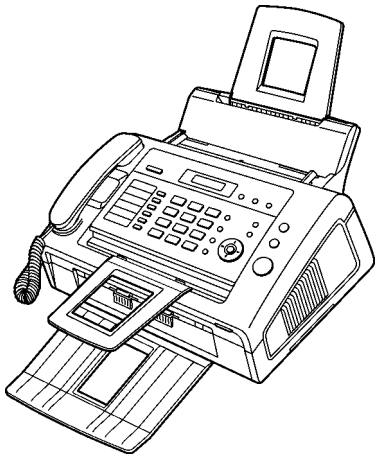
ORDER NO. KMF0905234CE

Service Manual

Compact Laser Fax



Model No. KX-FL422CX-B
KX-FL422CX-W

(Black / White version)
(for Asia, Middle Near East and Africa)

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards.
Do not modify the original design without permission of manufacturer.

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING

If lead free solder was used in the manufacture of this product, the printed circuit boards will be marked PbF.
Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.

When this mark does appear please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

When you note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.

Panasonic

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1 Safety Precautions

1. Before servicing, unplug the AC power cord to prevent an electric shock.
2. When replacing parts, use only the manufacturer's recommended components.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to perform the following insulation resistance test to prevent the customer from being exposed to shock hazards.

1.1. For Service Technicians

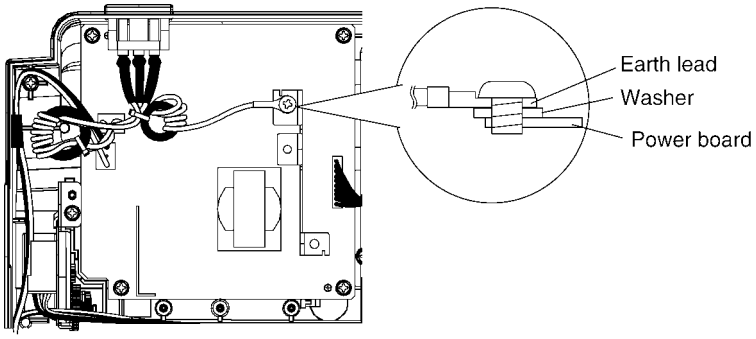
ICs and LSIs are vulnerable to static electricity.
When repairing, the following precautions will help prevent recurring malfunctions.

1. Cover the plastic part's boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on the worktable.
4. Do not touch the IC or LSI pins with bare fingers.

1.2. AC Caution

For safety, before closing the lower cabinet, please make sure of the following precautions.

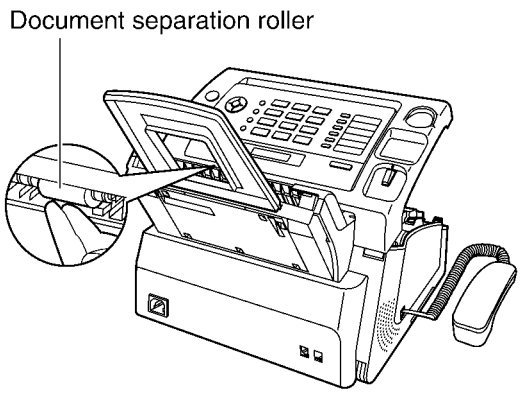
1. The earth lead is fixed with the screw as following illustration shows.
2. The AC connector is connected properly.

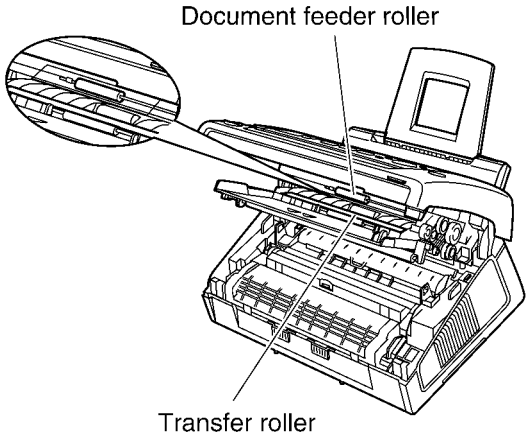


1.3. Personal Safety Precautions

1.3.1. Moving Sections of The Unit

Be careful not to let your hair, clothes, fingers, accessories, etc., become caught in any moving sections of the unit.
The moving sections of the unit are the rollers and a gear. There is a separation roller and a document feed roller which are rotated by the document feed motor. A gear rotates the two rollers. Be careful not to touch them with your hands, especially when the unit is operating.



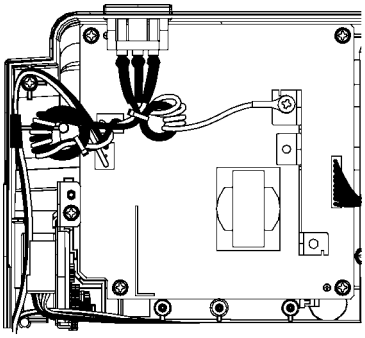


1.3.2. Live Electrical Sections

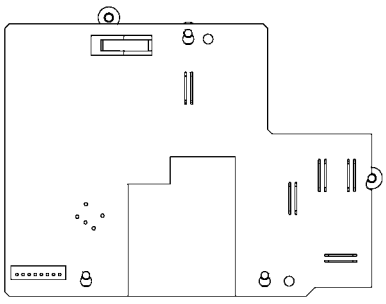
All the electrical sections of the unit supplied with AC power by the AC power cord are live.
Never disassemble the unit for service with the AC power supply plugged in.

CAUTION:

AC voltage is supplied to the primary side of the power supply unit. Therefore, always unplug the AC power cord before disassembling for service.



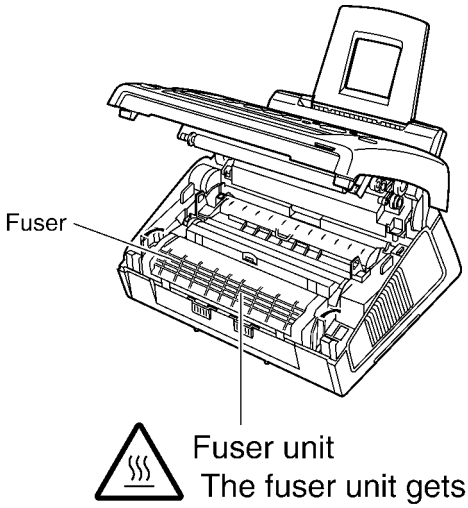
Low Voltage Power Board



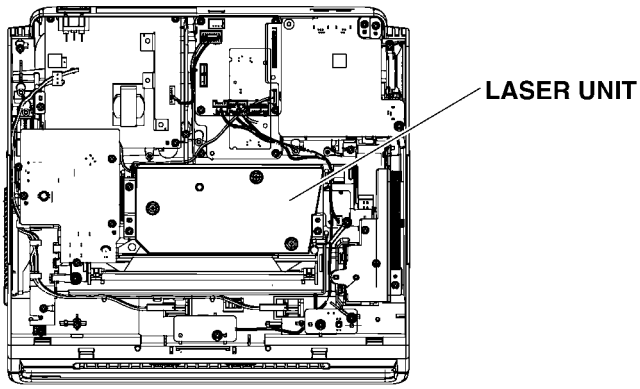
High Voltage Power Board

1.3.3. Laser Beam and Fuser Unit Section

- The printer of this unit utilizes a laser. Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
- The fuser unit is inside of the unit and gets hot. Do not touch it when removing the jammed paper or cleaning the lower glass.



Fuser unit
The fuser unit gets hot. Do not touch it.



1.4. Service Precautions

1.4.1. Precautions to Prevent Damage From Static Electricity

Electrical charges accumulate on a person. For instance, clothes rubbing together can damage electric elements or change their electrical characteristics. In order to prevent static electricity, touch a metallic part that is grounded to release the static electricity. Never touch the electrical sections such as the power supply unit, etc.

1.5. For Best Performance

- To extend the life of the drum unit, the unit should never be turned OFF immediately after printing. Leave the power turned ON for a minimum of 30 minutes after printing.
- In the printing process, heat is used to fuse toner onto the page. As a result, it is normal for the machine to produce an odor during and shortly after printing. Be sure to use this unit in an area with proper ventilation.
- Do not cover slots or openings on the unit. Inspect the air circulation vents regularly and remove any dust build-up with a vacuum cleaner.
- If the inside of the unit is dirty, clean it with a soft and dry cloth (especially the lower glass).
- When replacing the toner cartridge or drum unit, do not allow dust, water, or liquids to come in contact with the drum. This may affect print quality.
- Store unused paper in the original packaging, in a cool and dry place. Not doing so may affect print quality.
- Do not place the unit in an area where the paper tray may be obstructed (i.e., by a wall, etc.).
- Keep the air circulation vents away from walls etc. more than 50 mm to let the unit cool down.

2 Warning

2.1. About Lead Free Solder (PbF: Pb free)

Note:

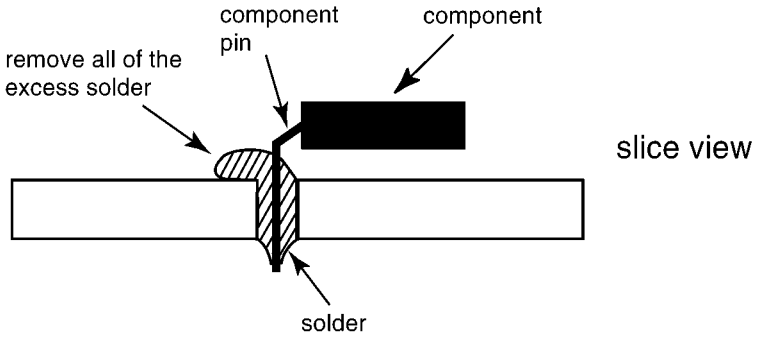
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.

We will use PbF solder when discussing the lead free solder used in our manufacturing process which is made from Tin, (Sn), Silver, (Ag), and Copper, (Cu).

This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder although, with some precautions, standard Pb solder can also be used.

Caution

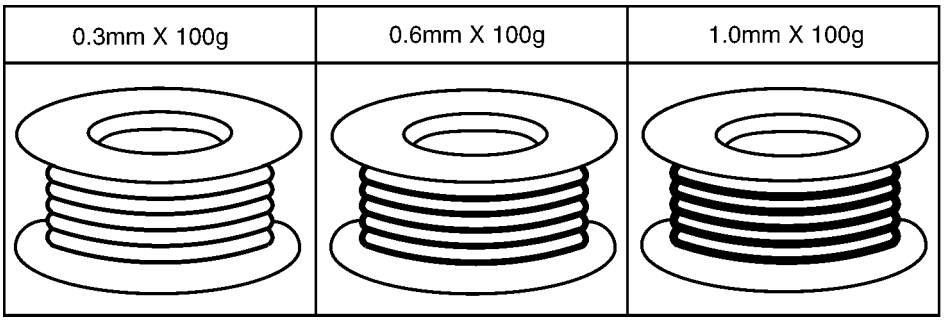
- PbF solder has a melting point that is 50° ~ 70° F, (30° ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700° ± 20° F, (370° ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.
- PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F, (600°C).
- If you must use Pb solder on a PCB manufactured using PbF solder, remove as much of the original PbF solder as possible and be sure that any remaining is melted prior to applying the Pb solder.
- When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See figure, below).



2.1.1. Suggested PbF Solder

There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper, (Sn+Ag+Cu), you can also use Tin and Copper, (Sn+Cu), or Tin, Zinc, and Bismuth, (Sn+Zn+Bi). Please check the manufacturer's specific instructions for the melting points of their products and any precautions for using their product with other materials.

The following lead free (PbF) solder wire sizes are recommended for service of this product: 0.3mm, 0.6mm and 1.0mm.

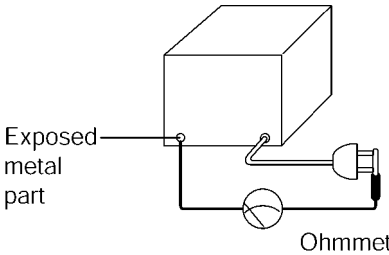


2.2. Discarding of P. C. Board

When discarding P. C. Board, delete all personal information such as telephone directory and caller list or scrap P. C. Board.

2.3. Insulation Resistance Test

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with an ohmmeter between the jumper AC plug and each exposed metal cabinet part (screw heads, control shafts, bottom frame, etc.).
   Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard.



Resistance = more than 10MΩ (at DC 500 V)

2.4. Battery Caution

CAUTION

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose used batteries according to the manufacturer's instructions:

The lithium battery is a critical component (type No. CR23541GUF). Please observe for the proper polarity and exact location when replacing and soldering the replacement battery.

3 Specifications

Applicable Lines:	Public Switched Telephone Network
Document Size:	Max. 216 mm in width
	Max. 600 mm in length
Effective Scanning Width:	208 mm
Effective Printing Width:	A4 : 202 mm
	Letter/Legal:208 mm
Transmission Time*:	Approx. 4 s/page (ECM-MMR Memory transmission)**
Scanning Density:	Horizontal:
	8 pels/mm
	Vertical:
	3.85 lines/mm - STANDARD
	7.7 lines/mm -FINE/PHOTO/MIXED(PHOTO WITH TEXT)
	15.4 lines/mm -SUPER FINE
Photo resolution:	64-level
Scanner Type:	Contact Image Sensor
Printer Type:	Laser printer
Data Compression System:	Modified Huffman (MH), Modified READ (MR), Modified, Modified READ (MMR)
Modem Speed:	33,600/31,200/28,800/26,400/24,000/21,600/19,200/16,800/14,400/12,000/9,600/7,200/
	4,800/2,400 bps; Automatic Fallback
Operating Environment:	10°C—32.5°C, 20%—70% RH (Relative Humidity)
Dimensions:	218 mm × 360 mm × 357 mm
Mass (Weight):	Approx. 7.4 kg
Power Consumption:	Standby: Approx. 2 W
	Transmission: Approx. 12W
	Reception: Approx. 240 W
	Copy: Approx. 240 W
	Maximum: Approx. 950W (When the fuser lamp turns on)
Power Supply:	220-240 V AC, 50/60Hz
FAX Memory Capacity:	Approx. 150 pages of memory transmission.
	Approx. 100 pages of memory reception.
	(Based on ITU-T No. 1 Test Chart in standard resolution.)
Laser diode properties:	Laser output: Max. 5 mW
	Wave length: 760 nm—810 nm
	Emission duration: Continuous
Print Speed:	10 ppm (page per minute)
Printing Resolution:	600 × 600 dpi
LED light of CIS properties:	LED radiation output: Max. 1 mW
	Wavelength: Green 520 nm typ.
	Emission duration: Continuous

* Transmission speed depends upon the contents of the pages, resolution, telephone line conditions and capability of the other party's machine.

** Transmission speed is based upon the ITU-T No. 1 Test Chart. (Refer to **ITU-T No.1 Test Chart**(P.208).) If the capability of the other party's machine is inferior to your unit, the transmission time may be longer.

Note:

- Design and specifications are subject to change without notice.
- The pictures and illustrations in these instructions may vary slightly from the actual product.

Recording paper specifications

Recording paper size: A4: 210 mm × 297 mm
Letter: 216 mm × 279 mm
Legal: 216 mm × 356 mm

Recording paper weight: 60 g/m^2 to 90 g/m^2

Note for recording paper:

- We recommend that you test paper (especially special sizes and types of paper) on the unit before purchasing large quantities.
- Do not use the following types of paper:
  - Paper with a cotton and/or fibre content that is over 20 %, such as letterhead paper or paper used for resumes
  - Extremely smooth or shiny paper, or paper that is highly textured
  - Coated, damaged or wrinkled paper
  - Paper with foreign objects attached, such as tabs or staples
  - Paper which has dust, lint or oil stains
  - Paper that will melt, vaporize, discolour, scorch or emit dangerous fumes near 200 °C, such as vellum paper. These materials may transfer onto the fusing roller and cause damage.
  - Moist paper
  - Inkjet paper
- Some paper is designed to be printed on only one side. Try printing on the other side of the paper if you are not happy with the print quality, or if misfeeding occurs.
- For proper paper feeding and best print quality, we recommend using long-grained paper.
- Do not use paper of different types or thickness at the same time. This may cause paper jams.
- Avoid double-sided printing.
- Do not use paper printed from this unit for doublesided printing with other copiers or printers. This may cause paper jams.
- To avoid curling, do not open paper packs until you are ready to use the paper. Store unused paper in the original packaging, in a cool and dry location.

4 General/Introduction

4.1. Optional Accessories

Model No.	Description	Specifications
KX-FAT88A/ KX-FAT88E	Toner cartridge	1 toner cartridge
KX-FAD89A/KX-FAD89E	Drum unit	1 drum unit

5 Features

General

- Help function

  Display:

  1. BASIC SETTINGS
  2. FEATURE LIST
  3. PHONEBOOK
  4. FAX RECEIVING
  5. COPIER
  6. REPORTS
  7. CALLER ID

Plain Paper Facsimile Machine

- Automatic document feeder (15 sheets)
- Quick scan
- Resolution: Standard/Fine/Super fine/Photo/Photo with text. (64 level)
  - STANDARD: For printed or typewritten documents with normal-sized characters.
  - FINE: For documents with small printing.
  - SUPER FINE: For documents with very small printing. This setting is effective only when the other party has a compatible fax machines.
  - PHOTO: For documents containing photographs, shaded drawing, etc.
  - MIXED (PHOTO WITH TEXT): For documents containing photograph and text.
- Broad cast
- 200-sheet paper capacity (60 g/m2~ 75 g/m2[16 lb~20 lb.])

Integrated Telephone System

- On-hook dialing
- Monitor speaker
- Voice muting
- Redialing function
- 100-Station telephone directory
- Caller identification service (Caller ID)

  This unit is Caller ID compatible. In order to display the caller's telephone number, you must subscribe to the appropriate service of your local telephone company.

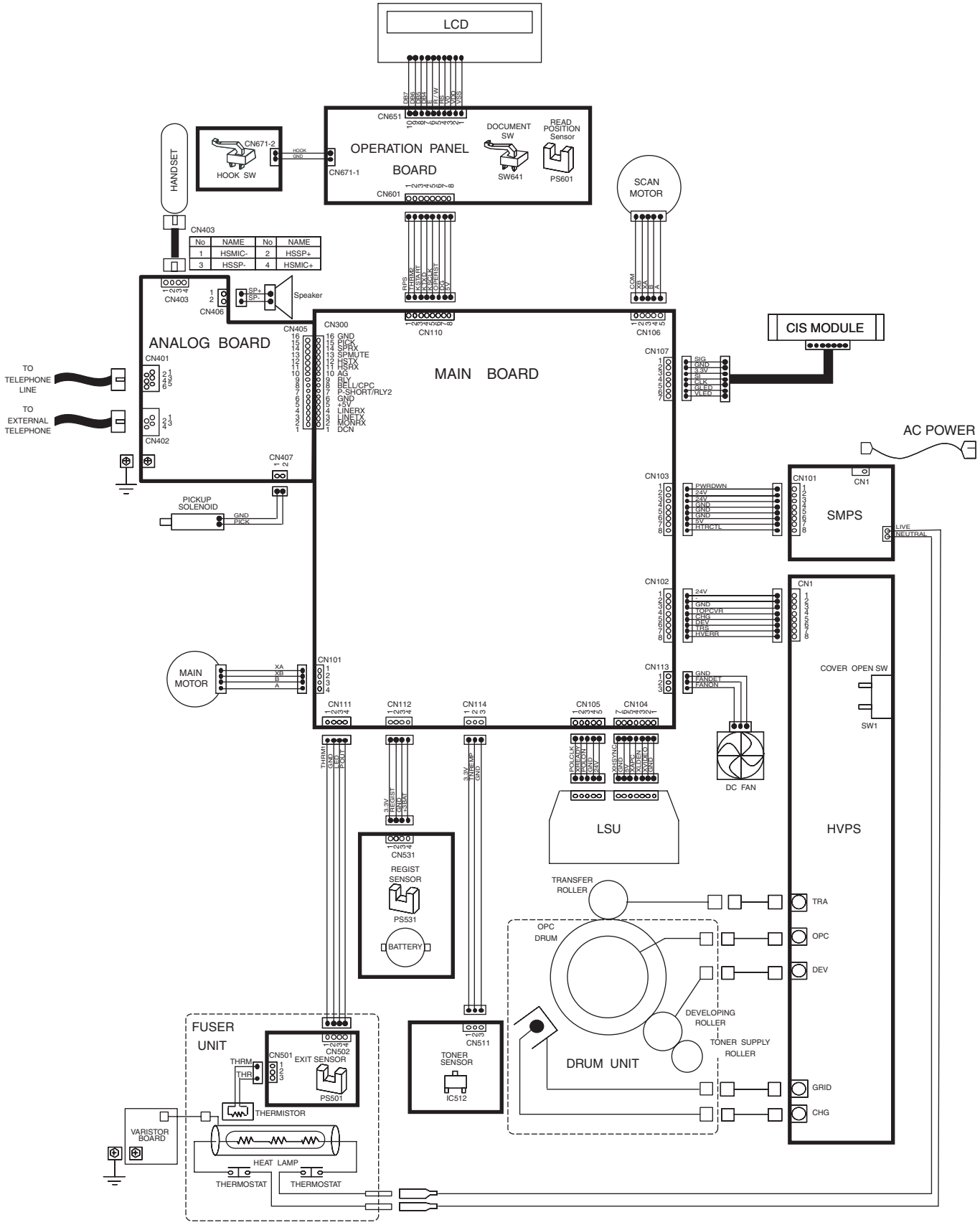
  Important:
  - This unit is designed in accordance with the ETS (European Telecommunication Standard) and only supports the basic CLIP (Calling Line Identification Presentation) features.
  - This unit will only display the caller's telephone number and name.
  - This unit will not support future additional telephone services.
  - Depending on the service of the local telephone company, the date/time of the call or the caller's name may not be displayed.

Enhanced Copier Function

- Multi-copy function (up to 99 copies)
- Enlargement and reduction
- Collate
- 64-Level halftone

6 Technical Descriptions

6.1. Connection Diagram



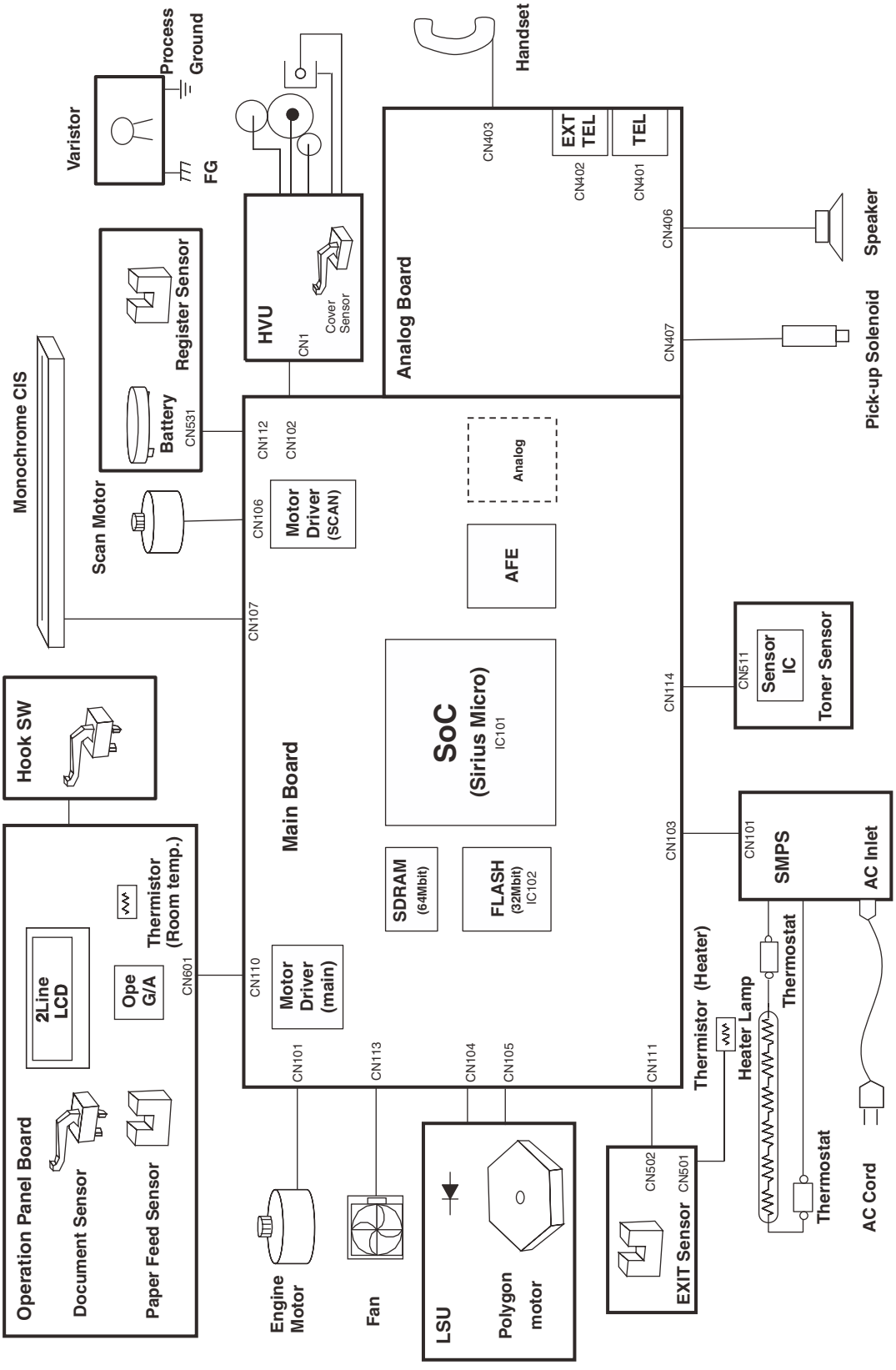
6.2. General Block Diagram

The following is an outline of each device IC on the digital board.

1. SOC (IC101)
   This custom IC is used for general FAX operations.

(1)	CPU:	This model uses a Z80 equivalent CPU operating at 16MHz. Many of the peripheral functions are handled by custom designed LSIs. As a result, the CPU only needs to process the results.
(2)	RTC:	Real time clock.
(3)	DECODER:	Decords the address.
(4)	ROM/RAM I/F:	Controls the SELECT signal of ROM or RAM and bank switching.
(5)	LSU I/F:	Controls the polygon motor and outputs the VIDEO signal to LSU.
(6)	I/O PORT:	I/O Port Interface.
(7)	ANALOG UNIT:	Sends beep tones, etc. Convert the analog signal to the digital signal.
(8)	MOTOR I/F:	Controls the SCAN Motor.
(9)	OPERATION PANEL I/F:	Serial interface with Operation Panel.
(10)	ANALOG GATE ARRAY I/F: Controls the ANALOG GATE ARRAY.	Controls the ANALOG GATE ARRAY.
(11)	MOTOR I/F:	Controls the ENGINE Motor.
(12)	FAN I/F:	Controls FAN MOTOR and detect the rotation of FAN MOTOR.
(13)	SENSOR I/F:	Controls the LED and detect the sensor signal.
(14)	MODEM:	Performs the modulation and the demodulation for FAX communication.

2. ROM (IC102)
   This 4MB FLASH ROM contains all of the program instructions on the unit operations.
3. Synchronous Dynamic RAM (IC103)
   This SDRAM is used for CPU work and receiving memory and page memory.
4. Read Section
   CIS image sensor to read transmitted documents.
5. LSU (Laser Scanning Unit)
   Forms the images on the OPC drum by rotating polygon motor and reflecting the laser beam against polygon.
6. Analog Board
   Composed of ITS circuit and NCU circuit.
7. Sensor Section
   Composed of 3 switches and 4 sensors.
8. Power Supply Board Switching Section
   Supplies +5V and +24V to the unit and controls the heat lamp.
9. High Voltage Power Supply Board Section
   Supplies bias need for the printing operation: bias of the DRUM, Developing and Transcription.
10. Fixing Unit
    Composed heat lamp, thermistor and thermal fuse.


Varistor
Process Ground
FG
Handset
HVU
CN1
Cover Sensor
Register Sensor
Battery
CN531
Monochrome CIS
Scan Motor
CN112
CN102
CN106
Motor Driver (SCAN)
Analog Board
CN403
EXT TEL
CN402
TEL
CN401
CN406
CN407
Speaker
Pick-up Solenoid
Analog
AFE
CN107
Hook SW
Main Board
SoC
(Sirius Micro)
IC101
CN114
CN511
Sensor IC
Toner Sensor
SDRAM
(64Mbit)
FLASH
(32Mbit)
IC102
CN103
CN101
SMPS
AC Inlet
Thermistor (Room temp.)
CN601
CN110
Motor Driver (main)
Operation Panel Board
2Line LCD
Ope G/A
Document Sensor
Paper Feed Sensor
CN101
CN113
CN104
CN105
CN111
Thermistor (Heater)
Heater Lamp
Thermostat
Thermostat
AC Cord
Engine Motor
Fan
LSU
Polygon motor
CN502
CN501
EXIT Sensor

6.3. Facsimile Section

6.3.1. Digital Section

6.3.1.1. SOC (IC101)

This custom IC is used for general FAX operations.

Description of Pin Distribution (IC101)

PIN NO.	I/O	Assigned Signal	EXPLANATION
ADR0	O	A[0]	Address Bus
ADR1	O	A[1]	Address Bus
ADR2	O	A[2]	Address Bus
ADR3	O	A[3]	Address Bus
ADR4	O	A[4]	Address Bus
ADR5	O	A[5]	Address Bus
ADR6	O	A[6]	Address Bus
ADR7	O	A[7]	Address Bus
ADR8	O	A[8]	Address Bus
ADR9	O	A[9]	Address Bus
ADR10	O	A[10]	Address Bus
ADR11	O	A[11]	Address Bus
ADR12	O	A[12]	Address Bus
ADR13	O	TP_P15	Test Pin
ADR14	O	TP_P16	Test Pin
ADR15	O	TP_P17	Test Pin
RBA0	O	RBA[0]	Address Bus
RBA1	O	RBA[1]	Address Bus
RBA2	O	RBA[2]	Address Bus
RBA3	O	RBA[3]	Address Bus
RBA4	O	RBA[4]	Address Bus
RBA5	O	RBA[5]	Address Bus
RBA6	O	RBA[6]	Address Bus
RBA7	O	RBA[7]	Address Bus
RBA8	O	-(RBA[8])	-
DB0	I/O	D[0]	Data Bus
DB1	I/O	D[1]	Data Bus
DB2	I/O	D[2]	Data Bus
DB3	I/O	D[3]	Data Bus
DB4	I/O	D[4]	Data Bus
DB5	I/O	D[5]	Data Bus
DB6	I/O	D[6]	Data Bus
DB7	I/O	D[7]	Data Bus
DB8	I/O	D[8]	Data Bus
DB9	I/O	D[9]	Data Bus
DB10	I/O	D[10]	Data Bus
DB11	I/O	D[11]	Data Bus
DB12	I/O	D[12]	Data Bus
DB13	I/O	D[13]	Data Bus
DB14	I/O	D[14]	Data Bus
DB15	I/O	D[15]	Data Bus
XRD	O	RD	XRD
XWR	O	WE	XWR
XNMI	O	TP_NMI	Test Pin
XSYSIN	I	XIN	System Clock in
XSYSOUT	O	XOUT	System Clock out
XVDGIN(XDOTIN)	I	XVDGIN	Video Clock in
XVDGOUT(XDOTOUT)	O	XVDGOUT	Video Clock out
TEST0	I	-	Test Pin
TEST1	I	-	Test Pin
TEST2	I	-	Test Pin
TEST3	I	-	Test Pin
TEST4	I	-	Test Pin
X32IN	I	X32IN	RTC Clock in
X32OUT	O	X32OUT	RTC Clock out
XROMCS	O	XROMCS	Test Pin
XFCS	I/O	XFCS	Test Pin
FCSG	I	FCSG	Test Pin

PIN NO.	I/O	Assigned Signal	EXPLANATION
XRESCS2	O	-	Test Pin
XCHKCS	O	TP_CHKCS	Test Pin
RAS	O	RAS	SD-RAM IF
CAS	O	CAS	SD-RAM IF
SDWE	O	SDWE	SD-RAM IF
SDCS	O	SDCS	SD-RAM IF
SDDQML	O	SDDQML	SD-RAM IF
SDDQMU	O	SDDQMU	SD-RAM IF
SDCLK	O	SDCLK	SD-RAM Clock
XEXTINT	I	TP_EXINT	Test Pin
TM0	O	TMA	Tx Motor Control
TM1	O	TMB	Tx Motor Control
TM2	O	XTMA	Tx Motor Control
TM3	O	XTMB	Tx Motor Control
TXE	O	TMPWR	Tx Motor Control
APC	O	XAPC	Laser IF
LDON	O	XLASERON	Laser IF
VIDEO	O	XVIDEO	Laser IF
HSYNC	I	XHSYNC	Laser IF
READY	I	-(PU)	Polygon Motor IF
POLON	O	POLON	Polygon Motor IF
POLCLK	O	POLCLK	Polygon Motor IF
FTG	O	FTG(SI)	CIS IF
F1	O	F1(CISCLK)	CIS IF
XRESET	I	XRESET	RESET
XBATRST	I	XBATRST	RTC Reset
XBACKEN	I	XBACKEN	Backup Reset
XWDERR	O	XWDERR	Watchdog Reset
TXD	O	TXD	for Flash ROM Program
RXD	I	RXD	for Flash ROM Program
RTS	O	RTS	for Flash ROM Program
CTS	I	CTS	for Flash ROM Program
DSR	O	-	-
DTR	O	-	-
DCD	O	-	-
CPC	O	-	-
HTRCTL	O	HTRCTL	Heat lamp Control
TRS	O	TRS	Transfer Voltage Control
DEV	O	DEV	Developing Voltage Control
XHSTRD	O	- (RBA[9])	-
XHSTWR	I	TP_CHK	Test Pin
TXD2	O	-	-
RXD2	I	-(PU)	-
RTS2	O	-	-
CTS2	I	-(PU)	-
RM0	O	RMA	Rx Motor Control
RM1	O	RMB	Rx Motor Control
RM2	O	XRMA	Rx Motor Control
RM3	O	XRMB	Rx Motor Control
RXE	O	-	Rx Motor Control
KSTART	O	KSTART	Operation Panel IF
KLATCH	O	-	-
KSCLK	O	KSCLK	Operation Panel IF
KTXD	I/O	KTXD	Operation Panel IF
KRXD	I	RPS	Read Position Signal in
SENIN0	I	POUT	Paper Exit signal in
SENIN1	I	REGIST	Paper Regist signal in
SENIN2	I	BELL	Analog Board IF
SENIN3	I	TNREMP	Toner Detection Signal in
SENCTL0	O	SENCTL0	Sensor Power Control
SENCTL1	O	SENCTL1	Sensor Power Control
SENCTL2	O	-	-
SENCTL3	O	24CTL	+24VPower Control
MILAT	O	-	-
MIDAT	O	MDMMICIN	Modem Signal Control
MICLK	O	TAMSPENB	TAM Signal Control
FANDET1	I	FANDET	Fan Rotation Signal in

PIN NO.	I/O	Assigned Signal	EXPLANATION
FANON1	O	FANON1	Fan Control
FANDET2	O	-	-
FANON2	O	FANON2	Fan Control
VIN0	I	-(PU)	-
VIN1	I	-(PU)	-
VIN2	I	-(PU)	-
VOUT0	O	-	-
VOUT1	O	-	-
VOUT2	O	-	-
GIOP30	O	5CTL	+5V Power Control
GIOP31	I	HVERR	High Voltage Unit Error
GIOP32	O	CISON	CIS IF
GIOP33	O	CISLEDON	CIS IF
GIOP34	O	-	-
GIOP35	O	PICKUP	Pickup Solenoid Control
GIOP36	O	DTMFSPENB	DTMF Control
GIOP37	O	LIN_RLY(LINERLY)	Relay Control
GIOP40	O	-	-
GIOP41	O	TONE_LN_ENB	Tone Control
GIOP42	O	OPERST	Operation Panel IF
GIOP43	O	P_SHORT	Analog Board IF
GIOP44	O	MDMRXEN	Analog Board IF
GIOP45	I	XREADY	Polygon Motor IF
GIOP46	O	SP_MUTE	Speaker Mute
GIOP47	O	HSRXEN	Analog Board IF
GIOP50	O	DCN	Analog Board IF
GIOP51	O	MDMTXEN	Analog Board IF
GIOP52	O	-	-
GIOP53	O	PDWN	PSU Output Control
GIOP54	I	TOPCVR	Top Cover Open
GIOP55	I/O	MMPWR1	Rx Motor Control
GIOP56	O	CHG	Charger Voltage Control
GIOP57	I/O	MMPWR2	Rx Motor Control
GIOP60	O	CIDENB	Analog Board IF
GIOP61	O	MMENB	Rx Motor Control
GIOP62	O	HSTXMUTE	Analog Board IF
GIOP63	O	-	-
GIOP64	O	-	-
ABITCLK	I	ABITCLK(1903 SCLK)	AFE IF
ASPCLK	O	ASPCLK(1903 FS)	AFE IF
ATXD	O	ATXD(1903 SDIN 47kPD)	AFE IF
ARXD	I	ARXD(1903 SDOUT)	AFE IF
BBITCLK	I	-(PD)	-
BSPCLK	I	-(PD)	-
BTXD	O	-	-
BRXD	I	-(PD)	-
AFERST	O	AFERST	AFE IF
AFECLK	O	AFECLK	AFE Clock
RING	I	-(PU)	-
DP	O	-	-
EYECLK	O	-	-
EYEDAT	O	-	-
AFESEL0	I	-(PD)	-
AFESEL1	I	-(PD)	-
NDBGREQ	I	-(PU)	-
DBGMOD	O	-	-
TONE	O	TONE	TONE
AIN1	I	AIN1(CIS SIG)	CIS Signal
AIN2	I	AIN2(THRM1)	Heat lamp Temp. Signal
AIN3	I	AIN3(THRM2)	Room Temp. Signal
VCL	I	OPEN	-
AMON		TP_AMON	Test Pin
VREFB		0.01uF 10uF	AD Converter Reference
VREFT		0.01uF 10uF	AD Converter Reference
EVOLIN		EVOLIN	Electrical Volume input
EVOLREF		EVOLREF	Electrical Volume Reference
EVOLOUT		EVOLOUT	Electrical Volume output

6.3.2. RTC Backup Circuit

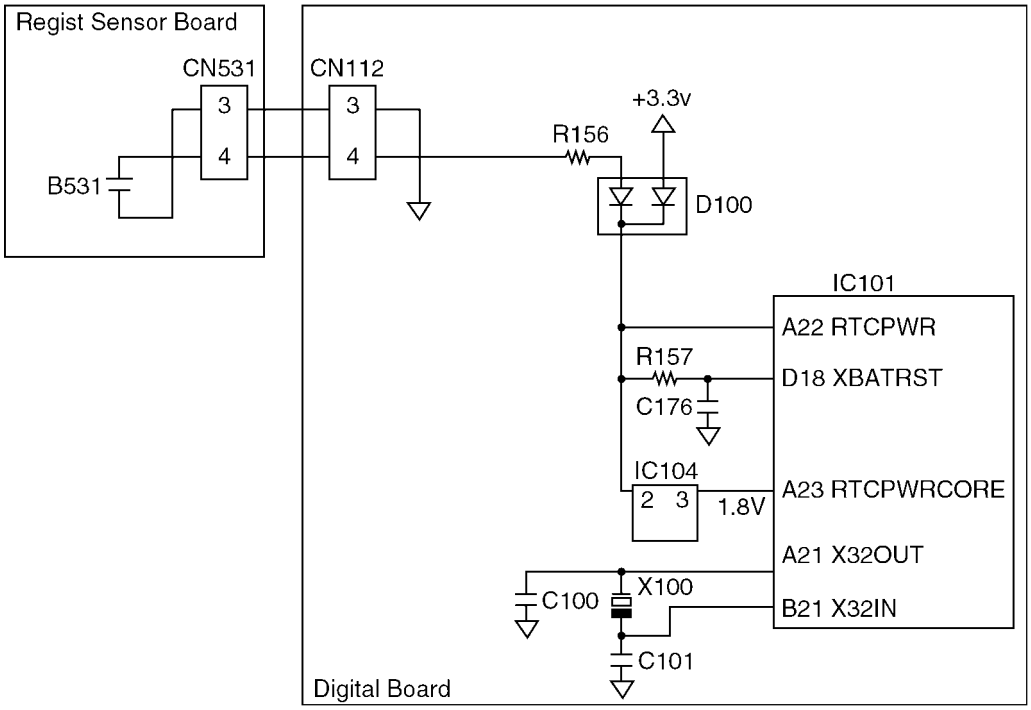
1. **Function**

   This set has a lithium battery (B531) which works for the Real Time Clock IC (RTC: inside IC101).
   The RTC continues to work, backed up by a lithium battery even when the power switch is OFF.

2. **RTC Inside (IC101) Backup Circuit Operation**

   When the power switch is turned ON, power is supplied to the RTC (inside IC101). At this time, the voltage at pin A22 of the IC101 is +3.3V. When the power switch is turned OFF, the BAT531 supplies power to RTC through D100. When the power switch is OFF and the voltage of +3.3V decreases, pin A22 of RTC (IC101) becomes roughly the same voltage as the battery voltage. RTC goes into the backup mode, in which the power consumption is lower.

Circuit Diagram



6.4. Analog circuit of Telephone section

6.4.1. General

This section is the explanation about analog signal route of voice, beep, fax signal, DTMF signal and so on.
Refer to **Check sheet for analog signal route**.

6.4.1.1. Telephone Monitor

1. **Function**
   This is the function when you are not holding the handset and can hear the caller's voice from the line.
2. **Signal Path**
   Refer to **Check sheet for analog signal route**(P.107).

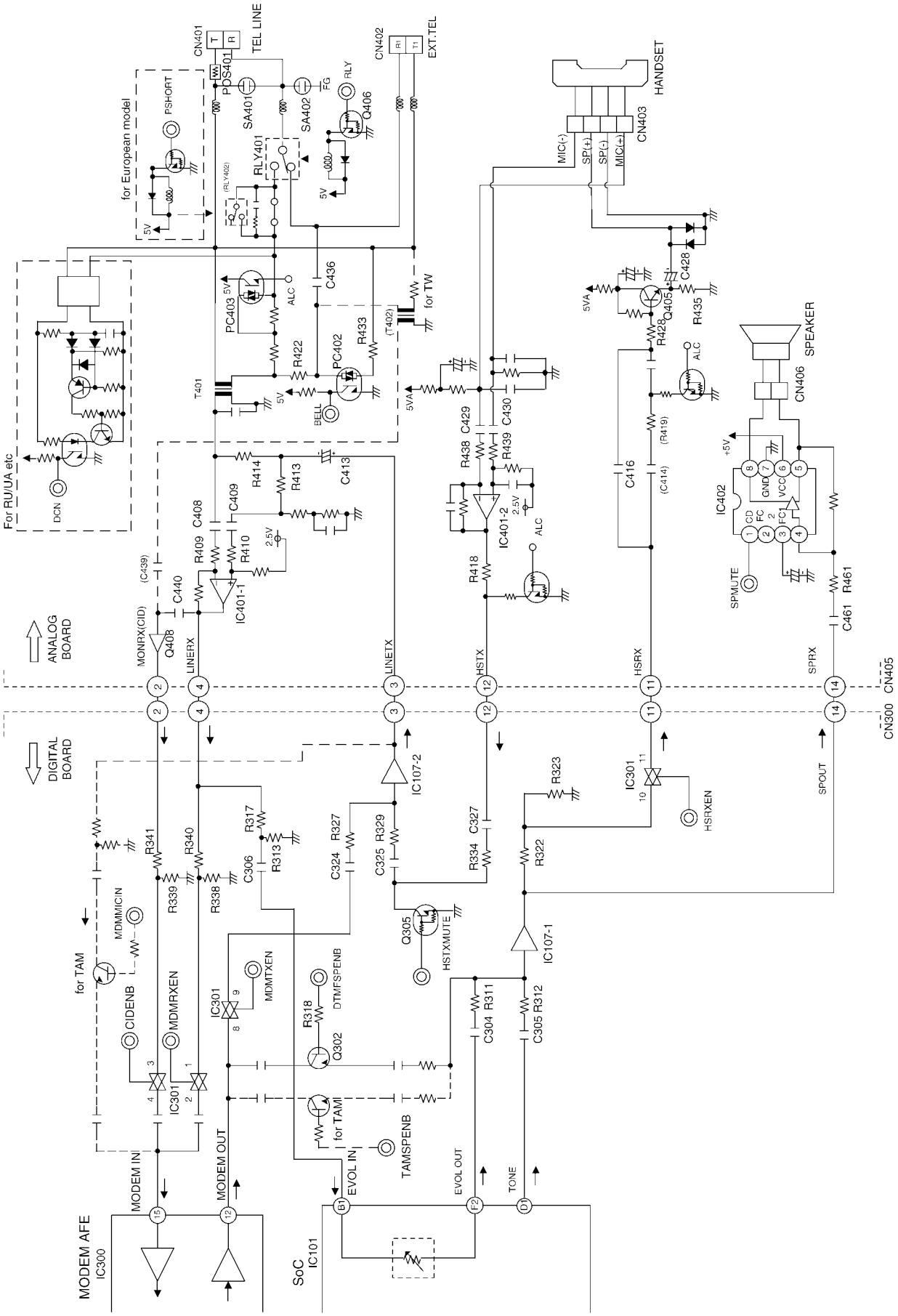
6.4.1.2. Handset Circuit

1. **Function**
   This circuit controls the conversation over the handset, i.e. the transmitted and received voices to and from the handset.
2. **Signal Path (Transmission signal)**
   Refer to **Check sheet for analog signal route**(P.107).

6.4.1.3. Monitor Circuit

1. **Function**
   This circuit monitors various tones, such as (1) DTMF tone, (2) Alarm/Beep/Key tone/Bell.
2. **Signal Path**
   Refer to **Check sheet for analog signal route**(**P.107**).

6.4.1.4. Analog Block Diagram



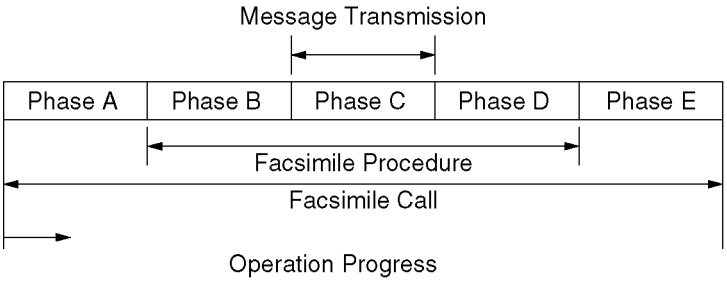
6.5. Modem Section

6.5.1. Function

The unit uses MODEM (IC101) that serves as an interface between the control section for FAX transmission and reception and the telephone line. During a transmitting operation, the digital image signals are modulated and sent to the telephone line via AFE(Analog Front End : IC300).
During a receiving operation, the analog image signals which are received from the telephone line via AFE(IC300) are demodulated and converted into digital image signals. The communication format and procedures for FAX communication are standardized by ITU-T. MODEM has hardware which sends and detects all of the necessary signals for FAX communication.
It can be controlled by the SOC (inside:IC101).
This MODEM also sends DTMF signals, and detects a caller ID signal, a busy tone and dial tones.

Overview of Facsimile Communication Procedures (ITU-T Recommendation):

1. **ON CCITT (International Telegraph and Telephone Consultative Committee)**
   The No. XIV Group of ITU-T, one of the four permanent organizations of the International Telecommunications Union (ITU), investigates and make recommendations on international standards for facsimiles.
2. **Definition of Each Group**
   - Group I (G1)
     Official A-4 size documents without using formats which reduce the band width of a signal are sent over telephone lines.
     Determined in 1968.
     Transmission for about 6 minutes at a scanning line density of 3.85 lines/mm.
   - Group II (G2)
     Using reduction technology in the modulation/demodulation format, an A-4 size document is sent at an official scanning line density of 3.85 lines/mm for about 3 minutes.
     Methods to suppress redundancy are not used.
     Determined in 1976.
   - Group III (G3)
     Method of suppressing redundancy in the image signal prior to modulation is used. An A-4 size document is sent within about one minute.
     Determined in 1980.
   - Group IV (G4)
     Transmission is via the data network. A method is provided for suppressing redundancy in signals prior to transmission, and error-free reception of transmission is possible.
     The scope of these facsimile applications is not limited simply to transmission of written statements. Through symbiotic linkages with other communication methods, it can be expected to expand to include integrated services.
3. **Facsimile Call Time Series**
   As shown in the following diagram, the facsimile call time series is divided into five phases.



Phase A: Call setting
Call setting can be manual/automatic.
Phase B: Pre-message procedure
Phase B is a pre-processing procedure and sequence for confirming the status of the terminal, transmission route, etc., and for terminal control. It implements terminal preparation status, determines and displays terminal constants, confirms synchronization status, etc. and prepares for transmission of facsimile messages.
Phase C: Message transmission
Phase C is the procedure for the transmitting facsimile messages.
Phase D: Post message procedure
Phase D is the procedure for confirming that the message is completed and received. For continuous transmission, phase B or phase C is repeated for transmission.
Phase E: Call retrieval
Phase E is the procedure for call retrieval, that is for circuit disconnection.

4. **Concerning Transmission Time**

Transmission Time = Control Time + Image Transmission Time + Hold Time

Transmission time consists of the following.

Control time:

This is time at the start of transmission when the functions at the sending and receiving sides are confirmed, the transmission mode is established, and transmission and reception are synchronized.

Image transmission time:

This is the time required for the transmission of document contents (image data). In general, this time is recorded in the catalog, etc.

Hold time:

This is the time required after the document contents have been sent to confirm that the document was actually sent, and to check for telephone reservations and/or the existence of continuous transmission.

5. **Facsimile Standards**

Item	Telephone Network Facsimile G3 Machine
Connection Control Mode	Telephone Network Signal Mode
Terminal Control Mode	T. 30 Binary
Facsimile Signal Format	Digital
Modulation Mode	PSK (V. 27 ter) or QAM (V. 29) or TCM (V17,V34)
Transmission Speed	300 bps (Control Signal) 33600, 31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, 2400 bps (FAX Signal)
Redundancy Compression Process (Coding Mode)	1 dimension: MH Mode 2 dimension: MR Mode (K=2.4) 3 dimension: MMR Mode
Resolution	Main Scan: 8 pel/mm Sub Scan: 3.85, 7.7l/mm
Line Synchronization Signal	EOL Signal
1 Line Transmission Time [ms/line]	Depends on the degree of data reduction. Minimum Value: 10, 20 Can be recognized in 40ms.

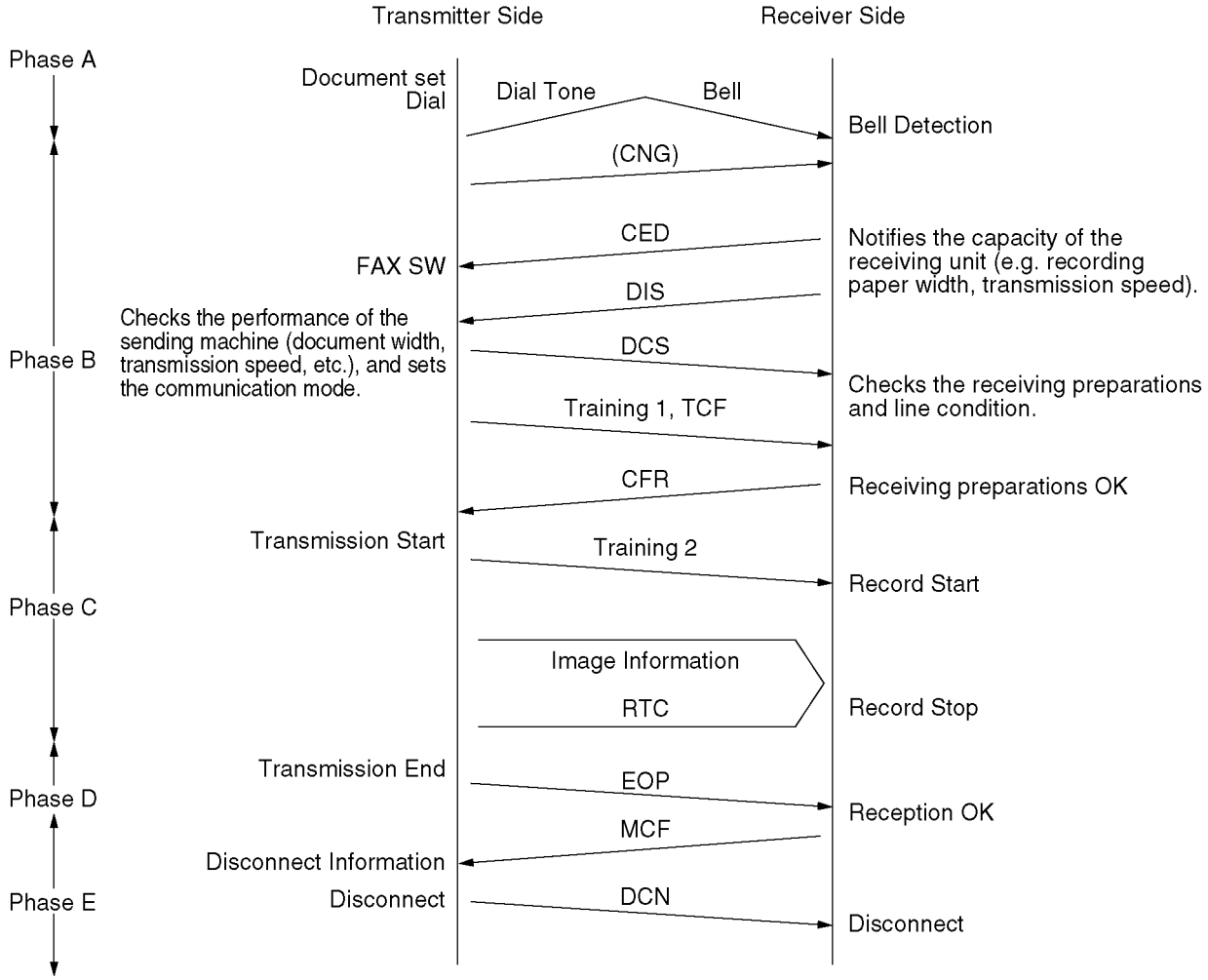
6. **Explanation of Communication and Compression Technology**

a. **G3 Communication Signals (T. 30 Binary Process)**

For G3 Facsimile communication, this is the procedure for exchanging control signals between the sending and receiving machines both before and after transmission of image signals.

Control signals at 300 bps FSK are: 1850 Hz...0, 1650Hz...1.

An example of a binary process in G3 communication is shown below.



Explanation of Signals

Control signals are comprised mainly of 8-bit identification signals and the data signals added to them. Data signals are added to DIS and DCS signals.

Signal.....DIS (Digital Identification Signal)

Identification Signal Format.....00000001

Function:

Notifies the capacity of the receiving unit. The added data signals are as follows.

Signal.....DCS (Digital Command Signal)

Identification Signal Format.....X1000001

Example

(Some models do not support the following items.):

Bit No.	DIS/DTC	DCS
1	Transmitter --- T.2 operation	
2	Receiver --- T.2 operation	Receiver --- T.2 operation
3	T.2 IOC = 176	T.2 IOC = 176
4	Transmitter --- T.3 operation	
5	Receiver --- T.3 operation	Receiver --- T.3 operation
6	Reserved for future T.3 operation features	
7	Reserved for future T.3 operation features.	
8	Reserved for future T.3 operation features.	
9	Transmitter --- T.4 operation	

Bit No.	DIS/DTC	DCS
10	Receiver --- T.4 operation	Receiver --- T.4 operation
11,12,13,14	Data signaling rate	Data signaling rate
0,0,0,0	V.27 ter fall back mode	2400 bit/s, V.27 ter
0,1,0,0	V.27 ter	4800 bit/s, V.27 ter
1,0,0,0	V.29	9600 bit/s, V.29
1,1,0,0	V.27 ter and V.29	7200 bit/s, V.29
0,0,1,0	Not used	14400 bit/s, V.33
0,1,1,0	Reserved	12000 bit/s, V.33
1,0,1,0	Not used	Reserved
1,1,1,0	V.27 ter and V.29 and V.33	Reserved
0,0,0,1	Not used	14400 bit/s, V.17
0,1,0,1	Reserved	12000 bit/s, V.17
1,0,0,1	Not used	9600 bit/s, V.17
1,1,0,1	V.27 ter and V.29 and V.33 and V.17	7200 bit/s, V.17
0,0,1,1	Not used	Reserved
0,1,1,1	Reserved	Reserved
1,0,1,1	Not used	Reserved
1,1,1,1	Reserved	Reserved
15	R8×7.7 lines/mm and/or 200×200 pels/25.4mm	R8×7.7 lines/mm and/or 200×200 pels/25.4mm
16	Two-dimensional coding capability	Two-dimensional coding capability
17, 18	Recording width capabilities	Recording width
(0, 0)	1728 picture elements along scan line length of 215 mm ± 1%	1728 picture elements along scan line length of 215 mm ± 1%
(0, 1)	1728 picture elements along scan line length of 215 mm ± 1% 2048 picture elements along scan line length of 255 mm ± 1% 2432 picture elements along scan line length of 303 mm ± 1%	2432 picture elements along scan line length of 303 mm ± 1%
(1, 0)	1728 picture elements along scan line length of 215 mm ± 1% 2048 picture elements along scan line length of 255 mm ± 1%	2048 picture elements along scan line length of 255 mm ± 1%
(1, 1)	Invalid	Invalid
19, 20	Maximum recording length capability	Maximum recording length
(0, 0)	A4 (297 mm)	A4 (297 mm)
(0, 1)	Unlimited	Unlimited
(1, 0)	A4 (297 mm) and B4 (364 mm)	B4 (364 mm)
(1, 1)	Invalid	Invalid

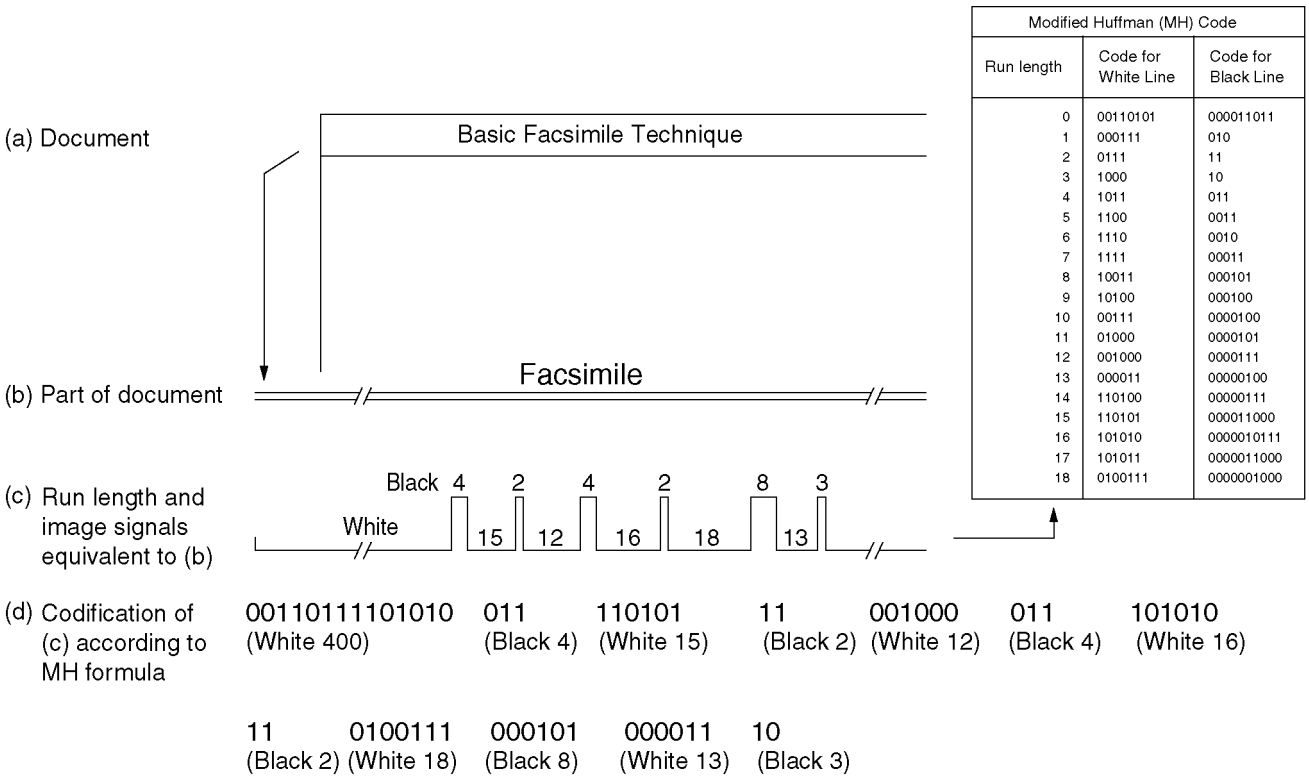
Bit No.	DIS/DTC	DCS
21, 22, 23 (0, 0, 0) (0, 0, 1) (0, 1, 0) (1, 0, 0) (0, 1, 1) (1, 1, 0) (1, 0, 1) (1, 1, 1)	Minimum scan line time capability of the receiver 20 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 40 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 10 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 5 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$ 10 ms at 3.85 l/mm: $T_{7.7} = 1/2\ T_{3.85}$ 20 ms at 3.85 l/mm: $T_{7.7} = 1/2\ T_{3.85}$ 40 ms at 3.85 l/mm: $T_{7.7} = 1/2\ T_{3.85}$ 0 ms at 3.85 l/mm: $T_{7.7} = T_{3.85}$	Minimum scan line time 20 ms 40 ms 10 ms 5 ms 0 ms
24	Extend field	Extend field
25	2400 bit/s handshaking	2400 bit/s handshaking
26	Uncompressed mode	Uncompressed mode
27	Error correction mode	Error correction mode
28	Set to “0”.	Frame size 0 = 256 octets 1 = 64 octets
29	Error limiting mode	Error limiting mode
30	Reserved for G4 capability on PSTN	Reserved for G4 capability on PSTN
31	T.6 coding capability	T.6 coding enabled
32	Extend field	Extend field
33 (0) (1)	Validity of bits 17, 18 Bits 17, 18 are valid Bits 17, 18 are invalid	Recording width Recording width indicated by bits 17, 18 Recording width indicated by this field bit information
34	Recording width capability 1216 picture elements along scan line length of 151 ± mm 1%	Middle 1216 elements of 1728 picture elements
35	Recording width capability 864 picture elements along scan line length of 107 ± mm 1%	Middle 864 elements of 1728 picture elements
36	Recording width capability 1728 picture elements along scan line length of 151 ± mm 1%	Invalid
37	Recording width capability 1728 picture elements along scan line length of 107 ± mm 1%	Invalid
38	Reserved for future recording width capability.	
39	Reserved for future recording width capability.	
40	Extend field	Extend field
41	R8×15.4 lines/mm	R8×15.4 lines/mm
42	300×300 pels/25.4 mm	300×300 pels/25.4 mm
43	R16×15.4 lines/mm and/or 400×400 pels/25.4 mm	R16×15.4 lines/mm and/or 400×400 pels/25.4 mm
44	Inch based resolution preferred	Resolution type selection “0”: neuritic based resolution “1”: inch based resolution
45	Metric based resolution preferred	Don’t care
46	Minimum scan line time capability for higher resolutions “0”: $T_{15.4} = T_{7.7}$ “1”: $T_{15.4} = 1/2T_{7.7}$	Don’t care
47	Selective Polling capability	Set to “0”.
48	Extend field	Extend field

Note 1 - Standard facsimile units conforming to T.2 must have the following capability: Index of cooperation (IOC)=264.
Note 2 - Standard facsimile units conforming to T.3 must have the following capability: Index of cooperation (IOC)=264.
Note 3 - Standard facsimile units conforming to T.4 must have the following capability: Paper length=297 mm.

Signal	Identification Signal Format	Function
Training 1	————————	A fixed pattern is transmitted to the receiving side at a speed (2400 to 14400 bps) designated by DCS, and the receiving side optimizes the automatic equalizer, etc., according to this signal.

Signal	Identification Signal Format	Function
TCF (Training Check)	————————	Sends 0 continuously for 1.5 seconds at the same speed as the training signal.
CFR (Confirmation to Receive)	X0100001	Notifies the sending side that TCF has been properly received. If TCF is not properly received, FTT (Failure To Train) X0100010 is relayed to the sender. The sender then reduces the transmission speed by one stage and initiates training once again.
Training 2	————————	Used for reconfirming the receiving side like training 1.
Image Signal	Refer to the next page.	————————
RTC (Return to Control)	————————	Sends 12 bits (0...01 × 6 times) to the receiver at the same speed as the image signal and notifies completion of transmission of the first sheet.
EOP (End of Procedure)	X1110100	End of one communication
MCF (Message Confirmation)	X0110001	End of 1 page reception
DCN (Disconnect)	X1011111	Phase E starts.
MPS (Multi-Page Signal)	X1110010	Completion of transmission of 1 page. If there are still more documents to be sent, they are output instead of EOP. After MCF reception, the sender transmits an image signal of the second sheet.
PRI-EOP (Procedural Interrupt-EOP)	X1111100	If there is an operator call from the sender, it is output after RTC.
PIP (Procedural Interrupt Positive)	X0110101	This is output when an operator call is received.

b. **Redundancy Compression Process Coding Mode**
This unit uses one-dimensional MH format.



Modified Huffman (MH) Code

Run length	Code for White Line	Code for Black Line
0	00110101	000011011
1	000111	010
2	0111	11
3	1000	10
4	1011	011
5	1100	0011
6	1110	0010
7	1111	00011
8	10011	000101
9	10100	000100
10	00111	0000100
11	01000	0000101
12	001000	0000111
13	000011	00000100
14	110100	00000111
15	110101	000011000
16	101010	0000010111
17	101011	0000011000
18	0100111	0000001000

(c) Total bit number before MH codification (497 bit)
(d) Total bit number after MH codification (63 bit)

6.6. NCU Section

6.6.1. General

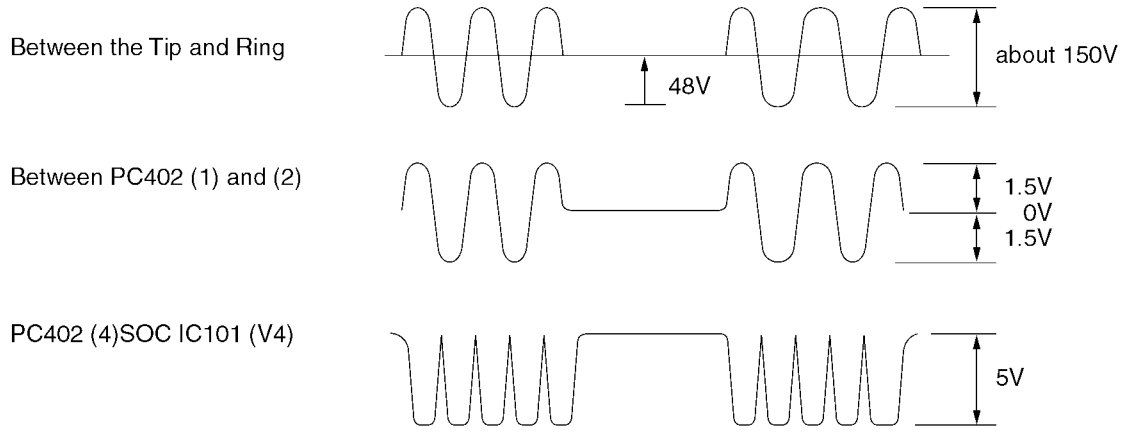
NCU is the with the telephone line. It is composed of Bell detection circuit, Pulse dial circuit, Line amplifier and sidetone circuits. The following is a brief explanation of each circuit.

6.6.2. Line Relay (RLY401)

1. **Circuit Operation**
   Normally, this relay switches to the external telephone side (break) and switches to the open side (make) while OFF-HOOK.
   { IC101 (V6) High Level→CN300 (9) High Level} →CN405 (9) High Level→Q406 ON→RLY401 (ON)→(make)

6.6.3. Bell Detection Circuit

1. **Circuit Operation**
   The signal waveform for each point is indicated below. The signal (low level section) input to pin V4 of SOC IC101 on the digital board is illustrated.



TEL LINE→PC402 (1, 2→4) →R342→IC101 (V4) : Bell

6.6.4. Pulse Dial Circuit and ON/OFF Hook Circuit

IC101 (V6) High Level(make)→Q406 ON(make)→RL401 ON(make)→TEL line

IC101 (V6) Low Level(break)→Q406 OFF(break)→RL401 OFF(break)→TEL line

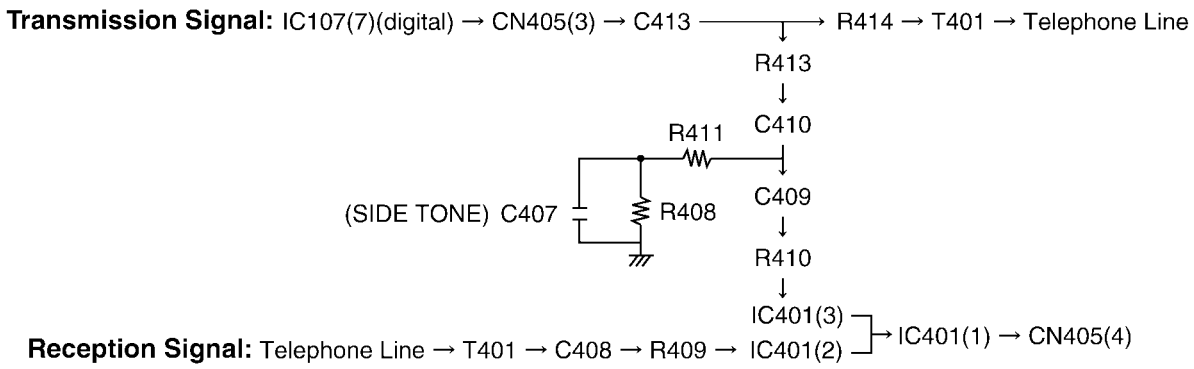
6.6.5. Line Amplifier and Side Tone Circuit

1. **Circuit Operation**

The reception signal output from the line transformer T401 is input to pin (2) of IC401 via C408, R409 and then the signal is amplified at pin (1) of IC401 and sent to the reception system.

The transmission signal is output from IC107(7) and transmitted to T401 via C413 and R414. If the side tone circuit is not applied, the transmission signal will return to the reception amplifier via C408 and R409.When the side tone circuit is active, the signal output from IC107 pin (7) passes through R413, C410, C409,and R410 and goes into the amplifier IC401 pin (3). This circuit is used to cancel the transmission return signal.

Side Tone Circuit



6.6.6. Caller ID Defection

This unit is compatible with the Caller ID service offered by your local telephone company. To use this feature, you must subscribe to a Caller ID service. The data for the caller ID from the telephone exchange is sent during the interval between the first and second rings of the bell signal. The data from the telephone exchange is a modem signal which is modulated in an FSK (Frequency Shift Keying) format. Data “0” is a 1200 Hz sine wave, and data 1 a 2200 Hz sine wave.

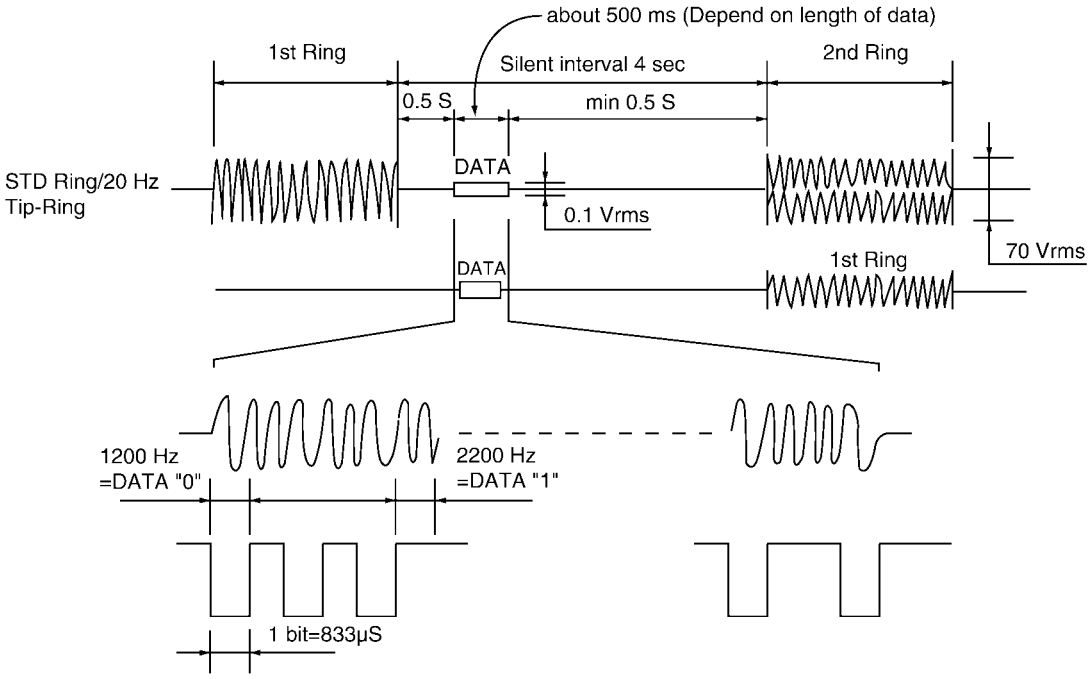
There are two type of the message format, which can be received: i.e. the single data message format and multiple data message format.

The multiple data format allows to transmit the name and data code information in addition to the time and telephone number data. When there is multiple data in the unit, the name or telephone number is displayed.

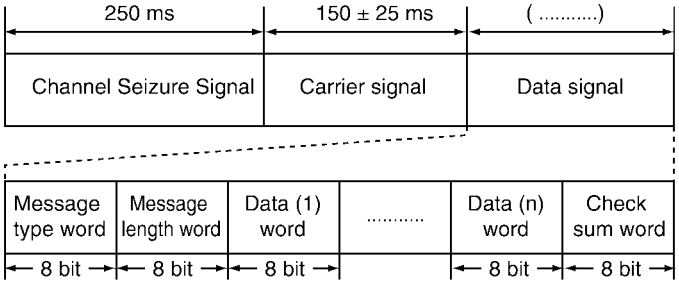
The Caller ID signal input from TEL LINE is processed with MODEM (included IC101).

Refer to **Check sheet for analog signal route**(P.107) for the route of caller ID signal.

Timing Chart



•Single data message

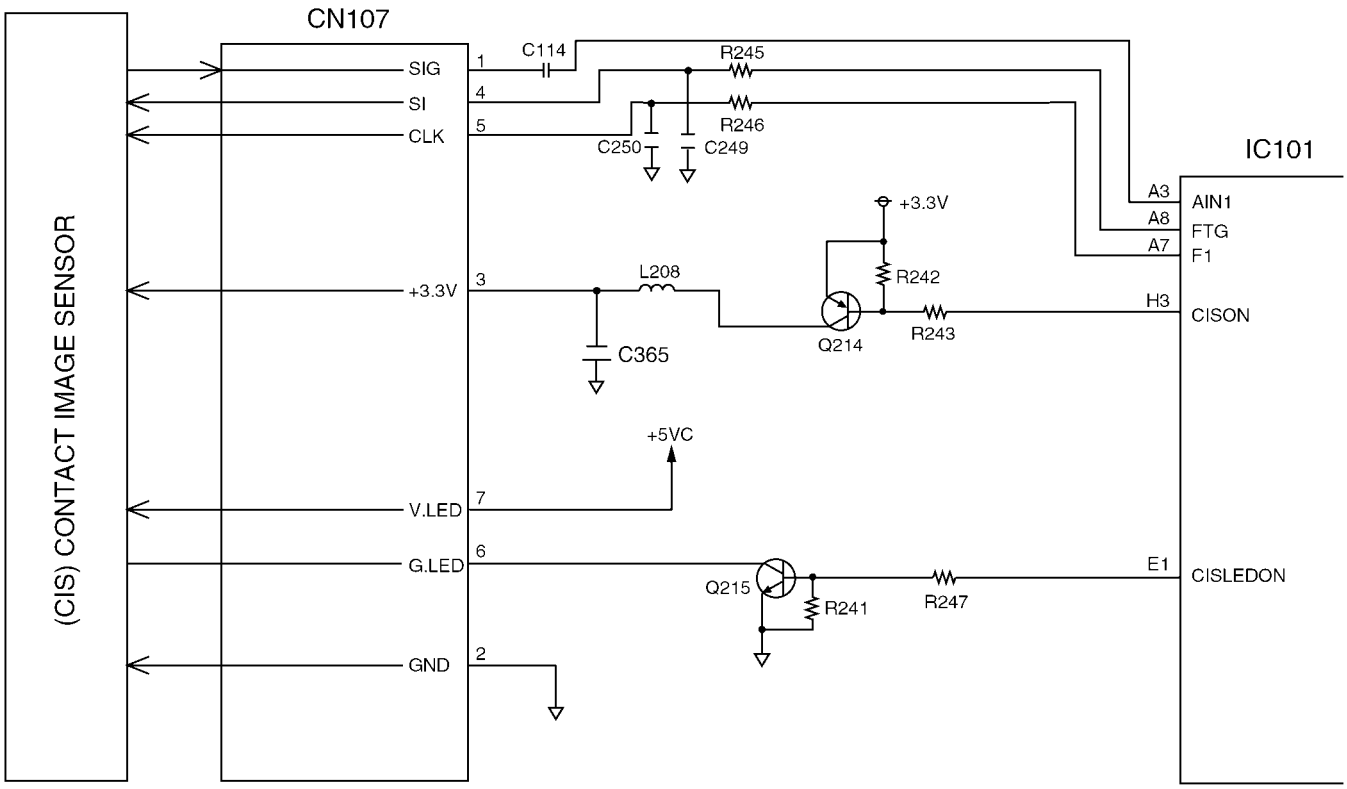


- 1 word = All 8 bit data
- Message Type Word = Fixed value "00000100"
- Message Length Word = number of the data word
- Data word = The data value (month, day, hour, minute, telephone number)

6.7. CIS Control Section

The scanning block of this device consists of a control circuit and a contact image sensor made up of a celfoc lens array, an LED, a light guide, and photoelectric conversion elements.

Circuit Diagram



When an original document is inserted and the start button pressed, pin E1 of IC101 goes to a high level and the transistor Q215 turns on. This applies voltage to the LED to light it. The contact image sensor is driven by each of the FTG-F1 signals output from IC101, and the original image illuminated by the LED undergoes photoelectric conversion to output an analog image signal (SIG). The analog image signal is input to the IC101 on AIN1 (pin A3) and converted into 8-bit data by the A/D converter inside IC101. Then this signal undergoes digital processing in order to obtain a high-quality image.

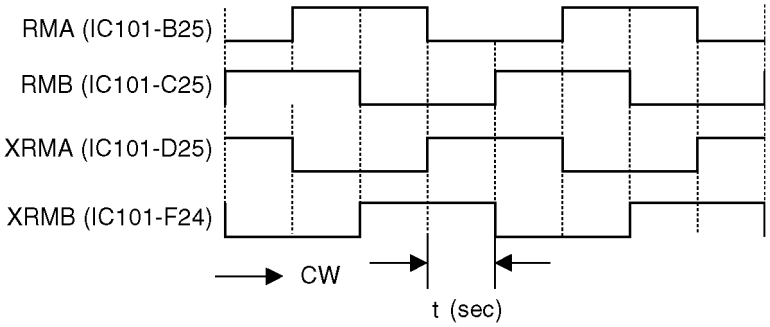
6.8. Stepping Motor Drive Section

6.8.1. Engine Motor Drive Circuit

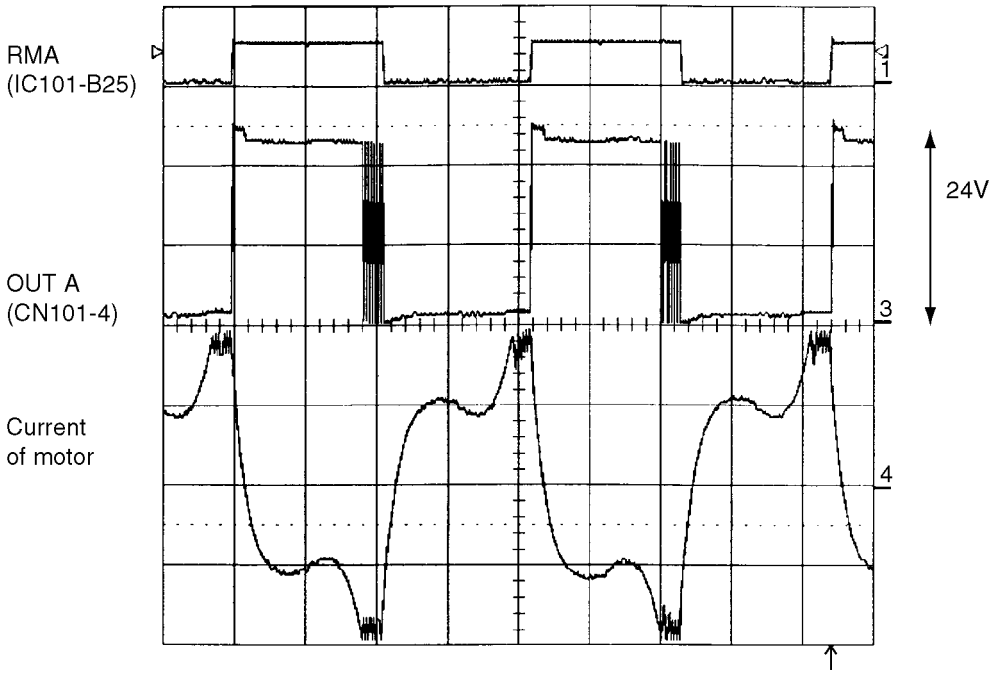
1. **Functions**
   This motor functions for main operations FAX reception and copy printing.
   This feed recording paper synchronized for printing.
2. **Motor operation**
   Excitation pulses is output from IC101 pins B25, C25, D25 and F25. Then stepping pulses are output from driver IC (IC200) pin No 16, 18, 19 and 21, and drives the motor coil.
   As a result, a current of about 1A are supplied to the motor coil.

6.8.1.1. Timing Chart

① 2 phase excitation



② 2 phase excitation output waveform (example "A Phase")

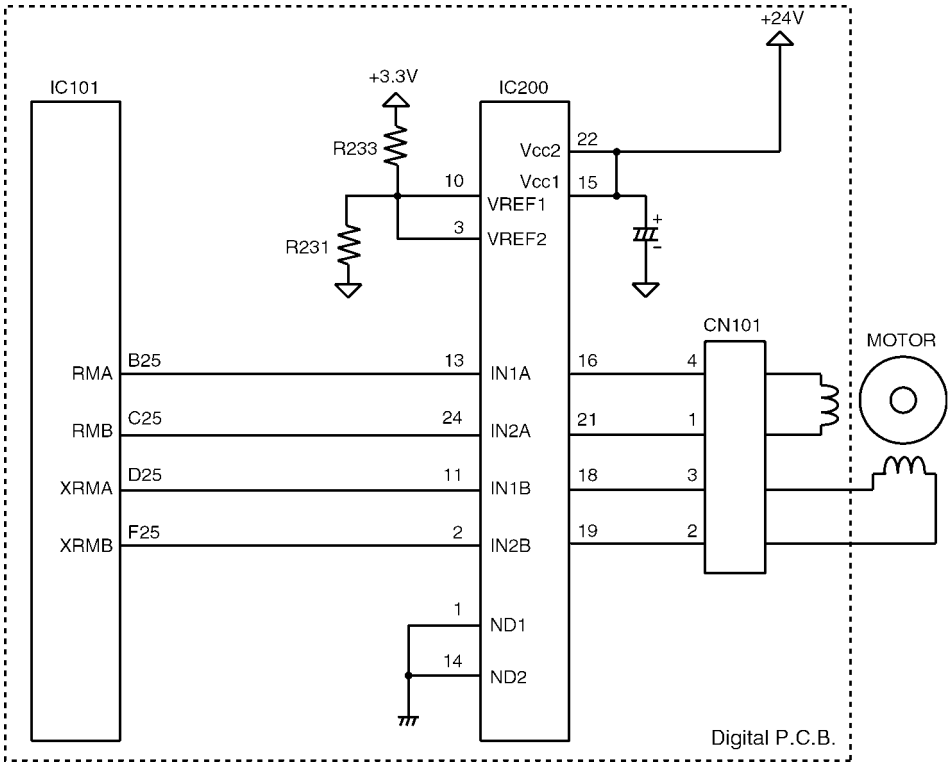


Other phase (RMB,XRMA, XRMB) operates as RMA phase does.

DRIVE MODE

FUNCTION	MODE	PHASE PATTERN	SPEED	CURRENT
PRINT	-	2 phase	824pps	1A

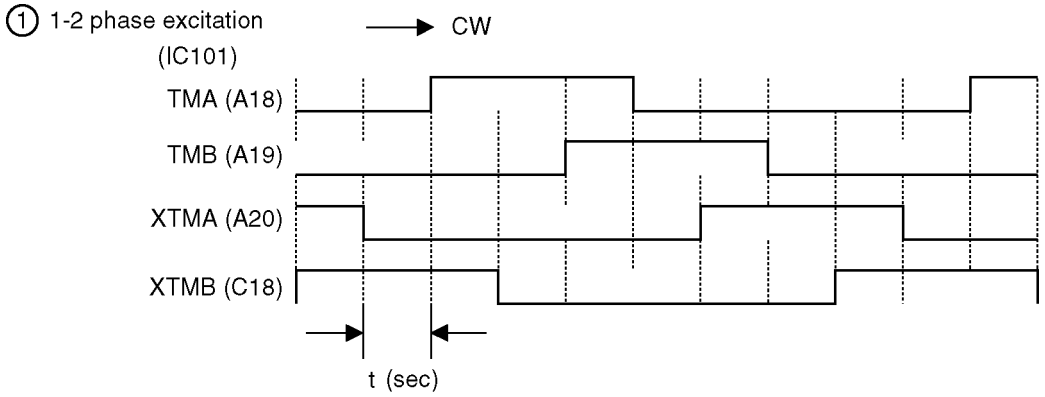
6.8.1.2. Engine Motor Drive Circuit



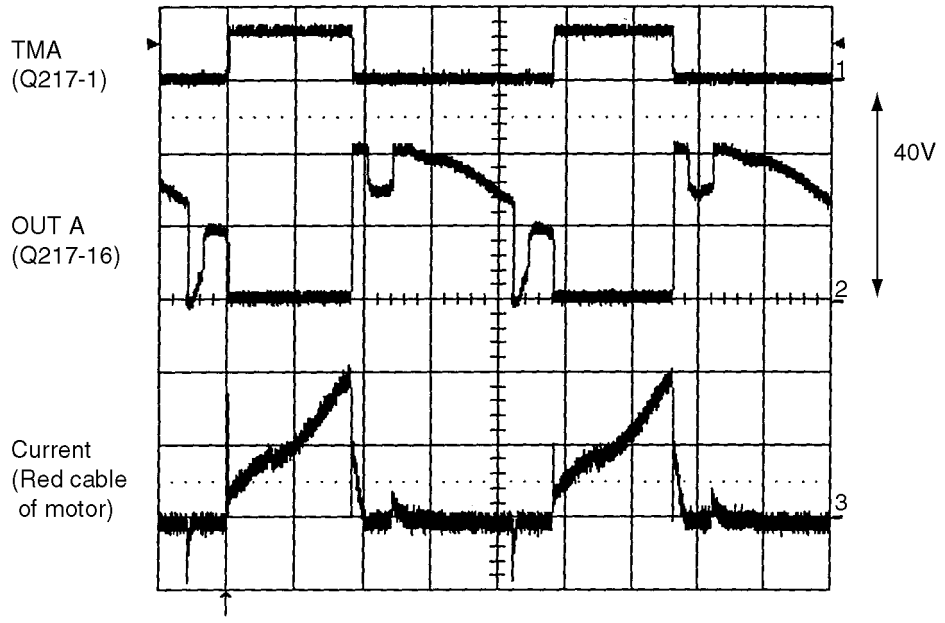
6.8.2. Scan Motor Drive Circuit

1. **Functions**
   This motor functions for main operations including FAX transmission.
   This feed document paper synchronized for reading.
2. **Motor operation**
   During motor driving, pin E18 of IC101 becomes a high level, and Q218, Q212 turns ON.
   As a result, +24V is supplied to the motor coil.
   Stepping pulses are output from IC101 pins, A18, A19, A20, C18, causing driver Q217 pins, 16 ~ 13 to drive the motor coil.
   The motor coil is energized sequentially in 2 phase increments, which causes a 1-step rotation.
   A 1-step rotation feeds 0.065mm of document paper.

6.8.2.1. Timing Chart

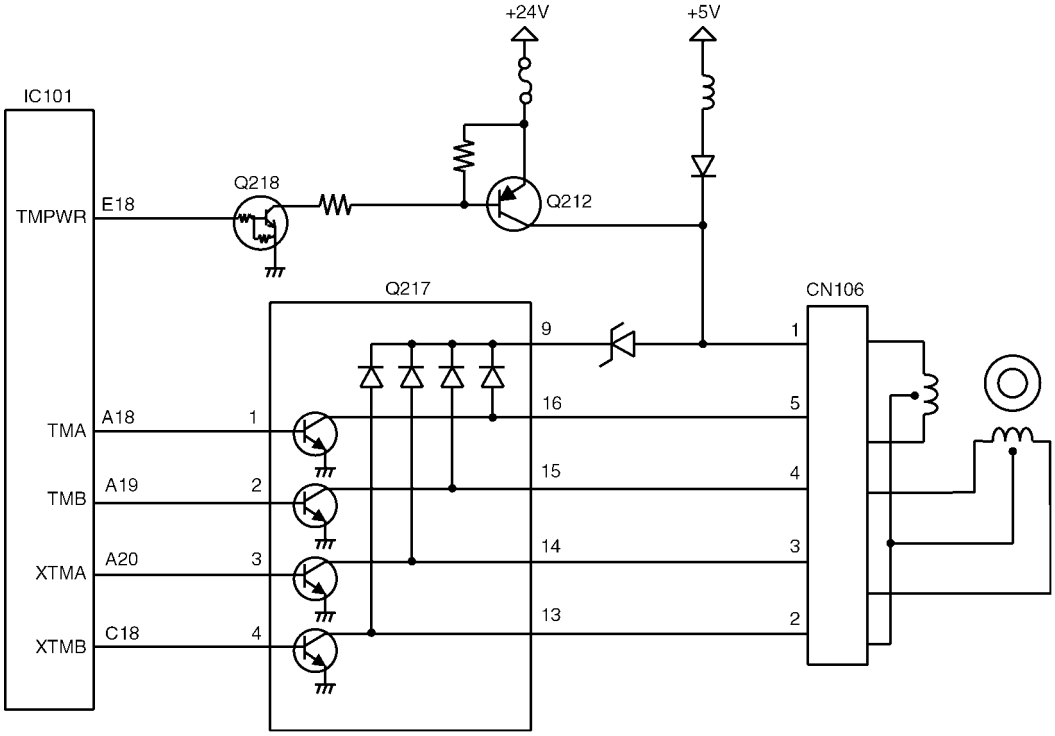


② 1-2 phase excitation output wave form (example "TMA Phase")



Other phase (TMB, XTMA, XTMB) operates as TMA phase does.

6.8.2.2. Scan Motor (ADF Motor) Drive Circuit

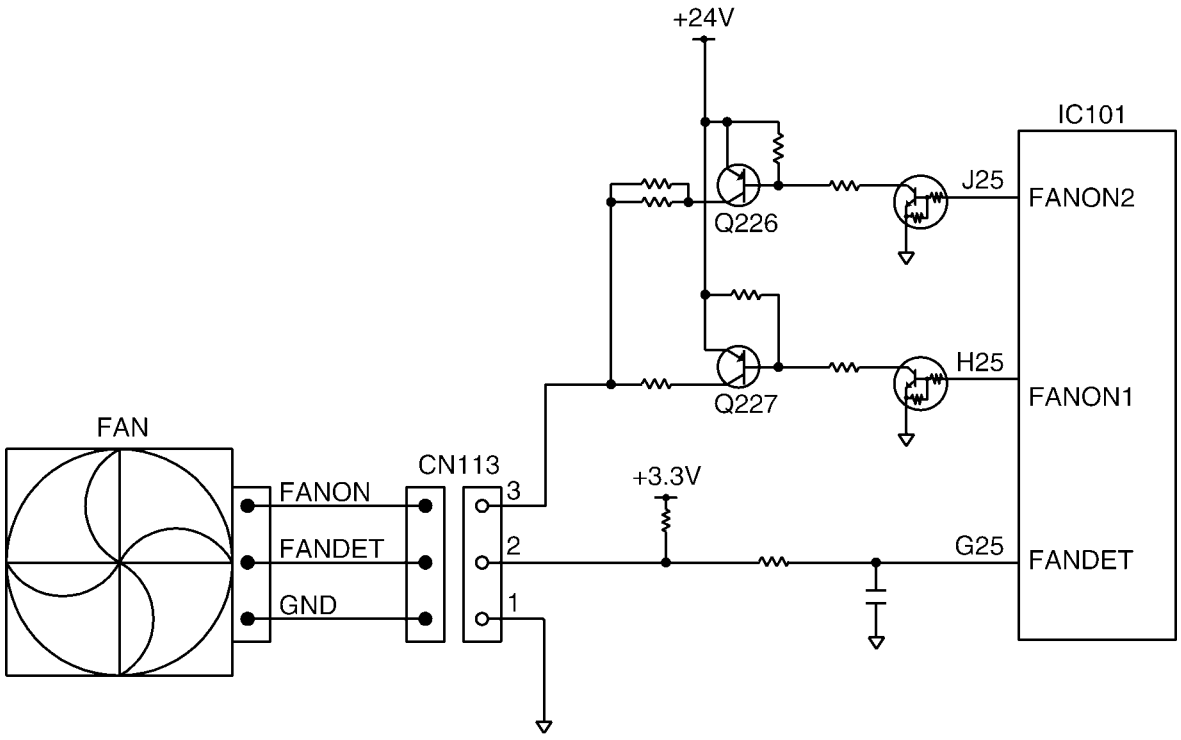


DRIVE MODE

FUNCTION		MODE	PHASE PATTERN	SPEED
SCAN	FAX	STANDARD	2 phase	579pps
SCAN	FAX/COPY	FINE/PHOTO	2 phase	579pps
SCAN	FAX/COPY	SUPER FINE	1-2 phase	579pps
SCAN	FAX/COPY	PHOTO WITH TEXT	2 phase	579pps
SCAN	DOC.PREFEED/EJECT	-	2 phase	579pps
STAND-BY		-	ALL PHASE OFF	-

6.9. FAN Motor Section

This FAN is used to radiate heat in the unit.
The signal level at pin J25/H25 of IC101 becomes high, the FAN is activated. In this case, the pulse signal as shown below input to pin G25 of IC101 and the rotation of the FAN is detected.

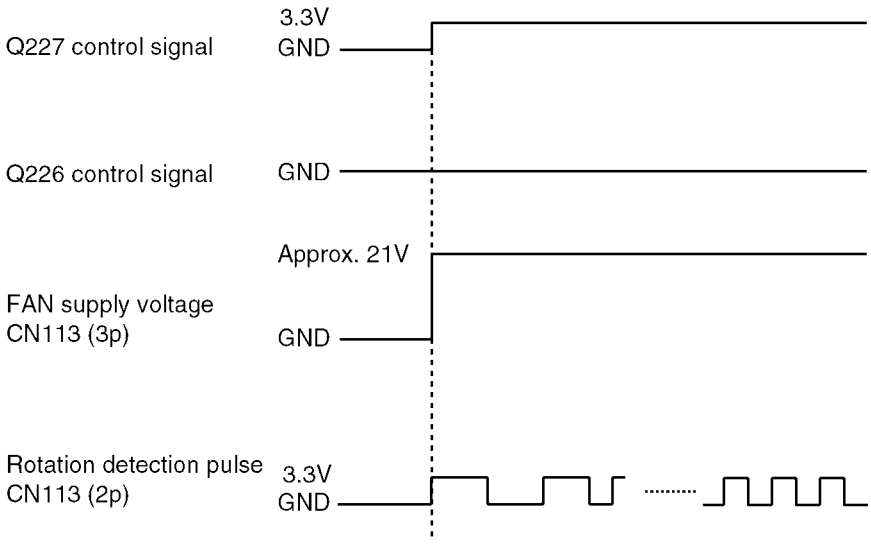


6.9.1. FAN Control

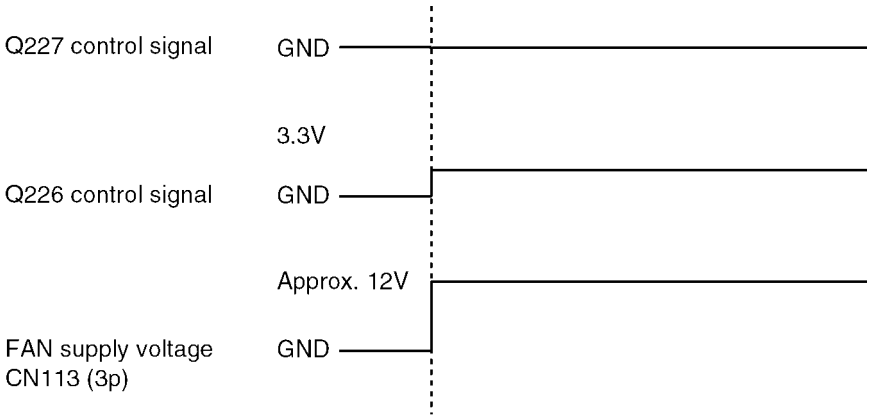
This unit is equipped with fan to prevent the developing device from rising in temperature while printing.
The air is inhaled from the right side of the unit.
The fan rotates at high speed (Approx. 3000 rpm) while printing (controlling the developing device). After printing is finished, it rotates at low speed (Approx. 2200 rpm) when the temperature of the unit goes up over a fixed one or depending on the number of printed papers (frequency).
While the fan is rotating at high speed, the voltage of Approx. 21 V is supplied to the fan, however, while rotating at low speed, the supply voltage is decreased to Approx. 12V.

Each signal wave is as follows:

1. High-speed rotation (typ. 3000 rpm)

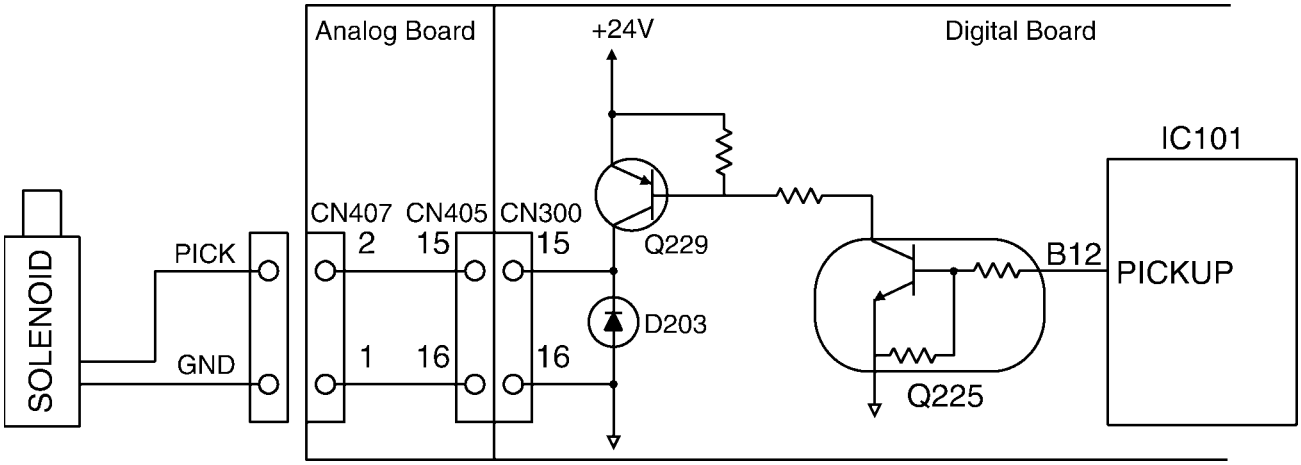


2. Low-speed rotation (typ. 2200 rpm)



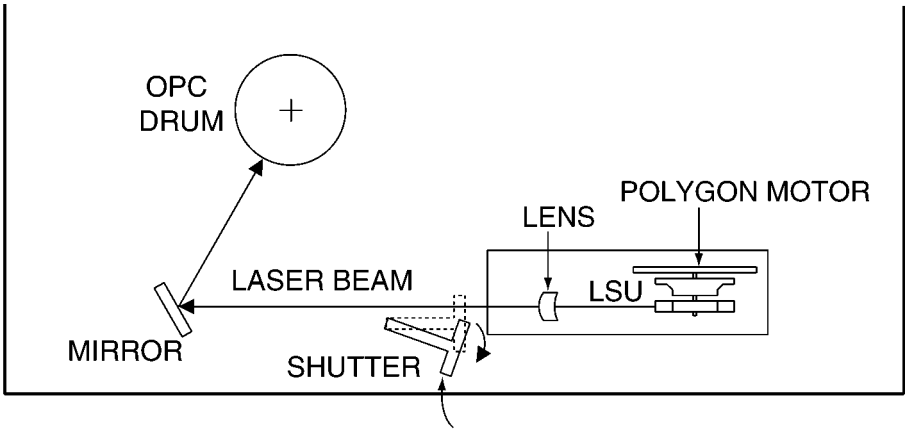
6.10. Solenoid Drive Section

The solenoid drive circuit controls the pick-up clutch.
The solenoid is designed to be driven by +24V, driven by IC101-B12 pin.
Diode D203 protects Q229 from backward voltage when the solenoid is driven.



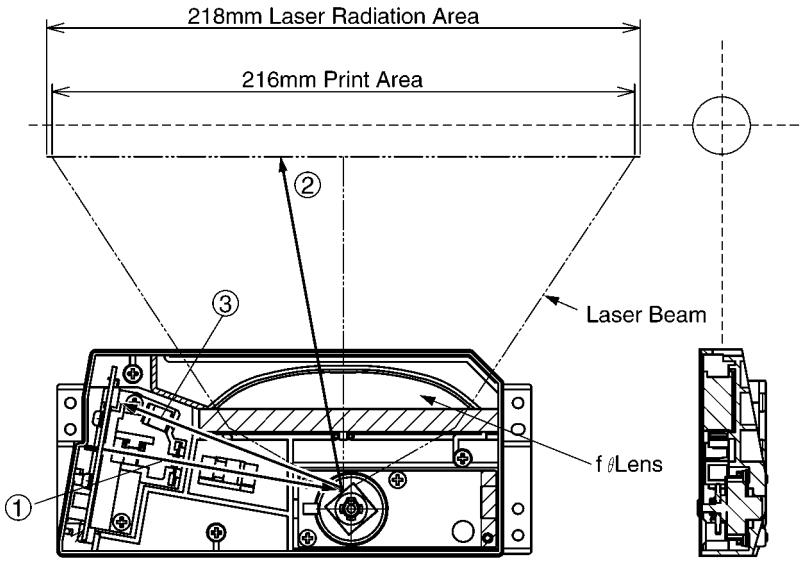
Mode	IC101-B12 pin
SOLENOID ON	high level
SOLENOID OFF	low level

6.11. LSU (Laser Scanning Unit) Section



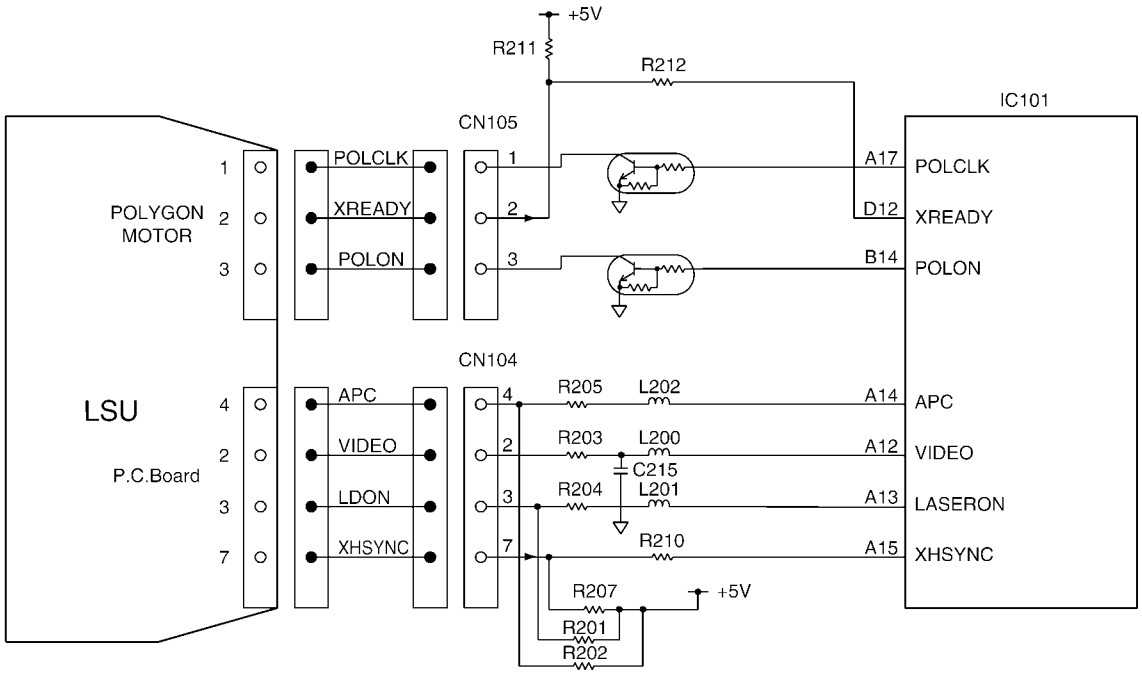
The mechanical shutter will be opened by setting DRUM UNIT properly.

LSU Layout

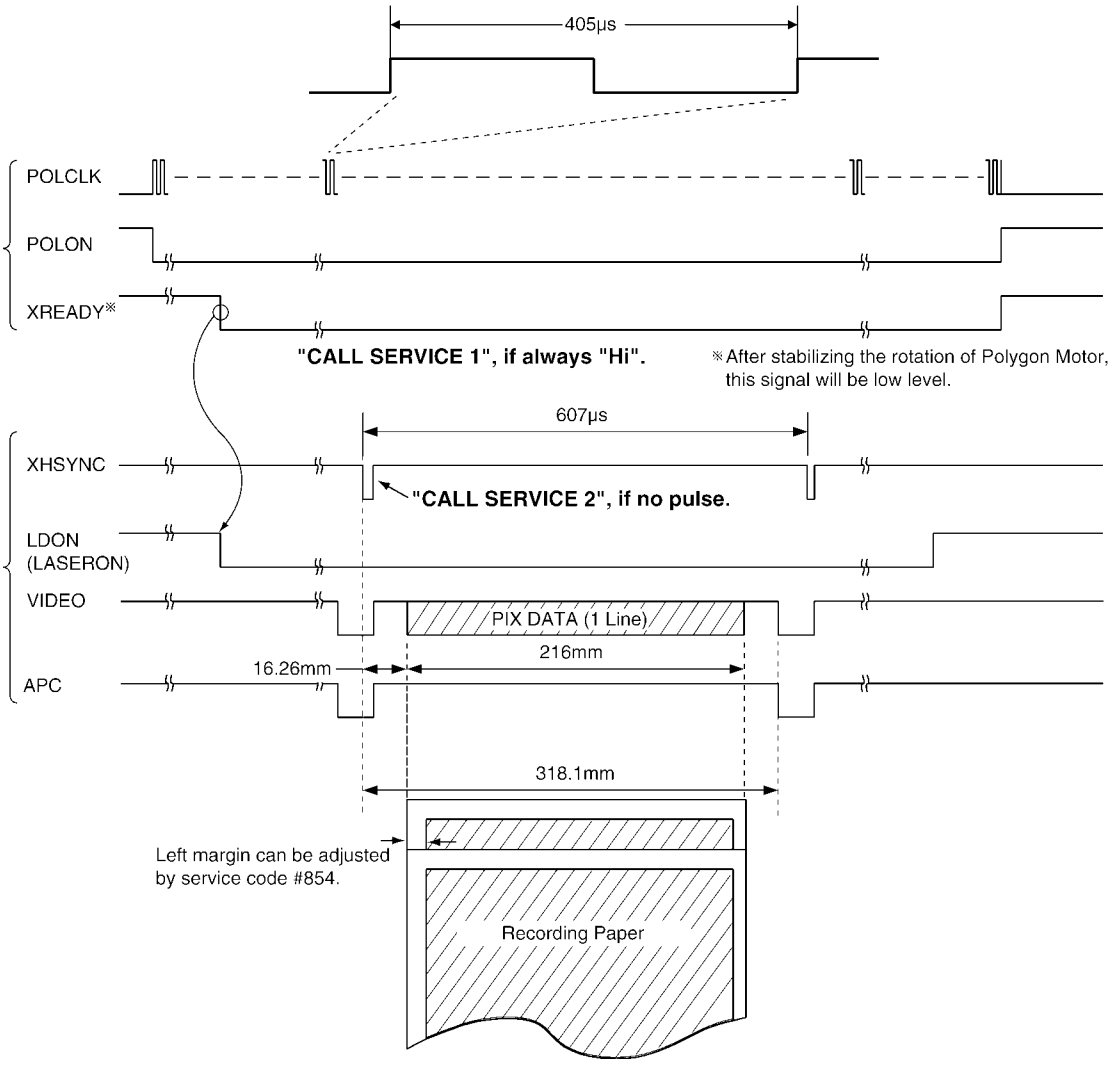


① Laser output
② OPC DRUM is irradiated with a laser.
③ The sensor outside the effective printing area detects the 1-line operation (scanning).

Circuit Diagram



Timing Chart



6.12. Sensors and Switches Section

All of the sensor and switches are shown below.

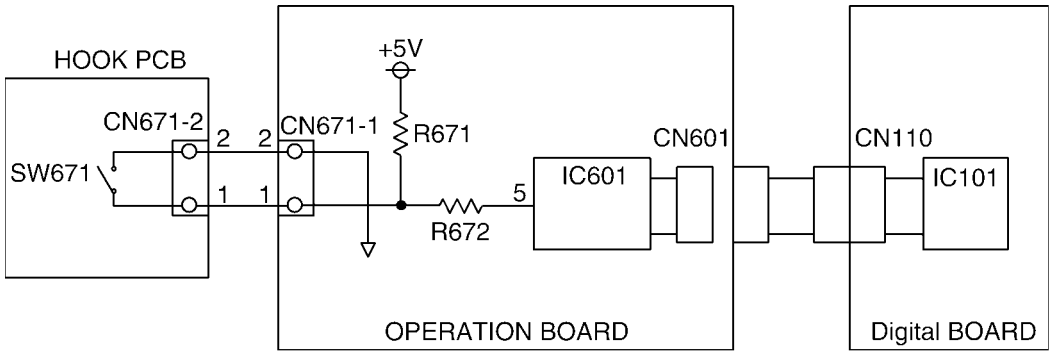
Sensor Circuit Location	Sensor	Sensor or Switch Name	Message Error
Operation Panel	SW641	Document set	[CHECK DOCUMENT]
Operation Panel	PS601	Paper Feed	[REMOVE DOCUMENT]
High Voltage PCB	SW1	Printer Open	[COVER OPEN]
Regist Sensor PCB	PS531	Regist	[FAILED PICKUP]
Exit Sensor PCB	PS501	Exit	[PAPER JAMMED]
Toner Sensor PCB	IC512	Dev & Toner Set	[TONER EMPTY] [TONER LOW] [CHECK DRUM]
Hook PCB	SW671	Hook	————

Note:

See TEST FUNCTIONS - SENSOR CHECK SECTION for the sensor test.
(#815 of Service Mode test. Refer to **Test Functions** (P.74).

6.12.1. Hook Switch

When the handset is raised, the switch is turned OFF, and the signal at pin 5 of IC601 is high.
When the handset is returned, the switch is turned ON, and the signal at pin 5 of IC601 is low.
IC601 send Hook sw status to Digital Board with other key matrix data.
Refer to **Operation Board Section** (P.48).



6.12.2. Paper Feed Sensor

The Sensor detects the front edge of the document.

When there is no document, the shelter plate shuts off the sensor light, the photo-transistor turns OFF, and the input signal of IC101-A9pin becomes a high level. When a document is detected, the shelter plate let the sensor light pass through, the photo-transistor turns ON, and the input signal of IC101-A9pin becomes a low level.

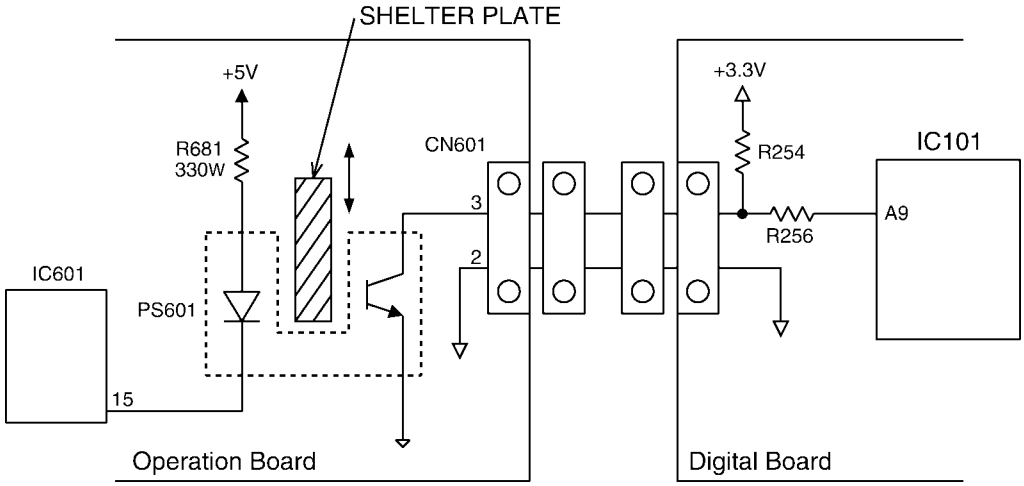
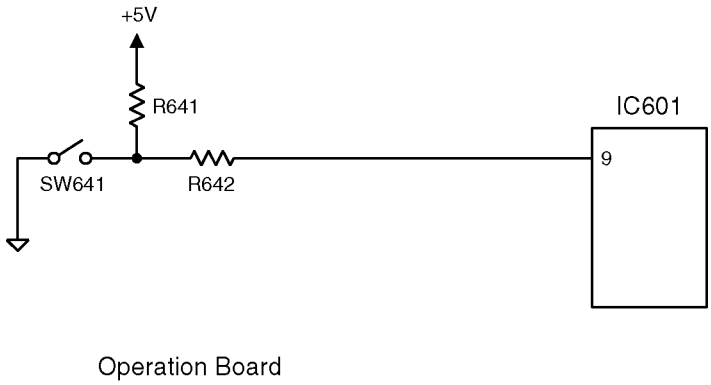


	Photo-transistor	Signal (IC101-A9pin)
Detect Document	ON	Low level
No Document	OFF	High level

6.12.3. Document Sensor

The Sensor detects the document insertion.

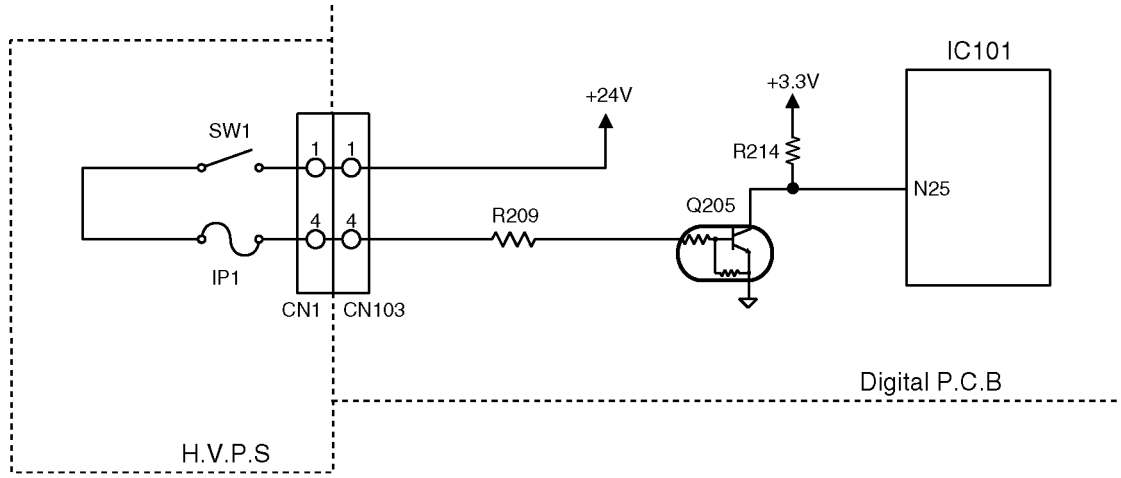
When a document is detected, the switch turns ON, and the input signal of IC601-9pin becomes a low level. When there is no document, the switch turns OFF, and the input signal of IC601-9pin becomes a high level.



	Switch	Signal (IC601-9pin)
Detect Document	ON	Low level
No Document	OFF	High level

6.12.4. Top Cover Open Switch

The Switches detect whether the printer cover is open or closed.
When the printer cover is closed, the switches turn ON, and the input signal of IC101-N25pin becomes a low level.
When the printer cover is open, the switches turns OFF, and the input signal of IC101-N25pin becomes a high level.

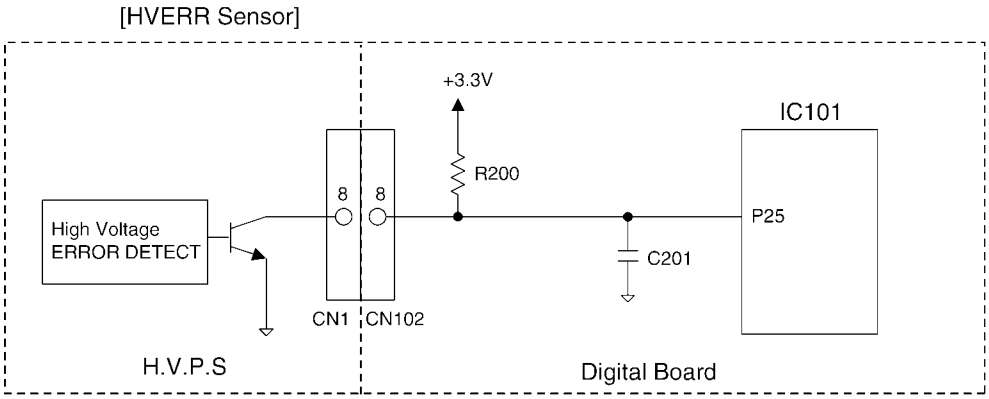


	Switch	Signal (IC101-N25 pin)
Open	OFF	High level
Close	ON	Low level

6.12.5. Drum Detection

DRUM SENSOR is not arranged.

DRUM unit is detected when HVERR SENSOR arranged in H.V.P.S becomes effective.



High Voltage ERROR Status	Drum sensor	Signal (IC101-P25)
Abnormal	DRUM can not be detected	Low level
Normal	DRUM can be detected	High level

6.12.6. Regist Sensor

The Sensor detects whether or not the recording paper is present so that printing can start.

When the recording paper is detected, the shelter plate let the sensor light passing through, the photo-transistor turns ON, and the input signal of IC101-AD25pin becomes a low level.

When there is no recording paper, the shelter plate closes the sensor light, the photo-transistor turns OFF, and the input signal of IC101-AD25pin becomes a high level.

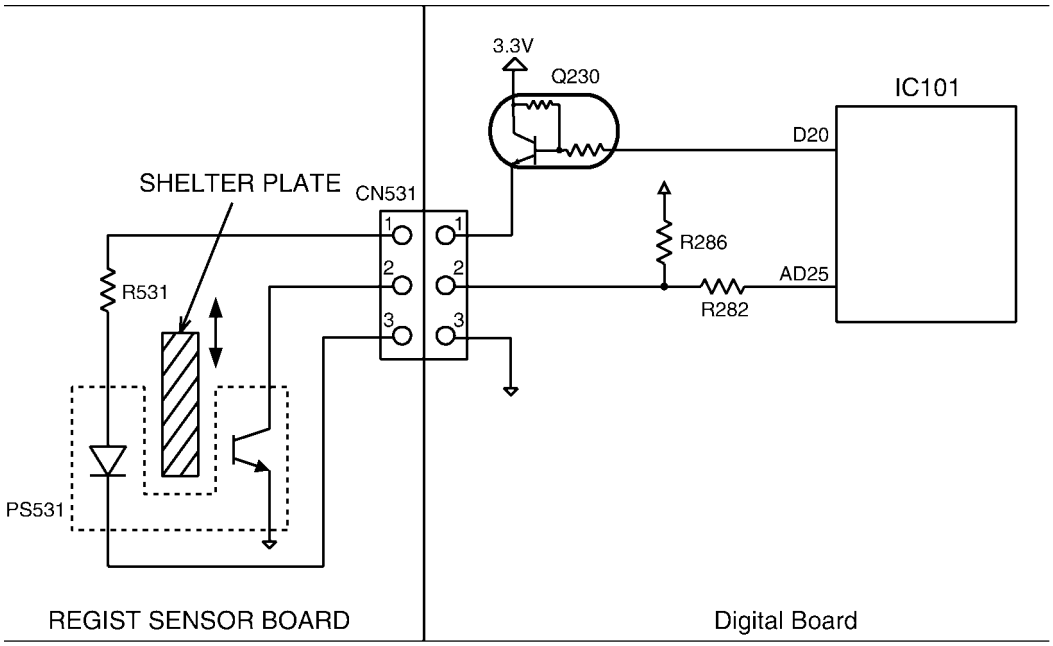
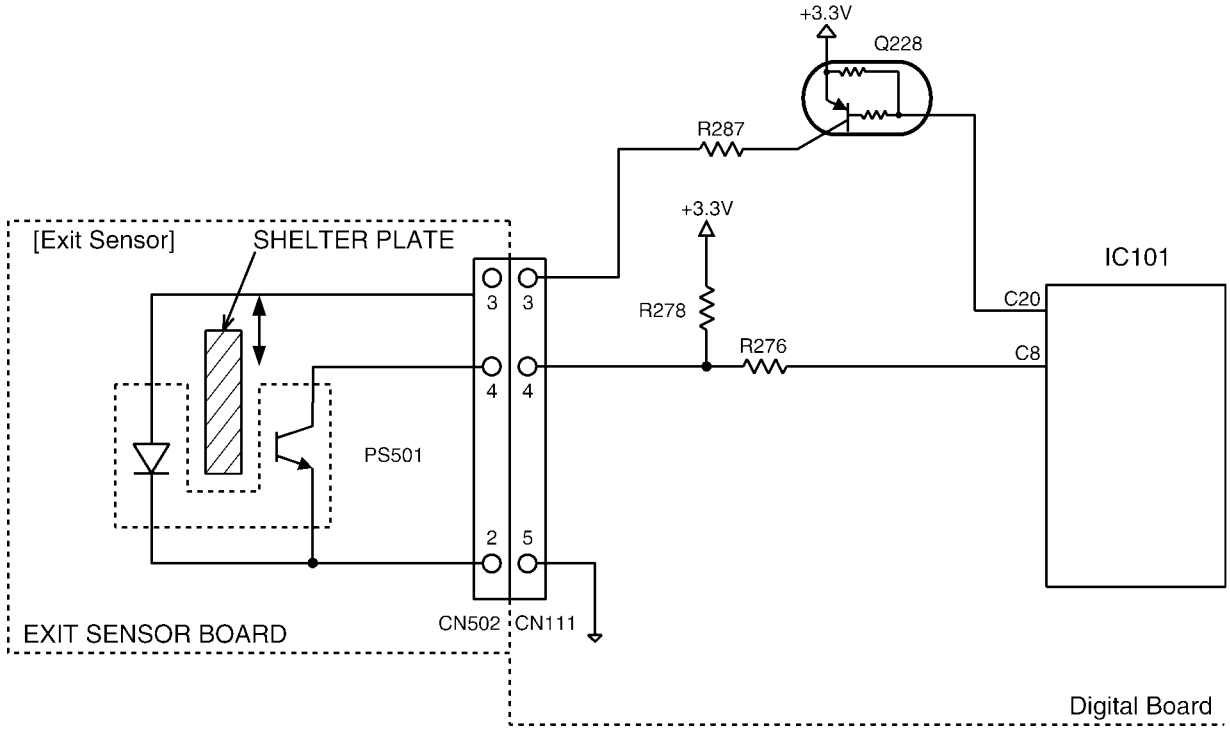


	Photo-transistor	Signal (IC101-AD25 pin)
No Recording Paper	OFF	High level
Recording Paper Regist	ON	Low level

6.12.7. Paper Exit Sensor..... "PAPER JAMMED"



The sensor detects whether the recording paper exit out or not.
When there is no recording paper at the position of the sensor, the shelter plate closes the sensor light, the photo-transistor fot tarus OFF, and the input signal of IC101-C8pin becomes high level.
When the recording paper reach the exit sensor, the shelter plate let the sensor light passing through, the photo-transistor ON, and the input signal of IC101-C8pin becomes a low level.

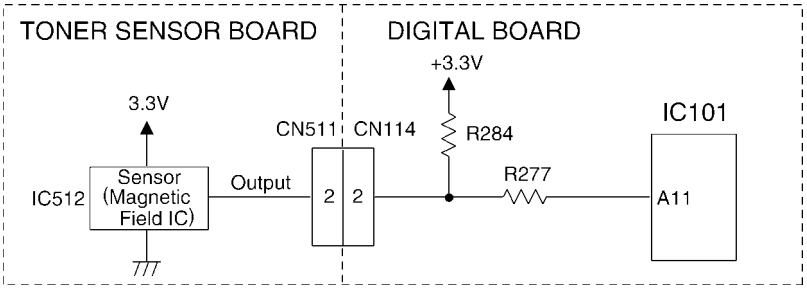
[Exit Sensor]

	Photo-transistor	Signal (IC101-C8 pin)
No Paper	OFF	High level
Paper Exist	ON	Low level

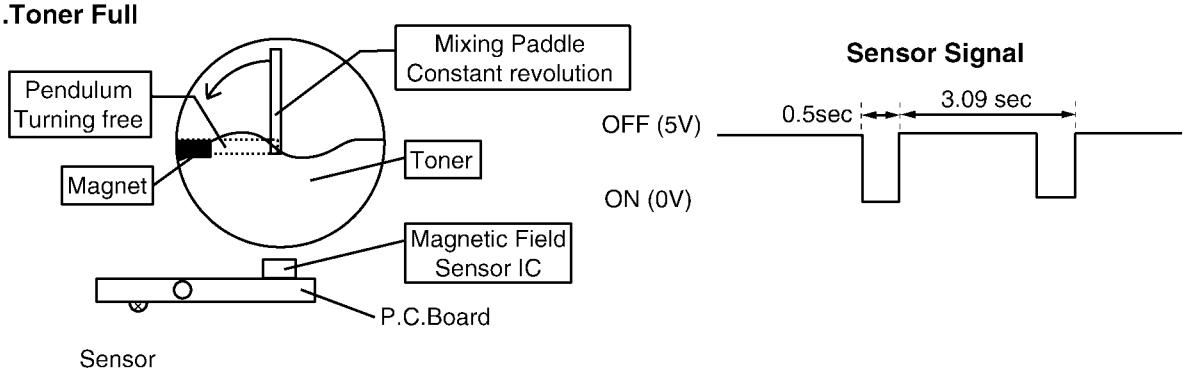
6.12.8. Toner Sensor.... "TONER EMPTY", "TONER LOW", "CHANGE DRUM"

The Sensor detects whether or not the Drum unit and the toner are present.

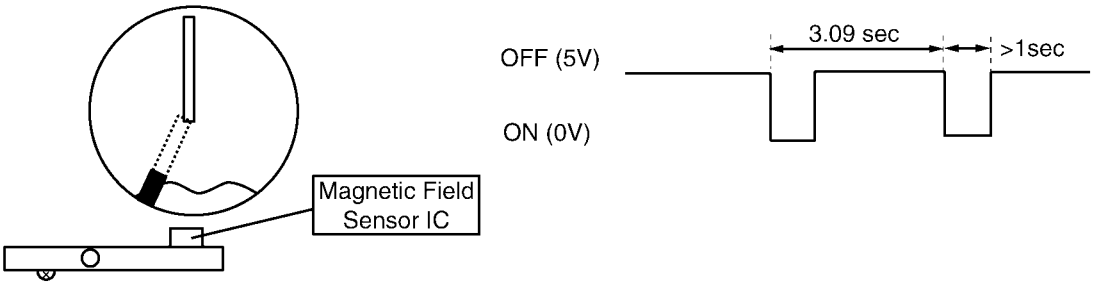
When there is not Drum unit, Magnetic Field Sensor IC (IC512) turns off, and the input signal of IC101-A11 pin (Digital P.C.B) becomes a High level over 9s. When the Developer unit is set, Magnetic Field Sensor IC (IC512) turns ON/OFF. If the time of IC101-A11 pin's Low level is under 600ms, there is enough toner in Developer unit, if not, toner is near empty.



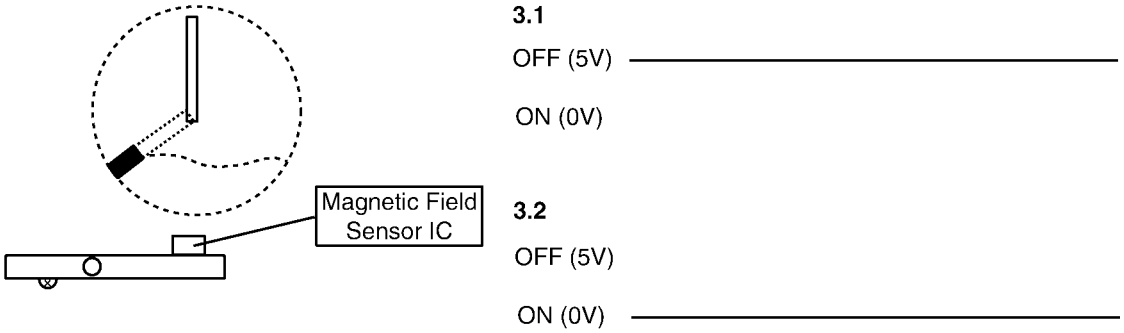
1.Toner Full



2. Toner Low



3. In case the Mixing Paddle does not rotate

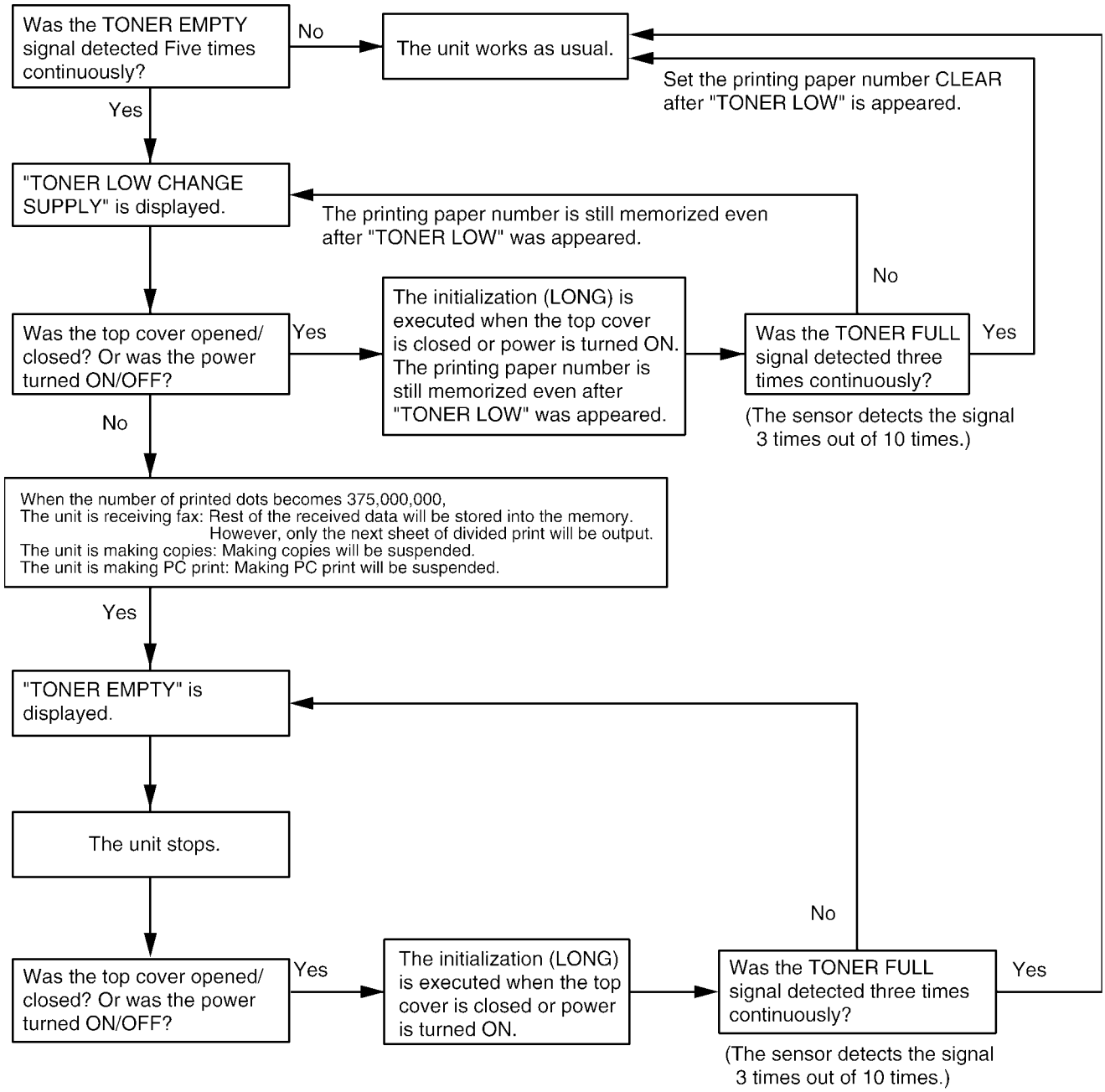


Toner Sensor

The rest of toner is detected by the move speed of the magnet put on the pendulum of Mixing Paddle. The pendulum is pushed up by the Mixing Paddle, then it falls down by its own weight. The rotation speed of paddle is set slower than the one of pendulum which falls down by its own weight. When the toner is still left, the pendulum falls and stops on the toner, then pushed by the paddle, it starts to rotate. When no toner is left, the pendulum falls to the bottom. Consequently the contact time between the magnet and steel becomes short when toner is left and long with no toner.

State	Display	Signal (IC101-A11pin)
Toner Set (full)	-	Low level = about 0.5s
Near Empty Toner	TONER LOW	Low level>1.0s
Mixing Paddle does not rotate (“CHANGE DRUM”)	CHANGE DRUM	High level fix or Low level fix

6.12.8.1. Toner Detection Flow

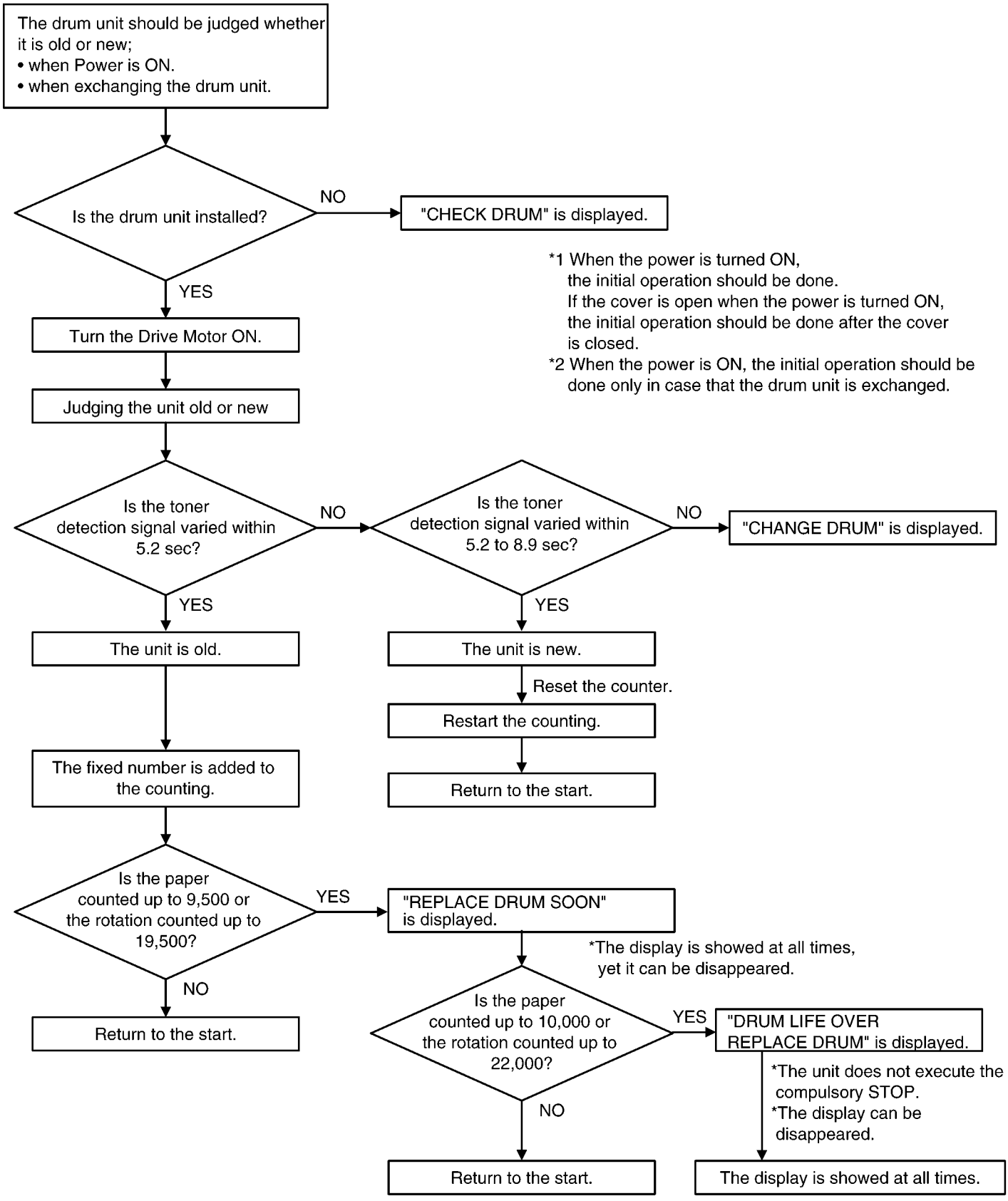


CAUTION:

1. Toner low can be judged by continuous 5-times TONER LOW signal at only printing.
   (It is not executed at.)
2. Toner full can be judged by continuous 3-times TONER FULL signal at initialization.
   (It is not executed at printing.)
3. In the ordinal operation, “CHECK DRUM” is displayed when TONER EMPTY sensor does not generate a signal for 3.1 seconds.

6.12.8.2. Drum Detection Flow

Detection Flowchart

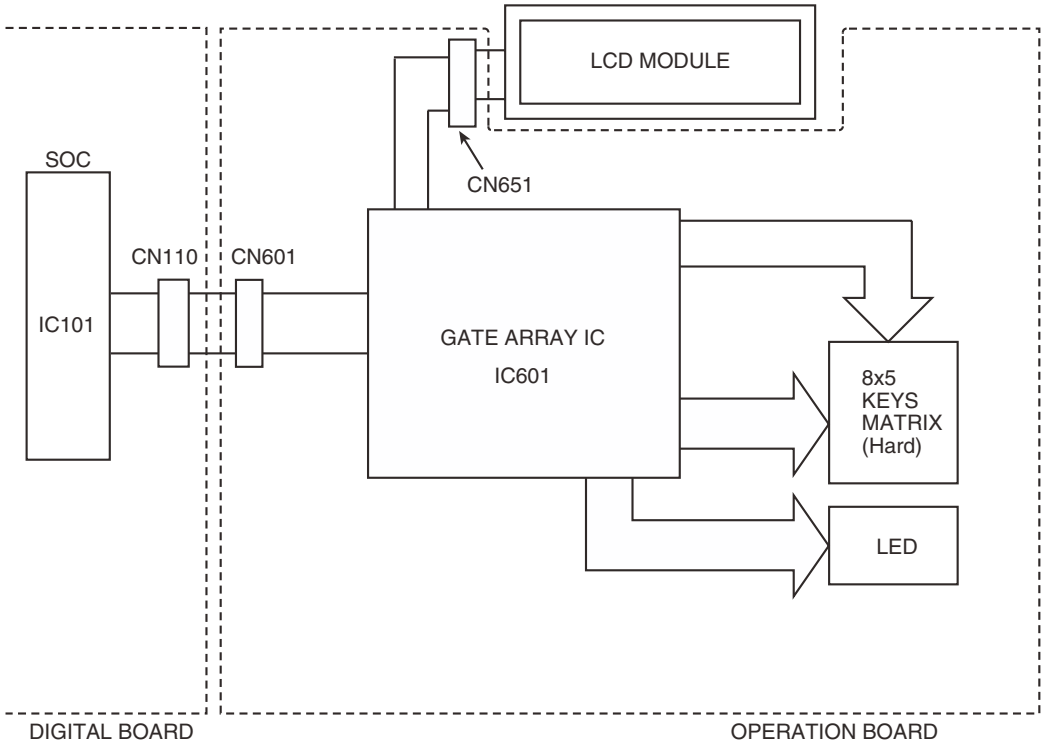


*1 When the power is turned ON, the initial operation should be done. If the cover is open when the power is turned ON, the initial operation should be done after the cover is closed.

*2 When the power is ON, the initial operation should be done only in case that the drum unit is exchanged.

6.13. Operation Board Section

The unit consists of a LCD (Liquid crystal display), KEYs and LEDs (light-emitting diodes). They are controlled by the Gate Array (IC601) and SOC (IC101: on the DIGITAL BOARD).
The key matrix table is shown below.



1. **Key Matrix**
   a. Hard Scan

	KIN0	KIN1	KIN2	KIN3	KIN4	KIN5	KIN6	KIN7
KSL0	SKEY1	4	NEXT	VOL-	MONITOR	#	0	*
KSL1	SKEY2	COPY	HELP	VOL+	FLASH	6	8	LOWER
KSL2	SKEY3	STOP	QUICK SCAN	PREV	REDIAL/ PAUSE	3	2	7
KSL3	1	----------	CALLER ID	JUNK FAX PROHIBITOR	AUTO ANSWER	GREETING	ERASE	PLAY BACK
KSL4	SKEY4	START	MENU	SET	MUTE	9	5	SKEY5

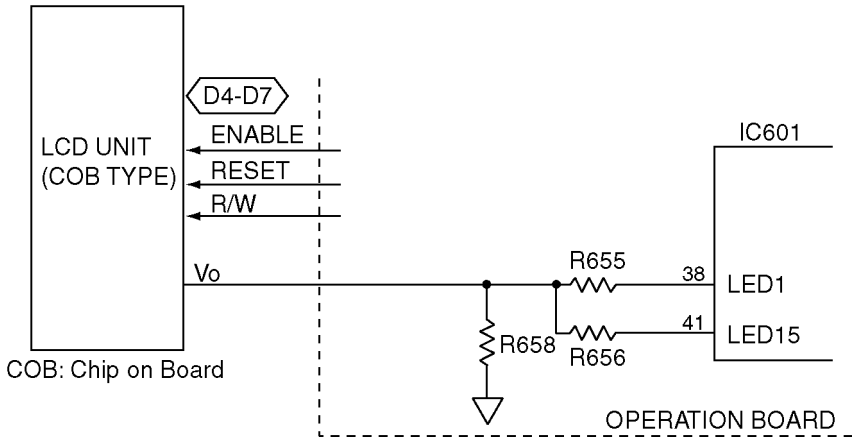
*LED7 should be set to KSL4. "8 x 5" key matrix is executed by hardware scanning.

2. **LED**
   • AUTO ANSWER LED ON/OFF port---LED6

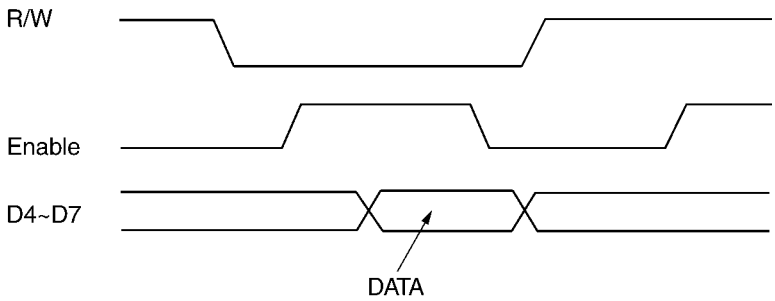
6.14. LCD Section

The Gate Array (IC601) works only for writing the ASCII code from the data bus (D4~D7). V0 is supplied for the crystal drive.
R123 and R124 are density control resistors.
Consequently, in this unit, the timing (positive clock) is generated by the LCD interface circuitry in the gate array (IC101).

Circuit Diagram



Timing Chart



<Density>

Display mode	User setting	LED1	LED15
2 LINE	NORMAL	H	L
	DARKER	L	L
Large	NORMAL	H	H
	DARKER	H	L

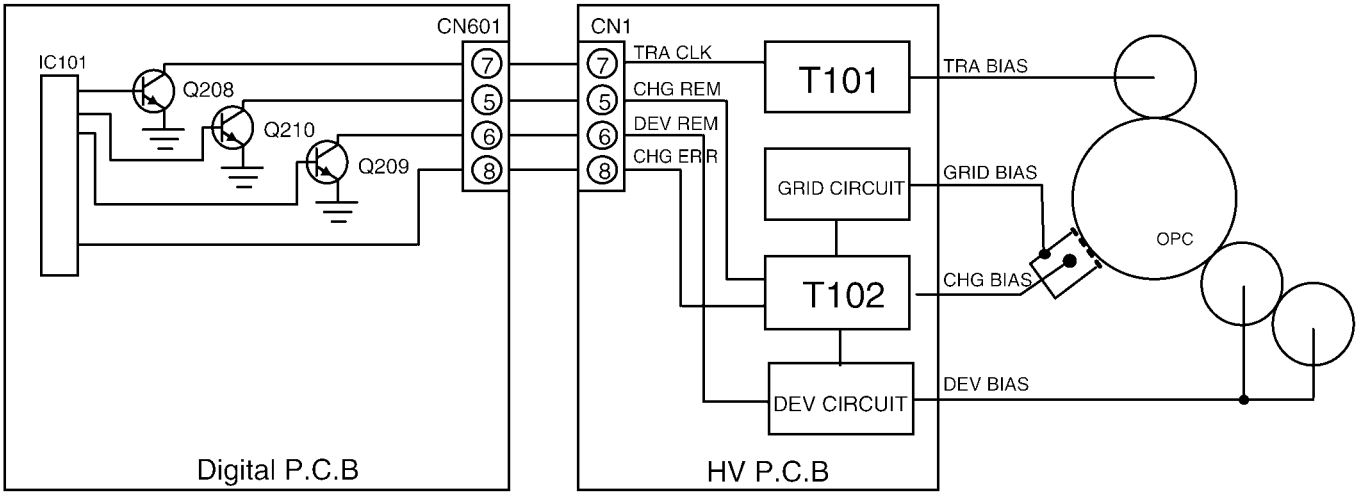
6.15. HVPS (High Voltage Power Supply) Section

6.15.1. HVPS Specification

	Charge (CHG)	Grid	Developing DC	Transfer (TRA-)	Transfer (TRA+)
Output Characteristics	Constant current	Constant voltage	Constant voltage	Constant current (Variable)	Constant voltage
Nominal Output Voltage	4.25kV	475±18V	220V±15V	100MΩ (-800V)	800V±100V
Nominal Output Current	180±15μA	(180μA)	---------	-10.4μA±1μA PWM 50% (at 100MΩ)	1000MΩ (0.8μA)
Load Range	21.0MΩ		100MΩ~2000MΩ	62.5~312MΩ	10MΩ~1000MΩ
Constant Current Range				-2500V~-500V	

There is one terminal for transcription output and + and - are switched to be output.

H.V.P.S. (High Voltage Power Supply) Circuit Diagram



6.15.2. CHG-BIAS (Charge BIAS)/GRID/Unit

When IC101 turns on the transistor Q210. CHG REM becomes “L”, and Charge BIAS(180μA) is output from CHG OUTPUT. GRID BIAS is generated by the current flowing in the GRID circuit via charge wire and GRID.

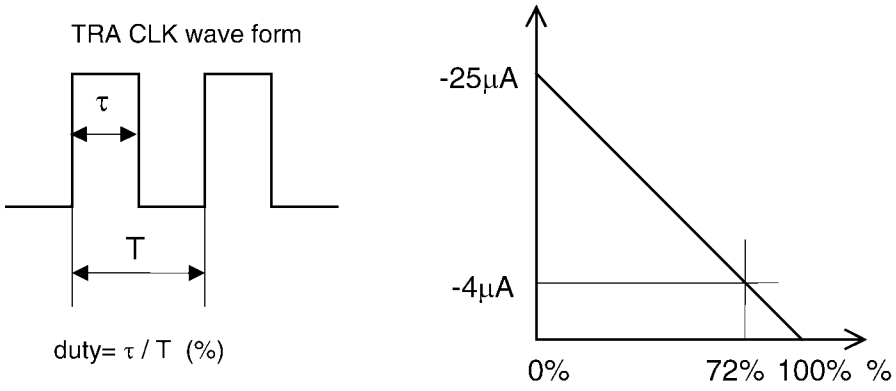
6.15.3. DEV DC BIAS UNIT

If CHG REM is “L”, transistor Q209 turns on from the IC101 and the DEV DEM becomes “L”, the developing voltage(+220V) is out put from DEV terminal.

6.15.4. TRA(+) BIAS (Transfer(+) BIAS)/TRA(-) BIAS (Transfer(-) BIAS) Unit

When CHG REM is “L” and TRA CLK is “open”, Charge BIAS(180μA) is output from CHG OUTPUT, and at the same time Transfer(+)BIAS(800V) is output from TRA OUTPUT. When 5.425kHz PWM(Plus Width Modulation) signal is input to TRA CLK through transistor Q208, Transfer(-) CURRENT BIAS corresponding to PWM signal is output from TRA OUTPUT.

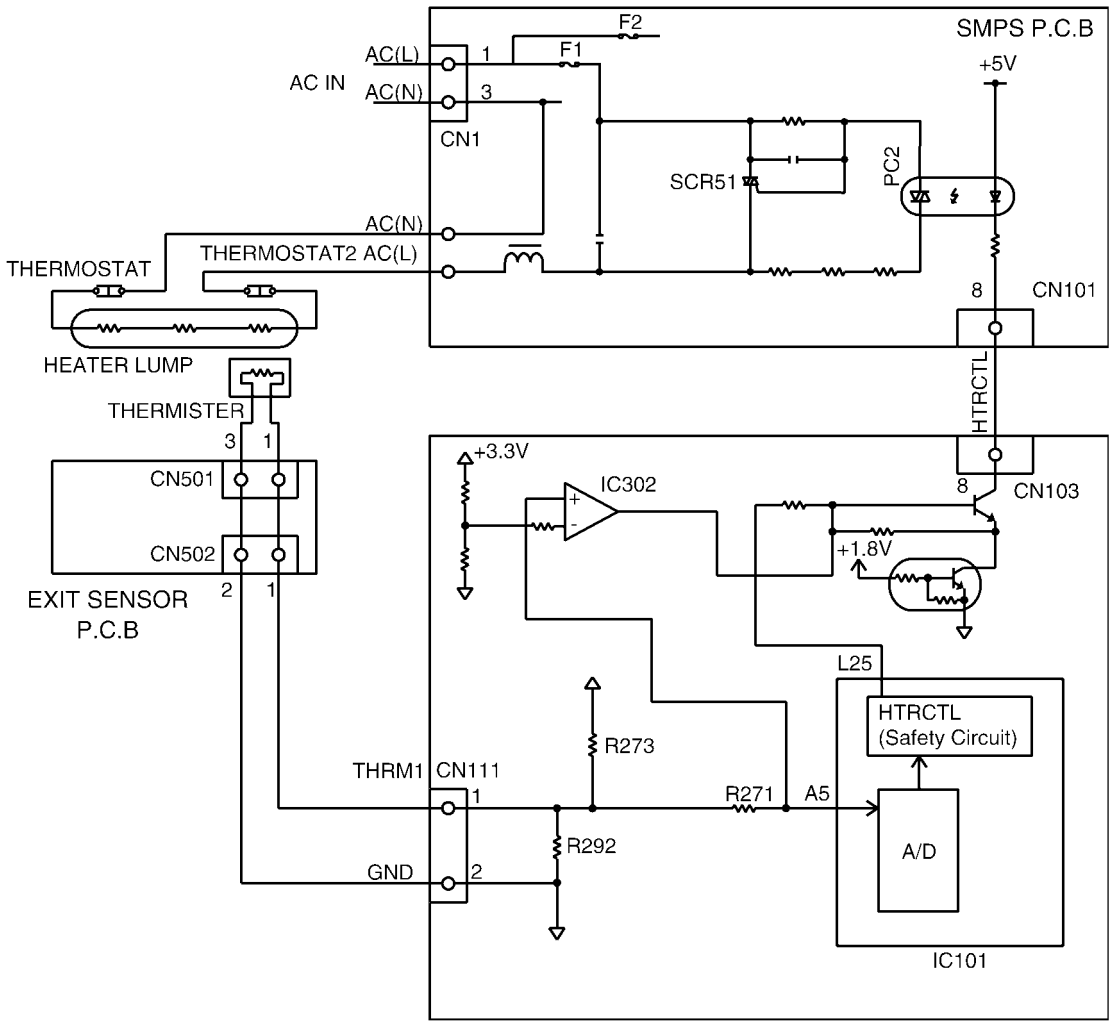
Transcription current variation corresponding to PWM input



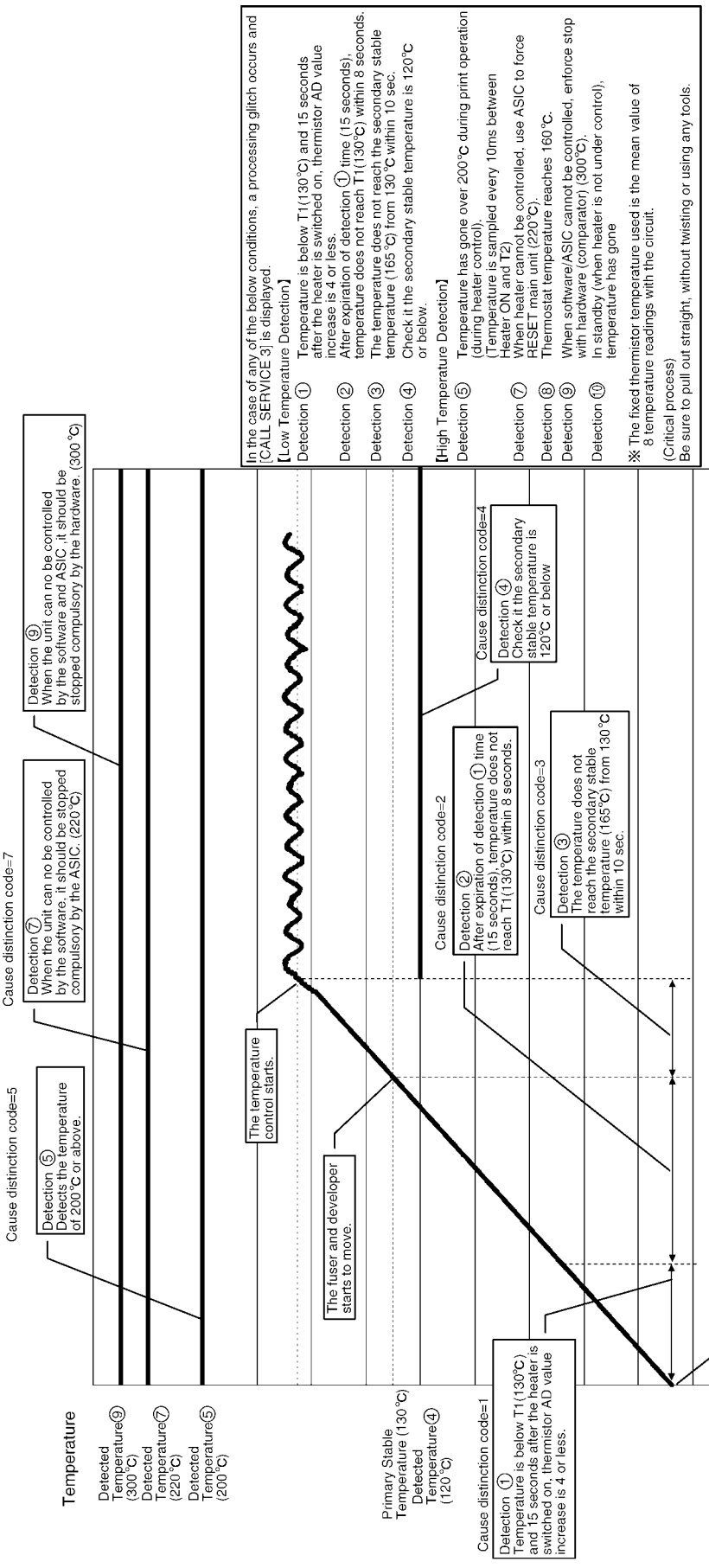
6.16. Heat Lamp Control Circuit

The temperature of the fixing part of the Fixing Unit is converted to a voltage by THERMISTOR and input to IC106-4pin. The heater turns ON/OFF the photo-coupler PC2 at the heater control port (IC106-29pin), and is turned ON/OFF at the triac SCR1. And two thermostats are set on the AC line as the safety devices.

Circuit Diagram



1. **Control at Printing**
   a. After the printing signal is received, turn ON the heater.
   b. After that, turn ON the motor at the Primary Stable Temperature (130°C).
   c. After that, control at the Secondary Stable temperature (160°C), N/N(25 - 30°C), and feed papers.



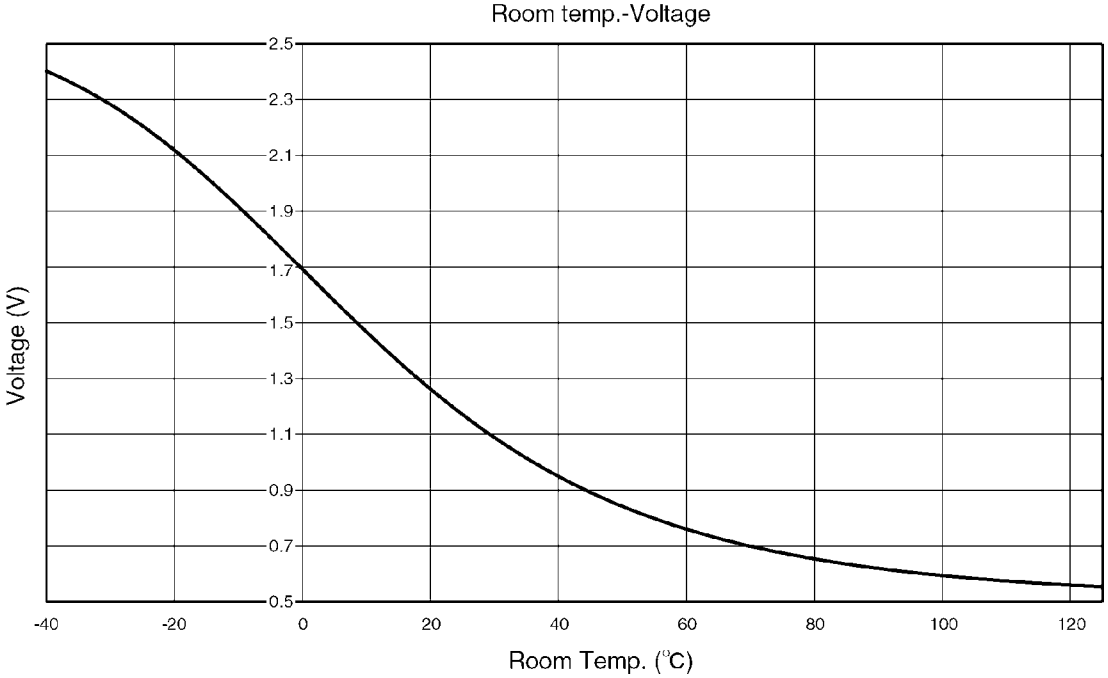
Refer to **Call Service Troubleshooting Guide** (P.137)

2. Safety Protection

a. 2 thermostats are provided with the unit, and the heater circuit is shut down when their surface temperatures became over 200°C.

b. The heater control circuit of IC101 has the built-in function that the software turns off the heater control automatically if the heater is not turned ON every a fixed time.

c. When the temperature became over 220°C, the heater control circuit of IC101 is turned off forcedly and system reset (IC106 pin 20 becomes Low) will be executed.



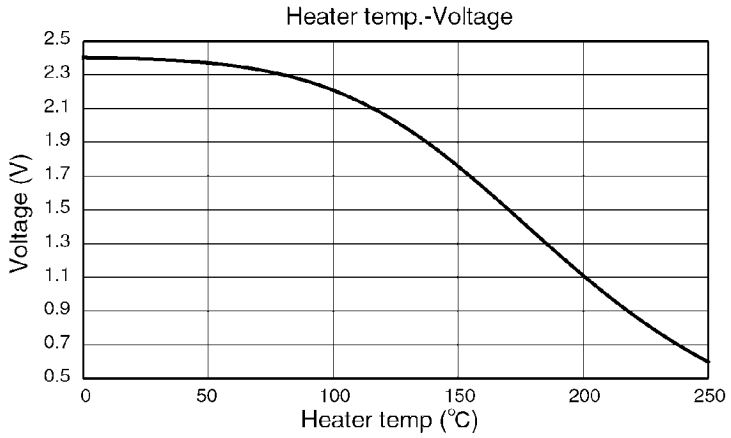
The correspondence readings between temperature measured by thermistor and HEX readings

Temperature(°C)	HEX reading	Temperature(°C)	HEX reading	Temperature(°C)	HEX reading
-40	F9	16	6D	72	17
-39	F8	17	6B	73	17
-38	F6	18	68	74	16
-37	F5	19	65	75	15
-36	F3	20	63	76	15
-35	F2	21	60	77	14
-34	F0	22	5E	78	14
-33	EF	23	5B	79	13
-32	ED	24	59	80	12
-31	EB	25	57	81	12
-30	E9	26	55	82	11
-29	E7	27	52	83	11
-28	E5	28	50	84	11
-27	E3	29	4E	85	10
-26	E1	30	4C	86	10
-25	DF	31	4A	87	0F
-24	DD	32	48	88	0F
-23	DB	33	46	89	0E
-22	D8	34	44	90	0E
-21	D6	35	42	91	0E
-20	D4	36	40	92	0D
-19	D1	37	3F	93	0D
-18	CF	38	3D	94	0D
-17	CC	39	3B	95	0C
-16	CA	40	3A	96	0C
-15	C7	41	38	97	0C
-14	C4	42	36	98	0B
-13	C1	43	35	99	0B
-12	BF	44	33	100	0B
-11	BC	45	32	101	0A
-10	B9	46	31	102	0A
-9	B6	47	2F	103	0A
-8	B3	48	2E	104	0A

Temperature(°C)	HEX reading	Temperature(°C)	HEX reading	Temperature(°C)	HEX reading
-7	B0	49	2D	105	9
-6	AD	50	2B	106	9
-5	AA	51	2A	107	9
-4	A7	52	29	108	9
-3	A4	53	28	109	8
-2	A1	54	27	110	8
-1	9E	55	26	111	8
0	9B	56	25	112	8
1	98	57	23	113	7
2	95	58	22	114	7
3	92	59	22	115	7
4	8F	60	21	116	7
5	8C	61	20	117	7
6	89	62	1F	118	6
7	87	63	1E	119	6
8	84	64	1D	120	6
9	81	65	1C	121	6
10	7E	66	1B	122	6
11	7B	67	1B	123	6
12	78	68	1A	124	5
13	75	69	19	125	5
14	73	70	18		
15	70	71	18		

Note:

The value is displayed on LCD at **Test Functions** (P.74) [#815].



The correspondence readings between temperature measured by fixing thermistor and HEX readings

Temperature(°C)	HEX Reading	Temperature(°C)	HEX Reading	Temperature(°C)	HEX Reading
0	F9	84	EA	168	86
1	F9	85	E9	169	84
2	F9	86	E9	170	82
3	F9	87	E8	171	81
4	F9	88	E7	172	7F
5	F9	89	E7	173	7D
6	F9	90	E6	174	7B
7	F9	91	E6	175	7A
8	F9	92	E5	176	78
9	F9	93	E4	177	76
10	F9	94	E4	178	74
11	F9	95	E3	179	73
12	F9	96	E2	180	71
13	F9	97	E2	181	6F
14	F9	98	E1	182	6D
15	F9	99	E0	183	6C
16	F8	100	DF	184	6A
17	F8	101	DF	185	68
18	F8	102	DE	186	66
19	F8	103	DD	187	65
20	F8	104	DC	188	63
21	F8	105	DC	189	61

Temperature(°C)	HEX Reading	Temperature(°C)	HEX Reading	Temperature(°C)	HEX Reading
22	F8	106	DB	190	60
23	F8	107	DA	191	5E
24	F8	108	D9	192	5C
25	F8	109	D8	193	5A
26	F8	110	D7	194	59
27	F8	111	D6	195	57
28	F8	112	D5	196	55
29	F8	113	D4	197	54
30	F8	114	D3	198	52
31	F7	115	D2	199	50
32	F7	116	D1	200	4F
33	F7	117	D0	201	4D
34	F7	118	CF	202	4B
35	F7	119	CE	203	4A
36	F7	120	CD	204	48
37	F7	121	CC	205	47
38	F7	122	CB	206	45
39	F7	123	C9	207	43
40	F6	124	C8	208	42
41	F6	125	C7	209	40
42	F6	126	C6	210	3F
43	F6	127	C5	211	3D
44	F6	128	C3	212	3C
45	F6	129	C2	213	3A
46	F6	130	C1	214	39
47	F5	131	C0	215	37
48	F5	132	BE	216	36
49	F5	133	BD	217	34
50	F5	134	BC	218	33
51	F5	135	BA	219	31
52	F4	136	B9	220	30
53	F4	137	B7	221	2F
54	F4	138	B6	222	2D
55	F4	139	B5	223	2C
56	F4	140	B3	224	2A
57	F3	141	B2	225	29
58	F3	142	B0	226	28
59	F3	143	AF	227	26
60	F3	144	AD	228	25
61	F2	145	AC	229	24
62	F2	146	AA	230	22
63	F2	147	A9	231	21
64	F2	148	A7	232	20
65	F1	149	A6	233	1F
66	F1	150	A4	234	1D
67	F1	151	A2	235	1C
68	F0	152	A1	236	1B
69	F0	153	9F	237	1A
70	F0	154	9E	238	18
71	EF	155	9C	239	17
72	EF	156	9A	240	16
73	EF	157	99	241	15
74	EE	158	97	242	14
75	EE	159	95	243	13
76	ED	160	94	244	12
77	ED	161	92	245	11
78	EC	162	90	246	0F
79	EC	163	8E	247	0E
80	EC	164	8D	248	0D
81	EB	165	8B	249	0C
82	EB	166	89	250	0B
83	EA	167	88		

Note:

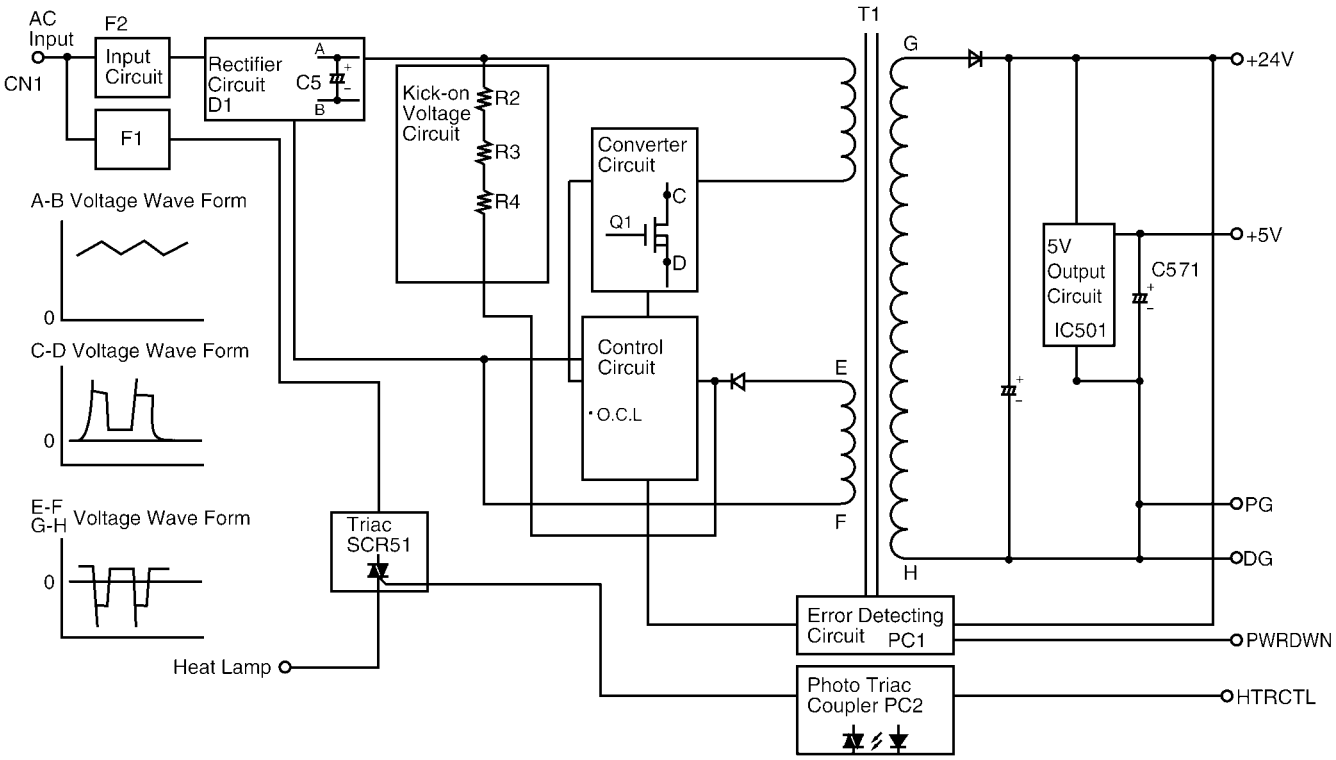
Hex reading : 01h or below = Short of Thermistor

Hex reading : F9h or over = Open of Thermistor

6.17. Power Supply Board Section

This power supply board uses the switching regulator method.

Block Diagram



[Input Circuit]

The input current goes into the input rectifier circuit through the filter circuit. The filter circuit decreases the noise voltage and the noise electric field strength.

[Rectifier Circuit]

The input current is rectified by D1and charges C5 to make DC voltage. Then it supplies power to the converter circuit.

[Kick-on voltage circuit]

Bias is applied to the Q1 gate via this circuit when the AC power is turned on and Q1 begins operating.

[PWR SAVE mode]

Out put Voltage of 24V is dropped to 9V by making PWR DWN Low.

[Control Circuit and Detecting Circuit]

The control circuit amplifies the output with increased voltage detected in the error detecting circuit. Then it drives the main transistor.

In this power supply, the duty ratio is defined by changing the ON period of the main transistor.

This is shown as follows.

When the output voltage of the 24V circuit increases, the current of the photo coupler PC1 increases, the pulse width of the output control IC becomes narrower and the ON period of Q1 becomes shorter.

[Over Current Limiter (O.C.L)]

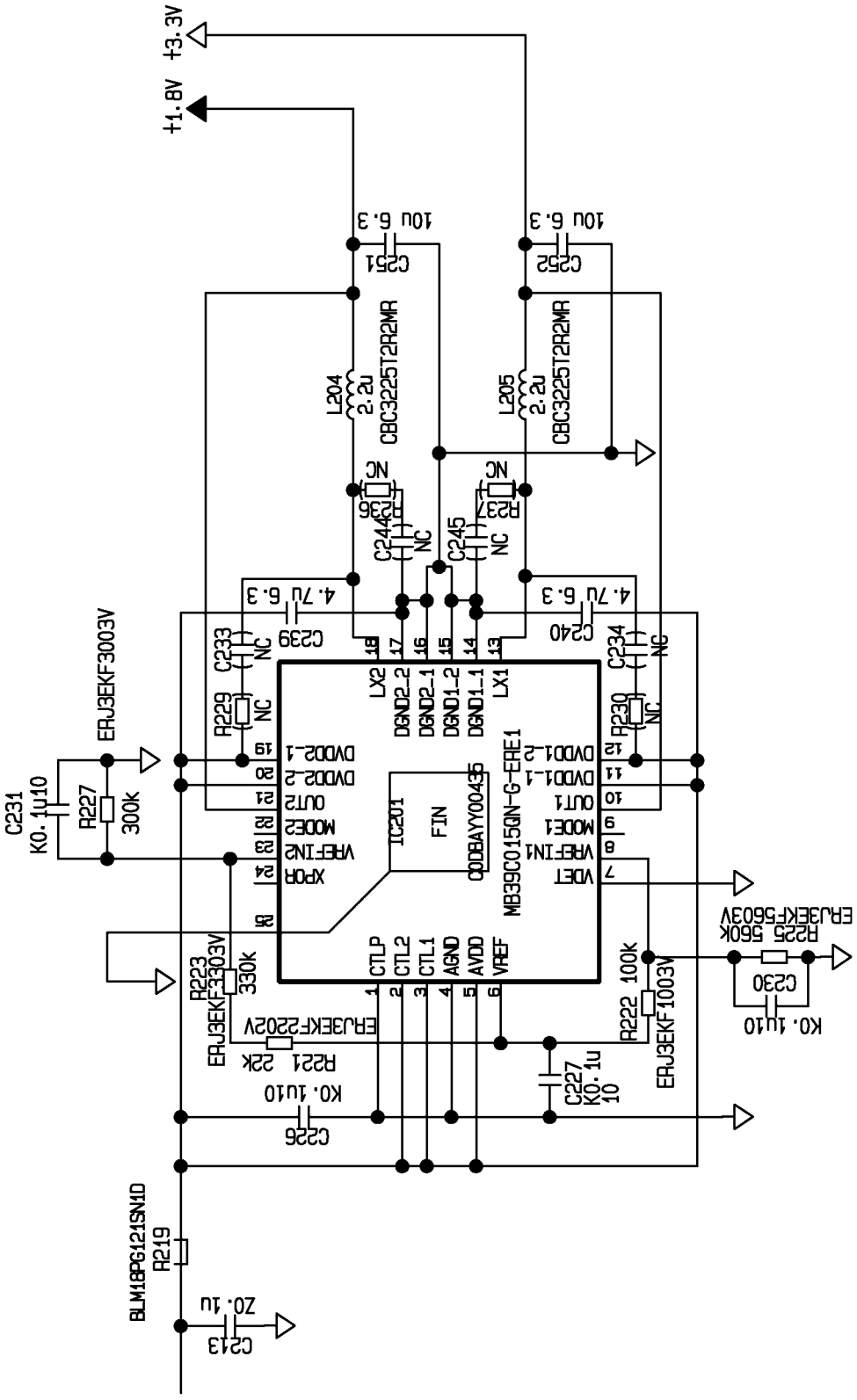
The highest drain current (Q1) is limited by a limiter circuit of 24V. The 24V output is limited by this circuit.

[Over Voltage Circuit]

If the 24V output increases because the error detecting circuit or control circuit is broken, Control Circuit will recognize this signal and output becomes 0V. D104 and D576 also prevent over voltage.

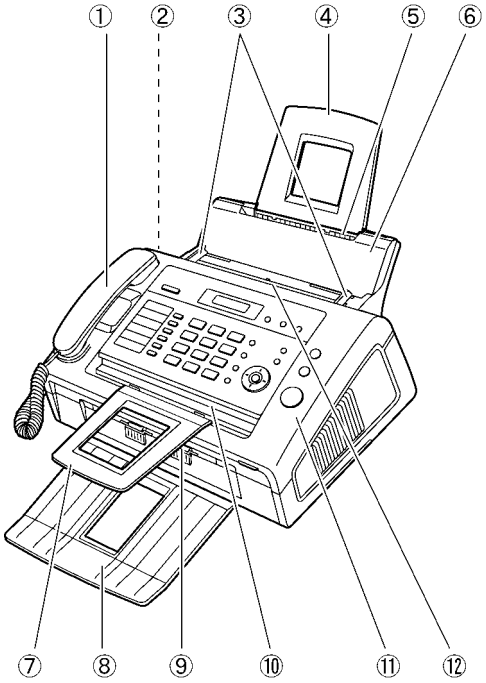
6.18. DC-DC POWER SUPPLY

IC201 is FET installed 2ch Synchronous switching regulator.
Output Voltage is +1.8V and +3.3V.
Oscillation frequency is 2MHz.



7 Location of Controls and Components

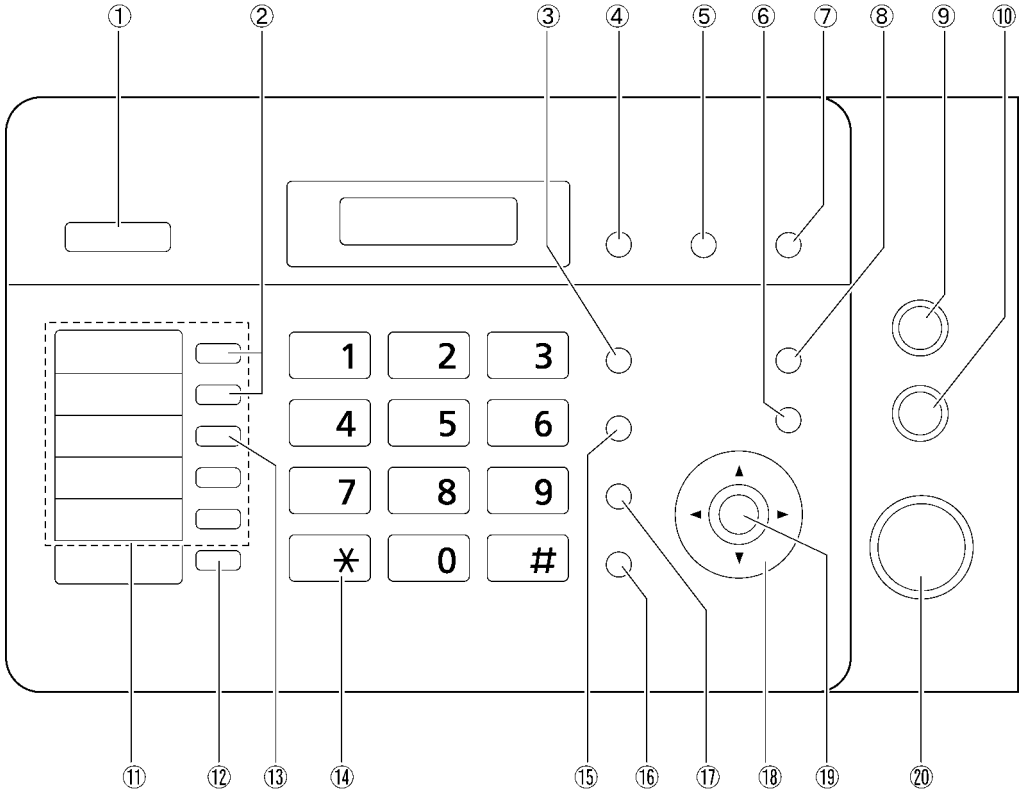
7.1. Overview



(1) Handset
(2) Speaker
(3) Document guides
(4)Paper tray
(5) Recording paper entrance
(6) Tension plate
(7) Document stacker[*1]
(8) Paper stacker[*1]
(9) Recording paper exit
(10) Document exit
(11) Front cover
(12) Document entrance

[*1]The paper stacker and document stacker may not be shown in all illustrations.

7.2. Control Panel

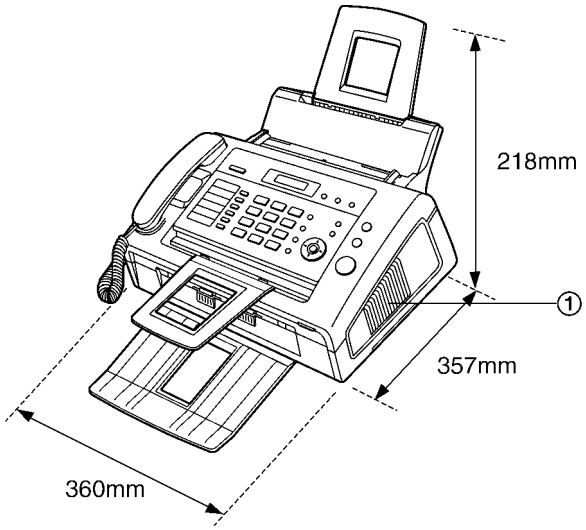


(1) Auto Answer
(2) Broadcast
(3) Redial/Pause
(4) Junk Fax Prohibitor
(5) Caller ID
(6) Menu
(7) Quick Scan
(8) Help
(9) Stop
(10) Copy
(11) Station keys
(12) Lower
(13) Manual Broad
(14) Tone
(15) Flash
(16) Monitor
(17) Handset Mute
(18) Navigator key
(19) Set
(20) Fax/Start

8 Installation Instructions

8.1. Installation Space

The space required to install the unit is shown below.
The dimensions given are necessary for the unit to operate efficiently.



Note:

- Avoid excessive heat or humidity.
- Use the unit within the following ranges of temperature and humidity.
- Ambient temperature: 10°C to 32.5°C
- Relative humidity: 20% to 70% (without condensation)
- Power cord length should be less than 5 meters. Using a longer cord may reduce the voltage or cause malfunctions.
- Avoid direct sunlight.
- Do not install near devices which contain magnets or generate magnetic fields.
- Do not subject the unit to strong physical shock or vibration.
- Keep the unit clean. Dust accumulation can prevent the unit from functioning properly.
- To protect the unit from damage, hold both sides when you move it.
- Do not place the unit in an area where the paper tray may be obstructed (i.e., by a wall, etc.)
- Keep this surface (1) away from walls etc. more than 50 mm to let the unit cool down.

8.2. Connections

Caution:

- **When you operate this product, the power outlet should be near the product and easily accessible.**
- **Be sure to use the telephone line cord supplied in this unit.**
- **Do not extend the telephone line cord.**

(1) Telephone line cord

- Connect to a single telephone line jack.

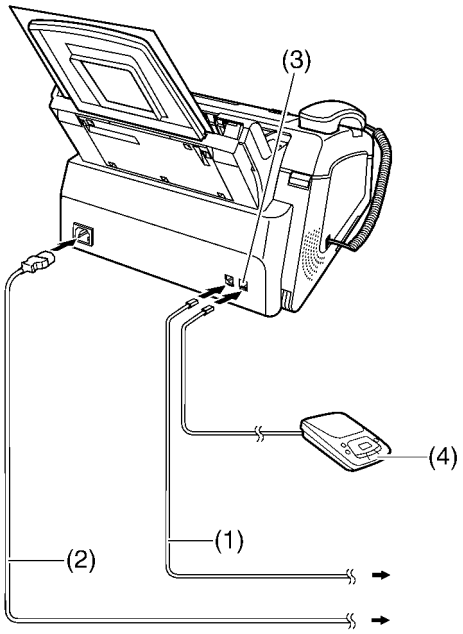
(2) Power cord

- Connect to the power outlet (220-240V, 50/60Hz).

(3) [EXT] jack

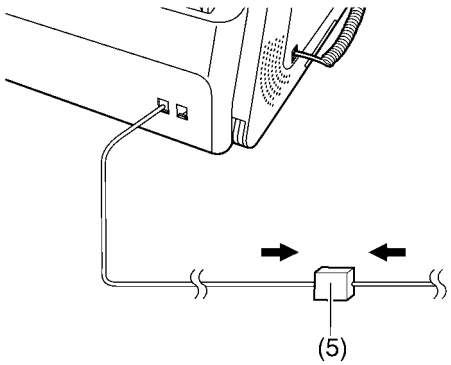
- You can connect an answering machine or a telephone. Remove the stopper if attached.

(4) Answering machine (not included)



Note:

- If any other device is connected to the same telephone line, this unit may disturb the network condition of the device.
- If you use the unit with a computer and your internet provider instructs you to install a filter (5), please connect it as follows.

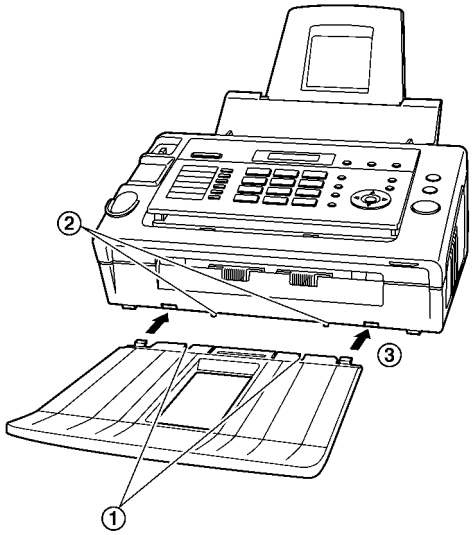


8.3. Paper Stacker

Line up the slots (1) in the paper stacker with the pegs (2) on the bottom of the unit, then insert the two tabs of the paper stacker into the slots on the unit (3).

Note

- Do not place the unit in an area where the paper stacker may be easily bumped into.
- Document and recording paper will be ejected from the front of the unit. Do not place anything in front of the unit.
- The paper stacker can hold up to approximately 30 sheets of printed paper. Remove the printed paper before the paper stacker becomes full.

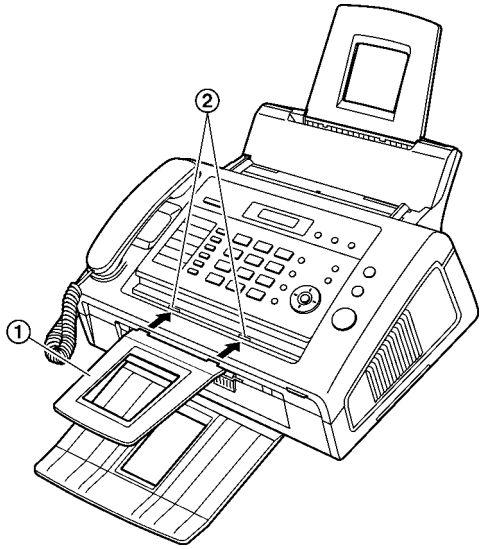


8.4. Document Stacker

- Insert the document stacker (1) into the slots.(2)

Note:

- Make sure the document stacker is inserted completely, or the document may jam.

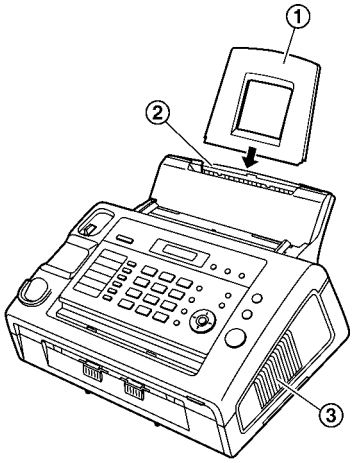


8.5. Paper Tray

Insert the paper tray (1) into the slot (2) on the back of the unit.

Note:

- Do not place the unit in an area where the paper tray may be obstructed (i.e. by a wall, etc.).
- Keep this surface (3) away from walls etc. more than 50 mm to let the unit cool down.



8.6. Recording Paper

A4, letter or legal size recording paper can be used.
The unit can hold:

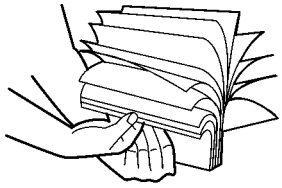
— Up to 250 sheets of 60 g/m^2 to 75 g/m^2 paper.

— Up to 230 sheets of 80 g/m^2 paper.

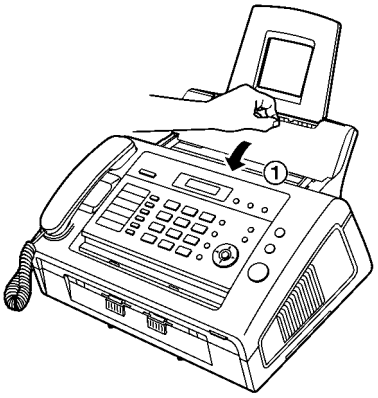
— Up to 200 sheets of 90 g/m^2 paper.

See the note for paper specifications.

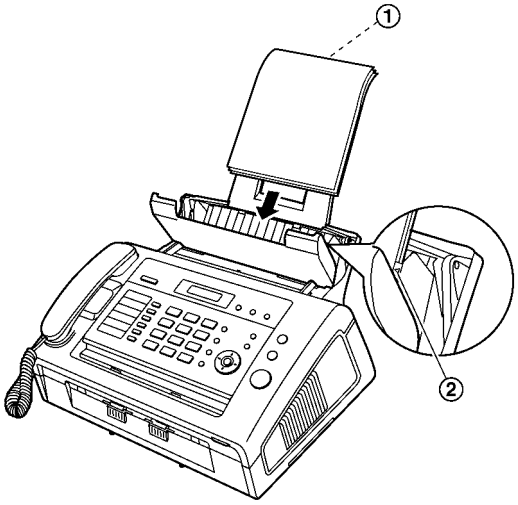
1. Before inserting a stack of paper, fan the paper to prevent paper jams.

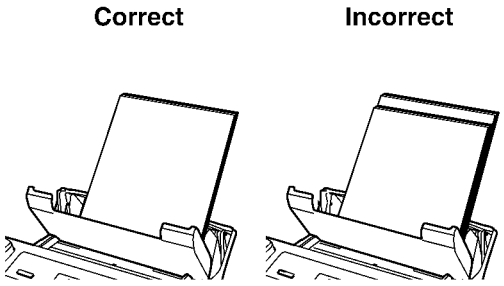


2. Pull the tension plate forward (1).

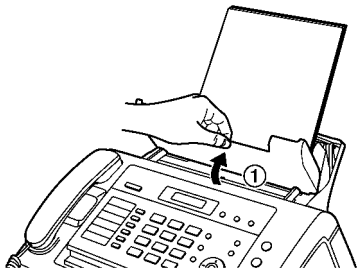


3. Insert the paper, print-side down (1).
- The paper should not be over the tab (2).
- If the paper is not inserted correctly, re-adjust the paper, or the paper may jam.





4. Push the tension plate back (1).



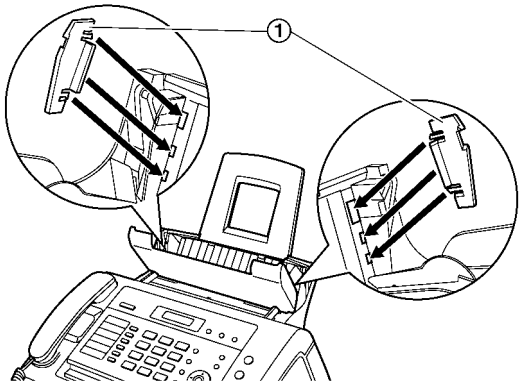
To use A4 size paper

Insert the tabs on the A4 paper guides (1) into the slots.

- "L" is shown on the A4 paper guide for the left side.
  "R" is shown on the A4 paper guide for the right side.

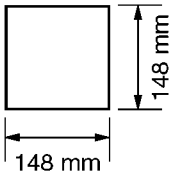
Note:

- When you use letter or legal paper, you do not need to install the A4 paper guides.
- Change the recording paper size to “A4” (feature #16 on **Program Mode Table**(P.128).)

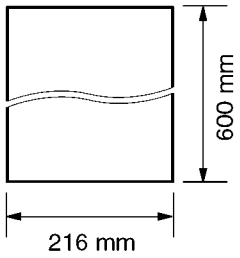


8.7. Document Requirements

Minimum document size

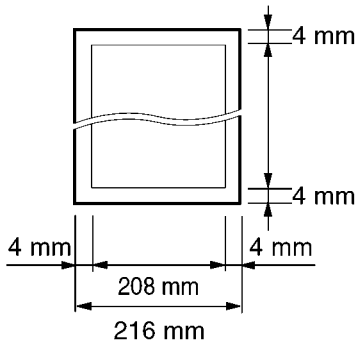


Maximum document size



Effective scanning area

● Shaded area will be scanned.



Document Weight

- Single sheet:45 g/m^2 to 90 g/m^2
- Multiple sheet:60 g/m^2 to 80 g/m^2

Note:

- Remove clips, staples or other fasteners.
- Do not set the following types of documents: (Make a copy of the document using another copier and set the copy.)
  - Chemically treated paper such as carbon or carbonless duplicating paper
  - Electrostatically charged paper
  - Badly curled, creased or torn paper
  - If documents printed from this unit are curled at one end, you can insert the other end that is not curled into the auto document feeder of this unit for better feeding results.
  - Paper with a coated surface
  - Paper with a faint image
  - Paper with printing on the opposite side that can be seen through the other side, such as newsprint
- Check that ink, paste or correction fluid has dried completely.
- To set a document with a width of less than 210 mm, we recommend using a copy machine to copy the original document onto A4 or letter-sized paper, then setting the copied document.
- Do not set documents that do not satisfy the requirements of size and weight. Make a copy of the document using a copy machine and set the copy.

8.8. Replacing the Toner Cartridge and the Drum Unit

When the display shows the following, replace the toner cartridge.

Display: TONER LOW or TONER EMPTY

To check the drum life and quality, please print the printer test list. If printing quality is still poor, replace the toner cartridge and drum unit.

To ensure that the unit operates properly, we recommend the use of **Panasonic toner cartridge (Model No. KX-FAT88E/KX-FAT88A) and drum unit (Model No. KX-FAD89E/KX-FAD89A)**.

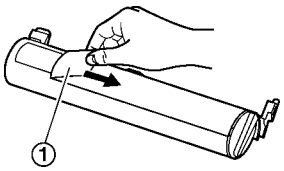
To maintain print quality and machine life, we recommend you to clean slots and openings and the inside of the unit when replacing the toner cartridge and/or drum unit.

Caution:

- **We cannot be responsible for any damage to the unit or degradation of print quality which may occur from the use of a non-Panasonic toner cartridge and drum unit.**
- **The drum unit contains a photosensitive drum.**
  Exposing it to light may damage the drum.
  Once you have opened the protection bag:
  - **Do not expose the drum unit to light for more than 5 minutes.**
  - **Do not touch or scratch the black drum surface.**
  - **Do not place the drum unit near dust or dirt, or in a high humidity area.**
  - **Do not expose the drum unit to direct sunlight.**
- **Do not unplug the unit. Loss of fax documents in memory may occur.**
- **Do not leave the toner cartridge out of the protection bag for a long time. It will decrease the toner life.**
- **Do not add toner to the toner cartridge.**

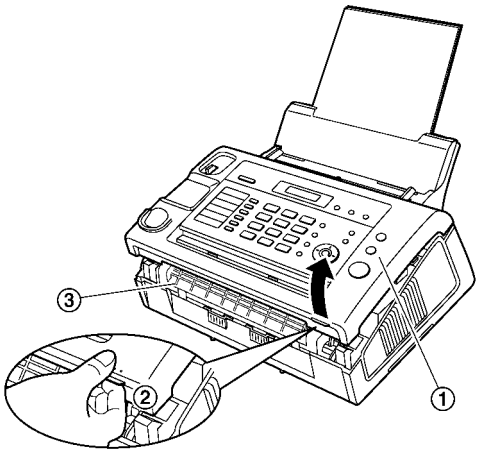
1. Before opening the protection bag of the new toner cartridge, shake it vertically more than 5 times.

2. Remove the new toner cartridge from the protection bag.
Peel off the seal (1) from the toner cartridge.



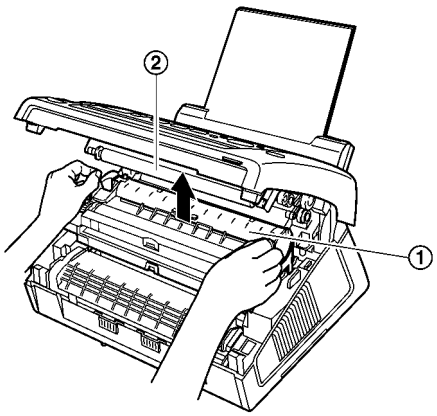
3. Remove the handset and document stacker.

4. Lift open the front cover (1), holding the dotted area (2) on the right side.

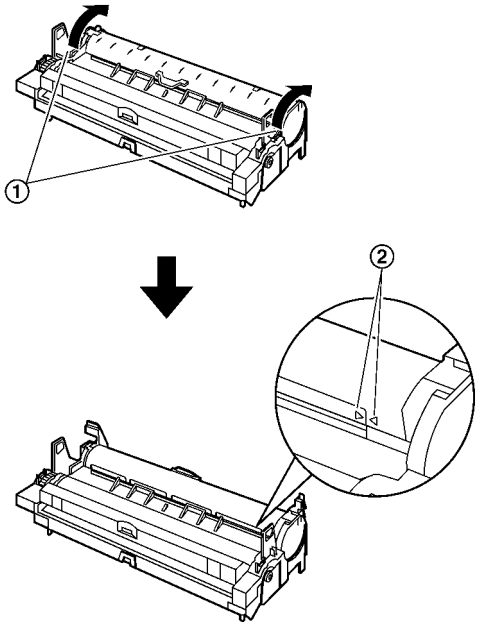


Caution:
The fuser unit (③) gets hot. Do not touch it.

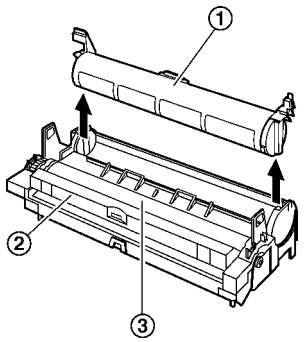
5. Remove the drum and toner unit (1) by holding the two tabs.
- Do not touch the transfer roller (2).
- If you replace the toner cartridge and the drum unit at the same time, skip to step 9.
- If you replace only the toner cartridge, tap on the used toner cartridge several times to allow the remaining toner to fall into the drum unit before removing.



6. Turn the two levers (1) on the used toner cartridge firmly, until the triangles (2) match.



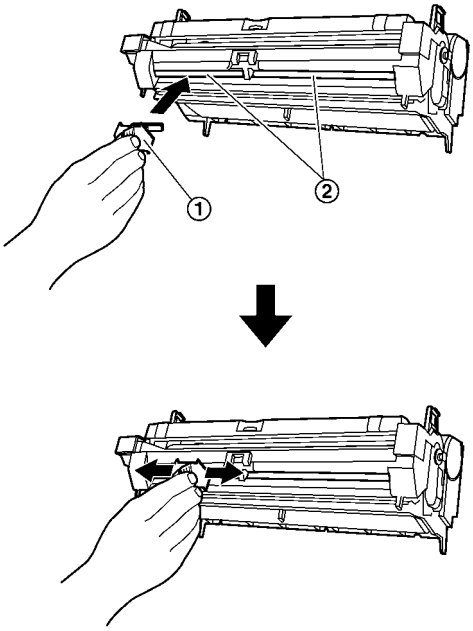
7. Remove the used cartridge (1) from the drum unit (2).
- The toner may stick to the cartridge and the drum unit. Be careful when handling.
- Do not drop the toner on the black drum surface (3).
- Put the used toner cartridge into the protection bag.



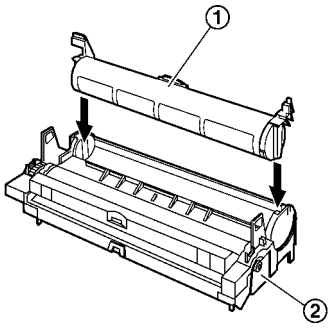
8. Insert the cleaner (1) fully into the groove (2) of the drum unit and move it from side to side at least 3 times to clean the inside of the drum unit.

Important:
- If the groove of the drum unit is dirty, lines or dirty patterns may appear on printed sheets.
  Be sure to remove any toner remaining on the inside of the drum unit to maintain the print quality.
- Repeat for the other groove.

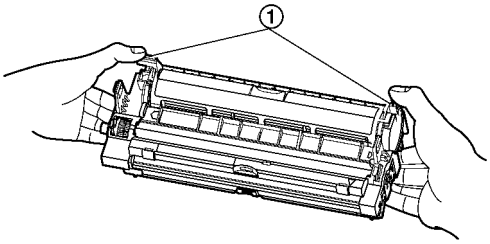
Note:
- Be sure to clean all the way to the edge of each groove.



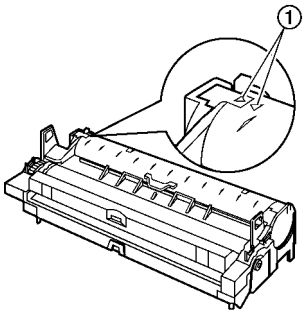
9. If you replace the drum unit at the same time, remove the new drum unit from the protection bag.
Place the new toner cartridge (1) into the drum unit (2) vertically.



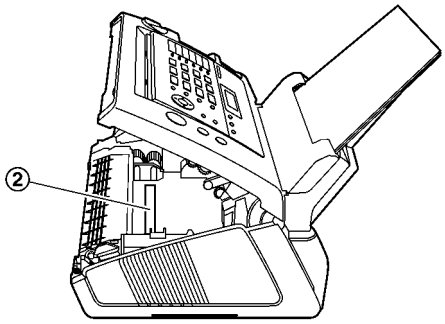
10. Turn the lever (1) on each side of the toner cartridge while pressing down firmly.



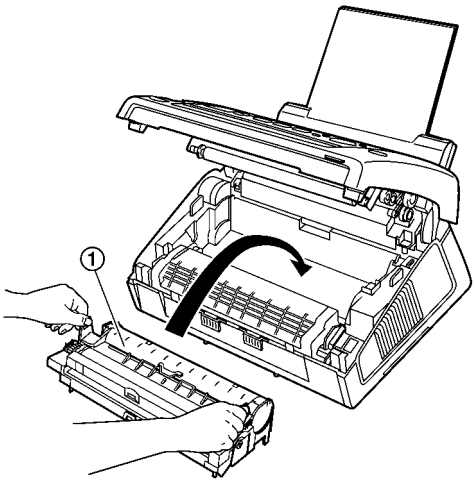
11. Make sure that the triangles (1) match, to install the toner cartridge correctly.



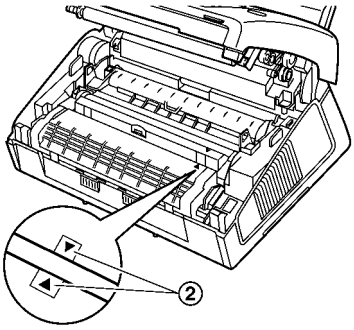
- If the lower glass (2) is dirty, clean it with a soft and dry cloth.



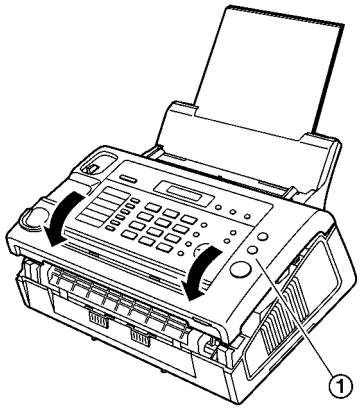
12. Install the drum and toner unit (1) by holding the tabs.



- Make sure that the triangles(2) match to install the drum and toner unit correctly.



13. • Close the front cover (1) by pushing down on both sides, until locked.



14. Place the handset on the cradle and attach the document stacker.
• While the unit displays “PLEASE WAIT”, do not open the front cover, or disconnect the power cord.

Waste disposal method

Waste material should be disposed of under conditions which meet all national and local environment regulations.

9 Operating Instructions

9.1. To Select Characters with the Dial Keypad

Pressing the dial keys will select a character as shown below.

Keypad	Characters
[1]	Space # & ' ( ) * , – . / 1
[2]	A B C 2
	a b c 2
[3]	D E F 3
	d e f 3
[4]	G H I 4
	g h i 4
[5]	J K L 5
	j k l 5
[6]	M N O 6
	m n o 6
[7]	P Q R S 7
	p q r s 7
[8]	T U V 8
	t u v 8
[9]	W X Y Z 9
	w x y z 9
[0]	Space 0
[*]	To change uppercase or lowercase letter.
[FLASH]	To enter a hyphen
[HANDSET MUTE]	To insert a space.
[STOP]	To delete a digit.

Note:

- To enter another character that is located on the same dial key, press [▶] to move the cursor to the next space.

9.2. To Select Characters Using [+] or [-]

Instead of pressing the dial keys, you can select characters using **[+]** or **[-]**.

1. Press **[-]** repeatedly to display the desired character. Characters will be displayed in the following order:
   (1) Uppercase letters
   (2) Number
   (3) Symbol
   (4) Lowercase letters
   - If you press **[+]**, the order will be reversed.
2. Press **[►]** to insert the character.
3. Return to step 1 to enter the next character.

9.3. Setting Your Logo

The logo can be your name or the name of your company.

1 Press **【MENU】**.

```
SYSTEM SETUP
PRESS [◄ ►]
```

2 Press **【#】** then **【0】【2】**.

```
YOUR LOGO
PRESS SET
```

3 Press **【SET】**.

- The cursor (▒) will appear on the display.

```
LOGO=▒
```

4 Enter your logo, up to 30 characters, See the following character table for details.

Example: "BILL"

1. Press **【2】** 2 times.

```
LOGO=B
```

2. Press **【4】** 3 times.

```
LOGO=BI
```

3. Press **【5】** 3 times.

```
LOGO=BIL
```

4. Press **【►】** to move the cursor to the next space and press **【5】** 3 times.

```
LOGO=BILL
```

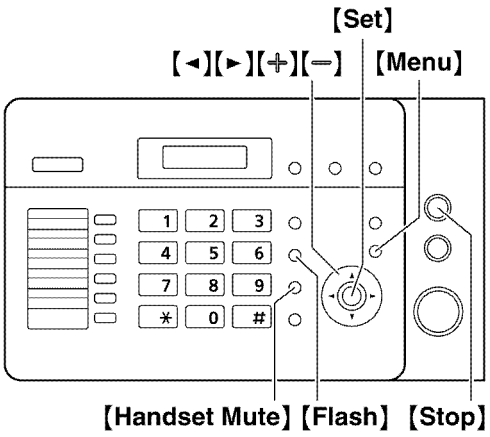
5 Press **【SET】**.

```
SETUP ITEM [  ]
```

6 Press **【MENU】** to exit.

Note:

- Your logo will be printed on the top of each page sent from your unit.



To correct a mistake

1. Press **【◄】** or **【►】** to move the cursor to the incorrect character.
2. Press **【STOP】**.
   - To erase all characters, press and hold **【STOP】**.
3. Enter the correct character.

To change uppercase or lowercase letters

Pressing the **【*】** key will change to uppercase or lowercase alternately.

1. Press **【2】** 2 times.

```
LOGO=B
```

2. Press **【4】** 3 times.

```
LOGO=BI
```

3. Press **【*】**

```
LOGO=Bi
```

4. Press **【5】** 3 times.

```
LOGO=Bil
```

10 Test Mode

10.1. Test Functions

The codes listed below can be used to perform simple checks of some of the unit's functions. When complaints are received from customers, they provide an effective tool for identifying the locations and causes of malfunctions.

Test Mode	Type of Mode	Code Operation after code input	Function
MOTOR TEST & High Voltage Power Supply Board CHECK	Service Mode	"5" "5" "6" START	0: Recording paper feed 1: Auto Document feed (STANDARD) 2: Auto Document feed (FINE) 3: Auto Document feed (SUPER FINE) Refer to **High Voltage Value Check Point** (P.117).
MODEM TEST	Service Mode	"5" "5" "4" START	Telephone line circuit is connected automatically, output the following signals on the circuit line. 0) OFF 1) 1100Hz 2) 2100Hz 3) 300bps 4) 2400bps 5) 4800bps 6) 7200 bps 7) 9600bps 8) 12000bps 9) 14400bps 10) 16800bps 11) 19200bps 12) 21600bps 13) 24000bps 14) 26400bps 15) 28800bps 16) 31200bps 17) 33600bps
ROM CHECK	Service Mode	"5" "5" "1" START	Indicates the version and checks the sum of the ROM.
LCD CHECK	Service Mode	"5" "5" "8" START	Checks the LCD indication. Illuminates all the dots to check if they are normal. Refer to **Operation Panel Section (**P.110).
DTMF SINGLE TEST	Service Mode	"5" "5" "2" 1....ON 2....OFF	Outputs the DTMF as single tones. Used to check the frequencies of the individual DTMF tones. Refer to **DTMF Single Tone Transmit Selection** (P.75).
LED CHECK	Service Mode	"5" "5" "7" START	All LEDs above the operation panel board flash on and off, or are illuminated.
KEY CHECK	Service Mode	"5" "6" "1" START (any key)	Checks the button operation. Indicates the button code on the LCD while the button is pressed. Refer to **Button Code Table** (P.76). Refer to **Operation Panel Section (**P.110).
CIS TEST	Service Mode	"5" "5" "5"	LED lights up, CIS scanning. Refer to **CIS (Contact Image Sensor) Section (P.116).**
LSU TEST	Service Mode	"6" "3" "9"	Laser radiates, Polygon rotates Refer to **LSU (Laser Scanning Unit) Section** (P.38).
MEMORY CLEAR	Service Mode	"5" "5" "0" START	To reset the value to the default one, except the top margin (#853), left margin (#854), time / day (#001), logo (#002), Fax no. (#003), History and Directory data. Please restart a power supply after clearing a memory.
FAN TEST	Service Mode	"6" "7" "7" START	1:TEST OFF 2:High-speed rotation 3:Low-speed rotation

Test Mode	Type of Mode	Code Operation after code input	Function
SENSOR CHECK	Service Mode	"8" "1" "5"	First of all, press the copy button, and confirm the action of ON/OFF. For each sensor's operation, refer to **Sensors and Switches Section** (P.40). D S C - R E - T * 3F * D 4 * V : LCD DISPLAY **D: Document sensor** D: Document set -: No document **S: Paper Feed Sensor** S: Read position -: No read position **C: Printer Cover Switch** C: Open -: Close **R: Regist Sensor** R: Detect recording paper -: Not defect recording paper **E: Exit Sensor** E: Detect recording paper -: Not detect recording paper **T: Toner Sensor** T: Toner sensor ON -: Toner sensor OFF ***: None** **3F: Temperature of THERMISTOR** Hex (00-FF) ***: None** **D4: Temperature of Atmosphere** Hex (00-FF) ***: None** **V: VOX signal** V: Detect the tone on the line -: Not detect
PRINT TEST PATTERN	Service Mode	"8" "5" "2" START	1. Press "852" then the SET key in the service mode. 2. As "PATNO =" is displayed on the LCD, enter the test pattern No. and press the SET key. 3. When "No. = "is displayed on the LCD, enter the printing number and press the SET key. (Press "00" for the infinite printing.) 4. "MODE" is displayed on the LCD. Press "0" to start printing or press "1" to go to the next screen. 5. When "1" is pressed at MODE, "INTVL = "is displayed on the LCD. Enter the printing interval (00~99 sec). 6. The printing repeats the designated number of times at the programmed printing intervals.

Note:
The numbers in the boxes (XXX) indicate the keys to be input for the various test modes.

10.1.1. DTMF Single Tone Transmit Selection

When set to ON (=1), the 12 keys and transmission frequencies are as shown.

key	Low Frequency (Hz)	Key	High Frequency (Hz)
"1"	697	"5"	1209
"2"	770	"6"	1336
"3"	852	"7"	1477
"4"	941	"8"	1633

When set to OFF (=2), the 12 keys and transmission frequencies are as shown.

High (Hz) / Low (Hz)	1209	1336	1477
697	"1"	"2"	"3"
770	"4"	"5"	"6"
852	"7"	"8"	"9"
941	"*"	"0"	"#"

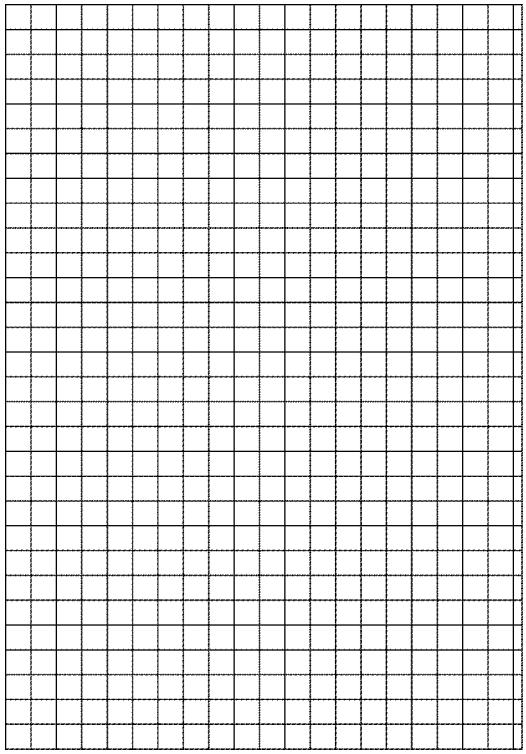
Note:
After performing this check, do not forget to turn the setting off. otherwise, dialing in DTMF signal will not work.

10.1.2. Button Code Table

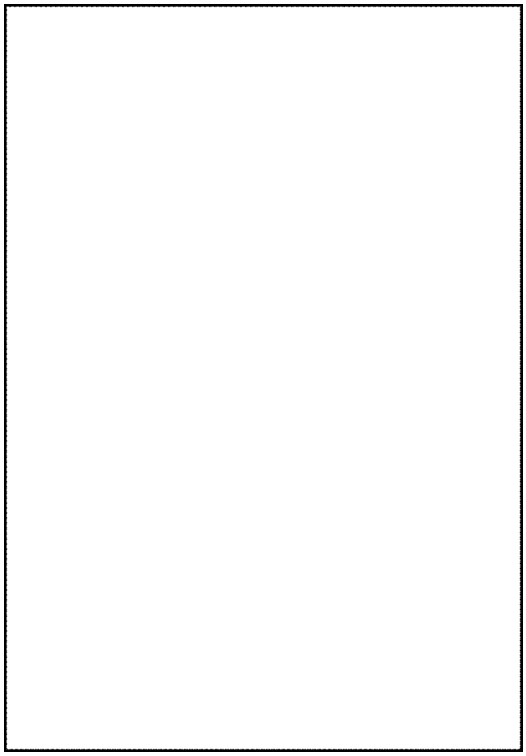
Code	Button Name	Code	Button Name	Code	Button Name
00	NO INPUT	31	1	49	QUICK SCAN
0B	SET	32	2	5B	BROADCAST 1
0E	JUNK FAX PROHIBITOR	33	3	5C	BROADCAST 2
-	STOP	34	4	5D	MANUAL BROAD
04	FAX START	35	5	5E	STATION 4
05	LOWER	36	6	5F	STATION 5
06	COPY START	37	7		
08	MONITOR	38	8		
0A	HANDSET MUTE	39	9		
0C	AUTO ANSWER	3A	0		
1E	NAVIGATOR NEXT▶	3B	✳(TONE)		
1F	NAVIGATOR PREV◀	3C	#		
20	MENU	3D	REDIAL/PAUSE		
22	HELP	3E	FLASH		
25	VOLUME ＋	47	CALLER ID SEARCH		
26	VOLUME －				

10.1.3. Print Test Pattern

1. NO.01



2. NO.06



3. NO.03

- These print test patterns are just image printing, and different from actual ones.
  When it is required to judge the print quality, compare with the printing of a nondefective machine.

11 Service Mode

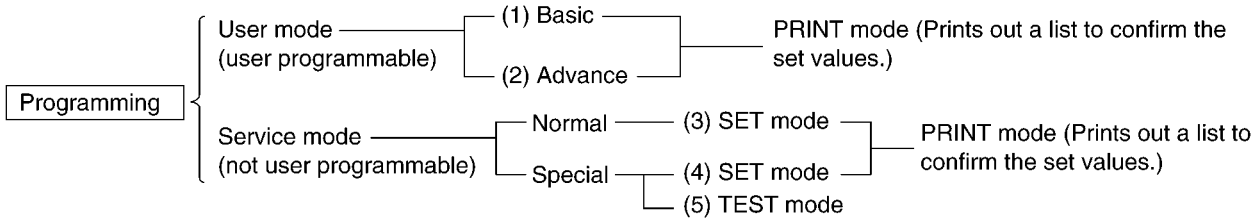
11.1. Programming and Lists

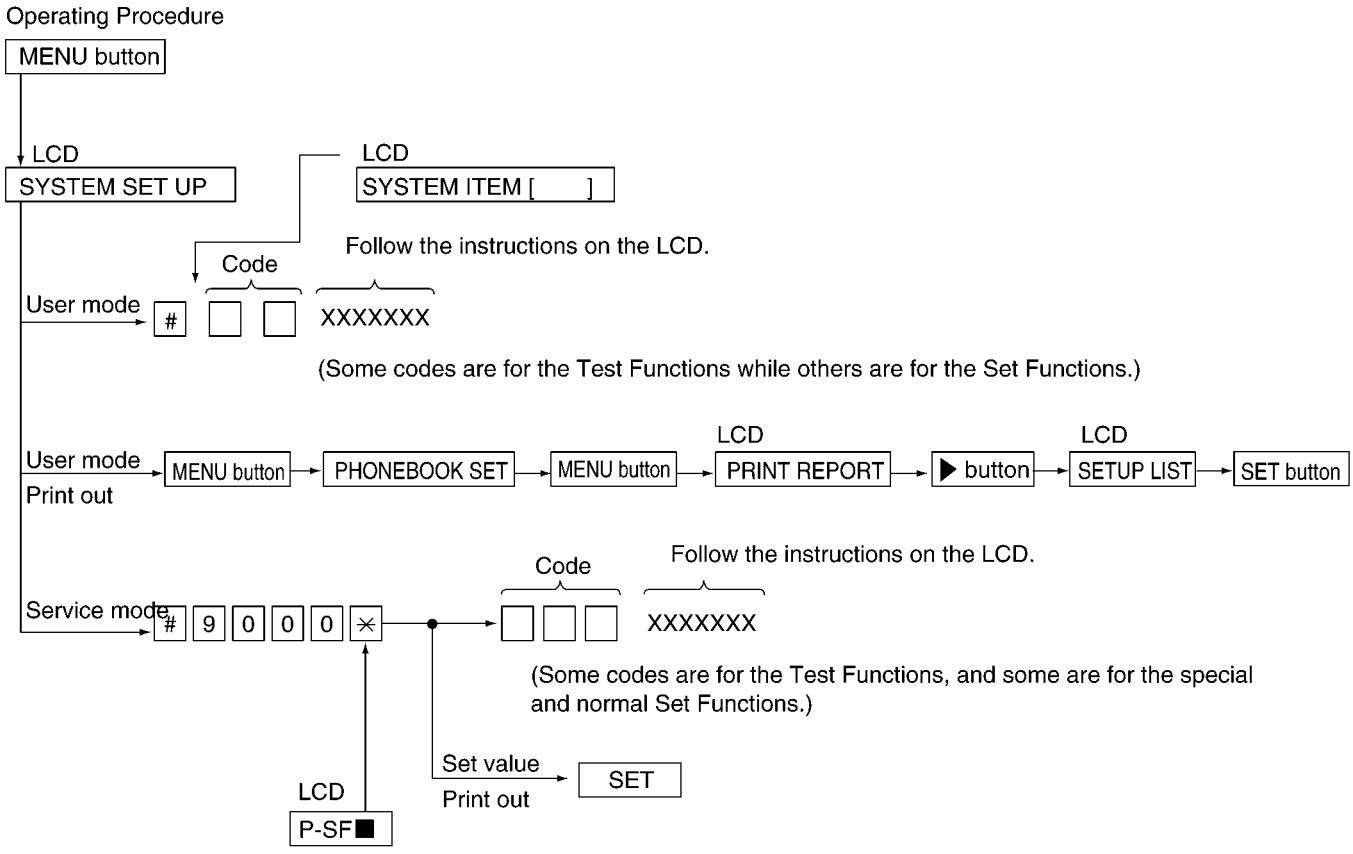
The programming functions are used to program the various features and functions of the machine, and to test the machine. This facilitates communication between the user and the service man while programming the unit.

11.1.1. Operation

There are 2 basic categories of programming functions, the User Mode and the Service Mode. The Service Mode is further broken down into the normal and special programs. The normal programs are those listed in the Operating Instructions and are available to the user. The special programs are only those listed here and not displayed to the user. In both the User and Service Modes, there are Set Functions and Test Functions. The Set Functions are used to program various features and functions, and the Test Functions are used to test the various functions. The Set Functions are accessed by entering their code, changing the appropriate value, then pressing the SET key. The Test Functions are accessed by entering their code and pressing the key listed on the menu. While programming, to cancel any entry, press the STOP key.

11.1.2. Operation Flow





11.1.3. Service Function Table

Code	Function	Set Value	Effective Range	Default	Remarks
501	Pause time set	X 100 msec	001~600	030	----------
502	Flash time	X 10 msec	01-09	70	----------
503	Dial speed select	1:10 pps 2:20 pps	1, 2	1	----------
507	V.34 transmit speed selection	0:DISABLE 1:33,600 2:31,200 3:28,800 4:26,400 5:24,000 6:21,600 7:19,200 8:16,800	0~8	1	----------
508	V.34 receive speed selection	0:DISABLE 1:33,600 2:31,200 3:28,800 4:26,400 5:24,000 6:21,600 7:19,200 8:16,800	0~8	1	----------
514	Bell signal detect time	X 100msec	1~9	6	----------
520	CED frequency select	1:2100 Hz 2:1100 Hz	1, 2	1	See Symptom/Countermeasure Table for long distance and international calls in (P.88).
521	International mode select	1:ON 2:OFF	1, 2	1	See Symptom/Countermeasure Table for long distance and international calls in (P.88).
522	Auto standby select	1:ON 2:OFF	1, 2	1	The resolution reverts to the default when transmission is complete.
523	Receive equalizer select	1: 0 km 2: 1.8 km 3: 3.6 km 4: 7.2 km	1~4	1	Set RX equalizer to automatic mode.
524	Transmission equalizer select	1: 0 km 2: 1.8 km 3: 3.6 km 4: 7.2 km	1~4	1	
529	Call Service Clear				
544	Selecting the document feed position	0~4mm	0~4	2	When the ADF function is incorrect, adjust the feed position.
550	Memory clear				See **Test Functions** (P.74).
551	ROM check				See **Test Functions** (P.74).
552	DTMF single tone test	1:ON 2:OFF	1, 2	2	See **Test Functions** (P.74).
553	Monitor on FAX communication select	1:OFF 2:PHASE B 3:ALL	1~3	1	Sets whether to monitor the line signal with the unit's speaker during FAX communication or not.
554	Modem test				See **Test Functions** (P.74).
555	Scan check				See **Test Functions** (P.74).
556	Motor test & H.V.P.S. check			0	See **Test Functions** (P.74).
557	LED test				See **Test Functions** (P.74).
558	LCD test				See **Test Functions** (P.74).
561	KEY test				See **Test Functions** (P.74).
567	T0 timer	X second	001~255	060	
570	BREAK % select	1:61% 2:67%	1, 2	1	Sets the % break of pulse dialing according PBX.
571	ITS auto redial time set	X number of times	00~99	05	Selects the number of times that ITS is redialed (not including the first dial).
572	ITS auto redial line disconnection time set	X second	001~999	185	Sets the interval of ITS redialing.
573	Remote turn-on ring number set	X number of rings	0~99	10	Sets the number of rings before the unit starts to receive a document in the TEL mode.
590	FAX auto redial time set	X number of times	00~99	05	Selects the number of redial times during FAX communication (not including the first dial).
591	FAX auto redial time disconnection time set	X second	001~999	185	Sets the FAX redial interval during FAX communication.

Code	Function	Set Value	Effective Range	Default	Remarks
592	CNG transmit select	1:OFF 2:ALL 3:AUTO	1~3	2	Lets you select the CNG output during FAX transmission. ALL: CNG is output at phase A. AUTO: CNG id output only when automatic dialing is performed. OFF: CNG id not output at phase A. Refer to (P.103).
593	Time between CED and 300bps	1:75 msec 2:500 msec 3:1 sec	1~3	1	See **Symptom/Countermeasure Table** for long distance and international calls in (P.88). Refer to (P.104) and (P.88).
594	Overseas DIS detection select	1:detects at the 1st time 2:detects at the 2nd time	1, 2	1	See **Symptom/Countermeasure Table** for long distance and international calls in (P.88). Refer to (P.103) and (P.88).
595	Receive error limit value set	1: 5% 2: 10% 3: 15% 4: 20%	1~4	2	If the number of errors during transmission exceeds this value, the sending side terminates the call.
596	Transmit level set	X dBm	- 15~00	11	Selects the FAX transmission level. Refer to (P.103)and (P.104).
598	Receiving sensitivity	43= -43 dBm	20~48	44	Used when there is an error problem. Refer to (P.88).
599	ECM frame size	1:256 2:64	1, 2	1	----------
628	H.V.P.S. check				See (P.74).
630	Paper Jam Cause Distinction Code				0:No Paper Jam 1:The paper was pulled into the unit. 2:The paper was longer than the maximum length of the register sensor. 3:The paper exit was not detected after the registration. 4:The paper was longer than the maximum length of the paper exit sensor. 5:The register sensor or paper exit sensor was turned ON before the motor started to rotate. 6:The register sensor chattered. 7:The paper exit sensor chattered.
639	LSU test				See **Test Functions** (P.74).
651	Write system program into the Flash Rom with a tool.				See the parts number of the tool. The tool includes the operating manual for writing program.
655	Cause Distinction Code of Call Service 3				See **Call Service Troubleshooting Guide** (P.137).
677	Fan test				See **Test Functions** (P.74).
710	Memory clear except History data				To reset the value to the default one, except History data. Please restart a power supply after clearing a memory.
717	Transmit speed selection	1:14400BPS 2:12000BPS 3:9600BPS 4:7200BPS 5:4800BPS 6:2400BPS	1~6	1	Adjusts the speed to start training during FAX transmission. Refer to (P.103) and
718	Receive speed selection	1:14400BPS 2:12000BPS 3:9600BPS 4:7200BPS 5:4800BPS 6:2400BPS	1~6	1	Adjusts the speed to start training during FAX reception. Refer to (P.104) and
719	Ringer off in TEL/FAX mode	1:ON 2:OFF	1, 2	1	----------
721	Pause tone detect	1:ON 2:OFF	1, 2	2	Selects the tone detection for pause in dialing.
722	Redial tone detect	1:ON 2:OFF	1, 2	1	Sets the tone detection mode after redialing.
763	CNG detect time for friendly reception	1:10 sec 2:20 sec 3:30 sec	1~3	3	Selects the CNG detection tone of friendly reception.
771	T1 timer	1:35 sec 2:60 sec	1, 2	1	Sets a higher value when the response from the other party needs more time during FAX transmission.
774	T4 timer	X 100 sec	00~99	00	Use this function when delay occurs in the line and communication. (ex. Mobile comm) does not work well.
815	Sensor & Vox check				See **Test Functions** (P.74).

Code	Function	Set Value	Effective Range	Default	Remarks
852	Print test pattern				See **Print Test Pattern** (P.77).
853	Top margin		1~5	3	----------
854	Left margin		1~7	4	----------
874	DTMF ON time	X msec	060~200	100	----------
875	DTMF OFF time	X msec	060~200	100	----------
880	History list				See (P.84).
881	Journal 2 list				See (P.99).
882	Journal 3 list				See (P.99).
890	TEL/FAX ring back tone	1:ON 2:OFF	1, 2	1	----------

11.2. The Example of the Printed List

11.2.1. User Mode (The list below is an example of the SYSTEM SETUP LIST the unit prints out.)

SETUP LIST

[BASIC FEATURE LIST]

NO.	FEATURE	CURRENT SETTING	
#01	SET DATE & TIME	01 Jan. 2009 11:05PM	
#02	YOUR LOGO	ABCDEFGHIJKLMNOPQRSTUVWXYZABCD	
#03	YOUR FAX NUMBER	12345678901234567890	
#04	PRINT SENDING REPORT	ERROR	[ERROR,ON,OFF]
#06	FAX RING COUNT	2	[1...9]
#13	DIALLING MODE	TONE	[TONE,PULSE]
#16	PAPER SIZE	A4	[LETTER,A4,LEGAL]
#17	EXT. RINGTONE	RINGTONE 1	[RINGTONE 1,2,3]

Code

Set Value

[ADVANCED FEATURE LIST]

NO.	FEATURE	CURRENT SETTING	
#22	JOURNAL AUTO PRINT	ON	[ON,OFF]
#23	OVERSEAS MODE	ERROR	[NEXT FAX,ERROR,OFF]
#25	DELAYED TRANSMISSION	OFF	[ON,OFF]
	DESTINATION =		
	START TIME =	12:00AM	
#26	AUTO CALLER ID LIST	OFF	[ON,OFF]
#30	SILENT FAX RECOGNITION RING	3	[3...9]
#37	AUTO REDUCTION	ON	[ON,OFF]
#39	LCD CONTRAST	NORMAL	[NORMAL,DARKER]
#41	FAX ACTIVATION CODE	ON	[ON,OFF]
	CODE =	*#9	
#44	MEMORY RECEIVE ALERT	ON	[ON,OFF]
#46	FRIENDLY RECEPTION	ON	[ON,OFF]
#49	AUTO DISCONNECT	ON	[ON,OFF]
	CODE =	*0	
#58	SCAN CONTRAST	NORMAL	[NORMAL,LIGHT,DARKER]
#65	MAINTENANCE TIME	12:00PM	
#66	MAX FAX SPEED	33.6Kbps	[14.4Kbps,33.6Kbps]
#68	ECM SELECTION	OFF	[ON,OFF]
#72	SET FLASH TIME	700msec	[80,90,100,110,160,200, 250,300,400,600,700,900]
#73	MANUAL ANSWER MODE	TEL	[TEL,TEL/FAX]
#76	CONNECTING TONE	ON	[ON,OFF]
#78	TEL/FAX DELAYED RING	2	[1...9]
#79	TONER SAVE	OFF	[ON,OFF]
#80	SET DEFAULT		

Code

Set Value

Note:
The above values are the default values.

11.2.2. Service Mode Settings (Example of a printed out list)

```
[ SERVICE DATA LIST ]

501 PAUSE TIME              =  030*100ms        [001...600]*100ms
503 DIAL SPEED              =  10pps            [1=10     2=20]pps
520 CED FREQUENCY           =  2100Hz           [1=2100   2=1100]Hz
521 INTERNATIONAL MODE      =  ON               [1=ON     2=OFF]
522 AUTO STANDBY            =  ON               [1=ON     2=OFF]
523 RX EQUALIZER            =  0.0Km            [1=0.0    2=1.8   3=3.6   4=7.2]Km
524 TX EQUALIZER            =  0.0Km            [1=0.0    2=1.8   3=3.6   4=7.2]Km
853 TOP MARGIN              =  3                [1...5]
854 LEFT MARGIN             =  4                [1...7]

[ SPECIAL SERVICE SETTINGS ]

514   544   552   553   567   570   571   572   573   590   591   592   593
 6     2     2     1   060     1   05   185    10    05   185     2     1

594   595   596   598   599   717   718   719   721   722   763   774   874
 1     2    11    44     1     1     1     1     2     1     3   00   100

875   890
100     1

USAGE TIME = 00000 HOURS


Version = GCF1CP  5ACB
```

Code

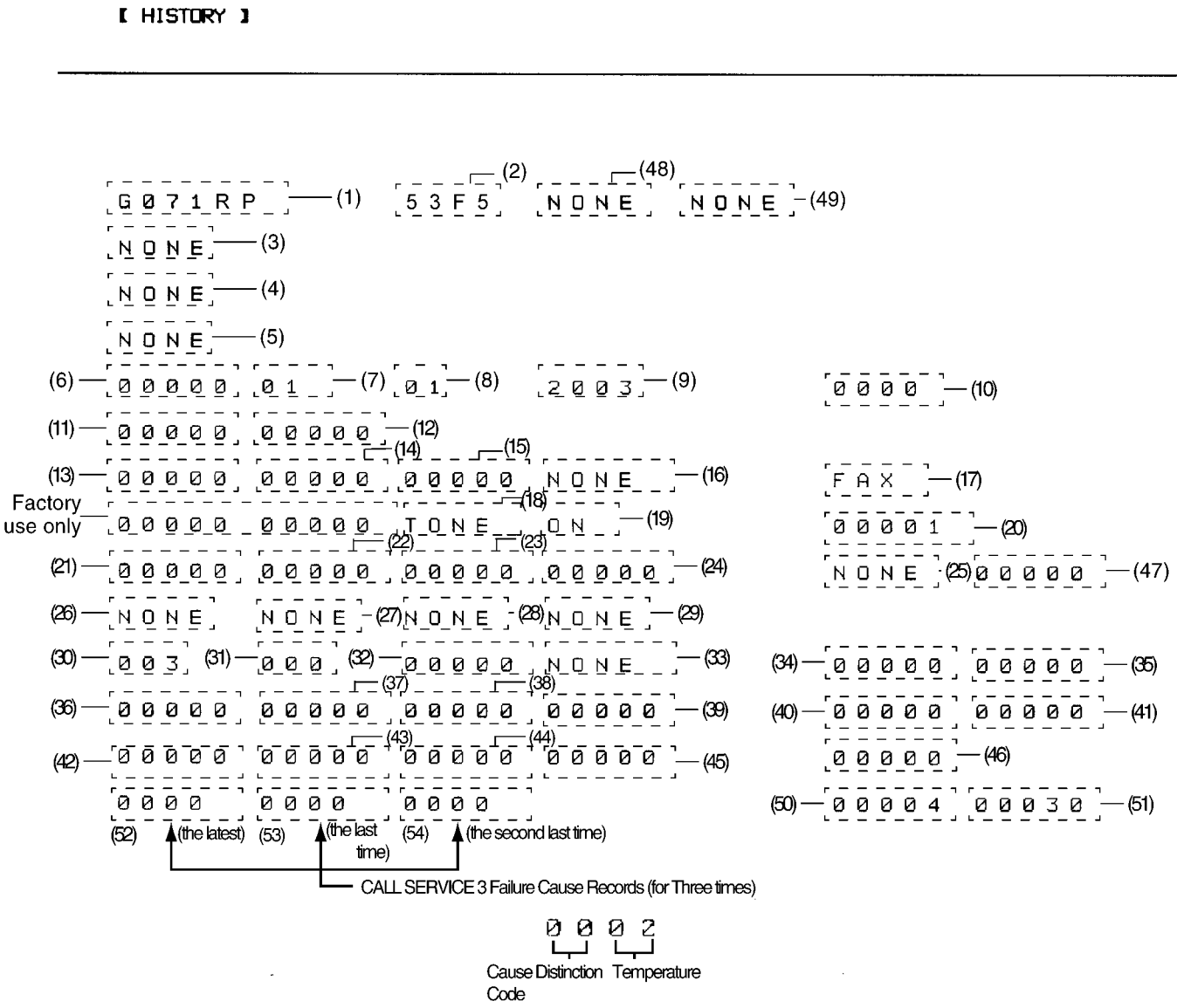
Set Value

Code

Set Value

Note:
The above values are the default values.

11.2.3. History (Example of a printed out list)



Note:

See the following descriptions of this report. Item No. (1) ~ (49) are corresponding to the listed items in **Descriptions of the History Report**(P.85).

11.2.3.1. Descriptions of the History Report

(1) ROM VERSION
FLASH ROM version
(2) SUM
FLASH ROM internal data calculation.
(3) YOUR LOGO
The user logo recorded in the unit. If it is not recorded, NONE will be displayed.
(4) YOUR TELEPHONE NUMBER
The user telephone number recorded in the unit. If it is not recorded, NONE will be displayed.
(5) Not used
(6) FACTORY - CUSTOMER
This shows how many days from factory production until the user turns ON the unit.
(7) MONTH
The shows the very first month, date, year and time set by the user after they purchased the unit.
(8) DAY
The shows the very first month, date, year and time set by the user after they purchased the unit.
(9) YEAR
The shows the very first month, date, year and time set by the user after they purchased the unit.
(10) TIME
The shows the very first month, date, year and time set by the user after they purchased the unit.
(11) USAGE TIME
The amount of time the unit has been powered ON.
(12) FACTORY - NOW
This shows how many days from factory production until the user prints out this history list.
(13) TEL MODE
The amount of time the TEL mode setting was used.
(14) FAX MODE
The amount of time the FAX mode setting was used.
(15) Not used
(16) Not used
(17) FINAL RECEIVE MODE
The last set receiving mode by the user.
(18) TONE/PULSE SELECTION
The most recently used setting used, either TONE or PULSE.
(19) RECEIVE REDUCTION
The compression rate when receiving.
(20) SETTING NO. OF DIRECTORY
The recorded directory stations (one touch dial).
(21) NUMBER OF COPY
The number of pages copied.
(22) NUMBER OF RECEIVE
The number of pages received.
(23) NUMBER OF SENDING
The number of pages sent.
(24) NUMBER OF CALLER ID
The number of times Caller ID was received.
(25) Not used
(26) Not used
(27) Not used
(28) Not used
(29) Not used
(30) Not used
(31) NUMBER OF PRINTING HELP
The number of help lists printed until now.
(32) NUMBER OF DIVIDED PRINTING IN FAX RECEPTION
The number of faxes received that were divided into more than one sheet since the unit was purchased.
(33) Not used.
(34), (35) Not used.
(36) FAX MODE
Means the unit received a fax message in the FAX mode.
(37) MAN RCV
Means the unit received a fax message by manual operation.
(38) FRN RCV
Means the unit received a fax message by friendly signal detect.
(39) Not used
(40) RMT DTMF
Means the unit detected DTMF (Remote Fax activation code) entered remotely.
(41) PAL DTMF
Means the unit detected DTMF (Remote Fax activation code) entered by a parallel connected telephone.
(42) TURN-ON
Means the unit started to receive after 10 rings. (Remote Turn On: Service Code #573)
(43) Not used
(44) IDENT
Means the unit detected Ring Detection.
(45) Not used
(46) Not used
(47) Not used
(48) Not Used
(49) Not Used
(50) Printing number of the drum unit
(51) Paddle rotation number of the drum unit
(52) CALL SERVICE 3 failure cause record (the latest)
(53) CALL SERVICE 3 failure cause record (the last time)
(54) CALL SERVICE 3 failure cause record (the second last time)

12 Troubleshooting Guide

12.1. User Recoverable Errors

If the unit detects a problem, one or more of the following messages will appear on the display.
The explanations given in the [ ] are for servicemen only.

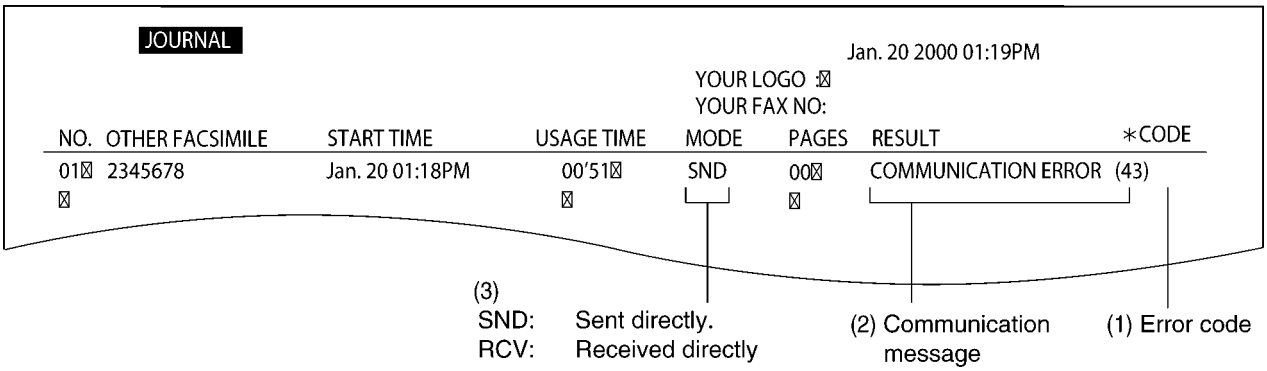
DISPLAY MESSAGE	CAUSE AND REMEDY
CALL SERVICE 1	• Polygon motor error. Refer to **Call Service 1** (P.138).
CALL SERVICE 2	• Laser beam error. Replace LSU unit. Refer to **Call Service 2** (P.139).
CALL SERVICE 3	• Fuser unit cannot heat up. Replace fuser unit. Refer to **Call Service 3** (P.140).
CALL SERVICE 4	• Fan motor error. Replace fan motor. Refer to **Call Service 4** (P.141).
CALL SERVICE 6	• Charge unit error (An error occurred in the Charge unit including High voltage unit. (Also the Charger went wrong.)) Refer to **Call Service 6** (P.142).
CHANGE DRUM ↕ CHANGE SUPPLIES	• There is something wrong with the drum unit. Replace the drum unit and the toner cartridge.
CHECK DOCUMENT	• The document was not fed into the unit properly. Re-insert the document. If misfeeding occurs frequently, clean the document feeder rollers or adjust the feeder pressure and try again.
CHECK DRUM	• The drum unit is not inserted properly. Re-insert it correctly.
CHECK PAPER	• Recording paper is not installed or the unit has run out of paper. Install paper and press **[Start]** to clear the message. • Recording paper is not fed into the unit properly. Re-install paper and press **[Start]** to clear the message.
COVER OPEN	• The front cover is open. Close it.
DRUM LIFE OVER REPLACE DRUM ↕ CHANGE SUPPLIES	• The drum life is complete. Replace the drum unit immediately.
FAX IN MEMORY	• The unit has a document in memory. See the other displayed message instructions to print out the document.
LOW TEMP.	• The inside of the unit is extremely cold and cannot be operated. Use the unit in a warmer area. While the unit cannot be operated, the received documents are temporarily stored into the memory, and will be printed out automatically when the unit warms up.
MEMORY FULL	• When performing memory transmission, the document being stored exceeded the memory capacity of the unit. Send the entire document manually. • When making a copy, the document being stored exceeded the memory capacity of the unit. Press **[STOP]** to clear the message. Divide the document into sections. • There is no space to store new items in phonebook. Erase unnecessary items.
MODEM ERROR	• There is something wrong with the unit's modem. Contact our service personnel.
NO FAX REPLY	• The other party's fax machine is busy or has run out of recording paper. Try again.
PAPER JAMMED	• A recording paper jam occurred. Clear the jammed paper. [If the printout jams, please refer to **Recording Paper Jams** (P.192).]
PLEASE WAIT	• The unit is warming up. Wait for a while.
POLLING ERROR	• The other party's fax machine does not offer the polling function. Check with the other party.
REDIAL TIME OUT	• The other party's fax machine is busy or has run out of recording paper. Try again.

DISPLAY MESSAGE	CAUSE AND REMEDY
REMOVE DOCUMENT	• The document is jammed. Remove the jammed document. • The document is longer than 600 mm. Press **[STOP]** to remove the document. Divide the document into two or more sheets and try again.
REPLACE DRUM SOON	• The drum life is near to an end. Replace the drum unit as soon as possible.
RX MEMORY FULL	• The memory is full of received documents due to a lack of recording paper or a recording paper jam. Install paper or remove the jammed paper.
TONER EMPTY ↕ CHANGE SUPPLIES	• The toner life is complete. Replace the toner cartridge immediately.
TONER LOW ↕ CHANGE SUPPLIES	• The toner life is near to an end. Replace the toner cartridge as soon as possible.
TRANSMIT ERROR	• A transmission error occurred. Try again.
WARM UP	• The inside of the unit is cold. Let the unit warm up. Wait for a while.
WRONG PAPER	• The fax message was printed on paper which is shorter than A4 size paper. Use the appropriate size paper.

12.2. Error Messages-Report

12.2.1. Journal Report

1. Press the MENU button.
2. Press “#”, then “8” and “3”.
3. Press the SET button.
4. The report prints out.



CROSS REFERENCE:

Features(P.12)

Error code table:

(1) CODE	(2) RESULT	(3) MODE	SYMPTOM	Counter-measure*
	PRESSED THE STOP KEY	SND & RCV	Communication was interrupted by the STOP button.	
	DOCUMENT JAMMED	SND	The document paper is jammed.	
	NO DOCUMENT	SND	No document paper.	
	THE COVER WAS OPENED	SND	The cover is open.	
28	COMMUNICATION ERROR	SND & RCV	---------	
40	COMMUNICATION ERROR	SND	Transmission is finished when the T1 TIMER expires.	1
41	COMMUNICATION ERROR	SND	DCN is received after DCS transmission.	2
42	COMMUNICATION ERROR	SND	FTT is received after transmission of a 2400BSP training signal.	3
43	COMMUNICATION ERROR	SND	No response after post message is transmitted three times.	4
44	COMMUNICATION ERROR	SND	RTN and PIN are received.	5
46	COMMUNICATION ERROR	RCV	No response after FTT is transmitted.	6
48	COMMUNICATION ERROR	RCV	No post message.	7
49	COMMUNICATION ERROR	RCV	RTN is transmitted.	8
50	COMMUNICATION ERROR	RCV	PIN is transmitted (to PRI-Q).	8
51	COMMUNICATION ERROR	RCV	PIN is transmitted.	8
52	COMMUNICATION ERROR	RCV	Reception is finished when the T1 TIMER expires.	9
54	ERROR-NOT YOUR UNIT	RCV	DCN is received after DIS transmission.	11
58	COMMUNICATION ERROR	RCV	DCN is received after FTT transmission.	13
59	ERROR-NOT YOUR UNIT	SND	DCN responds to the post message.	14
65	COMMUNICATION ERROR	SND	DCN is received before DIS reception.	2
65	COMMUNICATION ERROR	RCV	Reception is not EOP, EOM PIP, PIN, RTP or RTN.	2
68	COMMUNICATION ERROR	RCV	No response at the other party after MCF or CFR is transmitted.	13
70	ERROR-NOT YOUR UNIT	RCV	DCN is received after CFR transmission.	13
72	COMMUNICATION ERROR	RCV	Carrier is cut when the image signal is received.	16
75	MEMORY FULL	RCV	The document was not received due to memory full.	
79	CANCELED	SND	The multi-station transmission was rejected by the user.	
FF	COMMUNICATION ERROR	SND & RCV	Modem error. For the DCN, DCN, etc. abbreviations, refer to **Modem Section** (P.22).	12

SND=TRANSMISSION / RCV=RECEPTION

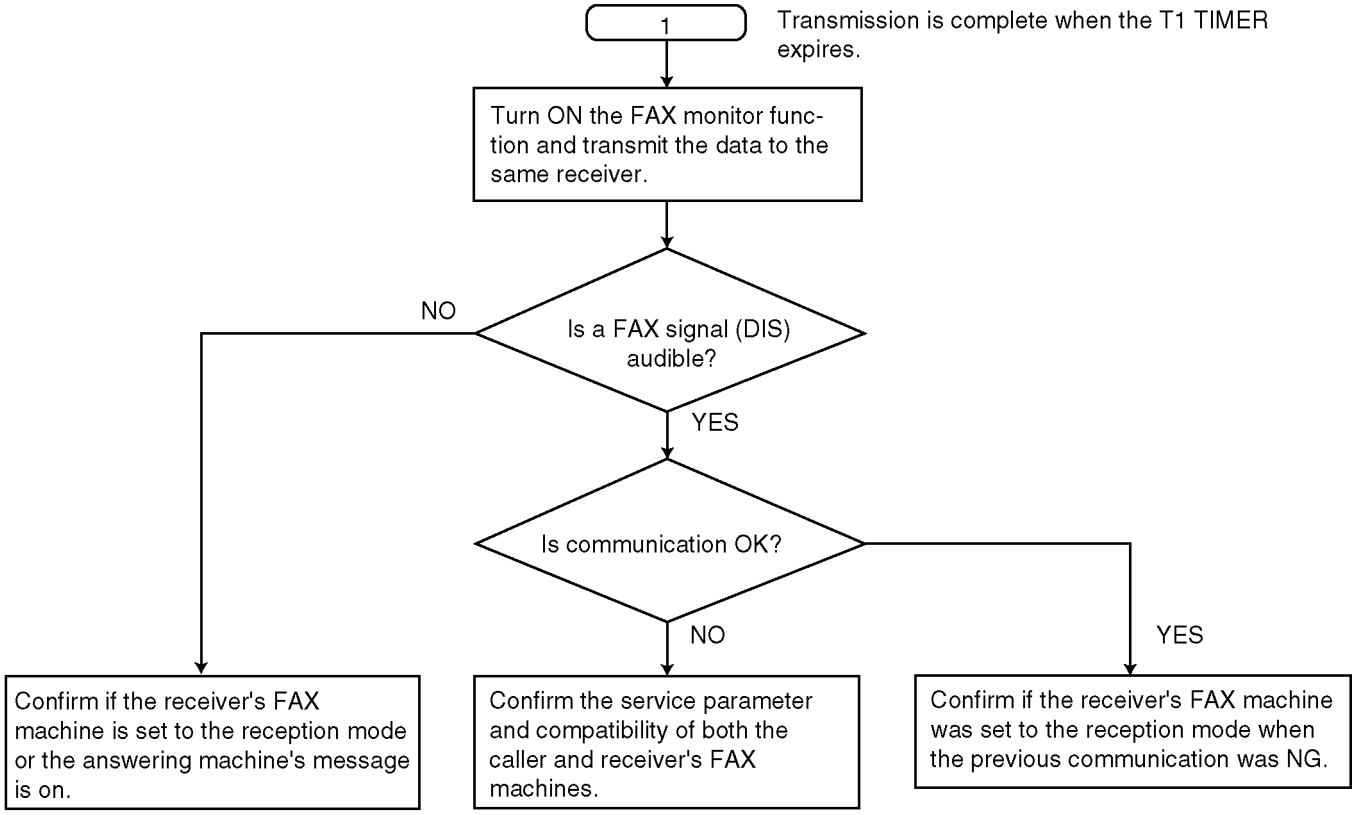
Most fax communication problems can be resolved by the following steps.

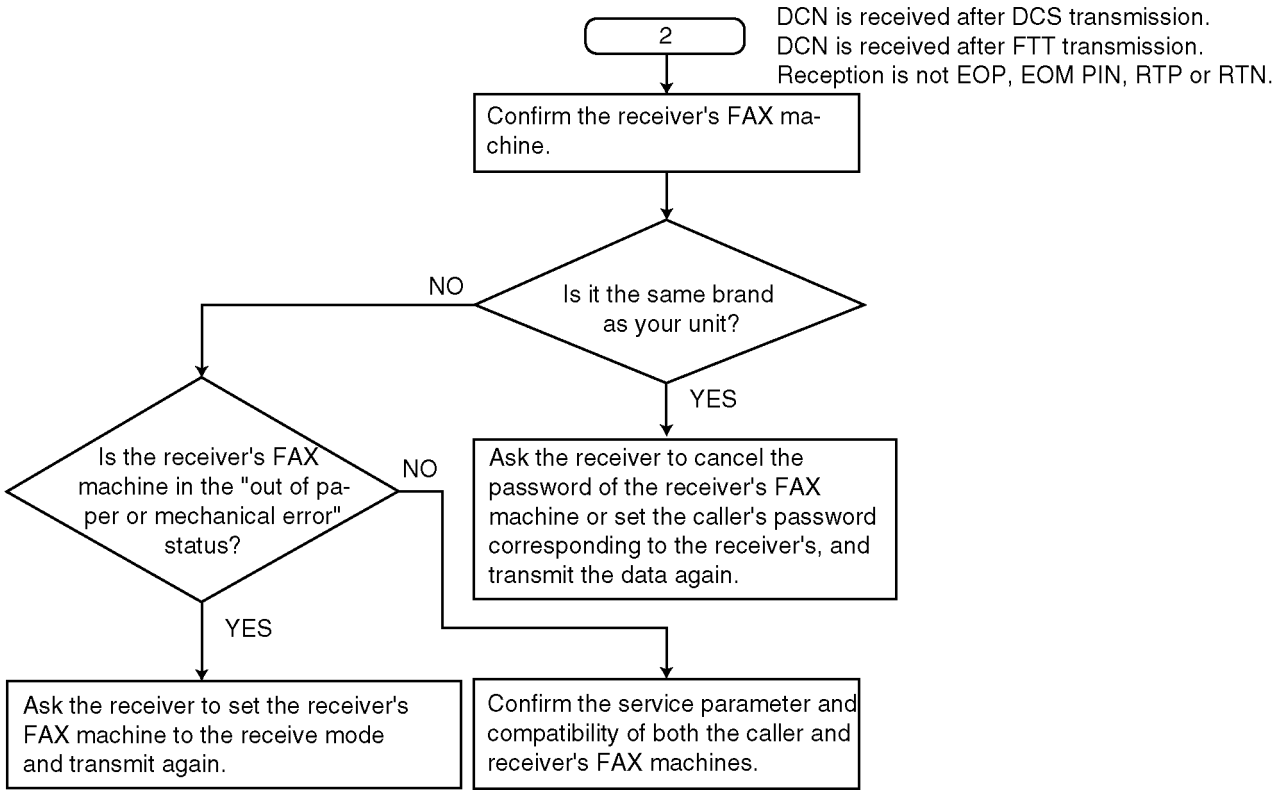
1. Change the transmit level. (Service code: 596, refer to **Service Function Table**(P.79).)
1. Change the TX speed/RX speed. (Service code: 717/718, refer to **Service Function Table** (P.79).)

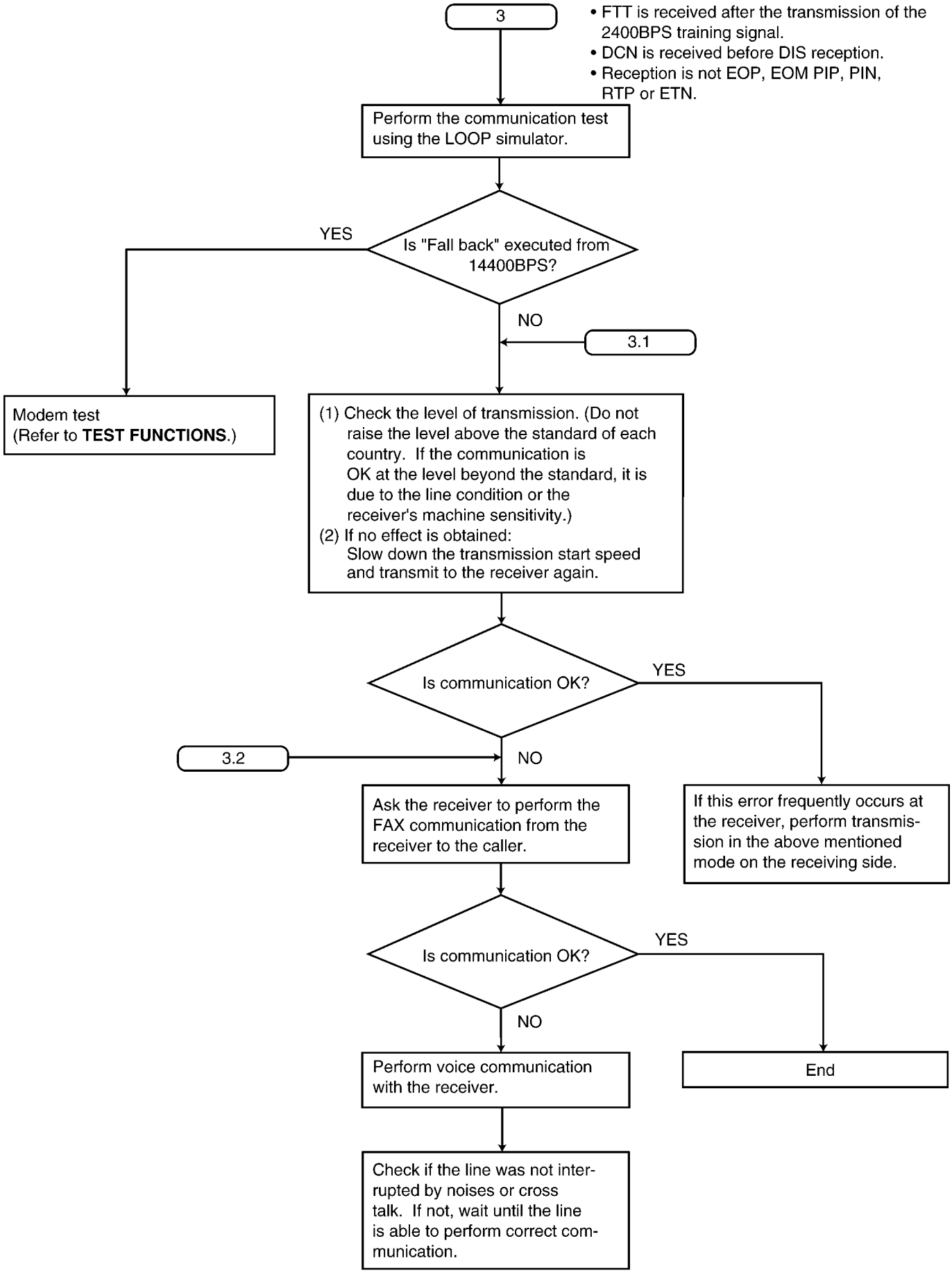
Note*:

If the problem remains, see the following “**Countermeasure**” flow chart.

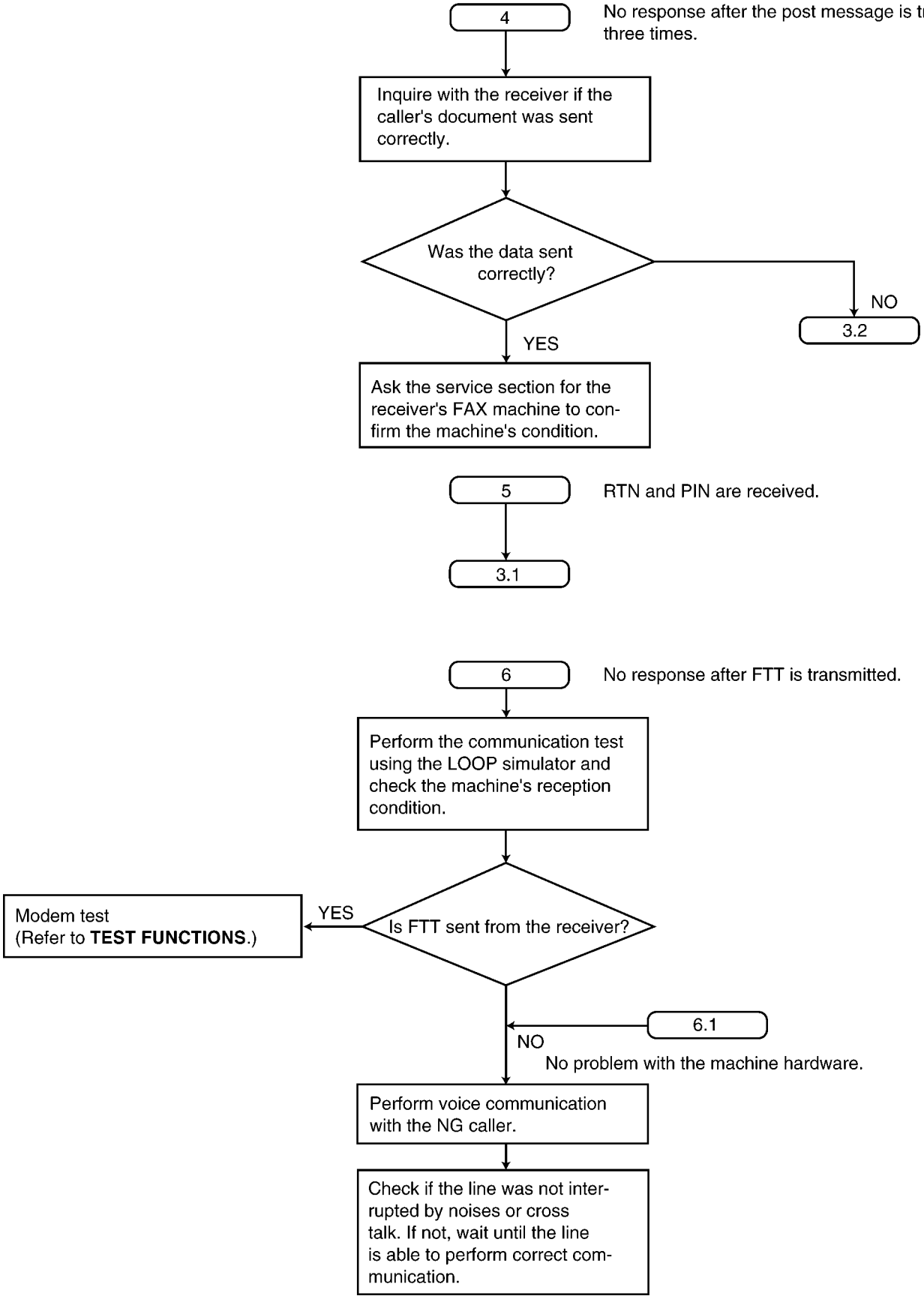
Countermeasure



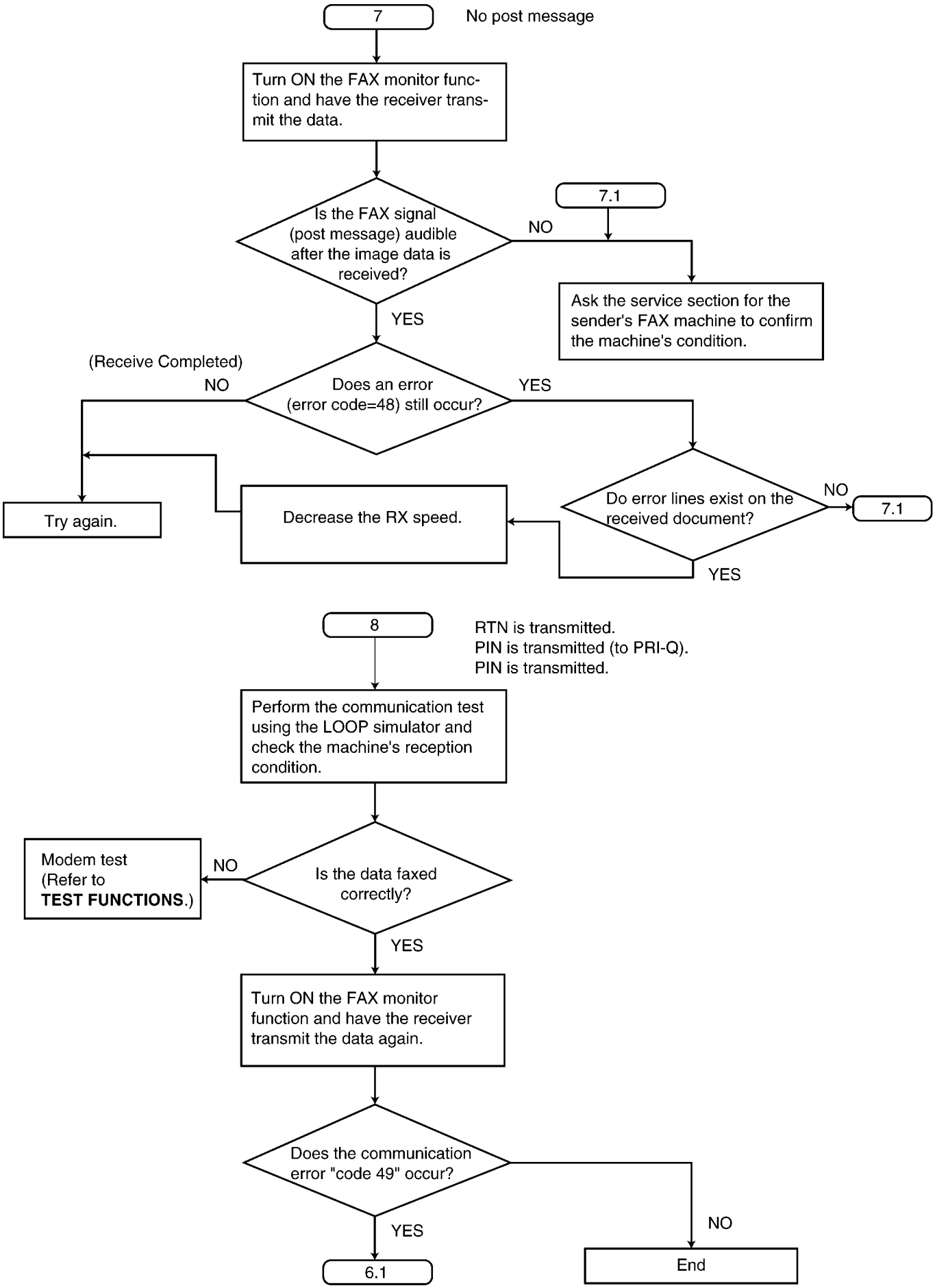




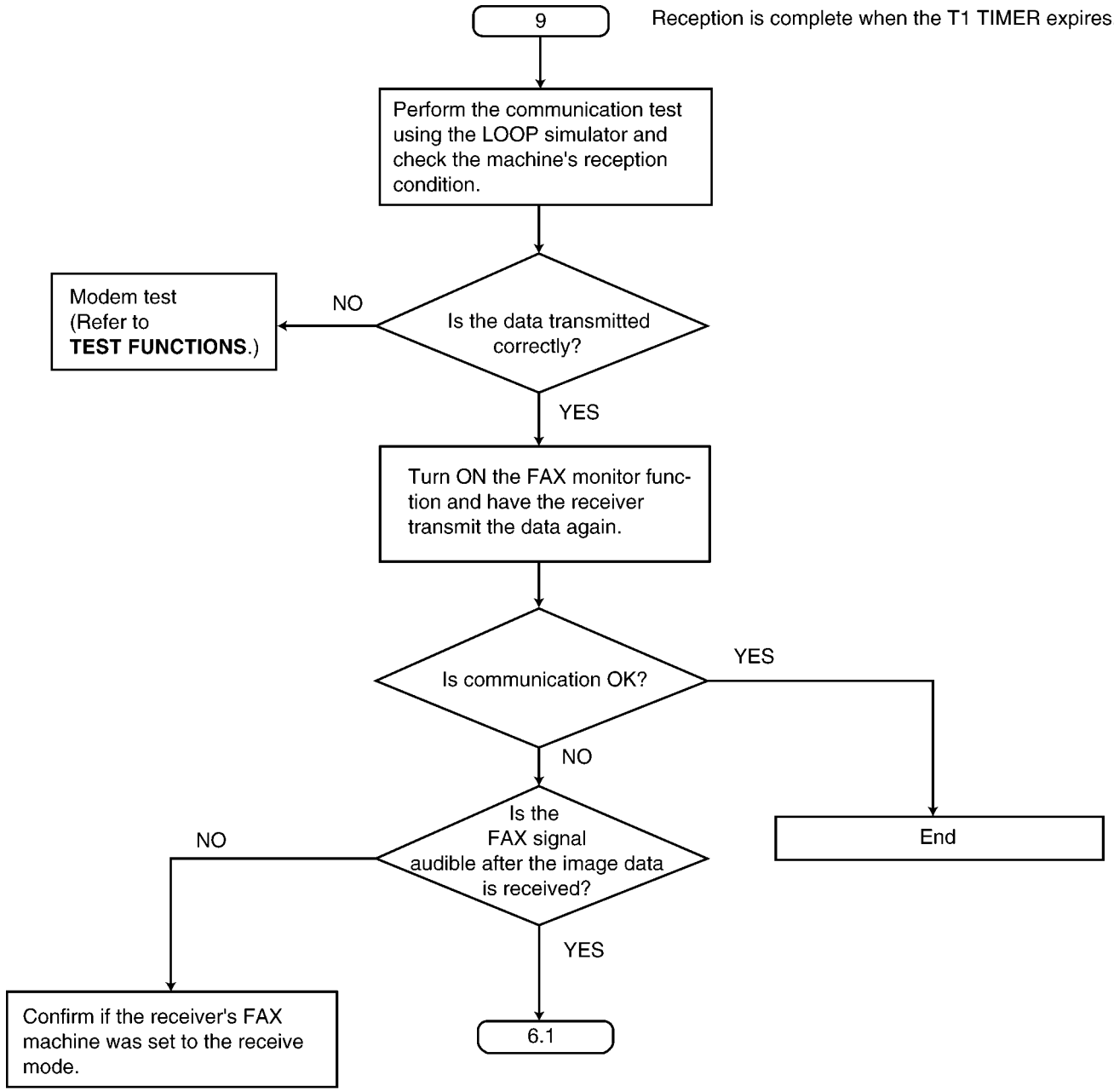
CROSS REFERENCE:
Test Functions (P.74)



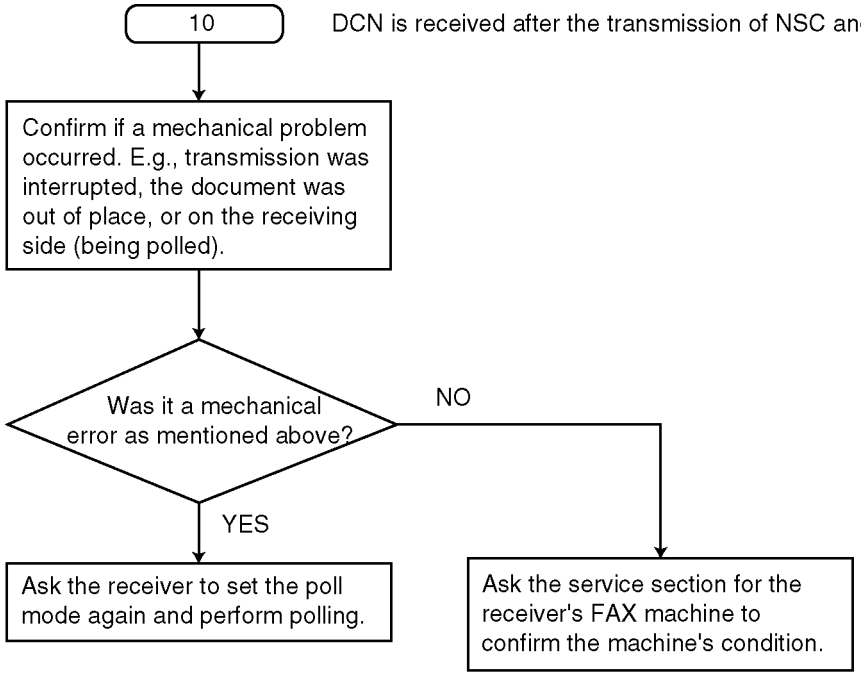
CROSS REFERENCE:
Test Functions (P.74)

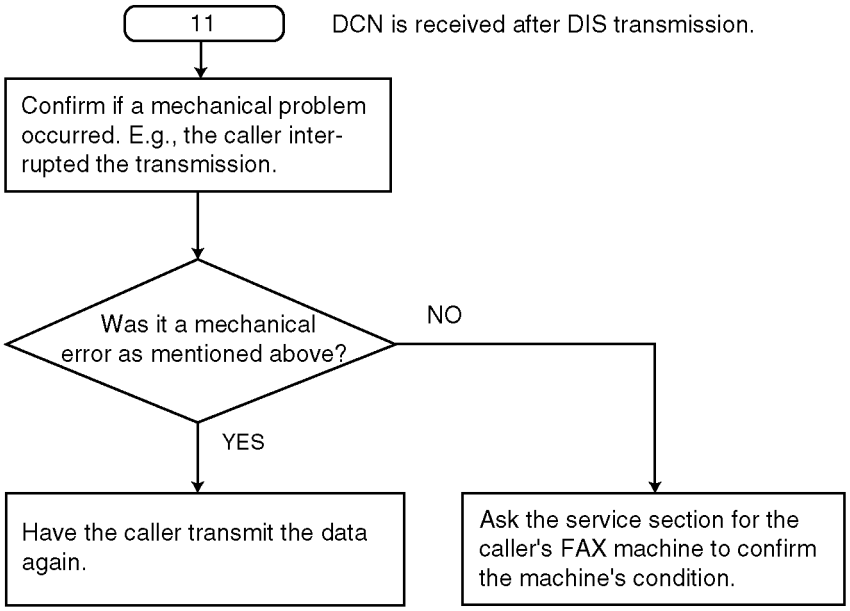


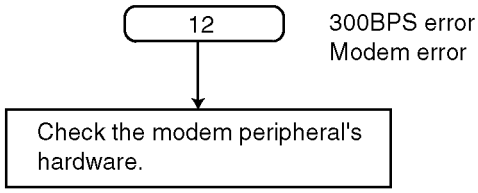
CROSS REFERENCE:
Test Functions (P.74)

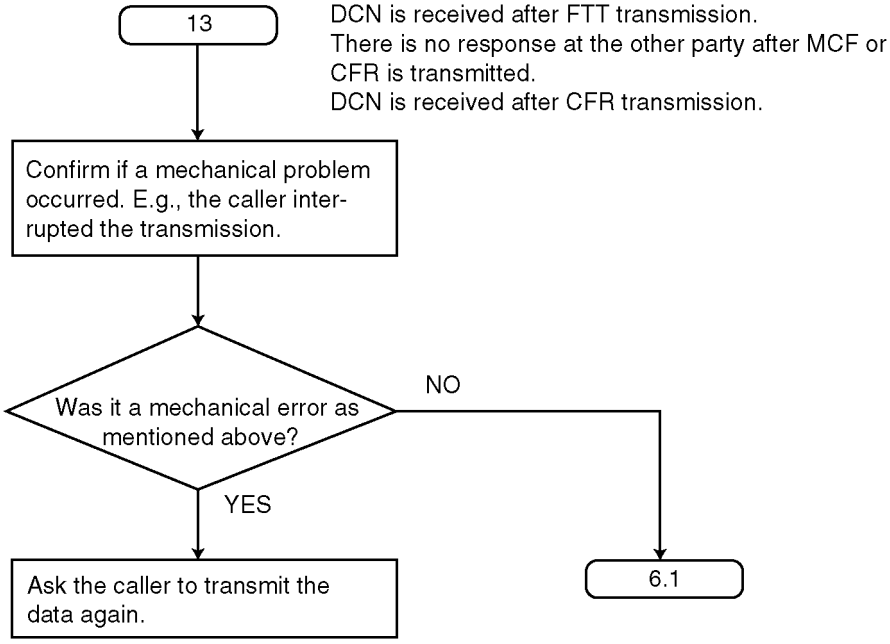


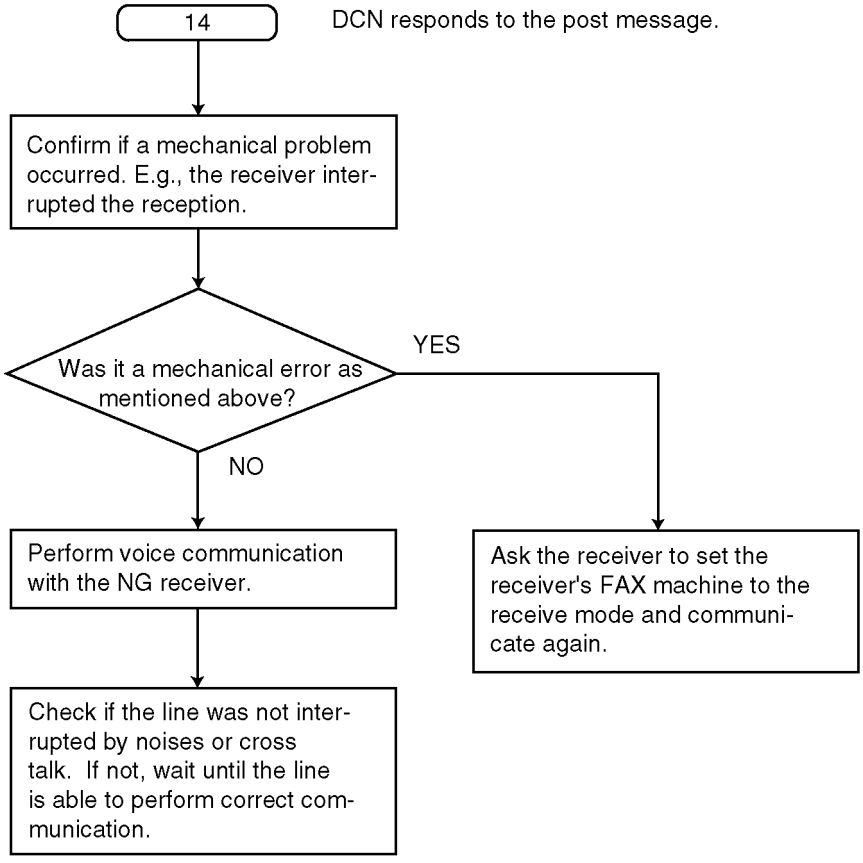
CROSS REFERENCE:
Test Functions (P.74)

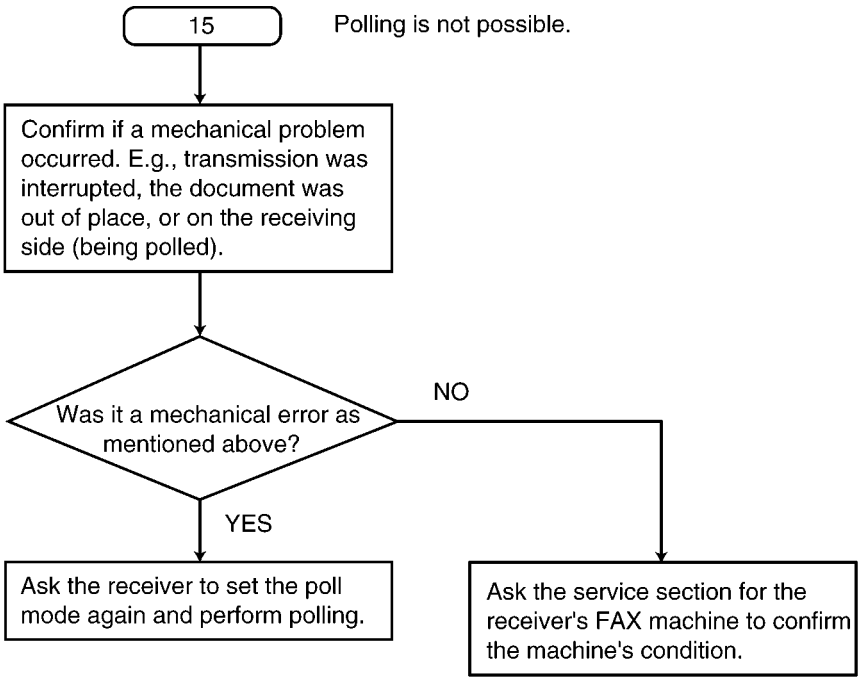

10
DCN is received after the transmission of NSC and DTC.
Confirm if a mechanical problem occurred. E.g., transmission was interrupted, the document was out of place, or on the receiving side (being polled).
Was it a mechanical error as mentioned above?
NO
YES
Ask the receiver to set the poll mode again and perform polling.
Ask the service section for the receiver's FAX machine to confirm the machine's condition.

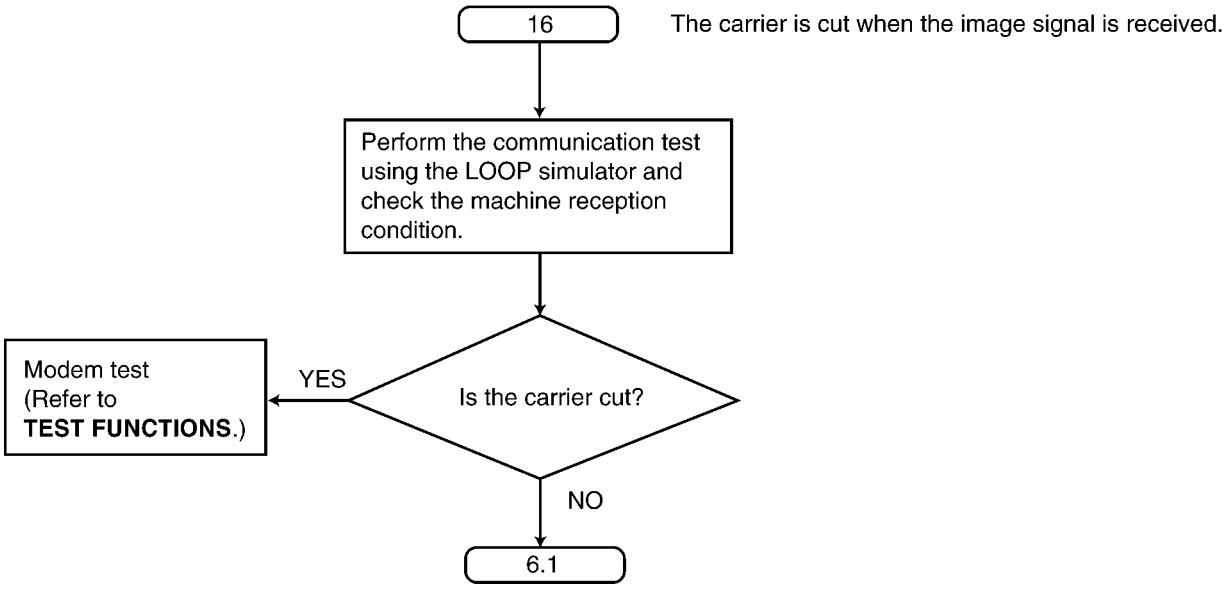

11
DCN is received after DIS transmission.
Confirm if a mechanical problem occurred. E.g., the caller interrupted the transmission.
Was it a mechanical error as mentioned above?
NO
YES
Have the caller transmit the data again.
Ask the service section for the caller's FAX machine to confirm the machine's condition.


12
300BPS error
Modem error
Check the modem peripheral's hardware.


13
DCN is received after FTT transmission.
There is no response at the other party after MCF or CFR is transmitted.
DCN is received after CFR transmission.
Confirm if a mechanical problem occurred. E.g., the caller interrupted the transmission.
Was it a mechanical error as mentioned above?
NO
YES
Ask the caller to transmit the data again.
6.1


14
DCN responds to the post message.
Confirm if a mechanical problem occurred. E.g., the receiver interrupted the reception.
Was it a mechanical error as mentioned above?
YES
NO
Perform voice communication with the NG receiver.
Ask the receiver to set the receiver's FAX machine to the receive mode and communicate again.
Check if the line was not interrupted by noises or cross talk. If not, wait until the line is able to perform correct communication.



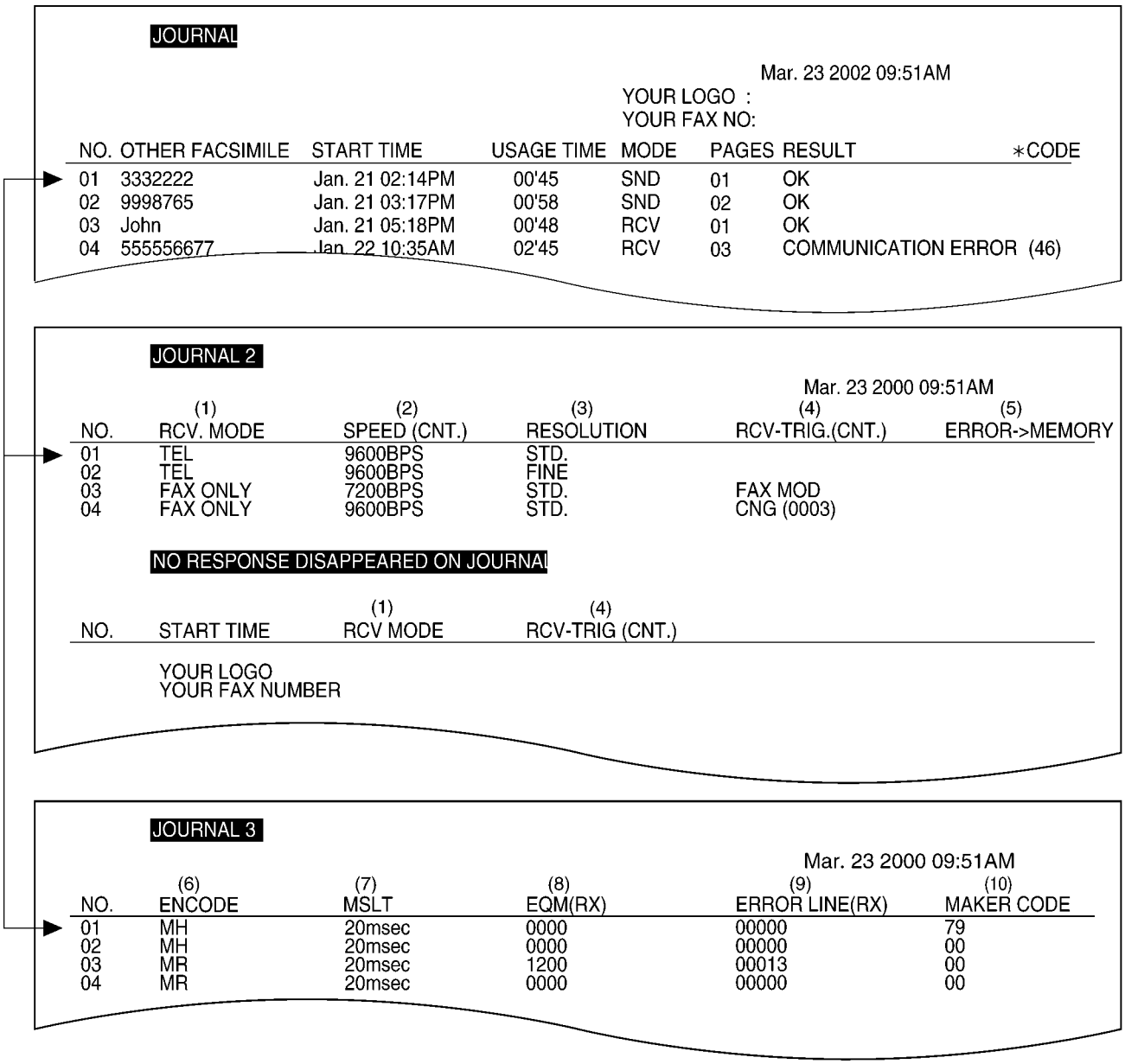


CROSS REFERENCE:

Test Functions (P.74)

12.2.2. Special Service Journal Reports

Journal 2 and Journal 3 shown below, which are special journals giving the additional detailed information about the latest 35 communications, can be printed by Service Code 881 or 882. Remote printing function for the journal reports (JOURNAL, JOURNAL 2 and JOURNAL 3) is also available for service technicians. (Refer to **Program Mode Table**(P.128).) The JOURNAL report only gives you basic information about a communication, but the other two journal reports provide different information on the same item (communication).



JOURNAL

Mar. 23 2002 09:51AM

YOUR LOGO :
YOUR FAX NO:

NO.	OTHER FACSIMILE	START TIME	USAGE TIME	MODE	PAGES	RESULT	∗CODE
01	3332222	Jan. 21 02:14PM	00'45	SND	01	OK	
02	9998765	Jan. 21 03:17PM	00'58	SND	02	OK	
03	John	Jan. 21 05:18PM	00'48	RCV	01	OK	
04	555556677	Jan. 22 10:35AM	02'45	RCV	03	COMMUNICATION ERROR	(46)

JOURNAL 2

Mar. 23 2000 09:51AM

NO.	(1) RCV. MODE	(2) SPEED (CNT.)	(3) RESOLUTION	(4) RCV-TRIG.(CNT.)	(5) ERROR->MEMORY
01	TEL	9600BPS	STD.		
02	TEL	9600BPS	FINE		
03	FAX ONLY	7200BPS	STD.	FAX MOD	
04	FAX ONLY	9600BPS	STD.	CNG (0003)	

NO RESPONSE DISAPPEARED ON JOURNAL

NO.	START TIME	(1) RCV MODE	(4) RCV-TRIG (CNT.)

YOUR LOGO
YOUR FAX NUMBER

JOURNAL 3

Mar. 23 2000 09:51AM

NO.	(6) ENCODE	(7) MSLT	(8) EQM(RX)	(9) ERROR LINE(RX)	(10) MAKER CODE
01	MH	20msec	0000	00000	79
02	MH	20msec	0000	00000	00
03	MR	20msec	1200	00013	00
04	MR	20msec	0000	00000	00

HOW TO READ JOURNAL REPORTS:

Example:

1. Look at **NO. 01** in the JOURNAL. If you want to know about the details about that item, see **NO. 01** in the JOURNAL 2 and the JOURNAL 3. You can get the following information.
   * MODE: Fax transmission
   * RCV. MODE: TEL
   * TX SPEED: 9.6 kbps
   * RESOLUTION: standard
   * ENCODE: MH
   * MAKER CODE: 79
2. Look at **NO. 04** in the JOURNAL 2. CNG (0003) indicates that the CNG signal has been received three times since the purchase date.

For further details, see **Journal 2** and **Journal 3**.

12.2.2.1. Journal 2

Refer to JOURNAL 2 in **Printout Example**(P.99).
Journal 2 displays the additional detailed information about the last 35 communications.

Descriptions:

(1) RCV. MODE

Indicates which receive mode the unit was in when the unit received a fax message.
This information is also displayed when the unit transmitted a fax message.

(2) SPEED

Indicates the speed of the communication. If multiple pages are transmitted or received, it indicates the last page's communication speed. If there is a communication error, "?" is displayed.

(3) RESOLUTION

Indicates the resolution of the communication. If multiple pages are transmitted or received, it indicates the last page's resolution. If there is a communication error, "?" is displayed.

(4) RCV-TRIG. (CNT.)

Indicates the trigger that causes the unit to switch to the fax receive mode. The available options are listed in JOURNAL 2 in **Printout Example**(P.99). The values in parentheses indicate how many times the trigger has been used. (For example, "0003" means three times.)

No.	Display	Function
1	FAX MODE	Means the unit received a fax message in the FAX mode.
2	MAN RCV	Means the unit received a fax message by manual operation.
3	RMT DTMF	Means the unit detected DTMF (Remote Fax activation code) entered remotely.
4	PAL DTMF	Means the unit detected DTMF (Remote Fax activation code) entered by a parallel connected telephone.
5	TURN-ON	Means the unit started to receive after 10 rings. (Remote Turn On: Service Code #573)

(5) ERROR→MEMORY

Indicates the reason why the unit received a fax message in memory.
If you look at No.11 in the JOURNAL 2 in **Printout Example**(P.99), it shows the fax message was received in memory due to "PAPER OUT" error.

NO RESPONSE DISAPPEARED ON JOURNAL

The "**NO RESPONSE DISAPPEARED ON JOURNAL**" displays the information about the last 10 communications terminated by "No Response". (Some of the communications terminated by "No Response" were not displayed in the JOURNAL.)
When a fax transmission cannot be performed because the other party's unit is set to the TEL mode, "No response" will be printed.

12.2.2.2. Journal 3

Refer to JOURNAL 3 in **Printout Example**(P.99).

Description

(6) ENCODE
Compression Code: MH/MR/MMR

(7) MSLT
MSLT means Minimum Scan Line Time. Used only at the factory.

(8) EQM
EQM means Eye Quality Monitor. Used only at the factory.

(9) ERROR LINE (RX)
When an error occurs while receiving a fax, this shows the number of error lines.

(10) MAKER CODE
This shows a 2 digit code of the other party's fax machine brand.

0E: “KX” model
00: Unknown
79: “UF” model
19: “Xerox” model

12.2.2.2.1. Printout Example

JOURNAL2

Mar. 25 2000 01:59PM

NO.	RCV. MODE	SPEED (CNT.)	RESOLUTION	RCV-TRIG. (CNT.)	ERROR->MEMORY
01	FAX ONLY	9600BPS	FINE.	FAX MOD	
02	FAX ONLY	9600BPS	STD.	FAX MOD	
03	FAX ONLY	9600BPS	FINE.		
04	FAX ONLY	9600BPS	FINE.	FAX MOD	
05	FAX ONLY	9600BPS	FINE.	FAX MOD	
06	FAX ONLY	9600BPS	FINE.	FAX MOD	
07	FAX ONLY	9600BPS	FINE.		
08	FAX ONLY	9600BPS	FINE.		
09	FAX ONLY	9600BPS	FINE.		
10	FAX ONLY	9600BPS	STD.	FAX MOD	
11	FAX ONLY	9600BPS	FINE.	FAX MOD	PAPER OUT
12	FAX ONLY	9600BPS	STD.	FAX MOD	
13	FAX ONLY	9600BPS	STD.		
14	FAX ONLY	?	?		
15	FAX ONLY	?	?		
16	FAX ONLY	?	?		
17	FAX ONLY	9600BPS	STD.		
18	FAX ONLY	9600BPS	FINE.	FAX MOD	
19	FAX ONLY	9600BPS	STD.	FAX MOD	
20	FAX ONLY	9600BPS	S-FINE.		
21	FAX ONLY	9600BPS	FINE.		
22	FAX ONLY	9600BPS	FINE.	FAX MOD	
23	FAX ONLY	?	?	FAX MOD	
24	FAX ONLY	9600BPS	STD.	FAX MOD	
25	FAX ONLY	9600BPS	STD.	FAX MOD	
26	FAX ONLY	9600BPS	FINE.	FAX MOD	
27	FAX ONLY	9600BPS	FINE.		
28	FAX ONLY	9600BPS	STD.	FAX MOD	
29	FAX ONLY	9600BPS	FINE.	FAX MOD	
30	FAX ONLY	9600BPS	S-FINE.	FAX MOD	
31	FAX ONLY	9600BPS	STD.	FAX MOD	
32	FAX ONLY	9600BPS	STD.	FAX MOD	
33	FAX ONLY	?	?	FAX MOD	
34	FAX ONLY	9600BPS	STD.	FAX MOD	
35	FAX ONLY	9600BPS	STD.	FAX MOD	

NO RESPONSE DISAPPEARED ON JOURNAL

NO.	START TIME	RCV MODE	RCV-TRIG. (CNT.)

JOURNAL3

Mar. 25 2000 01:58PM

NO.	ENCODE	MSLT	EQM(RX)	ERROR LINE(RX)	MAKER CODE
01	MR	10msec	007A	00000	0E
02	MR	20msec	016B	00000	00
03	MH	10msec	0000	00000	00
04	MR	20msec	019B	00003	00
05	MR	20msec	0156	00011	00
06	MR	20msec	0113	00000	00
07	MR	5msec	0000	00000	79
08	MR	5msec	0000	00000	79
09	MR	0msec	0000	00000	19
10	MR	20msec	0100	00000	00
11	MR	10msec	0073	00000	0E
12	MR	20msec	012B	00000	00
13	MH	20msec	0000	00000	79
14	MH	20msec	0000	00000	00
15	MH	20msec	0000	00000	00
16	MH	20msec	0000	00000	00
17	MR	5msec	0000	00000	79
18	MR	10msec	00AB	00004	0E
19	MR	20msec	0124	00000	00
20	MR	20msec	0000	00000	00
21	MR	20msec	0000	00000	00
22	MR	20msec	0135	00000	00
23	MR	20msec	0000	00000	00
24	MR	20msec	01BC	00000	00
25	MR	20msec	01AC	00000	00
26	MR	20msec	020F	00000	00
27	MR	10msec	0000	00000	0E
28	MR	20msec	01DF	00000	00
29	MR	20msec	01EA	00000	00
30	MR	20msec	00CD	00000	00
31	MR	20msec	02F8	00000	0E
32	MR	10msec	04F8	00000	0E
33	MR	10msec	0000	00000	00
34	MR	20msec	03B6	00000	0E
35	MH	20msec	00E0	00000	00

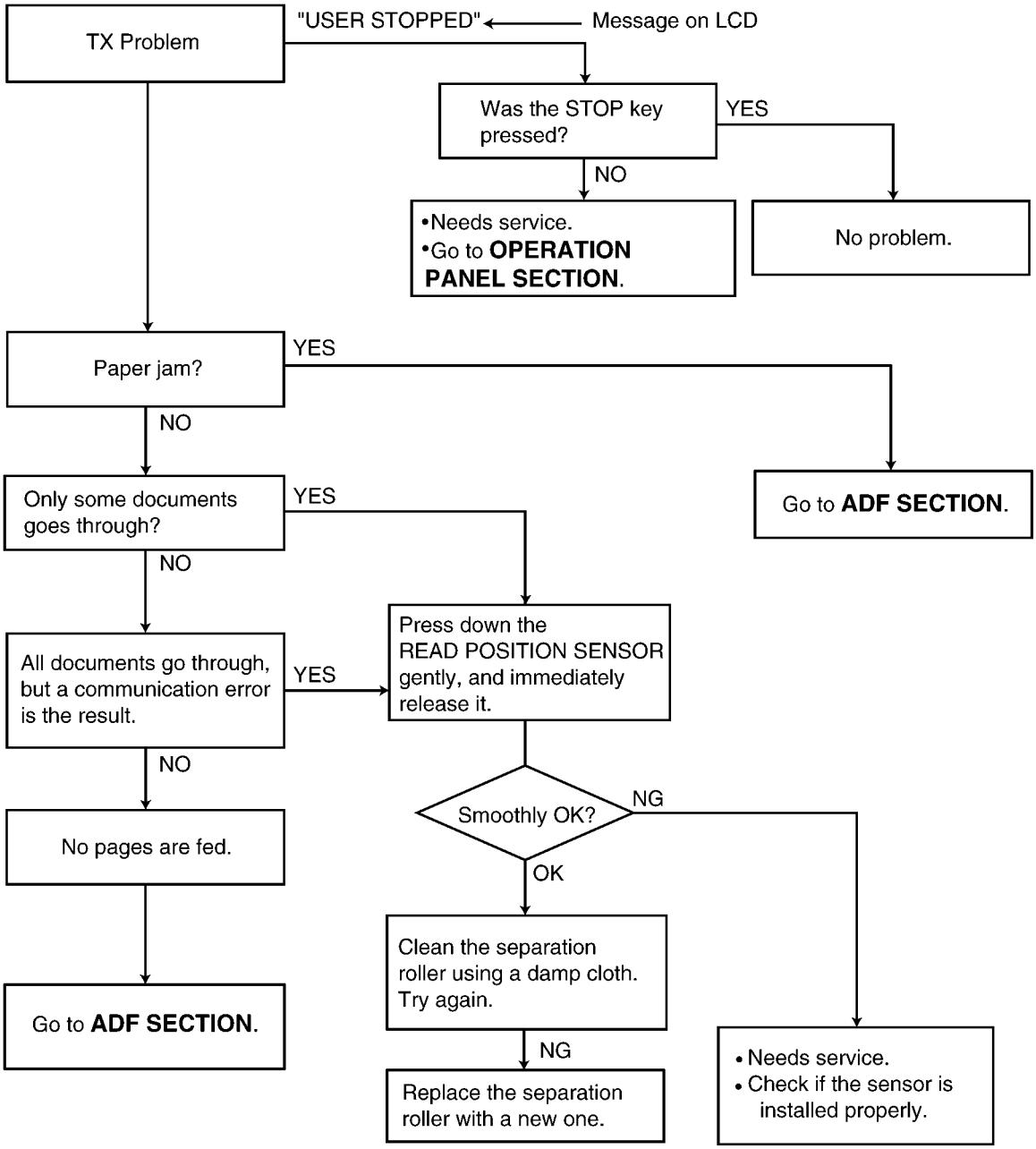
12.2.3. Communication Section

Find the problem in the table shown below, and refer to the corresponding troubleshooting procedure in **Defective Facsimile Section** (P.102).

No.	Symptom	Content	Possible cause
1	The paper dose not feed properly when faxing. (Copying is also not possible.)	Troubleshooting	Problem with the feeding mechanism. (Refer to **Transmit Problem** (P.102)
2	The fax transmits successfully one time and fails another. (Copying is also possible.)	Troubleshooting	Problem with the service line or with the receiver's fax. (Refer to **Sometime There is a Transmit Problem** (P.103)
3	The fax receives successfully one time and fails another. (Copying is also possible.)	Troubleshooting	Problem with the service line or with the transmitter's fax. (Refer to **Receive Problem** (P.104)
4	The fax completely fails to transmit or receive. (Copying is also possible.)	Troubleshooting	Problem with the electric circuit. (Refer to **The Unit can copy, but cannot Transmit / Receive** (P.105)
5	The fax fails either to transmit or receive when making a long distance or an international call. (Copying is also possible.)	Detailed description of the possible causes (Similar to troubleshooting items No.2 and No.3.)	Problem with the service line.
6	The fax image is poor when transmitting or receiving during a long distance or international call.		
7	No.1-No.5	The troubleshooting procedure for each error code will be printed on the communication result report.	(Refer to **Journal Report** (P.88)

12.2.3.1. Defective Facsimile Section

12.2.3.1.1. Transmit Problem



CROSS REFERENCE:

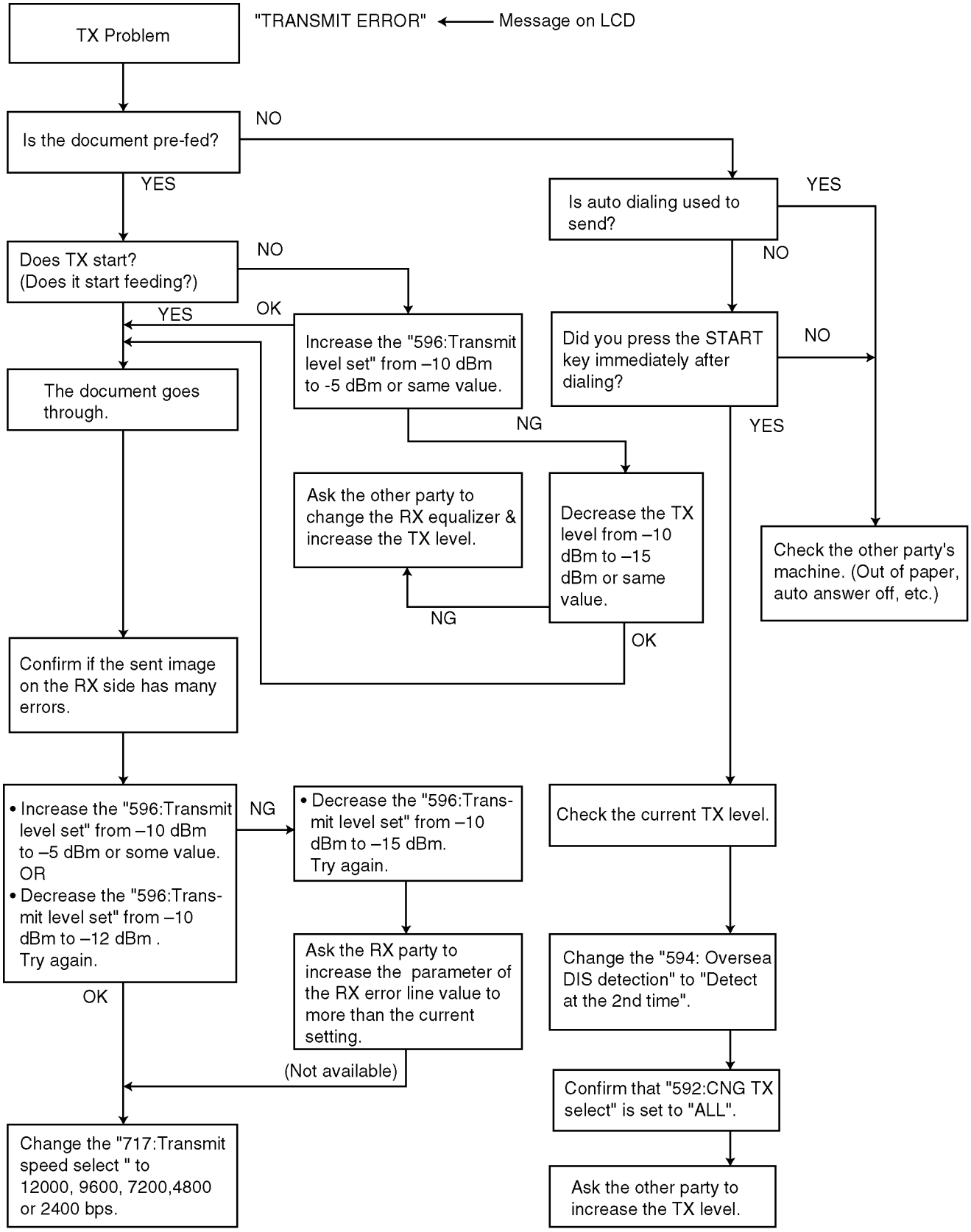
Cleaning the Inside of the Unit (P.187)
ADF (Auto Document Feed) Section (P.156)
Operation Panel Section (P.110)

12.2.3.1.2. Sometime There is a Transmit Problem

Note:

"596: Transmit level set" represents a service code. Refer to the **Service Function Table** (P.79).

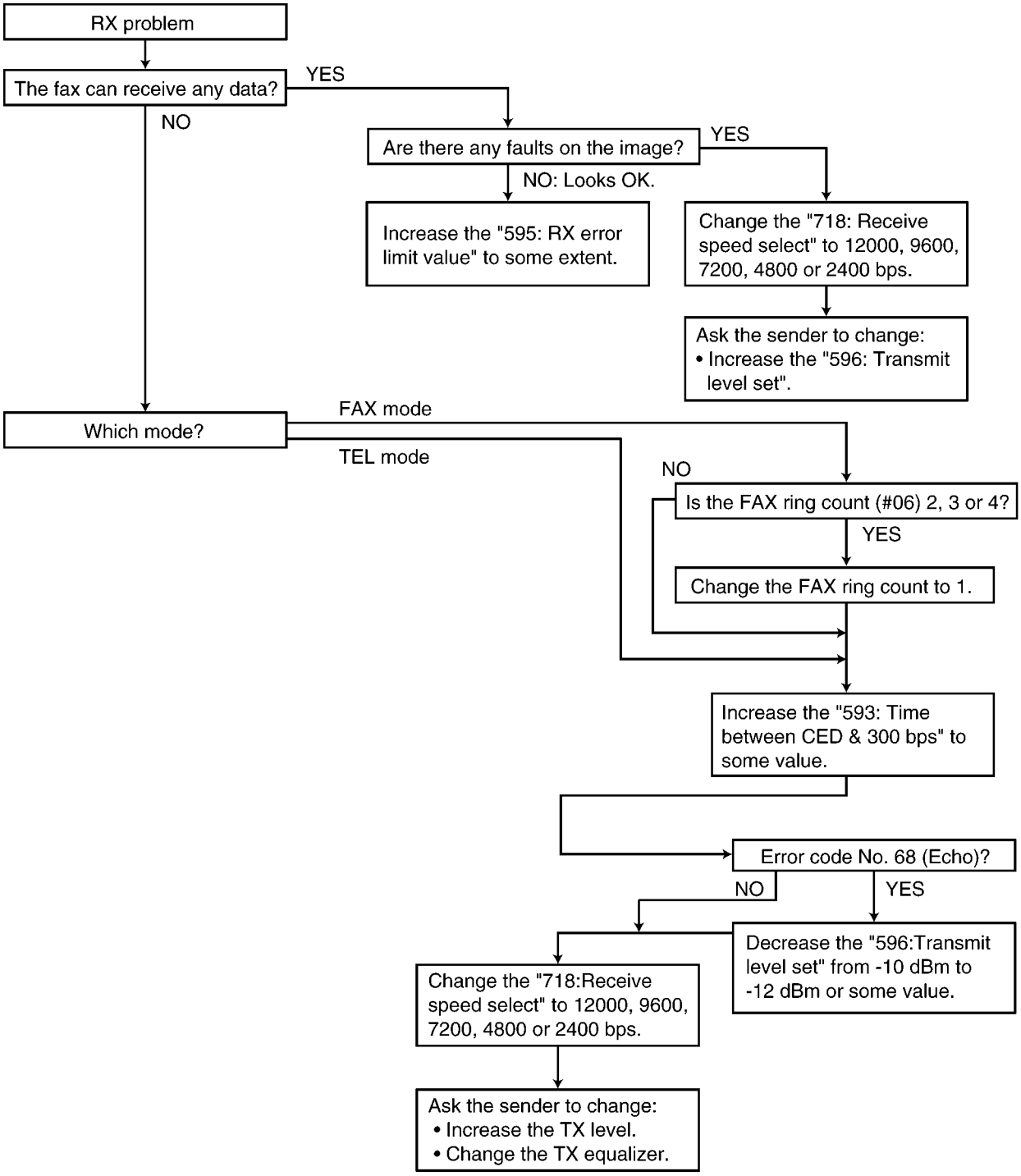
"717: Transmit speed select" represents a service code. Refer to the **Service Function Table** (P.79).



12.2.3.1.3. Receive Problem

Confirm the following before starting troubleshooting.

• Is the recording paper installed properly? Refer to the next page.



Note:

"596: Transmit level set" represents a service code. Refer to the **Service Function Table** (P.79).

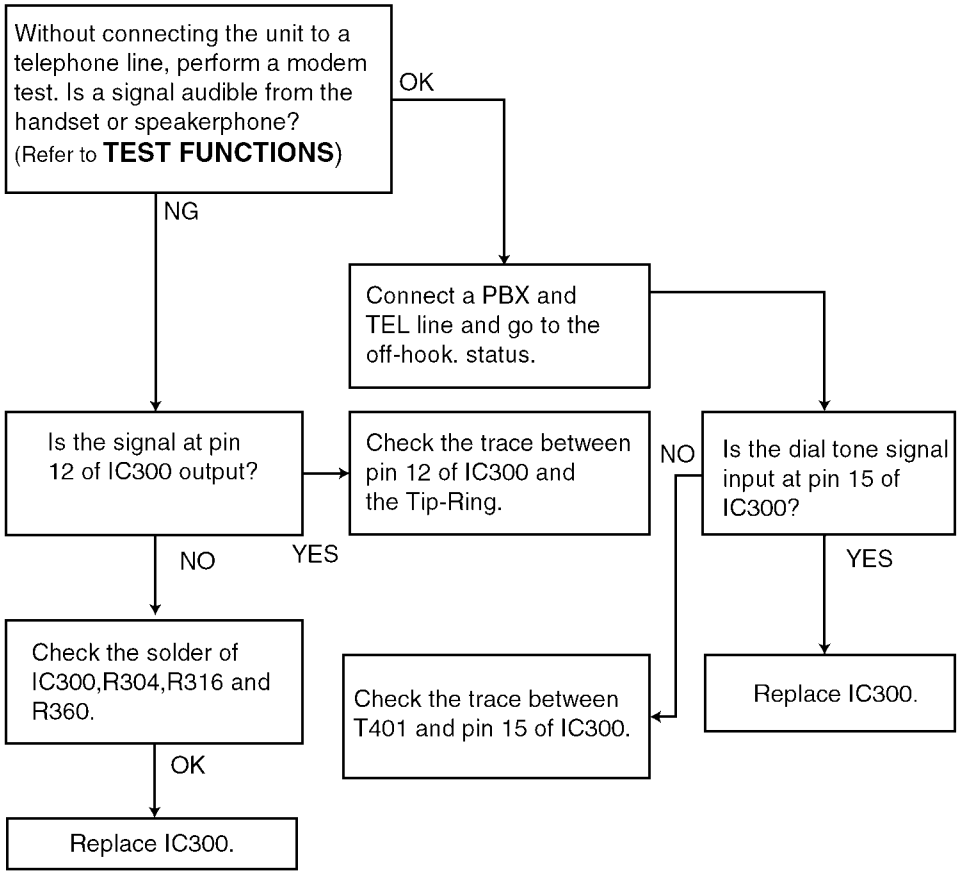
"718: Receive speed select" represents a service code. Refer to the **Service Function Table** (P.79).

For the receiving problem, we have thought of causes other than in the software. Some causes may be when the fax changes to the memory receiving mode (for example, when out of paper). and the memory becomes full of the unprinted fax data. In this case, [MEMORY FULL] and its main cause (for example, "OUT OF PAPER") are displayed on the LCD. Accordingly, by solving the main problem, [MEMORY FULL] can be canceled and the receiving problem can solved.

Please refer to **User Recoverable Errors** (P.86) for the above items.

Also, when it actually becomes a hardware deformity, please check each sensor.

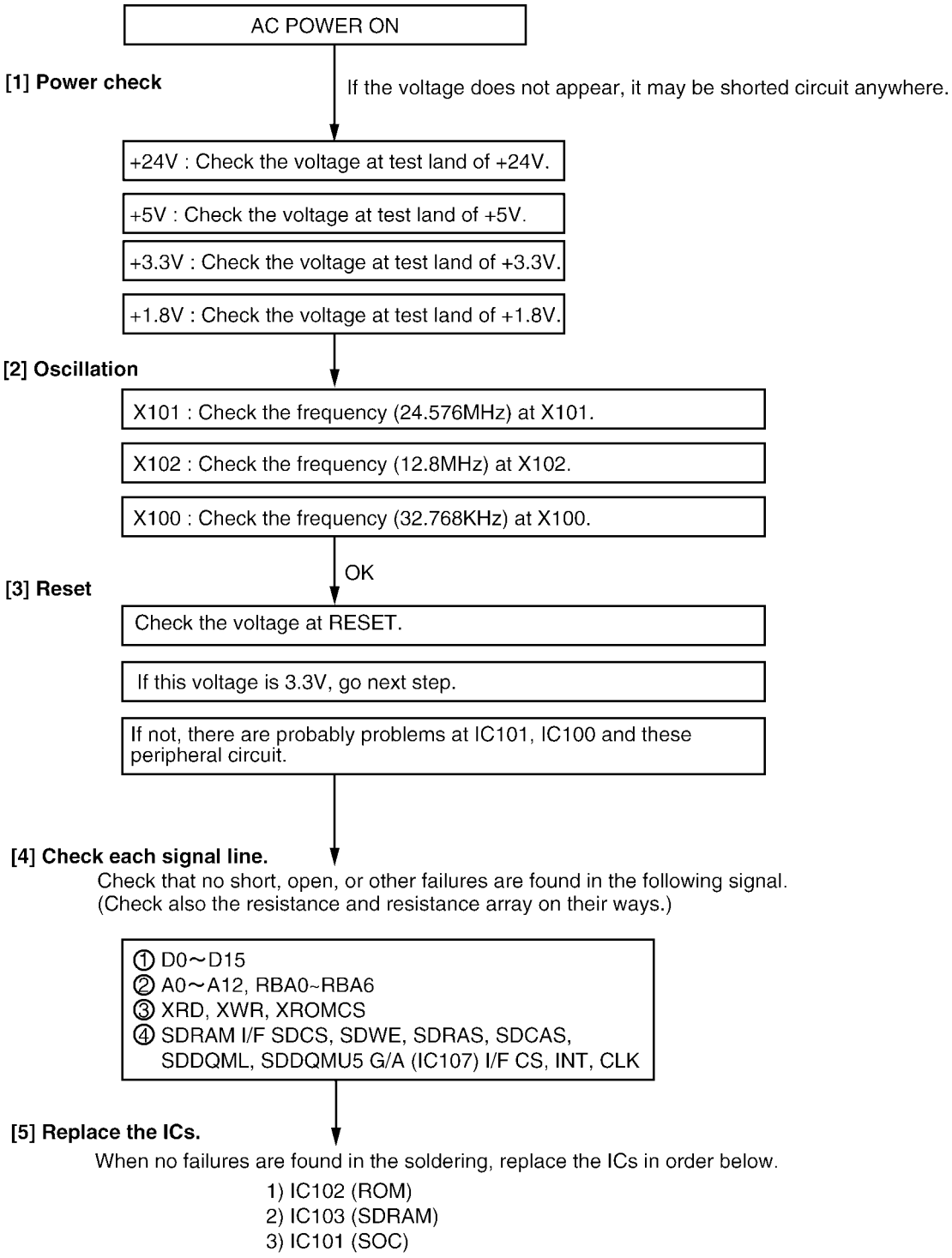
12.2.3.1.4. The Unit can copy, but cannot Transmit / Receive



CROSS REFERENCE:
Test Functions (P.74)

12.2.4. Initializing Error

After the power is turned on, the IC101 initializes and checks each IC.
The ROM (IC102), and SDRAM (IC103) are checked.
If initialization fails for the ICs, the system will not boot up.
In this case, please find the cause as follows.



CROSS REFERENCE:

NG Example (P.207)
Power Supply Board Section (P.57)

12.2.5. Analog Board Section

This chapter provides the testing procedures required for the analog parts. A signal route to be tested is determined depending upon purposes. For example, the handset TX route begins at the handset microphone and the signal is output to the telephone line. The signal mainly flowing on this route is analog. You can trace the signal with an oscilloscope. The signal flow on each route is shown in the Check Sheet here. If you find a specific problem in the unit, for example if you cannot communicate with the H/S, trace that signal route locally with the following Check Sheet and locate the faulty point.

12.2.5.1. Check sheet for analog signal route

ITEM TO CHECK	ROUTE IN → OUT
MONITOR	TEL LINE → T401 → C408 → R409 → IC401(2-1) → CN405(4) → {CN300(4) → R317 → C306 → IC101(B1) → IC101(F2) → C304 → R311 → IC107(2-1) → CN300(14)} → CN405(14) → C461 → R461 → IC402(4-5,8) → SPEAKER
HANDSET TX	HS MIC → L414 → C429 → R438 → IC401(6) → IC401(7) → R418 → CN405(12) → {CN300(12) ↓ L411 → C430 → R439 → IC401(5) ↑ → R336 → C327 → R334 → C325 → R329 → IC107(6-7) → CN300(3)} → CN405(3) → C413 → R414 → T401 → TEL LINE
HANDSET RX	TEL LINE → T401 → C408 → R409 → IC401(2-1) → CN405(4) → {CN300(4) → R317 → C306 → IC101(B1) → IC101(F2) → C304 → R311 → IC107(2-1) → R322 → IC301(10-11) → CN300(11)} → CN405(11) → C416 → R428 → Q405(B-E) → C428 → HS RECEIVER
DTMF for HANDSET RECEIVER	{IC300(12) → C312 → Q302(C-E) → C309 → R314 → IC107(2-1) → R322 → IC301(10-11) → CN300(11)} → CN405(11) → C416 → R428 → Q405(B-E) → C428 → HS RECEIVER
DTMF for SPEAKER	{IC300(12) → C312 → Q302(C-E) → C309 → R314 → IC107(2-1) → CN300(14)} → CN405(14) → C461→ R461 → IC402(4-5,8) → SPEAKER
FAX TX, DTMF for TEL LINE	{IC300(12) → IC301(8-9) → C324 → R327 → IC107(6-7) → CN300(3)} → CN405(3) → C413 → R414 → T401 → TEL LINE
FAX RX, CNG, DTMF Detection (OFF-HOOK)	TEL LINE → T401 → C408 → R409 → IC401(2-1) → CN405(4) → {CN300(4) → R340 → IC301(1-2) → C316 → IC300(15)}
RING, ALARM, BEEP KEY TONE	{IC101(D1) → C305 → R312 → IC107(2-1) → CN300(14)} → CN405(14) → C461 → R461 → IC402(4-5,8) → SPEAKER
Caller ID FAX Activate (ON-HOOK)	TEL LINE → RLY(3-5:break) → C436 → R422 → T401 → C408 → R409 → IC401(2-1) → C440 → R451 → Q408(B-C) → CN405(2) → {CN300(2) → R341 → IC301(4-3) → C317 → IC300(15)}

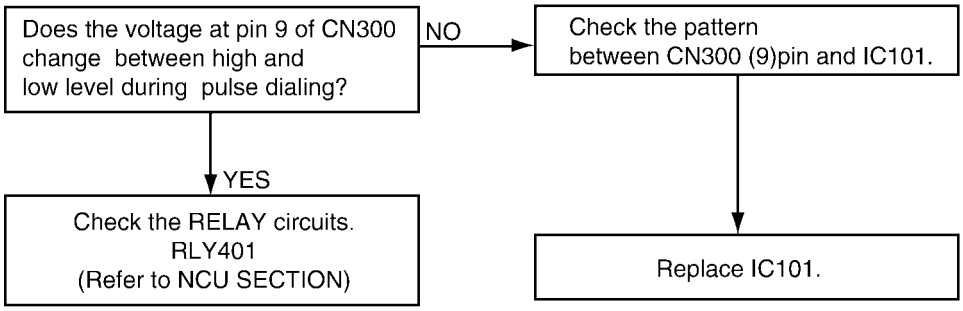
Note: { }: Inside the digital board

12.2.5.2. Defective ITS (Integrated Telephone System) SECTION

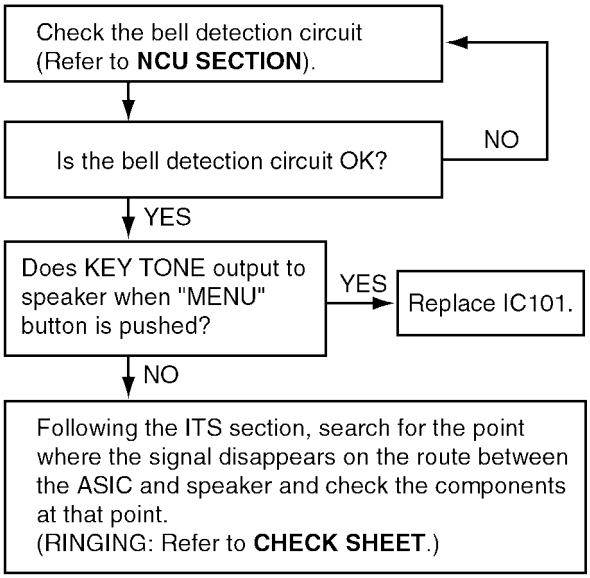
1. No handset and speakerphone transmission / reception

Perform a signal test in the **ITS or the NCU section** and locate a defective point (where the signal disappears) on each route between the handset microphone and telephone line (sending), or between the telephone line and the handset speaker (receiving), or between the microphone and the telephone line (sending), or between the telephone line and the speaker (receiving). Check the components at that point. **Check sheet for analog signal route**(P.107) is useful for this investigation.

2. No pulse dialing

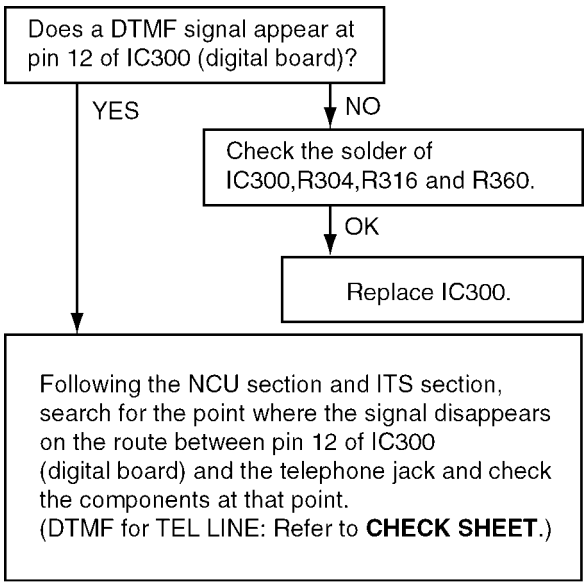


3. No ring tone (or No bell)



CROSS REFERENCE:
Check sheet for analog signal route (P.107)
NCU Section (P.28)

4. No tone dialing

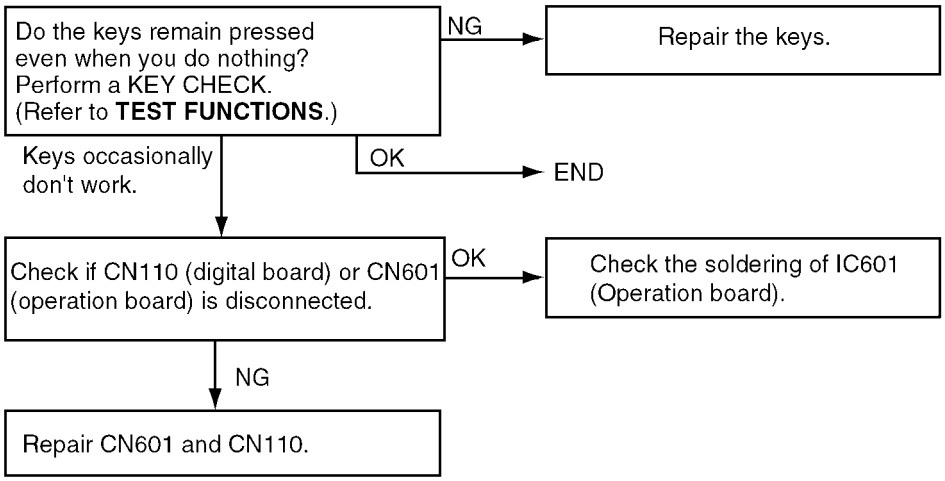


CROSS REFERENCE:
Check sheet for analog signal route (P.107**)**

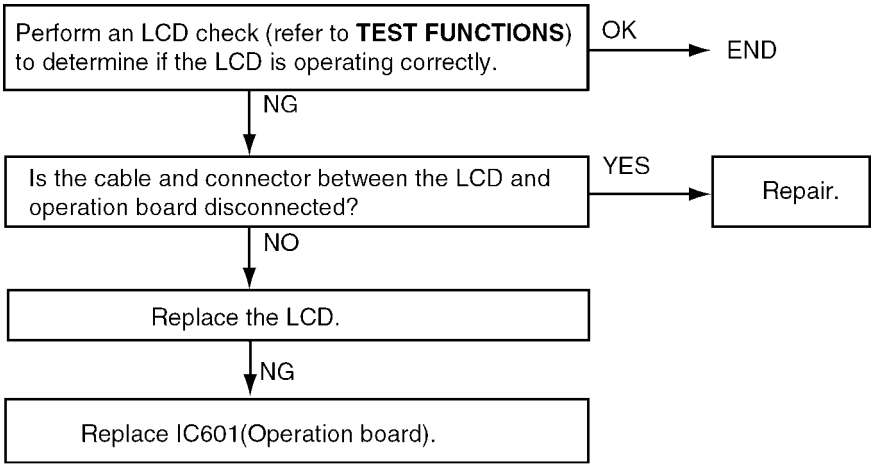
12.2.5.3. Operation Panel Section

Refer to **Test Functions** (P.74).

1. NO KEY OPERATION



2. NO LCD INDICATION



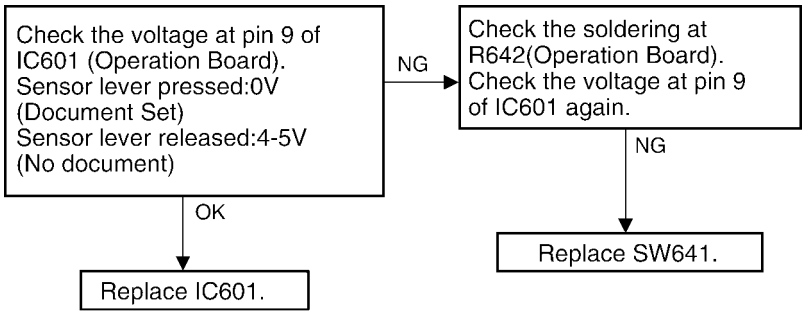
CROSS REFERENCE:
Test Functions (P.74)

12.2.5.4. Sensor Section

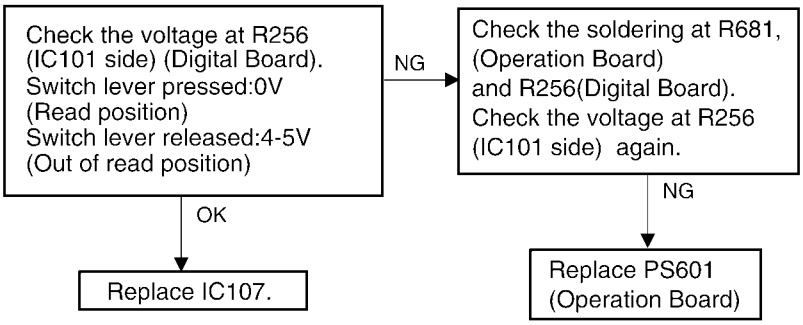
Refer to SENSORS AND SWITCHES for the circuit description.

Perform an SENSOR CHECK to determine if the sensor is operating correctly.

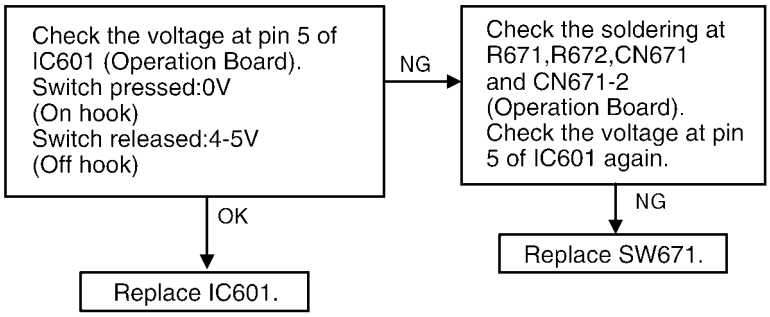
1. Check the ..... "CHECK DOCUMENT"



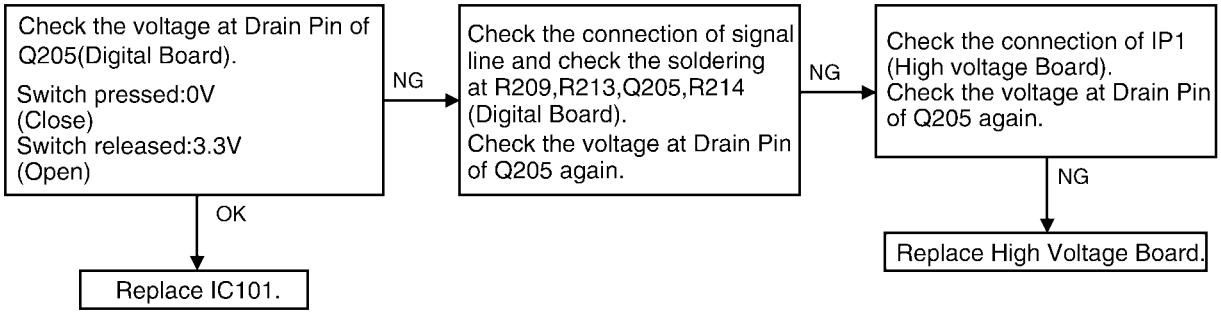
2. Check the paper feed sensor..... "REMOVE DOCUMENT"



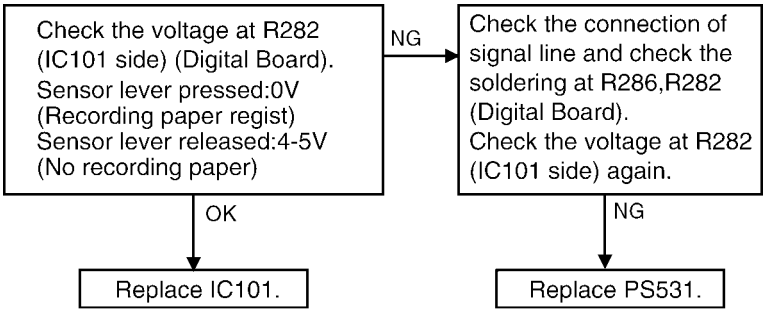
3. Check the hook switch



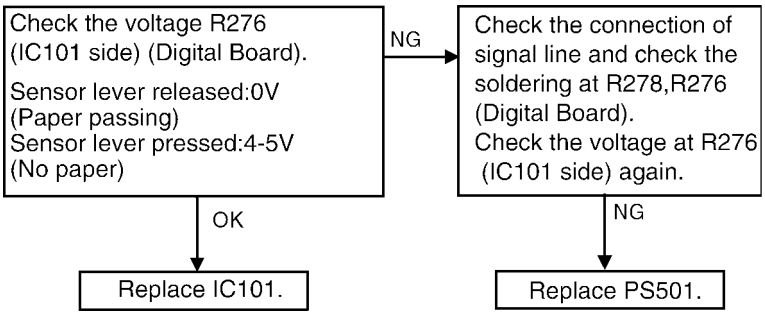
4. Check the cover open switch..... "COVER OPEN"



5. Check the regist sensor..... “CHECK PAPER”, “PRESS START”

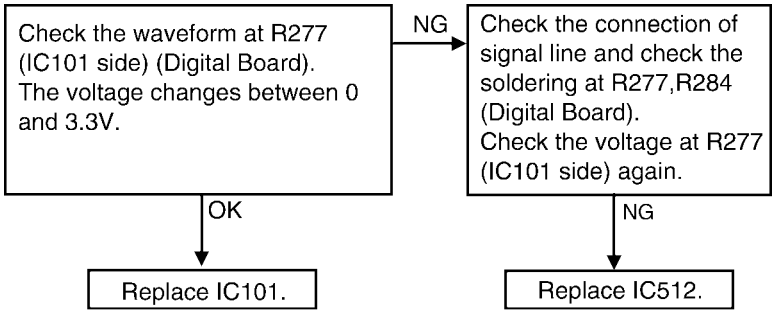


6. Check the exit switch..... “PAPER JAMMED”



7. Check the toner sensor..... “TONER LOW”, “CHANGE DRUM”

As for the following check, remove the drum from the main body, set it again and close the cover, then perform that check during initializing operation. Refer to **Sensors and Switches Section** (P.40).

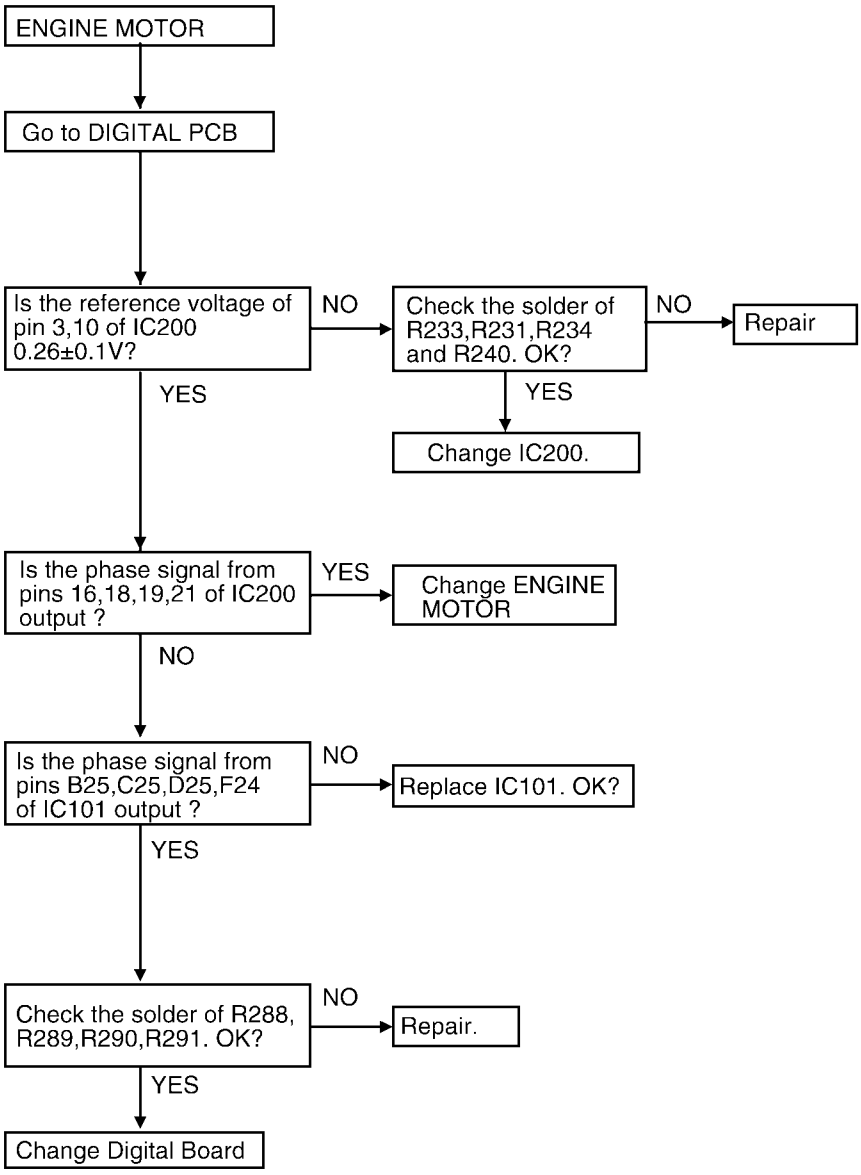


CROSS REFERENCE:

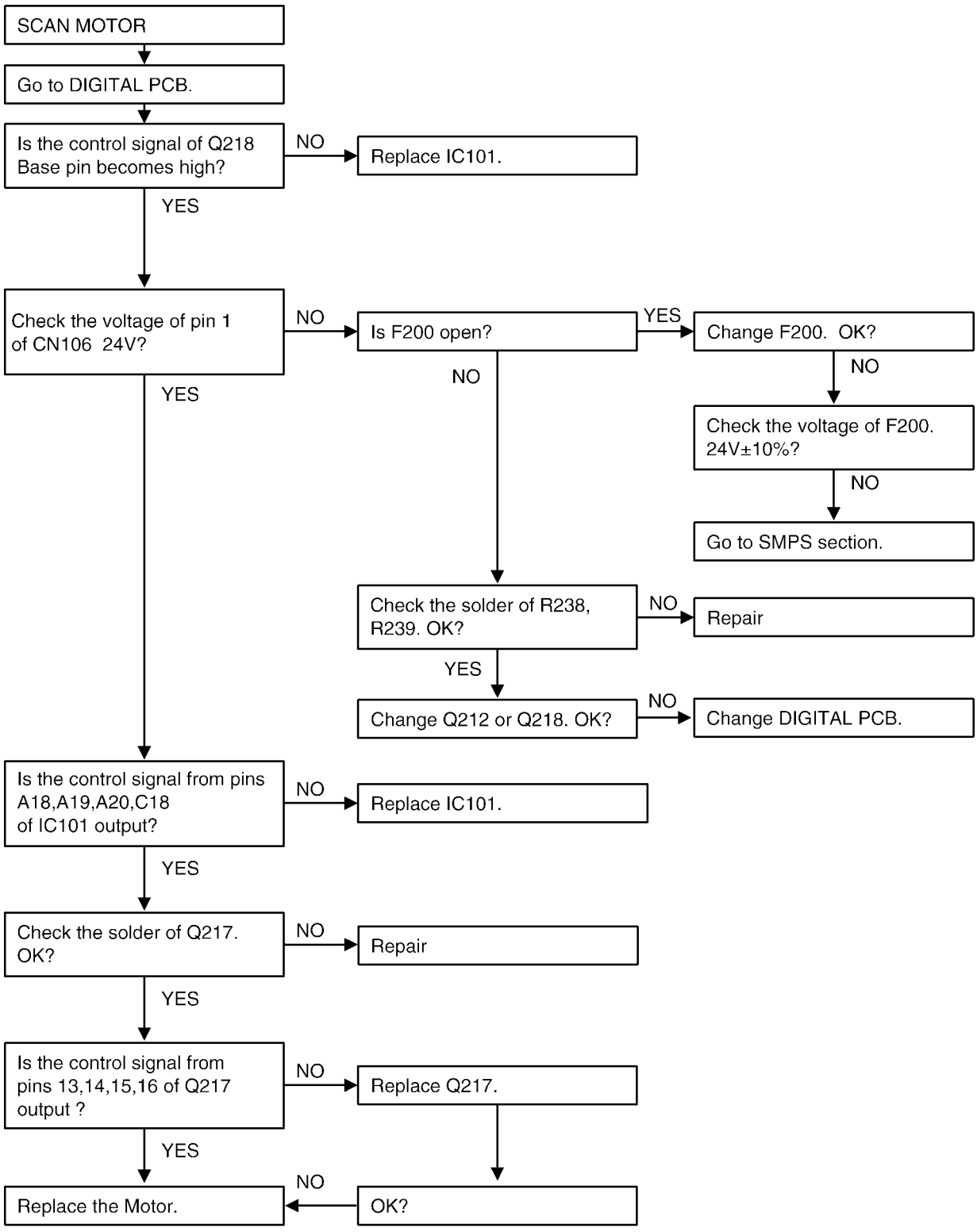
Sensors and Switches Section (P.40)

12.2.5.5. Motor Section

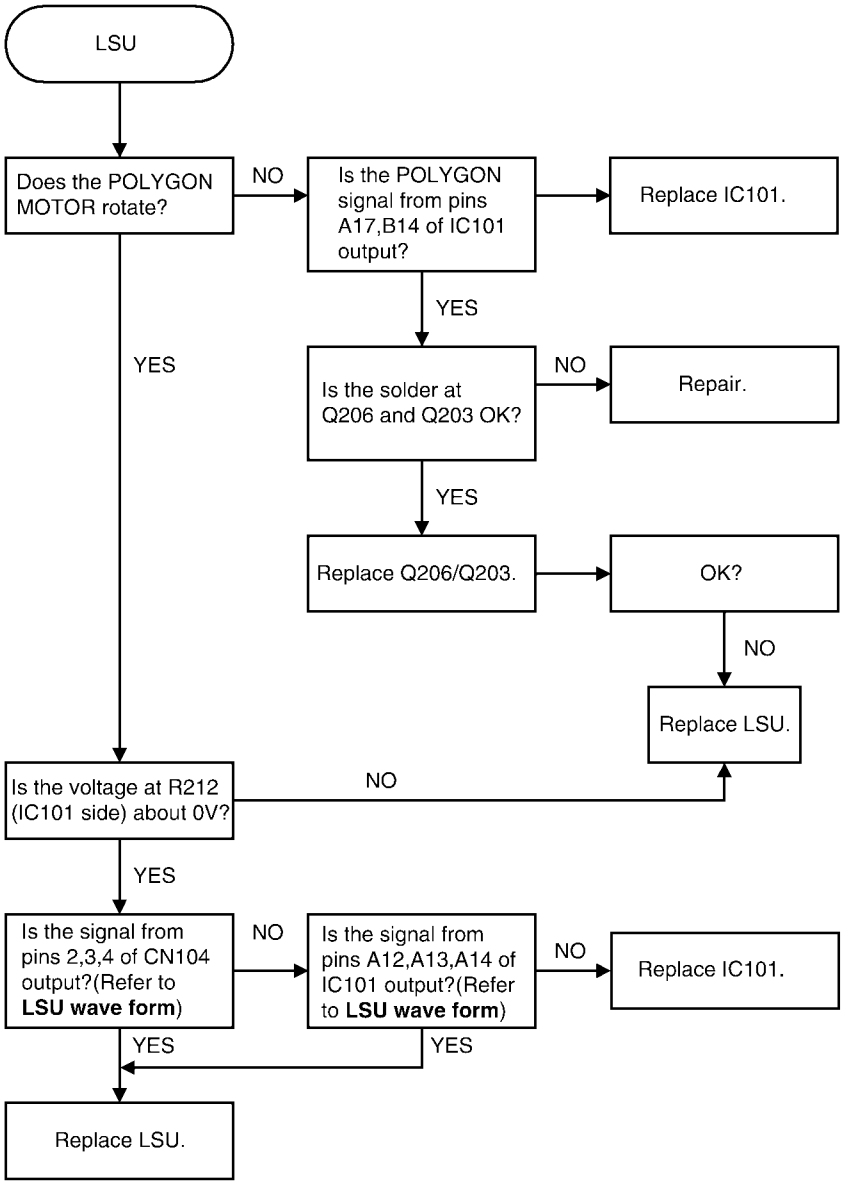
12.2.5.5.1. Engine Motor



12.2.5.5.2. Scan (ADF) Motor



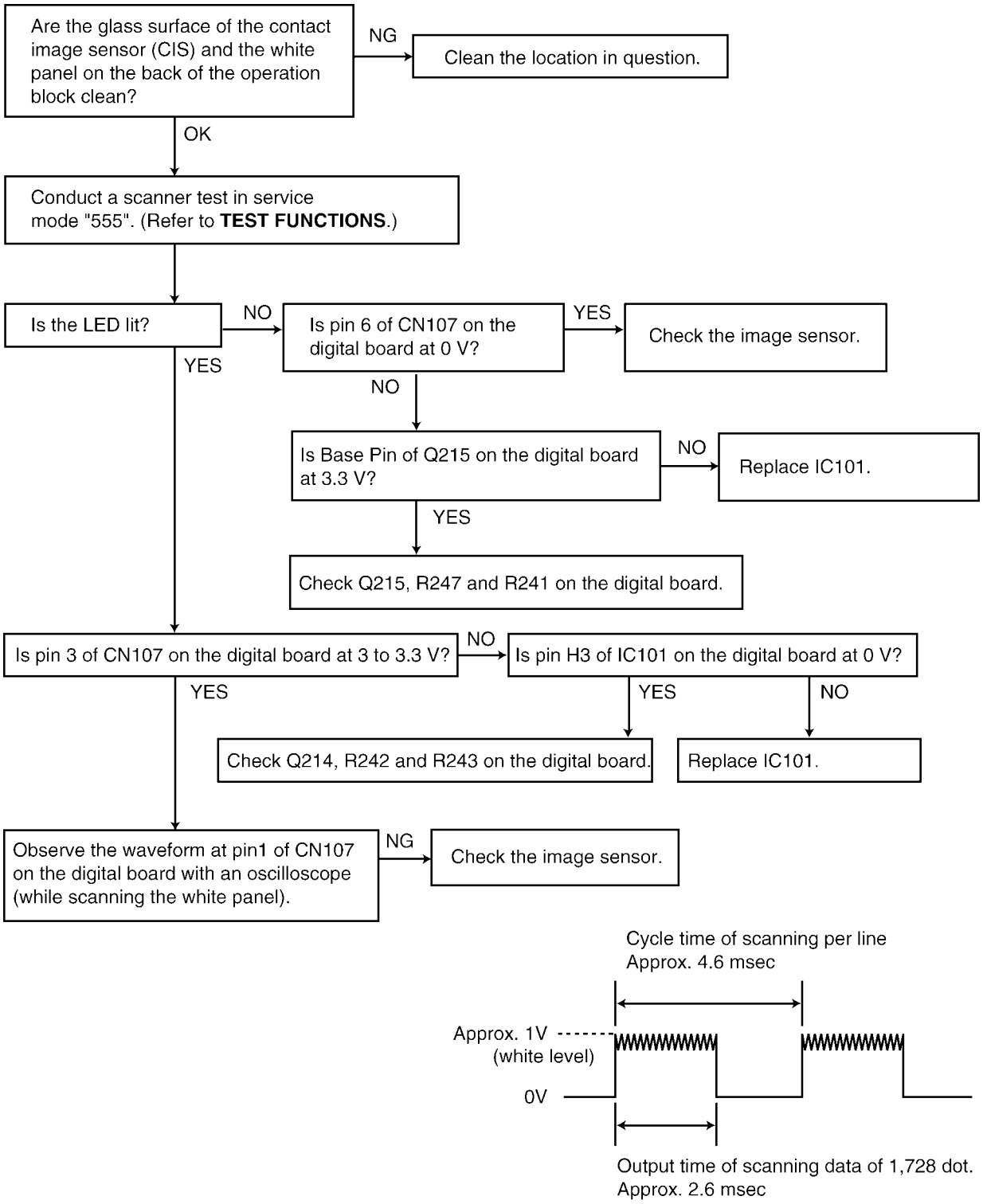
12.2.5.6. LSU Section



CROSS REFERENCE:

LSU (Laser Scanning Unit) Section (P.38)

12.2.6. CIS (Contact Image Sensor) Section



CROSS REFERENCE:
Test Functions (P.74)

12.2.7. High Voltage Value Check Point

Measurement Procedure

1. Unplug the unit, and open the unit cover.
2. Remove the developing unit, if it is equipped.
3. Connect the wire to the terminal to be measured (Fig. 2). The wire should be put out of the unit not to interfere in other terminals. See Fig 2 and 3 for fixing the wire to the terminal No.5.
4. Connect the wire fixed to the terminal to be measured and high voltage probe. Connect the earth of the high voltage probe to the screw located under metal plate (Fig4, 5).
5. Reinstall the developing unit and close the unit cover.
6. Plug un the unit. It causes the unit to start the initial operation. Be careful, high voltage is output at that moment. (Avoid measuring then.)
7. The unit enters the service mode. Then push *556_0. (Do not push the SET button.)
8. Push the SET button.
   (High voltage will be added to the unit in the hereafter. Avoid touching the wire and the tip of high voltage probe where high voltage is supplied.)
9. When the measurement is finished, push the STOP button.
   (The high voltage output is stopped.)
10. Remove the wire fixed to the output terminal after measuring.

Each terminal's output voltage

No.	BIAS Name	Rated Output	Rated Output Range
1	DEV (Developing)	220V	220V ± 15V
2	OPC (GND)	----------	----------
3	GRID (Grid)	475V	475± 18V
4	CHG (Charge)	180μA	Output voltage about 4.1~4.6KV
5	TRA+ (Transfer)	800V	800± 100V

* FLUKE85 (MULTIMETER) + HIOKI (HV PROVE 9014) or the equivalent should be used as the high voltage measuring instrument.

* As for measuring TRA, start measuring within 9 seconds after pressing the SET button. The output value will be changed in 9 seconds.

Fig1

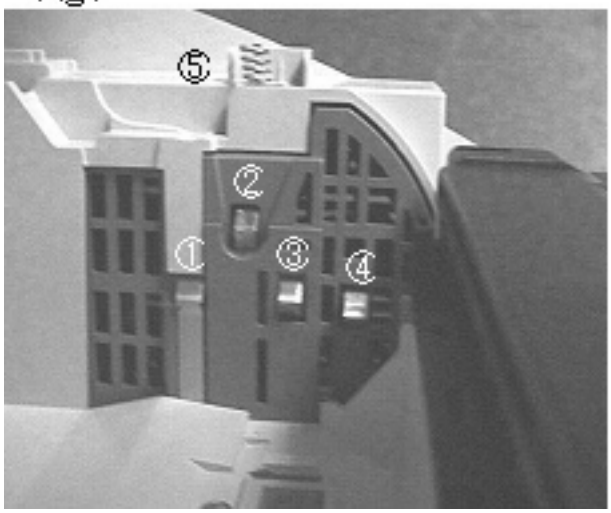


Fig2

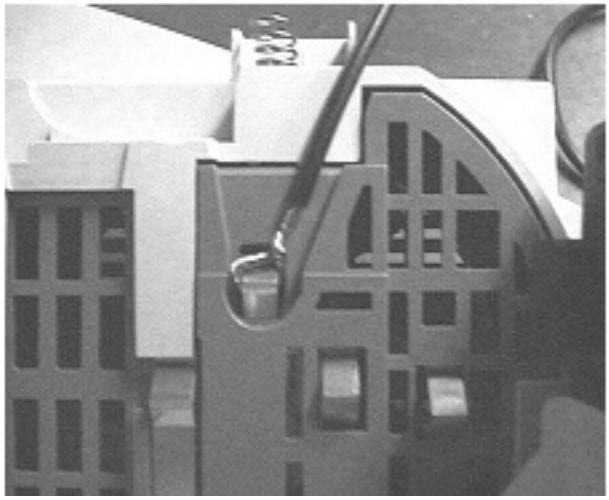


Fig.3

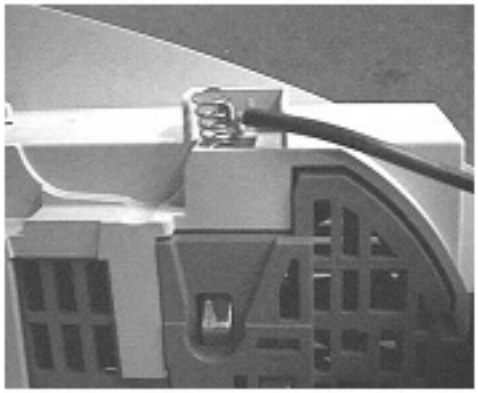
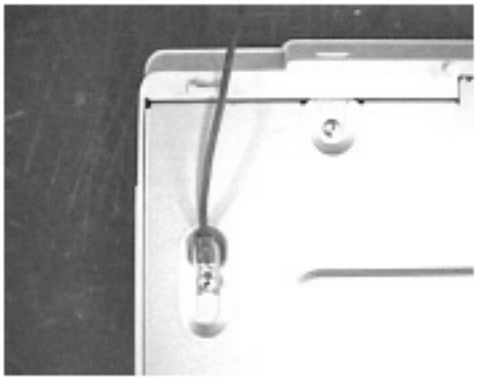
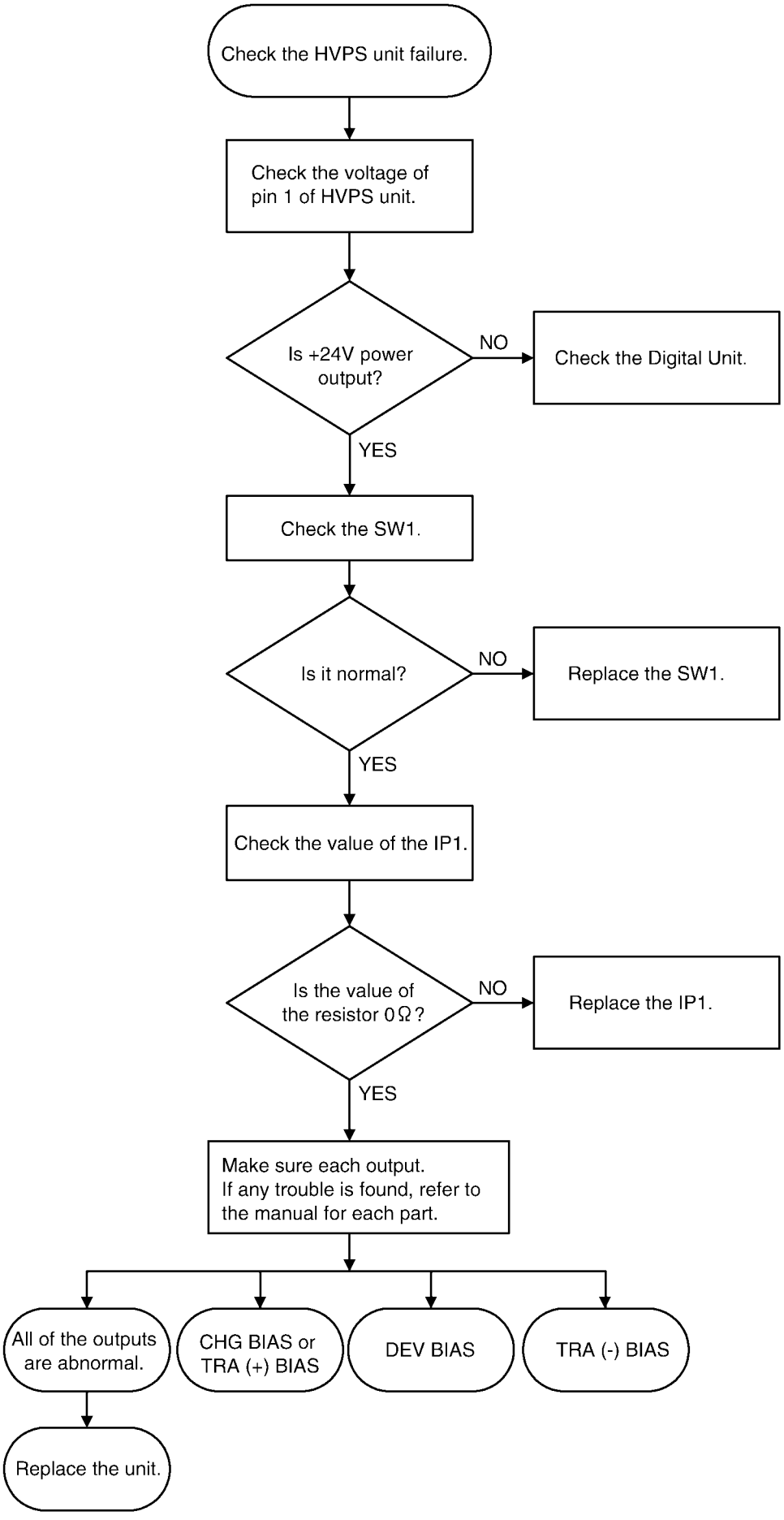


Fig.4

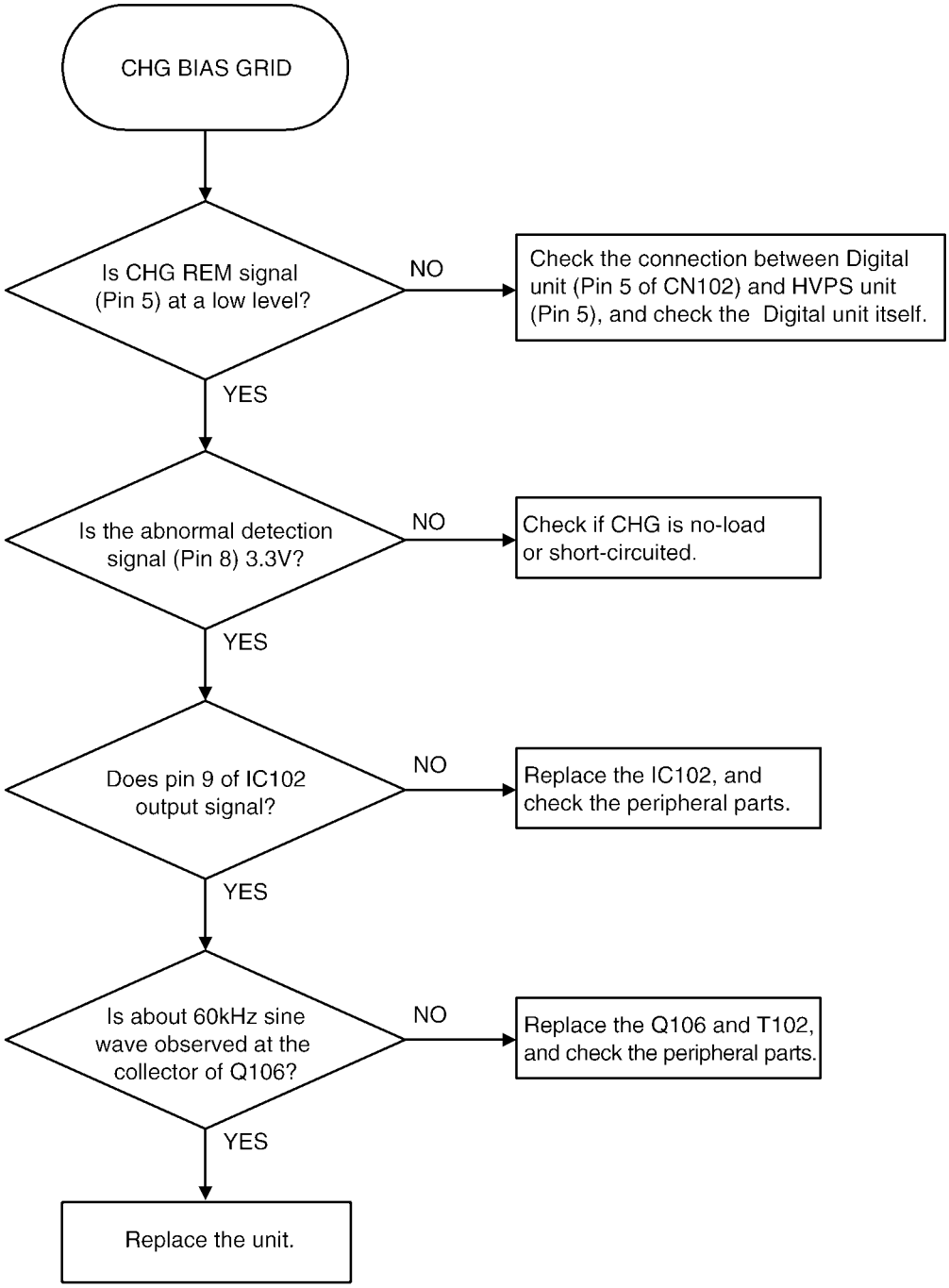


12.2.8. High Voltage Section

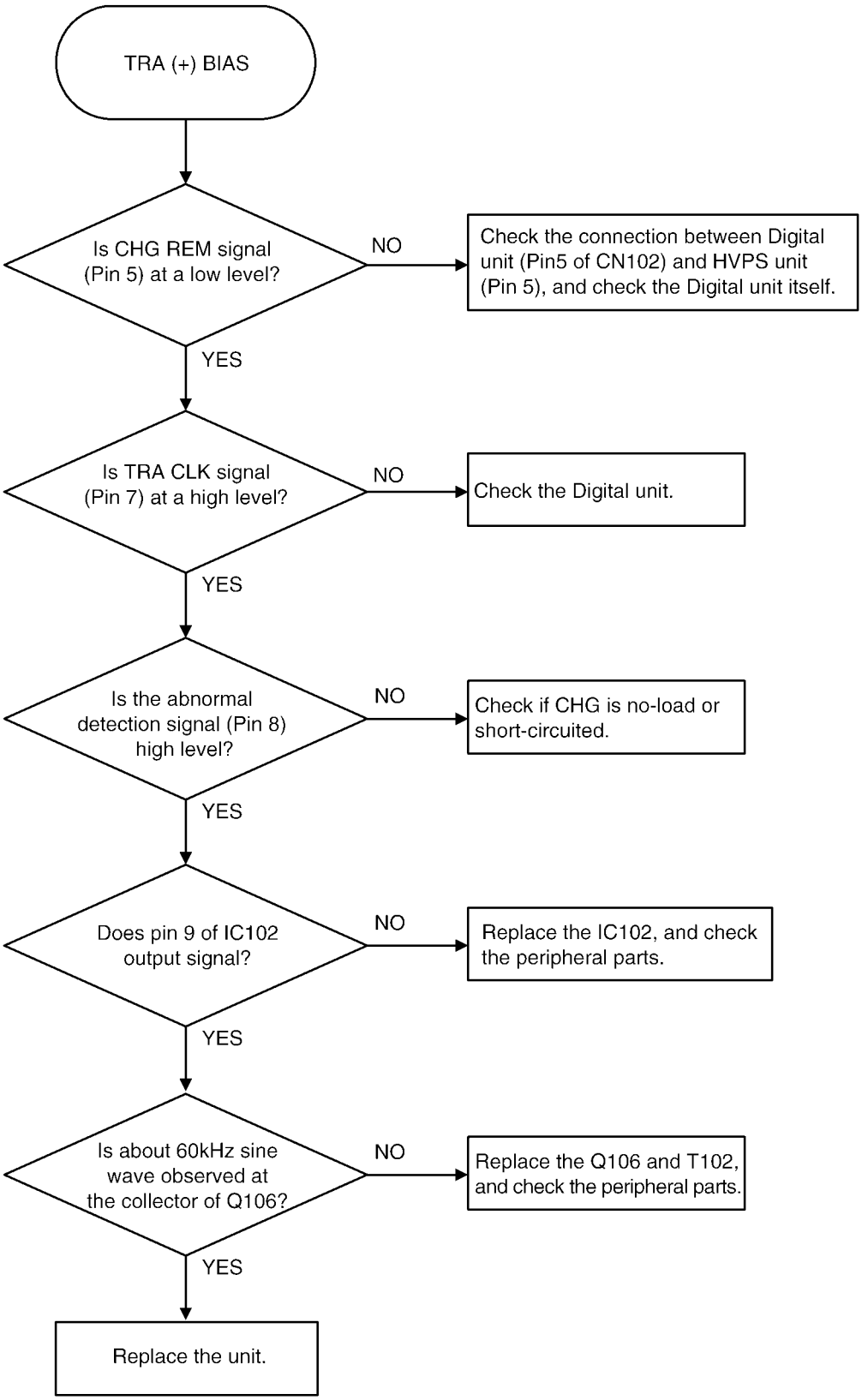
1. Main



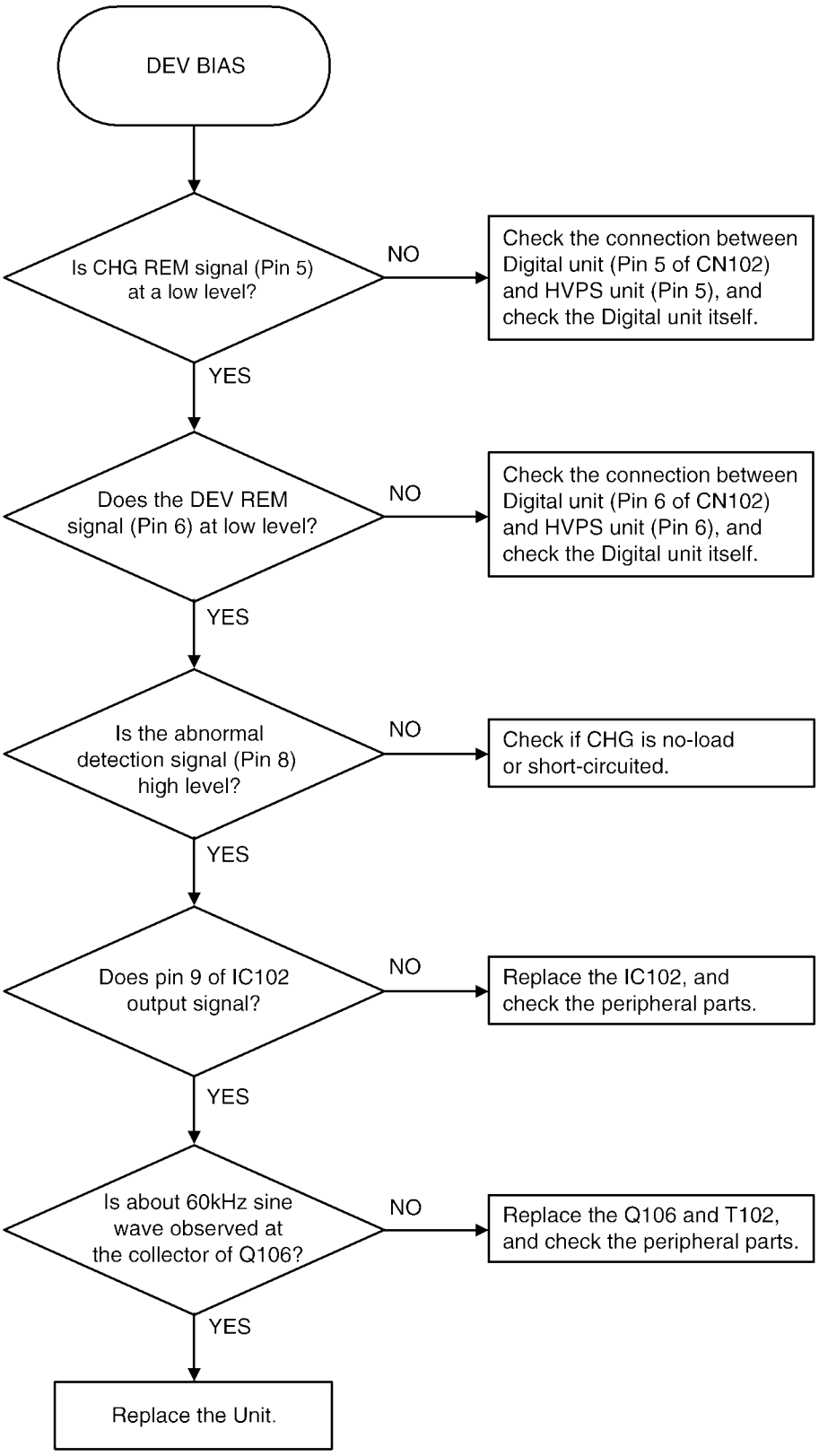
2. CHG, GRID

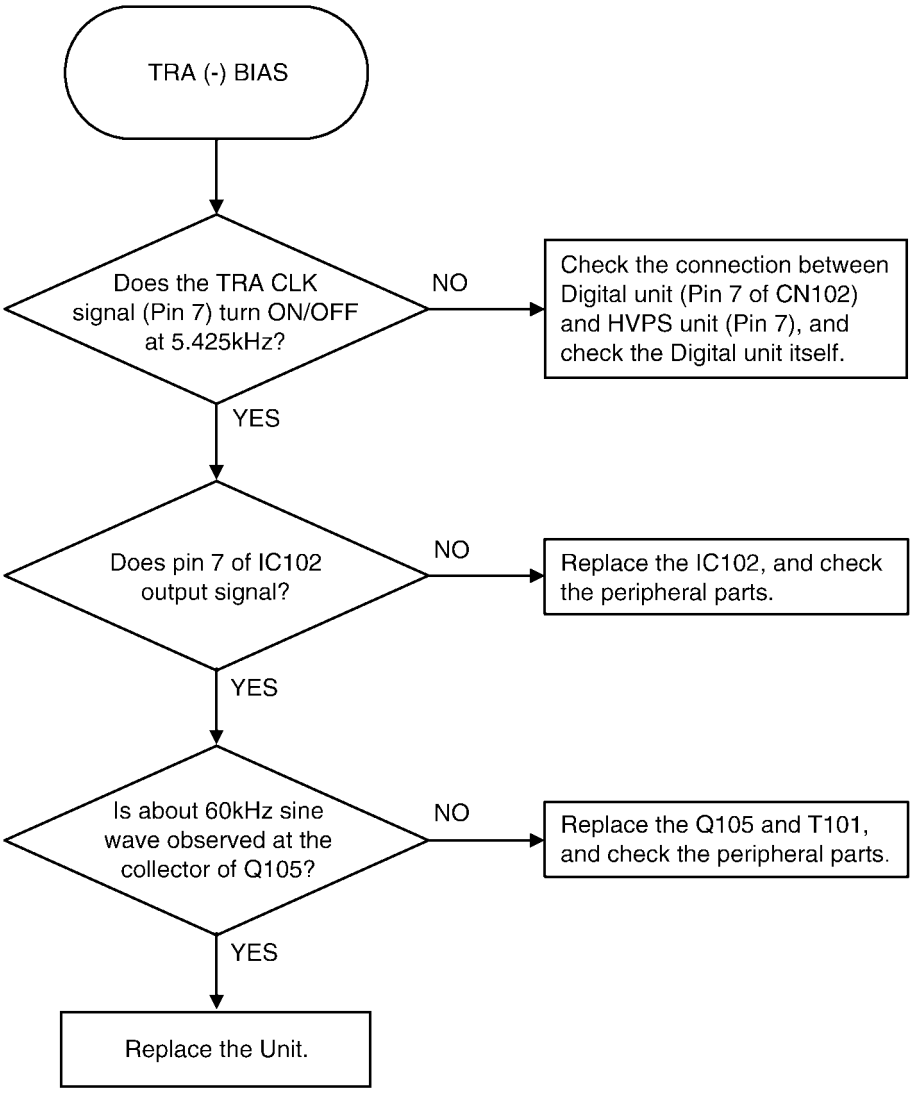

CHG BIAS GRID
Is CHG REM signal (Pin 5) at a low level?
NO
Check the connection between Digital unit (Pin 5 of CN102) and HVPS unit (Pin 5), and check the Digital unit itself.
YES
Is the abnormal detection signal (Pin 8) 3.3V?
NO
Check if CHG is no-load or short-circuited.
YES
Does pin 9 of IC102 output signal?
NO
Replace the IC102, and check the peripheral parts.
YES
Is about 60kHz sine wave observed at the collector of Q106?
NO
Replace the Q106 and T102, and check the peripheral parts.
YES
Replace the unit.

3. TRA (+)


TRA (+) BIAS
Is CHG REM signal (Pin 5) at a low level?
NO
Check the connection between Digital unit (Pin5 of CN102) and HVPS unit (Pin 5), and check the Digital unit itself.
YES
Is TRA CLK signal (Pin 7) at a high level?
NO
Check the Digital unit.
YES
Is the abnormal detection signal (Pin 8) high level?
NO
Check if CHG is no-load or short-circuited.
YES
Does pin 9 of IC102 output signal?
NO
Replace the IC102, and check the peripheral parts.
YES
Is about 60kHz sine wave observed at the collector of Q106?
NO
Replace the Q106 and T102, and check the peripheral parts.
YES
Replace the unit.

4. DEV


DEV BIAS
Is CHG REM signal (Pin 5) at a low level?
NO
Check the connection between Digital unit (Pin 5 of CN102) and HVPS unit (Pin 5), and check the Digital unit itself.
YES
Does the DEV REM signal (Pin 6) at low level?
NO
Check the connection between Digital unit (Pin 6 of CN102) and HVPS unit (Pin 6), and check the Digital unit itself.
YES
Is the abnormal detection signal (Pin 8) high level?
NO
Check if CHG is no-load or short-circuited.
YES
Does pin 9 of IC102 output signal?
NO
Replace the IC102, and check the peripheral parts.
YES
Is about 60kHz sine wave observed at the collector of Q106?
NO
Replace the Q106 and T102, and check the peripheral parts.
YES
Replace the Unit.


TRA (-) BIAS
Does the TRA CLK signal (Pin 7) turn ON/OFF at 5.425kHz?
NO
Check the connection between Digital unit (Pin 7 of CN102) and HVPS unit (Pin 7), and check the Digital unit itself.
YES
Does pin 7 of IC102 output signal?
NO
Replace the IC102, and check the peripheral parts.
YES
Is about 60kHz sine wave observed at the collector of Q105?
NO
Replace the Q105 and T101, and check the peripheral parts.
YES
Replace the Unit.

12.2.9. Power Supply Board Section

12.2.9.1. Key Components for Troubleshooting

Check the following parts first: F2, C5, and Q1.

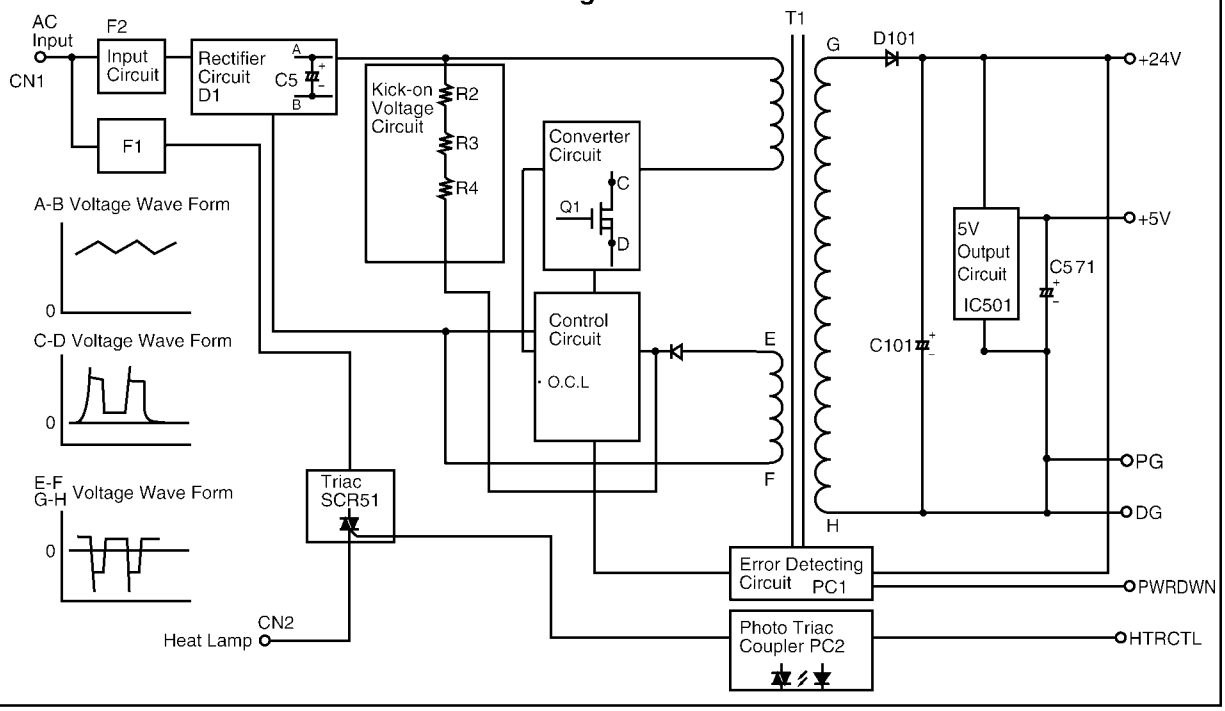
This comes from our experience with experimental tests. For example: power supply and lightning surge voltage test, withstanding voltage test, intentional short circuit test, etc.

Caution:

If you find a melted fuse in the unit, do not turn on the power until you locate and repair the faulty parts (except for the fuse); otherwise the fuse will melt again and you cannot pinpoint the faulty point.

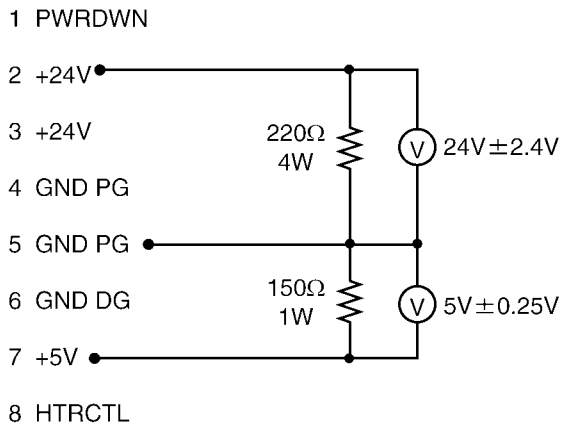
In most cases, the symptom is that nothing is output. It is more likely that the fault is in the primary side rather than the secondary side. Check the primary side first.

Block Diagram



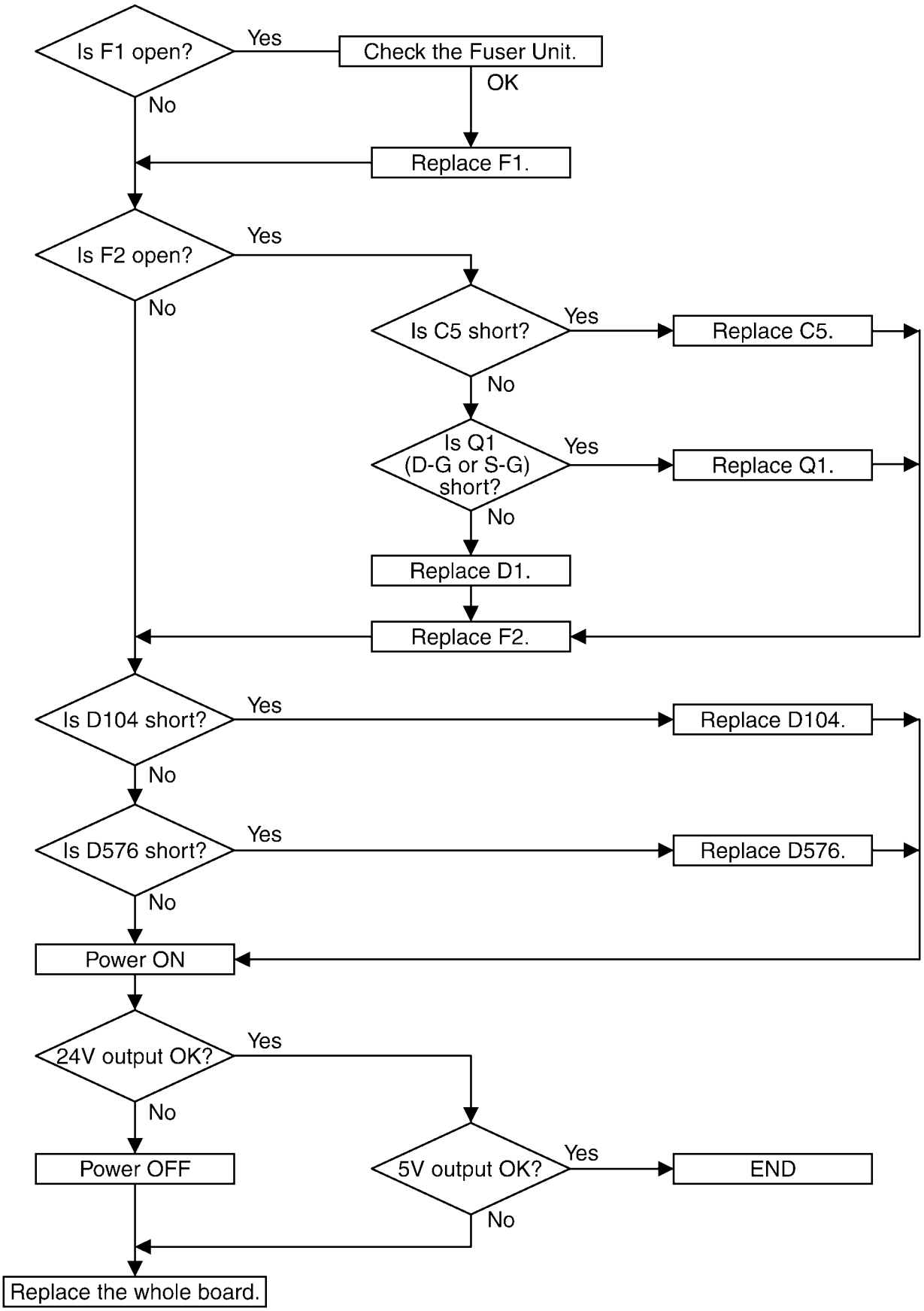
DUMMY LOAD to check voltage

When you check voltage in a power supply unit alone, use this dummy load. If the dummy load is not available, connect the main P.C.B. to the analog P.C.B.



V : Volt Meter

12.2.9.2. Troubleshooting Flow Chart



12.3. Remote Programming

If, after the call is connected, the customer describes the situation and it is determined that the problem can be corrected by making parameter changes, this function makes it possible to change parameters such as the user code and service code from another fax (using DTMF tones). Therefore, travel to the customer's location is not required. However, it is not possible to change all the parameters remotely (**Program Mode Table**(P.128)). The function used to accomplish this is remote programming.

First, in order to check the current status of the service code parameter, print out the setup list (code: 991) and the service list (code: 999) from the customer's fax machine.
Based on this, the parameters for the desired codes can be changed.
The procedure for changing and listing parameters is described on **Entering the Remote Programming Mode and Changing Service Codes**(P.127). Also, before exiting the remote programming mode, it is advisable to obtain a new list to confirm that the changes were made correctly.

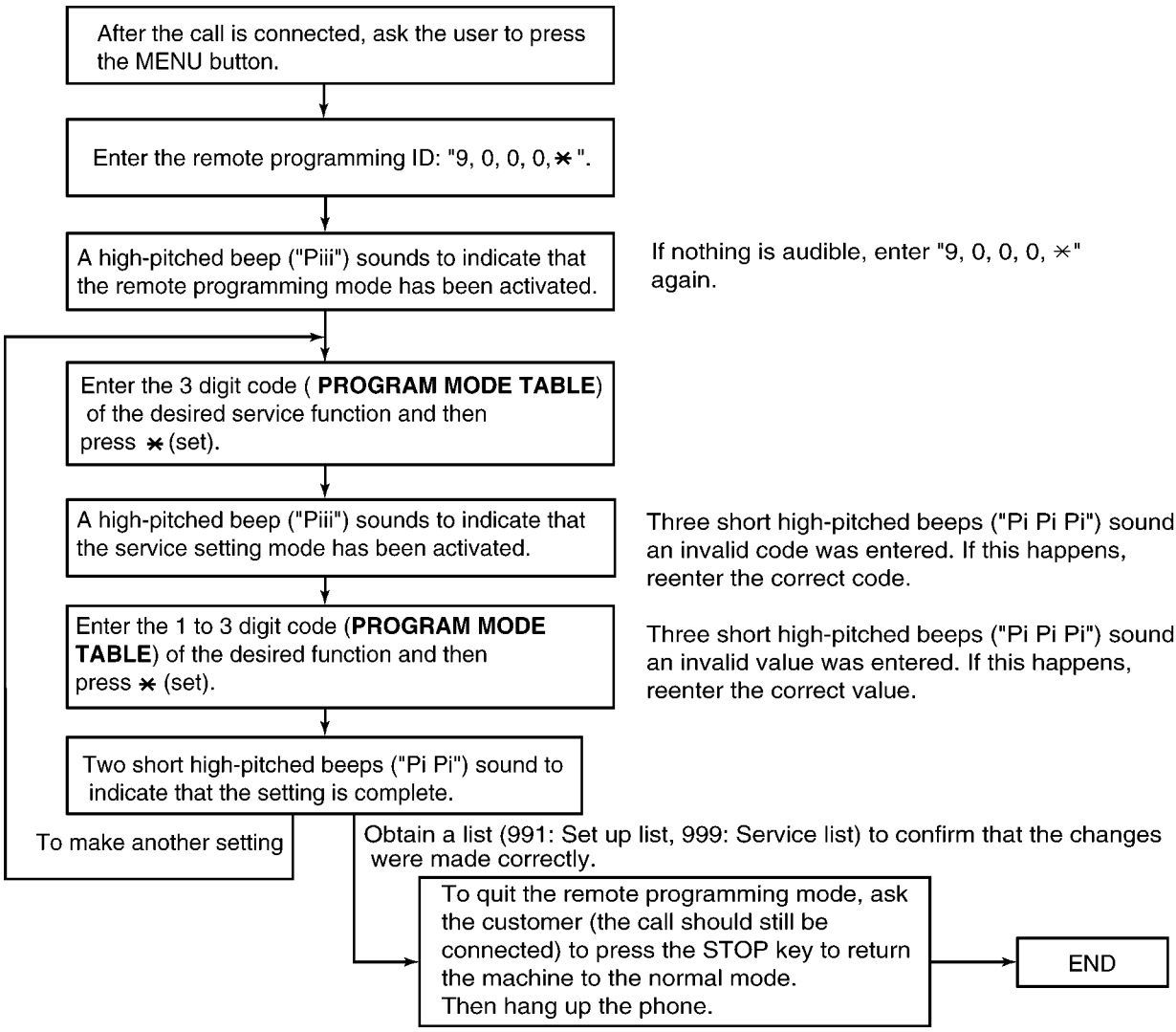
Hint:

Since the connected telephone is in use during the remote programming mode, it may be helpful to ask the customer to switch to the speakerphone. This frees the customer from the need to remain right next to the fax while you are making parameter settings. When finished, inform the customer. Also note that in very noisy locations where the DTMF tones are not audible, the remote programming function will not work.

12.3.1. Entering the Remote Programming Mode and Changing Service Codes

CROSS REFERENCE:

Program Mode Table (P.128)



12.3.2. Program Mode Table

Code	Function	Set Value	Default	Remote Set-ting
001	Set date and time	dd/mm/yy hh:mm	01/01/09	NG
002	Your logo	---	None	NG
003	Your fax telephone number	---	None	NG
004	Transmission report mode	2:ON / 3:OFF / 1:ERROR	ERROR	OK
006	FAX ring count	1 to 9 rings	2	OK
013	Dialling Mode	2:TONE / 1:PULSE	TONE	OK
016	Recording paper size	LETTER / A4 / LEGAL	A4	OK
017	Ext. Ring tone	RINGTONE 1 / 2 / 3	RINGTONE 1	NG
022	Auto journal print	1:ON / 2:OFF	ON	OK
023	Overseas mode	1:NEXT FAX / 2:ERROR / 3:OFF	ERROR	OK
025	Delayed transmission	ON / OFF	OFF	NG
026	Auto CALLER ID list	1:ON / 2:OFF	OFF	OK
030	SILENT FAX RECOGNITION RING	3~9	3	OK
037	Auto REDUCTION	1:ON / 2:OFF	ON	OK
039	LCD contrast	NORMAL / DARKER	NORMAL	NG
041	Remote FAX activation code	ON / OFF	ON CODE=*#9	NG
044	Receive alert	1:ON / 2:OFF	ON	OK
046	Friendly receive	1:ON / 2:OFF	ON	OK
049	Auto disconnection	1:ON / 2:OFF	ON	OK
058	Scan Contrast	1:NORMAL / 2:LIGHT/ 3:DARKER	NORMAL	OK
065	Maintenance Time	12:00 AM ~11:59PM	12:00 PM	NG
066	Max Fax Speed	1:14.4Kbps / 2:33.6Kbps	33.6Kbps	OK
068	ECM Selection	1:ON / 2:OFF	ON	OK
072	Set flash time	80msec / 90msec / 100msec / 110msec / 160msec / 200msec / 250msec / 300msec / 400msec / 600msec / 700msec / 900msec	700msec	OK
073	Manual answer mode	1:TEL 2: TEL/FAX	TEL	OK
076	FAX tone	1:ON / 2:OFF	ON	OK
078	TEL/FAX delayed ring	1~9	2	OK
079	Toner save	1:ON / 2:OFF	OFF	OK
080	Set default	YES / NO	NO	NG
501	Pause time set	001~600 x 100msec	030	OK
502	Flash time	01~99 x 10msec		
503	Dial speed	1:10pps / 2:20 pps	10pps	OK
507	V.34 transmit speed select	0:DISABLE /1:33600bps / 2:31200bps / 3:28800bps /4:26400bps/5:24000bps / 6:21600bps /7:19200bps/8:16800bps	33600bps	OK
508	V.34 receive speed select	0:DISABLE /1:33600bps / 2:31200bps / 3:28800bps /4:26400bps/5:24000bps / 6:21600bps /7:19200bps/8:16800bps	33600bps	OK
514	Bell signal detect time	1~9 x 100msec	6	OK
520	CED frequency select	1:2100Hz / 2:1100Hz	2100Hz	OK
521	International mode select	1:ON / 2:OFF	ON	OK
522	Auto standby select	1:ON / 2:OFF	ON	OK
523	Receive equalizer select	1:0kms / 2:1.8km / 3:3.6km / 4:7.2km	0 km	OK
524	Transmission equalizer select	1:0kms / 2:1.8km / 3:3.6km / 4:7.2km	0 km	OK
529	Memory clear for Call Service	---	---	NG
544	Document feed position adjustment value set	0~4mm	2	OK
550	Memory clear	---	---	NG
551	ROM check	---	---	NG
552	DTMF signal tone test	1:ON / 2:OFF	OFF	OK
553	Monitor on FAX communication	1:OFF / 2:Phase B / 3:ALL	OFF	OK
554	Modem test	---	---	NG
556	Motor test & H.V.P.S. check	---	---	NG
557	LED test	---	---	NG
558	LCD test	---	---	NG
561	Key test	---	---	NG
567	T0 timer	00~255 x sec	060sec	OK
571	ITS auto redial time set	00~99	05	OK
572	ITS auto redial line disconnection time set	001~999sec	185sec	OK
573	Remote turn-on ring number	00~99	10	OK
590	FAX auto redial time set	00~99	05	OK

Code	Function	Set Value	Default	Remote Setting
591	FAX auto redial line disconnection time set	001~999sec	185sec	OK
592	CNG transmit select	1:OFF / 2:ALL / 3:AUTO	ALL	OK
593	Time between CED and 300bps	1:75ms / 2:500ms / 3:1sec	75ms	OK
594	Overseas DIS detection select	1:1st / 2:2nd	1st	OK
595	Receive error limit value set	1:5% / 2:10% / 3:15% / 4:20%	10%	OK
596	Transmit level set	-15~00dBm	11	OK
598	Receiving Sensitivity	20~48	44	OK
599	ECM Frame size	1:256 / 2:64	256byte	OK
630	Paper jam cause distinction	---------	---------	NG
639	LSU test	---------	---------	NG
651	White system program into the Flash ROM	---------	---------	NG
655	Cause distinction code of call service 3	---------	---------	NG
677	Fan test	---------	---------	NG
710	Memory clear except History data	---------	---------	NG
717	Transmit speed select	1:14400/ 2:12000/ 3:9600/ 4:7200/ 5:4800/ 6:2400	14400bps	OK
718	Receive speed select	1:14400/ 2:12000/ 3:9600/ 4:7200/ 5:4800/ 6:2400	14400bps	OK
719	Ringer off in TEL/FAX mode	1:ON / 2:OFF	ON	OK
721	Pause tone detect	1:ON / 2:OFF	OFF	OK
722	Redial tone detect	1:ON / 2:OFF	ON	OK
763	CNG detect time for friendly reception	1:10s / 2:20s / 3:30s	30s	OK
771	T1 timer	1:35s / 2:60s	35s	OK
774	T4 timer	00~99 × 100msec	00	OK
815	Sensor test	---------	---------	NG
852	Print test pattern	---------	---------	NG
853	Top margin	1~5	3	OK
854	Left margin	1~7	4	OK
874	DTMF ON time	060~200msec	100	OK
880	History list	1:Start	---------	NG
881	Journal 2	---------	---------	NG
882	Journal 3	---------	---------	NG
890	TEL/FAX ring back tone	1:ON / 2:OFF	ON	OK
991	Setup list	1:Start	---------	OK
994	Journal list	1:Start	---------	OK
995	Journal 2 list	1:Start	---------	OK
996	Journal 3 list	1:Start	---------	OK
998	History list	1:Start	---------	OK
999	Service list	1:Start	---------	OK

OK means “can set”.

NG means “can not set”.

Note:

Refer to **Service Function Table** (P.79) for descriptions of the individual codes.

Example:

If you want to set value in the “004 Transmission report mode”, press the dial key number 1, 2 or 3 corresponding to the Set Value you want to select. (1:ERROR/2:ON/3:OFF)

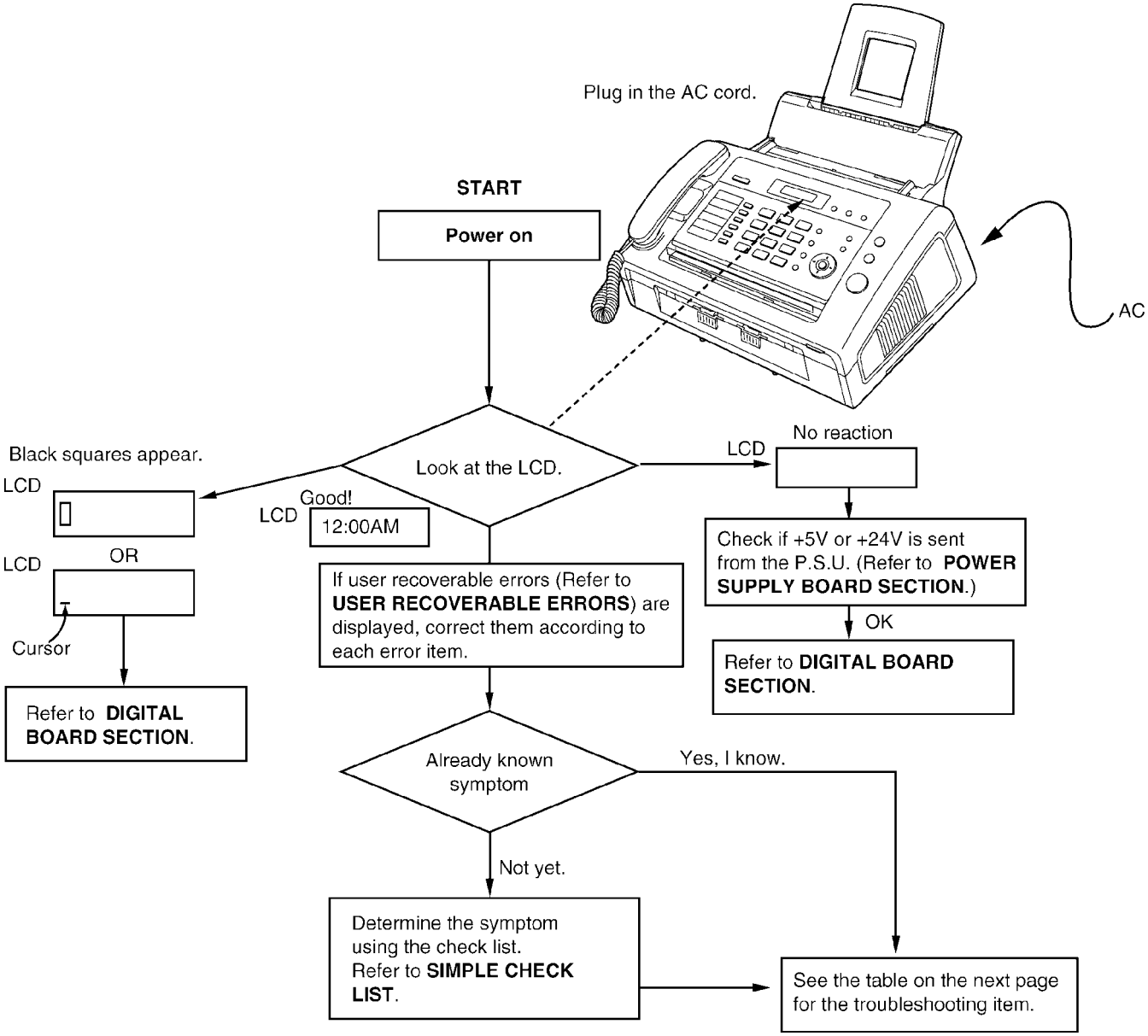
12.4. Troubleshooting Details

12.4.1. Outline

Troubleshooting is for recovering quality and reliability by determining the broken component and replacing, adjusting or cleaning it as required. First, determine the problem then decide the troubleshooting method. If you have difficulty finding the broken part, determine which board is broken. (For example: the Digital PCB, Analog PCB, etc.) The claim tag from a customer or dealer may use different expressions for the same problem, as they are not a technician or engineer. Using your experience, test the problem area corresponding to the claim. Also, returns from a customer or dealer often have a claim tag. For these cases as well, you need to determine the problem. Test the unit using the simple check list on **Simple Check List**(P.132). Difficult problems may be hard to determine, so repeated testing is necessary.

12.4.2. Starting Troubleshooting

Determine the symptom and the troubleshooting method.

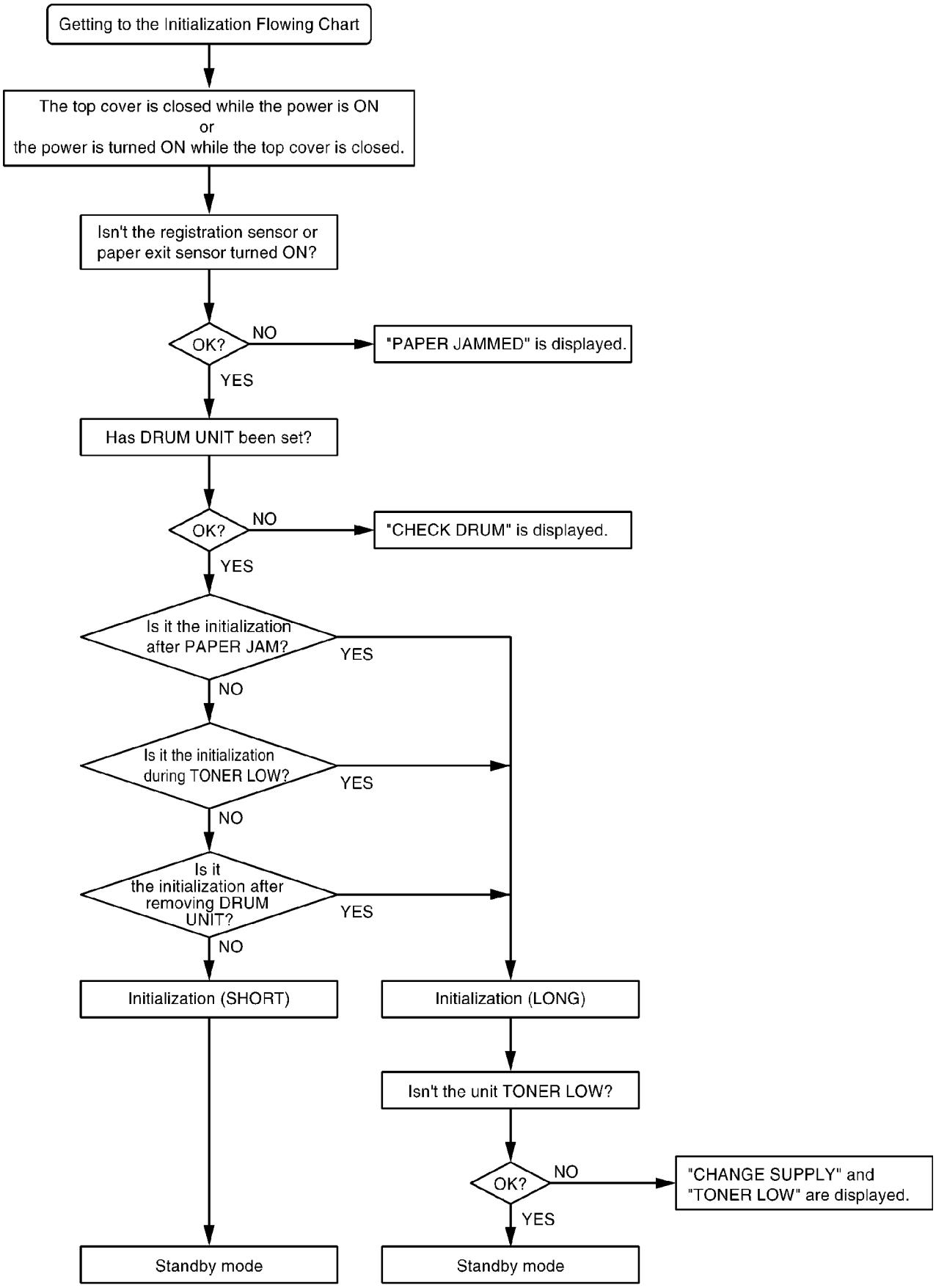


CROSS REFERENCE:

User Recoverable Errors(P.86)
Simple Check List(P.132)
Digital Board Section(P.206)
Power Supply Board Section(P.57)

12.4.3. Initialization

There are two types of initialization, one is the short initialization (about 3 seconds) and the other is the long initialization (about 10 seconds). The short initialization makes the unit enter the standby mode. The long initialization makes the unit enter the standby mode after cleaning or detecting the rest of toner.



12.4.4. Simple Check List

SERIAL NO. _____ DATE _____

FUNCTION		JUDGEMENT	REFERENCE
FAX operation	Transmission	OK / NG	
	Receiving	OK / NG	
Copy operation	Copy by ADF	OK / NG	
Telephone operation	Handset transceiver/ receiver	OK / NG	
	MONITOR sound	OK / NG	
	Ringer sound	OK / NG	
	Dial operation	OK / NG	
	Volume operation	OK / NG	
Operation panel	Key check	OK / NG	Service code 561※
	LED check	OK / NG	Service code 557※
	LCD check	OK / NG	Service code 558※
Sensor	Sensor check	OK / NG	Service code 815※
Clock		OK / NG	Is the time kept correctly? Check with another※ clock.
EXT-TAM	Handset transceiver/receiver	OK / NG	
	Remote control	OK / NG	

Note:
Check according to the service code referring to **Test Functions** (P.74)

12.4.5. Simplified Troubleshooting Guide

12.4.5.1. Printing

No.	Symptom	Cause	Countermeasure
1	**Ghost Image** (P.143)	Failed drum unit	Replace drum unit
		Failed transfer unit	Check the transfer roller and spring
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to **High Voltage Section** (P.119)
		Failed fuser unit	Check the heat roller and the pressurized roller and the spring and the heat lamp and the thermistor
		Failed the power supply board	Go to **Power Supply Board Section** (P.57)
		Too thick or too thin recording paper	Use the recording paper from 16lb to 24lb
2	**Dark or White Vertical Line** (P.144)	Dirty the lower glass or the reflecting mirror	Clean the lower glass and the reflecting mirror
		Dust on the path of the laser beam	Clean the path of the laser beam
		Dust on the developing roller	Replace drum unit
		Failed the heat roller or the pressurized roller	Check the heat roller and the pressurized roller
		Failed LSU	Go to **LSU Section** (P.115)
3	**Dark or White Horizontal Line** (P.145)	Failed drum unit	Replace drum unit
		Failed the gear	Check the gear
		Failed the engine motor	Go to **Engine Motor** (P.113)
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to **High Voltage Section** (P.119)
		Scratch on the OPC drum	Replace drum unit
		Static electricity on the documents (when copying)	Check the connection between the parts around CIS and earth
4	**Dirty or Hulk Darkness Black Ground** (P.146)	Failed drum unit	Replace drum unit
		Life of drum unit is over	Replace drum unit
		Dirty the pickup roller and the regist roller and the feed roller and the eject roller and the heat roller and the pressure roller	Clean the pickup roller and the regist roller and the feed roller and the eject roller and the heat roller and the pressure roller
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to **High Voltage Section** (P.119)
		Dirty the recording paper path	Clean the recording paper path
5	**Black Print** (P.147)	Failed drum unit	Replace drum unit
		Failed LSU	Go to **LSU Section** (P.115)
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to **High Voltage Section** (P.119)
		Failed the digital board	Check the digital board
		Failed CIS (when copying)	Go to **CIS (Contact Image Sensor) Section** (P.116)
6	**Light Print** (P.148)	Short toner	Supply toner
		Failed drum unit	Replace drum unit
		Life of drum unit is over	Replace drum unit
		Dirty the lower glass or the reflecting mirror	Clean the lower glass and the reflecting mirror
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to **High Voltage Section** (P.119)
7	**Black Density is Light or Uneven**(P.149)	Short toner	Supply toner
		Failed drum unit	Replace drum unit
		Life of drum unit is over	Replace drum unit
		Dirty the lower glass or the reflecting mirror	Clean the lower glass and the reflecting mirror
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to **High Voltage Section** (P.119)
8	**Blank Print (P.150)**	Failed drum unit	Replace drum unit
		Failed LSU	Go to **LSU Section** (P.115)
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to **High Voltage Section** (P.119)
		Failed the digital board	Check the digital board
		Failed CIS (when copying)	Go to **CIS (Contact Image Sensor) Section** (P.116)
9	**Black or White Point** (**P.150**)	Failed the developing roller (31.4mm pitch)	Replace drum unit
		Failed the OPC drum (75.4mm pitch)	Replace drum unit
		Failed the heat roller (62.8mm pitch)	Check the heat roller
		Failed the charge blush (21mm pitch)	Replace drum unit
		Failed the high voltage power supply board	Go to **High Voltage Section** (P.119)
		Too thick or too thin recording paper	Use the recording paper from 16lb to 24lb

12.4.5.2. Recording Paper Feed

No.	Symptom	Cause	Countermeasure
1	**Multiple Feed** (P.151)	Dirty or failed the pickup roller	Clean or replace the pickup roller
		Dirty or failed the pickup rubber	Clean or replace the separation rubber
2	**The Recording Paper is Waved or Wrinkled** (P.151)	Dirty the pressure roller or the heat roller	Clean the pressure roller and the heat roller
		Failed the spring of pressure roller	Replace the spring of pressure roller
		Too thin recording paper	Use the recording paper from 16lb to 24lb
3	**Skew** (P.152)	Dirty or failed the pickup roller	Clean or replace the pickup roller
		Dirty or failed the pickup rubber	Clean or replace the separation rubber
		Dirty or failed the paper feed roller	Clean or replace the regist roller
		Dust on the recording paper path	Clean the recording paper path
		Failed LSU	Replace LSU
		Over the max capacity of the recording paper	Set up to MAX 150 sheets
		Too thick or too thin recording paper	Use the recording paper from 16lb to 24lb
4	**The Recording Paper Does Not Feed** (P.153)	Dirty or failed the pickup roller	Clean or replace the pickup roller
		Dirty or failed the pickup rubber	Clean or replace the separation rubber
		Failed the gear	Check the gear
		Failed the engine motor	Go to **Engine Motor** (P.113)
		Failed the paper feed sensor lever	Check the regist sensor (paper top sensor) lever
		Failed the paper feed sensor	-----
5	**The Recording Paper Jam**(P.154) ”PAPER JAMMED” ON THE LCD	Dirty or failed the pressure roller	Clean or replace the pressure roller
		Dirty or failed the heat roller	Clean or replace the heat roller
		Dust on the recording paper path	Clean the recording paper path
		Failed the paper feed roller	Replace the regist roller
		Failed the gear	Check the gear
		Failed the engine motor	Go to **Engine Motor** (P.113)
		Failed the paper feed sensor lever	Check the regist sensor (paper top sensor) lever
		Failed the paper feed sensor	-----
		Failed the exit sensor lever	Check the exit sensor lever
		Failed the exit sensor	Go to **Paper Exit Sensor..... "PAPER JAMMED"** (P.44)
		Too thick or too thin recording paper	Use the recording paper from 16lb to 24lb
		Not set the toner bottle	Set toner bottle
6	**Back Side of The Recording Paper is Dirty**(P.155)	Dirty the recording paper path	Clean the recording paper path
		Dirty the pressure roller	Clean the pressure roller
		Dirty the regist roller	Clean the regist roller
		Failed the high-voltage terminal	Check the high-voltage terminal
		Failed the high voltage power supply board	Go to **High Voltage Section** (P.119)

12.4.5.3. Copy and Fax

No.	Symptom	Cause	Countermeasure
1	**NO DOCUMENT FEED** (No Document Feed, Document Jam and Multiple Document Feed) (P.156)	Failed the document sensor lever	Replace the document sensor lever
		Failed the document sensor	Go to **Document Sensor** (P.41)
		Dirty or failed the separation roller	Clean or replace the separation roller
		Dirty or failed the separation rubber	Clean or replace the separation rubber
		Failed the separation spring	Replace the separation spring
	DOCUMENT JAM (No Document Feed, Document Jam and Multiple Document Feed) (P.156)	Dust or scratch on the document paper path	Clean the document paper path
		Failed the gear	Check the gear
		Failed the ADF motor	Go to **Scan (ADF) Motor** (P.114)
		Failed the ADF cover open switch lever	Replace the ADF cover open switch lever
	MULTIPLE DOCUMENT FEED(No Document Feed, Document Jam and Multiple Document Feed) (P.156)	Dirty or failed the separation roller	Clean or replace the separation roller
		Dirty or failed the separation rubber	Clean or replace the separation rubber
		Failed the separation spring	Replace the separation spring
2	**Skew (ADF)** (P.158)	Dust or scratch on the document paper path	Clean the document paper path
		Failed the document feed roller	Replace the document feed roller
		Failed the document guide	Replace the document guide
3	**The Sent Fax Data is Skewed** (P.159)	The cause of ADF	Go to Skew (ADF)(P.158)
		The cause of scanner glass	----
		Problem with the other FAX machine	
4	**The Received Fax Data is Skewed** (P.159)	The cause of printing	Go to Skew (ADF)(P.158)
		Problem with the other FAX machine	
5	**The Received or Copied Data is Expanded** (P.160)	Dirty or failed the drive roller (at ADF)	Clean or replace the drive roller
		Dirty or failed the document feed roller (at ADF)	Clean or replace the document feed roller
		Dirty or failed the separation roller (at ADF)	Clean or replace the separation roller
		Failed CIS movement (at SG)	Replace the belt or the gear or the shaft or the ADF motor
6	**Black or White Vertical Line is Copied** (P.161)	Dirty or failed the white plate (2 places)	Clean or replace the white plate
		Dirty or failed the glass board	Clean or replace the glass board
		The cause of printing	Go to **Dark or White Vertical Line** (P.144)
		Failed CIS	Go to **CIS (Contact Image Sensor) Section** (P.116)
7	**An Abnormal Image is Copied** (P.162)	Dirty or failed the white plate (2 places)	Clean or replace the white plate
		Dirty or failed the glass board	Clean or replace the glass board
		Dirty or failed the drive roller (at ADF)	Clean or replace the drive roller
		Dirty or failed the document feed roller (at ADF)	Clean or replace the document feed roller
		Dirty or failed the separation roller (at ADF)	Clean or replace the separation roller
		Failed CIS movement (at SG)	Replace the belt or the gear or the shaft or the ADF motor
		Failed CIS	Go to **CIS (Contact Image Sensor) Section** (P.116)
		The cause of printing	Go to **Dark or White Vertical Line** (P.144)

12.4.5.4. Others

No.	Symptom	Cause	Countermeasure
1	Cannot print legal size	Not selected the legal mode	Select the legal mode in the user programming mode
2	'CHECK DRUM' on the LCD	The drum unit can not be detected. • Drum Sensor trouble • Mechanical shutter trouble	Go to **Drum Detection** (P.43) Go to **LSU (Laser Scanning Unit) Section** (P.38)
3	'CHANGE DRUM' on the LCD	The toner sensor cannot detect the toner sensor signal.	Go to **Toner Sensor.... "TONER EMPTY", "TONER LOW", "CHANGE DRUM"** (P.45)
4	'CHECK PAPER' on the LCD	Failed the regist sensor lever	Replace the regist sensor lever
		Failed the regist sensor	Go to **Regist Sensor** (P.43)
5	'COVER OPEN' on the LCD	Failed the top cover open switch lever	Replace the top cover open switch lever
		Failed the top cover open switch	Go to **Top Cover Open Switch** (P.42)
6	CALL SERVICE 1' on the LCD	The polygon motor of LSU is unusually	Check the connector and LSU and the digital board
7	CALL SERVICE 2' on the LCD	The laser of LSU is unusually	Check the connector and LSU and the digital board
8	CALL SERVICE 3' on the LCD	The fuser temperature is unusually	Check the connector and the fuser and the thermistor and the digital board
9	CALL SERVICE 4' on the LCD	The fan motor is unusually	Check the connector and the fan motor and the digital board

12.4.6. Call Service Troubleshooting Guide

Call Service related error is most frequent.

Call Service 1 ----- Polygon doesn't rotate..... Refer to **LSU (Laser Scanning Unit) Section** (P.38).

- First, listen to the sound. If rotation sound isn't heard, check 24V line, POLON signal and POLCLK signal. If even a little of sound is heard, check XREADY signal.

Call Service 2 ----- Laser isn't output..... Refer to **LSU (Laser Scanning Unit) Section** (P.38)

- This can be judged only by referring to signal. Check 5V line, XHSYNC, XAPC, XVIDEO, XLDEN.

Call Service 3 ----- Detection of fixing temperature..... Refer to **Heat Lamp Control Circuit** (P.52)

- *Service mode *655 tells the detection number and 3 latest temperatures of the thermistor. The cause distinction code of the Call Service 3 and the thermistor temperature is displayed. Maximum 3 latest temperatures are displayed showing the newest on the left. [AABB CCDD EEFF] AA, CC and EE show the cause distinction code and BB, DD and FF show their temperature.

Detection Point

00: CALL SERVICE 3 does not appear.
01: Temperature is below T1(130°C) and 15 seconds after the heater is switched on, thermistor AD value increase is 4 or less.
02: After expiration of 01 time (15 seconds), temperature does not reach T1(130°C) within 21 seconds.
03: After reaching T1(130°C), temperature does not reach stabilizing temperature T2: the secondary stabilizing temperature within 10 seconds.
04: Temperature has fallen below 120°C during T2 temperature control (when the heater is switched off).
05: Temperature has gone over 200°C.
07: A thermistor short (AD value 00h) is detected.

Call Service 4 ----- Rotation of Fan..... Refer to **FAN Motor Section** (P.36)

- Connector isn't inserted firmly, dust is caught in and the fan is broken.

Call service 6 ----- Detection of Charger error..... Refer to the **HVPS (High Voltage Power Supply) Section** (P.50)

- Breaking of charger's wire of developing machine and/or loose connection of High voltage terminals (CHRG, GRID).
- First, replace the Drum unit even so, it doesn't function check the high voltage power supply.

* As for Call Services 1, 2 4 and 6, turn the power OFF then ON to restart.

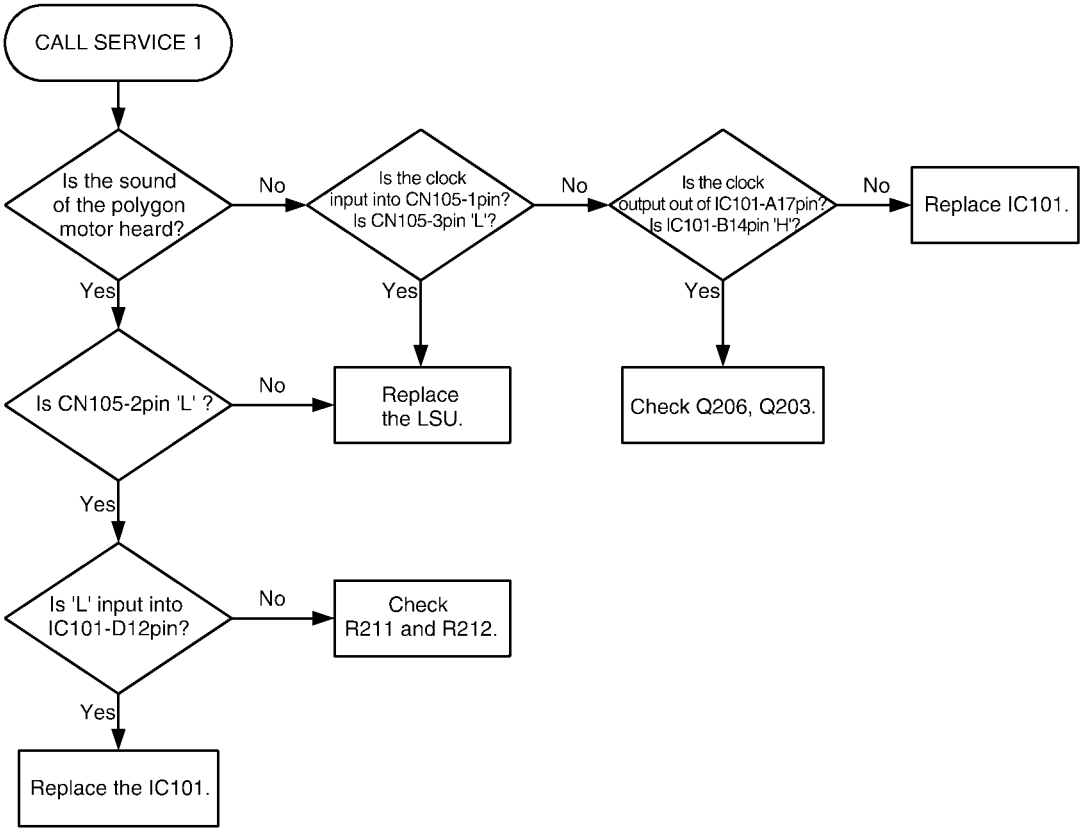
<Note>

Once "CALL SERVICE3" is displayed, the unit does not disappear until the Factory Setup or Service Function #529 is executed. Therefore Service Function #529 should be executed before the confirmation, and #529 should be done after the countermeasure.

12.4.6.1. Call Service 1

"CALL SERVICE 1" means that the polygon motor inside the LSU does not rotate.
The rotation of the polygon motor is detected by IC106-32pin (XREADY).

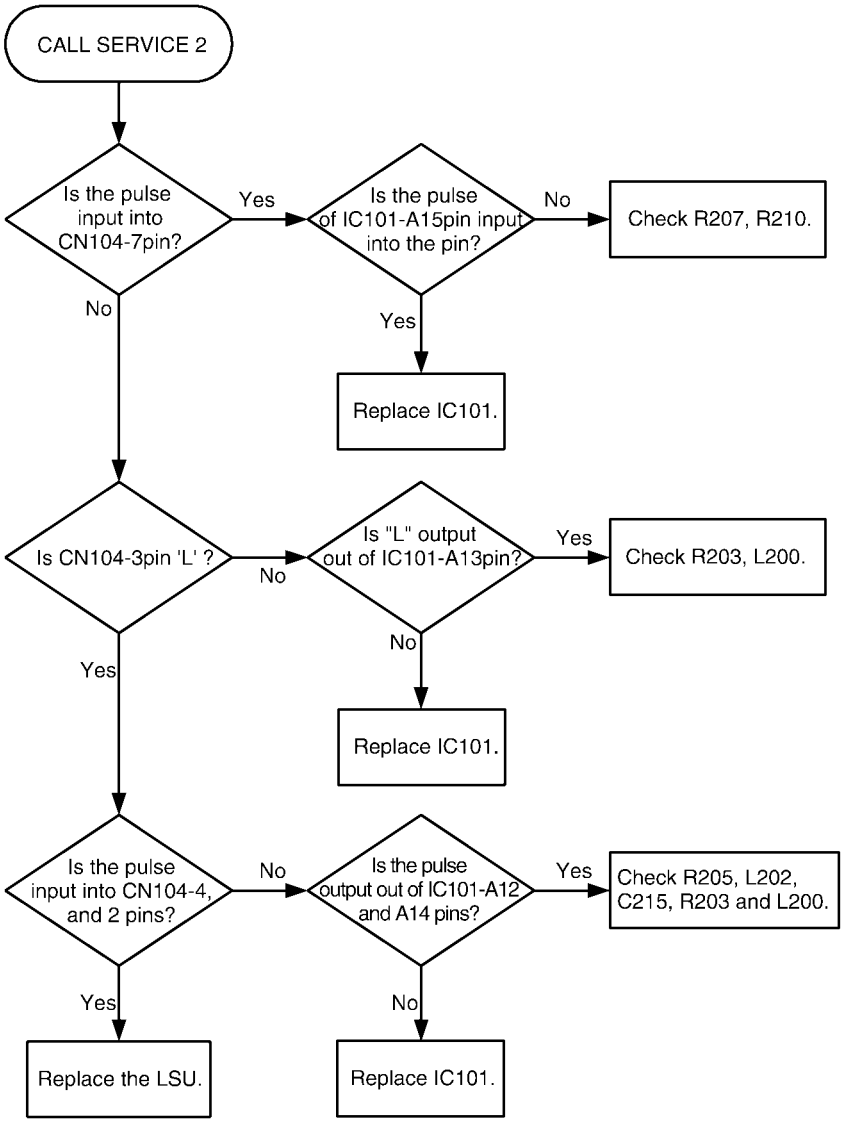
After the LCD indicates "CALL SERVICE 1 ", turn the power OFF/ON.
Then, when the unit starts initial operation, confirm that the rotating sound of the polygon motor is heard before the engine motor starts to run.



12.4.6.2. Call Service 2

"CALL SERVICE 2" means that the synchronous signal out of the LSU cannot be detected.
The synchronous signal out of the LSU is detected by IC101-A15pin. (XHSYNC)

After the LCD indicates "CALL SERVICE 2 ", turn the power OFF/ON, then confirm the waveform when the unit starts initial operation.



Note:

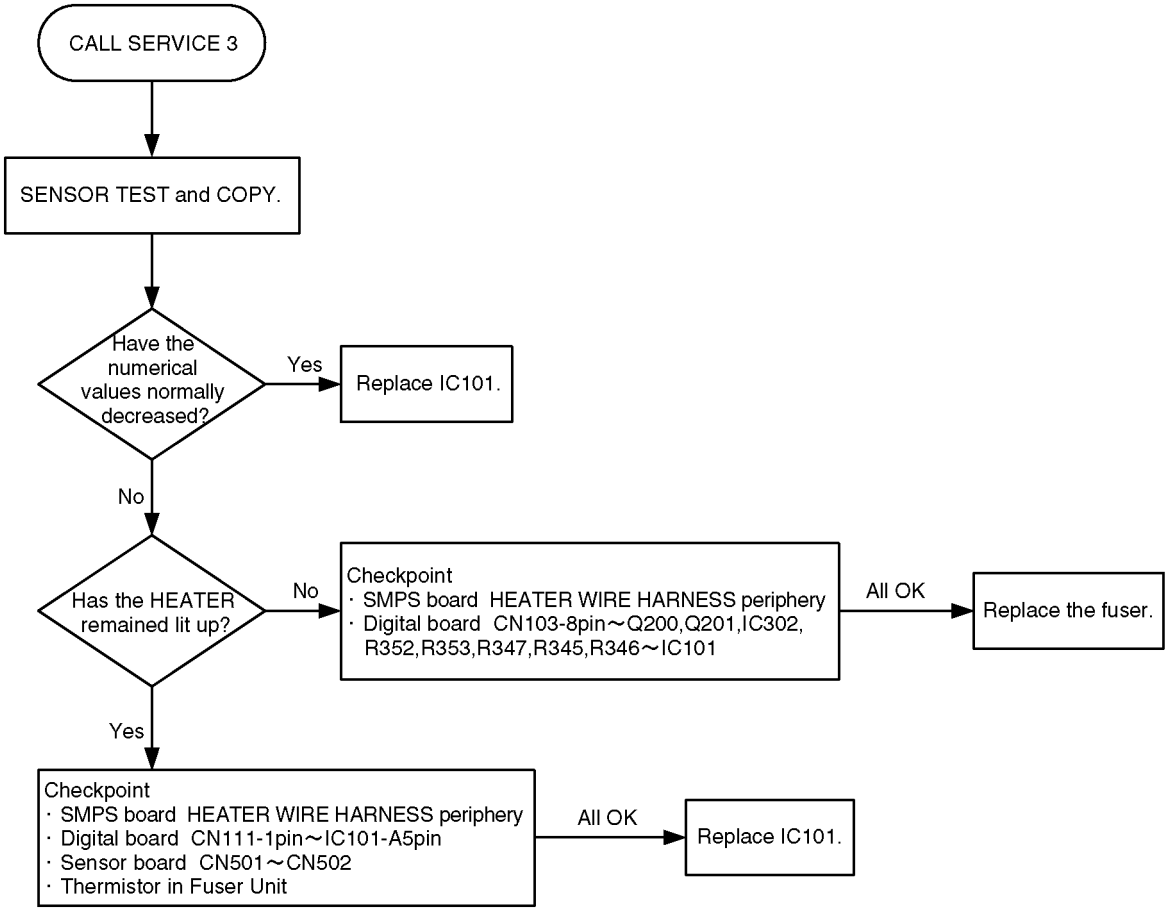
As for the "Pulse" waveform of the above flow chart, see the timing chart.

12.4.6.3. Call Service 3

"CALL SERVICE 3" means that the temperature of the fuser does not rise up to or exceed a constant temperature.
The temperature is monitored with the thermistor inside the fuser and detected with the voltage input into IC 101-A5pin.

*When Call Service 3 is occurred, the cause can be distinguished.
Refer to page 80 for details.

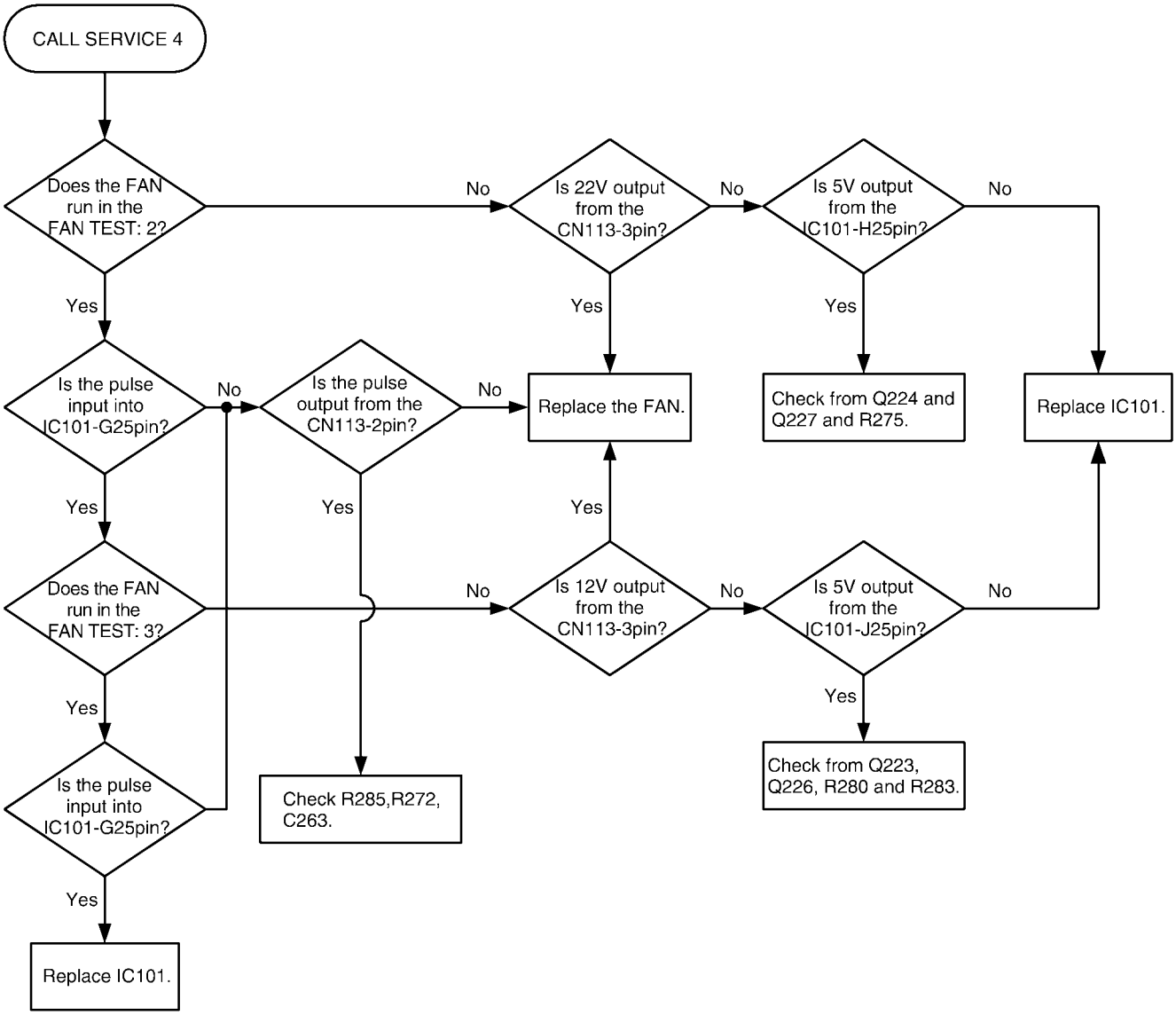
After the LCD indicate "CALL SERVICE 3" , perform the MENU → # → 9000 → ✳529. Then, turn the power OFF/ON.
Perform the SENSOR TEST in service mode.
SENSOR TEST can be performed by pressing MENU → # → 9000 → ✳815.
In this state, perform the copy operation to confirm how the two-digit numbers on the LCD change. In normal times, 'F8(25°C)' is displayed in the waiting state, and '94(160°C)' or its approximate numbers are displayed during printing.



12.4.6.4. Call Service 4

"CALL SERVICE 4" means that the FAN does not run or the running of the FAN cannot be detected normally.
The running of the FAN is detected by IC 101-G25pin. "CALL SERVICE 4" is displayed when it detects NG five times continuously.
After repairing, copy three times. If “CALL SERVICE 4 “ is displayed, check again.

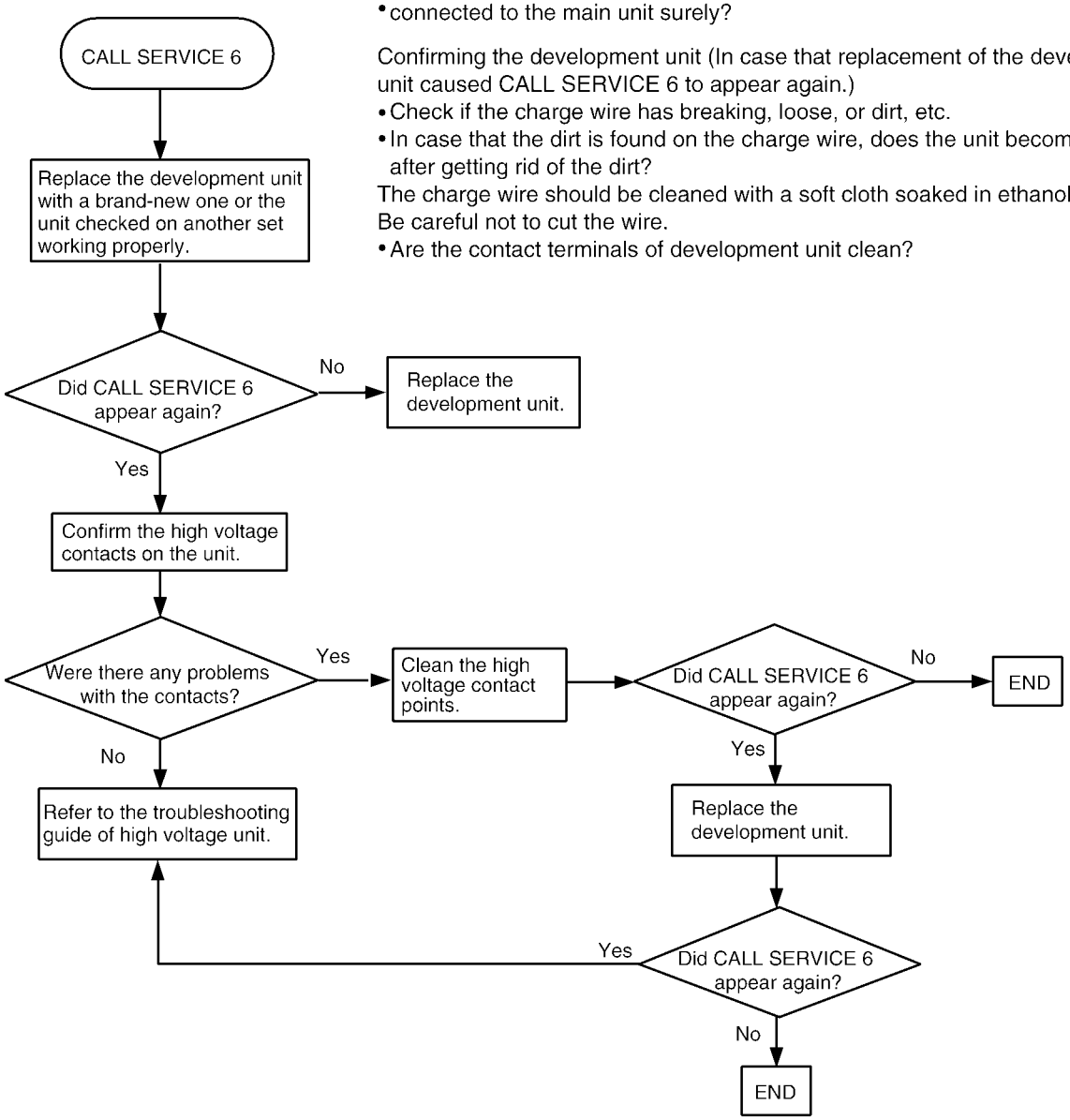
After the LCD indicates "CALL SERVICE 4 " , turn the power OFF/ON.
Then, perform the FAN TEST in service mode.
This can be performed by pressing MENU→#→9000→✳677.
1: OFF (Default)
2: ON (High Speed)
3: ON (Low Speed)



12.4.6.5. Call Service 6

"CALL SERVICE 6" indicates that abnormal charge voltage is output from the high voltage unit.

CALL SERVICE 6 appears when the charge voltage turns into abnormal voltage caused by charge wire breaking, short circuit, defect, and contact failure between development unit and main unit through charge and GRID terminals. When the charge voltage becomes abnormal, the high voltage unit shuts off the charge output, and then trouble detection signal is output from pin 8 of CN1.
When the digital unit detects the trouble detection signal, the unit displays CALL SERVICE 6.
CALL SERVICE 6 is canceled by turning the power OFF then ON. (When the problem is not solved, CALL SERVICE 6 will be displayed again.)



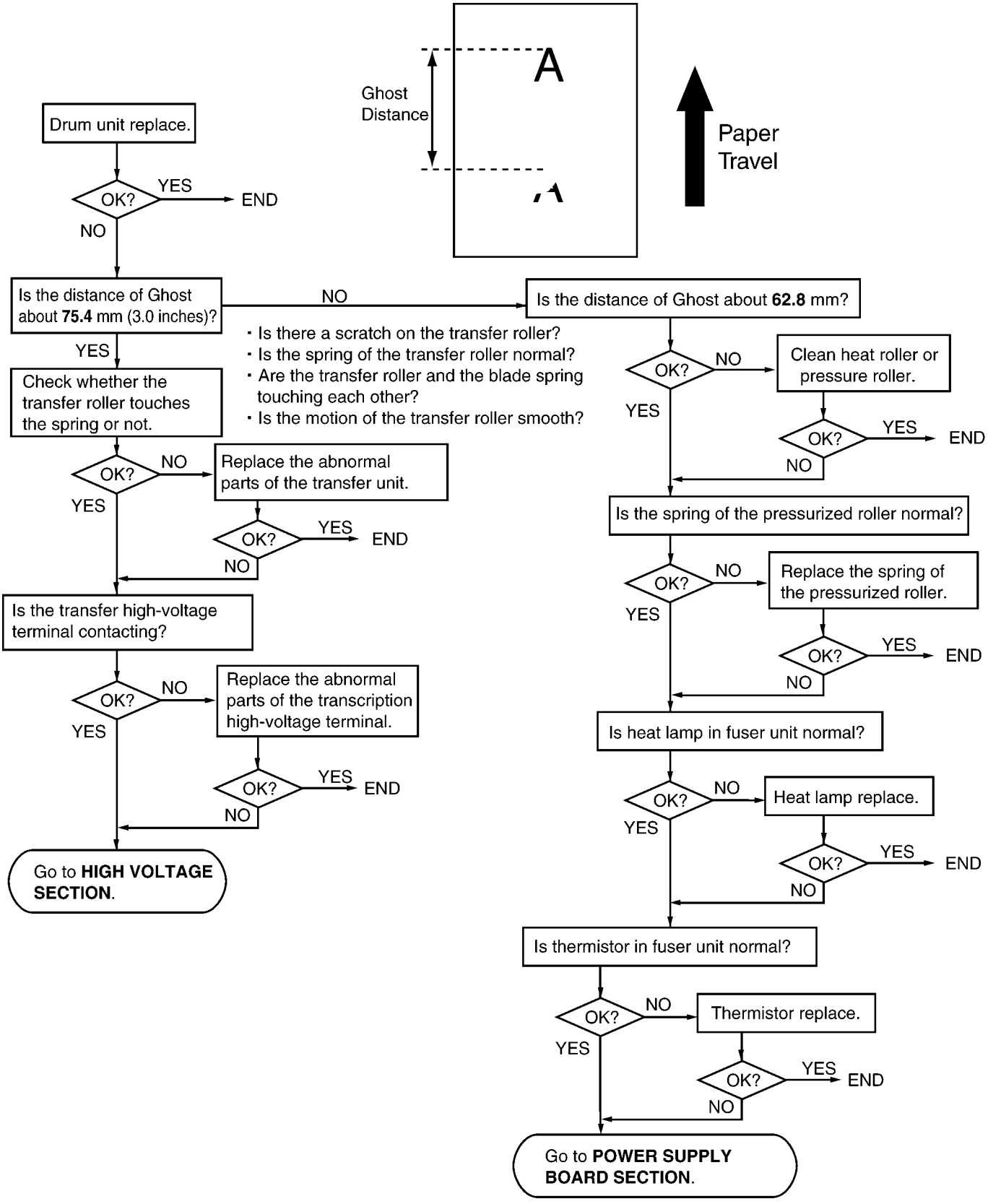
Confirming the contact points of the main unit
- Check the dirt on the high voltage terminals.
- Check if the spring pressure of each high voltage terminal is strong enough. (Isn ft it distorted or bent?)
- When a development unit is installed on the main unit, are the terminals
- connected to the main unit surely?

Confirming the development unit (In case that replacement of the development unit caused CALL SERVICE 6 to appear again.)
- Check if the charge wire has breaking, loose, or dirt, etc.
- In case that the dirt is found on the charge wire, does the unit become normal after getting rid of the dirt?

The charge wire should be cleaned with a soft cloth soaked in ethanol.
Be careful not to cut the wire.
- Are the contact terminals of development unit clean?

12.4.7. Print

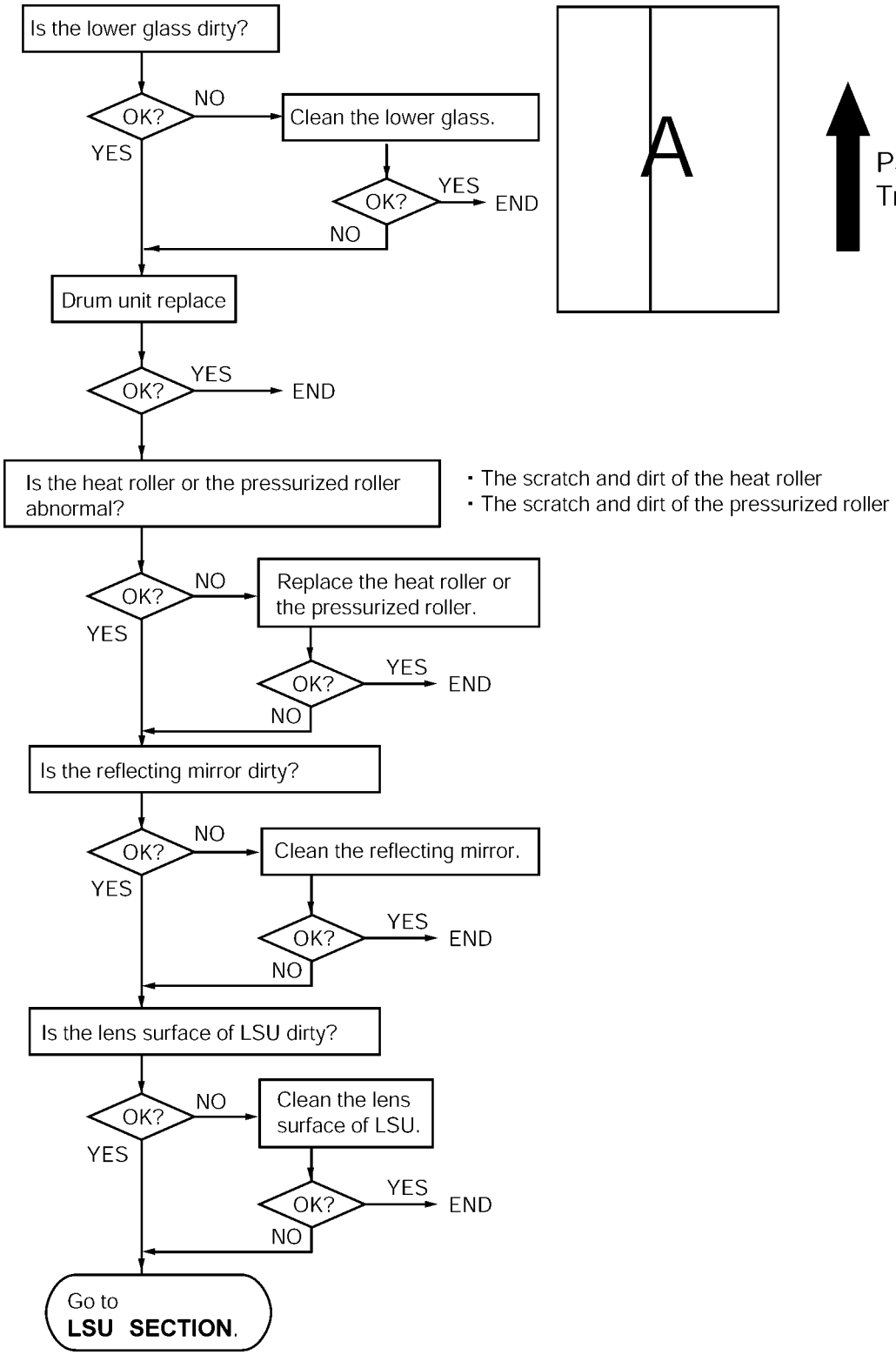
12.4.7.1. Ghost Image



CROSS REFERENCE:

High Voltage Section(P.119)
Power Supply Board Section(P.124)

12.4.7.2. Dark or White Vertical Line



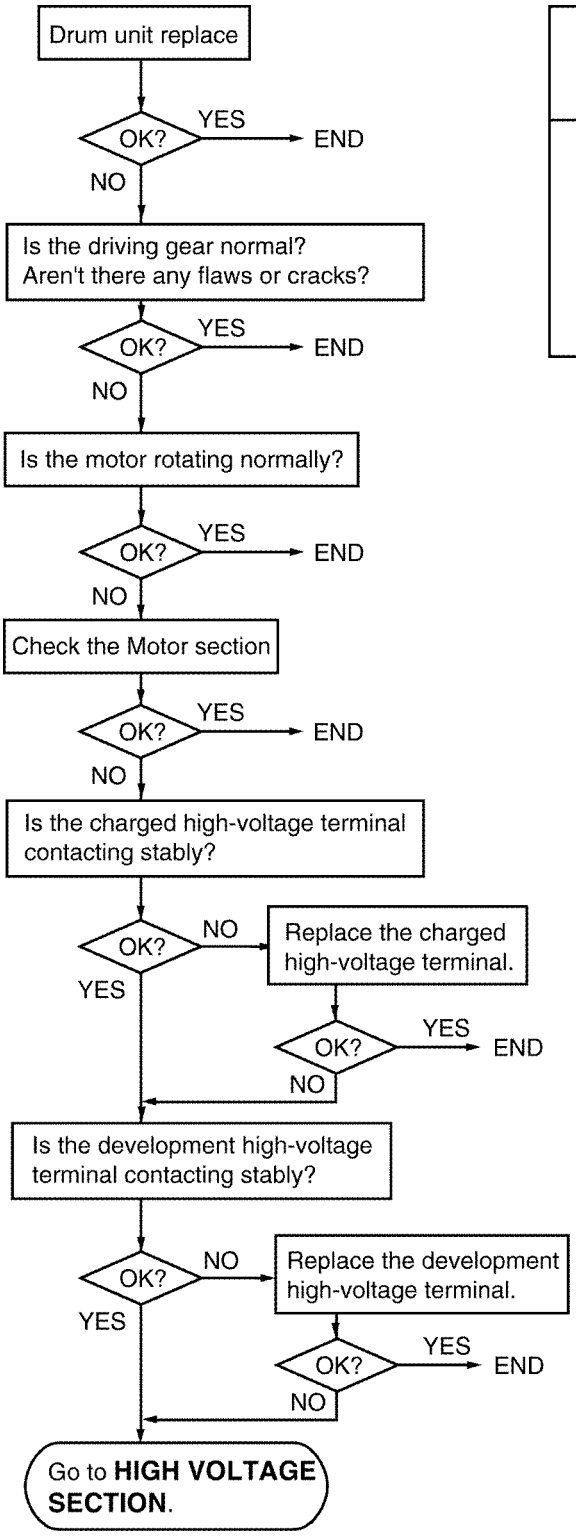
Note:

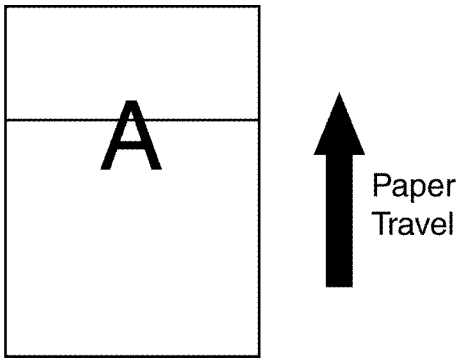
When wiping the lower glass, reflecting mirror and LSU lens, use a dry and soft cloth.

CROSS REFERENCE:

LSU Section (P.115)

12.4.7.3. Dark or White Horizontal Line

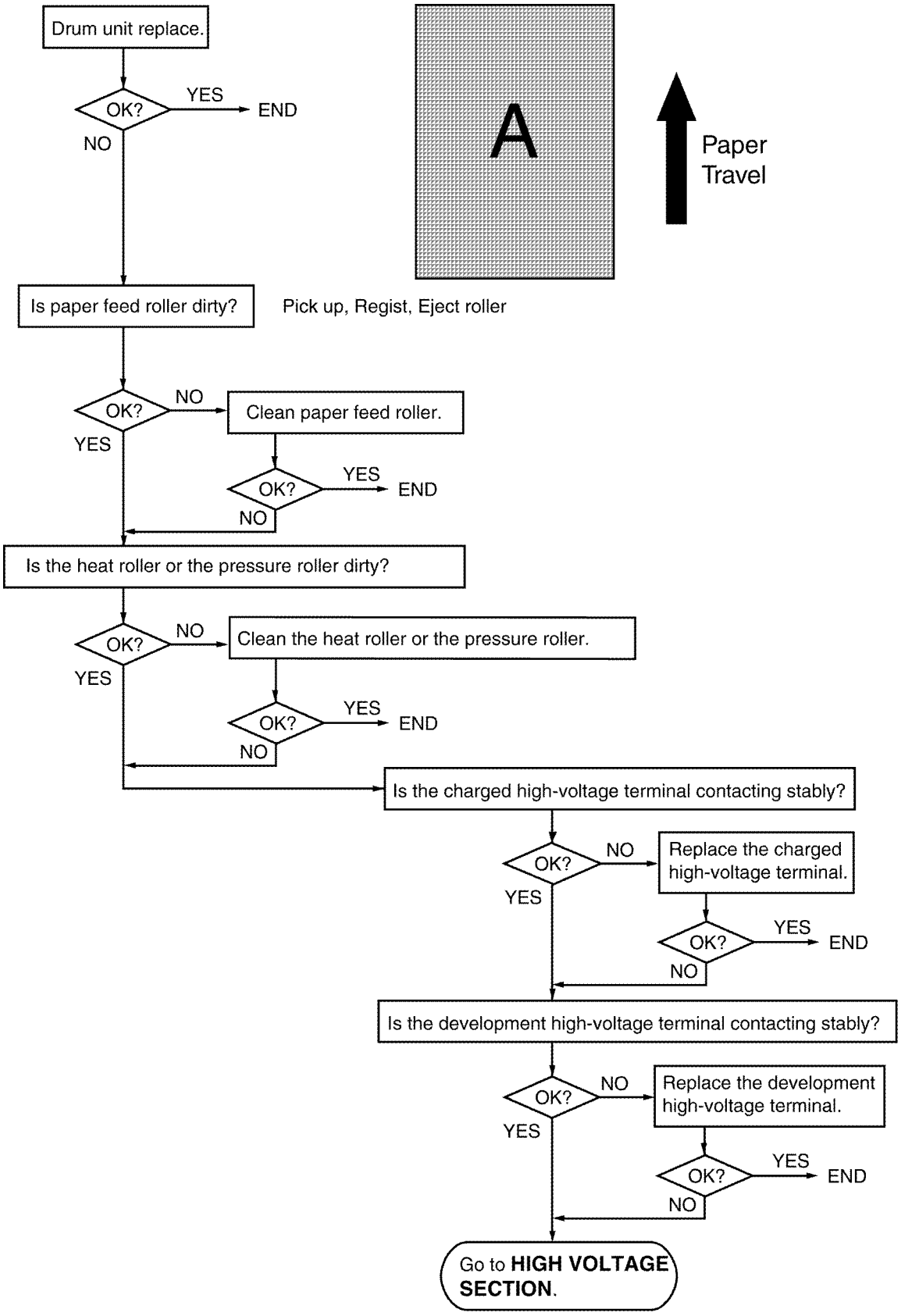




・It is necessary to describe the information about the lines that cannot be troubleshooted in such as halftone.
・When there is the information about the troubleshooted horizontal line, please add the description of it.

CROSS REFERENCE:
High Voltage Section (P.119)

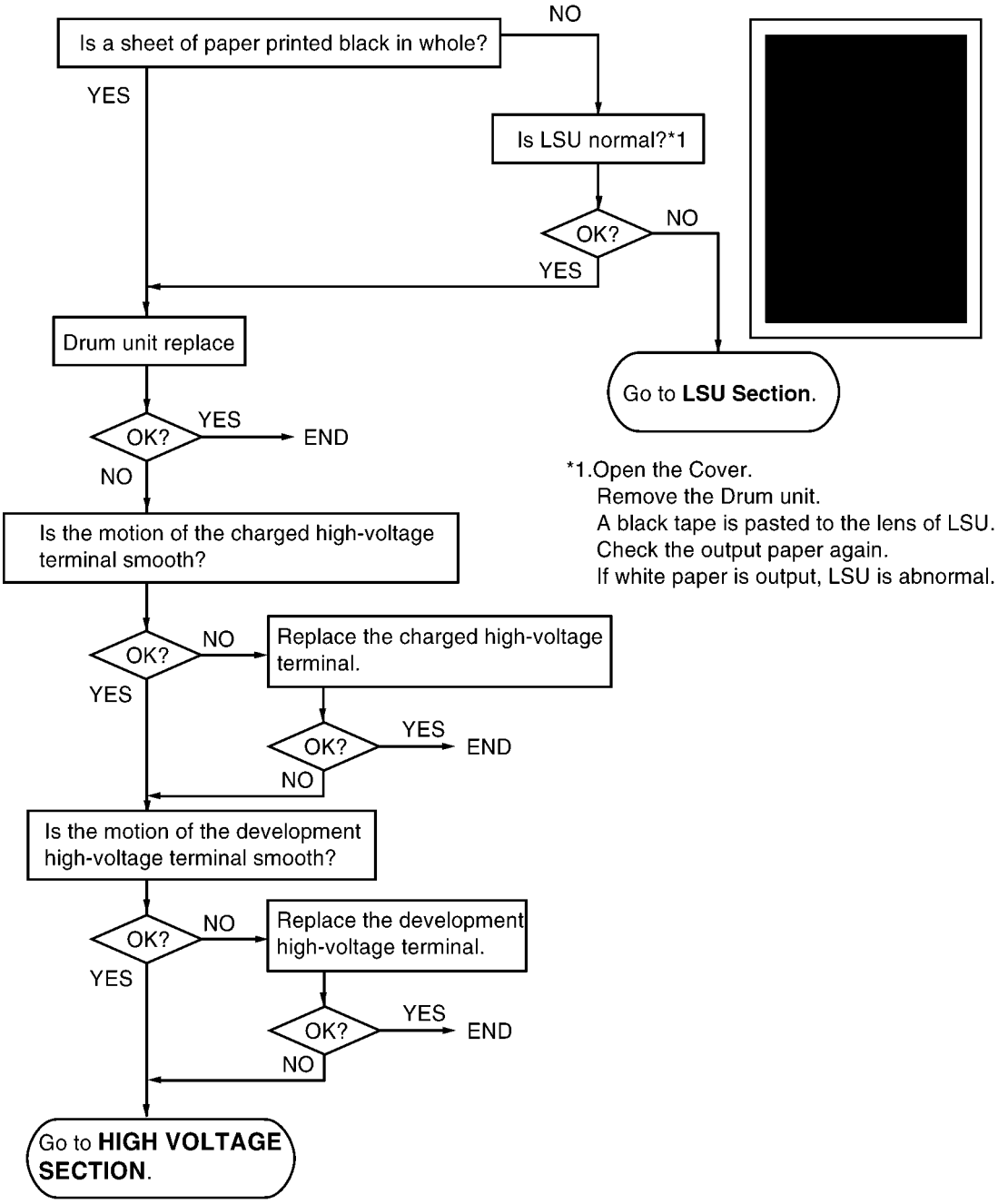
12.4.7.4. Dirty or Hulk Darkness Black Ground



CROSS REFERENCE:

High Voltage Section (P.119)

12.4.7.5. Black Print

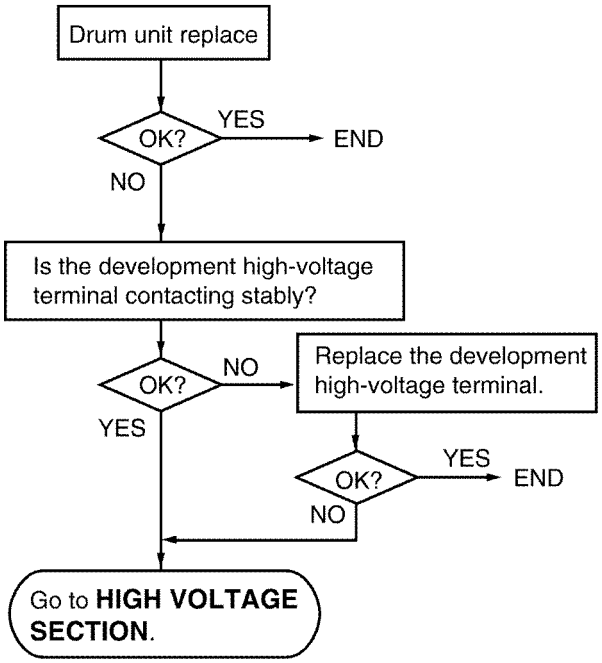


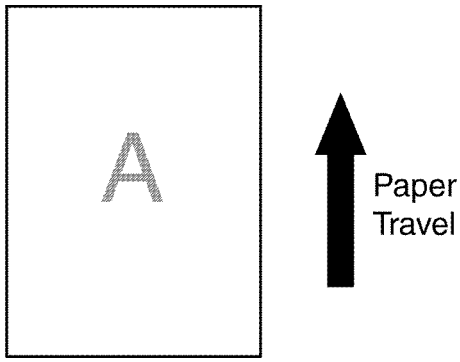
*1.Open the Cover.
Remove the Drum unit.
A black tape is pasted to the lens of LSU.
Check the output paper again.
If white paper is output, LSU is abnormal.

CROSS REFERENCE:

High Voltage Section (P.119)
LSU Section (P.115)

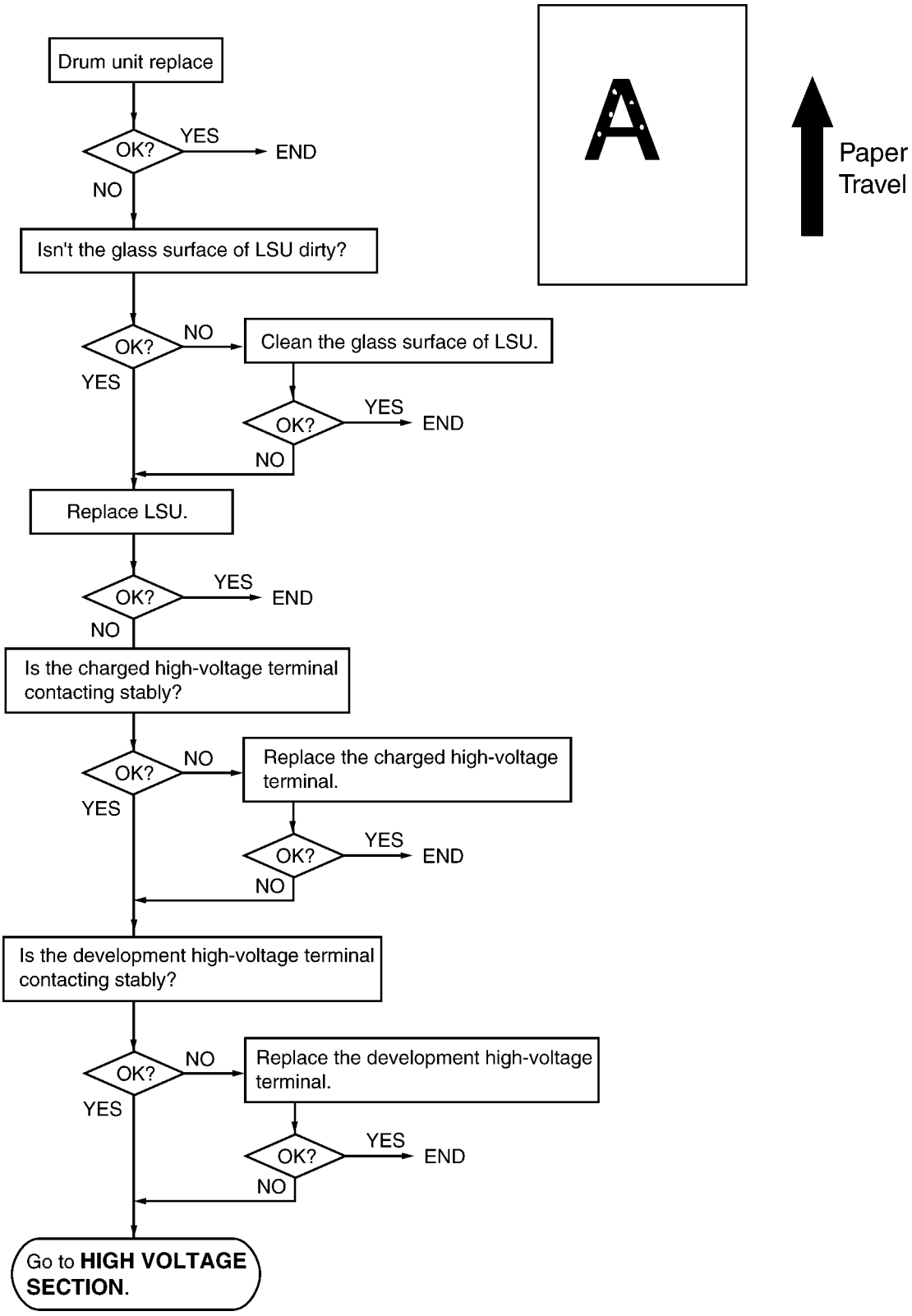
12.4.7.6. Light Print





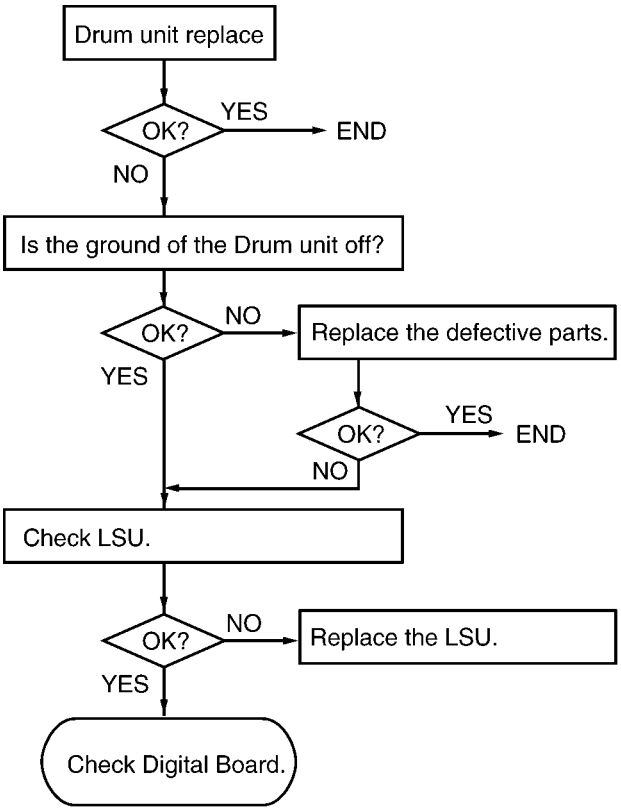
CROSS REFERENCE:
High Voltage Section (P.119)

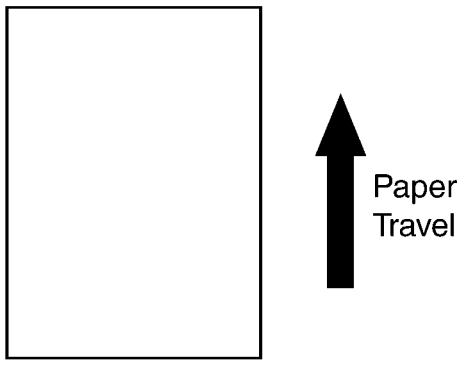
12.4.7.7. Black Density is Light or Uneven



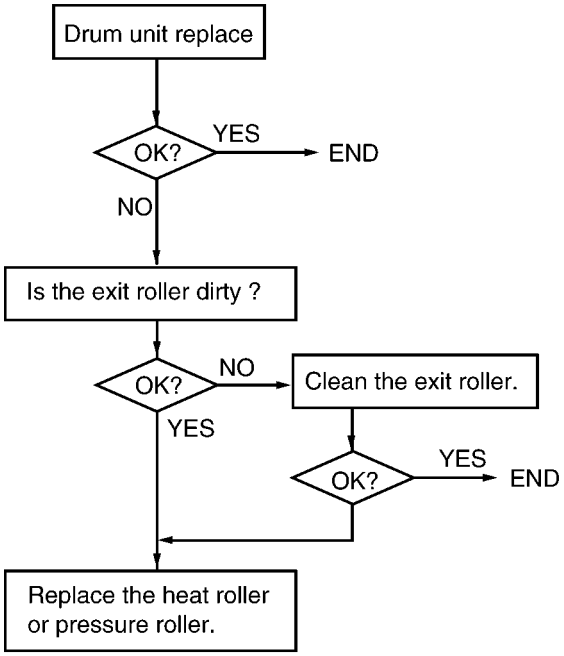
CROSS REFERENCE:
High Voltage Section (P.119)

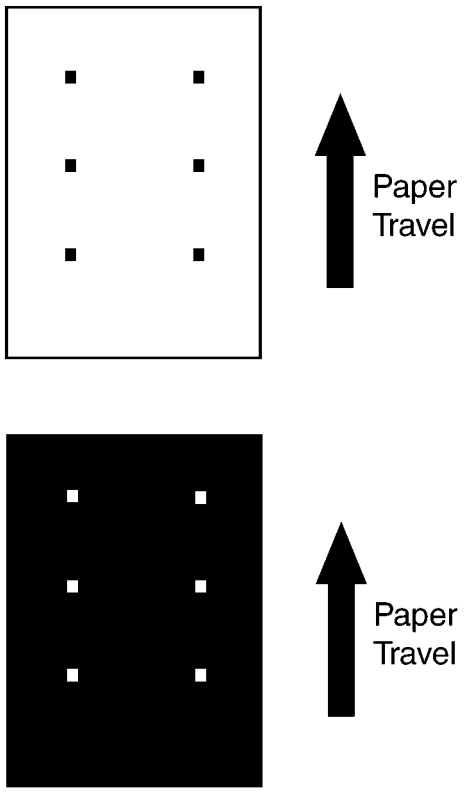
12.4.7.8. Blank Print





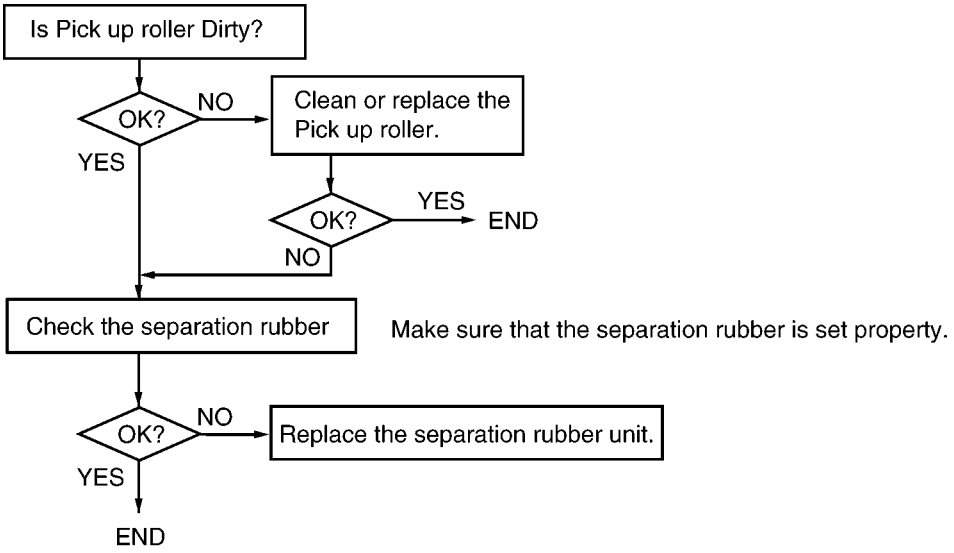
12.4.7.9. Black or White Point



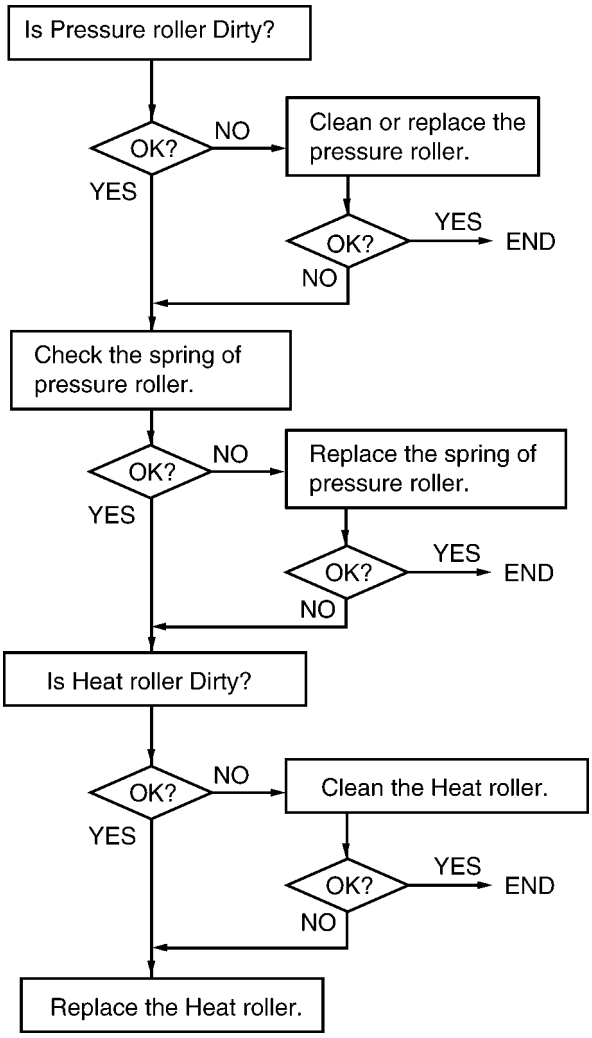


12.4.8. Recording Paper Feed

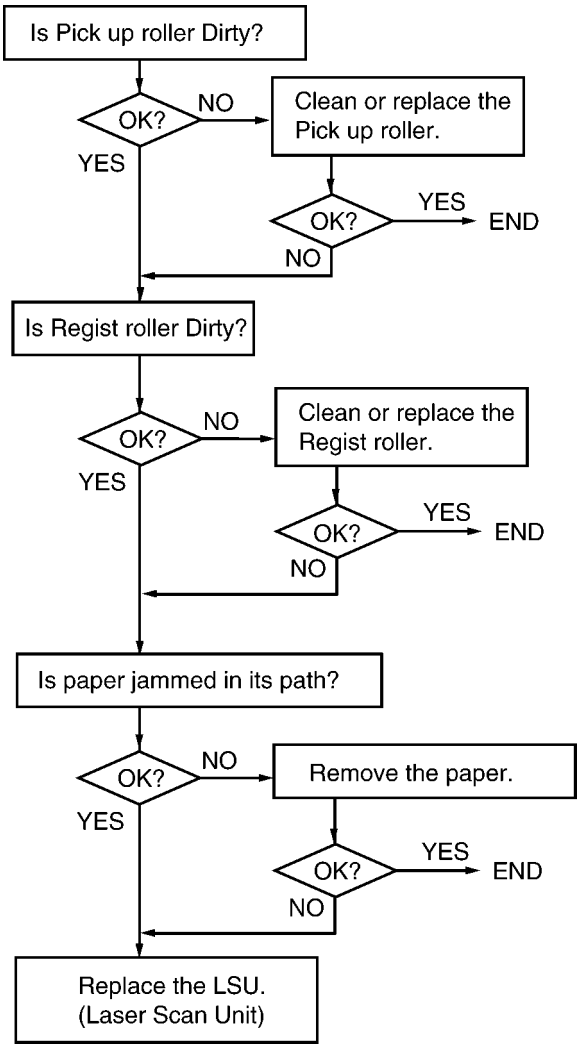
12.4.8.1. Multiple Feed



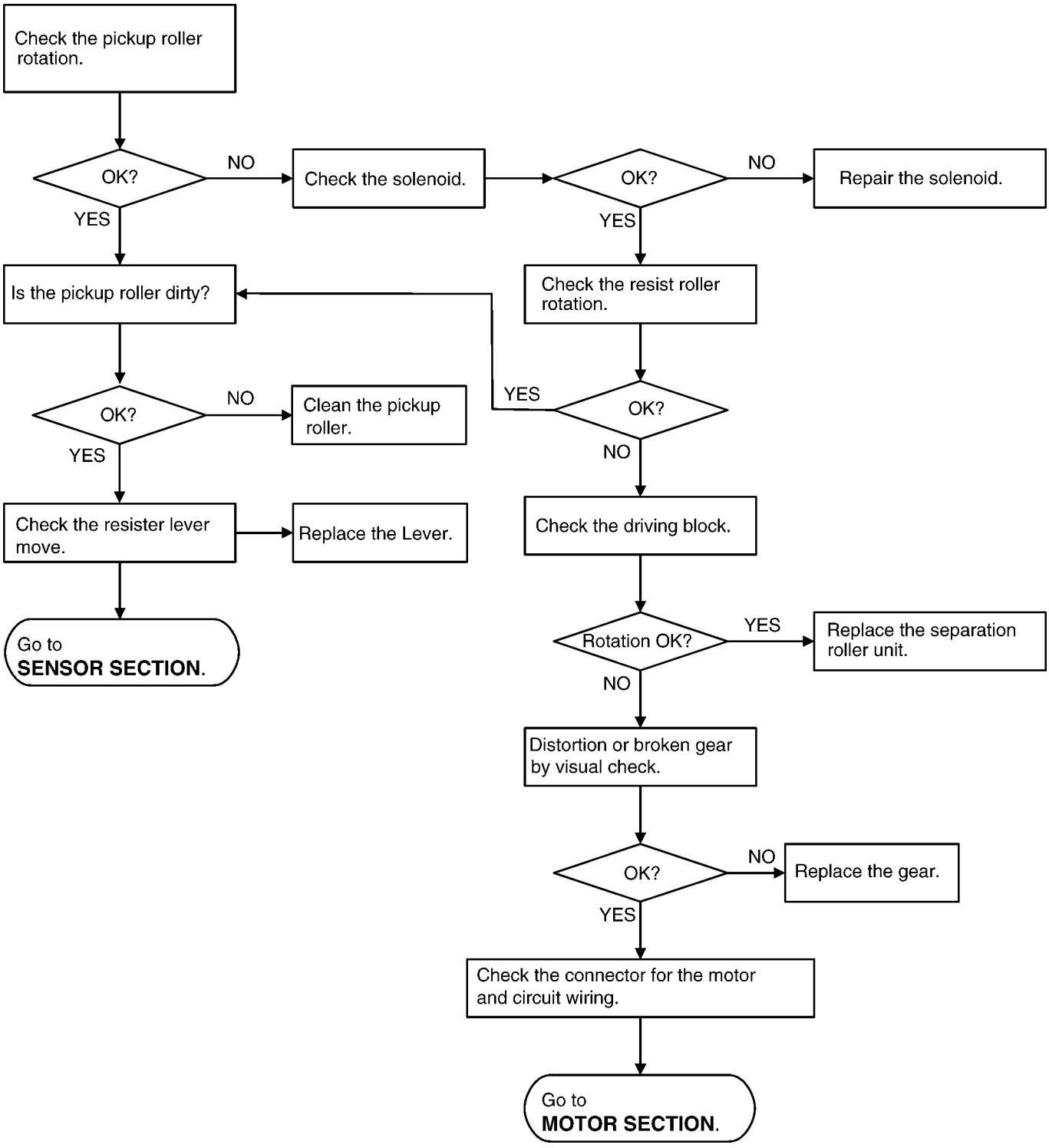
12.4.8.2. The Recording Paper is Waved or Wrinkled



12.4.8.3. Skew


Is Pick up roller Dirty?
OK?
NO
Clean or replace the Pick up roller.
YES
OK?
YES
END
NO
Is Regist roller Dirty?
OK?
NO
Clean or replace the Regist roller.
YES
OK?
YES
END
NO
Is paper jammed in its path?
OK?
NO
Remove the paper.
YES
OK?
YES
END
NO
Replace the LSU. (Laser Scan Unit)

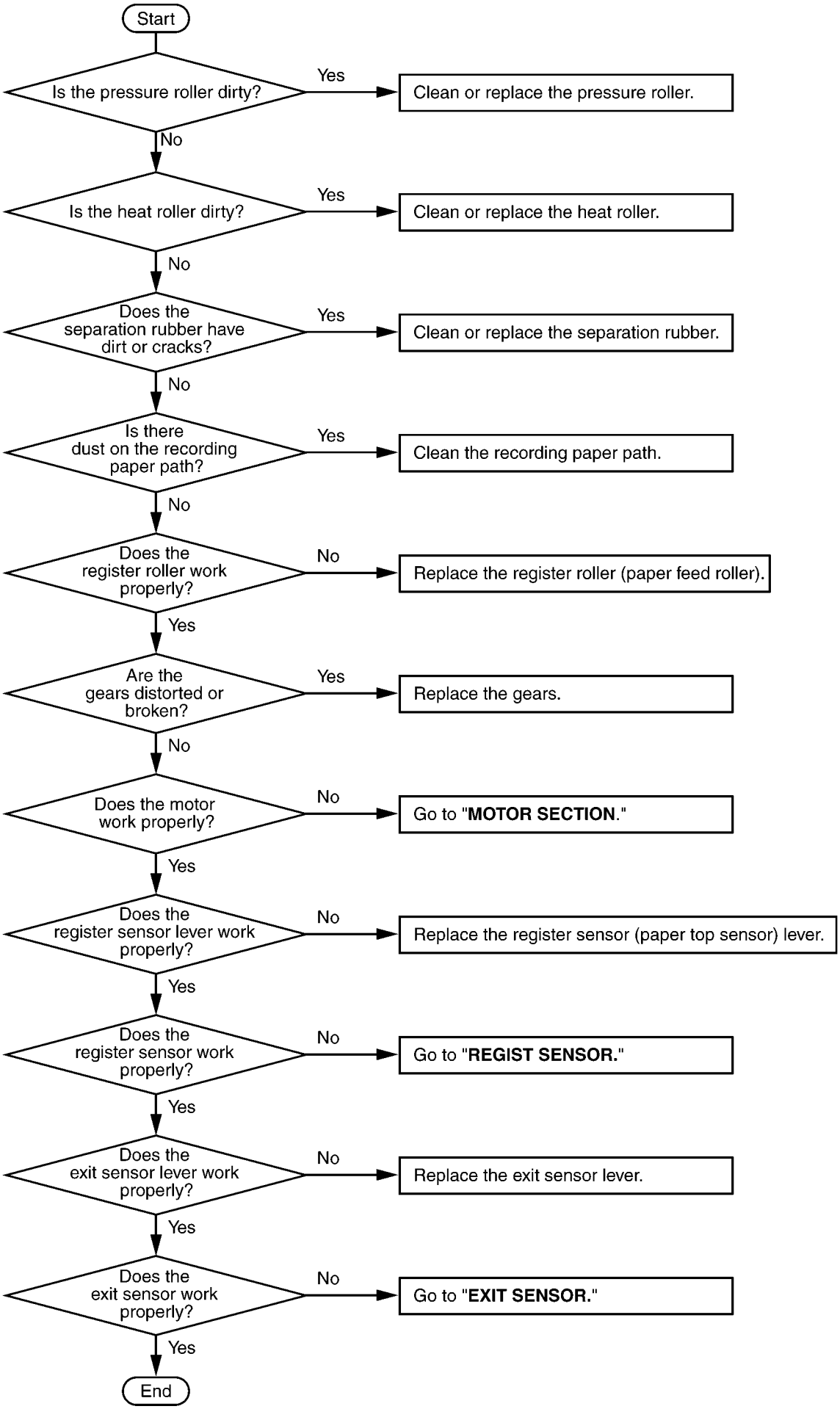
12.4.8.4. The Recording Paper Does Not Feed



CROSS REFERENCE:

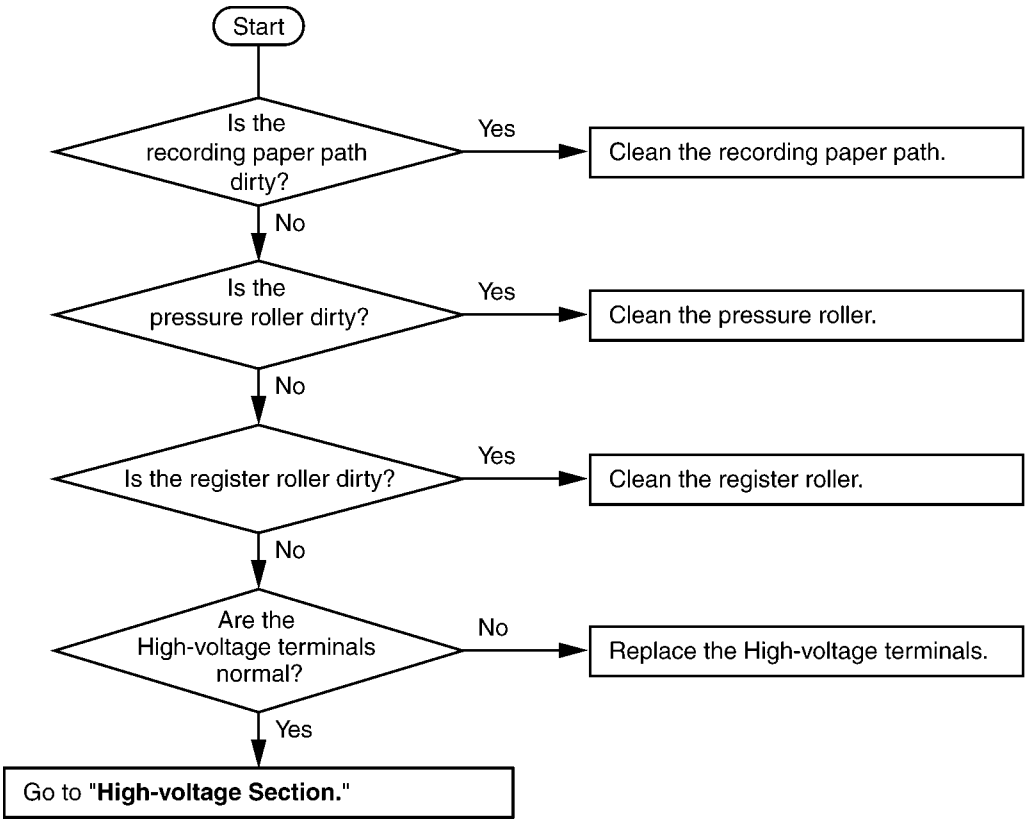
Sensor Section (P.111)
Motor Section (P.113)

12.4.8.5. The Recording Paper Jam



CROSS REFERENCE:
Paper Exit Sensor..... "PAPER JAMMED" (P.44**)**
FAN Motor Section (P.36**)**
Regist Sensor (P.43**)**
When the recording paper jam is occurred, the service mode *630 distinguishes the cause.
0:No Paper Jam
1:Failed pick up
2:The paper top sensor is not turned OFF although the fixed time had passed since the sensor was turned ON.
3:The paper eject sensor is not turned ON although the fixed time had passed since the paper top sensor was turned ON.
4:The paper eject sensor is not turned OFF although the fixed time had passed since it was turned ON.
5:The register sensor (paper top sensor) or paper exit sensor was turned ON before the motor started to rotate.
6:The register sensor (paper top sensor) chattered.
7:The paper exit sensor chattered.

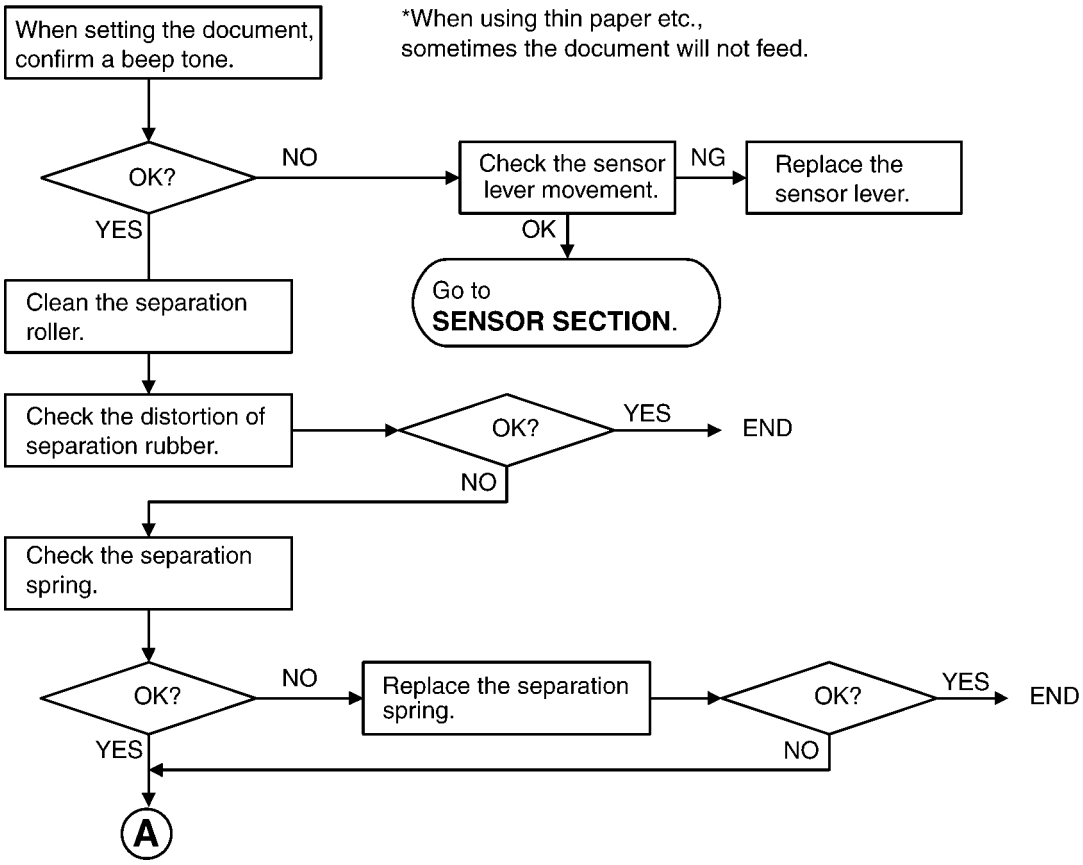
12.4.8.6. Back Side of The Recording Paper is Dirty



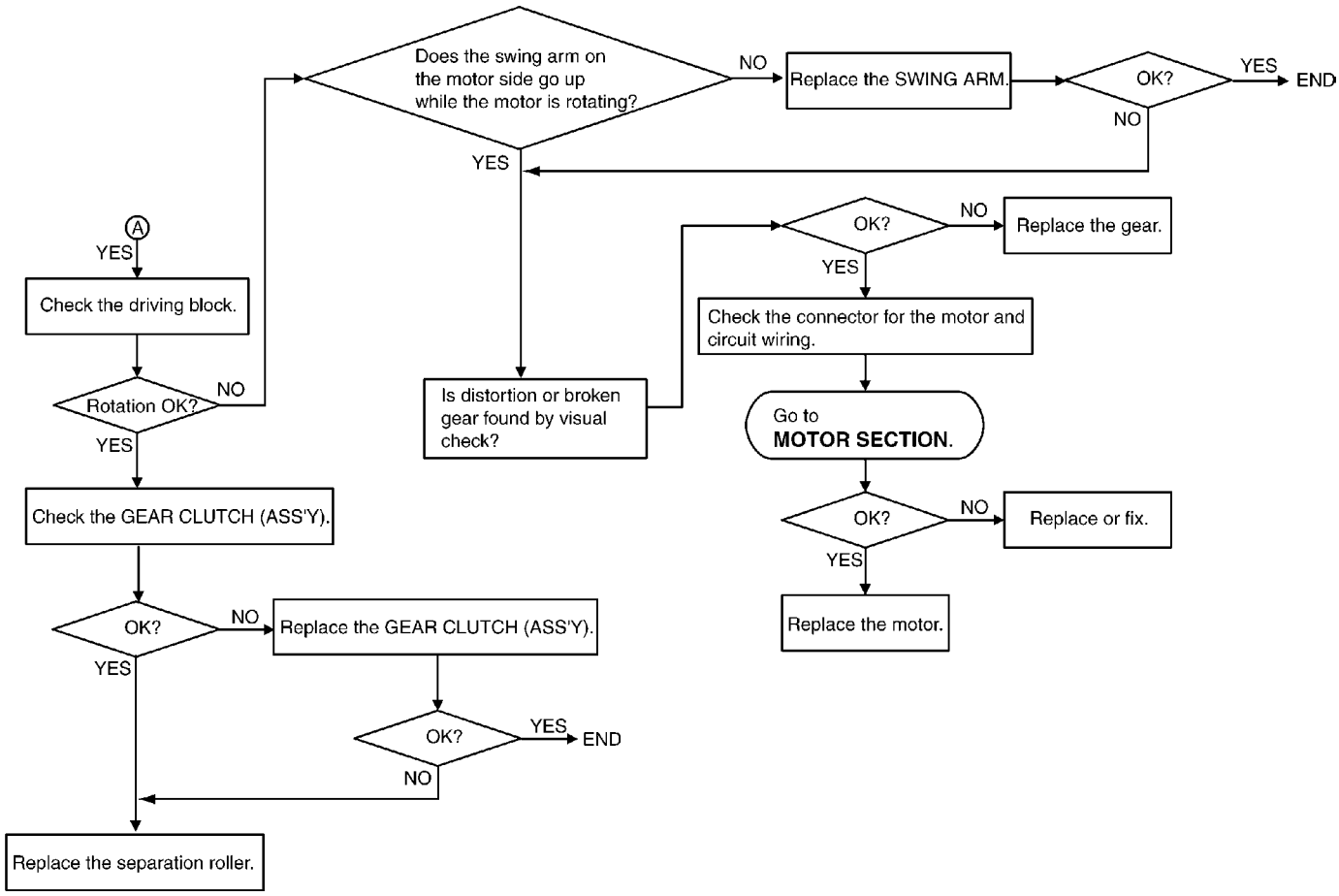
CROSS REFERENCE:
High Voltage Section (P.119)

12.4.9. ADF (Auto Document Feed) Section

12.4.9.1. No Document Feed, Document Jam and Multiple Document Feed



CROSS REFERENCE:
Sensor Section (P.111)



Depending on the circumstances, change the roller, one-way spring gear, etc., as well as the other rollers or parts.

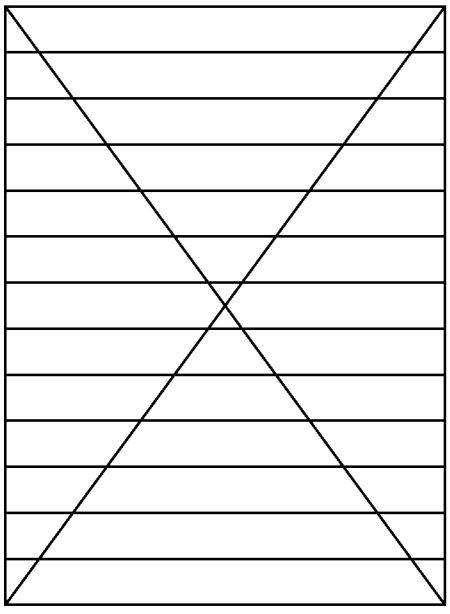


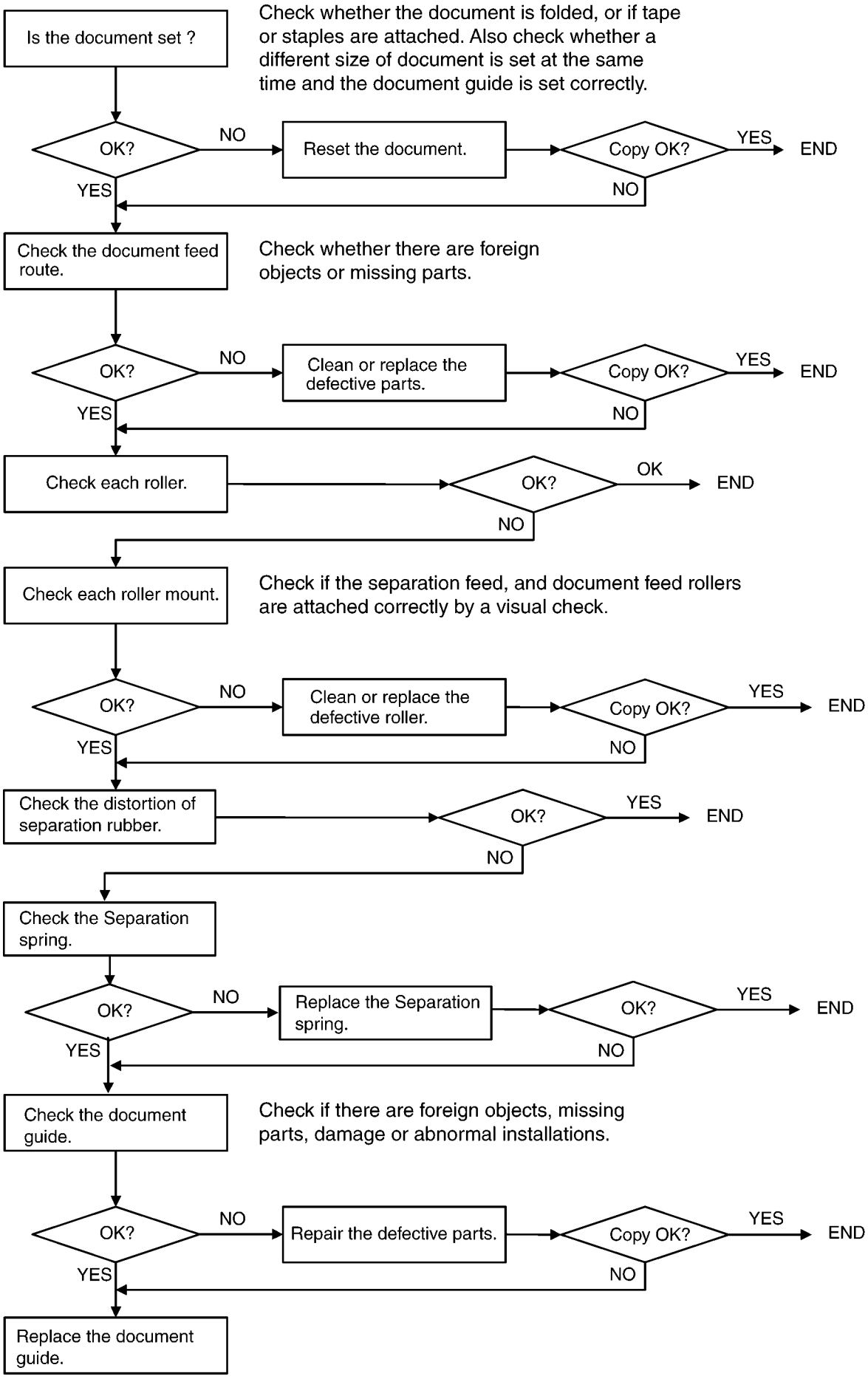
Fig. b

When confirming if the characters are extended or distorted on, if the feed problem occurs, use this test chart. (Fig b)

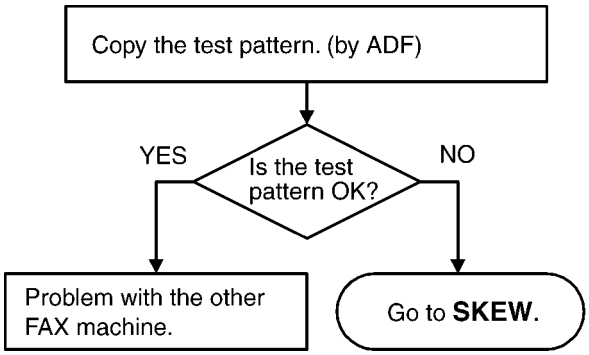
CROSS REFERENCE:

Motor Section (P.113)

12.4.9.2. Skew (ADF)

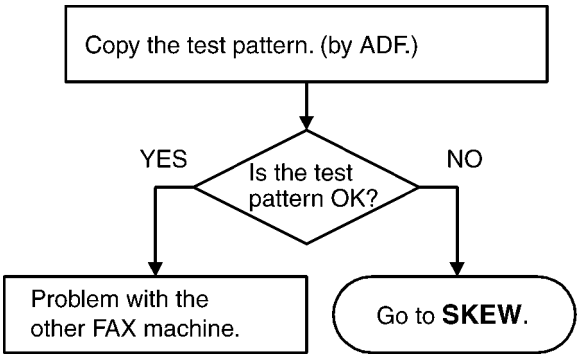


12.4.9.3. The Sent Fax Data is Skewed



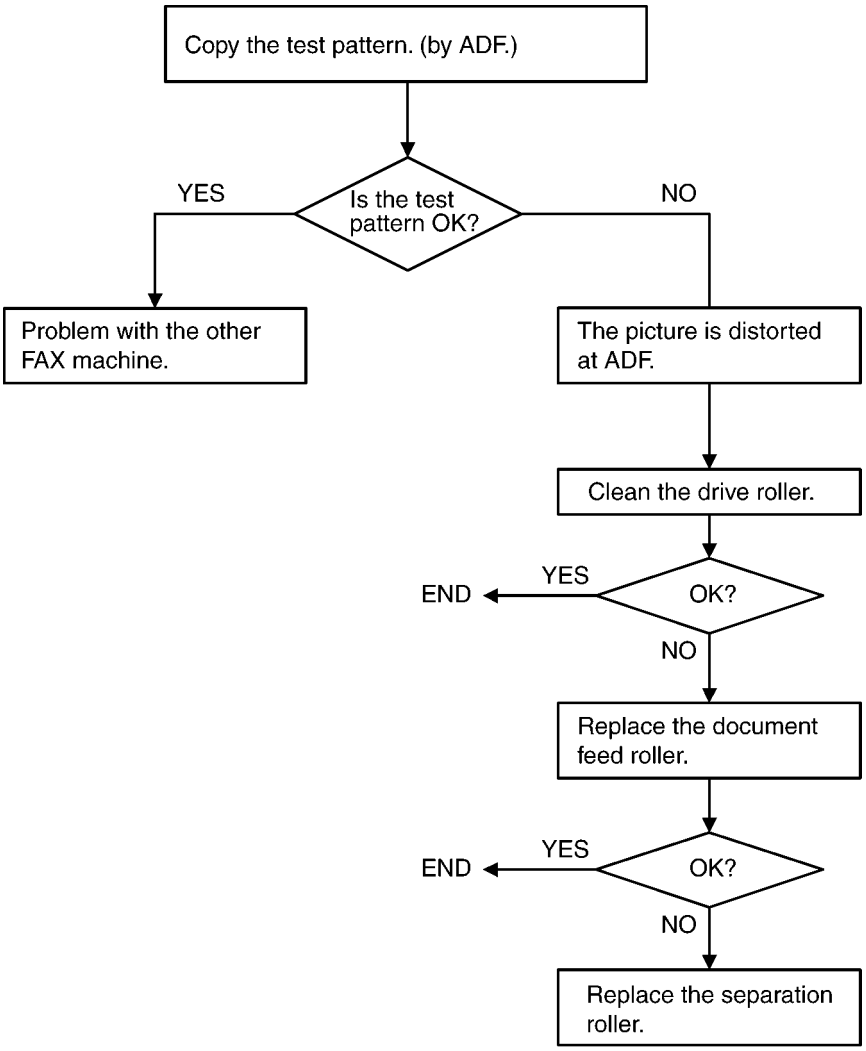
CROSS REFERENCE:
Skew (ADF) (P.158)

12.4.9.4. The Received Fax Data is Skewed

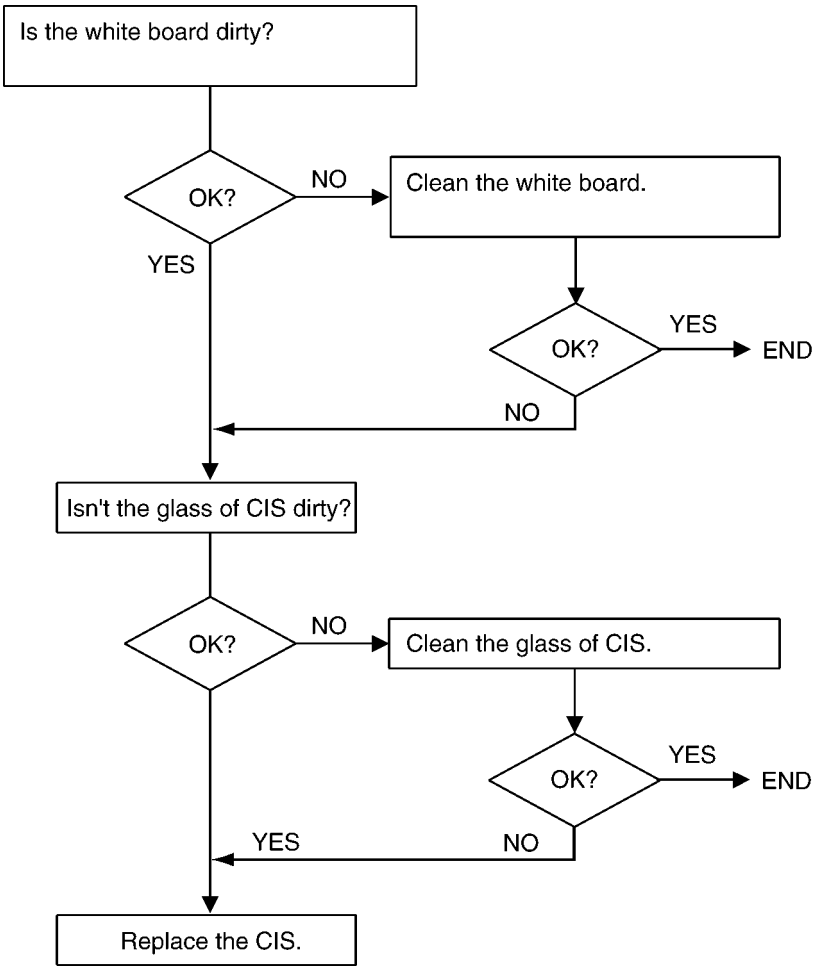


CROSS REFERENCE:
Skew (P.152)

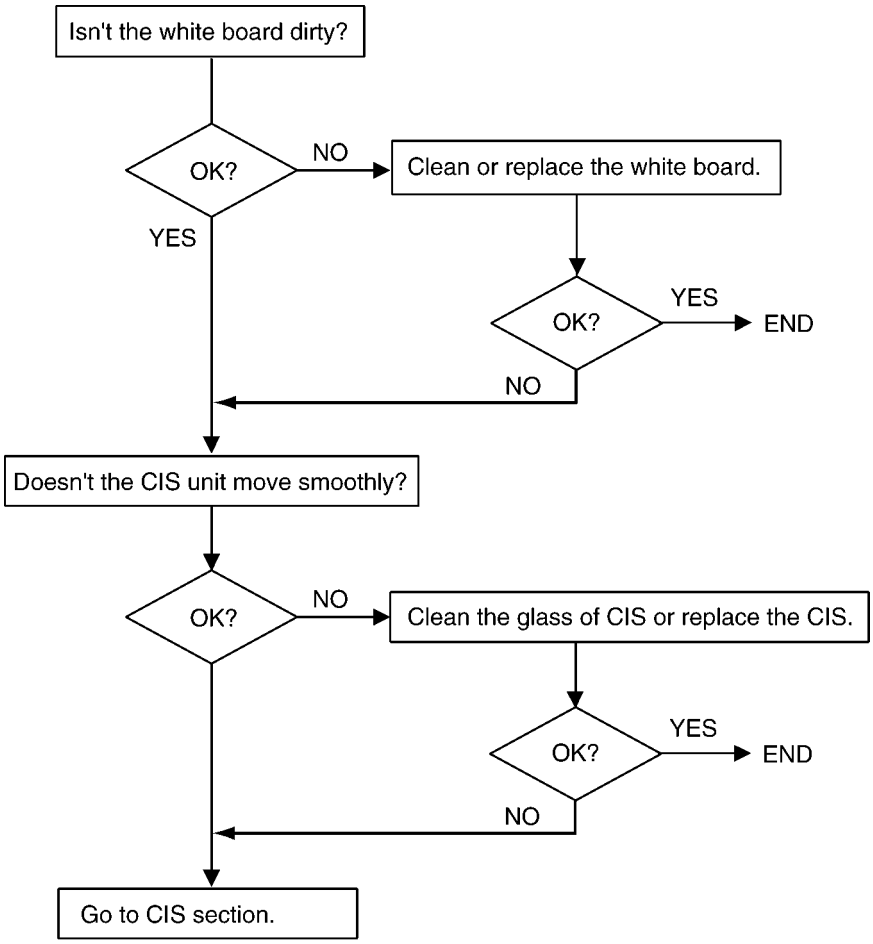
12.4.9.5. The Received or Copied Data is Expanded



12.4.9.6. Black or White Vertical Line is Copied



12.4.9.7. An Abnormal Image is Copied



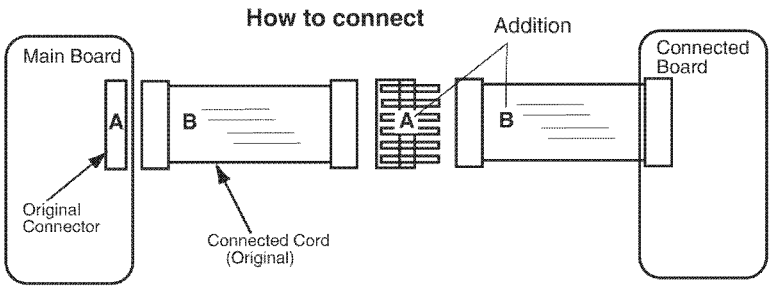
CROSS REFERENCE:

CIS (Contact Image Sensor) Section (P.116)

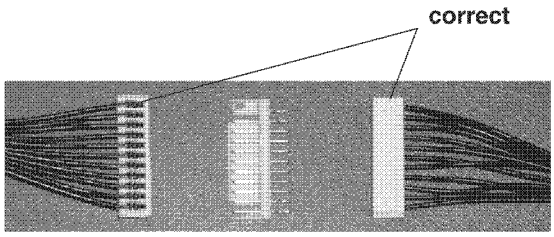
13 Service Fixture & Tools

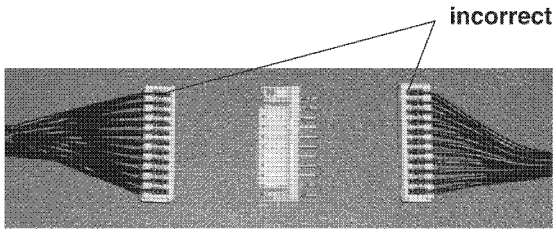
How to extend cords

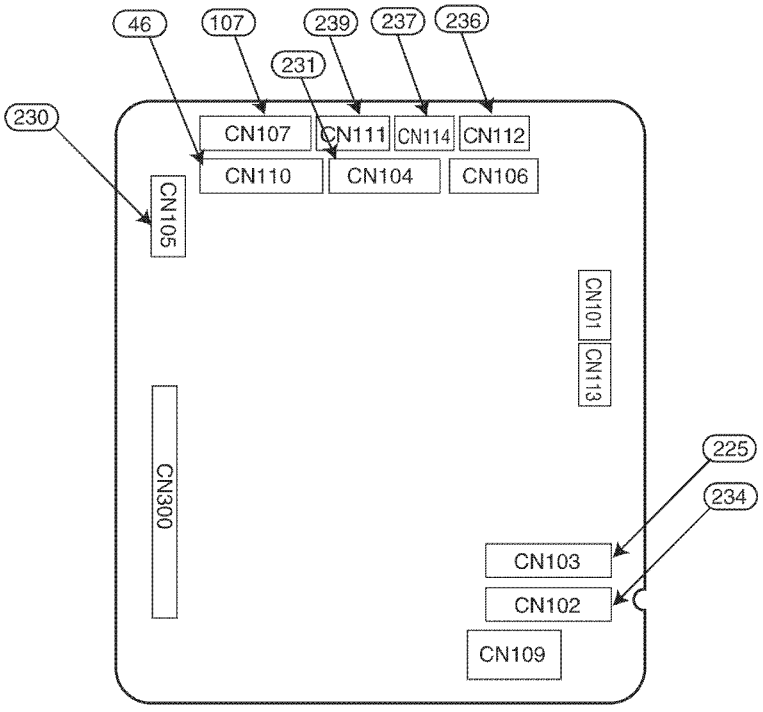
When extending cords, you need 2 pairs of A,B (A=connector, B=cord)
(One pair is connected to the Main board.)
If you do not have 2 pairs, order the necessary parts.



NOTE
Be sure if the direction of the connectors are correct.



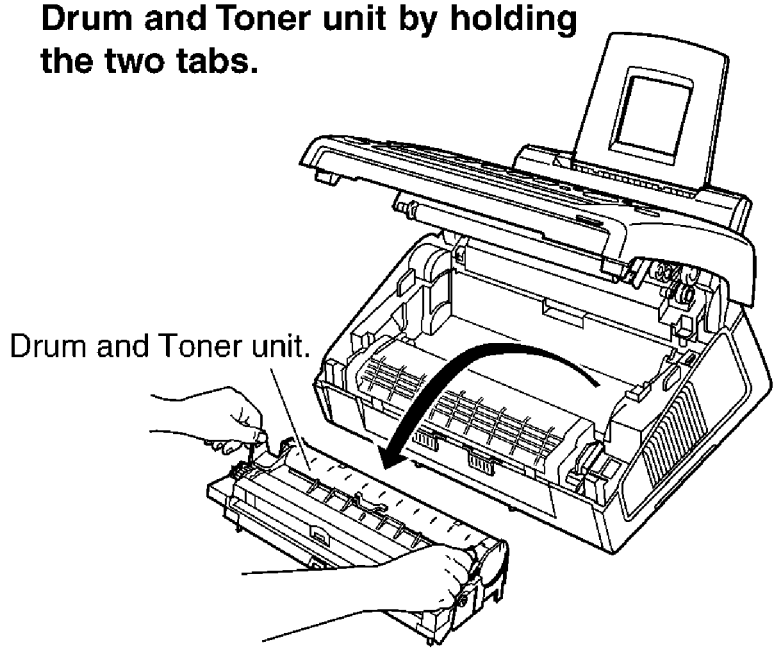




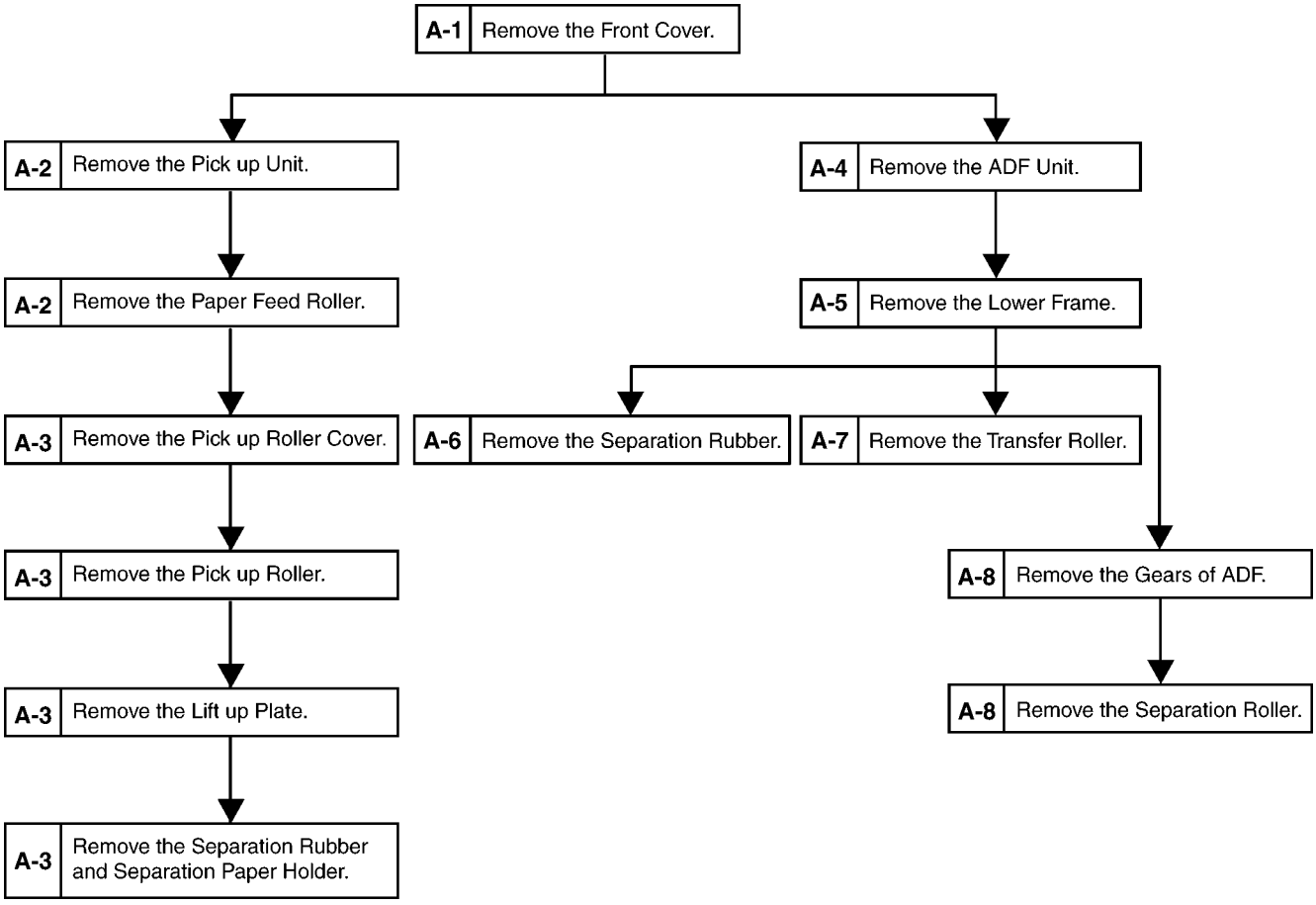
( ) means the Reference No. of the Replacement Parts List.

14 Disassembly and Assembly Instructions

Before disassembling, remove the Drum and Toner unit by holding the two tabs.



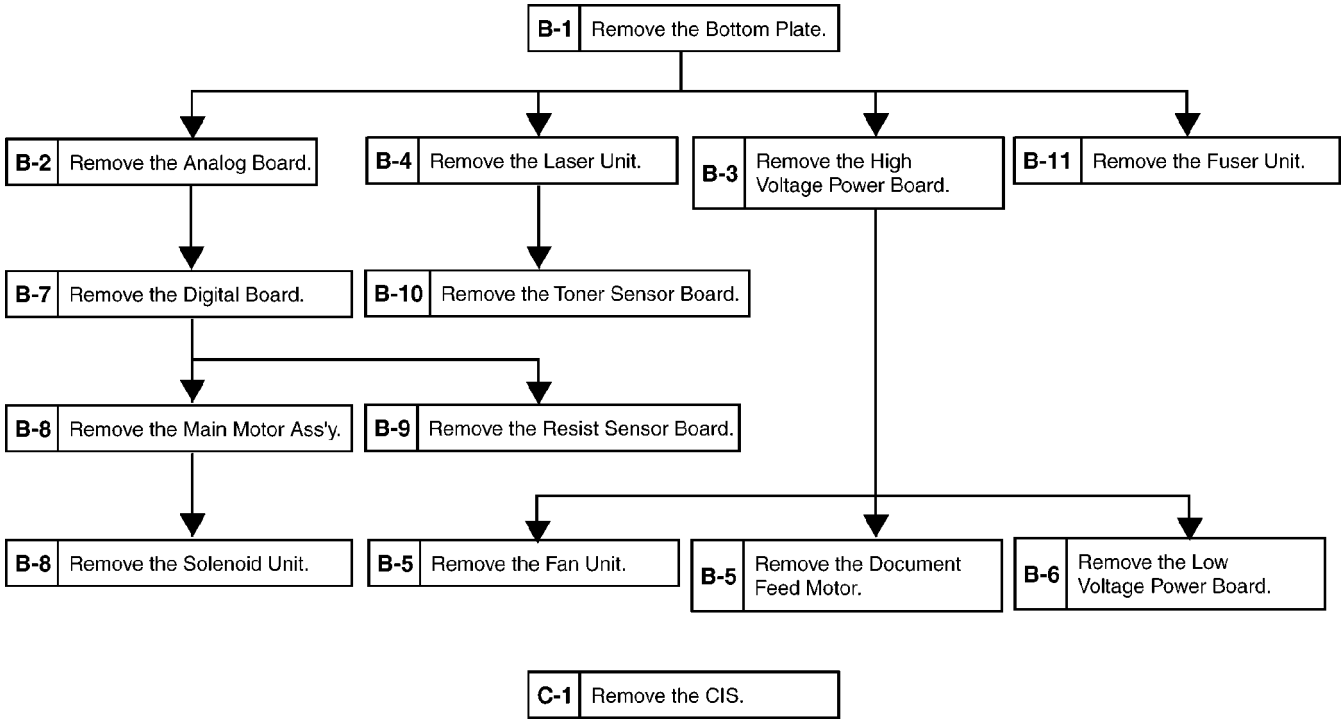
14.1. Upper Main Cabinet Section



CROSS REFERENCE:

A-1: **How to Remove the Front Cover** (P.166)
A-2: **How to Remove the Pick Up Unit** (P.167)
A-3: **How to Remove the Pick Up Roller** (P.168)
A-4: **How to Remove the Operation Board** (P.169)
A-5: **How to Remove the Lower Flame** (P.170)
A-6: **How to Remove the Separation Rubber** (P.170)
A-7: **How to Remove the Transfer Roller** (P.171)
A-8: **How to Remove the Separation Roller** (P.172)

14.2. Lower Main Cabinet Section



CROSS REFERENCE:

B-1: **How to Remove the Bottom Plate** (P.173)
B-2: **How to Remove the Analog Board** (P.173)
B-3: **How to Remove the High Voltage Power Board** (P.174)
B-4: **How to Remove the Laser Unit** (P.174)
B-5: **How to Remove the Fan Unit** (P.175)
B-6: **How to Remove the Low Voltage Power Board** (P.175)
B-7: **How to Remove the Digital Board** (P.176)
B-8: **How to Remove the Main Motor** (P.176)
B-9: **How to Remove the Resitst Sensor Board** (P.177)
B-10: **How to Remove the Toner Sensor Board** (P.177)
B-11: **How to Remove the Fuser Unit** (P.178)
C-1: **How to Remove the CIS** (P.179)

14.3. How to Remove the Front Cover

PROCEDURE: A-1

REF.NO.A-1

1) Open the Front Cover.
2) Insert the small screwdriver as illustrated in Fig-1
3) Close the Front Cover with the screwdriver remaining like Fig-2 and raise it with the screwdriver.
4) Lift up the Front Cover.(Fig-3)
*When disassembling the Front Cover , turn the unit on its side, as shown in Fig-4.

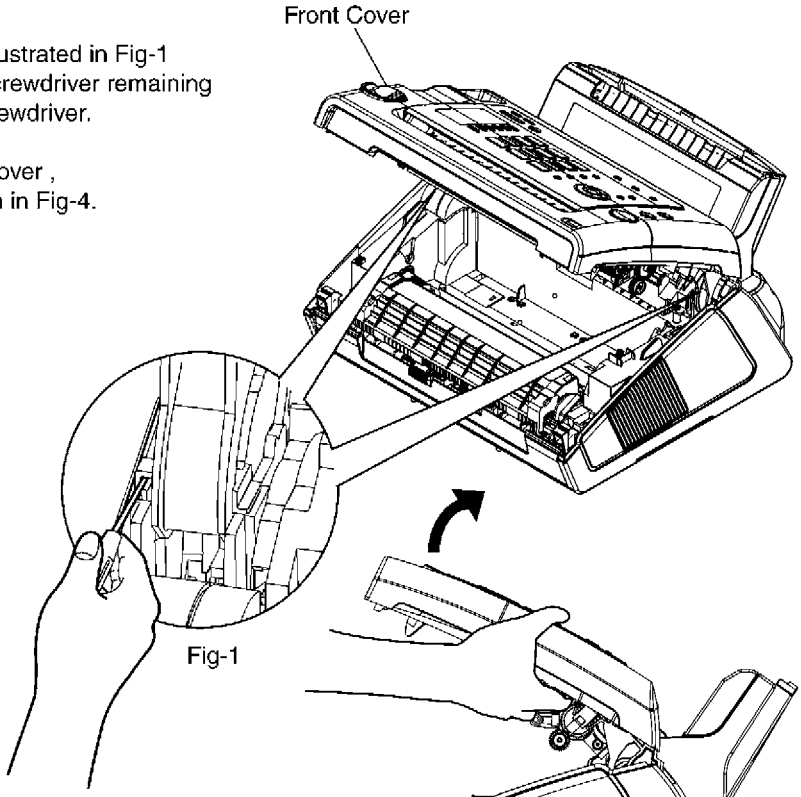


Fig-1

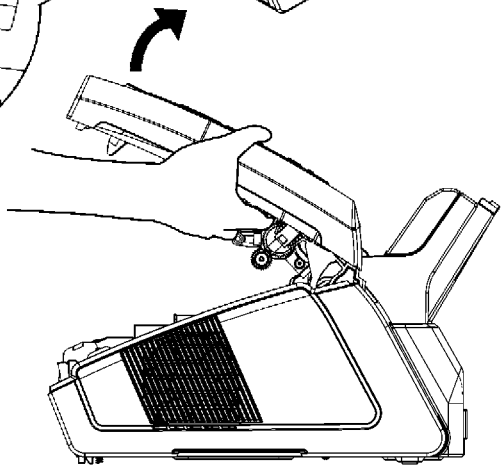


Fig-2

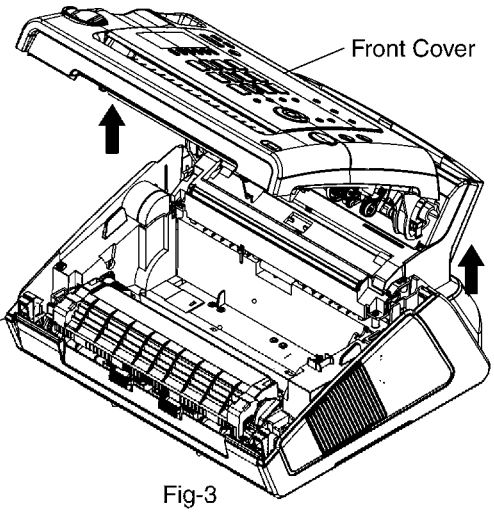


Fig-3

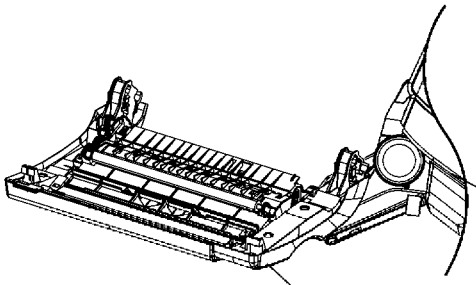


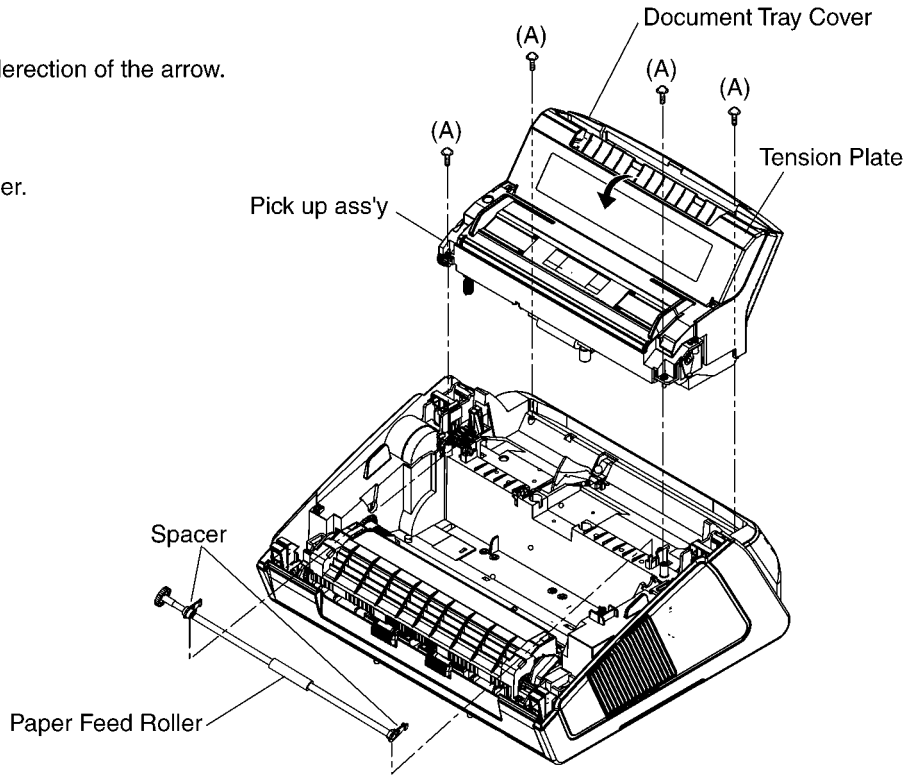
Fig-4

14.4. How to Remove the Pick Up Unit

PROCEDURE: A-1--> A-2

REF.NO.A-2

1) Pull the tension plate in the derection of the arrow.
2) Remove the 4 screws (A).
3) Lift up the Pick up ass'y.
4) Remove the 2 spacers.
5) Remove the Paper Feed Roller.

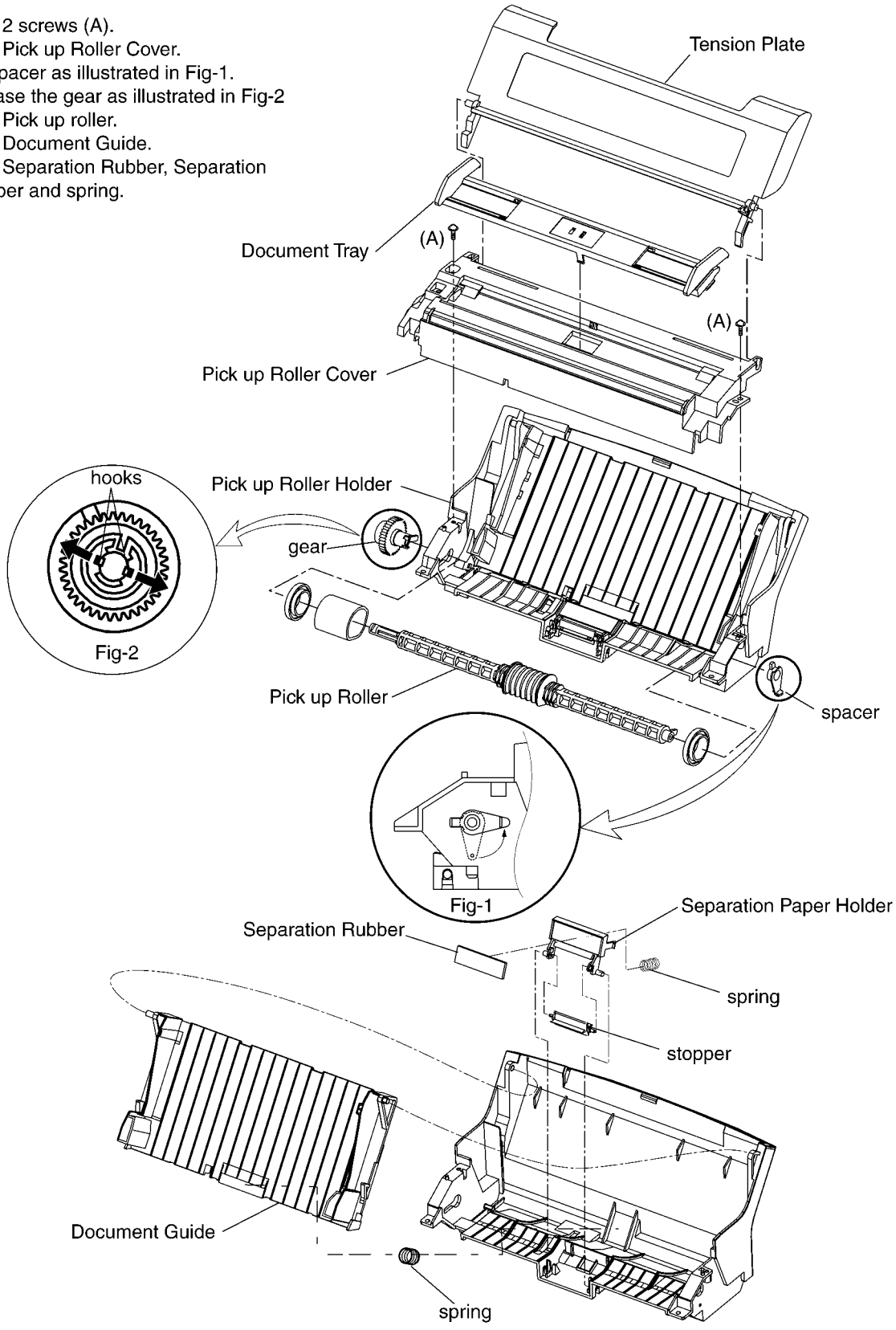


14.5. How to Remove the Pick Up Roller

PROCEDURE: A-1 --> A-2 --> A-3

REF.NO.A-3

1) Remove the 2 screws (A).
2) Remove the Pick up Roller Cover.
3) Rotate the spacer as illustrated in Fig-1.
   and the release the gear as illustrated in Fig-2
4) Remove the Pick up roller.
5) Remove the Document Guide.
6) Remove the Separation Rubber, Separation Holder, stopper and spring.

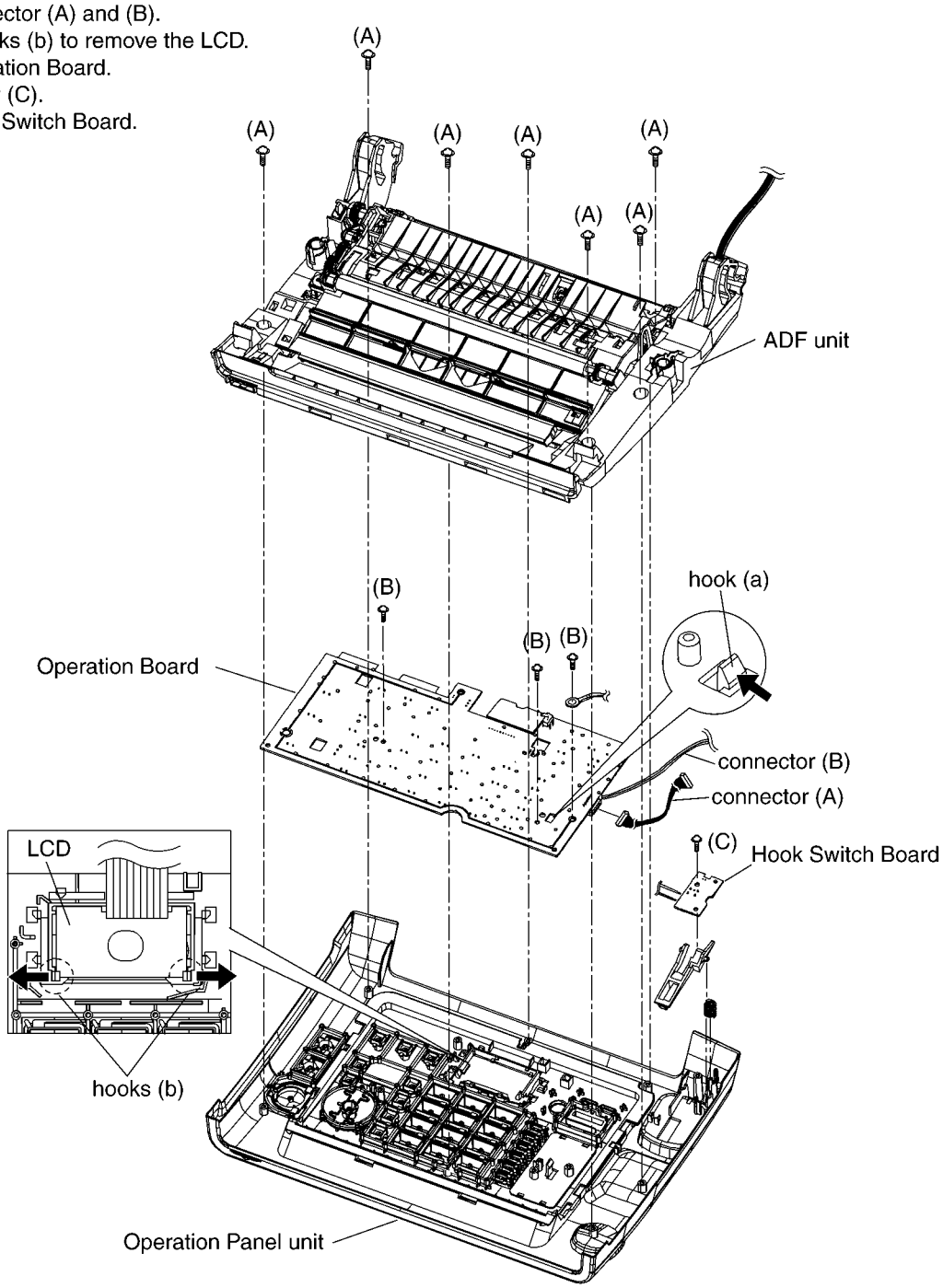


14.6. How to Remove the Operation Board

PROCEDURE: A-1 --> A-4

REF.NO.A-4

1) Remove the 7 screws (A)
2) Separate the ADF (Auto Document Feeder) unit from the Operation Panel unit.
3) Remove the 3 screws (B).
4) Release the hook (a).
5) Remove the connector (A) and (B).
6) Release the 2 hooks (b) to remove the LCD.
7) Remove the Operation Board.
8) Remove the screw (C).
9) Remove the Hook Switch Board.

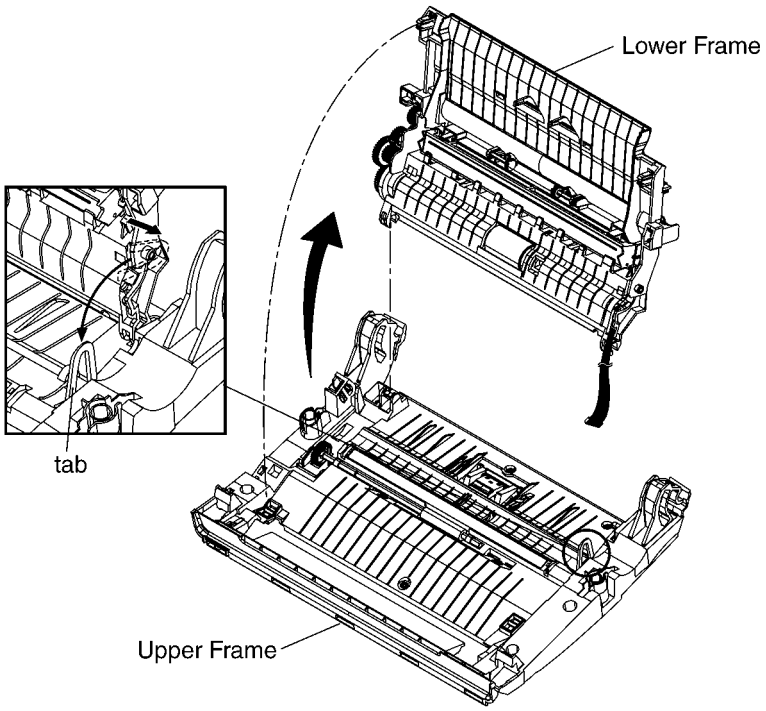


14.7. How to Remove the Lower Flame

PROCEDURE: A-1 --> A-4 --> A-5

REF.NO.A-5

1) Push the tab toward the outside of the unit and lift the Lower Frame.

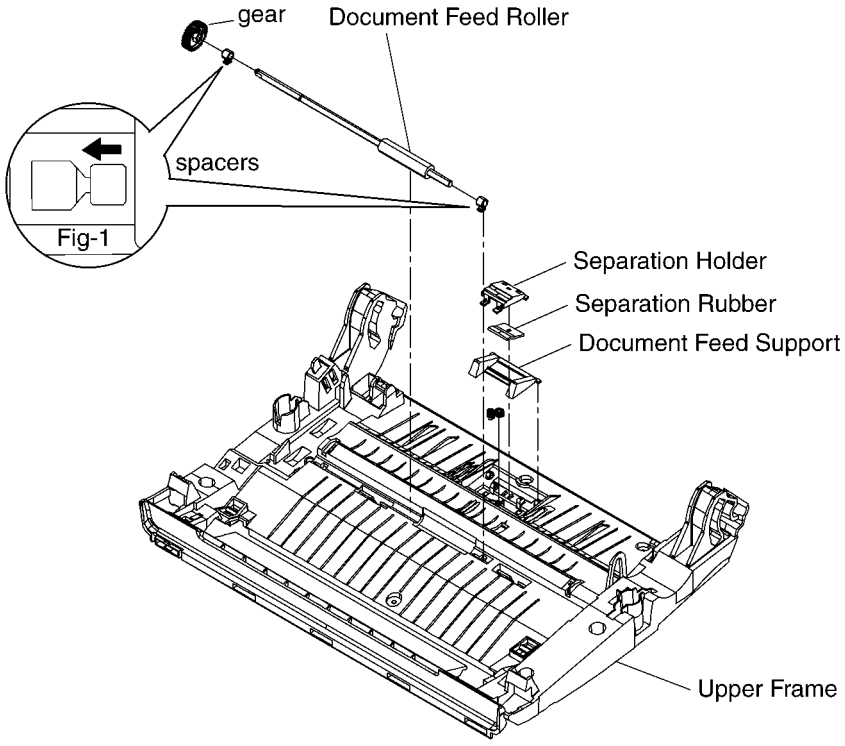


14.8. How to Remove the Separation Rubber

PROCEDURE: A-1 --> A-4 --> A-5 --> A-6

REF.NO.A-6

1) Remove the Separation Holder.
2) Remove the Separation Rubber and Document Feed Support.
3) Remove the 2 spacers as illustrated Fig-1.
4) Remove the gear.
5) Remove the Document Feed Roller.



14.9. How to Remove the Transfer Roller

PROCEDURE: A-1 --> A-4 --> A-5 --> A-7

REF.NO.A-7

1) Remove the 2 spacers as illustrated Fig-1.
(If the leg of both the sides of the spacer is pinched using tweezers, it can remove easily.)
2) Remove the Transfer Roller.

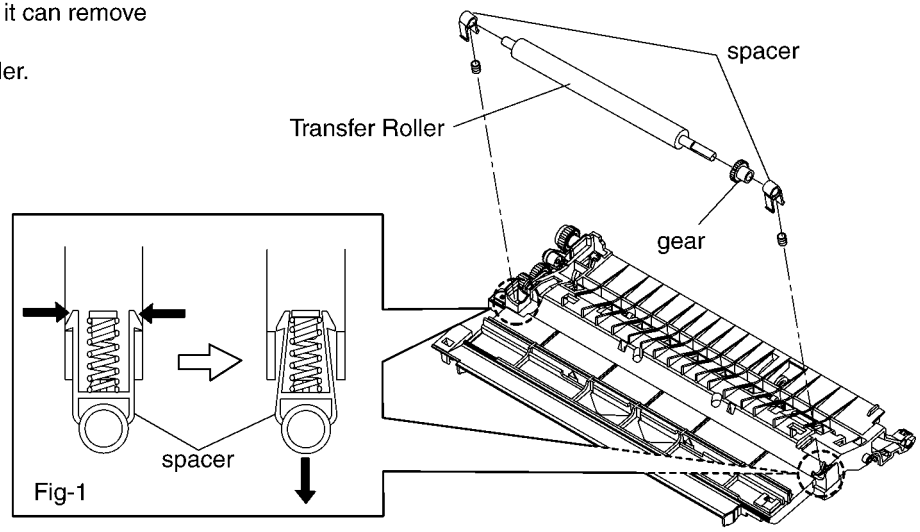


Fig-1

14.10. How to Remove the Separation Roller

PROCEDURE: A-1 --> A-4 --> A-5 --> A-8

REF.NO.A-8

1) Remove the screw (A), (B) and (C).
2) Remove the gear (A), (B) and (C).
3) Pinch and remove the pin of the gear in the direction of the arrows shown in Fig-1 using a thing like tweezers.
4) Rotate the spacer as illustrated Fig-2.
5) Remove the Separation Roller.

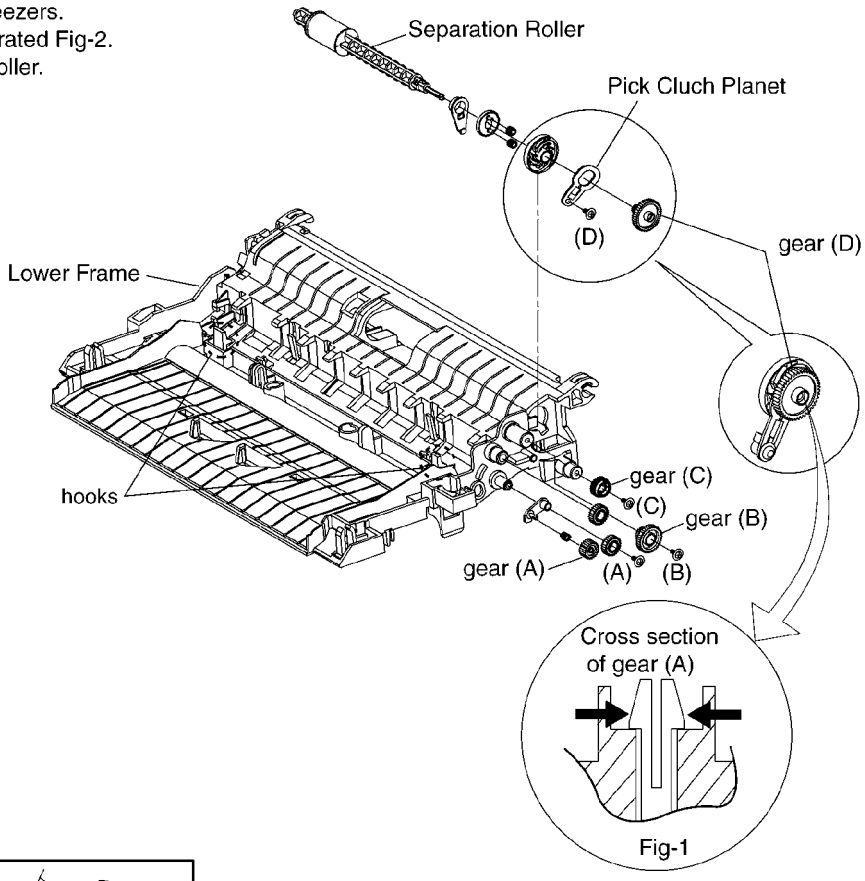


Fig-1

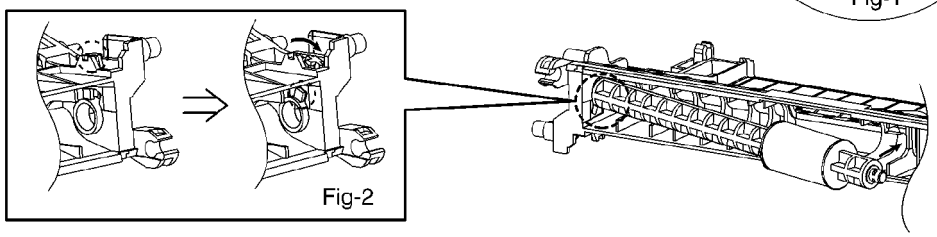


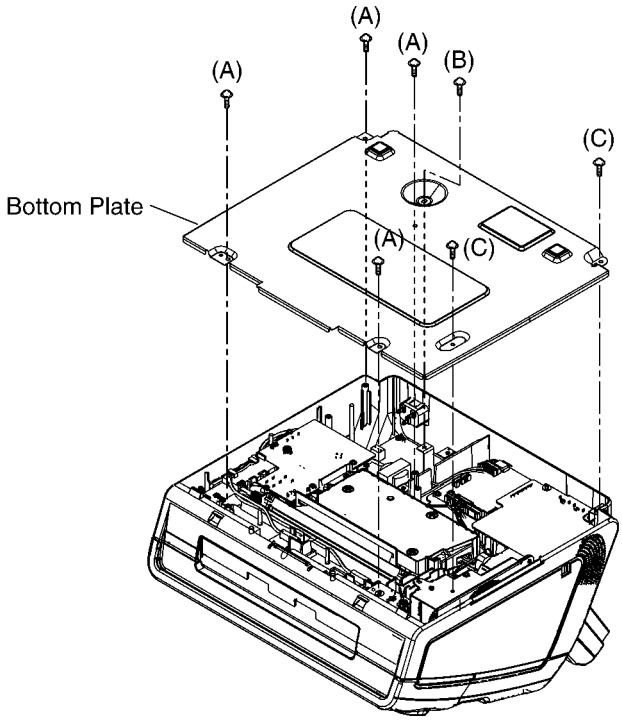
Fig-2

14.11. How to Remove the Bottom Plate

PROCEDURE: B-1

REF.NO.B-1

1) Remove the 4 screws (A).
2) Remove the screws (B).
3) Remove the 2 screws (C).
4) Remove the Bottom Plate.

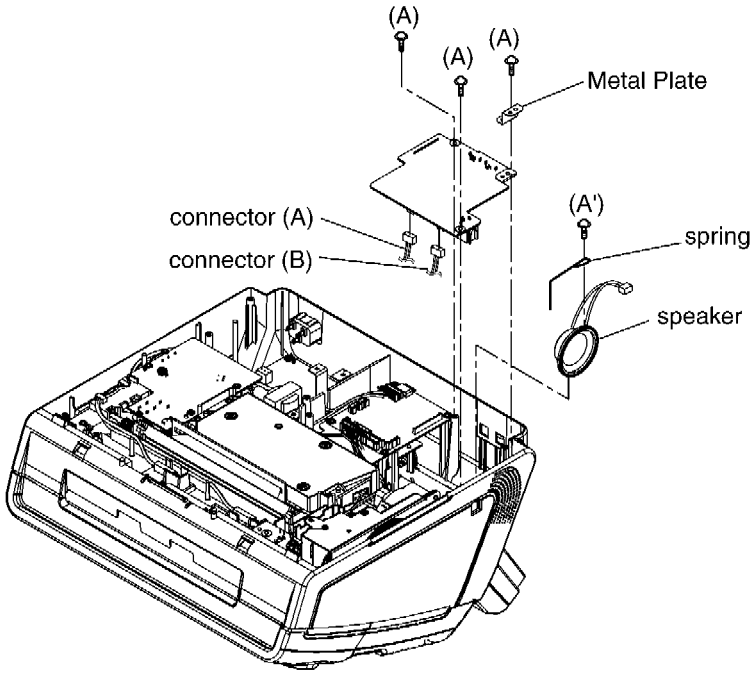


14.12. How to Remove the Analog Board

PROCEDURE: B-1 --> B-2

REF.NO.B-2

1) Remove the 3 screws (A).
2) Remove the Metal Plate.
3) Remove the connector (A) and (B).
4) Remove the Analog Board.
5) Remove the screw (A').
6) Remove the spring.
7) Remove the speaker.

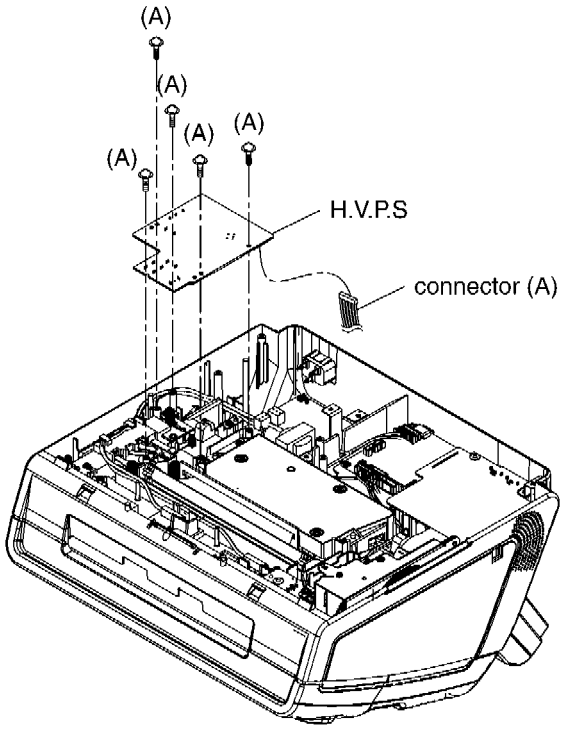


14.13. How to Remove the High Voltage Power Board

PROCEDURE: B-1 --> B-3

REF.NO.B-3

1) Remove the 5 screws (A).
2) Remove the connector (A).
3) Remove the H.V.P.S. (High Voltage Power Board).

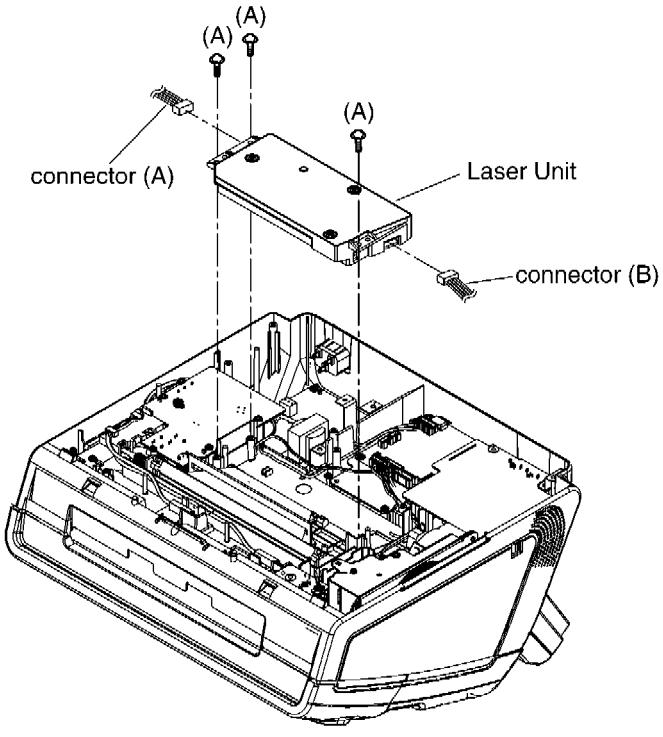


14.14. How to Remove the Laser Unit

PROCEDURE: B-1 --> B-4

REF.NO.B-4

1) Remove the 3 screws (A).
2) Remove the connector (A) and (B).
3) Remove the Laser Unit.

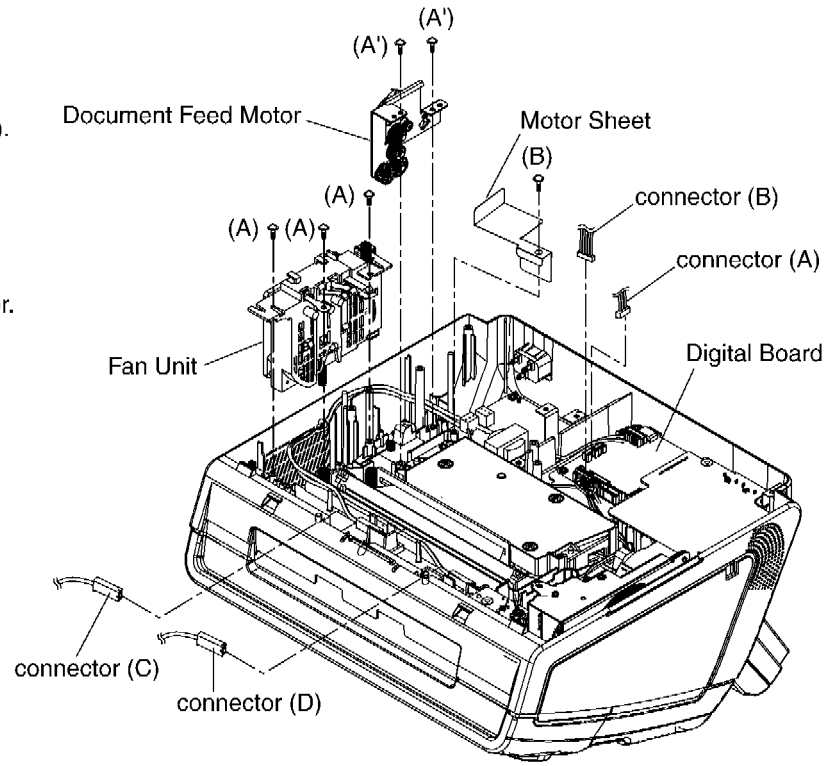


14.15. How to Remove the Fan Unit

PROCEDURE: B-1 --> B-3 --> B-5

REF.NO.B-5

1) Remove the screw (B).
2) Remove the Motor Sheet.
3) Remove the connector (C) and (D).
4) Remove the 3 screws (A).
5) Remove the connector (A).
6) Remove the Fan Unit.
7) Remove the 2 screws (A').
8) Remove the connector (B).
9) Remove the Document Feed Motor.

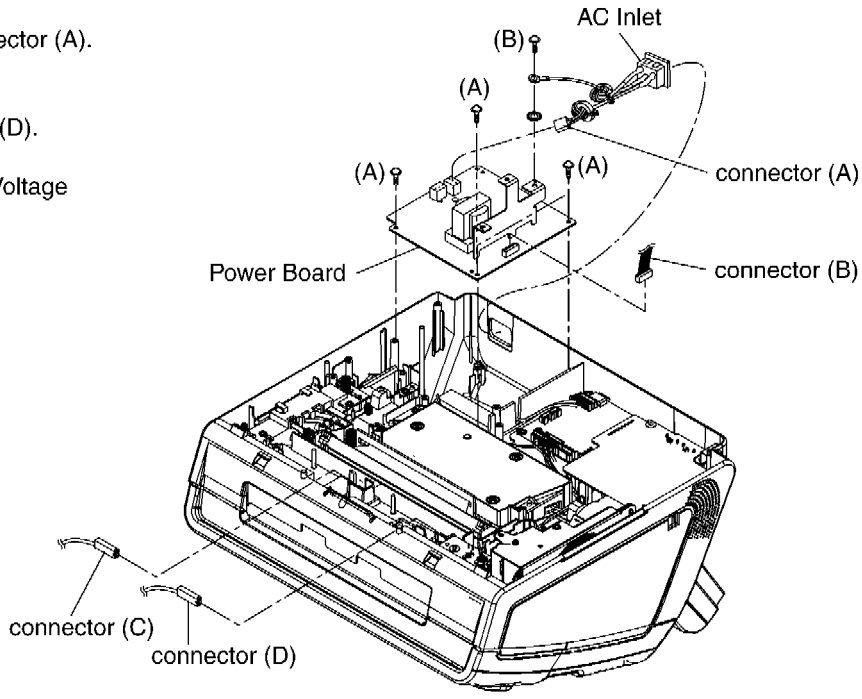


14.16. How to Remove the Low Voltage Power Board

PROCEDURE: B-1 --> B-3 --> B-6

REF.NO.B-6

1) Remove the screw (B) and connector (A).
2) Remove the AC Inlet.
3) Remove the connector (B).
4) Remove the connectors (C) and (D).
5) Remove the 4 screws (A).
6) Remove the Power Board (Low Voltage Power Board).

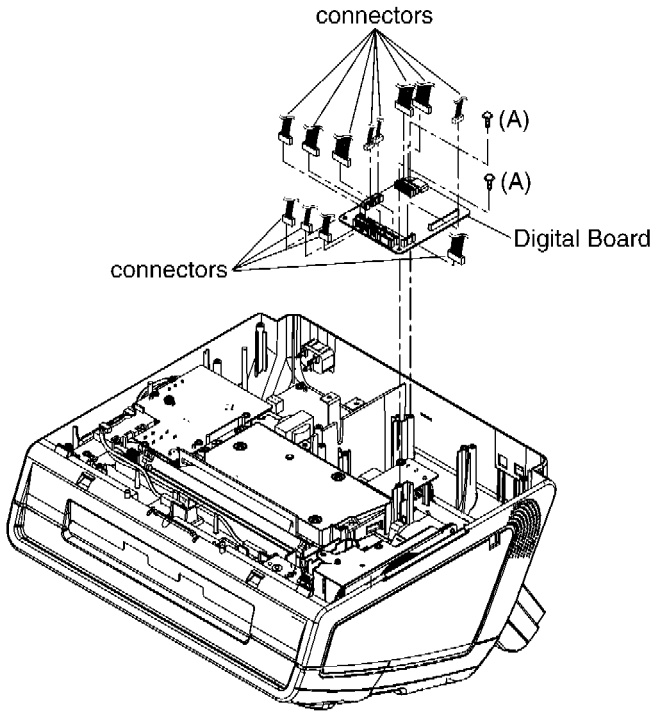


14.17. How to Remove the Digital Board

PROCEDURE: B-1 --> B-2 --> B-7

REF.NO.B-7

1) Remove the 2 screws (A).
2) Remove the 12 connectors.
3) Remove the Digital Board.

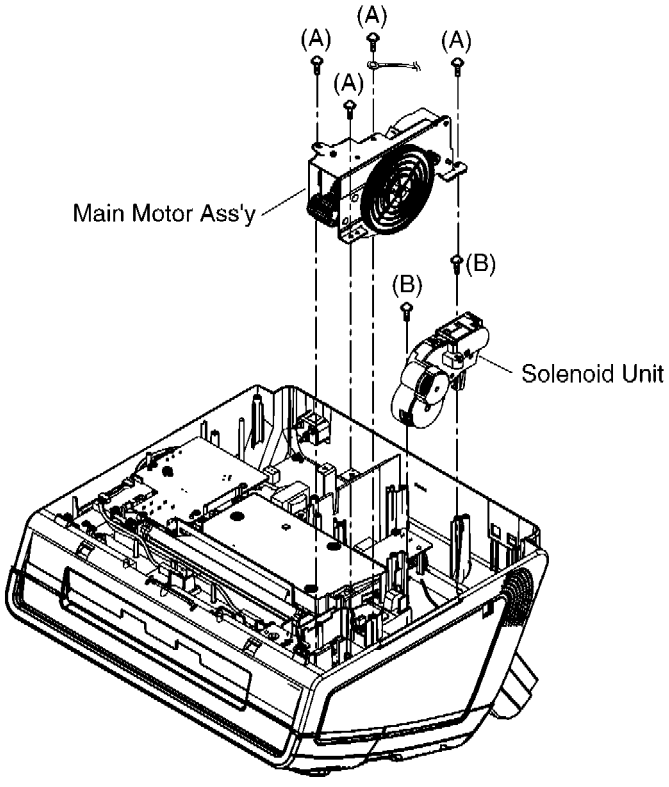


14.18. How to Remove the Main Motor

PROCEDURE: B-1 --> B-2 --> B-7 --> B-8

REF.NO.B-8

1) Remove the 4 screws (A).
2) Remove the Main Motor Ass'y.
3) Remove the 2 screws (B).
4) Remove the Solenoid Unit.

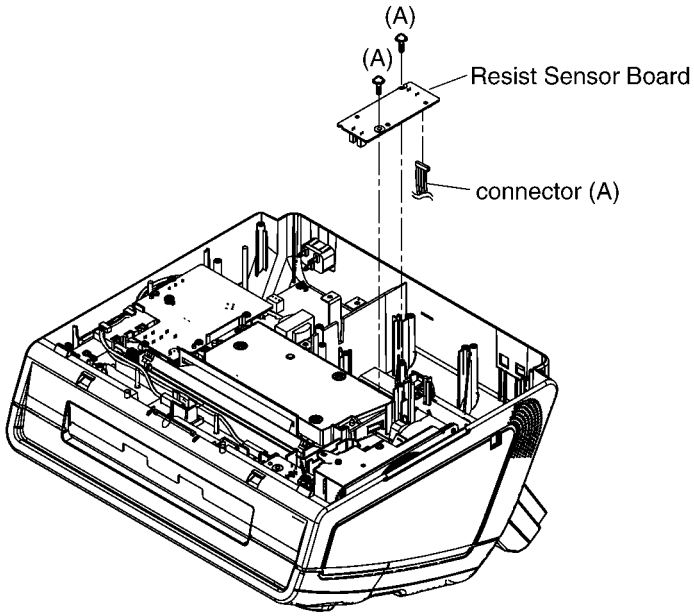


14.19. How to Remove the Resitst Sensor Board

PROCEDURE: B-1 --> B-2 --> B-7 --> B-9

REF.NO.B-9

1) Remove the 2screws (A).
2) Remove the connector (A).
3) Remove the Resist Sensor Board.

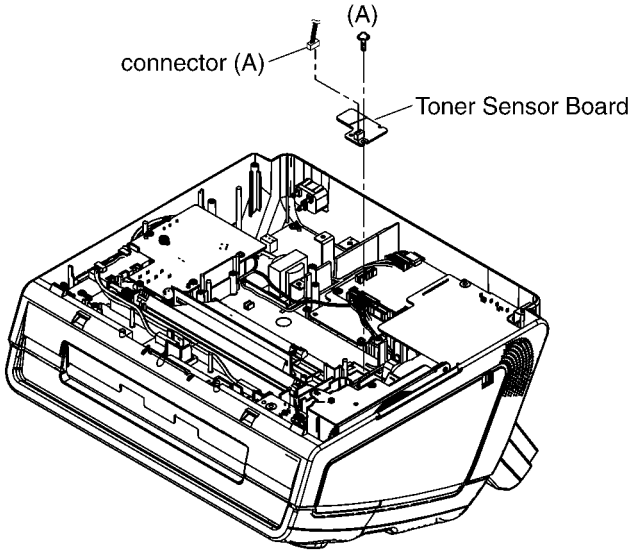


14.20. How to Remove the Toner Sensor Board

PROCEDURE: B-1 --> B-4 --> B-10

REF.NO.B-10

1) Remove the screw (A).
2) Remove the connector (A).
3) Remove the Toner Sensor Board.



14.21. How to Remove the Fuser Unit

PROCEDURE: B-1--> B-11

REF.NO.B-11

First of all,reverse the Main Unit. and remove the bottom Plate.(see the REF.NO.B-1)

1) Remove the connector (A) ,(B) and (C).(Fig-1)
2) Revert the Main Unit.
3) Remove the 2 screws (A).
4) Lift up the Fuser unit from the Main Cabinet.

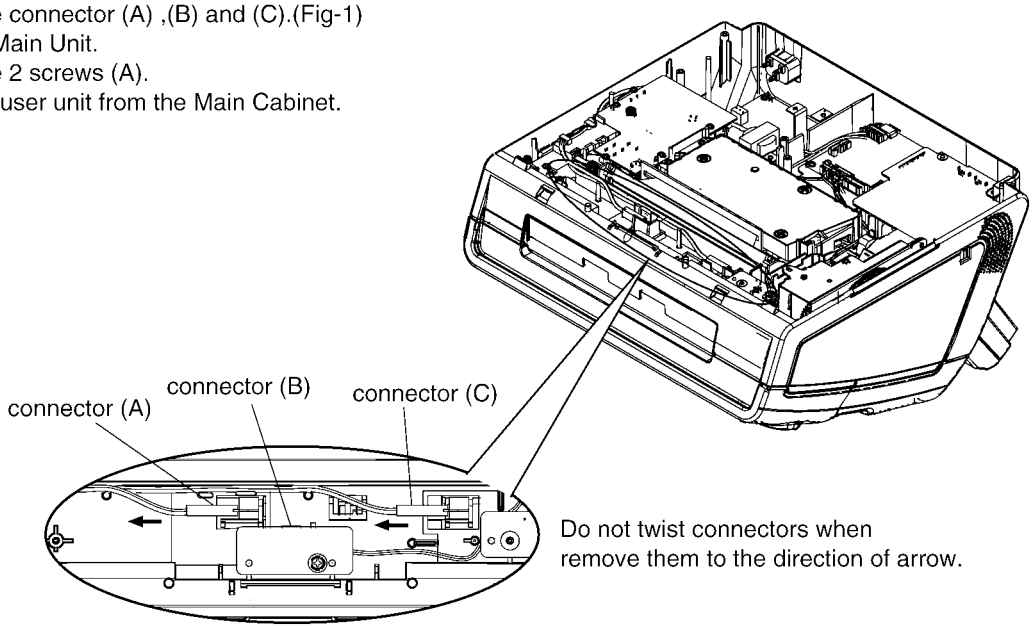
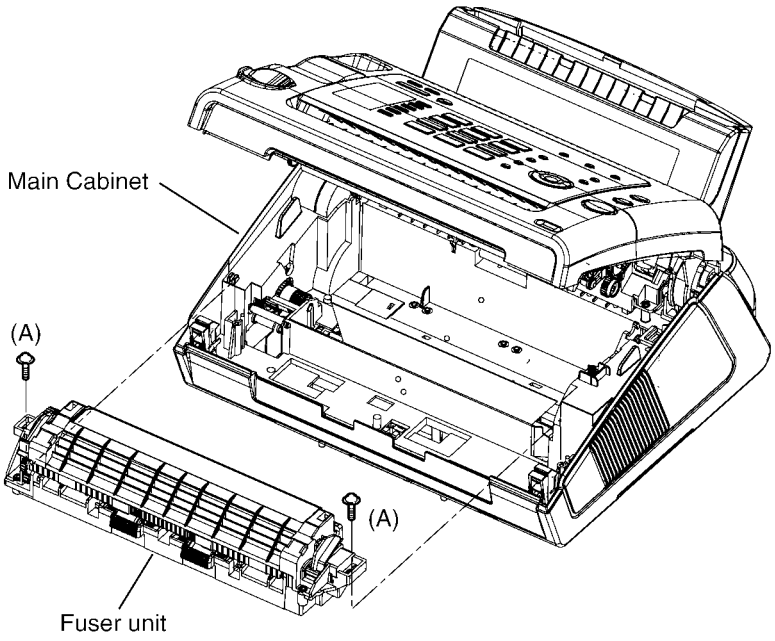


Fig-1



14.22. How to Remove the CIS

PROCEDURE: C-1

REF.NO.C-1

1) Push the CIS in the direction of an arrow to release the hooks (Fig-a).
4) Remove the CIS (Fig-b).

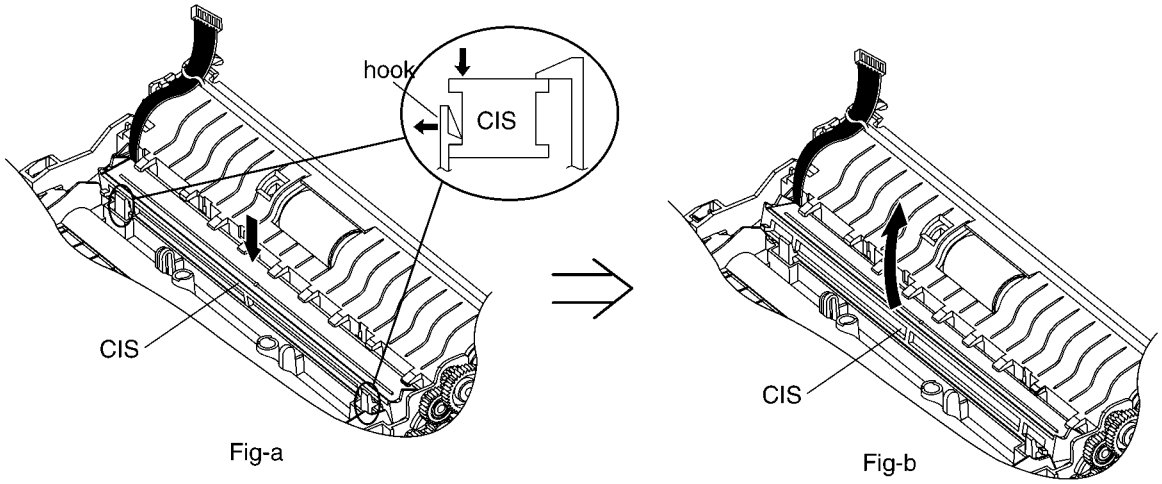
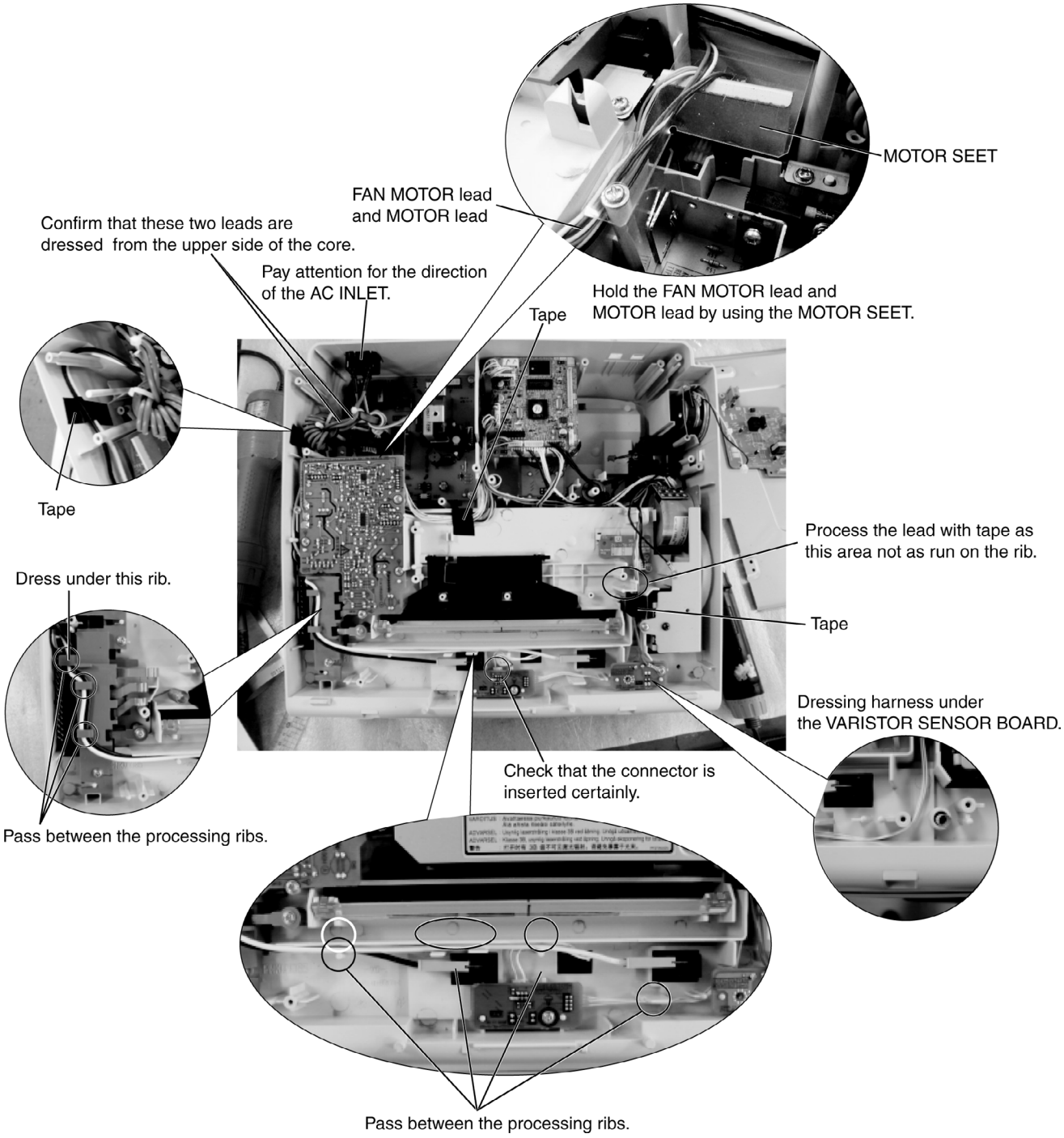
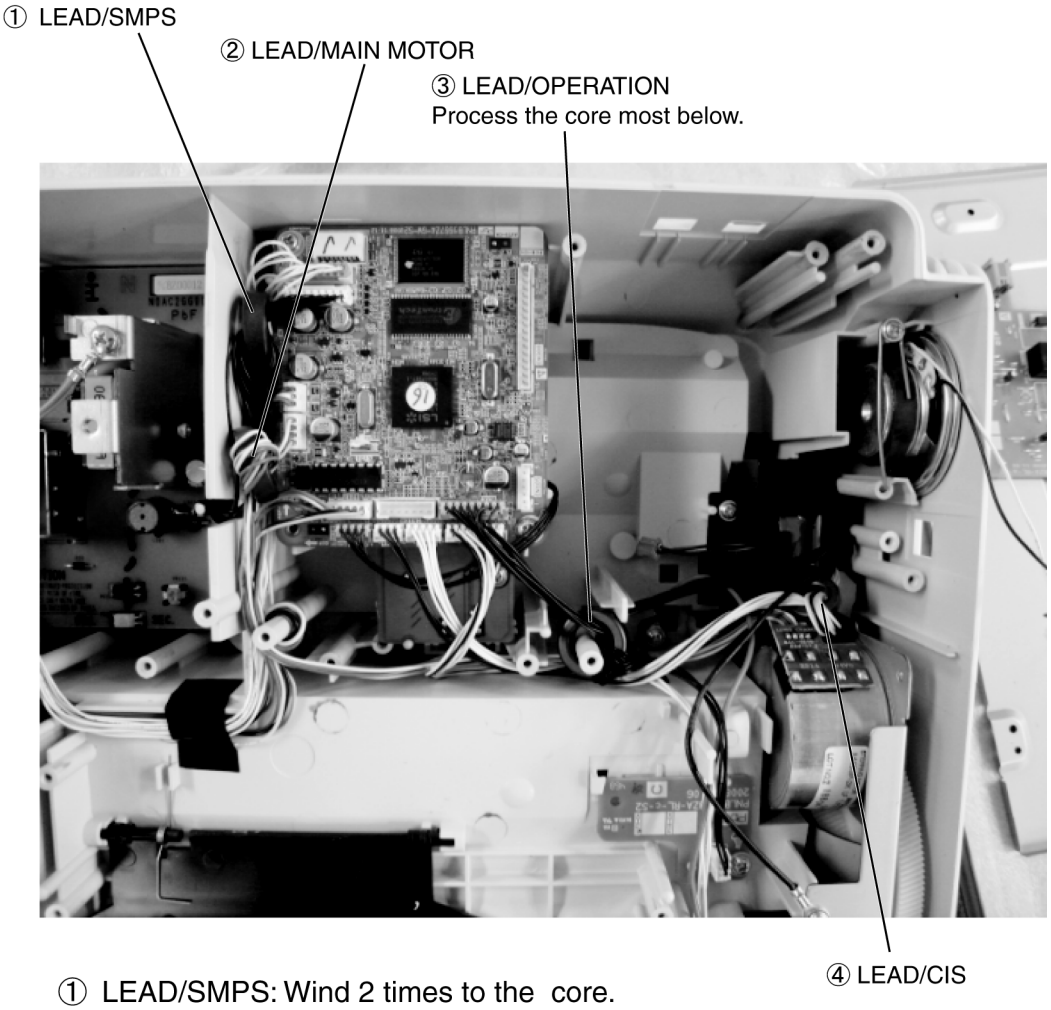


Fig-a

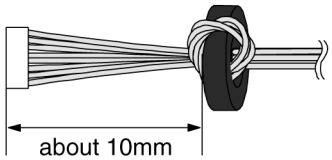
Fig-b

14.23. Installation Position of the Lead

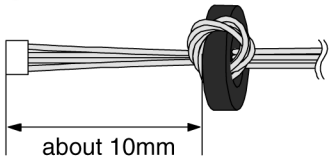




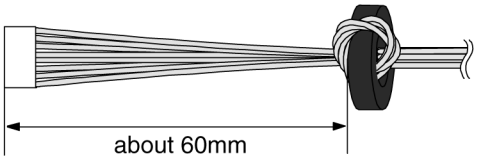
① LEAD/SMPS: Wind 2 times to the core.



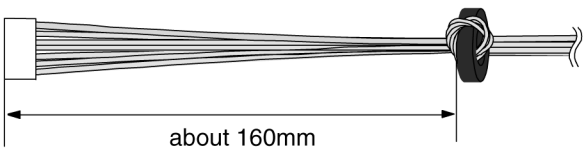
② LEAD/MAIN MOTOR: Wind 2 times to the core.



③ LEAD/OPERATION: Wind 2 times to the core.



④ LEAD/CIS: Wind 1 time to the core.



15 Maintenance

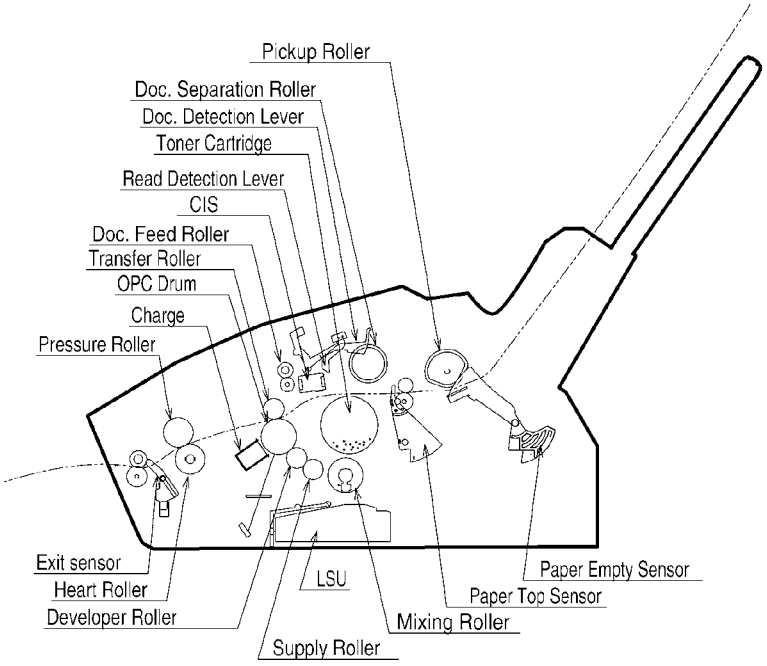
15.1. Maintenance Items and Component Locations

15.1.1. Outlines

MAINTENANCE AND REPAIRS ARE PERFORMED USING THE FOLLOWING STEPS.

1. **Periodic maintenance**
   Inspect the equipment periodically and if necessary, clean any contaminated parts.
2. **Check for breakdowns**
   Look for problems and consider how they arose.
   If the equipment can be still used, perform copying, self testing or communication testing.
3. **Check equipment**
   Perform copying, self testing and communication testing to determine if the problem originates from the transmitter, receiver or the telephone line.
4. **Determine causes**
   Determine the causes of the equipment problem by troubleshooting.
5. **Equipment repairs**
   Repair or replace the defective parts and take appropriate measures at this stage to ensure that the problem will not recur.
6. **Confirm normal operation of the equipment**
   After completing the repairs, conduct copying, self testing and communication testing to confirm that the equipment operates normally.
7. **Record keeping**
   Make a record of the measures taken to rectify the problem for future reference.

15.1.2. Maintenance Check Items/Component Locations



15.1.2.1. Maintenance List

NO.	OPERATION	CHECK	REMARKS
1	Document Path	Remove any foreign matter such as paper.	—
2	Rollers	If the roller is dirty, clean it with a damp cloth then dry thoroughly.	Refer to **Maintenance Check Items/Component Locations**(P.182).
3	Sensors	Hook switch (SW671), Paper feed sensor (PS601), Document sensor (SW641), Top cover open switch (SW1), Regist sensor (PS531), Paper exit sensor (PS501), Toner sensor (IC512). Confirm the operation of the sensors.	See **Maintenance Check Items/Component Locations**(P.182) and **Sensors and Switches Section**(P.40)**Test Functions**(P.74)
4	Glass	If the glass is dirty, clean them with a dry soft cloth.	Refer to **Maintenance**(P.187).
5	Abnormal, wear and tear or loose parts	Replace the part. Check if the screws are tight on all parts.	—

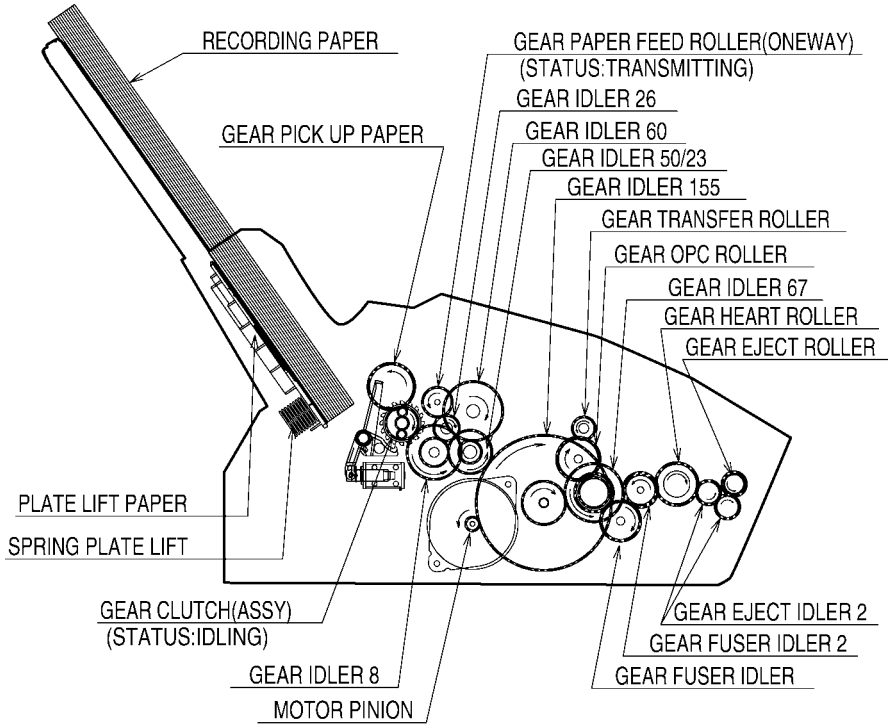
15.1.2.2. Maintenance Cycle

No.	Item	Cleaning Cycle
1	ADF Separation Roller (Ref.No.70)	3 months
2	Paper Feed Roller (Ref.No.8)	3 months
3	ADF Separation Rubber (Ref. No.80)	3 months
4	Pick up Roller (Ref No.157)	3 months
5	Separation Rubber (Ref. No.150)	3 months
6	Document Feed Roller (Ref.No.72)	3 months
7	Transfer Roller (Ref.No.123)	3 months
8	Pressure Roller (Ref.No.180)	3 months
9	Heat Roller (Ref.No.188)	3 months
10	Exit Roller (Ref.No.201)	3 months

If each part has got dirty, clean it with a damp cloth then dry thoroughly.

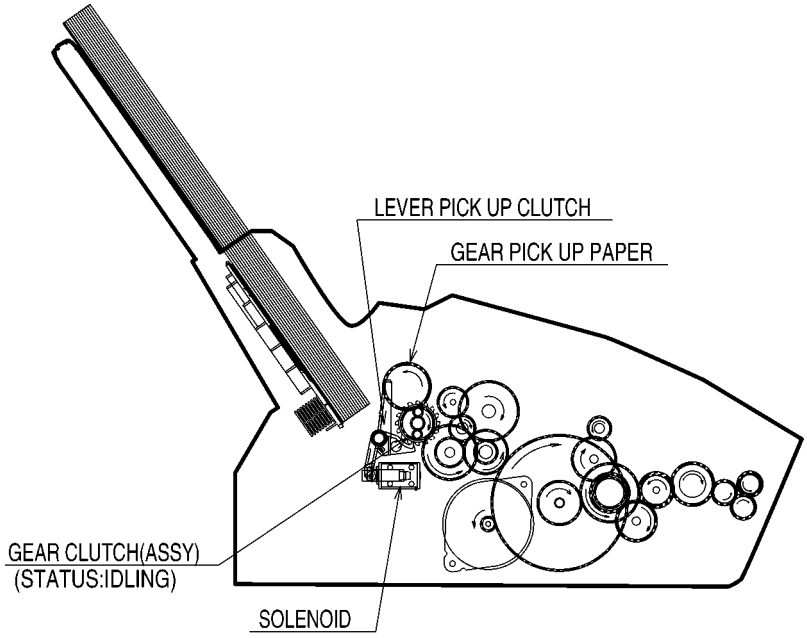
* These values are standard and may vary depending on usage conditions.

15.2. Printing



- The motor pinion rotates in the direction shown in the figure.
- The gears of fixing and developing parts are driven by the GEAR IDLER 67.
- The GEAR PAPER FEED ROLLER drives the roller.
- The GEAR CLUTCH runs idle and GEAR PICKUP PAPER is still.

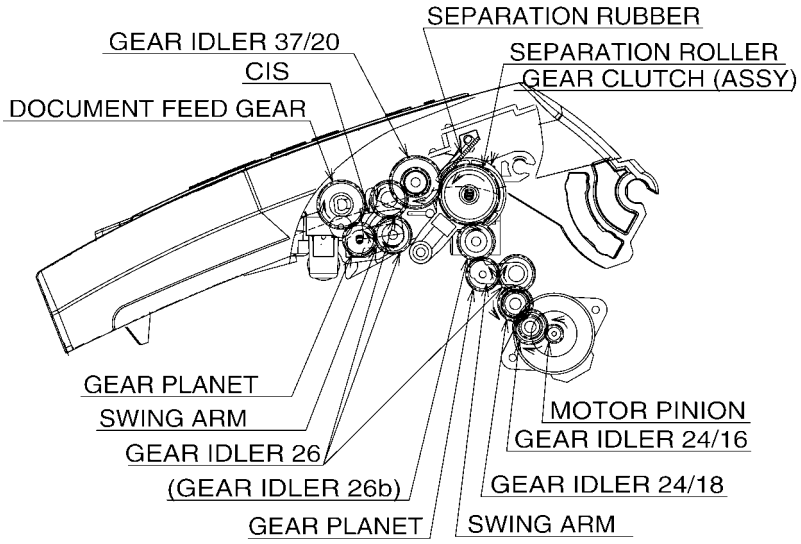
15.3. Printing (Paper Pick Up)



During printing

- When the SOLENOID is turned ON, the LEVER PICK UP CLUTCH is hooked on the RING of GEAR CLUTCH. It causes the GEAR PICKUP PAPER to rotate.
- The recording paper is pressed by the PICKUP ROLLER and the top paper is separated and fed.
- Even the SOLENOID is turned OFF, it can not stop on the way of a turn because the tip of LEVER PICK UP CLUTCH is on the CAM of GEAR PICKUP PAPER.
- When the tip of LEVER PICK UP CLUTCH returns to CAM's home position, the GEAR CLUTCH RING is unhooked, then the GEAR PICKUP PAPER is stopped.

15.4. Scanning (ADF)



• DOCUMENT TRANSMISSION (ADF)
When the tip of the document is set to a point of contact between the separation roller and the separation pad through the document feed roller, then the document is fed there separately. The document feed roller carries the document and the CIS reads it through the glass. The document is exited through the document feed roller.

15.5. Maintenance

15.5.1. Cleaning the Inside of the Unit

Clean the inside of the unit:

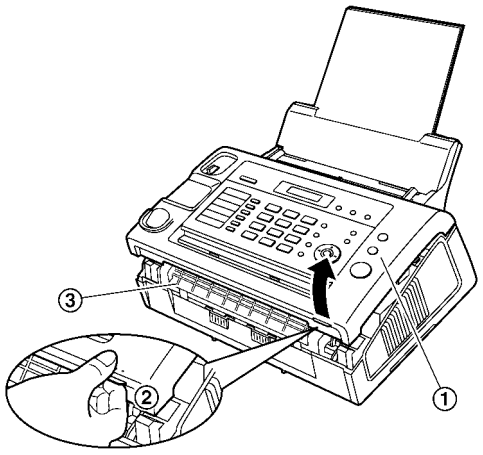
— If misfeeding of your original occurs frequently.

— If a black line, a white line or a dirty pattern appears on your recording paper, on your original, or on the fax document received by the other party.

Caution:

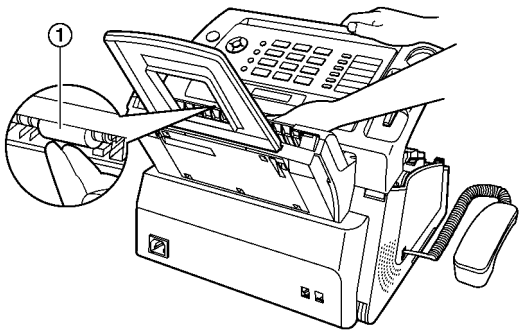
- **Be careful when handling the drum and toner unit.**
- **Do not use paper products, such as paper towels or tissues, to clean the inside of the unit.**

1. Disconnect the power cord and the telephone line cord.
2. Remove the handset and document stacker.
3. Lift open the front cover (1) , holding the dotted area (2) on the right side.

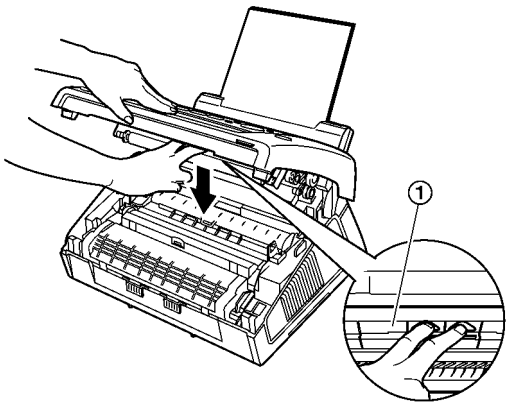


Caution:
The fuser unit (③) gets hot. Do not touch it.

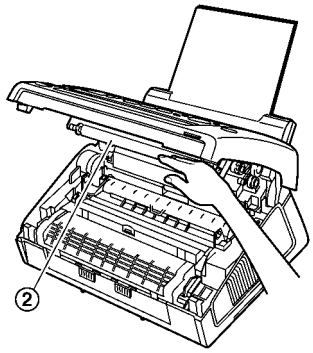
4. Clean the document separation roller (1) with a cloth moistened with isopropyl rubbing alcohol, and let all parts dry thoroughly.



5. Pull open the inner cover (1).

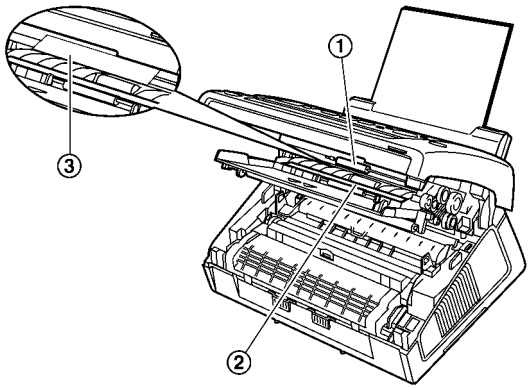


• Do not touch the transfer roller (2)



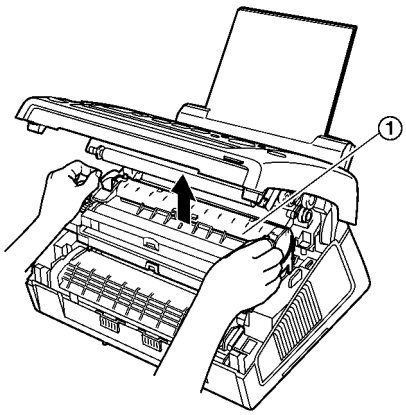
6. Clean the document feeder roller (1) with a cloth moistened with isopropyl rubbing alcohol, and let all parts dry thoroughly.
Clean the upper glass (2) with a soft and dry cloth.

• Do not damage the transparent sheet (3) when cleaning the document feeder roller.

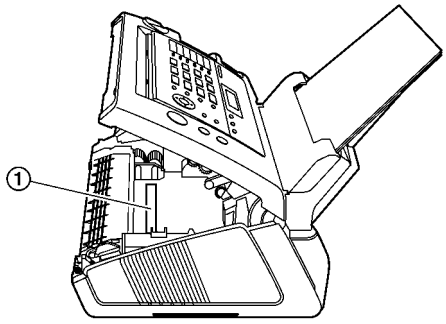


7. Push back the inner cover.

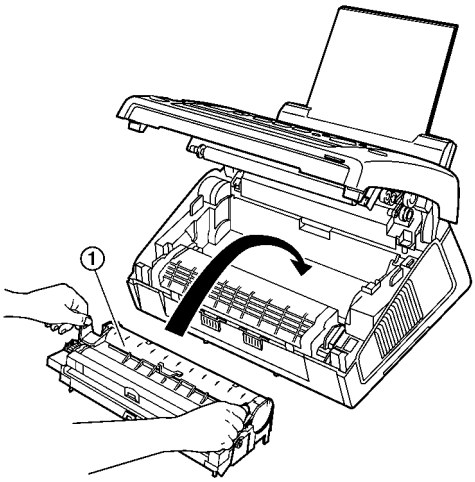
8. Remove the drum and toner unit (1) by holding the two tabs.



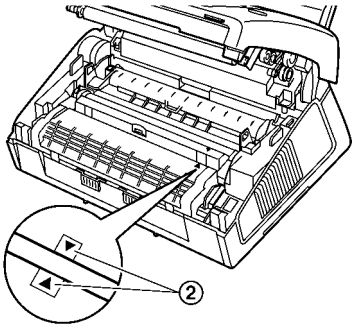
9. Clean the lower glass (1) with a soft and dry cloth.



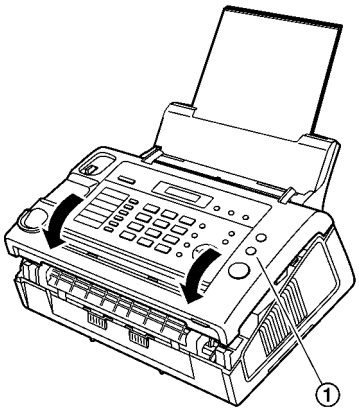
10. Re-install the drum and toner unit (1) by holding the tabs.



- Make sure that the triangles (2) match to install the drum and toner unit correctly.



11. Close the front cover (1) by pushing down on both sides, until locked.

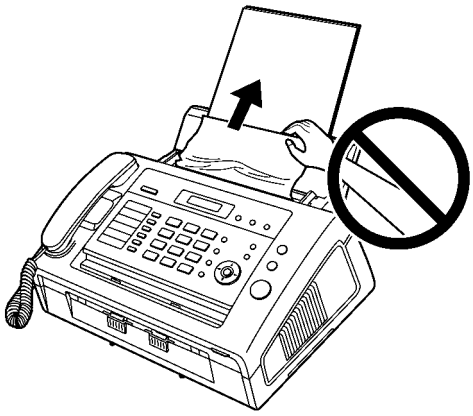


12. Place the handset on the cradle and attach the document stacker.

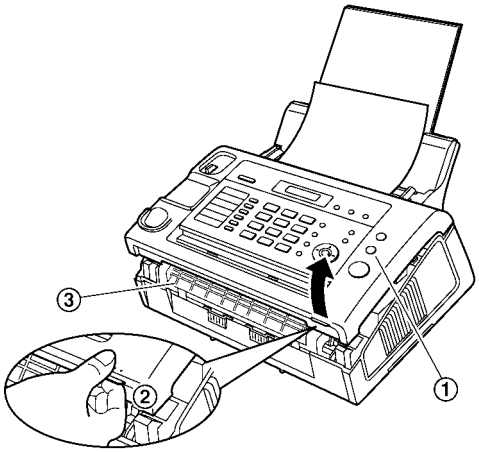
13. Re-connect the power cord and the telephone line cord.

15.6. Document Jams

Note:
- Do not pull out the jammed document forcibly before opening the front cover.

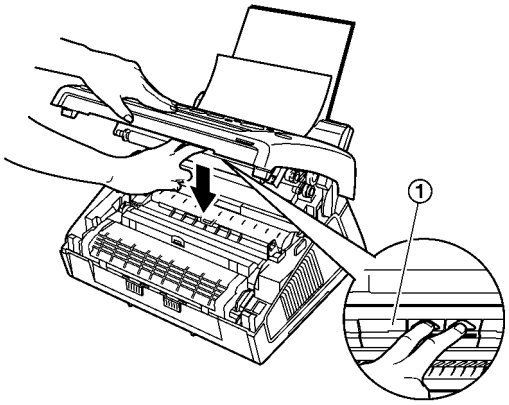


1. Remove the handset and document stacker.
2. Lift open the front cover (1), holding the dotted area (2) on the right side.

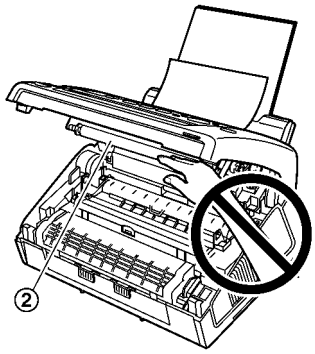


Caution:
The fuser unit (③) gets hot. Do not touch it.

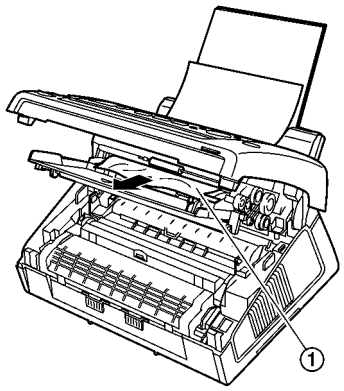
3. Pull open the inner cover (1).



Note:
- Do not touch the transfer roller (2).

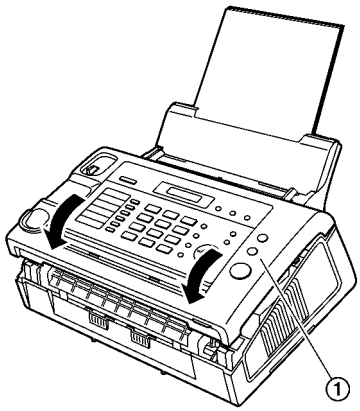


4. Remove the jammed document carefully (1).



5. Push back the inner cover.

6. Close the front cover (1) by pushing down on both sides, until locked.



7. Place the handset on the cradle and attach the document stacker.

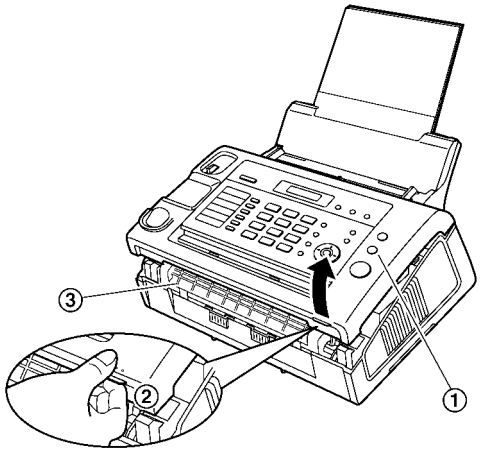
15.7. Recording Paper Jams

The display will show the following.

PAPER JAMMED

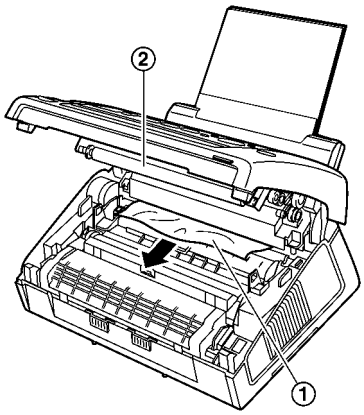
15.7.1. When the recording paper has jammed near the drum and toner unit

1. Remove the handset and document stacker.
2. Lift open the front cover (1), holding the dotted area (2) on the right side.

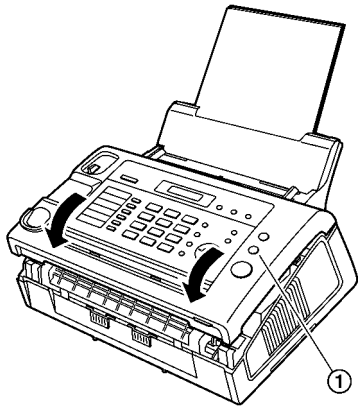


Caution:
The fuser unit (③) gets hot. Do not touch it.

3. Remove the jammed paper (1) carefully by pulling it toward you.
   • Do not touch the transfer roller (2).



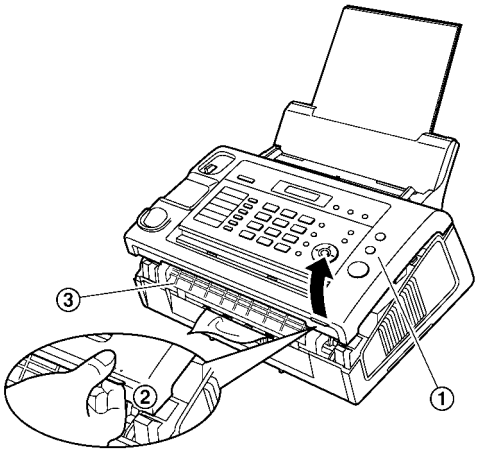
4. Close the front cover (1) by pushing down on both sides, until locked.



5. Place the handset on the cradle and attach the document stacker.

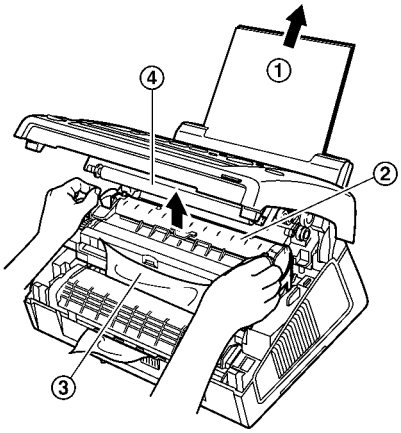
15.7.2. When the recording paper has jammed near the recording paper exit:

1. Remove the handset and document stacker.
2. Lift open the front cover (1), holding the dotted area (2) on the right side.

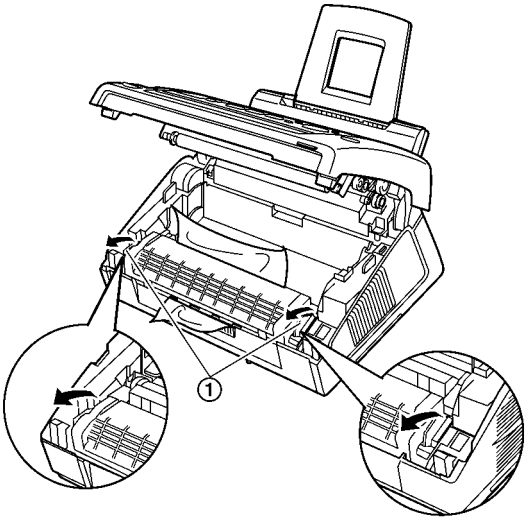


Caution:
The fuser unit (③) gets hot. Do not touch it.

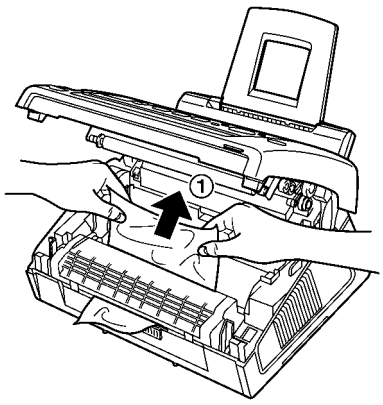
3. Remove the recording paper (1), then remove the drum and toner unit (2) to allow the jammed paper (3) to pull free from the rear cabinet.
   • Do not touch the transfer roller (4).



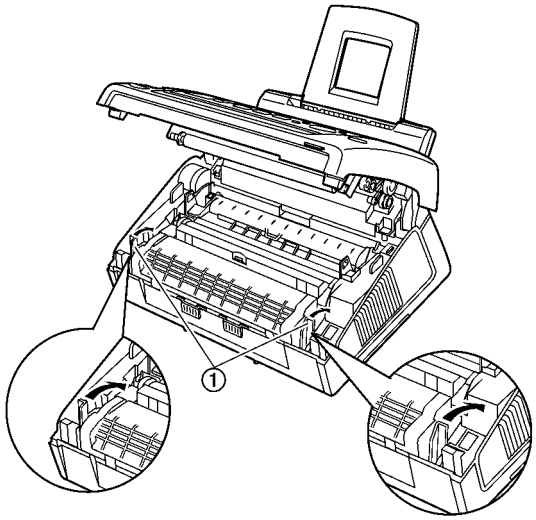
4. Lift both green levers (1) forward until they stop.



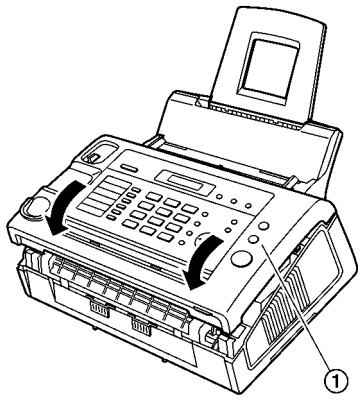
5. Remove the jammed paper (1) from the fuser unit by pulling it upwards carefully, then install the drum and toner unit.



6. Push back the levers (1) to the original position.

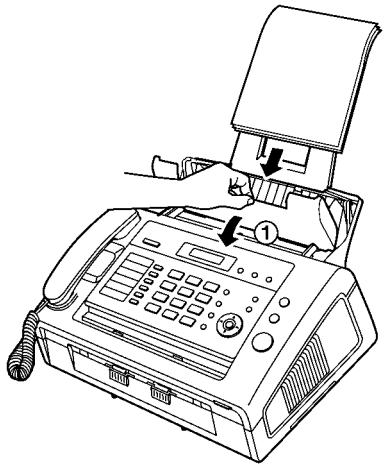


7 Close the front cover (1) by pushing down on both sides, until locked.



8. Place the handset on the cradle and attach the document stacker.

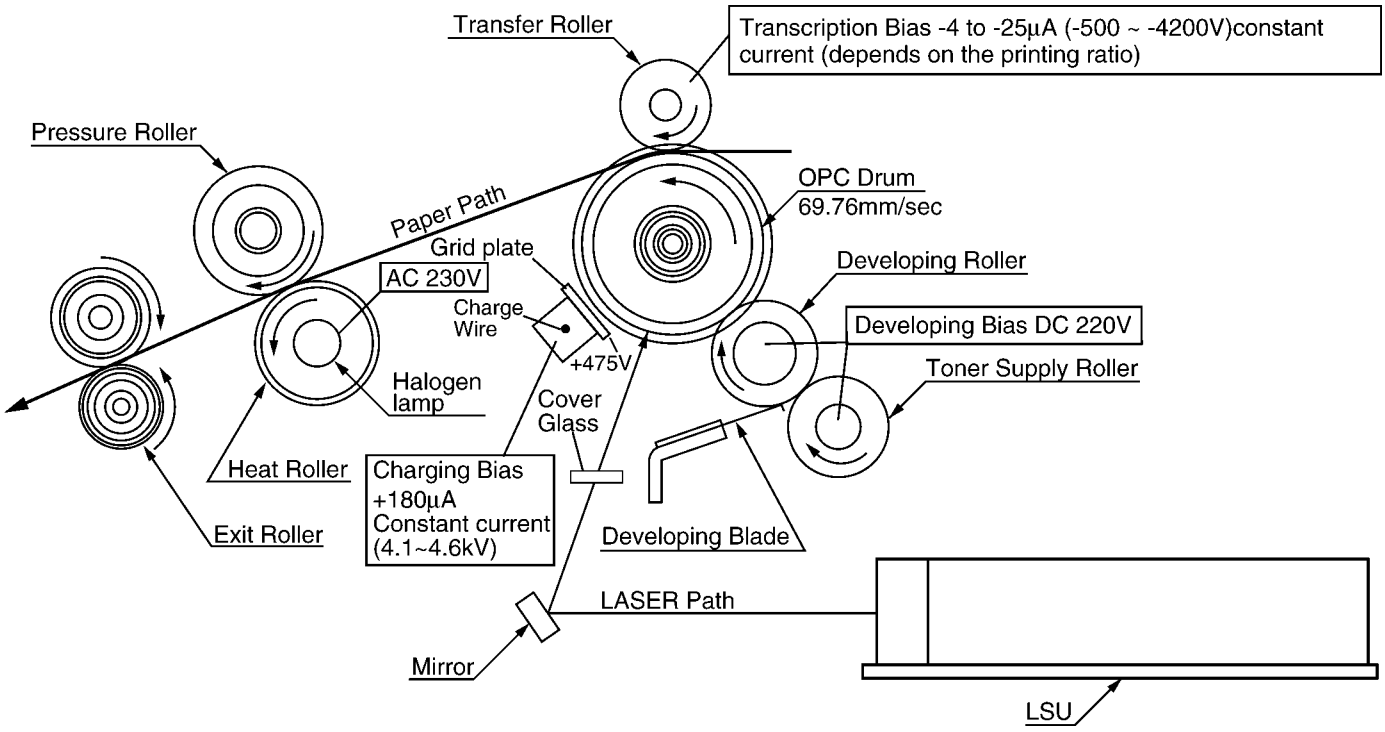
9. Pull the tension plate forward (1), then re-insert the recording paper.
- Before re-inserting, make sure to fan and straighten the recording paper.



10 Push back the tension plate.

15.8. Printing Operation Principle

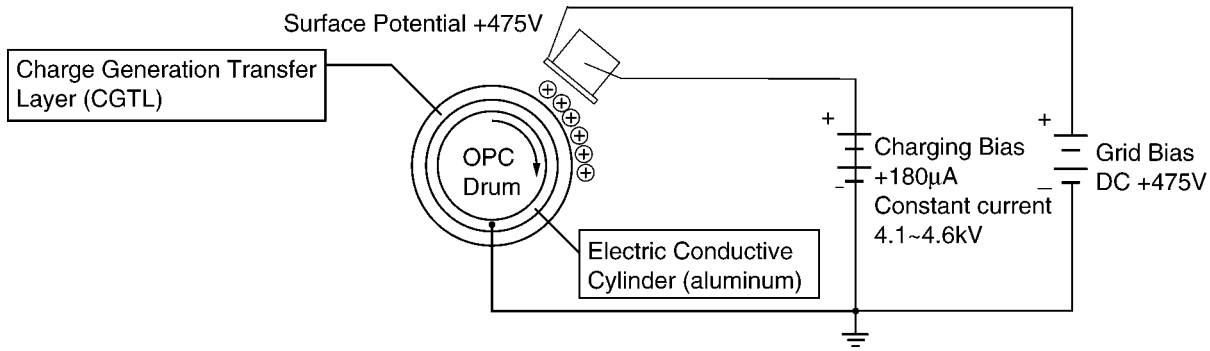
15.8.1. Process Chart and Process Bias



15.8.2. Charging

Charging is the stage that keeps the surface of the sensitive drum a fixed electric potential. The sensitive drum is the Organic Photo Conductor (OPC), which is a electric conductive cylinder whose surface is covered with the Charge Generation Transfer Layer (CGTL).

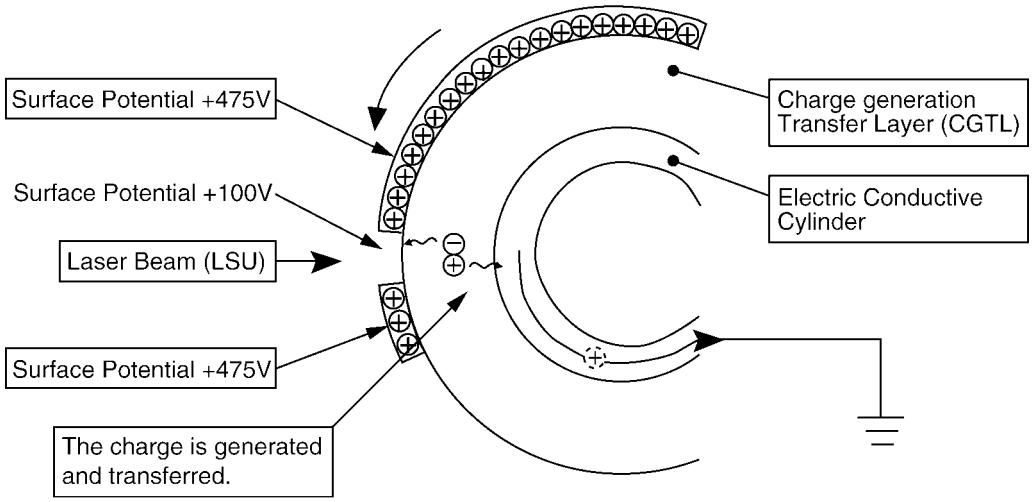
When the charging bias (DC +4.35kv) is added and the plus charge is supplied to the opc surface while charging, the whole surface potential of the drum is +475V.



15.8.3. Exposing

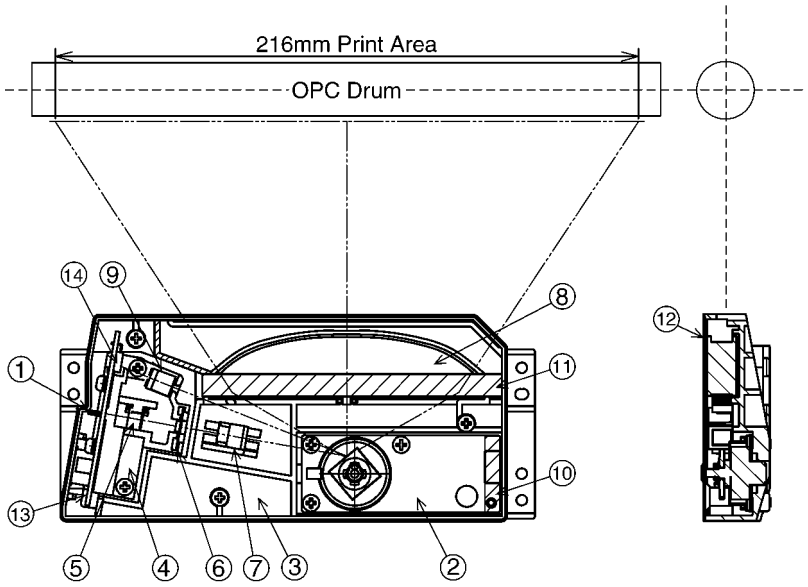
When the drum which is charged with the fixed electric charge is irradiated by the laser beam, the plus charge and minus charge are generated at the Charge Generation Transfer Layer. Passing through the Charge Generation Transfer Layer which conducts the minus charge, the plus-charged drum's surface is neutralized to be skipped. Then the plus charge goes to the ground from the electric conductive cylinder. Consequently the charge of the part which is not exposed remains as it is, and the electric potential of the scanned part changes.

At that time an invisible image is created on the drum.



15.8.4. Laser Scanning Unit Locations

LSU Layout & Parts List

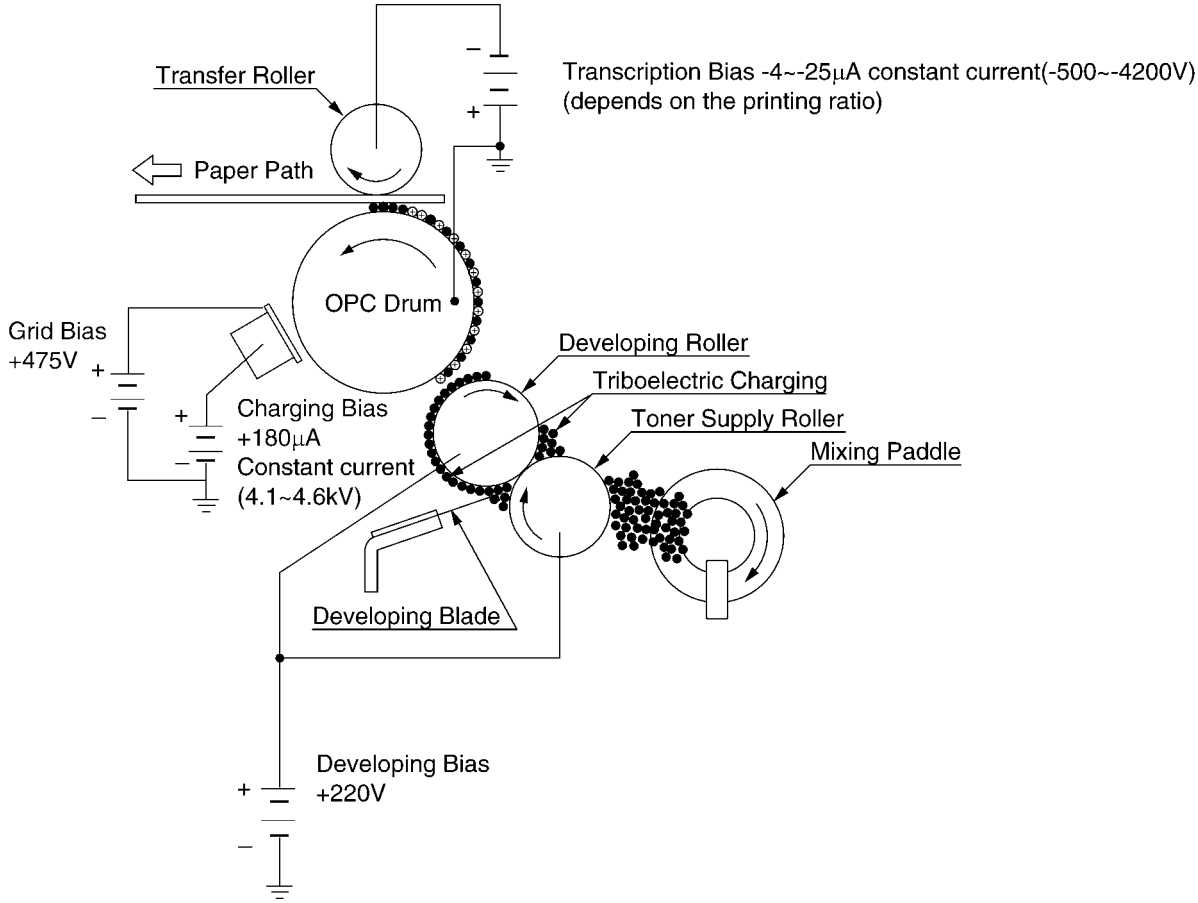


	Parts Name		Parts Name
1	Laser Diode	8	fϕ Lens
2	Polygon Motor Unit	9	BD Lens
3	Frame	10	Sponge
4	LD Block	11	Sponge
5	Collimator Lens	12	Cover
6	Aperture	13	LD PCB
7	Cy Lens	14	Pin Photodiode

15.8.5. Developing and Transcription

The developing is the stage that the OPC drum with an invisible image is changed to visible by the toner. The drum unit consists of mixing paddle, toner supply roller, developing roller, developing blade, charge wire, grid plate and OPC drum. The bias voltage is added to the developing roller and toner supply roller. Firstly the toner is mixed up in the mixing paddle and plus-charged by triboelectricity, then led to the toner supply roller. Secondly the potential difference causes to send the toner to the developing roller from the toner supply roller. The supplied toner to the developing roller is kept to a certain layer thickness by the developing blade and also it is charged by triboelectricity. Consequently the toner is transferred to the surface of the exposed OPC drum by the potential difference between the developing roller and OPC drum's surface.

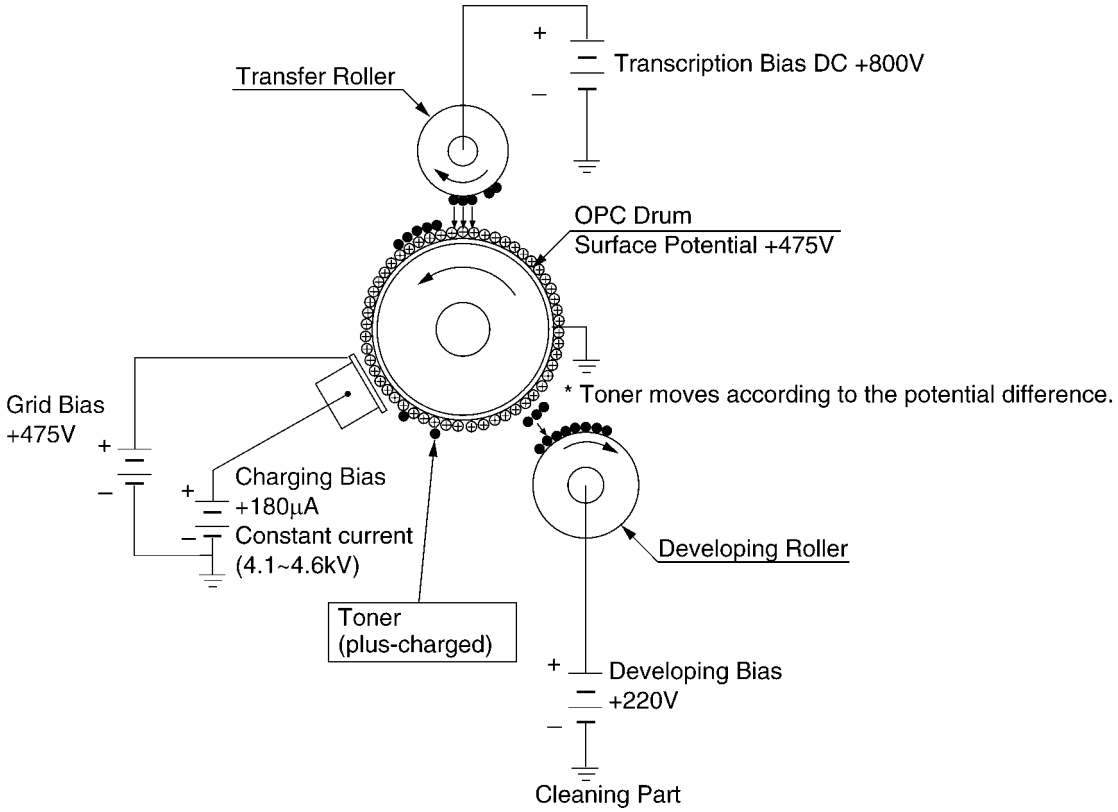
The transfer is the stage that the created image on the OPC drum is transferred to the paper. When the transfer roller is minus charged with the image, the plus-charged toner particles are gathered on the surface of the drum and transferred to the paper.



Developing and Transcription Part

15.8.6. Cleaning of Transfer Roller

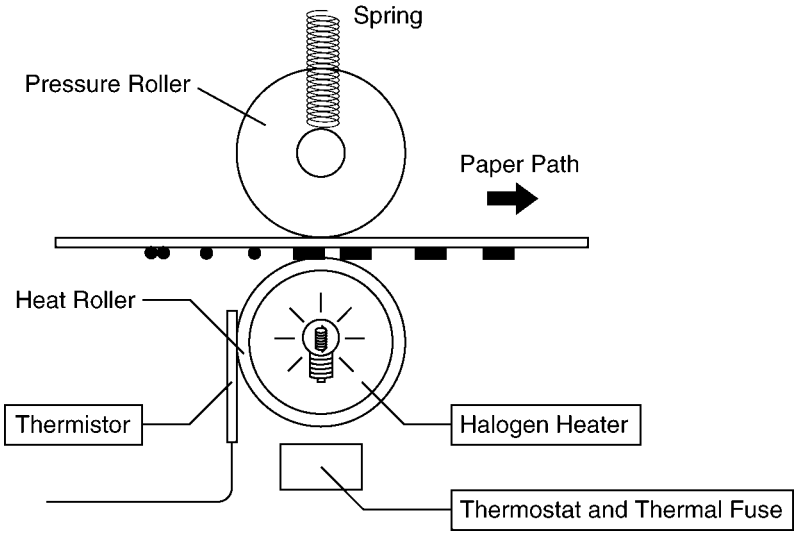
The toner attached to the surface of the OPC drum is transferred to the paper at the transcription stage, but a part of the toner remains. The cleaning is the stage that cleans the remain toner after the transcription stage. The remain toner on the drum and the toner which was attached to the place where the laser beam didn't scan are gathered to the developing roller to be used again. After paper jam or replacing toner and drum unit, the transfer roller is plus-charged to eliminate the plus-charged toner.



Cleaning Part

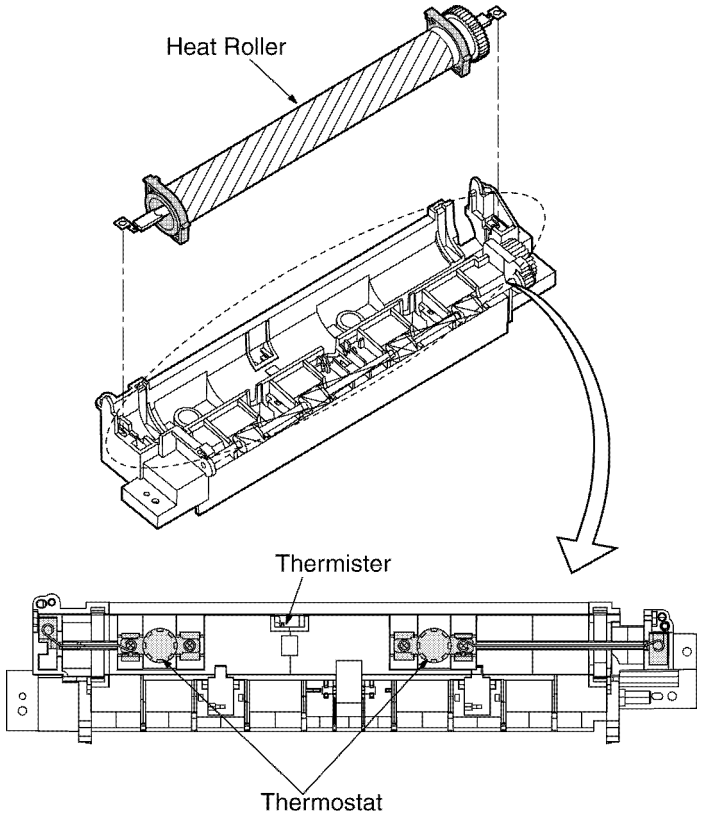
15.8.7. Fixing

On the process of the transfer, the transferred toner is weakly attached on the paper. Fixing means the process to fix the toner on the paper permanently. The fixing part melts the toner at the high temperature using the halogen heater. The toner is fixed on the paper by the heat and pressure through the fixing part with the image. The surface of the heat roller is rosined by Teflon and lubricated to prevent from attaching the toners. The press roller is made of silicon, and its spring compresses the melted toner.

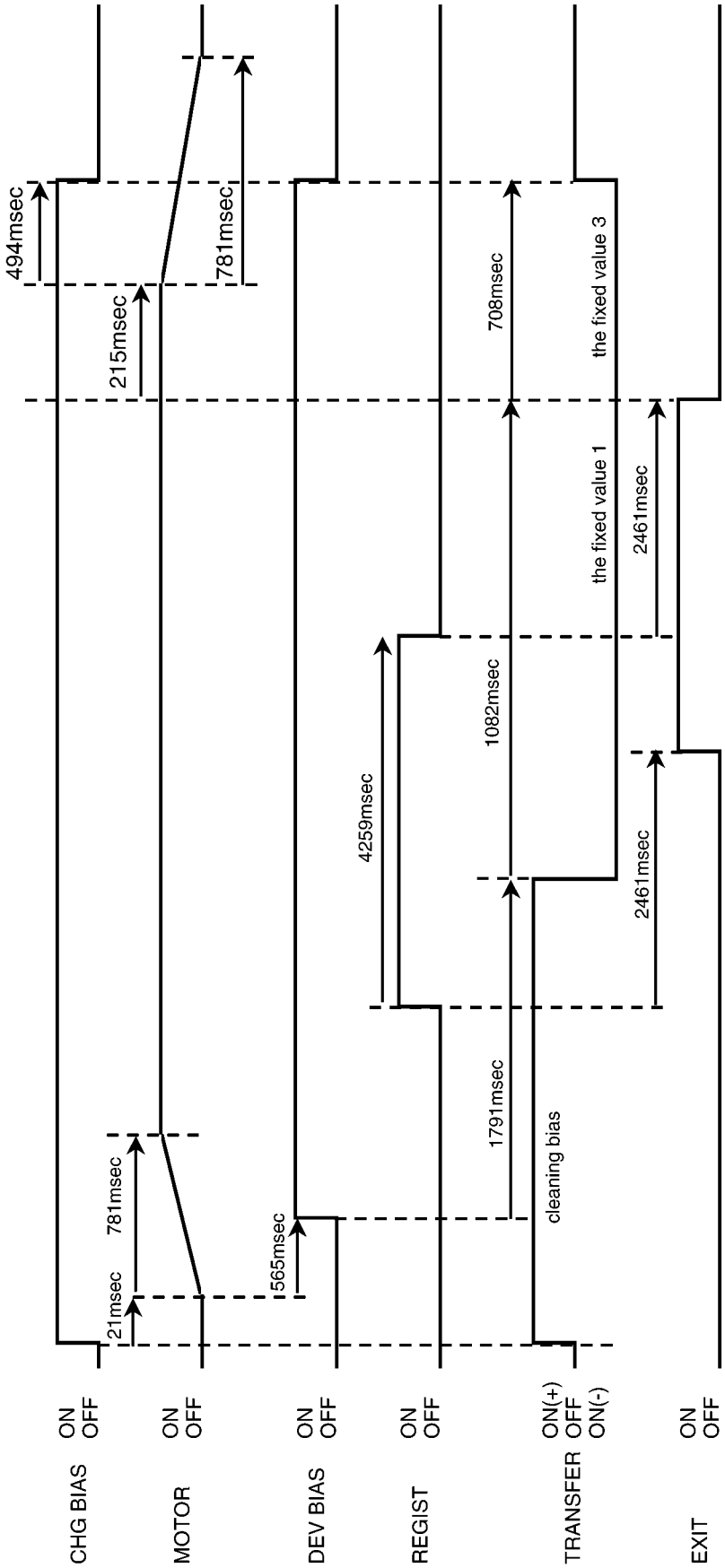


The fixing part becomes high temperature, so the thermistor and the thermal fuse are provided.

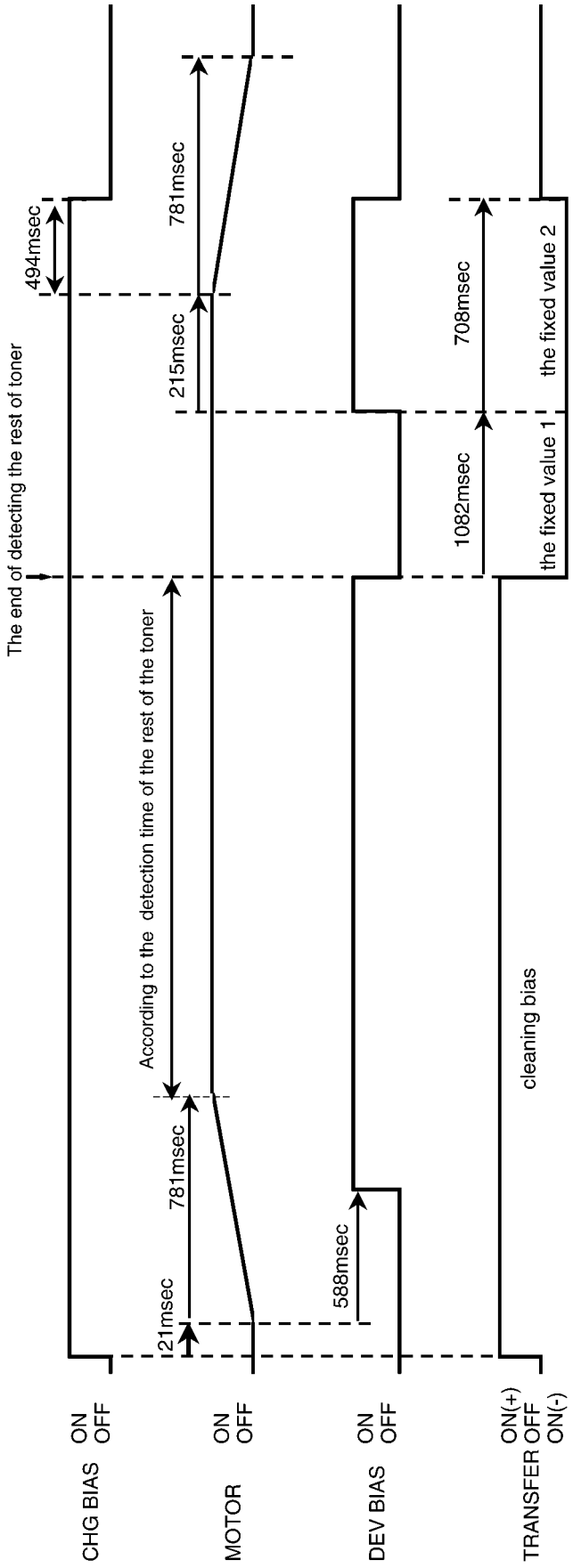
1. Thermistor
   The thermistor touches the heat roller and check the temperature to feed back to the control circuit. The surface temperature should be kept 145~165°C while printing.
2. Thermostat
   The thermostat takes the same role with the thermal fuse. The thermostat is located near the heat roller, and it turns OFF the power when the temperature around the thermostat becomes over 135°C.



15.8.8. Timing Chart (When Printing One Sheets of Paper) BASIC



15.8.9. Timing Chart [Initializing (Long)]



Long Initialization
- When the cover is closed after power is turned ON or when the power is turned ON with the cover closed.)
- When the developer is removed. (When the cover is closed after the developer is removed.)
- When the cover is closed after the toner becomes LOW.
- When the cover is closed after the Jam is released.

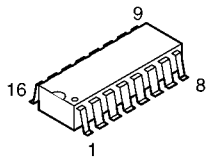
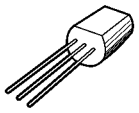
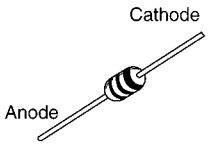
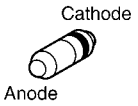
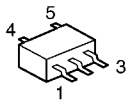
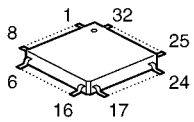
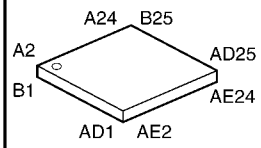
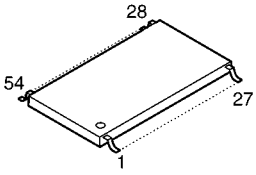
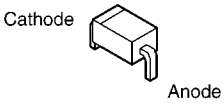
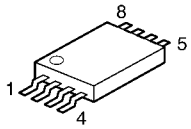
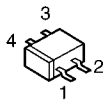
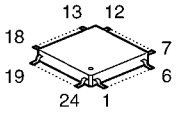
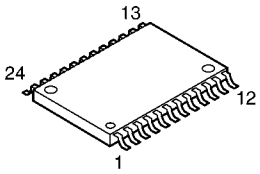
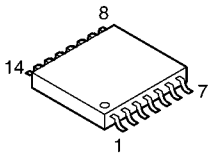
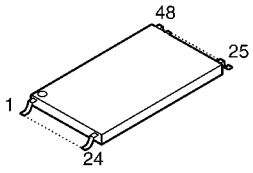
After FAILED PICK UP is released. (The initialization of the pick up roller position)

Aging: Once/day

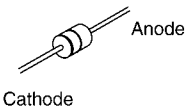
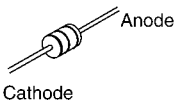
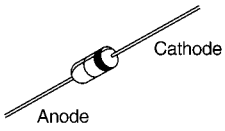
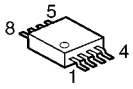
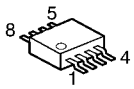
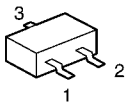
* In case that the abnormal paddle signal is detected during initialization, the motor is forced to stop without completion processing, on the other hand when it is detected during printing the process will be completed as usual. (To prevent the unit from being destructed by the OPC transfer voltage)

15.9. Terminal Guide of the ICs Transistors and Diodes

15.9.1. Digital Board

 B1HAGFF00015	 B1BCBD000002	 B0BA7R900004	 2SB0710ARL	 B0ACDM000002
 B1ABDF000025 B1ADCF000011 B1CBGD000001 B1ABCF000020 B1GBCFJJ0048	 B1CHND000004	 C0BBAA000008 C0EBE0000504	 C1CB00003161	 C1ZBZ0004052
 C3ABPY000027	 UNR91ANJ0L UNR92ALJ0L UNR92ANJ0L 2SD2216JRL UNR92A8J0L	 B0ACEL000004	 C0ABEB000023	 C0CBAAA00041
 C0DBAYY00435	 C0GBY0000059	 C0JBAS000128	 MA3J142E0L	 C3FBND000417

15.9.2. Analog Board

 MAZ41200MF	 MAZ40300MF	 B0ADEJ000026	 B0AACK000004	 C0ABEB000083
 C1AB00002556	 B4ZZ00000021	 B1ABDF000026 B1GBCFEN0010 B1ABDF000025		

15.10. How to Replace the Flat Package IC

Even if you do not have the special tools (for example, a spot heater) to remove the Flat IC, with some solder (large amount), a soldering iron and a cutter knife, you can easily remove the ICs that have more than 100 pins.

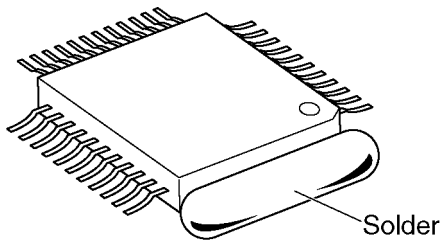
15.10.1. Preparation

15.10.1.1. For Power Supply Board

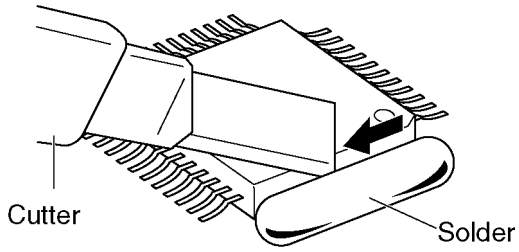
- SOLDER
  Sparkle Solder 115A-1, 115B-1 OR Almit Solder KR-19, KR-19RMA
- Soldering iron
  Recommended power consumption is between 30 W to 40 W.
  Temperature of Copper Rod 662 ± 50°F (350 ± 10°C)
  (An expert may handle a 60~80 W iron, but a beginner might damage the foil by overheating.)
- Flux
  HI115 Specific gravity 0.863
  (Original flux should be replaced daily.)

15.10.2. Flat Package IC Removal Procedure

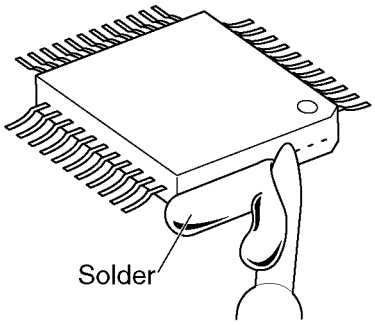
1. Put plenty of solder on the IC pins so that the pins can be completely covered.
   Note:
   If the IC pins are not soldered enough, you may give pressure to the P.C. board when cutting the pins with a cutter.



2. Make a few cuts into the joint (between the IC and its pins) first and then cut off the pins thoroughly.



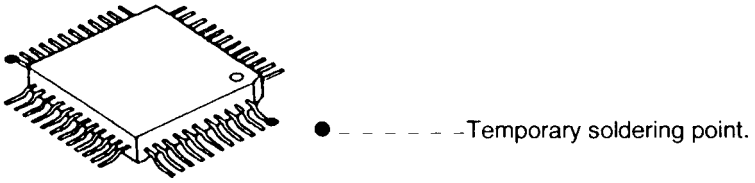
3. While the solder melts, remove it together with the IC pins.



When you attach a new IC to the board, remove all solder left on the land with some tools like a soldering wire. If some solder is left at the joint on the board, the new IC will not be attached properly.

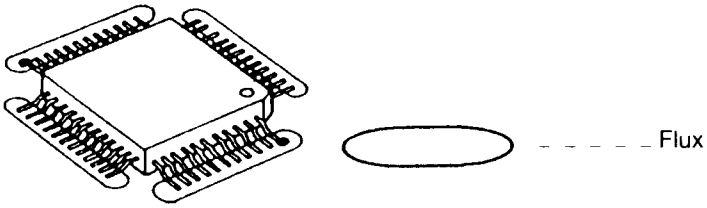
15.10.3. Flat Package IC Installation Procedure

1. Temporarily fix the FLAT PACKAGE IC, soldering the two marked pins.

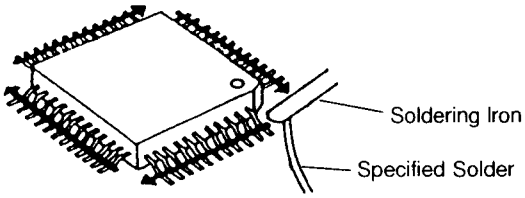


*Check the accuracy of the IC setting with the corresponding soldering foil.

2. Apply flux to all pins of the FLAT PACKAGE IC.

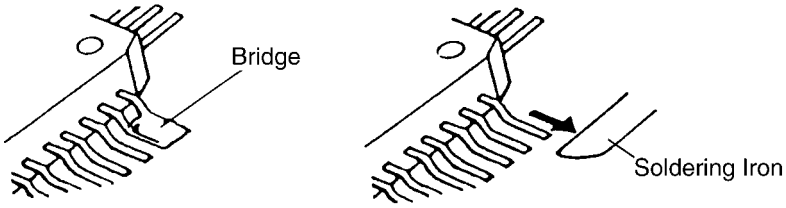


3. Solder the pins, sliding the soldering iron in the direction of the arrow.



15.10.4. Bridge Modification Procedure

1. Lightly resolder the bridged portion.
2. Remove the remaining solder along the pins using a soldering iron as shown in the figure below.

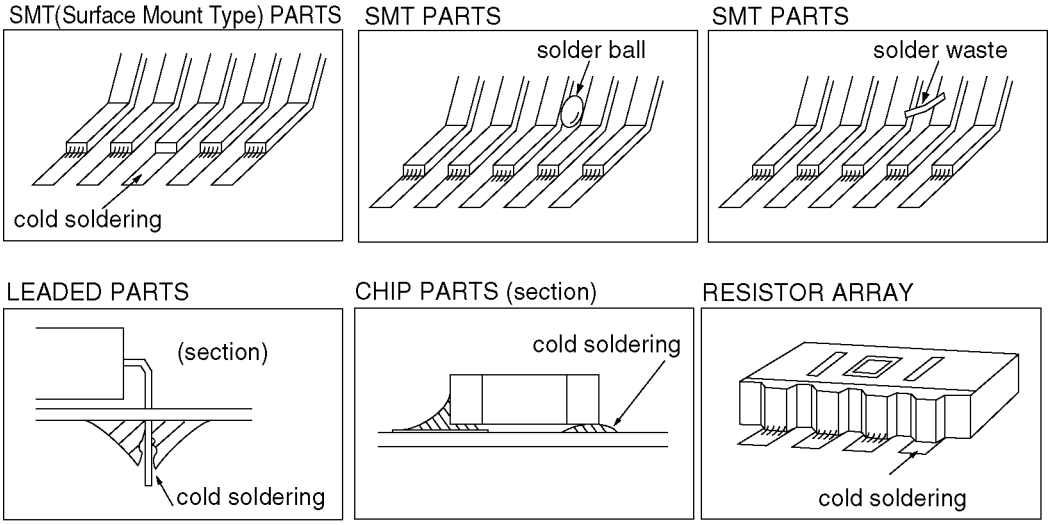


15.11. Digital Board Section

When the unit fails to boot up the system, take the troubleshooting procedures very carefully. It may have a serious problem.

The symptom: No response when the power is turned on. (No LCD display, and keys are not accepted.)

The first step is to check the power source. If there is no problem with the power supply unit, the problem may lie in the digital unit (main board).
As there are many potential causes in this case (ASIC, DRAM, etc.), it may be difficult to specify what you should check first. If a mistake is made in the order of checks, a normal part may be determined faulty, wasting both time and money.
Although the tendency is to regard the problem as a serious one (IC malfunction, etc.), usually most cases are caused by solder faults (poor contact due to a tunnel in the solder, signal short circuit due to solder waste).



Note:

1. Electrical continuity may have existed at the factory check, but a faulty contact occurred as a result of vibration, etc., during transport.
2. Solder waste remaining on the board may get caught under the IC during transport, causing a short circuit.

Before we begin mass production, several hundred trial units are produced at the plant, various tests are applied and any malfunctions are analyzed. (In past experiences, digital IC (especially, DRAM and ROM) malfunctions are extremely rare after installation in the product.)
This may be repaired by replacing the IC, (DRAM etc.). However, the real cause may not have been an IC malfunction but a soldering fault instead.
Soldering faults difficult to detect with the naked eye are common, particularly for ASIC and RA (Resistor Array). But if you have an oscilloscope, you can easily determine the problem site or IC malfunction by checking the main signal lines.
Even if you don't have such a measuring instrument, by checking each main signal line and resoldering it, in many cases the problem will be resolved.
An explanation of the main signals (for booting up the unit) is presented below.

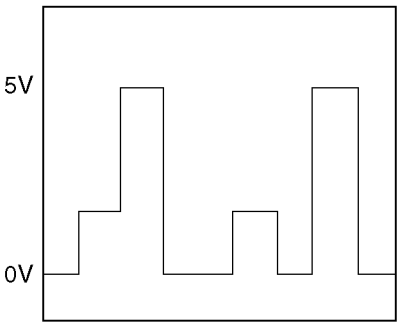
> Don't replace ICs or stop repairing until checking the signal lines.
> An IC malfunction rarely occurs. (By understanding the necessary signals for booting up the unit, the "Not Boot up" display is not a serious problem.)

What are the main signals for booting up the unit?

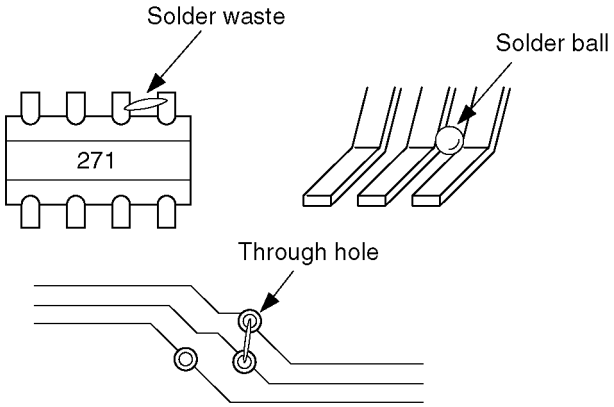
Please refer to **General Block Diagram** (P.14).
The ASIC (IC106) controls all the other digital ICs. When the power is turned on, the ASIC retrieves the operation code stored in the ROM (IC105), then follows the instructions for controlling each IC. All ICs have some inner registers that are assigned to a certain address.
It is the address bus by which the ASIC designates the location inside each IC. And the data bus reads or writes the data in order to transmit the instructions from the ASIC to the ICs.
These signal lines are all controlled by voltages of 3.3V (H) or 0V (L).

15.11.1. NG Example

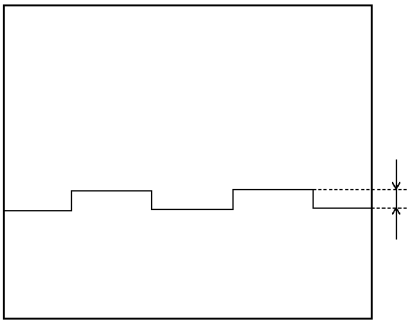
1.



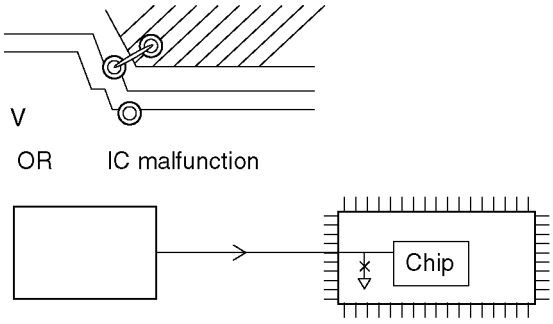
Short circuit from the adjacent signal wires.
Check for a short circuit in the RA and IC leads and the signal wire at the through hole.



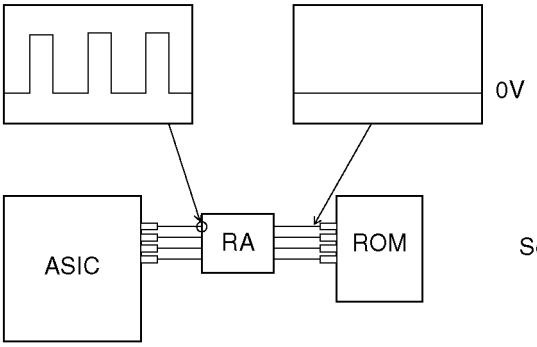
2.



Short between the signal line and GND.



3.



Solder fault on RA.

15.12. Test Chart

15.12.1. ITU-T No.1 Test Chart

THE SLEREXE COMPANY LIMITED

SAPORS LANE - BOOLE - DORSET - BH 25 8 ER

TELEPHONE BOOLE (945 13) 51617 - TELEX 123456

Our Ref. 350/PJC/EAC 18th January, 1972.

Dr. P.N. Cundall,
Mining Surveys Ltd.,
Holroyd Road,
Reading,
Berks.

Dear Pete,

Permit me to introduce you to the facility of facsimile transmission.

In facsimile a photocell is caused to perform a raster scan over the subject copy. The variations of print density on the document cause the photocell to generate an analogous electrical video signal. This signal is used to modulate a carrier, which is transmitted to a remote destination over a radio or cable communications link.

At the remote terminal, demodulation reconstructs the video signal, which is used to modulate the density of print produced by a printing device. This device is scanning in a raster scan synchronised with that at the transmitting terminal. As a result, a facsimile copy of the subject document is produced.

Probably you have uses for this facility in your organisation.

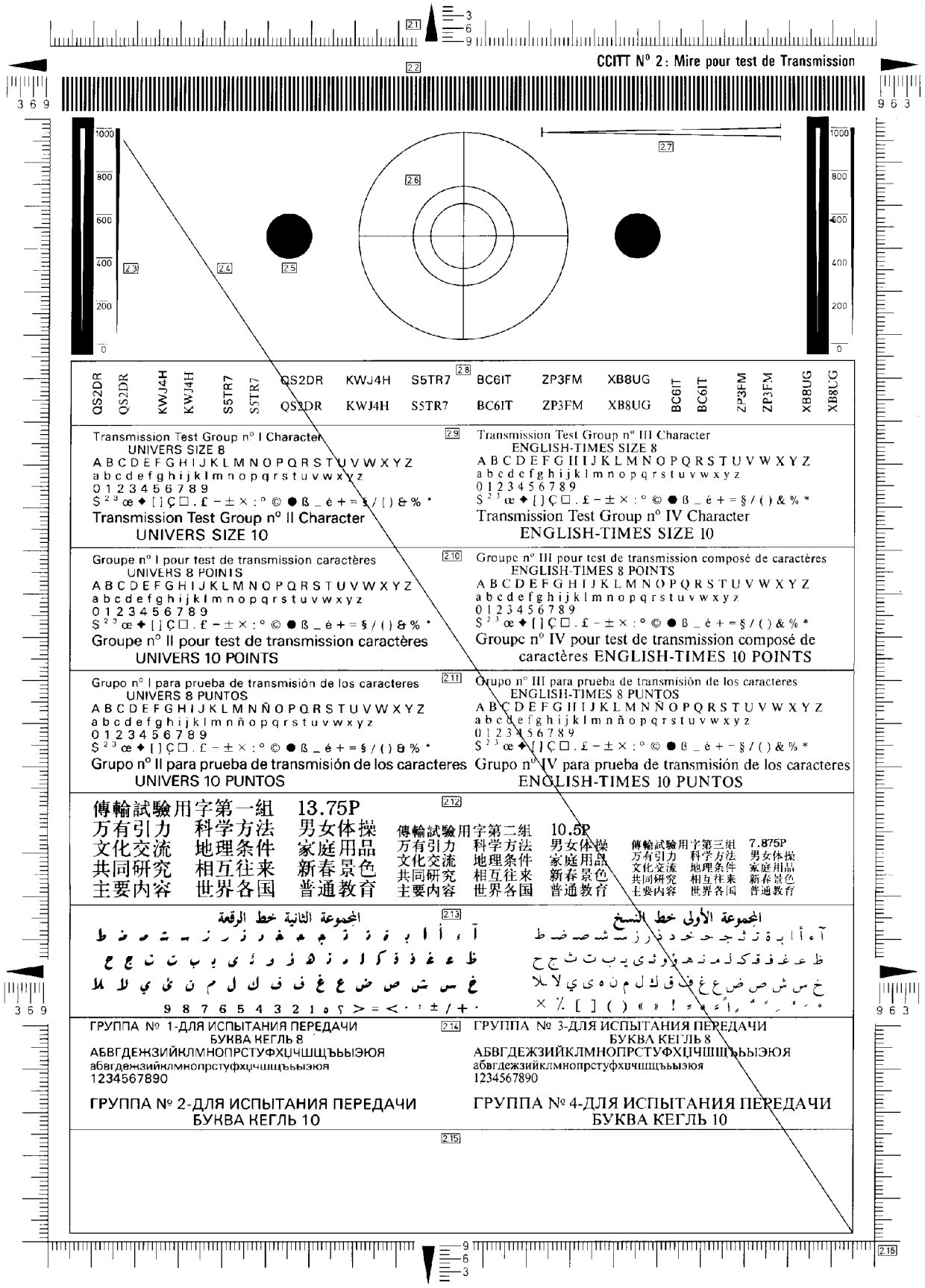
Yours sincerely,

Phil.

P.J. CROSS
Group Leader - Facsimile Research

Registered in England: No. 2038
Registered Office: 60 Vicara Lane, Ilford, Essex.

15.12.2. ITU-T No.2 Test Chart

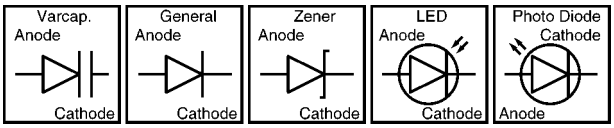


16 Schematic Diagram

16.1. For Schematic Diagram

Note:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagrams and circuit board may be modified at any time with the development of new technology.

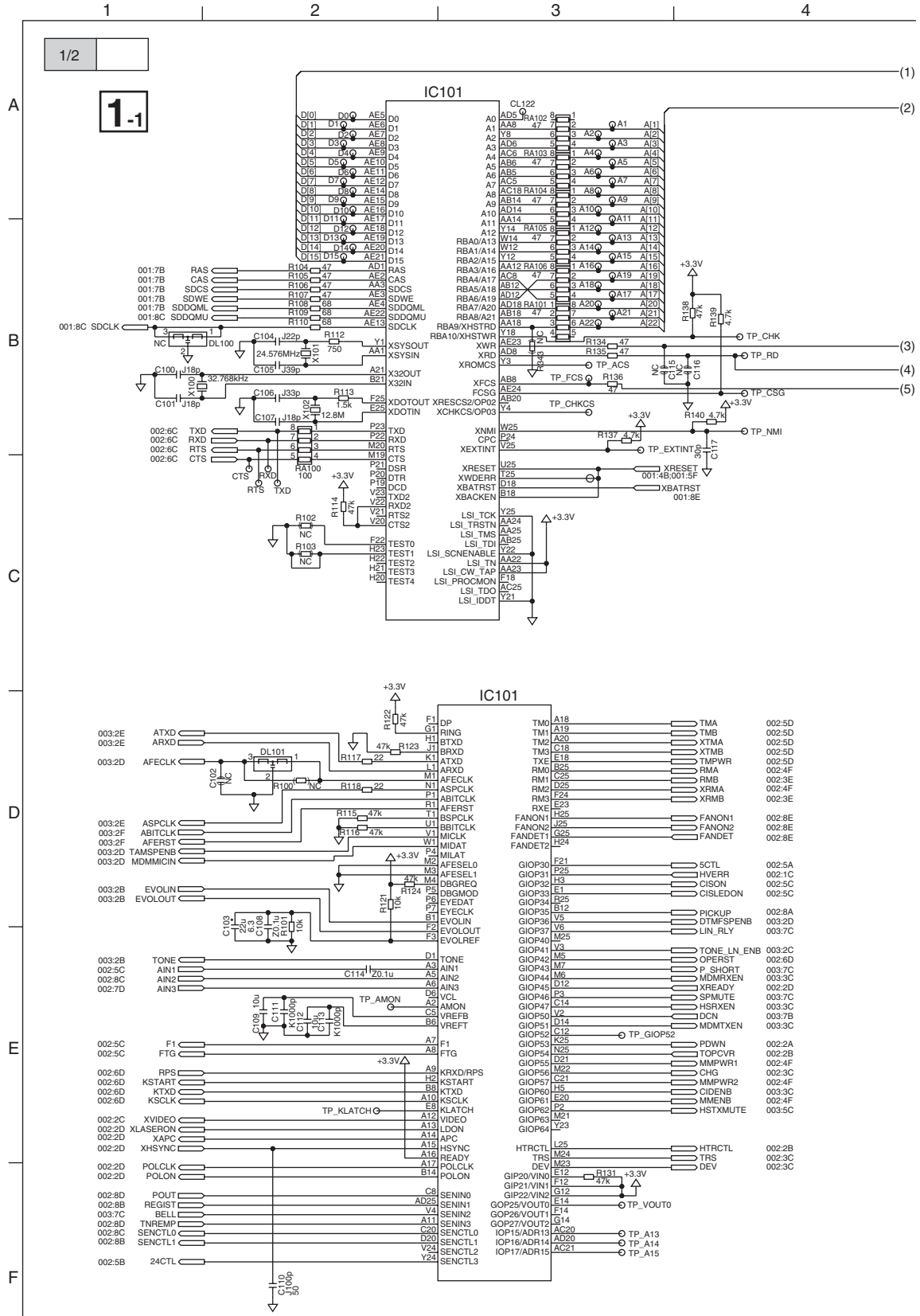


Important safety notice
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

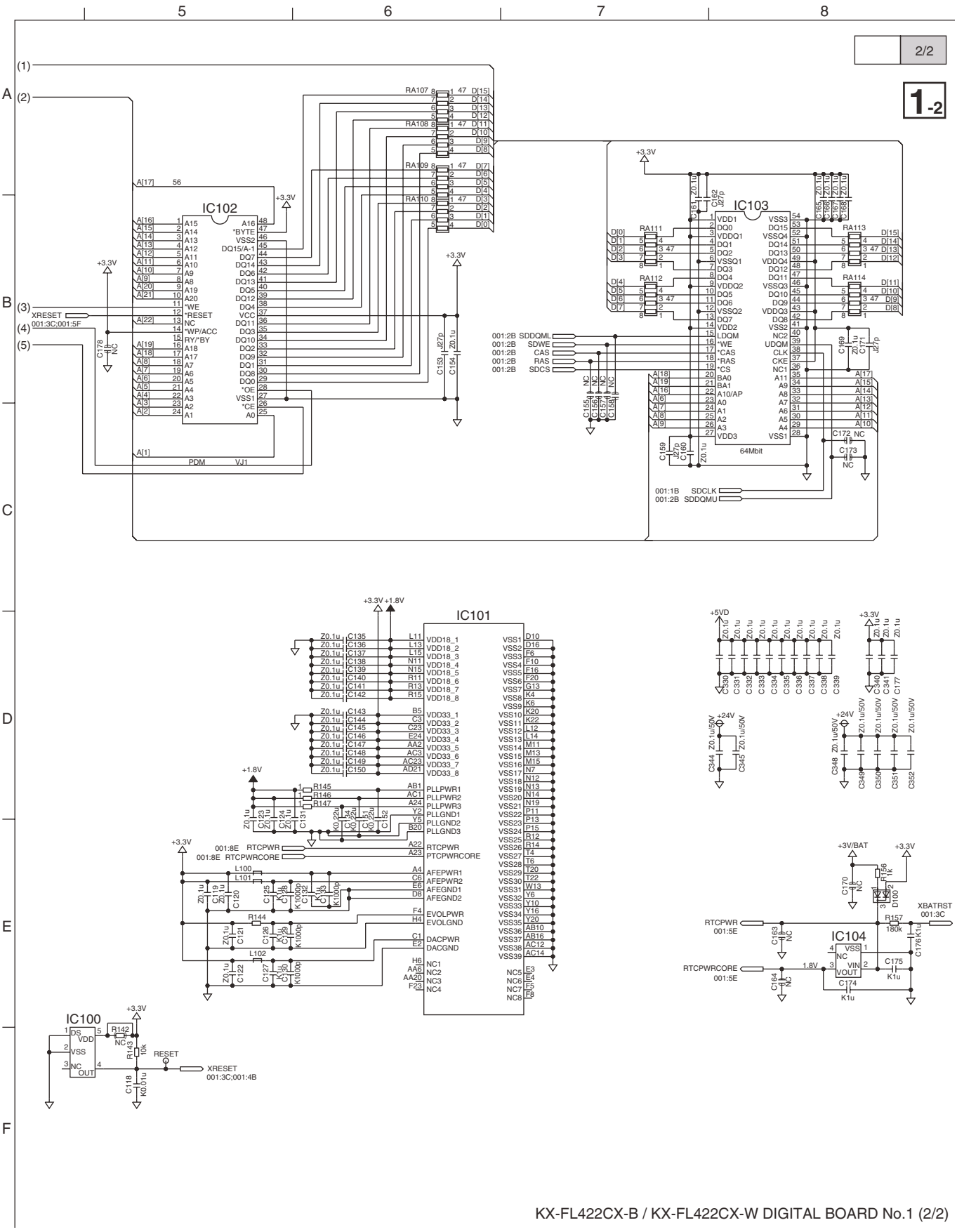
Memo

16.2. Digital Board (PCB1)

16.2.1. Digital Board(1)

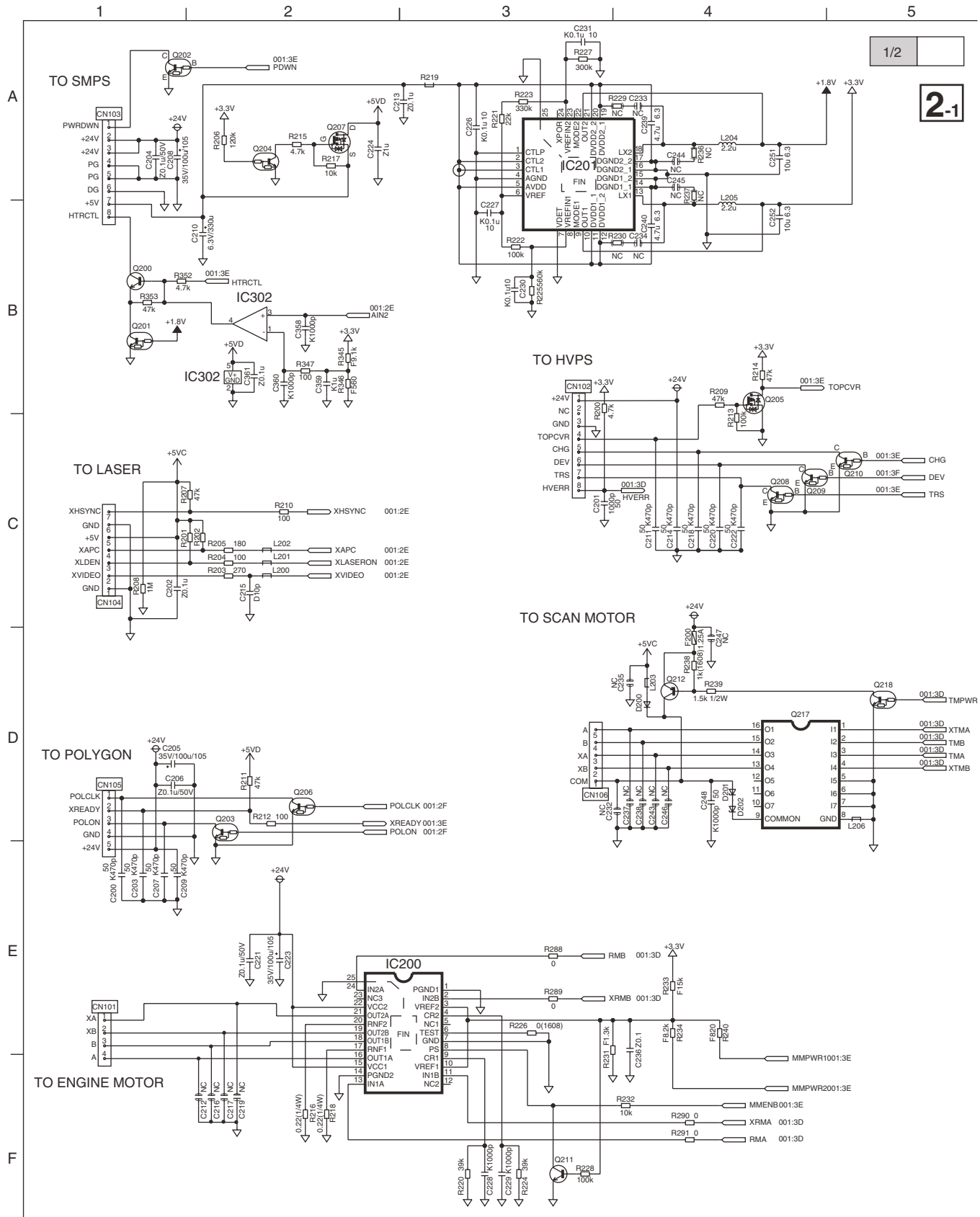


KX-FL422CX-B / KX-FL422CX-W DIGITAL BOARD No.1 (1/2)

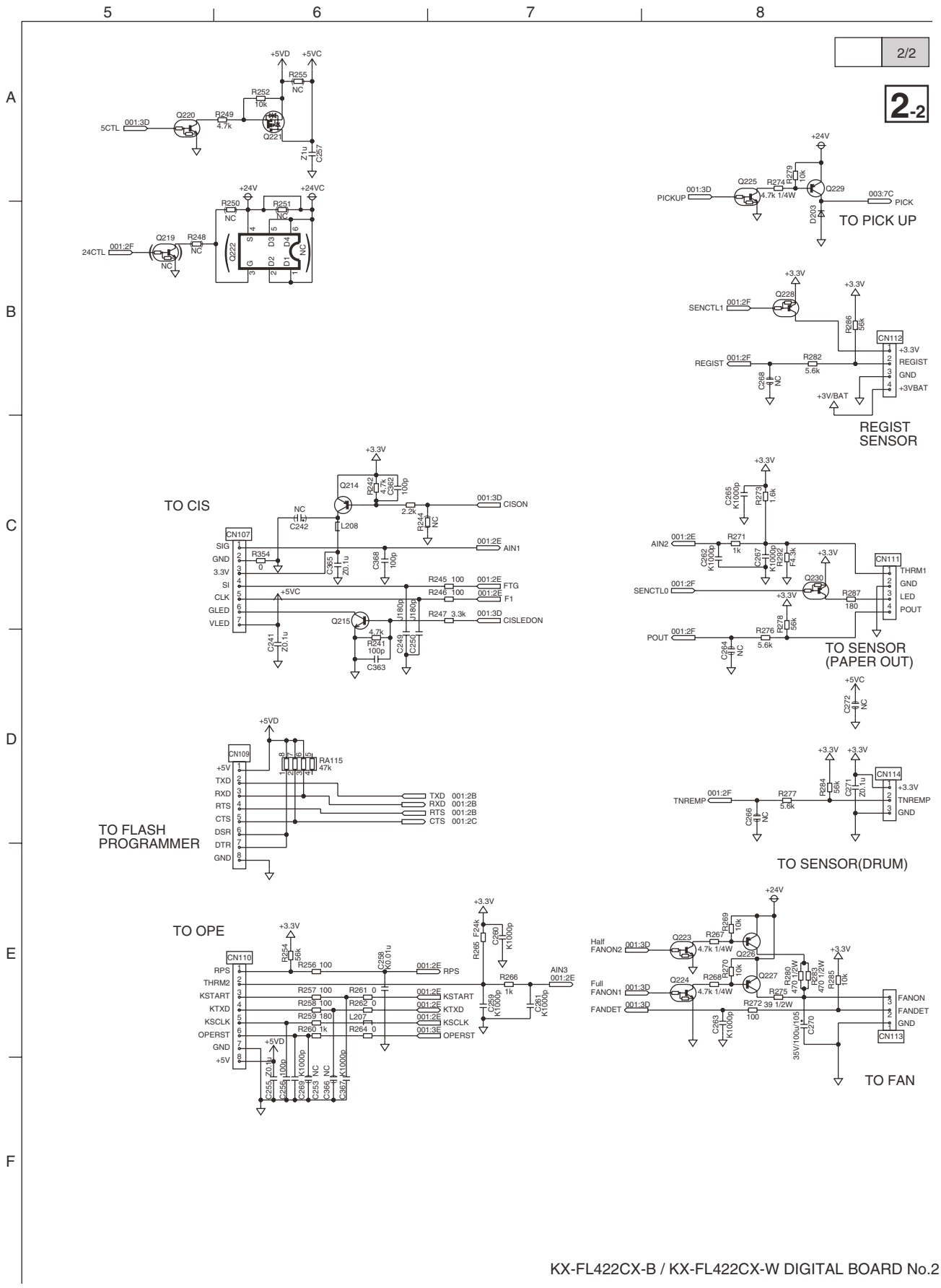


KX-FL422CX-B / KX-FL422CX-W DIGITAL BOARD No.1 (2/2)

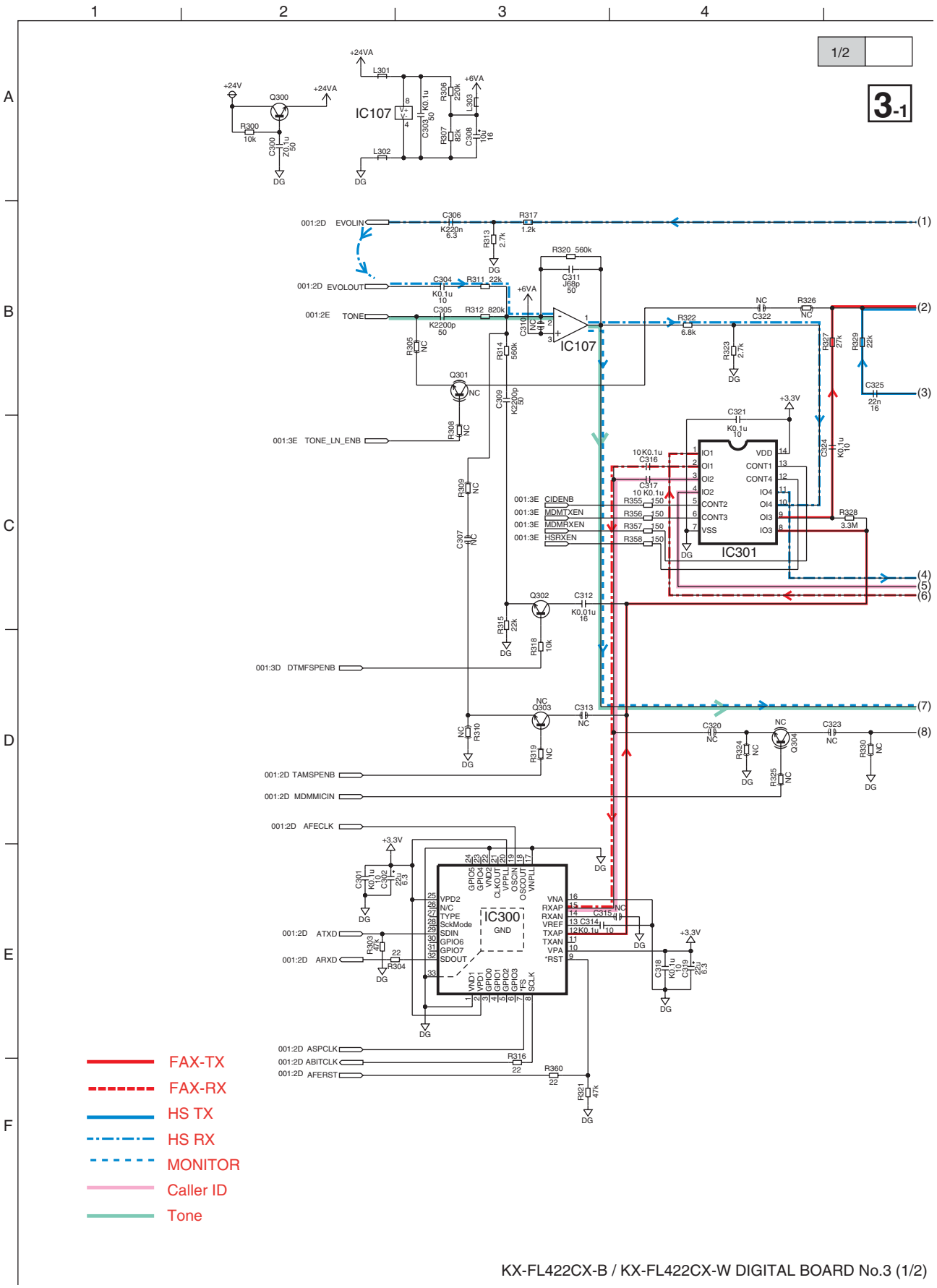
16.2.2. Digital Board(2)



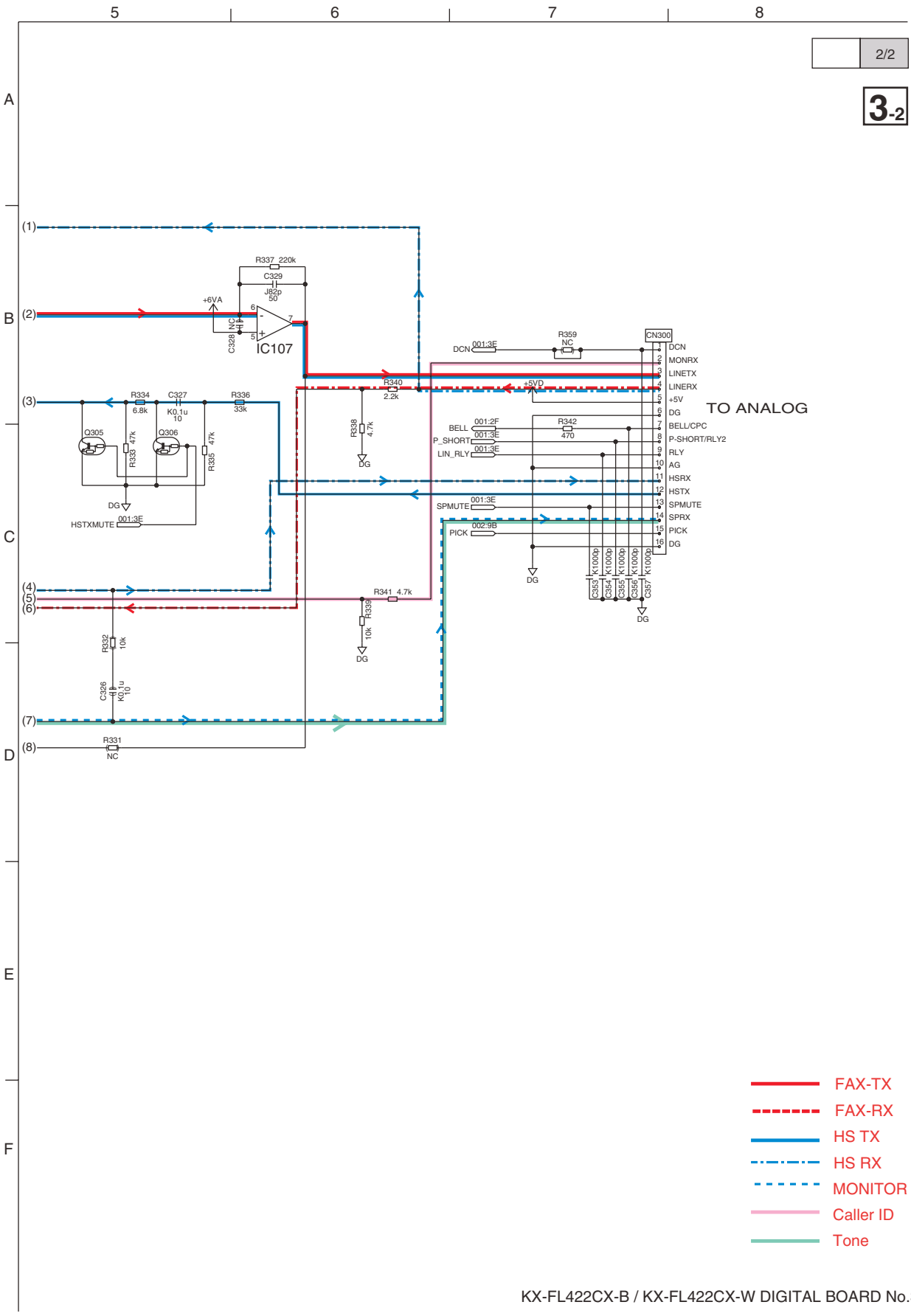
KX-FL422CX-B / KX-FL422CX-W DIGITAL BOARD No.2 (1/2)


5
6
7
8
A
B
C
D
E
F
2/2
2-2
TO PICK UP
REGIST SENSOR
TO CIS
TO SENSOR (PAPER OUT)
TO FLASH PROGRAMMER
TO SENSOR(DRUM)
TO OPE
TO FAN

16.2.3. Digital Board(3)

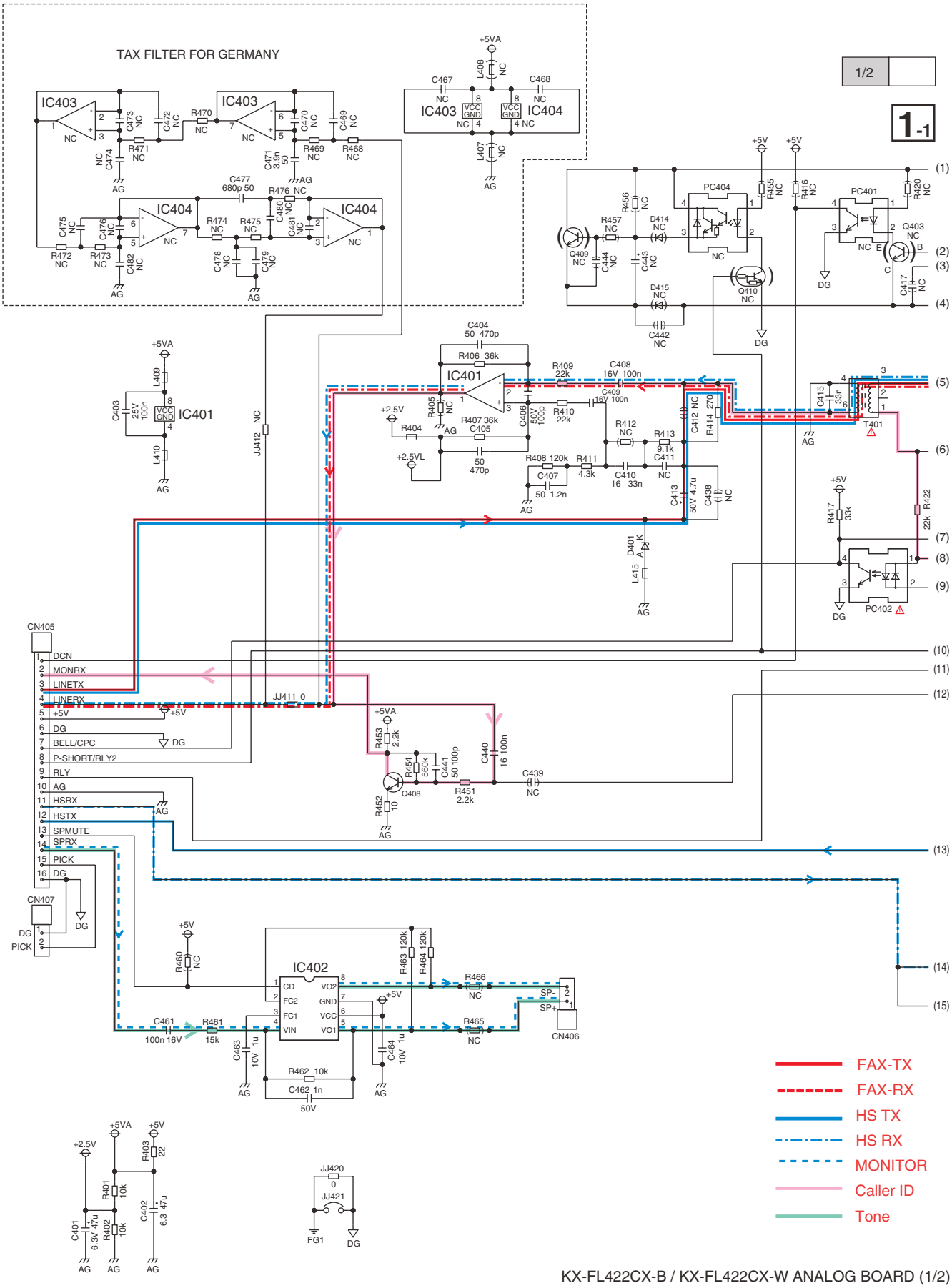


KX-FL422CX-B / KX-FL422CX-W DIGITAL BOARD No.3 (1/2)



KX-FL422CX-B / KX-FL422CX-W DIGITAL BOARD No.3 (2/2)

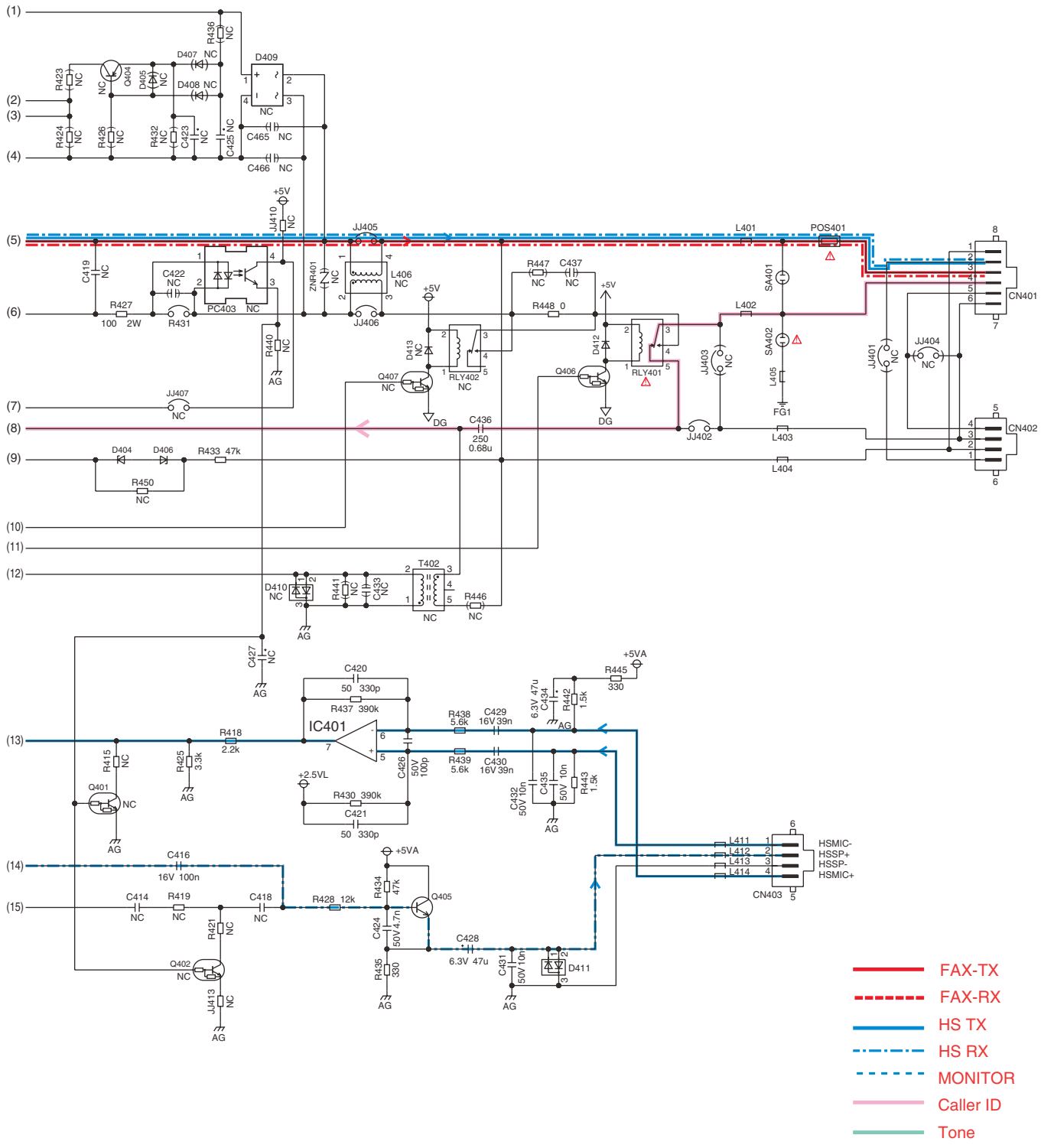
16.3. Analog Board (PCB2)



KX-FL422CX-B / KX-FL422CX-W ANALOG BOARD (1/2)

2/2

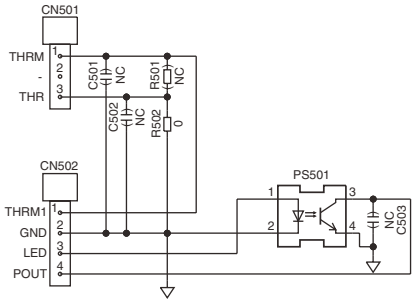
1-2



KX-FL422CX-B / KX-FL422CX-W ANALOG BOARD (2/2)

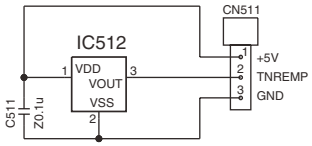
16.4. Sensor Boards (PCB3-6)

EXIT SENSOR



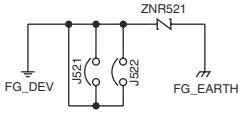
KX-FL422CX-B / KX-FL422CX-W EXIT SENSOR BOARD

DRUM & TONER SENSOR



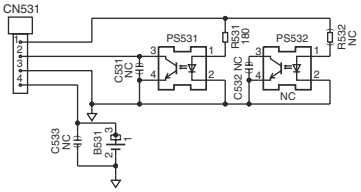
KX-FL422CX-B / KX-FL422CX-W DRUM & TONER SENSOR BOARD

VARISTOR SENSOR



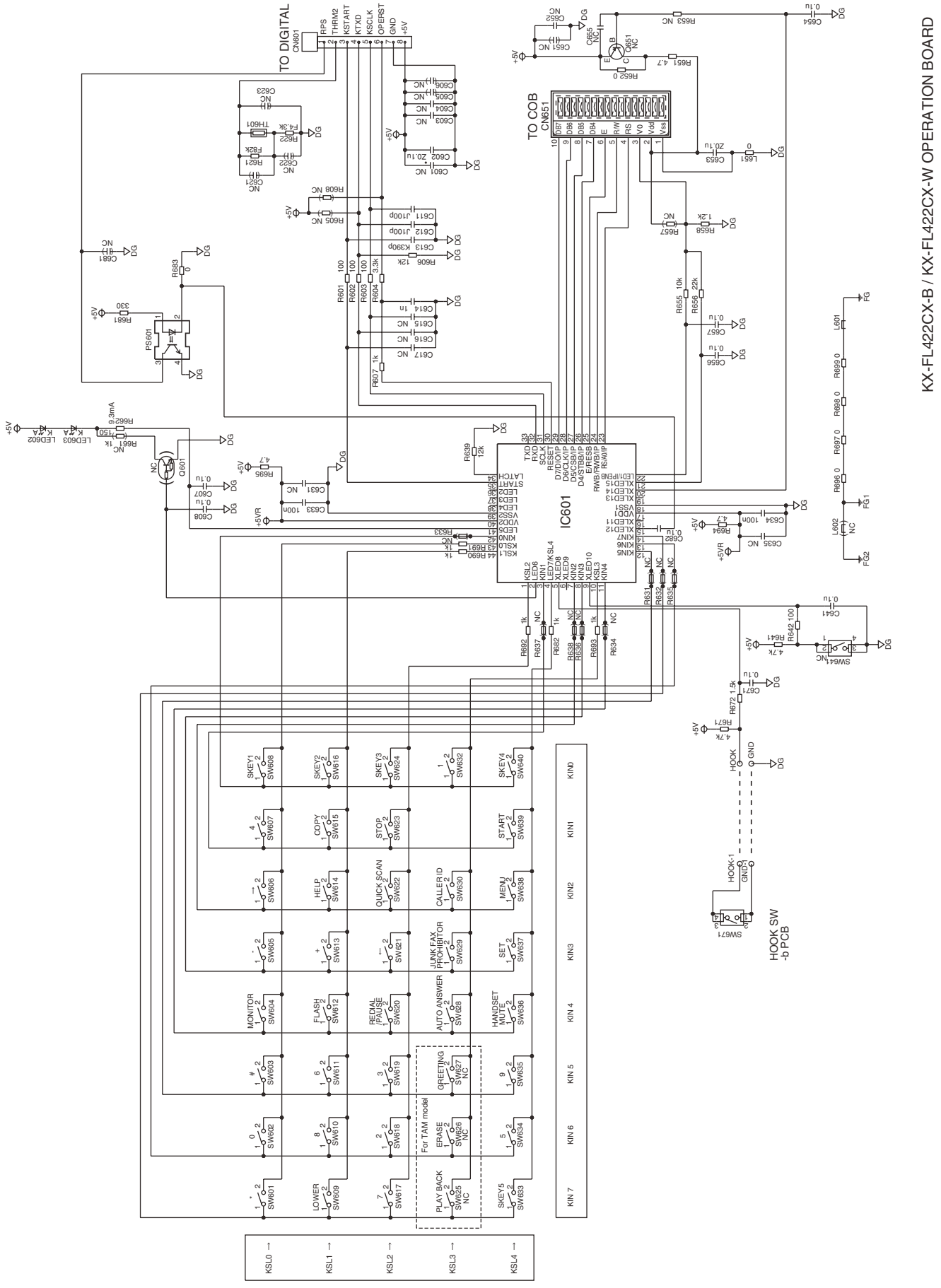
KX-FL422CX-B / KX-FL422CX-W VARISTOR SENSOR BOARD

RESIST SENSOR

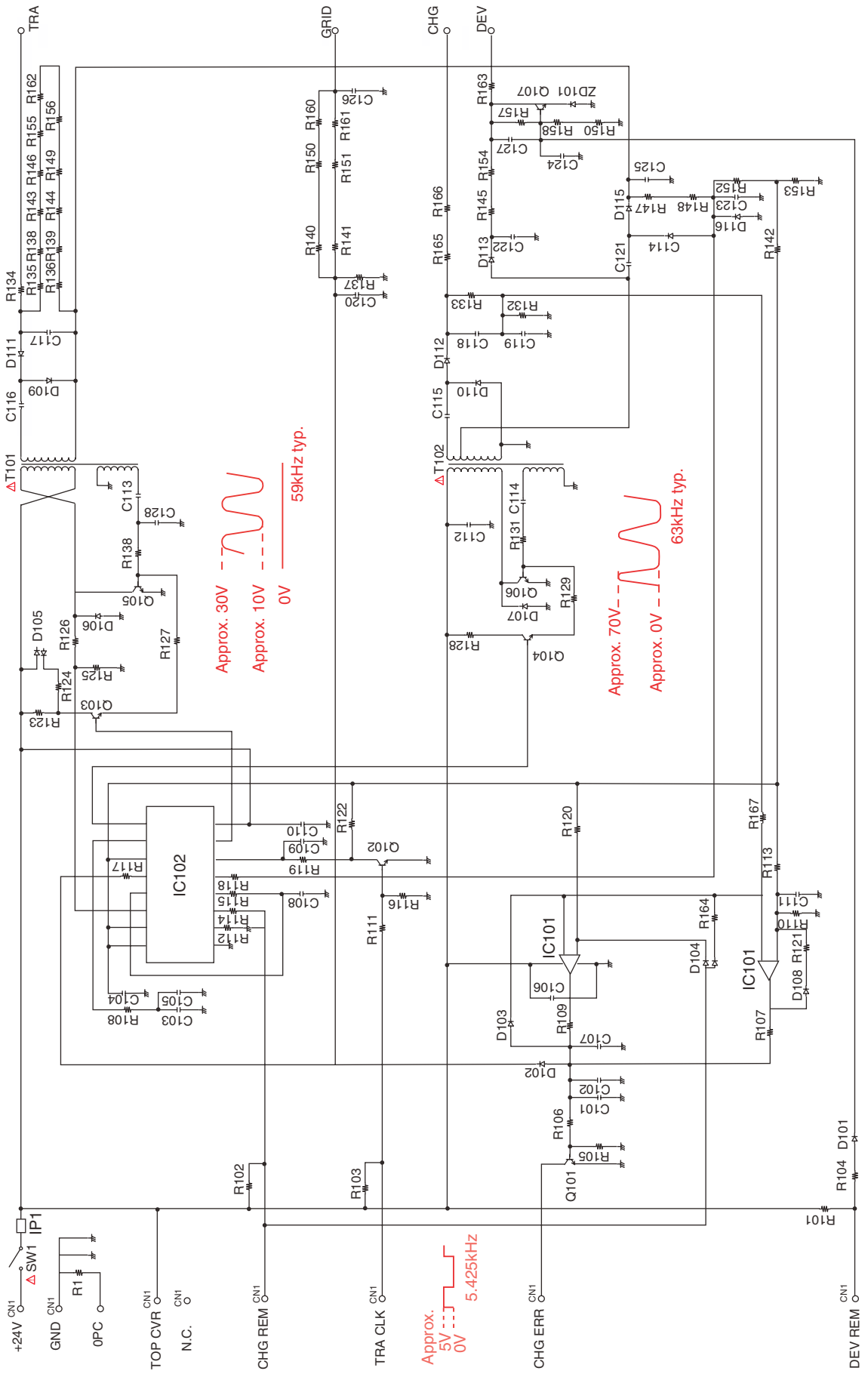


KX-FL422CX-B / KX-FL422CX-W RESIST SENSOR BOARD

16.5. Operation Board (PCB7)

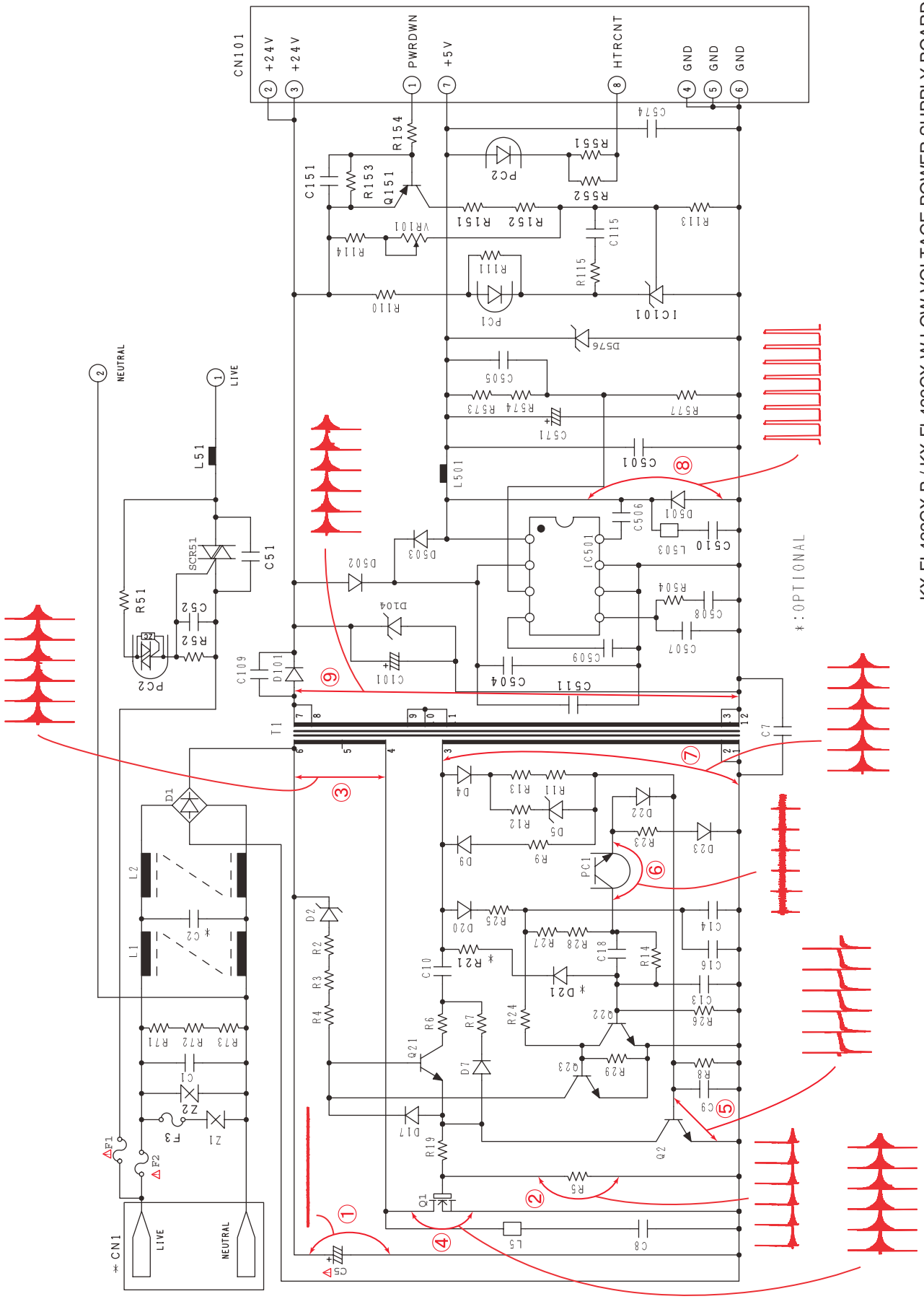


16.6. High Voltage Power Supply Board (PCB8)



KX-FL422CX-B / KX-FL422CX-W HIGH VOLTAGE POWER SUPPLY BOARD

16.7. Low Voltage Power Supply Board (PCB9)

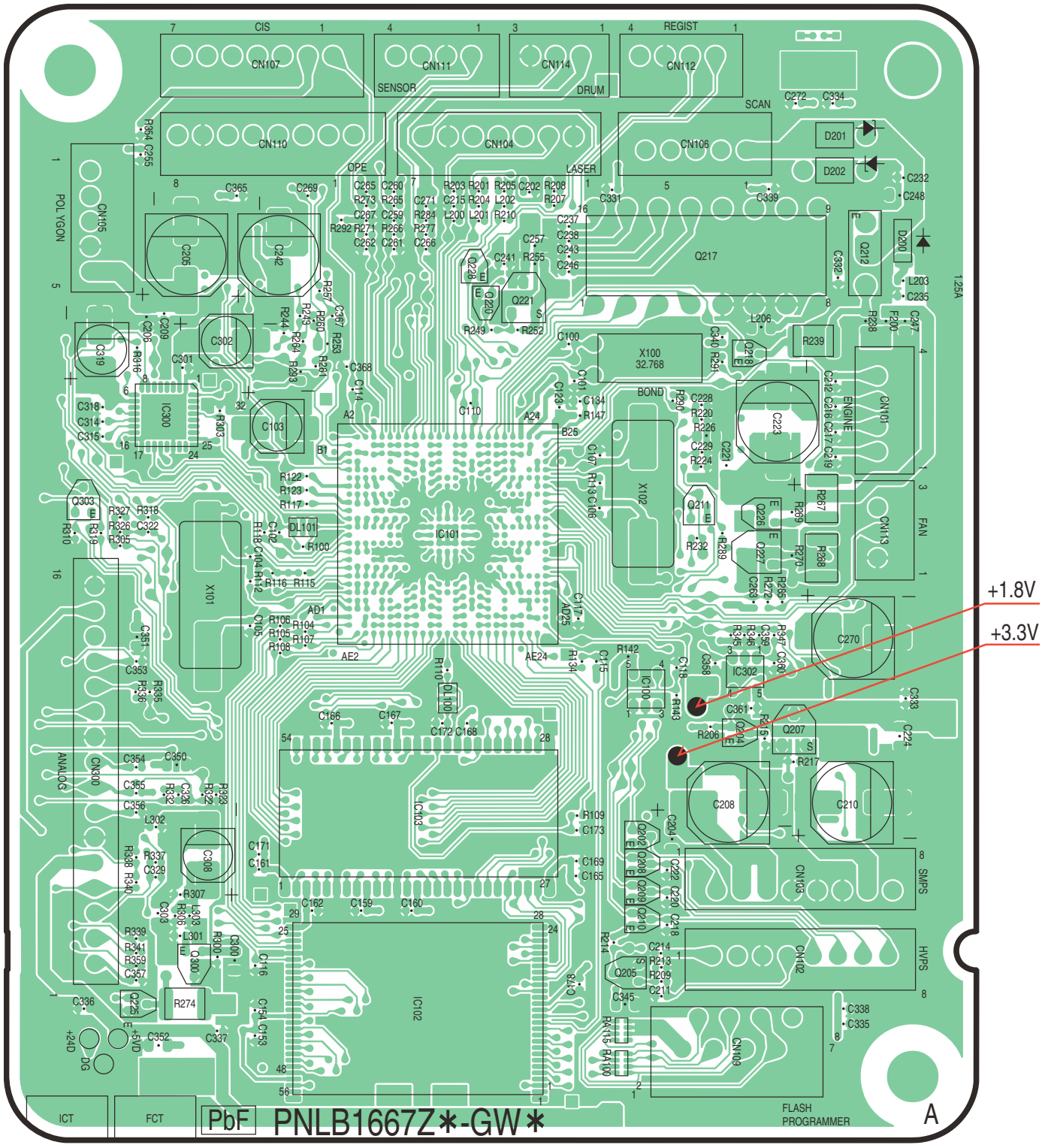


Memo

17 Printed Circuit Board

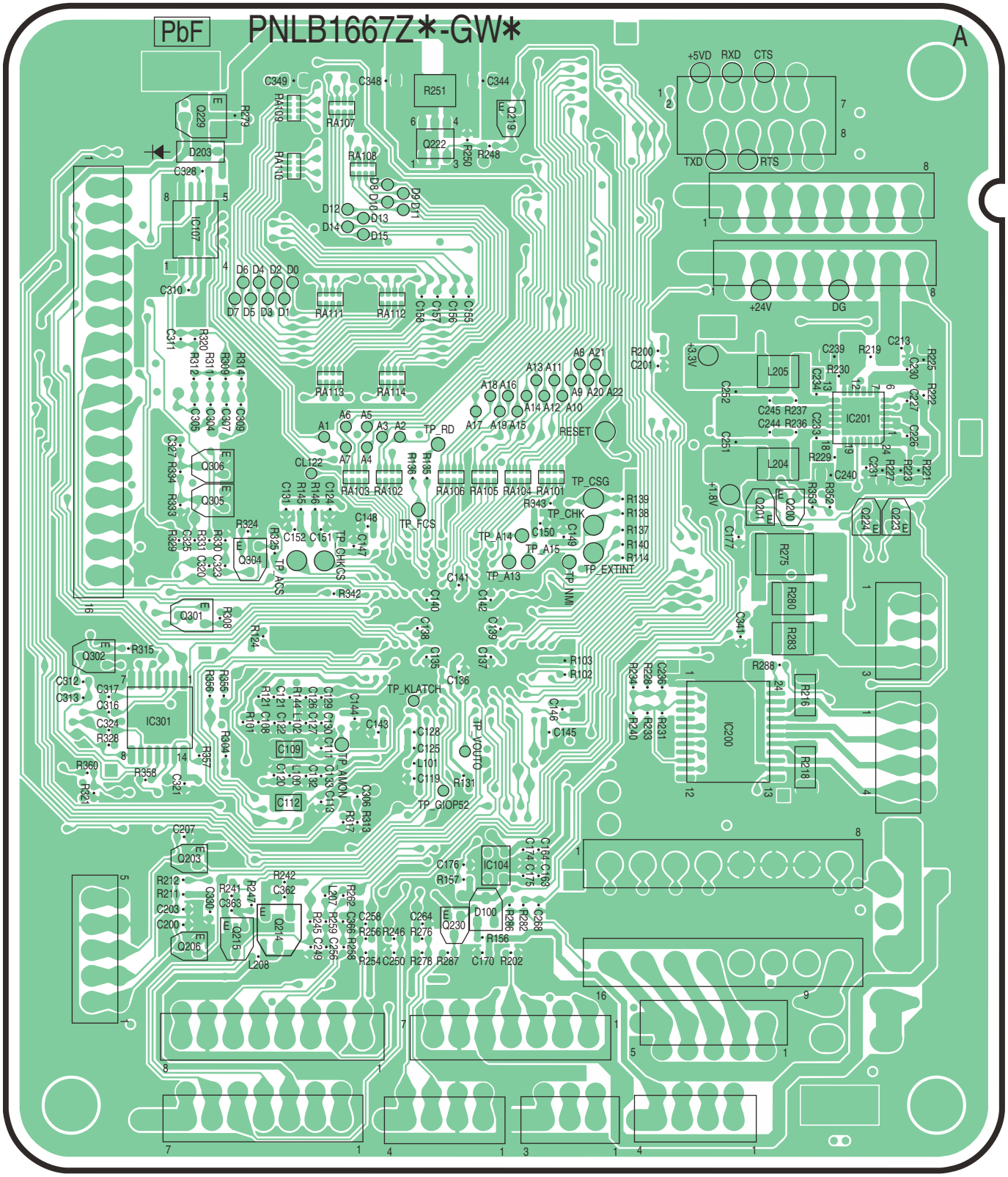
17.1. Digital Board (PCB1)

17.1.1. Digital Board: Component View



KX-FL422CX-B / KX-FL422CX-W DIGITAL BOARD COMPONENT VIEW

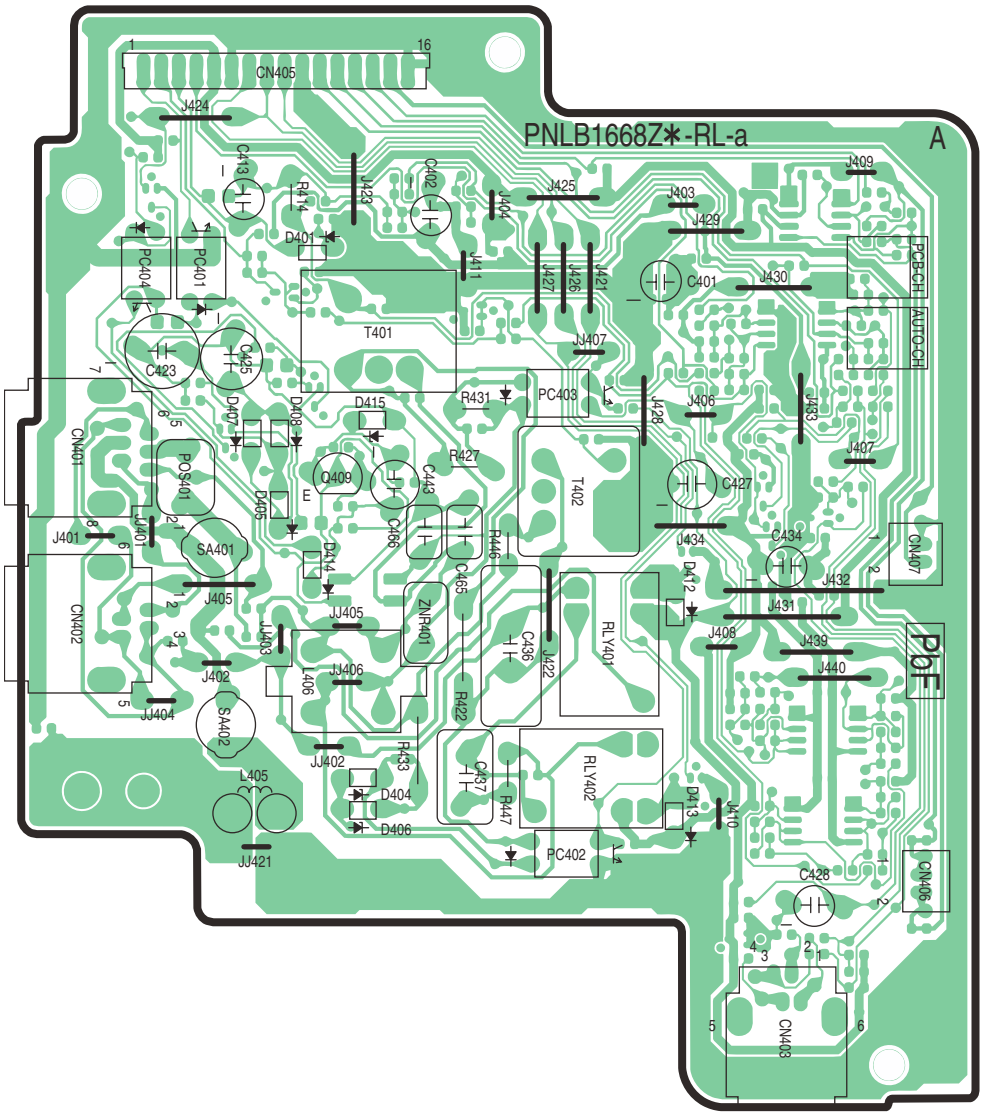
17.1.2. Digital Board: Bottom View



KX-FL422CX-B / KX-FL422CX-W DIGITAL BOARD BOTTOM VIEW

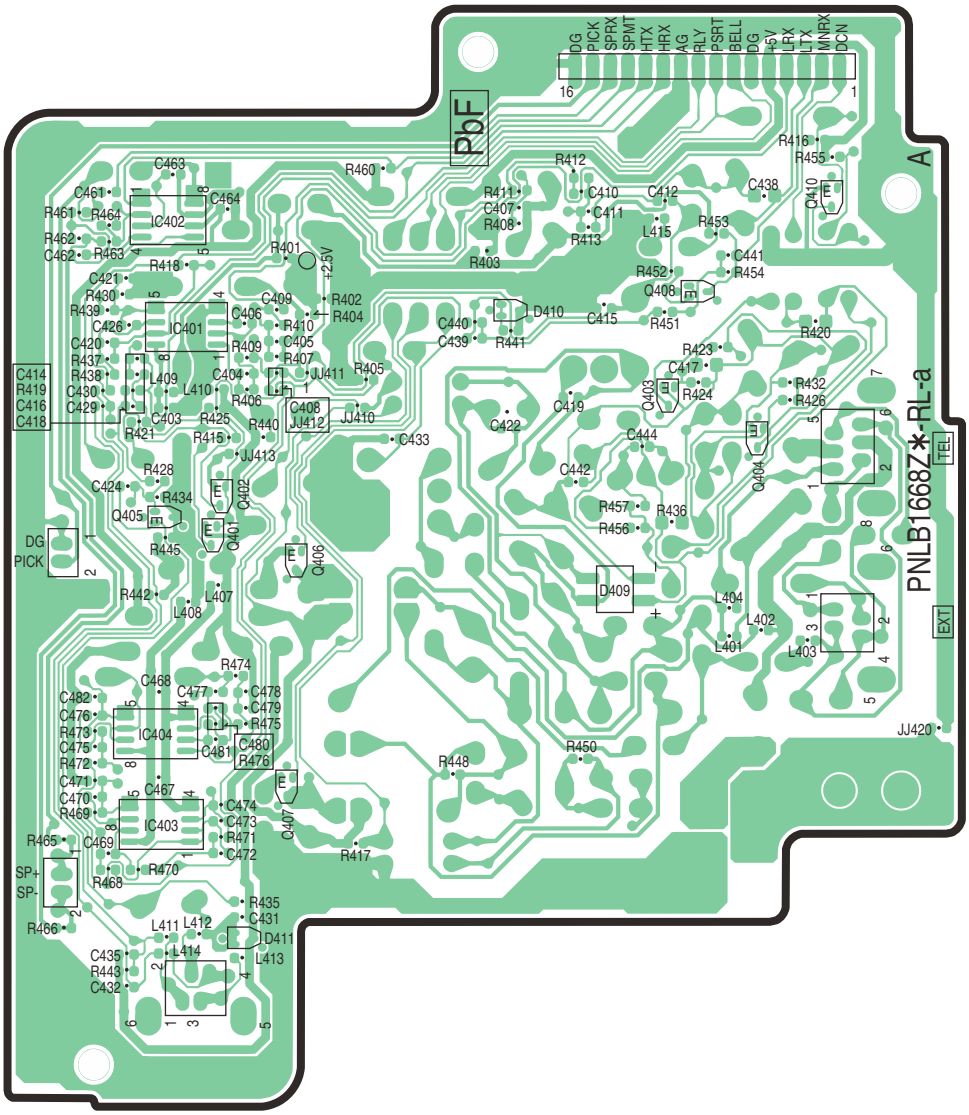
17.2. Analog Board (PCB2)

17.2.1. Analog Board: Component View



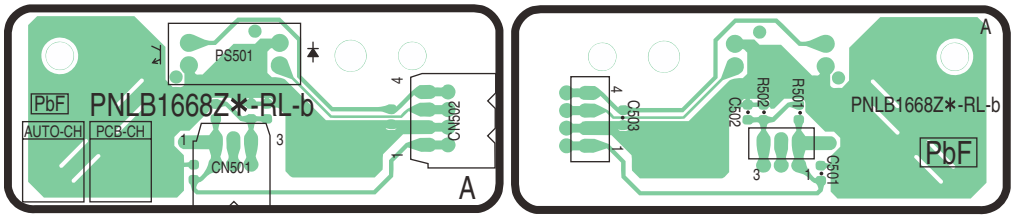
KX-FL422CX-B / KX-FL422CX-W ANALOG BOARD COMPONENT VIEW

17.2.2. Analog Board: Bottom View



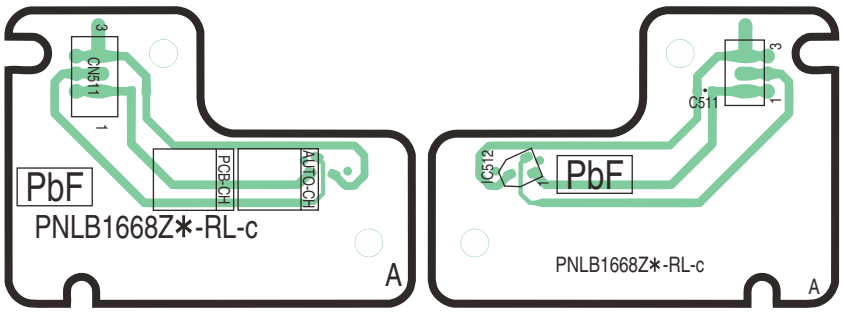
KX-FL422CX-B / KX-FL422CX-W ANALOG BOARD BOTTOM VIEW

17.3. Exit Sensor Board



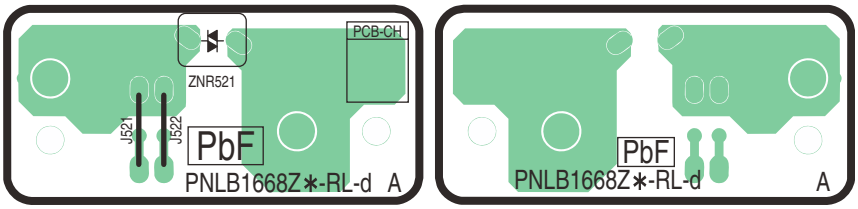
KX-FL422CX-B / KX-FL422CX-W EXIT SENSOR BOARD

17.4. Drum & Toner Sensor Board



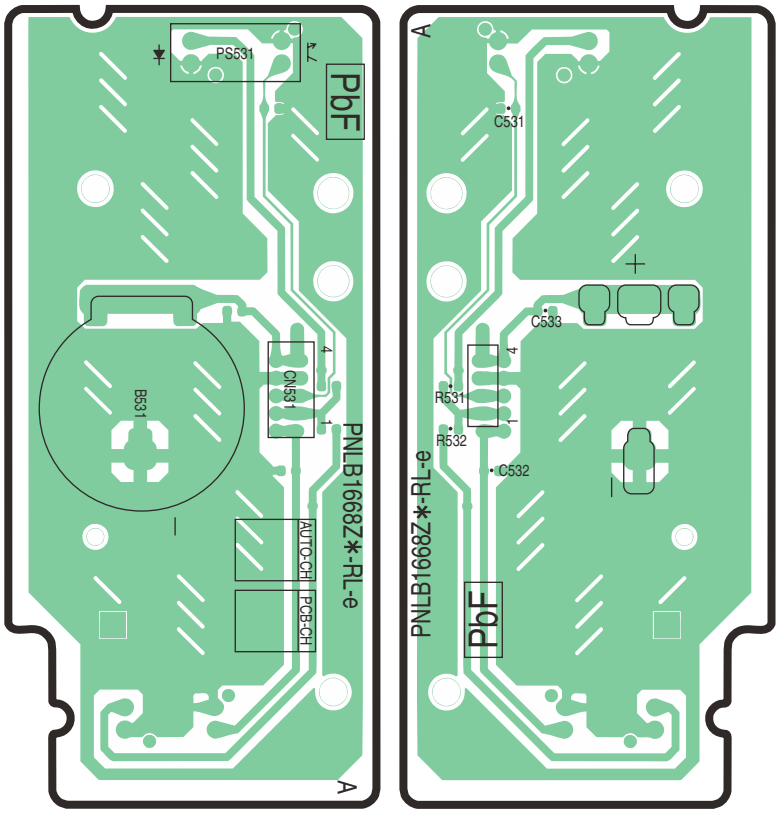
KX-FL422CX-B / KX-FL422CX-W DRUM & TONER SENSOR BOARD

17.5. Varistor Sensor Board



KX-FL422CX-B / KX-FL422CX-W VARISTOR SENSOR BOARD

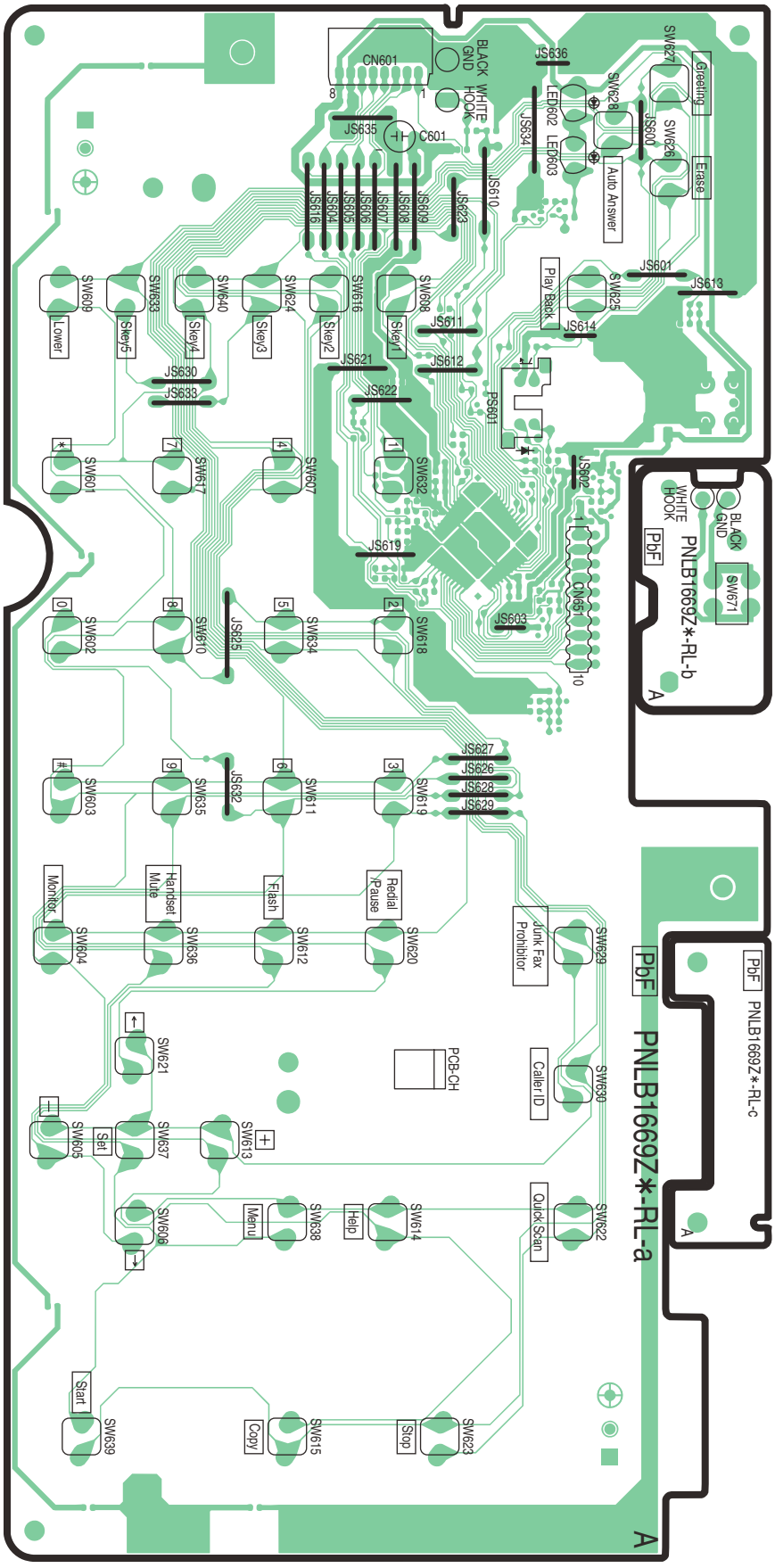
17.6. Resist Sensor Board



KX-FL422CX-B / KX-FL422CX-W RESIST SENSOR BOARD

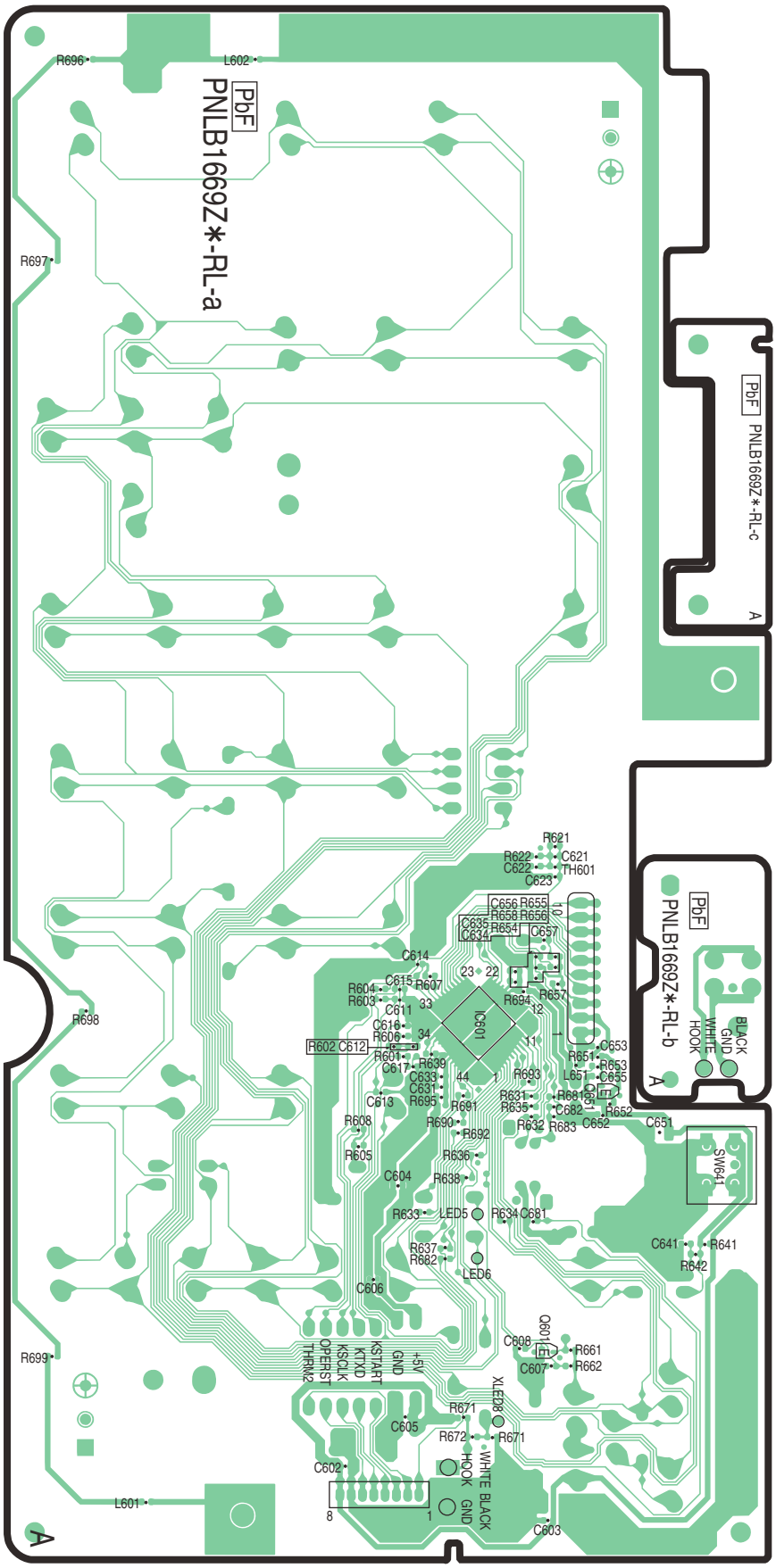
17.7. Operation Board (PCB7)

17.7.1. Operation Board: Component View



KX-FL422CX-B / KX-FL422CX-W OPERATION BOARD COMPONENT VIEW

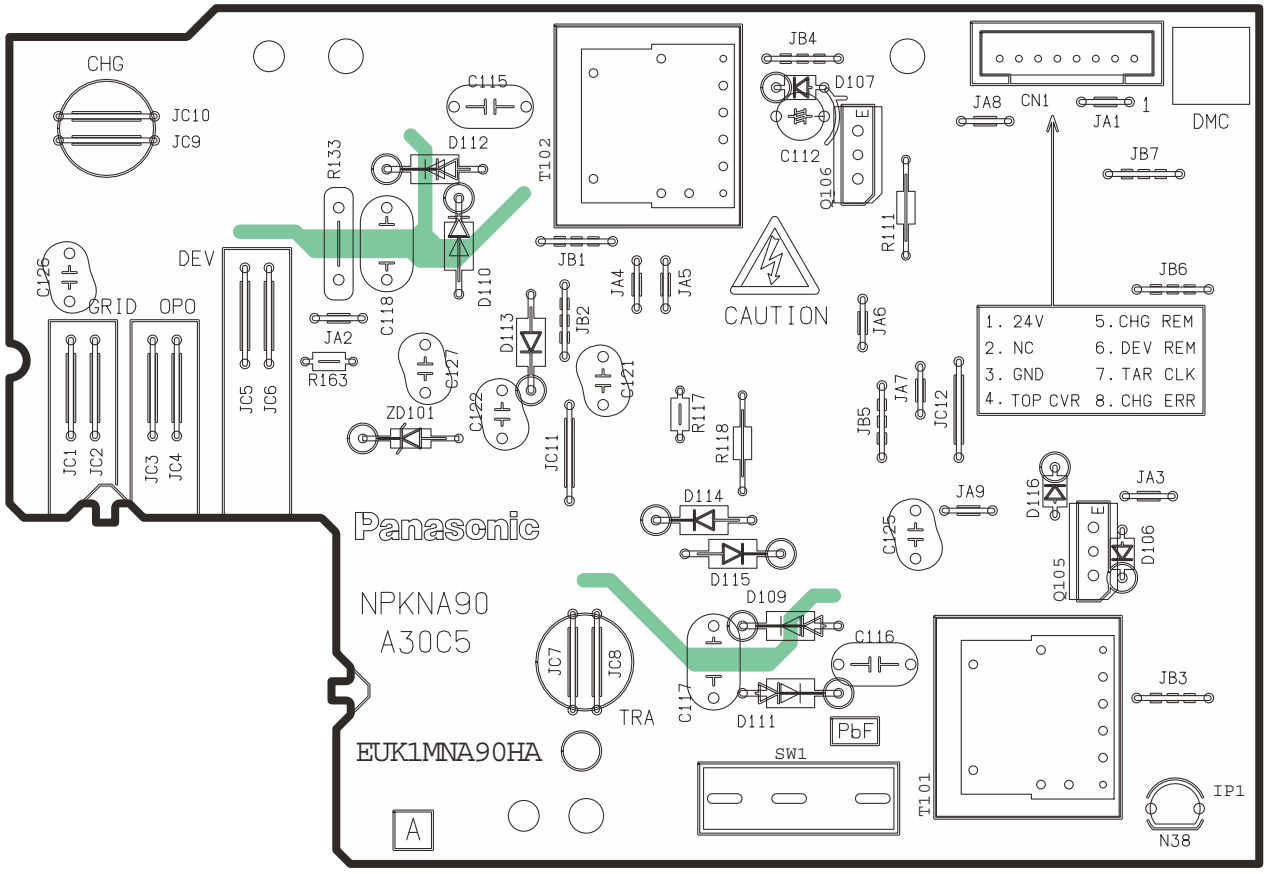
17.7.2. Operation Board: Bottom View



KX-FL422CX-B / KX-FL422CX-W OPERATION BOARD BOTTOM VIEW

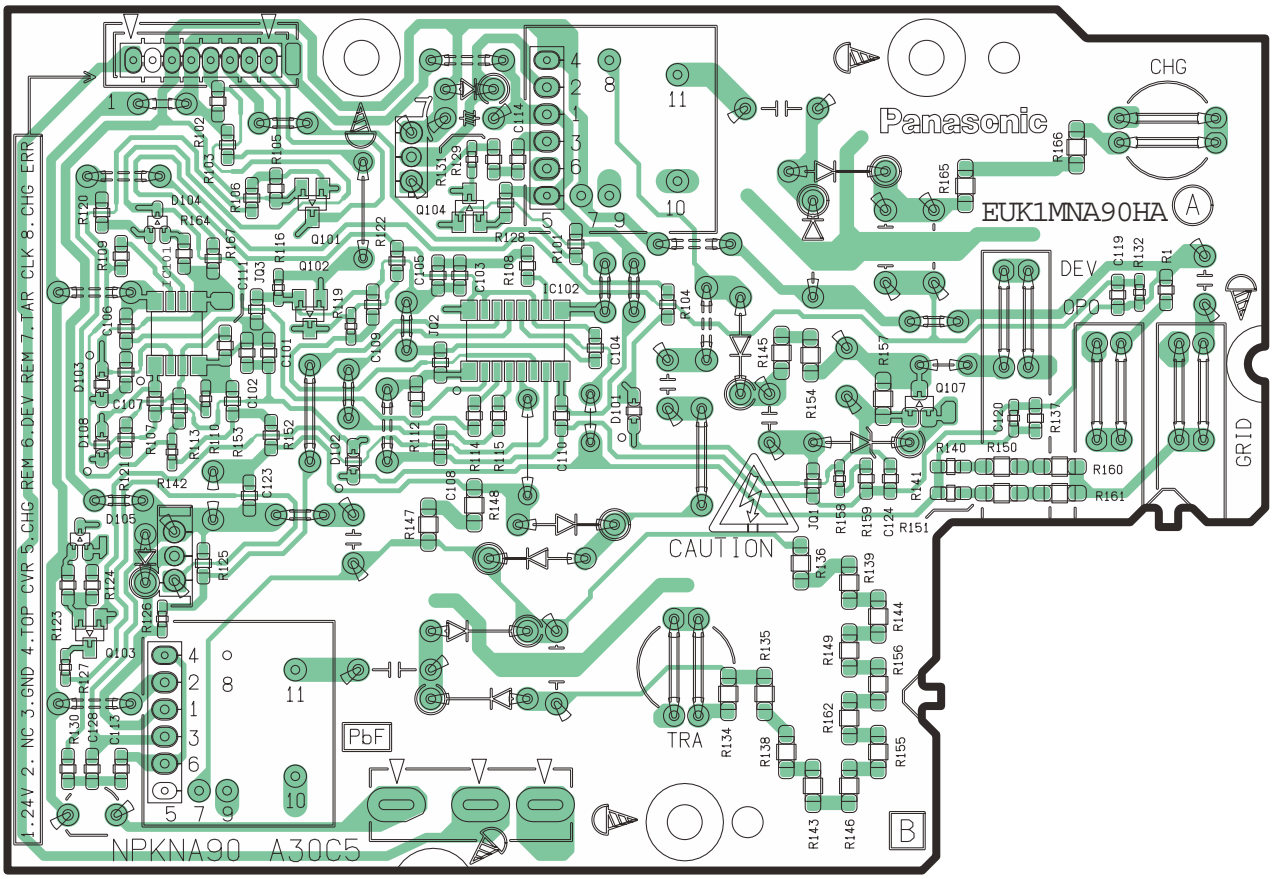
17.8. High Voltage Power Supply Board (PCB8)

17.8.1. High Voltage Power Supply Board: Component View



KX-FL422CX-B / KX-FL422CX-W HIGH VOLTAGE POWER SUPPLY BOARD (COMPONENT VIEW)

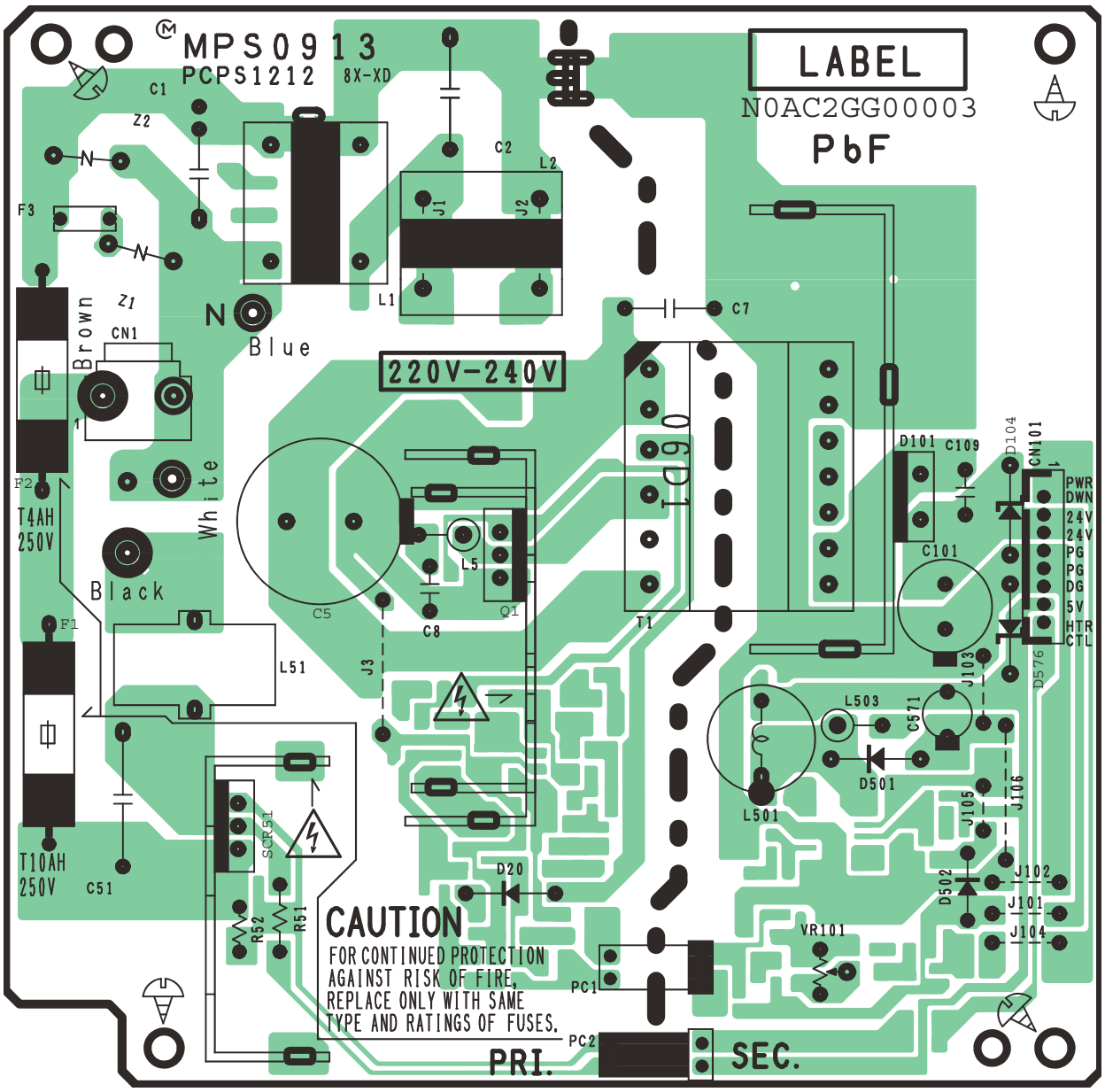
17.8.2. High Voltage Power Supply Board: Bottom View



KX-FL422CX-B / KX-FL422CX-W HIGH VOLTAGE POWER SUPPLY BOARD (BOTTOM VIEW)

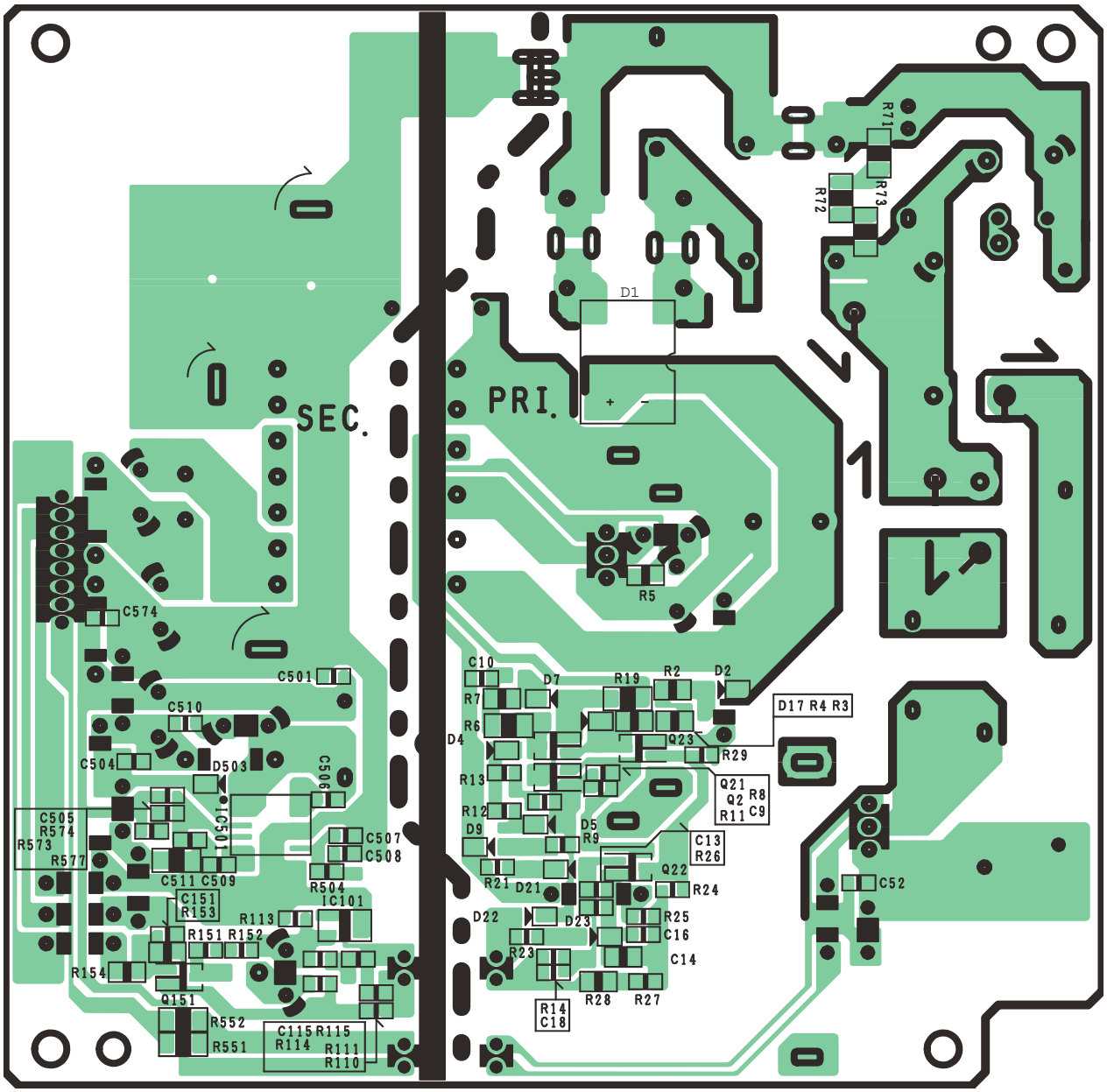
17.9. Low Voltage Power Supply Board (PCB9)

17.9.1. Low Voltage Power Supply Board: Component View



KX-FL422CX-B / KX-FL422CX-W LOW VOLTAGE POWER SUPPLY BOARD (COMPONENT VIEW)

17.9.2. Low Voltage Power Supply Board: Bottom View

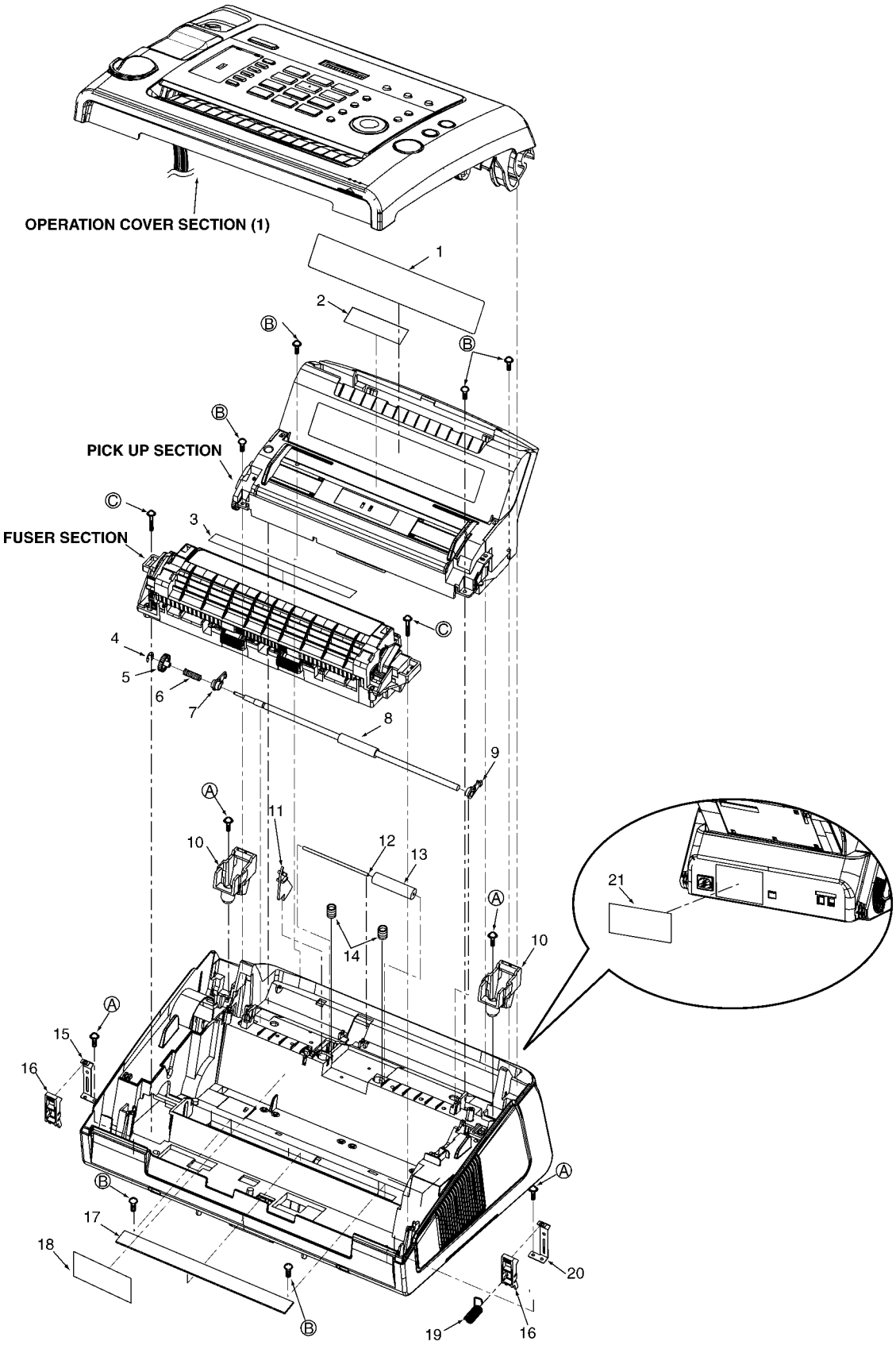


KX-FL422CX-B / KX-FL422CX-W LOW VOLTAGE POWER SUPPLY BOARD (BOTTOM VIEW)

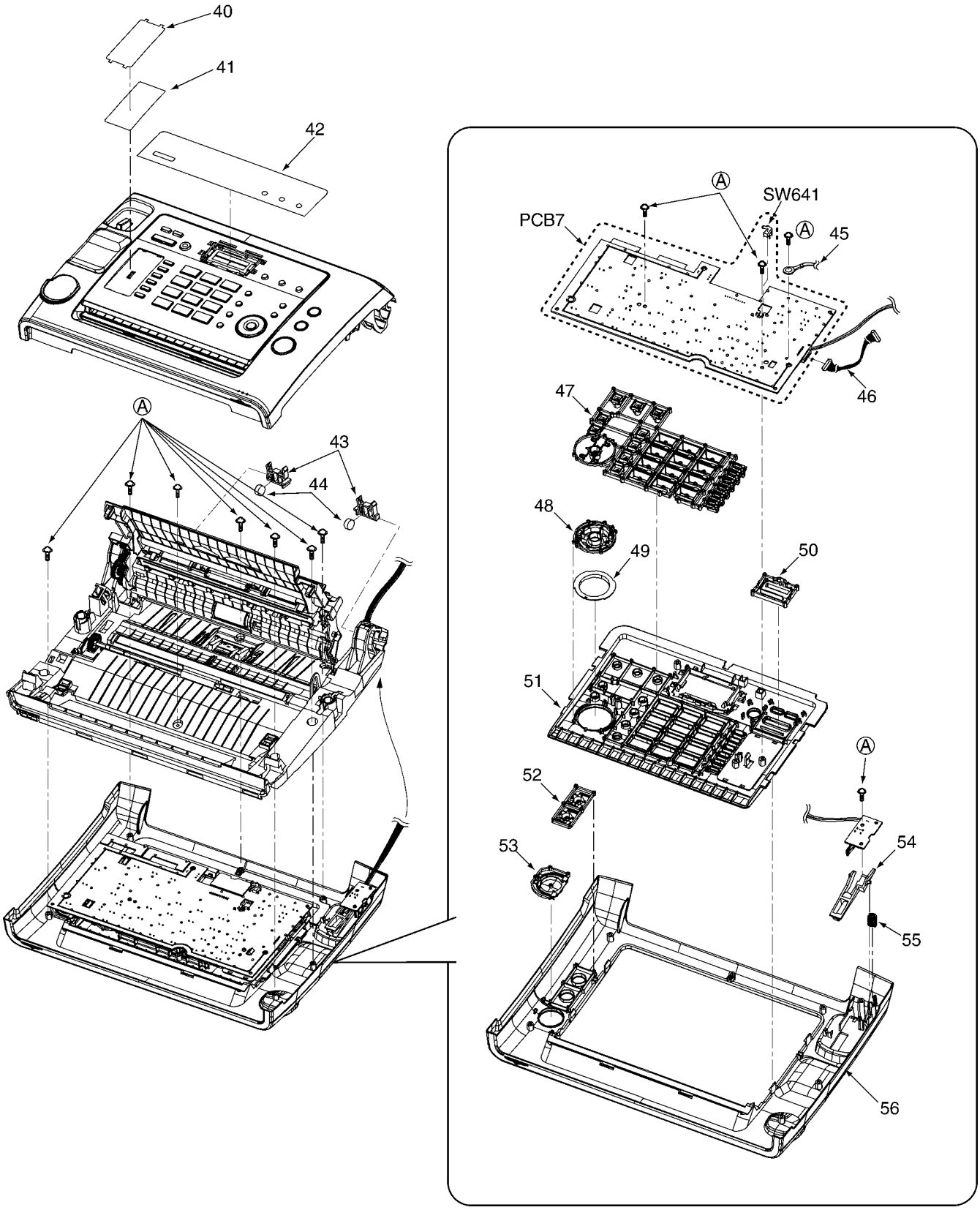
18 Exploded View and Replacement Parts List

18.1. Cabinet, Mechanical and Electrical Parts Location

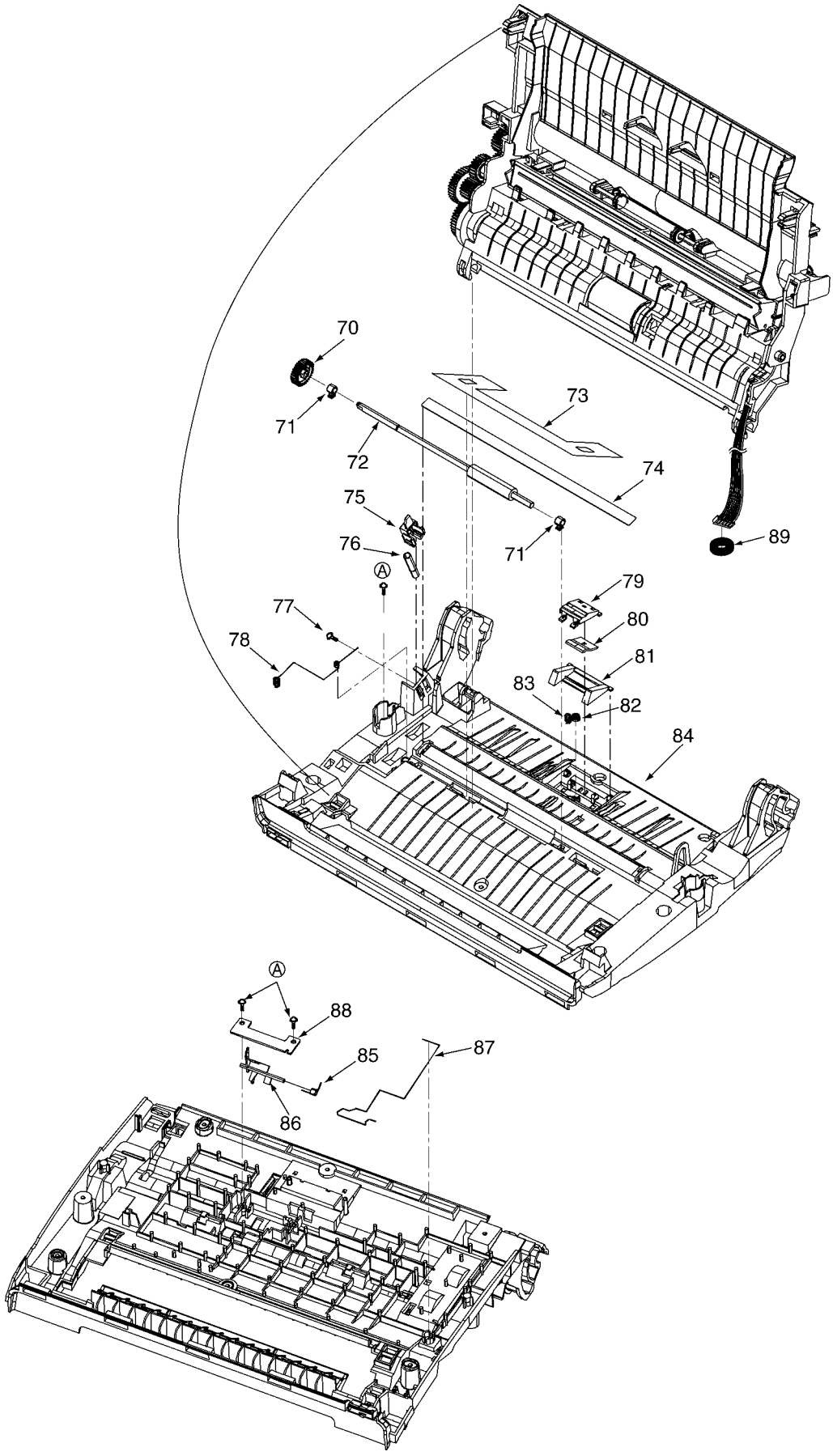
18.1.1. General Section



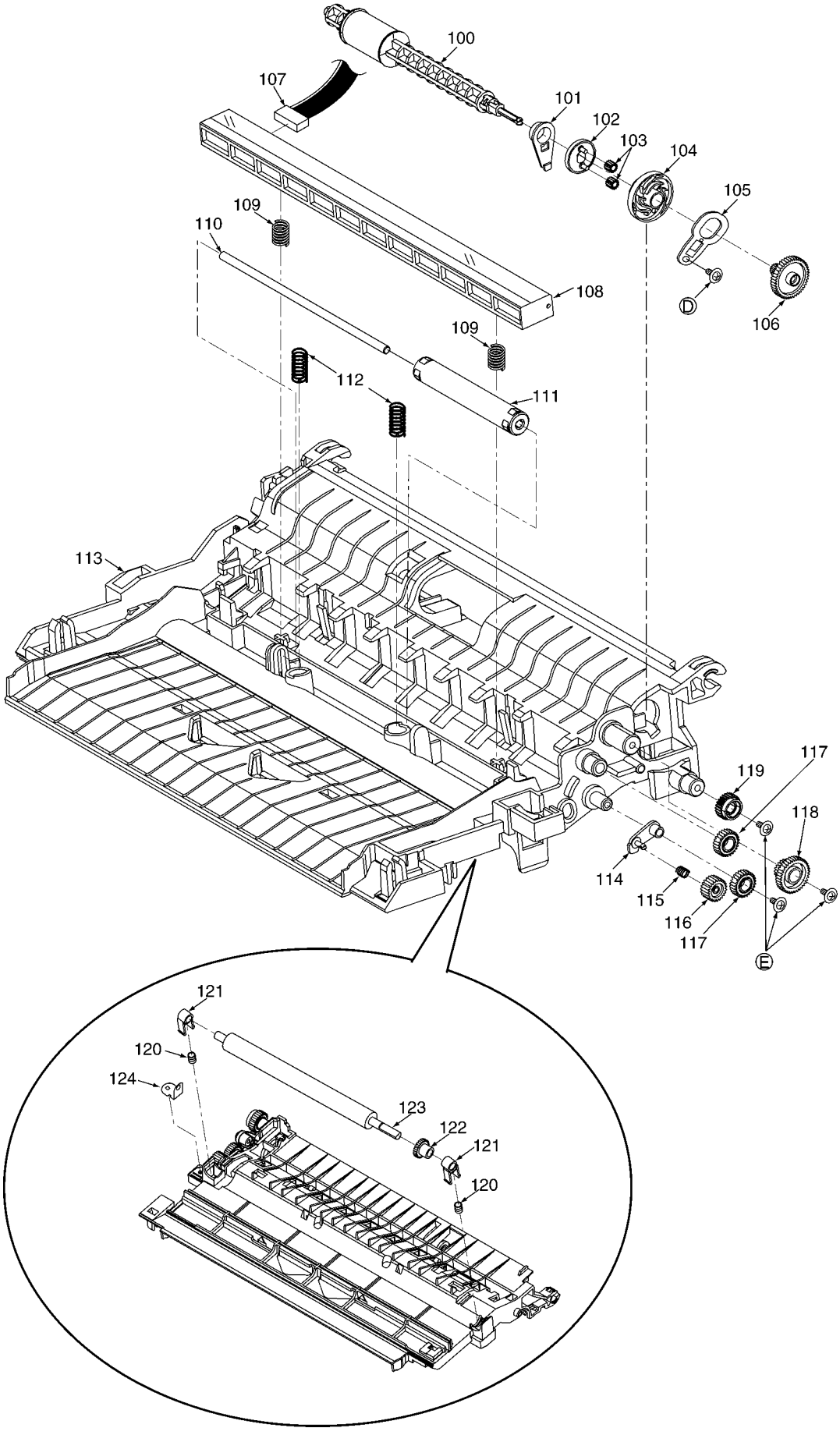
18.1.2. Operation Cover Section (1)



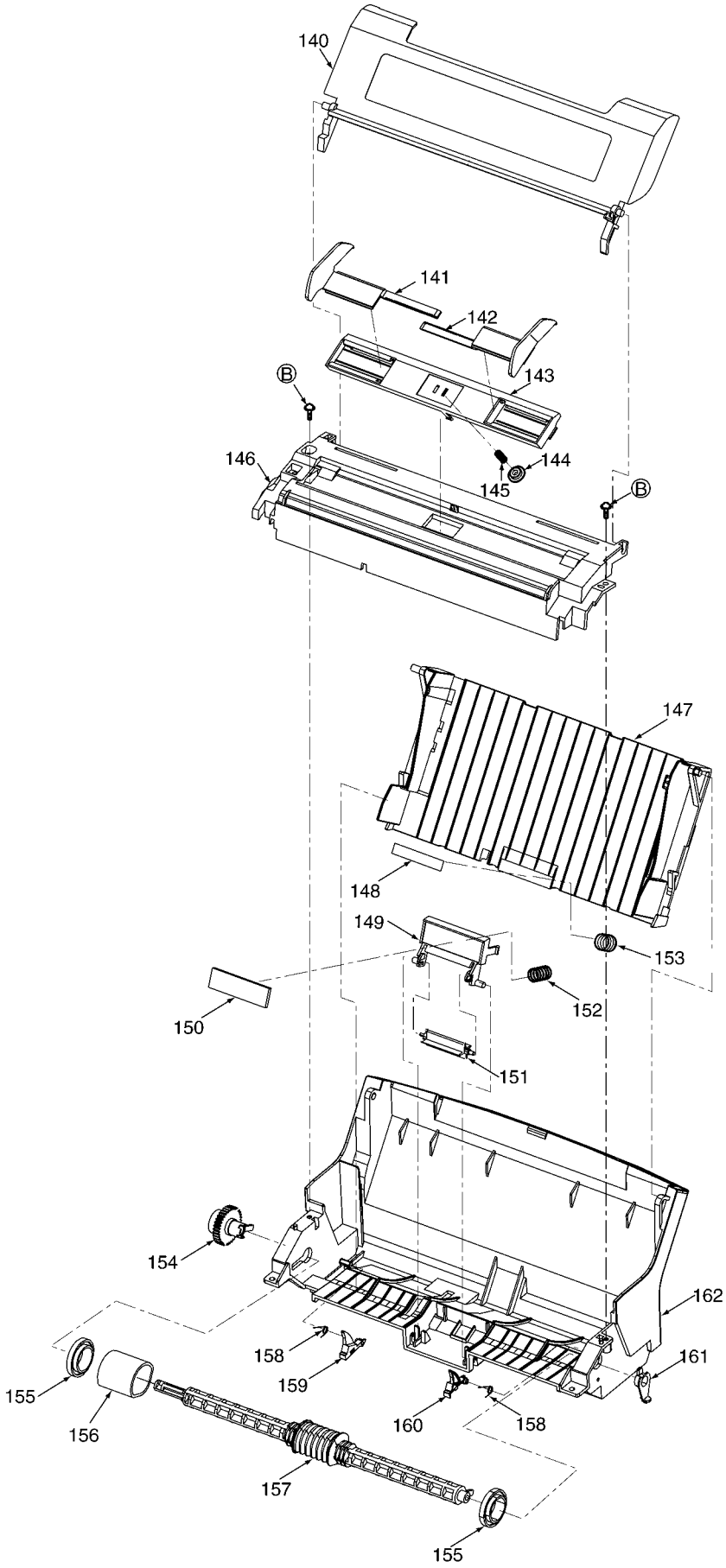
18.1.3. Operation Cover Section (2)



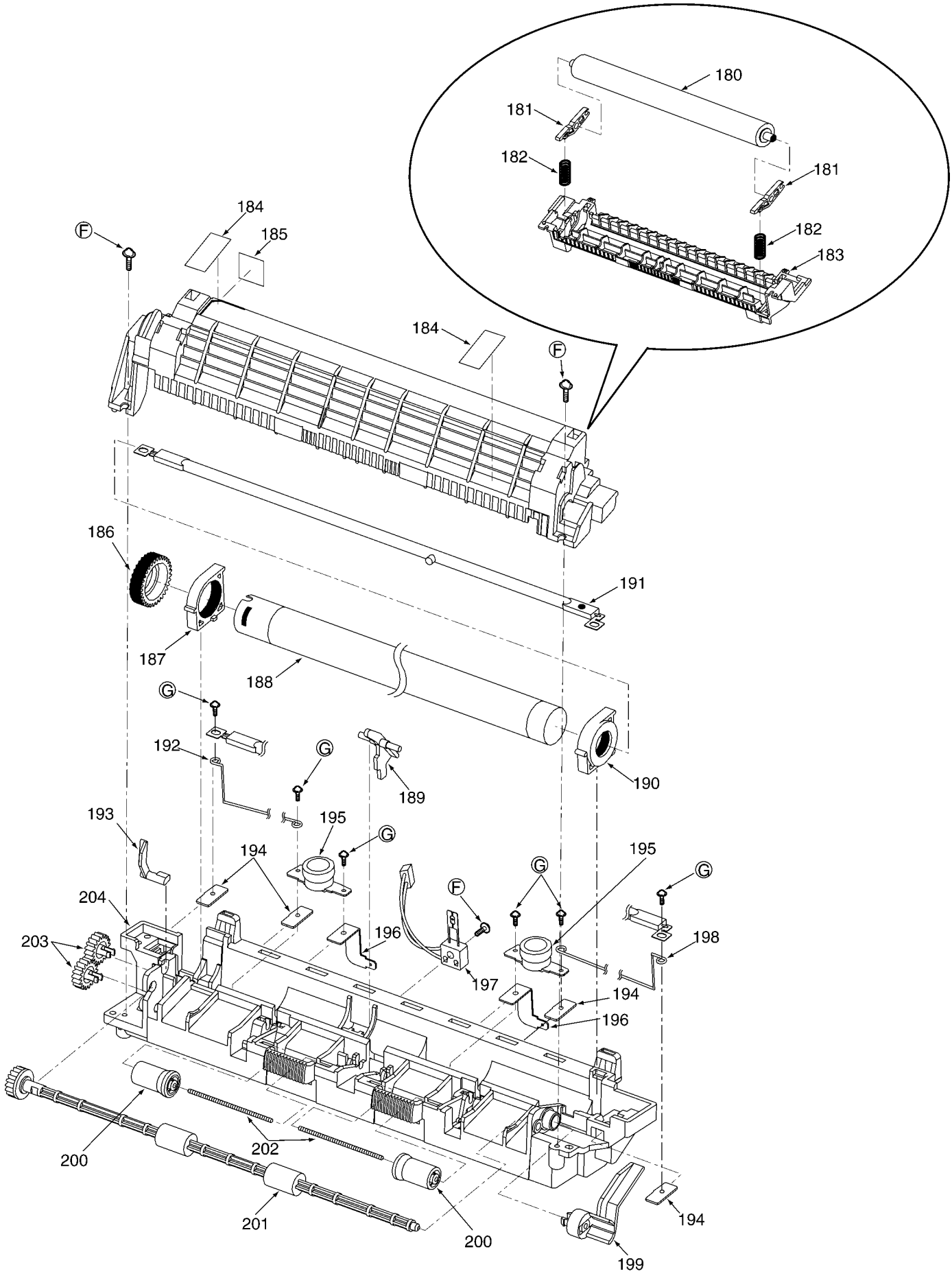
18.1.4. Operation Cover Section (3)



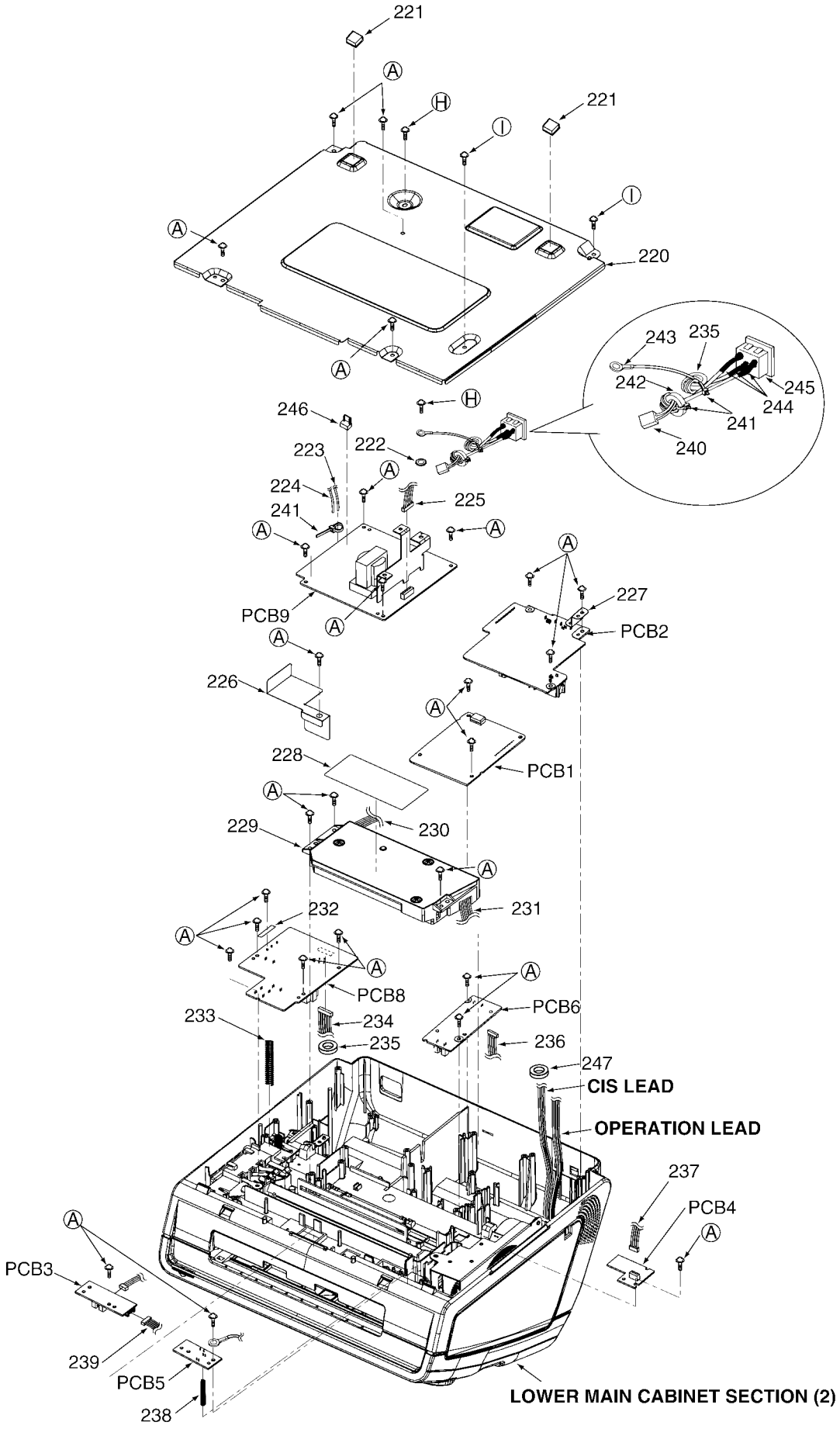
18.1.5. Pick Up Section



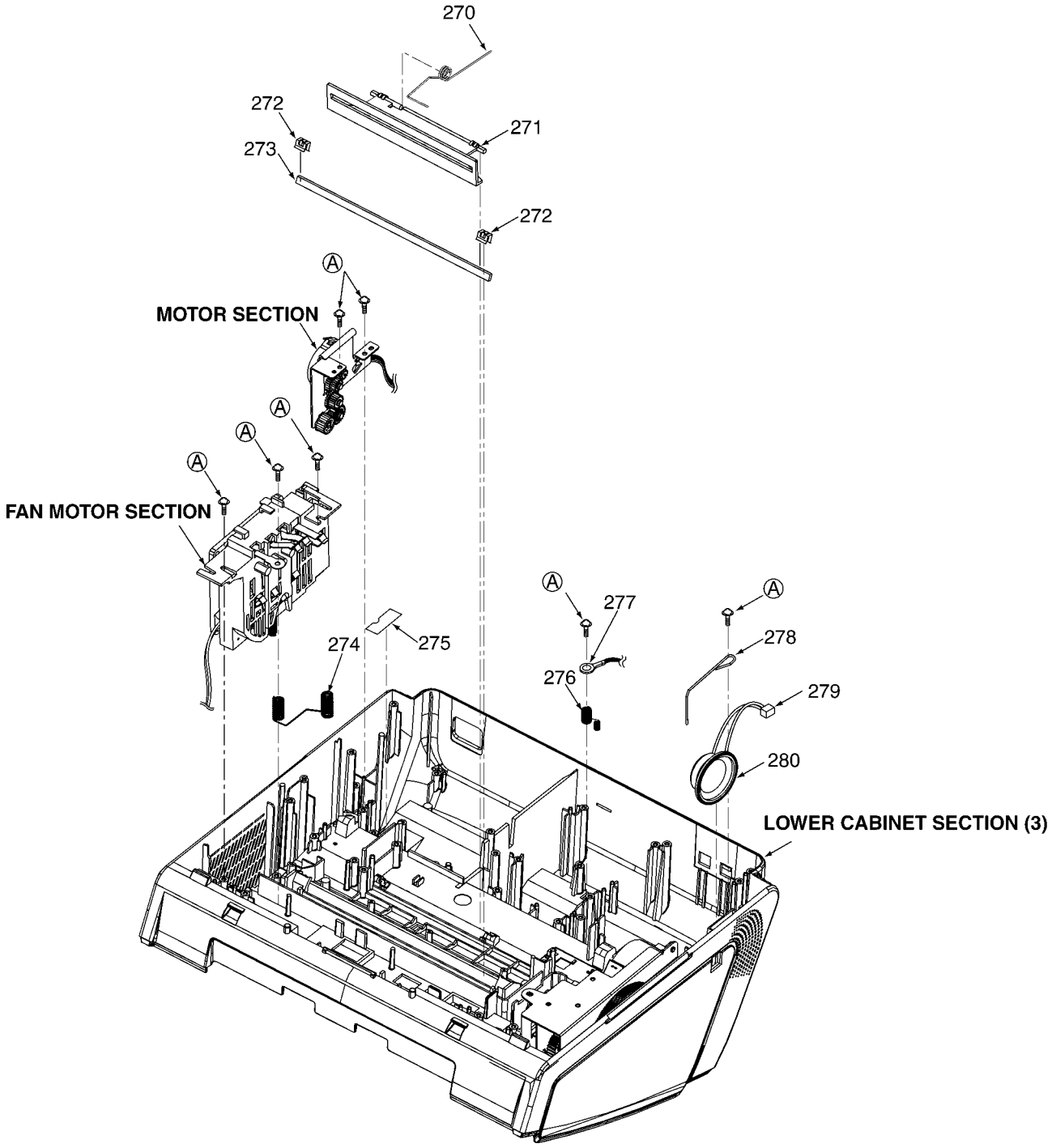
18.1.6. Fuser Section



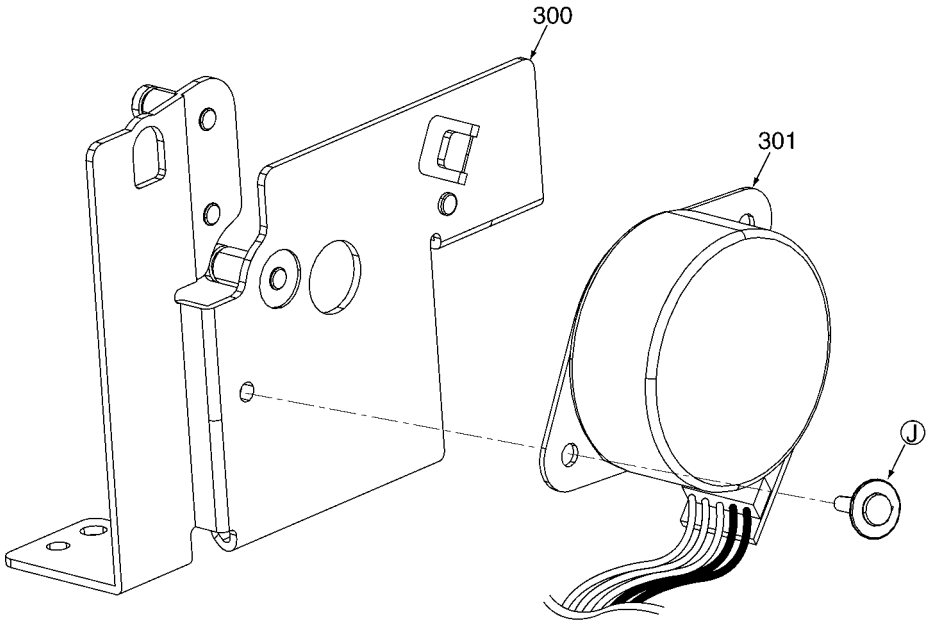
18.1.7. Lower Main Cabinet Section (1)

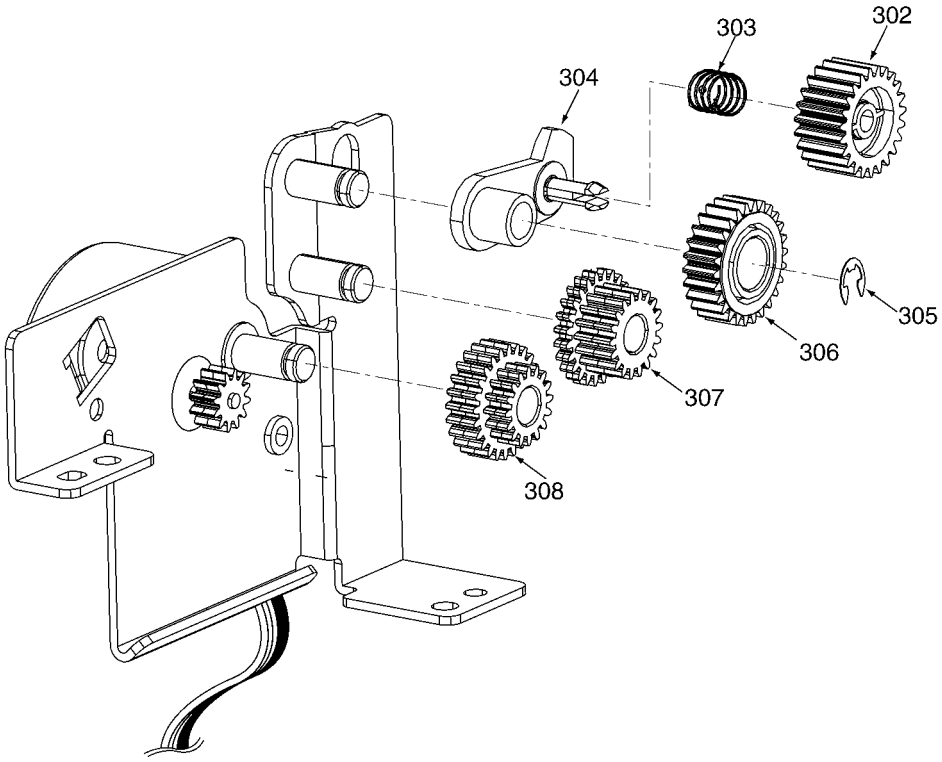


18.1.8. Lower Main Cabinet Section (2)

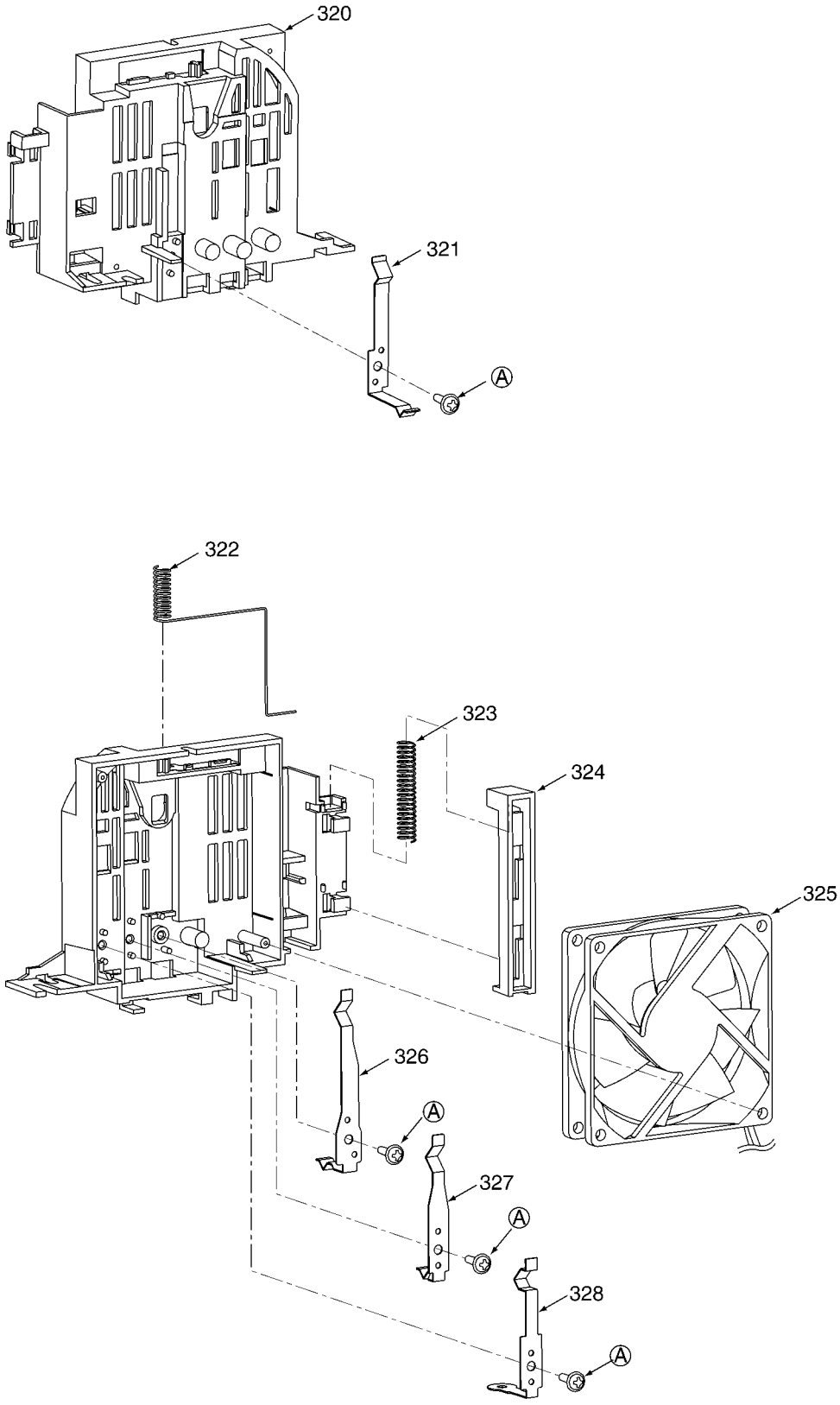


18.1.9. Motor Section

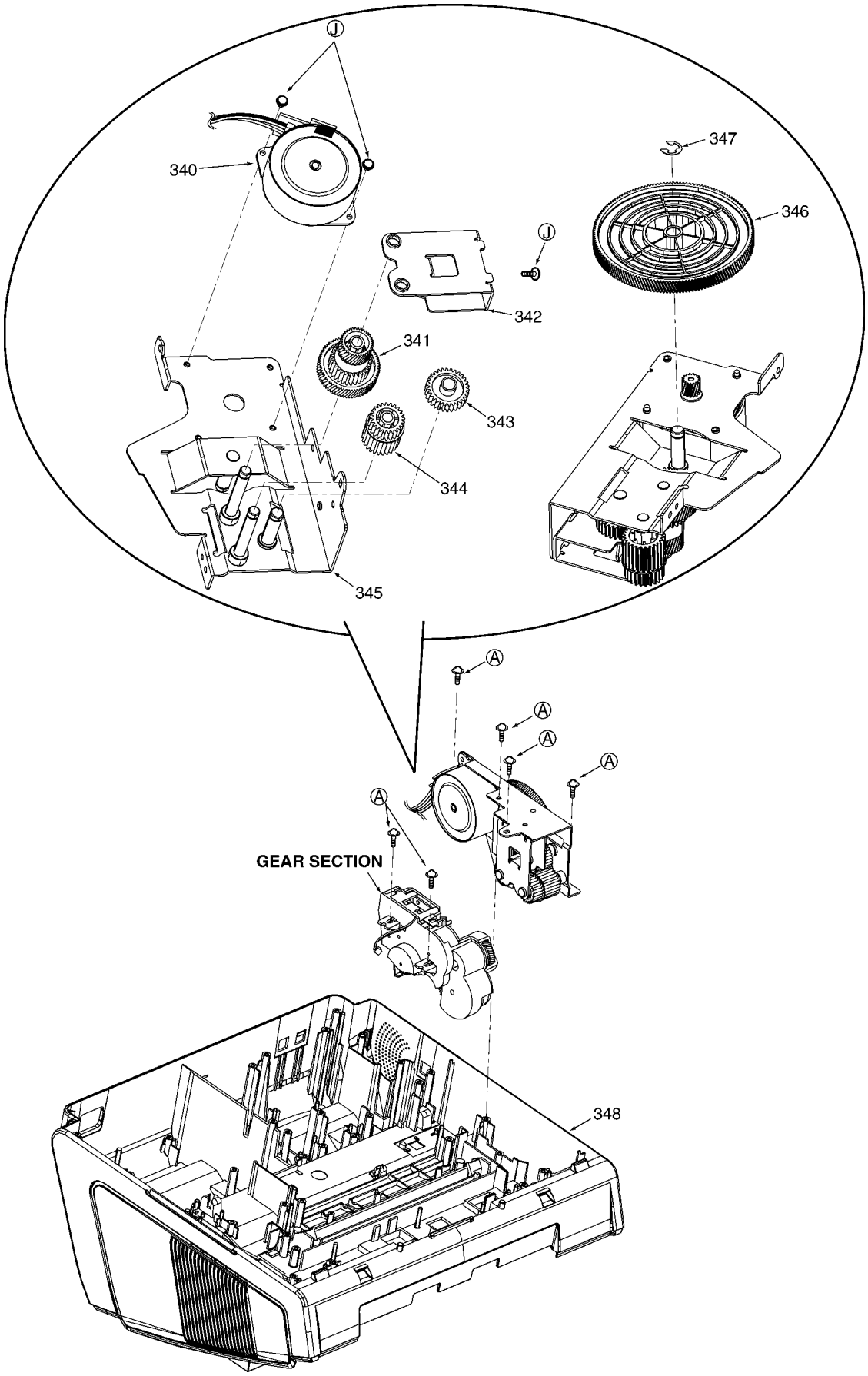




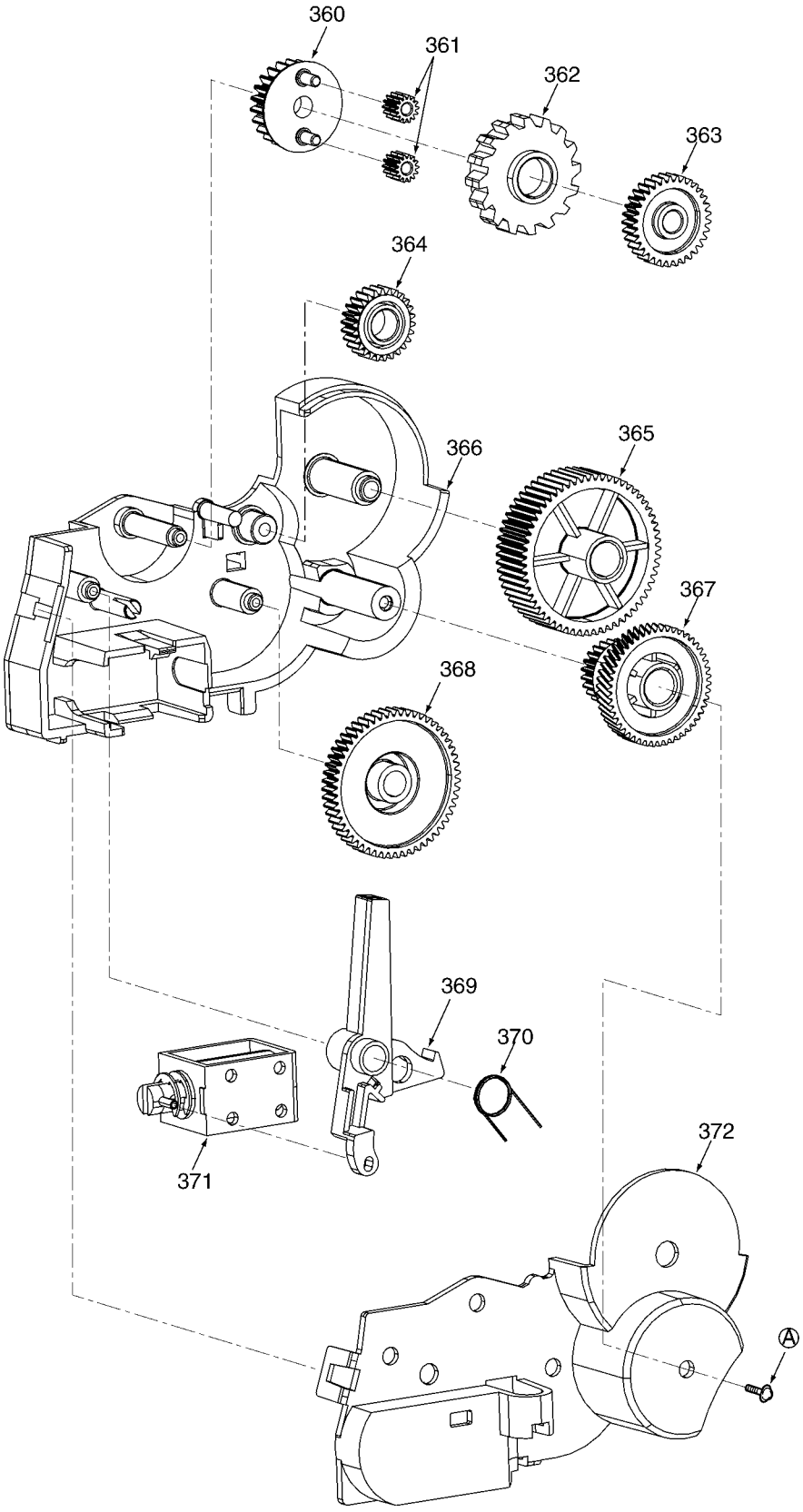
18.1.10. Fan Motor Section



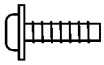
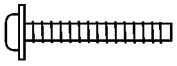
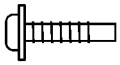
18.1.11. Lower Cabinet Section (3)



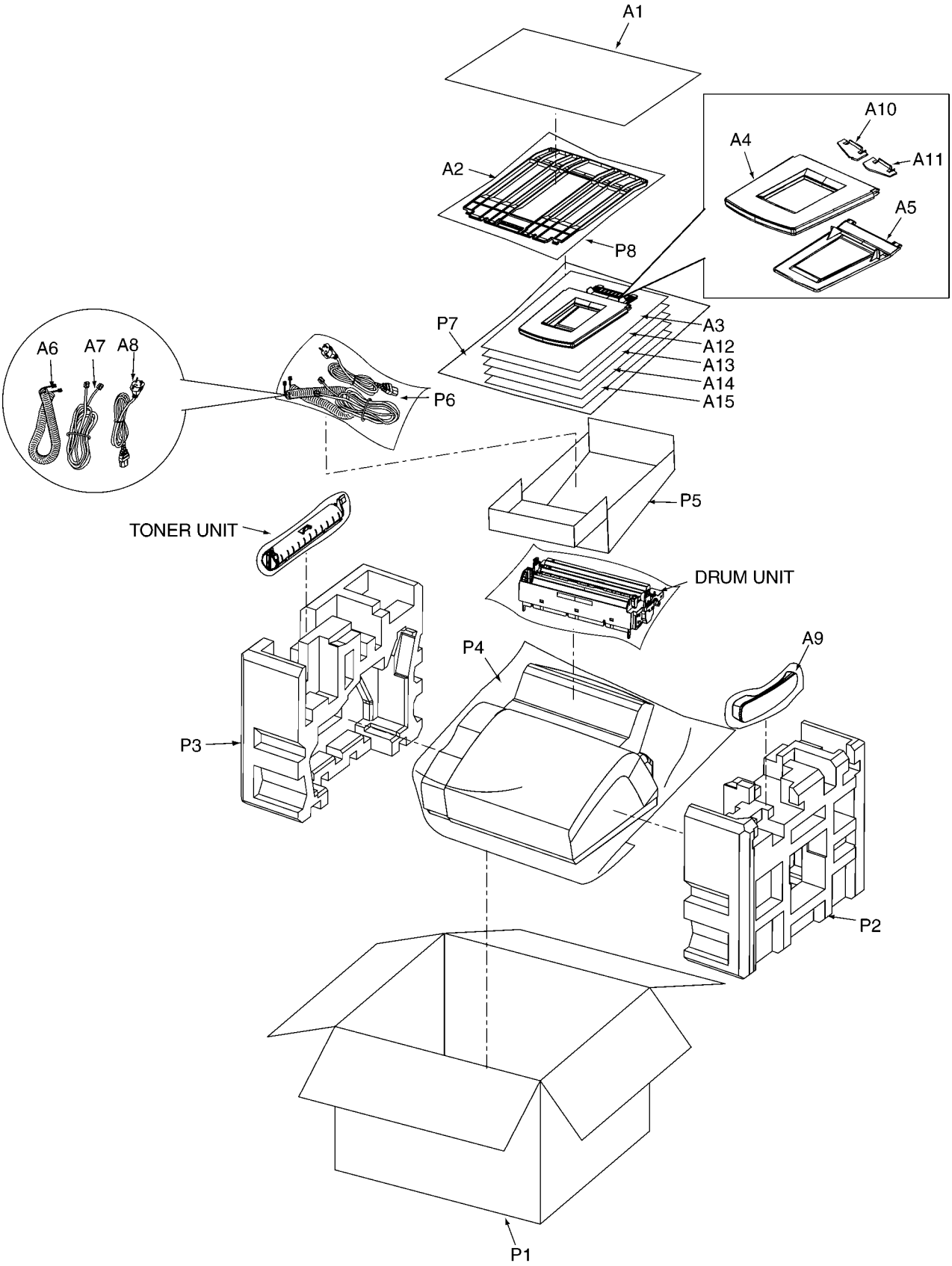
18.1.12. Gear Section



18.1.13. Actual Size of Screws and Washer

	Parts No.	Illustration
Ⓐ	XTW3+10PFJ7	
Ⓑ	XTB3+10GFJ	
Ⓒ	XTW3+20PFJ	
Ⓓ	XTW4+8PFJ	
Ⓔ	XTW2+W9PFJ	
Ⓕ	XTW3+12PFJ7	
Ⓖ	XYC3+FF8FJ	
Ⓗ	XSB4+6FJ	
Ⓘ	XTW3+6LFJ7	
Ⓙ	XTW3+5LFJK7	

18.1.14. Accessories and Packing Materials



18.2. Replacement Parts List

RTL (Retention Time Limited)

Notes:

1. The marking (RTL) indicates that the Retention Time is limited for this item.
   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing parts and product retention.
   After the end of this period, the assembly will no longer be available.
2. Important safety notice
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.
3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.
4. ISO code (Example : ABS-HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.
5. RESISTORS & CAPACITORS
   Unless otherwise specified;
   All resistors are in ohms (Ω) k=1000Ω, M=1000kΩ
   All capacitors are in MICRO FARADS (μF) P=μμF
   *Type & Wattage of Resistor

Type

ERC:Solid ERD:Carbon PQRD:Carbon	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Carbon ERS:Fusible Resistor ERF:Cement Resistor

Wattege

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor ECQS:Styrol PQCUV:Chip ECQMS:Mica	ECCD,ECKD,ECBT,PQCBC:Ceramic ECQE,ECQV,ECQG:Polyester ECEA,ECSZ:Electlytic ECQP:Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H:50V 2A:100V 2E:250V 2H:500V	05:50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :63V 2A :100V

18.2.1. Cabinet and Electrical Parts

18.2.1.1. General Section

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	1	PNQT1473Z	LABEL, PAPER SET (KX-FL422CX-B)	
	1	PNQT1474Z	LABEL, PAPER SET (KX-FL422CX-W)	
	2	PNQT1476Z	LABEL, FACE DOWN (KX-FL422CX-B)	
	2	PNQT1475Z	LABEL, FACE DOWN (KX-FL422CX-W)	
	3	PFQT2565X	LABEL, FUSER	
	4	XUC2FJP	RETAINING RING	
	5	PFDG1201Z	GEAR	POM-HB
	6	PFUS1325Z	COIL SPRING	
	7	PFDJ1067Z	SPACER	POM-HB
	8	PFDN1065Z	ROLLER	
	9	PFDJ1044Z	SPACER	POM-HB
	10	PFHR1542Z	CASE/COVER	PS-HB
	11	PFDE1204W	LEVER	POM-HB
	12	PFDF1097Z	SHAFT	
	13	PQDR9685Y	ROLLER	POM-HB
	14	PFUS1275Z	COIL SPRING	POM-HB
	15	PFUS1659Z	BAR SPRING	
	16	PFHR1543Z	LEVER	POM-HB
	17	PNOG1003Z	GLASS/TRANSPARENT PLATE	
	18	PFQT2543Y	LABEL, DEV. UNIT/INSTALL	
	19	PFUS1738Z	TORSION SPRING	
	20	PFUS1660Z	BAR SPRING	
	21	PNGT2133Z-M	NAME PLATE, AL (KX-FL422CX-B)	
	21	PNGT2138Z-M	NAME PLATE, AL (KX-FL422CX-W)	

18.2.1.2. Operation Cover Section (1)

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	40	PNGV1006Z	GLASS/TRANSPARENT PLATE	
	41	PNGD1013Y	CARD	
	42	PNGP1060Y	PANEL (KX-FL422CX-B)	
	42	PNGP1073Y1	PANEL (KX-FL422CX-W)	
	43	PFME1001Z	SPACER	POM-HB
	44	PFHG1094Z	RUBBER PARTS	
	45	PNVW1007Z	LEAD WIRE	
	46	PNJS081021Z	CONNECTOR	
	47	PNBX1049Z1	PUSH BUTTON, DIAL (KX-FL422CX-B)	ABS-HB
	47	PNBX1049Z2	PUSH BUTTON, DIAL (KX-FL422CX-W)	ABS-HB
	48	PNBC1269Y1	PUSH BUTTON, NAVIGATION (KX-FL422CX-B)	ABS-HB
	48	PNBC1269Y2	PUSH BUTTON, NAVIGATION (KX-FL422CX-W)	ABS-HB
	49	PNGX1009Z1	ORNAMENT	
	50	PNBC1270Z1	PUSH BUTTON, AUTO ANS	ABS-HB
	51	PNGG1041Y1	GRILLE (KX-FL422CX-B)	PS-HB
	51	PNGG1041Y2	GRILLE (KX-FL422CX-W)	PS-HB
	52	PNBX1050Z1	PUSH BUTTON, STOP (KX-FL422CX-B)	ABS-HB
	52	PNBX1050Z2	PUSH BUTTON, STOP (KX-FL422CX-W)	ABS-HB
	53	PNBC1271Z1	PUSH BUTTON, START (KX-FL422CX-B)	ABS-HB
	53	PNBC1271Z2	PUSH BUTTON, START (KX-FL422CX-W)	ABS-HB
	54	PFBH1033Z3	LEVER (KX-FL422CX-B)	ABS-HB
	54	PFBH1033Z4	LEVER (KX-FL422CX-W)	ABS-HB
	55	PFUS1696Z	COIL SPRING	
	56	PNGG1040Z1	GRILLE (KX-FL422CX-B)	PS-HB
	56	PNGG1040Z2	GRILLE (KX-FL422CX-W)	PS-HB

18.2.1.3. Operation Cover Section (2)

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	70	PFDG1320Z	GEAR	POM-HB
	71	PFDJ1006Z	SPACER	POM-HB
	72	PNDN1006Y	ROLLER	
	73	PNHX1157Z	SHEET	
	74	PFHX1834Z	SHEET	
	75	PNDE1018Z	LEVER	
	76	PNUS1075Z	COIL SPRING	
	77	PJHE5065Y	SMAL SCREW STEEL	
	78	PNUS1080Z	BAR SPRING	
	79	PNHR1124Z	CASE/COVER	PS-HB
	80	PNHG1051Z	RUBBER PARTS	
	81	PNHR1125Z	SPACER	PBY-HB
	82	PNUS1074Z	COIL SPRING	
	83	PNUS1073Z	COIL SPRING	
	84	PNKV1040X1	COVER (KX-FL422CX-B)	PS-HB

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	84	PNKV1040X2	COVER(KX-FL422CX-W)	PS-HB
	85	PNUS1078Z	COIL SPRING	
	86	PNDE1019Z	LEVER	POM-HB
	87	PNUS1091Z	BAR SPRING	
	88	PNLP2120CX-C	COVER	
	89	J0KE00000115	INSULATOR	

18.2.1.4. Operation Cover Section (3)

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	100	PFDS1010Z	ROLLER	POM-HB
	101	PFDJ1063Y	SPACER	POM-HB
	102	PFDE1198Z	ARM	POM-HB
	103	PFDG1189Z	GEAR	POM-HB
	104	PFDG1295Z	GEAR	POM-HB
	105	PFDE1199Z	ARM	POM-HB
	106	PFDG1296Z	GEAR	POM-HB
	107	PNJS071014Z	CONNECTOR	
	108	N2GZYY000002	IMAGE SENSOR	
	109	PNUS1086Z	COIL SPRING	
	110	PFDF1098Z	SHAFT	
	111	PFDR1044Y	ROLLER	POM-HB
	112	PFUS1441Y	COIL SPRING	
	113	PFUG1034V2	GUIDE (KX-FL422CX-B)	PS-HB
	113	PFUG1034V3	GUIDE (KX-FL422CX-W)	PS-HB
	114	PFDE1201X	ARM	POM-HB
	115	PFUS1019Z	TORSION SPRING	
	116	PFDG1299Z	GEAR	POM-HB
	117	PFDG1297Z	GEAR	POM-HB
	118	PFDG1298Z	GEAR	POM-HB
	119	PFDG1460Z	GEAR	POM-HB
	120	PFUS1269Y	COIL SPRING	
	121	PFDJ1042Z	SPACER	POM-HB
	122	PFDG1294Z	GEAR	POM-HB
	123	PFDS1032Z	ROLLER	
	124	PFMH1124Z	METAL PARTS	

18.2.1.5. Pick Up Section

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	140	PFKV1138Z3	COVER (KX-FL422CX-B)	PS-HB
	140	PFKV1138Z4	COVER (KX-FL422CX-W)	PS-HB
	141	PFKR1095Z4	GUIDE (KX-FL422CX-B)	PS-HB
	141	PFKR1095Z5	GUIDE (KX-FL422CX-W)	PS-HB
	142	PFKR1096Z4	GUIDE (KX-FL422CX-B)	ABS-HB
	142	PFKR1096Z5	GUIDE (KX-FL422CX-W)	ABS-HB
	143	PFKE1053Z3	PARTING PLATE (KX-FL422CX-B)	PS-HB
	143	PFKE1053Z4	PARTING PLATE (KX-FL422CX-W)	PS-HB
	144	PFDG1015Y	GEAR	POM-HB
	145	PFUS1622Z	COIL SPRING	
	146	PFKE1052Y3	COVER (KX-FL422CX-B)	PS-HB
	146	PFKE1052Y4	COVER (KX-FL422CX-W)	PS-HB
	147	PFKS1084Z2	TRAY (KX-FL422CX-B)	PS-HB
	147	PFKS1084Z3	TRAY (KX-FL422CX-W)	PS-HB
	148	PFHG1245Z	RUBBER PARTS	
	149	PFHR1370Z	CASE/COVER	ABS-HB
	150	PFHG1155Z	RUBBER PARTS	
	151	PFHR1371Z	PLASTIC PARTS	POM-HB
	152	PFUS1425Z	COIL SPRING	
	153	PFUS1424Z	COIL SPRING	
	154	PFDG1300Z	GEAR	POM-HB
	155	PFDR1018Z	ROLLER	POM-HB
	156	PFDN1048Z	RUBBER PARTS	
	157	PFDR1041Y	ROLLER	ABS-HB
	158	PFUS1423Z	TORSION SPRING	
	159	PFHR1368Z	LEVER	POM-HB
	160	PFHR1369Z	LEVER	POM-HB
	161	PFDJ1038Z	SPACER	POM-HB
	162	PFKE1050Z3	CABINET COVER (KX-FL422CX-B)	PS
	162	PFKE1050Z4	CABINET COVER (KX-FL422CX-W)	PS

18.2.1.6. Fuser Section

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	180	PNDS1012Z	ROLLER	
	181	PFDJ1105Z	SPACER	POLYE-THERIM-IDE-V0
	182	PFUS1426Z	COIL SPRING	
	183	PFUV1101Y	COVER	PBT+ABS +GF30%-V0
	184	PFHX1969Z	SHEET	
	185	PFHX1976Z	SHEET	
	186	PFDG1301Y	GEAR	PPS-V0
	187	PFDJ1065Z	SPACER	PPS-V0
	188	PNDS1009Z	ROLLER	
	189	PFDE1207Z	LEVER	PBT+GF30-V0
	190	PFDJ1064Z	SPACER	PPS-V0
⚠	191	A4DYYY000001	HALOGEN LAMP	
	192	PFJT1023Z	TERMINAL-TERMINAL PLATE	
	193	PFHR1408Z	LEVER	PBT+GF30-V0
	194	PFMH1085Z	METAL PARTS	
⚠	195	K0BDB0000073	THERMOSTAT	
	196	PFJT1021Z	TERMINAL-TERMINAL PLATE	
	197	L2AA00000106	THERMISTOR	
	198	PFJT1022Z	TERMINAL-TERMINAL PLATE	
	199	PFHR1372Y	LEVER	PBT+GF30-V0
	200	PFDR1043Y	ROLLER	POM-HB
	201	PFDR1042X	ROLLER	POM-HB
	202	PFUS1435Z	COIL SPRING	
	203	PFDG1302Z	GEAR	POM-HB
	204	PFUA1080Z	CHASSIS	PBT+ABS +GF30-V0

18.2.1.7. Lower Main Cabinet Section (1)

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	220	PFMD1099Z	CHASSIS	ABS
	221	PFHA1001Z	RUBBER PARTS	
	222	XWC4BFJ	WASHER	
⚠	223	PNJS011003Z	CONNECTOR	
⚠	224	PNJS011002Z	CONNECTOR	
	225	PNJS081018Z	CONNECTOR	
	226	PFHX1975Z	SHEET	V0
	227	PNMH1049Z	METAL PARTS	
	228	PFQT2643Z	LABEL, LASER CAUTION	
⚠	229	LPA1625K	LASER UNIT	
	230	PNJS051012Z	CONNECTOR	
	231	PNJS071016Z	CONNECTOR	
	232	PNHX1197Z	SHEET	V0
	233	PFUS1431Z	COIL SPRING	
	234	PNJS081017Z	CONNECTOR	
	235	PQLB1E1	INSULATOR	
	236	PNJS041007Z	CONNECTOR	
	237	PNJS031011Z	CONNECTOR	
	238	PFUS1449Z	COIL SPRING	
	239	PNJS041008Z	CONNECTOR	
⚠	240	PFJS02P02Z	CONNECTOR	
	241	PQHR945Z	BAND	
	242	KR06TT251508	INSULATOR	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	243	WLR18YK26CM4	LEAD WIRE	
	244	PQMX10010Z	CASE/COVER	
⚠	245	K2AH3G000011	JACK/SOCKET	
⚠	246	B2P3-VH	CONNECTOR	
	247	J0KE00000115	INSULATOR	

18.2.1.8. Lower Main Cabinet Section (2)

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	270	PFUS1592Z	TORSION SPRING	
	271	PFUE1036Z	PLASTIC PARTS	PS-HB
	272	PFUS1028Z	LEAF SPRING	
	273	PNOM1003Z	MIRROR	
	274	PNUS1081Z	COIL SPRING	
	275	PFHX1929Z	SHEET	
	276	PFUS1439Z	COIL SPRING	
	277	WLL20YG24M3M	LEAD WIRE	
	278	PFUS1502Z	TORSION SPRING	
	279	PFJS02P12Y	CONNECTOR	
	280	L0AA05A00048	SPEAKER	

18.2.1.9. Motor Section

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	300	PFUA1076Z	CHASSIS	
	301	L6HAYYYK0005	DC MOTOR	
	302	PFDG1299Z	GEAR	POM-HB
	303	PFUS1019Z	TORSION SPRING	
	304	PFDE1201X	ARM	
	305	XUC4FJP	RETAINING RING	
	306	PFDG1297Z	GEAR	POM-HB
	307	PFDG1457Z	GEAR	POM-HB
	308	PFDG1458Z	GEAR	POM-HB

18.2.1.10. Fan Motor Section

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	320	PFUV1094Y	CASE/COVER	PS-V0
	321	PFUS1667Z	BAR SPRING	
	322	PFUS1430Z	TORSION SPRING	
	323	PFUS1451Z	COIL SPRING	
	324	PFUE1016Z	LEVER	ABS-V0
	325	L6FAYYYK0001	DC MOTOR	
	326	PFUS1666Z	BAR SPRING	
	327	PFUS1664Z	BAR SPRING	
	328	PFUS1665Z	BAR SPRING	

18.2.1.11. Lower Cabinet Section (3)

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	340	L6HAYYYK0004	DC MOTOR	
	341	PFDG1304Y	GEAR	POM-HB
	342	PFMH1184Z	FRAME	
	343	PFDG1305Z	GEAR	POM-HB
	344	PFDG1306Y	GEAR	POM-HB
	345	PFUA1083Z	CHASSIS	
	346	PFDG1303Z	GEAR	POM-HB
	347	XUC5FJP	RETAINING RING	
	348	PNKM1085Z1	CABINET BODY (KX-FL422CX-B)	PS-V0
	348	PNKM1085Z2	CABINET BODY (KX-FL422CX-W)	PS-V0

18.2.1.12. Gear Section

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	360	PFDG1307Z	GEAR	POM-HB
	361	PFDG1189Z	GEAR	POM-HB
	362	PFDG1308Z	GEAR	POM-HB
	363	PFDG1309Z	GEAR	POM-HB
	364	PFDG1297Z	GEAR	POM-HB
	365	PFDG1310Z	GEAR	POM-HB
	366	PFUA1074Z	CHASSIS	PBT+ABS
	367	PFDG1311Z	GEAR	PBT+ABS
	368	PFDG1176Z	GEAR	PBT+ABS
	369	PFDE1272Z	LEVER	POM-HB
	370	PFUS1663Z	TORSION SPRING	
	371	L9AAACEB0007	PLUNGER	
	372	PFUA1073Z	CHASSIS	ABS-HB

18.2.1.13. Actual Size of Screws and Washers

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	A	XTW3+10PFJ7	TAPPING SCREW_STEEL	
	B	XTB3+10GFJ	TAPPING SCREW_STEEL	
	C	XTW3+20PFJ	TAPPING SCREW_STEEL	
	D	XTW4+8PFJ	TAPPING SCREW_STEEL	
	E	XTW2+W9PFJ	TAPPING SCREW_STEEL	
	F	XTW3+12PFJ7	TAPPING SCREW_STEEL	
	G	XYC3+FF8FJ	SCREW WITH WASHER_STEEL	
	H	XSB4+6FJ	SMALL SCREW_STEEL	
	I	XTW3+6LFJ7	TAPPING SCREW_STEEL	
	J	XTW3+5LFJK7	TAPPING SCREW_STEEL	

18.2.1.14. Accessories and Packing Materials

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	A1	PNQW1708Z	LEAFLET	
	A2	PFKS1096Z4	TRAY (KX-FL422CX-B)	PS-HB
	A2	PFKS1096Z5	TRAY (KX-FL422CX-W)	PS-HB
	A3	PNQX1902Z	INSTRUCTION BOOK	
	A4	PFKS1085Z3	TRAY (KX-FL422CX-B)	PS-HB
	A4	PFKS1085Z4	TRAY (KX-FL422CX-W)	PS-HB
	A5	PNKS1006Z1	TRAY (KX-FL422CX-B)	ABS-HB
	A5	PNKS1006Z2	TRAY (KX-FL422CX-W)	ABS-HB
	A6	PQJA10126X	CORD (KX-FL422CX-B)	
	A6	PQJA10126Z	CORD (KX-FL422CX-W)	
	A7	PFJA02B002Y	CORD	
⚠	A8	PFJA03A010Z	POWER CORD	
	A9	PFJXH0901Z	HANDLE/HANDSET (KX-FL422CX-B)	
	A9	PNLXH1004Z	HANDLE/HANDSET (KX-FL422CX-W)	
	A10	PFKS1097Z2	GUIDE (KX-FL422CX-B)	PS-HB
	A10	PFKS1097Z3	GUIDE (KX-FL422CX-W)	PS-HB
	A11	PFKS1098Z2	GUIDE (KX-FL422CX-B)	PS-HB
	A11	PFKS1098Z3	GUIDE (KX-FL422CX-W)	PS-HB
	A12	PNQW1705Z	LEAFLET, ARABIC	
	A13	PNQW1706Z	LEAFLET, PERSIAN	
	A14	PNQW1707Z	LEAFLET, THAI	
	A15	PNQW1709Z	LEAFLET, SPANISH	
	P1	PNPK2210Z-M	PACKING CASE (KX-FL422CX-B)	
	P1	PNPK2211Z-M	PACKING CASE (KX-FL422CX-W)	
	P2	PNPN1108Z	CUSHION	
	P3	PNPN1107Z	CUSHION	
	P4	PFPH1040X	PROTECTION COVER	
	P5	PFPD1279Z	CUSHION	
	P6	PFPP1052Z	PROTECTION COVER	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	P7	PFPP1053Z	PROTECTION COVER	
	P8	PFPH1046Y	PROTECTION COVER	

18.2.2. Digital Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB1	PNWP1FL422CX	DIGITAL BOARD ASS'Y (RTL)	
			(ICs)	
	IC100	C0EBE0000504	IC	
	IC101	C1ZBZ0004052	IC	
	IC102	PNWIFL422CX	IC (ROM)	
	IC103	C3ABPY000027	IC	
	IC104	C0CBAAA00041	IC	
	IC107	C0ABEB000023	IC	
	IC200	C0GBY0000059	IC	
	IC201	C0DBAYY00435	IC	
	IC300	C1CB00003161	IC	
	IC301	C0JBAS000128	IC	
	IC302	C0BBAA000008	IC	
			(TRANSISTORS)	
	Q200	2SD2216R	TRANSISTOR(SI)	S
	Q201	UNR92A8J0L	TRANSISTOR(SI)	
	Q202	UNR92ANJ0L	TRANSISTOR(SI)	
	Q203	UNR92ANJ0L	TRANSISTOR(SI)	
	Q204	UNR92ANJ0L	TRANSISTOR(SI)	
	Q205	2SK3018	TRANSISTOR(SI)	S
	Q206	UNR92ANJ0L	TRANSISTOR(SI)	
	Q207	B1CHND000004	TRANSISTOR(SI)	
	Q208	UNR92ANJ0L	TRANSISTOR(SI)	
	Q209	UNR92ANJ0L	TRANSISTOR(SI)	
	Q210	UNR92ANJ0L	TRANSISTOR(SI)	
	Q211	B1ABDF000025	TRANSISTOR(SI)	
	Q212	2SB1322	TRANSISTOR(SI)	S
	Q214	2SB1197KQ	TRANSISTOR(SI)	S
	Q215	B1ABDF000025	TRANSISTOR(SI)	
	Q217	B1HAGFF00015	TRANSISTOR(SI)	
	Q218	UNR92ANJ0L	TRANSISTOR(SI)	
	Q220	UNR92ANJ0L	TRANSISTOR(SI)	
	Q221	B1CHND000004	TRANSISTOR(SI)	
	Q223	UNR921LJ0L	TRANSISTOR(SI)	S
	Q224	UNR921LJ0L	TRANSISTOR(SI)	S
	Q225	UNR921LJ0L	TRANSISTOR(SI)	S
	Q226	2SA1576Q	TRANSISTOR(SI)	S
	Q227	2SB1197KQ	TRANSISTOR(SI)	S
	Q228	UNR91ANJ0L	TRANSISTOR(SI)	
	Q229	2SB1197KQ	TRANSISTOR(SI)	S
	Q230	UNR91ANJ0L	TRANSISTOR(SI)	
	Q300	B1ABDF000025	TRANSISTOR(SI)	
	Q302	2SC4081R	TRANSISTOR(SI)	S
	Q305	B1GBCFJJ0048	TRANSISTOR(SI)	
	Q306	B1GBCFJJ0048	TRANSISTOR(SI)	
			(DIODES)	
	D100	MA142WKTX	DIODE(SI)	S
	D200	PFVDRMRLS245	DIODE(SI)	S
	D201	B0BA7R900004	DIODE(SI)	
	D202	B0BA7R900004	DIODE(SI)	
	D203	B0ACEL000004	DIODE(SI)	
			(CAPACITORS)	
	C100	ECUE1H180JCQ	18p	
	C101	ECUE1H180JCQ	18p	
	C103	F2G0J2200006	22	
	C104	ECUE1H220JCQ	22p	
	C105	ECUE1H390JCQ	39p	
	C106	ECUE1H330JCQ	33p	
	C107	ECUE1H180JCQ	18p	
	C108	ECUE1C104ZFQ	0.1	
	C109	F1J0J1060006	10	
	C110	ECUE1H101JCQ	100p	
	C111	ECUE1H102KBQ	0.001	
	C112	F1J0J1060006	10	
	C113	ECUE1H102KBQ	0.001	
	C114	ECUE1A104KBQ	0.1	
	C117	ECUE1H300JCQ	30p	
	C118	ECUE1C103KBQ	0.01	
	C119	ECUE1C104ZFQ	0.1	
	C120	ECUE1C104ZFQ	0.1	
	C121	ECUE1C104ZFQ	0.1	
	C122	ECUE1C104ZFQ	0.1	
	C123	ECUE1C104ZFQ	0.1	
	C124	ECUE1C104ZFQ	0.1	
	C125	ECUE0J105KBQ	1	
	C126	ECUE0J105KBQ	1	
	C127	ECUE0J105KBQ	1	
	C128	ECUE1H102KBQ	0.001	
	C129	ECUE1H102KBQ	0.001	
	C130	ECUE1H102KBQ	0.001	
	C131	ECUE1C104ZFQ	0.1	
	C132	ECUE0J105KBQ	1	
	C133	ECUE1H102KBQ	0.001	
	C134	ECJ0EB0J224K	0.22	S
	C135	ECUE1C104ZFQ	0.1	
	C136	ECUE1C104ZFQ	0.1	
	C137	ECUE1C104ZFQ	0.1	
	C138	ECUE1C104ZFQ	0.1	
	C139	ECUE1C104ZFQ	0.1	
	C140	ECUE1C104ZFQ	0.1	
	C141	ECUE1C104ZFQ	0.1	
	C142	ECUE1C104ZFQ	0.1	
	C143	ECUE1C104ZFQ	0.1	
	C144	ECUE1C104ZFQ	0.1	
	C145	ECUE1C104ZFQ	0.1	
	C146	ECUE1C104ZFQ	0.1	
	C147	ECUE1C104ZFQ	0.1	
	C148	ECUE1C104ZFQ	0.1	
	C149	ECUE1C104ZFQ	0.1	
	C150	ECUE1C104ZFQ	0.1	
	C151	ECJ0EB0J224K	0.22	S
	C152	ECJ0EB0J224K	0.22	S
	C153	ECUE1H270JCQ	27p	
	C154	ECUE1C104ZFQ	0.1	
	C159	ECUE1H270JCQ	27p	
	C160	ECUE1C104ZFQ	0.1	
	C161	ECUE1C104ZFQ	0.1	
	C162	ECUE1H270JCQ	27p	
	C165	ECUE1C104ZFQ	0.1	
	C166	ECUE1C104ZFQ	0.1	
	C167	ECUE1C104ZFQ	0.1	
	C168	ECUE1C104ZFQ	0.1	
	C169	ECUE1C104ZFQ	0.1	
	C171	ECUE1H270JCQ	27p	
	C174	ECUE0J105KBQ	1	
	C175	ECUE0J105KBQ	1	
	C176	ECUE0J105KBQ	1	
	C177	ECUE1C104ZFQ	0.1	
	C200	ECUE1H471KBQ	470p	
	C201	ECUE1H102KBQ	0.001	
	C202	ECUE1C104ZFQ	0.1	
	C203	ECUE1H471KBQ	470p	
	C204	ECUV1H104ZFV	0.1	
	C205	F2G1V1010021	100	
	C206	ECUV1H104ZFV	0.1	
	C207	ECUE1H471KBQ	470p	
	C208	F2G1V1010021	100	
	C209	ECUE1H471KBQ	470p	
	C210	F2G0J3310025	330	
	C211	ECUE1H471KBQ	470p	
	C213	ECUE1C104ZFQ	0.1	
	C214	ECUE1H471KBQ	470p	
	C215	ECUE1H100DCQ	10p	
	C218	ECUE1H471KBQ	470p	
	C220	ECUE1H471KBQ	470p	
	C221	ECUV1H104ZFV	0.1	
	C222	ECUE1H471KBQ	470p	
	C223	F2G1V1010021	100	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C224	ECUV1A105ZFV	1	
	C226	ECUE1A104KBQ	0.1	
	C227	ECUE1A104KBQ	0.1	
	C228	ECUE1H102KBQ	0.001	
	C229	ECUE1H102KBQ	0.001	
	C230	ECUE1A104KBQ	0.1	
	C231	ECUE1A104KBQ	0.1	
	C236	ECUE1C104ZFQ	0.1	
	C239	ECJ1VB0J475K	4.7	
	C240	ECJ1VB0J475K	4.7	
	C241	ECUE1C104ZFQ	0.1	
	C248	ECUV1H102KBV	0.001	
	C249	ECUE1H181JCQ	180p	
	C250	ECUE1H181JCQ	180p	
	C251	PQCUV0J106KB	10	
	C252	PQCUV0J106KB	10	
	C255	ECUE1C104ZFQ	0.1	
	C256	ECUE1H101JCQ	100p	
	C257	ECUV1A105ZFV	1	
	C258	ECUE1C103KBQ	0.01	
	C259	ECUE1H102KBQ	0.001	
	C260	ECUE1H102KBQ	0.001	
	C261	ECUE1H102KBQ	0.001	
	C262	ECUE1H102KBQ	0.001	
	C263	ECUE1H102KBQ	0.001	
	C265	ECUE1H102KBQ	0.001	
	C267	ECUE1H102KBQ	0.001	
	C269	ECUE1H102KBQ	0.001	
	C270	F2G1V1010021	100	
	C271	ECUE1C104ZFQ	0.1	
	C300	ECUV1H104ZFV	0.1	
	C301	ECUE1A104KBQ	0.1	
	C302	F2G0J2200006	22	
	C303	ECUV1H104ZFV	0.1	
	C304	ECUE1A104KBQ	0.1	
	C305	ECUE1H222KBQ	0.0022	
	C306	ECJ0EB0J224K	0.22	S
	C308	EEE1CA100SR	10	
	C309	ECUE1H222KBQ	0.0022	
	C311	ECUE1H680JCQ	68p	
	C312	ECUE1C103KBQ	0.01	
	C314	ECUE1A104KBQ	0.1	
	C316	ECUE1A104KBQ	0.1	
	C317	ECUE1A104KBQ	0.1	
	C318	ECUE1A104KBQ	0.1	
	C319	F2G0J2200006	22	
	C321	ECUE1A104KBQ	0.1	
	C324	ECUE1A104KBQ	0.1	
	C325	ECUE1C223KBQ	0.022	
	C327	ECUE1A104KBQ	0.1	
	C329	ECUE1H820JCQ	82p	
	C330	ECUE1C104ZFQ	0.1	
	C331	ECUE1C104ZFQ	0.1	
	C332	ECUE1C104ZFQ	0.1	
	C333	ECUE1C104ZFQ	0.1	
	C334	ECUE1C104ZFQ	0.1	
	C335	ECUE1C104ZFQ	0.1	
	C336	ECUE1C104ZFQ	0.1	
	C337	ECUE1C104ZFQ	0.1	
	C338	ECUE1C104ZFQ	0.1	
	C339	ECUE1C104ZFQ	0.1	
	C340	ECUE1C104ZFQ	0.1	
	C341	ECUE1C104ZFQ	0.1	
	C344	ECUV1H104ZFV	0.1	
	C345	ECUV1H104ZFV	0.1	
	C348	ECUV1H104ZFV	0.1	
	C349	ECUV1H104ZFV	0.1	
	C350	ECUV1H104ZFV	0.1	
	C351	ECUV1H104ZFV	0.1	
	C352	ECUV1H104ZFV	0.1	
	C353	ECUE1H102KBQ	0.001	
	C354	ECUE1H102KBQ	0.001	
	C355	ECUE1H102KBQ	0.001	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C356	ECUE1H102KBQ	0.001	
	C357	ECUE1H102KBQ	0.001	
	C358	ECUE1H102KBQ	0.001	
	C359	ECUE0J105KBQ	1	
	C360	ECUE1H102KBQ	0.001	
	C361	ECUE1C104ZFQ	0.1	
	C362	ECUE1H101JCQ	100p	
	C363	ECUE1H101JCQ	100p	
	C365	ECUE1C104ZFQ	0.1	
	C367	ECUE1H102KBQ	0.001	
	C368	ECUE1H101JCQ	100p	
			(CONNECTORS)	
	CN101	K1KA04AA0193	CONNECTOR, 4PIN	
	CN102	K1KA08AA0193	CONNECTOR, 8PIN	
	CN103	K1KA08A00440	CONNECTOR, 8PIN	
	CN104	K1KA07A00280	CONNECTOR, 7PIN	
	CN105	K1KA05A00364	CONNECTOR, 5PIN	
	CN106	K1KA05AA0193	CONNECTOR, 5PIN	
	CN107	K1KA07A00257	CONNECTOR, 7PIN	
	CN109	K1MN08B00083	CONNECTOR, 8PIN	
	CN110	K1KA08A00498	CONNECTOR, 8PIN	
	CN111	K1KA04A00527	CONNECTOR, 4PIN	
	CN112	K1KA04A00644	CONNECTOR, 48PIN	
	CN113	K1KA03AA0193	CONNECTOR, 3PIN	
	CN114	K1KA03A00495	CONNECTOR, 3PIN	
	CN300	K1KA16A00206	CONNECTOR, 16PIN	
			(FUSE)	
	F200	K5H122Y00002	FUSE	
			(COILS)	
	L203	J0JCC0000278	COIL	
	L204	G1C2R2MA0203	COIL	
	L205	G1C2R2MA0203	COIL	
	L208	J0JCC0000278	COIL	
	R219	J0JHC0000045	COIL	
			(IC FILTERS)	
	DL101	J0MAB0000145	IC FILTER	
	L100	J0JCC0000276	IC FILTER	
	L101	J0JCC0000276	IC FILTER	
	L102	J0JCC0000276	IC FILTER	
	L200	J0JCC0000277	IC FILTER	
	L201	J0JCC0000277	IC FILTER	
	L202	J0JCC0000277	IC FILTER	
	L206	J0JGC0000020	IC FILTER	
	L207	J0JCC0000308	IC FILTER	
	L301	J0JCC0000308	IC FILTER	
	L302	J0JCC0000308	IC FILTER	
	L303	J0JCC0000308	IC FILTER	
			(RESISTORS)	
	R101	ERJ2GEJ103	10k	
	R104	ERJ2GEJ470	47	
	R105	ERJ2GEJ470	47	
	R106	ERJ2GEJ470	47	
	R107	ERJ2GEJ470	47	
	R108	ERJ2GEJ680	68	
	R109	ERJ2GEJ680	68	
	R110	ERJ2GEJ680	68	
	R112	ERJ2GEJ751	750	
	R113	ERJ2GEJ152	1.5k	
	R114	ERJ2GEJ473	47k	
	R115	ERJ2GEJ473	47k	
	R116	ERJ2GEJ473	47k	
	R117	ERJ2GEJ220	22	
	R118	ERJ2GEJ220	22	
	R121	ERJ2GEJ103	10k	
	R122	ERJ2GEJ473	47k	
	R123	ERJ2GEJ473	47k	
	R124	ERJ2GEJ473	47k	
	R131	ERJ2GEJ473	47k	
	R134	ERJ2GEJ470	47	
	R135	ERJ2GEJ470	47	
	R136	ERJ2GEJ470	47	
	R137	ERJ2GEJ472X	4.7k	
	R138	ERJ2GEJ473	47k	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R139	ERJ2GEJ472X	4.7k	
	R140	ERJ2GEJ472X	4.7k	
	R143	ERJ2GEJ103	10k	
	R144	ERJ2GEJ104	100k	
	R145	ERJ2GEJ1R0	1	
	R146	ERJ2GEJ1R0	1	
	R147	ERJ2GEJ1R0	1	
	R156	ERJ2GEJ102	1k	
	R157	ERJ2GEJ184	180k	
	R200	ERJ2GEJ472X	4.7k	
	R201	ERJ2GEJ473	47k	
	R202	ERJ2GEJ473	47k	
	R203	ERJ2GEJ271	270	
	R204	ERJ2GEJ101	100	
	R205	ERJ2GEJ181	180	
	R206	ERJ2GEJ124	120k	
	R207	ERJ2GEJ473	47k	
	R208	ERJ2GEJ105X	1M	
	R209	ERJ2GEJ473	47k	
	R210	ERJ2GEJ101	100	
	R211	ERJ2GEJ473	47k	
	R212	ERJ2GEJ101	100	
	R213	ERJ2GEJ104	100k	
	R214	ERJ2GEJ473	47k	
	R215	ERJ2GEJ472X	4.7k	
	R216	ERJ8RQFR22	0.22	
	R217	ERJ2GEJ103	10k	
	R218	ERJ8RQFR22	0.22	
	R220	ERJ2GEJ393X	39k	
	R221	ERJ3EKF2202	22k	
	R222	ERJ3EKF1003	100k	
	R223	ERJ3GEYF334	330k	S
	R224	ERJ2GEJ393X	39k	
	R225	ERJ3EKF5603	560k	
	R226	ERJ3GEY0R00	0	
	R227	ERJ3EKF3003	300k	
	R228	ERJ2GEJ104	100k	
	R231	ERJ2RKF1301	1.3k	
	R232	ERJ2GEJ103	10k	
	R233	ERJ2RKF1502	15k	
	R234	ERJ2RKF8201	8.2k	
	R238	ERJ3GEYJ102	1k	
	R239	ERJ14YJ152	1.5k	
	R240	ERJ2RKF8200	820	
	R241	ERJ2GEJ472X	4.7k	
	R242	ERJ2GEJ472X	4.7k	
	R243	ERJ2GEJ222	2.2k	
	R245	ERJ2GEJ101	100	
	R246	ERJ2GEJ101	100	
	R247	ERJ2GEJ332	3.3k	
	R249	ERJ2GEJ472X	4.7k	
	R252	ERJ2GEJ103	10k	
	R254	ERJ2GEJ563	56k	
	R256	ERJ2GEJ101	100	
	R257	ERJ2GEJ101	100	
	R258	ERJ2GEJ101	100	
	R259	ERJ2GEJ181	180	
	R260	ERJ2GEJ102	1k	
	R261	ERJ2GE0R00	0	
	R262	ERJ2GE0R00	0	
	R264	ERJ2GE0R00	0	
	R265	ERJ2RKF2402	24k	
	R266	ERJ2GEJ102	1k	
	R267	D0GG472JA002	4.7k	
	R268	D0GG472JA002	4.7k	
	R269	ERJ3GEYJ103	10k	
	R270	ERJ3GEYJ103	10k	
	R271	ERJ2GEJ102	1k	
	R272	ERJ2GEJ101	100	
	R273	ERJ2RKF1601	1.6k	
	R274	D0GG472JA002	4.7k	
	R275	ERJ12YJ390	39	
	R276	ERJ2GEJ562X	5.6k	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R277	ERJ2GEJ562X	5.6k	
	R278	ERJ2GEJ563	56k	
	R279	ERJ3GEYJ103	10k	
	R280	ERJ14YJ471U	470	
	R282	ERJ2GEJ562X	5.6k	
	R283	ERJ14YJ471U	470	
	R284	ERJ2GEJ563	56k	
	R285	ERJ2GEJ103	10k	
	R286	ERJ2GEJ563	56k	
	R287	ERJ2GEJ181	180	
	R288	ERJ2GE0R00	0	
	R289	ERJ2GE0R00	0	
	R290	ERJ2GE0R00	0	
	R291	ERJ2GE0R00	0	
	R292	ERJ2RKF4301	4.3k	
	R300	ERJ2GEJ103	10k	
	R303	ERJ2GEJ473	47k	
	R304	ERJ2GEJ220	22	
	R306	ERJ2GEJ224	220k	
	R307	ERJ2GEJ823	82k	
	R311	ERJ2GEJ223	22k	
	R312	ERJ2GEJ824	820k	
	R313	ERJ2GEJ272	2.7k	
	R314	ERJ2GEJ564	560k	
	R315	ERJ2GEJ223	22k	
	R316	ERJ2GEJ220	22	
	R317	ERJ2GEJ122	1.2k	
	R318	ERJ2GEJ103	10k	
	R320	ERJ2GEJ564	560k	
	R321	ERJ2GEJ473	47k	
	R322	ERJ2GEJ682	6.8k	
	R323	ERJ2GEJ272	2.7k	
	R327	ERJ2GEJ273X	27k	
	R328	ERJ2GEJ335	3.3m	
	R329	ERJ2GEJ223	22k	
	R333	ERJ2GEJ473	47k	
	R334	ERJ2GEJ682	6.8k	
	R335	ERJ2GEJ473	47k	
	R336	ERJ2GEJ333	33k	
	R337	ERJ2GEJ224	220k	
	R338	ERJ2GEJ472X	4.7k	
	R339	ERJ2GEJ103	10k	
	R340	ERJ2GEJ222	2.2k	
	R341	ERJ2GEJ472X	4.7k	
	R342	ERJ2GEJ471	470	
	R345	ERJ2RKF9101	9.1k	
	R346	ERJ2RKF5600	560	
	R347	ERJ2GEJ101	100	
	R352	ERJ2GEJ472X	4.7k	
	R353	ERJ2GEJ473	47k	
	R354	ERJ2GE0R00	0	
	R355	ERJ2GEJ151	150	
	R356	ERJ2GEJ151	150	
	R357	ERJ2GEJ151	150	
	R358	ERJ2GEJ151	150	
	R360	ERJ2GEJ220	22	
			(COMPONENTS PARTS)	
	RA100	EXB28V101JX	RESISTOR ARRAY	
	RA101	EXB28V470JX	RESISTOR ARRAY	
	RA102	EXB28V470JX	RESISTOR ARRAY	
	RA103	EXB28V470JX	RESISTOR ARRAY	
	RA104	EXB28V470JX	RESISTOR ARRAY	
	RA105	EXB28V470JX	RESISTOR ARRAY	
	RA106	EXB28V470JX	RESISTOR ARRAY	
	RA107	EXB28V470JX	RESISTOR ARRAY	
	RA108	EXB28V470JX	RESISTOR ARRAY	
	RA109	EXB28V470JX	RESISTOR ARRAY	
	RA110	EXB28V470JX	RESISTOR ARRAY	
	RA111	EXB28V470JX	RESISTOR ARRAY	
	RA112	EXB28V470JX	RESISTOR ARRAY	
	RA113	EXB28V470JX	RESISTOR ARRAY	
	RA114	EXB28V470JX	RESISTOR ARRAY	
	RA115	EXB28V473JX	RESISTOR ARRAY	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
			(CRYSTAL OSCILLATORS)	
	X100	H0A327200147	CRYSTAL OSCILLATOR	
	X101	H0J245500087	CRYSTAL OSCILLATOR	
	X102	H0J128500023	CRYSTAL OSCILLATOR	

18.2.3. Analog Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB2	PNLP2119CX-A	ANALOG BOARD ASS'Y (RTL)	
			(ICs)	
	IC401	C0ABEB000083	IC	
	IC402	C1AB00002556	IC	
			(TRANSISTORS)	
	Q405	B1ABDF000026	TRANSISTOR(SI)	
	Q406	B1GBCFEN0010	TRANSISTOR(SI)	
	Q408	B1ABDF000025	TRANSISTOR(SI)	
			(DIODES)	
	D401	MA4120	DIODE(SI)	S
	D404	MA4030	DIODE(SI)	S
	D406	MA4030	DIODE(SI)	S
	D411	B0ADEJ000026	DIODE(SI)	
	D412	1SS133	DIODE(SI)	S
			(CAPACITORS)	
	C401	ECEA0JKA470	47	
	C402	ECEA0JKS470	47	
	C403	ECUV1E104ZFV	0.1	
	C404	ECUV1H471JCV	470p	S
	C405	ECUV1H471JCV	470p	S
	C406	ECUV1H101JCV	100p	
	C407	ECUV1H122KBV	0.0012	
	C408	ECUV1C104KBV	0.1	
	C409	ECUV1C104KBV	0.1	
	C410	ECUV1C333KBV	0.033	
	C413	ECEA1HKA4R7	4.7	
	C415	ECUV1H333KDV	0.033	S
	C416	ECUV1C104KBV	0.1	
	C420	ECUV1H331JCV	330p	
	C421	ECUV1H331JCV	330p	
	C424	ECUV1H472KBV	0.0047	
	C426	ECUV1H101JCV	100p	
	C428	ECEA0JKA470	47	
	C429	ECUV1C393KBV	0.039	
	C430	ECUV1C393KBV	0.039	
	C431	ECUV1H103KBV	0.01	
	C432	ECUV1H103KBV	0.01	
	C434	ECEA0JKA470	47	
	C435	ECUV1H103KBV	0.01	
	C436	F0C2E684A216	0.68	
	C440	ECUV1C104KBV	0.1	
	C441	ECUV1H101JCV	100p	
	C461	ECUV1C104KBV	0.1	
	C462	ECUV1H102KBV	0.001	
	C463	ECUV1A105KBV	1	
	C464	ECUV1A105KBV	1	
			(JACKS AND CONNECTORS)	
	CN401	K2LB1YYB0002	JACK	
	CN402	K2LB1YYB0002	JACK	
	CN403	K2LA1YYB0001	JACK	
	CN405	PQJS16A10Z	CONNECTOR, 16PIN	S
	CN406	K1KA02A00587	CONNECTOR, 2PIN	
	CN407	K1KA02AA0193	CONNECTOR, 2PIN	
			(COILS)	
	L401	PQLQR2KA20T	COIL	S
	L402	PQLQR2KA20T	COIL	S
	L403	PQLQR2KA20T	COIL	S
	L404	PQLQR2KA20T	COIL	S
	L409	PQLQR2KA20T	COIL	S
	L410	PQLQR2KA20T	COIL	S
	L411	PQLQR2KA113	COIL	S
	L412	PQLQR2KA113	COIL	S
	L413	PQLQR2KA113	COIL	S
	L414	PQLQR2KA113	COIL	S
	L415	PQLQR2KA20T	COIL	S
	R404	PQLQR2KA20T	COIL	S
			(PHOTO ELECTRIC TRANS-DUCER)	
⚠	PC402	0N3181	PHOTO ELECTRIC TRANS-DUCER	S
			(POSISTOR)	
⚠	POS401	PFRT002	0k	S
			(RESISTORS)	
	JJ411	ERJ3GEY0R00	0	
	JJ420	ERJ3GEY0R00	0	
	R401	ERJ3GEYJ103	10k	
	R402	ERJ3GEYJ103	10k	
	R403	ERJ3GEYJ220	22	
	R406	ERJ3GEYJ363	36k	
	R407	ERJ3GEYJ363	36k	
	R408	ERJ3GEYJ124	120k	
	R409	ERJ3GEYJ223	22k	
	R410	ERJ3GEYJ223	22k	
	R413	ERJ3GEYJ912	9.1k	
	R414	ERDS2FJ271	270	S
	R417	ERJ3GEYJ333	33k	
	R418	ERJ3GEYJ222	2.2k	
	R422	ERDS1TJ223	22k	S
	R425	ERJ3GEYJ332	3.3k	
	R427	ERG2SJ101	100	
	R428	ERJ3GEYJ123	12k	
	R430	ERJ3GEYJ394	390k	
	R433	ERDS1TJ473	47k	
	R434	ERJ3GEYJ473	47k	
	R435	ERJ3GEYJ331	330	
	R437	ERJ3GEYJ394	390k	
	R438	ERJ3GEYJ562	5.6k	
	R439	ERJ3GEYJ562	5.6k	
	R442	ERJ3GEYJ152	1.5k	
	R443	ERJ3GEYJ152	1.5k	
	R445	ERJ3GEYJ331	330	
	R448	ERJ3GEY0R00	0	
	R451	ERJ3GEYJ222	2.2k	
	R452	ERJ3GEYJ100	10	
	R453	ERJ3GEYJ222	2.2k	
	R454	ERJ3GEYJ564	560k	
	R461	ERJ3GEYJ153	15k	
	R462	ERJ3GEYJ103	10k	
	R463	ERJ3GEYJ124	120k	
	R464	ERJ3GEYJ124	120k	
			(RELAY)	
⚠	RLY401	K6B1CYY00005	RELAY	
			(VARISTORS)	
	SA401	PFRZRA311P6T	VARISTOR	S
⚠	SA402	PFRZRA102P6T	VARISTOR	S
			(TRANSFORMER)	
⚠	T401	G4AYB0000005	TRANSFORMER	

18.2.4. Exit Sensor Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB3	PNLP2119CX-B	EXIT SENSOR BOARD ASS'Y (RTL)	
			(CONNECTORS)	
	CN501	K1KA03B00201	CONNECTOR, 3PIN	
	CN502	K1KA04B00225	CONNECTOR, 4PIN	
			(PHOTO ELECTRIC TRANS-DUCER)	
	PS501	B3NAA0000106	PHOTO ELECTRIC TRANS-DUCER	
			(RESISTORS)	
	R502	ERJ3GEY0R00	0	

18.2.5. Drum & Toner Sensor Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB4	PNLP2119CX-C	DRUM & TONNER SENSOR BOARD ASS'Y (RTL)	
			(PHOTO ELECTRIC TRANS-DUCER)	
	IC512	B4ZZ00000021	PHOTO ELECTRIC TRANS-DUCER	
			(CAPACITORS)	
	C511	ECUV1C104ZFV	0.1	
			(CONNECTOR)	
	CN511	K1KA03A00495	CONNECTOR, 3PIN	

18.2.6. Varistor Sensor Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB5	PNLP2119CX-D	VARISTOR SENSOR BOARD ASS'Y (RTL)	
			(VARISTOR)	
	ZNR521	PFRV271NS05K	VARISTOR	

18.2.7. Resist Sensor Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB6	PNLP2119CX-E	RESIST SENSOR BOARD ASS'Y (RTL)	
			(BATTERY)	
	B531	CR23541GUF	BATTERY	S
			(CONNECTOR)	
	CN531	K1KA04A00527	CONNECTOR, 4PIN	
			(PHOTO ELECTRIC TRANS-DUCER)	
	PS531	B3NAA0000106	PHOTO ELECTRIC TRANS-DUCER	
			(RESISTOR)	
	R531	ERJ3GEYJ181	180	

18.2.8. Operation Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB7	PNWP2FL422CX	OPERATION BOARD ASS'Y (RTL)	
			(ICs)	
	IC601	C1ZBZ0002089	IC	
			(DIODES)	
	LED602	B3AAA0000534	DIODE(SI)	
	LED603	B3AAA0000534	DIODE(SI)	
			(CAPACITORS)	
	C602	ECUV1C104ZFV	0.1	
	C607	ECUV1C104ZFV	0.1	
	C608	ECUV1C104ZFV	0.1	
	C611	ECUV1H101JCV	100p	
	C612	ECUV1H101JCV	100p	
	C613	ECUV1H391JCV	390p	S
	C614	ECUV1H102KBV	0.001	
	C633	ECUV1C104ZFV	0.1	
	C634	ECUV1C104ZFV	0.1	
	C641	ECUV1C104ZFV	0.1	
	C653	ECUV1C104ZFV	0.1	
	C654	ECUV1C104ZFV	0.1	
	C656	ECUV1C104ZFV	0.1	
	C657	ECUV1C104ZFV	0.1	
	C671	ECUV1C104ZFV	0.1	
	C682	ECUV1C104ZFV	0.1	
			(CONNECTOR)	
	CN601	K1KA08B00243	CONNECTOR, 8PIN	
			(LIQUID CRYSTAL DISPLAY)	
	CN651	L5DAAFB00001	LIQUID CRYSTAL DISPLAY	
			(COILS)	
	L601	PQLQR2KA113	COIL	S
			(LEAD WIRES)	
	LeadHO	PNWLFB15DDXX	LEAD WIRE	
	LeadHO	PNWLFW15DDXX	LEAD WIRE	
			(PHOTO ELECTRIC TRANS-DUCER)	
	PS601	CNA1006N	PHOTO ELECTRIC TRANS-DUCER	
			(RESISTOR)	
	L651	ERJ3GEY0R00	0	
	R601	ERJ3GEYJ101	100	
	R602	ERJ3GEYJ101	100	
	R603	ERJ3GEYJ101	100	
	R604	ERJ3GEYJ332	3.3k	
	R606	ERJ3GEYJ123	12k	
	R607	ERJ3GEYJ102	1k	
	R621	ERJ3ENF8202	82k	S
	R622	ERJ3EKF4301	4.3k	
	R639	ERJ3GEYJ123	12k	
	R641	ERJ3GEYJ472	4.7k	
	R642	ERJ3GEYJ101	100	
	R651	ERJ3GEYJ4R7	4.7	
	R652	ERJ3GEY0R00	0	
	R655	ERJ3GEYJ103	10k	
	R656	ERJ3GEYJ223	22k	
	R658	ERJ3GEYJ122	1.2k	
	R662	ERJ3GEYJ151	150	
	R671	ERJ3GEYJ472	4.7k	
	R672	ERJ3GEYJ152	1.5k	
	R681	ERJ3GEYJ331	330	
	R682	ERJ3GEYJ102	1k	
	R683	ERJ3GEY0R00	0	
	R690	ERJ3GEYJ102	1k	
	R691	ERJ3GEYJ102	1k	
	R692	ERJ3GEYJ102	1k	
	R693	ERJ3GEYJ102	1k	
	R694	ERJ3GEYJ4R7	4.7	
	R695	ERJ3GEYJ4R7	4.7	
	R696	ERJ3GEY0R00	0	
	R697	ERJ3GEY0R00	0	
	R698	ERJ3GEY0R00	0	
	R699	ERJ3GEY0R00	0	
			(SWITCHES)	
	SW601	EVQ11Y05B	SPECIAL SWITCH	
	SW602	EVQ11Y05B	SPECIAL SWITCH	
	SW603	EVQ11Y05B	SPECIAL SWITCH	
	SW604	EVQ11Y05B	SPECIAL SWITCH	
	SW605	EVQ11Y05B	SPECIAL SWITCH	
	SW606	EVQ11Y05B	SPECIAL SWITCH	
	SW607	EVQ11Y05B	SPECIAL SWITCH	
	SW608	EVQ11Y05B	SPECIAL SWITCH	
	SW609	EVQ11Y05B	SPECIAL SWITCH	
	SW610	EVQ11Y05B	SPECIAL SWITCH	
	SW611	EVQ11Y05B	SPECIAL SWITCH	
	SW612	EVQ11Y05B	SPECIAL SWITCH	
	SW613	EVQ11Y05B	SPECIAL SWITCH	
	SW614	EVQ11Y05B	SPECIAL SWITCH	
	SW615	EVQ11Y05B	SPECIAL SWITCH	
	SW616	EVQ11Y05B	SPECIAL SWITCH	
	SW617	EVQ11Y05B	SPECIAL SWITCH	
	SW618	EVQ11Y05B	SPECIAL SWITCH	
	SW619	EVQ11Y05B	SPECIAL SWITCH	
	SW620	EVQ11Y05B	SPECIAL SWITCH	
	SW621	EVQ11Y05B	SPECIAL SWITCH	
	SW622	EVQ11Y05B	SPECIAL SWITCH	
	SW623	EVQ11Y05B	SPECIAL SWITCH	
	SW624	EVQ11Y05B	SPECIAL SWITCH	
	SW628	EVQ11Y05B	SPECIAL SWITCH	
	SW629	EVQ11Y05B	SPECIAL SWITCH	
	SW630	EVQ11Y05B	SPECIAL SWITCH	
	SW632	EVQ11Y05B	SPECIAL SWITCH	
	SW633	EVQ11Y05B	SPECIAL SWITCH	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	SW634	EVQ11Y05B	SPECIAL SWITCH	
	SW635	EVQ11Y05B	SPECIAL SWITCH	
	SW636	EVQ11Y05B	SPECIAL SWITCH	
	SW637	EVQ11Y05B	SPECIAL SWITCH	
	SW638	EVQ11Y05B	SPECIAL SWITCH	
	SW639	EVQ11Y05B	SPECIAL SWITCH	
	SW640	EVQ11Y05B	SPECIAL SWITCH	
	SW671	PFSH1A005Z	PUSH SWITCH	S
			(SIGNAL SWITCH)	
	SW641	K0L1BB000037	SIGNAL SWITCH(ACTUATOR)	
			(THERMISTOR)	
	TH601	D4CC11030019	THERMISTOR	

18.2.9. High Voltage Power Supply Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	PCB8	EUK1MNA90HA	HIGH VOLTAGE POWER SUPPLY BOARD (RTL)	
			(IC PROTECTOR)	
	IP1	PFBAICPN38	FUSE	S
			(IC)	
	IC101	NJM2904M	IC	
			(TRANSISTORS)	
	Q105	2SD2137A	TRANSISTOR(SI)	
	Q106	2SD2137A	TRANSISTOR(SI)	
			(SWITCH)	
⚠	SW1	AV3215G3	MICRO SWITCH	
			(TRANSFORMERS)	
⚠	T101	ETB20DKA2	TRANSFORMER	
⚠	T102	ETB20DKC2	TRANSFORMER	

18.2.10. Low Voltage Power Supply Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
⚠	PCB9	N0AC2GG00003	LOW VOLTAGE POWER BOARD ASS'Y (RTL)	
			(TRANSISTOR)	
	Q1	2SK3565	TRANSISTOR(SI)	
			(DIODES)	
	D1	PFVDSIWB60B	DIODE(SI)	S
	D104	PFVDTZPT30	DIODE(SI)	S
	D576	PFVDTZPT7R5	DIODE(SI)	S
			(CAPACITOR)	
⚠	C5	PFCEA450VB56	56	S
			(FUSES)	
⚠	F1	PFBAS50510A	FUSE	S
⚠	F2	PFBAS5054R0A	FUSE	S
			(OTHERS)	
	SCR51	TM1261I	COMPONENTS PARTS	

HI(Q)
KXFL422CXB
KXFL422CXW