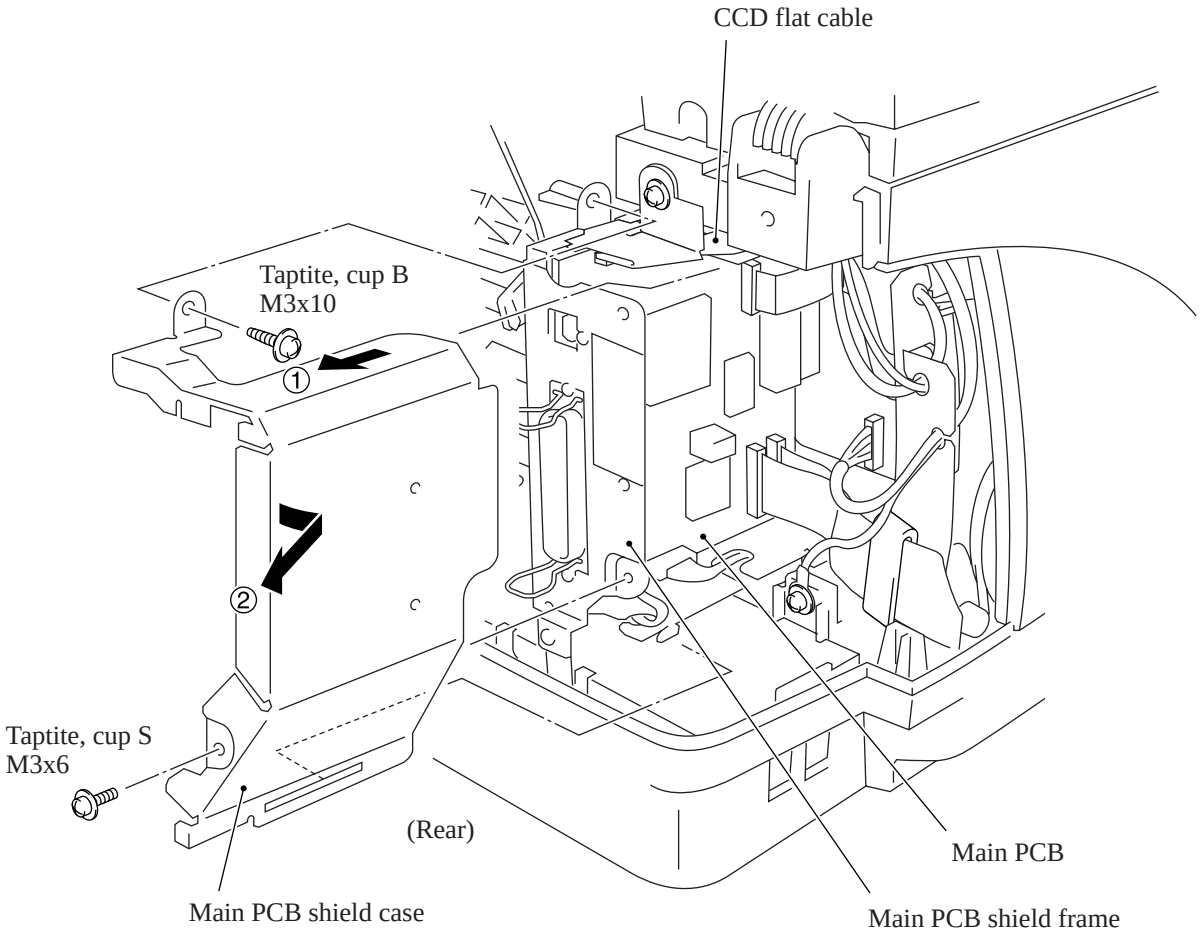


6.1.7 Main PCB Shield Case and Scanner Unit (Together with Document Cover)

(1) Remove the two screws from the main PCB shield case and pull out the main PCB shield case in the direction of arrows ① and ②.

NOTE: Take care not to scratch the CCD flat cable routing above the main PCB shield case.

NOTE: After the rear cover and main PCB shield case have been removed, you may install an optional LAN board to the main PCB.



(2) Remove screw "b" that secures the grounding wire, then release the wire from cutouts "z" and "y" provided in the harness support film L.

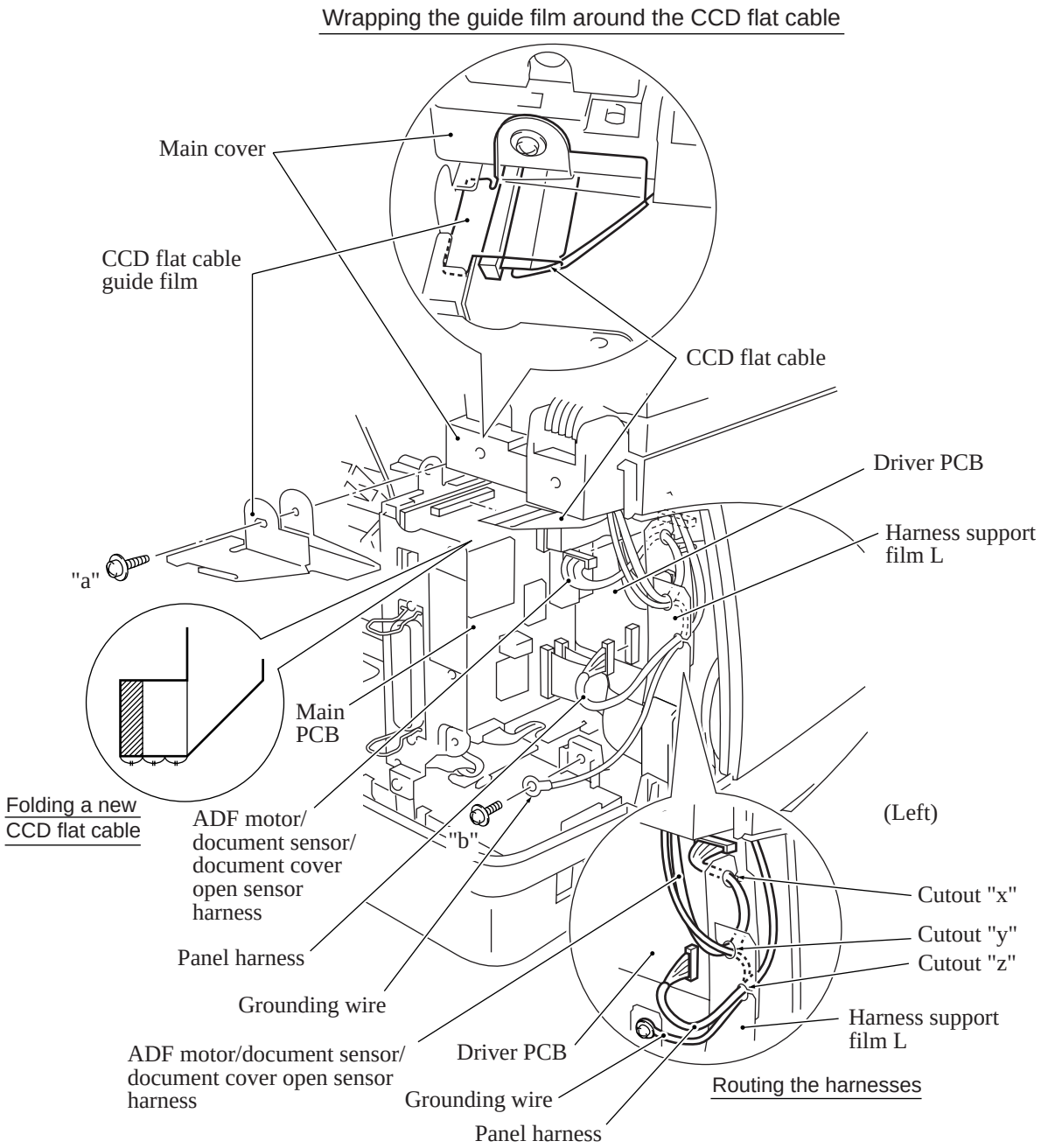
(3) Remove screw "a" that secures the CCD flat cable guide film, then take out the film.

(4) Disconnect the CCD flat cable from the main PCB.

NOTE: Handle the CCD flat cable with care.

(5) Disconnect the panel harness from the driver PCB, then release it from cutout "z" in the harness support film L.

(6) Disconnect the harness of the ADF motor/document sensor/document cover open sensor from the driver PCB, then release it from cutouts "x" and "y" in the harness support film L.



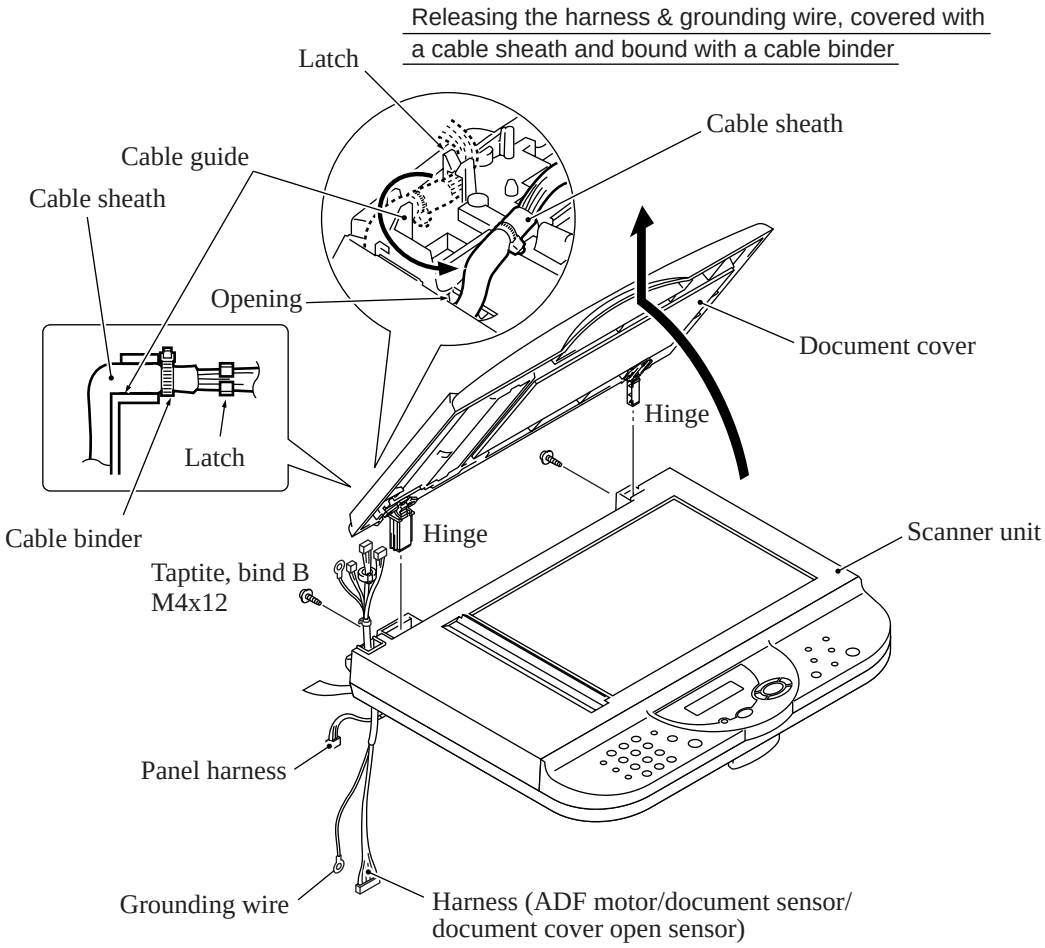
"a": Taptite, cup B M3x10
"b": Taptite, cup S M3x6

Be careful with
this boss (provided
for the scanner open
sensor actuator)

(10) Remove the two screws from the bottom rear of the hinges.

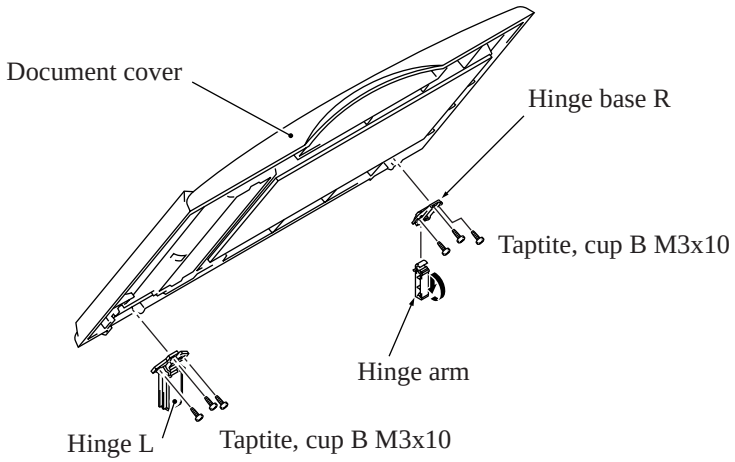
(11) Be sure to open the document cover, then release the harness & grounding wire (which are covered with a cable sheath and bound with a cable binder) from the latch and move them to the front in the opening.

(12) Lift up the document cover.



(13) From the hinge base R, remove the hinge arm as shown below. Remove the three screws and release the hinge base R.

(14) From the hinge L that should be kept opened, remove the three screws.



■ Reassembling Notes

- When setting the document cover on the scanner unit, pass the harness (ADF motor harness/document sensor/document cover open sensor) & grounding wire through the front section of the opening provided in the left rear corner of the document cover, with its bound section facing up (see the illustration given on the previous page).

  Move those bound harness & grounding wire to the rear section of the opening. Route the bound section through the cable guide so that the cable binder comes into contact with the cable guide as illustrated on the previous page. Refer to Subsection 6.1.31 "Harness routing A."

- When putting the scanner unit on the scanner mount, take special care not to bend, wrinkle, or scratch the CCD flat cable or not to break the boss of the main cover by the bottom of the scanner unit. (See the illustration given on page 6-27.)
- When connecting the ADF motor/document sensor/document cover open sensor harness to the driver PCB, be sure to route it through cutouts "x" and "y" provided in the harness support film L. (See the illustration given on page 6-26.)
- When connecting the panel harness to the driver PCB, be sure to route it through cutout "z" provided in the harness support film L. (See the illustration given on page 6-26.)
- When securing the grounding wire with screw "b," be sure to route it through cutout "z" together with the panel harness. (See the illustration given on page 6-26.)
- If the CCD flat cable is replaced with a new one, fold the new cable as illustrated on page 6-26.
- Wrap the guide film around the CCD flat cable as illustrated on page 6-26 and then secure the film to the main cover with a screw.
- If the scanner unit (or the CCD unit) is replaced with a new one, be sure to update the correction value (stored in the EEPROM of the driver PCB) for the multiplying factor of horizontal scanning. Refer to Appendix 2, A2.4 and CHAPTER 7, Subsection 7.5.11.

6.1.8 Control Panel ASSY

(1) Remove six screws "b" from the underside of the scanner base.

(2) Slightly lift up the control panel ASSY and disconnect the panel harness from the control panel PCB.

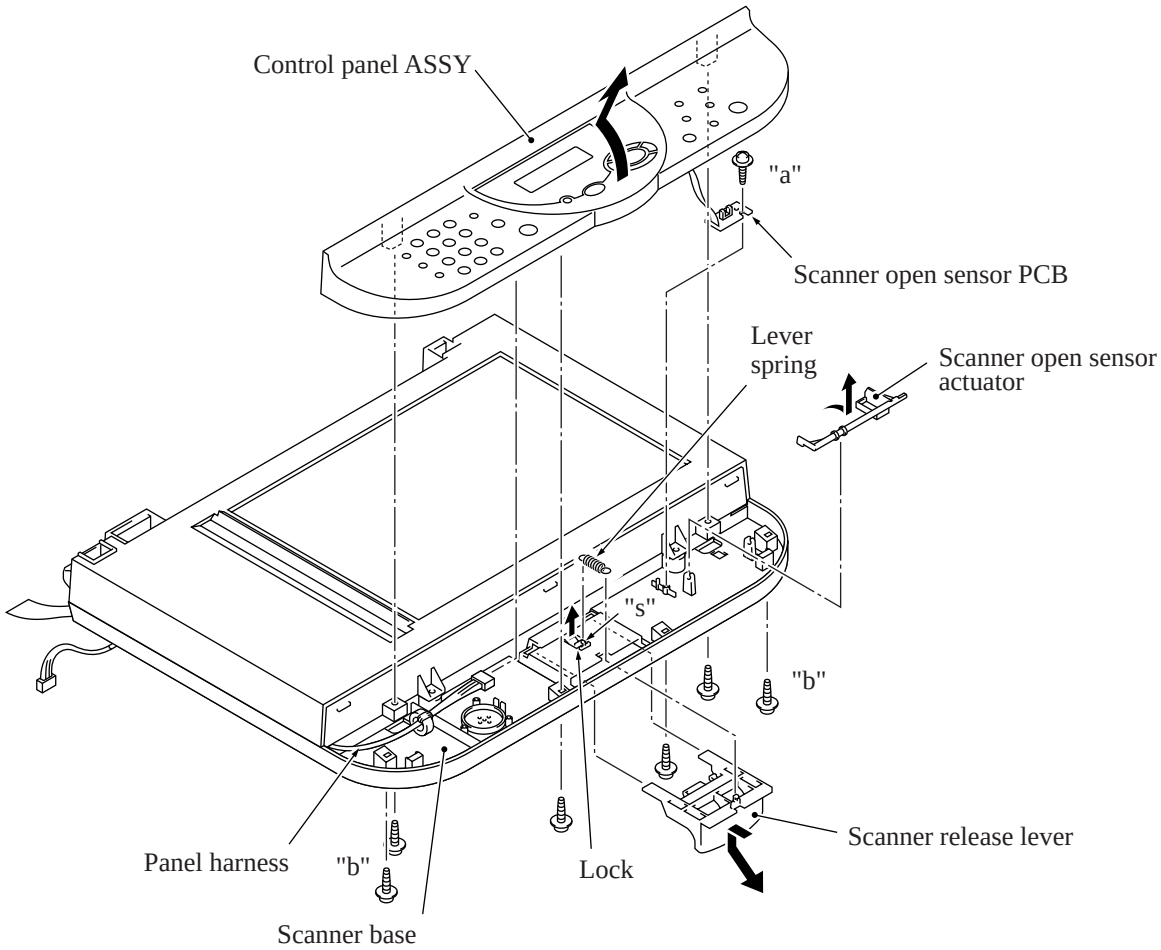
(3) Turn the scanner open sensor actuator as shown below and remove it.

(4) Remove screw "a" from the scanner open sensor PCB. Then the control panel ASSY is separated from the scanner unit.

(For the disassembly procedure of the control panel ASSY and scanner unit, refer to Subsections 6.1.9 and 6.1.10, respectively.)

(5) Remove the lever spring.

Insert the tip of a flat screwdriver into slit "s," push up the lock, and remove the scanner release lever in the direction of the arrow.



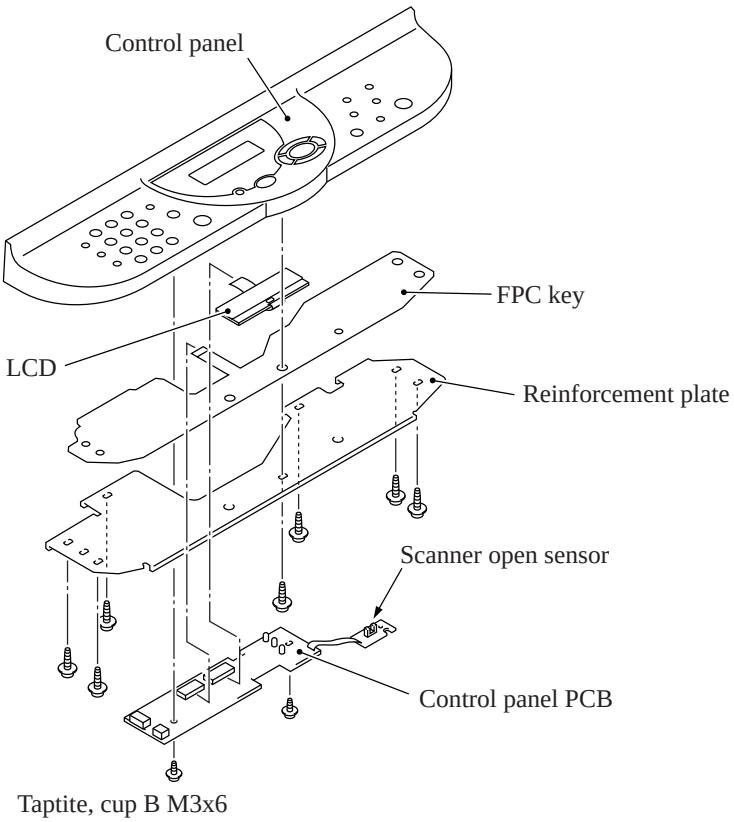
"a": Taptite, cup B M3x8
"b": Taptite, cup B M3x12

6.1.9 Disassembly of the Control Panel ASSY

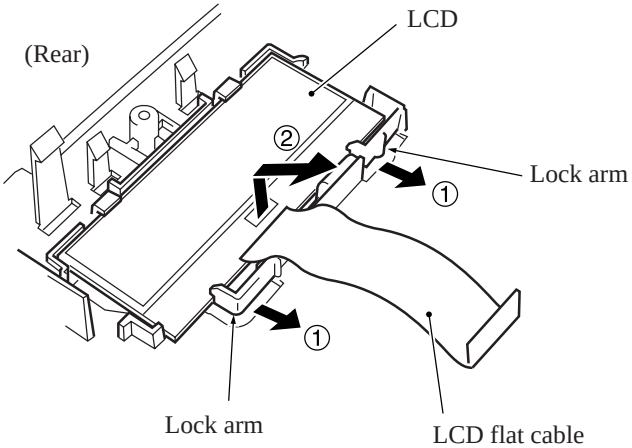
(1) Remove the two screws from the control panel PCB.

(2) Slightly lift up the control panel PCB, then unlock the FPC key connector and disconnect the FPC key. Next, unlock the LCD cable connector and disconnect the LCD flat cable.

(3) Remove the seven screws and take off the reinforcement plate and FPC key.



(4) As shown below, pull the lock arms outwards to release the LCD and pull the LCD flat cable gently.



■ **Reassembling Notes**

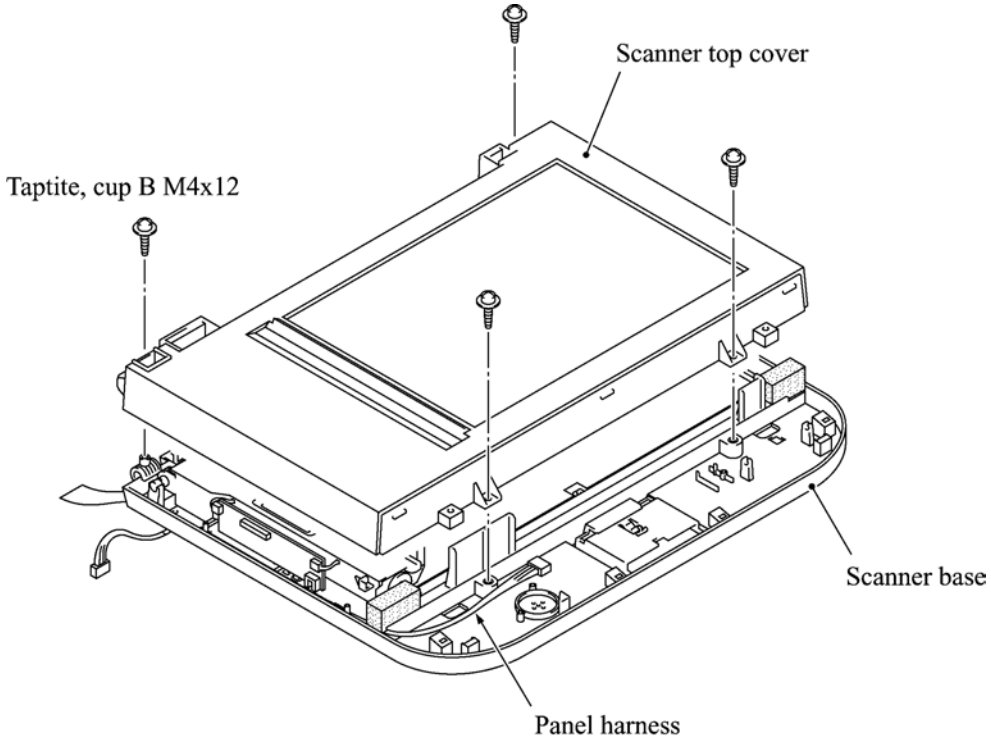
- Before reinstalling the LCD to the control panel, wipe fingerprints or dust off the LCD surface and control panel window with a soft cloth.
- A new LCD is covered with a protection sheet. Before installing it, remove the protection sheet.

6.1.10 Disassembly of the Scanner Unit

The disassembly job of the scanner unit should be done in a clean room to prevent dust or dirt from getting into the scanner unit.

(1) Remove the four screws from the scanner top cover.

(2) Separate the scanner top cover from the scanner base.



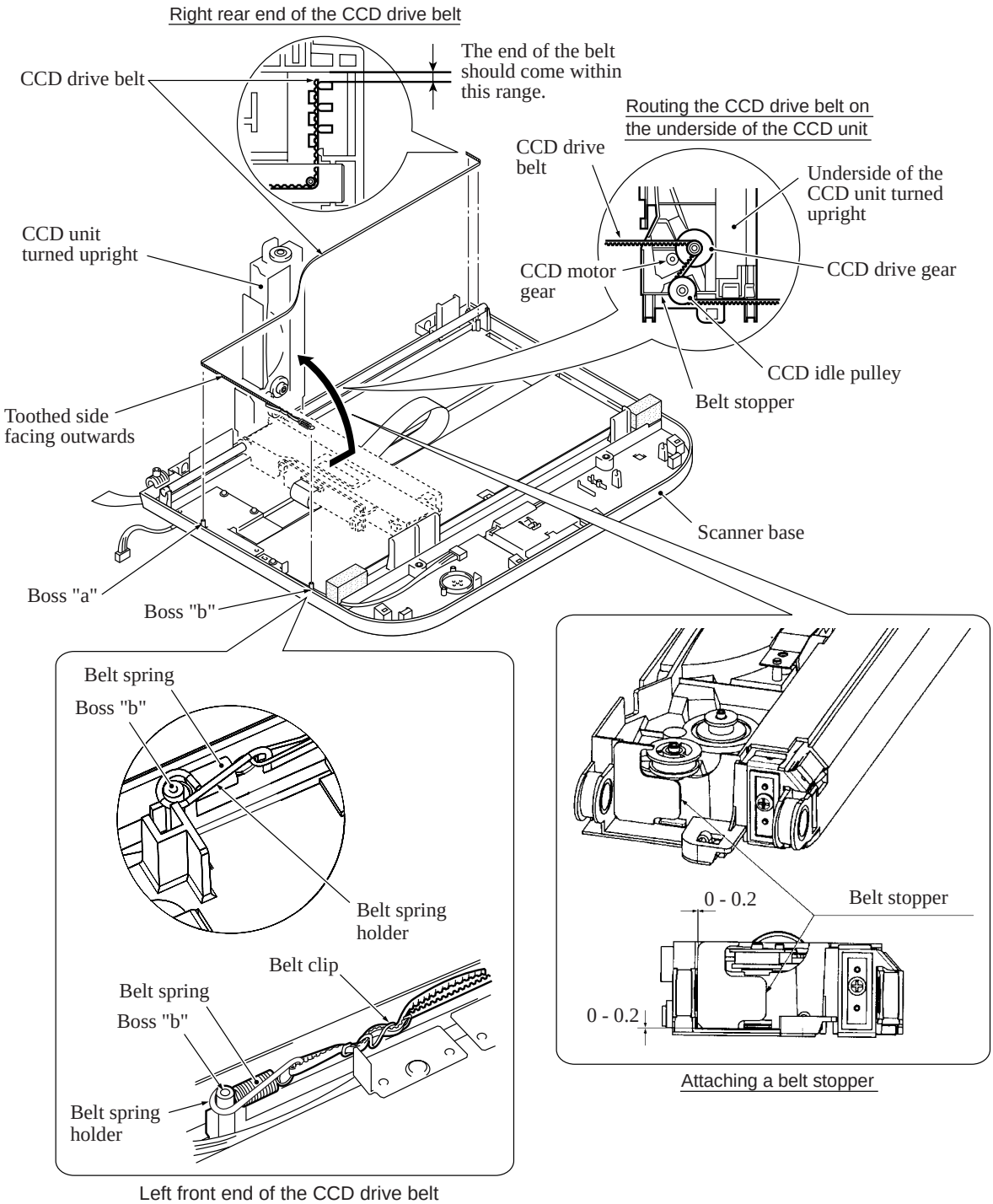
(3) Release the CCD drive belt from boss "a."

(4) At the left front end of the CCD drive belt, unhook the belt spring holder and belt spring from boss "b."

NOTE: Do not remove the belt spring or belt clip from the CCD drive belt.

(5) As illustrated below, move the CCD unit to the right, lift up its front end and turn the CCD unit upright. The CCD drive belt will slip off the CCD idle pulley, drive gear, and belt stopper on the underside of the CCD unit.

NOTE: Once removed, the belt stopper will become unusable and new part will have to be put back in.



Left front end of the CCD drive belt

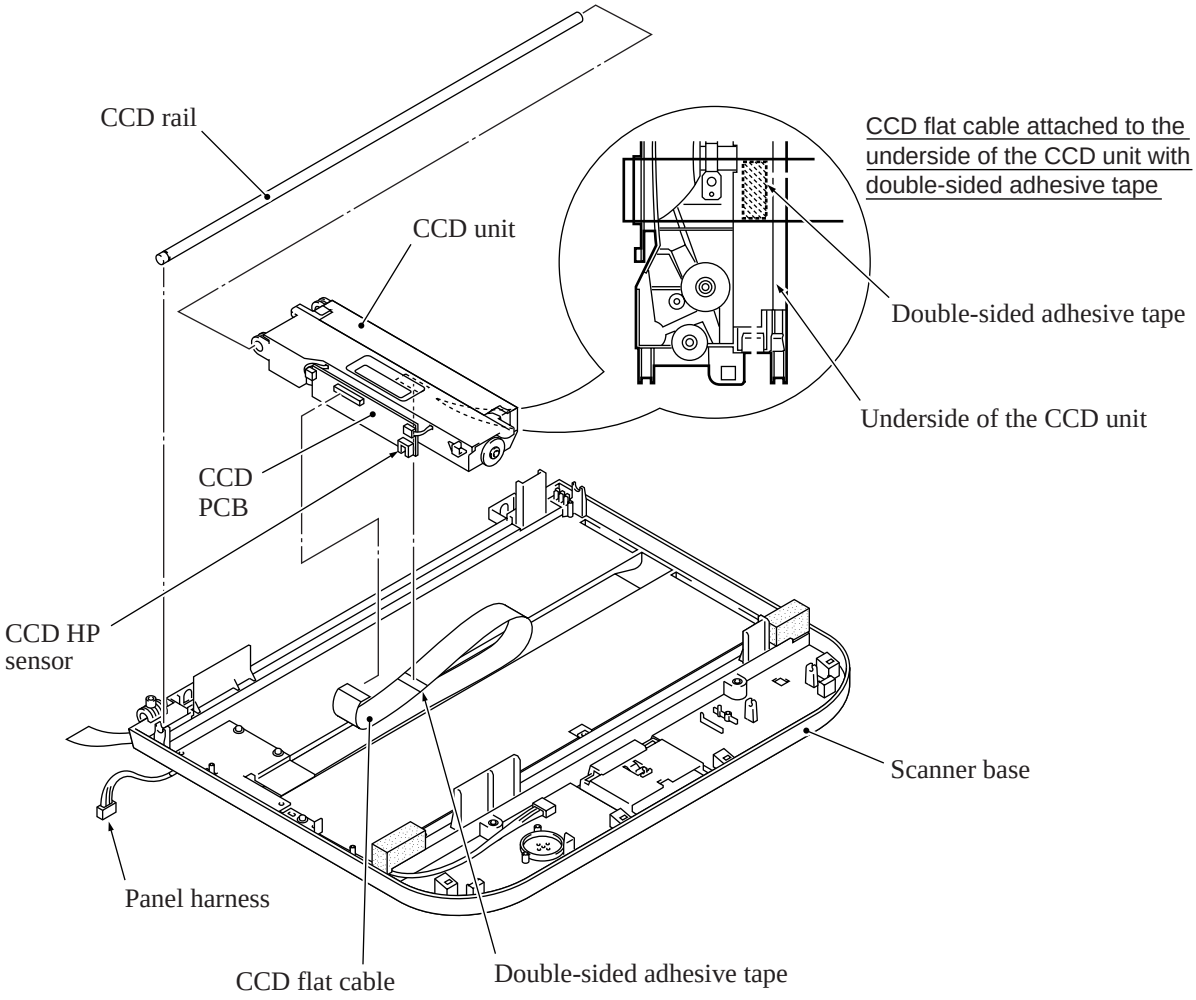
Attaching a belt stopper

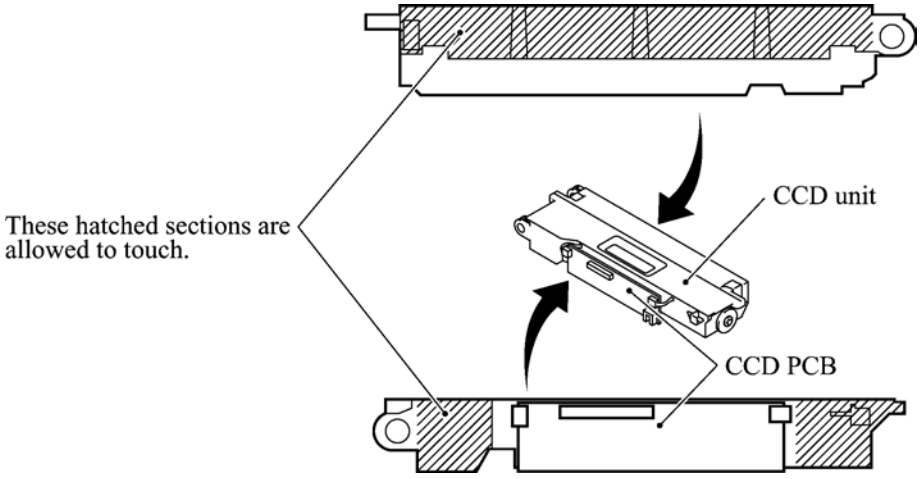
(6) Disconnect the CCD flat cable from the CCD PCB, then release the cable that is attached to the underside of the CCD unit with double-sided adhesive tape.

NOTE: Only when the CCD unit or CCD flat cable is defective and requires replacement, release the flat cable. Once released, the flat cable should be attached using new double-sided adhesive tape.

(7) Lift up the CCD rail together with the CCD unit from the scanner base, then pull out the CCD rail.

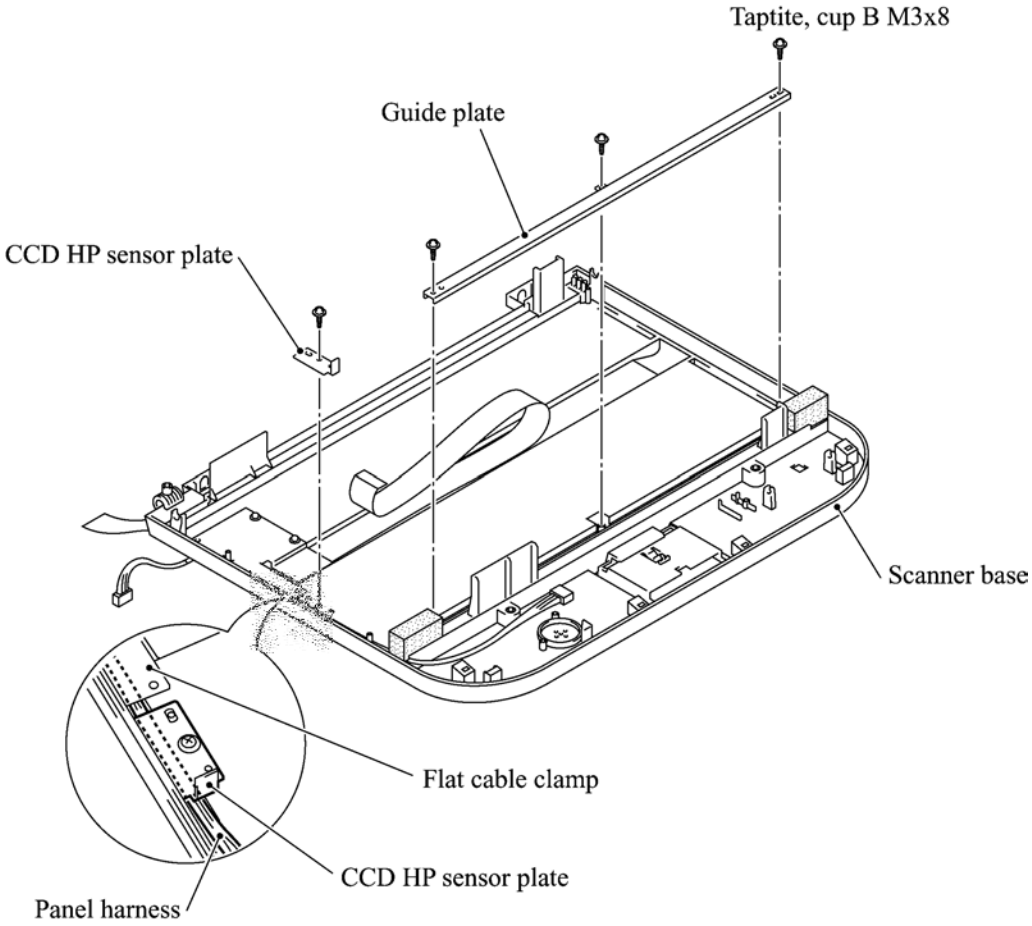
NOTE: When handling the CCD unit, do not touch the CCD PCB or glasses but hold the hatched sections as shown on the next page.





(8) Remove the three screws and lift up the guide plate.

(9) Remove the screw from the CCD HP sensor plate.

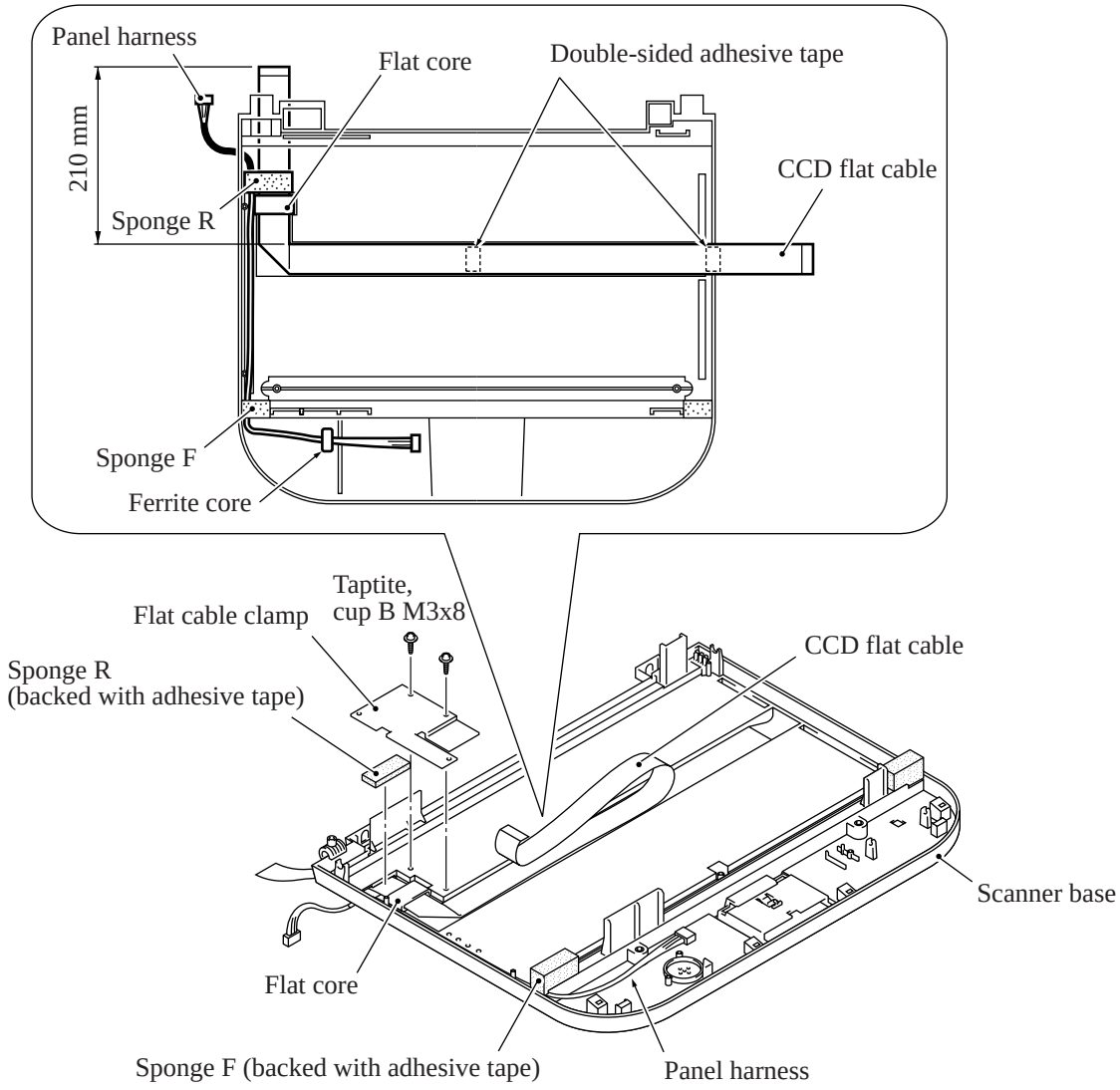


(10) Remove the two screws and take off the flat cable clamp. (See the next page.)

(11) To take out the panel harness, remove sponges F and R that are backed with adhesive tape.
NOTE: Once removed, those sponges will become unusable and new parts will have to be put back in.

(12) To take out the CCD flat cable, remove sponge R.

CCD flat cable and panel harness secured to the scanner base



■ Reassembling Notes

- When using a new CCD flat cable, fold it and secure it to the scanner base with double-sided adhesive tape and sponge R (backed with adhesive tape) as illustrated above.

  Then attach it to the underside of the CCD unit with double-sided adhesive tape.
- When reassembling the components inside the scanner unit, use screws (Taptite, cup B M3x8). Never use longer ones (e.g., M3x10). Using longer ones will bore a hole in the scanner base.
- When installing the CCD drive belt to the scanner base, set its rear end within the range specified on page 6-33.
- If the CCD unit (or the scanner unit) is replaced with a new one, be sure to update the correction value (stored in the EEPROM of the driver PCB) for the multiplying factor of horizontal scanning. Refer to Appendix 2, A2.4 and CHAPTER 7, Subsection 7.5.11.

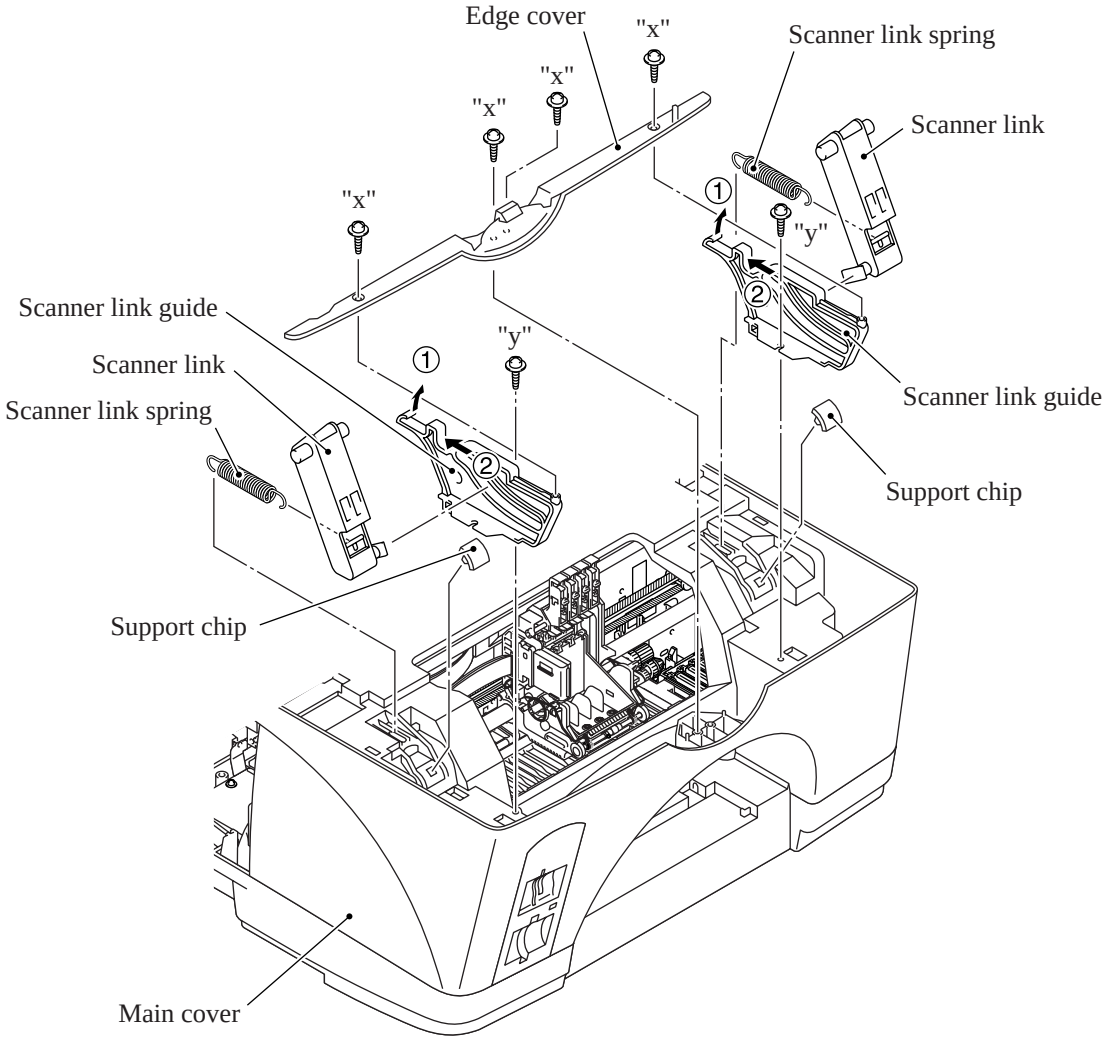
6.1.11 Edge Cover, Scanner Links and Their Guides

(1) Remove four screws "x" and lift up the edge cover.

(2) Unhook the rear edges of the scanner link springs from the main cover, then remove the scanner links.

(3) From each of the scanner link guides, remove screw "y." Pull up the rear end of each scanner link guide (in the direction of arrow ①) and slide the guide to the rear (arrow ②).

(4) Remove the support chips. (For easier removal, access them from the inside of the main cover after removing the main cover.)



"x" and "y": Taptite, cup B M3x10

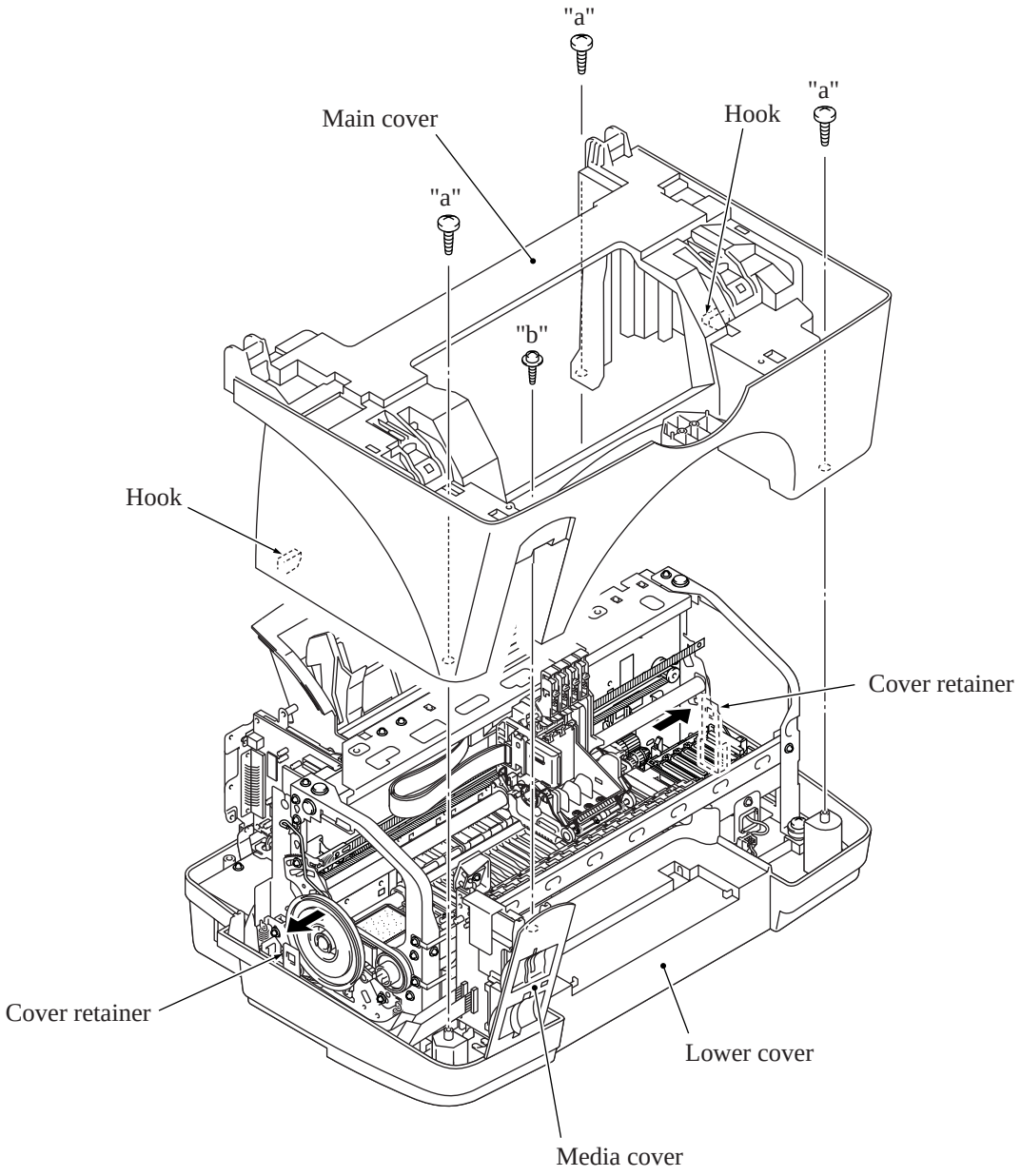
6.1.12 Main Cover

(1) Remove the four screws (three "a" and one "b") from the main cover.

(2) Press the cover retainers inwards with the tip of a flat screwdriver to release the hooks provided on the inside of the main cover.

(3) Lift up the main cover.

CAUTION: After removing the main cover, do not turn the machine upside down. The main chassis may be warped or distorted so that the print quality could deteriorate.



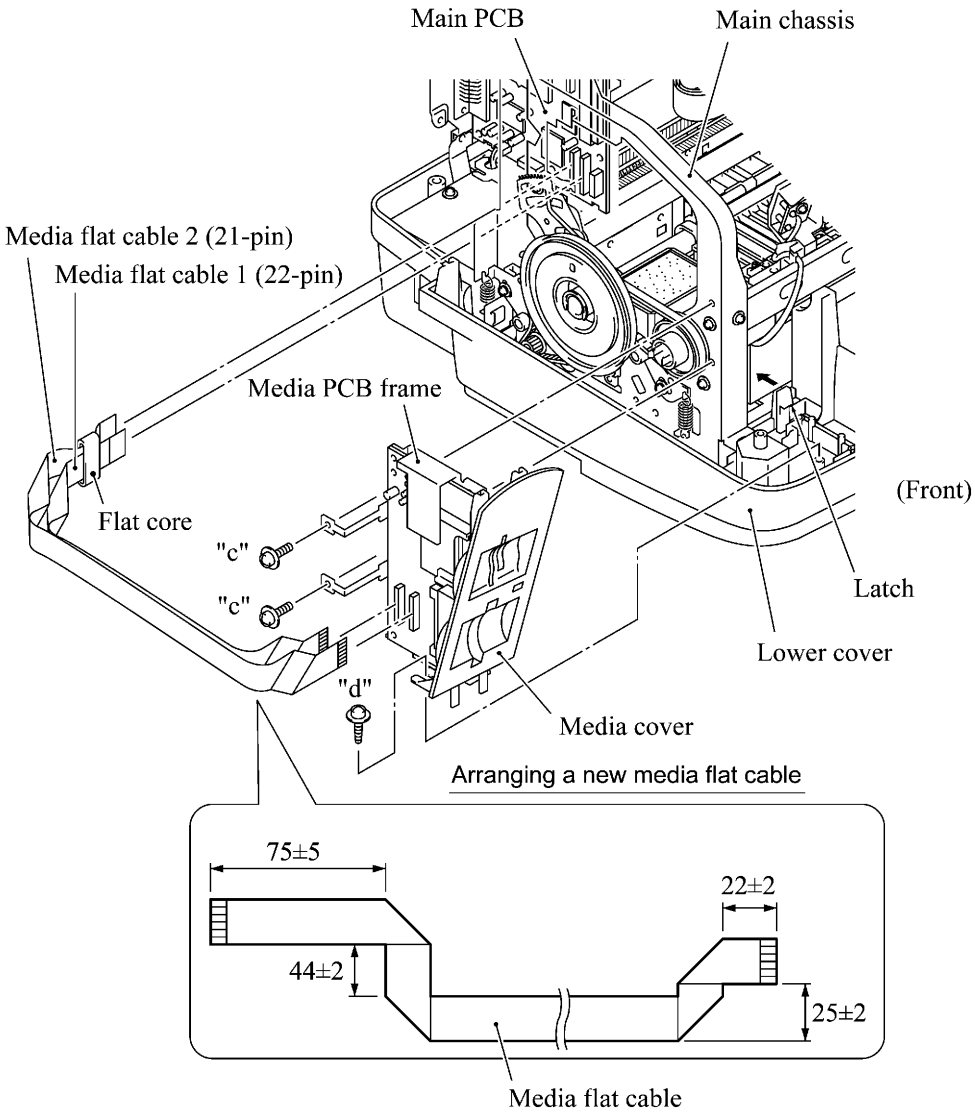
"a": Screw, bind B tite M4x12
"b": Taptite, cup B M3x10

6.1.13 Media Module (Media Cover, Media PCB, and Frame) and Media Flat Cables

(1) Remove the three screws (two "c" and one "d") as shown below.

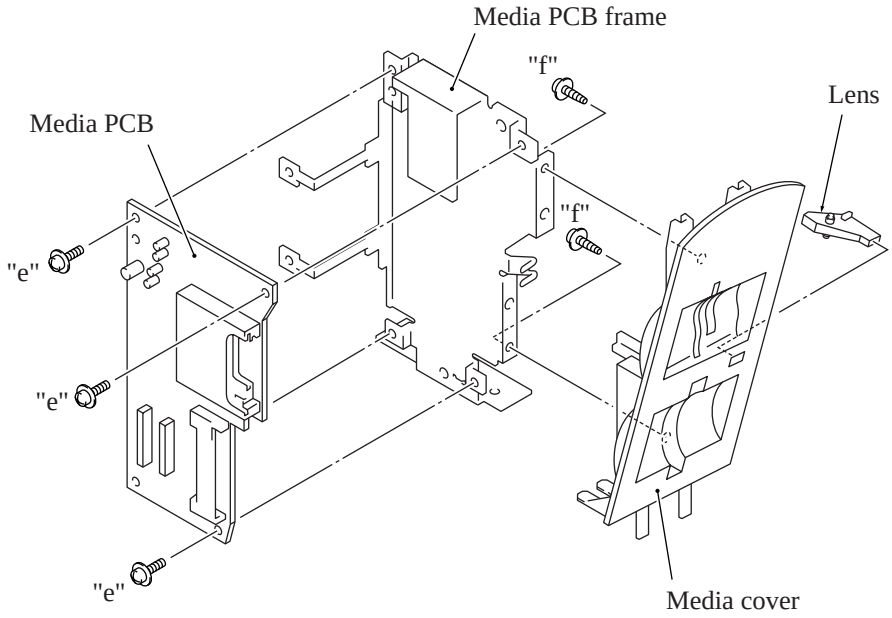
(2) Unlatch the media PCB frame and take the media module out of the machine.

(3) Disconnect the media flat cables 1 and 2 from the media PCB and the main PCB.



"c": Taptite, cup S M3x6
"d": Taptite, cup B M3x10

(4) You may disassemble the media module as illustrated below.



"e": Taptite, cup S M3x6
"f": Taptite, cup B M3x10

■ Reassembling Notes

- When using a new media flat cable, fold it as specified on the previous page.
- Be sure to route the media flat cables 1 and 2 and fit their flat core over the tab of the harness support film L as illustrated in Subsection 6.1.31 "Harness routing B."

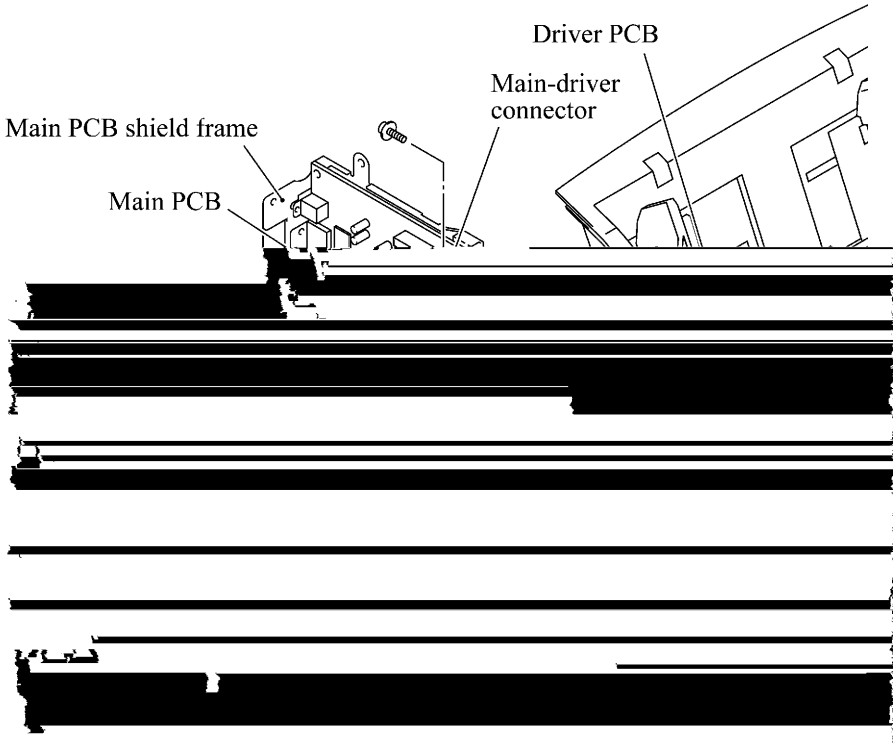
6.1.14 Main PCB and its Shield Frame

(1) Disconnect the following harnesses and flat cable from the main PCB:

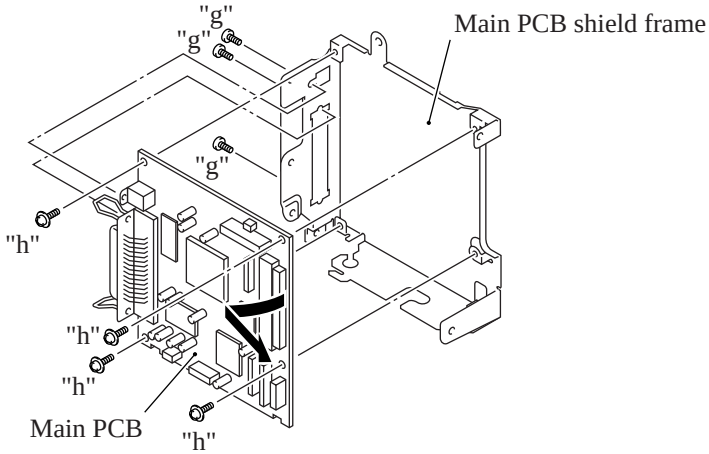
- Manual feed slot cover sensor harness
- Speaker harness
- NCU harness
- Head flat cable M (main-head power line)

(2) Remove the three screws from the main PCB shield frame.

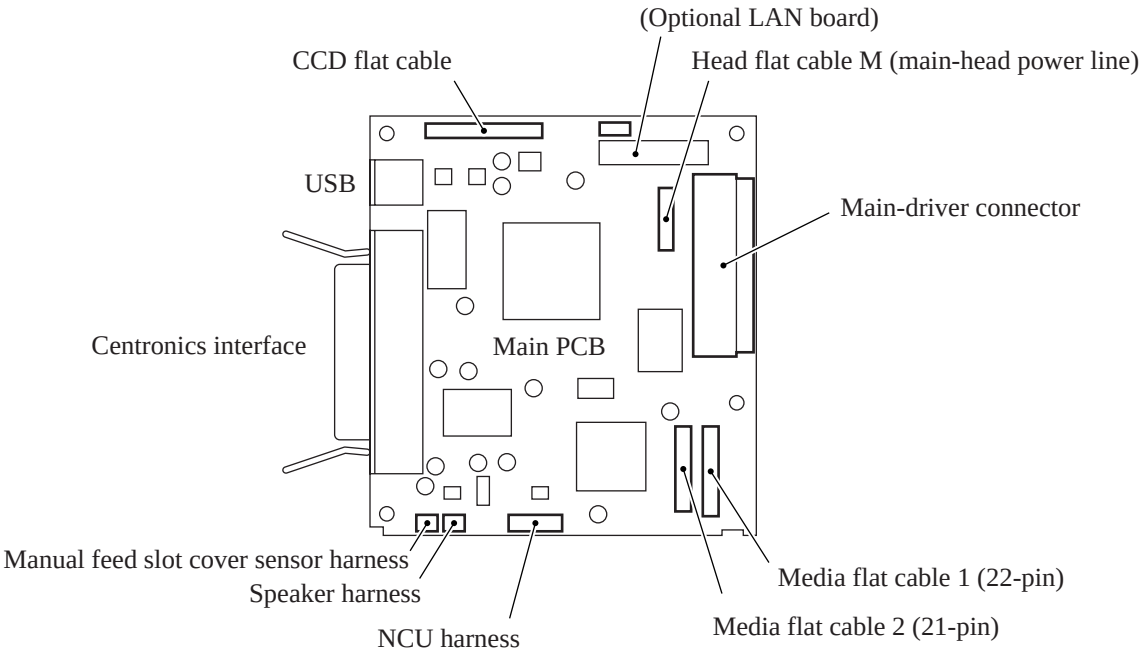
(3) Pull out the main PCB shield frame which holds the main PCB so that the main PCB will be disconnected from the driver PCB.



(4) Remove the seven screws (three "g" and four "h") and release the main PCB from its shield frame.



"g": Screw, pan M3x6
"h": Taptite, cup S M3x6



■ Reassembling Notes

- Be sure to route the speaker harness, NCU harness, and head flat cable M (main-head power line) as illustrated in Subsection 6.1.31 "Harness routing C."
- If the main PCB is replaced with a new one, be sure to install the update data to the flash ROM of the new main PCB, referring to Appendix 2, A2.1.

  Then make the machine enter the maintenance mode (by pressing the **Menu**, *****, **2**, **8**, **6**, and **4** keys in this order) after reassembly and then perform the following:

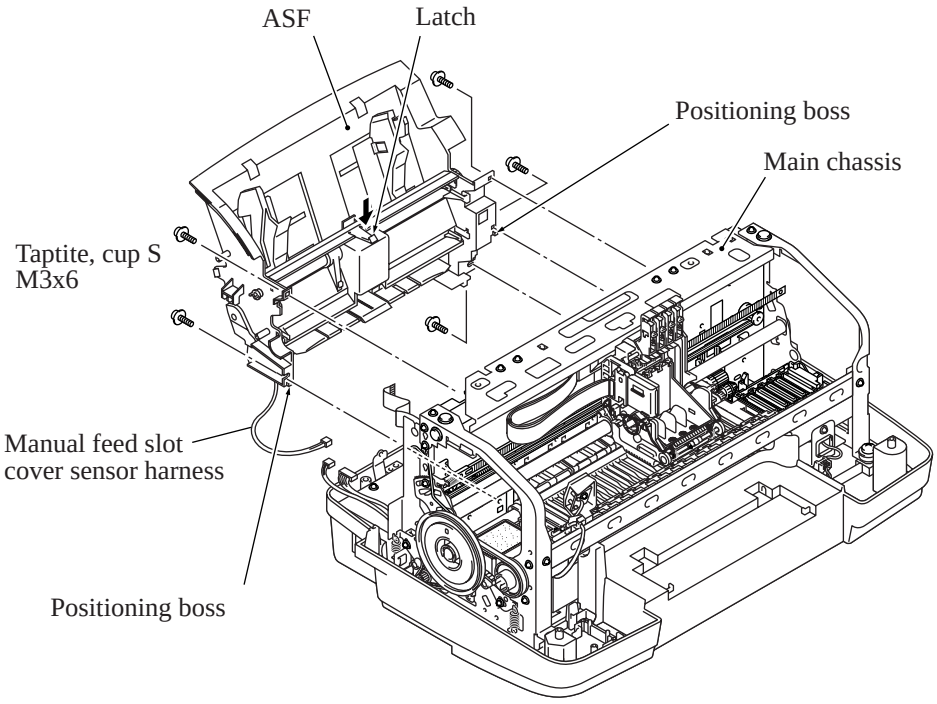
  - Sensor operational check [Function code: 32]
  - Operational check of control panel PCB [Function code: 13]
  - ADF performance test [Function code: 08]
  - Operational check of LCD [Function code: 12]

  For details about the entry to the maintenance mode, maintenance-mode functions, and exit from the maintenance mode, refer to CHAPTER 7.

6.1.15 ASF and ASF roller ASSY

(1) Disconnect the manual feed slot cover sensor harness from the main PCB, if the main PCB has not been removed.

(2) Remove the five screws from the rear side of the ASF and unlatch the ASF from the main chassis.

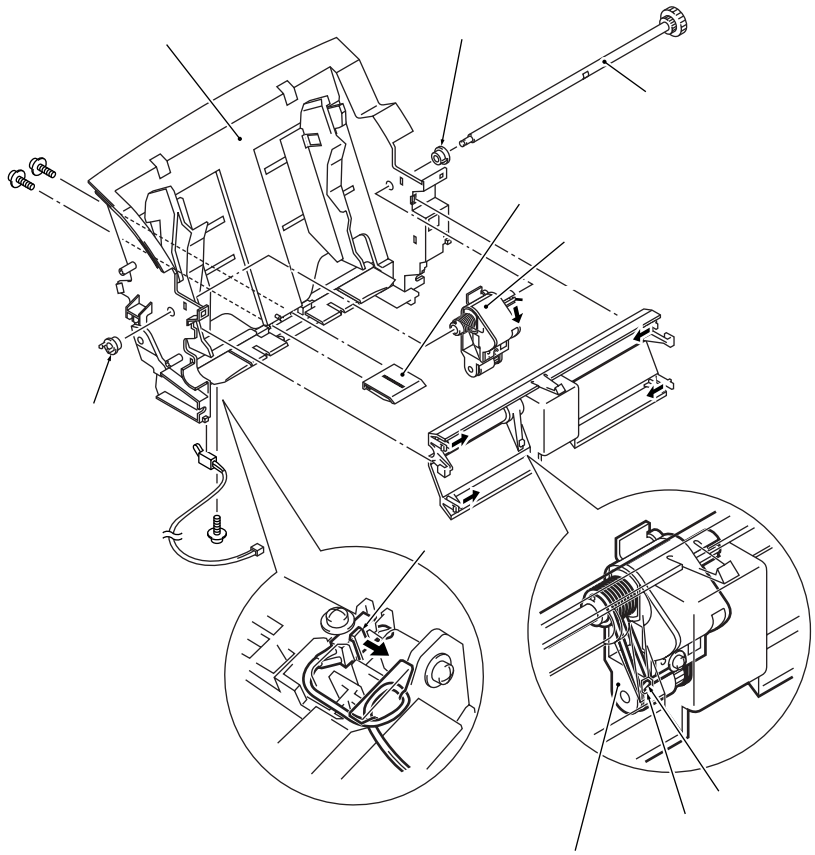


(3) Pull four latches "a" of the bank ASSY inwards and remove the ASSY from the ASF base.

(4) Remove the two screws to release the separation pad ASSY.

(5) Remove the pawled bushing from the left side of the ASF base and pull out the ASF shaft together with the bushing. The ASF roller ASSY also comes off.

(6) Remove the screw from the manual feed slot cover sensor.



6.1.16 FG Plates, Power Supply PCB, and NCU PCB

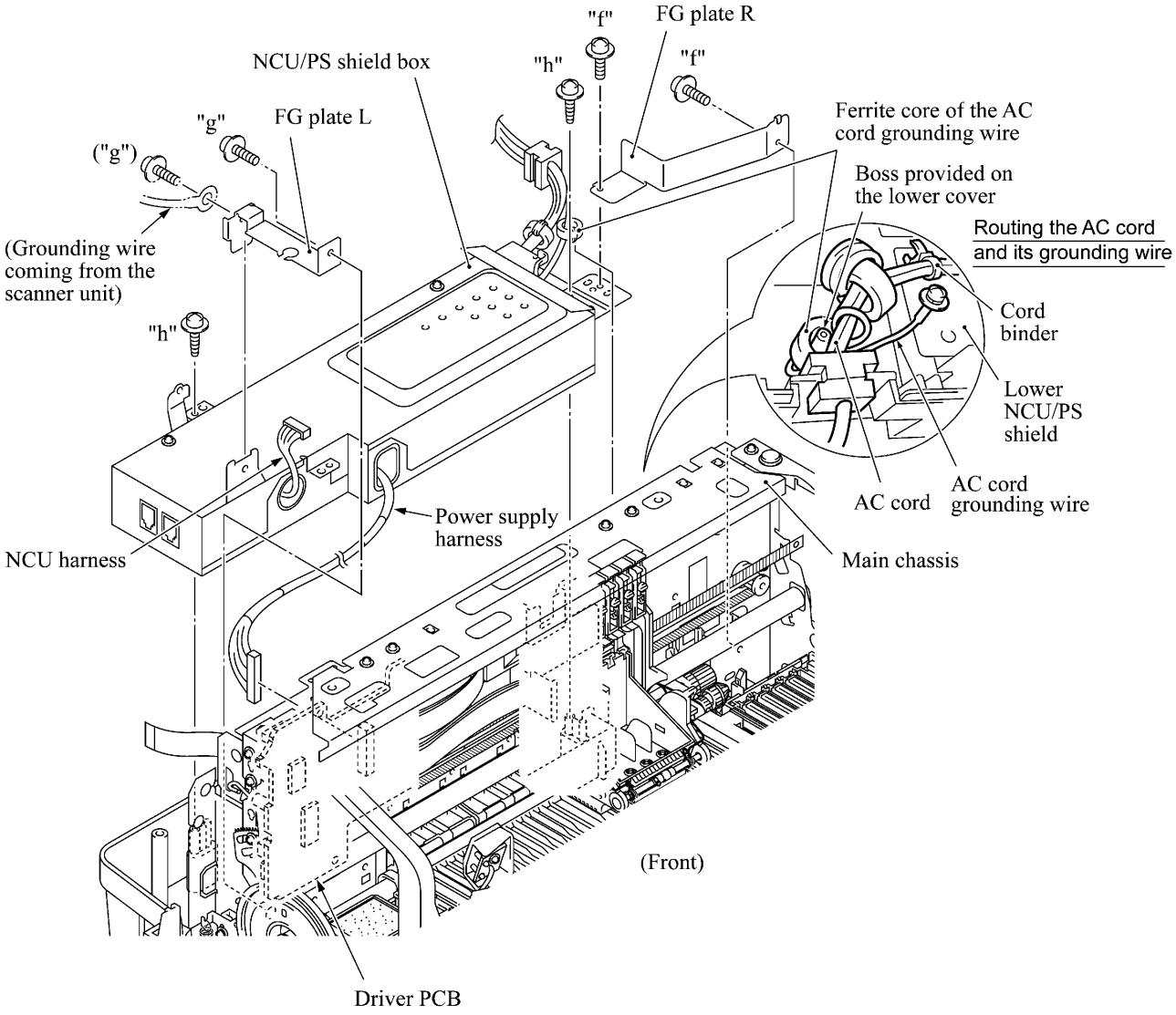
(1) Remove two screws "f" and take out the FG plate R.

(2) Remove screw "g" (two screws "g" if the scanner unit has not been removed) and take out the FG plate L. (Through the cutout provided in the FG plate L, the paper feed motor harness and ink empty sensor harness are routed.)

(3) Remove two screws "h."

(4) Disconnect the power supply harness from the driver PCB.

(5) Lift up the NCU/PS shield box while taking out the power supply harness from the cable guides.



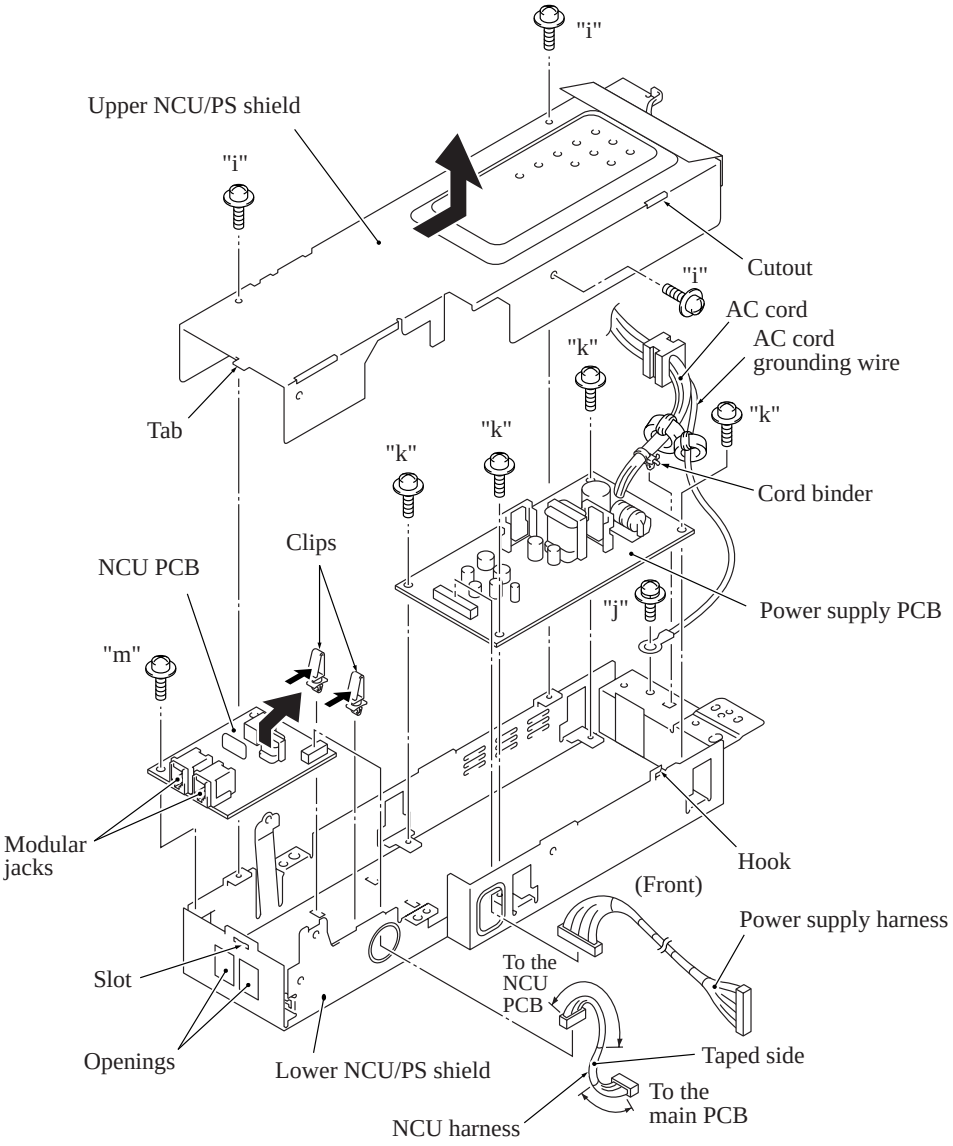
"f" and "g": Taptite, cup S M3x6
"h": Taptite, cup B M3x10

(6) Remove three screws "i" and separate the upper NCU/PS shield from the lower one.

(7) Remove screw "j" to release the AC cord grounding wire from the lower NCU/PS shield.

(8) Remove four screws "k" and lift up the power supply PCB.

(9) Remove screw "m" and unhook the NCU PCB from the two clips.



"i, "k," and "m": Taptite, cup S M3x6
"j": Screw, pan (washer) M4x8DB

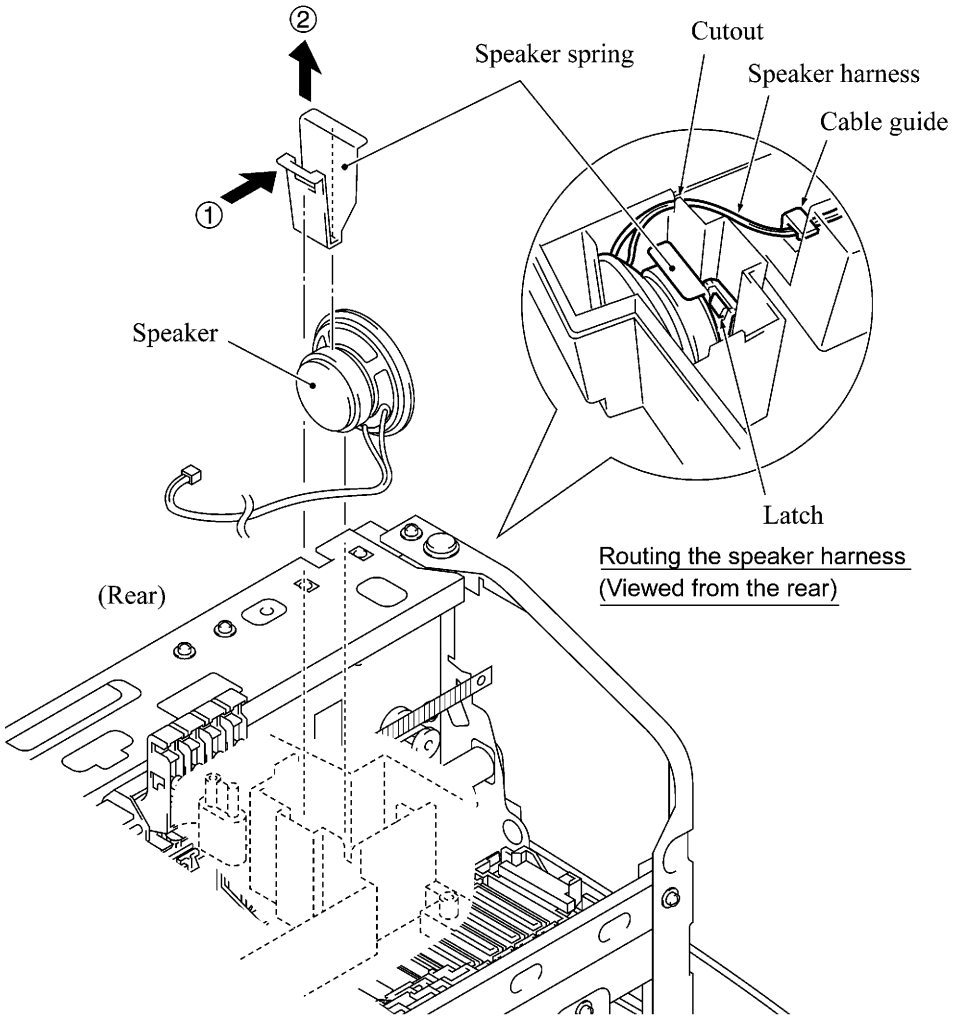
■ Reassembling Notes

- Secure the NCU PCB to the lower NCU/PS shield with a screw while pressing the modular jacks against the openings provided in the lower NCU/PS shield.
- When connecting the NCU harness, be careful with the orientation. Connect the non-taped side of the harness to the NCU PCB.
- As shown on the previous page, route the AC cord and its grounding wire. Be sure to secure the AC cord to the lower NCU/PS shield with a cord binder and fit the grounding wire's ferrite core over the boss provided on the lower cover.
- When securing the FG plate L, be sure to route the paper feed motor harness and ink empty sensor harness through the cutout provided in the plate.

6.1.17 Speaker

(1) Press the speaker spring in the direction of arrow ① and pull it up (arrow ②).

(2) Take the speaker up and out of the lower cover.



■ Reassembling Notes

- Route the speaker harness as illustrated above and in Subsection 6.1.31 "Harness routing C" and "Harness routing E."

6.1.18 Purge Unit

(1) Remove the print head unit (refer to Subsection 6.1.1).

(2) Disconnect the purge switch harness (blue and white) from the driver PCB.

(3) Remove screw "o" and take off the purge unit support together with its spring.

NOTE: Take care not to lose the spring.

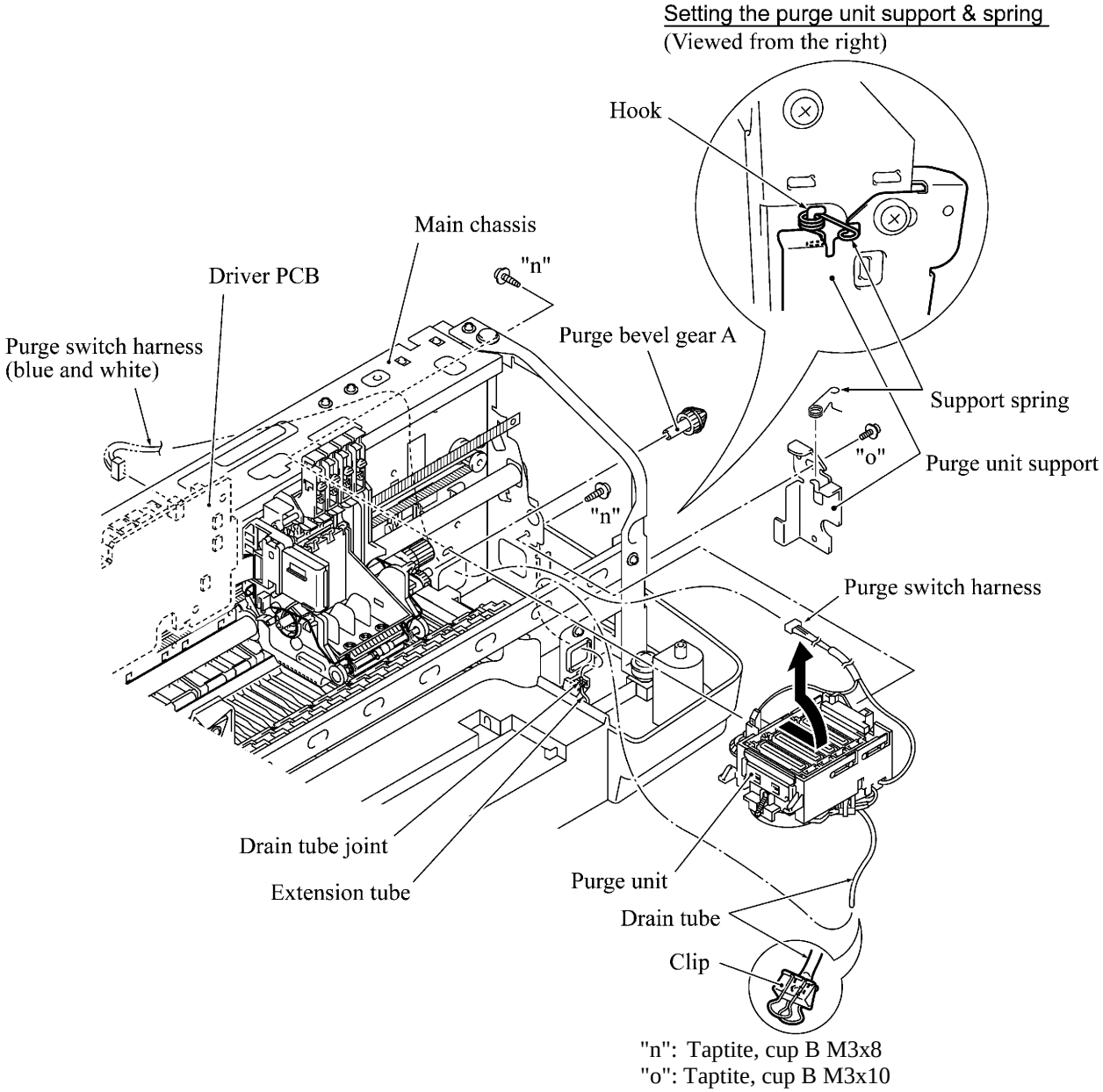
(4) Remove two screws "n," one from the rear side of the purge unit and the other from the right side of the main chassis (not from the purge unit stopper shown on the next page).

(5) Pull up the drain tube from the drain tube joint.

NOTE: Pinch the end of the drain tube with a clip to prevent drained ink from leaking out and making stains on the machine.

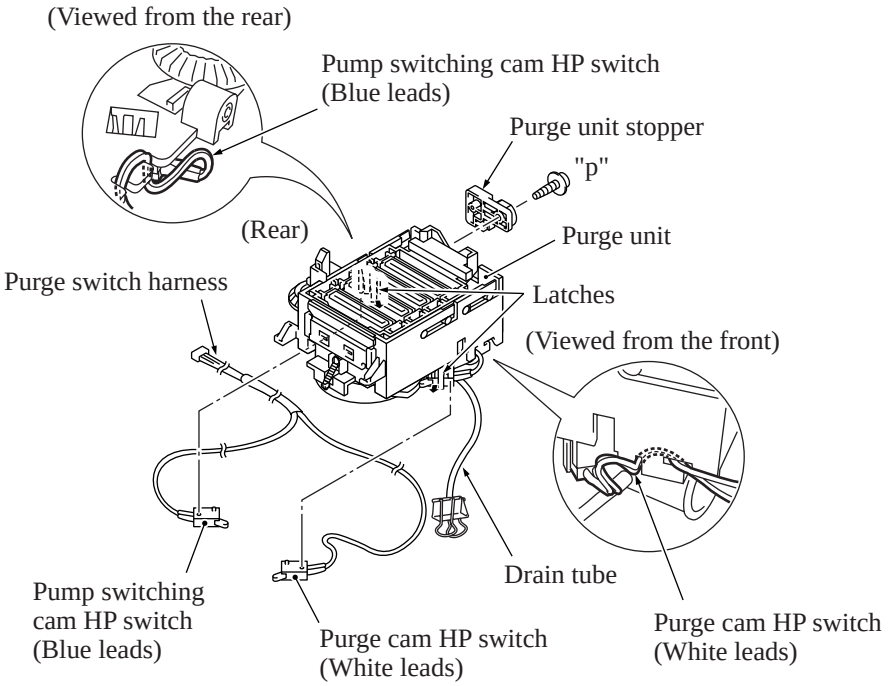
(6) Pull the purge unit to the front, tilt it to the rear, and then pull it up

(7) Remove the purge bevel gear A.



(8) Remove screw "p" and release the purge unit stopper from the purge unit.

(9) Take off the purge cam HP switch and pump switching cam HP switch from the purge unit by pulling the latches outwards, respectively.



"p": Taptite, cup B M3x8

■ Reassembling Notes

- When installing the purge unit support, set its spring on the hook of the support and then secure them to the main chassis with the screw as illustrated on the previous page.
- When installing the purge unit, be sure to fit the end of the drain tube over the drain tube joint that connects the drain tube and extension tube together.

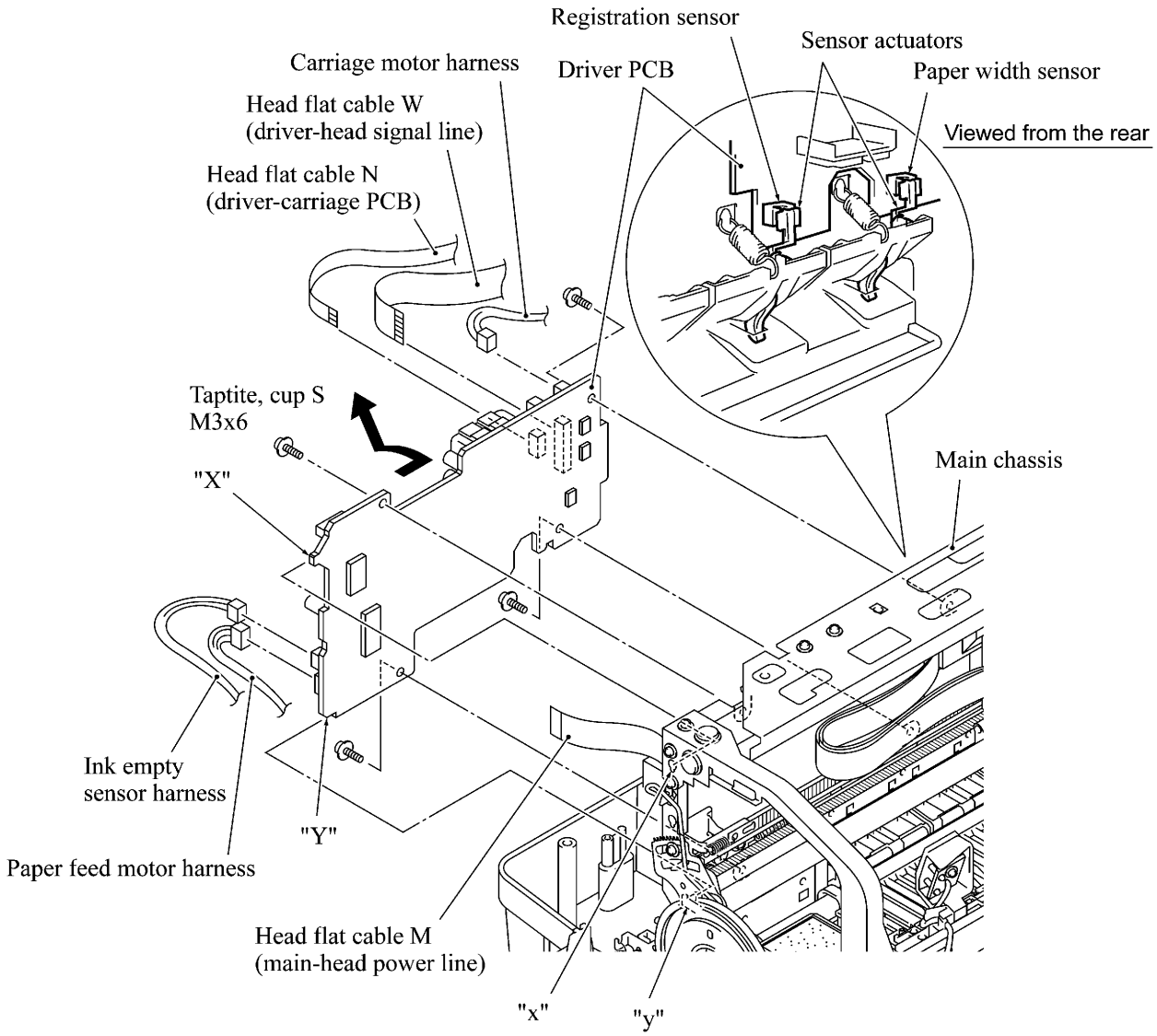
6.1.19 Driver PCB

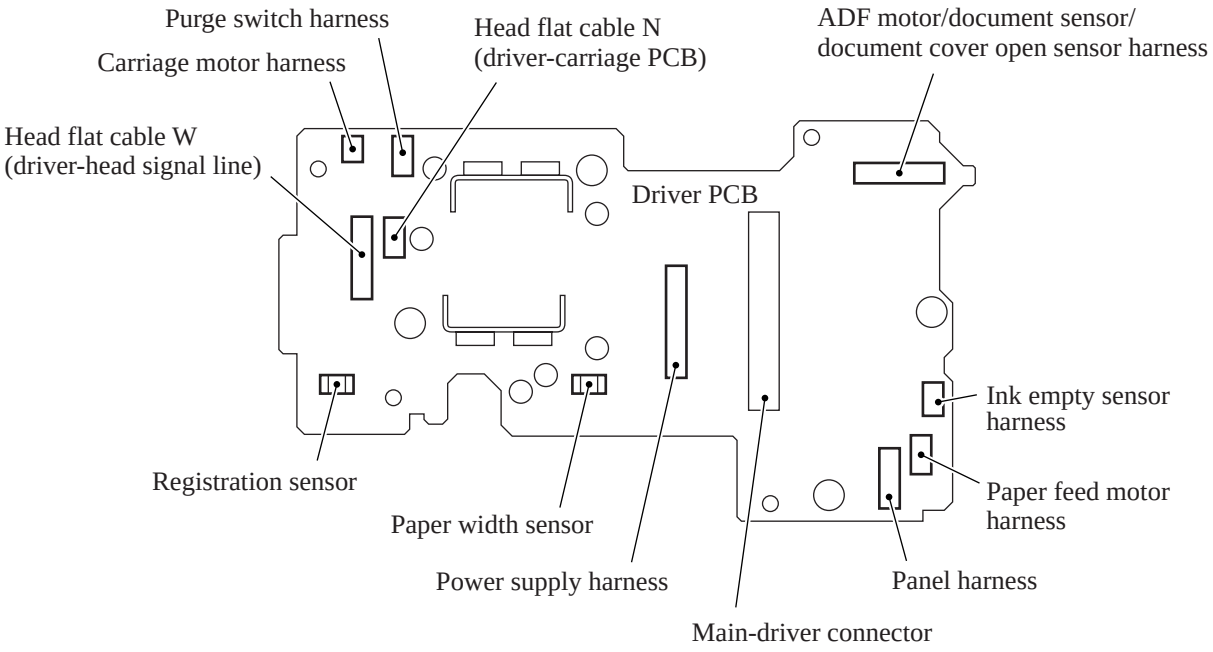
(1) Disconnect the following flat cables and harnesses from the driver PCB:

- Head flat cable N (driver-carriage PCB)
- Head flat cable W (driver-head signal line)
- Carriage motor harness
- Ink empty sensor harness
- Paper feed motor harness

(2) Remove the four screws.

(3) Slide the driver PCB to the left (when viewed from the rear) and remove it from the main chassis.





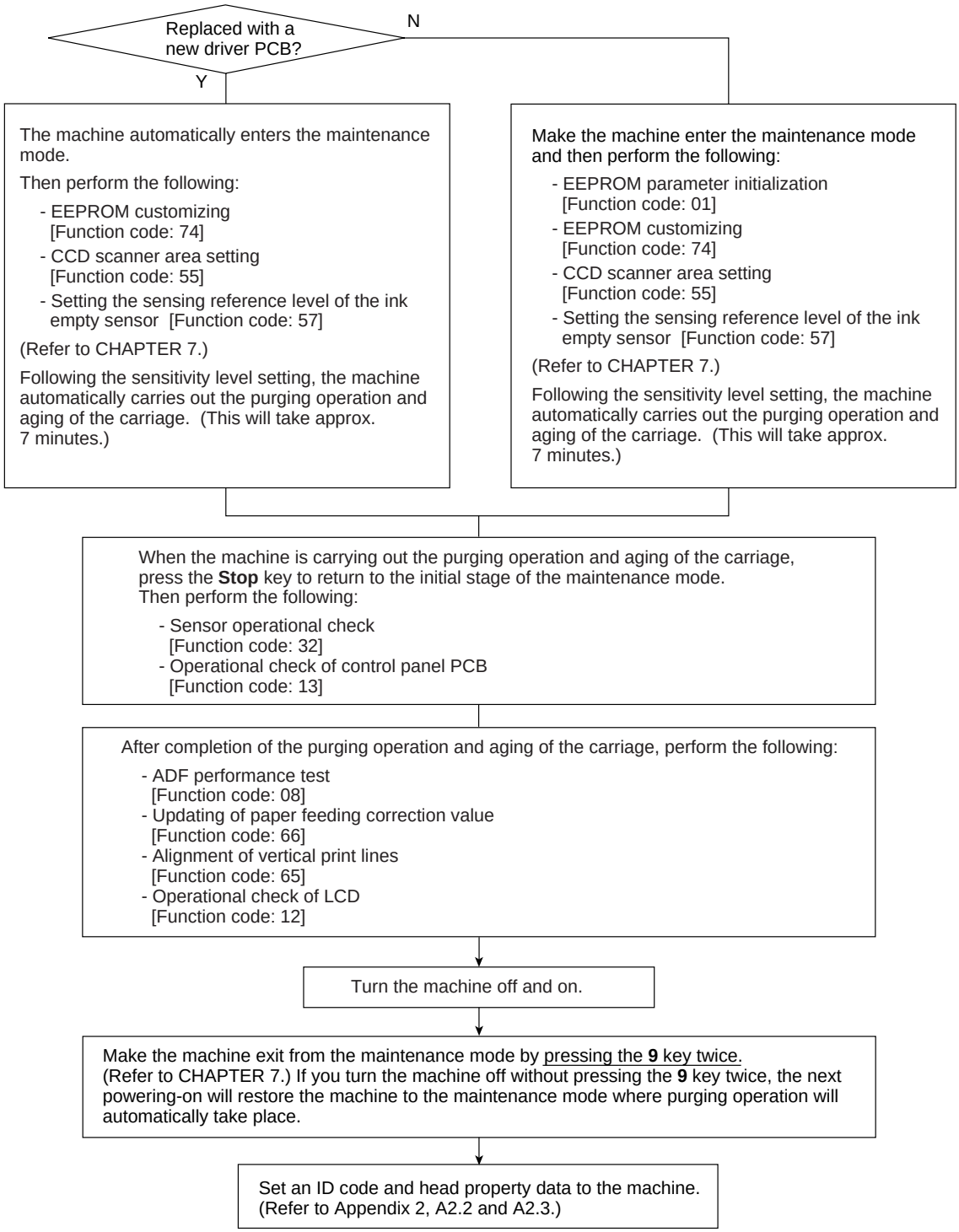
■ Reassembling Notes

- For easier installation of the driver PCB, pull the two sensor actuators to the rear and fit corners "X" and "Y" into/over opening "x" and pawl "y" as illustrated on the previous page.
- When reinstalling the harness support film L to the main chassis, route the head flat cable M through the slit provided in the film L and set the flat core onto the flat cable M. Then fit the flat core over the tab of the harness support film L. (Refer to Subsection 6.1.31 "Harness Routing C."
- If you replace the driver PCB, be sure to follow the flowchart given on the next page.

Setting up the driver PCB after replacement

- Important -

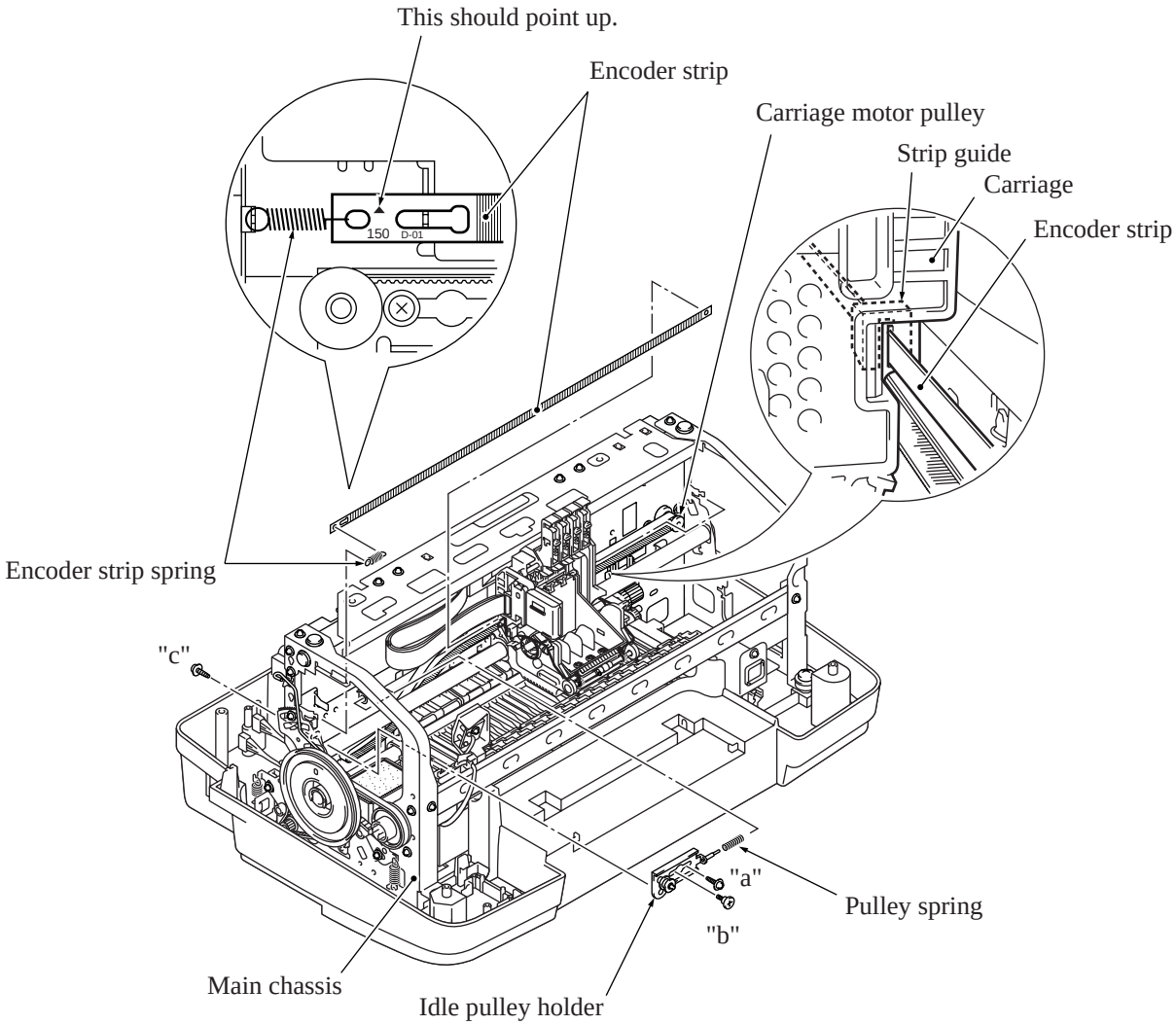
NOTE: Before starting the following procedure, make sure that the print head unit is installed.



6.1.20 Encoder Strip, Idle Pulley Holder, and Carriage Motor

(1) At the left end of the encoder strip, unhook the spring from the main chassis.

NOTE: Take care not to scratch or damage the encoder strip. If it becomes dirty, wipe it with a soft, dry cloth.



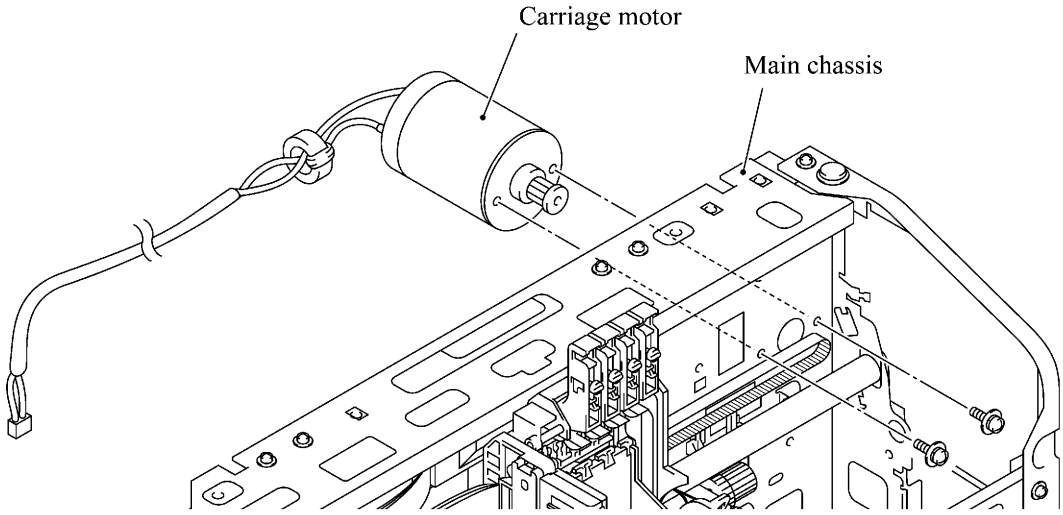
"a": Screw, pan (s/p washer) M3x6
"b": Shoulder screw
"c": Taptite, cup S M3x6

(2) Move the carriage to the center of its travel.

(3) Loosen two screws "a" and "c" on the idle pulley holder. (See the above illustration.)

(4) While pushing the idle pulley holder to the right, remove the carriage timing belt from the carriage motor pulley and idle pulley.

(5) Remove the carriage motor by removing the two screws.



Screw, pan (s/p washer) M3x6

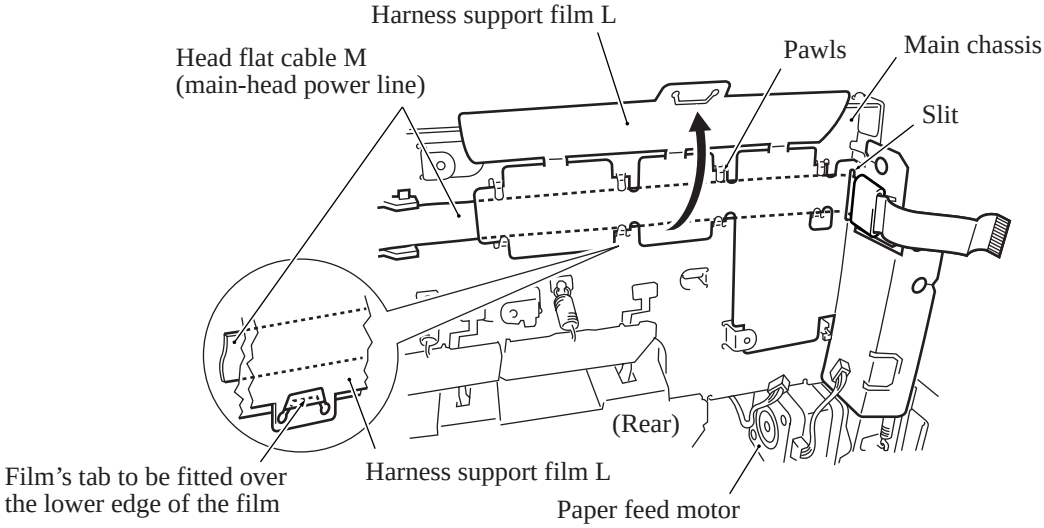
■ Reassembling Notes

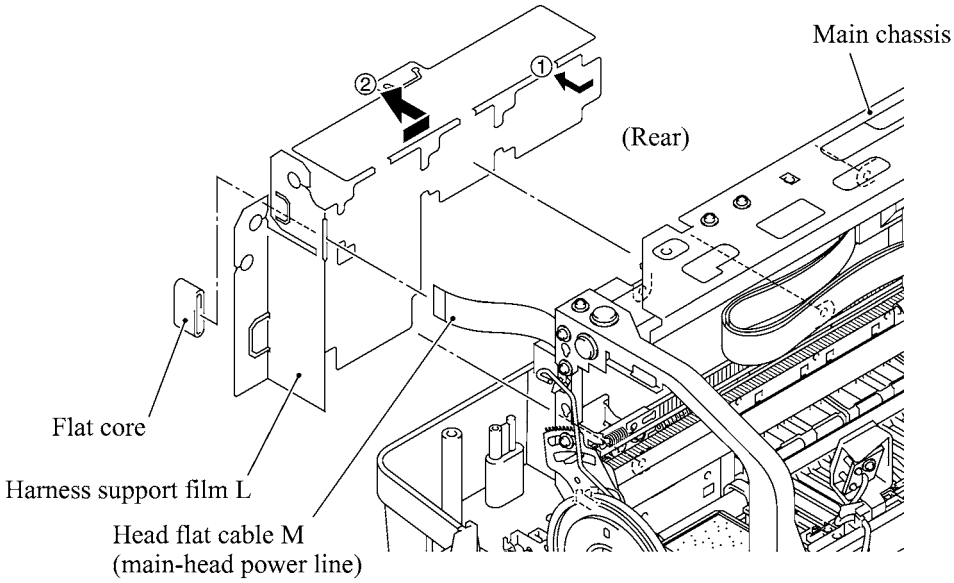
- Route the carriage motor harness as illustrated in Subsection 6.1.31 "Harness routing E."
- Pass the encoder strip through the strip guide provided on the back of the carriage so that the encoder strip will route as illustrated on the previous page and the ▲-marked end comes to the left. Then hook the ▲-marked end on the spring hooked on the main chassis so that the ▲ mark points up.

6.1.21 Harness Support Film L, Head Flat Cables, Carriage Rail, and Carriage ASSY

(1) Unfold the harness support film L as shown below, then remove it from the pawls provided on the main chassis. This releases the head flat cable M (main-head power line).

The flat core also comes off.





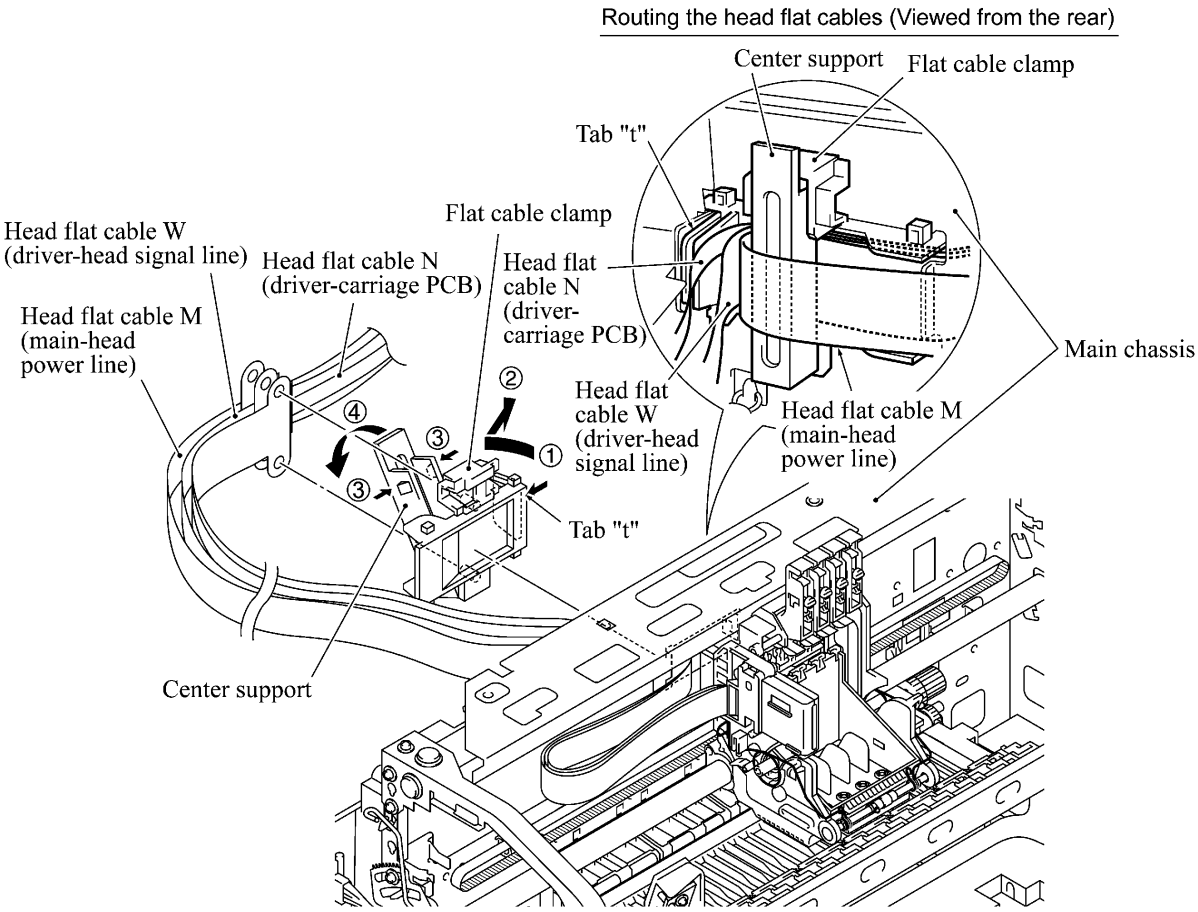
(2) If the ink cartridges have not been removed, push the colored ink cartridge covers and remove all ink cartridges. (Or, remove the shipping cover.)

(3) Remove the flat cable clamp and release the three head flat cables according to the following steps:

Push tab "t" in the direction of arrow ① and pull it to the rear (arrow ②).

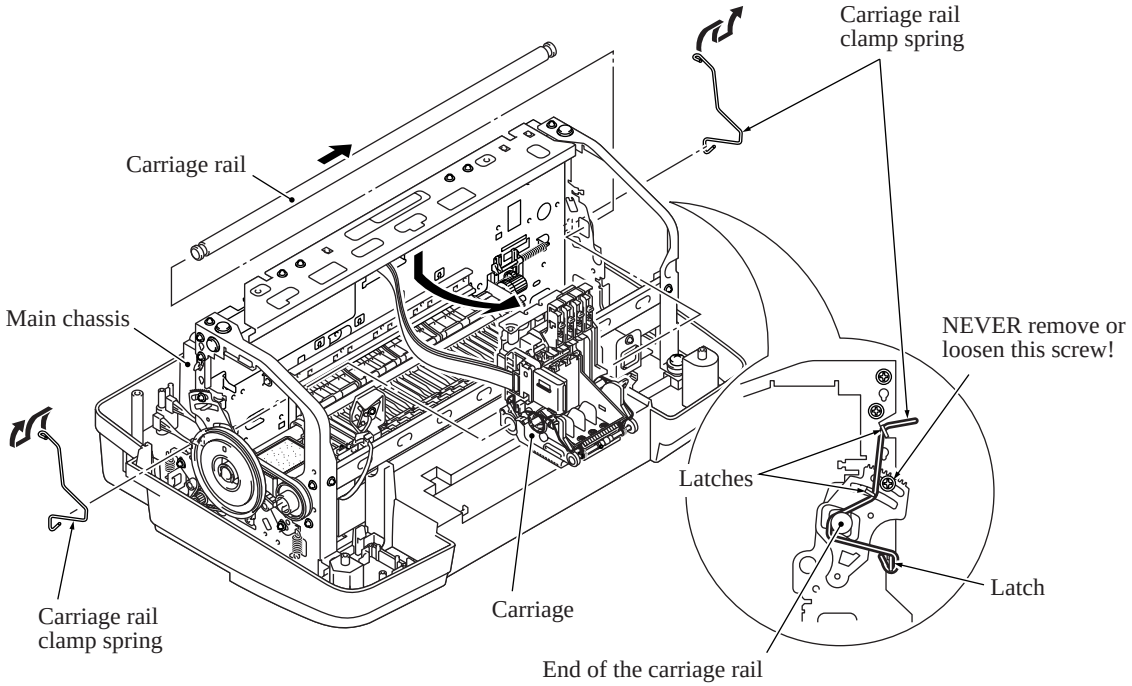
Press the center support inwards (arrow ③) and pull it to the rear (arrow ④).

Release the three flat cables from the two bosses provided on the flat cable clamp.



(4) Pull each of the carriage rail clamp springs in the direction of the arrow shown below to release it from the three latches on the main chassis.

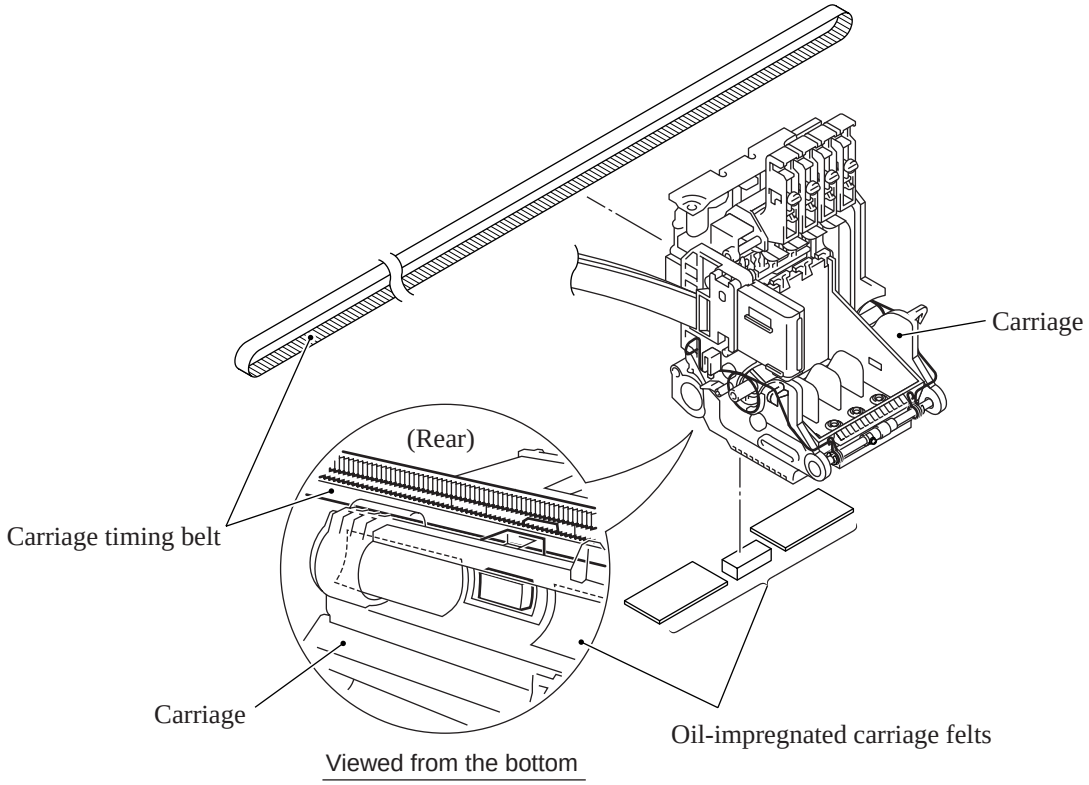
(5) Pull out the carriage rail to the right.



(6) Take the carriage out of the main chassis.

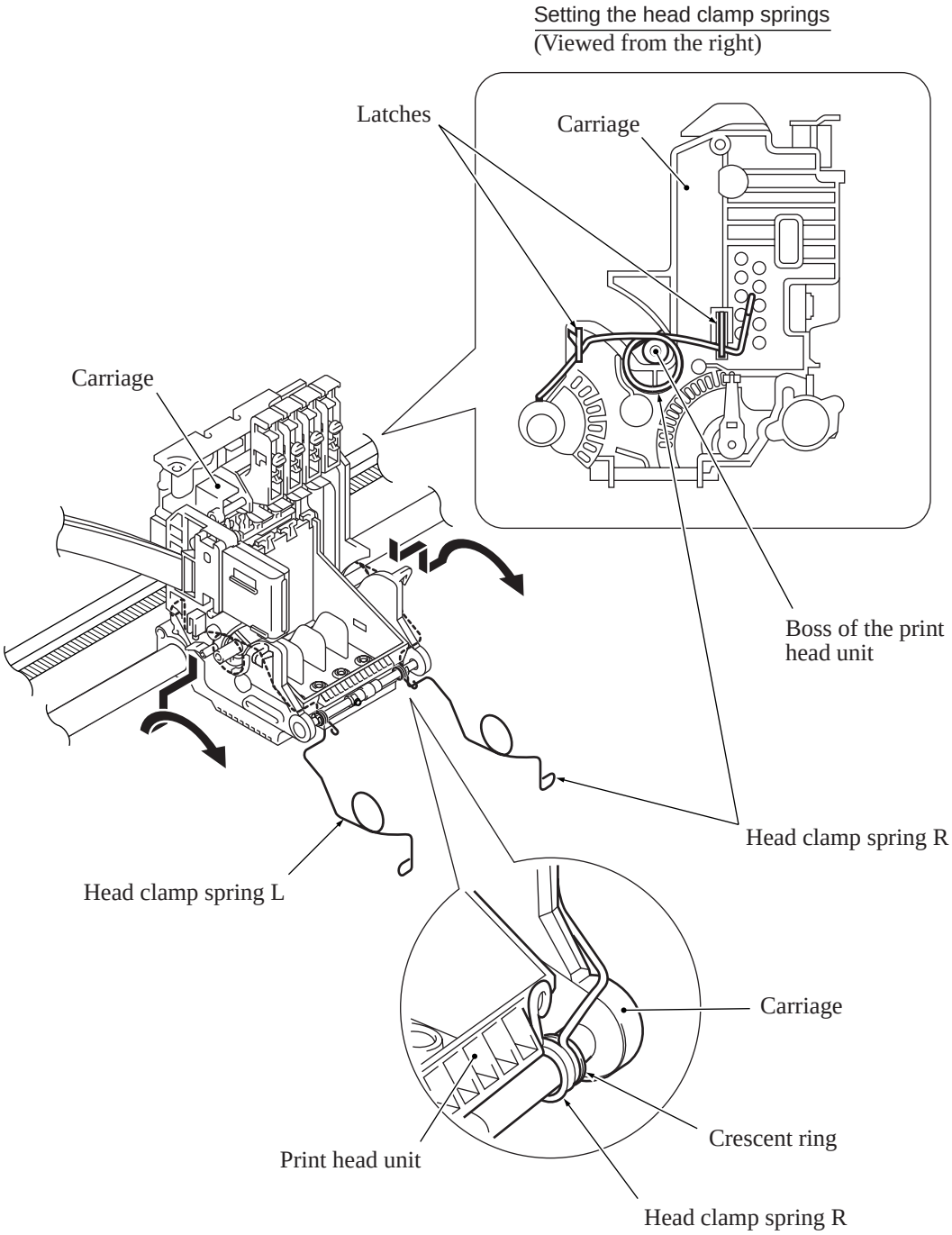
NOTE: Three oil-impregnated carriage felts will drop from the carriage.

(7) Remove the carriage timing belt from the back of the carriage.



If the print head unit has not been removed from the carriage (in Subsection 6.1.1), follow the steps given below.

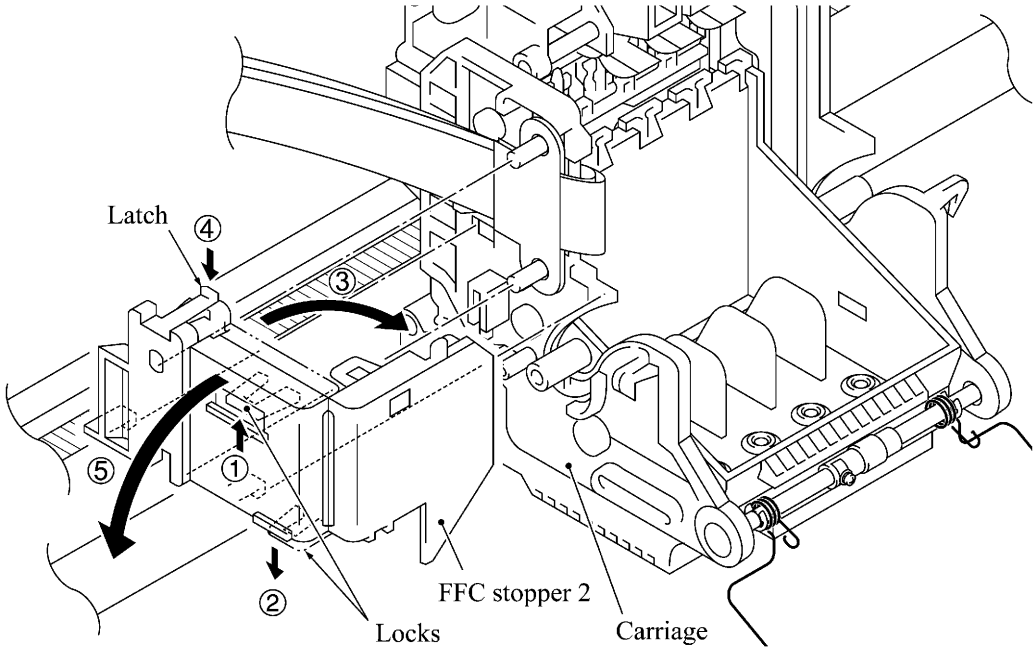
(8) Pull each of the head clamp springs in the direction of the arrow shown below to release it from the two latches on the carriage and the boss of the print head unit.



(9) Remove the FFC stopper 2 that secures the two head flat cables to the carriage according to the following steps:

First, pull up and down the upper and lower locks (in the direction of arrows ① and ②), respectively, and then open the FFC stopper 2 in the direction of arrow ③.

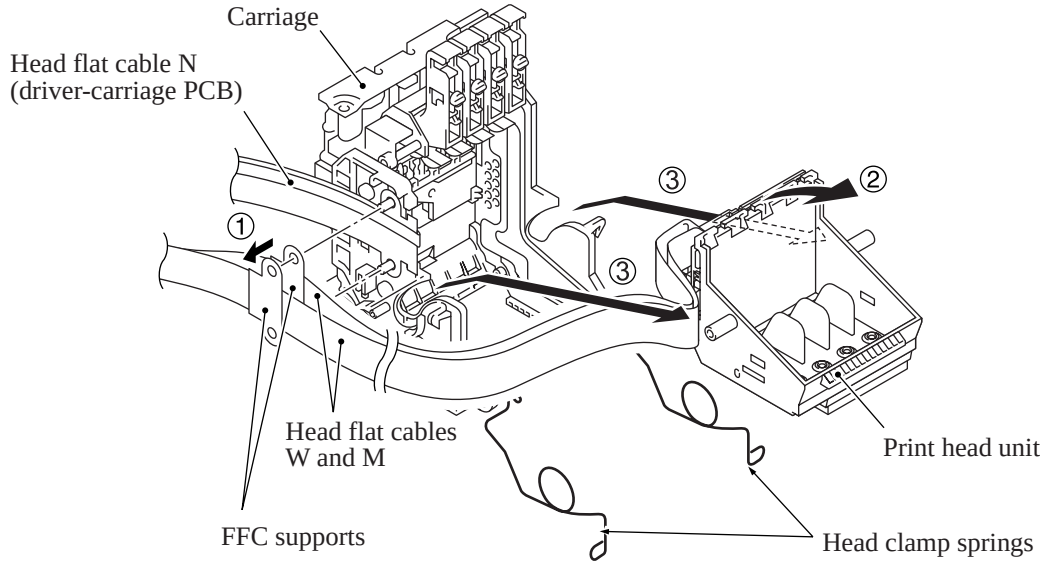
Then push down the latch (arrow ④) and release the FFC stopper 2 from the carriage.



(10) Pull out the FFC supports of the head flat cables W and M from the bosses provided on the left side of the chassis in the direction of arrow ① as shown below.

NOTE: There are three head flat cables--wide (W), medium (M), and narrow (N). To remove the print head, you need to disconnect the head flat cables W and M from the print head unit in steps (13) and (14). The head flat cable N is connected to the carriage PCB.

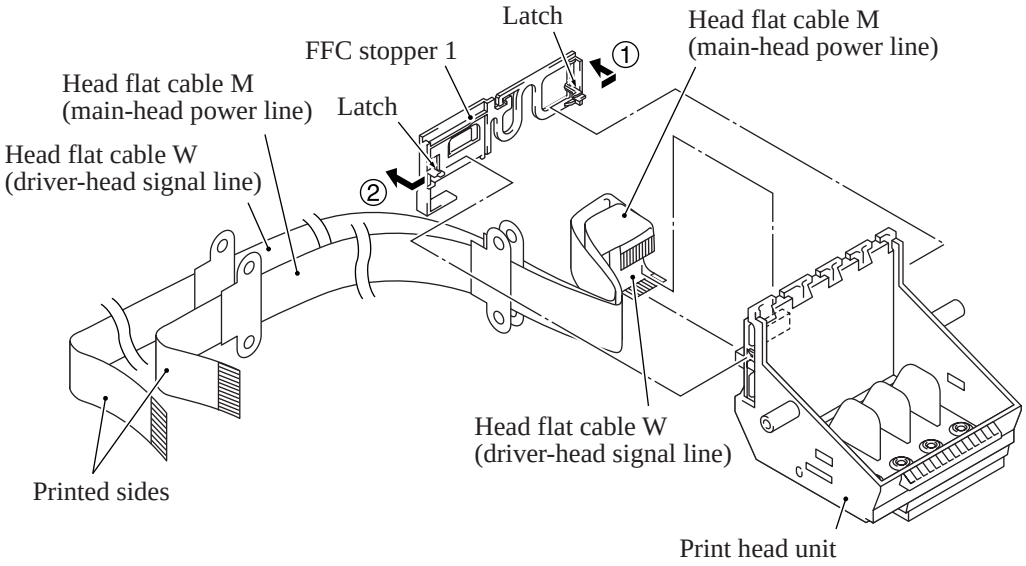
(11) Tilt the print head unit towards you (arrow ②) and lift it out of the carriage (arrow ③).



(12) Remove the FFC stopper 1 from the rear side of the print head unit in the order of ① and ② as shown below.

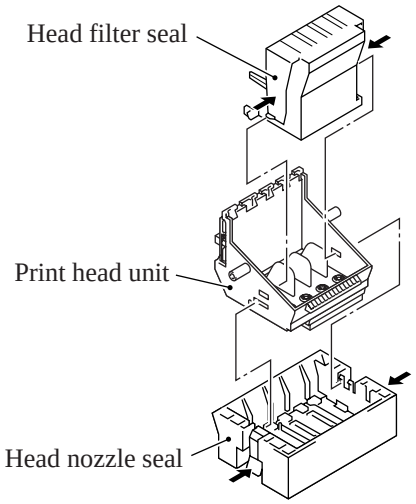
(13) Disconnect the head flat cable W (driver-head signal line) towards the rear.

(14) Unlock the connector of the head flat cable M (main-head power line) and disconnect it upwards.



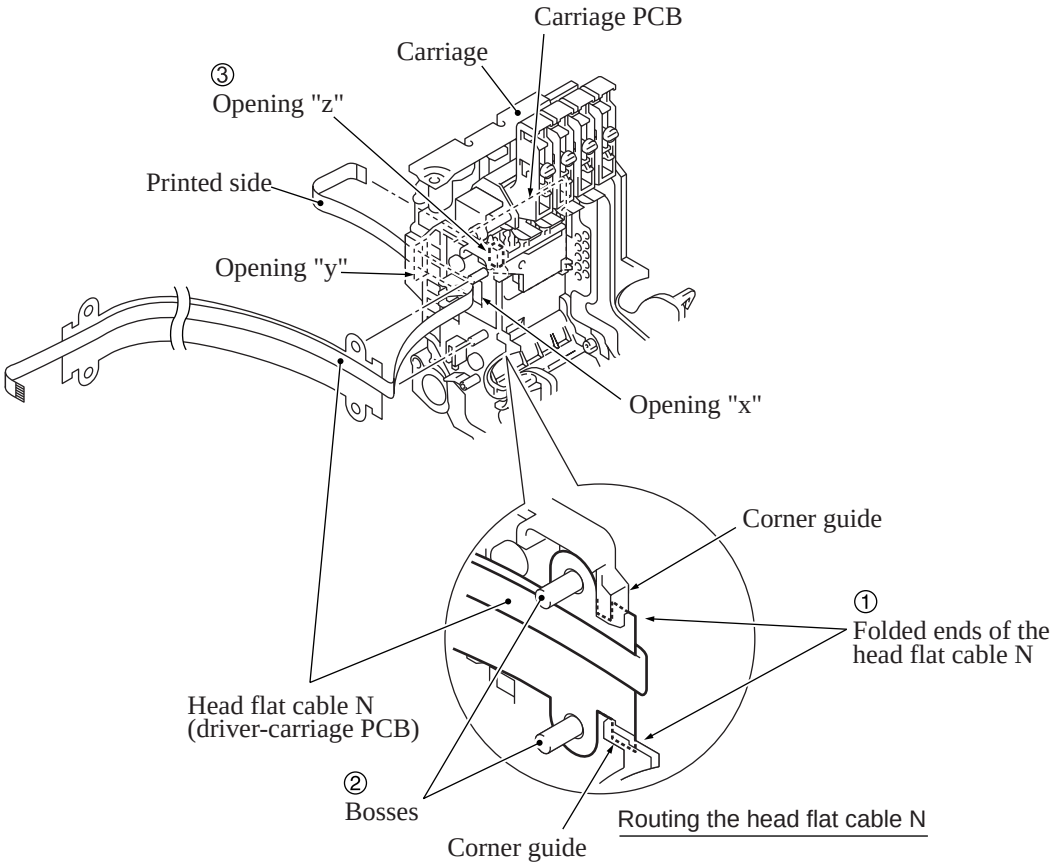
NOTE: Do not touch the printing ends (nozzles) of the print head unit or the ink orifices of the ink cartridges; doing so will not only stain your hands with ink but result in an ink jet-out failure. Once you touch them, clean them with a dedicated cleaning stick and liquid.

NOTE: Be sure to put a head nozzle seal and filter seal on the print head unit as shown below. Leaving the print head unit without those seals will dry up its printing ends and filters, resulting in a damaged head.



(15) Release the folded ends (①) of the head flat cable N (driver-carriage PCB) from the corner guides and remove the head flat cable N from the bosses (②) provided on the carriage.

(16) Disconnect the head flat cable N (driver-carriage PCB) from the carriage PCB through opening "z" (③) provided in the back of the carriage.



■ Reassembling Notes

- Route the head flat cable N (driver-carriage PCB) through openings "x," "y," and "z" of the carriage, then connect it to the carriage PCB located in the carriage as illustrated above. Also fit the folded ends of the head flat cable N in the corner guides.
- For the installation procedure of the print head unit, refer to Subsection 6.1.1, steps (15) through (33).

  If the print head unit is replaced with a new one, update the head property information stored in the EEPROM of the driver PCB, referring to Appendix 2.3.

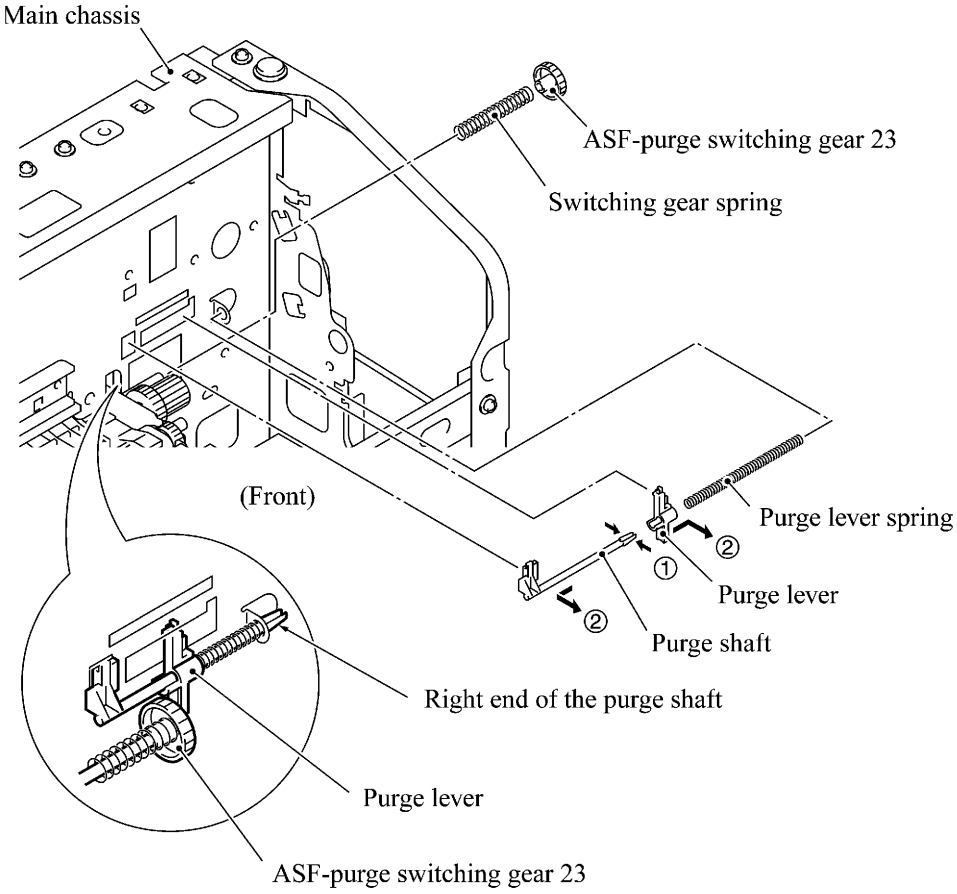
  If the print head unit or carriage is replaced, correct the positioning error of the print head unit, referring to Section 6.3 "ADJUSTMENT."

  Adjust the alignment of vertical print lines, referring to CHAPTER 7, Subsection 7.5.13.
- When setting the carriage rail through the carriage, be sure to put the oil-impregnated carriage felt in the carriage.
- As illustrated on page 6-55, after routing the head flat cable M (main-head power line) through the pawls provided on the rear side of the main chassis, pass it through the opening in the harness support film L, and then set the film to the same pawls. After that, fold the film and fit its tab over the lower edge of the film.

6.1.22 Purge-Related Parts (Purge Lever, Purge Shaft, and ASF-Purge Switching Gear 23)

(1) Press the right end of the purge shaft inwards and pull it out of the purge lever. The purge lever spring also comes off.

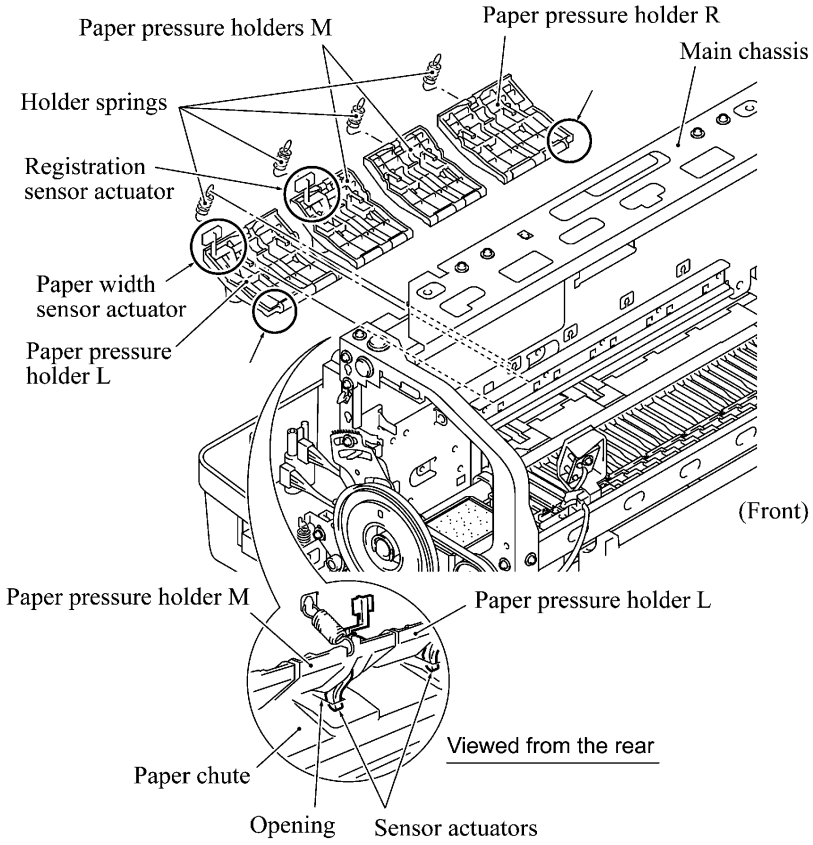
(2) Remove the ASF-purge switching gear 23 and its spring.



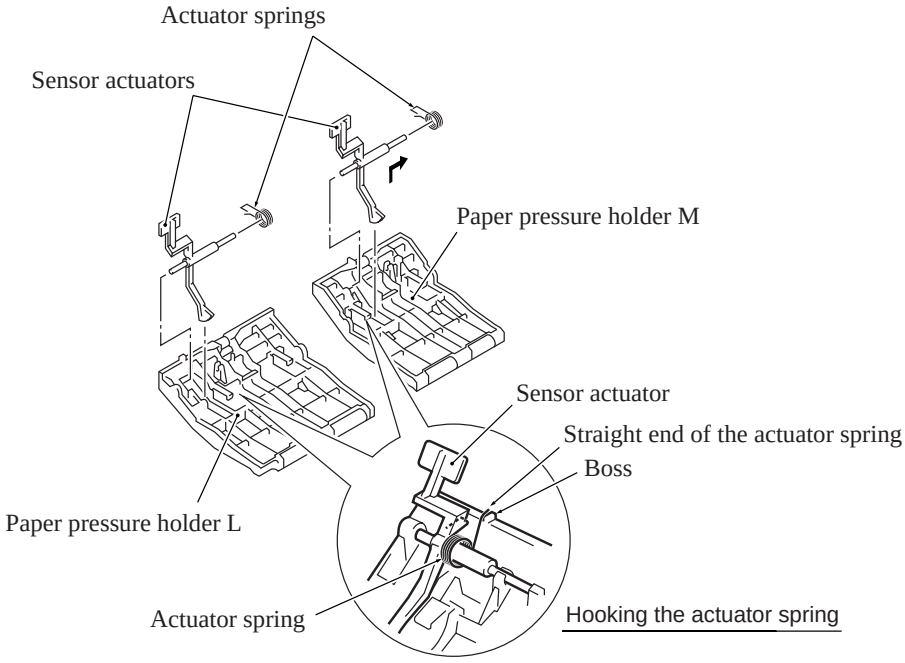
6.1.23 Paper Pressure Holders

(1) At each of the paper pressure holders, unhook the top end of the holder spring from the main chassis.

(2) Remove the paper pressure holders.

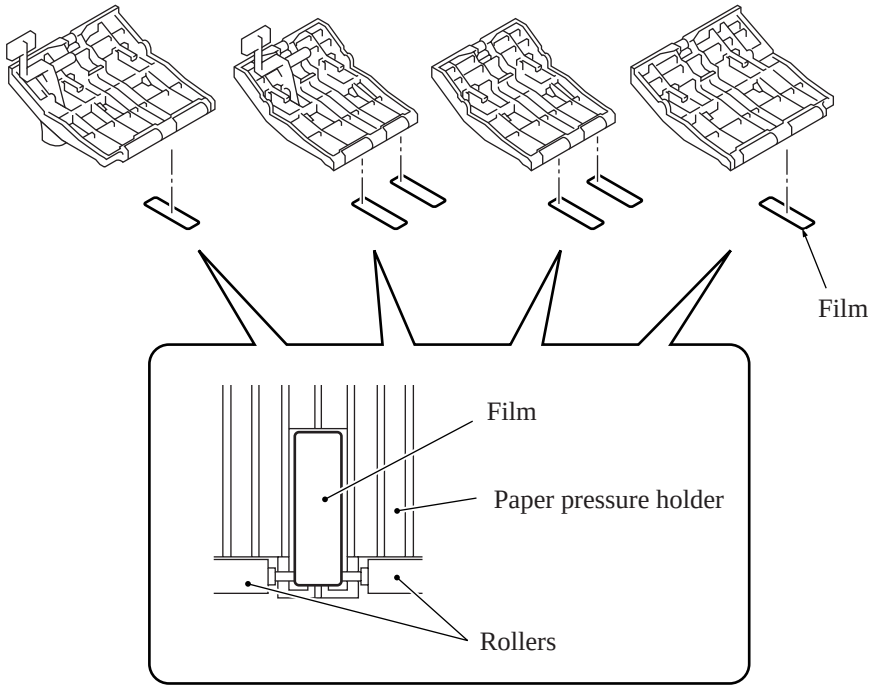


(3) Remove the sensor actuator from each of the paper pressure holder L and the adjacent paper pressure holder M together with its spring.



■ Reassembling Notes

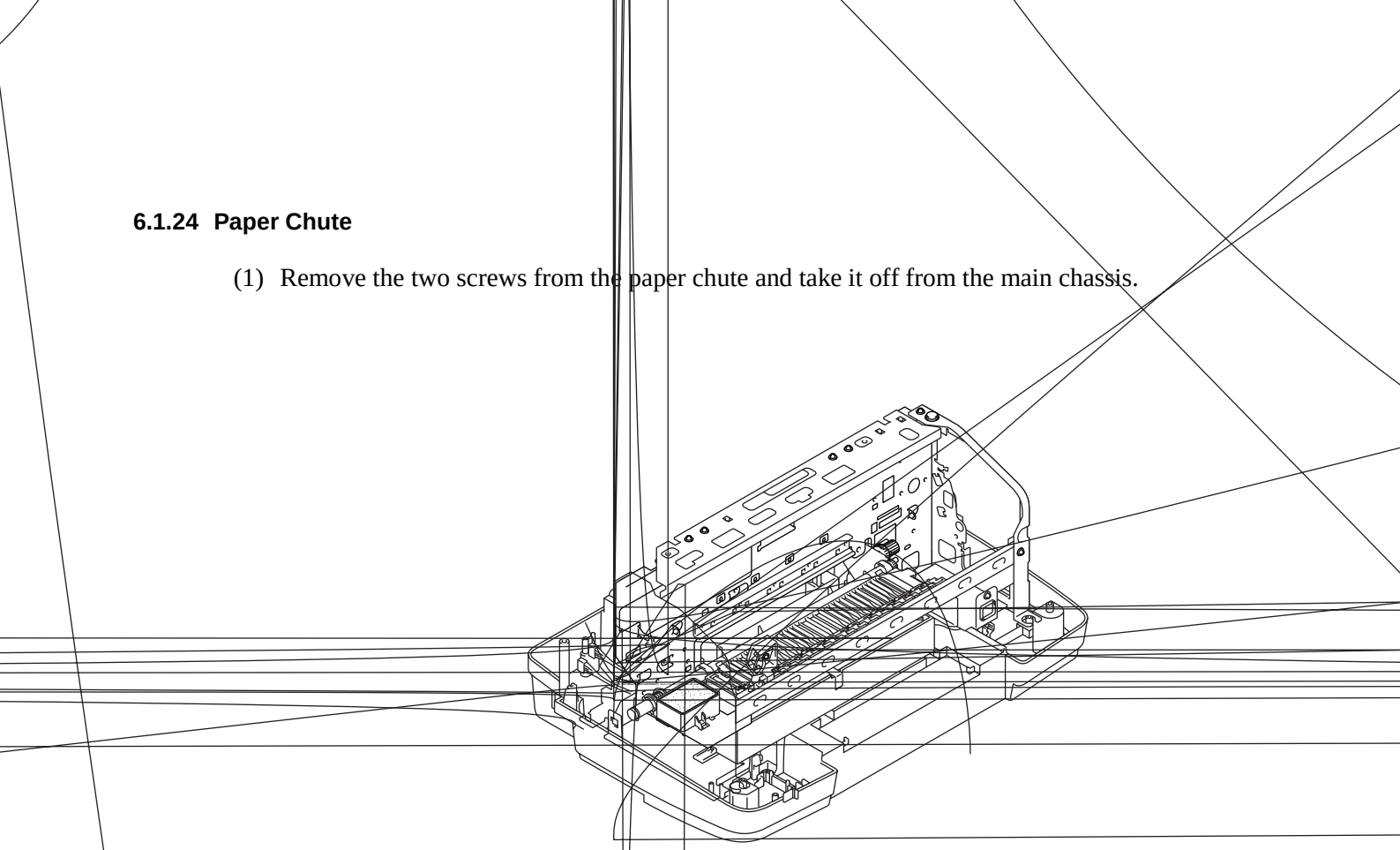
- When replacing films on the paper pressure holders with new ones, attach them as illustrated below.



- When hooking actuator springs onto the paper pressure holders M and L, be sure to fit the straight end of each spring outside the boss as illustrated on the previous page.

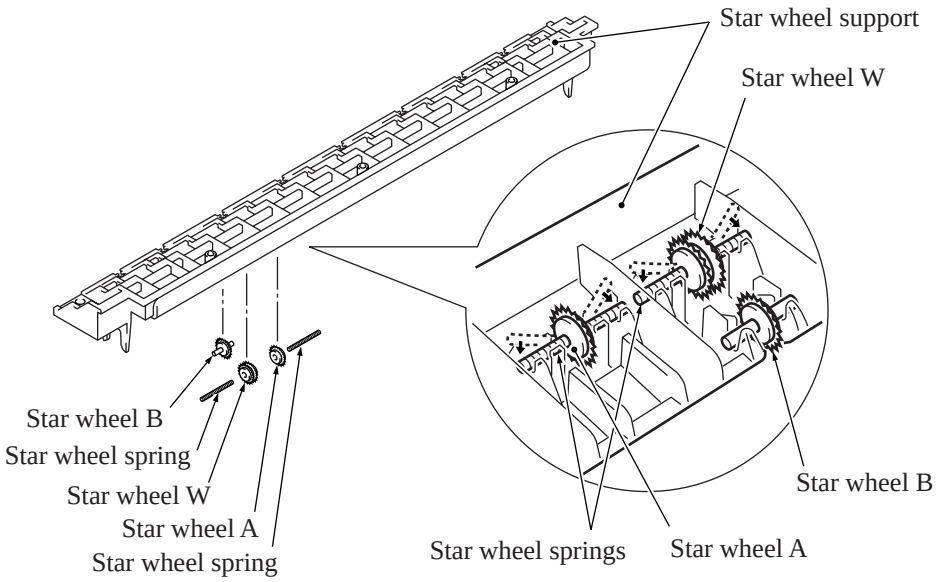
6.1.24 Paper Chute

(1) Remove the two screws from the paper chute and take it off from the main chassis.

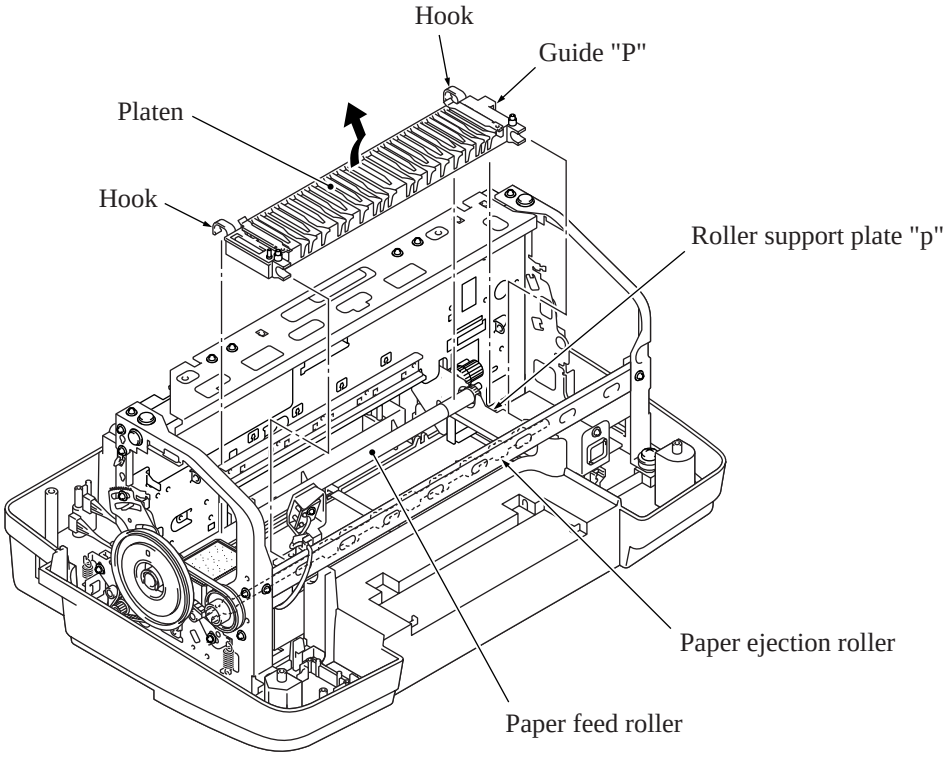


(3) Remove star wheels B from the star wheel support.

(4) Remove star wheels A and W from the star wheel support together with their springs.



(5) Release the right and left hooks of the platen from the paper feed roller shaft, tilt the platen towards you, and lift it up.

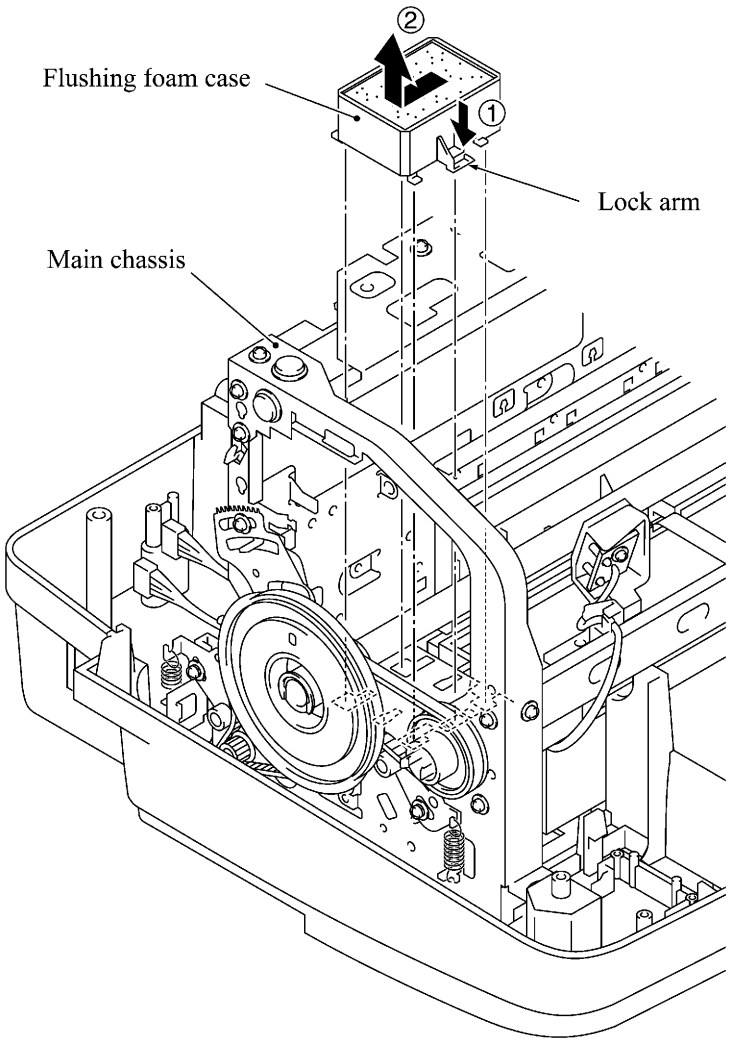


■ Reassembling Notes

- When setting the platen back into place, fit guide "P" over roller support plate "p."

6.1.26 Flushing Foam Case

(1) Lightly push down the lock arm (arrow ①) and remove the flushing foam case in the direction of arrow ②.



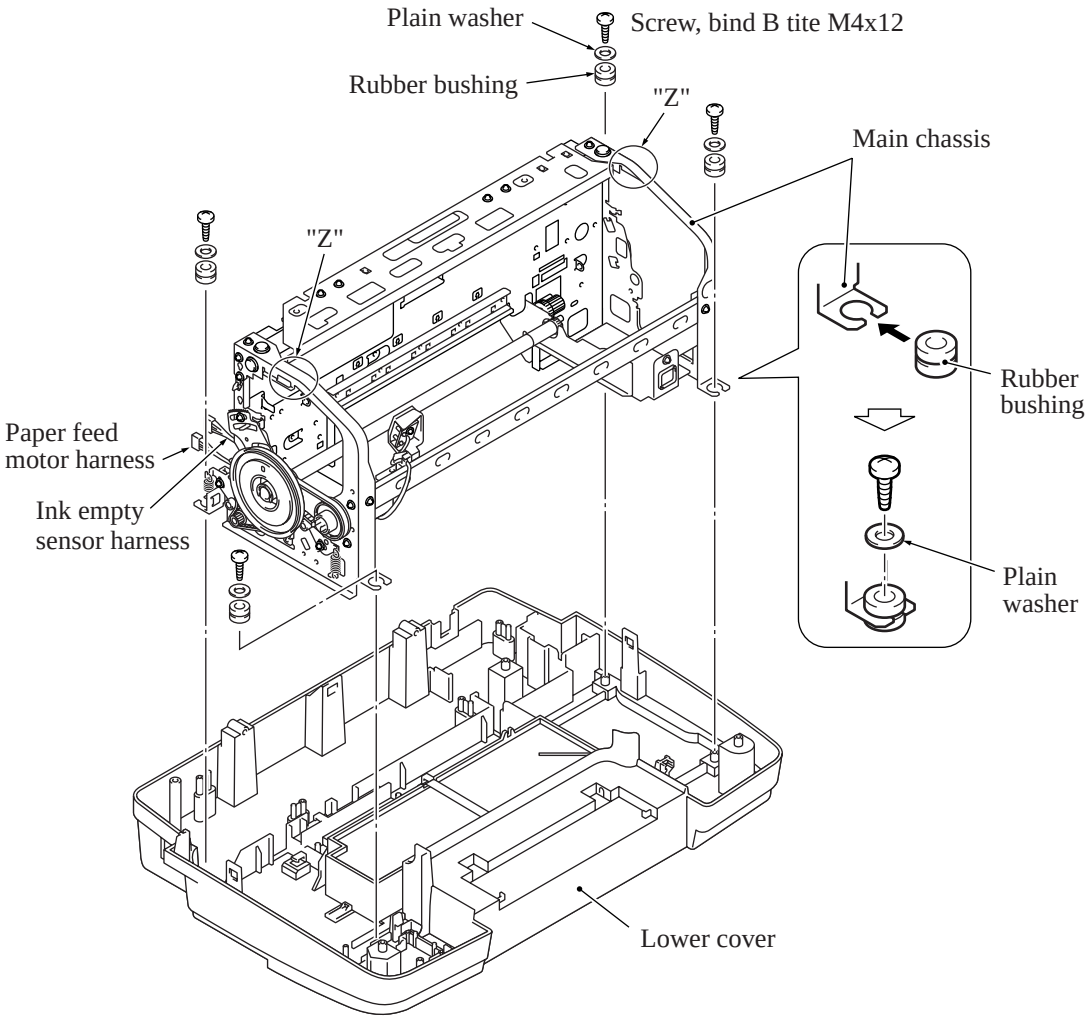
6.1.27 Main Chassis

(1) If you have not removed the main PCB, disconnect the speaker harness, NCU harness, media flat cables 1 and 2, and manual feed slot cover sensor harness from the main PCB.

(2) If you have not removed the driver PCB, disconnect the purge switch harness and power supply harness from the driver PCB.

(3) Remove the four screws and lift up the main chassis.

NOTE: When lifting it up, hold sections "Z" by hand. Do not touch other sections that may be sharp-edged.



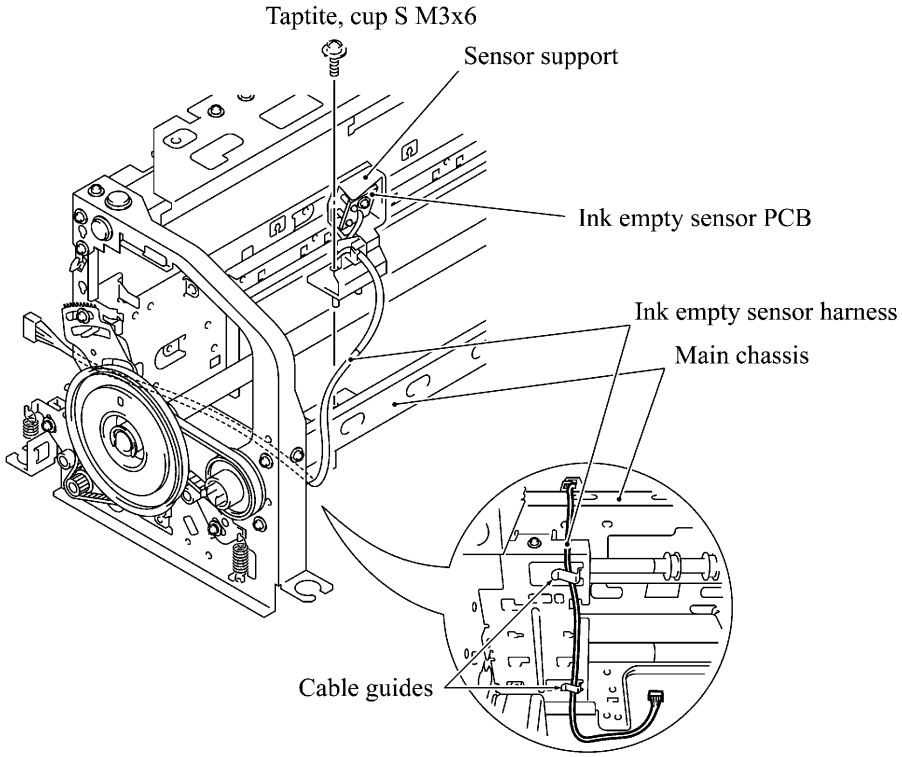
■ Reassembling Notes

- When securing the main chassis to the lower cover with four screws, be sure to set the rubber bushings and plain washers.

6.1.28 Ink Empty Sensor PCB

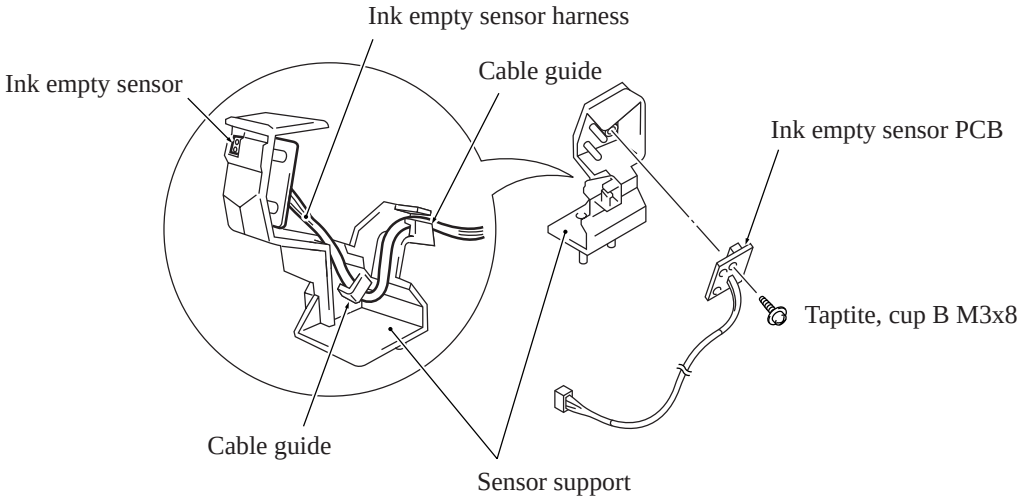
(1) Remove the screw that secures the sensor support to the main chassis if it has not been removed in Subsection 6.1.25.

(2) Pull up the sensor support and release the ink empty sensor harness from the cable guides provided on the underside of the main chassis.



Routing the ink empty sensor harness
(Viewed from the bottom)

(3) Remove the screw from the ink empty sensor PCB.



■ Reassembling Notes

- Route the ink empty sensor harness through the cable guides provided on the underside of the main chassis as illustrated above.

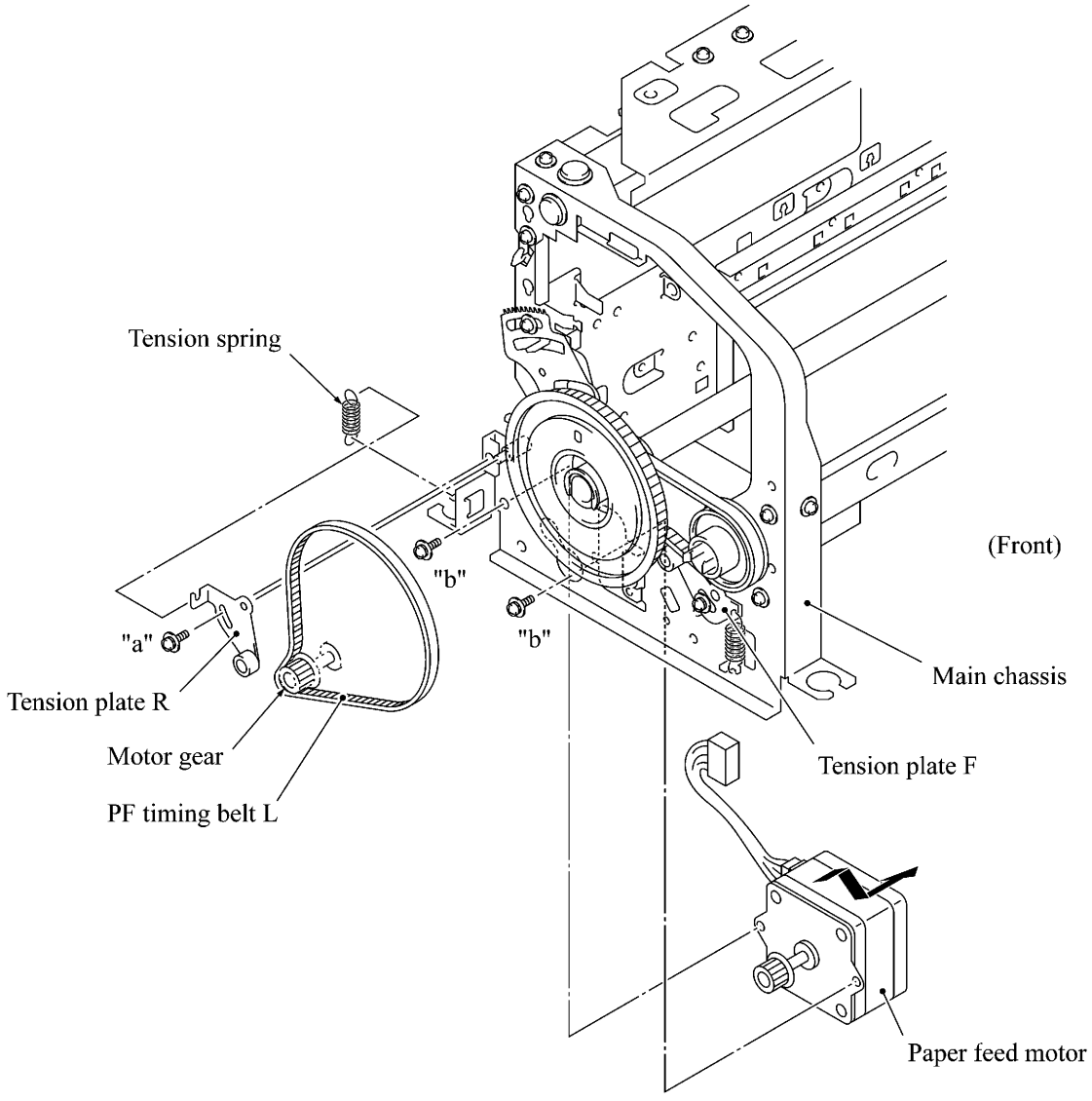
6.1.29 Paper Feed Motor, PF Timing Belts, PF Roller Pulley L, Paper Feed Roller, Ejection Roller Pulley, and Paper Ejection Roller

(1) Remove screw "a" from the tension plate R. (If you do not need to remove the tension plate R, loosen screw "a.") This decreases the tension of the PF timing belt L.

(2) Remove two screws "b" and release the paper feed motor from the main chassis.

(3) Unhook the tension spring and remove the tension plate R.

(4) Remove the PF timing belt L.



"a" and "b": Screw, pan (s/p washer) M3x6

(5) Remove screw "c" from the tension plate F. (If you do not need to remove the tension plate F, loosen screw "c.") This decreases the tension of the PF timing belt S.

(6) Unhook the tension spring and remove the tension plate F.

To remove the paper feed roller, follow steps (7) through (11).

(7) Remove the crescent ring from the left end of the paper feed roller shaft.

(8) Pull out the PF roller pulley L that is force-fitted over the paper feed roller shaft, and then remove the washer. The PF timing belt S also comes off.

NOTE: Once removed, the PF roller pulley L will become unusable and a new part will have to be put back in.

(9) At the right end of the paper feed roller shaft, remove the crescent ring and PF roller gear R.

(10) Remove the retaining ring, ASF/purge idle gear, and washer.

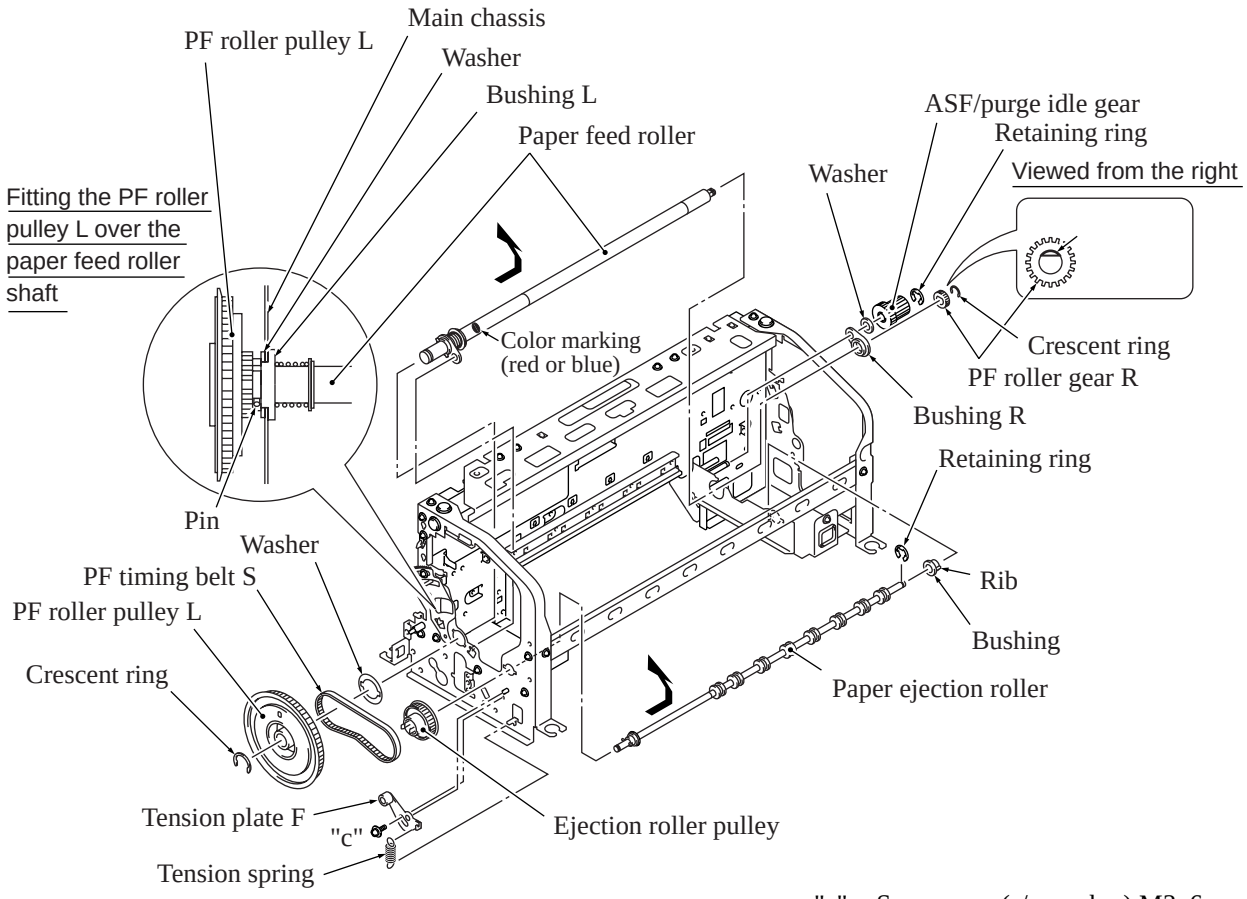
(11) Remove the bushing R from the paper feed roller shaft and main chassis, and then slide the paper feed roller to the right and lift it up

To remove the paper ejection roller, follow steps (12) through (14).

(12) Remove the ejection roller pulley by pulling its pawls outwards.

(13) Remove the retaining ring from the right end of the paper ejection roller shaft, then push the bushing inwards to release it from the main chassis.

(14) Slide the paper ejection roller to the right and lift it up, taking care not to touch its coated section.



"c": Screw, pan (s/p washer) M3x6

■ Reassembling Notes

- If the paper feed roller or paper ejection roller is replaced with a new one, be sure to update the paper feeding correction value stored in the EEPROM of the driver PCB. Refer to Appendix 2, A2.5 and CHAPTER 7, Subsection 7.5.14.
- Before fitting the PF roller pulley L over the left end of the paper feed roller, be sure to set the washer on the bushing L and bring it into contact with the side frame of the main chassis.
- When securing the tension plate F with a screw, keep its tension spring well-balanced.
- When setting the paper feed motor back into place, face the connector towards the rear.
- When securing the tension plate R with a screw, keep its tension spring well-balanced.

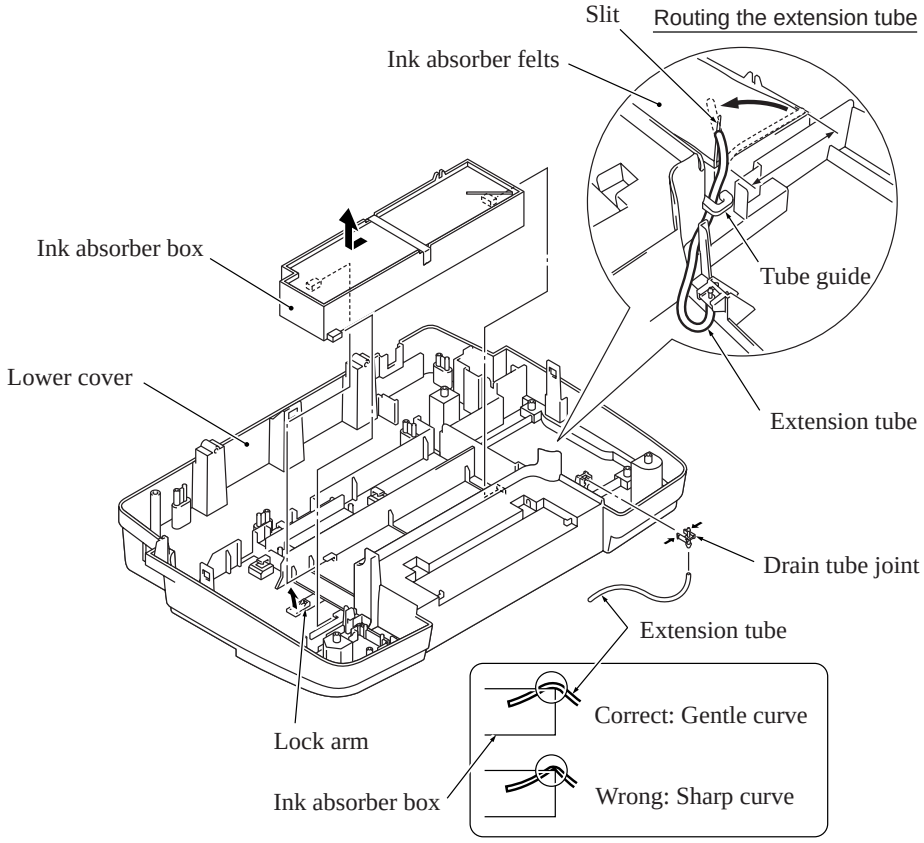
6.1.30 Extension Tube, Ink Absorber Box and its Felts, and Antistatic Brush

If the print head unit is replaced with a new one, replace also the ink absorber felts with new ones.

(1) Pull out the extension tube from the ink absorber felts, taking care not to leak out drained ink. Then pinch the end of the extension tube with a clip.
(2) Unlatch the drain tube joint from the lower cover.
(3) Remove the extension tube from the drain tube joint.
(4) Press the lock arm and remove the ink absorber box in the direction of the arrow shown below.

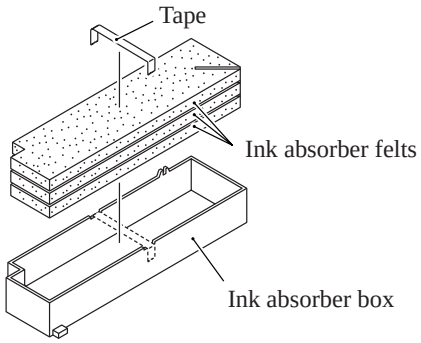
NOTE: Do not remove the ink absorber box unless it requires replacement. When replacing it, set a new one soon after the removal to prevent the machine from getting stained with drained ink.

NOTE: If the ink absorber box or the surrounding parts are stained with ink, wipe them with a waste cloth.



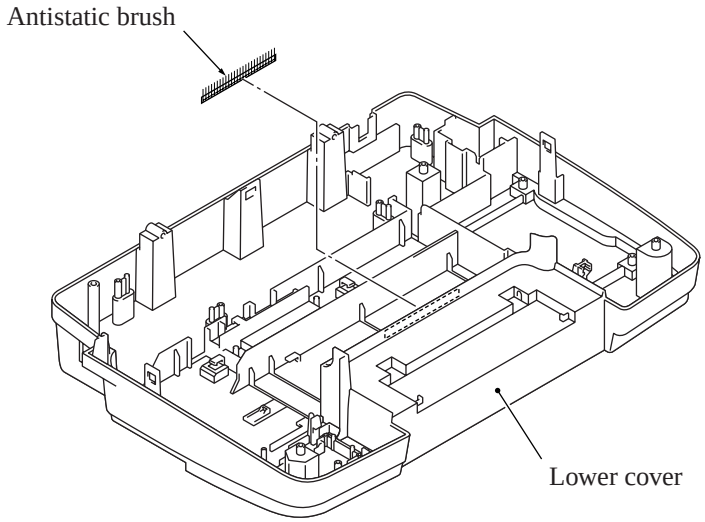
(5) Peel off the tape and pull out the ink absorber felts.

NOTE: Use vinyl gloves to prevent your hands from becoming dirty.



(6) You may peel off the antistatic brush from the lower cover.

NOTE: Once removed, the antistatic brush will become unusable and new one will have to be put back in.

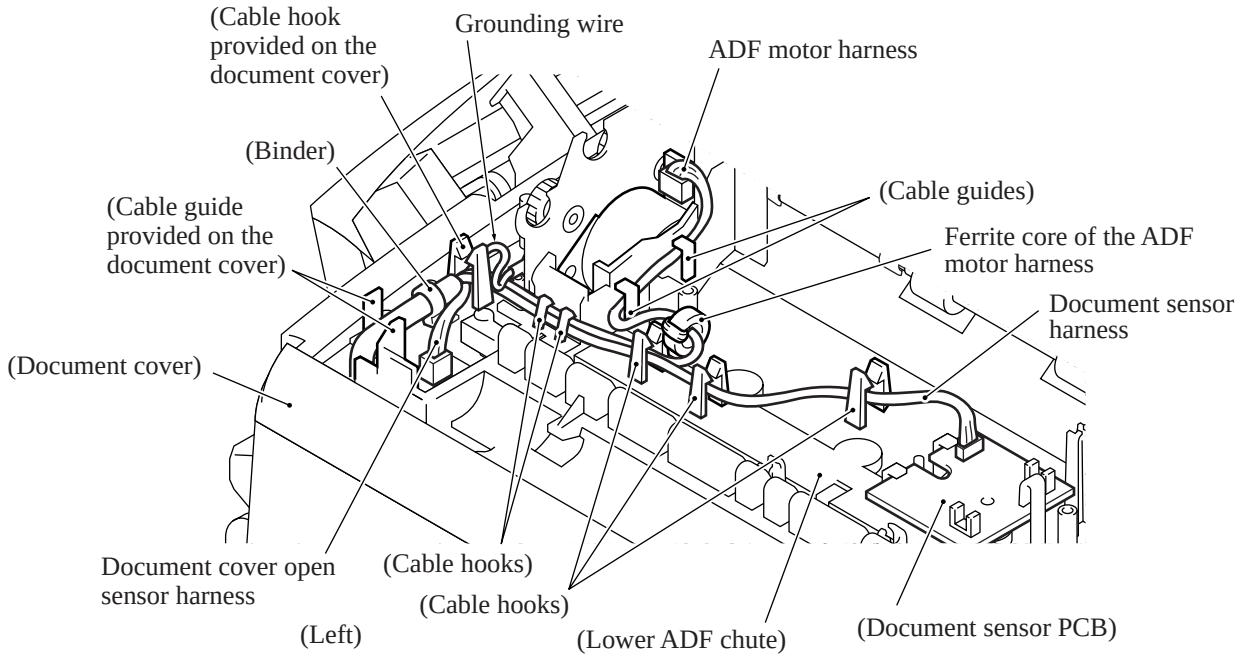


■ Reassembling Notes

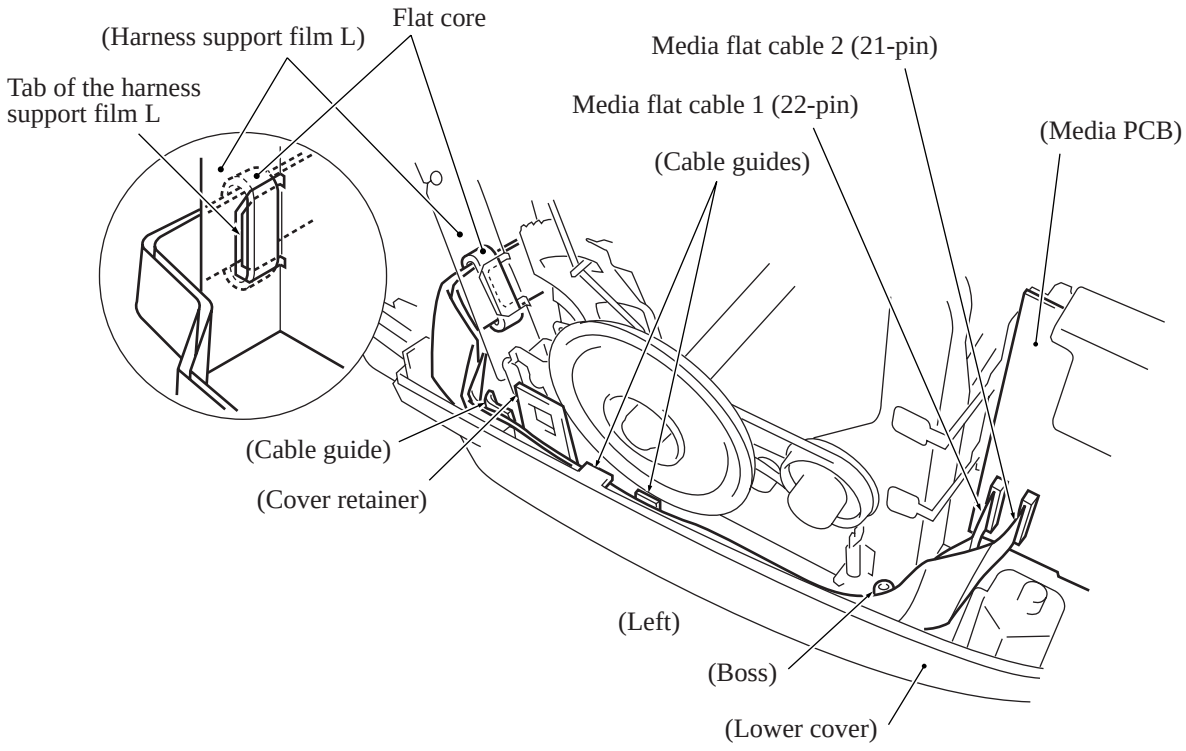
- When inserting the end of the extension tube into the slit of the ink absorber felts, route the tube in a gentle curve as illustrated on the previous page. After insertion, route the tube through the tube guide without flattening it out.

6.1.31 Harness Routing

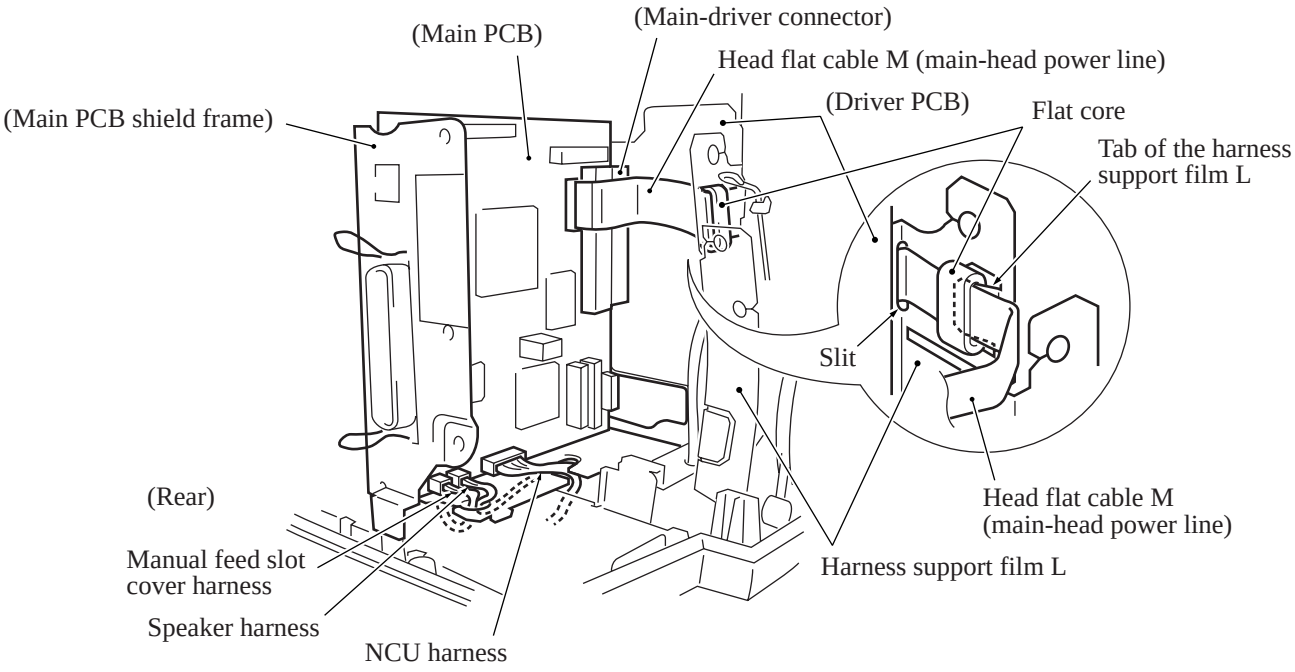
Harness routing A: ADF motor harness, document sensor harness, document cover open sensor harness, and grounding wire on the lower ADF chute



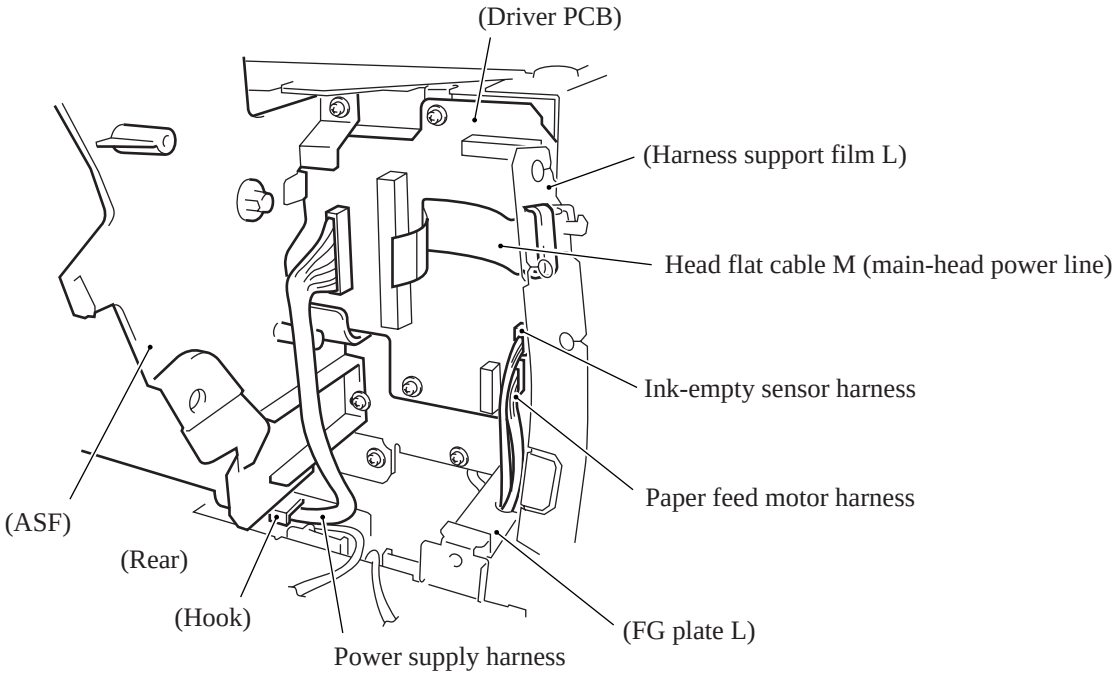
Harness routing B: Media flat cables 1 and 2 on the lower cover



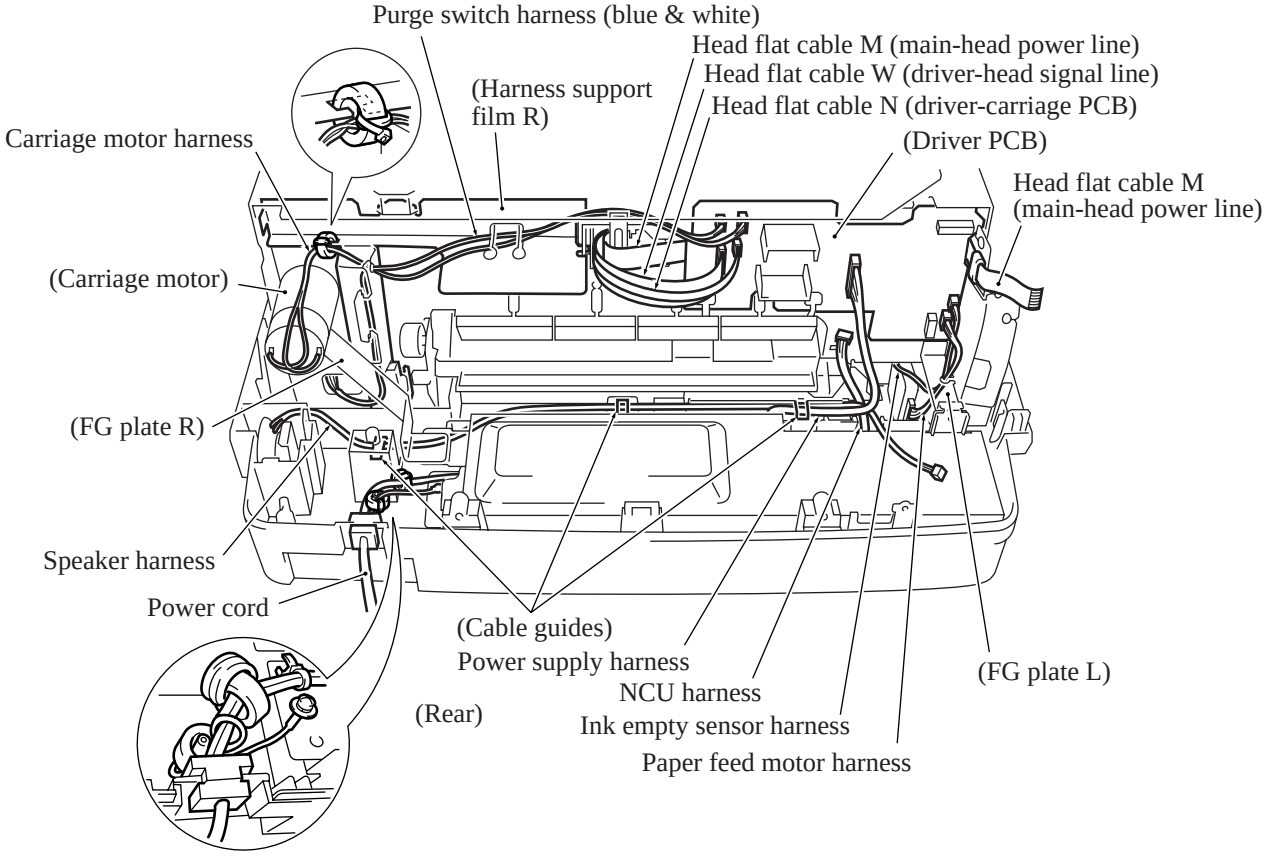
Harness routing C: Head flat cable M (main-head power line), NCU harness, speaker harness, and manual feed slot cover sensor harness



Harness routing D: Power supply harness, ink-empty harness, paper feed motor harness, and head flat cable M (main-head power line)



Harness routing E: Head flat cables, carriage motor harness, speaker harness, power supply harness, NCU harness, ink empty sensor harness, paper feed motor harness, and purge switch harness

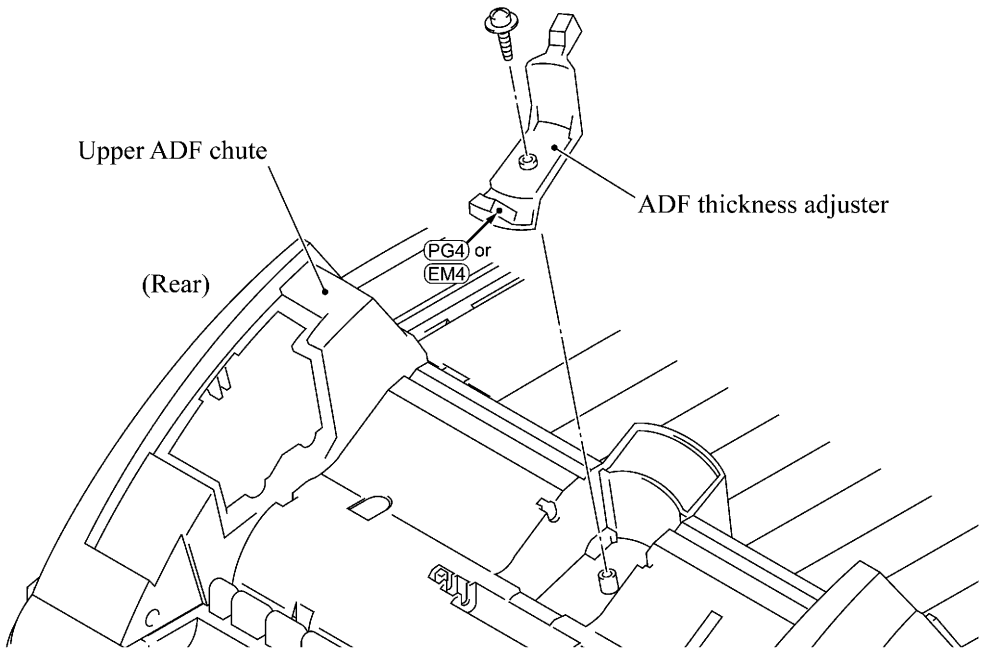


6.2 LUBRICATION

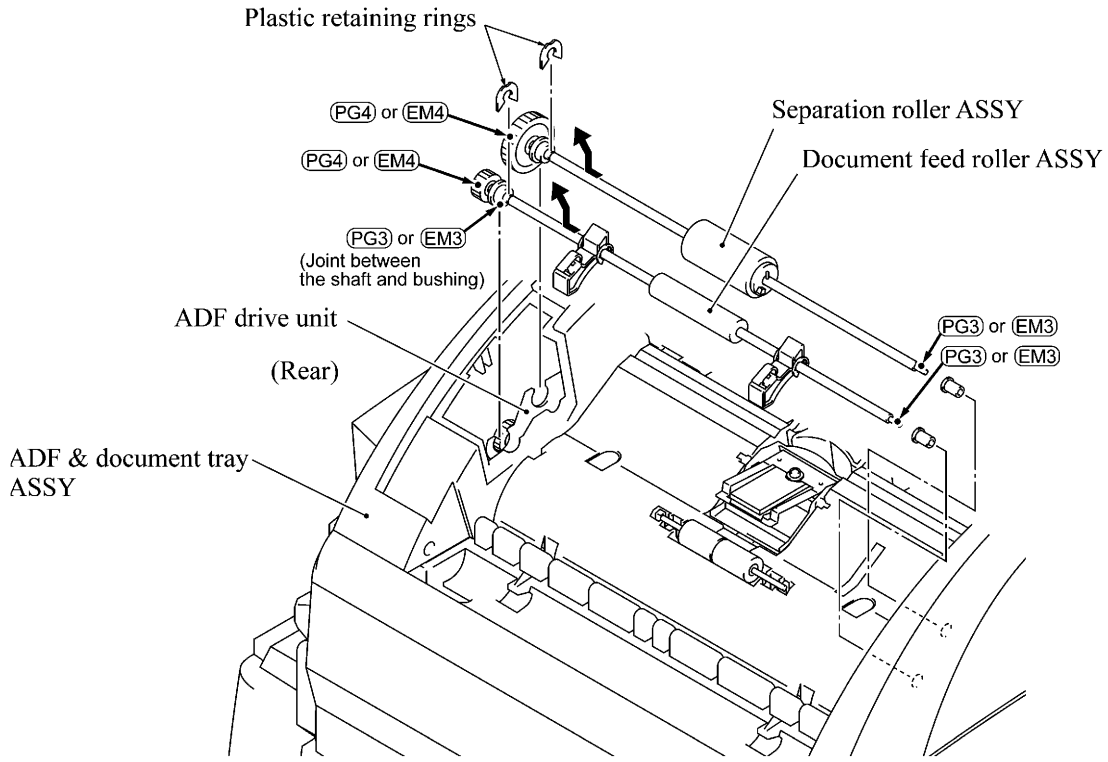
Apply the specified lubricants to the lubrication points as shown below.

Lubricant type (Manufacturer)	Lubricant amount						
	Thin coat of grease with a brush	0.5 mm dia. ball	1 mm dia. ball	2 mm dia. ball	3 mm dia. ball (Rice-sized pinch of grease)	4 mm dia. ball	5 mm dia. ball
Molykote PG662 (Dow Corning)	———	———	———	———	(PG3)	(PG4)	(PG5)
Molykote EM-30LG or EM-30L (Dow Corning)	———	(EM0.5)	(EM1)	(EM2)	(EM3)	(EM4)	(EM5)
Molykote EM-50LS (Dow Corning)	———	———	———	———	(EML3)	(EML4)	(EML5)
Conductive grease FLOIL 951P-32 (Kanto Kasei Ltd.)	———	———	———	———	(P3)	———	———

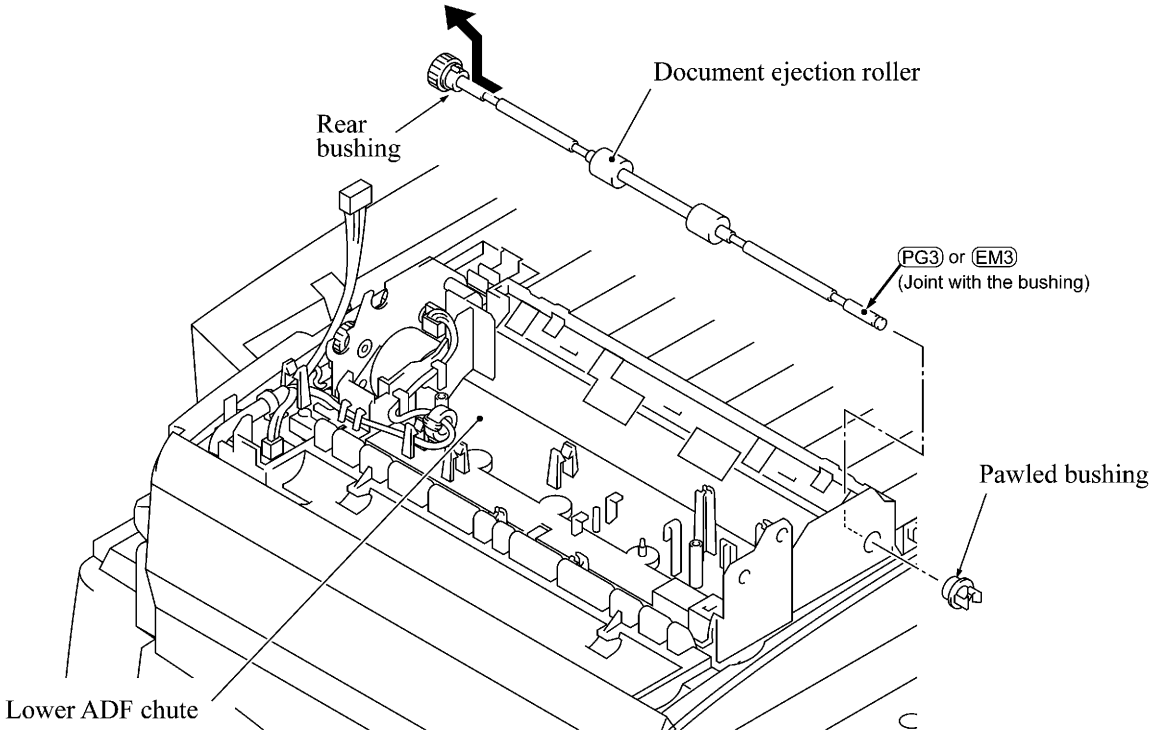
[1] ADF thickness adjuster



[2] Separation roller and document feed roller



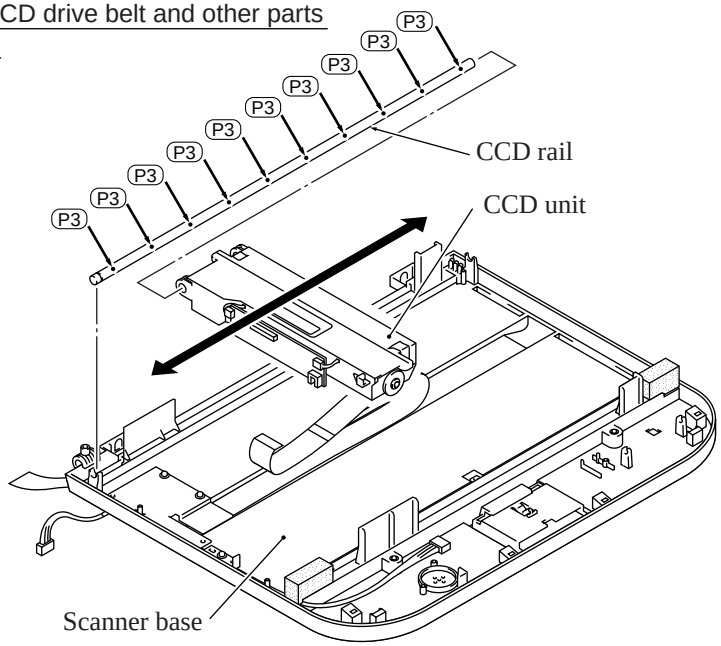
[3] Document ejection roller



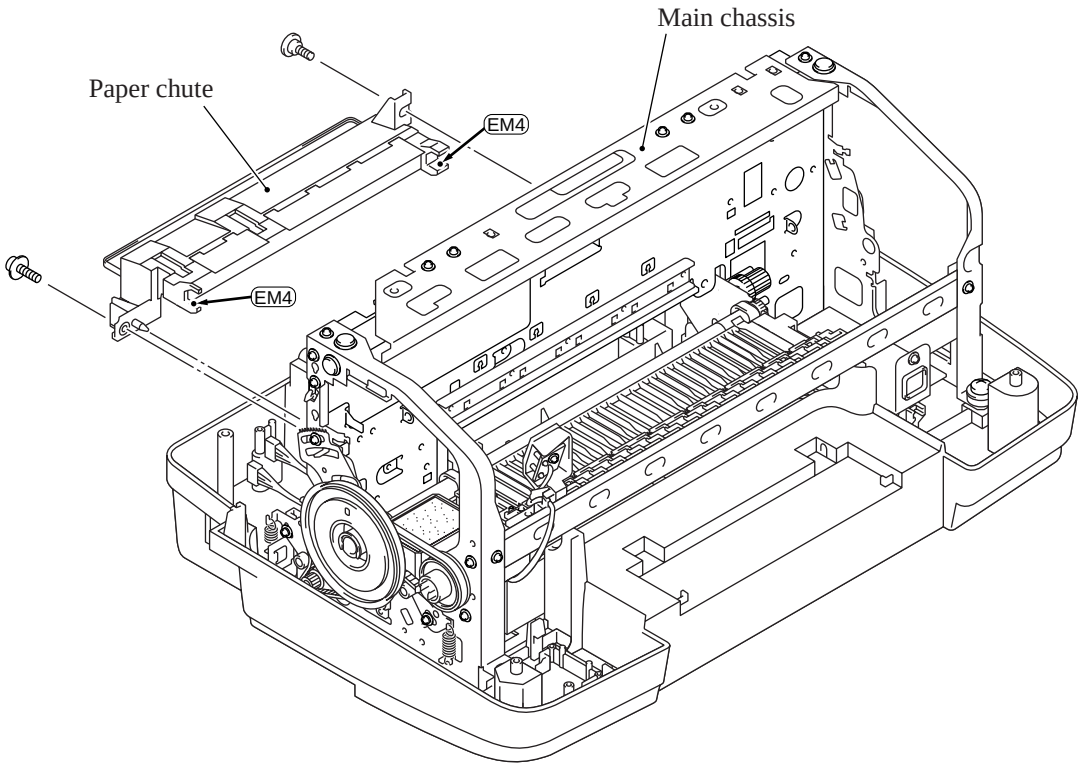
[4] CCD rail in the scanner unit

Apply (P3) to 10 points on the CCD rail and move the CCD unit to the right and left ends of its travel.

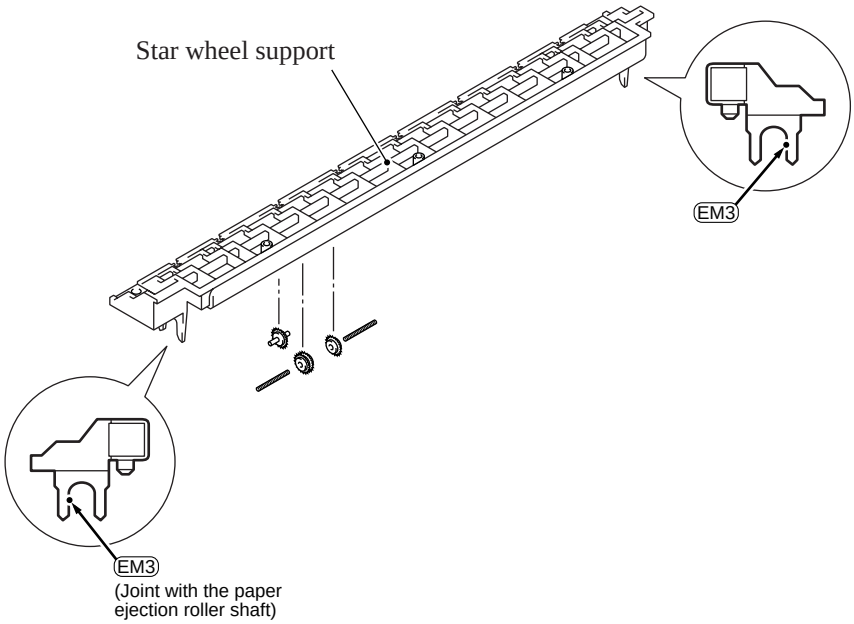
NOTE: Keep the CCD drive belt and other parts free from lubricant.



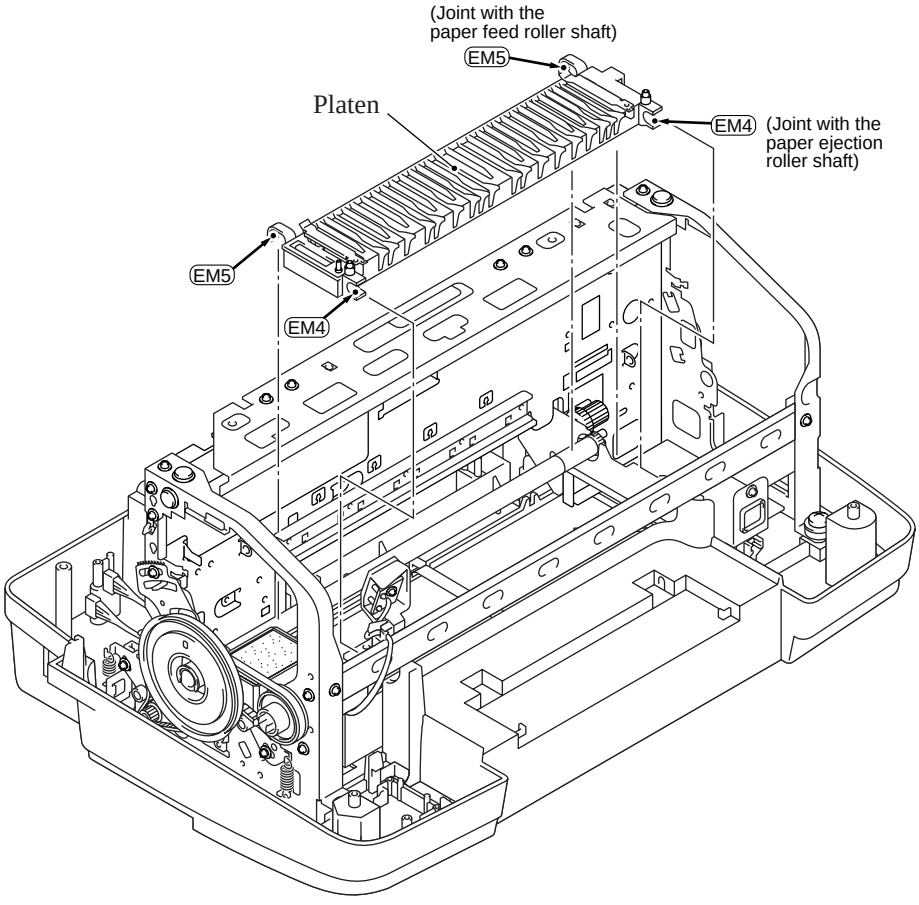
[5] Paper chute



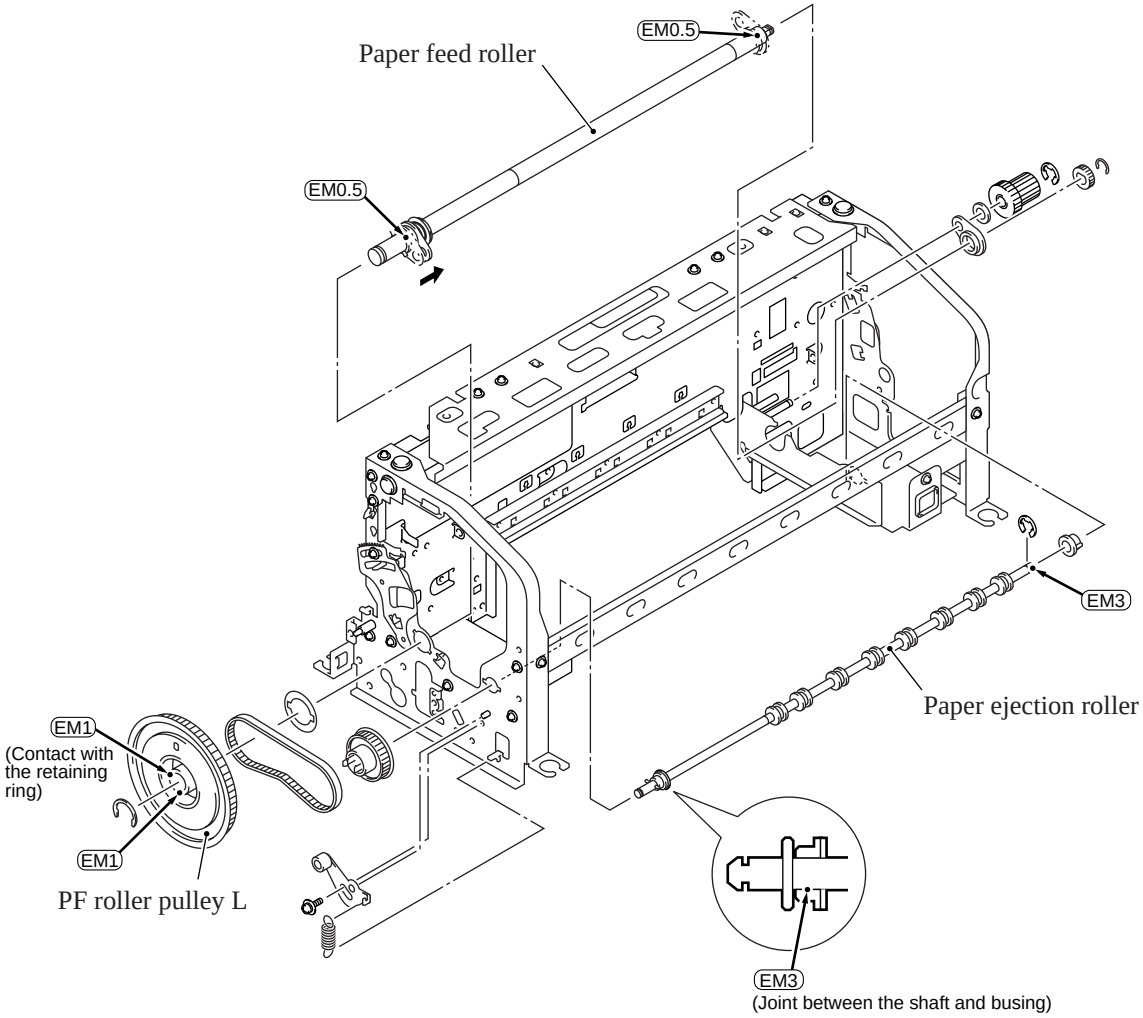
[6] Star wheel support



[7] Platen

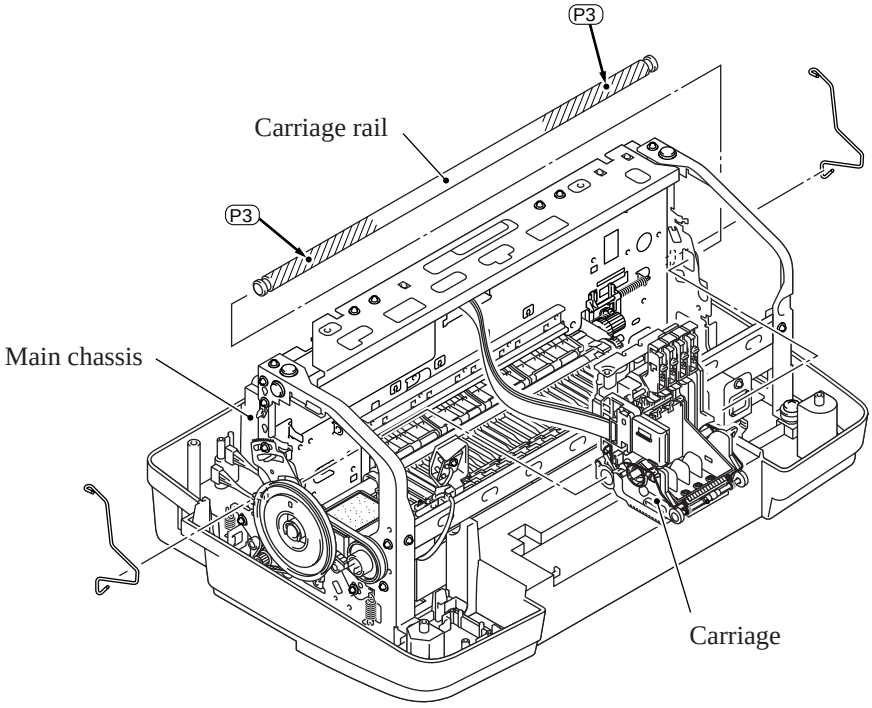


[8] Paper feed roller, paper ejection roller, and PF roller pulley L

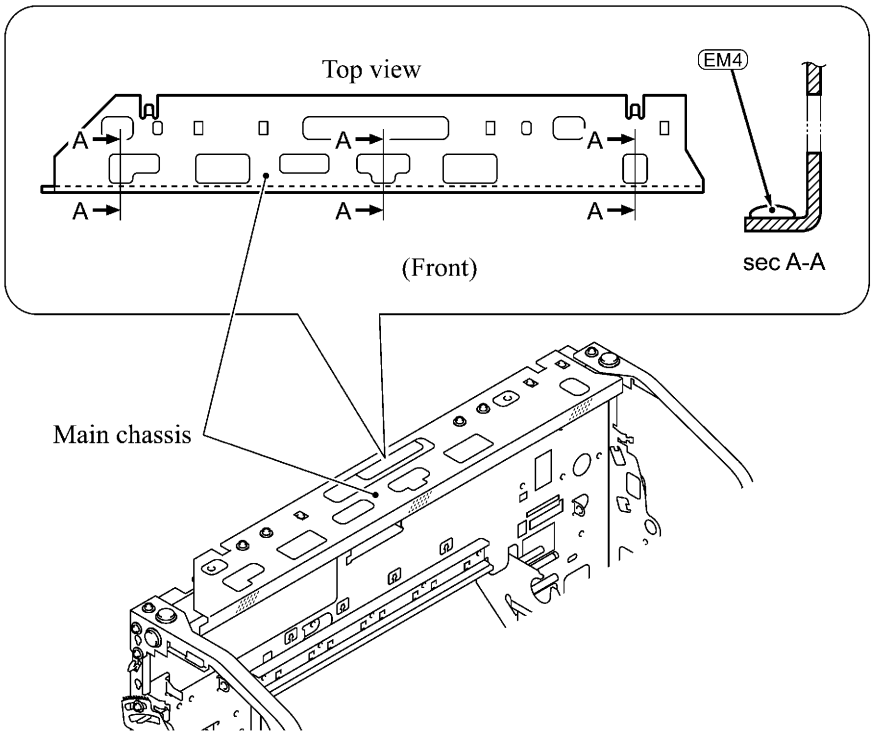


[9] Carriage rail

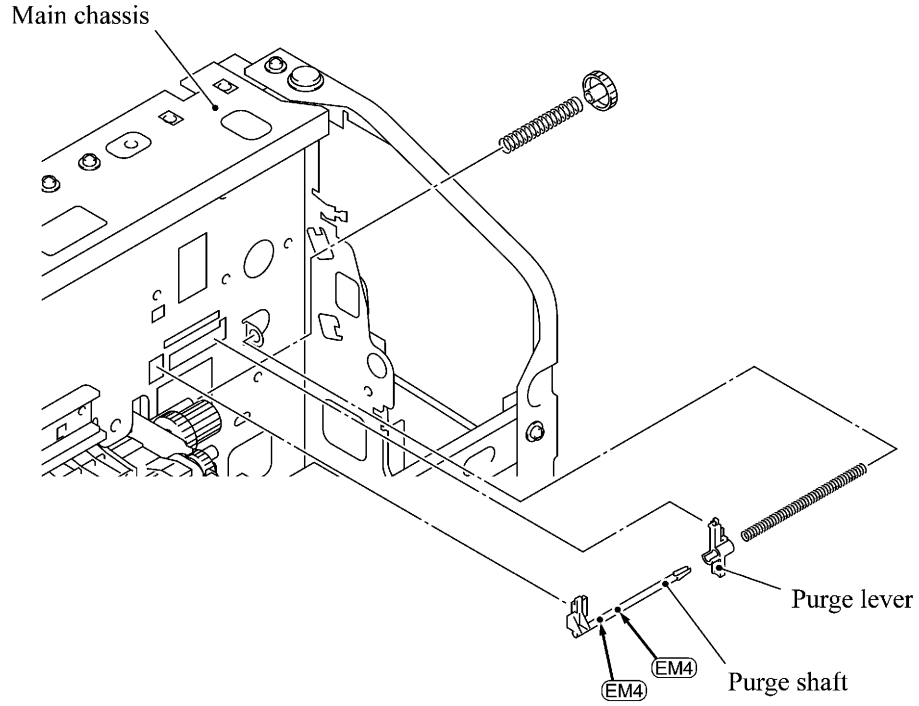
Apply a thin coat of grease to the right and left edges of the carriage rail with a brush.

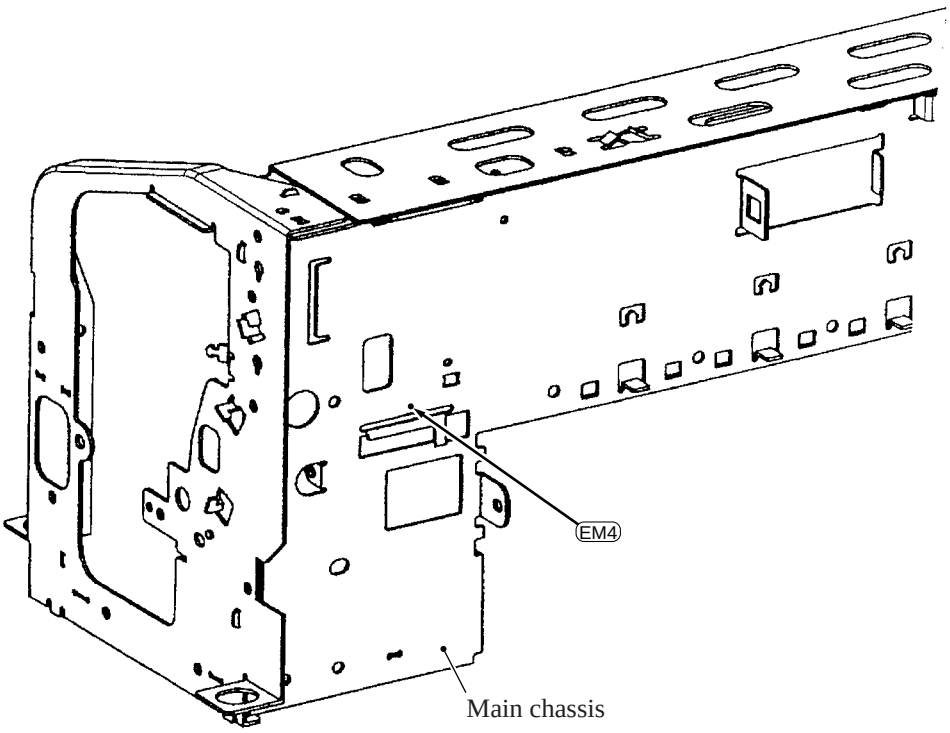


[10] Main chassis (slideway of the carriage guide)

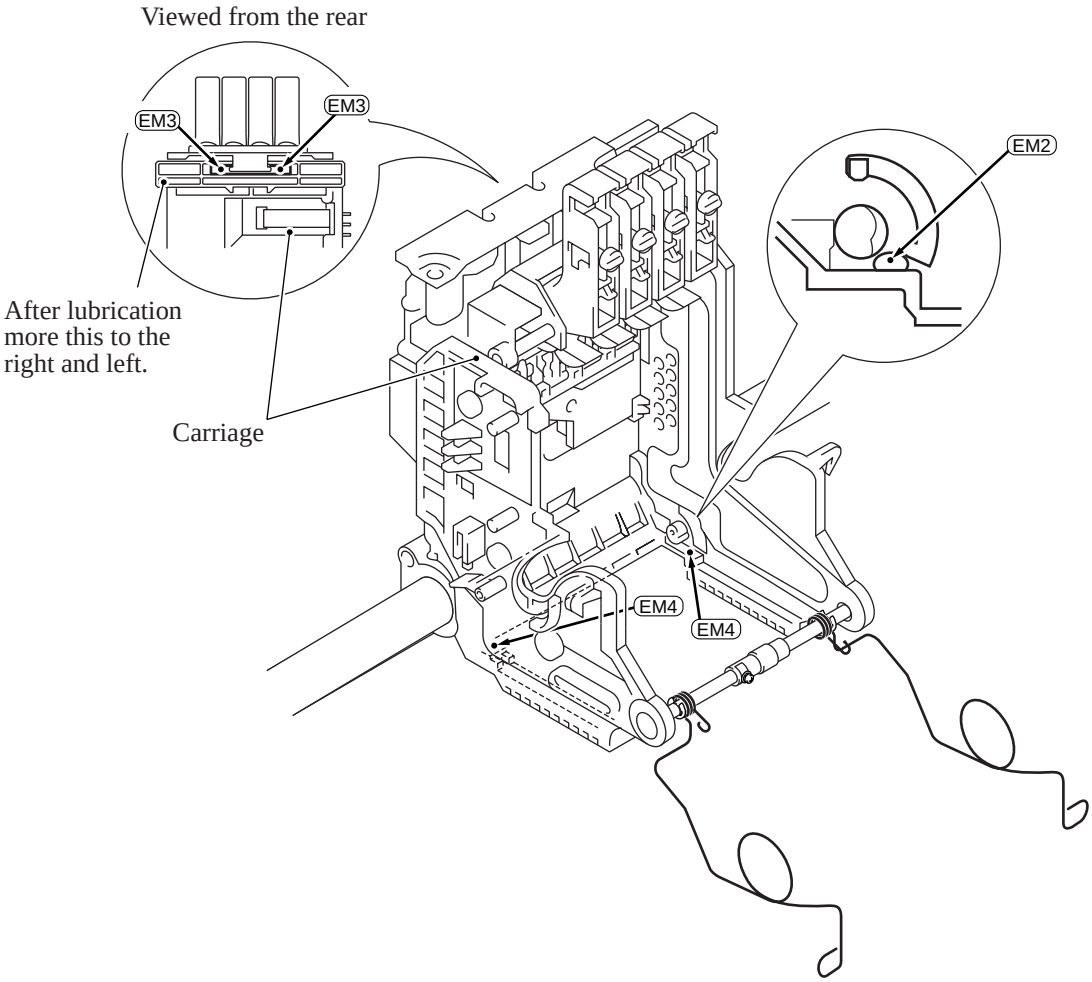


[11] Purge shaft





[12] Carriage


Viewed from the rear
EM3
EM3
EM2
After lubrication more this to the right and left.
Carriage
EM4
EM4

6.3 ADJUSTMENT

Correcting the positioning error of the print head

Once the print head or carriage is removed, you need to correct the positioning error of the print head according to the procedure given below. The head nozzle columns should be perpendicular to the carriage travel path.

NOTE: This adjustment procedure requires a PC and the specified test chart data.

Connecting the facsimile machine to your PC

(1) Make sure that your PC is turned off.

(2) Make sure that the machine's power cord is unplugged from a wall socket.

(3) Connect the machine to your PC as follows:

Connect the parallel interface cable to the parallel port on the back of the machine and secure it with the lock wires.

Connect the other end of the interface cable to the printer port of your PC and secure it with the two screws.

NOTE: You may use the USB instead of the parallel interface port.

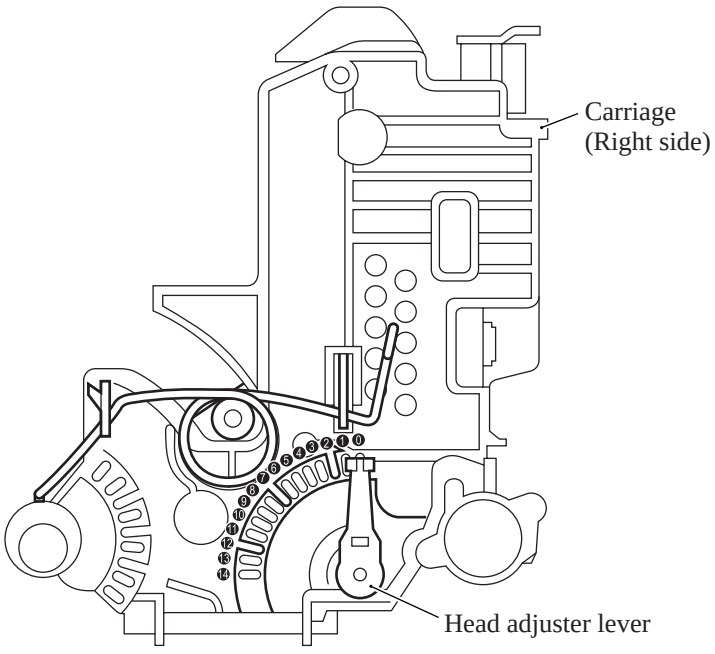
(4) Plug the machine's power cord into a wall socket. Then open the scanner unit.

(5) Turn on your PC.

Setting up the facsimile machine and your PC

(6) Make sure that:
- the print head is secured to the carriage by the head clamp springs,
- the ink cartridges are set into place, and
- paper is loaded in the paper tray.

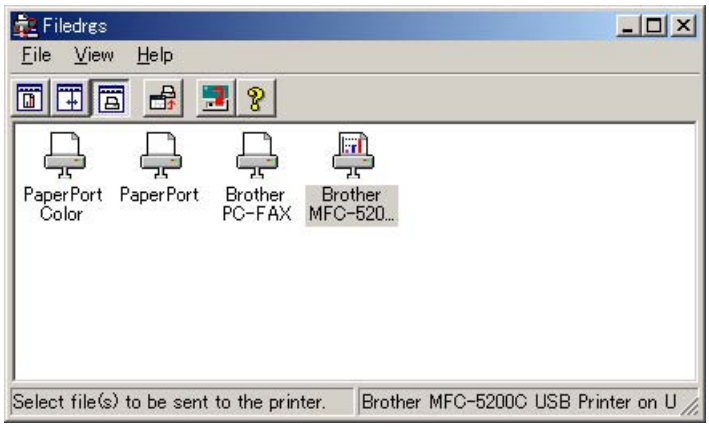
(7) Make sure that the head adjuster lever located on the right side of the carriage is placed at position 0 (rearmost position). (See the illustration given below.)



(8) Download "Filedg32" and "INCLINE.PRN" to your PC.

(9) Run "Filedg32."

The Filedrgs window will appear as shown below.



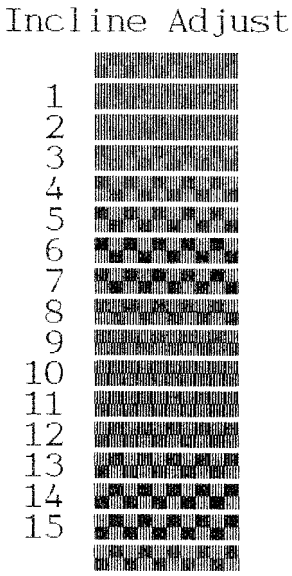
Printing out "Incline Adjust" test patterns and turning the head adjuster lever

(10) Drag and drop the "INCLINE.PRN" icon onto the "Brother MFC-5200C" icon in the Filedrgs window.

The "Incline Adjust" test chart will be printed out.

(11) Repeat step (10) four times more to get a total of five printouts.

(12) Check all printed test patterns on those five printouts and select the one that is the least uneven print (Pattern 2 in this sample). Make a note of the pattern number.



Head Positioning Test Pattern

(13) Turn the head adjuster lever to the front by the number of divisions specified by the pattern number you recorded in step (12). (In this sample, turn the lever to the front by two divisions.)

(14) Repeat the above printing sequence to get a total of five printouts again.

(15) Check all printed test patterns on those five printouts.

If pattern 0 is the least uneven print, the adjustment has been completed.

If pattern 1 is the least uneven print, for example, turn the head adjuster lever to the front by one division; if pattern 2 is, turn the lever by two divisions; if pattern 3 is,…

If the uppermost pattern (no number assigned) is the least uneven print, turn the lever to the rear by one division.

(16) Repeat steps (14) and (15) until pattern 1 becomes the least uneven print.

(17) Close the scanner unit.

(18) Turn your PC off.

(19) Unplug the machine's power cord from the wall socket.

(20) Disconnect the machine from your PC.

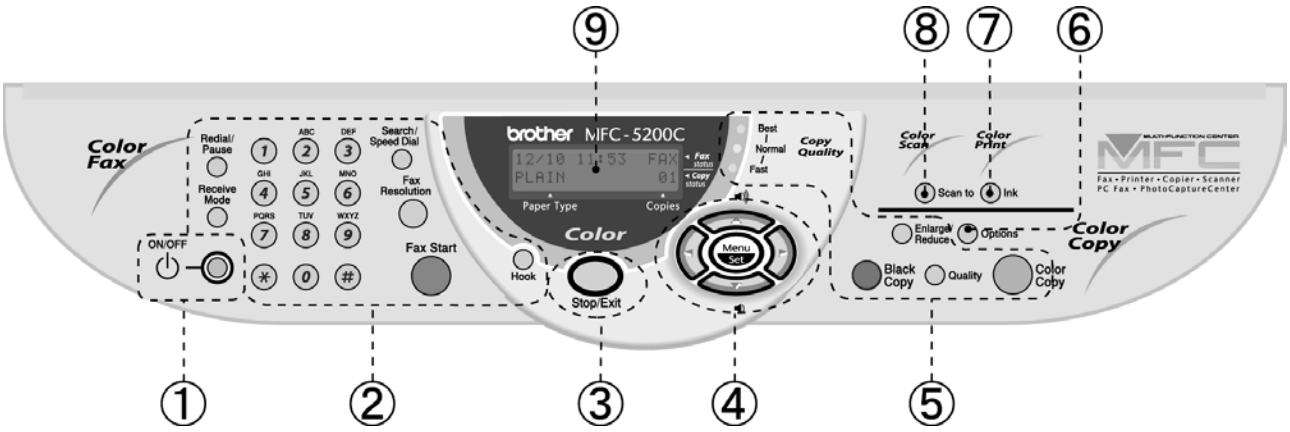
CHAPTER 7

MAINTENANCE MODE

CHAPTER 7 MAINTENANCE MODE

CONTENTS

7.1 CONTROL PANEL



① ON/OFF

You can turn the MFC on or off.

② Fax and telephone keys:

Redial/Pause

Redials the last number you called.
It also inserts a pause in auto dial numbers.

Receive Mode

Use to select how the MFC will handle incoming calls.

Dial Pad

Use this to dial telephone and fax numbers and as a keyboard for entering information into the MFC.
The # key lets you switch the dialing type during a telephone call from Tone to Pulse

Search/Speed Dial

Lets you look up numbers that are stored in the Dialing memory. It also lets you dial stored numbers by pressing # and a two-digit number.

Fax Resolution

Sets the resolution when you send a fax.

Fax Start

Starts an operation, such as sending a fax.

Hook

Lets you dial numbers without picking up the handset.

③ Stop/Exit

Stops a fax, cancels an operation or exits from the Menu.

④ Navigation keys:

Menu/Set

Lets you access the Menu to program and store your settings in the MFC.
Press to scroll forward or backward to a menu selection.
Also, you can use these keys to do an alphabetical search for the names of stored numbers.

Volume

Press to scroll through the menus and options.
When using the speaker, you can press these keys to adjust the volume.

⑤ Copy keys (Temporary settings):

Quality

Use this key to temporarily change the quality for Copying.

Quality indicator lights

These lights show the copy quality you selected with the Quality key.

Enlarge/Reduce

Lets you enlarge or reduce copies depending on the ratio you select.

Black Copy

Makes a black-and-white copy.

Color Copy

Makes a full-color copy.

⑥ Options

You can quickly and easily select temporary settings for copying or Photo Capture Center™.

⑦ Color Print key:

Ink

Lets you clean the print heads, replace an ink cartridge and check the available ink volume.

⑧ Scan key:

Scan to

Lets you scan the next original and select the destination in your computer.
(Such as a Word processing, graphics or E-mail application, Media card or on a Network.)

⑨ Liquid Crystal Display (LCD)

Displays messages on the screen to help you set up and use your MFC.

7.2 ENTRY INTO THE MAINTENANCE MODE

To make the facsimile equipment enter the maintenance mode, press the **Menu**, *****, **2**, **8**, **6**, and **4** keys in this order.
|← Within 2 seconds →|

The equipment beeps for approx. one second and displays "▮▮ MAINTENANCE ▮▮▮" on the LCD, indicating that it is placed in the initial stage of the maintenance mode, a mode in which the equipment is ready to accept entry from the keys.

To select one of the maintenance-mode functions listed in Section 7.3, enter the corresponding 2-digit function code with the numerical keys on the control panel. (The details of each maintenance-mode function are described in Section 7.5.)

NOTES:
- Pressing the **9** key twice in the initial stage of the maintenance mode makes the equipment exit from the maintenance mode, restoring it to the standby state.
- Pressing the **Stop** key after entering only one digit restores the equipment to the initial stage of the maintenance mode.
- If an invalid function code is entered, the equipment resumes the initial stage of the maintenance mode.

7.3 LIST OF MAINTENANCE-MODE FUNCTIONS

Maintenance-mode Functions

Function Code	Function	Reference Subsection (Page)
01	EEPROM Parameter Initialization	7.5.1 (7-6)
05	Printout of Scanning Compensation Data	7.5.2 (7-7)
06	Movement of CCD Unit to the Transport Position	7.5.3 (7-9)
08	ADF* Performance Test	7.5.4 (7-10)
09	Test Pattern 1	7.5.5 (7-11)
10	Firmware Switch Setting	7.5.6 (7-12)
11	Printout of Firmware Switch Data	7.5.6 (7-14)
12	Operational Check of LCD	7.5.7 (7-15)
13	Operational Check of Control Panel PCB (Check of Keys and Buttons)	7.5.8 (7-16)
32	Sensor Operational Check	7.5.9 (7-17)
54	Fine Adjustment of Scanning Start/End Position	7.5.10 (7-18)
55	CCD Scanner Area Setting	7.5.11 (7-19)
57	Setting the Sensing Reference Level of the Ink Empty Sensor	7.5.12 (7-20)
65	Alignment of Vertical Print Lines	7.5.13 (7-21)
66	Updating of Paper Feeding Correction Value	7.5.14 (7-23)
68	Updating of Head Property Information	7.5.15 (7-25)
69	Initial Adjustment of PWM Value (Aging of the carriage)	7.5.16 (7-26)
74	EEPROM Customizing	7.5.17 (7-27)
80	Display of the Equipment's Log Information	7.5.18 (7-28)
82	Equipment Error Code Indication	7.5.19 (7-29)
87	Output of Transmission Log to the Telephone Line	7.5.20 (7-29)
91	EEPROM Parameter Initialization (except the telephone number storage area)	7.5.1 (7-6)
99	Exit from the Maintenance Mode	----- (7-3)
—	Cancellation of the Pin TX Lock Mode (Not applicable to the American models)	7.5.21 (7-30)

* ADF: Automatic document feeder

7.4 USER-ACCESS TO THE MAINTENANCE MODE

Basically, the maintenance-mode functions listed on the previous page should be accessed by service personnel only. However, you may allow end users to access some of these under the guidance of service personnel (e.g., by telephone).

The user-accessible functions (codes 06, 10, 11, 12, 54, 65, 80, 82, 87 and 91) are shaded in the table given on the previous page. Function code 10 accesses the firmware switches, each of which has eight selectors. You should not allow end users to access all of those selectors, but you may allow them to access user-accessible selectors which are shaded in the firmware switch tables in Appendix 4.

The service personnel should instruct end users to follow the procedure given below.

(1) Press the **Menu** and **Receive Mode** keys in this order.

The LCD clears the current display.

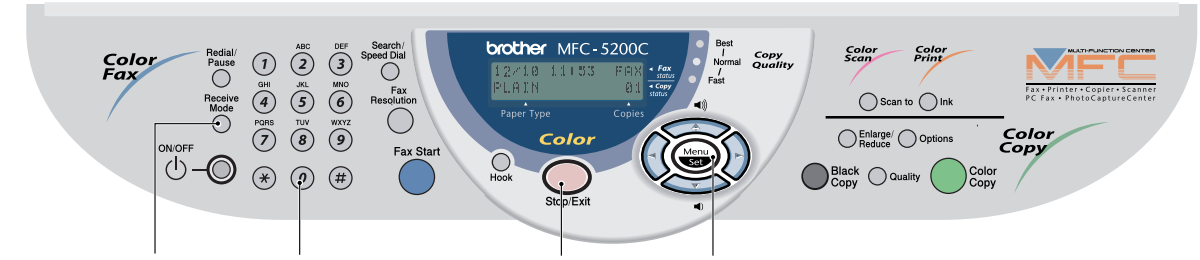
NOTE: The **Receive Mode** key is disabled during standby for redialing and timer.

(2) Press the **0** key.

(3) Enter the desired function code (06, 10, 11, 12, 54, 65, 80, 82, 87, or 91) with the numerical keys.

For function code 10, access the desired firmware switch according to the operating procedure described in Appendix 4.

(4) To make the equipment return to the standby state, press the **Stop** key.



Receive Mode key 0 key Stop key Menu key

7.5 DETAILED DESCRIPTION OF MAINTENANCE-MODE FUNCTIONS

7.5.1 EEPROM Parameter Initialization

■ Function

The equipment initializes the parameters, user switches, and firmware switches registered in the EEPROM, to the initial values. Entering the function code 01 initializes almost all of the EEPROM areas, but entering 91 does not initialize some areas, as listed below.

Data item \ Function code	01	91
Maintenance-mode functions User switches Firmware switches Remote activation code	All of these will be. initialized	These will be initialized
Activity report Station ID data Outside line number Telephone function registration One-touch dialing Speed dialing Group dialing		These will not be initialized
EEPROM customizing code (4-digit)	This will not be initialized. (Note that the first digit of the 4-digit code will be initialized to "0." If the code is 1001, for example, it will be initialized to 0001.)	

NOTE: you replace the driver PCB with one used for other facsimile equipment, carry out this procedure and then customize the EEPROM (maintenance-mode function code 74 in Section 7.5.17).

■ Operating Procedure

(1) Press the **0** and **1** keys (or the **9** and **1** keys according to your need) in this order in the initial stage of the maintenance mode.

The "PARAMETER INIT" will appear on the LCD.

(2) Upon completion of parameter initialization, the equipment returns to the initial stage of the maintenance mode.

7.5.2 Printout of Scanning Compensation Data

■ Function

The equipment prints out the white and black level data for scanning compensation.

■ Operating Procedure

Do not start this function merely after powering on the equipment but start it after carrying out a sequence of scanning operation. Unless the equipment has carried out any scanning operation, this function cannot print out correct scanning compensation data. This is because at the start of scanning operation, the equipment initializes white and black level data and takes in the scanning compensation reference data.

(1) Press the **0** and **5** keys in this order in the initial stage of the maintenance mode.

The "WHITE LEVEL 1" will appear on the LCD.

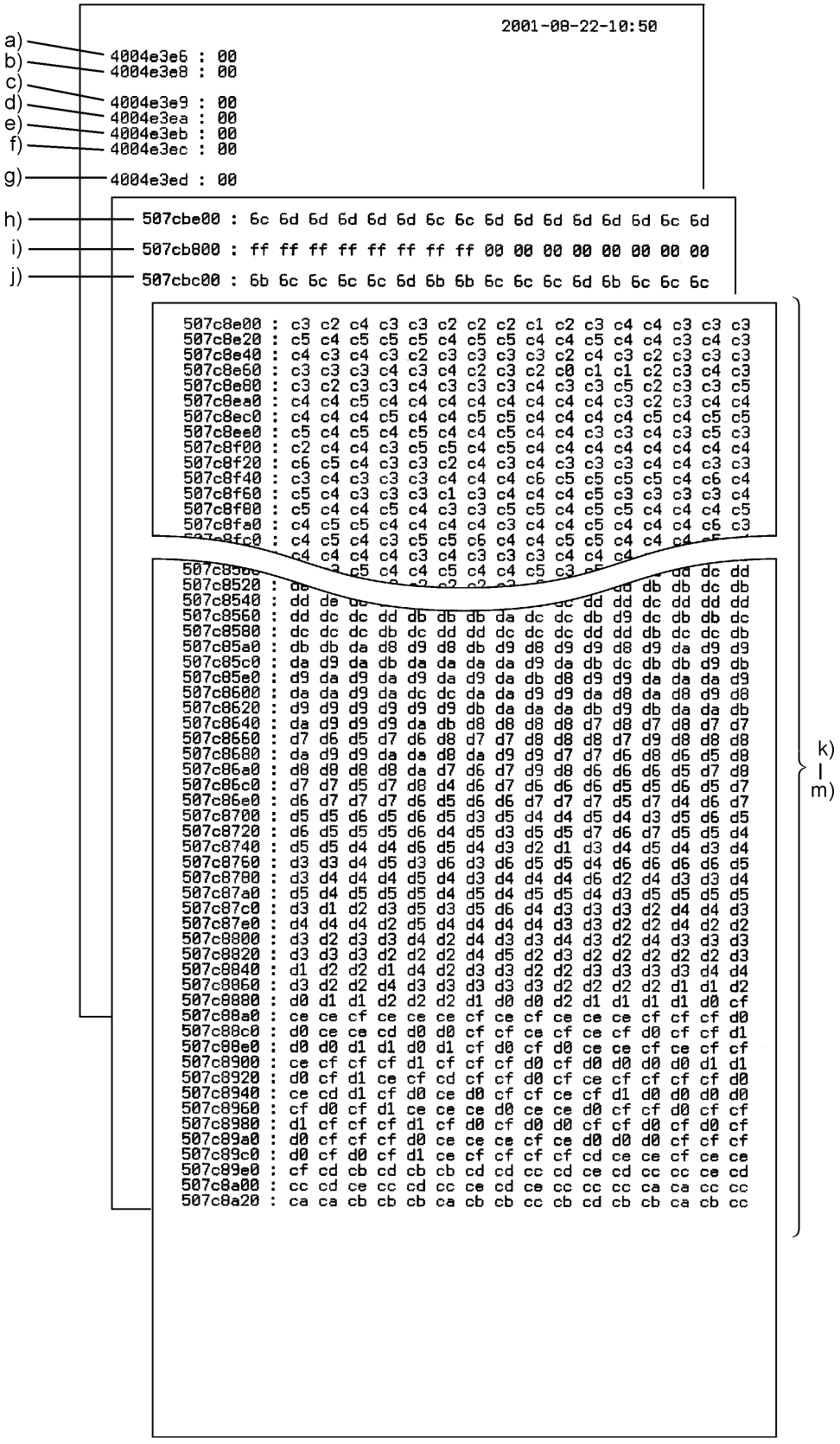
(2) The equipment prints out the scanning compensation data list containing the following:

a) PWM value for controlling the lower limit of the A/D converter reference voltage (1 byte)
b) Max. allowable value of a) above (1 byte)
c) Voltage divider ON/OFF level for red image (1 byte)
d) Voltage divider ON/OFF level for green image (1 byte)
e) Voltage divider ON/OFF level for blue image (1 byte)
f) Voltage divider ON/OFF level for monochrome image (1 byte)
g) Compensation data for background color (1 byte)
h) Black level data for red image (16 bytes)
i) Black level data for green image (16 bytes)
j) Black level data for blue image (16 bytes)
k) White level data for red image (4896 bytes)
l) White level data for green image (4896 bytes)
m) White level data for blue image (4896 bytes)

(3) Upon completion of recording of the compensation data list, the equipment returns to the initial stage of the maintenance mode.

NOTE: When the equipment prints monochrome images after monochrome scanning, only the green data is valid.

NOTE: If any data is abnormal, its code will be printed in inline style.



Scanning Compensation Data List

7.5.3 Movement of CCD Unit to the Transport Position

■ Function

This procedure moves the CCD unit to the transport position of the right end of its travel. After completing repairs and operation checks on the machine, you need to carry out this procedure immediately before packing and transporting the machine.

NOTE: If an end user needs to transport his/her machine to the dealer or service station for repair, then you should instruct him/her to carry out this procedure if possible before packing and transporting the machine. (For the user-access to the maintenance mode, refer to page 5-3.)

■ Operating Procedure

(1) Press the **0** and **6** keys in this order in the initial stage of the maintenance mode.

The CCD unit will move to the right end of its travel, during which the "MAINTENANCE 0" will appear on the LCD.

When the CCD unit reaches the transport position, the "SCAN LOCKED" will appear on the LCD.

(2) Press the **Stop** key to make the machine return to the initial stage of the maintenance mode.

7.5.4 ADF Performance Test

■ Function

The equipment counts the documents fed by the automatic document feeder (ADF) and displays the count on the LCD for checking the ADF performance.

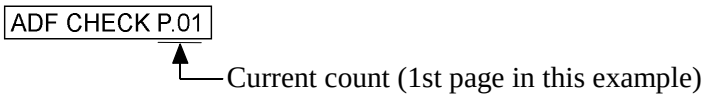
■ Operating Procedure

(1) Set documents. (Allowable up to the ADF capacity.)

The "DOC. READY" will appear on the LCD.

(2) Press the **0** and **8** keys in this order.

While counting the documents, the equipment feeds them in and out, displaying the current count on the LCD as shown below.



(3) After counting all documents, the equipment shows the final count. To return the equipment to the initial stage of the maintenance mode, press the **Stop** key.

7.5.5 Test Pattern 1

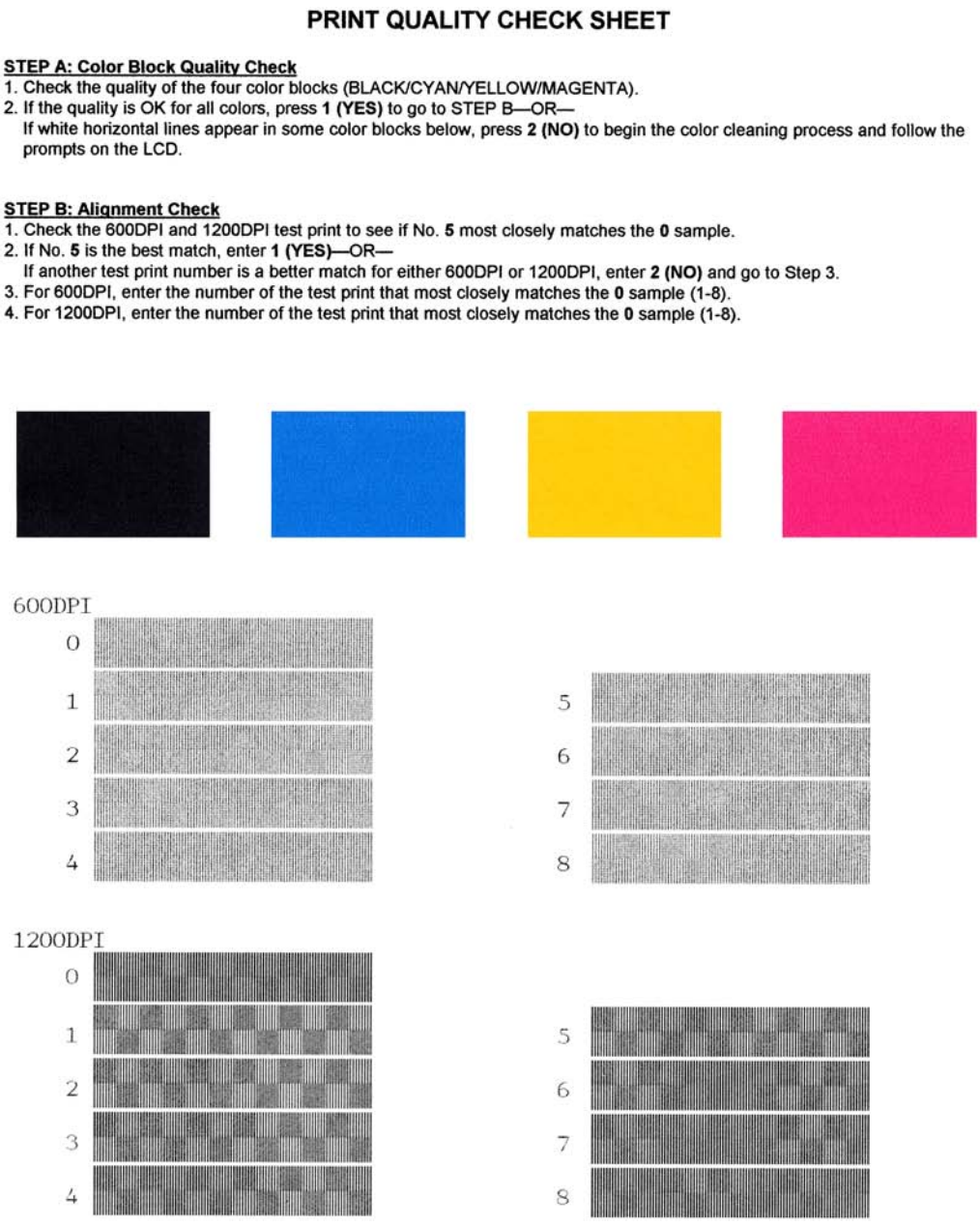
■ Function

This function, much like the copying function, prints out test pattern 1 to allow the service personnel to check for record data missing or print quality.

■ Operating Procedure

Press the **0** and **9** keys in this order in the initial stage of the maintenance mode.

The figure below shows test pattern 1.



Test Pattern 1

7.5.6 Firmware Switch Setting and Printout

[A] Firmware switch setting

■ **Function**

The facsimile equipment incorporates the following firmware switch functions which may be activated with the procedures using the control panel keys and buttons.

The firmware switches have been set at the factory in conformity to the communications standards and codes of each country. Do not disturb them unless necessary. Some firmware switches may not be applicable in some versions. The firmware switch data list indicates "Not used." for those inapplicable switches.

Firmware Switches (WSW01 through WSW50)

WSW No.	Function
WSW01	Dial pulse setting
WSW02	Tone signal setting
WSW03	PABX mode setting
WSW04	TRANSFER facility setting
WSW05	1st dial tone and busy tone detection
WSW06	**Pause** key setting and 2nd dial tone detection
WSW07	Dial tone setting 1
WSW08	Dial tone setting 2
WSW09	Protocol definition 1
WSW10	Protocol definition 2
WSW11	Busy tone setting
WSW12	Signal detection condition setting
WSW13	Modem setting
WSW14	AUTO ANS facility setting
WSW15	REDIAL facility setting
WSW16	Function setting 1
WSW17	Function setting 2
WSW18	Function setting 3
WSW19	Transmission speed setting
WSW20	Overseas communications mode setting
WSW21	TAD setting 1
WSW22	ECM and copy resolution setting
WSW23	Communications setting
WSW24	TAD setting 2
WSW25	TAD setting 3
WSW26	Function setting 4
WSW27	Function setting 5
WSW28	Function setting 6
WSW29	Function setting 7
WSW30	Not used.
WSW31	Function setting 9
WSW32	Function setting 10
WSW33	Function setting 11

Firmware Switches (WSW01 through WSW50) ***Continued***

WSW No.	Function
WSW34	Function setting 12
WSW35	Not used.
WSW36	Function setting 14
WSW37	Function setting 15
WSW38	Not used.
WSW39	Not used.
WSW40	Not used.
WSW41	CCD fluorescent lamp
WSW42	Function setting 20
WSW43	Function setting 21
WSW44	Speeding up scanning-1
WSW45	Speeding up scanning-2
WSW46	Monitor of power ON/OFF state and parallel port kept at high
WSW47	Paper handling for a feed error and delay of FAX line disconnection
WSW48	Not used.
WSW49	Not used.
WSW50	Not used.

■ Operating Procedure

(1) Press the **1** and **0** keys in this order in the initial stage of the maintenance mode.

The equipment displays the "WSW00" on the LCD and becomes ready to accept a firmware switch number.

(2) Enter the desired number from the firmware switch numbers (01 through 50).

The following appears on the LCD:

Selector 1 ↓ Selector 8 ↓

WSWXX = 0 0 0 0 0 0 0 0

(3) Use the right and left arrow keys to move the cursor to the selector position to be modified.

(4) Enter the desired number using the **0** and **1** keys.

(5) Press the **Set** key. This operation saves the newly entered selector values onto the EEPROM and readies the equipment for accepting a firmware switch number.

(6) Repeat steps (2) through (5) until the modification for the desired firmware switches is completed.

(7) Press the **Set** or **Stop** key to return the equipment to the initial stage of the maintenance mode.

NOTES:
- To cancel this operation and return the equipment to the initial stage of the maintenance mode during the above procedure, press the **Stop** key.
- If there is a pause of more than one minute after a single-digit number is entered for double-digit firmware switch numbers, the equipment will automatically return to the initial stage of the maintenance mode.

■ Details of Firmware Switches

The details of the firmware switches are described in Appendix 4 in which the user-accessible selectors of the firmware switches are shaded.

[B] Printout of firmware switch data

■ Function

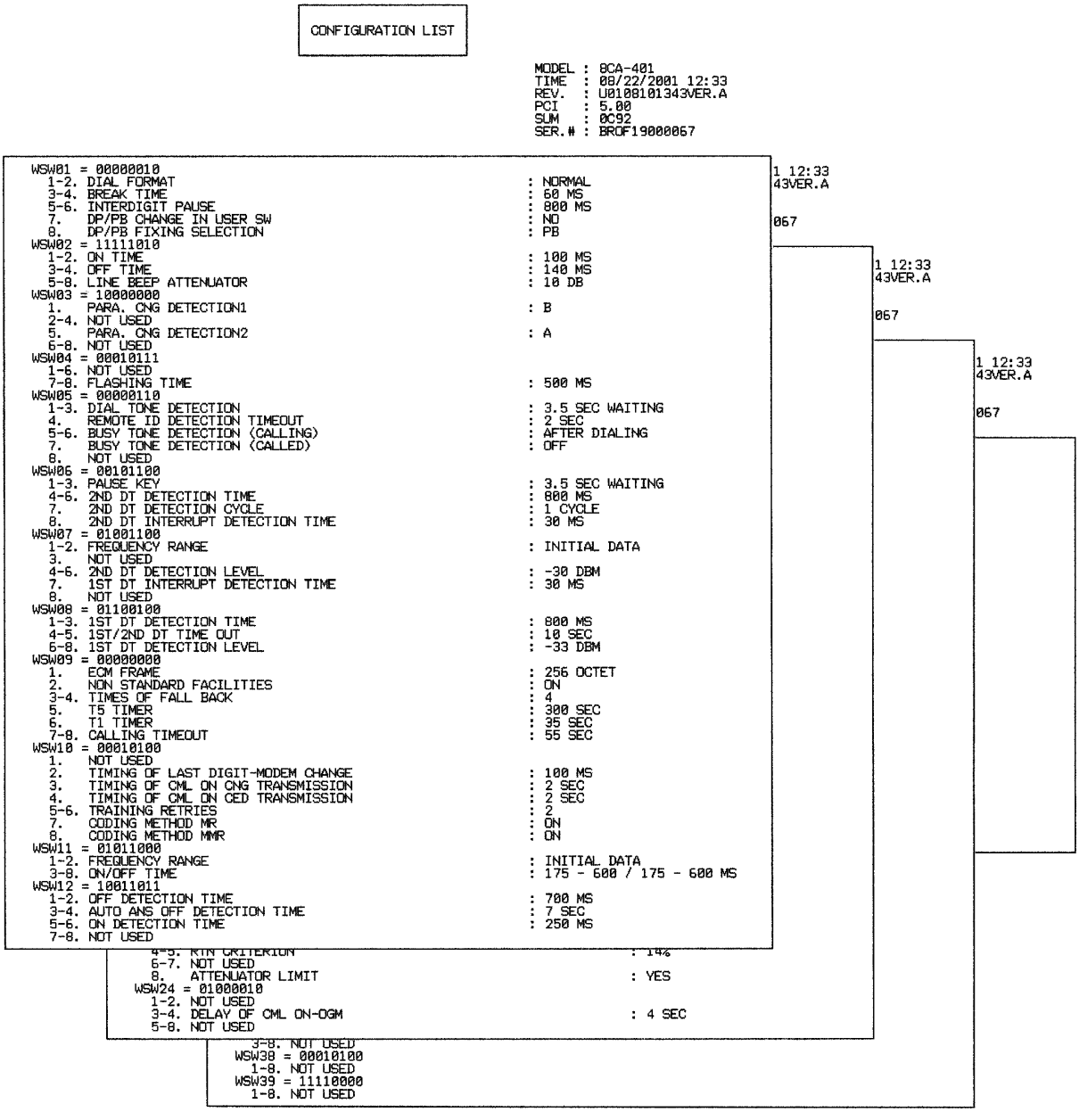
The equipment prints out the setting items and contents specified by the firmware switches.

■ Operating Procedure

(1) Press the **1** key twice in the initial stage of the maintenance mode.
The "PRINTING" will appear on the LCD.

(2) The equipment prints out the configuration list as shown in the figure below.

(3) Upon completion of printing, the equipment returns to the initial stage of the maintenance mode.



Configuration List

7.5.7 Operational Check of LCD

■ Function

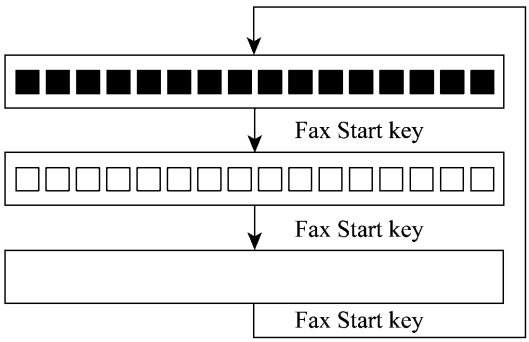
This function allows you to check whether the LCD on the control panel works normally.

■ Operating Procedure

(1) Press the **1** and **2** keys in this order in the initial stage of the maintenance mode.

The LCD shows the screen given at right.

(2) Press the **Fax Start** key. Each time you press the **Fax Start** key, the LCD cycles through the displays shown at right.



(3) Press the **Stop** key in any process of the above display cycle. The equipment beeps for one second and returns to the initial stage of the maintenance mode.

7.5.8 Operational Check of Control Panel PCB

■ Function

This function allows you to check the control panel PCB for normal operation.

■ Operating Procedure

(1) Press the **1** and **3** keys in this order in the initial stage of the maintenance mode.

The "00 " will appear on the LCD.

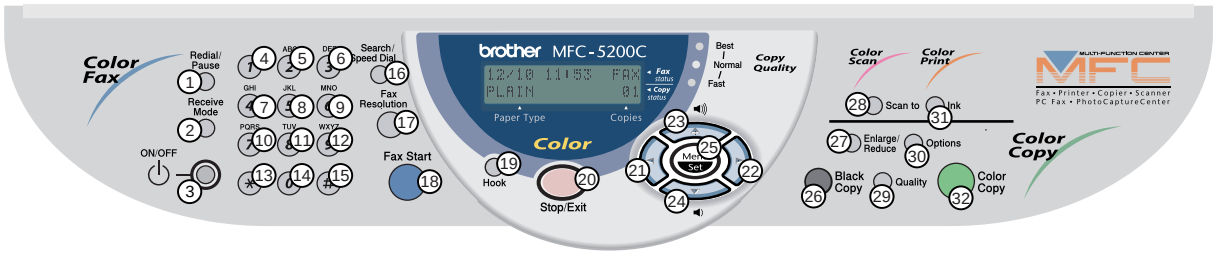
(2) Press the keys and buttons in the order designated in the illustration shown below.

The LCD shows the corresponding number in decimal notation each time a key or button is pressed. Check that the displayed number is correct by referring to the illustration below.

If a key or button is pressed out of order, the equipment beeps and displays the "INVALID OPERATE" on the LCD. To return to the status ready to accept key & button entry for operational check, press the **Stop** key.

(3) After the last number key or button is pressed, the equipment beeps and returns to the initial stage of the maintenance mode.

To terminate this operation, press the **Stop** key. The equipment returns to the initial stage of the maintenance mode.



Key & Button Entry Order

7.5.9 Sensor Operational Check

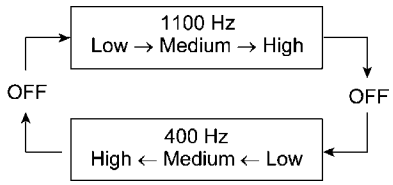
■ Function

This function allows you to check the following:

- Document front sensor
- Document rear sensor
- Document cover open sensor
- CCD HP sensor
- Scanner open sensor
- Registration sensor
- Paper width sensor
- Purge cam HP switch
- Pump switching cam HP switch
- (Print head detector)
- Black ink cartridge sensor
- Yellow ink cartridge sensor
- Cyan ink cartridge sensor
- Magenta ink cartridge sensor
- Manual feed slot cover sensor

■ Operating Procedure

(1) Press the **3** and **2** keys in this order in the initial stage of the maintenance mode. The equipment sounds 1100 Hz and 400 Hz tones cyclically through the following volumes for testing the speaker:



NOTE: To stop beeping, press the **Menu** key.

If the sensing status are as listed below, the LCD will show "DFDRDCFHCSCVRSPW" and "P1P2HDIKIYICIMMP," which can be switched by pressing the **Fax Start** key.

Given below is the relationship between the LCD indication, sensor name and sensor status.

LCD	Sensors	Sensing status
DF	Document front sensor	No document detected.
DR	Document rear sensor	No document detected.
DC	Document cover open sensor	Document cover closed.
FH	CCD HP sensor	CCD unit placed in the home position.
CS	Cassette sensor	Not applicable to the MFC5200C/MFC890
CV	Scanner open sensor	Scanner unit closed.
RS	Registration sensor	No recording paper detected.
PW	Paper width sensor	No paper detected.
P1	Purge cam HP switch	Purge cam placed in the home position.
P2	Pump switching cam HP switch	Pump switching cam placed in the home position.
HD	(Print head detector)	(Not used.)
IK	Black ink cartridge sensor	Black ink cartridge loaded.
IY	Yellow ink cartridge sensor	Yellow ink cartridge loaded.
IC	Cyan ink cartridge sensor	Cyan ink cartridge loaded.
IM	Magenta ink cartridge sensor	Magenta ink cartridge loaded.
MP	Manual feed slot cover sensor	Manual feed slot cover closed.

(2) Change the detecting conditions (e.g., insert paper through the document sensors, registration sensor or paper width sensor, open the document cover/scanner unit/manual feed slot cover, or remove the print head or ink cartridges) and then check that the indication on the LCD changes according to the sensor states.

(3) To stop this operation and return the equipment to the initial stage of the maintenance mode, press the **Stop** key.

7.5.10 Fine Adjustment of Scanning Start/End Position

■ Function

This function allows you to adjust the scanning start/end position.

■ Operating Procedure

(1) Press the **5** and **4** keys in this order in the initial stage of the maintenance mode.

The "SCAN START ADJ." and "1.ADF 2.FB" appear on the LCD in this order.

(2) Press the **1** or **2** key, and the current scanning position correction value appears.

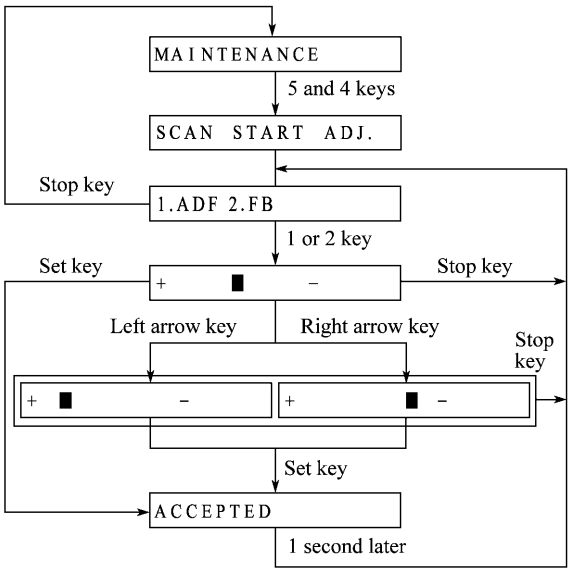
You may adjust the correction value to 11 levels from +5 to -5 (mm).

(3) To increase the correction value, press the left arrow key; to decrease it, press the right arrow key.

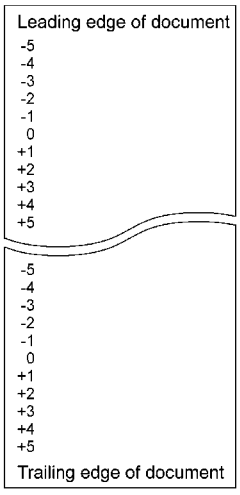
If you press the **Stop** key, the equipment returns to the initial stage of the maintenance mode without making change of the correction value.

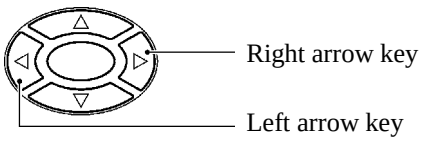
(4) Press the **Set** key.

The "ACCEPTED" appears on the LCD. After one second, the equipment returns to the initial stage of the maintenance mode.



NOTE: The relationship between the scanning start/end positions and their correction values is shown below.





7.5.11 CCD Scanner Area Setting

■ Function

This function allows the equipment to set the CCD scanner area and save it into the EEPROM of the driver PCB.

It is also used to update the correction value (stored in the EEPROM) for the multiplying factor of horizontal scanning. The updating is required if the CCD unit, scanner unit, or driver PCB is replaced with a new one. For details, refer to Appendix 2, A2.4.

■ Operating Procedure

(1) Press the **5** key twice in the initial stage of the maintenance mode.

The "SCANNER AREA SET" will appear on the LCD.

The equipment checks and sets the area to be scanned.

(2) If no error is noted, the equipment becomes ready to accept a new correction value required for the multiplying factor of horizontal scanning. Enter the new correction value obtained in Appendix 2, A2.4, "Correction Table."

If any error is noted, the "SCANNER ERROR" will appear on the LCD. To return the equipment to the initial stage of the maintenance mode, press the **Stop** key.

7.5.12 Setting the Sensing Reference Level of the Ink Empty Sensor

■ Function

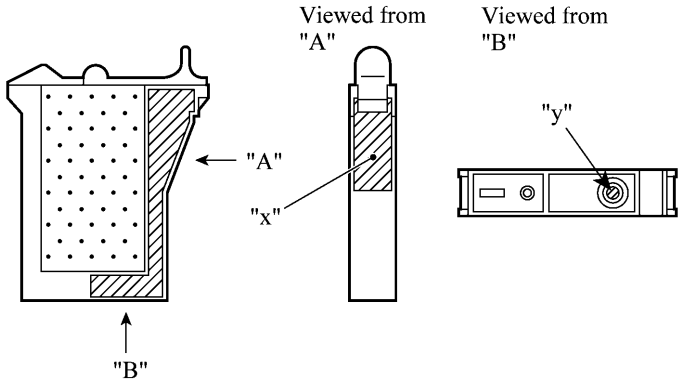
This function allows you to set the sensing reference level of the ink empty sensor which apply when the controller judges whether there is ink in the ink cartridges. The setting procedure requires a foam-empty cartridge as a reference cartridge.

NOTE: If you replace the driver PCB or ink empty sensor, carry out this procedure.

■ Operating Procedure

Handling notes for the reference cartridge: Shown below is a foam-empty cartridge to be used for setting the sensing reference level of the ink empty sensor. Do not touch section "x" or "y."

If any dust or dirt is found on "x" or "y," wipe it off with a soft cloth. If "x" is scratched, replace the cartridge with a new one. Using such a scratched cartridge will fail to set correct reference level. After completion of the setting procedure, store the cartridge in the container.



Foam-empty cartridge

(1) Press the **5** and **7** keys in this order in the initial stage of the maintenance mode.

(2) Open the scanner unit.
The carriage automatically moves left to the ink replacement position.

(3) Remove the yellow ink cartridge.
The LCD shows "SET F.EMP CART!!."
NOTE: When this message is displayed, do not load or unload any other ink cartridges.

(4) Set the foam-empty cartridge into the yellow ink cartridge position.
The LCD shows "CLOSE COVER!!."

(5) Close the scanner unit.
The equipment shows the "-INKEMP CHECK-" and starts setting the sensing level for the foam-empty cartridge.
If the equipment completes setting normally, it beeps and displays the "INKEMP TST:OK!."
If it fails, the "INKEMP F.EMP:NG!" appears, so press the **Stop** key and go back to step (1).

(6) Open the scanner unit and remove the foam-empty cartridge.

(7) Load the yellow ink cartridge removed in step (3) back into place.

(8) Press the **Stop** key to return to the initial stage of the maintenance mode.

7.5.13 Alignment of Vertical Print Lines

■ Function

This function allows you to align vertical lines printed in the forward and backward direction of the carriage.

NOTE: Before this alignment job, be sure to correct the positioning error of the print head. (Refer to CHAPTER 6, Section 6.3 "ADJUSTMENT.")

■ Operating Procedure

(1) Press the **6** and **5** keys in this order in the initial stage of the maintenance mode.

The equipment prints out a set of vertical alignment check patterns which consist of No. 1 to No. 9 lines for each of the 600 dpi, 1200 dpi, and 450 dpi.

If the vertical alignment is ON, No. 5 line (each in the 600 dpi, 1200 dpi, and 450 dpi printouts) shows vertically aligned lines as given on the next page.

The LCD shows the "600DPI NO.(1-9)."

(2) Check the printed vertical alignment check patterns for the 600 dpi and find which number line shows full alignment. If the line is other than No. 5, enter that line number by using the numerical keys.

The LCD shows the "1200DPI NO.(1-9)."

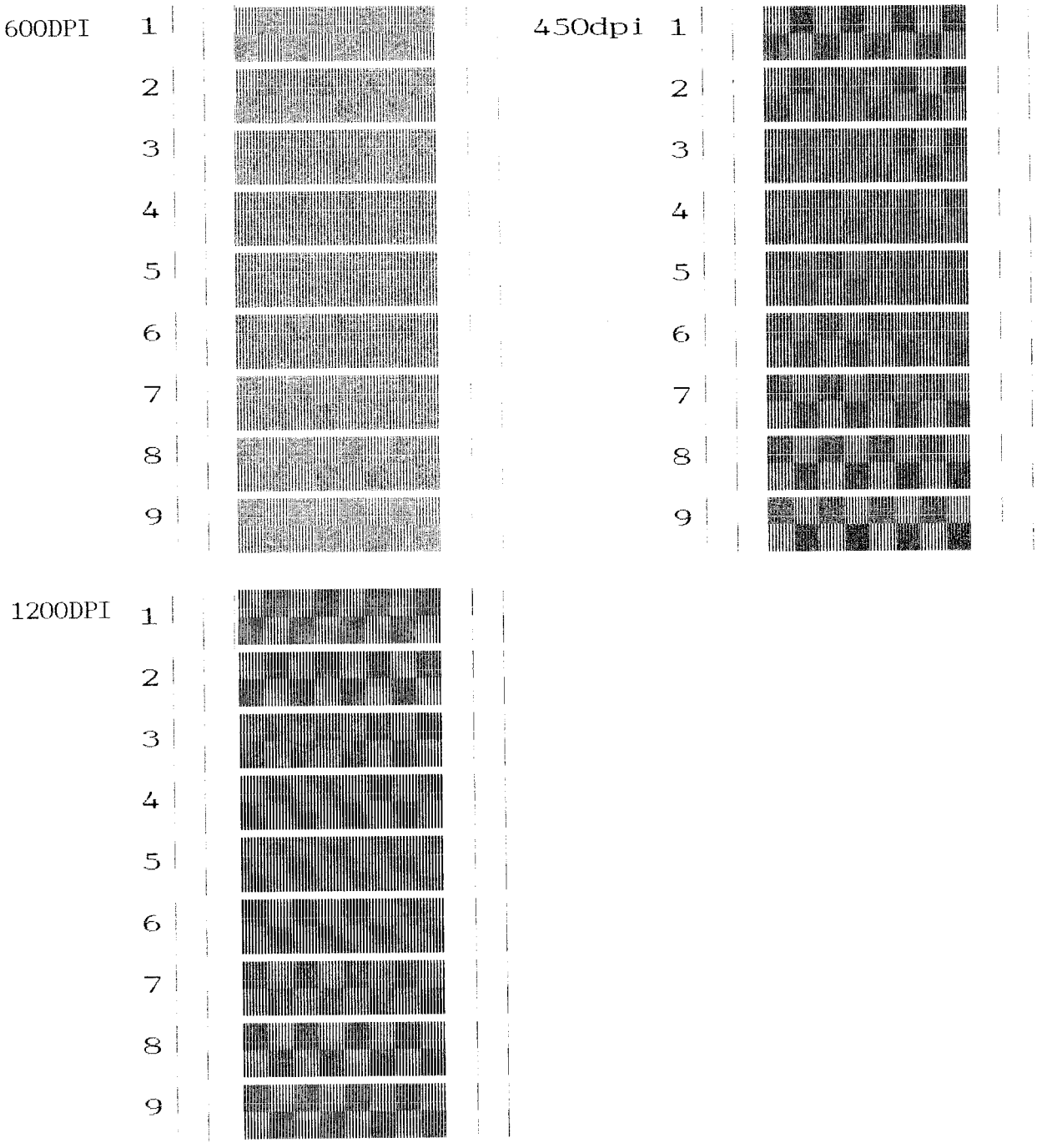
(3) For the 1200 dpi, perform the same operation as in step (2).

The LCD shows the "450DPI NO.(1-9)."

(4) For the 450 dpi, perform the same operation as in step (2).

The equipment automatically returns to the initial stage of the maintenance mode.

NOTE: If No. 1 line or No. 9 line is fully aligned so that you press the **1** or **9** key in the above procedure, then go back to step (1) to confirm that No. 5 line becomes aligned.



Vertical Alignment Check Pattern

7.5.14 Updating of Paper Feeding Correction Value

■ Function

To keep the paper feeding performance in the best condition for quality print, the controller optimizes the rotation of the paper feed roller and paper ejection roller, using the correction value stored in the EEPROM of the driver PCB.

If you replace the paper feed roller, paper ejection roller, or print head unit of the machine, then you need to update the paper feeding correction value according to the procedure given here.

TIP: This updating procedure requires a PC for printing out downloaded test patterns. Refer to Appendix 2, A2.5.

■ Operating Procedure

(1) Connect the facsimile machine to your PC via the USB, set up your PC and facsimile machine, and then print out test patterns. Refer to Appendix 2, A2.5.

(2) Press the **6** key twice in the initial stage of the maintenance mode.

The "1.PF ADJUST 2.EXIT ADJUST" appears on the LCD.

(3) Press the **1** key to select the PF roller adjustment.

The "PF ADJ NO.(1-9)" appears on the LCD.

(4) Check the test patterns printed out in step (1). See the next page for a sample printout.

Compare pattern "A" with the PF ADJUST check patterns and select which check pattern is closest to pattern "A" in unevenness.

If the evenness of pattern "A" is between those of check patterns 1 and 3, regard it as 2, just as in this sample.

If the unevenness is far to the left of check pattern 1, regard it as 1; If it is far to the right of check pattern 9, regard it as 9.

(5) Enter the number selected in step (4).

The machine automatically returns to the initial stage of the maintenance mode.

(6) Press the **6** and **6** keys again.

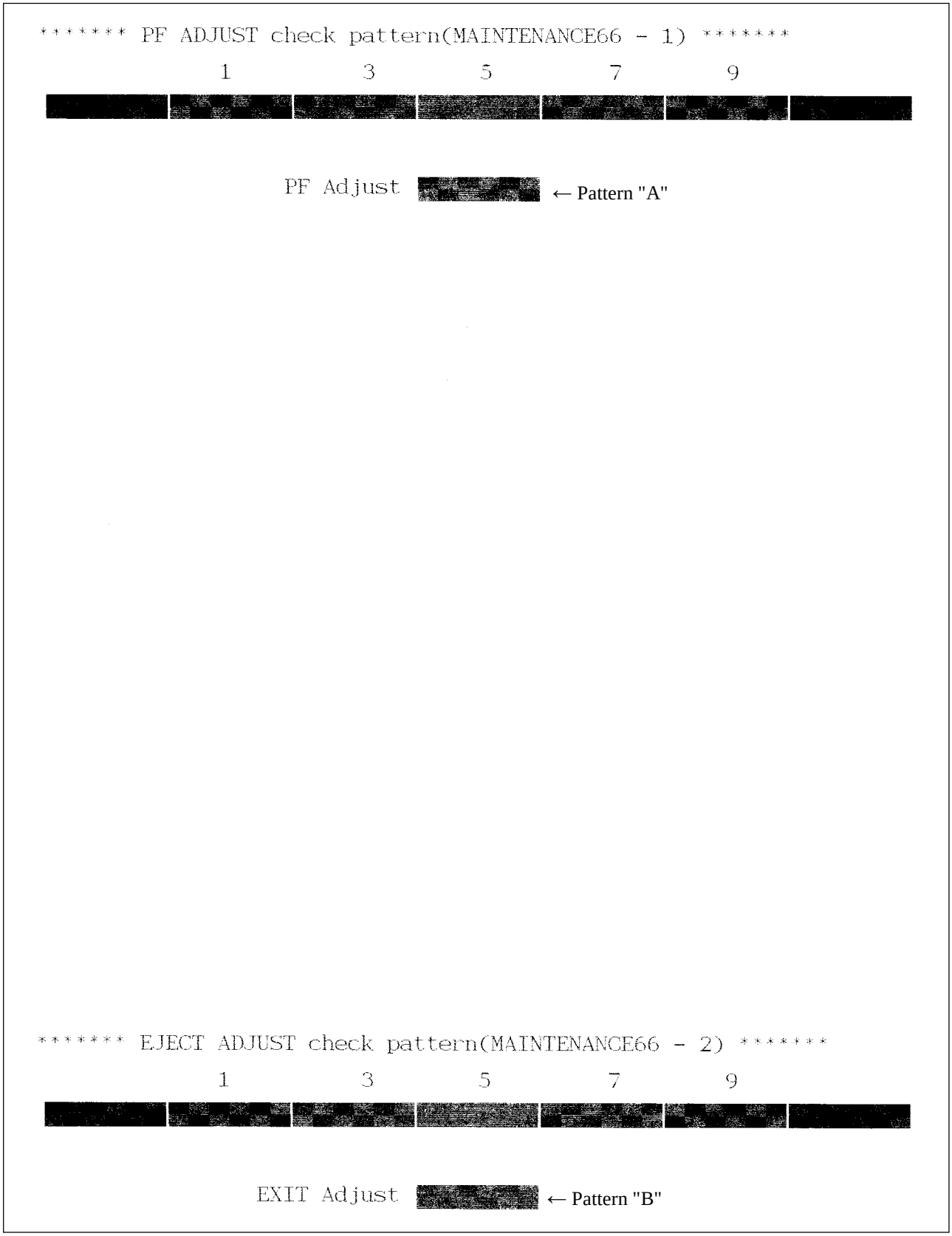
The "1.PF ADJUST 2.EXIT ADJUST" appears on the LCD.

(7) Press the **2** key to select the EXIT roller adjustment.

The "EXIT ADJ NO.(1-9)" appears on the LCD.

(8) Perform the same adjustment as in step (4) for the EJECT ADJUST check patterns and pattern "B."

The machine automatically returns to the initial stage of the maintenance mode.



Paper Feeding Check Patterns for the Paper Feed Roller and Paper Ejection Roller

7.5.15 Updating of Head Property Information

■ Function

To keep the print quality, the controller optimizes the head drive strength, ink jet-out timing, and other drive conditions according to the electromechanical properties unique to individual print heads and ambient temperature. The head property information is stored in the EEPROM of the driver PCB.

If you replace the print head unit and/or driver PCB of the machine, then you need to update the head property according to the procedure given here.

TIP: You may update the head property information from a PC connected to the facsimile machine. For the procedure, refer to Appendix 2, A2.3.

■ Operating Procedure

(1) Press the **6** and **8** keys in this order in the initial stage of the maintenance mode.

(2) Press the **2**, **5**, **8**, **0** keys in this order.

The facsimile machine shows the current head property information (13-digit code, e.g., 45352DABB485F) stored in the EEPROM on the LCD and becomes ready to accept entry.

(3) Check the head property code printed on the bar code label attached to the print head unit. Out of the 13-digit property code (enclosed with asterisks, e.g., *66667F657031H*), type upper 12 digits (e.g., 66667F657031).

NOTE: To enter letters "A" through "F," press the **1** through **6** keys while holding down the **#** key, respectively.

(4) Press the **Set** key.

The machine beeps, shows the "INPUT ACCEPTED" on the LCD, and writes the entered property code into the EEPROM. Then the machine returns to the initial stage of the maintenance mode.

NOTE: If the entered data contains any checksum error, the machine beeps, shows the "INPUT ERROR," and then returns to the ready-to-enter state. Go back to step (3).

7.5.16 Initial Adjustment of PWM Value (Aging of the Carriage)

■ Function

This function obtains the initial value of the PWM by aging the carriage and writes it onto the EEPROM, as well as checking the head drive voltage level.

This aging procedure should be performed if you replace the print head, carriage ASSY, carriage motor, or encoder strip or if you loosen the timing belt.

NOTE: Opening the scanner unit during the aging procedure will result in an error. If you perform this aging procedure with the scanner unit opened, the equipment will slowly age the carriage resulting in an error after completion of the aging.

■ Operating Procedure

(1) Press the **6** and **9** keys in this order in the initial stage of the maintenance mode.

The equipment starts aging the carriage, showing the "CR AGING" on the LCD.

After writing the initial value of the PWM onto the EEPROM and checking the head drive voltage level, the equipment automatically returns to the initial stage of the maintenance mode.

If any error occurs, the equipment beeps and shows some message, e.g., "OK30 NG15 NG07" on the LCD. This sample message indicates that the speed variation is within the allowable range when the carriage travels at high speed of 30 inches/sec.;however, it is out of the range at medium or low speed of 15 inches/sec. or 7 inches/sec.

To return to the initial stage of the maintenance mode, press the **Stop** key.

7.5.17 EEPROM Customizing

■ Function

This function allows you to customize the EEPROM according to language, function settings, and firmware switch settings. The customizing codes list is given in Appendix 3.

NOTE: If you replace the driver PCB, be sure to carry out this procedure.

■ Operating Procedure

(1) Press the **7** and **4** keys in this order in the initial stage of the maintenance mode.

The current customizing code (e.g., 3001 in the case of MFC5200C U.S.A. versions) appears.

(2) Enter the desired customizing code (e.g., 2002 in the case of MFC5200C Canadian versions).

NOTE: To enter letters "A" through "F," press the **1** through **6** keys while holding down the **#** key, respectively.

The newly entered code appears.

NOTE: *If a wrong 4-digit code is entered, the equipment will malfunction.*

(3) Press the **Fax Start** key.

The equipment saves the setting and returns to the initial stage of the maintenance mode.

If you press the **Stop** key or no keys are pressed for one minute in the above procedure, the equipment stops the procedure and returns to the initial stage of the maintenance mode.

7.5.18 Display of the Equipment's Log Information

■ Function

The equipment may display the its log information on the LCD.

■ Operating Procedure

(1) Press the **8** and **0** keys in this order in the initial stage of the maintenance mode.

The USB serial number appears on the LCD.

(2) Press the **Fax Start** key. Each time the **Fax Start** key is pressed, one of the following log information items appears on the LCD in the order given below.

1) Ink cartridge drop count, indicating how many droplets have been jetted out from each of the ink cartridges*[1]
2) Ink drop count after near-empty, indicating how many droplets have been jetted out from each of the ink cartridges*[1] after the ink empty sensor detects near-empty
3) Total ink drop count, indicating how many droplets the equipment has been jetted out from each of the ink cartridges*[1] since produced
4) Jam count, indicating how many times a paper jam has been occurred
5) Total page count, indicating how many pages have been printed since the equipment was produced
6) PC print page count, indicating how many pages the equipment has been printed as an output device of the connected PC
7) Copy page count, indicating how many copies have been made
8) FAX page count, indicating how many received FAX pages have been printed
9) Purge count, indicating how many times the purge operation has been carried out
10) Wiper count, indicating how many times the wiper operation has been carried out
11) Ink cartridge change count, indicating how many times ink cartridge replacement has been made for each color*[1]
12) Error code of the most recent machine error*[2]
13) Error code of the most recent communications error*[3]
14) ADF jam count, indicating how many times a document jam has been occurred
15) ADF page count, indicating how many documents have been fed
16) Flat-bed page count, indicating how many documents have been scanned

(3) To stop this operation and return to the equipment to the initial stage of the maintenance mode, press the **Stop** key.

*[1] To check each of the four ink cartridges, press the **Menu** key. Pressing the key cycles through black, yellow, cyan, and magenta.

*[2] When a machine error code is displayed, pressing the **Menu** key cycles through recent nine errors that have occurred.

*[3] When a communications error code is displayed, pressing the **Menu** key cycles through the latest error, 2nd latest error, and 3rd latest error.

7.5.19 Equipment Error Code Indication

■ Function

This function displays an error code of the last error on the LCD.

■ Operating Procedure

(1) Press the **8** and **2** keys in this order in the initial stage of the maintenance mode.

The LCD shows the "MACHINE ERROR X X."

(2) To stop this operation and return the equipment to the initial stage of the maintenance mode, press the **Stop** key.

7.5.20 Output of Transmission Log to the Telephone Line

■ Function

This function outputs the transmission log (that the equipment has stored about the latest transmission) to the telephone line. It allows the service personnel to receive the transmission log of the user's equipment at a remote location and use it for analyzing problems arising in the user's equipment.

■ Operating Procedure

(1) If the user's equipment has a transmission-related problem, call the user's equipment at a remote location from your equipment.

(2) If the line is connected, have the user perform the following:

1) Press the **Menu**, **Receive Mode**, and **0** keys in this order.
2) Press the **8** and **7** keys in this order.

The above operation makes the user's equipment send CNG to your equipment for sending the transmission log.

(3) If you hear the CNG sent from the user's equipment, press the **Fax Start** key of your equipment.

Your equipment will start to receive the transmission log from the user's equipment.

7.5.21 Cancellation of the Pin TX Lock Mode (Not applicable to American models)

■ Function

This procedure can cancel the Pin TX lock mode. Use this procedure if the user forgets his/her password entered when setting the Pin TX lock mode so as not to exit from the mode.

NOTE: Carrying out this procedure will lose passwords previously entered but retain FAX messages received in the Pin TX lock mode.

■ Operating Procedure

(1) When the PIN TX LOCK is displayed on the LCD, press the **Menu** and **#** keys *at the same time*. Within two seconds, start to press the **2**, **7**, **9**, **0**, and **0** keys.

The Pin TX lock mode will be canceled and the equipment returns to the calendar clock screen.

CHAPTER 8

ERROR INDICATION AND TROUBLESHOOTING

CHAPTER 8 ERROR INDICATION AND TROUBLESHOOTING

CONTENTS

8.1 ERROR INDICATION

To help the user or the service personnel promptly locate the cause of a problem (if any), the facsimile equipment incorporates the self-diagnostic functions which display error messages for equipment errors and communications errors.

For the communications errors, the equipment also prints out the transmission verification report and the communications list.

8.1.1 Equipment Errors

If an equipment error occurs, the facsimile equipment emits an audible alarm (continuous beeping) for approximately 4 seconds and shows the error message on the LCD. For the error messages, see [1] below.

To display detailed error information, use the maintenance-mode function code 82 described in CHAPTER 7, Subsection 7.5.18 (that is, make the equipment enter the maintenance mode and then press the **8** and **2** keys). Following the MACHINE ERROR, one of the error codes listed in [2] will appear on the LCD.

[1] Error messages on the LCD

Messages on the LCD	Probable Cause
CHECK CARTRIDGE Open cover, then reinstall ink cartridge. (These messages appear alternately.)	Any of the ink cartridges is not loaded.
CHECK ORIGINAL (CHECK DOCUMENT) Remove original, and press STOP KEY. (Remove documents, then press STOP KEY.) (These messages appear alternately.)	■ Document jam (1) The document length exceeds the limitation (400 or 90 cm) registered by firmware switch WSW16. (Refer to Appendix 2.) (Both the document front and rear sensors stay ON even after the document has been fed by the registered length.) (2) The document rear sensor detects no trailing edge of a document after the document has been fed by 400 cm. (The document rear sensor stays ON even after the document has been fed when the document front and rear sensors were OFF and ON, respectively.)

Messages on the LCD	Probable Cause
CHECK ORIGINAL (CHECK DOCUMENT) Remove original, and press STOP KEY. (Remove documents, then press STOP KEY.) (These messages appear alternately.)	■ Document loading error (1) The document rear sensor detects no leading edge of a document within 10 seconds from the start of document loading operation. (The document rear sensor stays OFF even after the document has been fed when the document front sensor was ON.) (2) The loaded document is too short. (Since the document is shorter than the distance between the document front and rear sensors, the document front sensor is turned OFF before the document rear sensor is turned ON.)
CHECK PAPER Reload paper, then press FAX START. (These messages appear alternately.)	The registration sensor detects no recording paper loaded in the auto sheet feeder (ASF).
COVER OPEN PLS CLOSE COVER (These messages appear alternately.)	The scanner open sensor detects that the scanner unit is not closed.
DOC. COVER OPEN Remove original, and close cover. (Remove document, then close cover.) (These messages appear alternately.)	The document cover is not closed.
HIGH TEMPERATURE COOL DOWN ROOM (These messages appear alternately.)	The temperature inside the machine is too high. This message will appear if the ambient temperature exceeds 47°C.
INK EMPTY CYAN INK EMPTY MAGENT INK EMPTY YELLOW INK EMPTY BLACK PLS OPEN COVER (These messages appear alternately.)	The ink dot counter (for the indicated color) in the EEPROM on the main PCB has counted up the specified number of dots, meaning that the ink has run out. Once any of these messages is displayed, color printing is no longer possible.

Messages on the LCD	Probable Cause
LOW TEMPERATURE Room temperature is below spec.	The temperature inside the machine is too low.
MANUAL TRAY OPEN Please close the Manual Tray.	The manual feed slot cover is not closed. If it is closed, check the sensor by using maintenance-mode function 32. (Refer to CHAPTER 7, Subsection 7.5.9.) The manual feed slot cover sensor or the main PCB is defective.
NEAR EMPTY CYAN NEAR EMPTY MGENT NEAR EMPTY YELLW NEAR EMPTY BLACK	The ink empty sensor detects that the ink cartridge (cyan, magenta, yellow, or black) is near empty. Even if any of these messages is displayed, color printing is still possible.
PAPER JAM Open cover, then remove jammed paper. (These messages appear alternately.)	The registration sensor detects that a paper jam has occurred.
PC BUSY OR FAIL Check PC cable, then press STOP KEY. (These messages appear alternately.)	After connected with the host computer, the equipment has received no response from the computer. (A communications error has occurred.)
PLS OPEN COVER	To display the relating detailed error code, use maintenance-mode function code 82. (Refer to CHAPTER 7, Subsection 7.5.18.) If this message appears, open and close the scanner unit. The message may disappear if opening/closing the scanner unit removes the error. If the error persists, the "MACHINE ERROR X X" will appear instead of this message.
SCAN LAMP WARMUP	After the fluorescent lamp in the CCD unit had been OFF, the scanning operation got started. Until the fluorescent lamp becomes stabilized in lighting, the scanning operation will be delayed.
SCANNER ERROR	In the scanning compensation data list printed by the maintenance-mode function code 05 (refer to CHAPTER 7, Subsection 7.5.2), fifty percent or more of the white level data is faulty. (This message may appear only in the maintenance mode)

If only an alarm beep is heard without any message on the LCD when the equipment is turned on, then the ROM or RAM will be defective.

[2] Error codes shown in the "MACHINE ERROR X X " message

If the LCD shows the "PLS OPEN COVER" message, you can display the detailed error code following the MACHINE ERROR, by using the maintenance-mode function code 82 described in CHAPTER 7, Section 7.5.18.

NOTE: When checking a PCB as instructed in the "Check:" column, check its harness also.

NOTE: To check sensors, use the maintenance-mode function code 32 described in CHAPTER 7, Section 7.5.9 (that is, press the **3** and **2** keys in the maintenance mode).

Error Code (Hex)	Error factor	Check:
25	Ink cartridges had already been loaded when the power was first applied.	Reload ink cartridges, referring to the Owner's Manual.
26	The black ink has run out.	• Ink cartridges • Cartridge PCB • Head flat cables • Main PCB • Driver PCB • Ink empty sensor
27	The yellow ink has run out.	
28	The cyan ink has run out.	
29	The magenta ink has run out.	
2A	No black ink cartridge is loaded.	Load the ink cartridge.
2B	No yellow ink cartridge is loaded.	Load the ink cartridge.
2C	No cyan ink cartridge is loaded.	Load the ink cartridge.
2D	No magenta ink cartridge is loaded.	Load the ink cartridge.
3*	Carriage travel error	• Carriage ASSY • Encoder strip (Any stains or scratches? Hooked correctly?) • Carriage motor • Main PCB • Power supply PCB • Purge unit • Head flat cable N • Driver PCB • Main chassis
41	The head drive voltage has not been turned from Low to High within the specified time.	• Carriage ASSY • Main PCB • Print head unit • Power supply PCB • Driver PCB
42	The head drive voltage has not been turned from High to Low within the specified time.	

Error Code (Hex)	Error factor	Check:
43	Head thermister broken.	• Print head unit • Carriage ASSY • Main PCB • Driver PCB
44	Head thermister short-circuited or error in its related parameters stored in the EEPROM of the main PCB	
45	Flushing operation abnormally ended. (The head temperature has arisen abnormally.)	• Print head unit
46	The number of performed purge sequences has reached the limit.	• Ink absorber box • Main PCB
47	Head parameters stored in the EEPROM are invalid. (This code may appear only in the maintenance mode.)	• Print head unit • Main PCB • Power supply PCB • Driver PCB
48	Weak connection of the head flat cable M (main-head power line).or W (driver-head signal line)	• Main PCB • Head flat cable M • Driver PCB • Head flat cable W • Print head unit
4D	Error in the head drive voltage parameter stored in the EEPROM but not accessible at the user site. (This code may appear only in the maintenance mode.)	• Main PCB • Driver PCB
4E	Out of the allowable range of the head drive voltage designed for individual print head properties. (This code may appear only in the maintenance mode.)	• Main PCB • Print head unit
50	The purge cam HP switch does not come ON even after the purge cam has been driven by the specified number of pulses.	• Purge unit • Purge-related gears on the main chassis (Purge bevel gear A, ASF/purge idle gear, and ASF-purge switching gear 23) • Main chassis • Paper feed motor • Main PCB
51	The purge cam HP switch does not go OFF even after the purge cam has been driven by the specified number of pulses.	
52	The pump switching cam HP switch does not come ON even after the switching cam has been driven by the specified number of pulses.	
53	The pump switching cam HP switch does not go OFF even after the switching cam has been driven by the specified number of pulses.	
7D	Any of the ink dot counters has counted up to the specified number of dots, meaning the end of the head service life.	• Print head unit • Ink absorber box
7E	No head parameters stored in the EEPROM. (This code may appear only in the maintenance mode.)	• Print head unit • Main PCB • Driver PCB

Error Code (Hex)	Error factor	Check:
7F	Print engine error.	• Main PCB
80	At the start of recording operation, it is detected that paper is smaller than A4 size in length or width.	• Paper width sensor • Paper size
83	Recording paper jam. (At the retry of paper pulling-in operation, the registration sensor is not OFF.)	• Registration sensor actuator • Main PCB
84	Recording paper jam. (The paper width sensor and/or registration sensor has detected a paper jam.)	• Paper width sensor actuator • Registration sensor actuator • Main PCB
88	Recording paper jam. (Even after paper pulling-in operation, the registration sensor is still OFF.)	
89	Manual feed slot cover opened.	• Manual feed slot cover sensor • Main PCB
A1	Scanner unit opened.	• Scanner open sensor actuator • Main PCB • Scanner unit
A2	Document too long to scan.	• Document front sensor actuator • Document rear sensor actuator • Control panel PCB • Document sensor PCB • Document feed roller • ADF motor • Main PCB
A3	Document not detected by the document rear sensor.	
A4	50% or more faulty of white level data.	• CCD unit • Main PCB
A7	One-line feeding timeout.	
A8	One-line scanning timeout.	
AA	The document cover is not closed.	Remove the document and close the document cover.
AC	Less than 50% faulty of white level data.	• CCD unit • Main PCB

Error Code (Hex)	Error factor	Check:
AE	The CCD HP sensor will not come ON.	• CCD unit • CCD flat cable • Driver PCB • Main PCB
AF	The CCD HP sensor will not go OFF.	
B1	Dark level offset data level error for scanning.	• CCD unit • Main PCB
B2	Gain control data level error for scanning.	
B3	Scan area left edge detection error.	• CCD unit • Main PCB • Black markings on the white-level reference film inside the scanner top cover
B4	Scan area right edge detection error.	
B5	Horizontal scanning edge reduction detection error in scanning area setting	
B6	Horizontal scanning edge enlargement detection error in scanning area setting	
BB	White level data error.	• CCD unit • CCD harness • Main PCB • Document pressure bar
BD	Black level data error.	• CCD unit • Main PCB
BE	Scan starting edge detection error.	• CCD unit • CCD harness • Main PCB • Black markings on the white-level reference film inside the scanner top cover
D*	Modem error.	• Main PCB
E4	Out of recording paper.	• ASF • Registration sensor actuator • Document feed roller • Main PCB
E6	Write error in EEPROM.	• Main PCB • Driver PCB
E8	Data scanning error during transmission.	• CCD unit • Main PCB
EA	Document removed at phase B.	

Error Code (Hex)	Error factor	Check:
F3 F5	Internal software error.	• Replace the main PCB if this error occurs frequently.
F6	PC interface error.	• Interface cable • Main PCB
F7	Media module error	• Main PCB • Media PCB
FF	Memory management error.	• Replace the main PCB if this error occurs frequently.

8.1.2 Communications Errors

If a communications error occurs, the facsimile equipment

① emits an audible alarm (intermittent beeping) for approximately 4 seconds,

② displays the corresponding error message, and

③ prints out the transmission verification report if the equipment is in sending operation.

■ Definition of Error Codes on the Communications List

(1) Calling

Code 1	Code 2	Causes
10	08	Wrong number called.
11	01	No dial tone detected before start of dialing.
11	02	Busy tone detected before dialing.
11	03	2nd dial tone not detected.
11	05	No loop current detected.*
11	06	Busy tone detected after dialing or called.
11	07	No response from the remote station in sending.
11	10	No tone detected after dialing.
17	07	No response from the calling station in receiving.

*Available in German versions only.

(2) Command reception

Code 1	Code 2	Causes
20	01	Unable to detect a flag field.
20	02	Carrier was OFF for 200 ms or longer.
20	03	Abort detected ("1" in succession for 7 bits or more).
20	04	Overrun detected.
20	05	A frame for 3 seconds or more received.
20	06	CRC error in answerback.
20	07	Undefined command received.
20	08	Invalid command received.
20	09	Command ignored once for document setting or for dumping-out at turn-around transmission.
20	0A	T5 time-out error
20	0B	CRP received.
20	0C	EOR and NULL received.

(3) Compatibility [checking the NSF and DIS]

Code 1	Code 2	Causes
32	01	Remote terminal only with V.29 capability in 2400 or 4800 bps transmission.
32	02	Remote terminal not ready for polling.
32	10	Remote terminal not equipped with password function or its password switch OFF.
32	11	Remote terminal not equipped with or not ready for confidential mailbox function.
32	12	Remote terminal not equipped with or not ready for relay broadcasting function.
32	13	No confidential mail in the remote terminal.
32	14	The available memory space of the remote terminal is less than that required for reception of the confidential or relay broadcasting instruction.
32	18	Remote terminal not equipped with color function.

(4) Instructions received from the remote terminal [checking the NSC, DTC, NSS, and DCS]

Code 1	Code 2	Causes
40	02	Illegal coding system requested.
40	03	Illegal recording width requested.
40	05	ECM requested although not allowed.
40	06	Polled while not ready.
40	07	No document to send when polled.
40	10	Nation code or manufacturer code not coincident.
40	13	Polled by any other manufacturers' terminal while waiting for secure polling.
40	17	Invalid resolution selected.
40	20	Invalid full-color mode requested.

(5) Command reception [checking the NSF and DIS after transmission of NSS and DCS]

Code 1	Code 2	Causes
50	01	Vertical resolution capability changed after compensation of background color.

(6) ID checking

Code 1	Code 2	Causes
63	01	Password plus "lower 4 digits of telephone number" not coincident.
63	02	Password not coincident.
63	03	Polling ID not coincident.

(7) DCN reception

Code 1	Code 2	Causes
74		DCN received.

(8) TCF transmission/reception

Code 1	Code 2	Causes
80	01	Fallback impossible.

(9) Signal isolation

Code 1	Code 2	Causes
90	01	Unable to detect video signals and commands within 6 seconds after CFR is transmitted.
90	02	Received PPS containing invalid page count or block count.

(10) Video signal reception

Code 1	Code 2	Causes
A0	03	Error correction sequence not terminated even at the final transmission speed for fallback.
A0	11	Receive buffer empty. (5-second time-out)
A0	12	Receive buffer full during operation except receiving into memory.
A0	13	Decoding error continued on 500 lines.
A0	14	Decoding error continued for 10 seconds.
A0	15	Time-out: 5 seconds or more for one-line transmission.
A0	16	RTC not found and carrier OFF signal detected for 6 seconds.
A0	17	RTC found but no command detected for 60 seconds.
A0	18	Receive buffer full during receiving into memory.
A0	19	No video data to be sent
A0	20	Unable to continue to receive color FAX (Remaining ink insufficient)
A8	01	RTN, PIN, or ERR received at the calling terminal.*
A9	01	RTN, PIN, or ERR received at the called terminal.*

* Available in German versions only

(11) General communications-related

Code 1	Code 2	Causes
B0	02	Unable to receive the next-page data.
B0	03	Unable to receive polling even during turn-around transmission due to call reservation.
B0	04	PC interface error.

(12) Maintenance mode

Code 1	Code 2	Causes
E0	01	Failed to detect 1300 Hz signal in burn-in operation.
E0	02	Failed to detect PB signals in burn-in operation.

(13) Equipment error

Code 1	Code 2	Causes
FF	X X	Equipment error (For X X, refer to Subsection 8.1.1 [2].)

8.2 TROUBLESHOOTING

8.2.1 Introduction

This section gives the service personnel some of the troubleshooting procedures to be followed if an error or malfunction occurs with the facsimile equipment. It is impossible to anticipate all of the possible problems which may occur in future and determine the troubleshooting procedures, so this section covers some sample problems. However, those samples will help service personnel pinpoint and repair other defective elements if he/she analyzes and examines them well.

8.2.2 Precautions

Be sure to observe the following to prevent the secondary troubles from happening:

(1) Always unplug the AC power cord from the outlet when removing the covers and PCBs, adjusting the mechanisms, or conducting continuity testing with a circuit tester.

(2) When disconnecting the connectors, do not pull the lead wires but hold the connector housings.

(3)
- Before handling the PCBs, touch a metal portion of the machine to discharge static electricity charged in your body.
- When repairing the PCBs, handle them with extra care.

After repairing the defective section, be sure to check again if the repaired section works correctly. Also record the troubleshooting procedure so that it would be of use for future trouble occurrence.

8.2.3 Checking prior to Troubleshooting

Prior to proceeding to the troubleshooting procedures given in Subsection 8.2.4, make the following initial checks:

Environmental conditions

Check that:

(1) The machine is placed on a flat, firm surface.

(2) The machine is used in a clean environment at or near normal room temperature (10°C to 35°C) with normal relative humidity (20 to 80%).

(3) The machine is not exposed to direct sunlight or harmful gases.

Power requirements

Check that:

(1) The power supply specified on the rating plate located on the bottom of the machine is used. The supply voltage stays within the rating ±10%.

(2) Each voltage level on AC input lines and DC lines is correct.

(3) All cables and harnesses are firmly connected.

(4) None of the fuses are blown.

Recording paper

Check that:

(1) A recommended type of recording paper is used.

(2) The recording paper is not dampened.

Ink cartridges

(1) Check that all of four ink cartridges are loaded.

Print head

(1) Check that the print head is installed on the carriage correctly.

(2) Repeat the head purging operation several times.

(3) Clean the print surface of the print head unit. (Refer to page 8-25.)

8.2.4 Troubleshooting Procedures

[1] Control panel related

Trouble	Check:
(1) LCD shows nothing.	• Panel-main harness • Control panel PCB • Power supply PCB • Main PCB
(2) Control panel inoperative.	• Panel-main harness • Control panel PCB • FPC key • Main PCB

[2] Telephone related

Trouble	Check:
(1) No phone call can be made.	• FPC key • Control panel PCB • NCU PCB • Main PCB
(2) Speed dialing or one-touch dialing will not work.	• Ordinary dialing function (other than the speed and one-touch dialing) If it works normally, check the driver PCB; if not, refer to item (1) above.
(3) Dial does not switch between tone and pulse.	• Main PCB
(4) Telephone does not ring.	• Ringer • NCU PCB • Main PCB

[3] Communications related

Trouble	Check:
(1) No tone is transmitted.	• Main PCB • NCU PCB

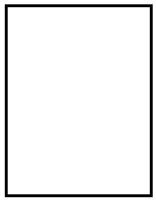
[4] Paper/document feeding related

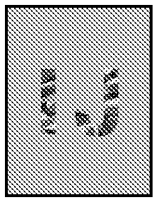
Trouble	Check:
(1) Neither "COPY: PRESS COPY" nor "FAX: NO. & START" message appears although documents are set.	• Sensors by using the maintenance-mode function code 32. (Refer to CHAPTER 7, Subsection 7.5.9.) • Document front sensor actuator and document rear sensor actuator • Main PCB/Driver PCB
(2) Document not fed.	• ADF and its related sections • ADF motor and its harness • Document feed rollers and their related gears • Main PCB/Driver PCB
(3) Document double feeding	• ADF parts
(4) Document jam	• ADF motor • Driver PCB
(5) Recording paper not fed.	• ADF-related gears • Main PCB/Driver PCB
(6) Recording paper jam	• Paper feeding mechanism • Check that the print head unit is installed to the carriage correctly.

[5] Print-image related

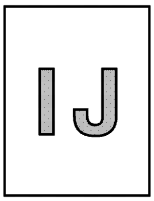
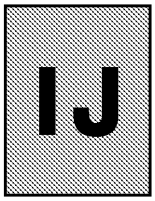
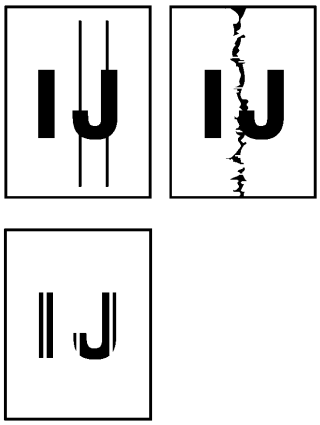
If the received or sent image has any problem, first make a copy with the facsimile equipment.

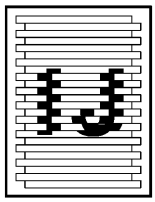
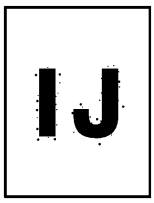
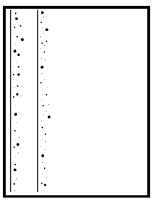
If the copied image is normal, the problem may be due to the remote terminal; if it is abnormal, proceed to the following checks:

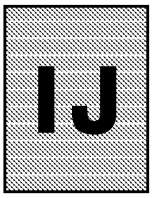
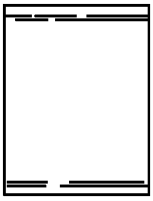
<table>
<tr><th>Trouble</th><th>Action to be taken</th></tr>
<tr><td>(1) Completely blank
  </td><td rowspan="2"><u>At the scanner</u>
Check the following components:
- CCD flat cable
- Main PCB/Driver PCB
- CCD unit

<u>At the printer</u>
• Check the ink cartridges. If any cartridges have run out of ink, replace them.
• Check the connection of the head flat cable M on the main PCB and print head PCB. (If the flat cable M is broken or damaged, replace it.)
• Replace the main PCB.
• Clean the head caps and wiper of the purge unit with a Rubycel stick. For the cleaning procedure, refer to "Cleaning the purge unit" given on page 8-25.</td></tr>
<tr><td>(2) Random color
  </td></tr>
<tr><td>(3) All black
  </td><td><u>At the scanner</u>
Check the following components:
- CCD flat cable
- CCD unit
- Main PCB/Driver PCB

<u>At the printer</u>
Check the following components:
- Print head unit
- Main PCB/driver PCB
- Carriage ASSY</td></tr>
</table>

Trouble	Action to be taken
(4) Light 	<u>At the scanner</u> Check the following components: - CCD unit - Main PCB <u>At the printer</u> Check the following components: - Ink cartridges - Print head unit - Main PCB - Power supply PCB - Driver PCB - Print head parameters (to be installed to the main PCB from the connected PC. Refer to Appendix 2, A2.3.)
(5) Dark 	<u>At the scanner</u> Check the following components: - CCD unit - Main PCB <u>At the printer side</u> • For each of the four ink-jet units, perform the head purging operation several times to remove dust or air bubbles from its nozzles. If the problem persists, replace the print head unit. • Check the paper feed-related rollers. • Replace the main PCB and power supply PCB.
(6) Black or blurred vertical stripes 	<u>At the scanner</u> Check the following components: - CCD unit - Scanner glass <u>At the printer side</u> • Check whether paper is in abnormal contact with any other components during ejecting. • Check the encoder strip for stains or scratches. (If the encoder strip is not hooked properly, correct it.)

Trouble	Action to be taken
(7) Print edges not aligned 	At the printer • Check the alignment of vertical print lines by using the maintenance-mode function code 65. (Refer to CHAPTER 7, Subsection 7.5.13). • Check the print head unit. • Check the encoder strip for stains or scratches. (If the encoder strip is not hooked properly, correct it.) • Correct the positioning error of the print head unit, referring to CHAPTER 6, Section 6.3, "ADJUSTMENT."
(8) Ink splash  	At the printer • For each of the four ink-jet units, perform the head purging operation several times to remove dust or air bubbles from its nozzles. • Check the ink cartridges. Any of them has run out of ink or the ink viscosity has been increased, so replace it. • Replace the print head unit. • Replace the driver PCB. • Replace the main PCB. • Replace the power supply PCB. • Check that the print head unit is installed to the carriage correctly. • Check that the carriage rail clamp springs catch the carriage rail correctly.
(9) Random missing dots 	At the printer • For each of the four ink-jet units, perform the head purging operation several times to remove dust or air bubbles from its nozzles. • Check the ink cartridges. If any cartridges have run out of ink, replace them. • Replace the print head unit. (If the problem persists, replace the carriage ASSY.) • Check the connection of the head flat cables on the main PCB, driver PCB, and print head PCB. (If any of those cables is broken or damaged, replace it.) • Replace the main PCB. • Replace the driver PCB. • Clean the head caps and wiper of the purge unit with a Rubycel stick. For the cleaning procedure, refer to "Cleaning the purge unit" given on page 8-25.

Trouble	Action to be taken
(10) White horizontal streaks  	• For each of the four ink-jet units, perform the head purging operation several times to remove dust or air bubbles from its nozzles. • Replace the print head unit. • Check the paper feed-related rollers. • Clean the head caps and wiper of the purge unit with a Rubycel stick. For the cleaning procedure, refer to "Cleaning the purge unit" given on the next page.
(11) Stained leading edge of recording paper 	<u>At the printer</u> • Clean the nozzle ends of the ink-jet units. • Check that the print head unit is installed to the carriage correctly.

[6] PC-driven printing

Trouble	Action to be taken
(1) PC-driven printing is impossible.	• Interface with the host computer • PC interface cable • Main PCB • Centronics interface • USB interface

[7] SmartMedia-, Compact Flash-, or Memory Stick-driven printing

Trouble	Check:
(1) No image data can be read.	• Insertion direction of SmartMedia, Compact Flash, or Memory Stick card - Insert a SmartMedia or Memory Stick card with the cutout corner leading and facing down. - Insert a Compact Flash card with the label side facing towards the left. • SmartMedia, Compact Flash, or Memory Stick - Formatted? - Any data in the media? - Images stored in the media are in EXIF2.0-compliant JPEG file format (having extension .JPG)? • Media PCB • Media flat cables • Main PCB
(2) No SmartMedia can be recognized.	• Check whether Compact Flash card is already inserted. If not, refer to item (1) above.
(3) Media printing is impossible.	• Check whether the memory is full.
(4) No Memory Stick can be recognized.	• Check whether you inserted a Memory Stick pro card that cannot be used in this machine.

Cleaning the purge unit

(1) Unplug the machine's power cord from the wall socket.

(2) Plug the power cord again. When you hear the carriage moving out of the home position for initialization, then unplug the power cord again. The carriage will stop at the middle of the travel.

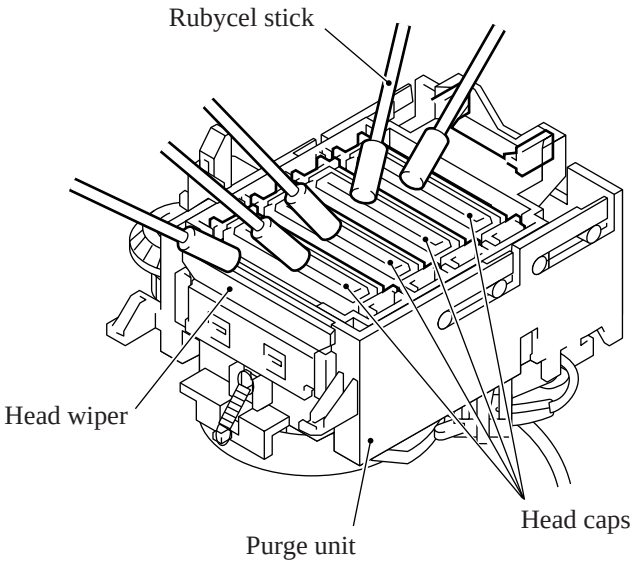
(3) Open the scanner unit.

(4) Clean the four head caps and wiper of the purge unit with a "Rubycel" stick that is a head cleaner stick provided as a spare part.

NOTE: Do not use a cotton swab that may leave lint on the cleaned sections. Lint left on the purge unit will affect the print performance.

NOTE: Use a new Rubycel stick and do not use the used one for any other purge units.

NOTE: During the cleaning jobs, take care not to touch the head caps or wiper directly by hand or scratch their surfaces. Do not remove them from the head cap holder.



Cleaning the print head unit

(1) Remove the print head unit from the carriage. (Refer to CHAPTER 6, Section 6.1.1.)

(2) Soak a Rubycel stick in "Glycerol cleaner."

(3) Clean the printing surface of the print head unit by rolling the Rubycel stick lightly on the printing surface.

NOTE: Do not use a cotton swab that may leave lint on the cleaned sections. Lint left on the purge unit will affect the print performance.

NOTE: Use a new Rubycel stick and do not use the used one for any other print heads.

NOTE: During the cleaning jobs, take care not to scratch the surface of the print head.

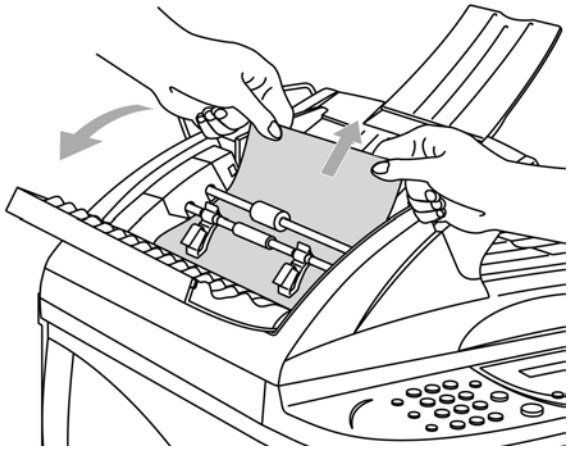
8.3 JAMS

8.3.1 Original Jams

Based upon where the original or printed sheet is jammed, follow the appropriate set of instructions to remove it.

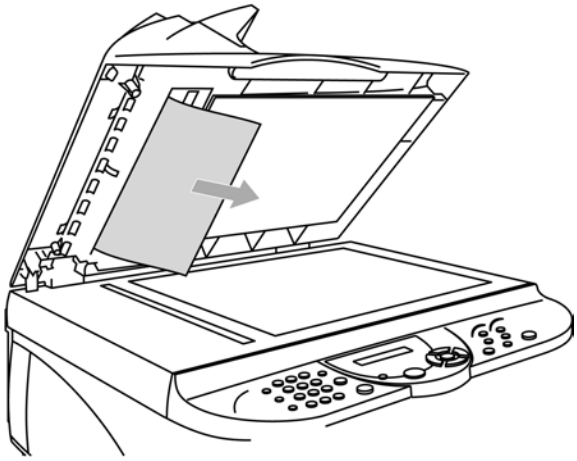
(1) Original is jammed in the top of the ADF unit

1) Take out any paper from the ADF that is not jammed.
2) Lift the ADF cover
3) Pull the jammed original out to the right.
4) Close the ADF cover.
5) Press Stop/Exit.



(2) Original is jammed inside the ADF unit

1) Take out any paper from the ADF that is not jammed.
2) Lift the document cover.
3) Pull the jammed original out to the right.
4) Close the document cover.
5) Press Stop/Exit.

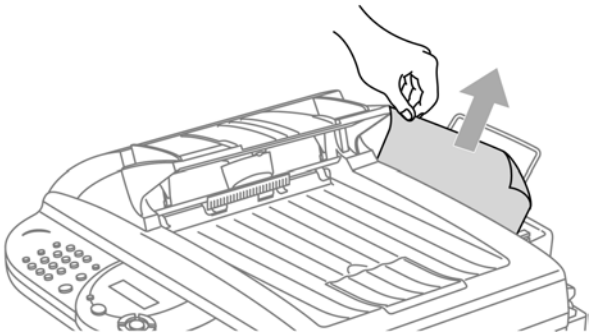


8.3.2 Printer Jam or Paper Jam

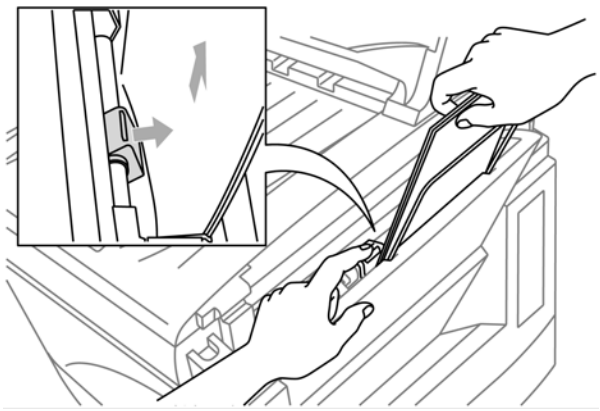
Remove the jammed paper depending on where it is jammed in the machine.

(1) Paper is jammed in the paper tray.

1) Remove any paper from the paper tray that is not jammed.



2) Pull up the jammed paper to remove it.



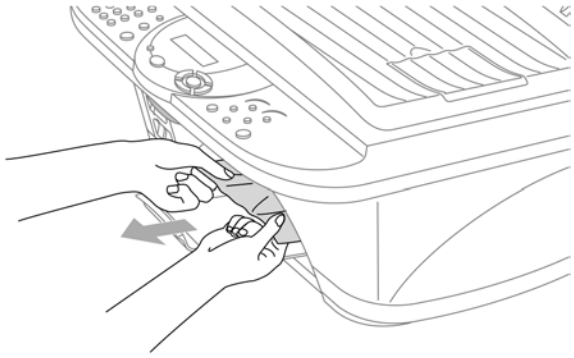
(2) Paper is jammed inside the MFC.

1) Open the scanner cover by releasing the scanner cover release lever and lifting the scanner cover.
2) Remove the jammed paper.

   If the jammed paper is under the print heads, unplug the MFC, and then you can move the print heads to take out the paper.
3) Close the scanner cover.

(3) Paper is jammed inside the front of the MFC.

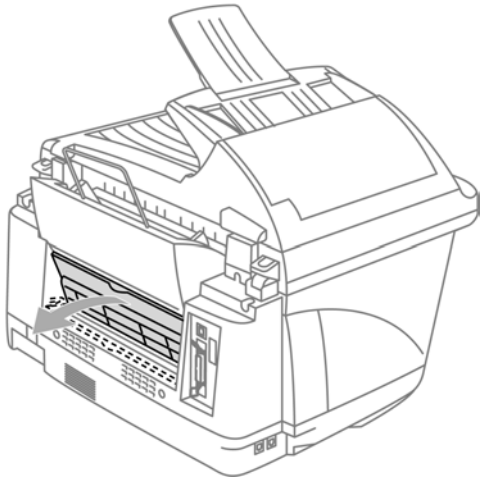
Pull the jammed paper toward you.



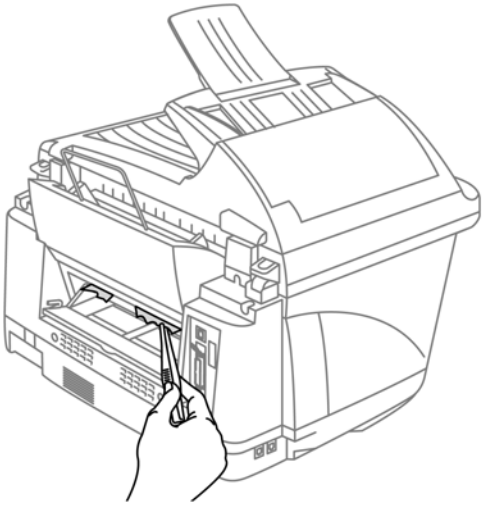
(4) Paper is jammed inside the back of the MFC.

If the paper rips, the pieces of paper may get stuck inside the back of the machine.

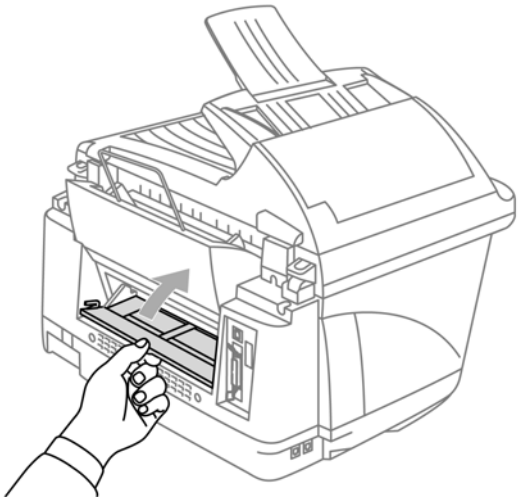
1) Remove any paper from the paper tray that is not jammed.
2) Open the manual feed cover.



3) Use tweezers to pull out the ripped pieces of paper.



4) Close the manual feed cover.



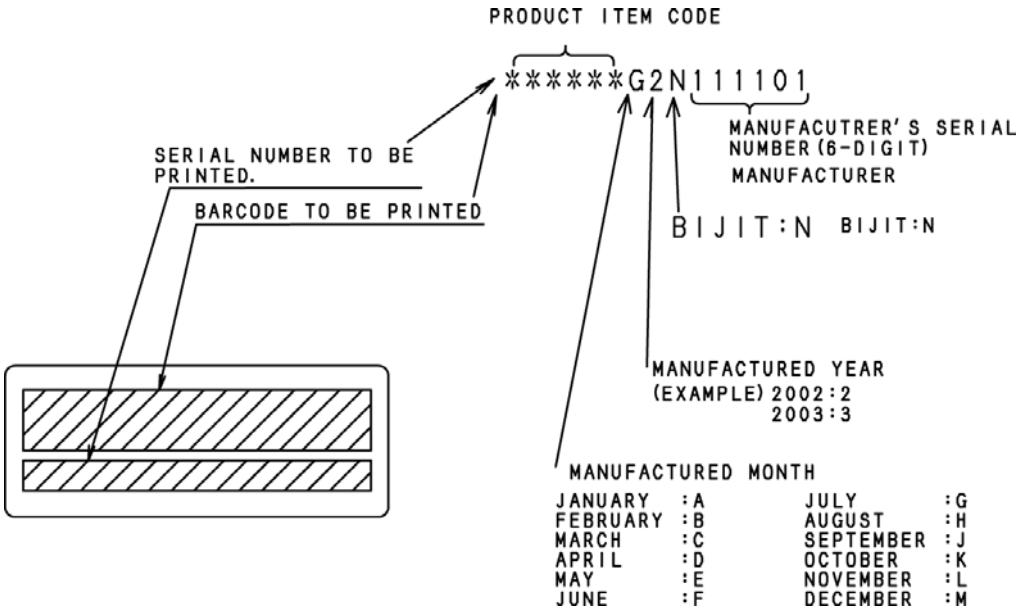
MFC5200C/MFC890

Appendix 1. Serial No. Descriptions

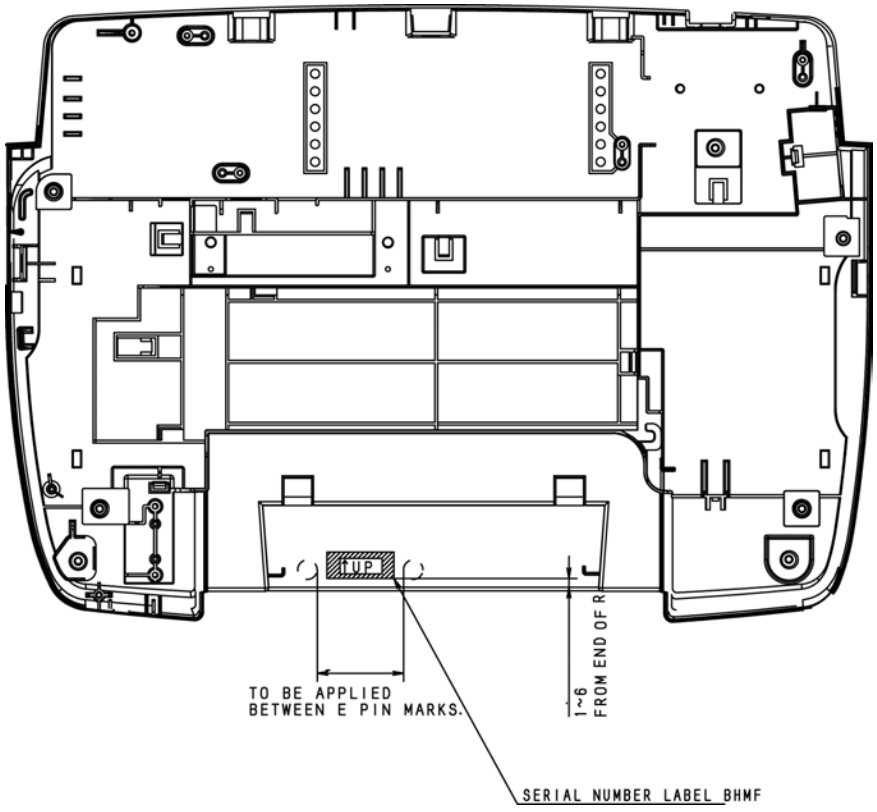
SERIAL NO. DESCRIPTIONS

The descriptions as below shows how to read labels on each place.

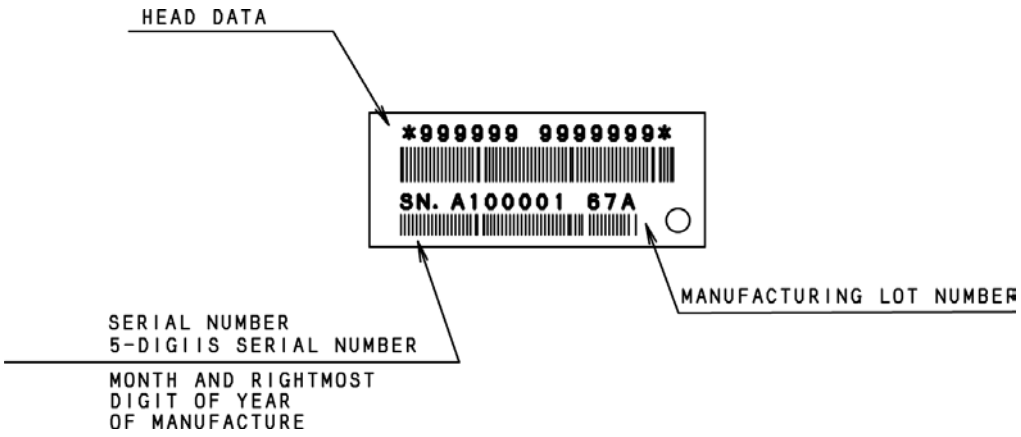
(1) SET



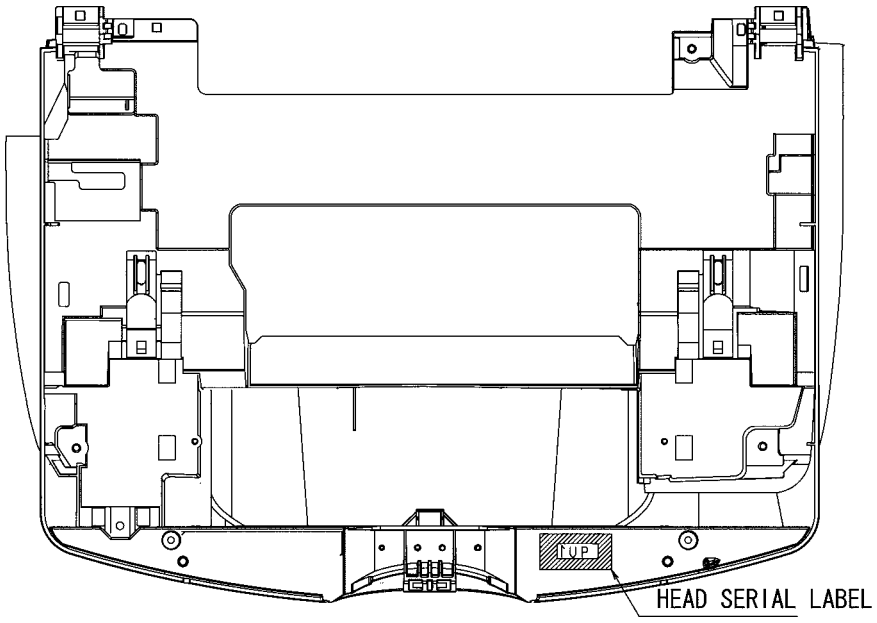
Location



(2) PRINTER HEAD UNIT



Location



MFC5200C/MFC890

Appendix 2. Installation

A2.1 Installing the Update Data to the Facsimile Machine

If you want to update the current program stored in the flash ROM of the main PCB to the newer version or after you replace the main PCB, install the update program onto the flash ROM.

The program installation requires a PC/AT-compatible computer (which is capable of running MS-DOS or its compatible OS).

Connecting the facsimile machine to your PC

(1) Make sure that your PC is turned off.

(2) Make sure that the power cord of the facsimile machine is unplugged from a wall socket or other power source.

(3) Connect the parallel interface cable to the parallel port on the back of the machine and secure it with the lock wires.

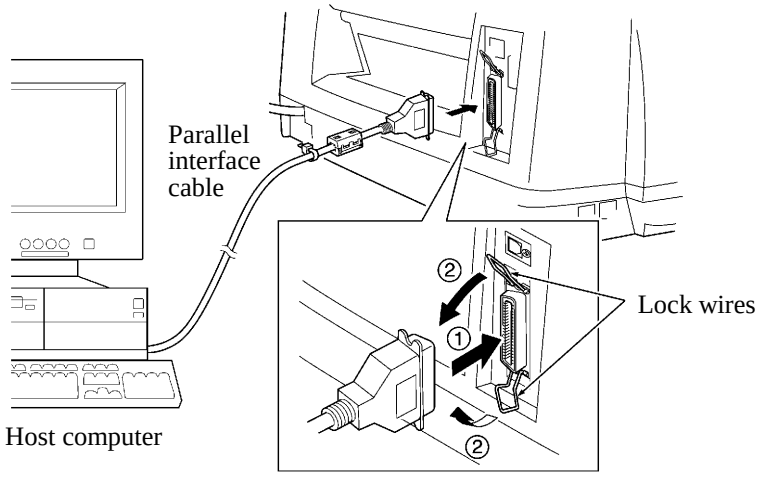
(4) Connect the other end of the interface cable to the printer port of your PC and secure it with two screws.

Setting up the facsimile machine and your PC

(1) Plug the power cord of the facsimile machine into a wall socket while pressing the **5** key on the machine's control panel.

(2) Check to see that the following pattern displays on the LCD. If it does not display, go back to step (2) above.

(3) Turn on your PC.



Installing the update data onto the flash ROM of the facsimile machine

NOTE: The following is an installation procedure example on a PC that is running Windows 95/98.

(1) Copy the update data and transfer utility onto the desired directory of the hard disk.
e.g., C:\UPDATE

(2) Click the Start button, point to Programs, and then click MS-DOS Prompt to open an MS-DOS window.

(3) Type the drive letter where the update data and transfer utility are located. In the above example, type C:\ from the command line and press the **ENTER** key.

Then type CD UPDATE and press the **ENTER** key.

(4) Check that your PC is connected with the facsimile machine correctly.

(5) To start the transfer utility transmitting the update data to the flash ROM of the facsimile machine, type the following:

`ICEN` *`filename`* `/b`

Where *`filename`* is an update data file, e.g., 5200x.dat and 890xxxx.dat.

Then press the **ENTER** key.

During downloading, the machine beeps *intermittently*.

Upon completion of the downloading, the machine beeps *continuously*.

NOTE: If the facsimile machine cannot return to the standby state after completion of downloading, turn the power off and on.

A2.2 Setting ID Codes to Facsimile Machines

Brother facsimile machines are assigned unique ID codes (character strings) at the factory. If you replace the driver PCB of the machine, the machine will lose its assigned ID code so that it will not be identified by the connected PC*.

You need to assign a unique ID code (character string) to the machine according to the procedure given here. For models covered by this manual, set serial numbers given to individual machines as ID codes.

(*ID codes are essential when more than one machine is connected to a single PC via USB.)

Connecting the facsimile machine to your PC (See the illustration on page App. 2-1.)

(1) Make sure that your PC is turned off.

(2) Make sure that the power cord of the facsimile machine is unplugged from a wall socket or other power source.

(3) Connect the interface cable to the parallel interface port on the back of the facsimile machine and secure it with the lock wires.

(4) Connect the other end of the interface cable to the printer port of your PC and secure it with the two screws.

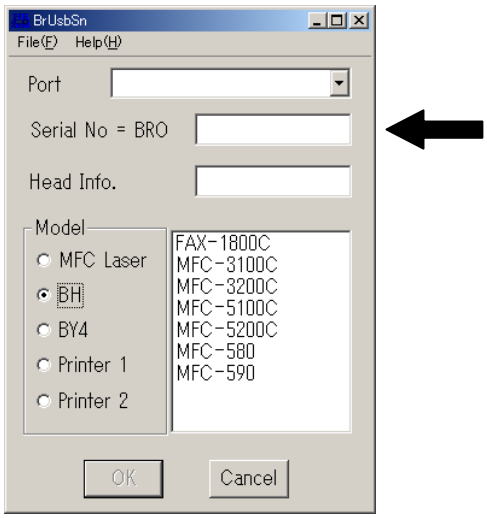
Setting up the facsimile machine and your PC

(1) Plug the power cord of the facsimile machine into a wall socket while pressing the **5** key on the machine's control panel.

(2) Turn on your PC.

Running the setup utility

(1) On your PC, run the ID/head property setup utility (BRUSBSN.EXE). The following window will appear.



(2) On the **Model** menu, click **BH**.

In **Port**, make sure that the LPT1 is selected.

In the **Serial No = BRO** box, type the 9-digit serial number (e.g., G01012345) printed on the nameplate labeled to the back of the facsimile machine as an ID code. Then press the **Enter** key.

The setup utility will transmit the ID code data from your PC to the facsimile machine and then it will terminate.

The facsimile machine will automatically return to the standby mode.

(3) To check whether the entered character string (ID code) is correct, make the machine enter the maintenance mode (refer to CHAPTER 7, Section 7.2) and then press the **1** key twice (Subsection 7.5.6).

The facsimile machine will print out a Configuration List. At the right top of the list, "SER.#: BROXXXXXXXXX" is printed.

(4) Check that the character string entered in step (2) is printed in "XXXXXXXXX."

If it is OK, press the **9** key twice to exit from the maintenance mode.

If something other than that is printed in XXXXXXXXX, check the connection between the PC and facsimile machine and go back to step (1).

A2.3 Updating Head Property Info Stored in the Facsimile Machine

To keep the print quality, the controller optimizes the head drive strength, ink jet-out timing, and other drive conditions according to the electromechanical properties unique to individual print heads and ambient temperature. The head property information is stored in the EEPROM of the driver PCB.

If you replace the print head unit and/or driver PCB of the machine, then you need to update head property information according to the procedure given here.

TIP: The updating procedure given here uses a PC. For the updating procedure in the maintenance mode without using a PC, refer to CHAPTER 7, Subsection 7.5.15.

Connecting the facsimile machine to your PC (See the illustration on page App. 2-1.)

(1) Make sure that your PC is turned off.

(2) Make sure that the power cord of the facsimile machine is unplugged from a wall socket or other power source.

(3) Connect the interface cable to the parallel interface port on the back of the facsimile machine and secure it with the lock wires.

(4) Connect the other end of the interface cable to the printer port of your PC and secure it with two screws.

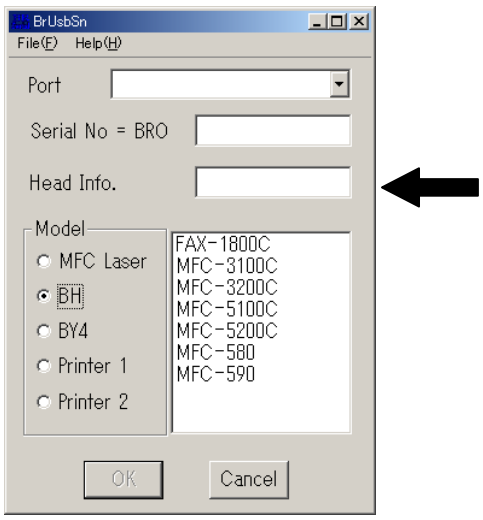
Setting up the facsimile machine and your PC

(1) Plug the power cord of the facsimile machine into a wall socket while pressing the **5** key on the machine's control panel.

(2) Turn on your PC.

Running the setup utility

(1) On your PC, run the ID/head property setup utility (BRUSBSN.EXE). The following window will appear.



(2) On the **Model** menu, click **BH**.

In **Port**, make sure that the LPT1 is selected.

In the **Head Info.** box, type upper 12 digits (e.g., 66667F657031) out of the 13-digit property code (enclosed with asterisks, e.g., *66667F657031H*) which is printed on the bar code label attached to the print head unit. Then press the **Enter** key.

The setup utility will transmit the entered data from your PC to the facsimile machine and then it will terminate.

The facsimile machine will automatically return to the standby mode.

(3) To check whether the entered head property is correct, make the machine enter the maintenance mode (refer to CHAPTER 7, Section 7.2) and then press the **7** key twice.

The facsimile machine will print out the Equipment's Log. On the line about 1/3 of full length of the log sheet below from the top, the 12-digit code will be printed.

(4) Check that the character string entered in step (2) is printed in "XXXXXXXXXXXX."

If it is OK, press the **9** key twice to exit from the maintenance mode.

If something other than that is printed in XXXXXXXXXXXX, check the connection between the PC and facsimile machine and go back to step (1).

A2.4 Updating Correction Value for Multiplying Factor of Horizontal Scanning, Stored in the Facsimile Machine

To keep the scanning quality in reduction/enlargement copying, the controller compensates the multiplying factor of horizontal scanning according to the correction value stored in the EEPROM of the driver PCB.

If you replace the CCD unit, scanner unit, or driver PCB of the machine, then you need to update the correction value for the multiplying factor of horizontal scanning according to the procedure given below.

TIP: The updating procedure given here needs entry to the maintenance mode. Refer to CHAPTER 7, Subsection 7.5.11.

(1) After completion of replacement of the CCD unit, scanner unit, or driver PCB, plug the machine's power cord into a wall socket and then turn on the facsimile machine.

The LCD shows the number of pixels.

(2) According to the number of pixels displayed, obtain the new correction value from the correction table given on the next page.

(3) Make the machine enter the maintenance mode (refer to CHAPTER 7, Section 7.2) and then press the **5** key twice (Subsection 7.5.11).

The machine checks and sets the area to be scanner. After that, it becomes ready to accept a new correction value.

(4) Enter the new correction value obtained in step (2) above.

Press the **Stop** key to return to the initial stage of the maintenance mode, then press the **9** key twice to exit from the maintenance mode.

Correction Value Table for Multiplying Factor of Horizontal Scanning

If this number of pixels appears on the LCD:	Enter this correction value
5000	5000101760
4990	4990101554
4980	4980101351
4970	4970101158
4960	4960100943
4950	4950100740
4940	4940100547
4930	4930100333
4920	4920100130
4910	4910099934
4900	4900099720
4890	4890099526
4880	4880099323
4870	4870099119
4860	4860098915
4850	4850098701
4840	4840098508
4830	4830098305

A2.5 Updating Paper Feeding Correction Value Stored in the Facsimile Machine

To keep the paper feeding performance in the best condition for quality print, the controller optimizes the rotation of the paper feed roller and paper ejection roller, using the correction value stored in the EEPROM of the driver PCB.

If you replace the paper feed roller, paper ejection roller, print head unit, or driver PCB, then you need to update the paper feeding correction value according to the procedure given here.

TIP: The updating procedure given here needs entry to the maintenance mode. Refer to CHAPTER 7, Subsection 7.5.14.

Connecting the facsimile machine to your PC

(1) Connect the USB interface cable to the USB port on the back of the facsimile machine.

(2) Connect the other end of the interface cable to the USB port of your PC.

Setting up the facsimile machine and your PC

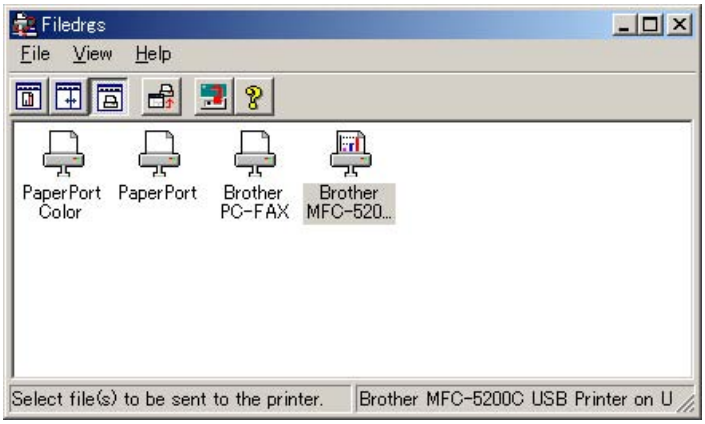
(1) Download the printer driver to your PC.

(2) Make the facsimile machine enter the maintenance mode.

(3) Download "Filedg32" and "PFROLL_CHECK.PRN" to your PC.

(4) Run "Filedg32."

The Filedrgs window will appear as shown below.



Printing out "PF ADJUST" and "EJECT ADJUST" check patterns

(1) Drag and drop the "PFROLL_CHECK.PRN" ion onto the "Brother MFC-5200C" icon in the Filedrgs window.

The facsimile machine will display the "RECEIVING DATA" on the LCD and print out "PF ADJUST" and "EJECT ADJUST" check patterns.

(2) Press the 6 key twice in the initial stage of the maintenance mode. Then proceed to the adjustment procedure of the paper feeding correction value, given in CHAPTER 7, Subsection 7.5.14.

MFC5200C/MFC890

Appendix 3. EEPROM Customizing Codes

EEPROM CUSTOMIZING CODES

This function allows you to customize the EEPROM according to language, function settings, and firmware switch settings.

■ Operating Procedure

←Within 2 seconds→

(1) Press the **Menu**, *****, **2**, **8**, **6**, and **4** keys in this order to make the facsimile equipment enter the maintenance mode.

The equipment beeps for approx. one second and displays "▮▮ MAINTENANCE ▮▮▮" on the LCD.

(2) Press the **7** and **4** keys in this order in the initial stage of the maintenance mode.

The current customizing code (e.g., 3001 in the case of MFC5200C U.S.A. versions) appears.

(3) Enter the desired customizing code (e.g., 2002 in the case of MFC5200C Canadian version).

NOTE: To enter letters "A" through "F," press the **1** through **6** keys while holding down the **#** key, respectively.

The newly entered code appears.

NOTE: *If a wrong 4-digit code is entered, the equipment will malfunction.*

(4) Press the **Fax Start** key.

The equipment saves the setting and returns to the initial stage of the maintenance mode.

If you press the **Stop** key or no keys are pressed for one minute in the above procedure, the equipment stops the procedure and returns to the initial stage of the maintenance mode.

■ EEPROM Customizing Codes List

(1) MFC5200C

Versions	Model
	MFC5200C
U.S.A.	3001 *
CANADA	2002
AUSTRALIA	---
ASIA (SINGAPORE)	---
NEW ZEALAND	---

(2) MFC890

Versions	Model
	MFC890
GERMANY	---
U.K.	2004
FRANCE	---
BELGIUM	---
NETHERLANDS	---
SWITZERLAND	---
IRELAND	---
DENMARK	---
AUSTRIA	---
SPAIN	---
ITALY	---
SOUTH AFRICA	---
EURO GENERIC	---
PAN NORDIC	---

* To enter letters "A" through "F," press the **1** through **6** keys while holding down the **#** key, respectively.

MFC5200C/MFC890

Appendix 4. Firmware Switches (WSW)

WSW No.	Function	Reference Page
WSW01	Dial pulse setting	App. 4-2
WSW02	Tone signal setting	App. 4-3
WSW03	PABX mode setting	App. 4-4
WSW04	TRANSFER facility setting	App. 4-5
WSW05	1st dial tone and busy tone detection	App. 4-6
WSW06	**Pause** key setting and 2nd dial tone detection	App. 4-8
WSW07	Dial tone setting 1	App. 4-10
WSW08	Dial tone setting 2	App. 4-11
WSW09	Protocol definition 1	App. 4-12
WSW10	Protocol definition 2	App. 4-13
WSW11	Busy tone setting	App. 4-14
WSW12	Signal detection condition setting	App. 4-15
WSW13	Modem setting	App. 4-16
WSW14	AUTO ANS facility setting	App. 4-17
WSW15	REDIAL facility setting	App. 4-18
WSW16	Function setting 1	App. 4-19
WSW17	Function setting 2	App. 4-20
WSW18	Function setting 3	App. 4-21
WSW19	Transmission speed setting	App. 4-22
WSW20	Overseas communications mode setting	App. 4-23
WSW21	TAD setting 1	App. 4-24
WSW22	ECM and copy resolution setting	App. 4-24
WSW23	Communications setting	App. 4-25
WSW24	TAD setting 2	App. 4-26
WSW25	TAD setting 3	App. 4-26
WSW26	Function setting 4	App. 4-27
WSW27	Function setting 5	App. 4-28
WSW28	Function setting 6	App. 4-29
WSW29	Function setting 7	App. 4-30
WSW30	Not used.	App. 4-30
WSW31	Function setting 9	App. 4-31
WSW32	Function setting 10	App. 4-32
WSW33	Function setting 11	App. 4-33
WSW34	Function setting 12	App. 4-34
WSW35	Not used.	App. 4-34
WSW36	Function setting 14	App. 4-35
WSW37	Function setting 15	App. 4-36
WSW38	Not used.	App. 4-37
WSW39	Not used.	App. 4-37
WSW40	Not used.	App. 4-37
WSW41	CCD fluorescent lamp	App. 4-37
WSW42	Function setting 20	App. 4-38
WSW43	Function setting 21	App. 4-38
WSW44	Speeding up scanning-1	App. 4-39
WSW45	Speeding up scanning-2	App. 4-40
WSW46	Monitor of power ON/OFF state and parallel port kept at high	App. 4-41
WSW47	Paper handling for a feed error and delay of FAX line disconnection	App. 4-42
WSW48	Not used.	App. 4-42
WSW49	Not used.	App. 4-42
WSW50	Not used.	App. 4-42

WSW01 (Dial pulse setting)

Selector No.	Function	Setting and Specifications
1 2	Dial pulse generation mode	No. 1 2 0 0 : N 0 1 : N+1 1 0 : 10-N 1 1 : N
3 4	Break time length in pulse dialing	No. 3 4 0 0 : 60 ms 0 1 : 67 ms 1 0 : 40 ms (for 16 PPS) 1 1 : 64 ms (at 106-ms intervals)
5 6	Inter-digit pause	No. 5 6 0 0 : 800 ms 0 1 : 850 ms 1 0 : 950 ms 1 1 : 600 ms
7	Switching between pulse (DP) and tone (PB) dialing, by the function switch	0: Yes 1: No
8	Default dialing mode, pulse (DP) or tone (PB) dialing	0: PB 1: DP

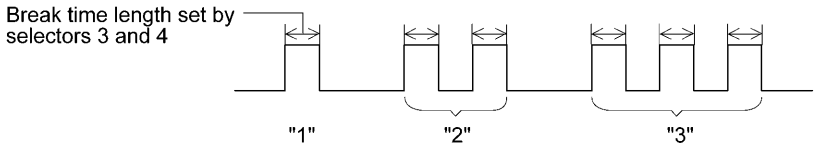
- **Selectors 1 and 2: Dial pulse generation mode**

  These selectors set the number of pulses to be generated in pulse dialing.

  N: Dialing "N" generates "N" pulses. (Dialing "0" generates 10 pulses.)
  N + 1: Dialing "N" generates "N + 1" pulses.
  10 - N: Dialing "N" generates "10 - N" pulses.

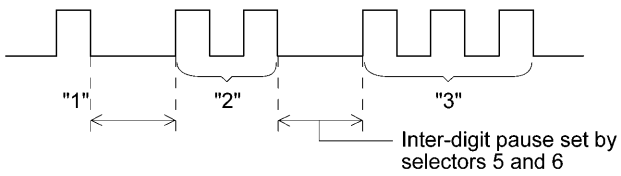
- **Selectors 3 and 4: Break time length in pulse dialing**

  These selectors set the break time length in pulse dialing.
  (Example: If "1," "2," and "3" are dialed when N is set by selectors 1 and 2.)



- **Selectors 5 and 6: Inter-digit pause**

  These selectors set the inter-digit pause in pulse dialing.
  (Example: If "1," "2," and "3" are dialed when N is set by selectors 1 and 2.)



- **Selector 7: Switching between pulse (DP) and tone (PB) dialing, by the function switch**

  This selector determines whether or not the dialing mode may be switched between the pulse (DP) and tone (PB) dialing by using the function switch.

- **Selector 8: Default dialing mode, pulse (DP) or tone (PB) dialing**

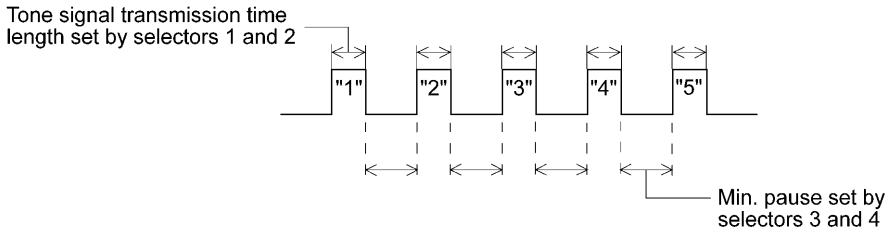
  This selector sets the default dialing mode (pulse dialing or tone dialing) which may be changed by the function switch. If the user switches it with the function switch when selector 7 is set to "0," the setting specified by this selector will also be switched automatically.

WSW02 (Tone signal setting)

Selector No.	Function	Setting and Specifications
1 2	Tone signal transmission time length	No. 1 2 0 0 : 70 ms 0 1 : 80 ms 1 0 : 90 ms 1 1 : 100 ms
3 4	Min. pause in tone dialing	No. 3 4 0 0 : 70 ms 0 1 : 80 ms 1 0 : 90 ms 1 1 : 140 ms
5 | 8	Attenuator for pseudo ring backtone to the line (selectable in the range of 0-15 dB)	0: 0 dB 1: 8 dB 0: 0 dB 1: 4 dB 0: 0 dB 1: 2 dB 0: 0 dB 1: 1 dB

- **Selectors 1 through 4: Tone signal transmission time length and Min. pause in tone dialing**

  These selectors set the tone signal transmission time length and minimum pause in tone dialing. (Example: If "1," "2," "3," "4," and "5" are dialed.)



- **Selectors 5 through 8: Attenuator for pseudo ring backtone to the line**

  These selectors are used to adjust the sound level of beep generated as a ring backtone in the F/T mode or as a signal during remote control operation or at the start of ICM recording.

  Setting two or more selectors to “1” produces addition of attenuation assigned to each selector.

WSW03 (PABX* mode setting)

Selector No.	Function	Setting and Specifications
1	CNG detection when sharing a modular wall socket with a telephone	0: A 1: B
2 | 4	Min. detection time length of PABX* dial tone, required for starting dialing	No. 2 3 4 0 0 0 : 50 ms 0 0 1 : 210 ms 0 1 0 : 500 ms 0 1 1 : 800 ms 1 0 0 : 900 ms 1 0 1 : 1.5 sec. 1 1 0 : 2.0 sec. 1 1 1 : 2.5 sec.
5	CNG detection when sharing a modular wall socket with a telephone	0: A 1: B
6 7	Dial tone detection in PABX*	No. 6 7 0 0 : No detection (3.5 sec. WAIT) 0 1 : No detection (5 sec. WAIT) 1 0 : No detection (7 sec. WAIT) 1 1 : Detection (Frequency only)
8	Not used.	

* PABX: Private automatic branch exchange

NOTE: Selectors 2 through 4, 6 and 7 are not applicable where no PABX is installed.

- **Selectors 1 and 5: CNG detection when sharing a modular wall socket with a telephone**

  These selectors determine whether or not the equipment detects a CNG signal when a line is connected to a telephone sharing a modular wall socket with the equipment. Upon detection of CNG signals by the number of cycles specified by these selectors, the equipment interprets CNG as an effective signal and then starts FAX reception.

Selector No. 1	Selector No. 5	Cycle
0 (A)	0 (A)	0.5 cycle
0 (A)	1 (B)	1.0 cycle
1 (B)	0 (A)	1.5 cycles
1 (B)	1 (B)	2.0 cycles

- **Selectors 2 through 4: Min. detection time length of PABX dial tone, required for starting dialing**

  Upon detection of the PABX dial tone for the time length set by these selectors, the equipment starts dialing.

  These selectors are effective only when both selectors 6 and 7 are set to "1" (Detection).

- **Selectors 6 and 7: Dial tone detection in PABX**

  These selectors activate or deactivate the dial tone detection function which detects a dial tone when a line is connected to the PABX.

  Setting both of these selectors to "1" activates the dial tone detection function so that the equipment starts dialing upon detection of a dial tone when a line is connected.

  Other setting combinations deactivate the dial tone detection function so that the equipment starts dialing after the specified WAIT (3.5, 5.0, or 7.0 sec.) without detection of a dial tone when a line is connected.

WSW04 (TRANSFER facility setting)

Selector No.	Function	Setting and Specifications
1	Earth function in transfer facility	0: Provided 1: Not provided
2 | 4	Not used.	
5 6	Earth time length for earth function	No. 5 6 0 0 : 200 ms 0 1 : 300 ms 1 0 : 500 ms 1 1 : 700 ms
7 8	Break time length for flash function	No. 7 8 0 0 : 80 ms 0 1 : 110 ms 1 0 : 250 ms 1 1 : 500 ms

NOTE: Selectors 1 and 5 through 8 are not applicable in those countries where no transfer facility is supported.

- **Selector 1: Earth function in transfer facility**

  This selector determines whether or not the earth function is added to the transfer setting menu to be accessed by the function switch.

- **Selectors 5 and 6: Earth time length for earth function**

  These selectors set the short-circuiting time length of the telephone line (La or Lb) to ground.

  This setting is effective only when the earth function is selected for the R key by using the function switch.

- **Selectors 7 and 8: Break time length for flash function**

  These selectors set the break time length.

  This setting is effective only when the flash function is selected for the Speed Dial key by using the function switch.

WSW05 (1st dial tone and busy tone detection)

Selector No.	Function	Setting and Specifications
1 | 3	1st dial tone detection	No. 1 2 3 0 0 0 : 3.5 sec. WAIT 0 0 1 : 7.0 sec. WAIT 0 1 0 : 10.5 sec. WAIT 0 1 1 : 14.0 sec. WAIT 1 0 0 : 17.5 sec. WAIT 1 0 1 : 21.0 sec. WAIT 1 1 0 : 24.5 sec. WAIT 1 1 1 : Detection (Without WAIT)
4	Max. pause time allowable for remote ID code detection	0 : 2 seconds 1: 1 second
5 6	Busy tone detection in automatic sending mode	No. 5 6 0 0 : No detection 0 1 : Detection only after dialing 1 0 : No detection 1 1 : Detection before and after dialing
7	Busy tone detection in automatic receiving mode	0 : Yes 1: No
8	Not used.	

NOTE: Selectors 5 through 7 are not applicable in those countries where no busy tone detection is supported.

- **Selectors 1 through 3: 1st dial tone detection**

  These selectors activate or deactivate the 1st dial tone detection function which detects the 1st dial tone issued from the PSTN when a line is connected to the PSTN.

  Setting all of these selectors to "1" activates the dial tone detection function so that the equipment starts dialing upon detection of a dial tone when a line is connected. (However, in those countries which support no dial tone detection function, e.g., in the U.S.A., setting these selectors to "1" makes the equipment start dialing after a WAIT of 3.5 seconds.) For the detecting conditions of the 1st dial tone, refer to WSW07 and WSW08.

  Other setting combinations deactivate the dial tone detection function so that the equipment starts dialing after the specified WAIT (3.5, 7.0, 10.5, 14.0, 17.5, 21.0, or 24.5 seconds) without detection of a dial tone when a line is connected to the PSTN.

- **Selector 4: Max. pause time allowable for remote ID code detection**

  This selector sets the maximum pause time allowable for detecting the second digit of a remote ID code after detection of the first digit in remote reception.

  If selector 4 is set to "0" (2 seconds), for instance, only a remote ID code whose second digit is detected within 2 seconds after detection of the first digit will become effective so as to activate the remote function.

- **Selectors 5 and 6: Busy tone detection in automatic sending mode**

  These selectors determine whether or not the equipment automatically disconnects a line upon detection of a busy tone in automatic sending mode.

  Setting selector 6 to "0" ignores a busy tone so that the equipment does not disconnect the line.

  Setting selectors 5 and 6 to "0" and "1," respectively, makes the equipment detect a busy tone only after dialing and disconnect the line.

  Setting both of selectors 5 and 6 to "1" makes the equipment detect a busy tone before and after dialing and then disconnect the line.

- **Selector 7: Busy tone detection in automatic receiving mode**

  This selector determines whether or not the equipment automatically disconnects the line upon detection of a busy tone in automatic receiving mode.

WSW06 (Pause key setting and 2nd dial tone detection)

Selector No.	Function	Setting and Specifications
1 | 3	**Pause** key setting and 2nd dial tone detection	No. 1 2 3 0 0 0 : No pause 0 0 1 : 3.5 sec. WAIT 0 1 0 : 7 sec. WAIT 0 1 1 : 10.5 sec. WAIT 1 0 0 : 14 sec. WAIT 1 1 0 : 2nd dial tone detection only in pulse dialing (DP) system 1 0 1 : } 2nd dial tone detection 1 1 1 : } both in DP and push-button (PB) dialing system
4 | 6	Detection of international tone	No. 4 5 6 0 0 0 : 50 ms 0 0 1 : 210 ms 0 1 0 : 500 ms 0 1 1 : 800 ms 1 0 0 : 900 ms 1 0 1 : 1.5 sec. 1 1 0 : 2.0 sec. 1 1 1 : 2.5 sec.
7	No. of 2nd dial tone detection times	0: Once 1: Twice
8	2nd dial tone interrupt detecting time	0: 30 ms 1: 50 ms

NOTE: Selectors 4 through 8 are not applicable in those countries where no dial tone detection is supported, e.g., U.S.A.

- **Selectors 1 through 3: Pause key setting and 2nd dial tone detection**

Selectors 1	2	3	
0	0	0	No WAIT is inserted even if the **Pause** key is pressed.
0	0	1	If you press the **Pause** key during dialing, the facsimile equipment will insert WAIT as defined in the above table. If the **Pause** key is pressed repeatedly, the equipment inserts the specified WAIT multiplied by the number of depressions. It applies also in hook-up dialing.
0	1	0	
0	1	1	
1	0	0	
1	0	1	When these selectors are set to "1, 0, 1": Each time you press the **Pause** key in dialing, the equipment will wait for the 2nd dial tone to be sent via the communications line regardless of pulse dialing or tone dialing. When these selectors are set to "1, 1, 0": If you press the **Pause** key in pulse dialing, the equipment will first wait for the 2nd dial tone to be sent via the communications line. After that, pressing the **Pause** key will cause the equipment to insert a WAIT of 3.5 seconds. In tone dialing, the equipment will insert a WAIT of 3.5 seconds. When these selectors are set to "1, 1, 1": If you press the **Pause** key, the equipment will first wait for the 2nd dial tone to be sent via the communications line regardless of pulse dialing or tone dialing. After that, pressing the **Pause** key will cause the equipment to insert a WAIT of 3.5 seconds. (In those countries where no dial tone detection function is supported, setting these selectors to "1, 0, 1," "1, 1, 0," or "1, 1, 1" inserts a WAIT of 3.5 seconds.)
1	1	0	
1	1	1	

- **Selectors 4 through 6: Detection of international tone**

  Upon detection of the 2nd dial tone for the time length specified by these selectors, the equipment starts dialing.

  This setting is effective only when the 2nd dial tone detection function is activated by selectors 1 through 3 (Setting 101, 110, or 111).

  This function does not apply in those countries where no dial tone detection function is supported.

- **Selector 7: No. of 2nd dial tone detection times**

  This selector sets the number of dial tone detection times required for starting dialing.

- **Selector 8: 2nd dial tone interrupt detecting time**

  This selector sets the allowable time length of an interrupt which should not be interpreted as an interrupt in the 2nd tone dialing.

WSW07 (Dial tone setting 1)

Selector No.	Function	Setting and Specifications
1 2	Frequency band range	No. 1 2 0 0 : Narrows by 10 Hz 0 1 : Initial value 1 X : Widens by 10 Hz
3	Line current detection	0: No 1: Yes
4 | 6	2nd dial tone detection level (Z = 600 Ω)	No. 4 5 6 0 0 0 : -21 dBm 0 0 1 : -24 dBm 0 1 0 : -27 dBm 0 1 1 : -30 dBm 1 0 0 : -33 dBm 1 0 1 : -36 dBm 1 1 0 : -39 dBm 1 1 1 : -42 dBm
7	1st dial tone interrupt detecting time	0: 30 ms 1: 50 ms
8	Not used.	

NOTE: Selectors 1, 2, 4 through 7 are not applicable in those countries where no dial tone or line current detection is supported, e.g., U.S.A.

NOTE: Selector 3 is not applicable to those models having no loop current detection function.

- **Selectors 1 and 2: Frequency band range**

  These selectors set the frequency band for the 1st dial tone and the busy tone (before dialing) to be detected.

  This setting is effective only when selectors 1 through 3 of WSW05 are set to "1,1,1."

- **Selector 3: Line current detection**

  This selector determines whether or not the equipment should detect a line current before starting dialing.

- **Selectors 4 through 6: 2nd dial tone detection level**

  These selectors set the detection level of the 2nd dial tone.

- **Selector 7: 1st dial tone interrupt detecting time**

  This selector sets the allowable time length of an interrupt which should not be interpreted as an interrupt in the 1st dial tone dialing.

WSW08 (Dial tone setting 2)

Selector No.	Function	Setting and Specifications
1 | 3	1st dial tone detection time length	No. 1 2 3 0 0 0 : 50 ms 0 0 1 : 210 ms 0 1 0 : 500 ms 0 1 1 : 800 ms 1 0 0 : 900 ms 1 0 1 : 1.5 sec. 1 1 0 : 2.0 sec. 1 1 1 : 2.5 sec.
4 5	Time-out length for 1st and 2nd dial tone detection	No. 4 5 0 0 : 10 sec. 0 1 : 20 sec. 1 0 : 15 sec. 1 1 : 30 sec.
6 | 8	Detection level of 1st dial tone and busy tone before dialing	No. 6 7 8 0 0 0 : -21 dBm 0 0 1 : -24 dBm 0 1 0 : -27 dBm 0 1 1 : -30 dBm 1 0 0 : -33 dBm 1 0 1 : -36 dBm 1 1 0 : -39 dBm 1 1 1 : -42 dBm

NOTE: The WSW08 is not applicable in those countries where no dial tone detection is supported, e.g., U.S.A.

- **Selectors 1 through 3: 1st dial tone detection time length**

  Upon detection of the 1st dial tone for the time length set by these selectors, the equipment starts dialing.

  This setting is effective only when selectors 1 through 3 of WSW05 are set to "1,1,1."

- **Selectors 4 and 5: Time-out length for 1st and 2nd dial tone detection**

  These selectors set the time-out length for the 1st and 2nd dial tone detection so that the equipment waits dial tone input for the specified time length and disconnects itself from the line when no dial tone is inputted.

WSW09 (Protocol definition 1)

Selector No.	Function	Setting and Specifications
1	Frame length selection	0: 256 octets 1: 64 octets
2	Use of non-standard commands	0: Allowed 1: Prohibited
3 4	No. of retries	No. 3 4 0 0 : 4 times 0 1 : 3 times 1 0 : 2 times 1 1 : 1 time
5	T5 timer	0: 300 sec. 1: 60 sec.
6	T1 timer	0: 35 sec. 1: 40 sec.
7 8	Elapsed time for time-out control for no response from the called station in automatic sending mode	No. 7 8 0 0 : 55 sec. (in U.S.A. and Canadian versions) 60 sec. (in other versions) 0 1 : 140 sec. 1 0 : 90 sec. 1 1 : 35 sec.

NOTE: Selectors 1 through 5 are not applicable in those models which do not support ECM.

- **Selector 1: Frame length selection**

  Usually a single frame consists of 256 octets (1 octet = 8 bits). For communications lines with higher bit error rate, however, set selector 1 to "1" so that the facsimile equipment can divide a message into 64-octet frames.

  Remarks: The error correction mode (ECM) is a facsimile transmission manner in which the equipment divides a message into frames for transmission so that if any data error occurs on the transmission line, the equipment retransmits only those frames containing the error data.

- **Selector 2: Use of non-standard commands**

  If this selector is set to "0," the equipment may use non-standard commands (the machine's native-mode commands, e.g., NSF, NSC, and NSS) for communications. If it is set to "1," the equipment will use standard commands only.

- **Selectors 3 and 4: No. of retries**

  These selectors set the number of retries in each specified modem transmission speed.

- **Selector 5: T5 timer**

  This selector sets the time length for the T5 timer.

- **Selector 6: T1 timer**

  This selector sets the time length for the T1 timer.

- **Selectors 7 and 8: Elapsed time for time-out control**

  If the equipment receives no response (no G3 command) from the called terminal in automatic sending during the time set by these selectors, it disconnects the line.

WSW10 (Protocol definition 2)

Selector No.	Function		Setting and Specifications
1	Not used.		
2	Time length from transmission of the last dial digit to CML ON		0: 100 ms 1: 50 ms
3	Time length from CML ON to CNG transmission		0: 2 sec. 1: 4 sec.
4	Time length from CML ON to CED transmission (except for facsimile-to-telephone switching)		0: 0.5 sec. 1: 2 sec.
5 6	No. of training retries		No. 5 6 0 0 : 1 time 0 1 : 2 times 1 0 : 3 times 1 1 : 4 times
7	Encoding system (Compression)	MR	0: Allowed 1: Not allowed
8		MMR	0: Allowed 1: Not allowed

- **Selector 2: Time length from transmission of the last dial digit to CML ON**

  This selector sets the time length from when the equipment transmits the last dial digit until the CML relay comes on.

- **Selector 3: Time length from CML ON to CNG transmission**

  This selector sets the time length until the equipment transmits a CNG after it turns on the CML relay.

- **Selector 4: Time length from CML ON to CED transmission**

  This selector sets the time length until the equipment transmits a CED after it turns on the CML relay. This setting does not apply to switching between facsimile and telephone.

- **Selectors 5 and 6: No. of training retries**

  These selectors set the number of training retries to be repeated before automatic fallback.

- **Selectors 7 and 8: Encoding system (Compression)**

  This selector determines whether or not use of the MR/MMR coding system will be allowed.

WSW11 (Busy tone setting)

U.S.A. and Canadian versions

Selector No.	Function	Setting and Specifications
1 2	Frequency band range	No. 1 2 0 0 : Narrows by 10 Hz 0 1 : Initial value 1 x : Widens by 10 Hz
3	Not used.	
4	ON/OFF time length ranges (More than one setting allowed)	1: 400-600/400-600 ms
5		1: 175-440/175-440 ms
6		1: 100-1000 ms/17-660 ms
7		1: 110-410/320-550 ms
8		1: 100-660/100-660 ms

Other versions

Selector No.	Function	Setting and Specifications
1 2	Frequency band range	No. 1 2 0 0 : Narrows by 10 Hz 0 1 : Initial value 1 x : Widens by 10 Hz
3	ON/OFF time length ranges (More than one setting allowed)	1: 250-750/250-750 ms
4		1: 400-600/400-600 ms
5		1: 175-440/175-440 ms
6		1: 100-1000 ms/17-660 ms
7		1: 110-410/320-550 ms
8		1: 100-660/100-660 ms

NOTE: WSW11 is not applicable in those countries where no busy tone detection is supported.

NOTE: The setting of WSW11 is effective only when selectors 5 and 6 of WSW05 are set to "0, 1" or "1, 1" (Busy tone detection).

- **Selectors 1 and 2: Frequency band range**

  These selectors set the frequency band for busy tone to be detected.

- **Selectors 4 through 8**
  Selectors 3 through 8: ON/OFF time length ranges

  These selectors set the ON and OFF time length ranges for busy tone to be detected. If more than one selector is set to "1," the ranges become wider. For example, if selectors 4 and 5 are set to "1," the ON and OFF time length ranges are from 175 to 600 ms.

WSW12 (Signal detection condition setting)

Selector No.	Function	Setting and Specifications
1 2	Min. OFF time length of calling signal (Ci)	No. 1 2 0 0 : 1500 ms 0 1 : 500 ms 1 0 : 700 ms 1 1 : 900 ms
3 4	Max. OFF time length of calling signal (Ci)	No. 3 4 0 0 : 6 sec. 0 1 : 7 sec. 1 0 : 9 sec. 1 1 : 11 sec.
5 6	Detecting time setting	No. 5 6 0 0 : 800 ms (1000 ms*) 0 1 : 200 ms 1 0 : 250 ms 1 1 : 150 ms
7 8	Not used.	

*1000 ms in Chinese versions.

- **Selectors 1 through 4: Min. and max. OFF time length of calling signal (Ci)**

  If the equipment detects the OFF state of calling signal (Ci) for a time length which is greater than the value set by selectors 1 and 2 and less than the value set by selectors 3 and 4, it interprets the Ci signal as OFF.

- **Selectors 5 and 6: Detecting time setting**

  These selectors set the time length required to make the equipment acknowledge itself to be called. That is, if the equipment continuously detects calling signals with the frequency set by selectors 1 through 4 of WSW14 during the time length set by these selectors 5 and 6, it acknowledges the call.

WSW13 (Modem setting)

Selector No.	Function	Setting and Specifications
1 2	Cable equalizer	No. 1 2 0 0 : 0 km 0 1 : 1.8 km 1 0 : 3.6 km 1 1 : 5.6 km
3 4	Reception level	No. 3 4 0 0 : -43 dBm 0 1 : -47 dBm 1 0 : -49 dBm 1 1 : -51 dBm
5 | 8	Modem attenuator	0: 0 dB 1: 8 dB 0: 0 dB 1: 4 dB 0: 0 dB 1: 2 dB 0: 0 dB 1: 1 dB

The modem should be adjusted according to the user's line conditions.

- **Selectors 1 and 2: Cable equalizer**

  These selectors are used to improve the pass-band characteristics of analogue signals on a line. (Attenuation in the high-band frequency is greater than in the low-band frequency.)

  Set these selectors according to the distance from the telephone switchboard to the facsimile equipment.

- **Selectors 3 and 4: Reception level**

  These selectors set the optimum receive signal level.

- **Selectors 5 through 8: Modem attenuator**

  These selectors are used to adjust the transmitting level of the modem when the reception level at the remote station is improper due to line loss. This function applies for G3 protocol signals.

  Setting two or more selectors to "1" produces addition of attenuation assigned to each selector.

  This setting will be limited if selector 8 of WSW23 is set to "0."

WSW14 (AUTO ANS facility setting)

Selector No.	Function	Setting and Specifications
1 2	Frequency band selection (Lower limit)	No. 1 2 0 0 : 13 Hz 0 1 : 15 Hz 1 0 : 23 Hz 1 1 : 20 Hz
3 4	Frequency band selection (Upper limit)	No. 3 4 0 0 : 30 Hz 0 1 : 55 Hz 1 X : 70 Hz
5 | 8	No. of rings in AUTO ANS mode	No. 5 6 7 8 0 0 0 0 : Fixed to once 0 0 0 1 : Fixed to 2 times 0 0 1 0 : Fixed to 3 times 0 0 1 1 : Fixed to 4 times 0 1 0 0 : 1 to 2 times 0 1 0 1 : 1 to 3 times 0 1 1 0 : 1 to 4 times 0 1 1 1 : 1 to 5 times 1 0 0 0 : 2 to 3 times 1 0 0 1 : 2 to 4 times 1 0 1 0 : 2 to 5 times 1 0 1 1 : 2 to 6 times 1 1 0 0 : 1 to 10 times 1 1 0 1 : 2 to 10 times 1 1 1 0 : 3 to 5 times 1 1 1 1 : 4 to 10 times

- **Selectors 1 through 4: Frequency band selection**

  These selectors are used to select the frequency band of calling signals for activating the AUTO ANS facility.

  In the French versions, if the user sets the PBX to OFF from the control panel, the setting made by selectors 1 and 2 will take no effect and the frequency's lower limit will be fixed to 32 Hz. (Even if the setting made by these selectors does not apply, it will be printed on the configuration list.)

- **Selectors 5 through 8: No. of rings in AUTO ANS mode**

  These selectors set the number of rings to initiate the AUTO ANS facility.

WSW15 (REDIAL facility setting)

Selector No.	Function	Setting and Specifications
1 2	Selection of redial interval	No. 1 2 0 0 : 5 minutes 0 1 : 1 minute 1 0 : 2 minutes 1 1 : 3 minutes
3 | 6	No. of redialings	No. 3 4 5 6 0 0 0 0 : 16 times 0 0 0 1 : 1 times 0 0 1 0 : 2 times 0 0 1 1 : 3 times | | 1 1 1 1 : 15 times
7	Redialing for no response sent from the called terminal	0: Redialing 1: No redialing
8	Not used.	

- **Selectors 1 through 6: Selection of redial interval and No. of redialings**

  The equipment redials by the number of times set by selectors 3 through 6 at intervals set by selectors 1 and 2.

- **Selector 7: Redialing for no response sent from the called terminal**

  This selector determines whether or not the equipment redials if no G3 command response comes from the called station after dialing within the time length set by selectors 7 and 8 of WSW09.

WSW16 (Function setting 1)

Selector No.	Function	Setting and Specifications
1	Not used.	
2	ITU-T (CCITT) superfine recommendation	0: OFF 1: ON
3 | 6	Not used.	
7	Max. document length limitation	0: 400 cm 1: 90 cm
8	**Stop** key pressed during reception	0: Not functional 1: Functional

- **Selector 2: ITU-T (CCITT) superfine recommendation**

  If this selector is set to "1," the equipment communicates in ITU-T (CCITT) recommended superfine mode (15.4 lines/mm). If it is set to "0," it communicates in native superfine mode.

- **Selector 7: Max. document length limitation**

  This selector is used to select the maximum length of a document to be sent.

- **Selector 8: Stop key pressed during reception**

  If this selector is set to "1," pressing the **Stop** key can stop the current receiving operation. The received data will be lost.

WSW17 (Function setting 2)

Selector No.	Function	Setting and Specifications
1 2	Off-hook alarm	No. 1 2 0 0 : No alarm 0 1 : Always valid 1 X : Valid except when 'call reservation' is selected.
3 4	Not used.	
5	Calendar clock type	0: U.S.A. type 1: European type
6	Not used.	
7	Non-ring reception	0: OFF 1: ON
8	Not used.	

NOTE: Selector 4 is not applicable to those models having a 2-row LCD.

- **Selectors 1 and 2: Off-hook alarm**

  These selectors activate or deactivate the alarm function which sounds an alarm when the communication is completed with the handset being off the hook.

- **Selector 5: Calendar clock type**

  If this selector is set to "0" (USA), the MM/DD/YY hh:mm format applies; if it is set to "1" (Europe), the DD/MM/YY hh:mm format applies: DD is the day, MM is the month, YY is the last two digits of the year, hh is the hour, and mm is the minute.

- **Selector 7: Non-ring reception**

  Setting this selector to "1" makes the equipment receive calls without ringer sound if the ring delay is set to 0.

WSW18 (Function setting 3)

Selector No.	Function	Setting and Specifications
1	Not used.	
2 3	Detection enabled time for CNG and no tone	No. 2 3 0 0 : 40 sec. 0 1 : 0 sec. (No detection) 1 0 : 5 sec. 1 1 : 80 sec.
4 5	Not used.	
6	Registration of station ID	0: Permitted 1: Prohibited
7 8	Tone sound monitoring	No. 7 8 0 X : No monitoring 1 0 : Up to phase B at the calling station only 1 1 : All transmission phases both at the calling and called stations

- **Selectors 2 and 3: Detection enabled time for CNG and no tone**

  After the line is connected via the external telephone or by picking up the handset of the facsimile equipment, the equipment can detect a CNG signal or no tone for the time length specified by these selectors. The setting specified by these selectors becomes effective only when selector 8 of WSW20 is set to "1."

- **Selector 6: Registration of station ID**

  Setting this selector to "0" permits the registration of station ID for Austrian and Czech versions.

- **Selectors 7 and 8: Tone sound monitoring**

  These selectors set monitoring specifications of the tone sound inputted from the line.

WSW19 (Transmission speed setting)

Selector No.	Function	Setting and Specifications
1 | 3	First transmission speed choice for fallback	No. 1 2 3 / No. 4 5 6 0 0 0 : 2,400 bps 0 0 1 : 4,800 bps 0 1 0 : 7,200 bps 0 1 1 : 9,600 bps 1 0 0 : 12,000 bps 1 0 1 : 14,400 bps 1 1 0 : 14,400 bps 1 1 1 : 14,400 bps
4 | 6	Last transmission speed choice for fallback	
7	Not used.	
8	V. 17 mode	0: Permitted 1: Prohibited

- **Selectors 1 through 6: First and last choices of transmission speed for fallback**

  These selectors are used to set the MODEM speed range. With the first transmission speed choice specified by selectors 1 through 3, the equipment attempts to establish the transmission link via the MODEM. If the establishment fails, the equipment automatically steps down to the next lowest speed and attempts to establish the transmission link again. The equipment repeats this sequence while stepping down the transmission speed to the last choice specified by selectors 4 through 6.

  If the MODEM always falls back to a low transmission speed (e.g., 4,800 bps), set the first transmission speed choice to the lower one (e.g., modify it from 12,000 bps to 7,200 bps) in order to deactivate the high-speed MODEM function and reduce the training time for shorter transmission time.

  Generally, to save the transmission time, set the last transmission speed choice to a higher one.

WSW20 (Overseas communications mode setting)

Selector No.	Function	Setting and Specifications
1	EP* tone prefix	0: OFF 1: ON
2	Overseas communications mode (Reception)	0: 2100 Hz 1: 1100 Hz
3	Overseas communications mode (Transmission)	0: OFF 1: Ignores DIS once.
4 5	Min. time length from reception of CFR to start of transmission of video signals	No. 4 5 0 0 : 100 ms 0 1 : 200 ms 1 0 : 300 ms 1 1 : 400 ms
6 7	Not used.	
8	CNG detection on/off	0: OFF 1: ON

* EP: Echo protection

- **Selector 1: EP tone prefix**

  Setting this selector to "1" makes the equipment transmit a 1700 Hz echo protection (EP) tone immediately preceding training in V.29 modulation system to prevent omission of training signals.

  Prefixing an EP tone is effective when the equipment fails to transmit at the V.29 modem speed and always has to fall back to 4800 bps transmission.

- **Selectors 2 and 3: Overseas communications mode**

  These selectors should be used if the facsimile equipment malfunctions in overseas communications. According to the communications error state, select the signal specifications.

  Setting selector 2 to "1" allows the equipment to use 1100 Hz CED signal instead of 2100 Hz in receiving operation. This prevents malfunctions resulting from echoes, since the 1100 Hz signal does not disable the echo suppressor (ES) while the 2100 Hz signal does.

  Setting selector 3 to "1" allows the equipment to ignore a DIS signal sent from the called station once in sending operation. This operation suppresses echoes since the first DIS signal immediately follows a 2100 Hz CED (which disables the ES) so that it is likely to be affected by echoes in the disabled ES state. However, such a disabled ES state will be removed soon so that the second and the following DIS signals are not susceptible to data distortion due to echoes. Note that some models when called may cause error by receiving a self-outputted DIS.

- **Selectors 8: CNG detection on/off**

  If this selector is set to "1," the equipment detects a CNG signal according to the condition preset by selectors 2 and 3 of WSW18 after a line is connected. If it is set to "0," the equipment detects a CNG signal as long as the line is connected.

WSW21 (TAD setting 1)

Selector No.	Function	Setting and Specifications
1 | 7	Not used.	
8	Erasure of message stored in the memory after the message transfer	0: Yes 1: No

- **Selector 8: Erasure of message stored in the memory after the message transfer**

  Setting this selector to "0" will erase the message recorded in the memory after the document retrieval feature transfers the message.

WSW22 (ECM and copy resolution setting)

Selector No.	Function	Setting and Specifications
1	ECM* in sending	0: ON 1: OFF
2	ECM* in receiving	0: ON 1: OFF
3	Call Waiting Caller ID	0: ON 1: OFF
4	Not used.	
5 | 8	Acceptable TCF bit error rate (%) (Only at 4800 bps)	0: 0% 1: 8% 0: 0% 1: 4% 0: 0% 1: 2% 0: 0% 1: 1%

* ECM: Error correction mode

NOTE: Selector 3 is applicable to the American versions only.

NOTE: Selectors 5 through 8 are applicable to the Chinese, Taiwanese and Asian versions only.

- **Selector 3: Call Waiting Caller ID**

  Setting this selector to "0" allows the user to decide whether or not to interrupt the current call when a new call comes in. If Call Waiting Caller ID service is available in the area and the user subscribes to it, he/she can see information about his/her incoming call on the LCD.

- **Selectors 5 through 8: Acceptable TCF bit error rate (%)**

  Setting two or more selectors to "1" produces addition of percent assigned to each selector. If you set selectors 7 and 8 to "1," the acceptable TCF bit error rate will be 3%.

WSW23 (Communications setting)

Selector No.	Function	Setting and Specifications
1	Starting point of training check (TCF)	0: From the head of a series of zeros 1: From any arbitrary point
2 3	Allowable training error rate	No. 2 3 0 0 : 0% 0 1 : 0.5% 1 0 : 1% 1 1 : 2%
4 5	Decoding error rate for transmission of RTN	No. 4 5 0 0 : 16% 0 1 : 14% 1 0 : 10% 1 1 : 8%
6 7	Not used.	
8	Limitation of attenuation level	0: Yes 1: No

NOTE: Selector 8 is not applicable to the French versions.

- **Selector 1: Starting point of training check (TCF)**

  At the training phase of receiving operation, the called station detects for 1.0 second a training check (TCF) command, a series of zeros which is sent from the calling station for 1.5 seconds to verify training and give the first indication of the acceptability of the line.

  This selector sets the starting point from which the called station should start counting those zeros. If this selector is set to "0," the called station starts counting zeros 100 ms after the head of a series of zeros is detected.

  If it is set to "1," the called station starts counting zeros upon detection of 10-ms successive zeros 50 ms after the head of a series of zeros is detected. In this case, if the detection of 10-ms successive zeros is too late, the data counting period will become less than 1.0 second, making the called station judge the line condition unacceptable.

- **Selectors 2 and 3: Allowable training error rate**

  The called station checks a series of zeros gathered in training (as described in Selector 1) according to the allowable training error rate set by these selectors. If the called station judges the line condition to be accepted, it responds with CFR; if not, it responds with FTT.

- **Selectors 4 and 5: Decoding error rate for transmission of RTN**

  The facsimile equipment checks the actual decoding errors and then transmits an RTN according to the decoding error rate (Number of lines containing an error per page ÷ Total number of lines per page) set by these selectors.

- **Selector 8: Limitation of attenuation level**

  Setting this selector to "0" limits the transmitting level of the modem to 10 dB.

  This setting has priority over the settings selected by WSW02 (selectors 5 through 8) and WSW13 (selectors 5 through 8).

WSW24 (TAD setting 2)

Selector No.	Function	Setting and Specifications
1 2	Not used.	
3 4	Time length from CML ON to start of pseudo ring backtone transmission	No. 3 4 0 0 : 4 sec. 0 1 : 3 sec. 1 0 : 2 sec. 1 1 : 1 sec.
5 | 8	Not used.	

- **Selectors 3 and 4: Time length from CML ON to start of pseudo ring backtone transmission**

  These selectors set the length of time from CML-ON up to the start of pseudo ring backtone transmission.

  In those versions which have an OGM facility, the settings made by these selectors also apply to the length of time from CML-ON up to the start of OGM transmission.

WSW25 (TAD setting 3)

Selector No.	Function	Setting and Specifications
1 | 4	Not used.	
5 | 7	Pause between paging number and PIN	No. 5 6 7 0 0 0 : 2 sec. 0 0 1 : 4 sec. 0 1 0 : 6 sec. 0 1 1 : 8 sec. 1 0 0 : 10 sec. 1 0 1 : 12 sec. 1 1 0 : 14 sec. 1 1 1 : 16 sec.
8	Not used.	

NOTE: Selectors 5 through 7 are applicable only to the U.S.A. versions.

- **Selectors 5 through 7: Pause between paging number and PIN**

  These selectors set the pause time between a telephone number being paged and PIN (private identification number) for the paging feature.

WSW26 (Function setting 4)

Selector No.	Function	Setting and Specifications
1 2	Not used.	
3	Dialing during document reading into the temporary memory in in-memory message transmission	0: Disabled 1: Enabled
4 5	No. of CNG cycles to be detected (when the line is connected via the external telephone except in the external TAD mode or via the built-in telephone)	No. 4 5 0 0 : 0.5 (A) 0 1 : 1 (B) 1 0 : 1.5 (C) 1 1 : 2 (D)
6 7	No. of CNG cycles to be detected (when the line is connected via the external telephone in the external TAD mode or via the facsimile equipment in F/T mode)	No. 6 7 0 0 : 0.5 (A) 0 1 : 1 (B) 1 0 : 1.5 (C) 1 1 : 2 (D)
8	Not used.	

- **Selector 3: Dialing during document reading into the temporary memory in in-memory message transmission**

  If this selector is set to "0," the facsimile equipment waits for document reading into the memory to complete and then starts dialing. This enables the equipment to list the total number of pages in the header of the facsimile message.

- **Selectors 4 and 5: No. of CNG cycles to be detected**

  The equipment interprets a CNG as an effective signal if it detects a CNG signal by the number of cycles specified by these selectors when the line is connected via the external telephone except in the external TAD mode or via the built-in telephone.

- **Selectors 6 and 7: No. of CNG cycles to be detected**

  The equipment interprets a CNG as an effective signal if it detects a CNG signal by the number of cycles specified by these selectors when the line is connected via the external telephone in the external TAD mode or via the facsimile equipment in F/T mode.

WSW27 (Function setting 5)

Selector No.	Function	Setting and Specifications
1	Not used.	
2	Ringer OFF setting	0: Yes 1: No
3	Not used.	
4	Detection of distinctive ringing pattern	0: Yes 1: No
5 | 8	Not used.	

NOTE: Selector 4 is applicable only to the U.S.A. versions.

- **Selector 2: Ringer OFF setting**

  This selector determines whether or not the ringer can be set to OFF.

- **Selector 4: Detection of distinctive ringing pattern**

  If this selector is set to "1," the equipment detects only the number of rings; if it is set to "0," the equipment detects the number of rings and the ringing time length to compare the detected ringing pattern with the registered distinctive one.

WSW28 (Function setting 6)

Selector No.	Function	Setting and Specifications
1 | 3	Transmission level of DTMF high-band frequency signal	No. 1 2 3 0 0 0 : 0 dB 0 0 1 : +1 dB 0 1 0 : +2 dB 0 1 1 : +3 dB 1 0 0 : 0 dB 1 0 1 : -1 dB 1 1 0 : -2 dB 1 1 1 : -3 dB
4 | 6	Transmission level of DTMF low-band frequency signal	No. 4 5 6 0 0 0 : 0 dB 0 0 1 : +1 dB 0 1 0 : +2 dB 0 1 1 : +3 dB 1 0 0 : 0 dB 1 0 1 : -1 dB 1 1 0 : -2 dB 1 1 1 : -3 dB
7 8	Not used.	

- **Selectors 1 through 6: Transmission level of DTMF high-/low-band frequency signal**

  These selectors are intended for the manufacturer who tests the equipment for the Standard. Never access them.

WSW29 (Function setting 7)

Selector No.	Function	Setting and Specifications
1 | 6	Not used.	
7	Impedance switching control in pulse dialing	0: OFF 1: ON
8	Prompt beep when the memory area for the activity report becomes full	0: No 1: Yes

NOTE: Selectors 7 and 8 are applicable only to the European versions.

- **Selector 8: Prompt beep for activity report**

  This selector determines whether or not the equipment will beep if the memory area for the activity report becomes full, for prompting you to print out the report. (Printing it out will clear the memory area.)

WSW30

Selector No.	Function	Setting and Specifications
1 | 8	Not used.	

WSW31 (Function setting 9)

Selector No.	Function	Setting and Specifications
1	Not used.	
2	Default reduction rate for failure of automatic reduction during recording	0: 100% 1: 70%
3	Not used.	
4	Ink empty sensor	0: Yes 1: No
5	Minimum short-OFF duration in distinctive ringing	0: 130 ms 1: 90 ms
6 | 8	Not used.	

NOTE: Selector 5 is applicable only to the U.S.A. versions.

- **Selector 2: Default reduction rate for failure of automatic reduction during recording**

  This selector sets the default reduction rate to be applied if the automatic reduction function fails to record one-page data sent from the calling station in a single page of the current recording paper.

  If it is set to "0," the equipment records one-page data at full size (100%) without reduction; if it is set to "1," the equipment records it at 70% size.

- **Selector 5 Minimum short-OFF duration in distinctive ringing**

  The ringer pattern consists of short and long rings, e.g., short-short-long rings. This selector sets the minimum OFF duration following a short ring in order to avoid missing ringer tones in distinctive ringing.

  If this selector is set to "1," when the short-OFF duration is a minimum of 90 ms long, then the equipment will interpret the short-OFF as OFF.

WSW32 (Function setting 10)

Selector No.	Function	Setting and Specifications
1 | 4	Not used.	
5 6	Default resolution	No. 5 6 0 0 : Standard 0 1 : Fine 1 0 : Super fine 1 1 : Photo
7 8	Default contrast	No. 7 8 0 X : Automatic 1 0 : Super light 1 1 : Super dark

- **Selectors 5 and 6: Default resolution**

  These selectors set the default resolution which applies when the equipment is turned on or completes a transaction.

- **Selectors 7 and 8: Default contrast**

  These selectors set the default contrast which applies when the equipment is turned on or completes a transaction.

WSW33 (Function setting 11)

Selector No.	Function	Setting and Specifications
1 | 3	Not used.	
4 5	FAX receiving speed to be kept within the transmission speed limit to the PC	No. 4 5 0 0 : 14,400 bps 0 1 : 12,000 bps 1 0 : 9,600 bps 1 1 : 7,200 bps
6	Report output of polled transmission requests	0: Yes 1: No
7 8	Not used.	

- **Selectors 4 and 5: FAX receiving speed to be kept within the transmission speed limit to the PC**

  To transmit FAX data being received from other facsimile equipment to the connected PC, you may need to keep the FAX receiving speed within the transmission speed limit to the PC. In an initial negotiation sequence for transmission, the equipment responds to the calling station with the allowable FAX receiving speed specified by these selectors.

WSW34 (Function setting 12)

Selector No.	Function	Setting and Specifications
1 | 5	Not used.	
6 7	Number of DTMF tone signals for inhibiting the detection of CNG during external TAD operation	No. 6 7 0 0 : 3 0 1 : 2 1 0 : 1 1 1 : OFF
8	Not used.	

- **Selectors 6 and 7: Number of DTMF tone signals for inhibiting the detection of CNG during external TAD operation**

  If the equipment receives this specified number of DTMF tone signals during external TAD operation, it will not detect CNG afterwards.

  If these selectors are set to "1, 1," the CNG detection will not be inhibited.

WSW35

Selector No.	Function	Setting and Specifications
1 | 8	Not used.	

WSW36 (Function setting 14)

Selector No.	Function	Setting and Specifications
1	ECP mode*	0: ON 1: OFF
2	Recovery from Inactive PC Interface	0: Disabled 1: Enabled
3	PC Power-off Recognition Time	0: Normal 1: Long
4	Not used.	
5	Escape from phase C	0: Yes 1: No
6 | 8	Lower limit of frequency to be ignored after detection of calling signals (Ci)	No. 6 7 8 0 0 0 : 0 (Not ignored) 0 0 1 : 4 (448 Hz) 0 1 0 : 8 (244 Hz) 0 1 1 : 12 (162 Hz) 1 0 0 : 16 (122 Hz) 1 0 1 : 20 (97 Hz) 1 1 0 : 24 (81 Hz) 1 1 1 : 28 (69 Hz)

*ECP (Enhanced Capabilities Port)

- **Selector 1: ECP mode**

  The ECP mode enhances the normal bidirectional communications between the facsimile equipment and the connected PC for higher transmission speed.

- **Selector 2: Recovery from Inactive PC Interface**

  If the facsimile equipment recognizes via the STB signal line that the connected PC is powered off, it will turn the PC interface outputs Low to protect the PC from hazards that could be caused by weak electric current accidentally flown from the equipment.

  This selector determines whether the equipment should recover from the inactive PC interface to normal interfacing state upon receipt of data from the PC.

- **Selector 3: PC Power-off Recognition Time**

  This selector sets the time length from when the equipment detects the PC powered off until it recognizes the detected state as power-off.

  If selector 2 is set to "0," it is recommended that selector 3 be set to "1"; otherwise, the equipment may mistakenly detect PC powered off.

- **Selector 5: Escape from phase C**

  This selector determines whether or not the equipment will escape from phase C when it detects an RTC (Return to Control) in non-ECM mode or an RCP (Return to Control Partial page) in ECM mode.

- **Selectors 6 through 8: Lower limit of frequency to be ignored after detection of calling signals (Ci)**

  At the start of reception, if the equipment detects the frequency of calling signals (Ci) specified by selectors 1 through 4 of WSW14, it will start the ringer sounding. When doing so, the equipment may fail to detect the calling signals normally due to noises superimposed at the time of reception. To prevent it, use selectors 6 through 8 of WSW36.

  If the equipment detects higher frequencies than the lower limit specified by these selectors, it will regard them as noise and interpret that detecting state as being normal, allowing the ringer to keep sounding (until the equipment starts automatic reception of FAX data if in the FAX mode or enters the TAD mode if set in the TEL mode, according to the preset number of ringers).

WSW37 (Function setting 15)

Selector No.	Function	Setting and Specifications
1	Printout of the stored image data of an unsent document onto an error report	0: No 1: Yes
2	Erasure of the stored image data of an unsent document at the time of the subsequent in-memory message transmission	0: No 1: Yes
3 | 8	Not used.	

- **Selector 1: Printout of the stored image data of an unsent document onto an error report**

  This selector determines whether or not the 1st-page image data of a document will be printed out onto the error report if the document image data stored in the temporary memory cannot be transmitted normally.

- **Selector 2: Erasure of the stored image data of an unsent document at the time of the subsequent in-memory message transmission**

  If in-memory message transmission fails repeatedly when selector 1 is set to "1," the temporary memory will be occupied with image data. Setting selector 2 to "1" will automatically erase the stored 1st-page image data of an unsent document at the time of the subsequent in-memory message transmission only when recording paper or toner runs out.

WSW38 to WSW40

Selector No.	Function	Setting and Specifications
1 | 8	Not used.	

WSW41 (CCD fluorescent lamp)

Selector No.	Function	Setting and Specifications
1 | 3	ON-duration of the fluorescent lamp built in the CCD unit	No. 1 2 3 0 0 0 : 16 hours 0 0 1 : 24 hours 0 1 0 : 12 hours 0 1 1 : 8 hours 1 0 0 : 4 hours 1 0 1 : 2 hours 1 1 0 : 10 minutes 1 1 1 : 0 minute
4 | 8	Not used.	

- **Selectors 1 through 3: ON-duration of the fluorescent lamp built in the CCD unit**

  If the scanning operation is started when the fluorescent lamp is off, then the lamp will come on for scanning. These selectors determine how long the lamp will stay ON after scanning.

  If these selectors are set to "1, 1, 1," the fluorescent lamp will go off immediately after the scanning sequence.

WSW42 (Function setting 20)

Selector No.	Function	Setting and Specifications
1 | 3	Not used.	
4	JBIG coding	0: Disabled 1: Enabled
5 | 8	Not used.	

WSW43 (Function setting 21)

Selector No.	Function	Setting and Specifications
1	Not used.	
2 3	Wait time for PC-Fax reception (Class 2) and FPTS command transmission	No. 2 3 0 0 : 50 ms 0 1 : 100 ms 1 0 : 150 ms 1 1 : 0 ms
4 | 6	Not used.	
7	Automatic start of remote maintenance	0: No 1: Yes
8	JPEG coding	0: Disabled 1: Enabled

- **Selector 8: JPEG coding**

  Setting this selector to "0" disables the equipment from sending/receiving JPEG color images and from receiving JPEG monochrome images.

WSW44 (Speeding up scanning-1)

Selector No.	Function	Setting and Specifications
1 | 5	Not used.	
6 | 8	Effective time length of the white level compensation data obtained beforehand	No. 6 7 8 0 0 0 : Obtained compensation data ineffective 0 0 1 : 1 min. 0 1 0 : 3 min. 0 1 1 : 5 min. 1 0 0 : 10 min. 1 0 1 : 15 min. 1 1 0 : 20 min. 1 1 1 : 30 min.

NOTE: WSW44 is applicable only to models equipped with a flat-bed scanner.

- **Selectors 6 through 8: Effective time length of the white level compensation data obtained beforehand**

  If you set documents in the ADF and the document front sensor detects them or if you open the document tray ASSY and the document tray open sensor detects the open state, then the controller will make correction of the reference voltage to be applied to white level compensation for document scanning before the Copy button is pressed.

  These selectors determine how long compensation data obtained beforehand will keep effective.

WSW45 (Speeding up scanning-2)

Selector No.	Function	Setting and Specifications
1 | 3	Delay time from when documents are set until the ADF starts drawing them in	No. 1 2 3 0 0 0 : No automatic drawing-in 0 0 1 : 1 sec. 0 1 0 : 2 sec. 0 1 1 : 3 sec. 1 0 0 : 4 sec. 1 0 1 : 5 sec. 1 1 0 : 6 sec. 1 1 1 : 7 sec.
4 | 6	Periodical correction intervals of the reference voltage to be applied to white level compensation for document scanning, during standby	No. 4 5 6 0 0 0 : No correction of reference voltage during standby 0 0 1 : 10 sec. 0 1 0 : 30 sec. 0 1 1 : 1 min. 1 0 0 : 3 min. 1 0 1 : 5 min. 1 1 0 : 10 min. 1 1 1 : 30 min.
7	Standby position of the CCD unit	0: CCD home position 1: Location of the white-level reference film
8	Not used.	

NOTE: WSW45 is applicable only to models equipped with a flat-bed scanner.

- **Selectors 1 through 3: Delay time from when documents are set until the ADF starts drawing them in**

  These selectors determine how long the ADF will delay automatic drawing-in of documents (to the scanning standby position) after you set them in the ADF, as well as determining whether or not the ADF automatically draws in documents.

- **Selectors 4 through 6: Periodical correction intervals of the reference voltage applied to white level compensation for document scanning, during standby**

  These selectors set the correction intervals (in seconds) of the reference voltage to be applied to white level compensation for document scanning during standby, as well as determining whether or not the controller makes the reference voltage correction during standby. (Conventionally, the correction has been made immediately before the start of actual scanning)

  This function takes effect in copying. Making the correction during standby may shorten the preparation time for copying.

  NOTE: Do not access these selectors.

- **Selector 7: Standby position of the CCD unit**

  This selector determines whether the standby position of the CCD unit should be the home position or the location of the white-level reference film (attached to the inside of the scanner top cover). If the location of the reference film is selected, the CCD unit will not return to the home position so as to shorten the travel time, decreasing the preparation time for copying.

WSW46 (Monitor of power ON/OFF state and parallel port kept at high)

Selector No.	Function	Setting and Specifications
1 2	Monitoring the PC ON/OFF state	No. 1 2 0 0 : Disabled 0 1 : Monitor SELECT IN 1 0 : Monitor STROBE 1 1 : Monitor both SELECT IN and STROBE
3	Parallel port output pins kept at high level	0: Enabled 1: Disabled
4 5	Not used.	
6 | 8	Delay time at the start of scanning for making a single copy	No. 6 7 8 0 0 0 : No delay time 0 0 1 : 1 sec. 0 1 0 : 2 sec. 0 1 1 : 3 sec. 1 0 0 : 4 sec. 1 0 1 : 5 sec. 1 1 0 : 6 sec. 1 1 1 : 7 sec.

NOTE: Selector 3 is applicable only to models equipped with a parallel interface.
NOTE: Selectors 6 through 8 are applicable only to models equipped with a flat-bed scanner.

- **Selectors 1 and 2: Monitoring the PC ON/OFF state**

  For the related functions, refer to WSW36, selectors 2 and 3.

- **Selector 3: Parallel port output pins kept at high level**

  Setting this selector to "0" will keep all parallel output pins of the facsimile equipment at high level. Use this setting if Resource Manager (bundled with MFC models) installed to WindowsNT running on the connected PC fails to monitor the power ON/OFF state of the facsimile equipment.

- **Selectors 6 through 8: Delay time at the start of scanning for making a single copy**

  According to the setting made by these selectors, the MFC models may delay the scanning start timing to prevent the carriage drive vibration from affecting the document scanning. No setting change is required unless otherwise specified by Brother.

WSW47 (Paper handling for a feed error and delay of FAX line disconnection)

Selector No.	Function	Setting and Specifications
1	Handling paper at the occurrence of a paper feed timing error	0: Eject paper w/o print 1: Print on the current paper
2	Not used.	
3 4	Delay of FAX line disconnection when switching to the pseudo-ringing external telephone	No. 3 4 0 0 : 200 ms 0 1 : 400 ms 1 0 : 700 ms 1 1 : 1000 ms
5 | 8	Not used.	

NOTE: Selector 1 is applicable only to models equipped with a flat-bed scanner.
NOTE: Selectors 3 and 4 are applicable only to models supporting pseudo-ringing of a connected external telephone.

- **Selector 1: Handling paper at the occurrence of a paper feed timing error**

  When feeding paper to the print start position, the equipment might cause a feed timing error so that the registration sensor goes ON signaling the presence of paper. This selector determines whether the equipment will print on the current paper or eject the current paper without printing and print on the next paper.

- **Selectors 3 and 4: Delay of FAX line disconnection when switching to the pseudo-ringing external telephone**

  When the equipment receives a phone call, it can make the connected external telephone ring (so called pseudo-ringing). During pseudo-ringing, if you pick up the handset of the external telephone, the line might be disconnected due to cut-off of the line current.

  To hold the line, the equipment may supply line current by making use of the pulse generator circuit that forms a parallel loop. This way the FAX line disconnection may be delayed. These selectors determine the delay period.

WSW48 to WSW50

Selector No.	Function	Setting and Specifications
1 | 8	Not used.	

MFC5200C/MFC890

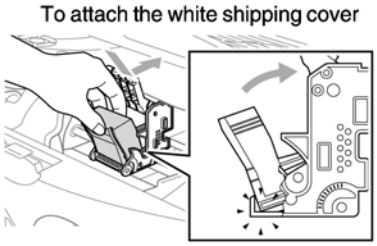
Appendix 5. Re-Packing Instructions

RE-PACKING INSTRUCTIONS

⚠ WARNING

Do NOT unplug the machine after a print job until you hear the final click.

(1) Remove all the ink cartridges and attach the white shipping cover.



(2) Attach the protective yellow bar and the protector.

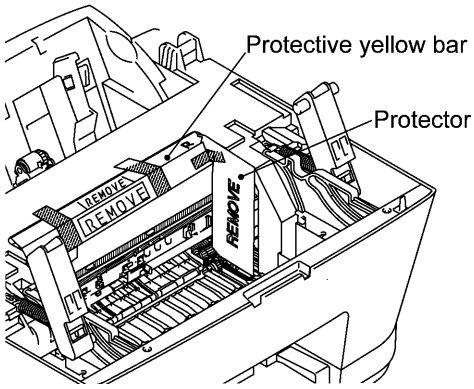
(3) Unplug the machine from the telephone wall jack (phone socket).

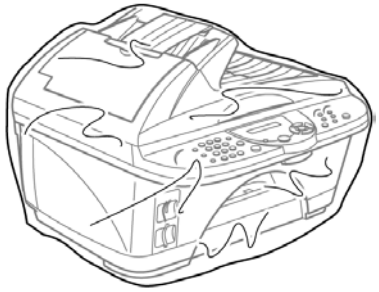
(4) Unplug the Parallel cable or USB cable from the machine.

(5) Unplug the machine from the AC power outlet.

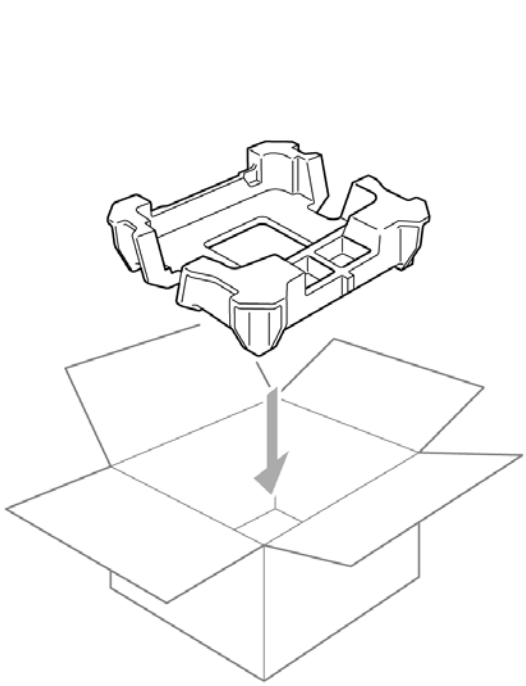
(6) Remove the telephone line cord, and put all the parts in their original packaging or protective wrapping.

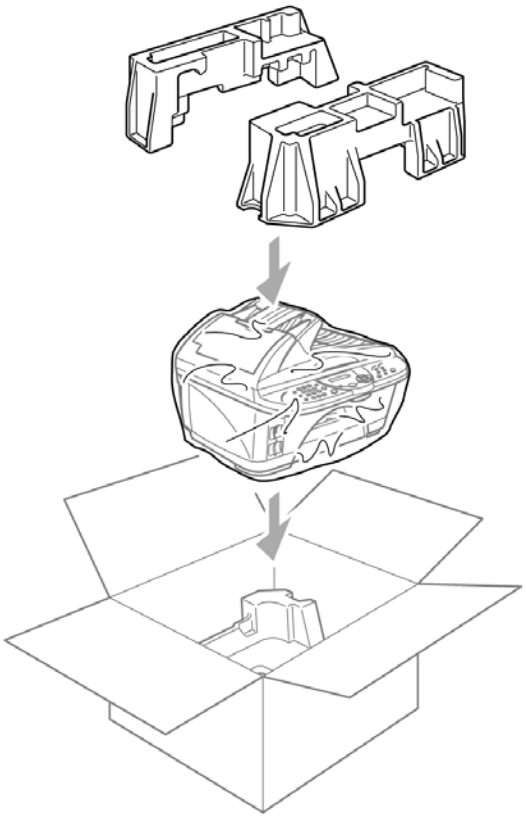
(7) Wrap the machine in the plastic bag.





(8) Place the machine in the original box with the original packaging material.





MFC5200C/MFC890

Appendix 6. Wiring Diagram

MFC5200C/MFC890
WIRING DIAGRAM

CCD UNIT

HEAD PCB

LAN *1

USB

CN10 USB
6 FG
5 FG
4 GND
3 DP
2 DN
1 PC5V

CN11 CDCC
38 FG
37 FG
36 SELELCT_IN
35 NC-35
34 NC-34
33 NC-33
32 FAULT
31 INIT
30 S0V-30
29 S0V-29
28 S0V-28
27 S0V-27
26 S0V-26
25 S0V-25
24 S0V-24
23 S0V-23
22 S0V-22
21 S0V-21
20 S0V-20
19 S0V-19
18 +5V
17 S0V-17
16 S0V-16
15 NC-15
14 AUTO_FD_XT
13 SELECT
12 PE
11 BUSY
10 ACK
9 CD7
8 CD6
7 CD5
6 CD4
5 CD3
4 CD2
3 CD1
2 CD0
1 STROBE

CENTRO

CN8 CCD
30 FBM_PHA
29 FBM_PHAB
28 FBM_PHB
27 FBM_PHBB
26 FBM_PWM1
25 FBM_PWM2
24 MVCC
23 MVCC
22 MGND
21 MGND
20 STB
19 SH
18 VCC
17 RS
16 VCC
15 CP
14 R5V
13 PH1
12 PH2
11 +12VC
10 VOR
9 AGND
8 VOG
7 AGND
6 VOB
5 AGND
4 HMSEN
3 FGND
2 FGND
1 +24V

CN4 SERI
6 TXD
5 RXD
4 CTS
3 RTS
2 S0V
1 +5V

CN7 BAT
2 BAT_N
1 BAT_P

CN6 HEAD
32 HD_VTEMP
31 HD_CLK3
30 S0V
29 HD_CLK2
28 S0V
27 HD_CLK1
26 S0V
25 HD_CLK0
24 S0V
23 HD_JET3
22 HD_JET2
21 HD_JET1
20 HD_JET0
19 +3.3VHEAD
18 HD_SOUT32
17 HD_SOUT31
16 HD_SOUT30
15 +3.3VHEAD
14 HD_SOUT22
13 HD_SOUT21
12 HD_SOUT20
11 +3.3VHEAD
10 HD_SOUT12
9 HD_SOUT11
8 HD_SOUT10
7 +3.3VHEAD
6 HD_SOUT02
5 HD_SOUT01
4 HD_SOUT00
3 S0V
2 HEAD_SEL
1 HEAD_RSTN

MAIN PCB

CN3 MEDIA1
22 MDCSN
21 MDO2
20 MDO14
19 MD01
18 S0V
17 MD015
16 MDA2
15 MDA13
14 MDA3
13 S0V
12 MDA12
11 MDA4
10 MDA11
9 MDA5
8 +5V
7 MDA10
6 MDA6
5 MDA9
4 MDA7
3 +3.3V
2 MDA8
1 MDD0

CN2 MEDIA2
21 MDWRN
20 MDRSTN
19 MDDACKN
18 MDDREQN
17 MDINT
16 S0V
15 MDO08
14 MDO07
13 MDO09
12 S0V
11 MDO06
10 MDO10
9 MDO05
8 MDO11
7 S0V
6 MDO04
5 MDO12
4 MDO03
3 MDO13
2 S0V
1 MDRDN

CN12 MANUAL
2 MANUAL
1 GND

P1 NCU
11 PLS
10 TELOFF
9 CI
8 SRL
7 S0V
6 +30V
5 CMLL
4 RL2
3 RDPS
2 EARTH
1 GIJI

NCU

CN9 SP
2 VOUT1
1 VOUT2

SPEAKER

MEDIA PCB

MANUAL FEED SLOT COVER SENSOR

US model 5-11
EUR model 2-11
JPN model 1-11

MAIN-DRIVER CON-NECTOR *2

K/B FPC

SCANNER OPEN SENSOR

BACKLIGHT PCB

(Only for MFC890)

LCD

CN3
12 KI5
11 KO5
10 KI4
9 KO4
8 KI3
7 KO3
6 KI0
5 KO2
4 KI1
3 KO1
2 KI2
1 KO0

JW7

JW1

CN1
2 +30V
1 LEDON/OFF

CN2
14 RS
13 RW
12 E
11 LCD0
10 LCD1
9 LCD2
8 LCD3
7 LCD4
6 LCD5
5 LCD6
4 LC7
3 S0V
2 +5V
1 V_0

CONTROL PANEL PCB

FSEN SENS

RSEN SENS

1 2 3 4

DOCUMENT COVER OPEN SENSOR

1 2

ADF MOTOR

1 2 3 4

CARRIAGE PCB

5,4,3,2|6,10,1,9|8,7

10P

CN7 HEAD2
18 CHK1
17 HVGND
16 HVGND
15 HVGND
14 HVGND
13 HVDD
12 HVDD
11 HVDD
10 HVDD
9 HVDD
8 HVDD
7 HVDD
6 HVDD
5 HVGND
4 HVGND
3 HVGND
2 HVGND
1 CHK2

CN1 PANEL
7 POW_SW
6 S0V
5 5V
4 PCLK
3 SDIN
2 SDOUT
1 30V

CN8 CR
7 ENC1
6 SLP5V
5 ENC2
4 S0V
3 CTGSNS0
2 CTGSNS1
1 HD_THM

CN9
10 FSEN
9 SLP30V
8 S0V
7 COVER
6 S0V
5 OUT_A
4 OUT_AB
3 OUT_B
2 OUT_BB
1 RSEN

DRIVER PCB

CN5 POWER
13 0V
12 PWM
11 HDV_CUT
10 PS_DOWN
9 P0V
8 +30V
7 +30V
6 P0V
5 +5V
4 +5V
3 0V
2 HVDD
1 HVGND

CN4 ENK_EMP
3 S0V
2 INK_EMP
1 INK_LED

CN10 PURGE
4 S0V
3 PURGE2
2 S0V
1 PURGE1

CN2 LF-MOT
4 OUT4
3 OUT3
2 OUT2
1 OUT1

CN11 CR-MOTOR
2 DC_BK
1 DC_RED

INK EMPTY PCB

SWITCHING POWER SUPPLY 5V/30V/HVDD

PURGE RELATED SWITCHES

PAPER FEED MOTOR

CARRIAGE MOTOR

*1 LAN

CN5 LAN
62 FG
61 FG
60 LAN_INTN
59 GND
58 +3.3V
57 +3.3V
56 D15
55 D14
54 D13
53 D12
52 D11
51 D10
50 D9
49 D8
48 GND
47 GND
46 +3.3V
45 +3.3V
44 D7
43 D6
42 D5
41 D4
40 D3
39 D2
38 D1
37 D0
36 GND
35 GND
34 +3.3V
33 +3.3V
32 UNIPORT1
31 LAN_CSN
30 IOWRN
29 IORDN
28 A17
27 A16
26 A15
25 A14
24 GND
23 GND
22 +3.3V
21 +3.3V
20 A13
19 A12
18 A11
17 A10
16 A9
15 A8
14 GND
13 +3.3V
12 A7
11 A6
10 A5
9 A4
8 A3
7 A2
6 GND
5 GND
4 +3.3V
3 +3.3V
2 LAN_RSTN
1 UNIPORT0

*2 MAIN-DRIVER CONNECTOR

CN1 DRIVER
70 S0V
69 S0V
68 SEN_RESI
67 SEN_HABA
66 +5V
65 +5V
64 EE_CLK
63 HVDD
62 EE_DATA
61 HEAD_CHK2
60 HEAD_CHK1
59 HD_ENC2
58 HD_ENC1
57 ENC_CNT5V
56 +3.3V
55 +3.3V
54 +30V
53 +30V
52 PS_DWN
51 +3.3VHEAD
50 HDV_CUT
49 HDVCNT_PWM
48 CTGSNS1
47 HD_THM
46 CTGSNS0
45 +3.3VLAN
44 CR0
43 CR1
42 CR0N
41 CR1N
40 SEN_PURGE2
39 SEN_PURGE1
38 INV_24VON
37 CCD12V
36 P0V
35 INV24V
34 S0V
33 S0V
32 INKLED_PWM
31 INK_EMP
30 LF_ENC1
29 LF_ENC2
28 -
27 PNL_SDIN
26 PNL_SDOUT
25 PNL_PCLK
24 POW_SW
23 -
22 +3.3V
21 +3.3V
20 +30V
19 +30V
18 LF_ENB
17 LF_PHB
16 LF_DECAY
15 LF_PWM1
14 LF_PWM0
13 LF_PHA
12 LF_ENA
11 RM_PH4
10 RM_PH2
9 RM_PWM2
8 FBM_SELH
7 RM_PWM1
6 RM_PH1
5 RM_PH3
4 SEN_FSEN
3 FB-COVER
2 SEN_RSEN
1 P0V

MFC5200C/MFC890

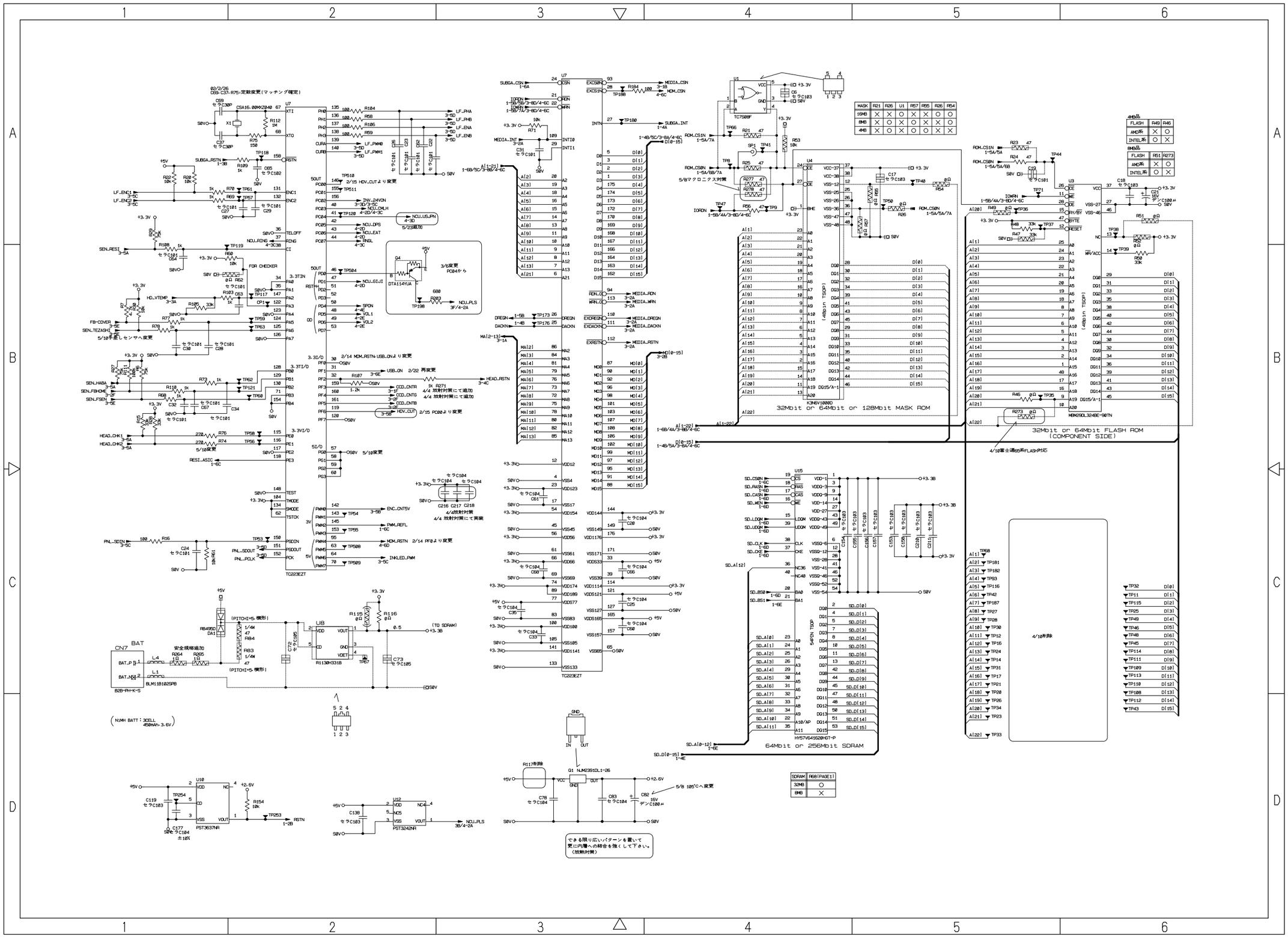
Appendix 7. Circuit Diagrams

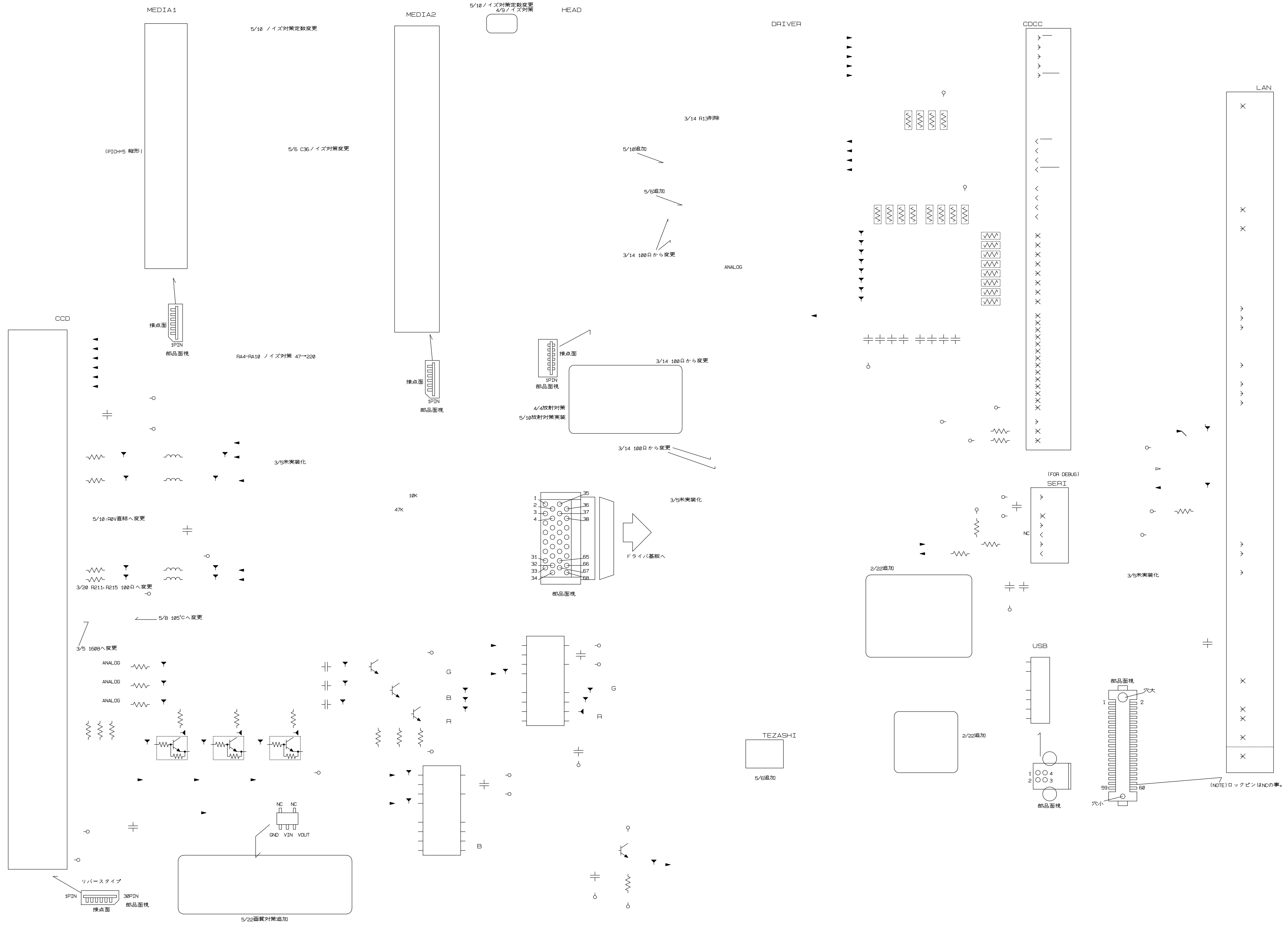
Terms in circuit diagrams

セラC: Ceramic capacitor
デンC: Chemical capacitor

A. Main PCB (1/4)
(MFC5200C)

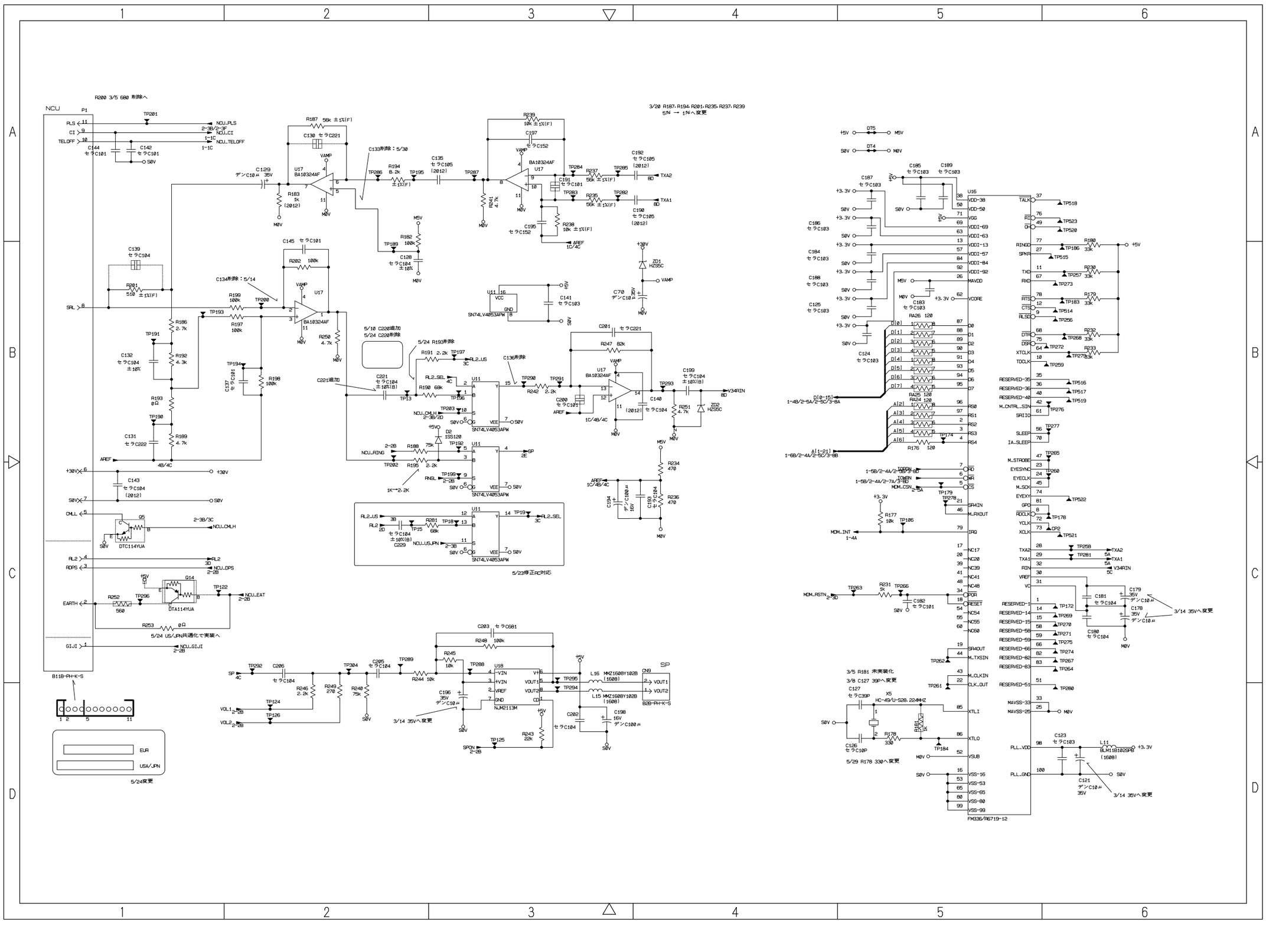
A. Main PCB (2/4)
(MFC5200C)

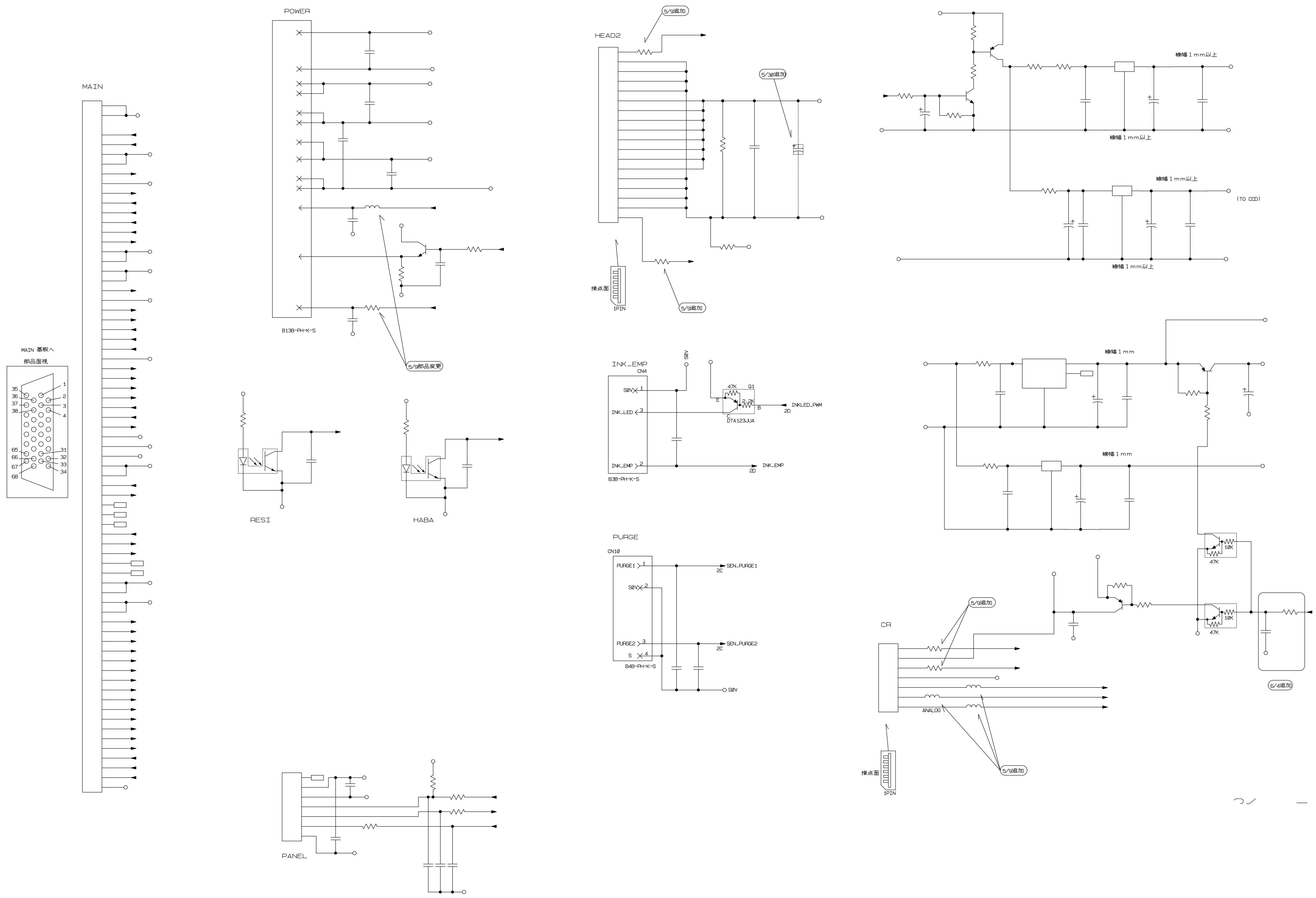




MEDIA1
MEDIA2
5/10ノイズ対策定数変更
4/9ノイズ対策
HEAD
DRIVER
CDCC
LAN
5/10 ノイズ対策定数変更
(PICH=5 縦形)
5/6 C36ノイズ対策変更
3/14 R13削除
5/10追加
5/6追加
3/14 100Ωから変更
ANALOG
CCD
接点面
1PIN
部品面視
RA4-RA10 ノイズ対策 47→220
3/14 100Ωから変更
4/4放射対策
5/10放射対策実装
3/14 100Ωから変更
3/5未実装化
10K
47K
ドライバ基板へ
3/5未実装化
(FOR DEBUG)
SERI
NC
5/10:A0V直結へ変更
2/22追加
3/20 R211,R215 100Ωへ変更
5/8 105℃へ変更
3/5 1600へ変更
3/5未実装化
USB
部品面視
穴大
2/22追加
TEZASHI
5/6追加
穴小
(NOTE)ロックピンはNCの事。
NC NC
GND VIN VOUT
リバースタイプ
1PIN 30PIN
5/22画質対策追加

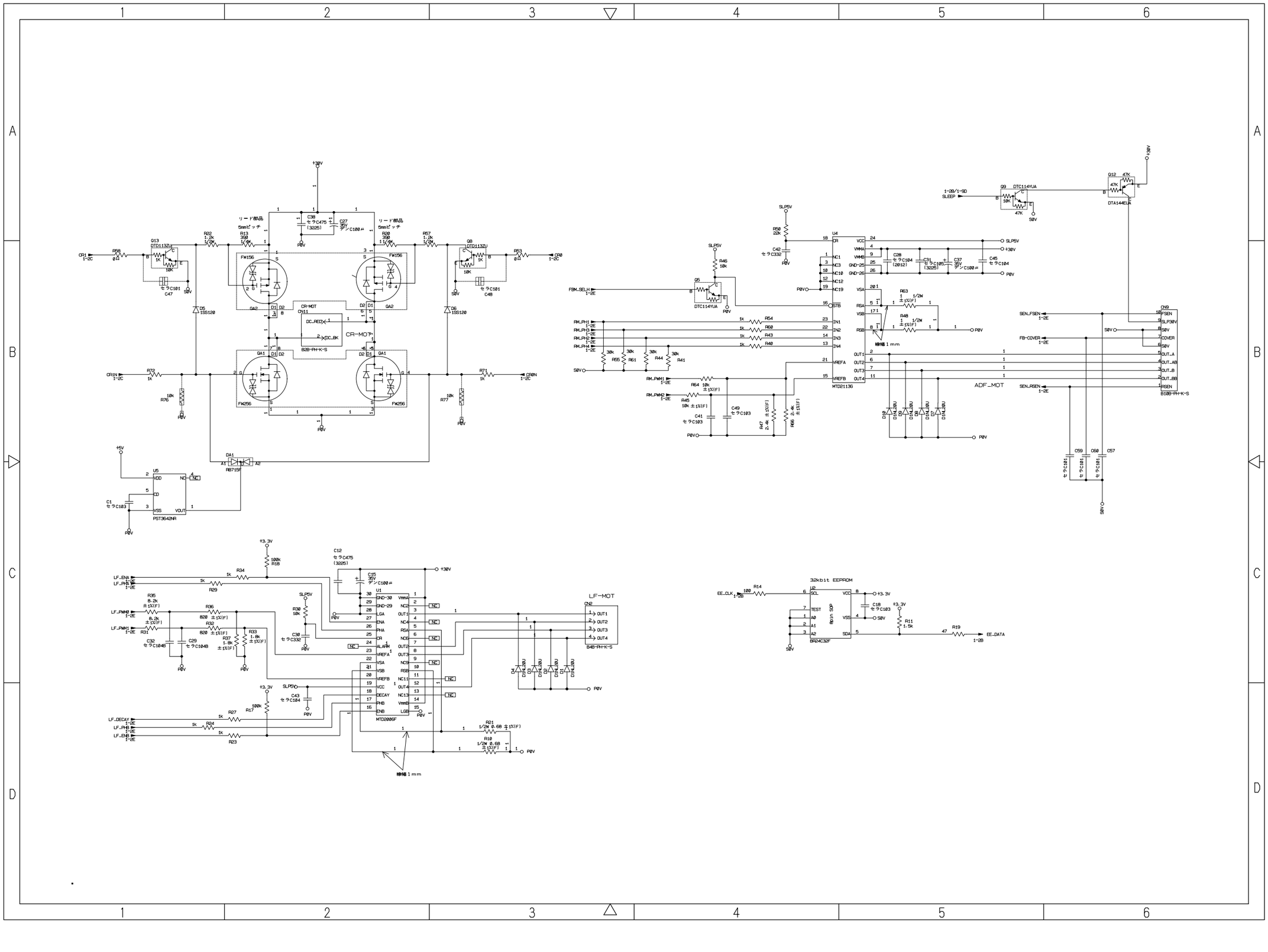
A. Main PCB (4/4)
(MFC5200C)



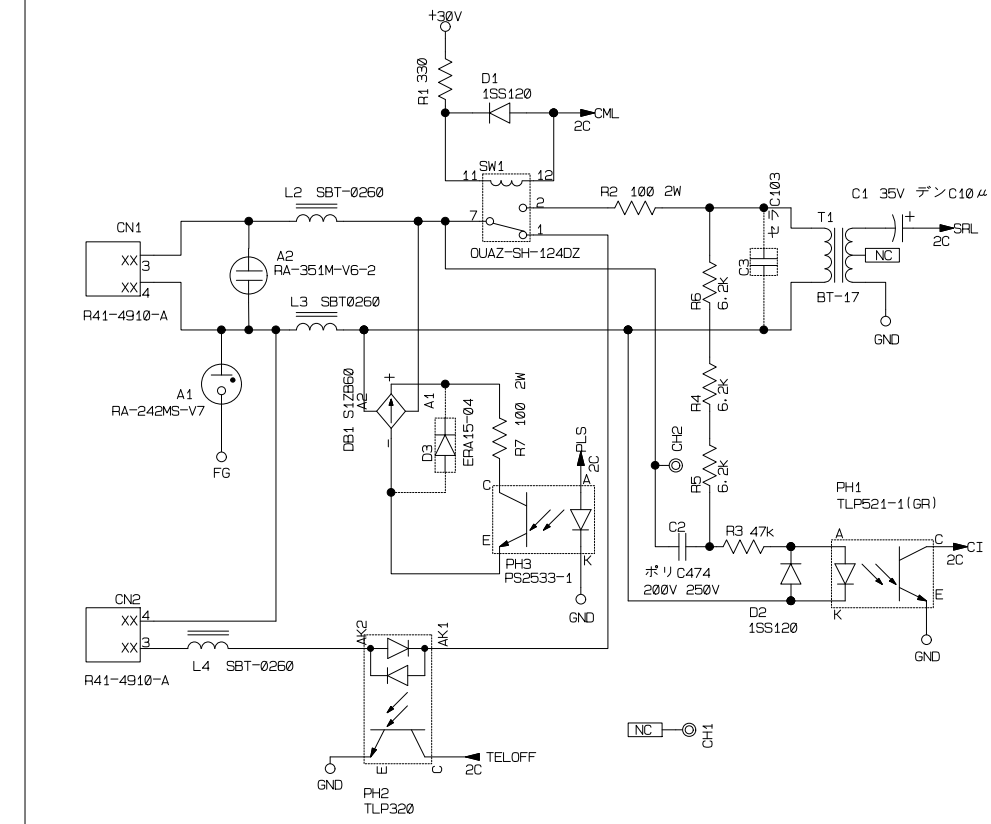


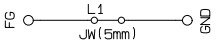
MAIN
MAIN 基板へ
部品面視
POWER
B13B-PH-K-S
5/9部品変更
RESI
HABA
PANEL
HEAD2
5/9追加
5/30追加
接点面
1PIN
INK_EMP
CN4
S0V
INK_LED
INK_EMP
B3B-PH-K-S
47K
Q1
DTA123JUA
INKLED_PWM
PURGE
CN10
PURGE1
PURGE2
SEN_PURGE1
SEN_PURGE2
B4B-PH-K-S
線幅1mm以上
(TO CCD)
線幅1mm
10K
CR
ANALOG
6/4追加

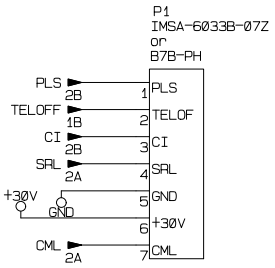
B. Driver PCB (2/2)



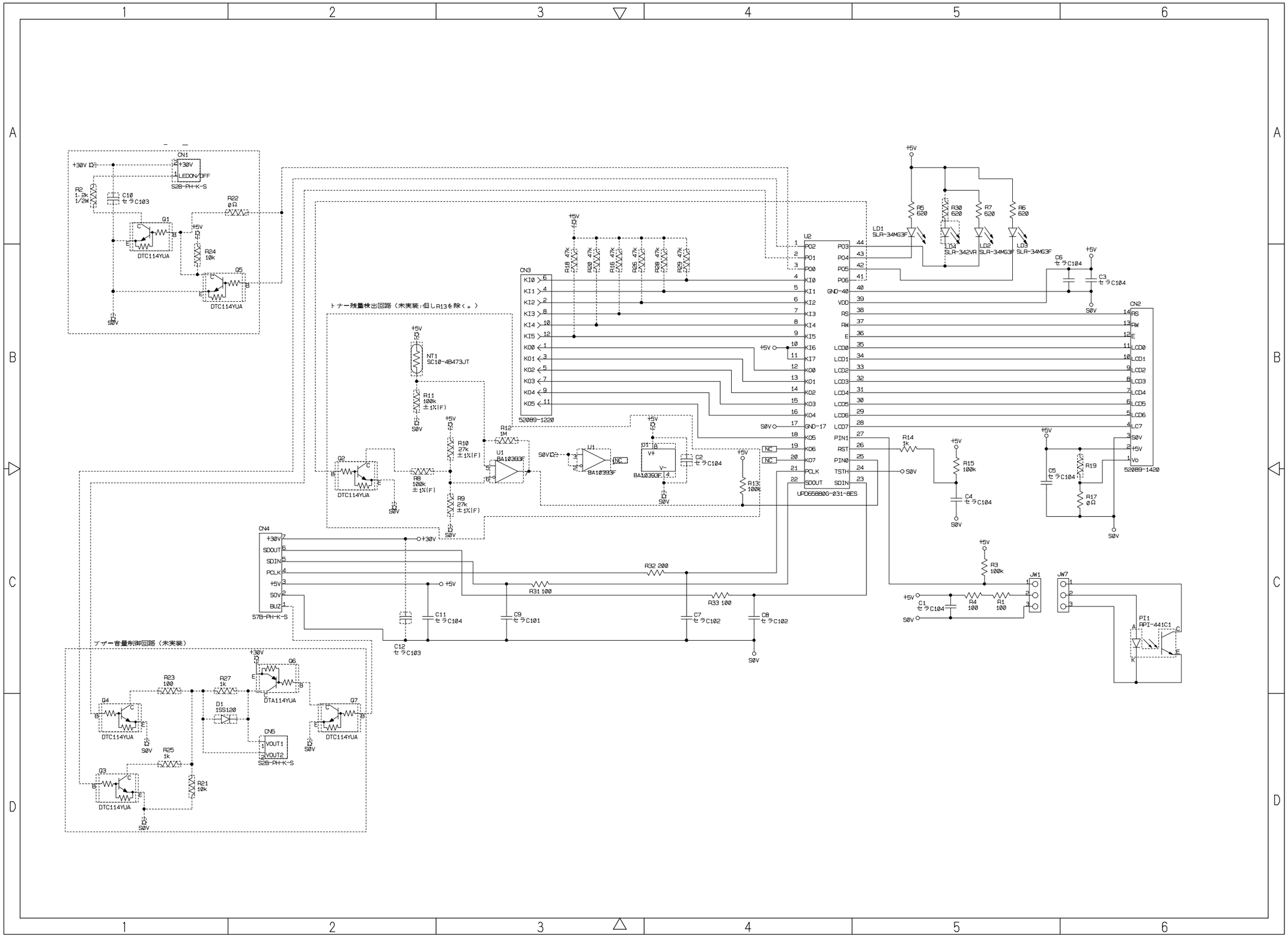
C. NCU PCB
(MFC5200C)



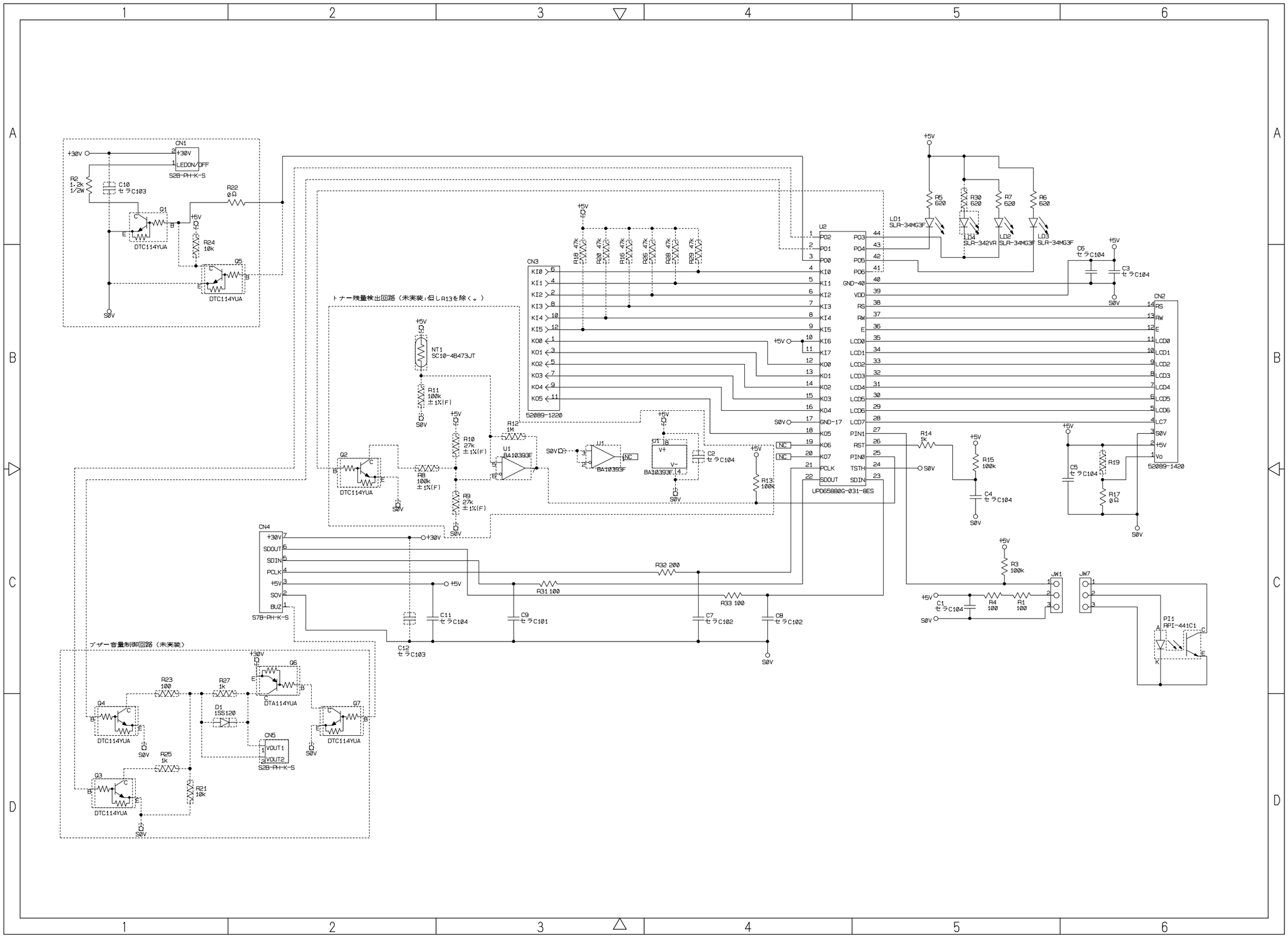




D. Control Panel PCB (1/2)
(MFC5200C)



D. Control Panel PCB (1/2)
(MFC890)



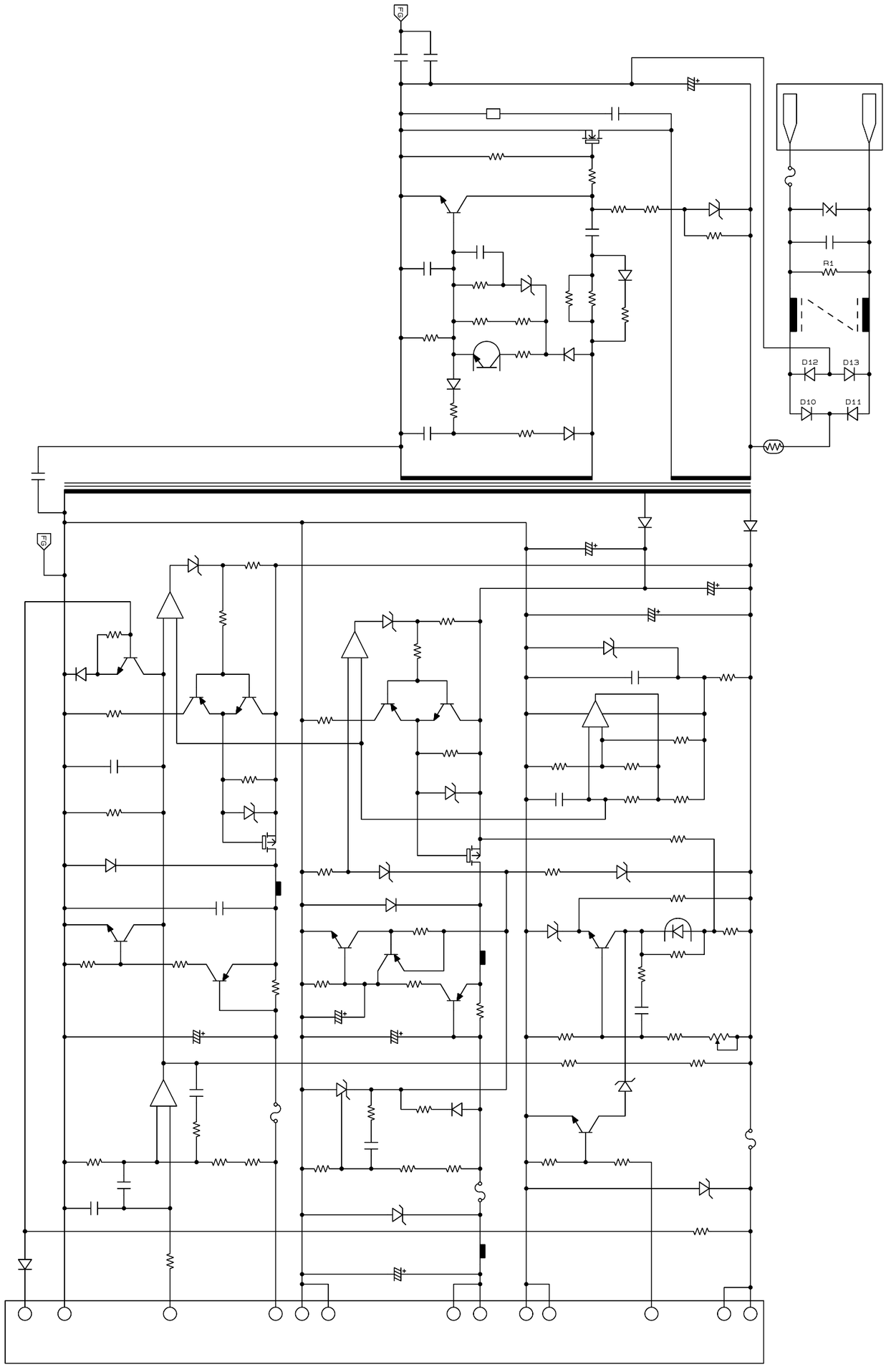
BHM-FB PANEL KEY MATRIX REFERENCE TABLE 1

KEY NO.	KEY NAME	KEY CODE
1	Redial/Pause	2BH
2	10KEY-1	13H
3	10KEY-2	03H
4	10KEY-3	0BH
5	Search/Speed Dial	1BH
6	Receive Mode	2AH
7	10KEY-4	12H
8	10KEY-5	02H
9	10KEY-6	0AH
10	Fax Resolution	1AH
11	ON/OFF	11H
12	10KEY-7	29H
13	10KEY-8	01H
14	10KEY-9	09H
15	10KEY-*	14H
16	10KEY-0	04H

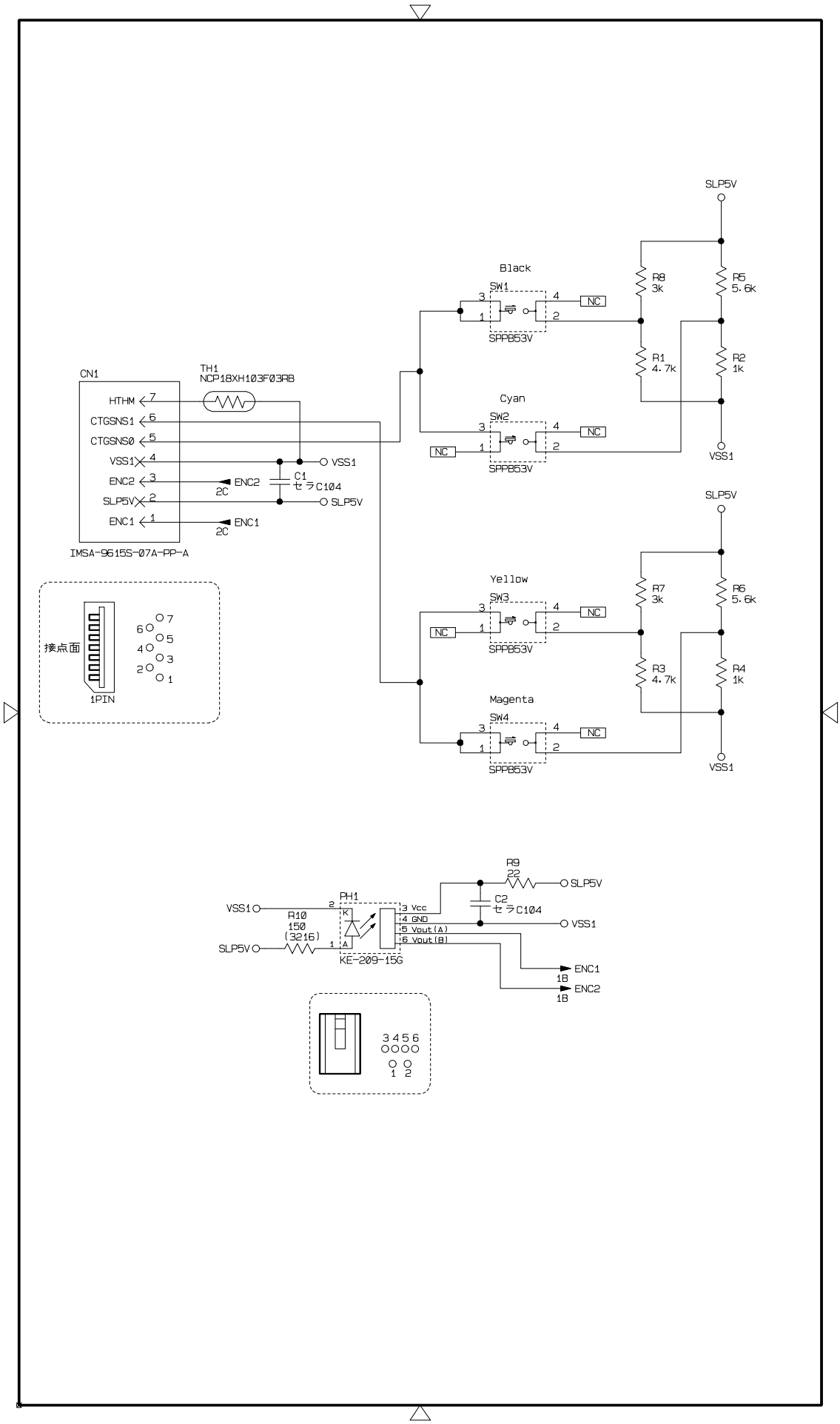
KEY NO.	KEY NAME	KEY CODE
17	10KEY-#	0CH
18	Fax Start	1CH
19	Hook	19H
20	Stop/Exit	24H
21	←	25H
22	↑	15H
23	Menu Set	1DH
24	→	0DH
25	↓	21H
26	Black Copy	05H
27	Enlarge/Reduce	06H
28	Scan to	2EH
29	Quality	1EH
30	Options	0EH
31	Ink	16H
32	Color Copy	26H

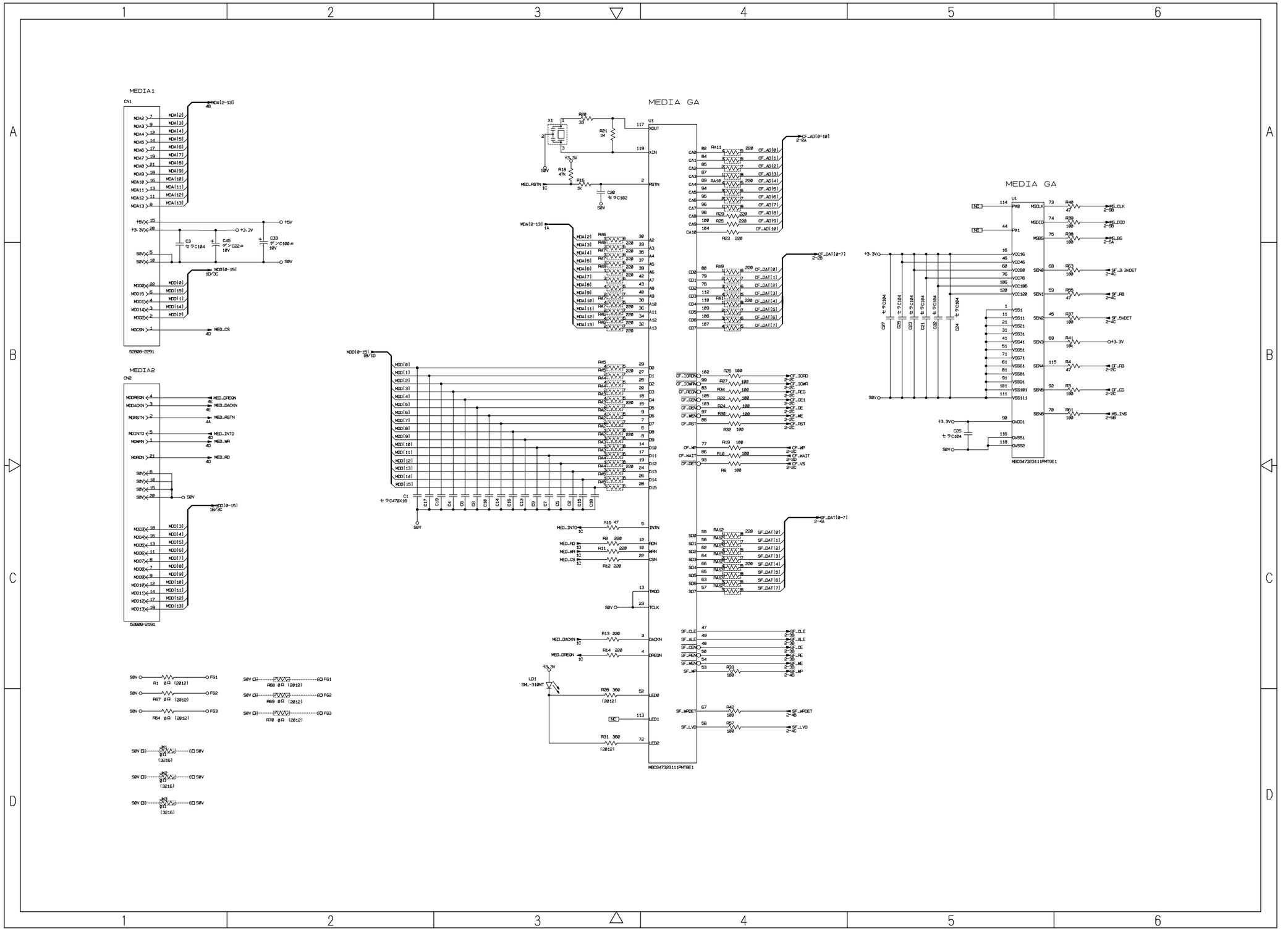
BHM-FB PANEL KEY MATRIX REFERENCE TABLE 2

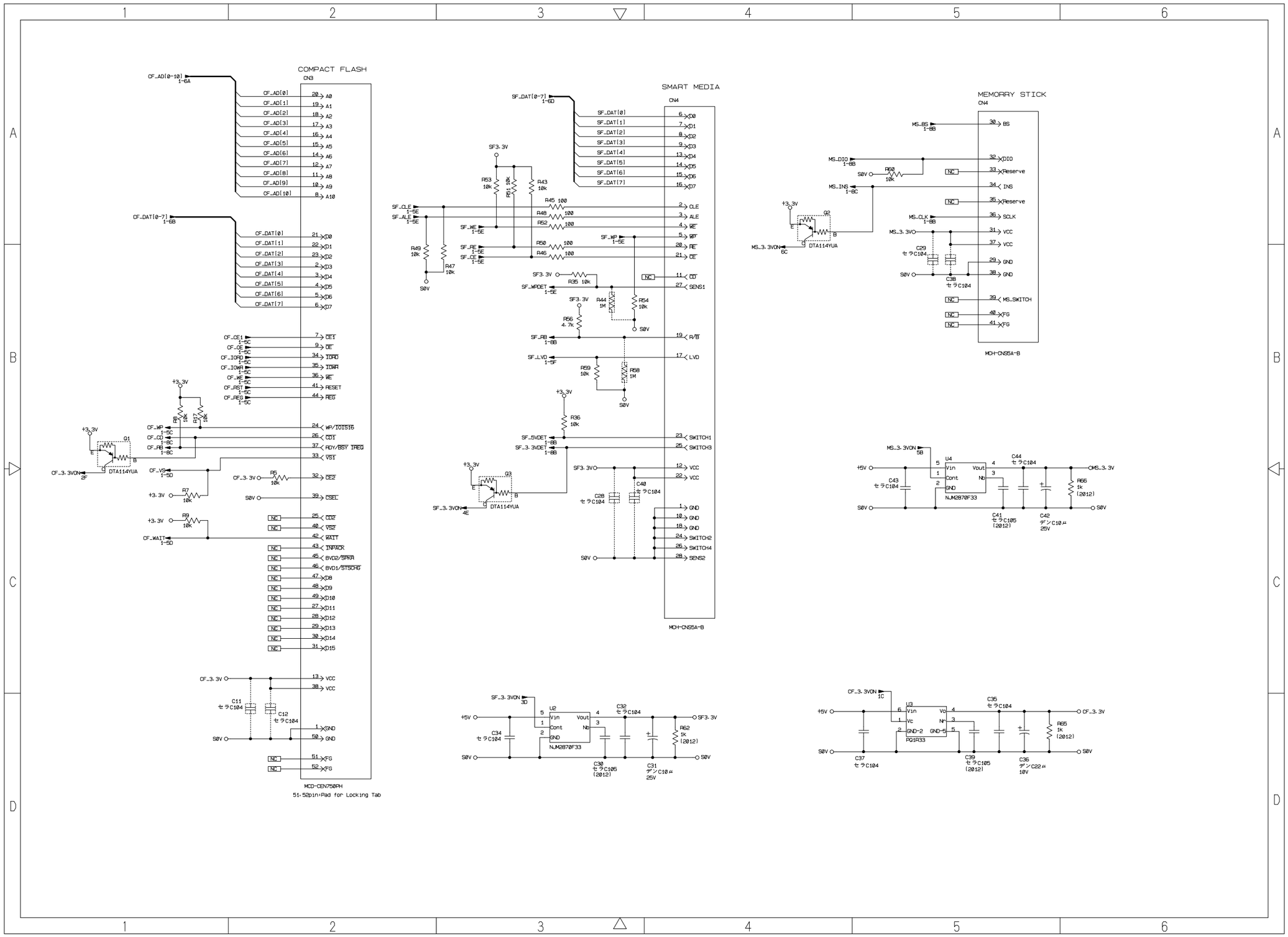
	K00 CN3-1P	K01 CN3-3P	K02 CN3-5P	K03 CN3-7P	K04 CN3-9P	K05 CN3-11P
KI0 CN3-6P	13	14	12	19	25	–
KI1 CN3-4P	8	9	7	10	–	6
KI2 CN3-2P	3	4	2	5	–	1
KI3 CN3-8P	16	17	15	18	20	11
KI4 CN3-10P	26	24	22	23	21	–
KI5 CN3-12P	27	30	31	29	32	28


FG
R1
D12
D13
D10
D11

F. Carriage PCB




MEDIA1
MEDIA2
MEDIA GA
MEDIA GA
MBDC47323111PMTGE1
MBDC47323111PMTGE1
52808-2291
52808-2191


COMPACT FLASH
CN3
CF_AD[0-10] 1-6A
CF_AD[0] 20 A0
CF_AD[1] 19 A1
CF_AD[2] 18 A2
CF_AD[3] 17 A3
CF_AD[4] 16 A4
CF_AD[5] 15 A5
CF_AD[6] 14 A6
CF_AD[7] 12 A7
CF_AD[8] 11 A8
CF_AD[9] 10 A9
CF_AD[10] 8 A10
CF_DAT[0-7] 1-6B
CF_DAT[0] 21 D0
CF_DAT[1] 22 D1
CF_DAT[2] 23 D2
CF_DAT[3] 2 D3
CF_DAT[4] 3 D4
CF_DAT[5] 4 D5
CF_DAT[6] 5 D6
CF_DAT[7] 6 D7
CF_CE1 1-5C 7 CE1
CF_OE 1-5C 9 OE
CF_IORD 1-5C 34 IORD
CF_IOWR 1-5C 35 IOWR
CF_WE 1-5C 36 WE
CF_RST 1-5C 41 RESET
CF_REG 1-5C 44 REG
+3.3V
R8 10K
R11 10K
CF_WP 1-5C 24 WP/IOIS16
CF_CD 1-5C 26 CD1
CF_RB 1-8C 37 RDY/BSY IREQ
Q1
DTA114YUA
CF_3.3VON 2F
CF_VS 1-5D 33 VS1
CF_3.3V R5 10K 32 CE2
+3.3V R7 10K
S0V 39 CSEL
+3.3V R9 10K
CF_WAIT 1-5D 42 WAIT
NC 25 CD2
NC 40 VS2
NC 43 INPACK
NC 45 BVD2/SPKR
NC 46 BVD1/STSCHG
NC 47 D8
NC 48 D9
NC 49 D10
NC 27 D11
NC 28 D12
NC 29 D13
NC 30 D14
NC 31 D15
CF_3.3V 13 VCC
38 VCC
C11 セラC104
C12 セラC104
S0V 1 GND
50 GND
NC 51 FG
NC 52 FG
MCD-CEN750PH
51・52pin:Pad for Locking Tab
SMART MEDIA
CN4
SF_DAT[0-7] 1-6D
SF_DAT[0] 6 D0
SF_DAT[1] 7 D1
SF_DAT[2] 8 D2
SF_DAT[3] 9 D3
SF_DAT[4] 13 D4
SF_DAT[5] 14 D5
SF_DAT[6] 15 D6
SF_DAT[7] 16 D7
SF3.3V
R53 10K
R51 10K
R43 10K
SF_CLE 1-5E 2 CLE
SF_ALE 1-5E 3 ALE
SF_WE 1-5E 4 WE
SF_RE 1-5E 5 RP
SF_CE 1-5E 20 RE
21 CE
R45 100
R48 100
R52 100
R50 100
R46 100
R49 10K
R47 10K
S0V
SF_WP 1-5E
SF3.3V R35 10K NC 11 CD
SF_WPDET 1-5E 27 SENS1
SF3.3V R44 1M R54 10K
R56 4.7K
S0V
SF_RB 1-8B 19 R/B
SF_LVD 1-5F 17 LVD
R59 10K R58 1M
S0V
+3.3V R36 10K
SF_5VDET 1-8B 23 SWITCH1
SF_3.3VDET 1-8B 25 SWITCH3
+3.3V
Q3
DTA114YUA
SF_3.3VON 4E
SF3.3V 12 VCC
22 VCC
C28 セラC104
C40 セラC104
1 GND
10 GND
18 GND
24 SWITCH2
26 SWITCH4
S0V 28 SENS2
MCH-CNS5A-B
MEMORRY STICK
CN4
MS_BS 1-8B 30 BS
MS_DIO 1-8B 32 DIO
S0V R60 10K NC 33 Reserve
MS_INS 1-8C 34 INS
NC 35 Reserve
MS_CLK 1-8B 36 SCLK
MS_3.3V 31 VCC
37 VCC
C29 セラC104
S0V 29 GND
38 GND
C38 セラC104
NC 39 MS_SWITCH
NC 40 FG
NC 41 FG
+3.3V
Q2
DTA114YUA
MS_3.3VON 6C
MCH-CNS5A-B
SF_3.3VON 3D
+5V
U2
Vin
Cont
GND
Vout
NJM2870F33
C34 セラC104
C32 セラC104
SF3.3V
R62 1k (2012)
S0V
C30 セラC105 (2012)
C31 デンC10μ 25V
MS_3.3VON 5B
U4
C44 セラC104
C43 セラC104
C41 セラC105 (2012)
C42 デンC10μ 25V
R66 1k (2012)
MS_3.3V
CF_3.3VON 1C
U3
Vin
Vc
GND-2
FG1R33
C35 セラC104
C37 セラC104
C39 セラC105 (2012)
C36 デンC22μ 10V
R65 1k (2012)
CF_3.3V

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