WINJET ML2000

Maintenance Manual

VER 1.0 11-2014

KPOWERSCIENCE CO.,LTD.

ISO 9001 CERTIFIED

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Documentation Conventions

This document uses the following conventions.

【Note】	Notes contain important information.
CAUTION	Caution messages appear before procedures, which, if not observed, could result in damage to parts and consumables.
WARNING	Warning messages alert the reader to a specific procedure or practice, which, if not followed correctly, could cause personal injury.

Safety Information

Thanks for using KPOWER product. Kpowerscience Co., LTD. is an ISO 9001 certified manufacturer. It's our responsibility to inform users about the following safety information:

Safety Instructions

1. **Installation:** After moving the printer, examine the power cord and confirm good connection of each connector before turn on the printer. Make sure the four level feet of the printer kept at the same level. To prevent from causing damage to the printer, do not incline or shake the printer.

   ☆Do not put the printer near direct sunlight.
   ☆Do not place the printer near heating source.
   ☆Do not put the printer near air conditioner, fan or any heating air exit.
   ☆Do not place the printer near dusty location and vibration.
   ☆Do not put the printer near combustibles.
   ☆Do not place the printer on any unstable surface.
   ☆Do not plug in too many power cords or multiple outlet.
   ☆Avoid drastic temperature change to maintain print quality.
   ☆Do not place the printer in an environment of temperature or humidity extremes. Environment required for normal printer performance:
      ※Temperature: 15˚C to 30˚C
      ※Humidity: 30% ~ 80% RH
   ☆Install the printer in a well air-conditioning room.
   ☆Periodic examination of the followings:
      ※Does the plug abnormally overheat?
      ※Does the AC power cable break?
      ※Is there a bad connection of the plug and outlet?

   【Note】A proper environment assists better print quality and printer performance as well as extension of printer life.

2. **Operation:** This printer is a high-tech product. Please comply with the manual to handle parts, consumables, and engine. Please employ correct ways and steps to operate the printer carefully. Do not open the front door while the printer is printing.

3. **Storage:** Please follow the instructions on the manual and provide a proper environment for storage of paper, parts, consumables and engine; and be aware of the expiration date of each item. When intend not to use the printer for a long period of time, clean the entire printer then remove the consumables and put into boxes for proper storage.

4. **Consumables:** Please use KPOWER's consumables to ensure the engine function and life as well as the print quality.

   Before deliver developing unit, make sure the toner cartridge is removed and the toner remained inside the toner hopper, if any, is cleared by vacuum cleaner. Otherwise, it may cause abnormal operation of toner supply.

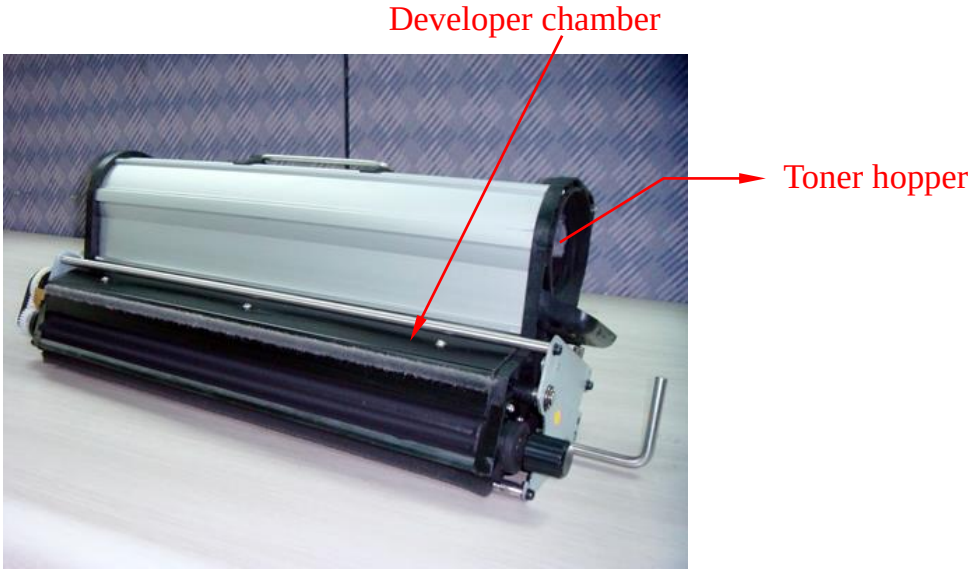

Fig. S-4-1

Then use the vacuum cleaner to clear the toner remained on the toner supply roller (sponge roller) while use a slotted (-) screwdriver to turn the gear of the toner supply roller counterclockwise.

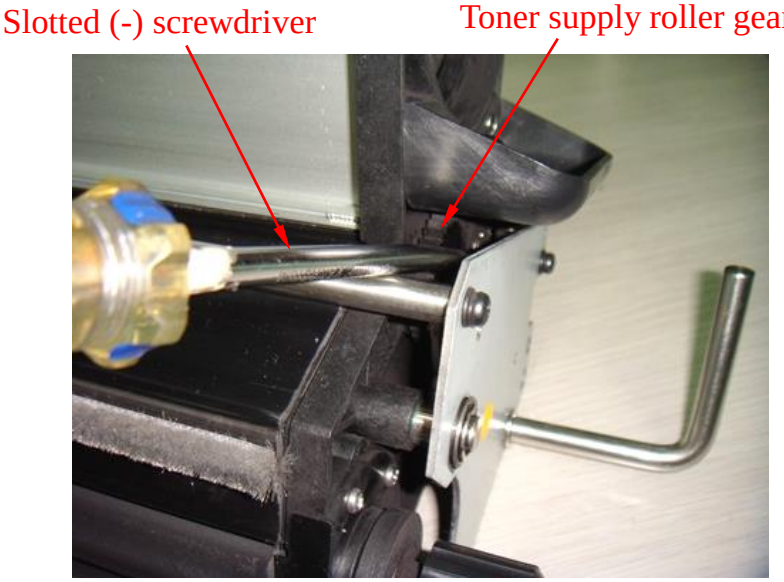

Fig. S-4-2

Fig. S-4-3

Disclaimers

Please follow all warnings, precautions, and maintenance as recommended in this manual to maximize the life of this KPOWER printer. If users do not employ correct ways and steps to store and operate KPOWER printers, and/or use non-KPOWER parts and consumables, Kpowerscience Co., LTD. disclaims the responsibility of product guarantee. If you have any questions on operating the printer, please contact our customer service department.

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Chapter 1

General Description

1-1 External View

External View

WINJET ML2000 Series

Fig. 1-1

INSIDE THE FRONT COVER

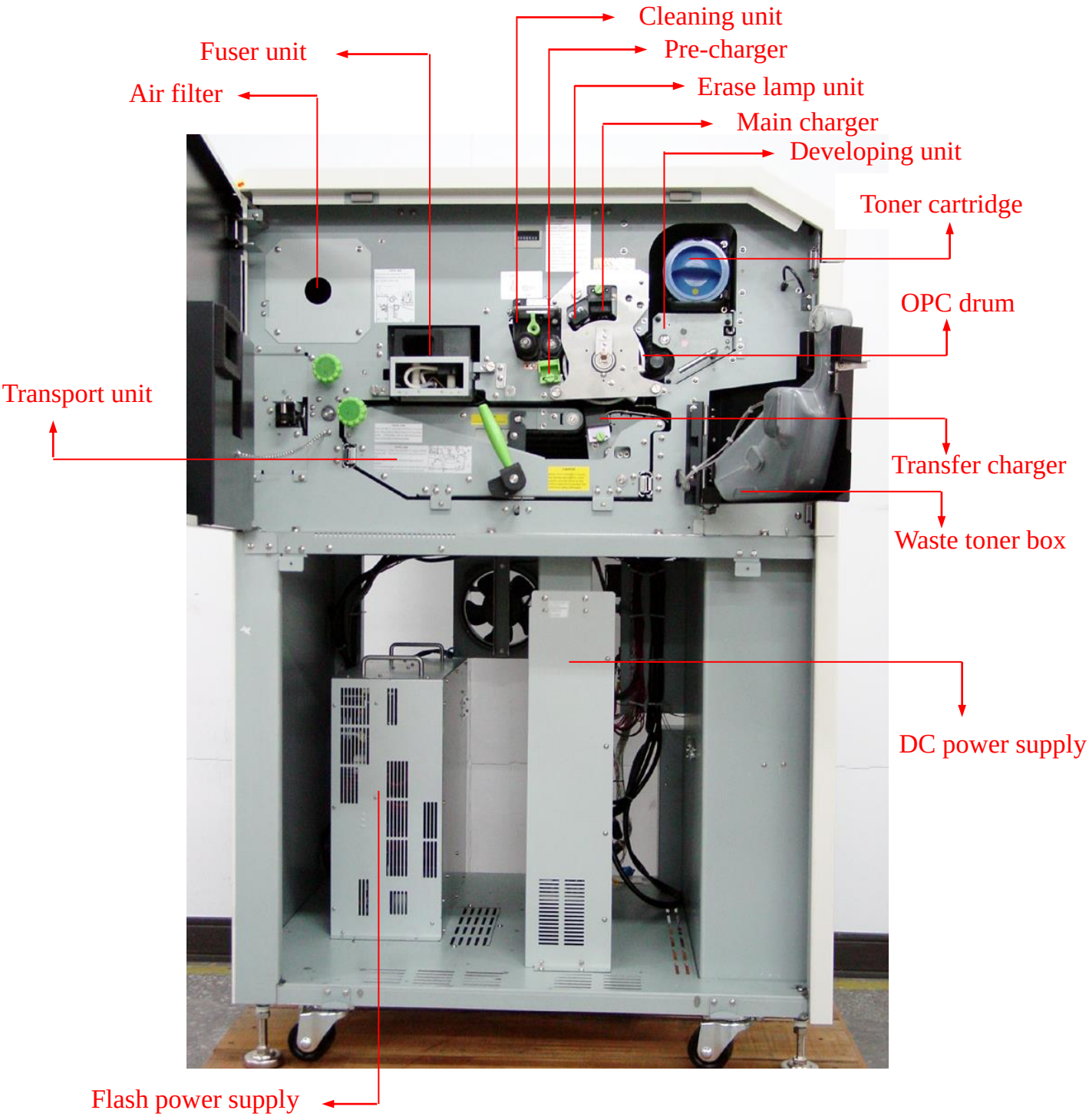


Fig. 1-2

INSIDE THE REAR COVER

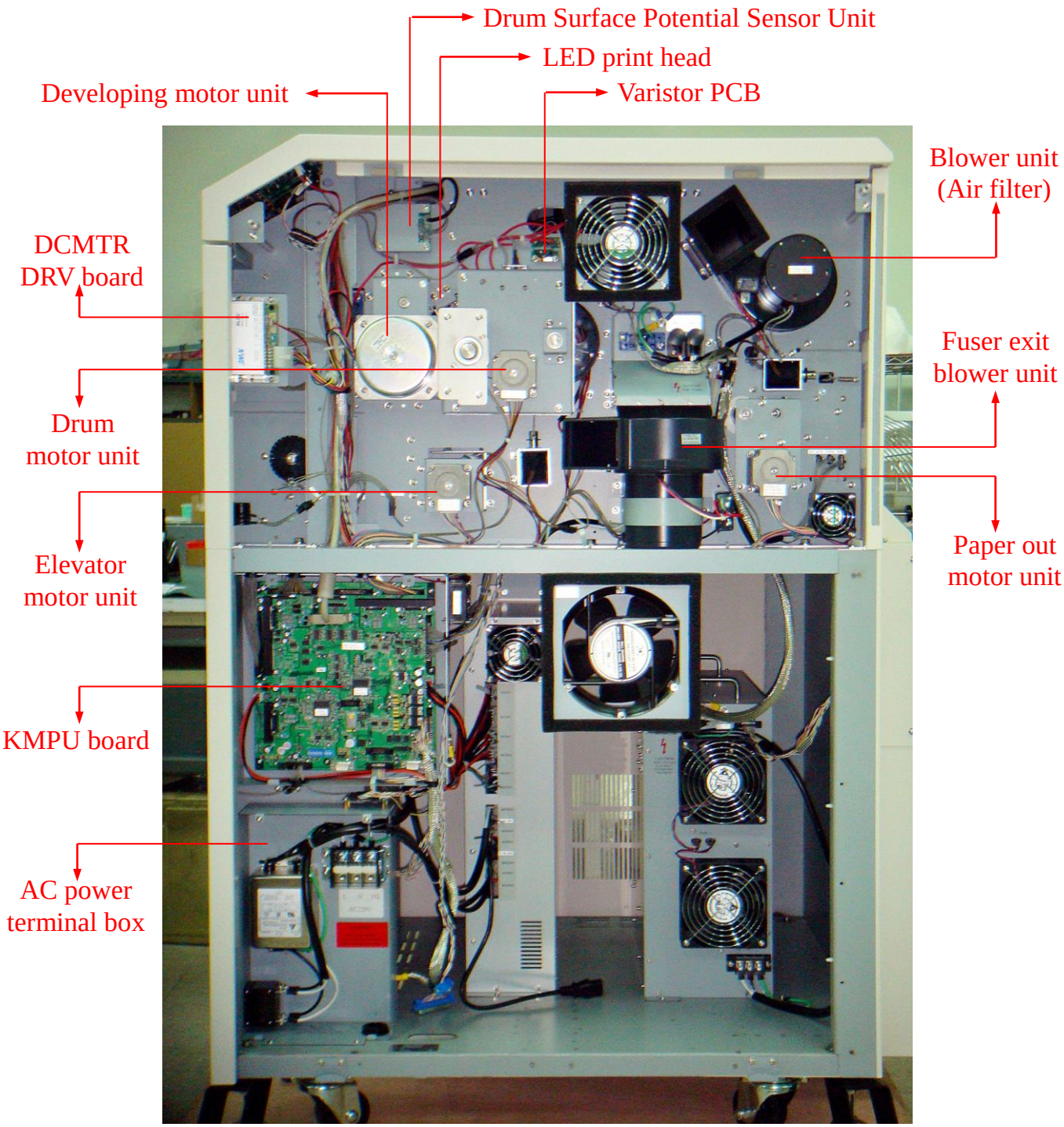


Fig. 1-3

1-2 Specifications

General Scope	
Print speed	2000 LPM (6LPI), 40 PPM Max.
Print method	Electro photography process, LED array
Resolution	300 × 300 DPI / 600 × 600 DPI
Print width	14.6 inches Max.
Paper feed rate	141 mm /second
Photosensitive material	OPC drum
Interface	Video interface
Developing method	Dry, two-ingredient developer
Cleaning system	Blade-type cleaning system
Fusing method	Flash fusing with Xenon lamp
Paper feed: Input Transport	 Tractor feed (automatic paper loading without waste of paper) Suction belt feed
Printing	Face up print
Paper hopper	3000 sheets (64 g/m2)
Stacker capacity	3000 sheets (64 g/m2)
Dimension	780 mm (W) x 1270 mm (H) x 850 mm (D)
Dimension with stacker	780 mm (W) x 1270 mm (H) x 890 mm (D)
Weight	220 kg (240 kg with stacker)

Power	
Power supply	200~230VAC, single phase, 3 wires, 50 / 60 Hz
Power consumption Operating Standby state	 3.0 KVA max. 0.6 KVA max.

Paper	
Type	Fanfold paper (standard)
Page length	7 to 20 inches
Page width (Fanfold paper)	6.5 to 16 inches (When the power stacker unit is used, paper length range is 8 to 14 inches).
Weight	60~204 g/m^2

Environment	
Temperature	Operating：15 to 30°C Non-operating：-10 to 35°C
Humidity	Operating：30 to 80% RH Non-operating：10 to 80% RH (non-condensing)
Inclination of floor	1° (angle) max.

Reliability	
Monthly duty cycle	300K pages (A4 landscape)
Mechanical life	5 years or 36,000,000 pages (8.5”)
Warm-up time	60 seconds max.
First page print time	25 seconds max.
MTBF	2,000 hours
MTTR	less than 1 hour

1-3 Features

WINJET ML2000 Series offers an optimum solution to users who need to handle volume printing effectively. With its high speed, reliable print quality, superb paper handling, and easy operation, the WINJET ML2000 Series indeed enhances the volume printing productivity in the workplace. These remarkable features assure the WINJET ML2000 Series is a high-value cost-effective option to fulfill your volume printing demand.

Excellent Performance
WINJET ML2000 Series has an excellent performance of printing up to 2000 lines per minute with 300 x 300 / 600 x 600 dpi resolution. Printing images and graphics is certainly at full speed. The robust print engine and hardware give the printer the power to have a duty cycle of 300K pages (A4 landscape) per month.

Superb Paper Handling
WINJET ML2000 Series offers a printable width of maximum 14.6 inch, with first page printable to minimize the waste of paper. Its automatic paper loading mechanism can reliably feed fanfold paper 6.5 to 16-inch wide. The companioned Power Stacker, with a capacity of 3,000 sheets, automatically stacks paper output without user intervention. The auto-splitter provides the benefit of splitting paper output automatically instead of manually, which is a great alternative to enhance productivity.

Flat Paper Path
WINJET ML2000 Series employs flat paper path that transports paper straightly without turns. This paper transport mechanism greatly reduces paper jams, and is particularly ideal for label printing since labels don’t get peeled off on internal rollers.

Easy Operation
WINJET ML2000 Series printer is easy to operate. The LCD operation panel provides an easy configuration interface for users. All features are designed to offer you a friendly printing environment.

1-4 Configuration

Engine

- OPC drum
- Main charger
- Exposure section
  - LED print head
- Developing section
  - Developing unit
- Transfer/separation section
  - Transfer charger
  - Separation charger
- Cleaning section
  - Pre-charger
  - Blade
  - Waste toner box
  - Erase lamp unit
- Fuser section
  - Fusing lamp (Xenon lamp)
- Paper feed/paper transport section
  - Tractor unit
  - Transport unit
  - Scuff roller assembly
- Power stacker
  - Fanfold paper stacker
- Operation panel

1-5 Connection Diagram

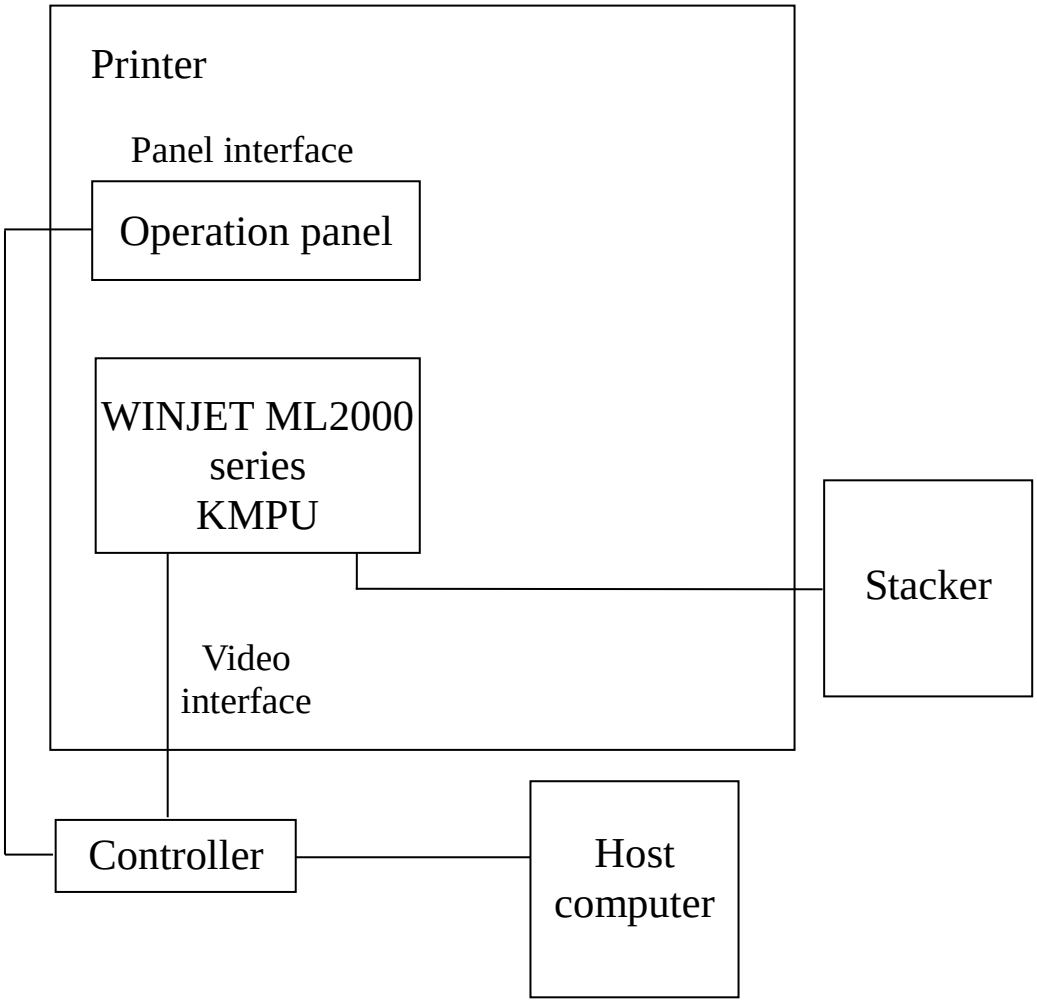


Fig. 1-4

1-6 Operations and Adjustments

1. Operations – by controller

(1) Mechanical initialization（reset operation）
(2) Change length of fanfold paper
(3) Automatic loading of fanfold paper
(4) Page feeding of fanfold paper
(5) Feeding of paper by 0.5 inch (line feed)
(6) Printing on fanfold paper
(7) Output of fanfold paper
(8) Folding of fanfold paper

2. Adjustments – by KMPU Board

(1) Change of standard value of the LED strobe
(2) Change of printing starting position (X, Y)
(3) Change of the target value of the drum surface potential
(4) Change of the DC component of the developing bias
(5) Change of the engine standby time

1-7 Printing System Descriptions

The printing system of WINJET ML2000 Series includes LED print head, main charger, developing unit, transfer charger, pre-charger, cleaning unit, erase lamp unit, and fuser unit, located around the OPC drum.

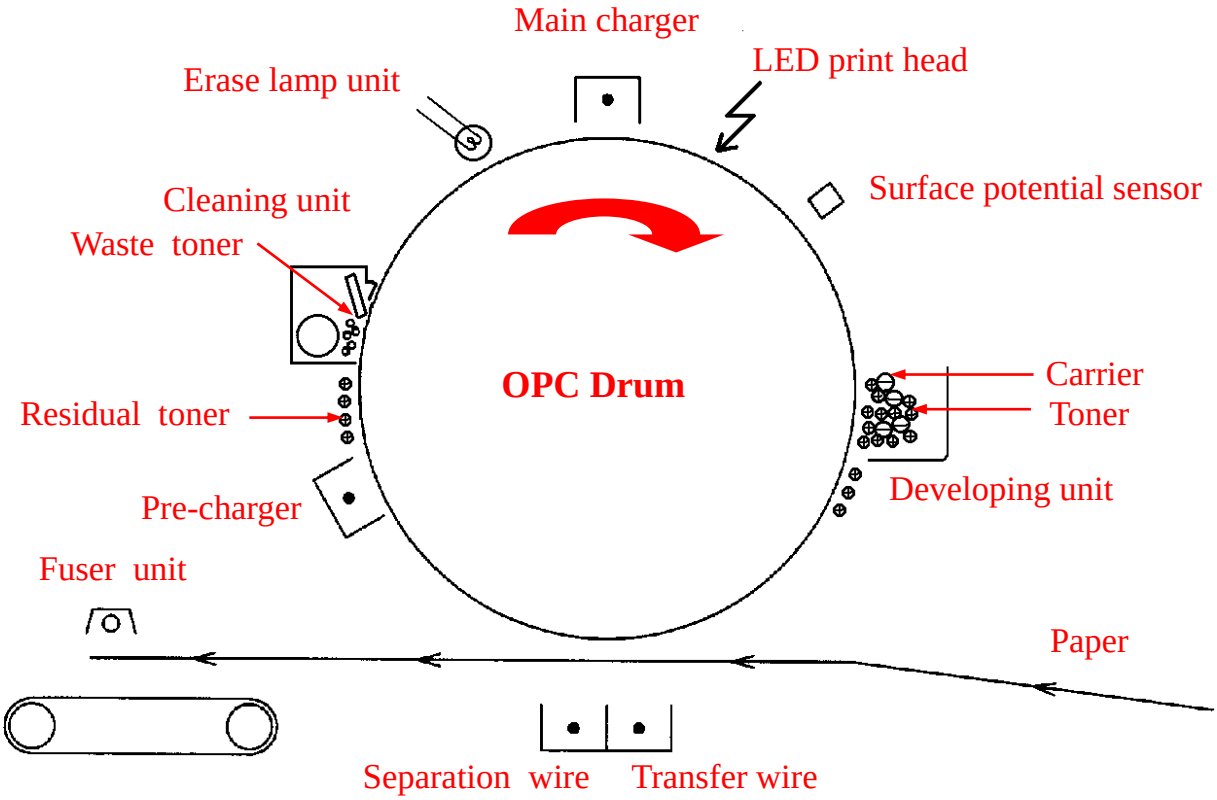


Fig. 1-5

1-7-1 LED Print Head

In the main charging step the drum is uniformly and positively charged. When the OPC drum is exposed to light, the photosensitive film, which is in exposed area, goes into conduction. Therefore, the charge in exposed area is neutralized.

The LED print head includes LED components arranged in the direction of print width. According to the image data came from host computers, the LED array illuminates and rotates the OPC drum to develop a latent print image on the drum surface that has been positively charged. One horizontal line of image data is converted into a row of illumination dots.

1-7-2 Main Charger

The OPC drum has uniform positive charges after being neutralized in the erase step. The grid potential of the main charger, which is grounded by a varistor, determines the potential on the OPC drum surface. To prevent from the OPC drum surface potential being inconsistent because of the variation of temperature or humidity in operation environment, a surface potential sensor monitors the OPC drum surface potential, and then the current of the main charger is controlled accordingly.

1-7-3 Developing Unit

The developing unit contains a developing roller that consists of an inner magnet roller and an outer sleeve roller. In the developing section, a developing bias, which is obtained by a DC bias (available setting range: +200V ~ +500V), is applied to the developing roller, and delivers positive surface potential to the developing roller. Since the strength of an electric field, which is resulting from the difference between the potential and the OPC drum surface potential, is greater than the magnetic force put out between the toner and inner magnet, the positively charged toner is attracted to the electrostatic latent image area developed on the OPC drum surface.

1-7-4 Transfer Charger

Transfer charger consists of the transfer wire and separation wire.

1-7-4-1 Transfer Wire

As a result of the friction with the carrier in the developing unit, the toner is positively charged and attracted to the print image area on the OPC drum surface. The transfer wire negatively charges the paper supplied from the tractor. When the paper contacts the OPC drum surface, the toner on the OPC drum surface is transferred to the paper.

1-7-4-2 Separation Wire

The negatively charged paper in the transfer section is attached to the OPC drum because the drum surface areas where no toners exist contain positive charge. The separation wire uses DC bias to get rid of the charge from the paper, after the completion of toner transfer, to separate the paper from the OPC drum.

1-7-5 Pre-charger

Since the voltage on the area where the electrostatic latent image developed is different from that on the area without the development of the latent image, the pre-charger charges the OPC drum surface to unify the residual charge for the erase step.

1-7-6 Cleaning Unit

A blade scraps away the residual toner particles, and the toner particles are delivered into a waste toner box at last.

1-7-7 Erase Lamp Unit

The OPC drum is exposed to light from the erase lamp unit to neutralize residual charge in the beginning of the printing process. This is to make sure the OPC drum is charged uniformly before exposure process begins.

1-7-8 Fuser Unit

This printer uses a xenon lamp to heat the toner with flashlight and then fix the toner onto paper.

1-8 Drive Mechanism Description

The drive system of WINJET ML2000 Series is illustrated in the figure below.

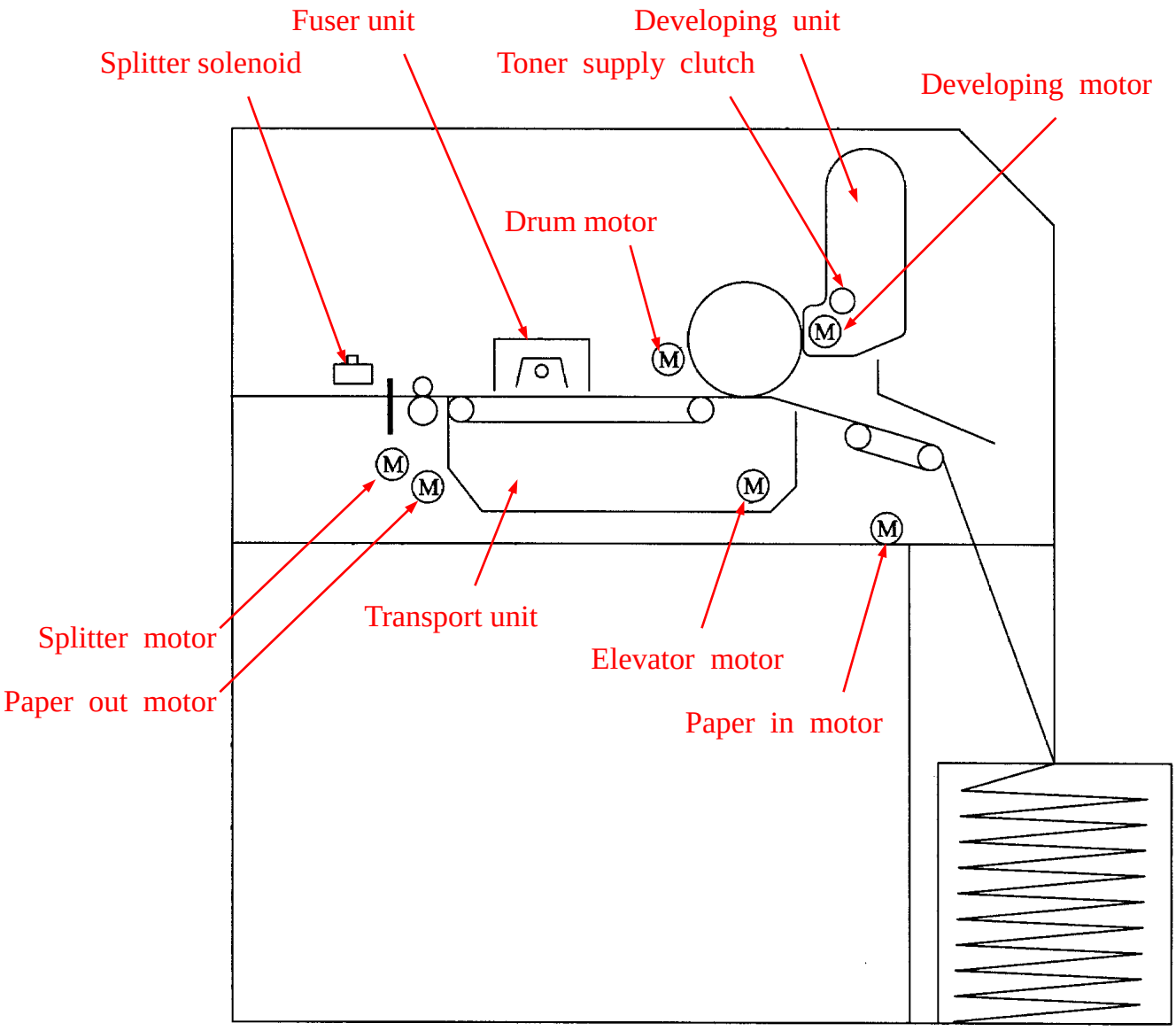


Fig. 1-6

1-8-1 Paper in Drive

The paper in motor drives the tractor.

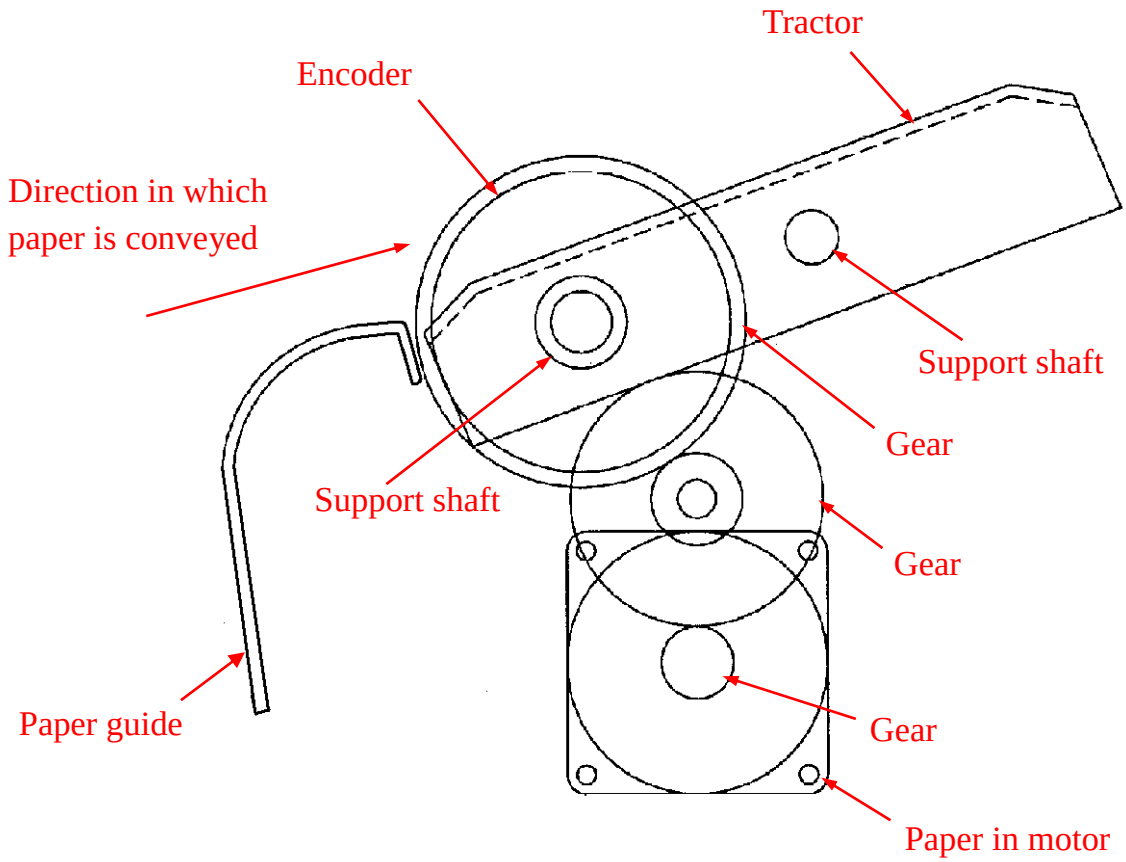


Fig. 1-7

1-8-2 OPC Drum Drive

The drum motor drives the OPC drum and the cleaning unit.

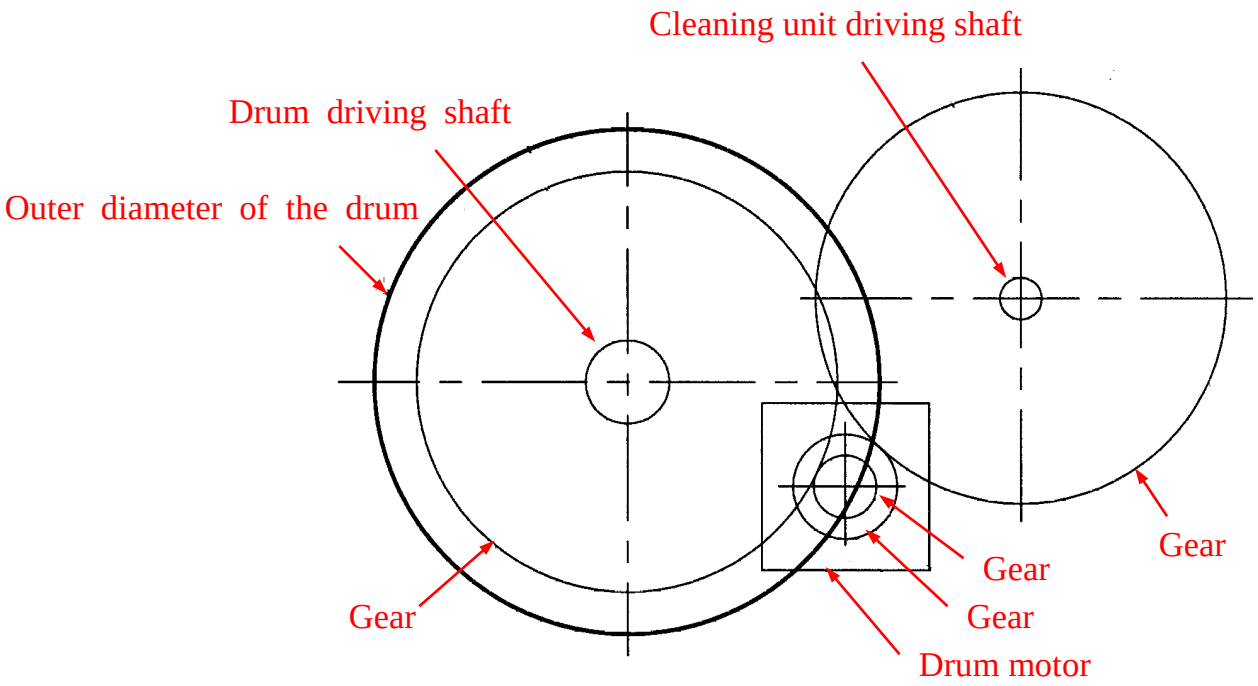


Fig. 1-8

1-8-3 Developing Drive

The gears of the developing motor drive two shafts. One shaft drives the magnet roller of the developing roller, and the other shaft drives the sleeve roller simultaneously.

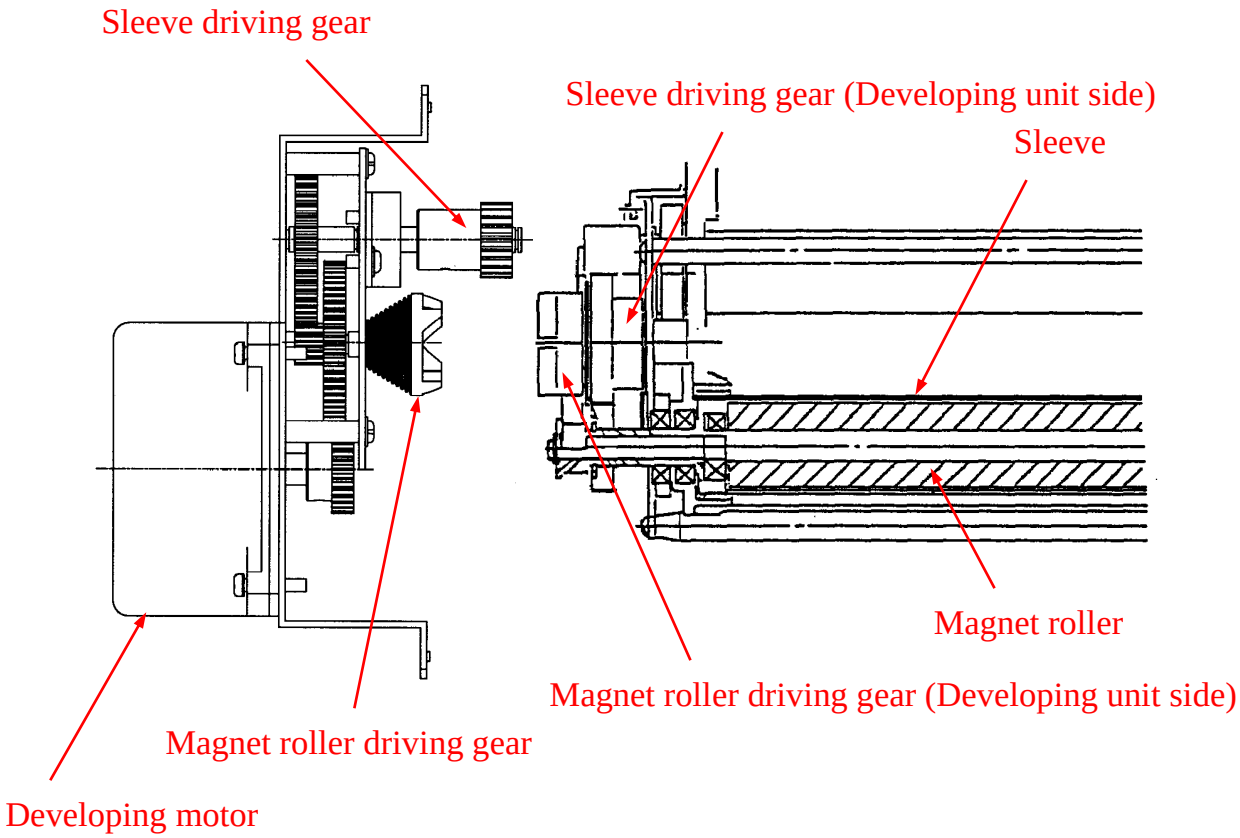


Fig. 1-9

1-8-4 Transfer Unit Drive

The cams installed on the elevator motor rotate to move the transfer unit up and down.

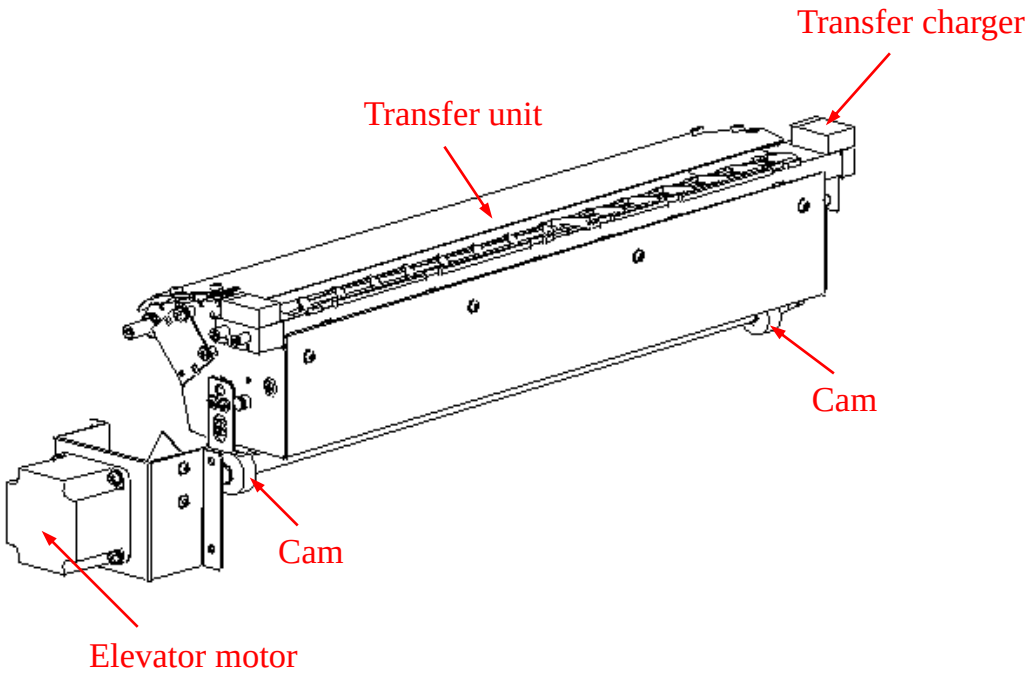
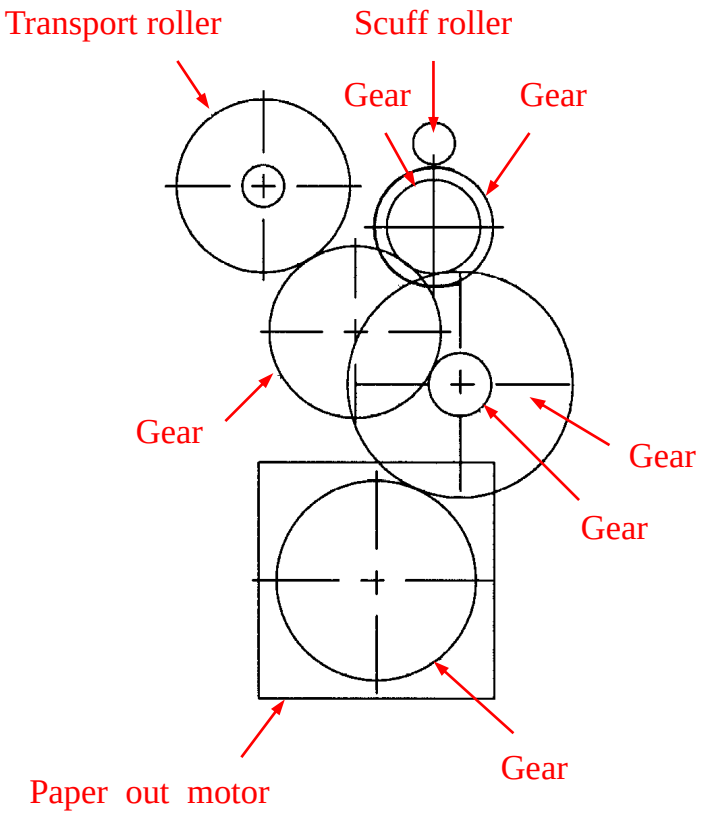


Fig. 1-10

1-8-5 Paper out Drive

The paper out motor drives transport roller and scuff roller.



(View from motor side)

Fig. 1-11

1-9 Sensor System Descriptions

The sensor system of WINJET ML2000 Series is shown in the following figures.

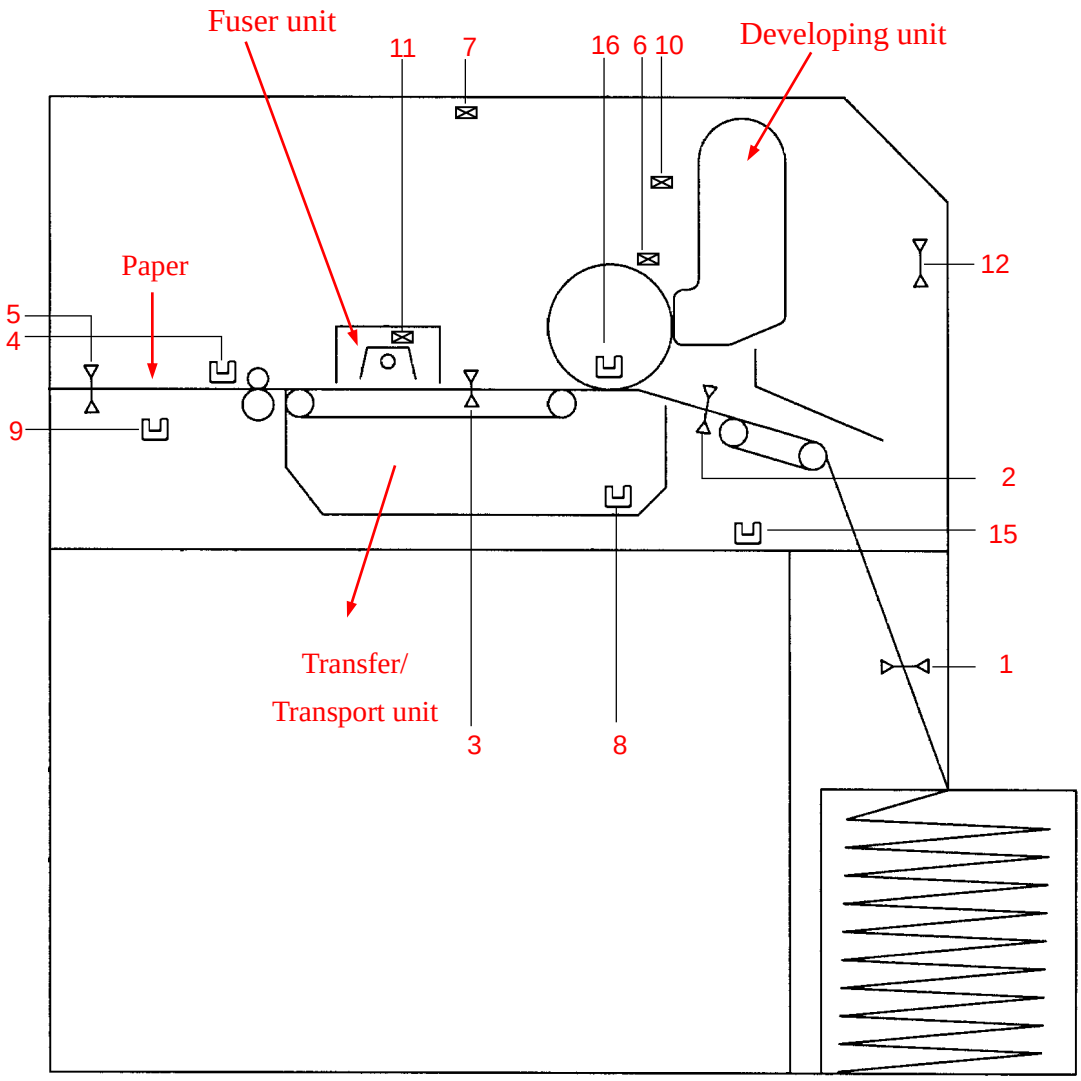


Fig. 1-12

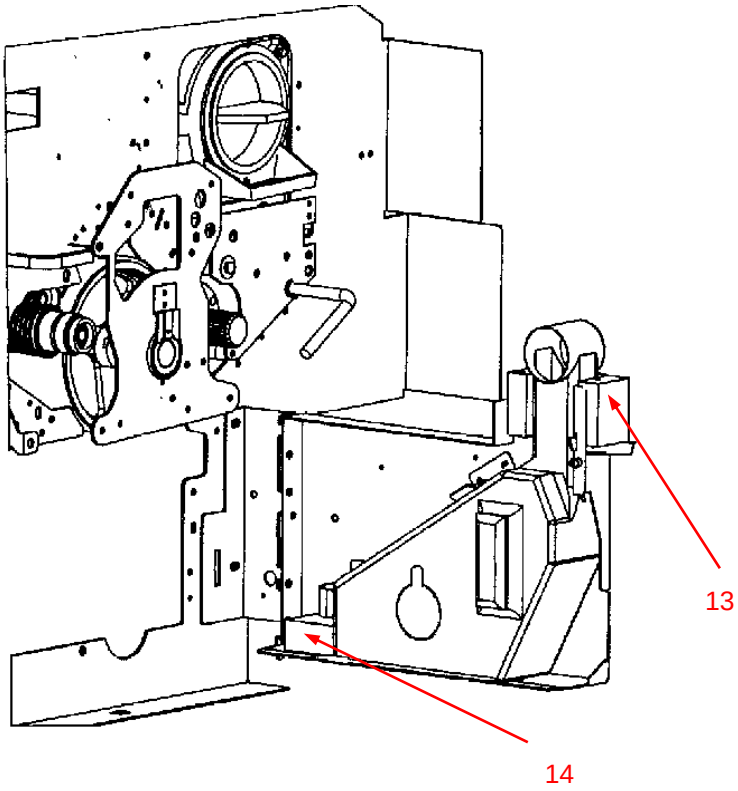


Fig. 1-13

1. Paper Empty Sensor (PES)
2. Paper Top Sensor (PTS)
3. Paper Transport Position Sensor (PTPS)
4. Paper Moving Sensor (PMS)
5. Paper out Position Sensor (POPS)
6. Drum Surface Potential Sensor (DSPS)
7. Cleaning Unit Set Sensor (CLN-UNIT)
8. Transfer Unit Upper Limit Sensor
9. Splitter Sensor (SHS, SRS)
10. LED Array Thermistor Sensor
11. Lamp Thermistor Sensor
12. Front Cover Sensor (FRT-COVER)
13. Waste Toner Full Sensor (WAS-BOXR.WAS-BOXT)
14. Waste Toner Box Set Sensor (WAS-SET)
15. Paper in Encoder (PI-ENC)
16. Drum Motor Encoder (DRM-ENC)

Chapter 2

Installation

2-1 Preparations

Prepare the below items

1) Maintenance tools
   1. Phillips screwdriver (No.2 × 1)
   2. Phillips screwdriver (No.1 × 1; for attaching AC cable)
   3. Wrench (20mm × 1; for adjusting level feet)
   4. Level × 1
   5. Drum support rod × 1
2) Related manuals
3) Fanfold paper × 1 (carton)

2-2 Cautions

Supply correct power：200~230VAC, Single phase, 3 wires 50/60HZ, 3.0KVA

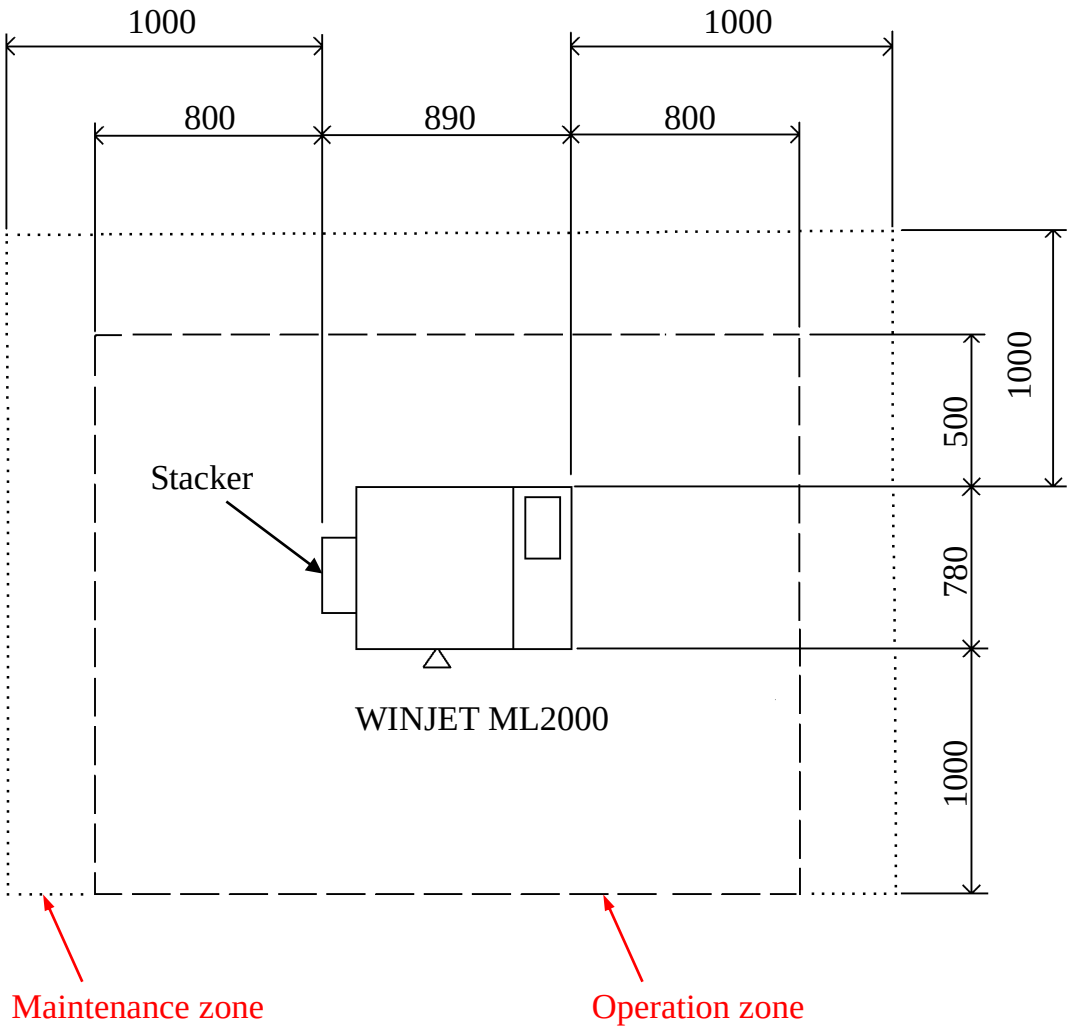
Usage environment：

Temperature	：15 ~ 30℃
Humidity	：30 ~ 80% RH
Inclination of floor	：less than 1°

Precautions：

1) Turn off the power and the circuit breaker before installing.
2) Do not use the printer on carpet. The printer may not operate normally due to cotton fiber and static electricity.
3) Do not operate the printer near heating source, dusty location, and direct sunlight.
4) Do not place the printer on any unstable place.
5) Do not put the printer near combustibles.
6) Install the printer in a well air-conditioning room.
7) Do not obstruct the ventilation slot in the front and rear of the printer. Excessive temperature rise in the printer may cause abnormal printer operation.
8) Be sure that the AC input voltage matches the applied AC voltage. Otherwise the printer may cause equipment malfunction or personal injury.

Installation space：



△ Front

(Dimensions in mm)

Fig. 2-1

2-3 Delivery

When deliver the printer for installation, observe the following precautions：

1) As the weight of the printer is 220kg, move it with a forklift and avoid exposing it to vibration or shock.
2) The forks of a forklift truck must always be inserted in the prescribed direction.
3) Casters may be used for transportation only on level floor surface inside an office.
4) The printer must not be inclined by more than 10°.
5) The printer must not be dropped from more than 3 cm in height.

2-4 Unpacking

Step 1. Remove the packing materials, such as the binding bands, the top plate, the outer cover, the vinyl bag, the cushioning material, and the inner box.

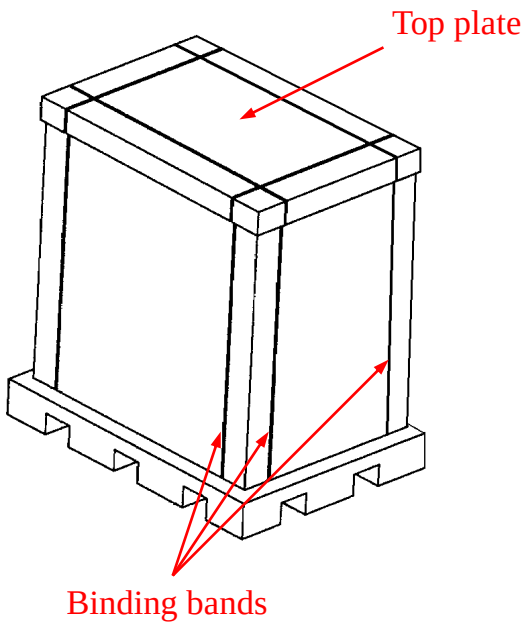


Fig. 2-2

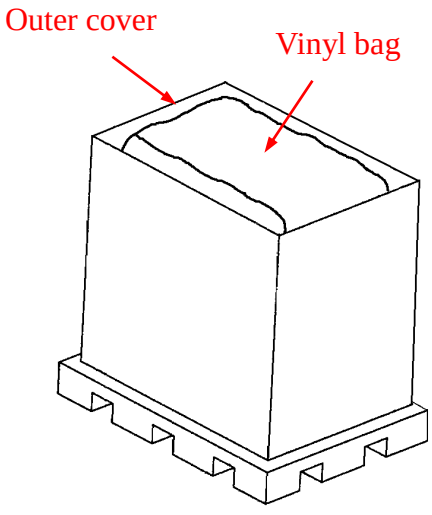


Fig. 2-3

Step 2. Unload the printer from the palette carefully. Set the printer on a level floor.

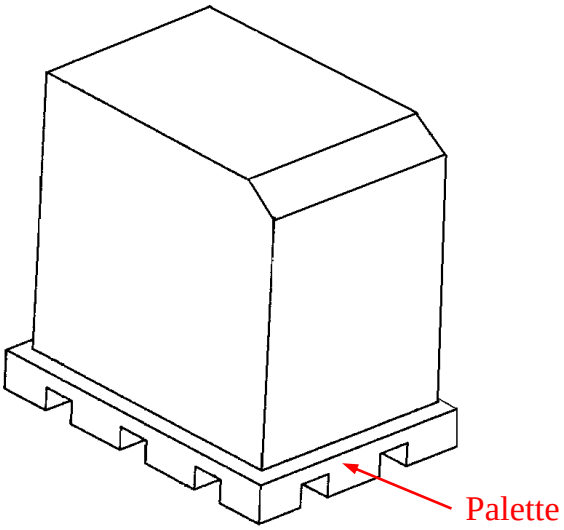


Fig. 2-4

Step 3. Adjust up the level feet of the printer engine with a wrench by turning it until the lower surface of the base frame remains at 93 mm above the floor level. Place a level on the top cover to ensure the level feet kept at the same level.

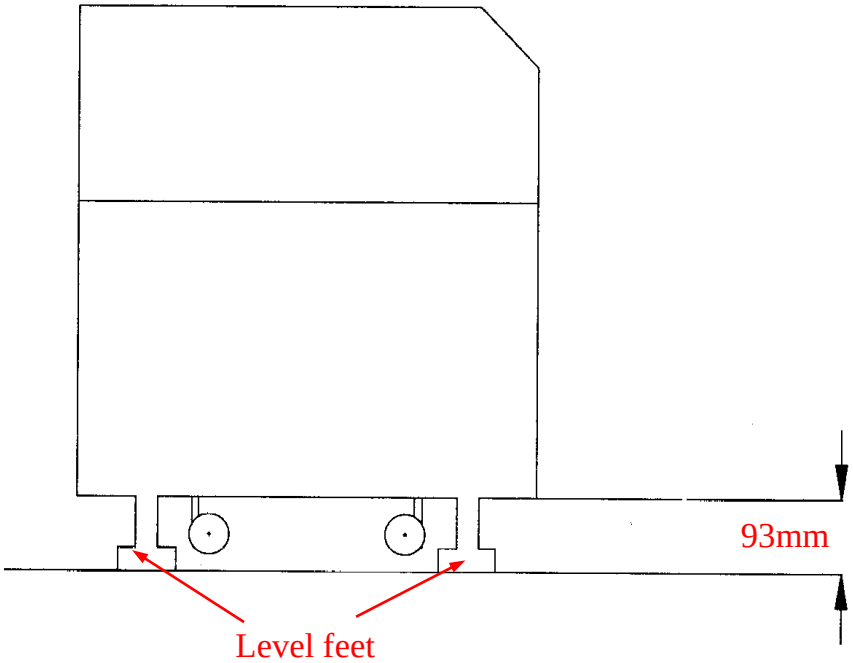


Fig. 2-5

2-5 Setting OPC Drum

CAUTION

1) Make sure the green lock lever of the cleaning unit is turned to the "open" position (horizontally to 3-o'clock direction) before setting OPC drum.
2) Never touch the drum surface.
3) Since the life of the drum will be shortened by exposure to light, mount the drum as quickly as possible.
4) To mount the drum, push the drum properly into the inner end, and then turn the drum to align the slits of the drum with the pins of the drum shaft until a click sound is heard.
5) In order to prevent damaging the drum, confirm that the transfer elevator is at the "down" position and that the notch part of the shaft is horizontal.

Step 4. Open the front cover (upper).
Step 5. Open the waste toner box unit.
Step 6. Loosen the 3 thumbscrews and remove the drum plate.

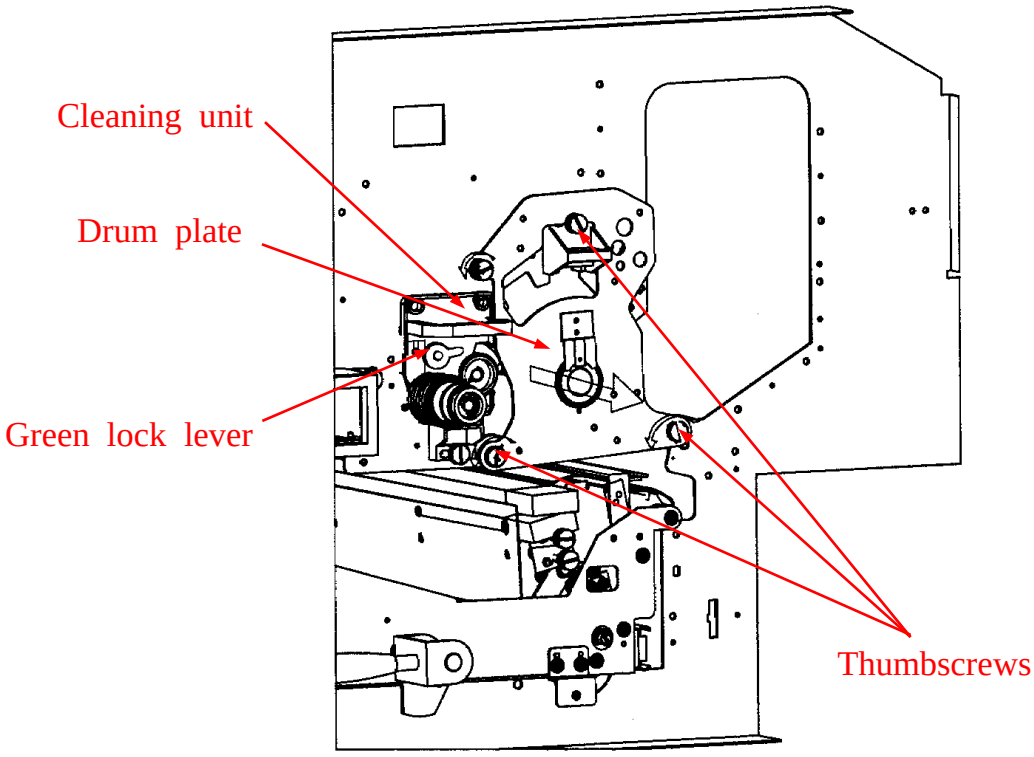


Fig. 2-6

Step 7. Turn the nut and then remove the nut from the drum shaft.

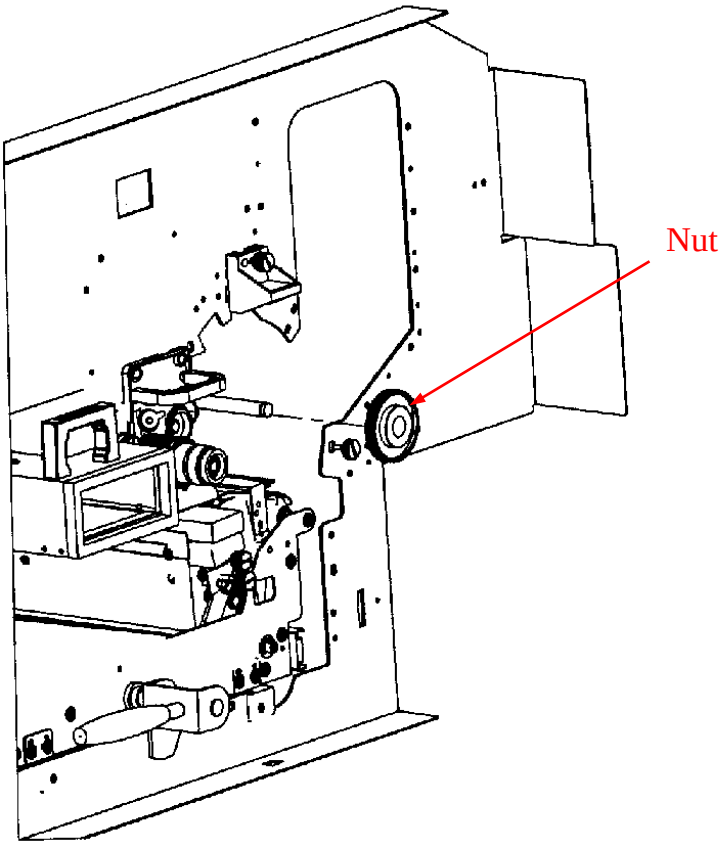


Fig. 2-7

Step 8. Attach the drum support rod to the drum shaft.

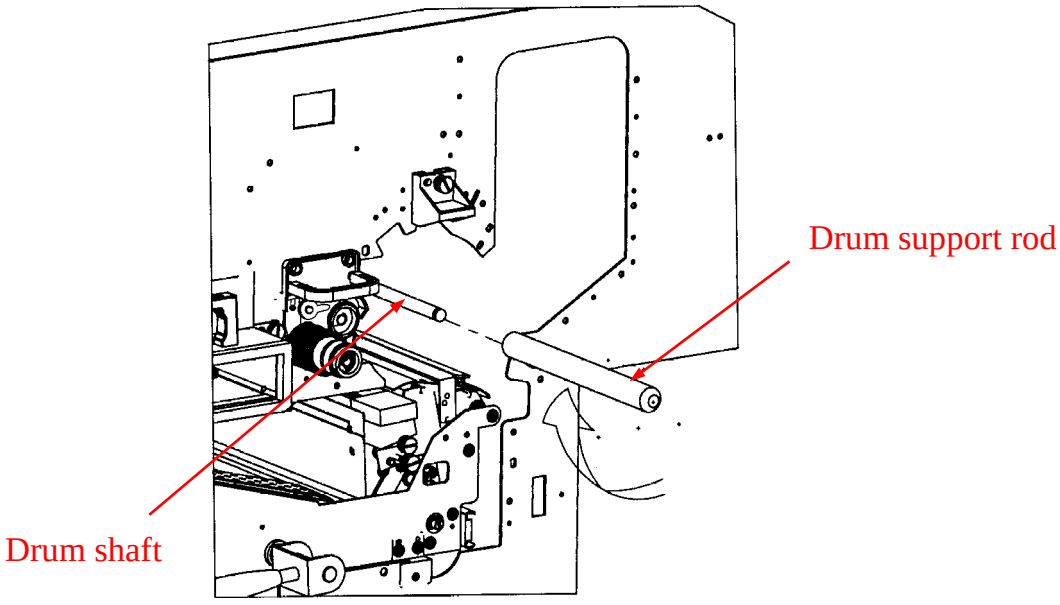


Fig. 2-8

Step 9. Insert the drum through the shaft and when the drum contacts the inner end, turn the drum to fit the drum securely. Remove the drum support rod and securely tighten the nut. Put the drum plate back and tighten the 3 thumbscrews. Turn the green lock lever of the cleaning unit to “lock” position (vertically to 12-o’clock direction).

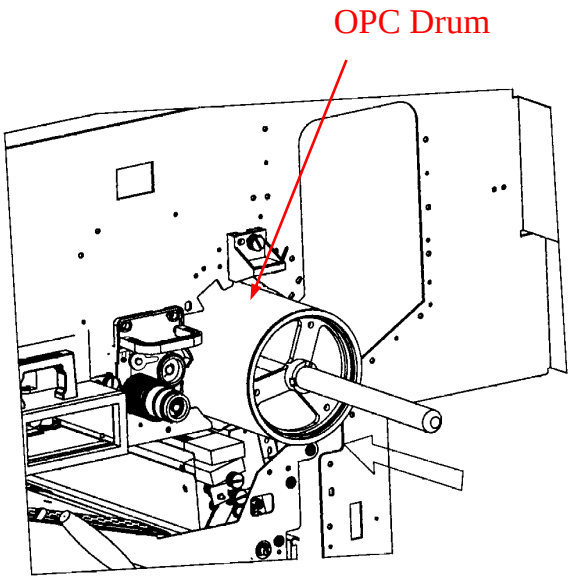


Fig. 2-9

Step 10. Make sure the green lever of the transport unit is set to upward position. Then close the waste toner box unit.

2-6 Setting Developing Unit

Step 11. Take out the developing unit.
Step 12. Loosen the 3 screws and then remove the upper cover of the developer introduction section of the developing unit.

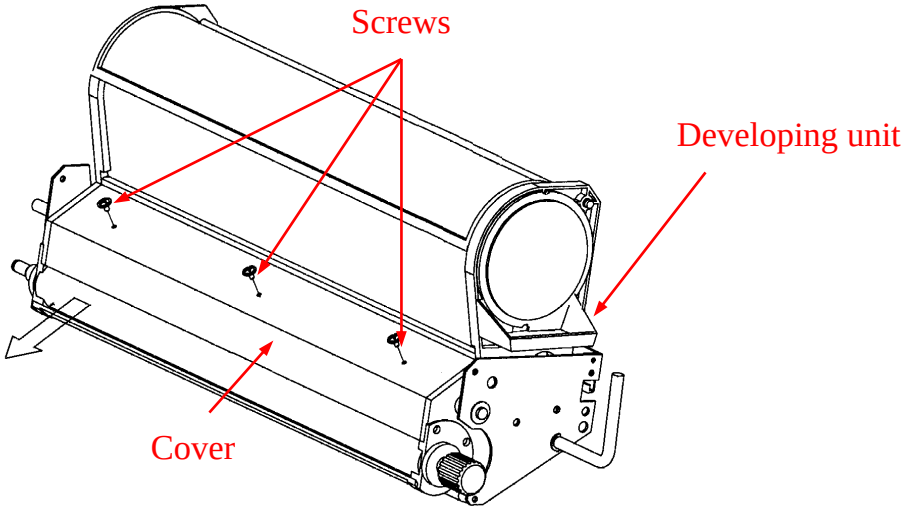


Fig. 2-10

Step 13. Take out the developer and attach the nozzle to the developer bottle.

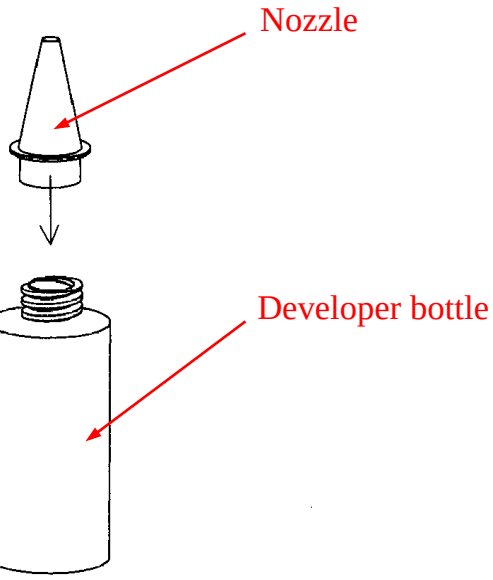


Fig. 2-11

Step 14. Move the developer bottle back and forth, and pour the developer uniformly into the developer introduction port.

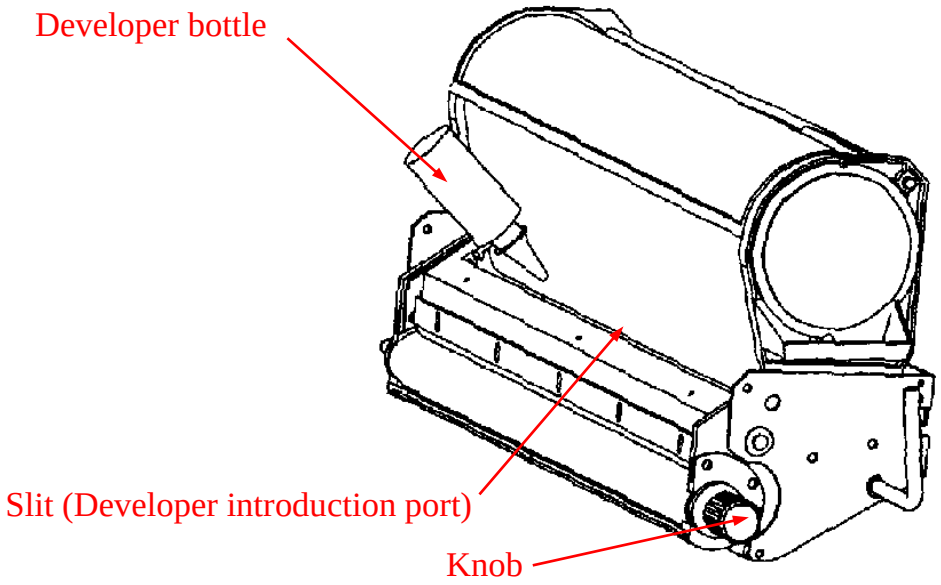


Fig. 2-12

Step 15. Use your hand to turn the knob at the side to rotate the developing roller a few times, so the developer will settle uniformly across the roll.

Step 16. Mount the upper cover and tighten the 3 screws.

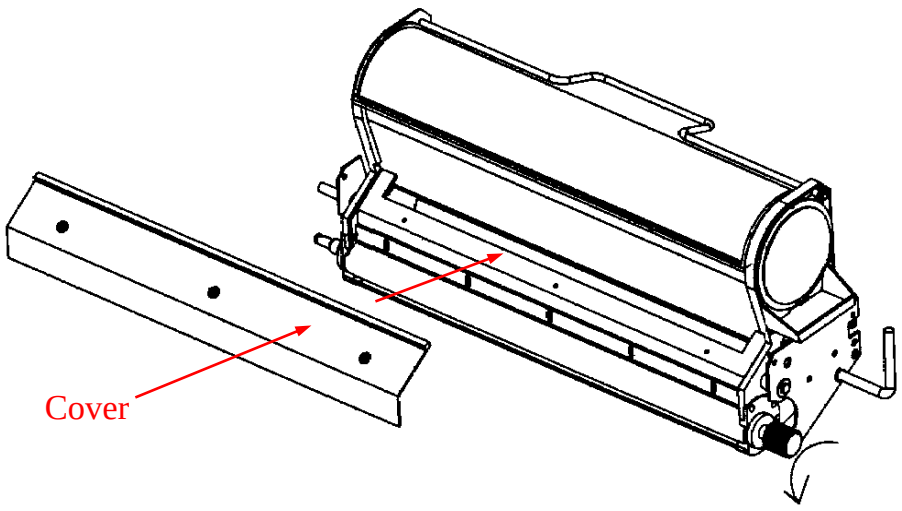


Fig. 2-13

Step 17. Insert the developing unit into the main body slowly and gently.

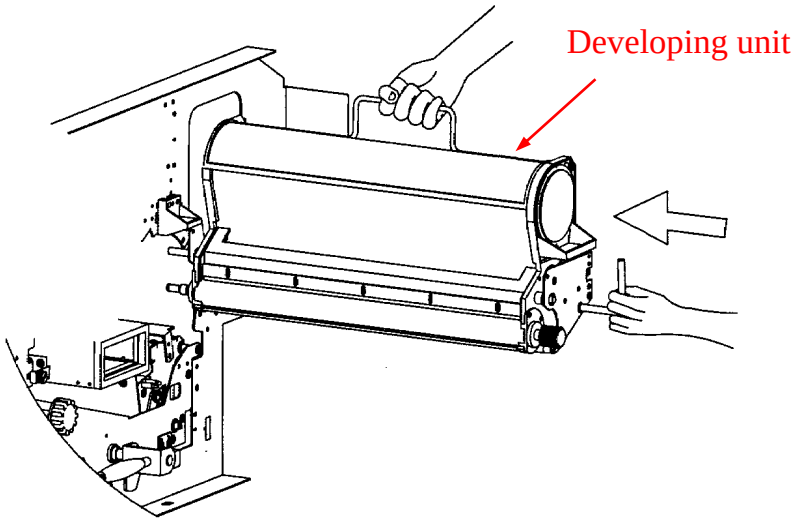


Fig. 2-14

Step 18. Align the pinhole on the unit with the positioning pin on the main body. After the developing unit has been inserted all the way in, turn the lever downward by 120° to the position shown in figure to ensure the developing unit has been set firmly. If the lever could not be turned downward, turn the developing roller knob and engage it with the gear at the rear and then push in the developing unit firmly.

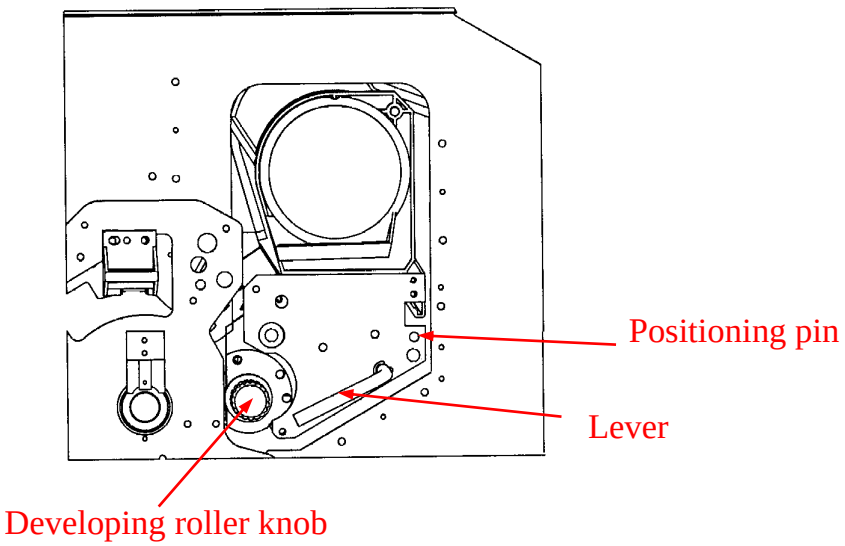


Fig. 2-15

2-7 Setting Toner Cartridge

It's recommended to wear vinyl gloves when handling the toner.

Step 19. With the cover tape facing up, hold the toner cartridge and shake it 4 or 5 times in the direction of the arrows shown in the figure.

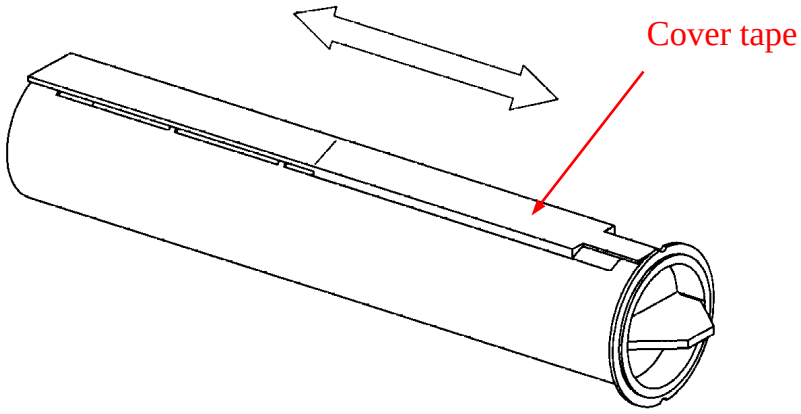


Fig. 2-16

Step 20. Make sure the cover tape is facing up. Insert the cartridge into the toner hopper and slowly peel off the cover tape from the arrow labeled on the tape.

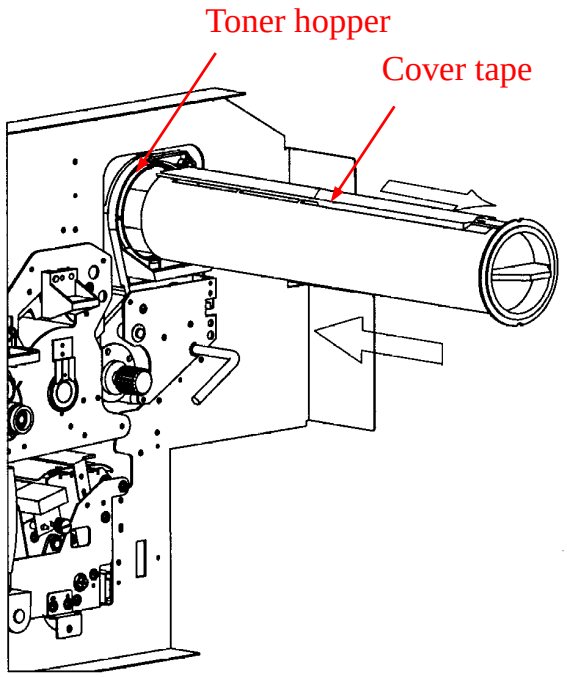


Fig. 2-17

Step 21. Then turn the toner cartridge clockwise by 180°to move the slit of the toner cartridge upward from the position of pin.

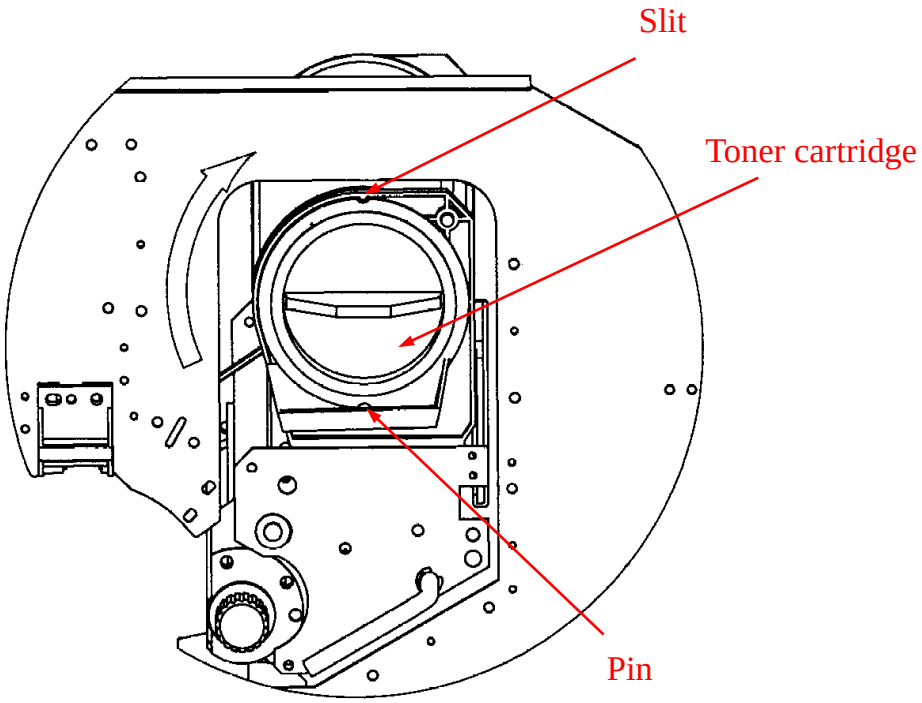


Fig. 2-18

2-8 Setting Others

Step 22. Remove the rubber bands and tapes securing the transport unit.
Step 23. Remove all other tapes attached to the interior of the engine.
Step 24. Close the front cover (upper).

2-9 Setting-up of the AC Power Cable

Step 25. Open the rear cover.
Step 26. Open the AC power terminal box.
Step 27. Attach (screw on) the AC power cable with a No.1 Philips screwdriver.
Step 28. Close the AC power terminal box.
Step 29. Turn on the breaker.
Step 30. Close the rear cover.

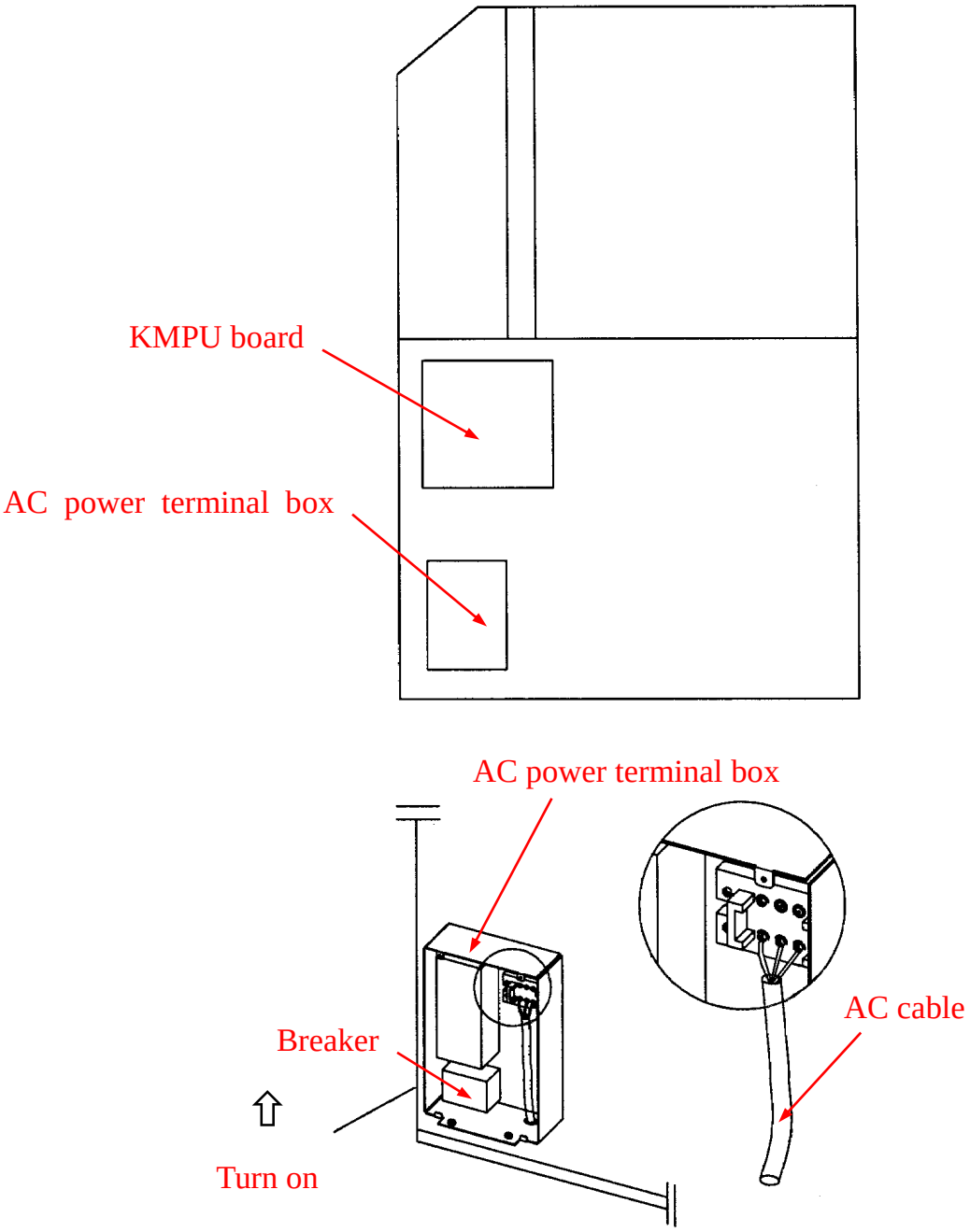


Fig. 2-19

Terminal	Wire Color	
	USA	Europe
L (Line)	Black	Brown
N (Neutral)	White	Blue
FG (Ground)	Green or Green/Yellow	

This apparatus is shipped without AC power cable and plug.

2-9-1 AC Power Cable Specification

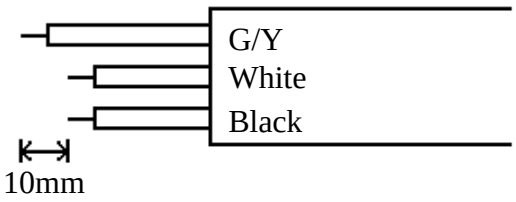
(1) It shall have three conductors, each with a nominal cross-sectional area of 5.5mm^2, 25A and outer diameter of 15mm.

(2) An insulated grounding conductor that is identical in size, insulation material, and thickness to the grounded and ungrounded branch-circuit supply conductors except that it is green with or without one or more yellow stripes is to be installed as part of the branch circuit that supplies the unit or system. The grounding conductor described is to be connected to earth at the service equipment or if supplied by a separately derived system, at the supply transformer or motor-generated set.

2-9-2 Attach AC Power Cable in USA

(1) Prepare the AC power cable as follows:

- Strip 40mm from the outer insulation jacket of the AC power cable.
- Cut the Black and White wires 10mm shorter than the Green/Yellow wire.
- Strip the wires as appropriate for the terminals used.



- Clamp the terminals onto the wires in accordance with the manufacturer's instructions.

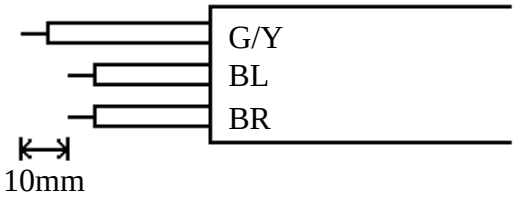
(2) Attach the AC power cable to the printer as follows:

- Connect the Green/Yellow wire to the printer terminal marked "FG".
- Connect the White wire to the printer terminal marked "N".
- Connect the Black wire to the printer terminal marked "L".

2-9-3 Attach AC Power Cable in Europe

(1) Prepare the AC power cable as follows:

- Strip 40mm from the outer insulation jacket of the AC power cable.
- Cut the Brown and Blue wires 10mm shorter than the Green/Yellow wire.
- Strip the wires as appropriate for the terminals used.



- Clamp the terminals onto the wires in accordance with the manufacturer's instructions.

(2) Attach the AC power cable to the printer as follows:

- Connect the Green/Yellow wire to the printer terminal marked "FG".
- Connect the Blue wire to the printer terminal marked "N".
- Connect the Brown wire to the printer terminal marked "L".

2-9-4 Attach the Plug

(1) Select a plug that has the appropriate rating and agency approval as shown in the following table.

Plug Type	Reference Standards
EURO 250V AC 25A	CEE 7-7
UK 240V AC More than 20A (INDUSTRIAL)	BS 4343 IEC 309-2 EN 60309-2 CEE 17

(2) Prepare the AC power cable as follows:
- Strip off a short section of he outer insulation jacket of the AC power cable.
- Strip the wires as appropriate for the terminals of the plug to be used.

(3) Attach the plug to the AC power cable in USA as follows:
- Connect the Green/Yellow wire to the plug terminal marked with “E” or “PE” or the safety earth symbol or green or green/yellow.
- Connect the White wire to the plug terminal marked with “N” or black.
- Connect the Black wire to the plug terminal marked with “L” or “W” or red.

(4) Attach the plug to the AC power cable in Europe as follows:
- Connect the Green/Yellow wire to the plug terminal marked with “E” or “PE” or the safety earth symbol or green or green/yellow.
- Connect the Blue wire to the plug terminal marked with “N” or black.
- Connect the Brown wire to the plug terminal marked with “L” or “W” or red.

2-9-5 Verify Grounding

Please verify that the grounding conductor in the AC power cable is connected to the printer terminal marked “FG” and to the plug terminal marked with “E” or “PE” or the safety earth symbol or green or green/yellow.

2-10 Setting the Paper

Step 31. Make sure the left tractor is set at the left end, and align the left side of the paper carton with the alignment mark.

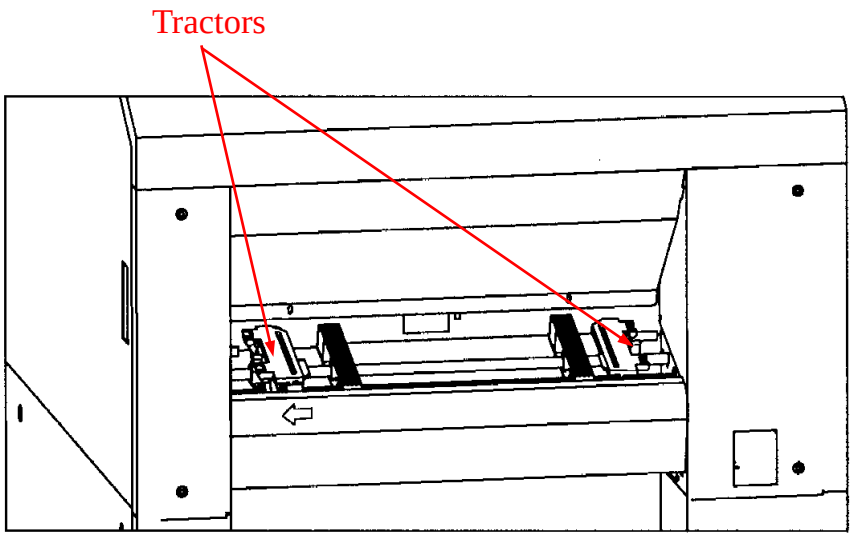


Fig. 2-20

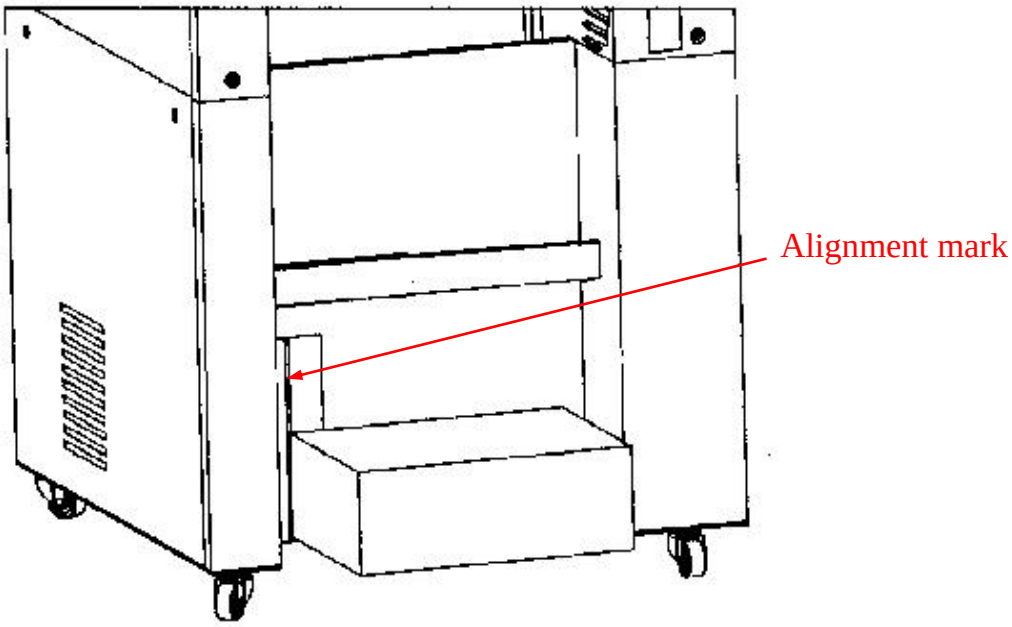


Fig. 2-21

Step 32. Supply the fanfold paper between the paper empty sensor guide and the printer body.

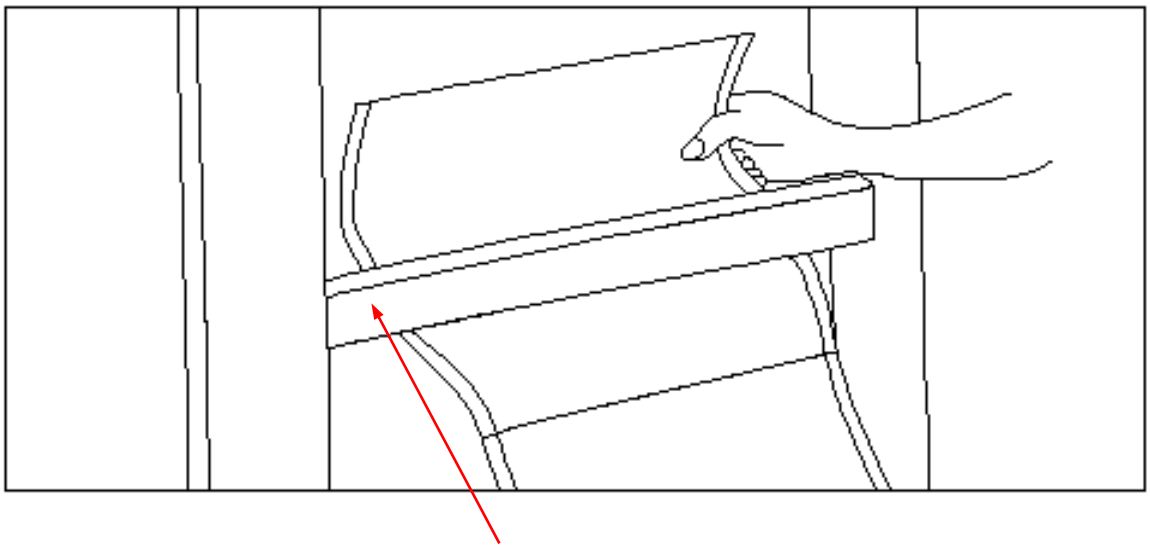


Fig. 2-22

Step 33. Ensure the first perforation is at the peak.

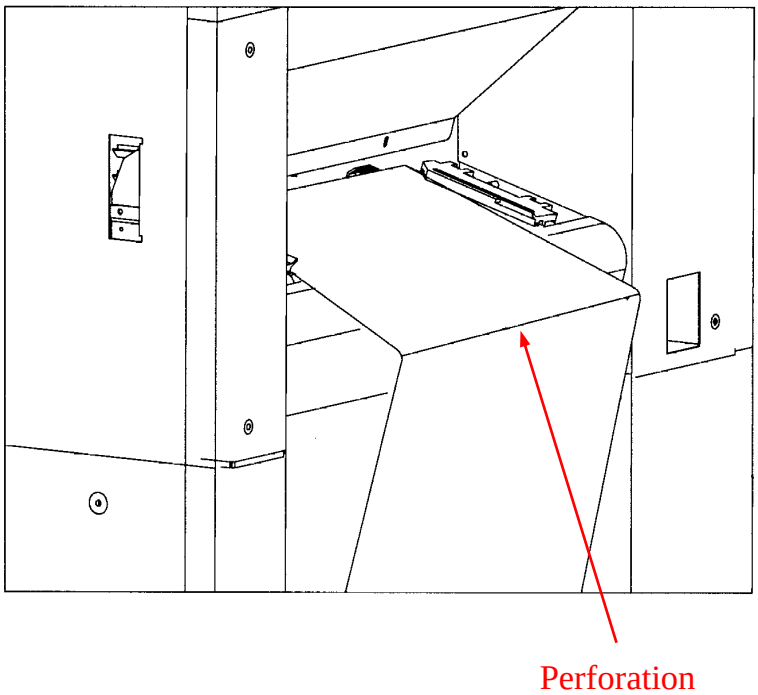


Fig. 2-23

Step 34. Open the paper holder covers on the tractors. Set the leading end of the paper on the tractors and have 4 or 5 of the tractor pins engage with the holes of the paper. Move the right paper holder to a position where the tension of the paper is not too tight or too loose.

Step 35. Close the paper holder covers, and lock the green lock lever.

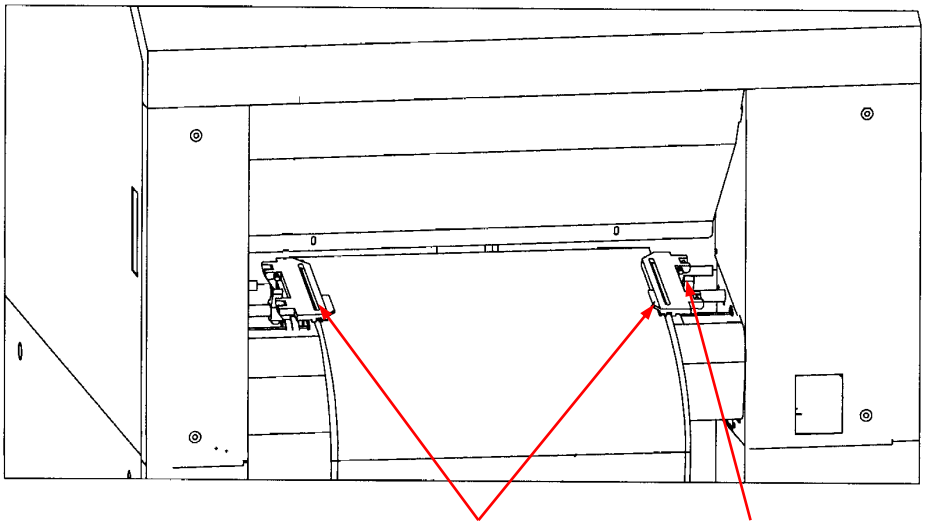


Fig. 2-24

2-11 Power on

Step 36. When the setting of the print engine has been completed, turn on the power. The panel screen displays “Warm Up” message. Wait until the green light of the status indicator “Ready” is constantly on.

2-12 Engine Self Test Printing

WINJET ML2000 Series support pure engine self test without controller. Set Dip-switch SW2 to self-test mode, then turn on the power, and perform engine self test printing.

For another applications, changing the setting of Dip-switch SW2 can change the mode.

KMPU board

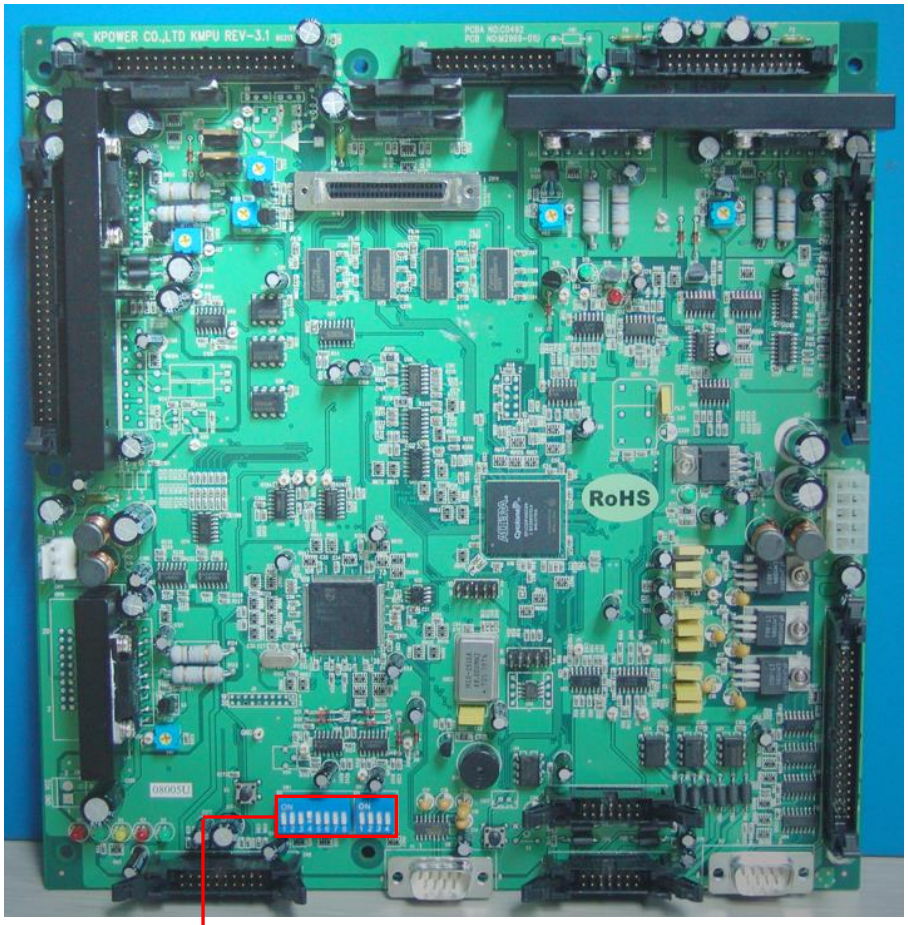
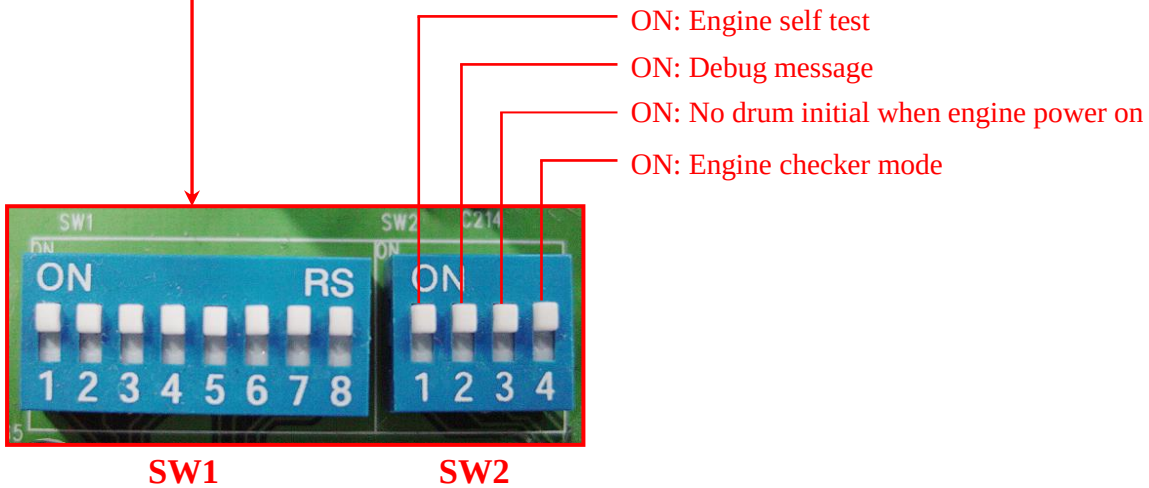


Fig. 2-25



SW1 **SW2**

Fig. 2-26

Chapter 3

Adjustments

3-1 Operation Panel

The operation panel contains ten function keys, one LCD screen, three status indicators, and five error indicators.

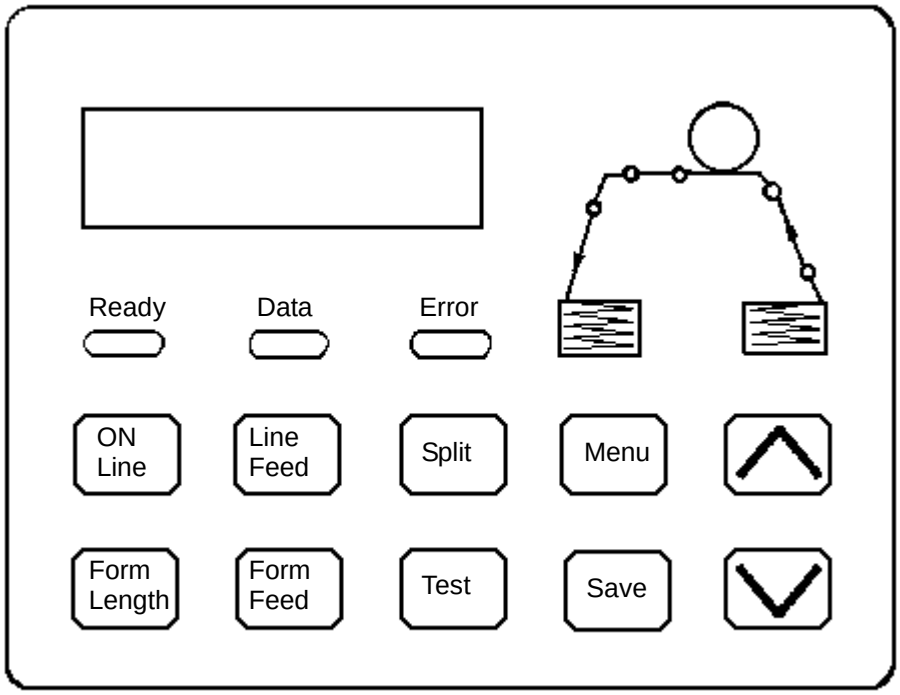


Fig. 3-1

1. Function Keys:

ON LINE	No error exists: Set the printer in the on-line or off-line state. Error exists: Clear the error message.
FORM LENGTH	Set paper length.
LINE FEED	Manually feed paper by 1／2 INCH.
FORM FEED	Manually feed paper by one page.
SPLIT	Split fanfold paper.
TEST	Self-test.
MENU	Enter or exit the main menu.
SAVE	Set the value of the selected function.
ﹿ	Select previous sub menu or increase the value.
﹀	Select next sub menu or decrease the value.

2. Status Indicators:

READY (GREEN)	Blinking: Printer is warming up. On: Printer is in the on-line state. Out: Printer is in the off-line state.
DATA (GREEN)	Blinking: Data is in buffer when printer is ready. On: Data is in buffer when printer stops. Out: No data is in buffer.
ERROR (RED)	Blinking: Error is occurring. On: Error is cleared but the printer is not in the on-line state.（The operator has to press the〝ON LINE〞key to clear the error message. Meanwhile,〝LINE FEED〞key and〝SPLIT〞 key are applicable）. Out: No error exists.

3. Error Indicators:

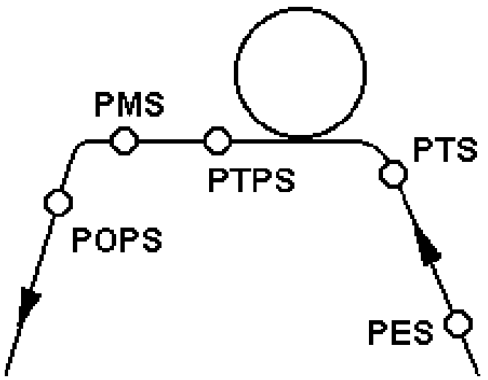


Fig. 3-2

PES (Paper Empty Sensor)	LED is blinking: No paper exists.
PTS (Paper Top Sensor)	LED is blinking: Paper is jammed at PTS.
PTPS (Paper Transport Position Sensor)	LED is blinking: Paper is jammed at PTPS.
PMS (Paper Moving Sensor)	LED is blinking: Paper is jammed at PMS.
POPS (Paper Out Position Sensor)	LED is blinking: Paper is jammed at POPS.

3-2 KMPU Board

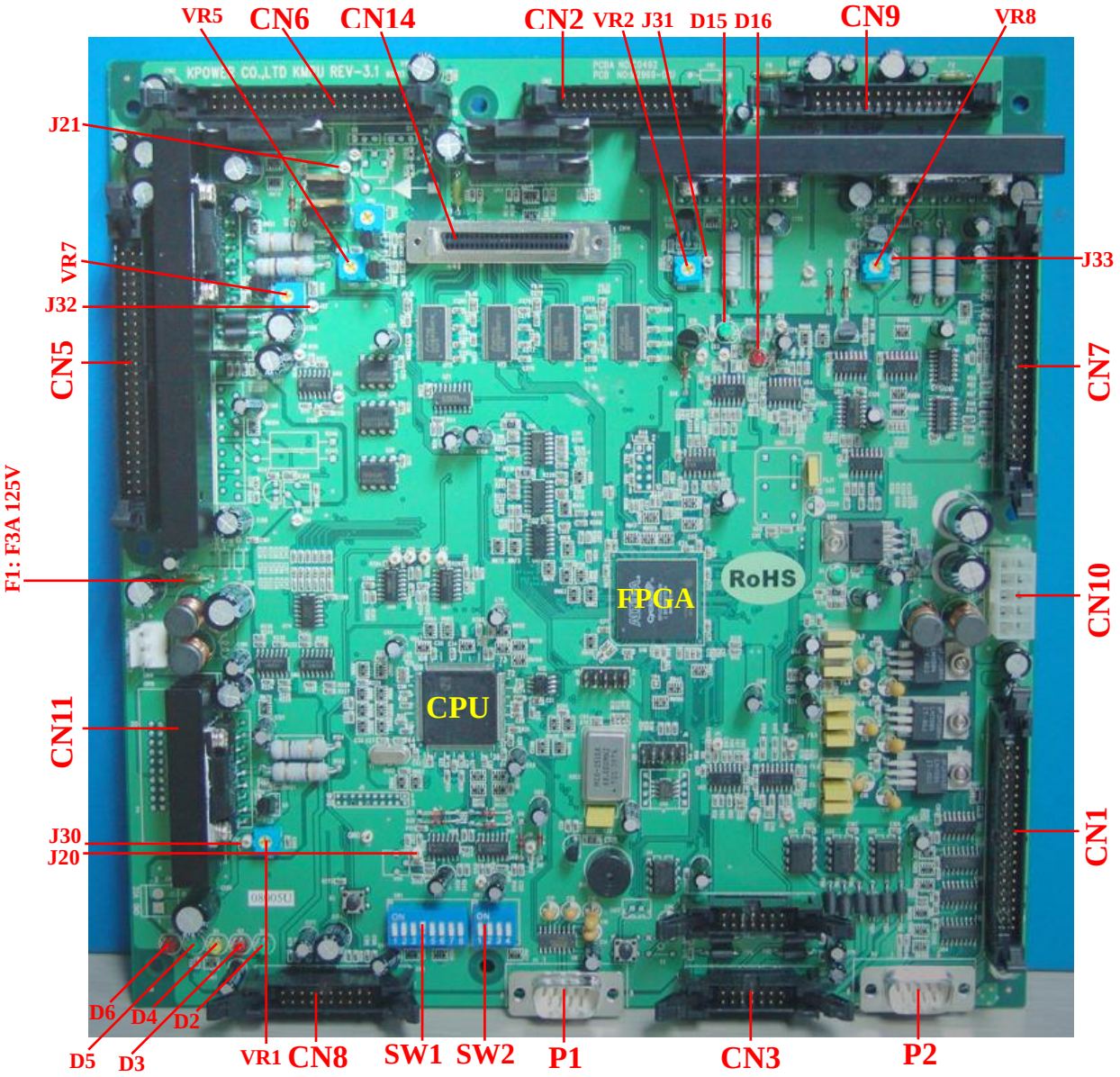


Fig. 3-3

Variable Resistor	Adjustment Object	Test Point	Voltage	LED	Definition
VR1	Paper in Motor	J30	+1.80V	D2	Status of PMS, flash while paper moving.
VR2	Paper out Motor	J31	+1.91V	D3	Status of toner density, same as D16 LED.
VR7	Drum Motor	J32	+1.80V	D4	Toner supply LED, light on while supply toner.
VR8	Elevator Motor	J33	+2.56V	D5	Flash while KMPU CPU is running, or deadlock.
VR5	Erase Lamp Unit	J21 (PELDRV)	+16V	D6	Power LED, red color.
				D15	Toner enough
				D16	Toner low

3-3 Setting Dip-switches

Changing the setting of Dip-switch SW1 and SW2 at KMPU board can change the mode.

SW1 SW2

Fig. 3-4

DIP SW1 bit definition

Bit 1: None
Bit 2: None
Bit 3: Split Mode ON: Manual Split OFF: Auto
Bit 4: Pre-Feed Mode ON: 4 pages will be pre-fed to avoid paper jam if paper status is not good for first page print.
Bit 5: None
Bit 6: OFF: Regular Version
Bit 7: None
Bit 8: Flash Fusing ON: Disable OFF: Normal

DIP SW2 bit definition

Bit 1: Engine self test ON: Test OFF: No
Set Dip-switch SW2 pin 1 “ON” to change the printer to self test mode to perform engine self test printing.
Bit 2: Debug message to maintenance port. ON: On OFF: Off
Bit 3: Drum initial when engine power on ON: No OFF: Initial
Bit 4: Engine checker mode ON: Checker mode OFF: normal
Set Dip-switch SW2 pin 4 “ON” to change the printer to engine checker mode, and detach video interface connector (37 pins) from “CN1” on KMPU board, and disconnect panel interface connector (9 pins) from the controller side then connect to “P2” connector on KMPU board, then turn on the power. The printer will perform under engine checker mode.

3-4 Checking Individual Engine Status

Under engine checker mode, you can check individual engine status, such as the status of motor, fan, charger, sensor, etc., without connecting to a controller.

1. Power off engine.

2. Set Dip-switch SW2 pin 1, 2, 3 "OFF" but pin 4 "ON" to change the printer to engine checker mode.

3. Disconnect video interface connector (37 pins) from "CN1" on KMPU board. Connect panel interface connector (9 pins) to "P2" connector on KMPU board.

4. Power on engine. You are under engine checker mode now.

5. LCD screen on the operation panel displays that you are in the MAINTENANCE menu. Press "∧" key or "∨" key to select the sub menu ("OPERATION", "SENSOR", "ALARM", "SETTING", "VOLUME") you want to enter.

- When "OPERATION" is selected:
  - (1) Press "SAVE" key to enter sub menus. "ERROR" indicator is on (red).
  - (2) Press "∧" key or "∨" key to select the item you want to check. Then press "TEST" key to start the test. "DATA" indicator is on (green). To stop the test, press "TEST" key again. "ERROR" indicator is on (red).
  - (3) Press "MENU" key to exit "OPERATION" menu. "DATA" indicator is on (green).
- When "SENSOR" is selected:
  - (1) Press "SAVE" key to enter sub menus.
  - (2) Press "∧" key or "∨" key to select the item you want to check. If the selected sensor detects something, "DATA" indicator is on (green). If the selected sensor detects nothing, "ERROR" indicator is on (red).
  - (3) Press "MENU" key to exit "SENSOR" menu. "DATA" indicator is on (green).
- When "ALARM" is selected:
  - (1) Press "SAVE" key to enter sub menus. "DATA" indicator is on (green).
  - (2) Press "∧" key or "∨" key to select the item you want to check. If the situation causing the alarm occurs, "ERROR" indicator is on (red). If not, "DATA" indicator is on (green).
  - (3) Press "MENU" key to exit "ALARM" menu. "DATA" indicator is on (green).

- When “SETTING” is selected:
  (1) Press “SAVE” key to enter sub menus. “DATA” indicator is off.
  (2) Press “∧” key or “∨” key to select the item you want to check. The saved value of the selected item is indicated by a symbol of “∗” next to the value.
  (3) Press “SAVE” key if you want to change the setting of the selected item. If “DATA” indicator is on (green), it means the value can be changed.
  (4) Press “∧” key or “∨” key to select the value you want, and then press “SAVE” key to save the value. A symbol of “∗” is appeared next to the value when it has been saved.
  (5) Press “MENU” key to exit the item. “DATA” indicator is off. Press “∧” key or “∨” key to select other item you want to check, or press “MENU” key to exit “SETTING” menu. “DATA” indicator is on (green).
- When “VOLUME” is selected:
  (1) Press “SAVE” key to enter sub menus. “DATA” indicator is off.
  (2) Press “∧” key or “∨” key to select the item you want to check. (Values cannot be changed).
  (3) Press “MENU” key to exit “VOLUME” menu. “DATA” indicator is on (green).

6. After all engine check operations are finished, power off engine.

7. Detach the panel interface connector (9 pin) from the “P2” connector on KMPU board, and then plug it into the controller. Connect video interface connector (37 pins) to “CN1” on KMPU board.

8. Set Dip-switch SW2 pin 4 “OFF”, then power on engine.

MAINTENANCE menu:

MAINTENANCE	OPERATION	00: PI-MTR FOR
		01: PI-MTR REV
		02: TRANSPORT UP
		03: TRANS-30UPDN
		04: POMTR+PIMTR
		05: PO-MOTOR
		06: COUNTER UP
		08: SPLIT-REAR
		09: SPLIT-HOME
		0A: DRUM MOTOR
		0B: DEVELOP-MTR
		12: SEPARAT-CLAW
		14: SPLIT-SOLEN
		16: TONER SUPPLY
		18: SUCTION FAN
		1C: VENTILAT FAN
		1D: FUSER EX-FAN
		1E: AIR FILTER
		20: MAIN CHARGER
		21: DEVELOP-BIAS
		22: TRANS-CHARGE
		23: SEPA-CHARGER
		24: PRE-CHARGER
		25: CLEAN-BIAS
		26: FLASH POWER
		28: ERASE LAMP-L
		29: ERASE LAMP-H
	SENSOR	00: DRUM ENCODER
		01: TRANSPORT UP
		02: SPLIT HOME
		03: SPLIT REAR
		04: PI-ENCODER
		05: PTS
		06: PMS

		07: POPS
		08: PTPS
	ALARM	01: COVER OPEN
		02: PAPER EMPTY
		07: SCUFF OPEN
		08: NO CLEAN SET
		09: W-TONER FULL
		0E: NO W-TNR-BOX
		0F: NO TONER
		14: LED OVERHEAT
		18: DRUM-MTR ERR
		1D: FUSER TEM-HI
		1E: FLASH PWR-ER
	SETTING	05: LED STROBE
		07: IMAGE X0
		08: IMAGE Y0
		10: DSPS-SETUP
		11: DEVELOP-BIAS
		1B: SPLIT OFFSET
		22: STANDBY TIME
		2B: TONER CONTROL
	VOLUME	10: DSPS CHECK
		18: FIRMWARE VER
		24: ENGINE MODEL
		30: SW2-VALUE
		31: SW1-VALUE

3-5 Adjusting High Voltage Power Supply

1. +HV2 PRE CHARGE

Use a digital multimeter and set to Ampere scale. Connect the meter's red probe into the High Voltage Supply +HV2 transformer output terminal, and then connect the black probe into the High Voltage Supply +HV2 wire (See Fig.3-5). Turn on PRE-CHARGE under ENGINE CHECK selection, and then adjust High Voltage Supply VR201 (See Fig.3-6). Turn VR201 clockwise to increase the current. Turn VR201 counterclockwise to decrease the current. Adjust VR201 to +0.20mA.

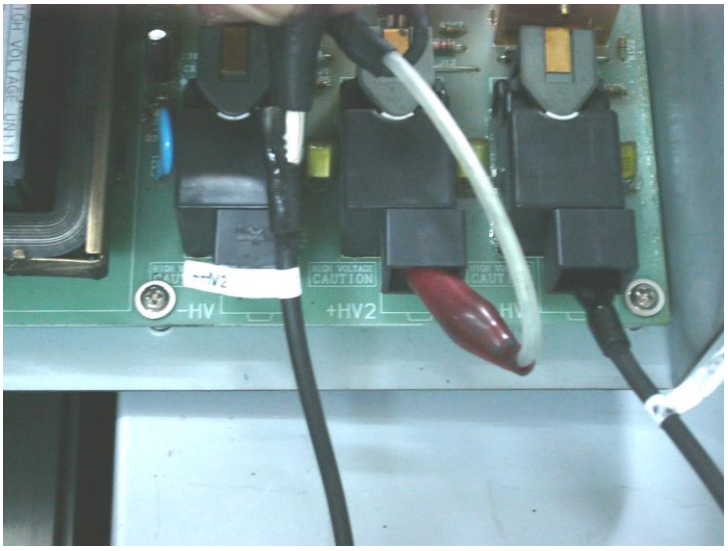


Fig. 3-5

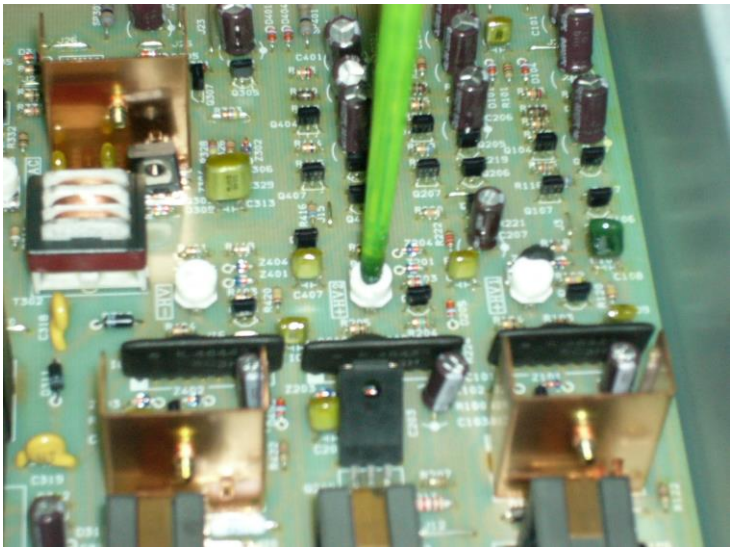


Fig. 3-6

2. -HV TRANSFER CHARGE

Use a digital multimeter and set to Ampere scale. Connect the meter's red probe into the High Voltage Supply -HV transformer output terminal, and then connect the black probe into the High Voltage Supply -HV wire (See Fig.3-7). Turn on TRANSFER CHARGE under ENGINE CHECK selection, and then adjust High Voltage Supply VR401 (See Fig.3-8). Turn VR401 clockwise to increase the current. Turn VR401 counterclockwise to decrease the current. Adjust VR401 to -0.45mA.

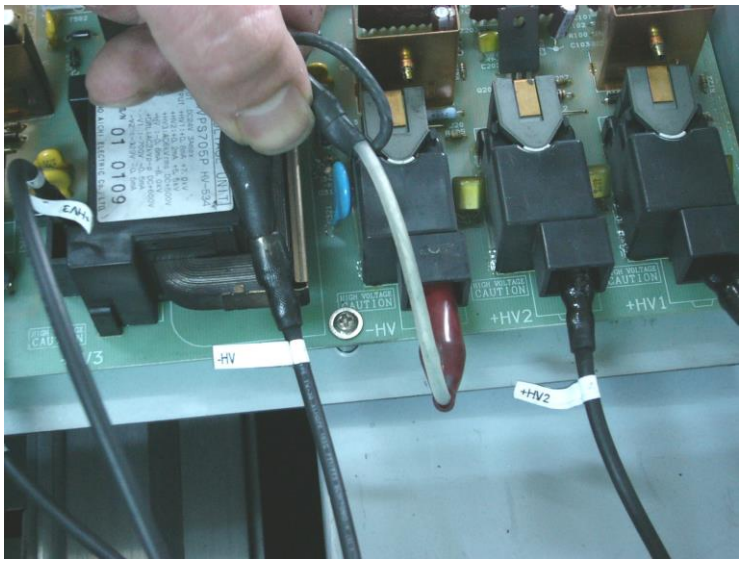


Fig. 3-7

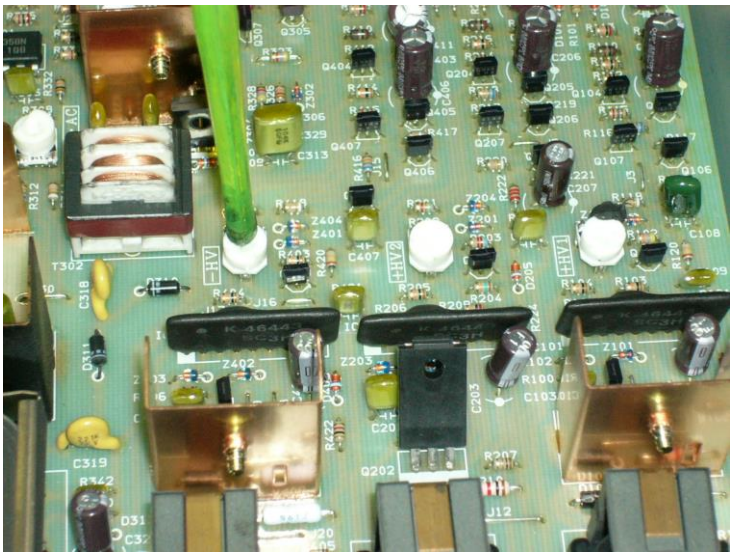


Fig. 3-8

3. -V1 CLEAN BIAS

Use a digital multimeter and set to DC Voltage scale. Connect the meter's red probe into the High Voltage Supply –V1, and then connect the black probe into the Case GND (See Fig.3-9). Turn on CLEAN BIAS under ENGINE CHECK selection, and then adjust High Voltage Supply VR601 (See Fig.3-10). Turn VR601 clockwise to increase the voltage. Turn VR601 counterclockwise to decrease the voltage. Adjust VR601 to –750V.

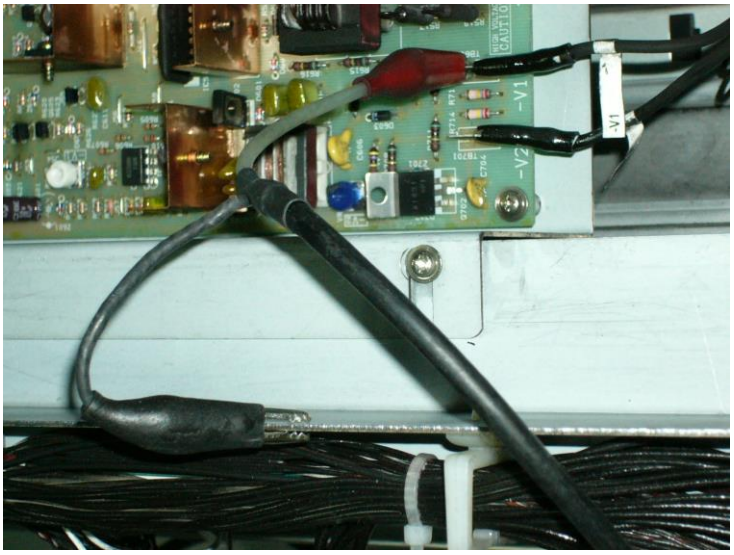


Fig. 3-9

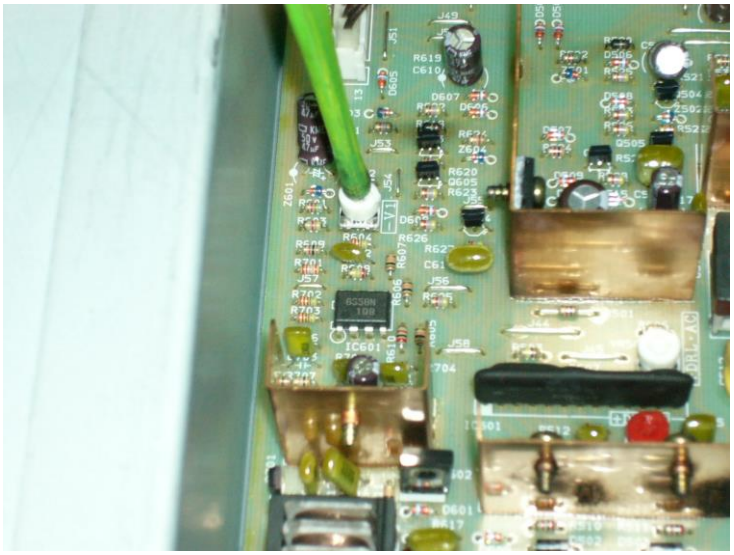


Fig. 3-10

3-6 Transfer Charger Gap

The standard value of transfer charger gap is 1.6 mm.

1. Open the front cover (upper).
2. Detach the developing unit (see "**5-2-5 Developing Unit**").
3. Detach the OPC drum (see "**5-2-8 OPC Drum**").
4. Detach the main charger, pre-charger and transfer charger (see "**5-2-10 Main Charger, Pre-charger, Transfer Charger**").
5. Detach cleaning unit (see "**5-2-11 Cleaning Unit**").
6. Incline the green lever to the left to lower the transport unit and pull out the unit.
7. Install a new transfer charger (see "**5-2-10 Main Charger, Pre-charger, Transfer Charger**").
8. Stick the transfer charger adjuster (1 mm thick) near the front end of transfer charger. Insert the transfer gap gauge through drum shaft and place the gauge near the front end of drum shaft.

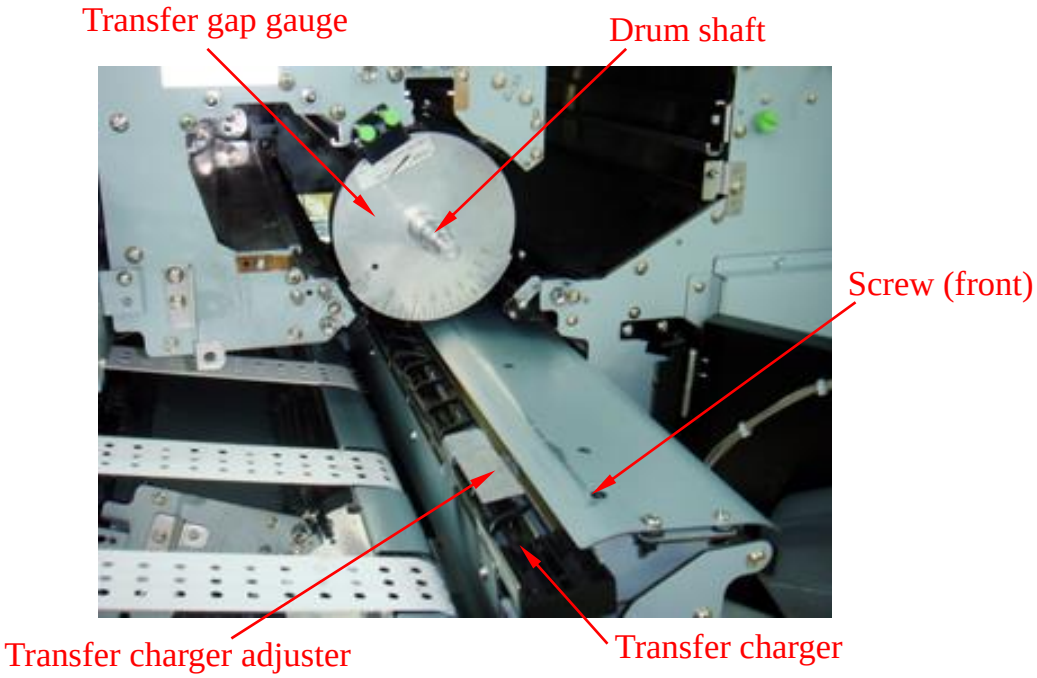


Fig. 3-11

9. Insert the transport unit back to its original position.

10. Loosen the screws on one side of the transfer unit.

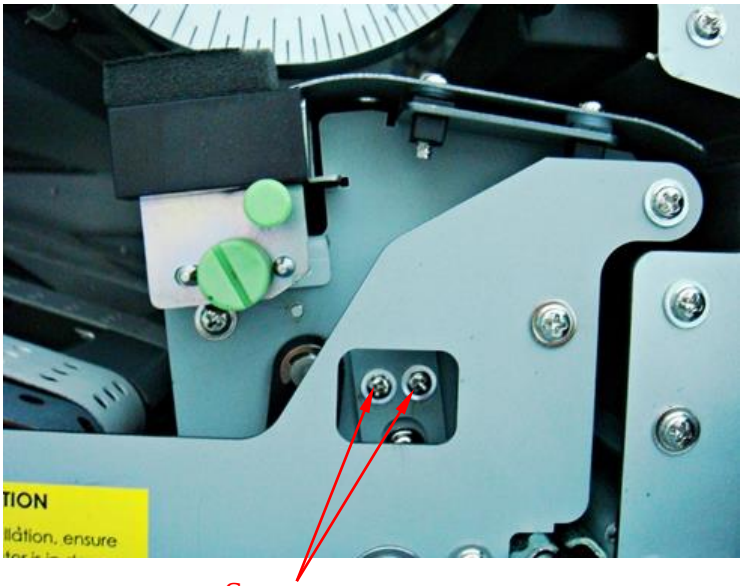


Fig. 3-12

11. Loosen the screws on the other side of the transfer unit.

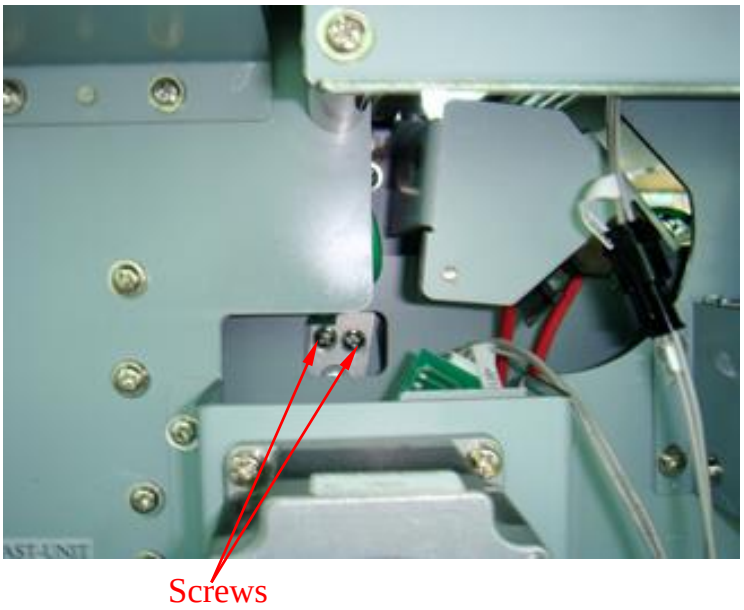


Fig. 3-13

12. Attach the drum plate. Change to engine checker mode. In the MAINTENANCE menu, press "∧" key or "∨" key on operation panel to select sub menu OPERATION. Then press "∧" key or "∨" key to select "02: TRANSPORT UP". Press "Test" key to set the transfer unit at upper position.

13. Use the mini screwdriver to move the transfer charger up or down by turning the screw near the front end.

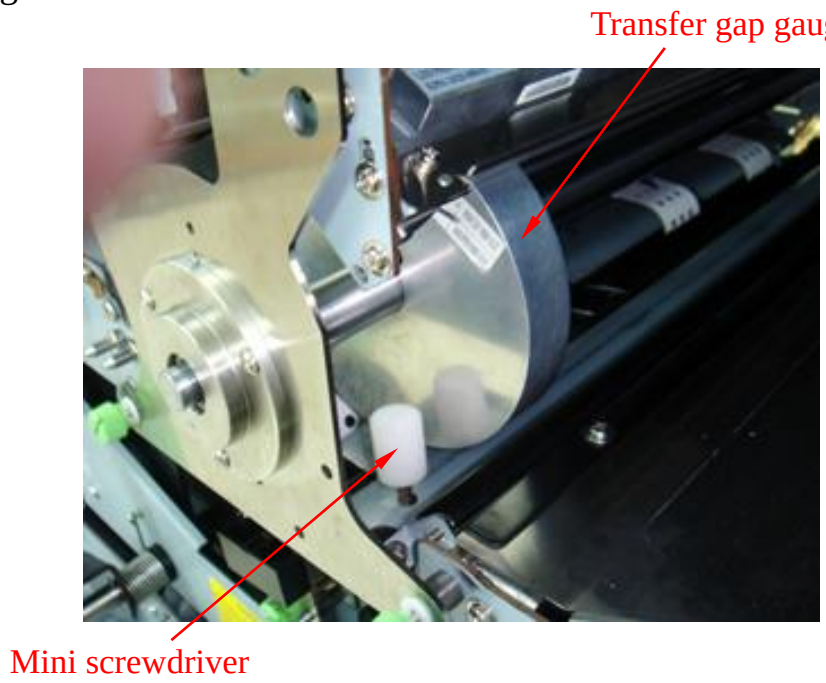


Fig. 3-14

14. Adjust the position of the transfer charger to have the transfer charger adjuster contact the “-0.4” mark on the transfer gap gauge.

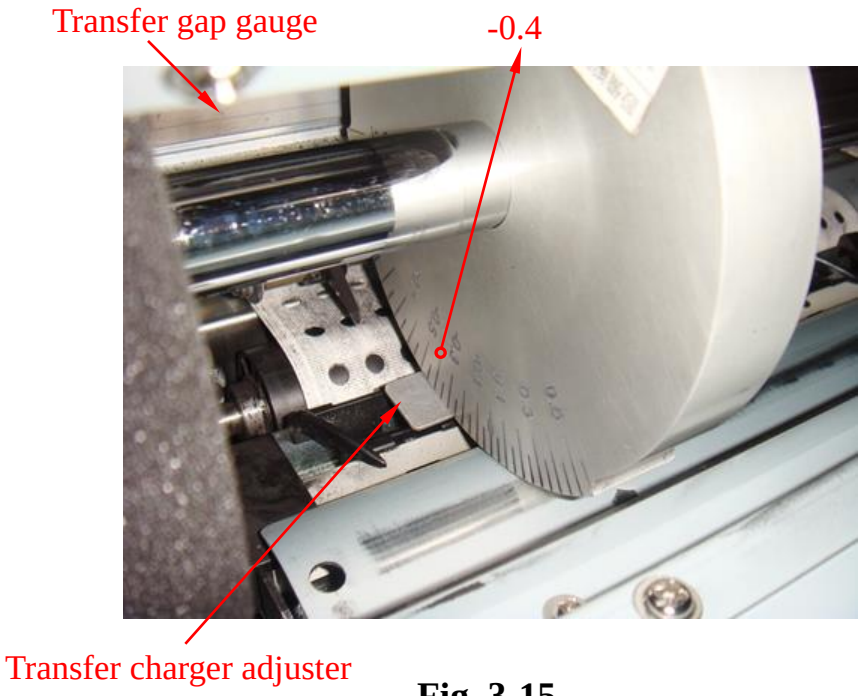


Fig. 3-15

15. Incline the green lever to the left to lower the transport unit and pull out the unit. Stick the transfer charger adjuster near the rear end of transfer charger.

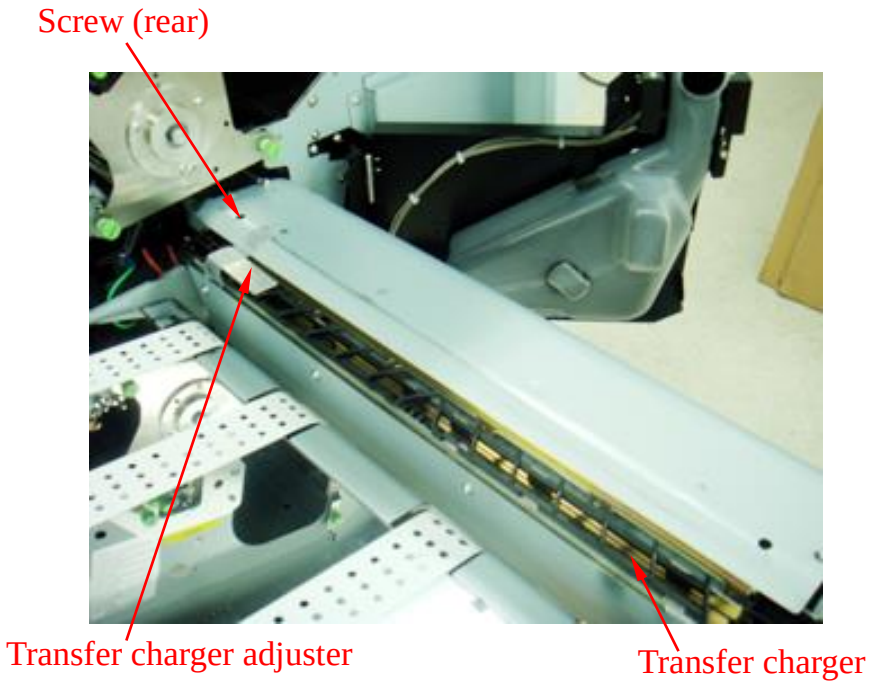


Fig. 3-16

16. Move the transfer gap gauge through drum shaft and place the gauge near the rear end of drum shaft. Then insert the transport unit back to its original position. Press “Test” key to set the transfer unit at upper position. Use the mini screwdriver to move the transfer charger up or down by turning the screw near the rear end. Adjust the position of the transfer charger to have the transfer charger adjuster contact the “-0.4” mark on the transfer gap gauge.

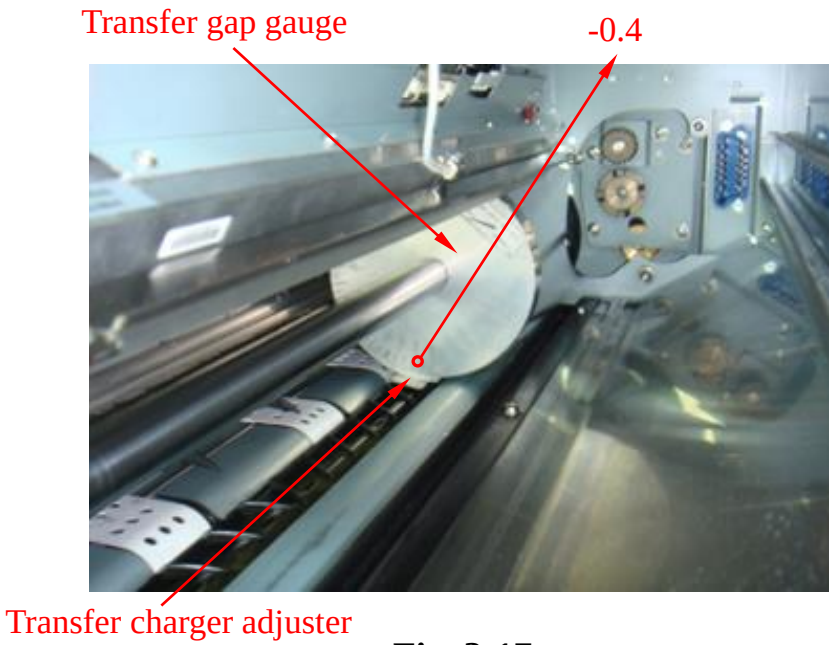


Fig. 3-17

17. Tighten the screws that were loosened in step 10 and step 11.

18. Press “Test” key to set the transfer unit at lower position. Remove the transfer gap gauge. Press “Test” key to move the transfer unit up and down twice then set the transfer unit at upper position. Stick the transfer charger adjuster near the front/rear end of transfer charger. Insert the transfer gap gauge through drum shaft and place the gauge near the front/rear end of drum shaft. Check if the transfer charger adjuster still contacts the “-0.4” mark on the transfer gap gauge. If it does not, readjust the transfer charger gap.

3-7 Transfer Guide Plate Gap

The standard range of transfer guide plate gap is 1.3 ~ 1.6 mm.

1. Open the front cover (upper).
2. Detach the developing unit (see "**5-2-5 Developing Unit**").
3. Detach the OPC drum (see "**5-2-8 OPC Drum**").
4. Detach the main charger, pre-charger and transfer charger (see "**5-2-10 Main Charger, Pre-charger, Transfer Charger**").
5. Detach cleaning unit (see "**5-2-11 Cleaning Unit**").
6. Incline the green lever to the left to lower the transport unit.
7. Insert the transfer gap gauge through drum shaft and place the gauge near the front end of drum shaft.
8. Attach the drum plate. Change to engine checker mode. In the MAINTENANCE menu, press "∧" key or "∨" key on operation panel to select sub menu OPERATION. Then press "∧" key or "∨" key to select "02: TRANSPORT UP". Press "Test" key to set the transfer unit at upper position.
9. The transfer guide plate can be moved up or down by turning the screws near the front/rear end.

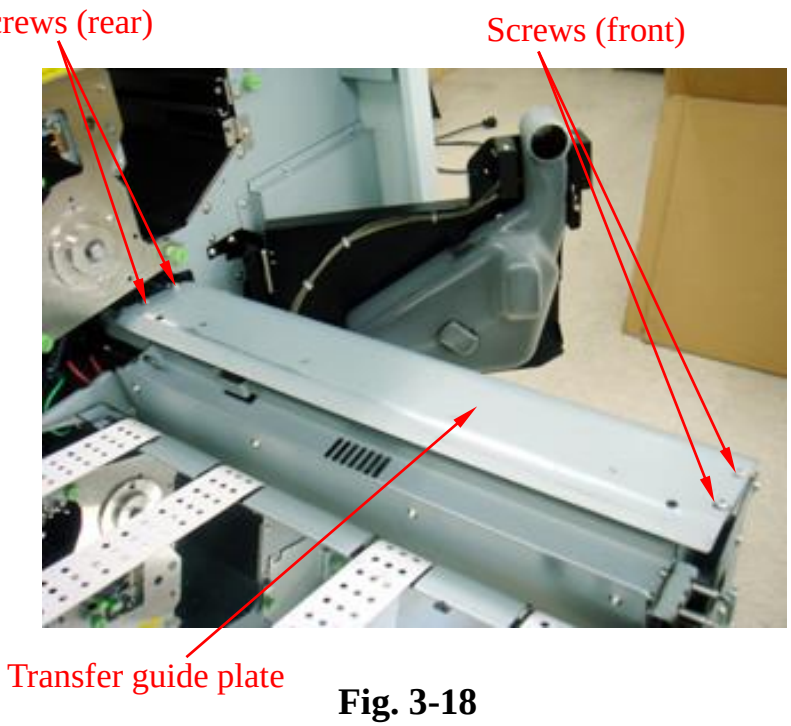


Fig. 3-18

10. Adjust the position of the transfer guide plate by turning the screws near the front end to have the transfer guide plate contact “+0.3” ~ “+0.6” mark on the transfer gap gauge.

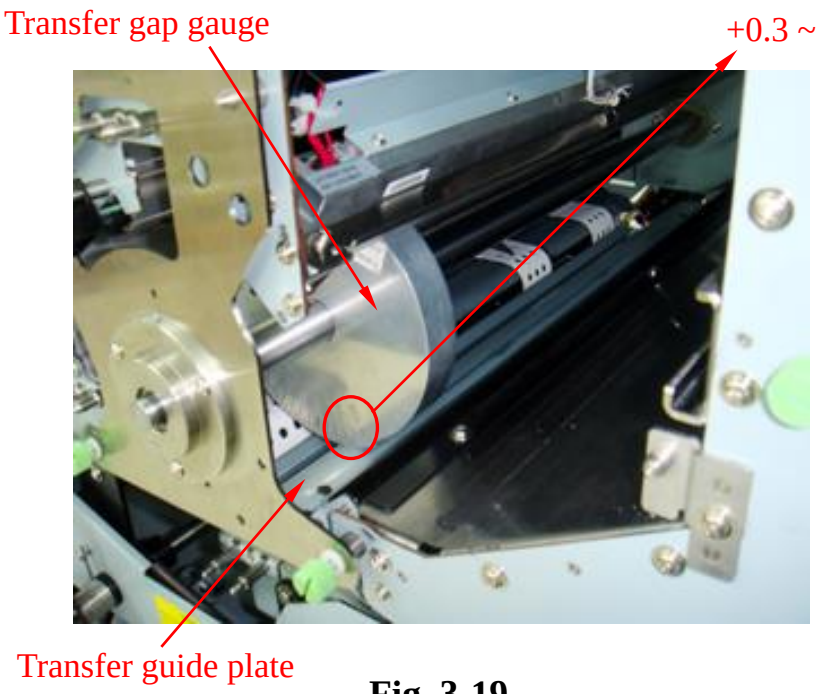


Fig. 3-19

11. Move the transfer gap gauge through drum shaft and place the gauge near the rear end of drum shaft. Adjust the position of the transfer guide plate by turning the screws near the rear end to have the transfer guide plate contact “+0.3” ~ “+0.6” mark on the transfer gap gauge.

12. Press “Test” key to set the transfer unit at lower position. Remove the transfer gap gauge. Press “Test” key to move the transfer unit up and down twice then set the transfer unit at upper position. Insert the transfer gap gauge through drum shaft and place the gauge near the front/rear end of drum shaft. Check if the transfer guide plate still contacts “+0.3” ~ “+0.6” mark on the transfer gap gauge. If it does not, readjust the transfer guide plate gap.

3-8 Adjusting Drum Surface Potential Sensor Position

1. Power off the printer. Open the front cover (upper).
2. Detach the developing unit (see "**5-2-5 Developing Unit**").
3. Detach the OPC drum (see "**5-2-8 OPC Drum**").
4. Detach the main charger and pre-charger (see "**5-2-10 Main Charger, Pre-charger, Transfer Charger**").
5. Detach cleaning unit (see "**5-2-11 Cleaning Unit**").
6. Attach the dummy drum to the drum shaft.

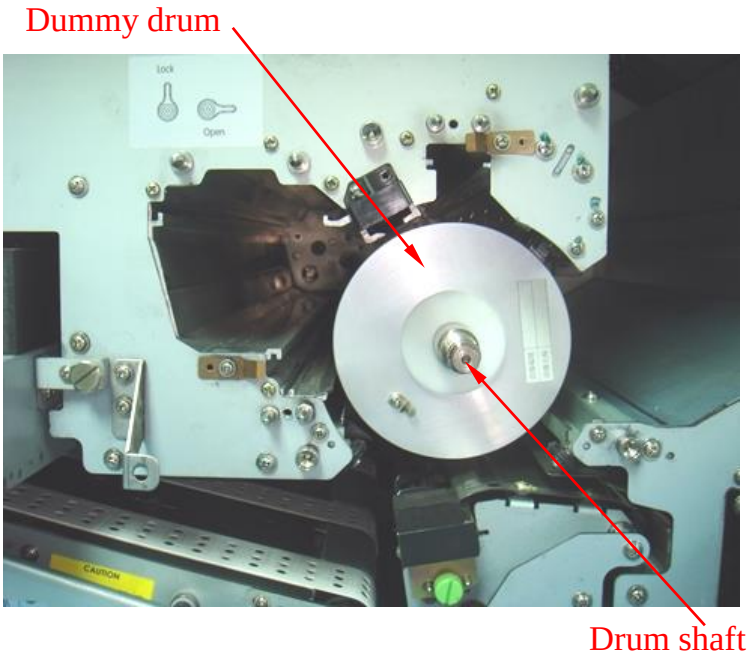


Fig. 3-20

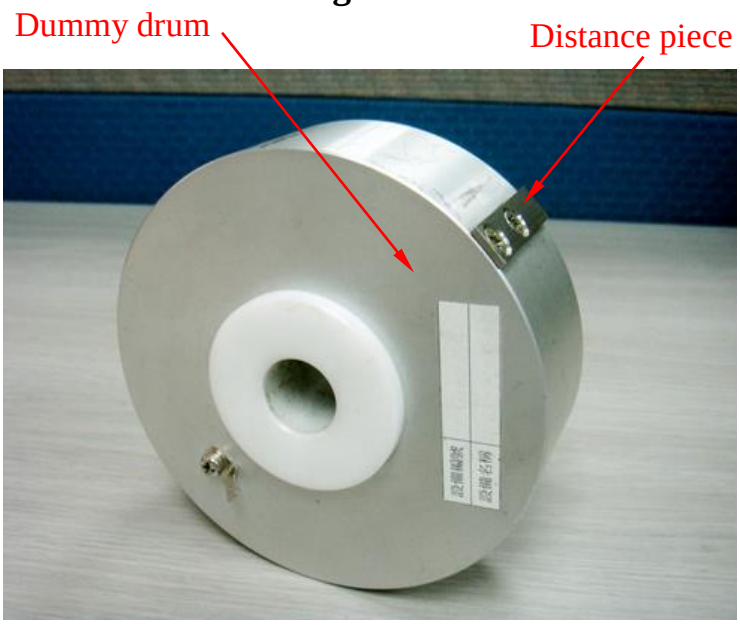


Fig. 3-21

7. Put the drum plate back and tighten the 3 thumbscrews.
8. Turn the dummy drum to put the distance piece on dummy drum below the metal part of drum surface potential sensor.

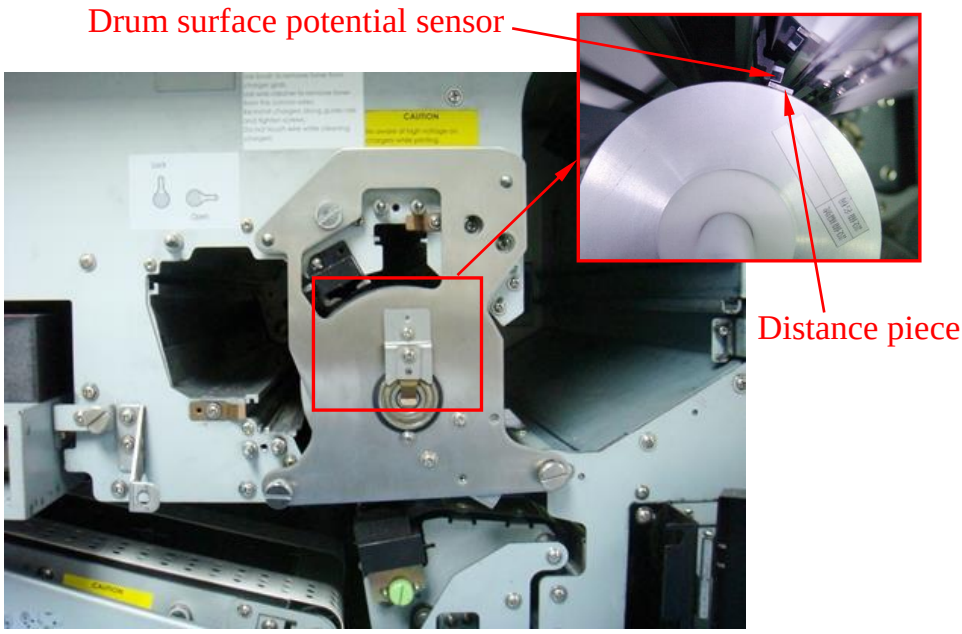


Fig. 3-22

9. Loose the screws on the sensor bracket and adjust the position of drum surface potential sensor to touch the distance piece on dummy drum (KP05-5098-001-01) (the distance between drum surface potential sensor and drum surface would be 2 mm). Then tighten the screws.

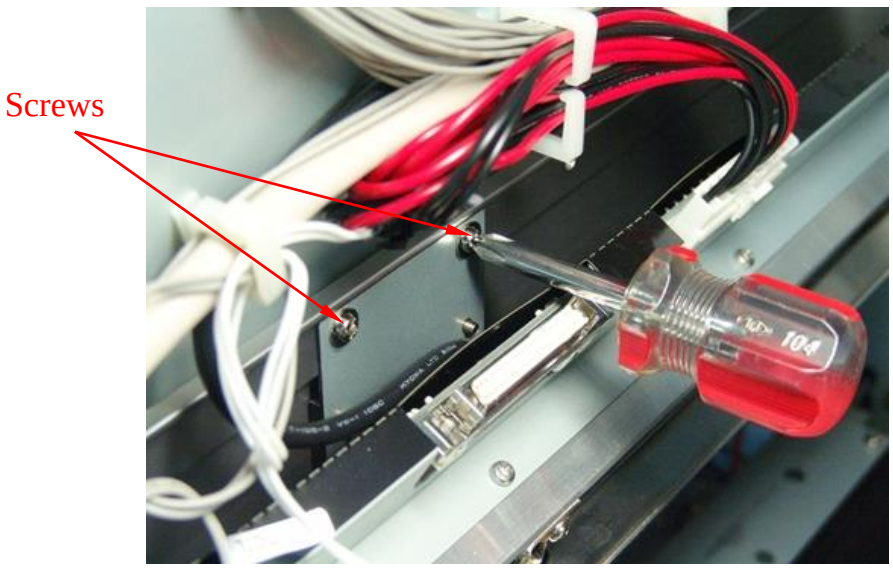


Fig. 3-23

3-9 Adjusting Drum Surface Potential Voltage

1. Power off the printer. Open the front cover (upper).
2. Detach the developing unit (see "**5-2-5 Developing Unit**").
3. Detach the OPC drum (see "**5-2-8 OPC Drum**").
4. Detach the main charger and pre-charger (see "**5-2-10 Main Charger, Pre-charger, Transfer Charger**").
5. Detach cleaning unit (see "**5-2-11 Cleaning Unit**").
6. Attach the dummy drum to the drum shaft.

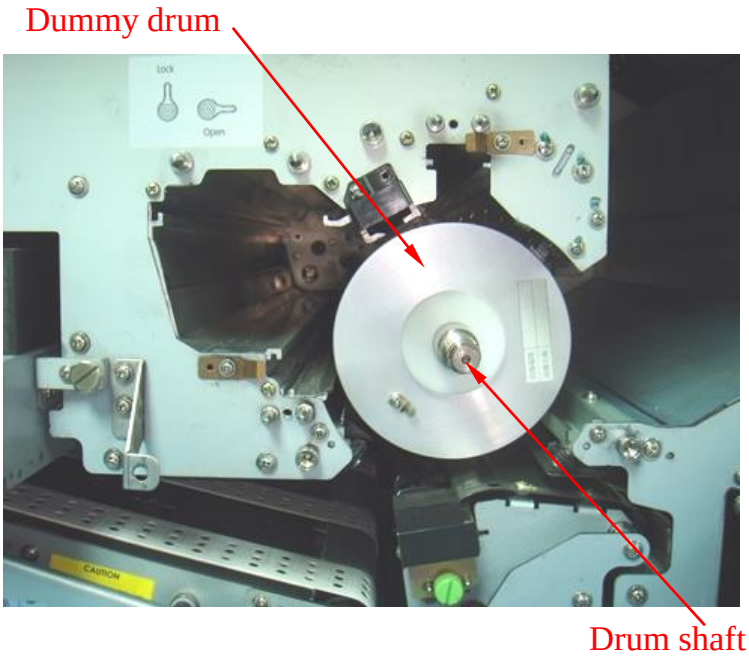


Fig. 3-24

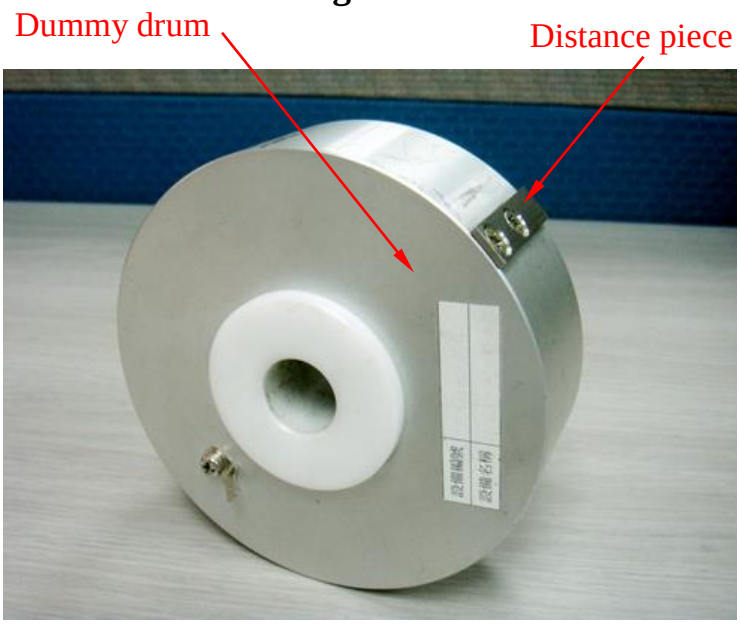


Fig. 3-25

7. Make sure the gap between drum surface potential sensor and OPC drum is correct (standard is 2 mm).
8. Attach the DC600V power supply red wire (+) to the dummy drum. Attach the DC600V power supply black wire (-) to engine frame.

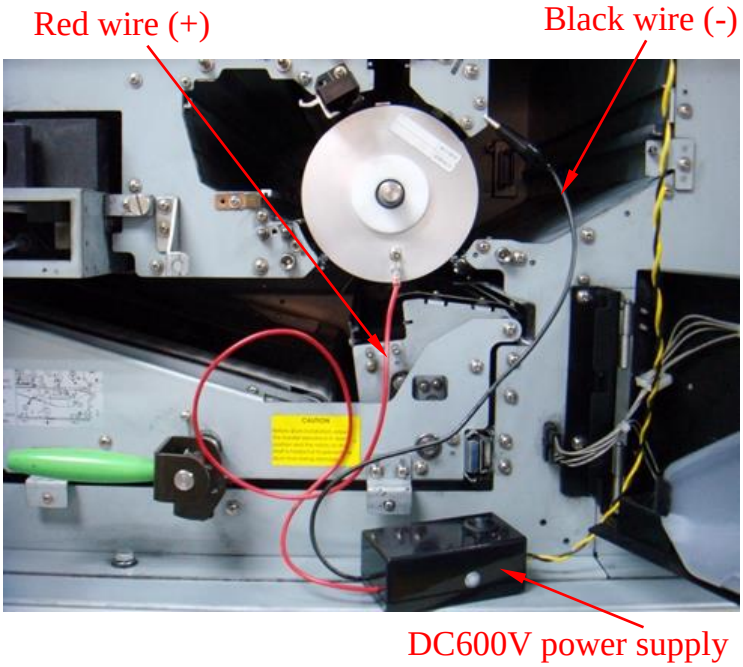


Fig. 3-26

9. Push the dummy drum to the position below drum surface potential sensor. Turn the dummy drum to put the distance piece away from below the drum surface potential sensor. Put the drum plate back and tighten the 3 thumbscrews.

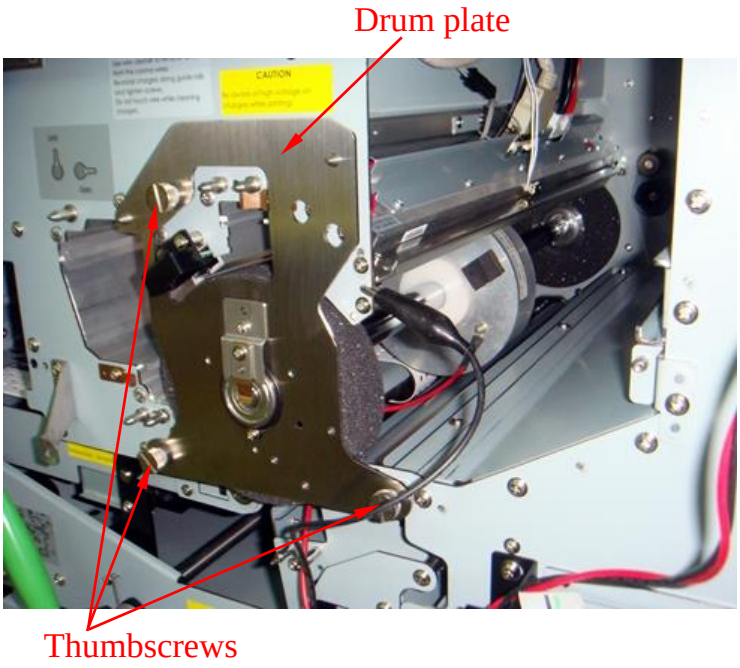


Fig. 3-27

10. Detach the DCMTR DRV board connector labeled BL150-24V. Attach the DC600V power supply connector to the DCMTR DRV board connector.

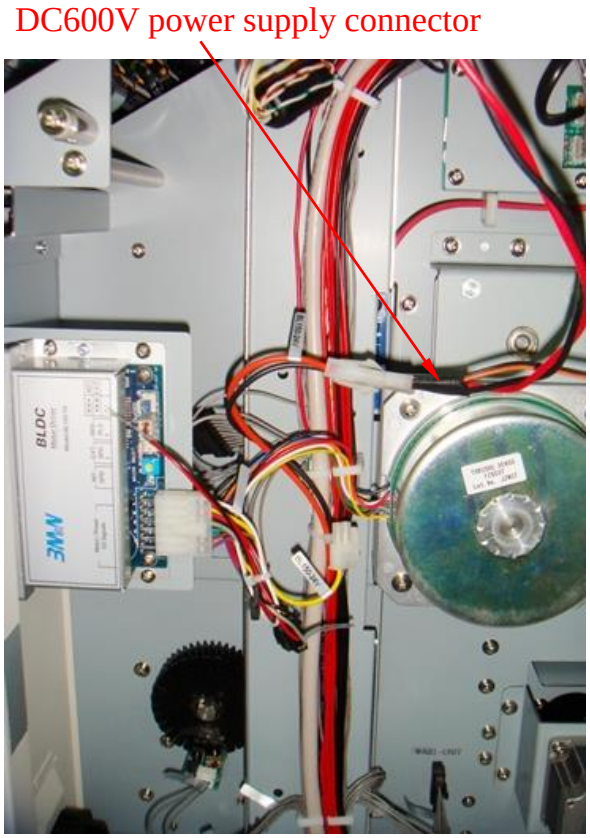


Fig. 3-28

11. Disable front cover sensor.

Fig. 3-29

12. Set KMPU board Dip-switch SW2 pin 1, 2, 3 “OFF” but pin 4 “ON” to change the printer to engine checker mode. Disconnect video interface connector (37 pins) from “CN1” on KMPU board. Connect panel interface connector (9 pins) to “P2” connector on KMPU board. Power on engine.

13. LCD screen on the operation panel displays that you are in the MAINTENANCE menu. Press “∧” key or “∨” key to select the sub menu “VOLUME”. Press “Save” key to enter sub menus. Press “∧” key or “∨” key to select “10:DSPS CHECK”.

Fig. 3-30

14. Turn on DC600V power supply.

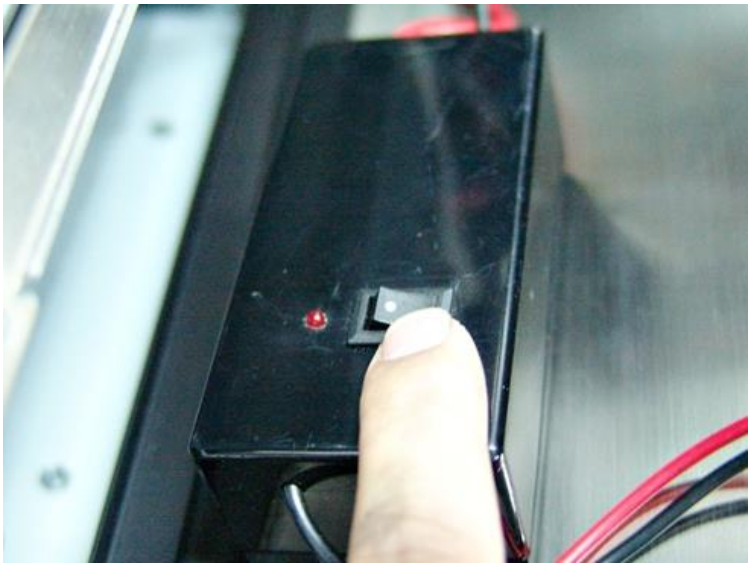


Fig. 3-31

CAUTION

Use a multimeter to make sure the voltage on dummy drum surface is DC 600V.

15. Turn VR on drum surface potential sensor board to adjust the voltage to 599V. Turn off and on DC600V power supply three times to ensure the drum surface potential voltage is still 599V.

Fig. 3-32

Fig. 3-33

3-10 Adjusting Paper in Encoder

1. Remove the rear cover.
2. Detach the connector.
3. Remove the screw to detach the bracket.
4. Remove the screws to detach the paper in encoder (interrupt sensor) from the bracket.

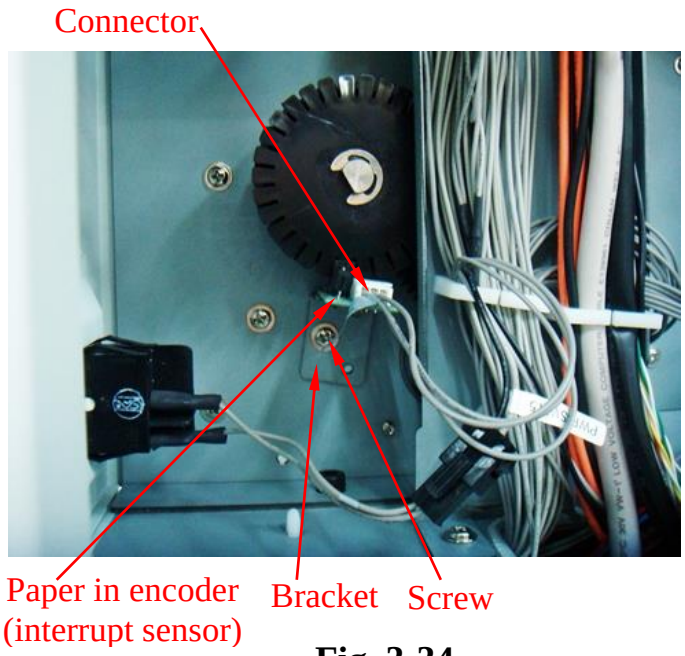


Fig. 3-34

5. Attach the new paper in encoder (interrupt sensor) to the bracket with screws.

6. Use screw to attach the bracket, and then install the adjustment tool (KP05-5199-000-02) to the shaft in a position as shown in the figure. Adjust the bracket to make sure the sensor is fully covered by the indentation of adjustment tool (KP05-5199-000-02), and then tighten the screw fastening the bracket.

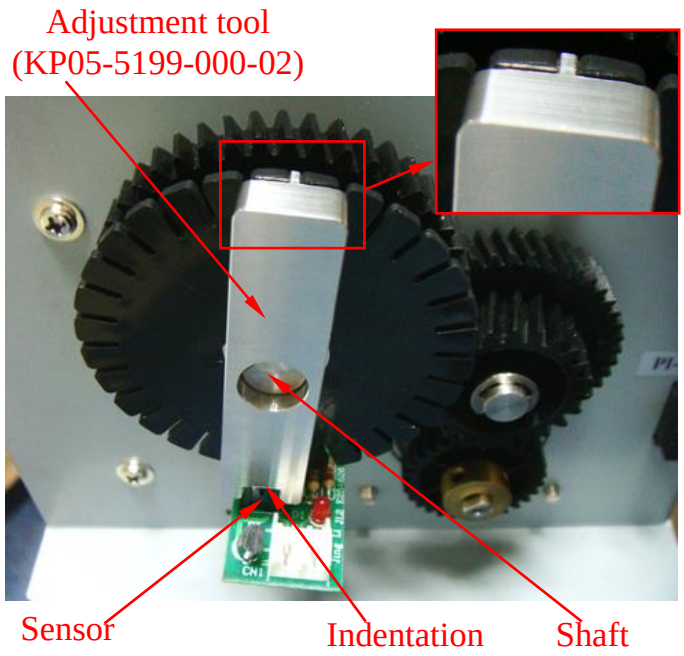


Fig. 3-35

7. Couple the connector.
8. Connect V24 (RS232) cable and upload KVA1-R2.hex.
9. On KMPU board, set Dip-switch SW1 (bit 4: OFF) and SW2 (bit 2: ON) to disable the prefeed-4 page function temporarily.
10. Fanfold the first two pages to have a rigid front paper edge then install the paper on the tractor.
11. Run PC-V24 terminal program then power on engine.
12. After warm-up, in PC terminal tools type “p” to pull paper back then type “l” to load paper. A message of “PTS on at = xx, PTS OK = yy” is displayed on the screen. “xx” stands for the stepping motor steps when paper top sensor detected paper front edge. “yy” stands for the stepping motor steps when firmware detected paper front edge within defined windows (4 – 12).

13. Adjust paper in encoder to reach the target. The target of adjustment: xx = around 3 or 4. Install the adjustment tool (KP05-5199-000-02) to the shaft in a position as shown in the figure. Be ware of the direction of the adjustment tool. Loosen the screw on the bracket and move the paper in encoder a bit toward left or right as shown in the figure. Tighten the screw then remove the adjustment tool.

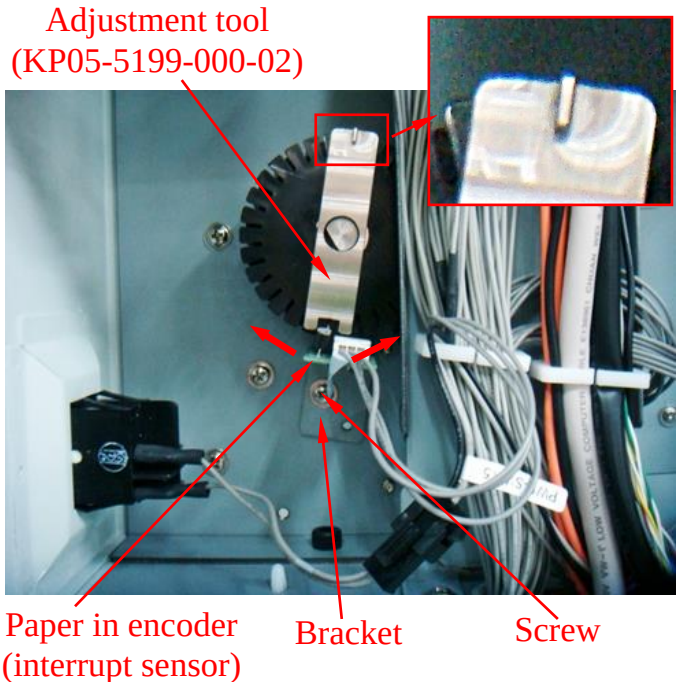


Fig. 3-36

14. In PC terminal tools type “p” to pull paper back then type “l” to load paper. A message of “PTS on at = xx, PTS OK = yy” is displayed on the screen. If the xx is not at the target value, repeat step 13 & 14 until the xx reach the target value.

15. Power off engine. On KMPU board, set Dip-switch SW1 (bit 4: ON) and SW2 (bit 2: OFF).

Chapter 4

Periodic Maintenance

4-1 Periodic Maintenance

It is important to perform periodic maintenance to ensure the printing quality and accuracy of WINJET ML2000 Series for practical use. The periods of cleaning and replacing the consumables and parts performed by users and/or service engineers are indicated in the following tables.

CAUTION

Use Fluoro-Silicone Synthetic Grease FS503 for parts lubrication in case needed. Do not use any type of grease other than Fluoro-Silicone Synthetic Grease FS503.

Fig. 4-1

(Count by 8.5” size, B/W 5%)

Item	Time-Clean (in pages)	User	Time-Clean (in pages)	Service Engineer	Tool
Transport belt	50K	*			Cloth with alcohol
Pre-charger	50K	*	200K	*	Brush Wire cleaner
Tractor unit	50K	*	200K	*	Brush Vacuum cleaner
Transport unit	50K	*	200K	*	Vacuum cleaner Cloth with alcohol
LED print head			200K	*	Dry cloth
Guide rail section of pre-charger			200K	*	Brush Vacuum cleaner
Developing unit			200K	*	Vacuum cleaner
Guide section of developing unit			200K	*	Brush Vacuum cleaner
Guide plate below separation claw			200K	*	Brush Vacuum cleaner
Waste toner box unit			200K	*	Vacuum cleaner
Paper empty sensor area			200K	*	Brush Vacuum cleaner
Transfer guide plate			200K	*	Dry cloth
Fuser cover glass			200K	*	Cotton cloth Scraper
Main charger	50K	*	300K	*	Brush Wire cleaner
Transfer charger	50K	*	300K	*	Brush Wire cleaner
Paper empty sensor area	200K	*			Brush Vacuum cleaner
OPC drum shaft & flange	300K	*			Shaft: dry cloth Flange: dry cloth with alcohol Remark: Lubricant is prohibited
Erase lamp unit			300K	*	Brush

Table 4-1

(Count by 8.5" size, B/W 5%)

Item	Time-Replace (in pages)	User	Time-Replace (in pages)	Service Engineer	Remark
Toner cartridge	20K	*			Replace when the "Toner Empty" indication appears. (A4, 5% printing coverage)
Waste toner box	100K	*			Replace when the "Waste Toner Full" indication appears. (A4, 5% printing coverage)
Main charger	300K	*			
Transfer charger	300K	*			
Developer			300K	*	
Air filter			300K	*	
Cleaning unit			300K	*	
OPC drum			300K	*	
Pre-charger	450K	*			
Transport belt				*	
Developing unit			600K	*	
Xenon lamp			900K	*	
HV connector sets (+HV3, +HV2, -HV, +HV1, Varistor)			2000K	*	

Table 4-2

4-2 Cleaning

4-2-1 Tractor Unit

In order to clean the tractor unit, use a vacuum cleaner to clear the paper dust scattered around the tractor unit.

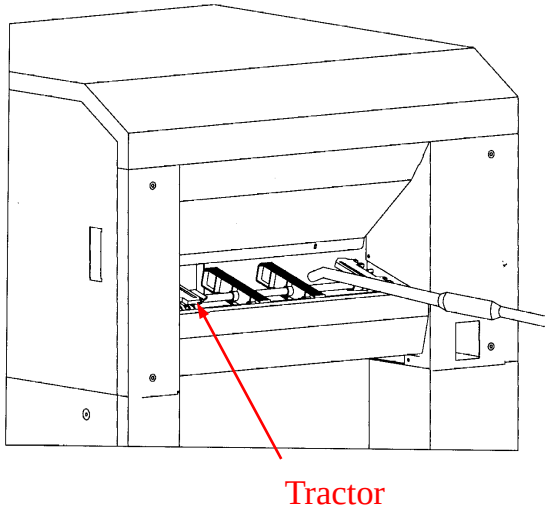


Fig. 4-2

4-2-2 Inside the Front Cover

In order to clean the inside of the front cover, use a vacuum cleaner to clear the scattered paper dust or toner particles.

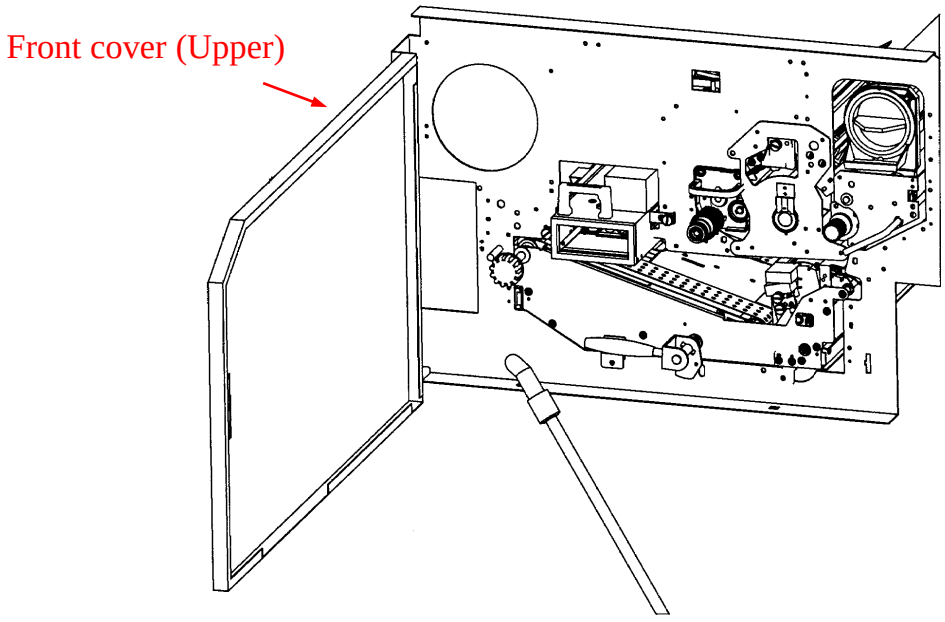


Fig. 4-3

4-2-3 Developing Unit/Toner Cartridge Hopper Area

Use a vacuum cleaner to clean the developing unit/toner cartridge hopper area.

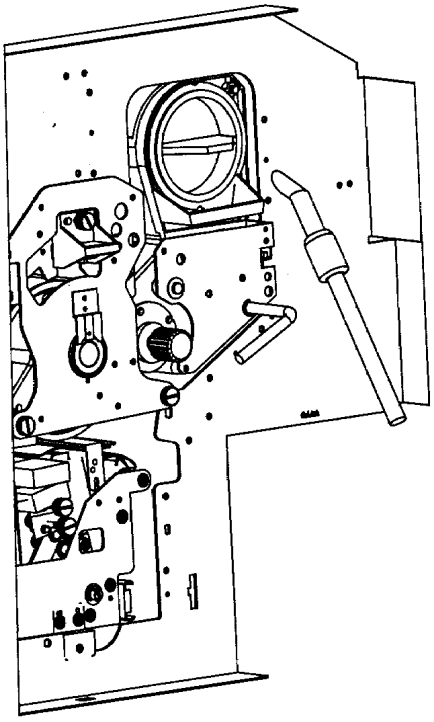


Fig. 4-4

4-2-4 Cleaning Unit Area

Use a vacuum cleaner to clean the cleaning unit area.

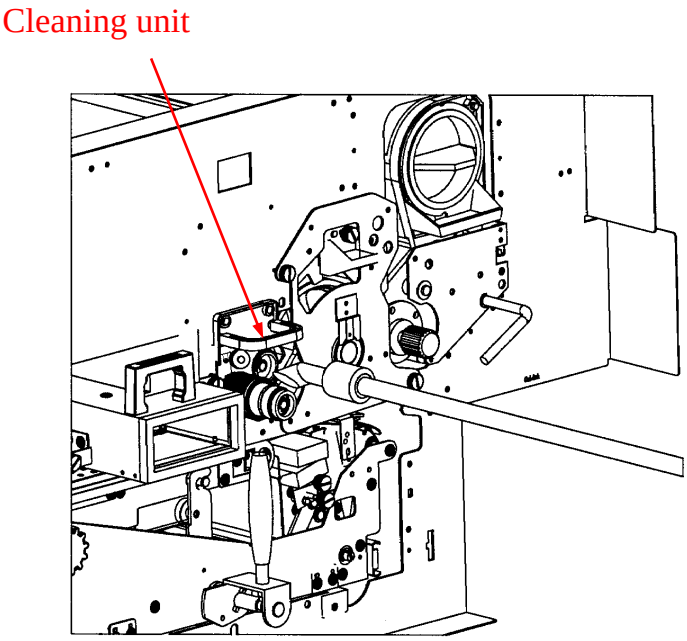


Fig. 4-5

4-2-5 Fuser Unit Area

Use a vacuum cleaner to clean the fuser unit area.

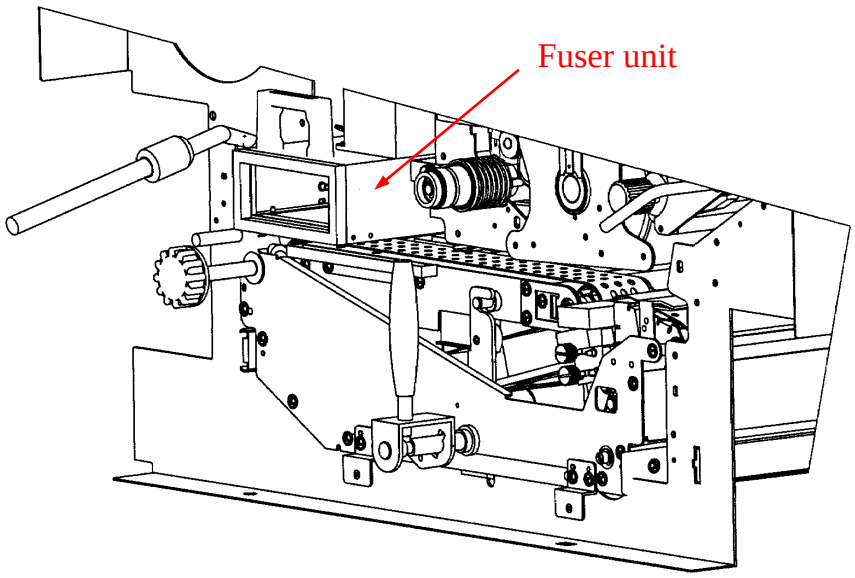


Fig. 4-6

4-2-6 Waste Toner Box Unit Area

Press down the opening lever to open the waste toner box unit. Use a vacuum cleaner to clean the waste toner box unit area.

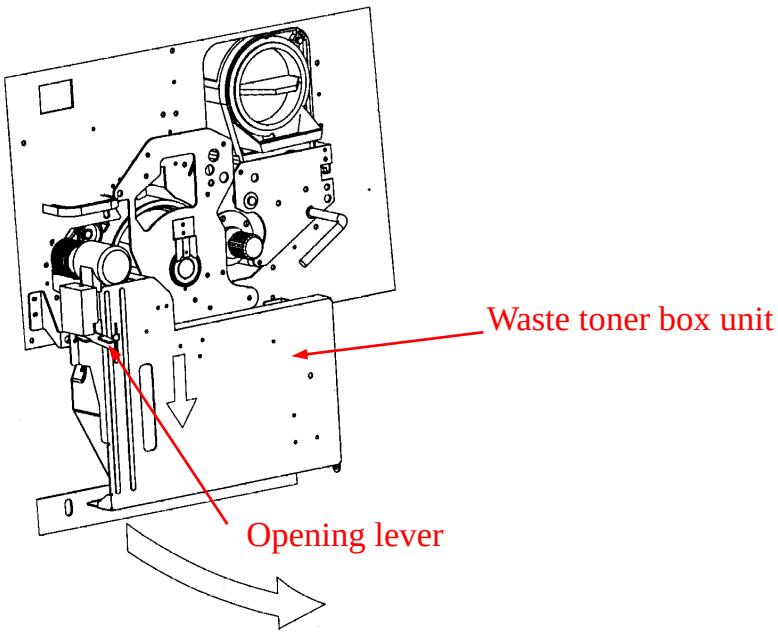


Fig. 4-7

4-2-7 Transport Unit

1. Open the waste toner box unit (see **"4-2-6 Waste Toner Box Unit Area"**). Then incline the green lever of the transport unit to the left to lower the transport surface. Pull out the transport unit, and use a vacuum cleaner to clear the scattered paper dust or toner particles.

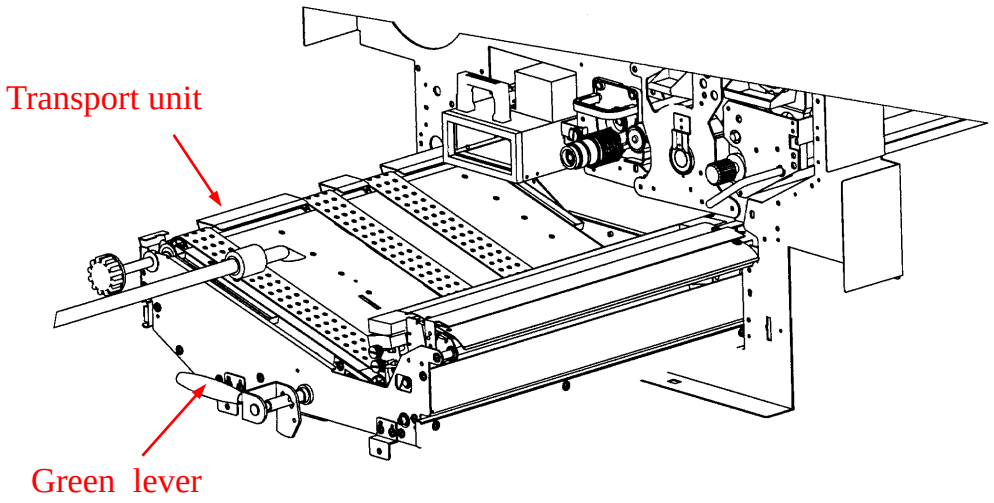


Fig. 4-8

2. Use a piece of cloth with alcohol to remove the dirt on the transport surface and transport belts.

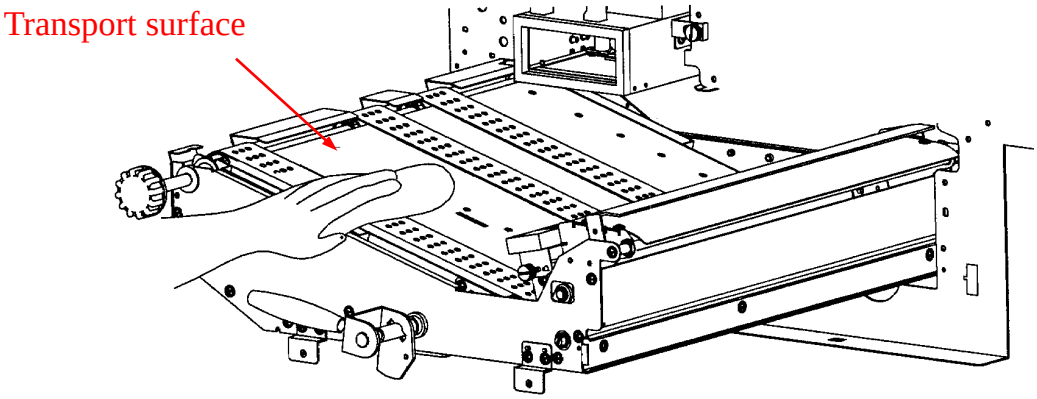


Fig. 4-9

3. Insert the transport unit back as it was originally. When the transport unit contacts with the inner end, raise the green lever to the right then close the waste toner box unit.

4-2-8 Main Charger

CAUTION

Handle the chargers carefully to prevent damaging or cutting the charger wires.

1. Loosen the thumbscrew and pull the main charger out.

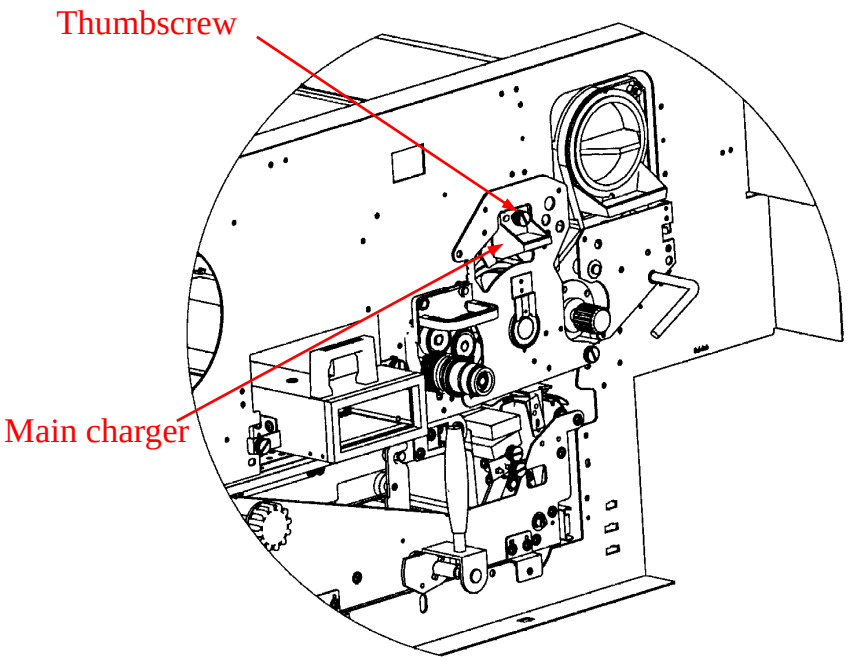


Fig. 4-10

2. Use the brush to wipe off the dust on the main charger.

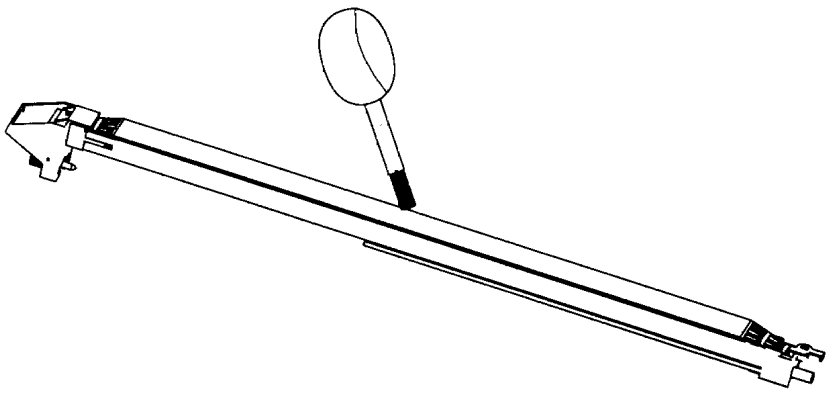


Fig. 4-11

3. Detach the grid.
4. Use the wire cleaner (applied with alcohol) to clean the wire of the main charger.

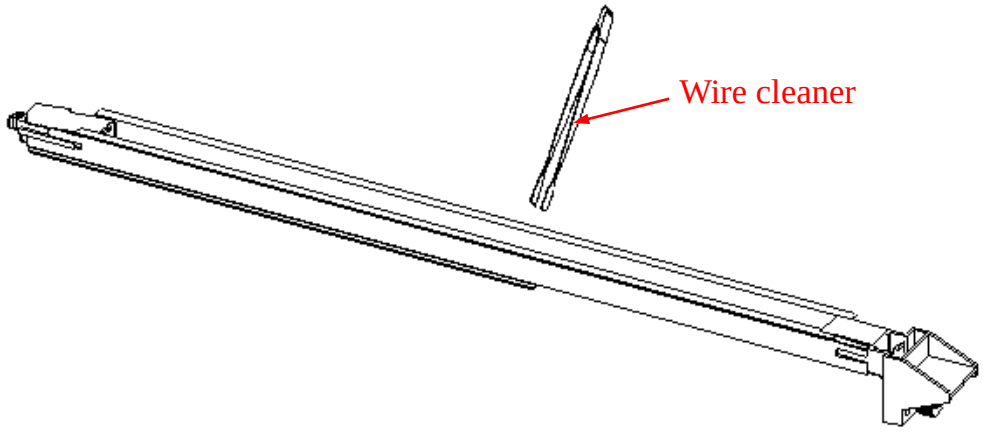


Fig. 4-12

5. Gently move the stainless spring plate to an exact 90˚angle. Insert the right side rectangle hole of the grid to the stainless spring plate.

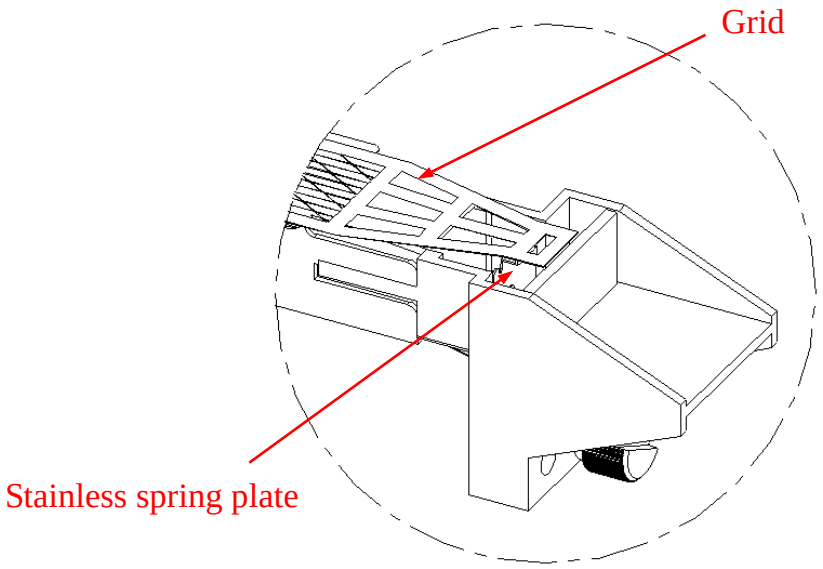


Fig. 4-13

6. Insert the main charger to its original location and tighten the thumbscrew.

4-2-9 Pre-charger and Transfer Charger

1. Open the waste toner box unit (see "**4-2-6 Waste Toner Box Unit Area**").
2. Loosen the thumbscrew and pull out the pre-charger.

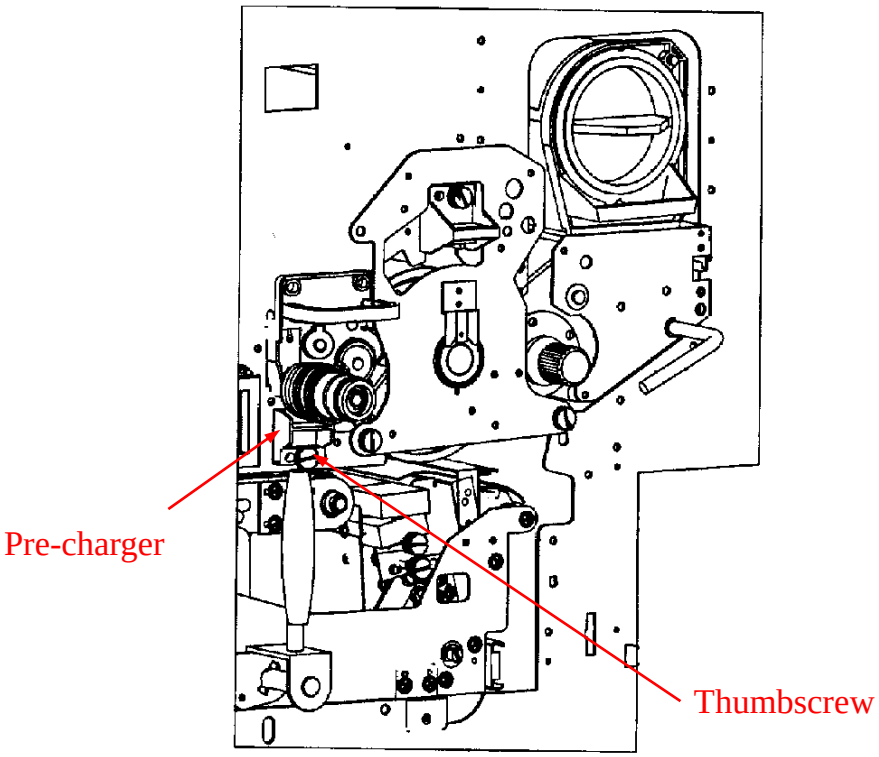


Fig. 4-14

3. Confirm that the transfer charger is at the "down" position. If the transfer charger is not at the "down" position, use a slotted screwdriver to turn the transfer elevator drive shaft counterclockwise to lower the transfer charger to the "down" position. Then loosen the thumbscrew and pull out the transfer charger.

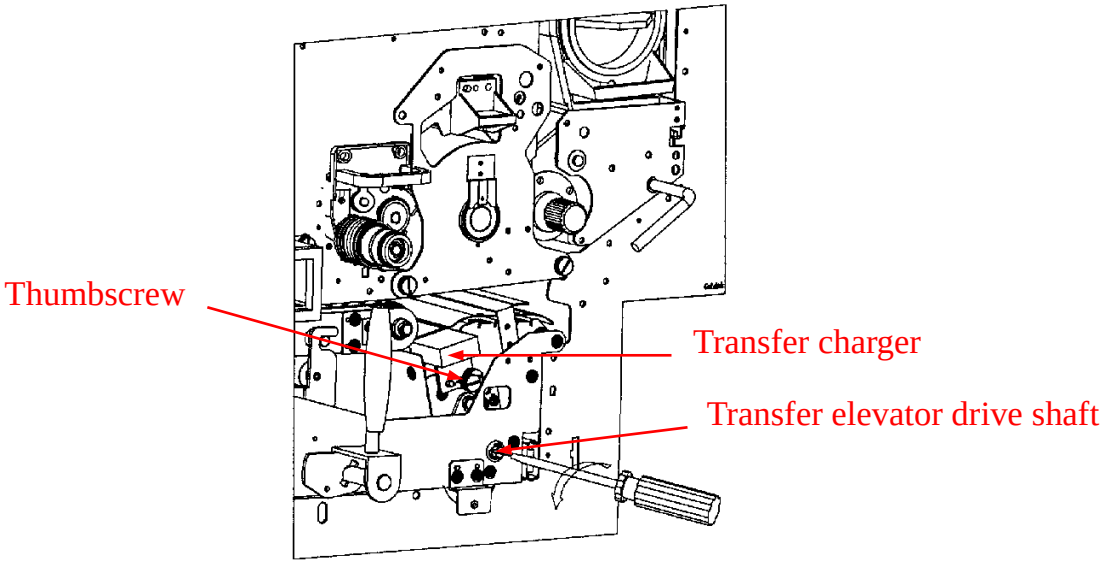


Fig. 4-15

4. Use the brush to wipe off the dust on the pre-charger and transfer charger.
5. Clean the wires of the pre-charger and transfer charger with the wire cleaner.

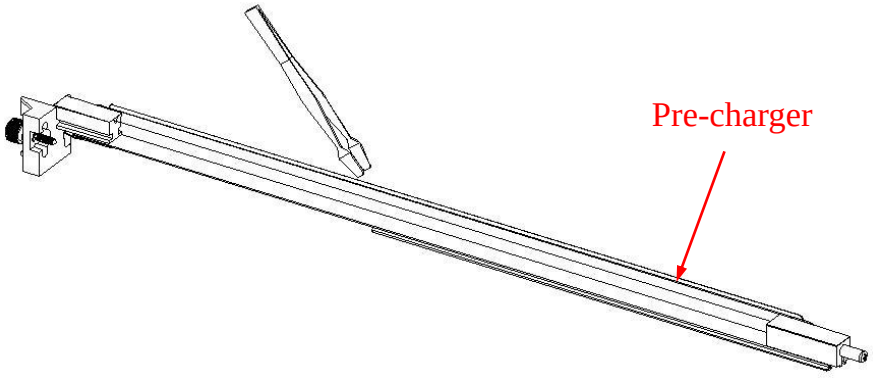


Fig. 4-16

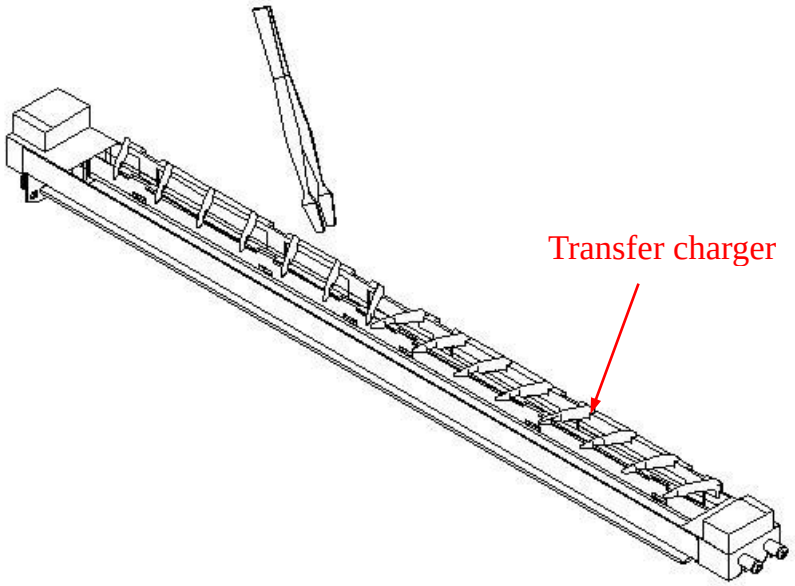


Fig. 4-17

6. After cleaning, insert the pre-charger and transfer charger to their original locations and tighten the thumbscrews. Close the waste toner box unit.

4-2-10 OPC Drum

CAUTION

1) Do not touch the drum surface.
2) Clean the drum at a dustless location to avoid making the drum surface defective.
3) If the drum is left in the main body for a long period of time with wiping stains on it, areas of the drum with wiping stains may deteriorate. Make sure to confirm there are no wiping stains by performing printing on paper of the maximum size with drum installed after the cleaning so that after printing several dozens of pages the wiping stains would disappear.

1. Take out the OPC drum (see "**5-2-8 OPC Drum**").

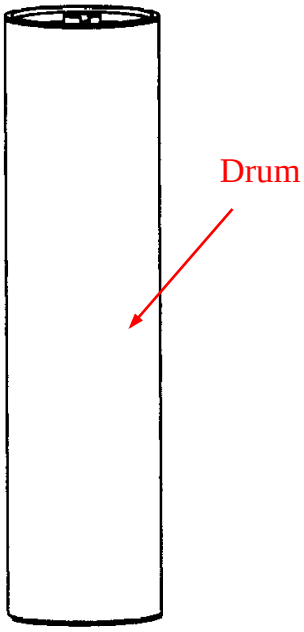


Fig. 4-18

2. Wipe the drum surface with the cotton cloth.

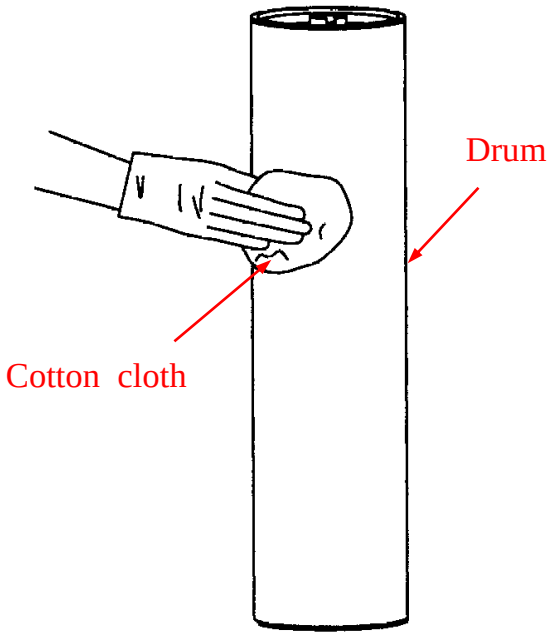


Fig. 4-19

4-2-11 LED Print Head

Before cleaning the LED print head, take out the developing unit and the OPC drum firstly (see **"5-2-5 Developing Unit"** and **"5-2-8 OPC Drum"**). Insert your hand from the OPC drum mounting section and clean the dirt on the LED print head with dry cloth.

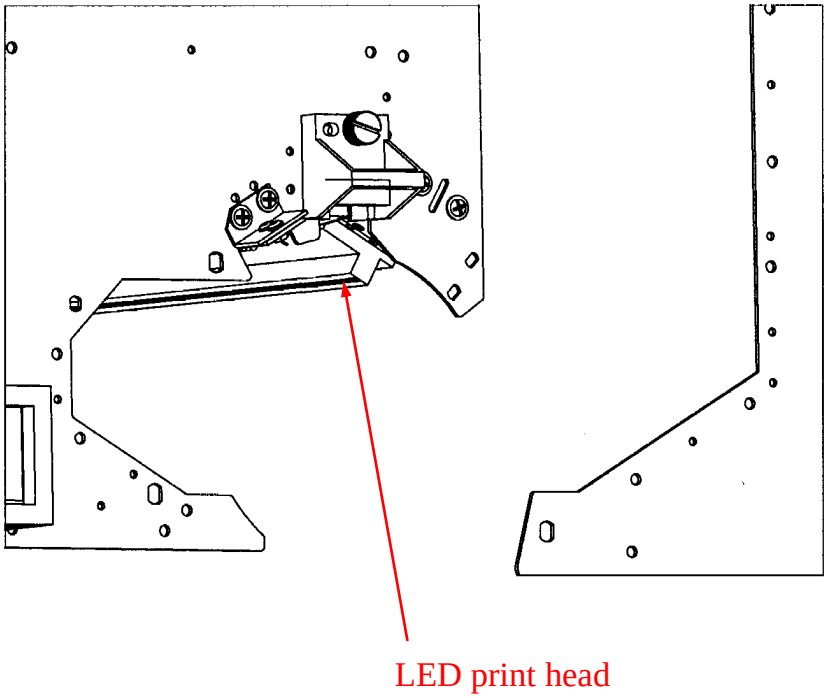


Fig. 4-20

4-2-12 Erase Lamp Unit

1. Loosen the screws for the erase lamp unit and pull out the erase lamp unit.
2. Use the brush to wipe off the dirt on the erase lamp unit.

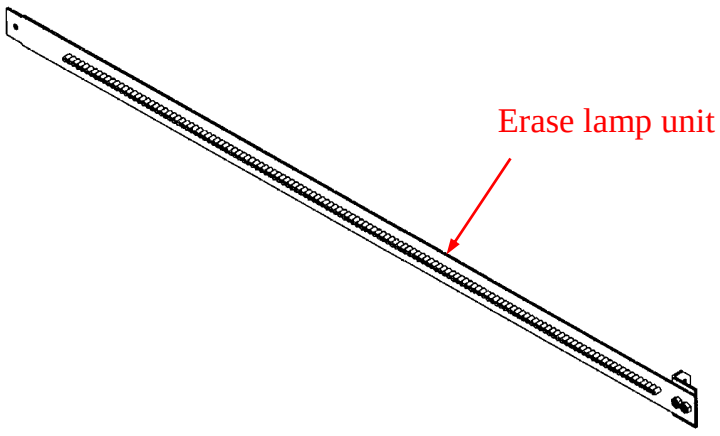


Fig. 4-21

4-2-13 Fuser Cover Glass

CAUTION

1) Do not handle the fuser unit until it has fully cooled due to the unit becomes very hot after operation.
2) Do not use your hands touch the fuser cover glass directly, or make scratches on the glass.

1. Loosen the thumbscrews on the holder plates at the right and left sides. Then take out the fuser unit.
2. Use cotton cloth with alcohol to clean the fuser cover glass. Then use the scraper to scrape off the dirt remained on the fuser cover glass surface. After cleaning, install the fuser unit by reversing the steps then restore all units to their original locations.

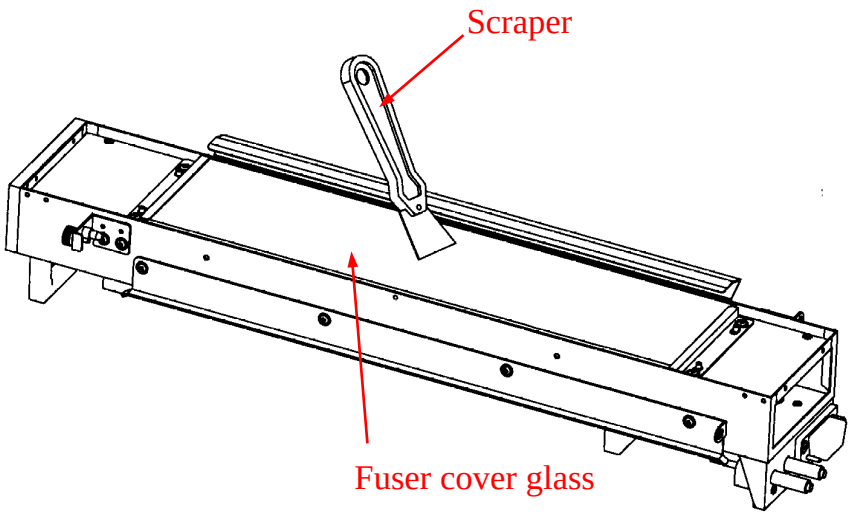


Fig. 4-22

4-2-14 Developing Unit

CAUTION

1) Be careful of not making the developing roller defective.
2) It is recommended to wear a mask and rubber gloves when removing the developer from the developing unit.

1. Take out the developing unit (see **"5-2-5 Developing Unit"**).
2. Use a vacuum cleaner to suck up the toner attached to the toner scatter prevention brush of the developing unit.

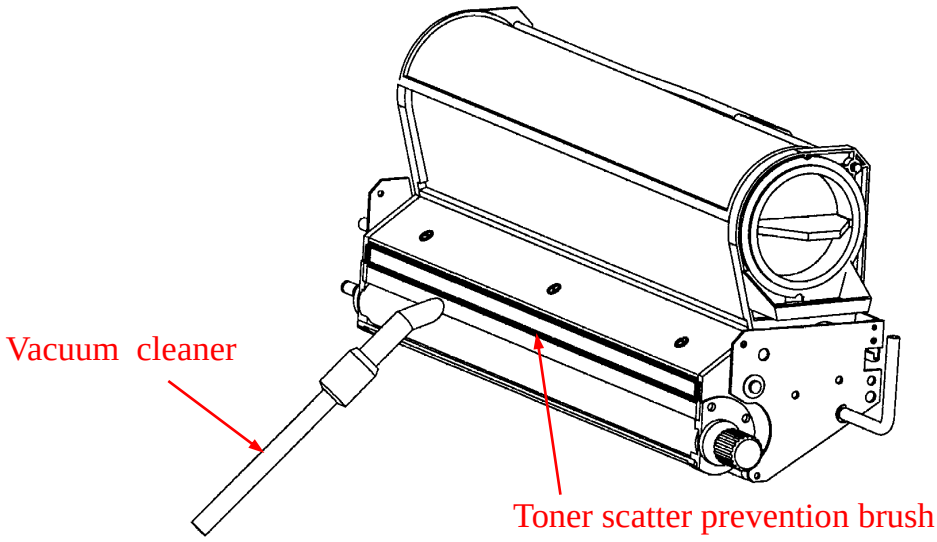


Fig. 4-23

3. Loosen the screws and remove the cover of the developing unit.

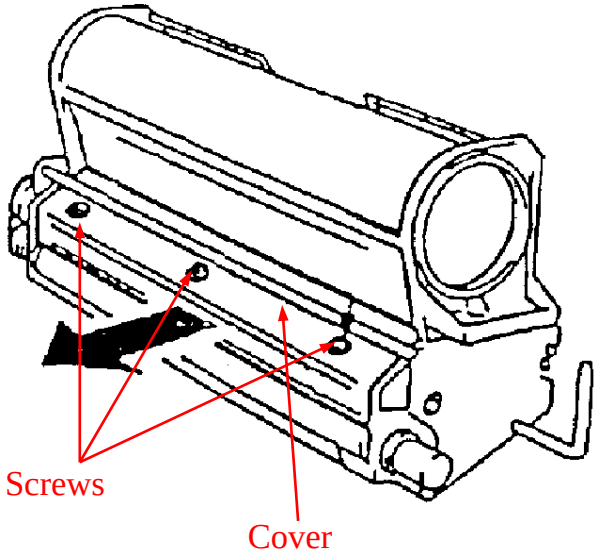


Fig. 4-24

4. Turn the knob to rotate the developing roller, so the doctor blade can catch foreign substance (paper dust, toner lumps, etc.). White stripes will appear on the developing roller.

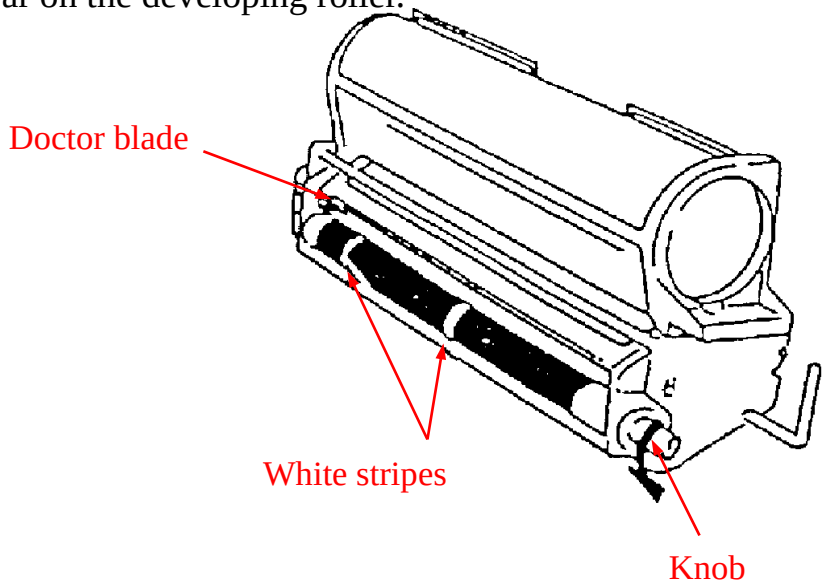


Fig. 4-25

5. Insert a scraper or thin film into the gap between the developing roller and the doctor blade at the position of the white stripes on the developing roller. Pull the scraper or thin film to remove the foreign substance caught inside the doctor blade.

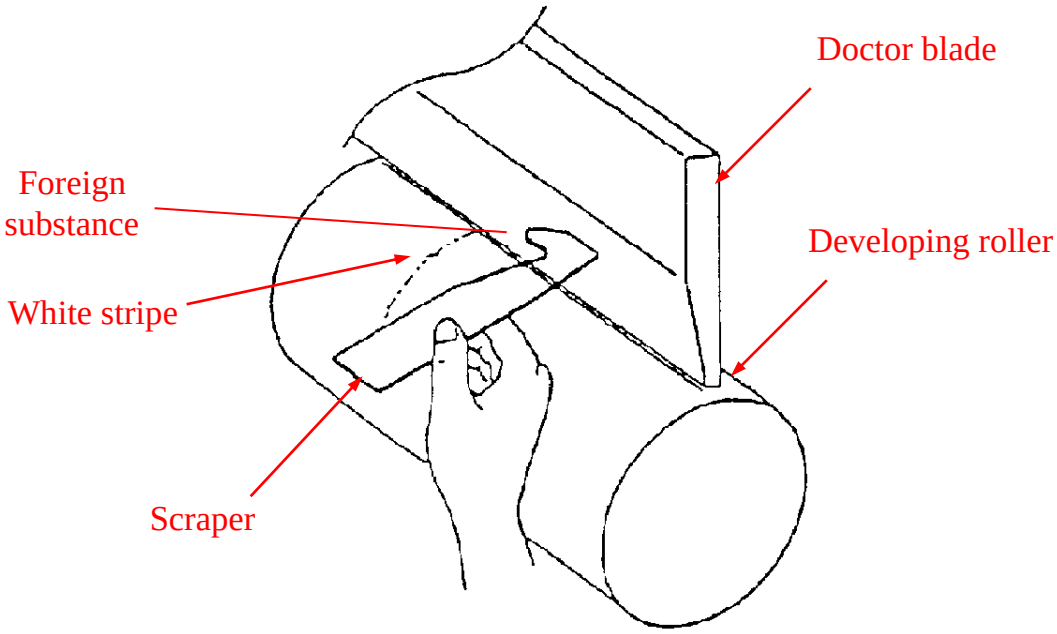


Fig. 4-26

6. Repeat step 4 and step 5 until no more white stripes appear on the developing roller.

Follow step 7 and step 8 to clear the developer inside the developing unit before developer replacement:

7. Use a vacuum cleaner to clear the developer inside the developing unit.
8. While turning the developing roller, use a vacuum cleaner to clear the developer attached to the roller. Then use the vacuum cleaner to clean the entire developing unit.
9. Attach the cover of the developing unit and tighten the screws.

Chapter 5

Parts Replacement

WARNING

1) Except for inspection, adjustment, or maintenance work specified in this manual, do not operate the engine with parts detached.
2) Be careful to unplug the power cord before remove any parts except consumables.

5-1 Cover Overview

WINJET ML2000 Series

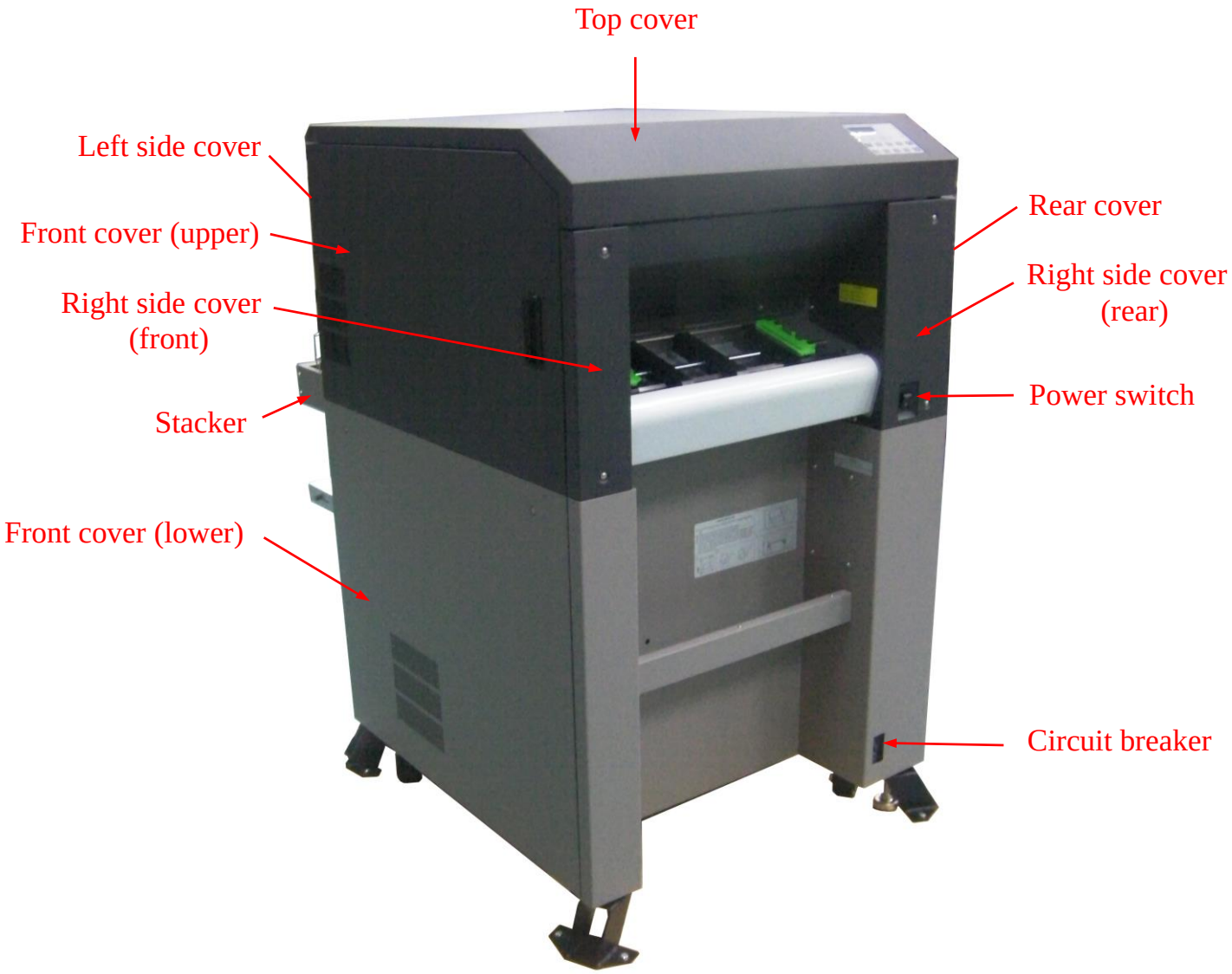


Fig. 5-1

Inside the Front Cover

The units shown in the following figure are installed inside the front cover.

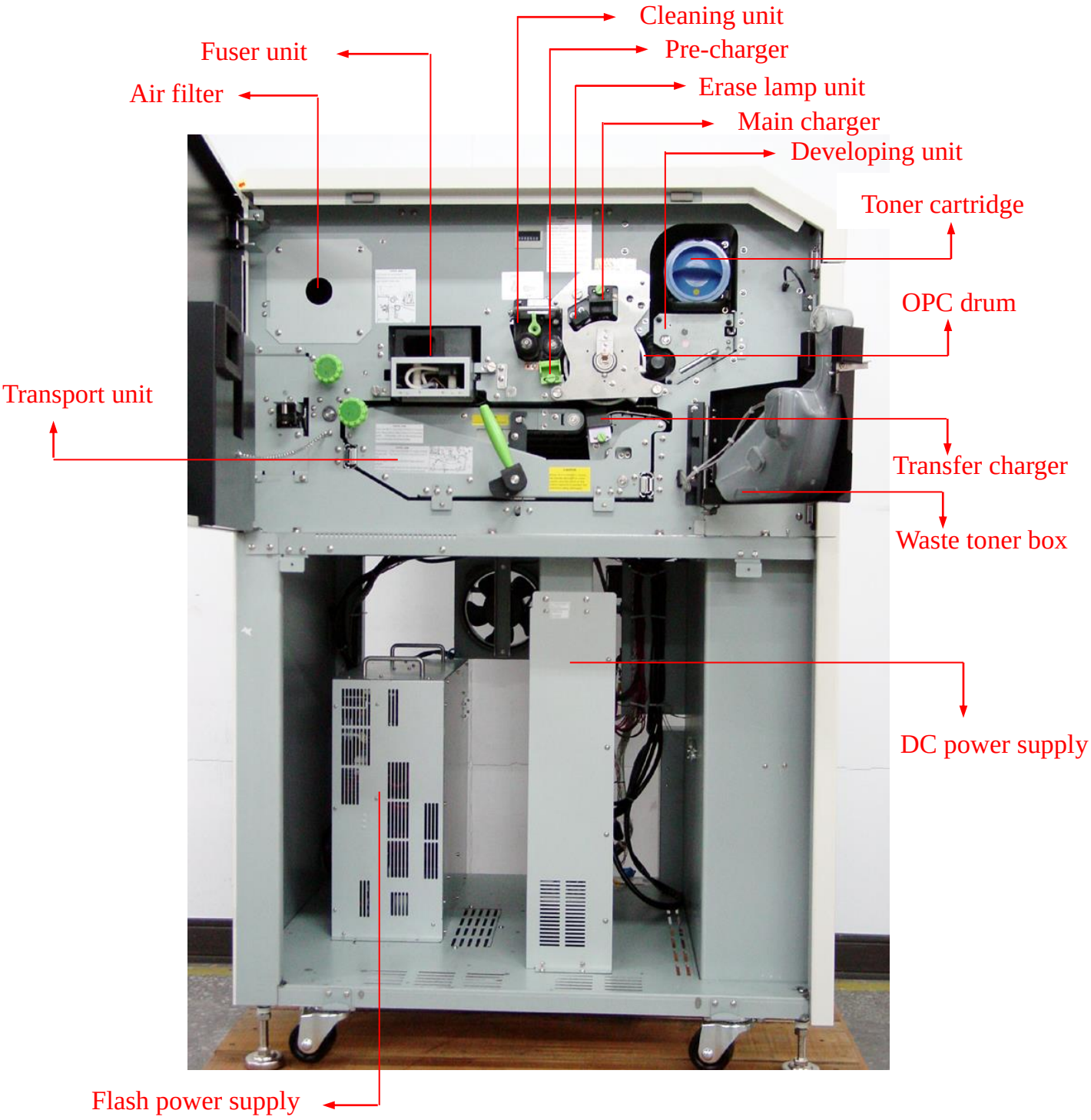


Fig. 5-2

5-1-1 Waste Toner Box Unit

This unit includes a box collecting waste toner conveyed from the cleaning unit. The waste toner full sensor, which detects the full condition of the box, is attached to the right and left sides of the box's neck. The waste toner box set sensor is located on the lower left side of the box, which detects whether the box is set.

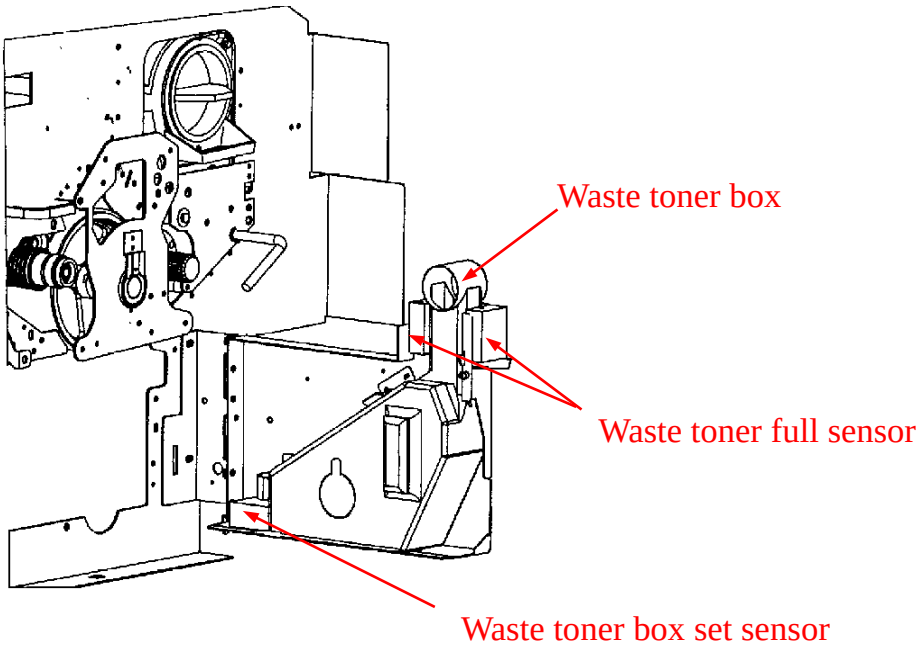


Fig. 5-3

To replace the waste toner box unit, remove the connector and waste toner box (see **"5-2-2 Waste Toner Box"**) firstly. Then release the spring and remove the waste toner box unit by lifting it. Remove sensors (see **"5-2-3 Waste Toner Full Sensor"** and **"5-2-4 Waste Toner Box Set Sensor"**) and then replace with a new waste toner box unit.

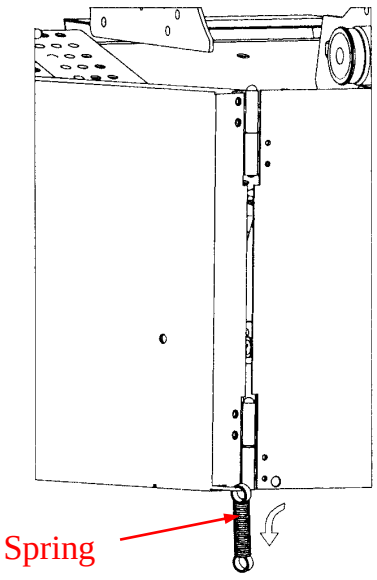


Fig. 5-4

5-1-2 Waste Toner Box

Follow the steps below to replace waste toner box when the box becomes full.

1. Press down the opening lever to open the waste toner box unit.

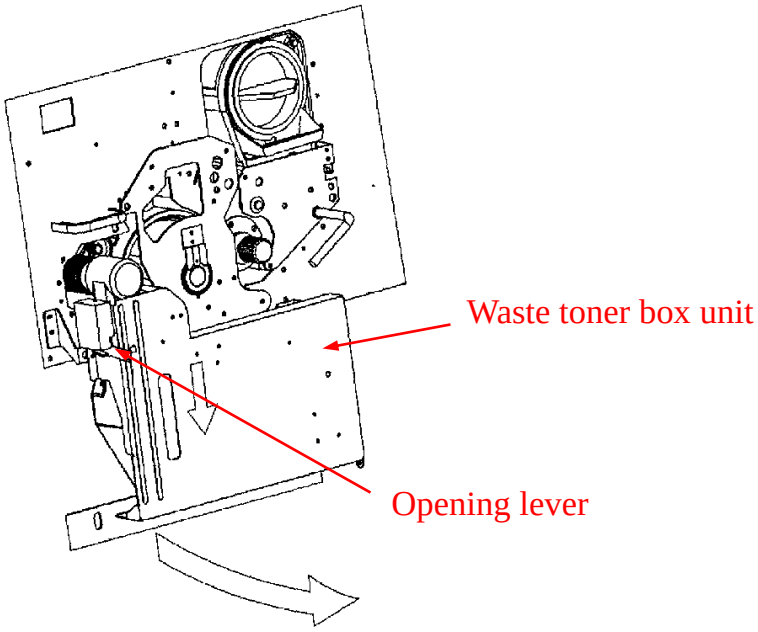


Fig. 5-5

2. Detach the cap from the waste toner box. Then use the cap to seal the waste toner box. Remove the waste toner box.

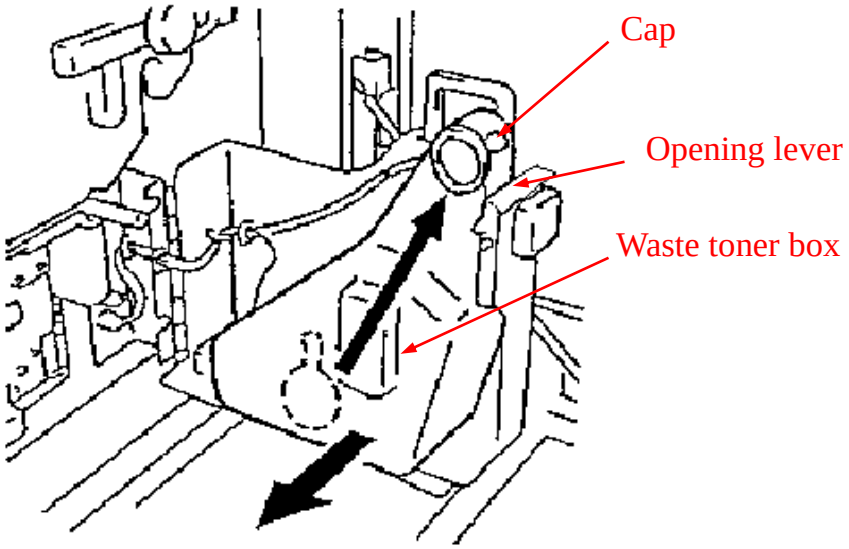


Fig. 5-6

3. Install a new waste toner box.

5-1-3 Waste Toner Full Sensor

1. Take out the waste toner box from the waste toner box unit.
2. Loosen the screws to remove the sensor cover.

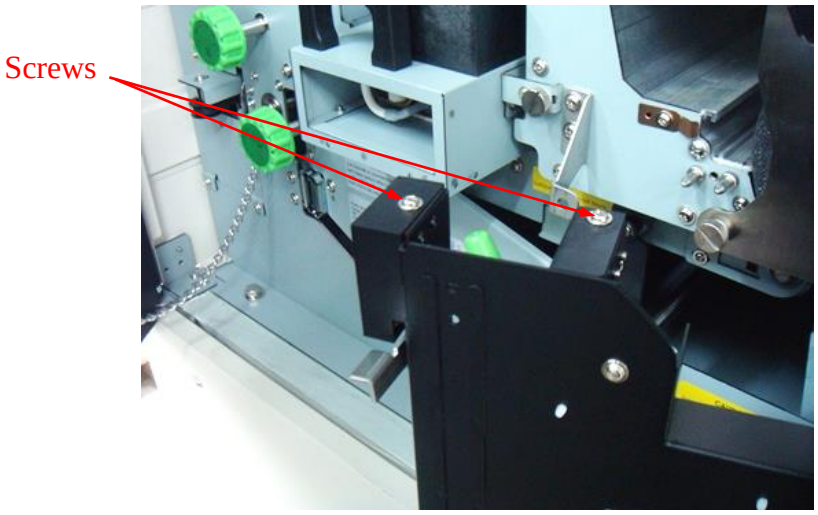


Fig. 5-7

3. Loosen the screws to take out the sensor boards then detach the connectors.

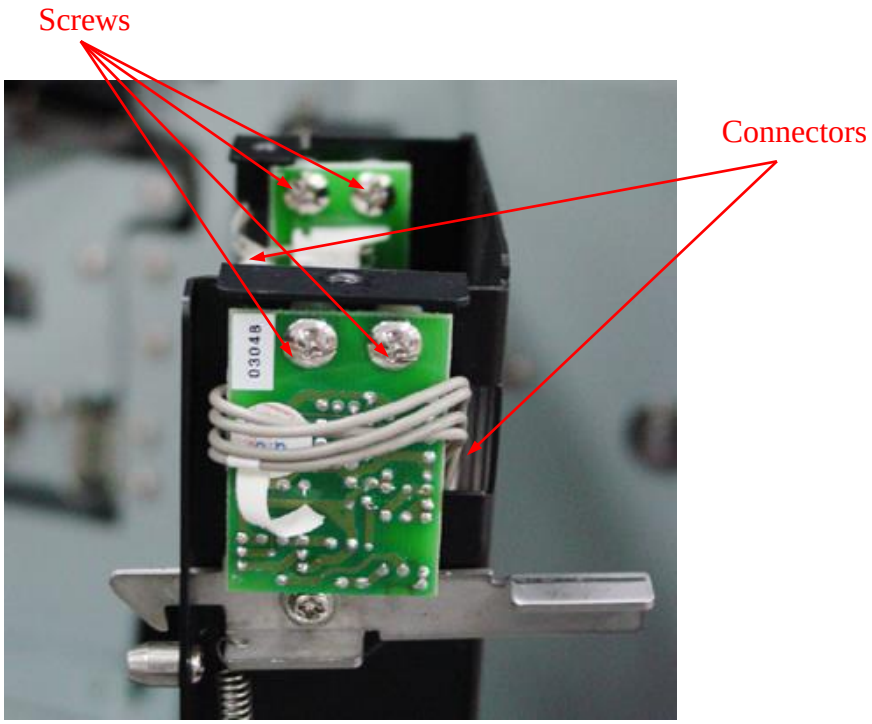


Fig. 5-8

5-1-4 Waste Toner Box Set Sensor

1. Take out the waste toner box from the waste toner box unit.
2. Loosen screws 1 and 2 to detach the sensor bracket. Then remove screws 3 and 4 to take out the sensor.

Fig. 5-9

5-1-5 Developing Unit

1. Turn the lever by 120˚to the right to detach the developing roller from the OPC drum.

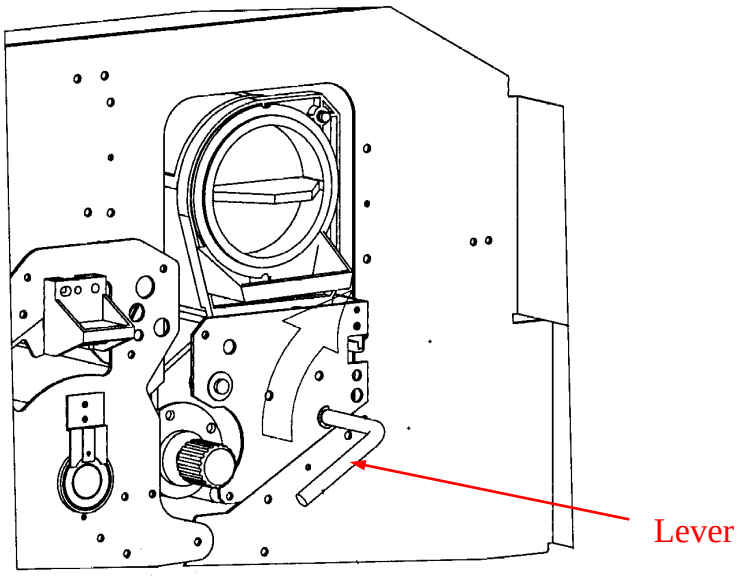


Fig. 5-10

2. Hold the lever with one hand and pull out the unit partially.

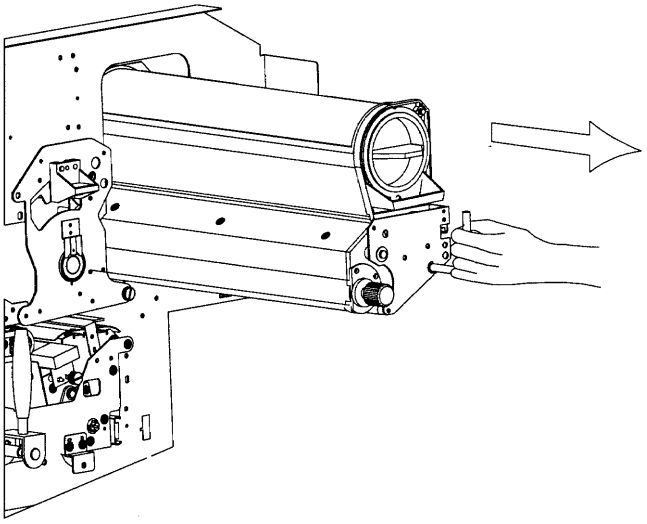


Fig. 5-11

3. Hold the handling bar with another hand and take out the unit from the main body.

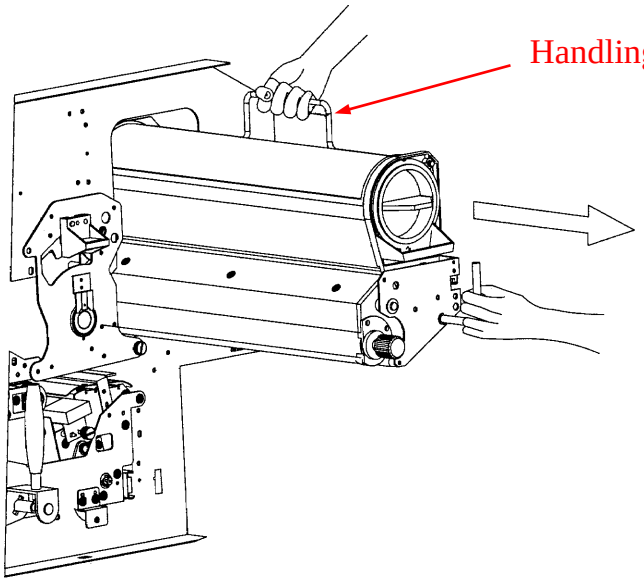


Fig. 5-12

5-1-6 Setting the Developing Unit

1. Insert the developing unit. Align the pinhole on the unit with the positioning pin on the main body.
2. After the developing unit has been inserted all the way in, turn the lever downwards by 120° to the position shown in figure to ensure the developing unit has been set firmly.
3. If the lever could not be turned downwards, turn the developing roller knob and engage it with the gear at the rear and then push in the developing unit firmly.

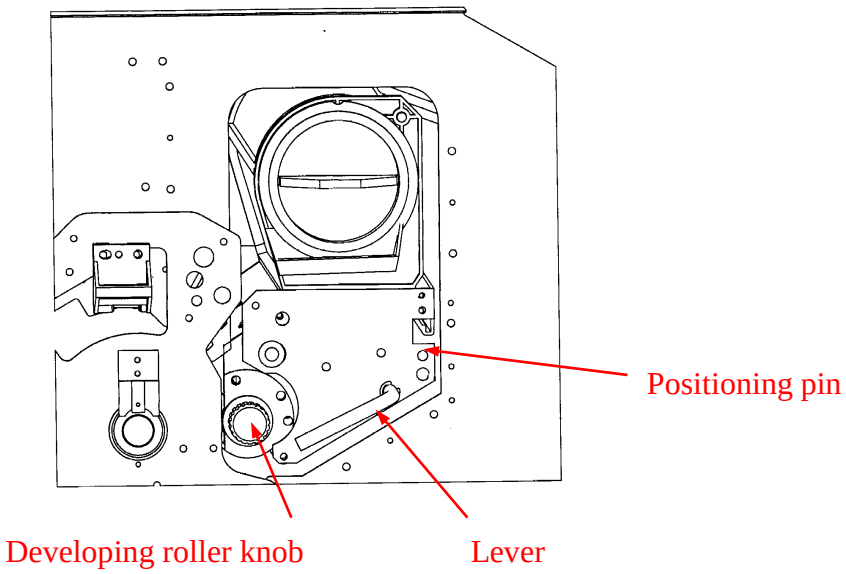


Fig. 5-13

5-1-7 Toner Cartridge

Follow the steps below to replace the toner cartridge, with the developing unit being set, when the toner empty sensor detects the toner empty condition.

1. Rotate the toner cartridge counterclockwise by 180˚ to align the slit of the toner cartridge with the pin of the developing unit. Then pull out the toner cartridge and properly dispose the removed cartridge.

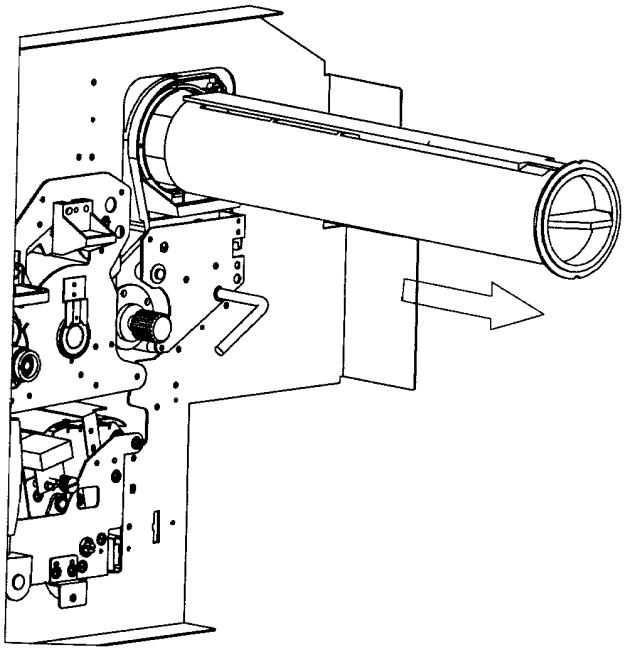


Fig. 5-14

2. Take out a new cartridge from the vinyl bag. With the cover tape facing up, hold the toner cartridge and shake it 4 or 5 times in the direction of the arrows shown in the figure.

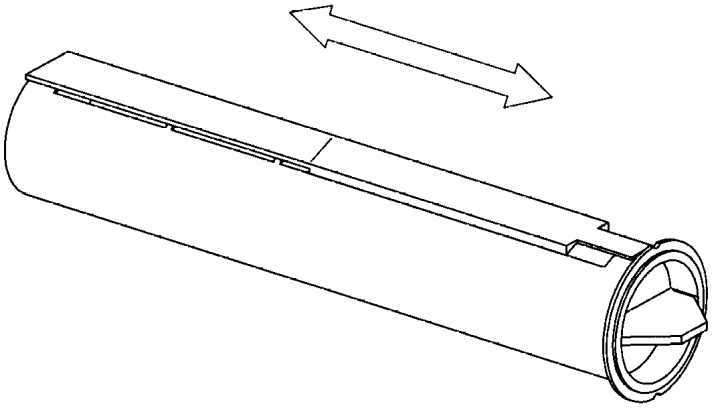


Fig. 5-15

3. With the cover tape facing up, insert the cartridge into the toner hopper and slowly peel off the cover tape from the arrow labeled on the tape.

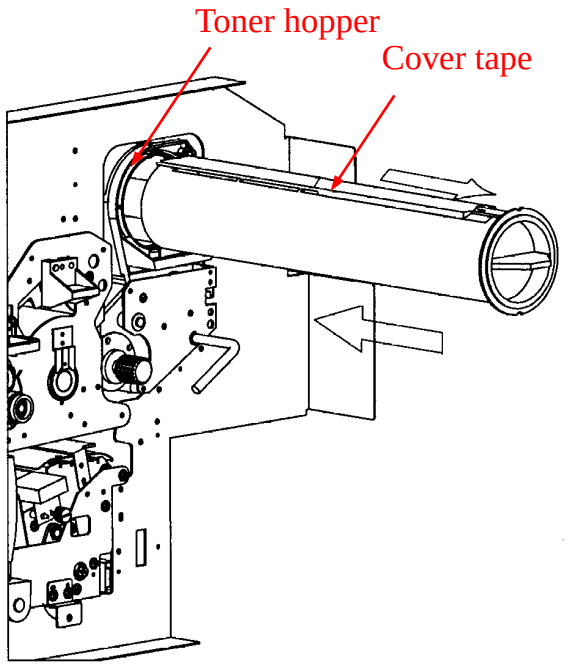


Fig. 5-16

4. After inserting the toner cartridge into the toner hopper, rotate the toner cartridge clockwise by 180° to move the slit of the toner cartridge upward from the position of pin.

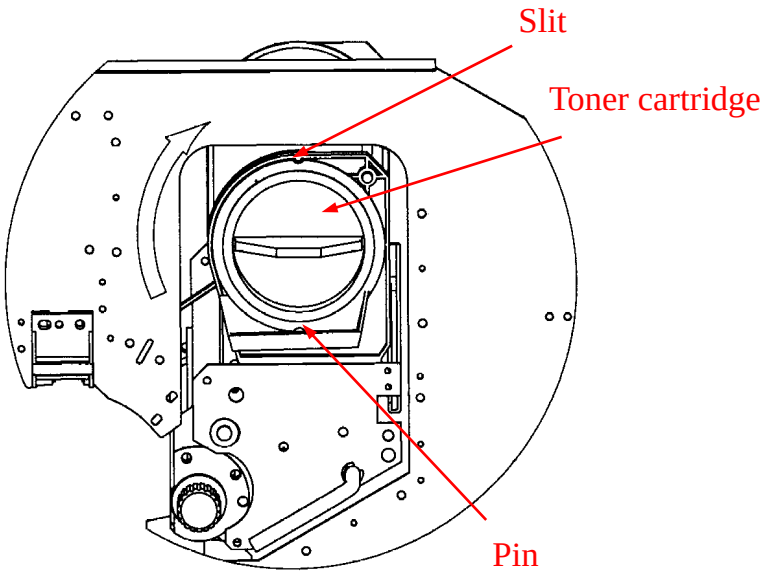


Fig. 5-17

5-1-8 OPC Drum

CAUTION

Be careful of the following points in installing or removing the OPC drum.

1) Make sure the green lock lever of the cleaning unit is turned to the "open" position (horizontally to 3-o'clock direction) before removing or installing OPC drum.
2) Never touch the drum surface.
3) Since the life of the drum will be shortened by exposure to light, be sure to store the drum in the box before and after replacement.
4) To mount the drum, push the drum properly into the inner end, and then turn the drum to align the slits of the drum with the pins of the drum shaft until a click sound is heard.
5) In order to prevent damaging the drum, confirm that the transfer elevator is at the "down" position and that the notch part of the shaft is horizontal.

1. Open the front cover (upper). Then turn the lever of the developing unit by 120° to the right to detach the developing unit.

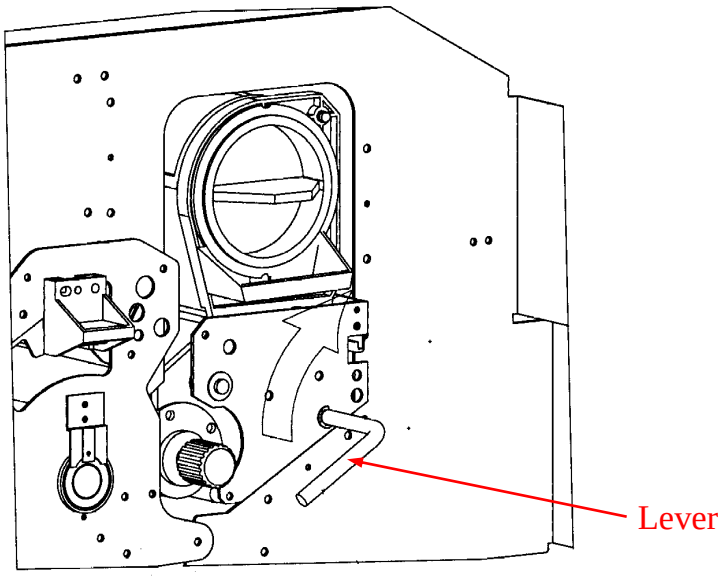


Fig. 5-18

2. Open the waste toner box unit. Confirm that the transfer charger is at the "down" position. If the transfer charger is not at the "down" position, use a slotted screwdriver to turn the transfer elevator drive shaft counterclockwise to lower the transfer charger to the "down" position.

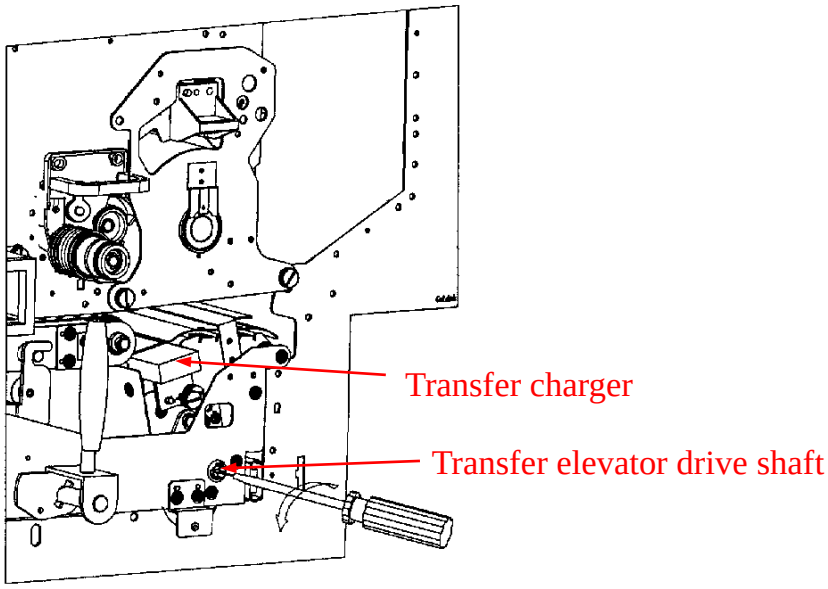


Fig. 5-19

3. Make sure the green lock lever of the cleaning unit is turned to the "open" position (horizontally to 3-o'clock direction). Loosen the 3 thumbscrews and remove the drum plate.

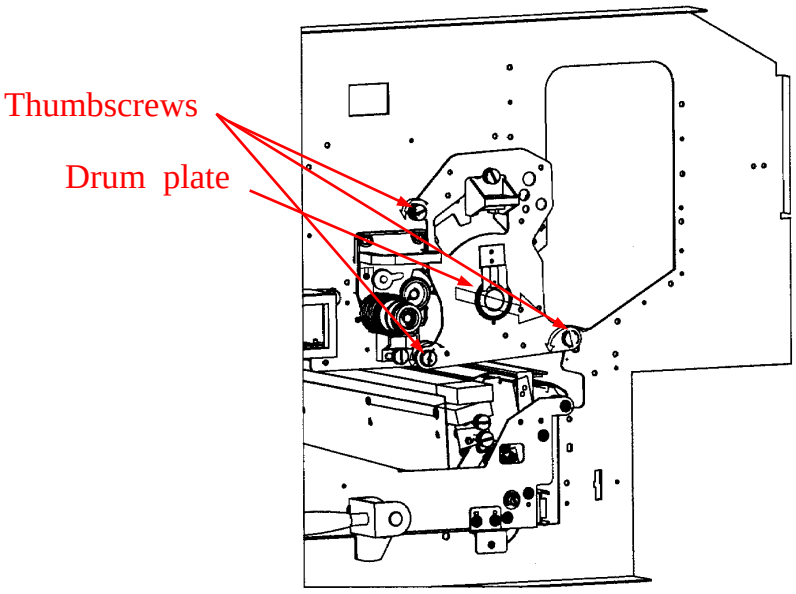


Fig. 5-20

4. Turn the nut and then remove the nut from the drum shaft.

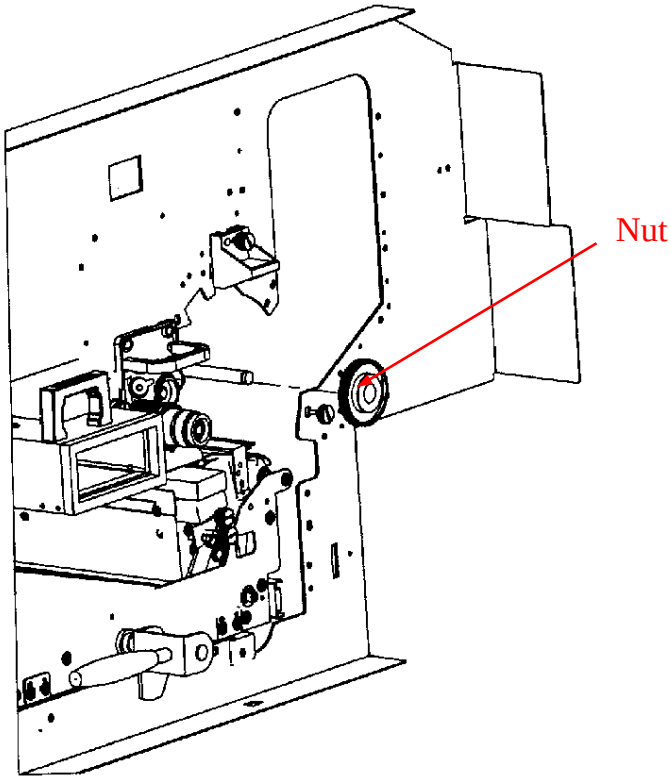


Fig. 5-21

5. Attach the drum support rod to the drum shaft.

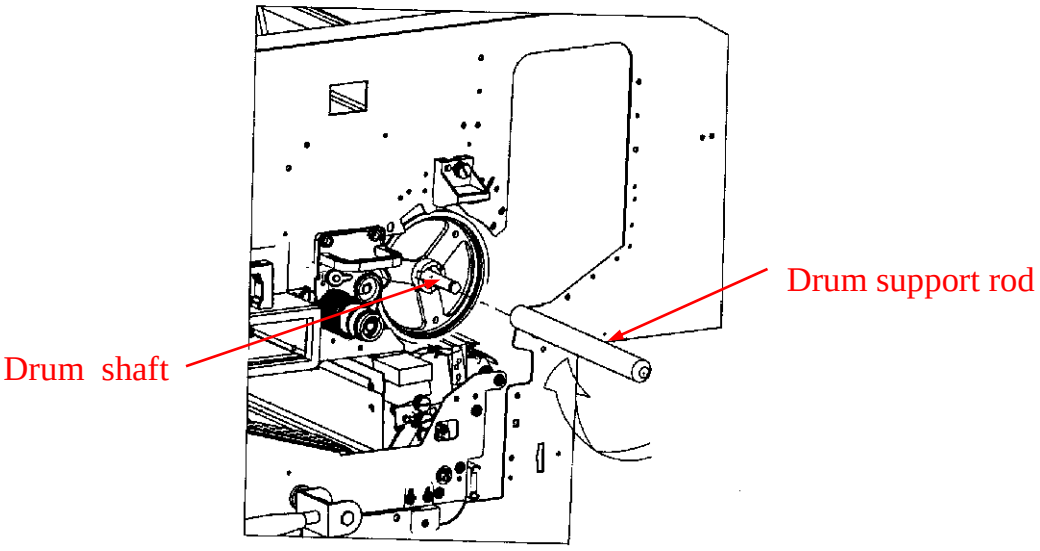


Fig. 5-22

6. Pull out the drum. Make sure to use both hands to hold both sides of the drum when taking out the drum. Do not touch the drum surface by hands.

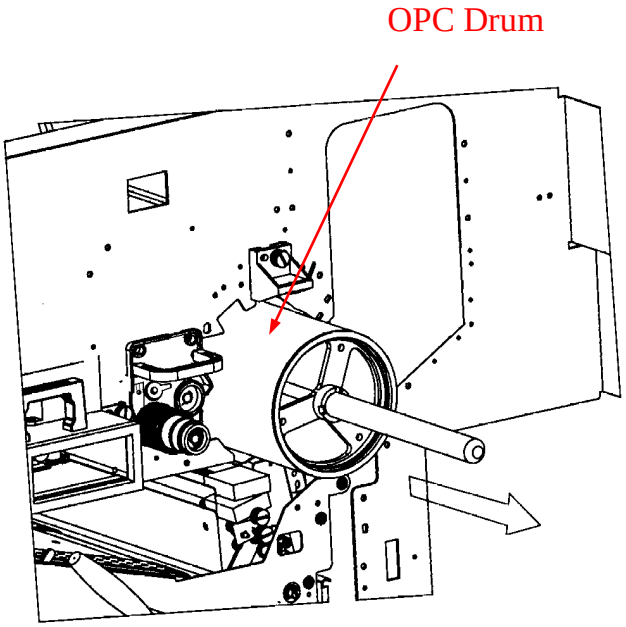


Fig. 5-23

7. Insert the new drum through the shaft and when the drum contacts the inner end, turn the drum to fit the drum securely. Remove the drum support rod and securely tighten the nut. Put the drum plate back and tighten the 3 thumbscrews. Turn the lever of the developing unit by 120° to the left to set the developing unit.
8. Make sure the green lever of the transport unit is set to upward position. Then close the waste toner box unit and close the front cover (upper).
9. Turn the green lock lever of the cleaning unit to the “lock” position (vertically to 12-o’clock direction). Close the front cover (upper).

5-1-9 Units Around OPC Drum

The correct methods of removing the units around OPC drum are as the followings:

1 It's not required to remove the drum plate before taking out the main charger, pre-charger, transfer charger, and erase lamp unit.

2 The drum plate has to be removed before taking out the cleaning unit. The drum plate and the OPC drum have to be removed before taking out the drum support rollers.

3 The developing unit and the OPC drum have to be removed before taking out the LED print head and drum surface potential sensor from the top cover.

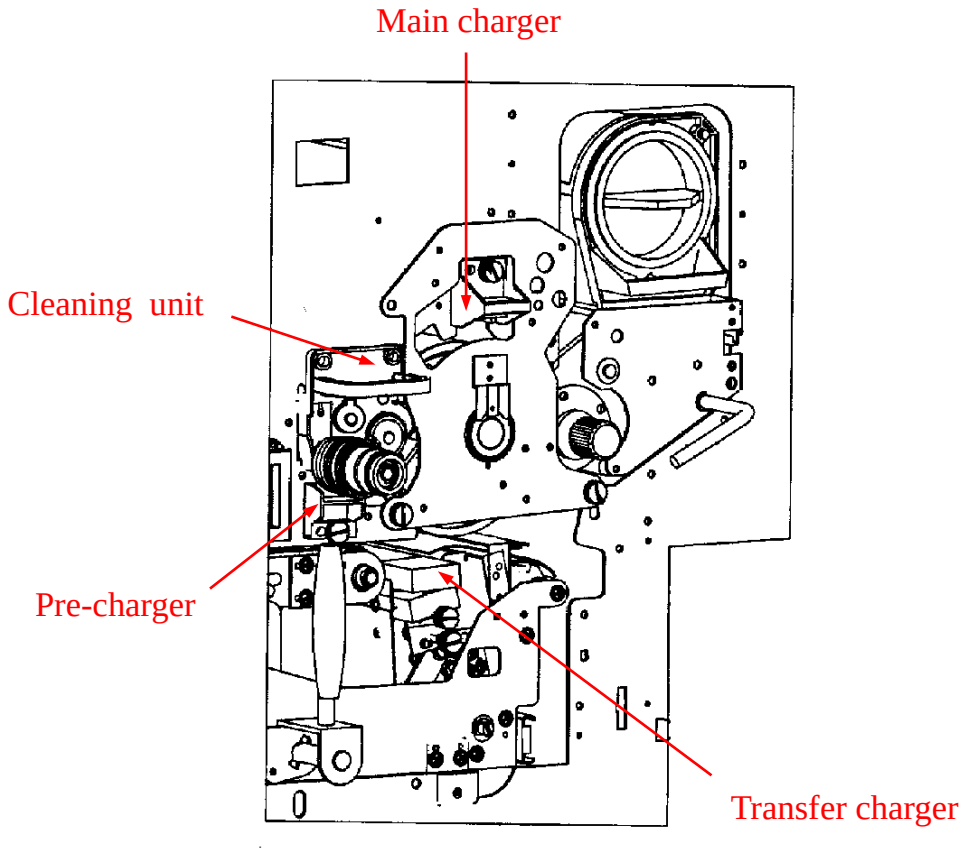


Fig. 5-24

5-1-10 Main Charger, Pre-charger, Transfer Charger

About the removing and setting of these chargers, please see **"4-2-8 Main Charger"** and **"4-2-9 Pre-charger and Transfer Charger"**). Be very careful when handling these chargers since high voltage is applied during printing process, and never touch the charger power supply.

5-1-11 Cleaning Unit

CAUTION

1) Before replace a cleaning unit, make sure the printer is turned on, and the paper is set correctly. Turn the green lock lever of the cleaning unit to the 〝OPEN〞 position (horizontally to 3-o'clock direction) before removing or inserting the unit.
2) Do not move the cleaning unit upside down since the toner may spill.
3) Before installing the new cleaning unit, please remove the red-dot-labeled protective tape on the blade and then lubricate the blade of the new cleaning unit with Talc powder.

1. If the printer is not turned on, turn on the power. The panel screen displays "Warm Up" message. Wait until the green light of the status indicator "Ready" is constantly on.
2. Open the front cover (upper) and the waste toner box unit. Make sure the green lock lever of the cleaning unit is turned to the "open" position (horizontally to 3-o'clock direction). Remove the drum plate, and then remove the cleaning unit by holding the handle and pulling the unit out.

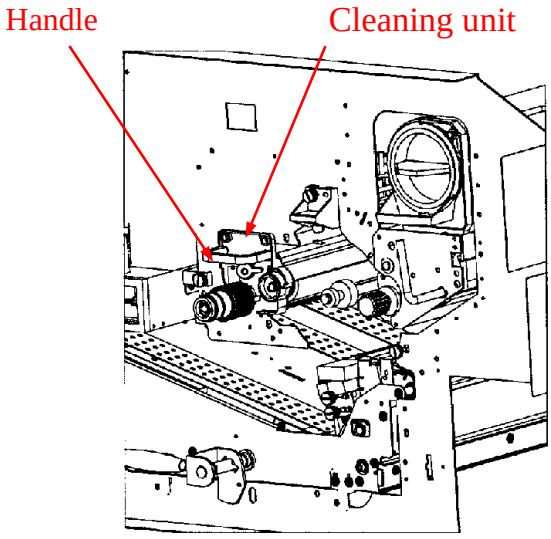


Fig. 5-25

3. Make sure the green lock lever of the new cleaning unit is turned to the "open" position, then insert the new cleaning unit. Put the drum plate back and tighten the 3 thumbscrews. Close the waste toner box unit and close the front cover (upper).
4. Press "On Line" key on the operation panel to clear the message of error code 01 (front cover open). The process of lubricating OPC drum is working for a while. Then the message of error code 24 is displayed.

5. Open the front cover (upper). Then turn the green lock lever of the cleaning unit to the “lock” position (vertically to 12-o’clock direction), then close the front cover (upper).
6. Press “On Line” key on the operation panel to clear the error message. To set the printer in the on-line state, press “On Line” key again.

5-1-12 Drum Support Roller

Drum support rollers are provided to prevent the drum surface from contacting the metal parts in the surrounding areas when removing the OPC drum. The rollers are removed by removing screws fastening the bracket.

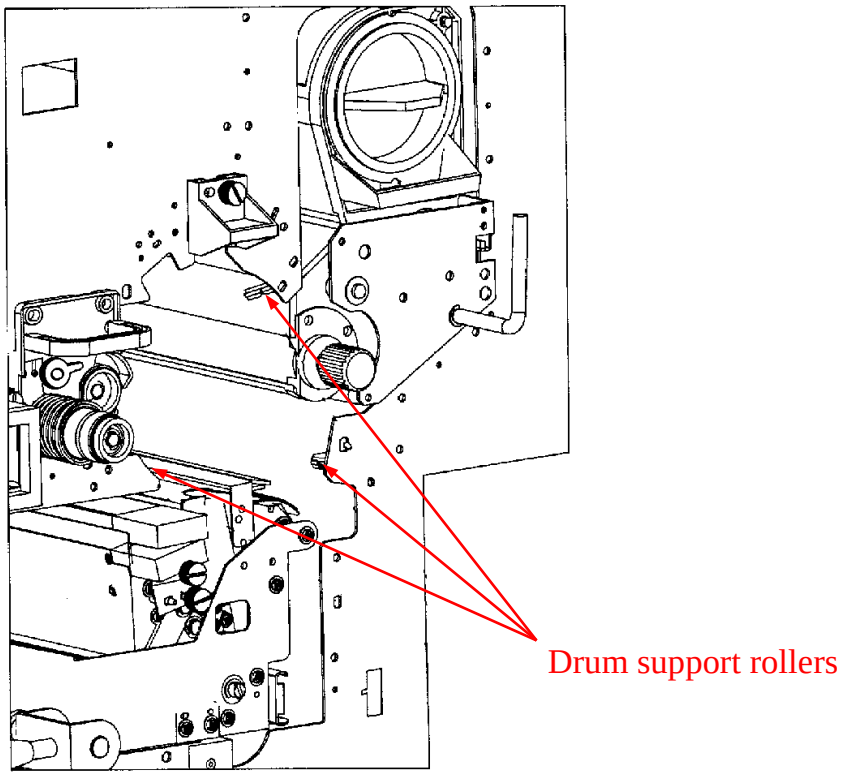


Fig. 5-26

5-1-13 Air Filter

1. Remove the screws at the front cover and then remove the air filter cover.

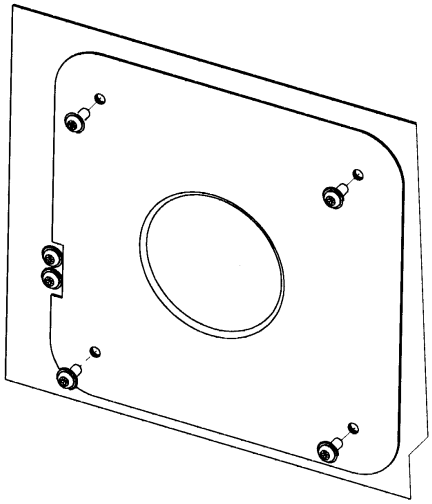


Fig. 5-27

2. Pull the air filter out.

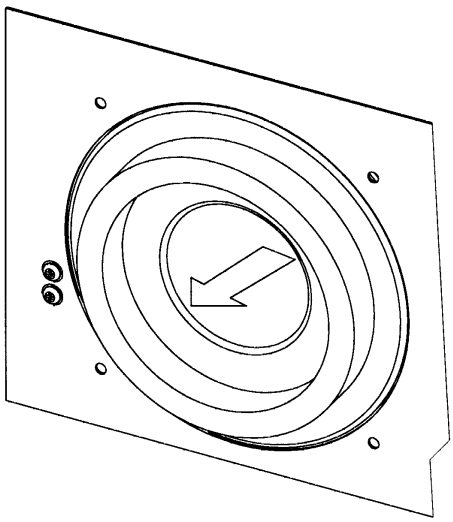


Fig. 5-28

5-1-14 Transport Unit

1. Open the waste toner box unit.
2. Incline the green lever to the left to lower the transport unit and pull out the unit.

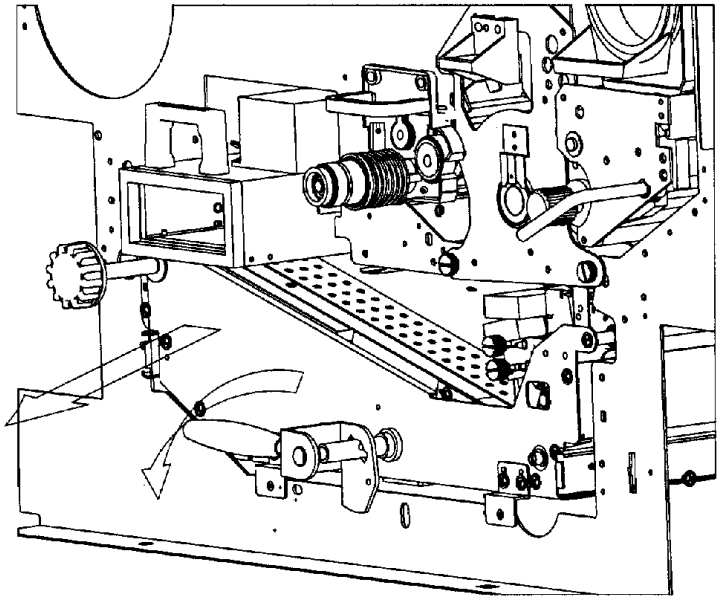


Fig. 5-29

3. Take out the screws fastening the right and left slide rails to the transport unit. Shift the unit so that the rear screws are matched in position with the holes on the rails and can be seen through the holes. Remove the screws at rear.

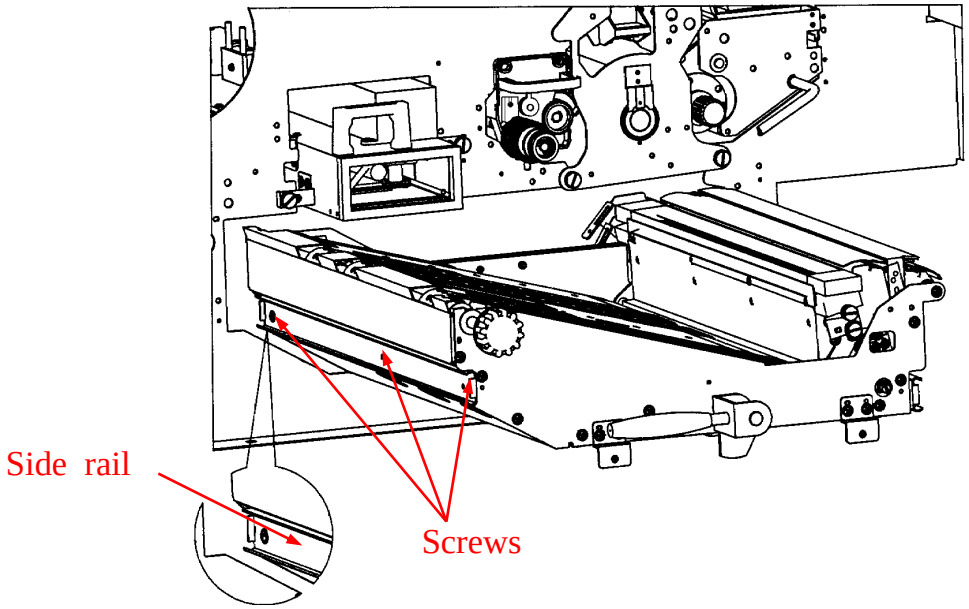


Fig. 5-30

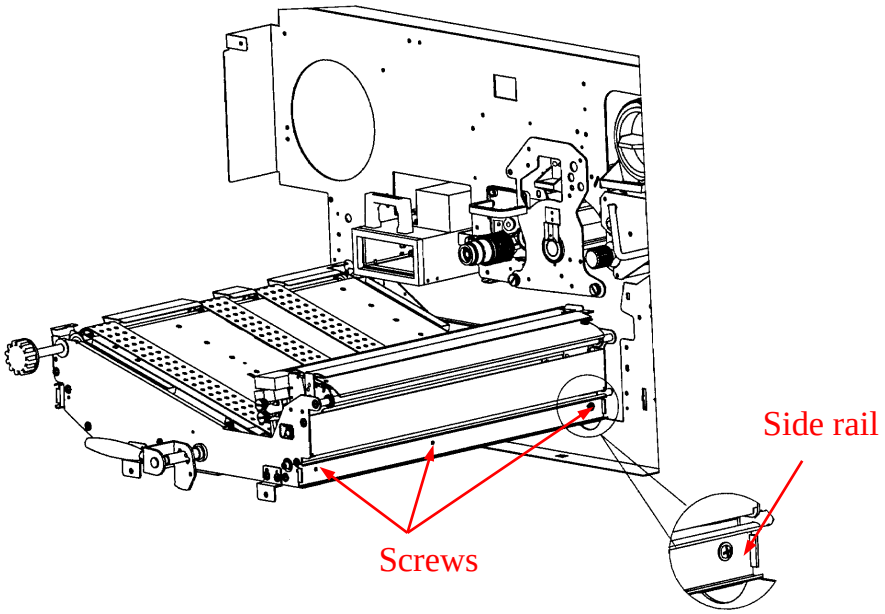


Fig. 5-31

4. Detach the unit by lifting the unit from the rails.

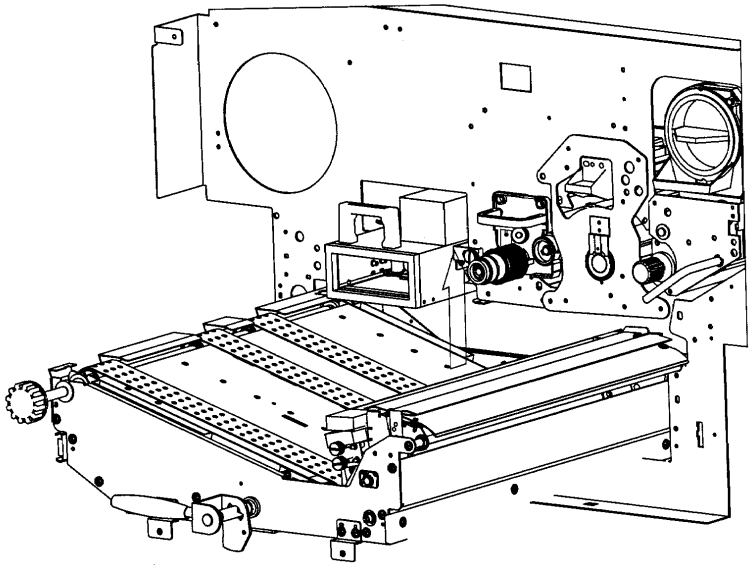


Fig. 5-32

5-1-15 Transport Belt

1. Remove the screws fastening the output guide and detach the output guide.

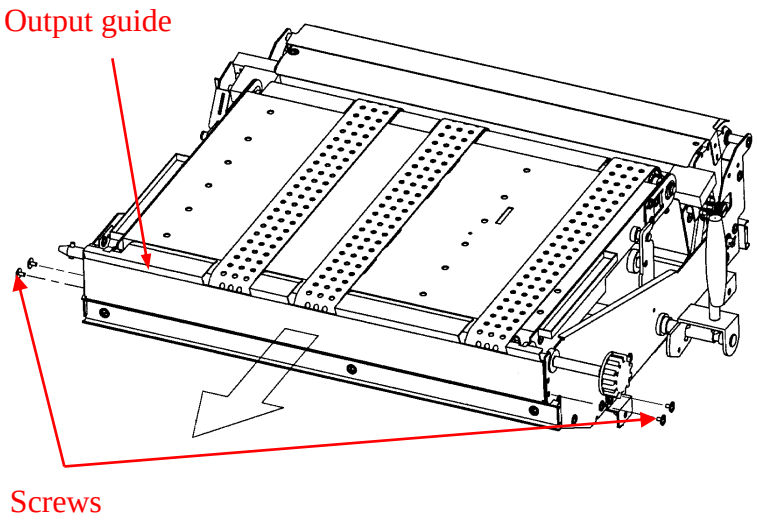


Fig. 5-33

2. Remove the screw and then the stainless plate.

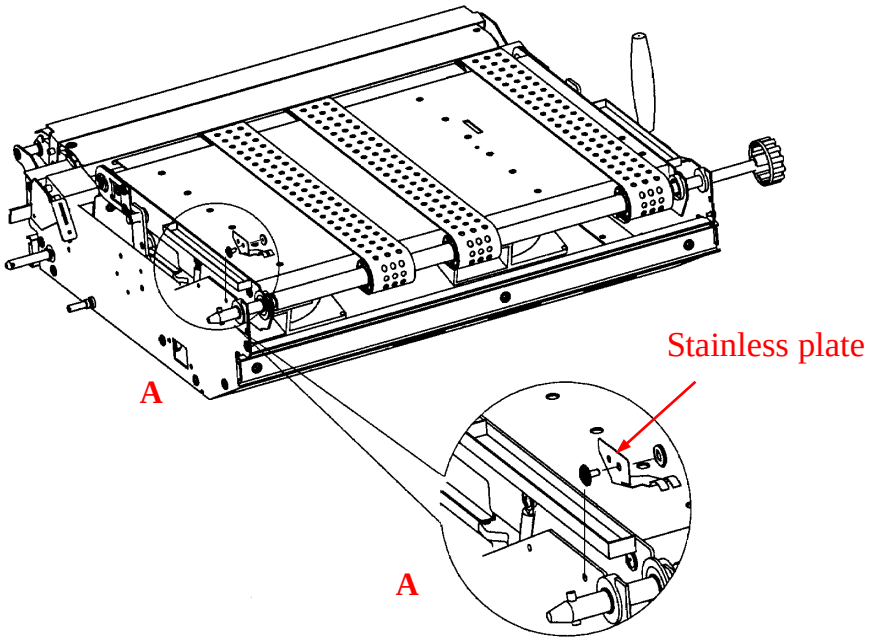


Fig. 5-34

3. Remove the screw, and then remove the E-rings securing the drive shaft to the unit frame and remove the bearing.

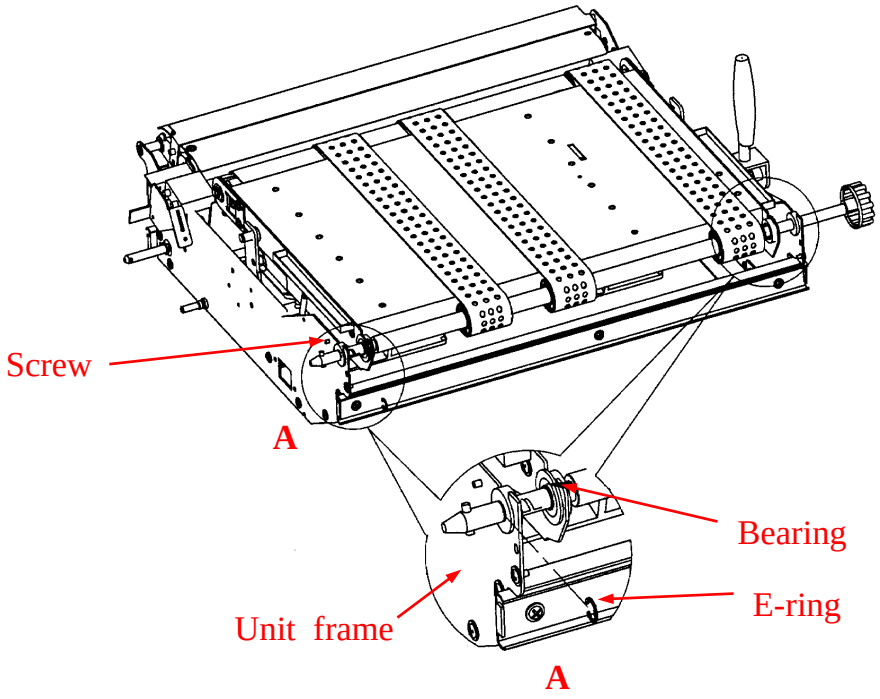


Fig. 5-35

4. Move the transport unit upside down. Remove the suction fan and detach the connectors. Remove the screw fastening the ground wire. Loosen the screws to remove the two metal plates.

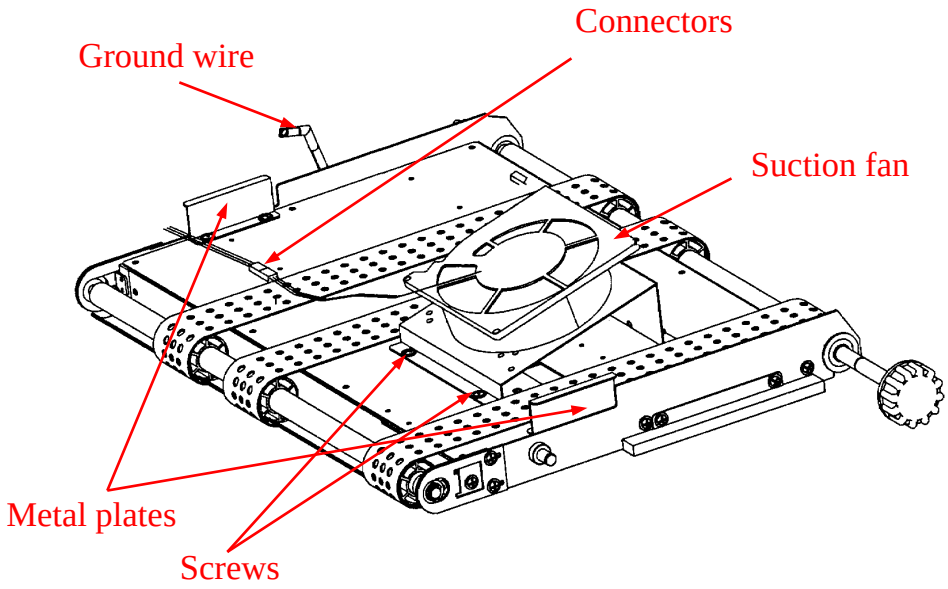


Fig. 5-36

5. Detach the base conveyor from the unit frame.
6. Take out the E-rings holding the drive shaft to the base conveyor. Slide the bearing off the shaft.

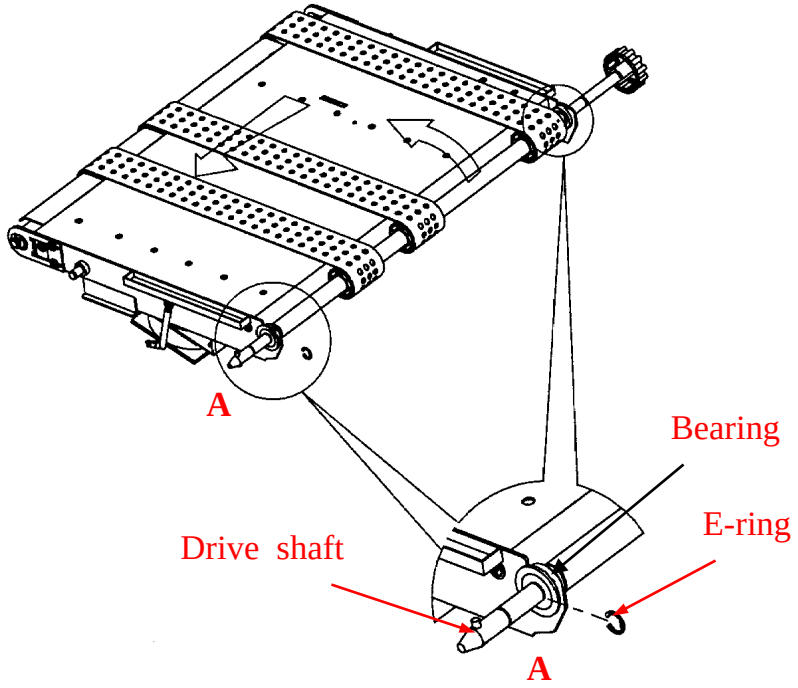


Fig. 5-37

7. Detach the drive shaft from the base conveyor, and take out the transport belts.

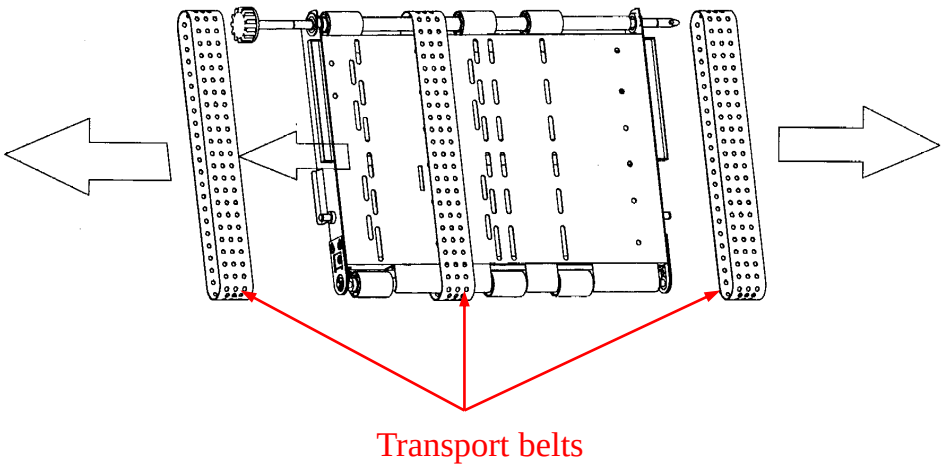


Fig. 5-38

8. Be aware of the distinction between the new belt's front side and the backside when replacing the transport belt. The surface of the front side is smooth, while the surface of the backside is rough.

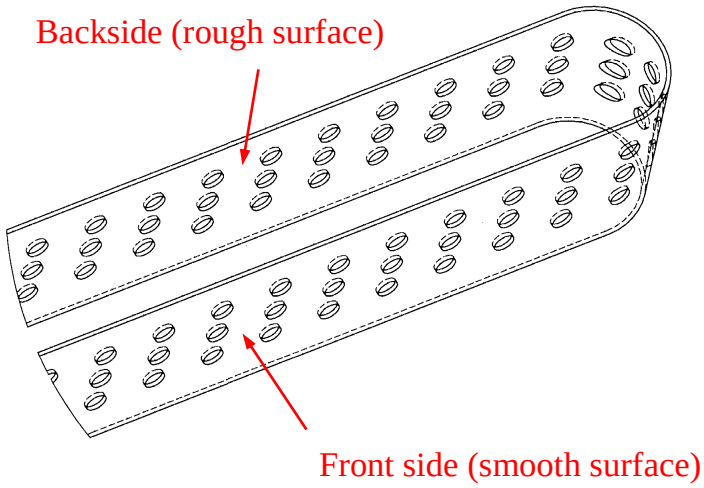


Fig. 5-39

9. Install the new transport belts to the transport unit by reversing from step 7 to step 1, but do not attach the connectors, ground wires and the two metal plates in step 4.
10. Loosen the screws fastening the base conveyor. Then use a hexagonal wrench to adjust the tension of the belt by turning the setscrew.

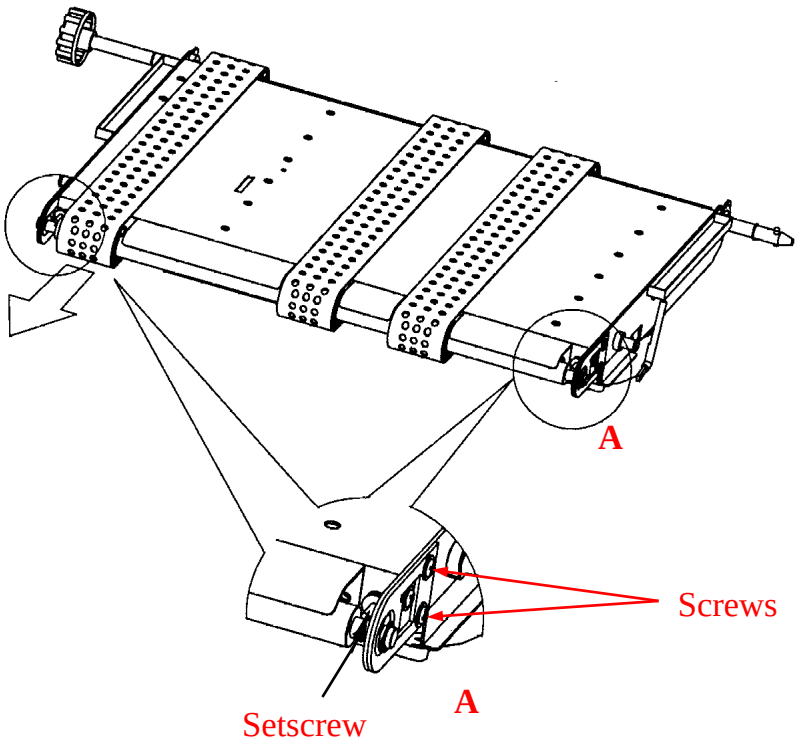


Fig. 5-40

11. Adjust the height of the belt so that when a force of 350 +/- 30g pulls the belt center, it is lifted by 1.5 cm over the conveyor base. Tighten the screws (described in step 10) firmly to secure the adjustment. Attach the connectors, ground wires and the two metal plates.

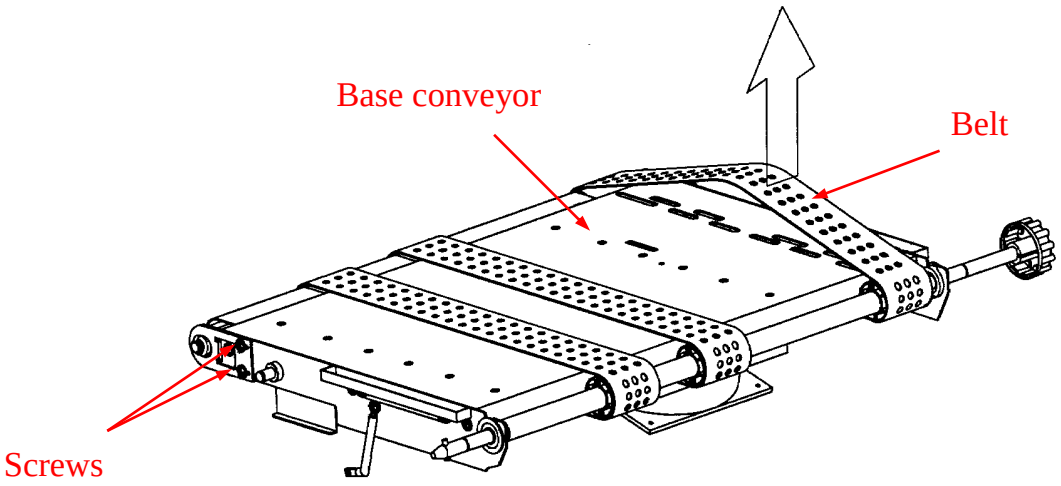


Fig. 5-41

5-1-16 Sensor PTPS

1. Open the waste toner box unit.
2. Incline the green lever to the left to lower the transport unit and pull out the unit.
3. Under the transport unit, loosen the screws fastening the sensor PTPS bracket.

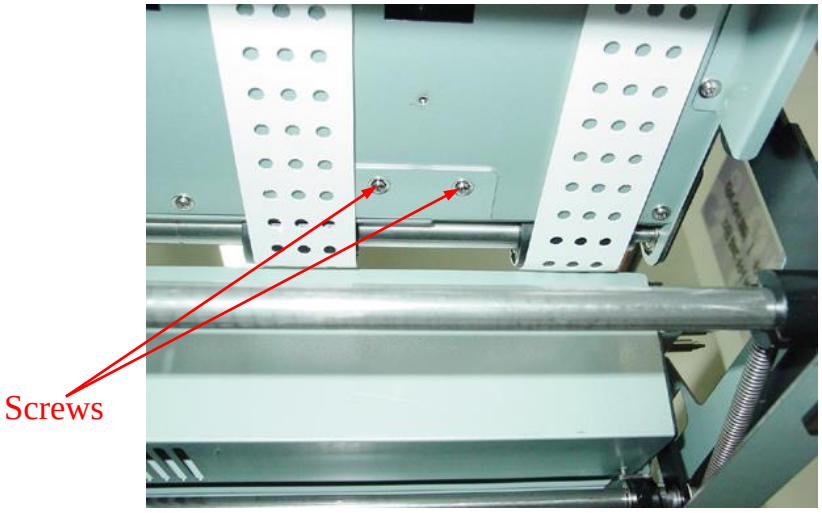


Fig. 5-42

4. Pull out the sensor bracket. Detach the connector, and loosen the screw to remove the sensor PTPS.

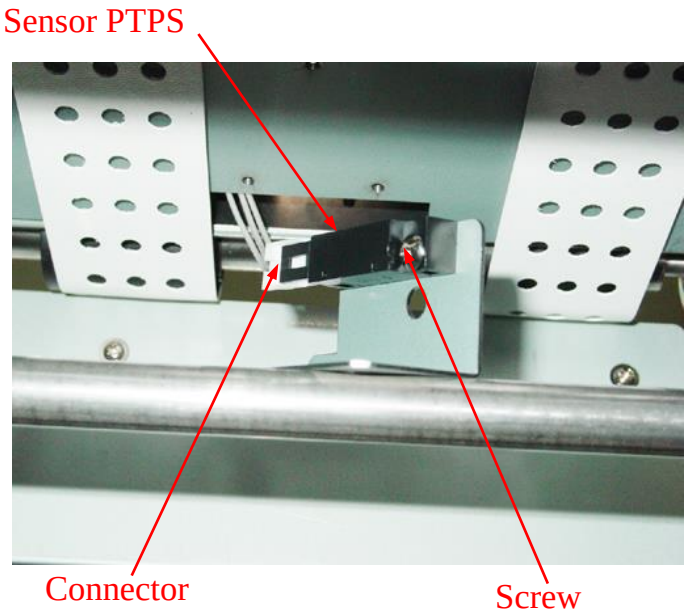


Fig. 5-43

5-1-17 Fuser Unit

The fuser unit contains replaceable parts: such as Xenon lamp, fuse set, fuser cover glass, Xenon lamp trigger coil unit, and HV connector for fuser unit. Make sure to make room below the fuser unit by turning the green lever to the left to lower the transport surface. Loosen the thumbscrews on the holder plates at the right and left sides then pull out the fuser unit.

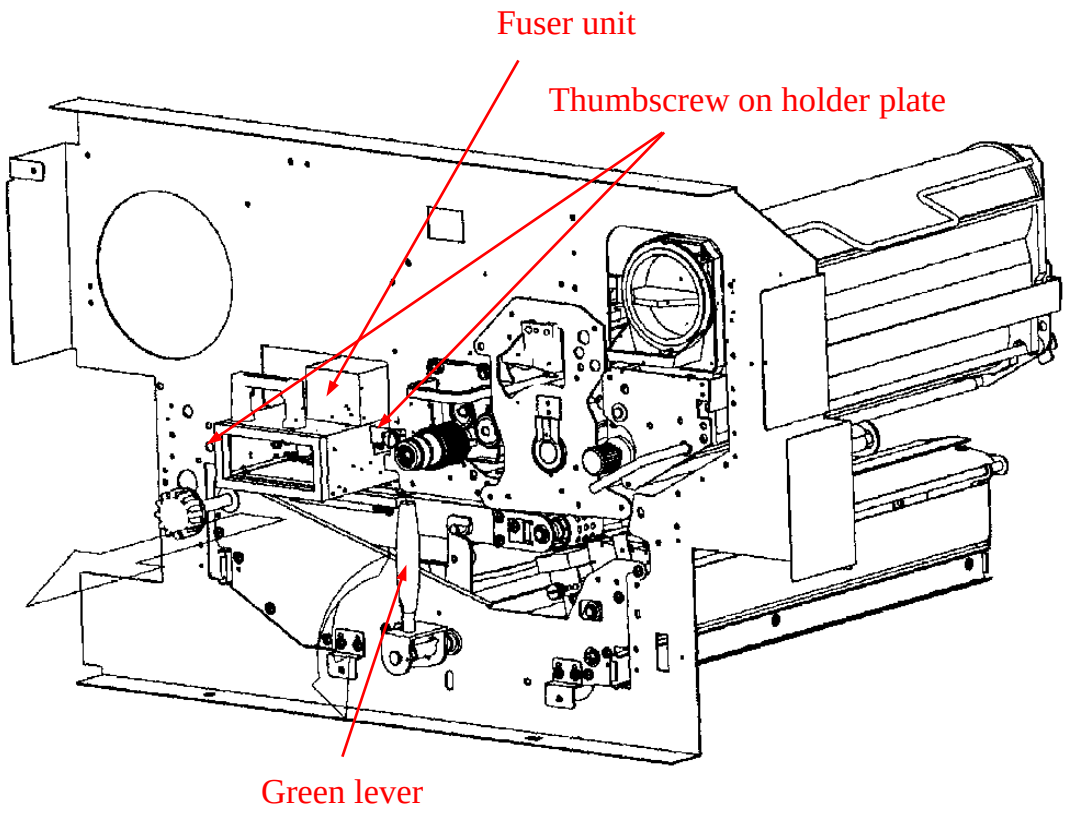


Fig. 5-44

WARNING

Since the fuser unit reaches high temperatures (141℃) after operation, be careful when handling the fuser unit. Do not use your hands to touch the fuser cover glass.

5-1-18 Xenon lamp

1. After removing the fuser unit from the main body, set the unit with the fuser cover glass facing up.

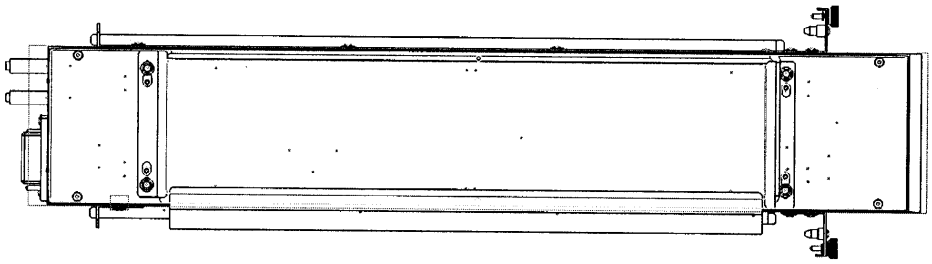


Fig. 5-45

2. Loosen the screws fastening the paper guide on the entrance side of the unit. Then remove the paper guide.

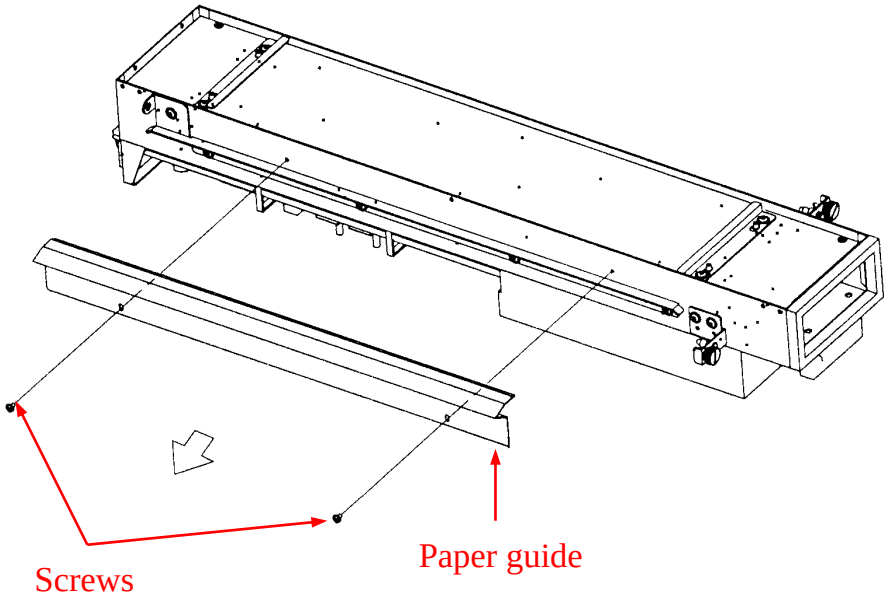


Fig. 5-46

3. Loosen the screws fastening the glass frame to the fuser box. Then detach the glass frame.

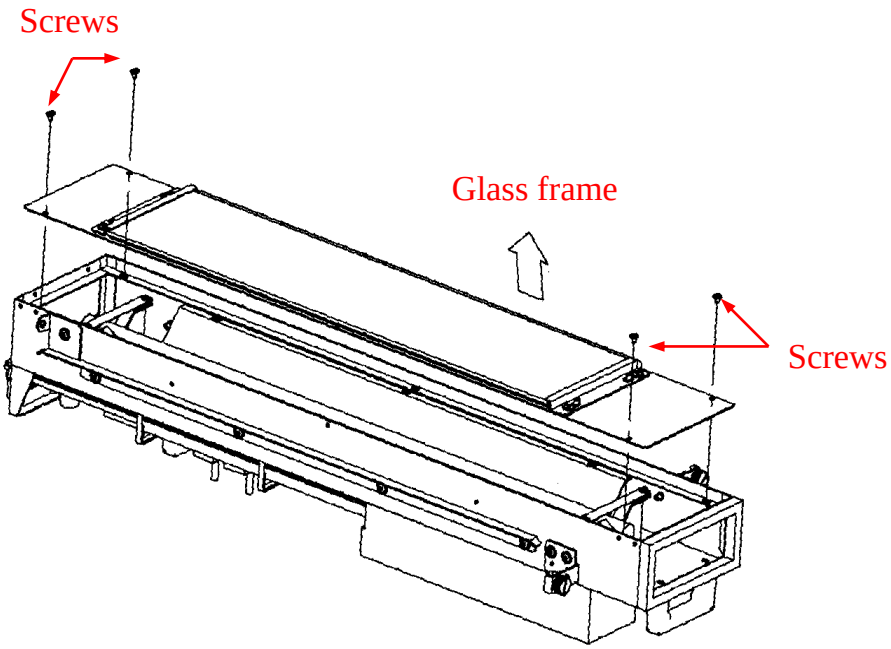


Fig. 5-47

4. Loosen the screws fastening the Xenon lamp terminals

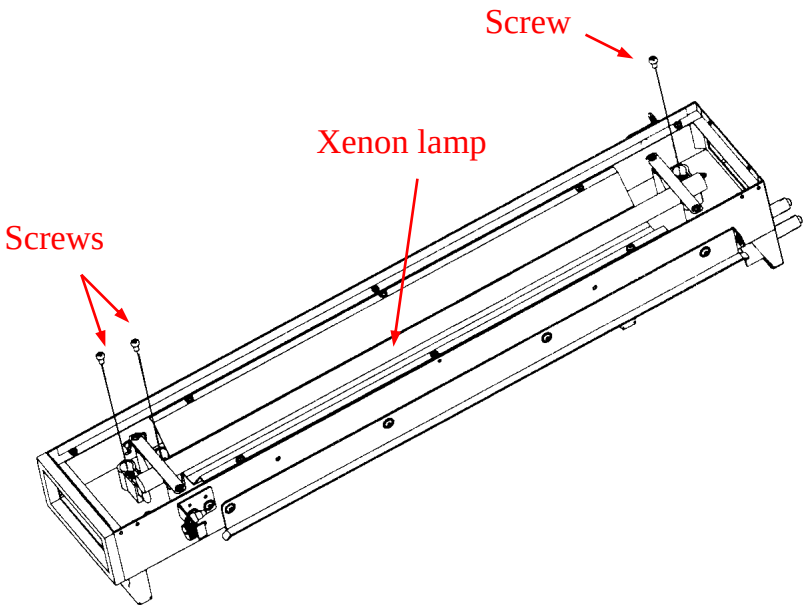


Fig. 5-48

5. Remove the screw from the front bracket and the rear bracket. Then remove the lamp.

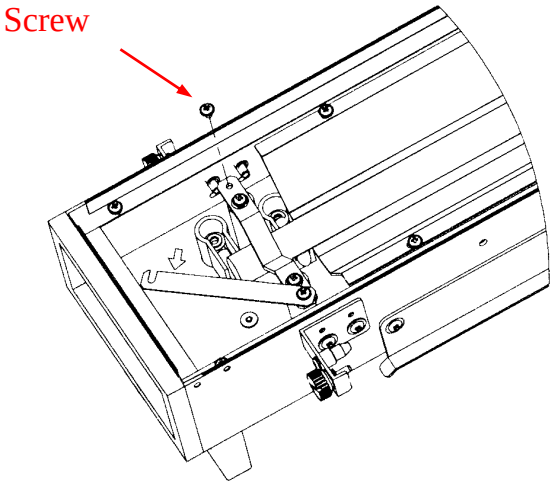


Fig. 5-49

5-1-19 Fuse Set

1. Move the fuser unit upside down. Remove the screw fastening the fuse set to the fuser unit.

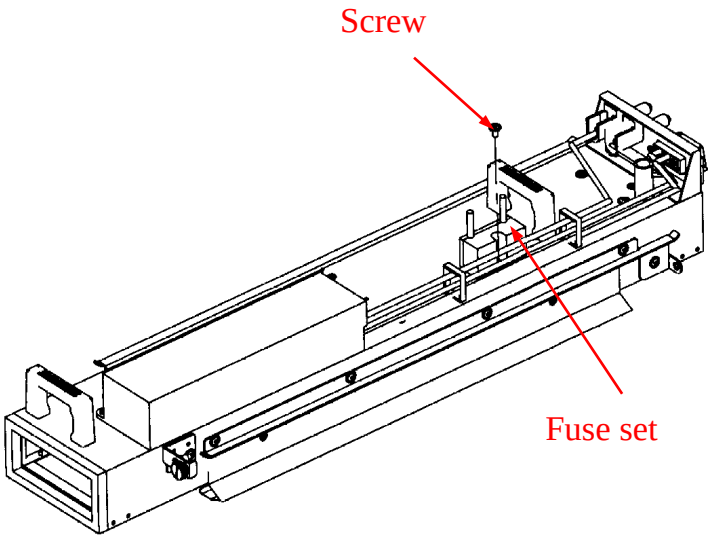


Fig. 5-50

2. Remove the screw fastening the fuse set cover.

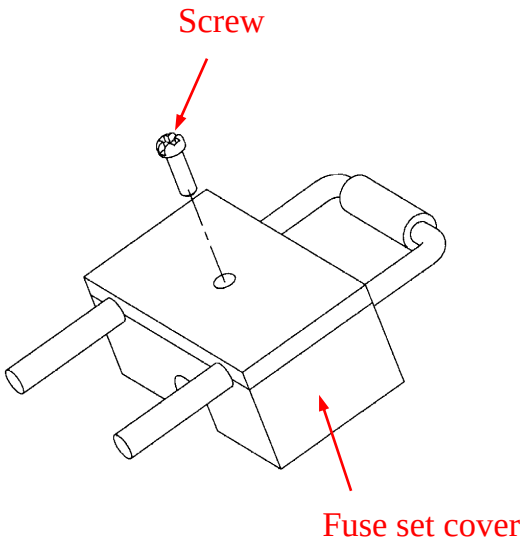


Fig. 5-51

3. Open the cover. Loosen the screws and detach the fuse set.

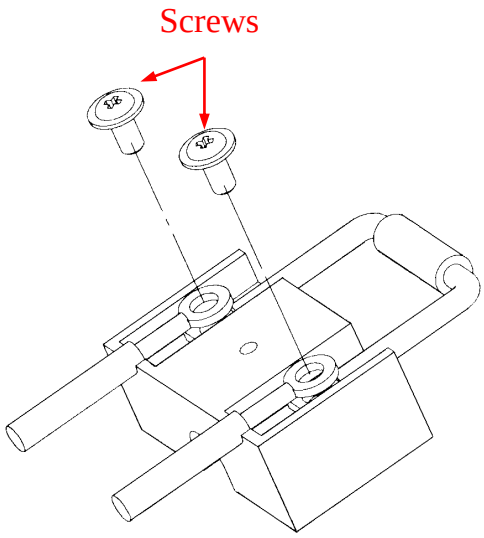


Fig. 5-52

5-1-20 DC Power Supply

1. Remove the front cover (lower) and the rear cover.
2. Remove the connectors and screws from the rear side of the DC power supply.
3. Remove the screws from the front side, and then take out the DC power supply from the front side.

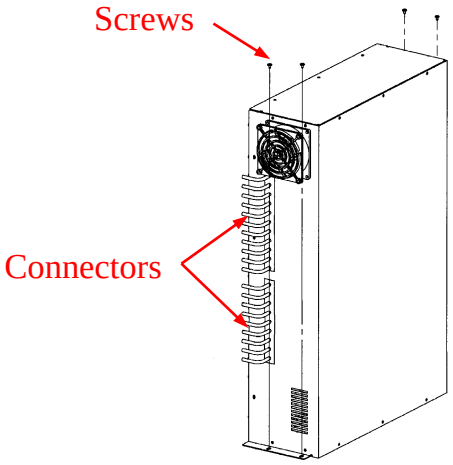


Fig. 5-53

5-1-21 Flash Power Supply Unit

WARNING

Wait at least 5 minutes after the main power (220V) is turned off. It is dangerous to handle the power supply unit directly after turning off the main power.

1. Remove the front cover (lower) and the rear cover before the following steps.
2. Turn “off” the power switch, and turn “off” the breaker and unplug main power cord. Wait until the charge LED indicators (green light) are out.

Fig. 5-54

3. Detach the connectors of J11 and TRIG. Remove the screws to detach the wires connected to FV and AC IN terminal.
4. Remove the screw that fastens the ground wire to main body.
5. Remove the screws fastening the flash power supply. Then pull out the flash power supply.

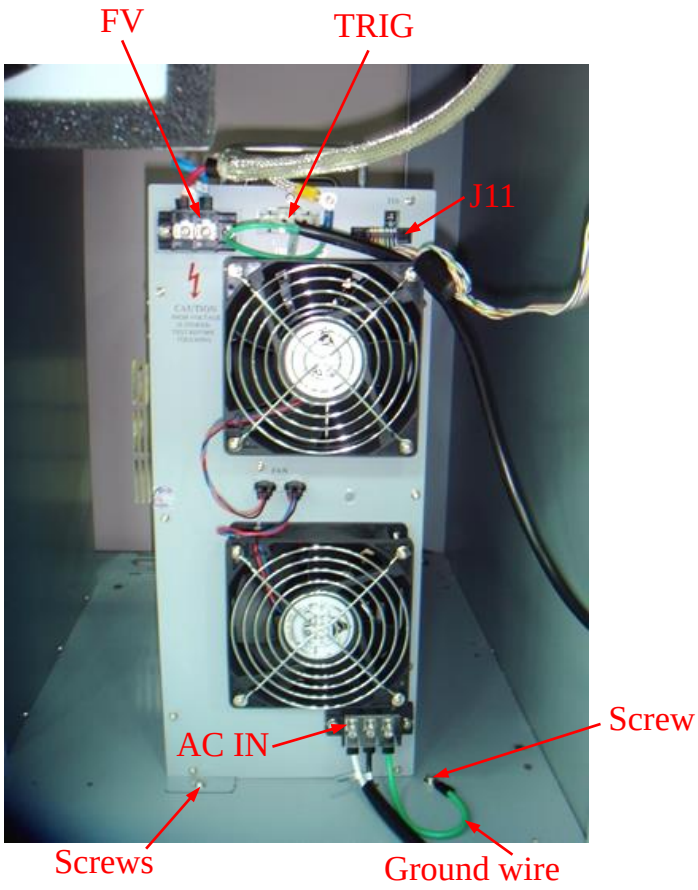


Fig. 5-55

5-2 Inside the Rear Cover

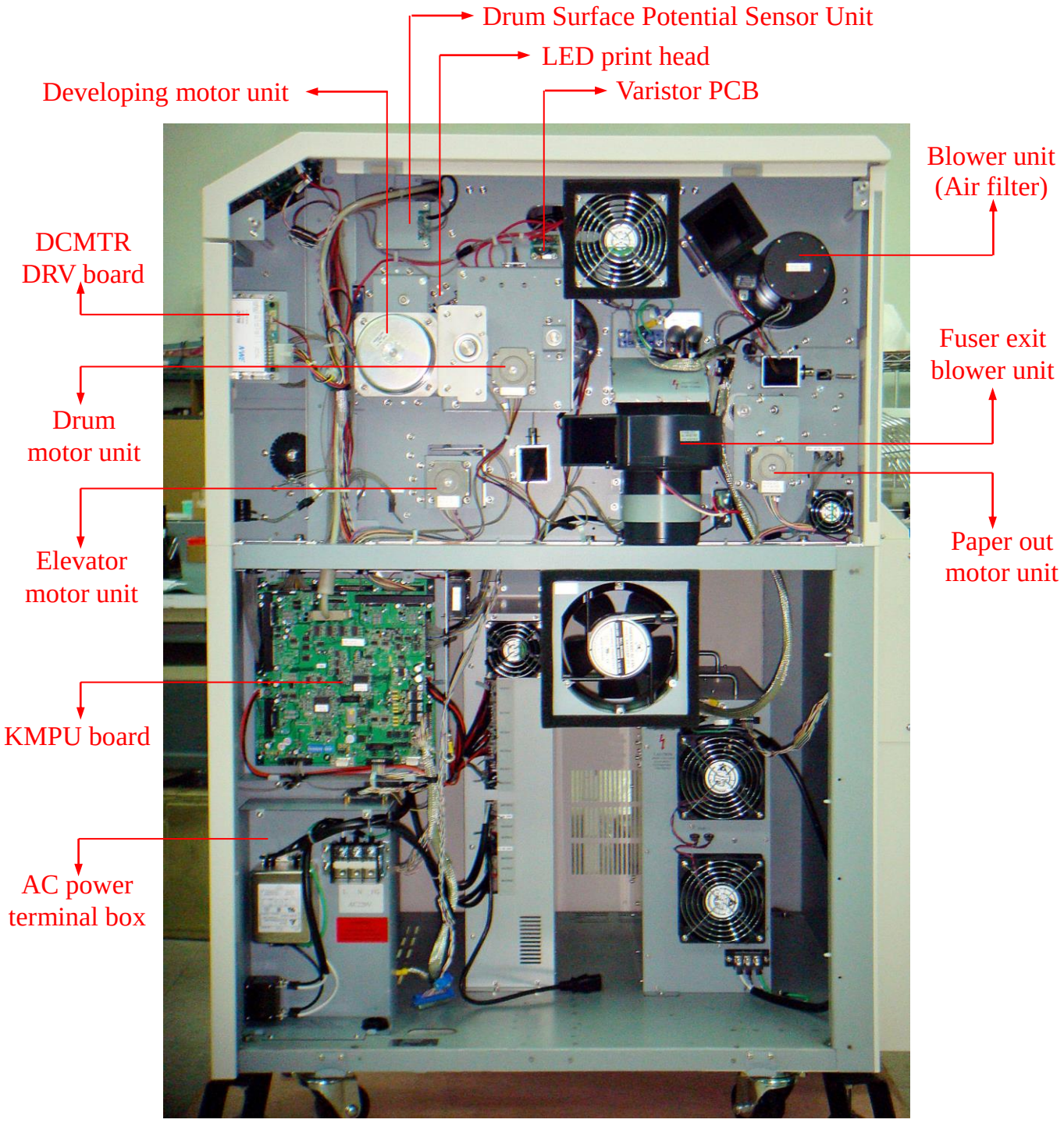


Fig. 5-56

5-2-1 KMPU Board

1. Loosen the screws and remove the cover.

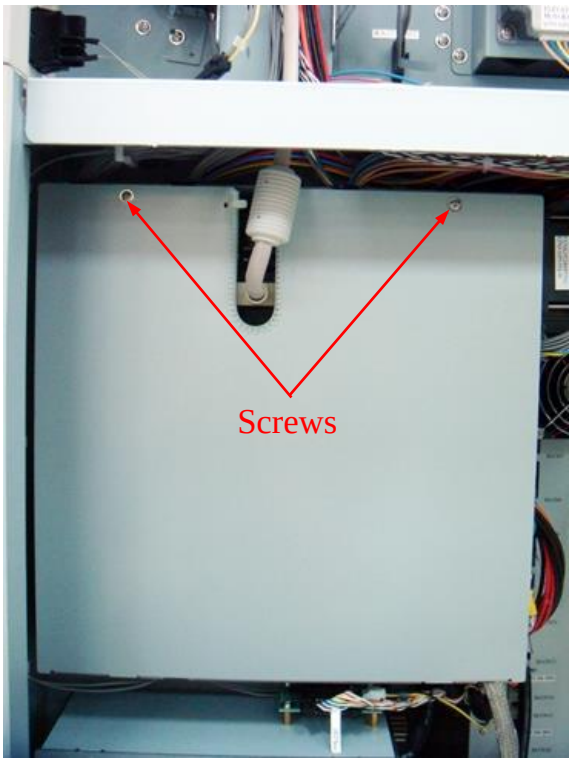


Fig. 5-57

2. Detach the connectors.
3. Remove the screws fastening the KMPU board.

Fig. 5-58

5-2-2 DCMTR DRV Board

1. Detach the connectors.
2. Remove screws A & B and loosen screws C & D.
3. Take out the DCMTR DRV board.

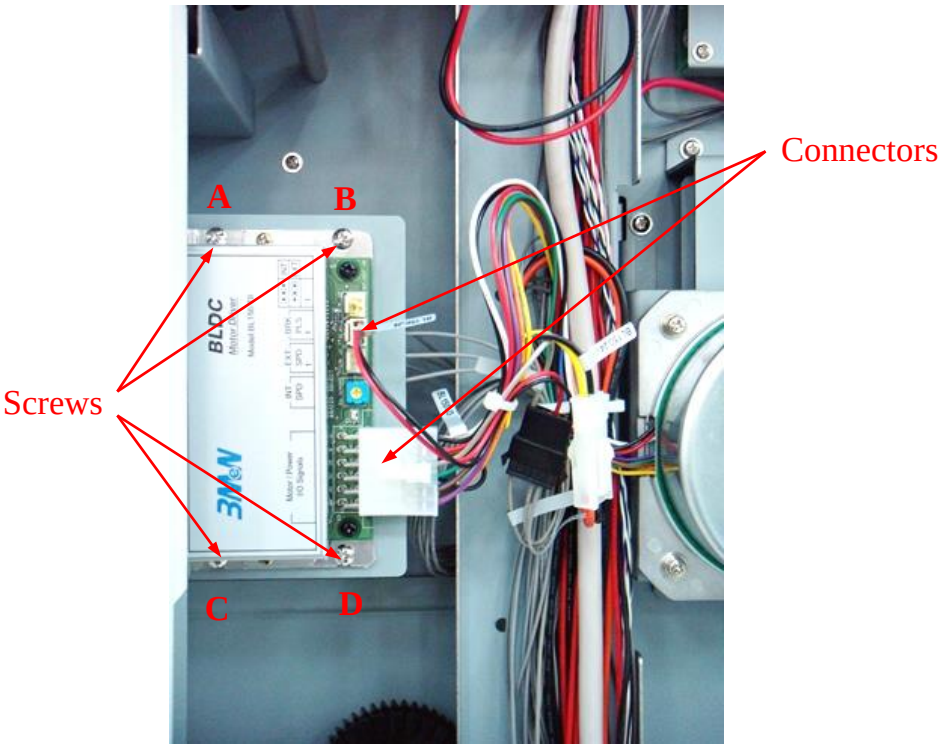


Fig. 5-59

5-2-3 Drum Surface Potential Sensor Unit

1. Remove the rear cover and the top cover.
2. Open the front cover (upper).
3. Remove the screws and the protective cover.

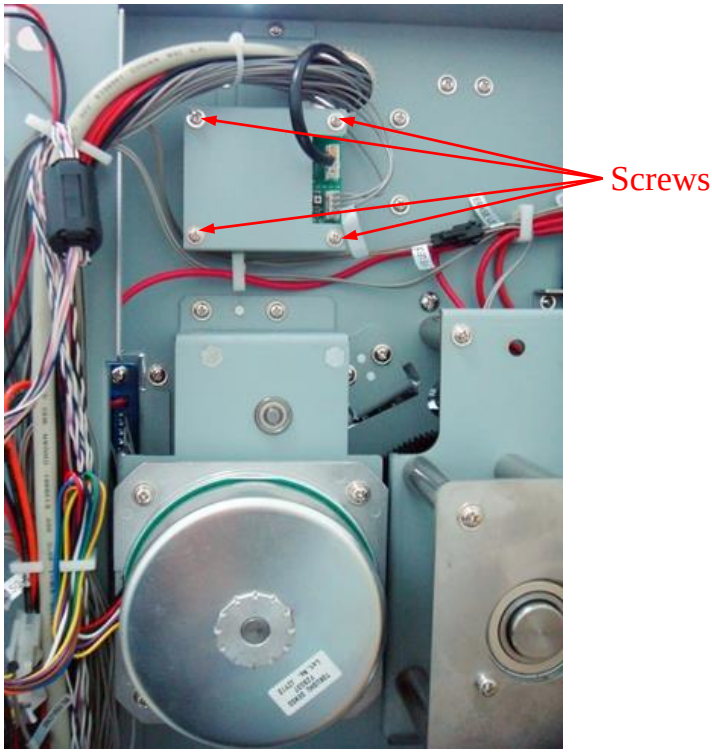


Fig. 5-60

4. Detach the connectors. Remove the screw pillars and then detach the drum surface potential sensor unit.

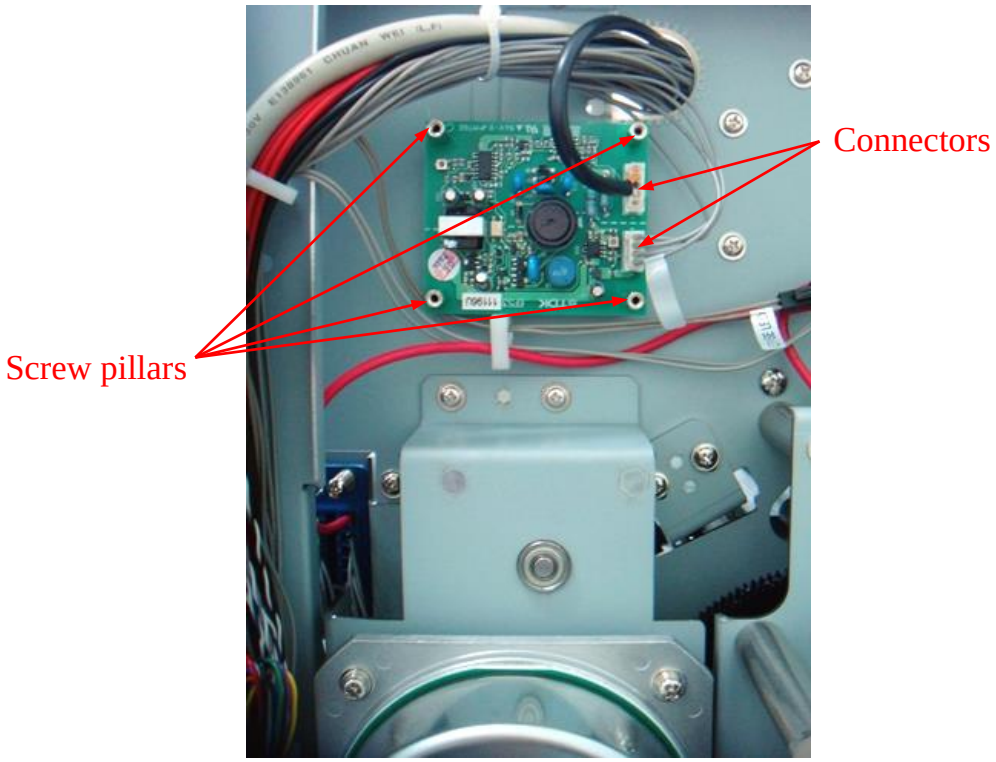


Fig. 5-61

5. Remove the main charger, OPC drum and developing unit (see **"4-2-8 Main Charger"**, **"5-2-8 OPC Drum"** and **"5-2-5 Developing Unit"**).
6. Put one of your hands below the sensor bracket from the OPC drum mounting section. Remove the screws on the sensor bracket, and use your hand to catch the sensor bracket.

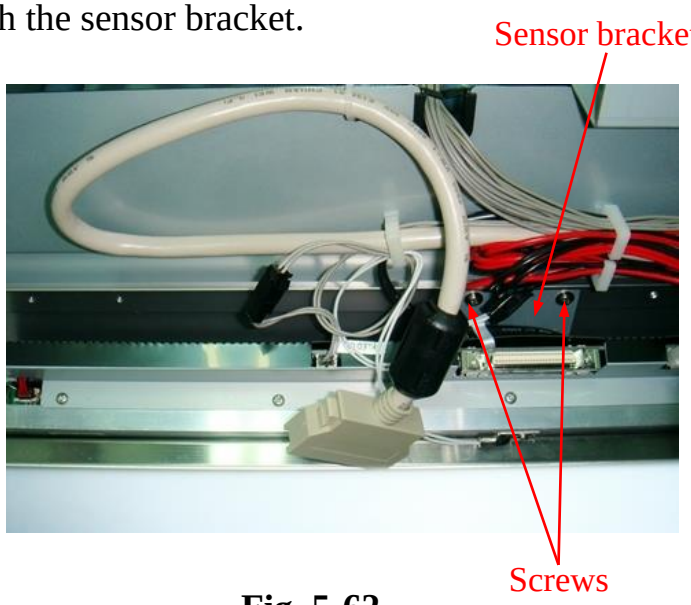


Fig. 5-62

7. Detach the sensor from the bracket and then take out the sensor from the front cover side.

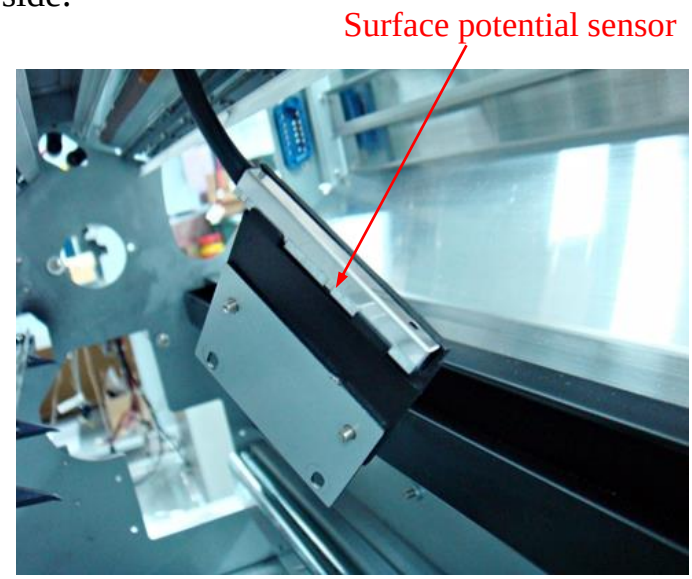


Fig. 5-63

5-2-4 Drum Motor Unit

1. Remove the rear cover.
2. Remove the screws to detach the drum shaft holder.

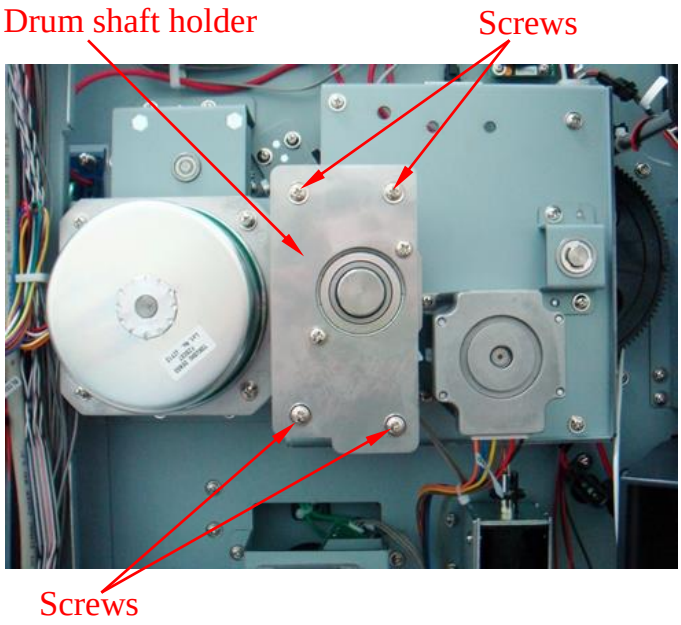


Fig. 5-64

3. Remove the C-ring.
4. Remove the screws to detach the drum motor encoder (interrupt sensor).
5. Pull out the disk from drum shaft.
6. Detach the drum motor connector.
7. Remove the screws to detach the drum motor unit.
8. Install new drum motor unit by reversing the steps.

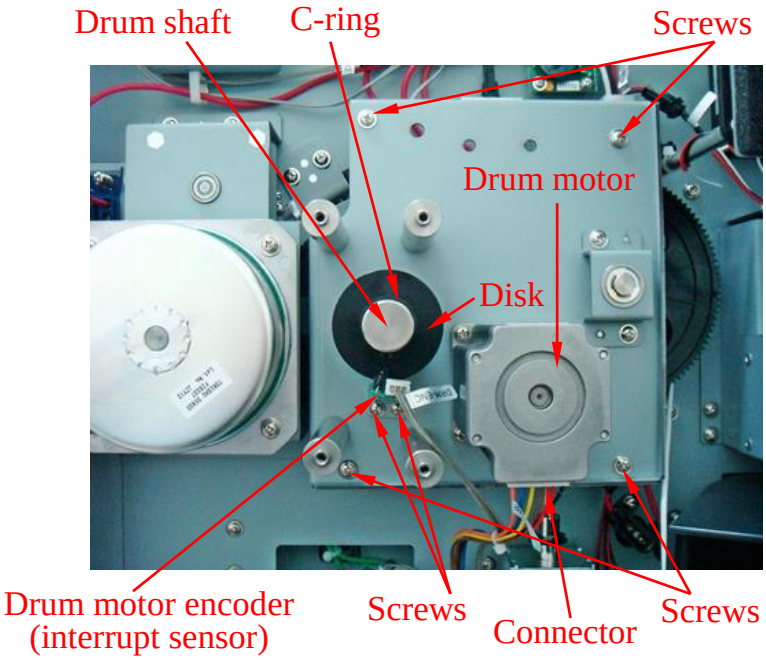


Fig. 5-65

5-2-5 Developing Motor Unit

1. Loosen the screws and remove the developing motor unit.

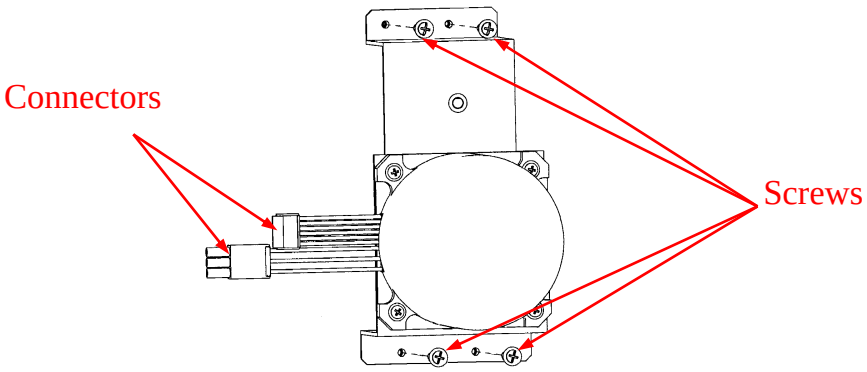


Fig. 5-66

5-2-6 Paper out Motor Unit

1. Detach the connector.
2. Remove the E-ring.
3. Loosen the screws and pull out the paper out motor unit.

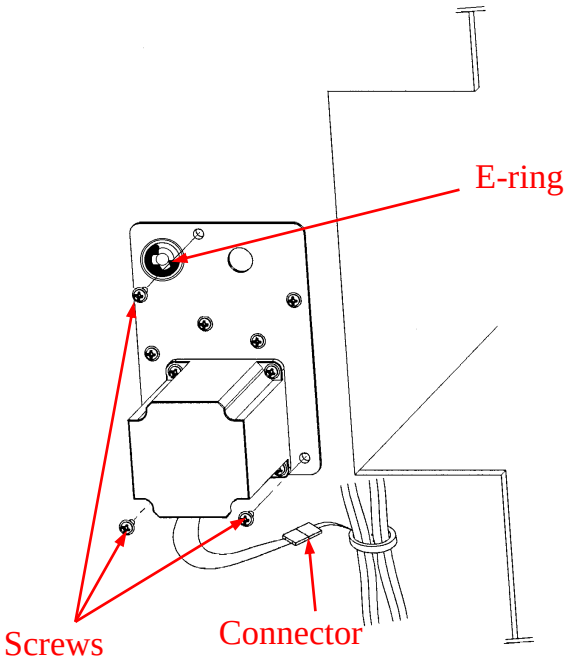


Fig. 5-67

5-2-7 Paper in Motor Unit

1. Loosen the screws to remove the rear cover and right side cover (2).
2. Detach the motor connector inside the rear cover of the main body.
3. Push out motor connector.
4. Loosen the screws that secure the motor, and then remove the motor.

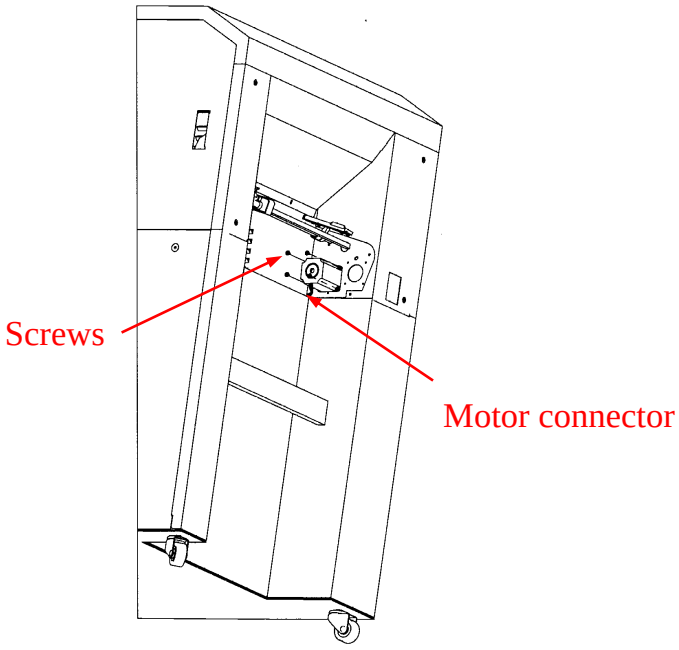


Fig. 5-68

5-2-8 Elevator Motor Unit

1. Detach the motor connector and sensor connector.
2. Loosen the screws and pull out the elevator motor unit.

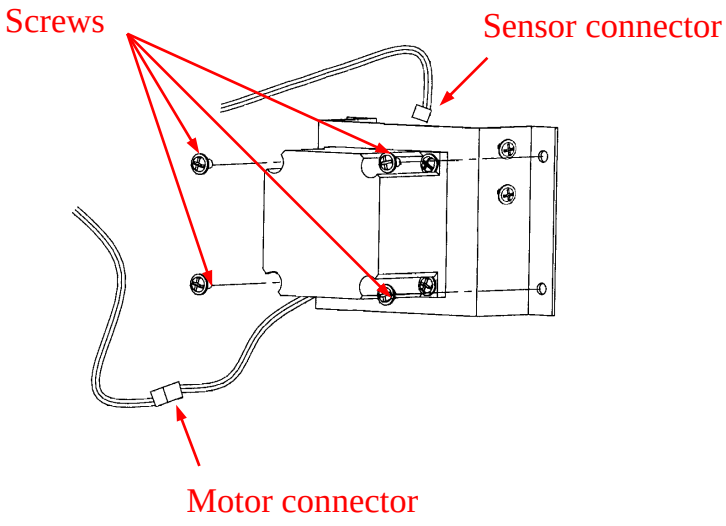


Fig. 5-69

5-2-9 Varistor PCB

1. Remove the rear cover.
2. Remove the drum motor unit (see **"5-3-4 Drum Motor Unit"**).
3. Remove the screws to detach the gear and varistor PCB.

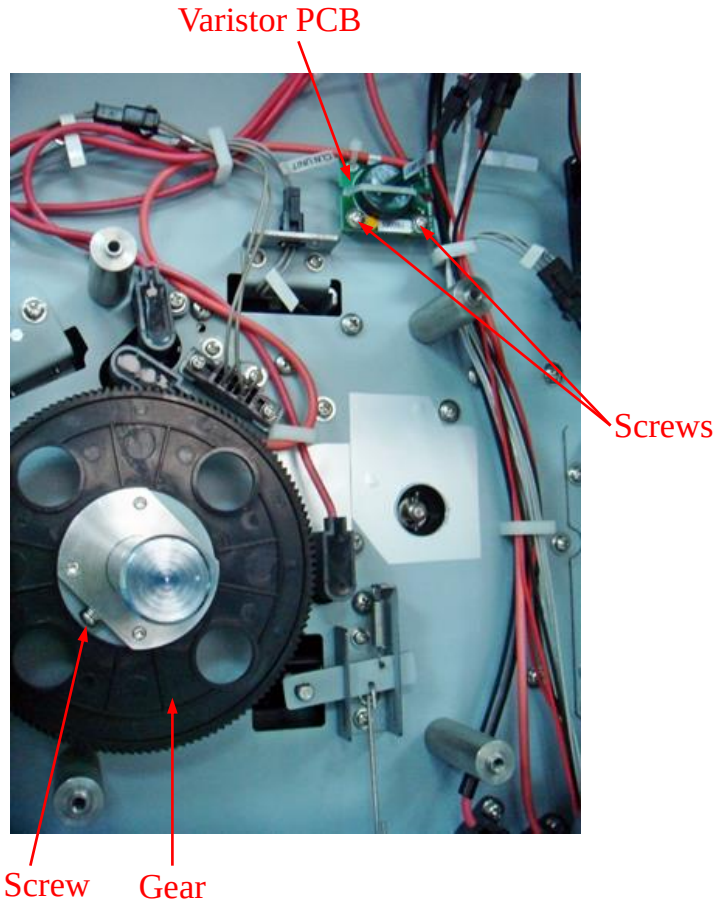


Fig. 5-70

4. Remove the screw to detach the high voltage wire.

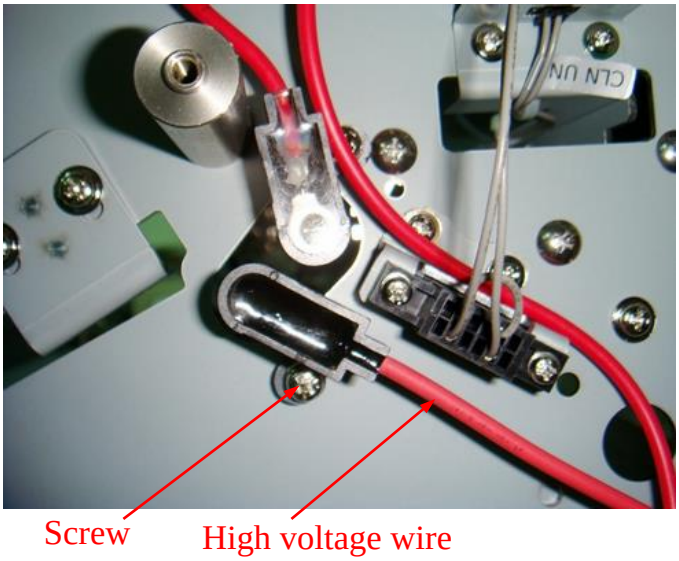


Fig. 5-71

5-2-10 HV Connector for Fuser Unit

1. Power off engine. Open the rear cover. Wait until the charge LED indicators (green light) of flash power supply are out.
2. Remove the fuser unit (see **"5-2-17 Fuser Cover Glass"**).
3. Remove the screws.

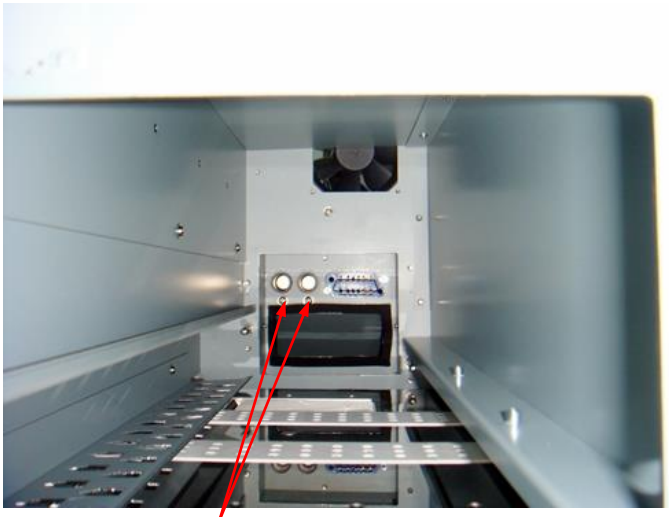


Fig. 5-72

4. Detach the HV connectors.

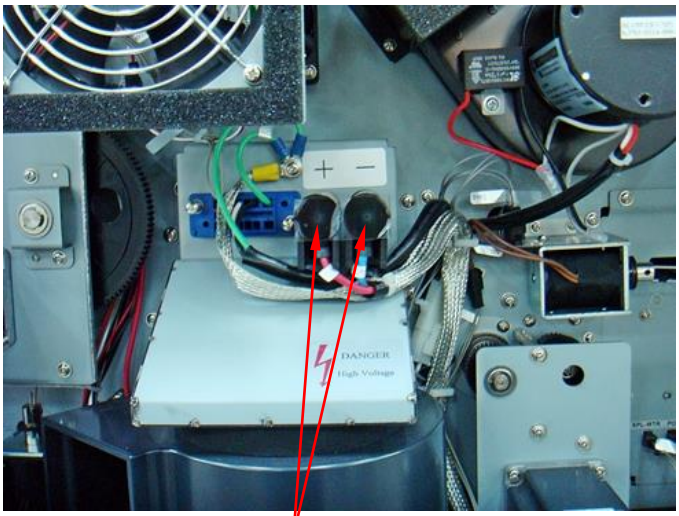


Fig. 5-73

5. Remove the cover.

Fig. 5-74

6. Remove the screw to detach the HV wire.

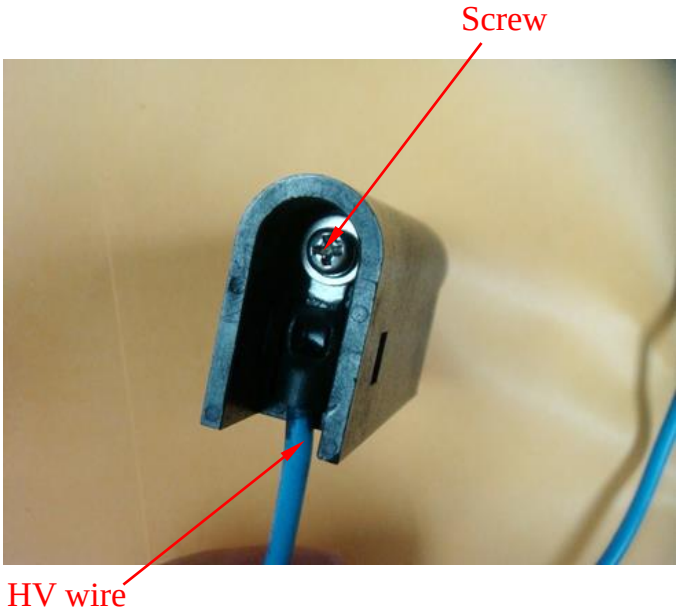


Fig. 5-75

7. Do the followings to assemble the new HV connector: insert the beryllium copper pillar into the spring; align side “A” of the pillar with side “A” of the holder then insert the pillar (with spring) into the holder.

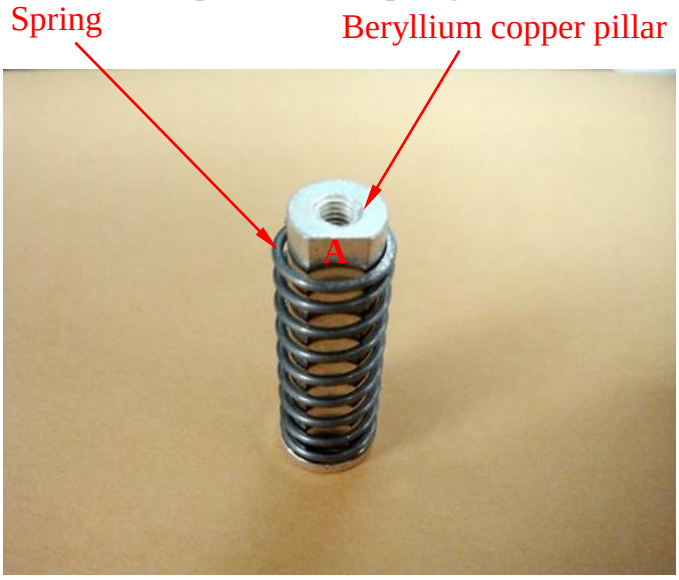


Fig. 5-76

Fig. 5-77

8. Use finger to press the beryllium copper pillar completely then use screw to attach the HV wire.
9. Check if the beryllium copper pillar can be pressed down. If not, remove the screw to detach the HV wire. Re-align side “A” of the pillar with side “A” of the holder then repeat steps 8 to 9.

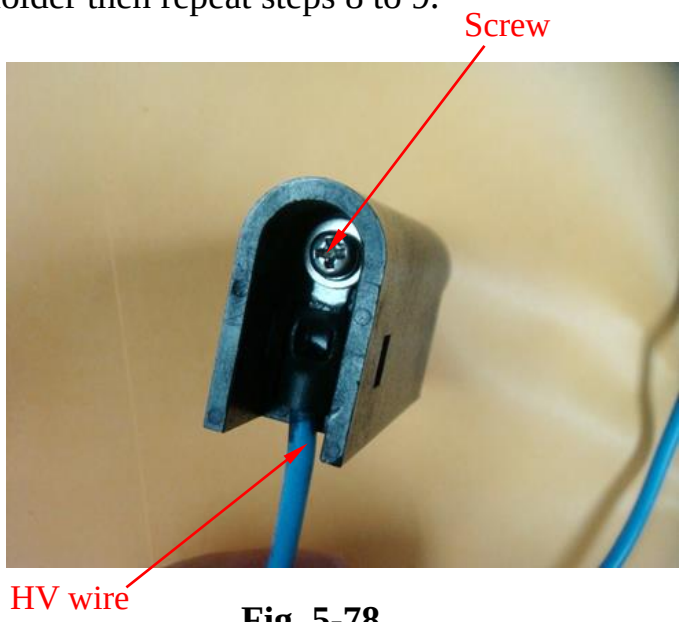


Fig. 5-78

10. Put the cover back.

Fig. 5-79

11. Use screws to re-attach the HV connectors.
12. Restore the fuser unit to its original position.

5-3 Inside the Left Side Cover

5-3-1 Paper Output Unit

1. Open front cover (upper). Remove left side cover and rear cover. Then remove the screws in the front.

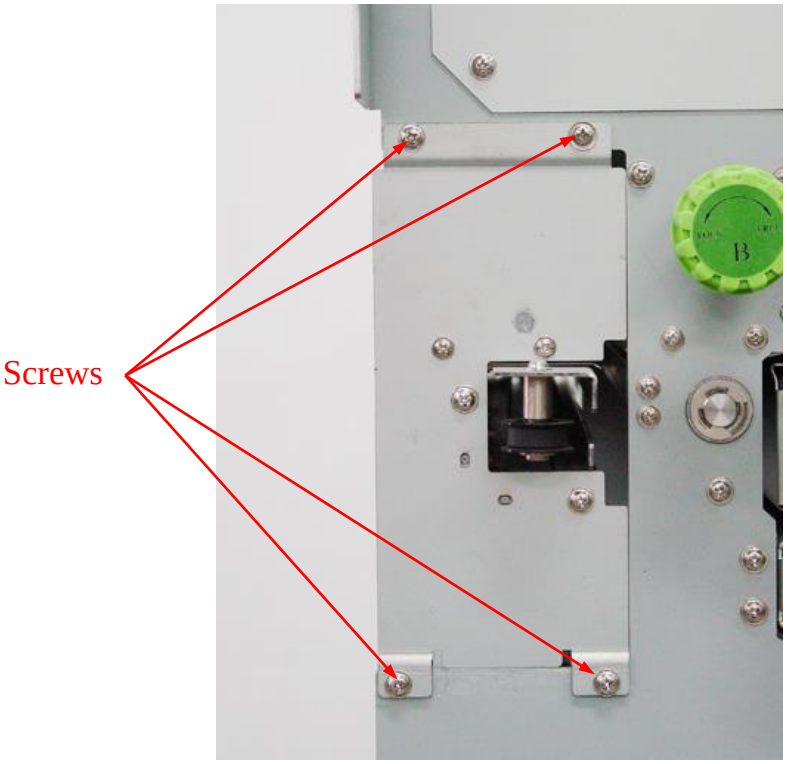


Fig. 5-80

2. Remove the screws in the rear, and detach the connectors.

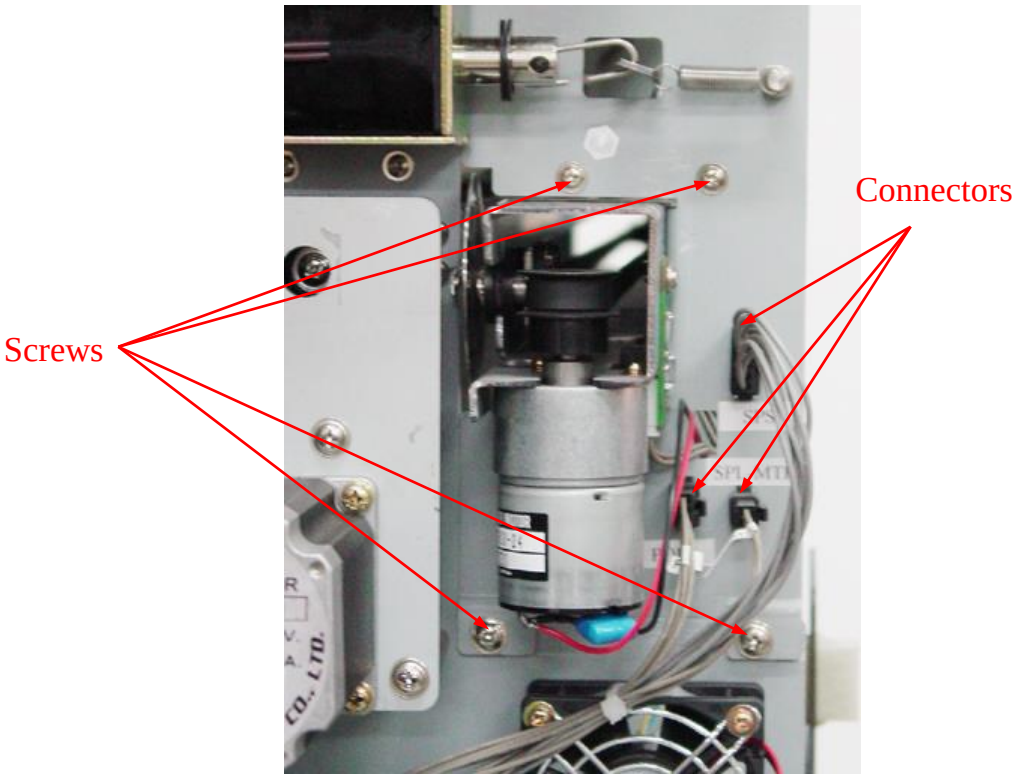


Fig. 5-81

3. Pull out the paper out unit from the left cover side of the main body.

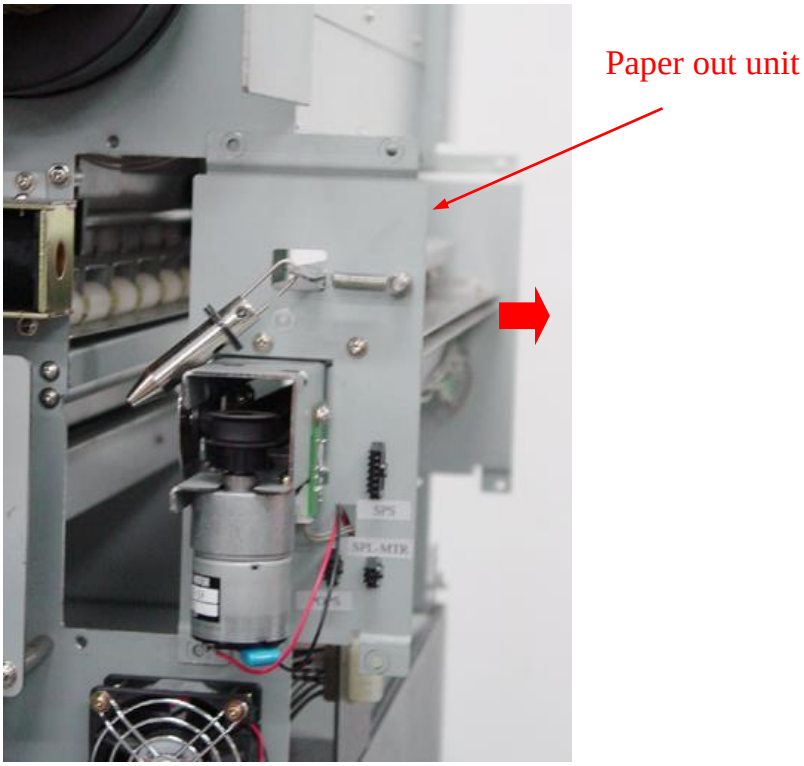


Fig. 5-82

5-3-2 Sensor PMS

1. Detach the connector.
2. Remove the screws on the sensor bracket, and then remove the sensor PMS bracket.

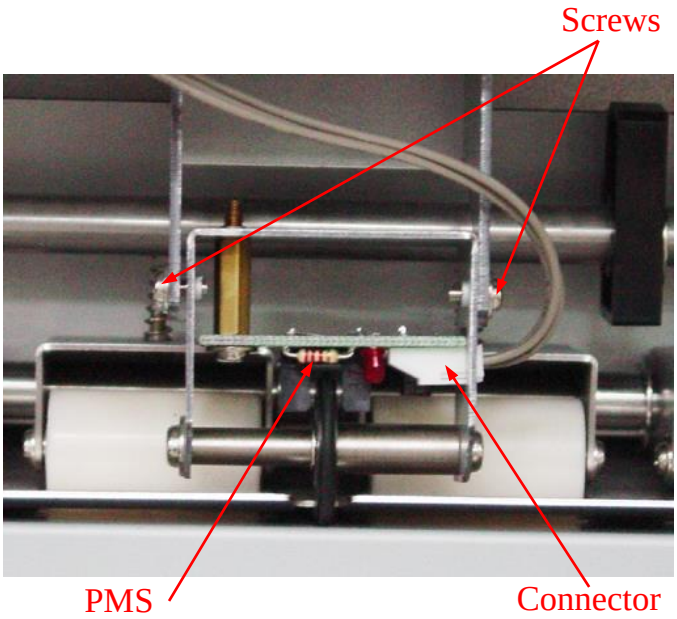


Fig. 5-83

5-3-3 Sensor POPS

1. Remove left side cover.
2. Remove the screw and detach the connector to take out the sensor POPS.

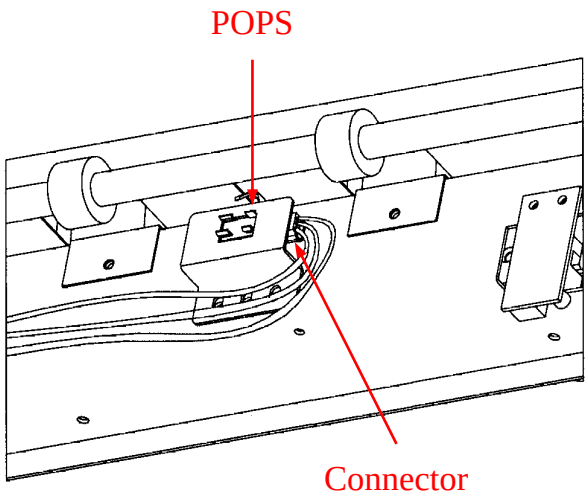


Fig. 5-84

5-4 Inside the Right Side Cover

5-4-1 Tractor Unit

1. Power off printer.
2. Remove the rear cover.
3. Detach the power switch connector.
4. Detach the paper in motor connector.
5. Detach the paper in encoder connector. Remove the screws to detach the paper in encoder (interrupt sensor).

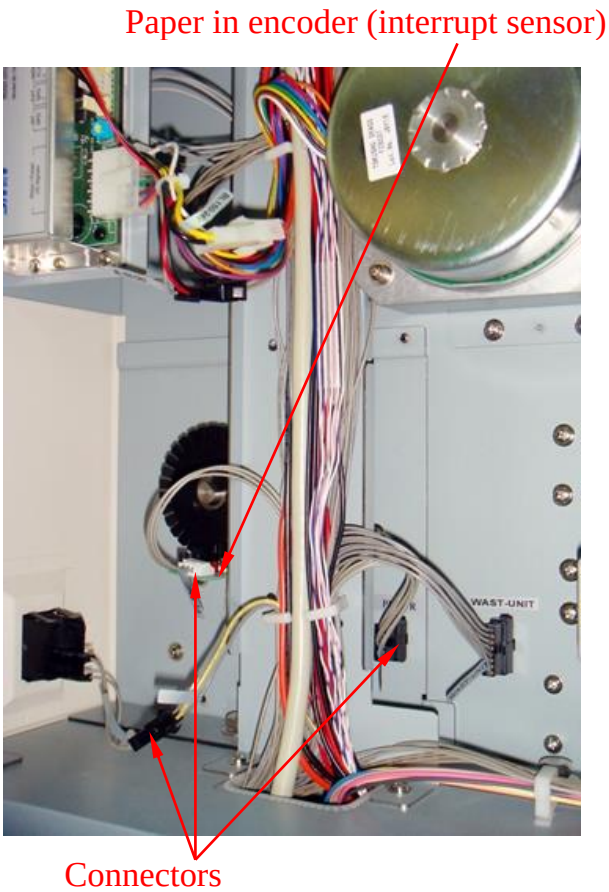


Fig. 5-85

6. Remove the screws to detach the right side cover (2).

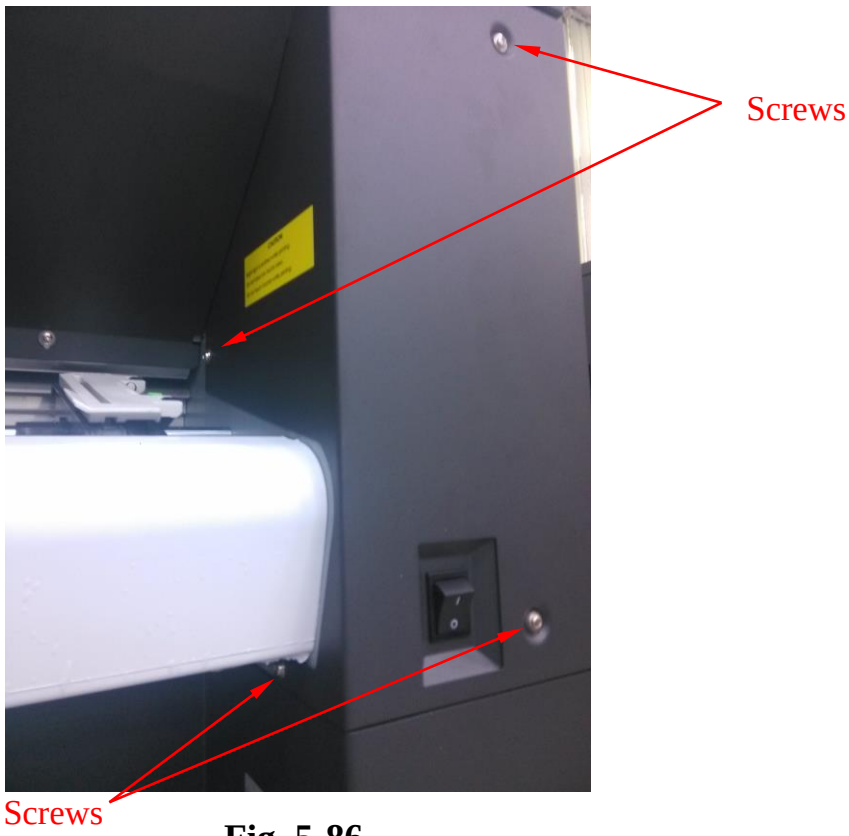


Fig. 5-86

7. Remove the screws to detach the right side cover (1).

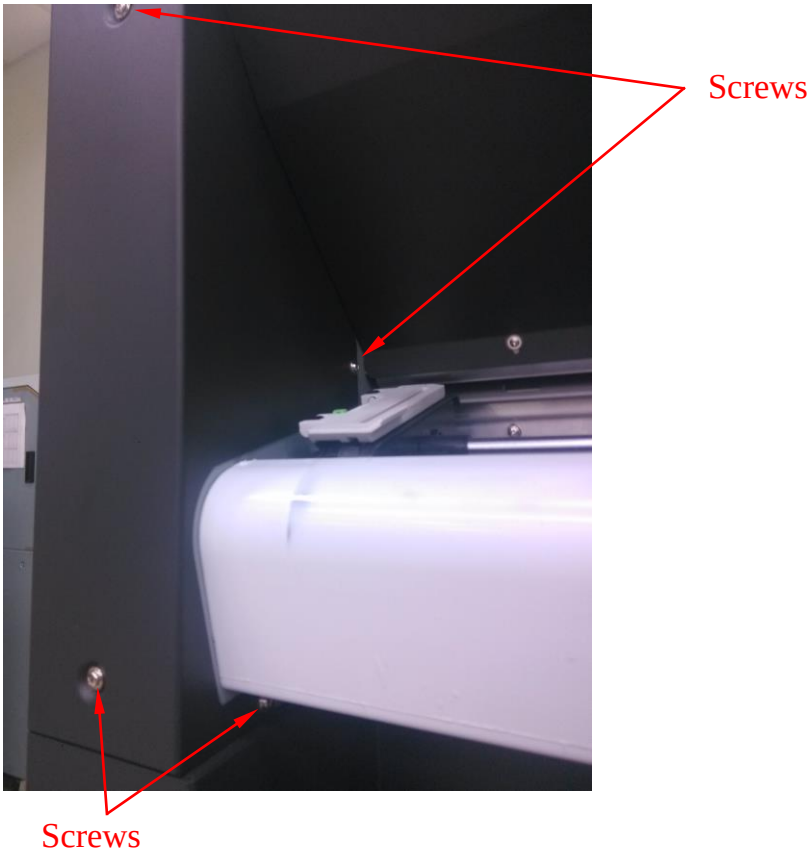


Fig. 5-87

8. Remove the screws fastening the tractor unit. Pull out the tractor unit.

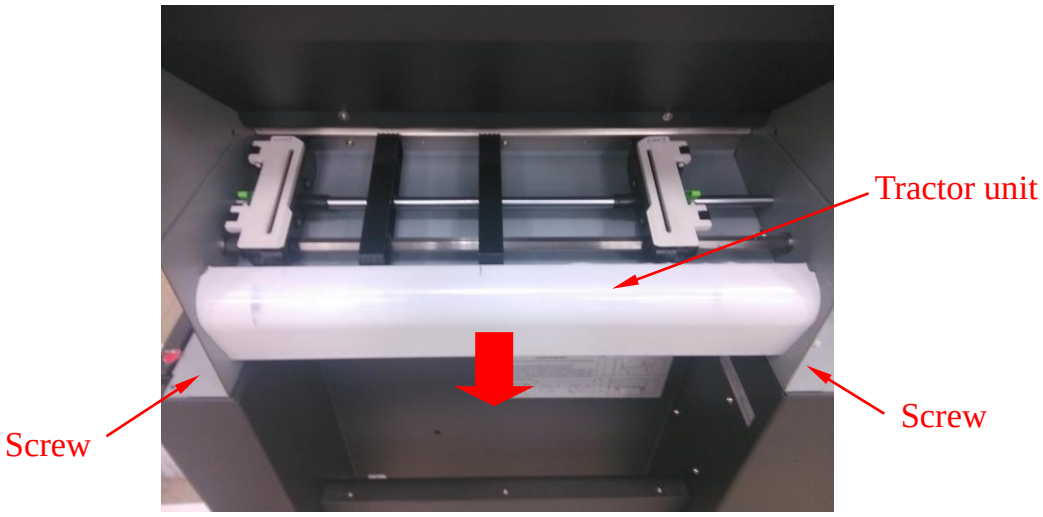


Fig. 5-88

5-4-2 Tractor Belt Unit

1. Detach the tractor unit (see **"5-5-1 Tractor Unit"**).

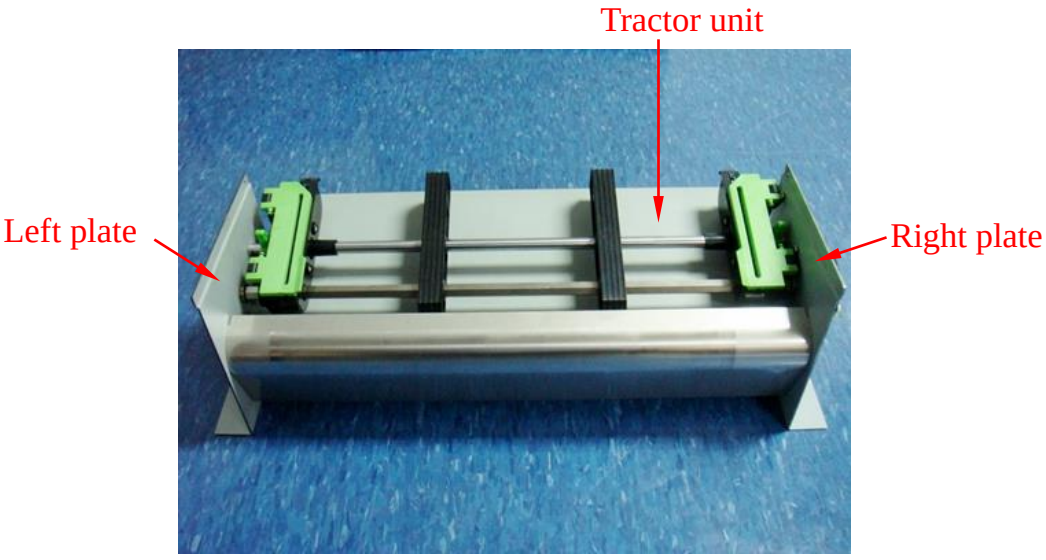


Fig. 5-89

2. Remove the E-ring.

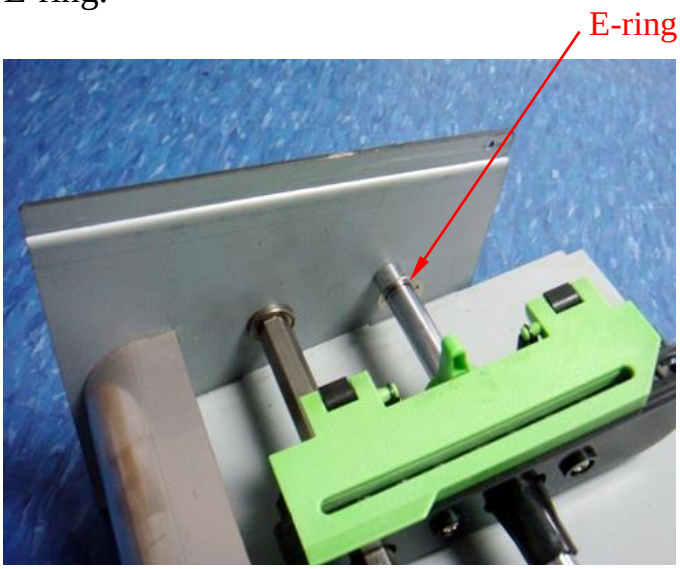


Fig. 5-90

3. Remove the screws and E-ring to detach the left plate.

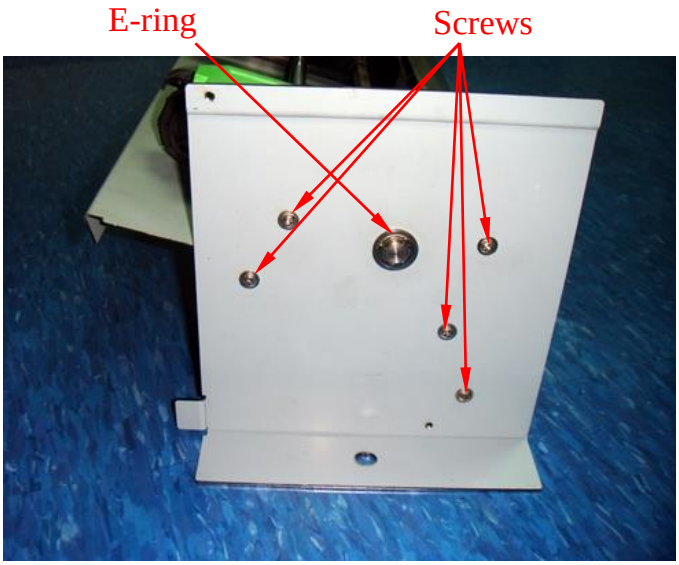


Fig. 5-91

4. Detach the tractor belt units (left & right) and the guides from the shaft.

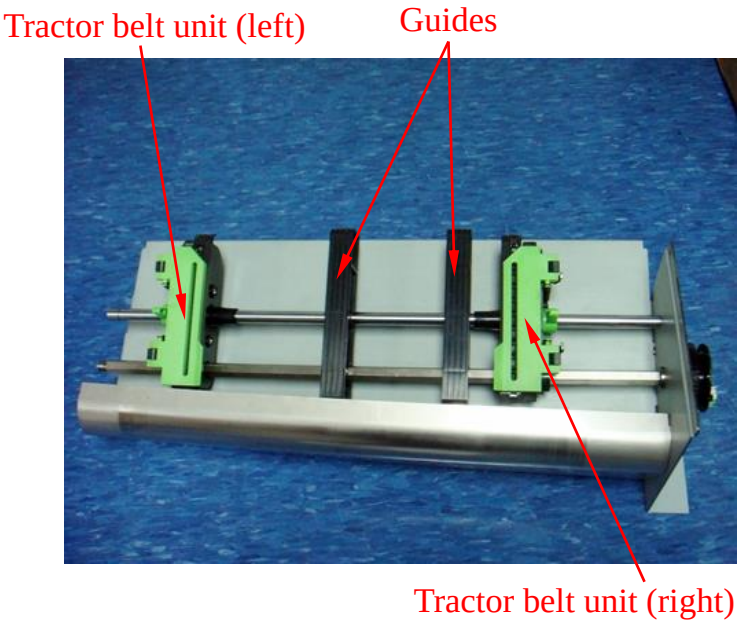


Fig. 5-92

5. Turn the shaft to the position shown in the figure.

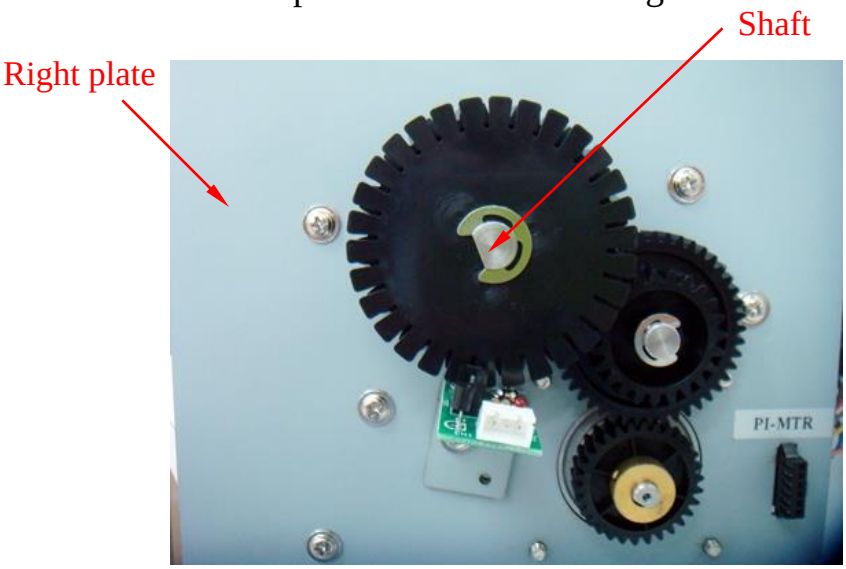


Fig. 5-93

6. Rotate the belt of the new tractor belt unit (right) to turn the alignment point on hexagonal ring to approximately 1-o'clock direction.

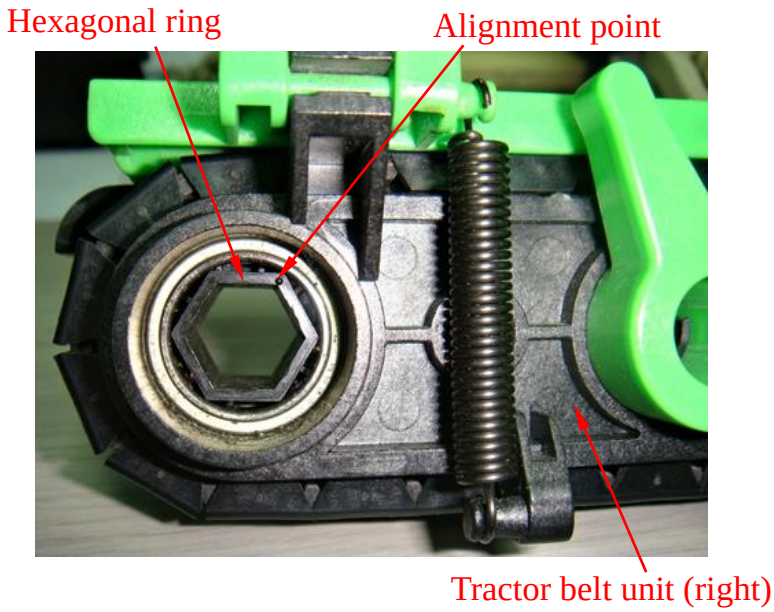


Fig. 5-94

7. Attach the new tractor belt unit (right) to the shaft. Make sure angle A of the shaft aligns with the alignment point on hexagonal ring.

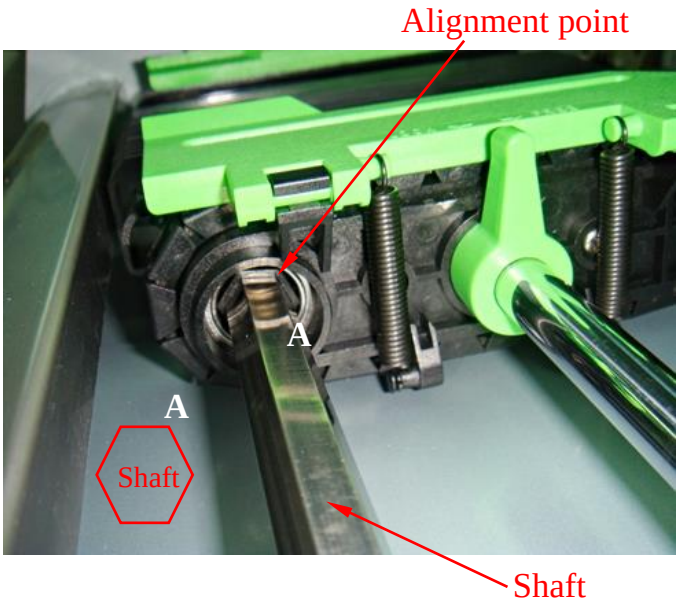


Fig. 5-95

8. Attach the guides to the shaft.
9. Rotate the belt of the new tractor belt unit (left) to turn the alignment point on hexagonal ring to approximately 11-o'clock direction. Attach the new tractor belt unit (left) to the shaft.

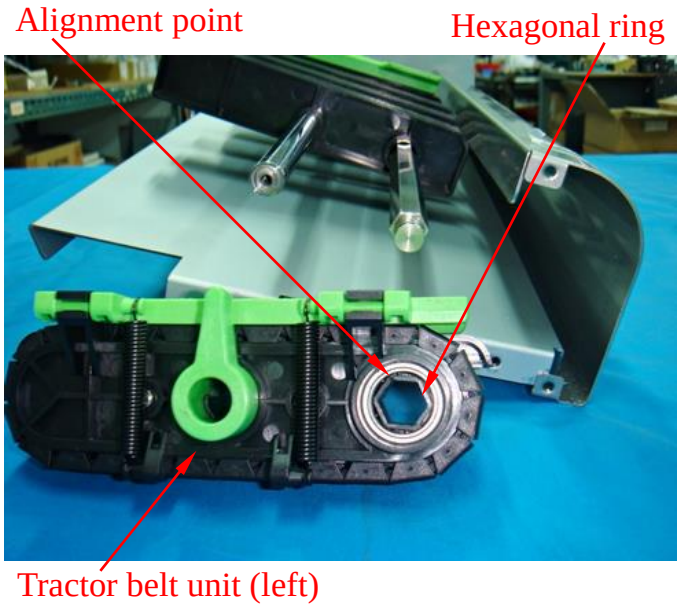


Fig. 5-96

10. Attach the left plate and then reinstall the tractor unit by reversing the steps from step 1 to step 3.

5-4-3 Sensor PTS

1. Remove rear cover and two right side covers.
2. Remove developing unit and OPC drum (see **"5-2-5 Developing Unit"** and **"5-2-8 OPC Drum"**).
3. Remove developing motor unit (see **"5-3-5 Developing Motor Unit"**).
4. Detach the PTS connector from the rear cover side of the main body.
5. Push out the PTS connector from the rear cover side of the main body.
6. Remove the screw from the rear cover side of the main body.
7. Remove the screws from the front cover side of the main body.
8. Pull out the PTS bracket.
9. Detach the PTS connector. Loosen the screw and take out the PTS.

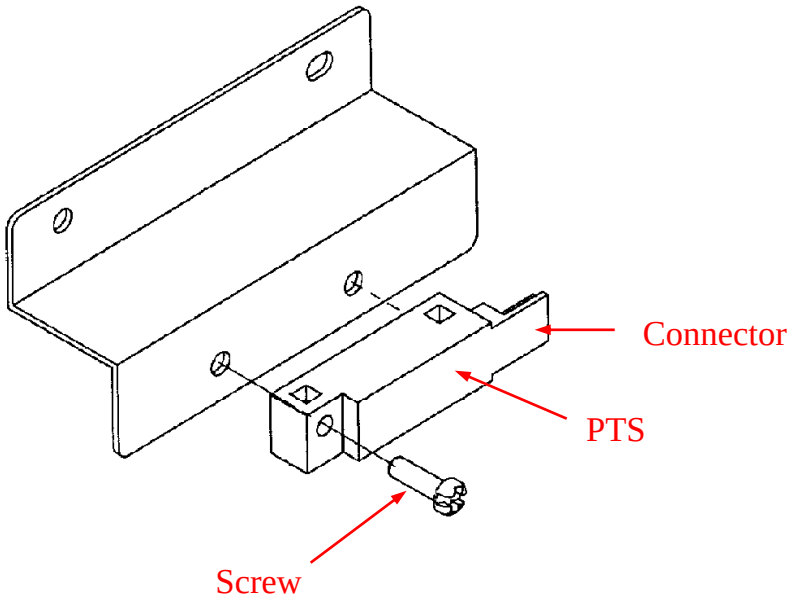


Fig. 5-97

5-4-4 Paper Empty Sensor

1. Remove the screws on the paper empty sensor guide cover.
2. Remove the rear cover of the paper empty sensor guide.
3. Remove the screws inside the rear cover (lower) of the main body.
4. Remove the screws inside the front cover (lower) of the main body.
5. Detach the connector, and remove the screws to take out the sensor inside the cover of the paper empty sensor guide.
6. Detach the DC power supply (see **"5-2-20 DC Power Supply"**).
7. Detach the connector, and remove the screws to take out the sensor attached to the main body.

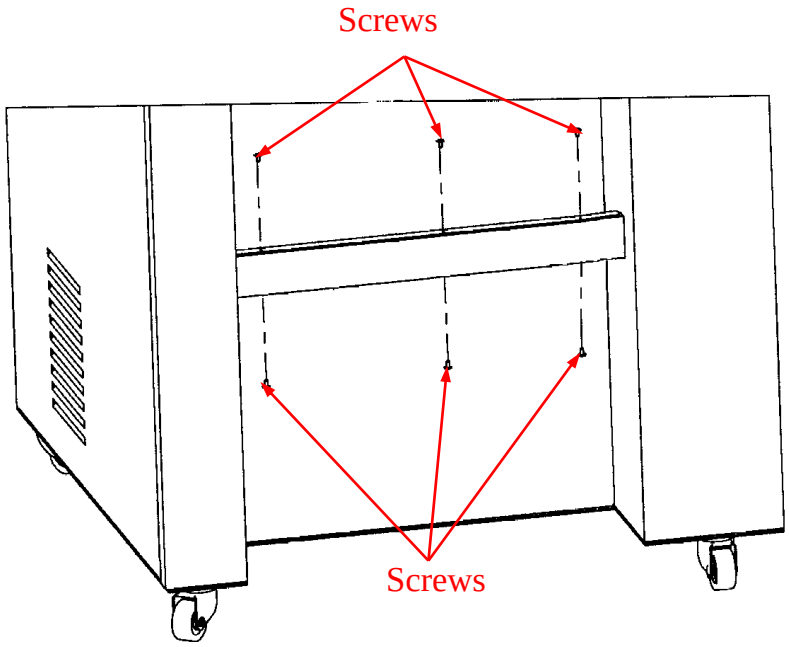


Fig. 5-98

5-5 Inside the Top Cover

5-5-1 High Voltage Power Supply

CAUTION

The signal names are labeled on the terminal sides of the high voltage wire and the unit. Make sure to connect the connectors properly when installing the high voltage power supply.

Removing this unit by detaching the connectors and the high voltage wire terminal connected to the output terminal. Then remove the screws fastening the high voltage power supply.

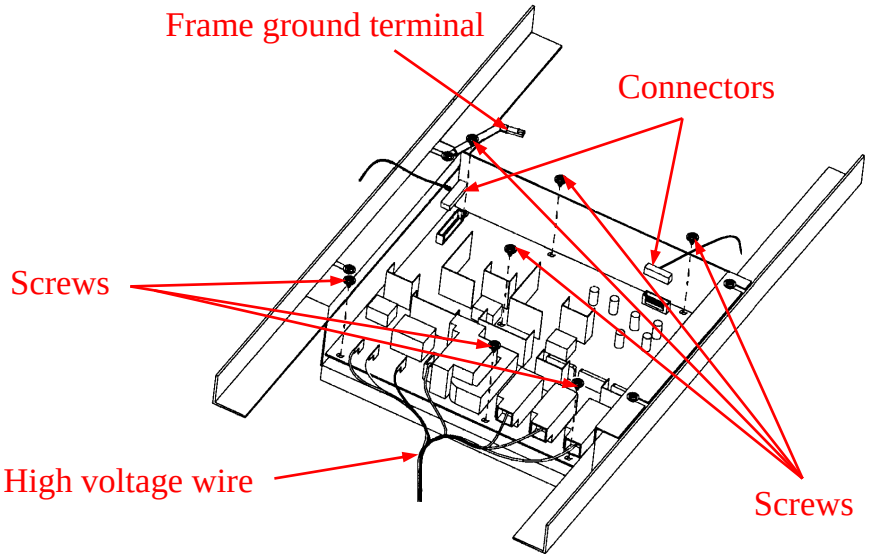


Fig. 5-99

5-5-2 LED Print Head

Before remove LED print head, be sure to remove the top cover, the developing unit, and the OPC drum (see **"5-1 Cover Overview"**, **"5-2-5 Developing Unit"**, and **"5-2-8 OPC Drum"**).

1. Detach the connectors from the LED print head. Remove the screw fastening the LED array thermal sensor.

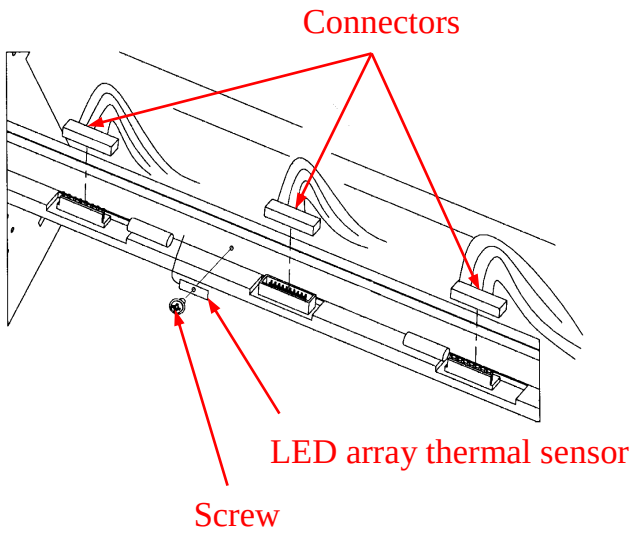


Fig. 5-100

2. Remove the screws fastening the LED print head.

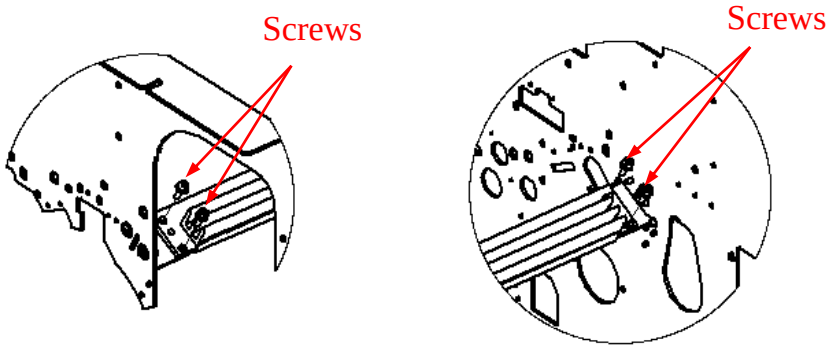


Fig. 5-101

3. Lift the LED print head.

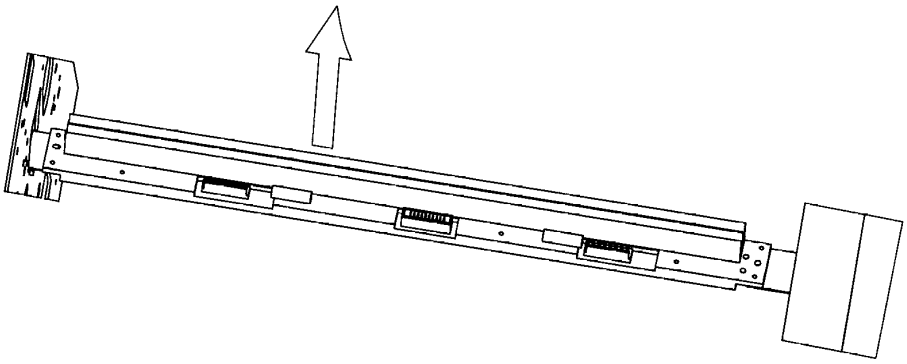


Fig. 5-102

CAUTION

When remove or attach the LED print head, be careful not to touch the surface of the LED head.

4. When installing LED print head, place the LED print head on the left and right mounting brackets, and then insert the alignment pins into the holes of LED print head mounting brackets.

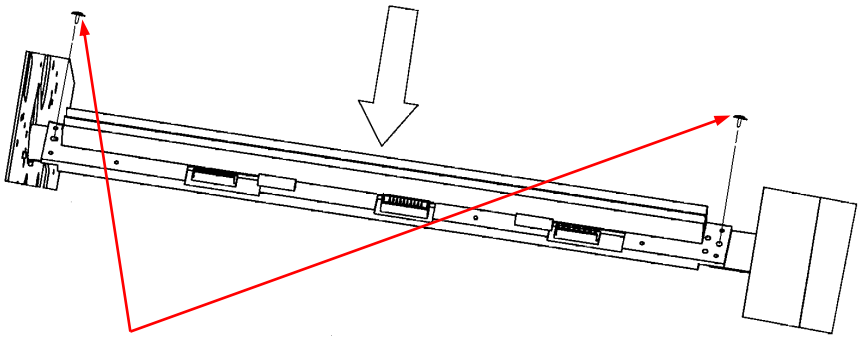


Fig. 5-103

5. Use screws to attach the LED print head to the left and right LED print head mounting brackets then pull out the alignment pins.
6. Connect LED print head connectors, and use screw to attach the LED array thermal sensor to its original position.

CAUTION

When install a new LED print head, make sure to apply proper amount of thermal grease to the LED array thermal sensor on the side contacting the LED print head before using the screw to fasten the thermal sensor to the LED print head.

5-5-3 Cleaning Unit Set Sensor

1. Remove the rear cover.
2. Remove the top cover.
3. Remove the cleaning unit.
4. Detach the connector to the sensor and remove the screws fastening the sensor bracket.

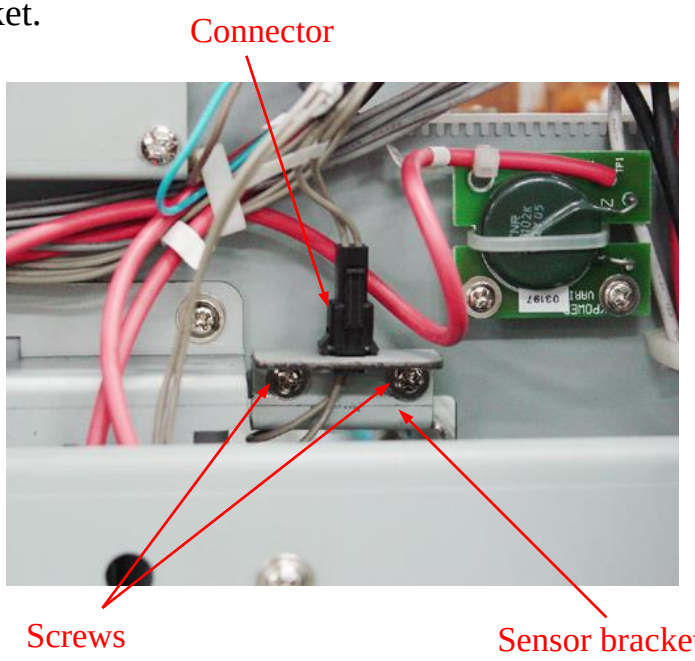


Fig. 5-104

5. Push the sensor bracket into the inside of the main body and take out the sensor bracket.
6. Pull up the two pins and loosen the two screws to take out the micro switches attached on the bracket.

Chapter 6

Troubleshooting

6-1 Error Code

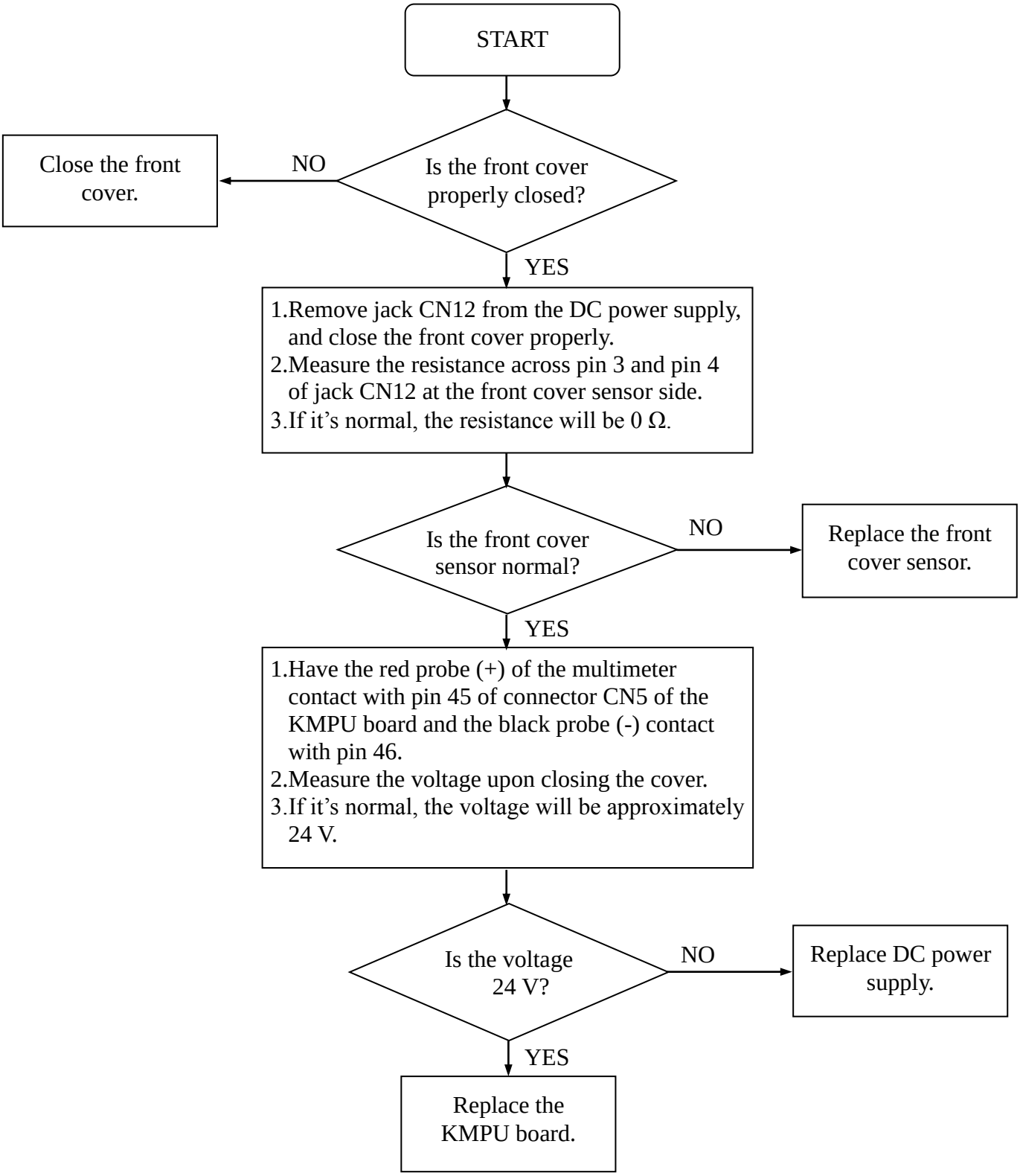
6-1-1 Error Code Descriptions

Code	Descriptions
01	Front cover open
02	No fanfold paper
03	Paper jam at fuser (PTPS)
04	Paper jam after fusing (PMS)
05	Paper jam at paper output section (POPS)
07	Scuff lever open
0A	Splitter failure (during movement towards the front)
0B	Splitter failure (during movement towards the rear)
0C	Elevator motor failure (during upward movement)
0D	Elevator motor failure (during downward movement)
12	Paper remaining in fuser section (PTPS)
13	Paper remaining in paper output section (POPS)
16	Abnormal paper position
17	High voltage failure
18	Drum motor failure (Abnormal rotation speed)
19	Surface potential too high
1A	Surface potential too low
1E	Flash power supply failure
1F	No.1 Flash failure
20	Fuser unit overheat
22	Developing motor failure (Abnormal rotation speed)
26	No cleaning unit
28	Waste toner box full
29	No waste toner box
2A	No toner
2C	Toner density too low
2D	Toner near end
32	LED array overheat
39	High Voltage Failure - +HV1 Main Charge
3A	High Voltage Failure - +HV2 Pre-Charge
3B	High Voltage Failure - -HV Transfer Charge
3C	High Voltage Failure - +HV3 Separation Charge
3D	High Voltage Failure - +DRL Developing Bias
3E	High Voltage Failure - -V1, -V2 Cleaning Bias
56	Stacker full

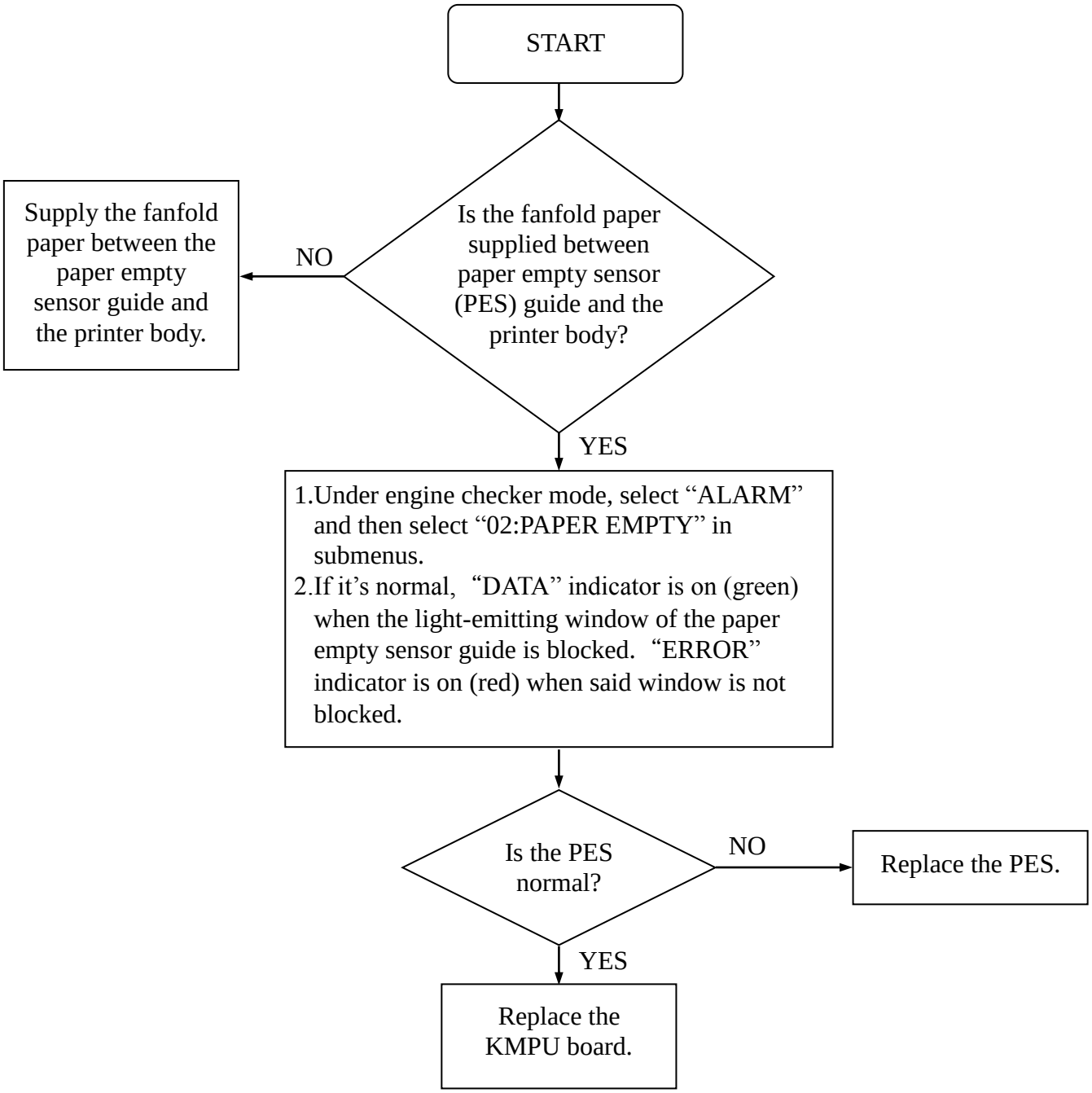
6-1-2 Checking Procedures

The locations of the sensors described in the procedures are indicated in **Fig. 1-12** and **Fig. 1-13** of **"1-9 Sensor System Description".** The locations of the connectors described in the procedures are indicated in **Fig. 3-3** of **"3-2 KMPU Board".**

Error Code 01: Front cover open



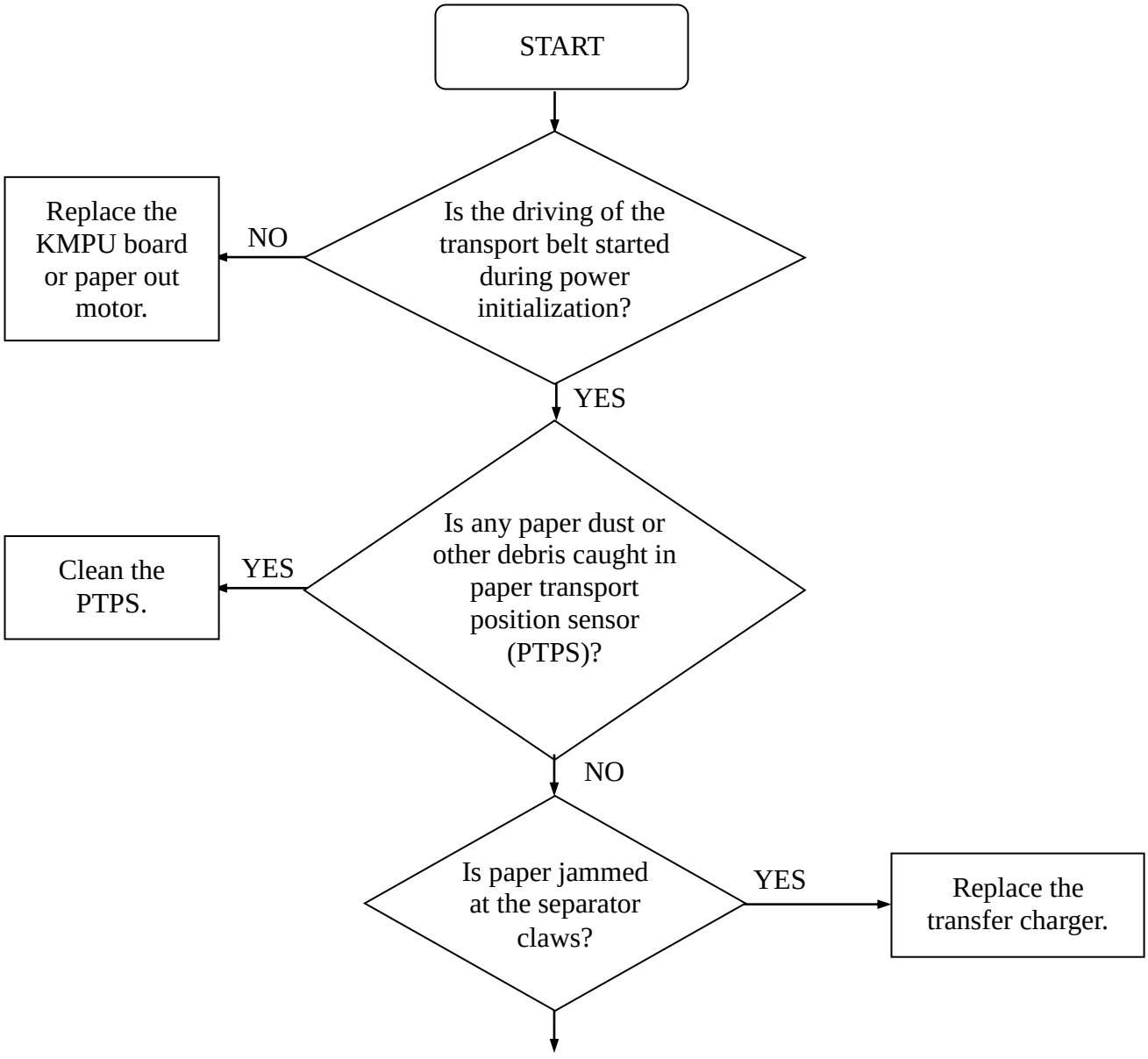
Error Code 02: No fanfold paper

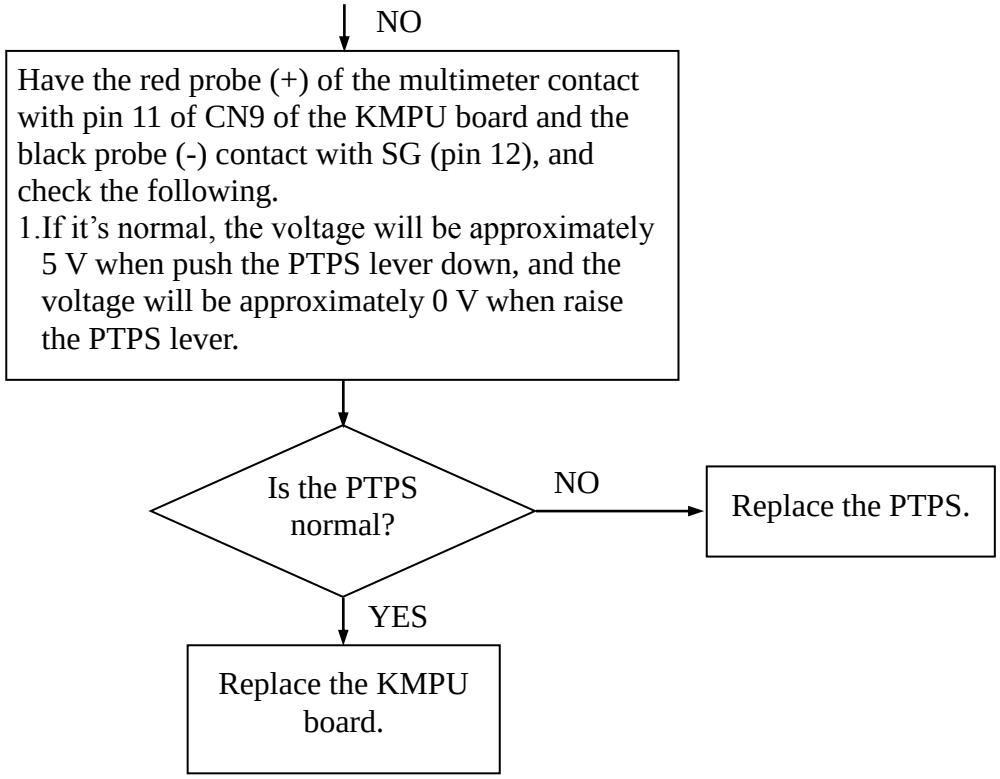


Error Code 03: Paper jammed at fuser (PTPS)

Main Causes:

1.Angle of PTPS actuator.
2.Warping of the trapnsport belt.
3.The suction fan is stopped.
4.Printing paper.
5.Printing pattern and flash voltage.
6.The transport unit is lowered.
7.The fuser cover glass is not installed or is broken.
8.A jammed sheet or shred of paper has been left in the transport section.
9.The PTPS sensor lever is broken or does not move smoothly.
10.The paper holder rubber does not return properly during split.

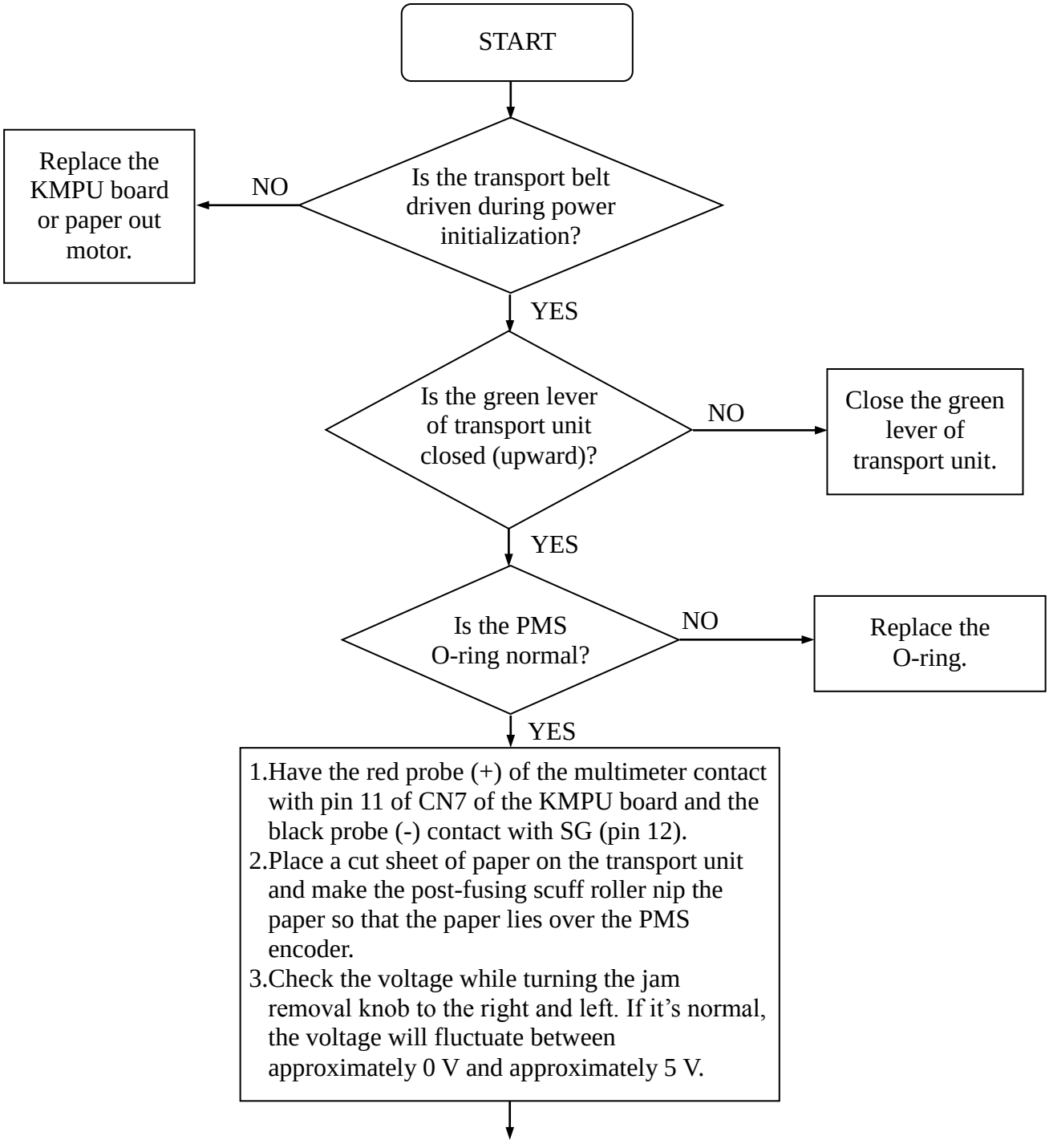


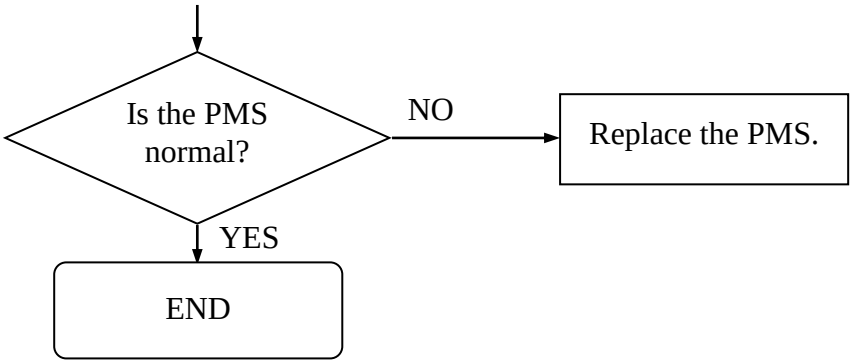

NO
Have the red probe (+) of the multimeter contact with pin 11 of CN9 of the KMPU board and the black probe (-) contact with SG (pin 12), and check the following.
1.If it's normal, the voltage will be approximately 5 V when push the PTPS lever down, and the voltage will be approximately 0 V when raise the PTPS lever.
Is the PTPS normal?
NO
Replace the PTPS.
YES
Replace the KMPU board.

Error Code 04: Paper jammed after fusing (PMS)

Main Causes:

1.Paper is not nipped by the scuff roller.
2.The lamp housing is lowered.
3.The clearance for transport is too narrow.
4.Skewing occurs at the transport unit.
5.The O-ring of paper moving sensor (PMS) roller slips or does not rotate smoothly.
6.A jammed sheet or shred of paper has been left in the paper out section.
7.The paper moving sensor is dirty.



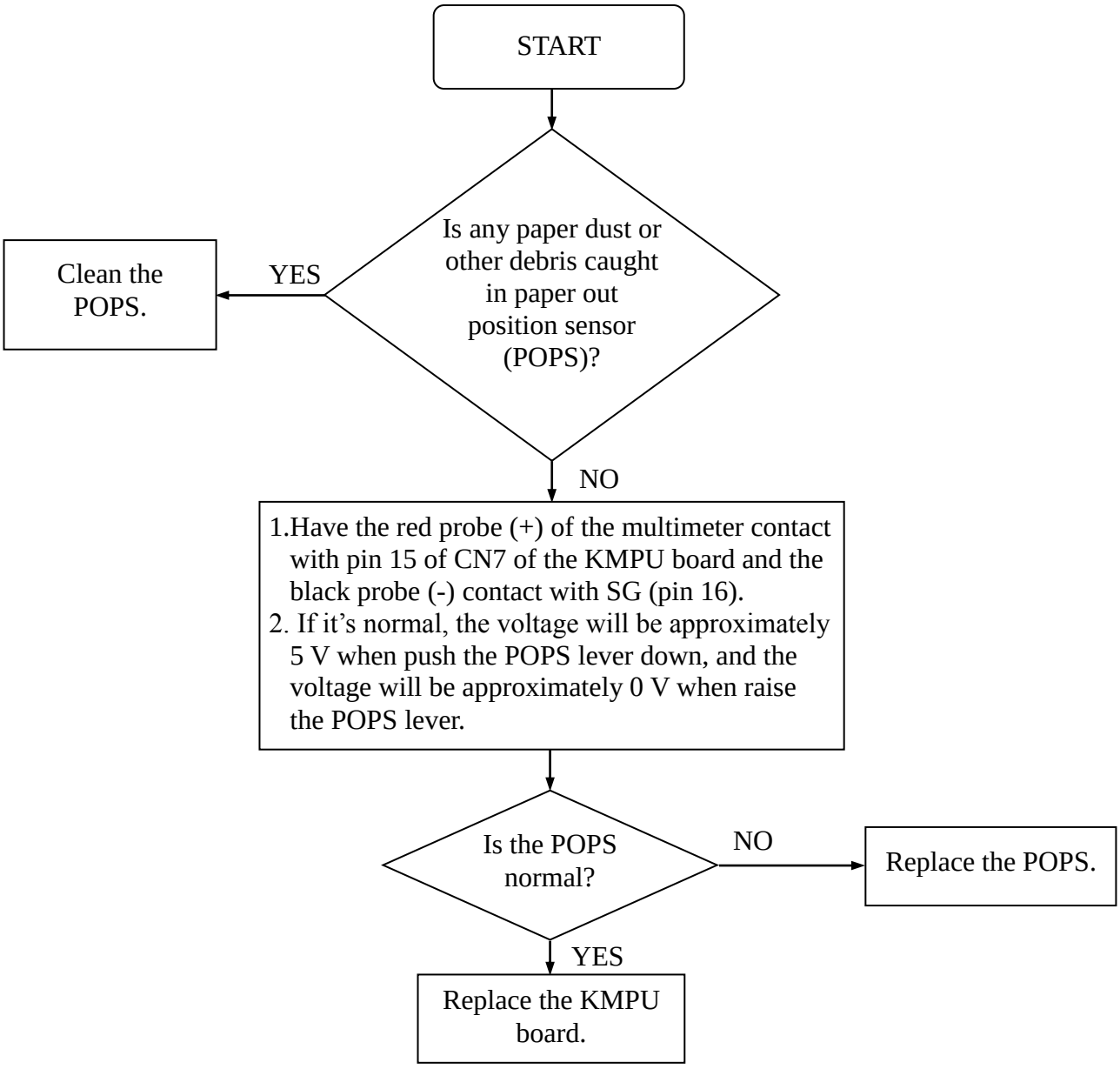

Is the PMS normal?
NO
Replace the PMS.
YES
END

Error Code 05: Paper jammed at paper output section (POPS)

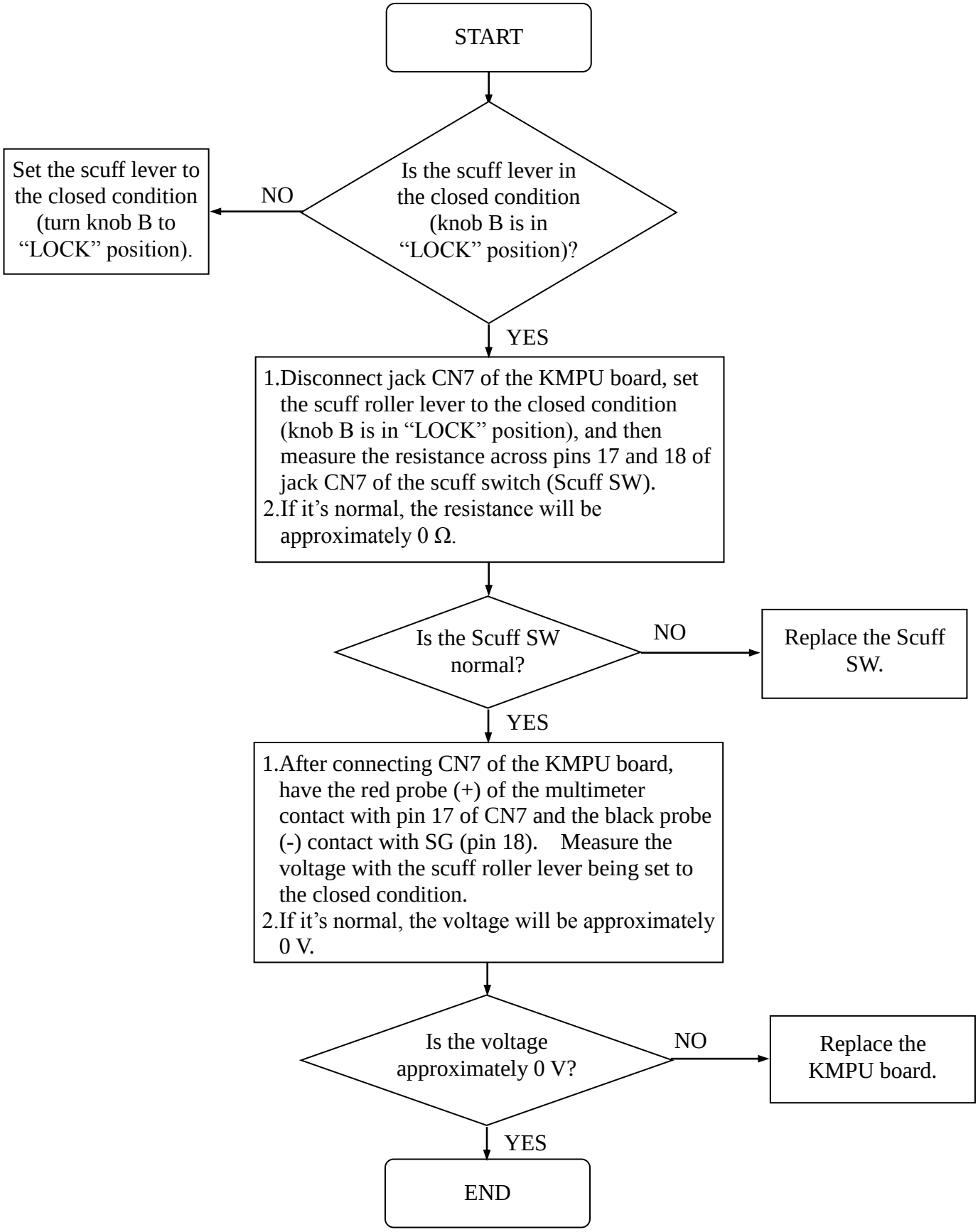
Main Causes:

1.Paper hits the paper guide.

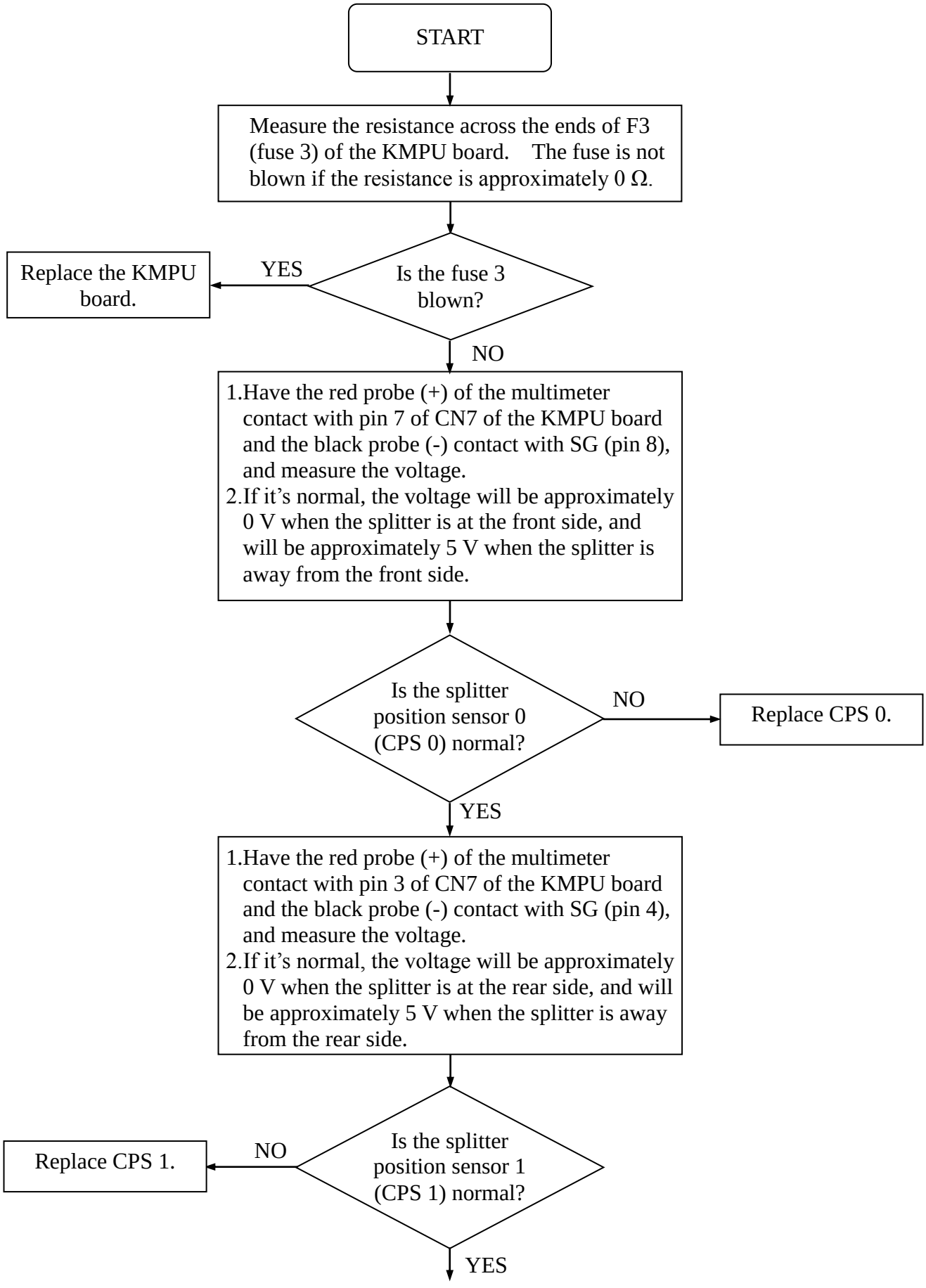
2.The solenoid actuator is mounted poorly.

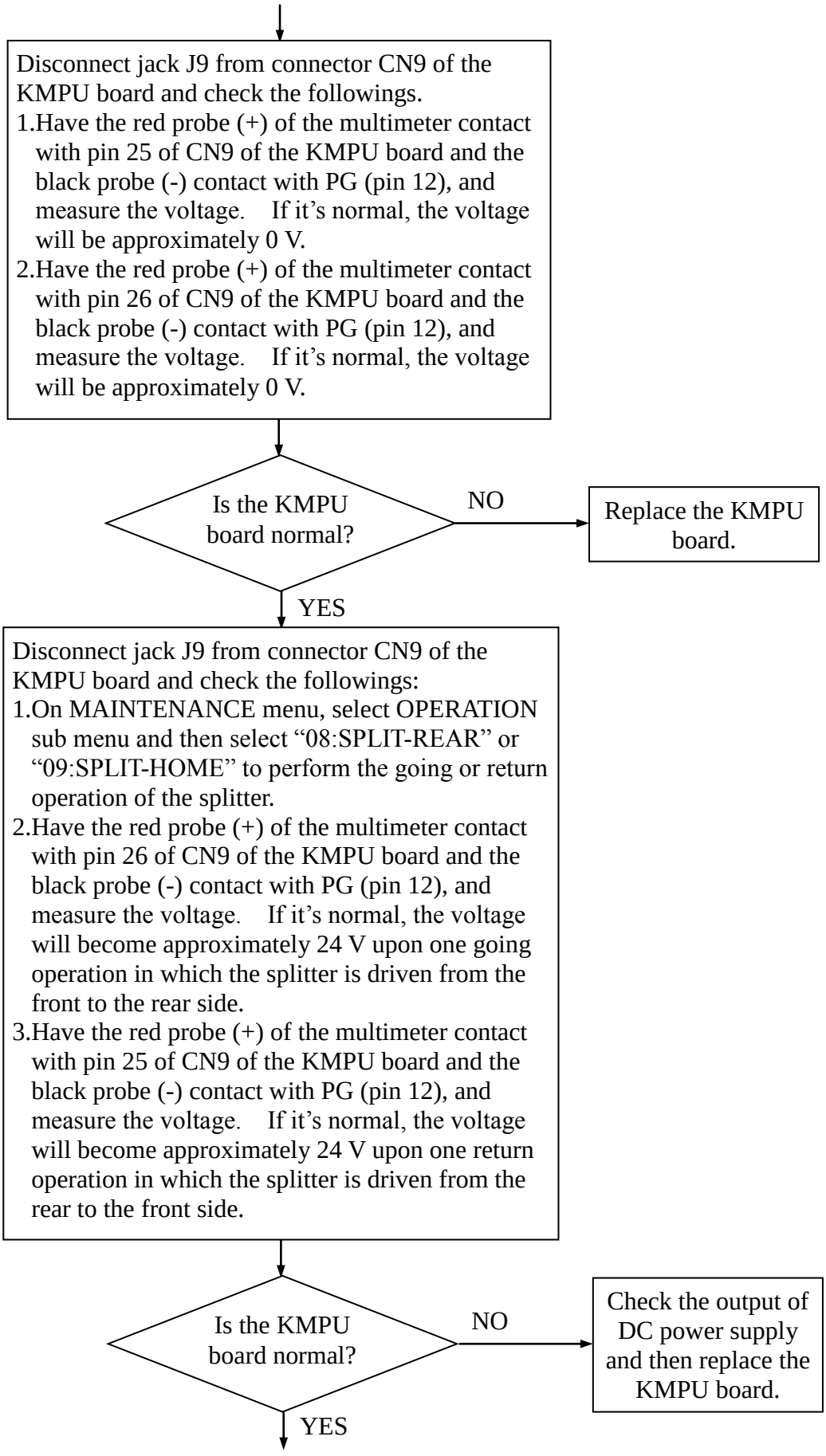


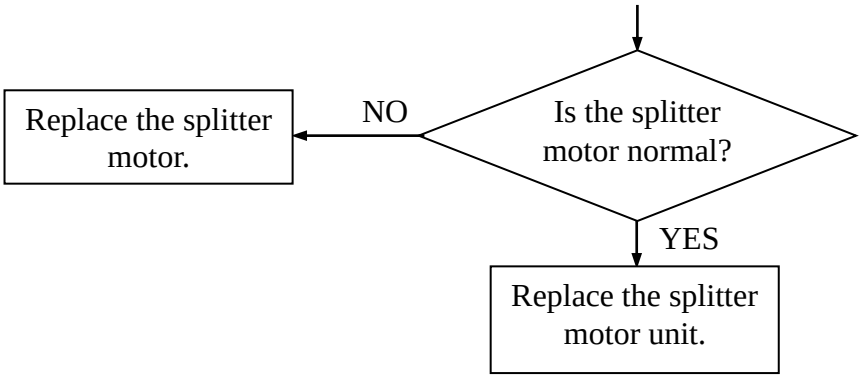
Error Code 07: Scuff lever open



Error Code 0A/0B: Splitter failure (during movement towards front/rear)




Disconnect jack J9 from connector CN9 of the KMPU board and check the followings.
1.Have the red probe (+) of the multimeter contact with pin 25 of CN9 of the KMPU board and the black probe (-) contact with PG (pin 12), and measure the voltage. If it's normal, the voltage will be approximately 0 V.
2.Have the red probe (+) of the multimeter contact with pin 26 of CN9 of the KMPU board and the black probe (-) contact with PG (pin 12), and measure the voltage. If it's normal, the voltage will be approximately 0 V.
Is the KMPU board normal?
NO
Replace the KMPU board.
YES
Disconnect jack J9 from connector CN9 of the KMPU board and check the followings:
1.On MAINTENANCE menu, select OPERATION sub menu and then select "08:SPLIT-REAR" or "09:SPLIT-HOME" to perform the going or return operation of the splitter.
2.Have the red probe (+) of the multimeter contact with pin 26 of CN9 of the KMPU board and the black probe (-) contact with PG (pin 12), and measure the voltage. If it's normal, the voltage will become approximately 24 V upon one going operation in which the splitter is driven from the front to the rear side.
3.Have the red probe (+) of the multimeter contact with pin 25 of CN9 of the KMPU board and the black probe (-) contact with PG (pin 12), and measure the voltage. If it's normal, the voltage will become approximately 24 V upon one return operation in which the splitter is driven from the rear to the front side.
Is the KMPU board normal?
NO
Check the output of DC power supply and then replace the KMPU board.
YES


Is the splitter motor normal?
NO
Replace the splitter motor.
YES
Replace the splitter motor unit.

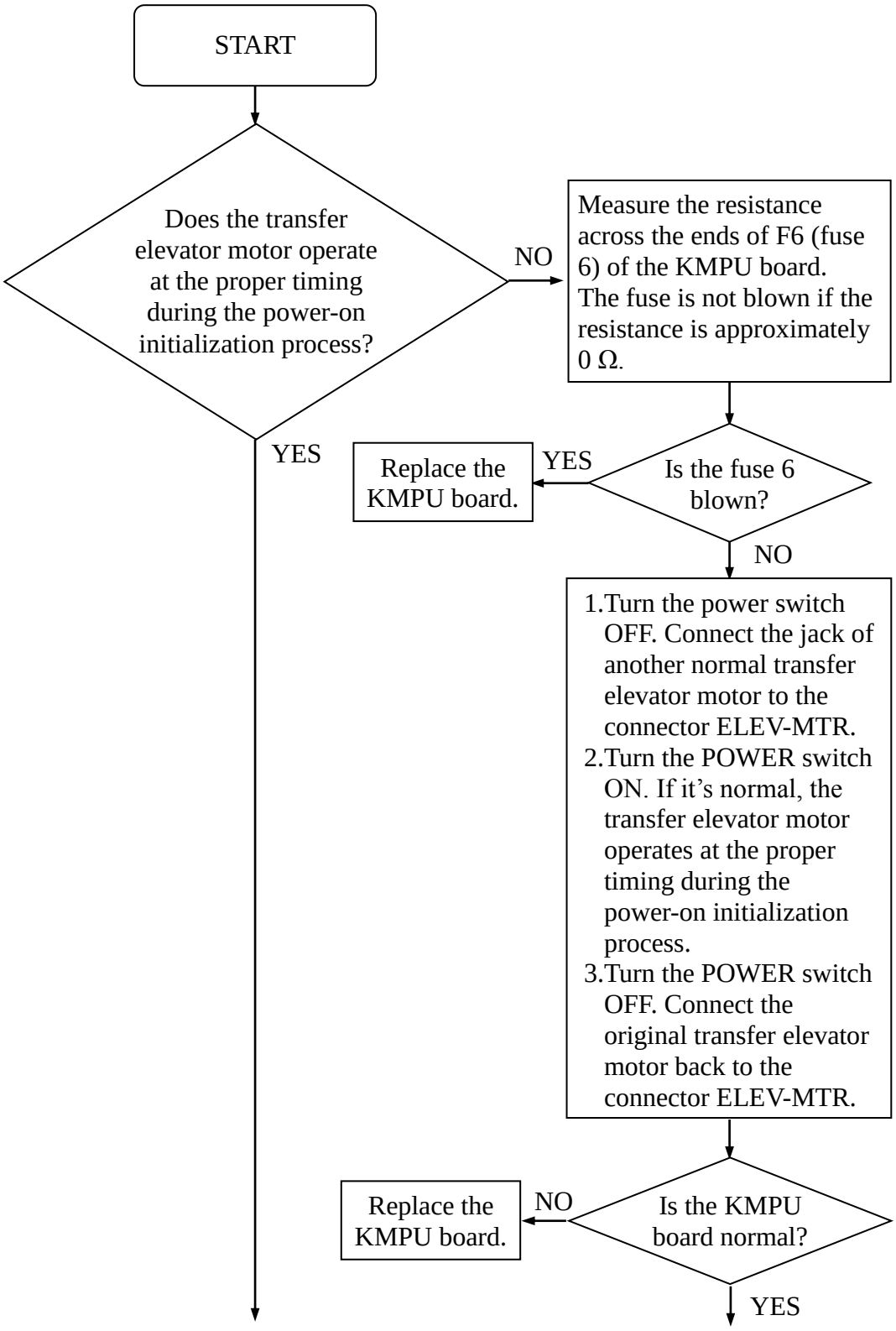
Error Code 0C/0D: Elevator motor failure (during upward/downward movement)

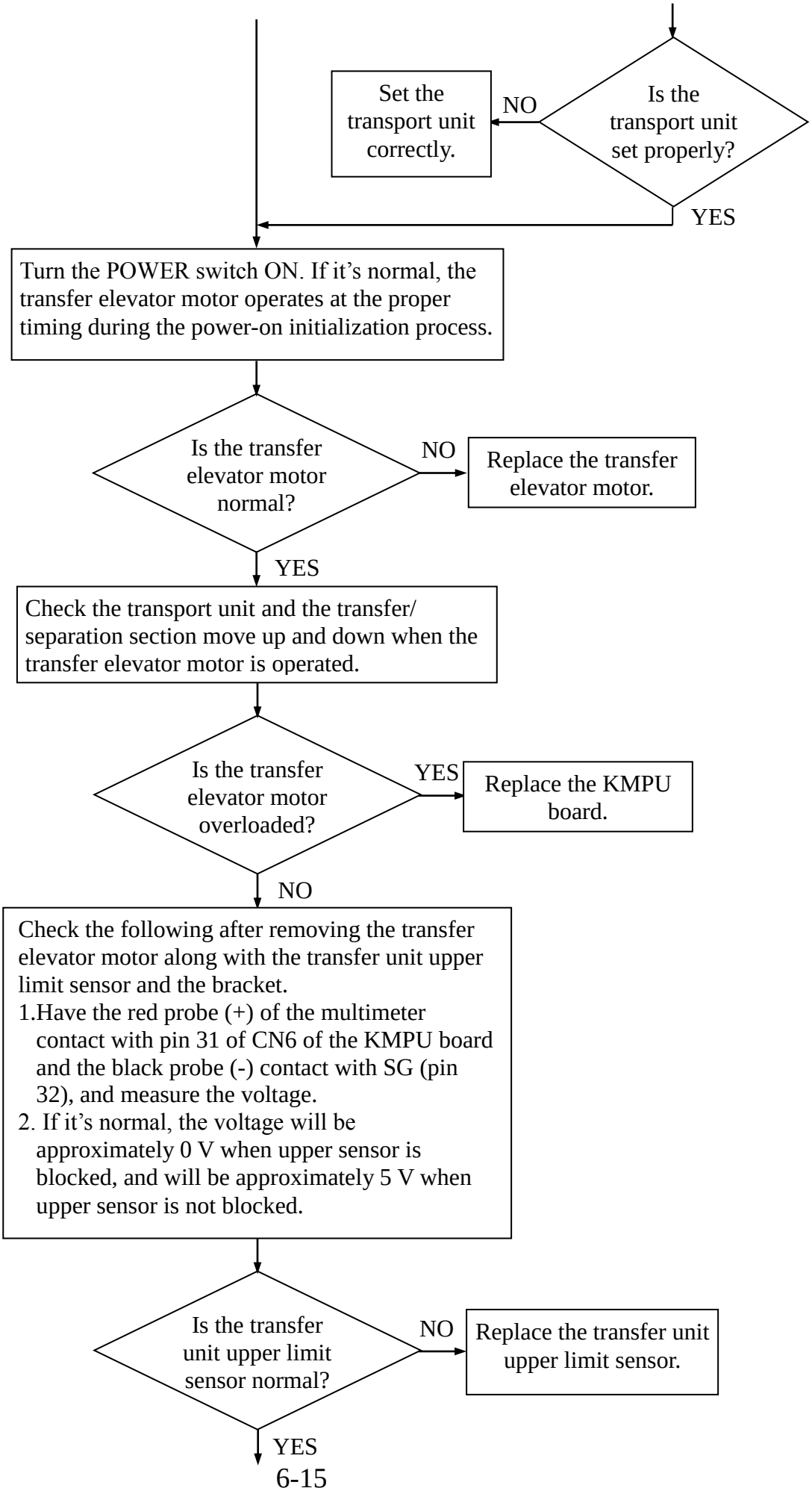
Main Causes:

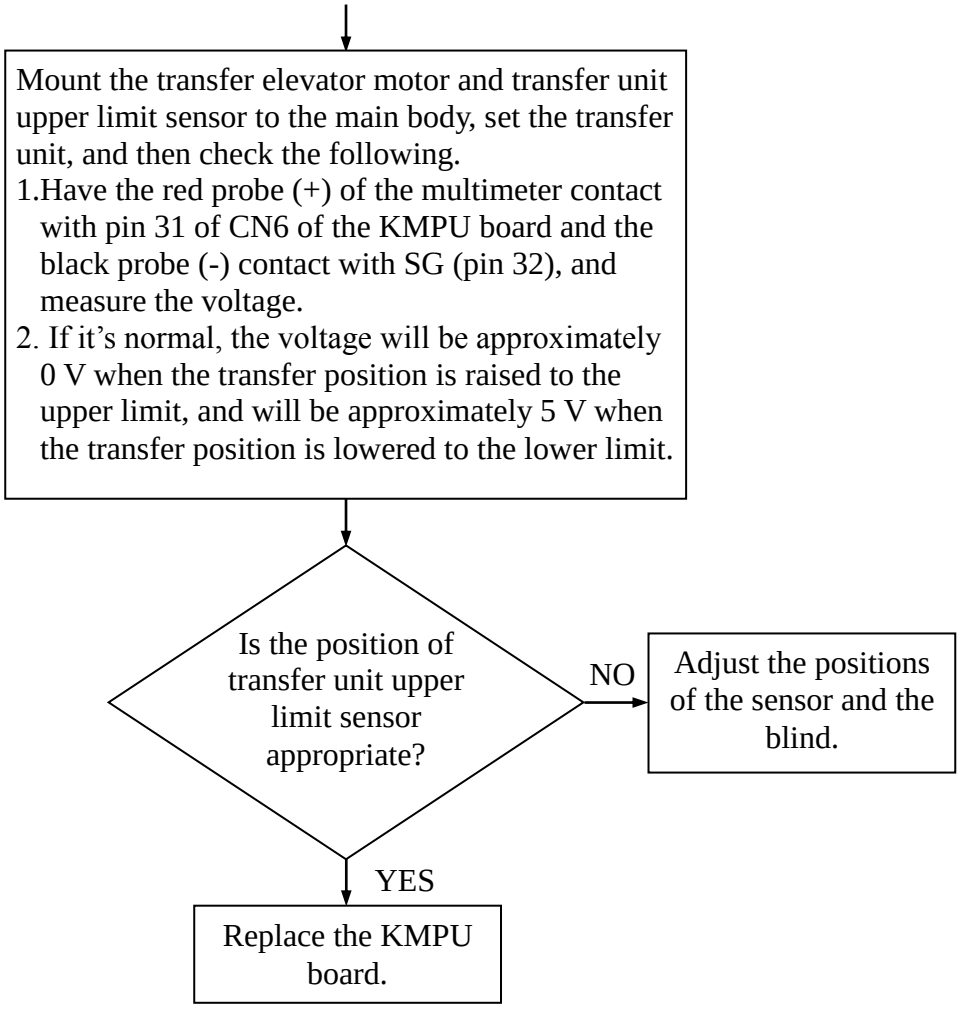
1.The transport unit is not pushed in adequately.

2. Breakage of the transfer unit upper limit sensor.

3. The transfer unit upper limit sensor is dirty.



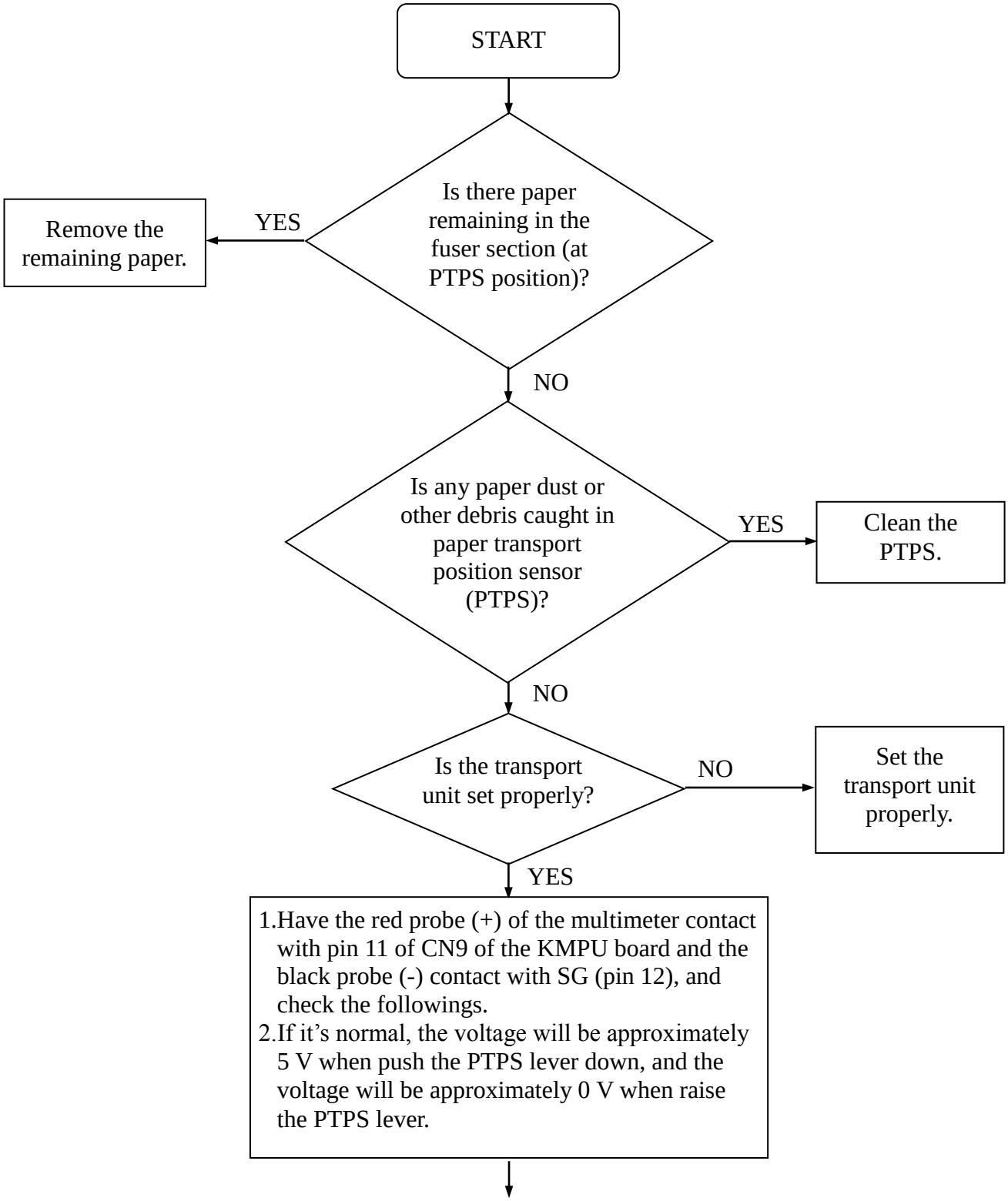

Is the transport unit set properly?
NO
Set the transport unit correctly.
YES
Turn the POWER switch ON. If it's normal, the transfer elevator motor operates at the proper timing during the power-on initialization process.
Is the transfer elevator motor normal?
NO
Replace the transfer elevator motor.
YES
Check the transport unit and the transfer/ separation section move up and down when the transfer elevator motor is operated.
Is the transfer elevator motor overloaded?
YES
Replace the KMPU board.
NO
Check the following after removing the transfer elevator motor along with the transfer unit upper limit sensor and the bracket.
1.Have the red probe (+) of the multimeter contact with pin 31 of CN6 of the KMPU board and the black probe (-) contact with SG (pin 32), and measure the voltage.
2. If it's normal, the voltage will be approximately 0 V when upper sensor is blocked, and will be approximately 5 V when upper sensor is not blocked.
Is the transfer unit upper limit sensor normal?
NO
Replace the transfer unit upper limit sensor.
YES

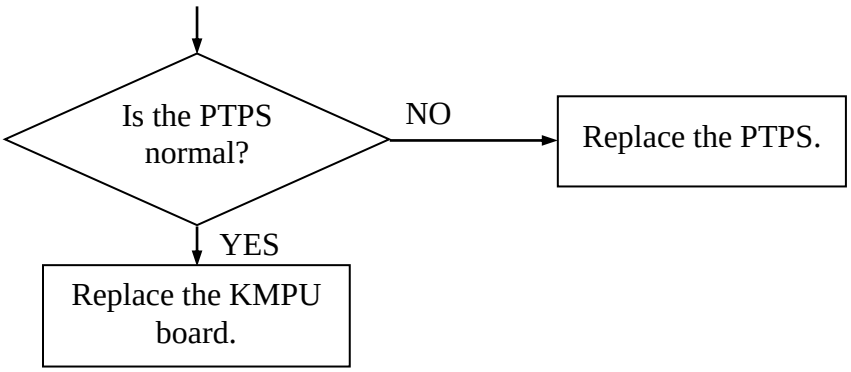

Mount the transfer elevator motor and transfer unit upper limit sensor to the main body, set the transfer unit, and then check the following.
1.Have the red probe (+) of the multimeter contact with pin 31 of CN6 of the KMPU board and the black probe (-) contact with SG (pin 32), and measure the voltage.
2. If it's normal, the voltage will be approximately 0 V when the transfer position is raised to the upper limit, and will be approximately 5 V when the transfer position is lowered to the lower limit.
Is the position of transfer unit upper limit sensor appropriate?
NO
Adjust the positions of the sensor and the blind.
YES
Replace the KMPU board.

Error Code 12: Paper remaining in fuser section (PTPS)

Main Causes:

1.Angle of PTPS actuator.
2.Warping of the transport belt.
3.Suction force.
4.Printing paper.



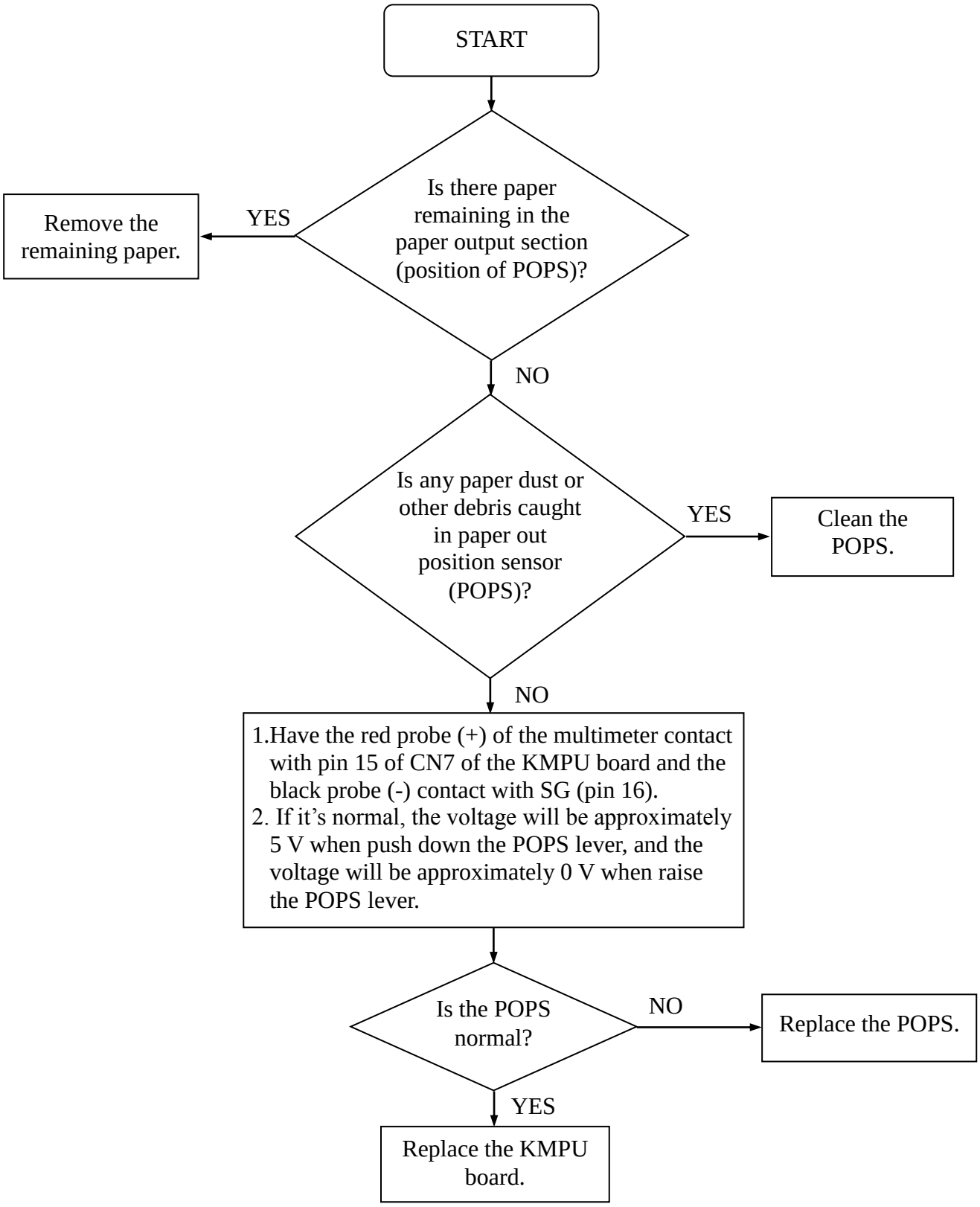

Is the PTPS normal?
NO
Replace the PTPS.
YES
Replace the KMPU board.

Error Code 13: Paper remaining in paper output section (POPS)

Main Causes:

1.Paper hits the paper guide.

2.The solenoid actuator is mounted poorly.



Error Code 16: Abnormal paper position (PTS)

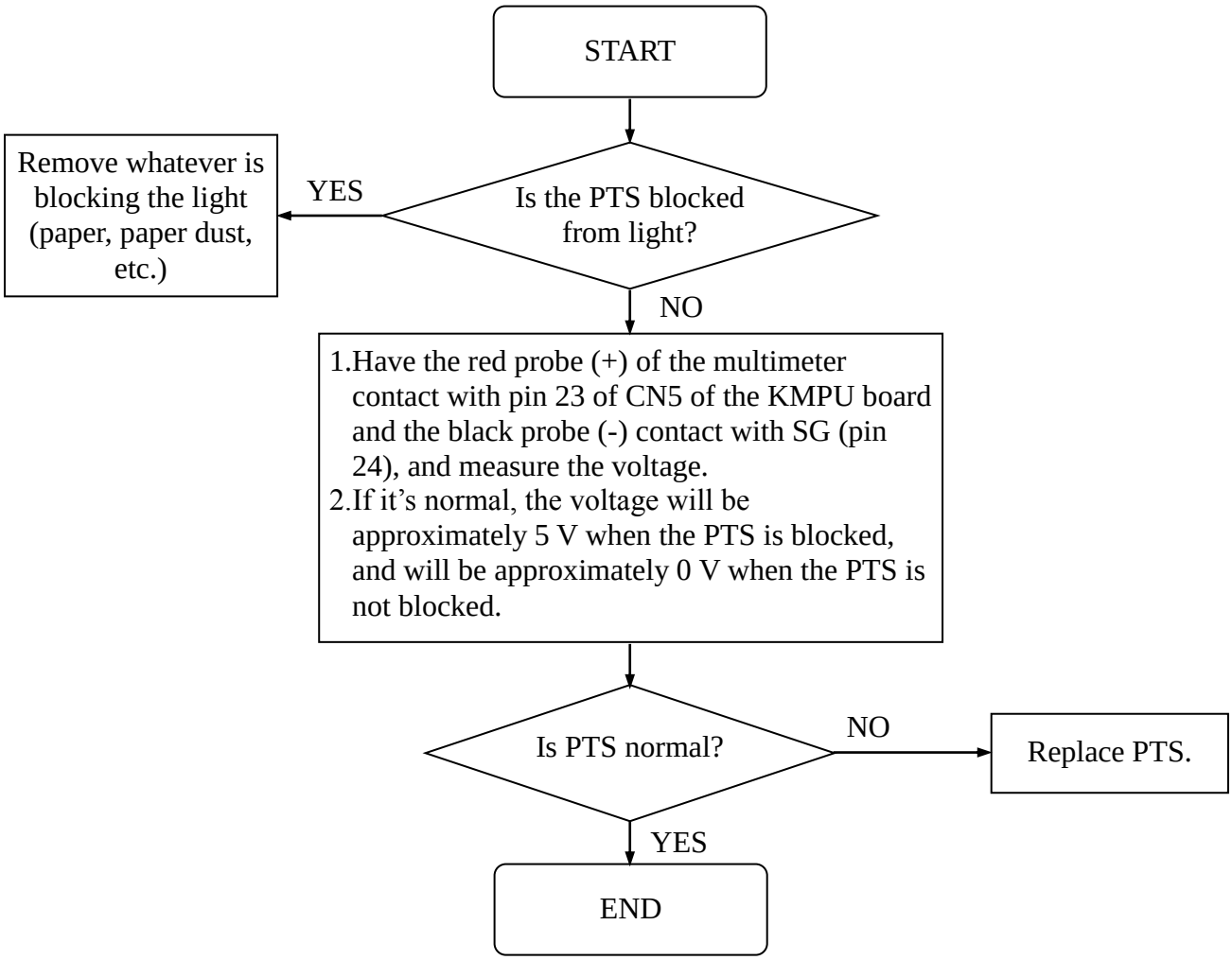
Main Causes:

1.Paper top sensor (PTS) position is wrong.

2.Tractor position is wrong (paper is too tight or too loose).

3.PTS is blocked.

4.The position at which the paper is set is wrong.

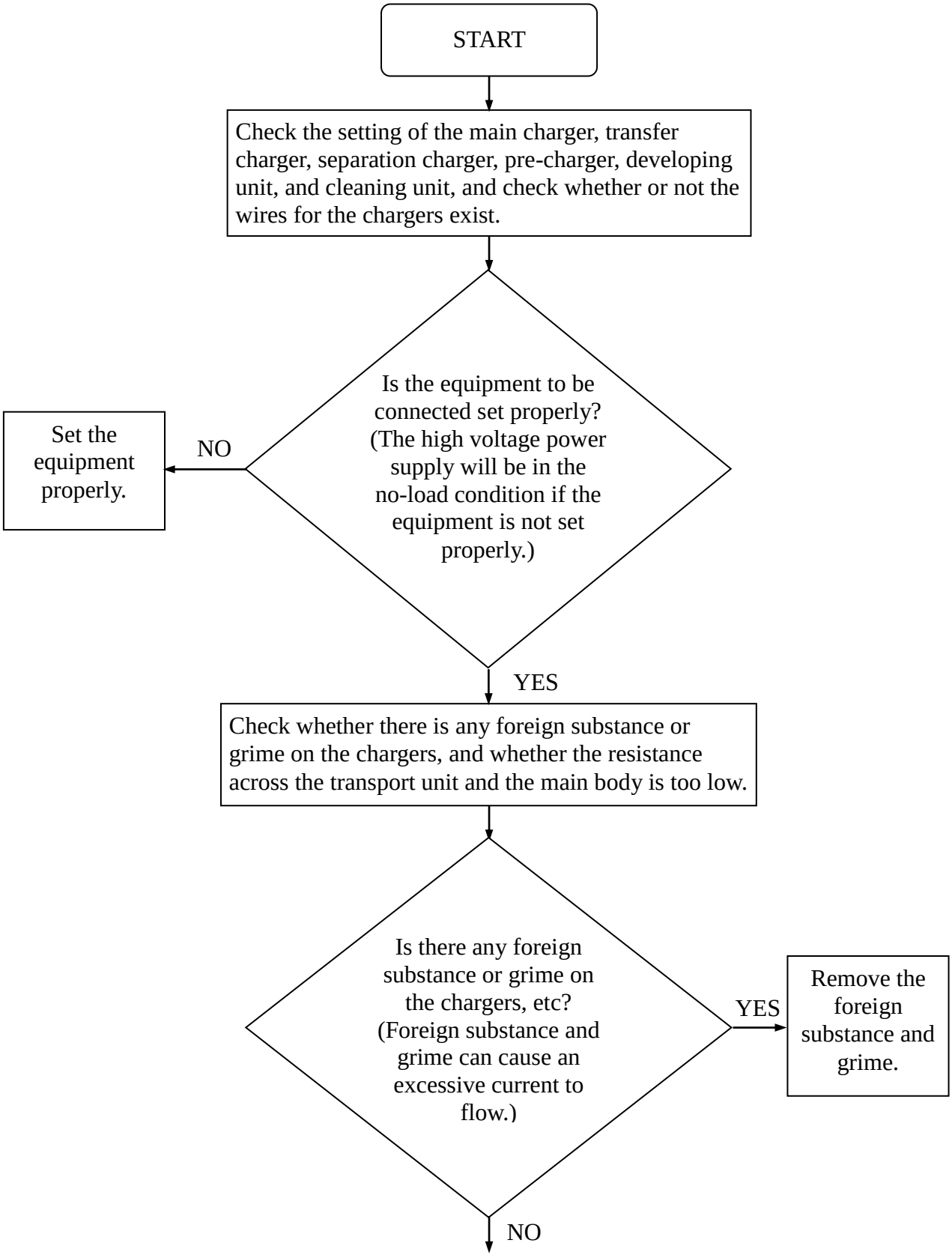


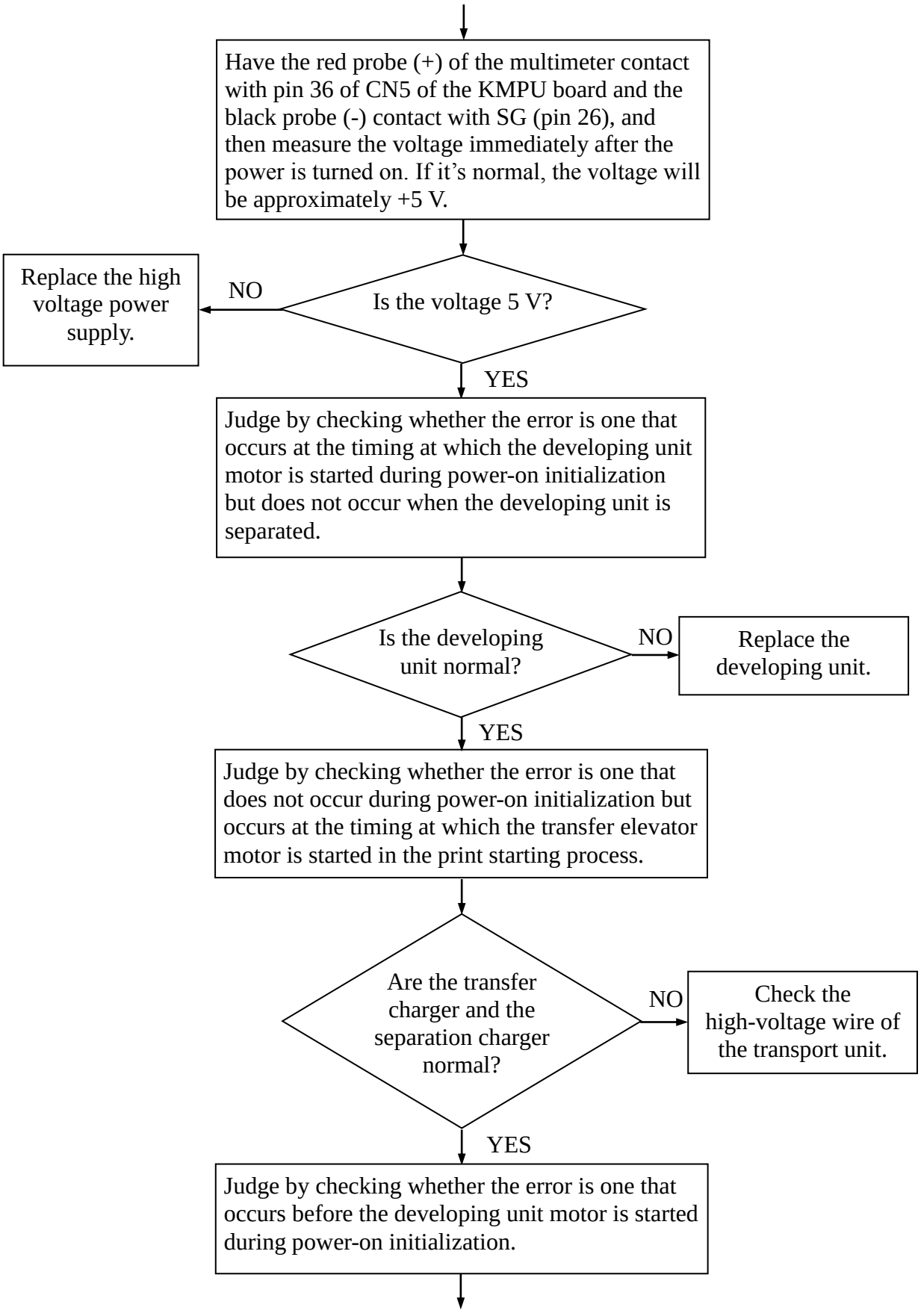
Error Code 17: High voltage failure

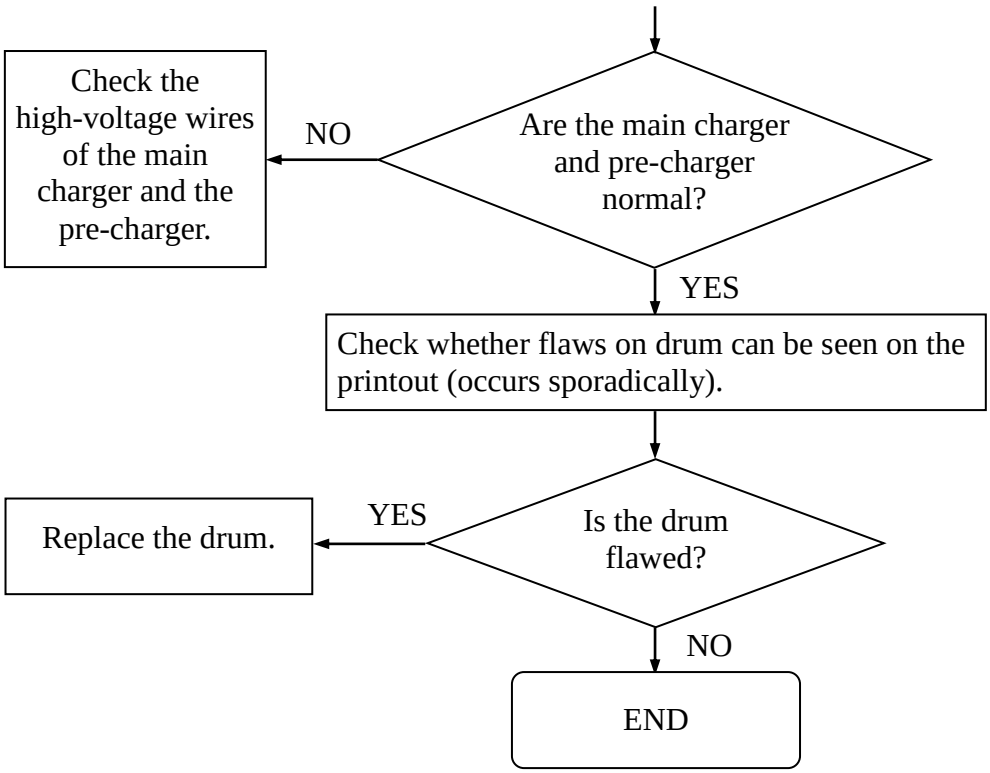
Main Causes:

1.The transport unit is in contact with the FG (Frame Ground) section. (The correct voltage is -750 V on the transport unit.)

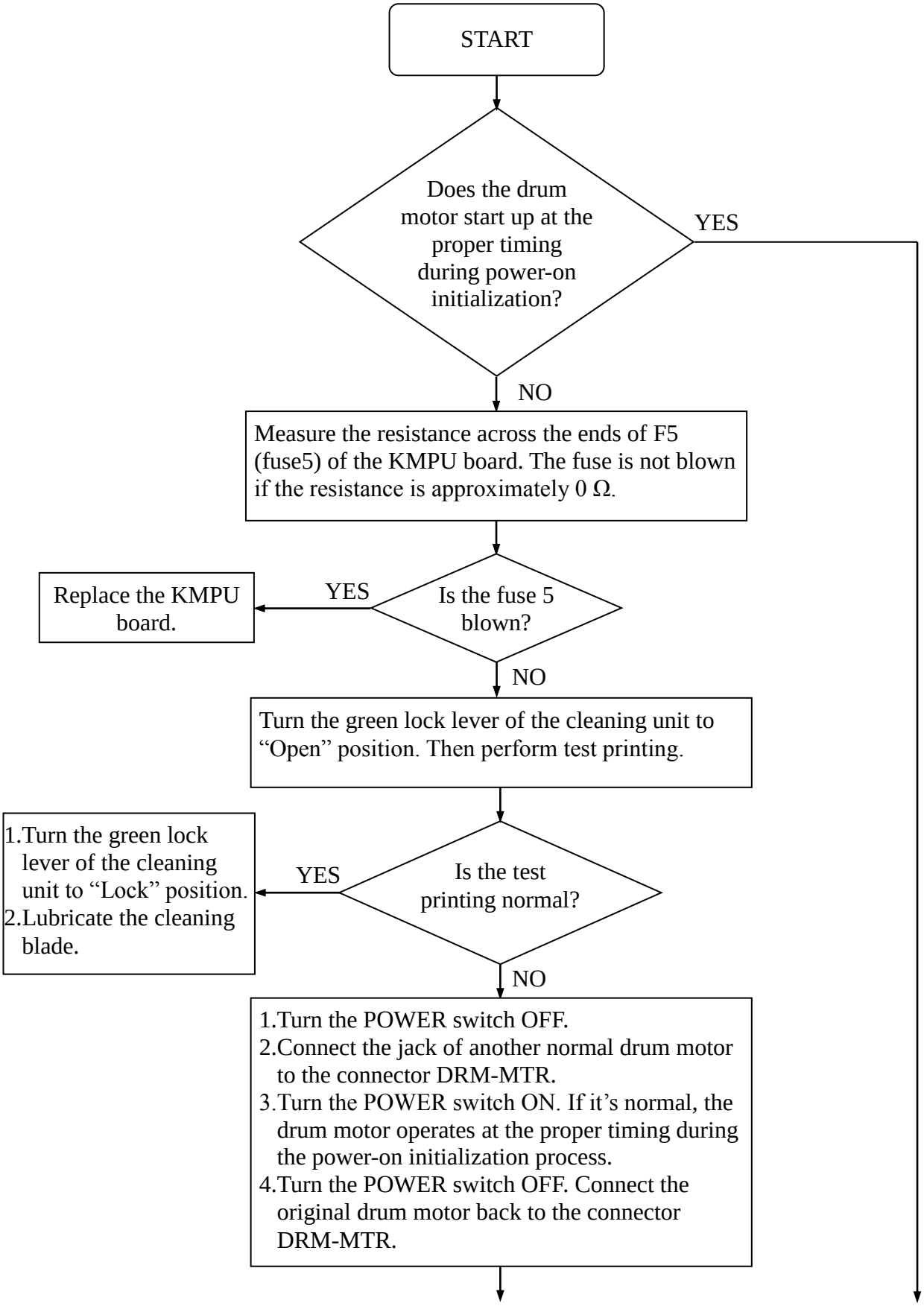
2.The corona wire of the charger is cut, or poor installation of the charger.

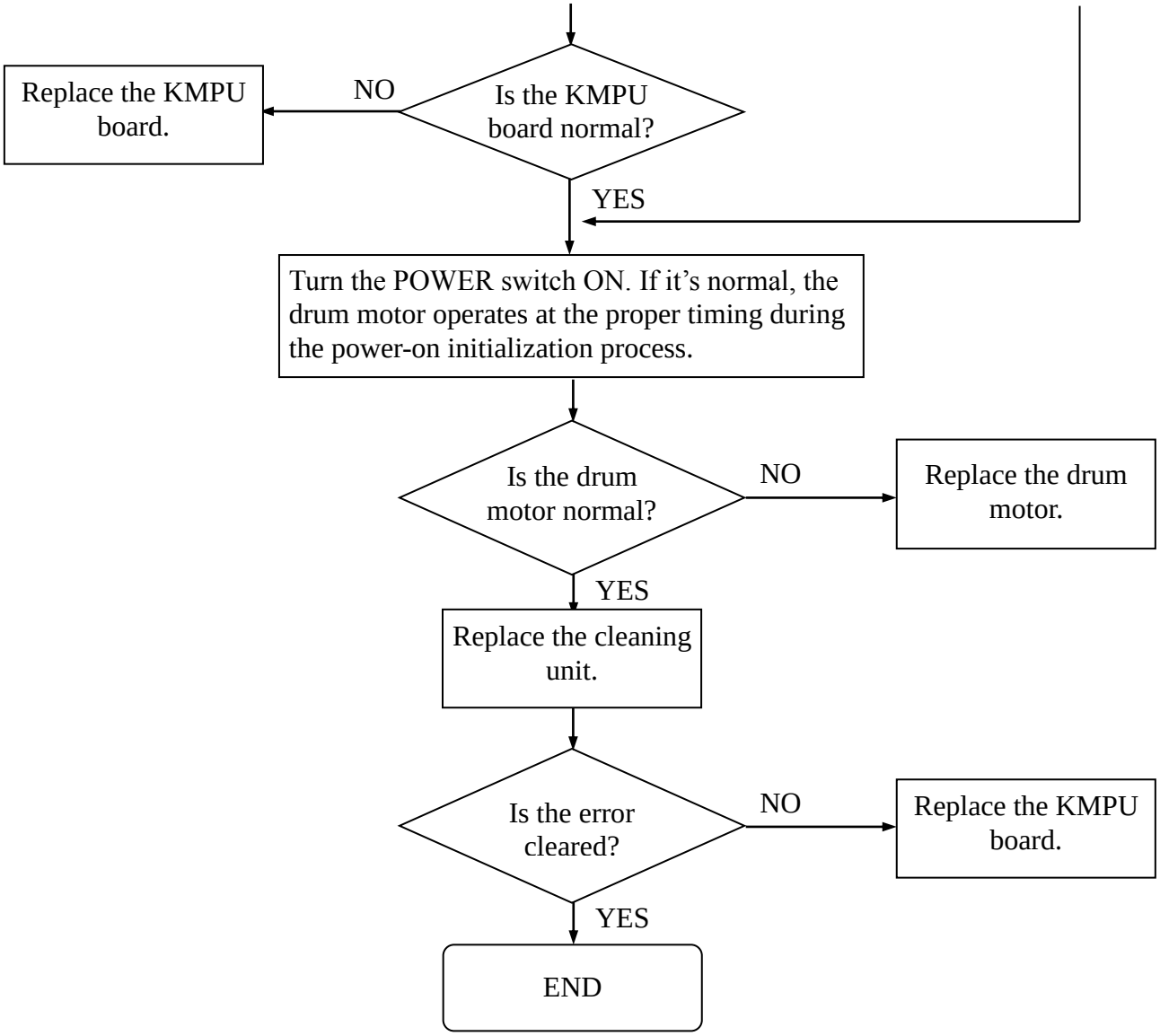



Have the red probe (+) of the multimeter contact with pin 36 of CN5 of the KMPU board and the black probe (-) contact with SG (pin 26), and then measure the voltage immediately after the power is turned on. If it's normal, the voltage will be approximately +5 V.
Is the voltage 5 V?
NO
Replace the high voltage power supply.
YES
Judge by checking whether the error is one that occurs at the timing at which the developing unit motor is started during power-on initialization but does not occur when the developing unit is separated.
Is the developing unit normal?
NO
Replace the developing unit.
YES
Judge by checking whether the error is one that does not occur during power-on initialization but occurs at the timing at which the transfer elevator motor is started in the print starting process.
Are the transfer charger and the separation charger normal?
NO
Check the high-voltage wire of the transport unit.
YES
Judge by checking whether the error is one that occurs before the developing unit motor is started during power-on initialization.

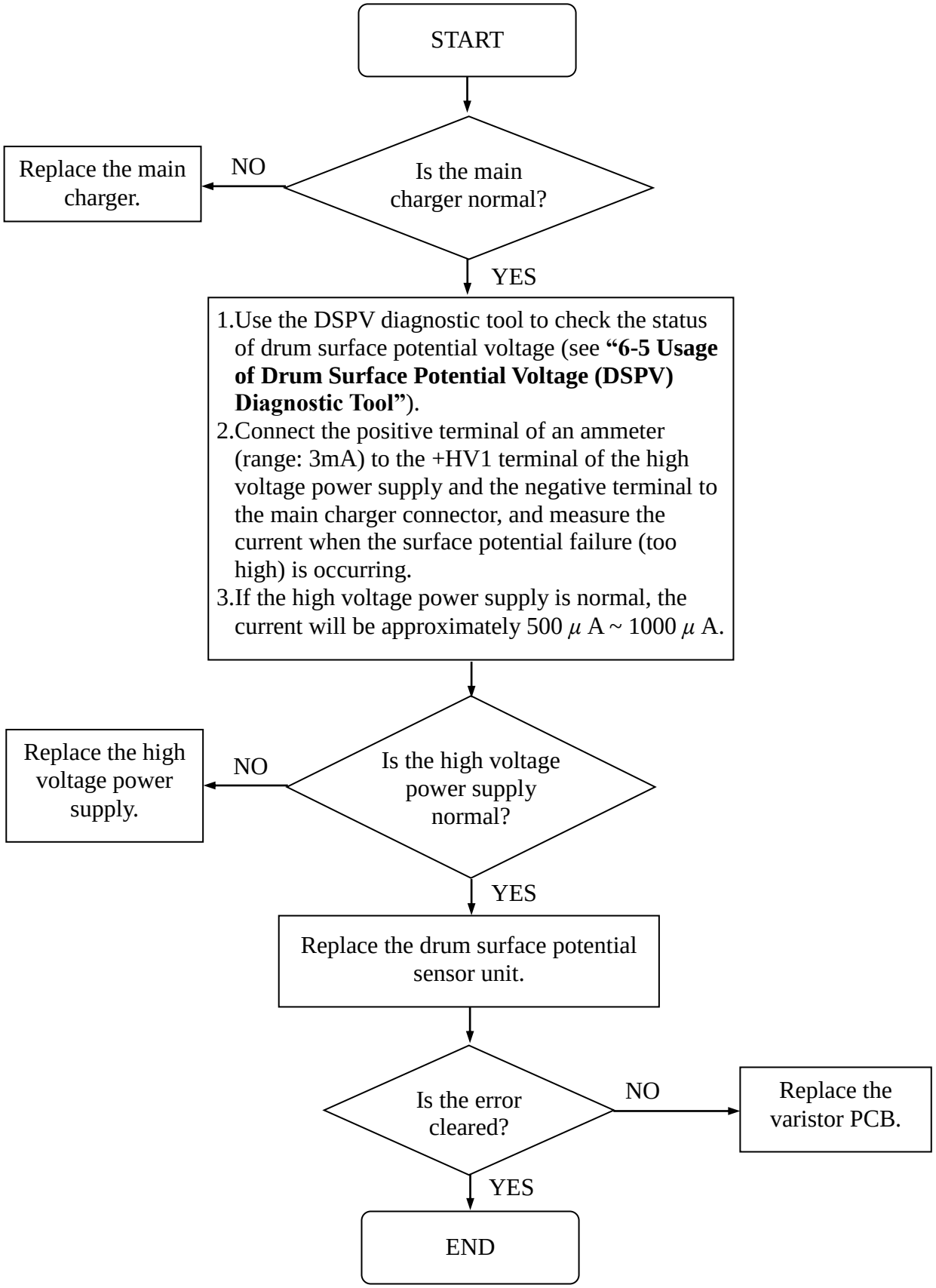

Are the main charger and pre-charger normal?
NO
Check the high-voltage wires of the main charger and the pre-charger.
YES
Check whether flaws on drum can be seen on the printout (occurs sporadically).
Is the drum flawed?
YES
Replace the drum.
NO
END

Error Code 18: Drum motor failure (Abnormal rotation speed)

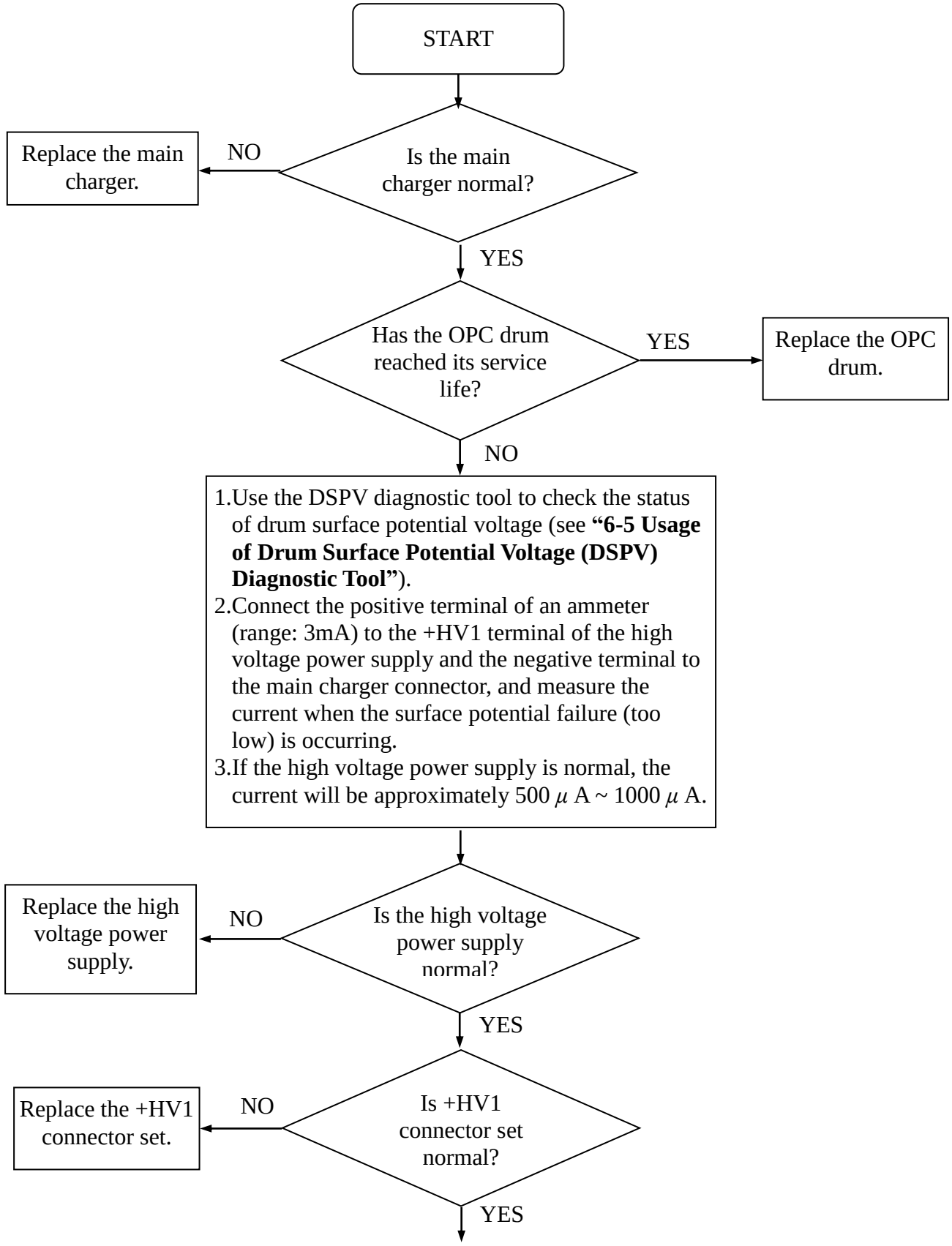


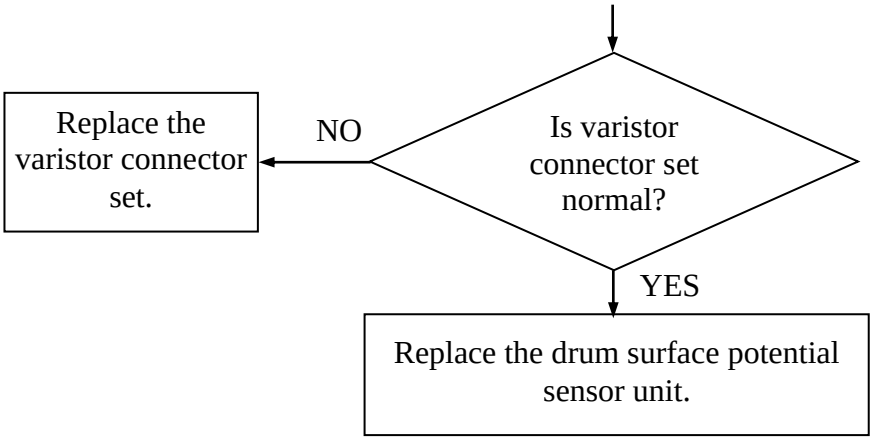

Is the KMPU board normal?
NO
Replace the KMPU board.
YES
Turn the POWER switch ON. If it's normal, the drum motor operates at the proper timing during the power-on initialization process.
Is the drum motor normal?
NO
Replace the drum motor.
YES
Replace the cleaning unit.
Is the error cleared?
NO
Replace the KMPU board.
YES
END

Error Code 19: Surface potential too high

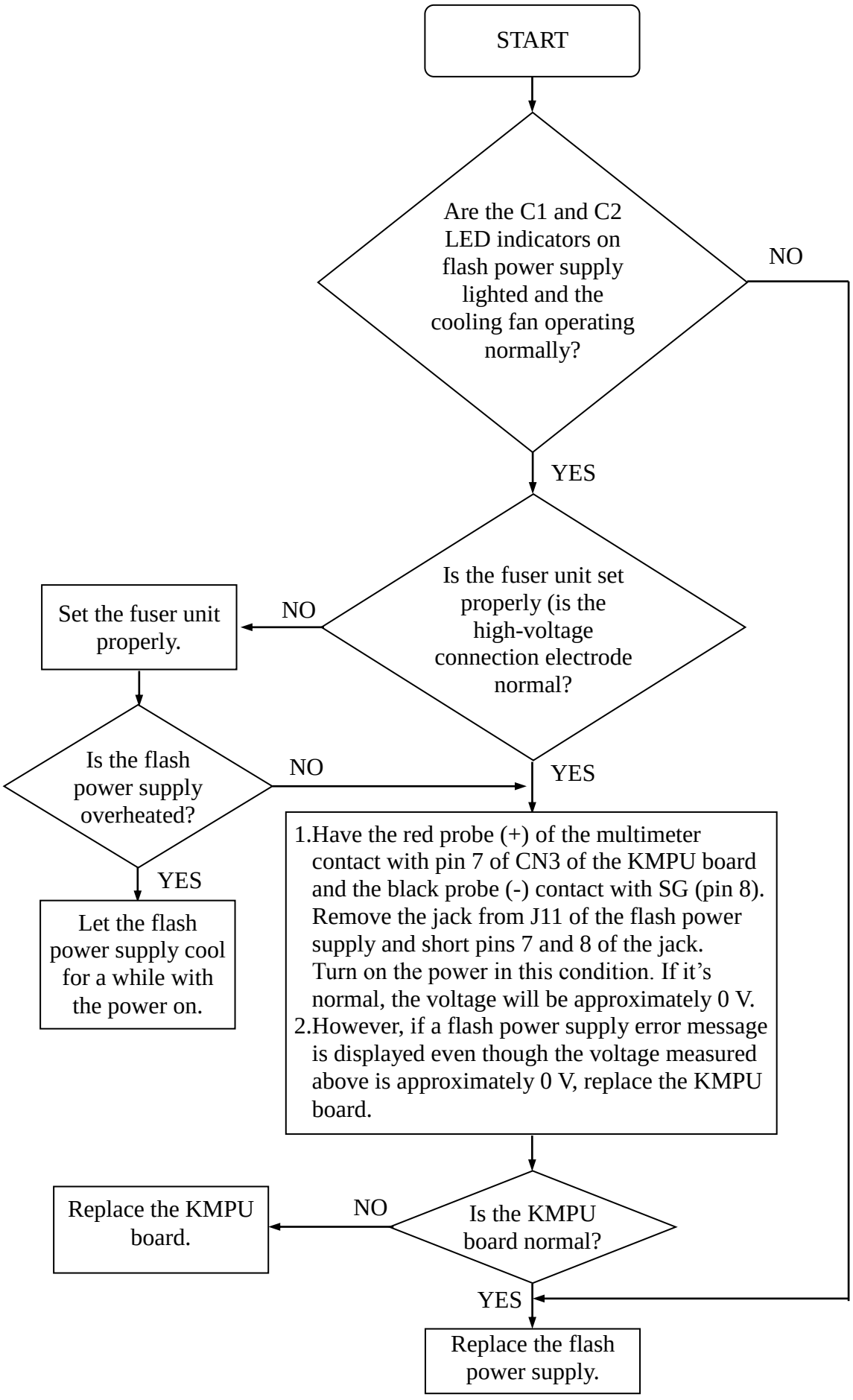


Error Code 1A: Surface potential too low

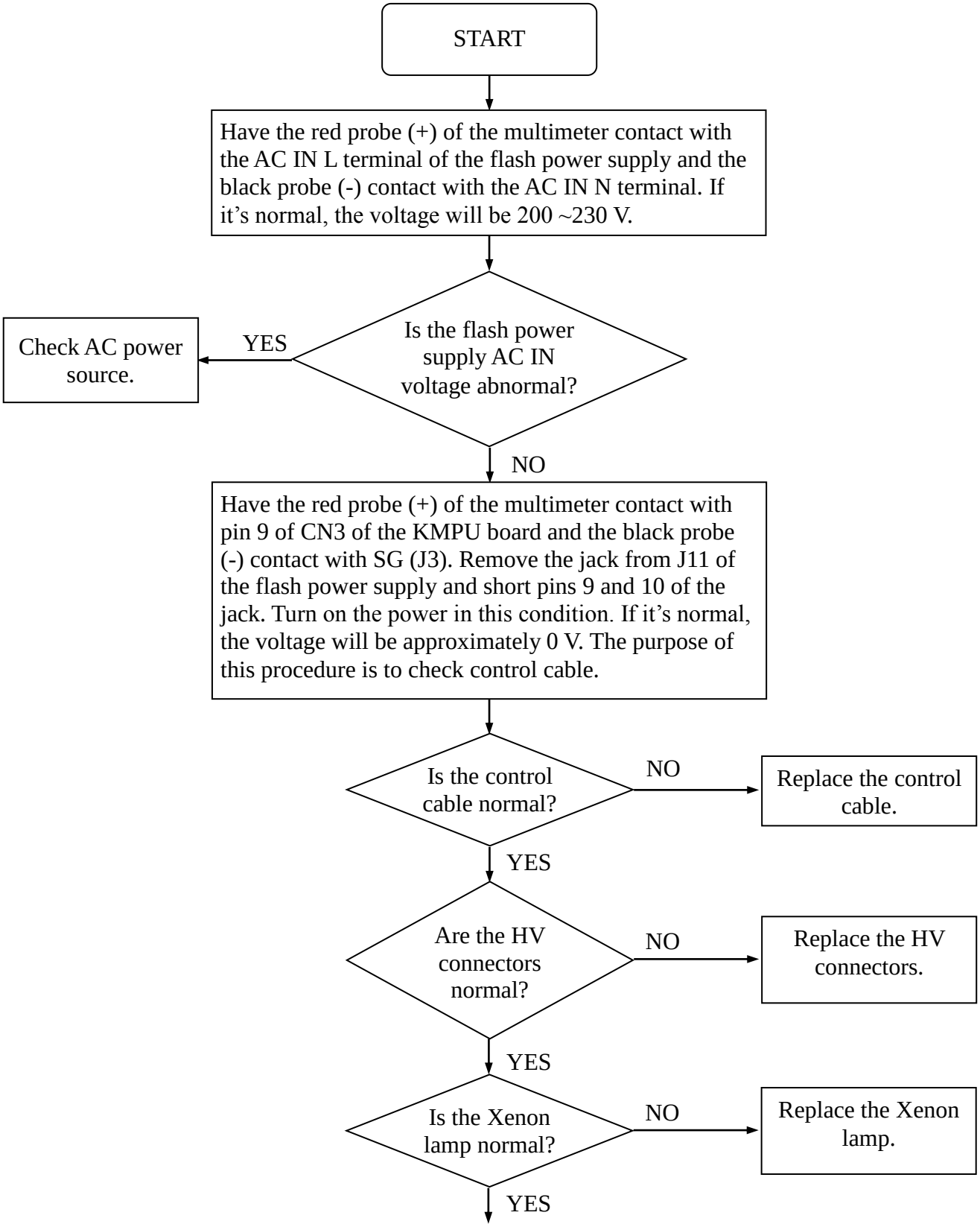


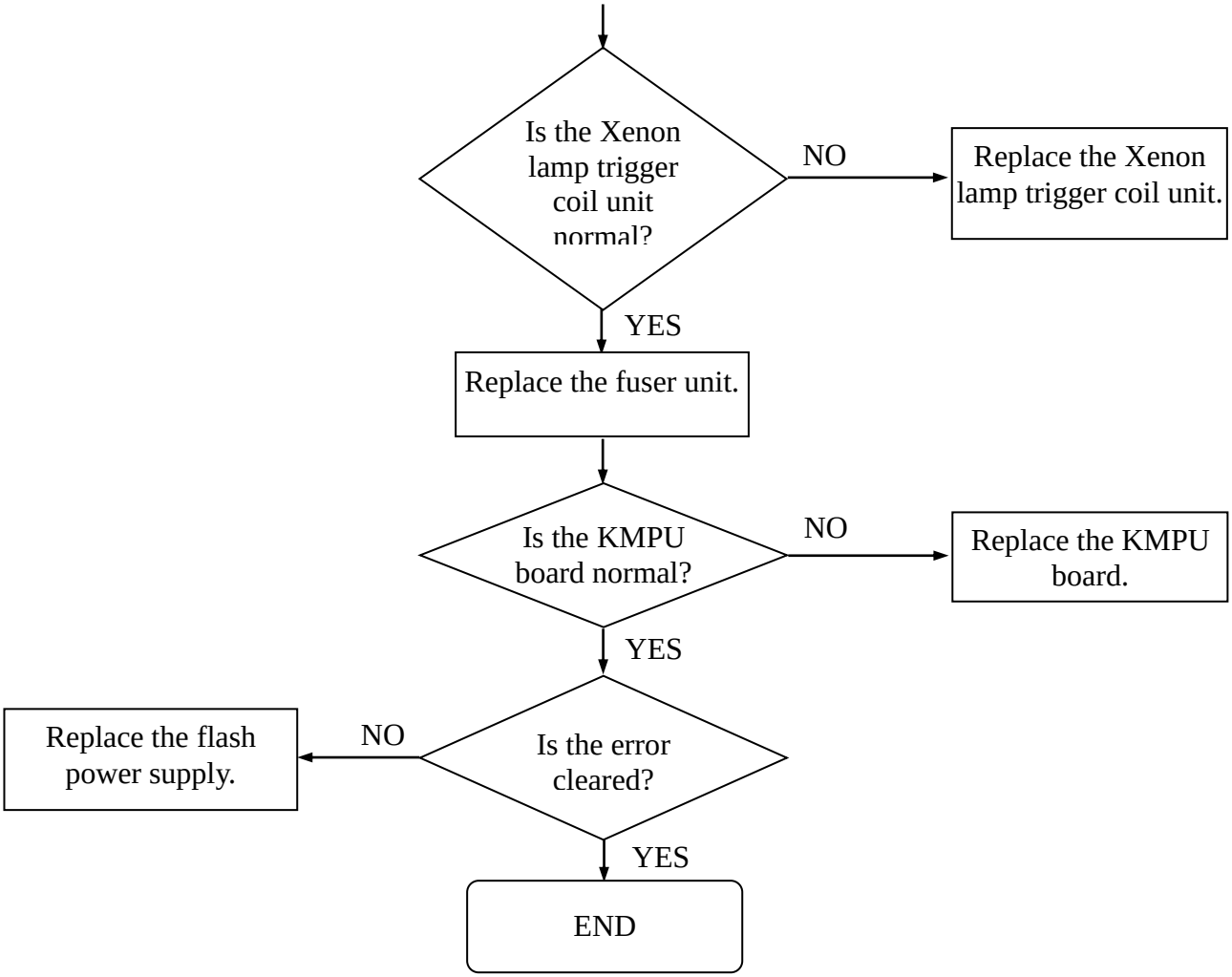

Is varistor connector set normal?
NO
Replace the varistor connector set.
YES
Replace the drum surface potential sensor unit.

Error Code 1E: Flash power supply failure



Error Code 1F: No. 1 Flash failure




Is the Xenon lamp trigger coil unit normal?
NO
Replace the Xenon lamp trigger coil unit.
YES
Replace the fuser unit.
Is the KMPU board normal?
NO
Replace the KMPU board.
YES
Is the error cleared?
NO
Replace the flash power supply.
YES
END

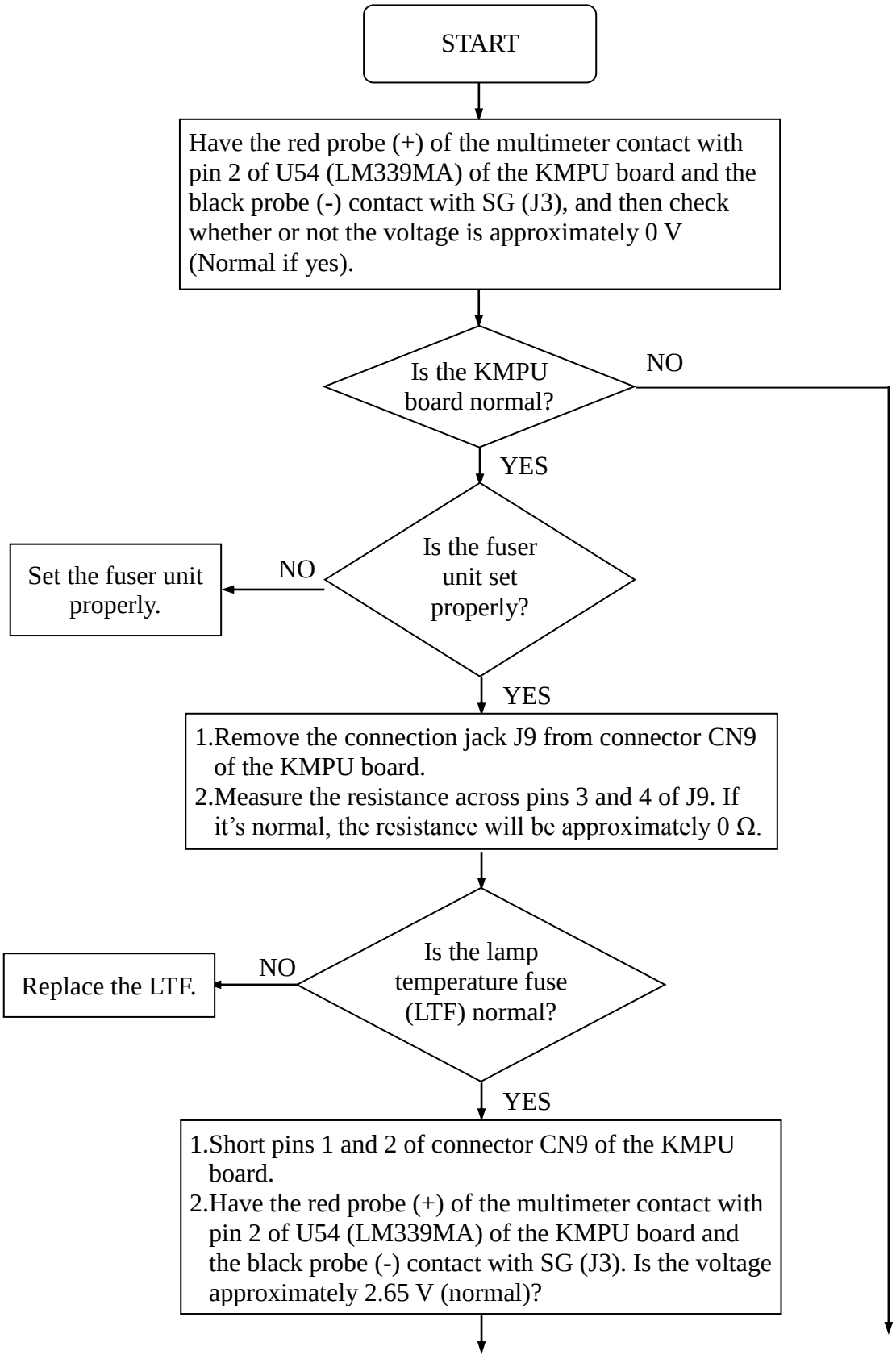
Error Code 20: Fuser unit overheat

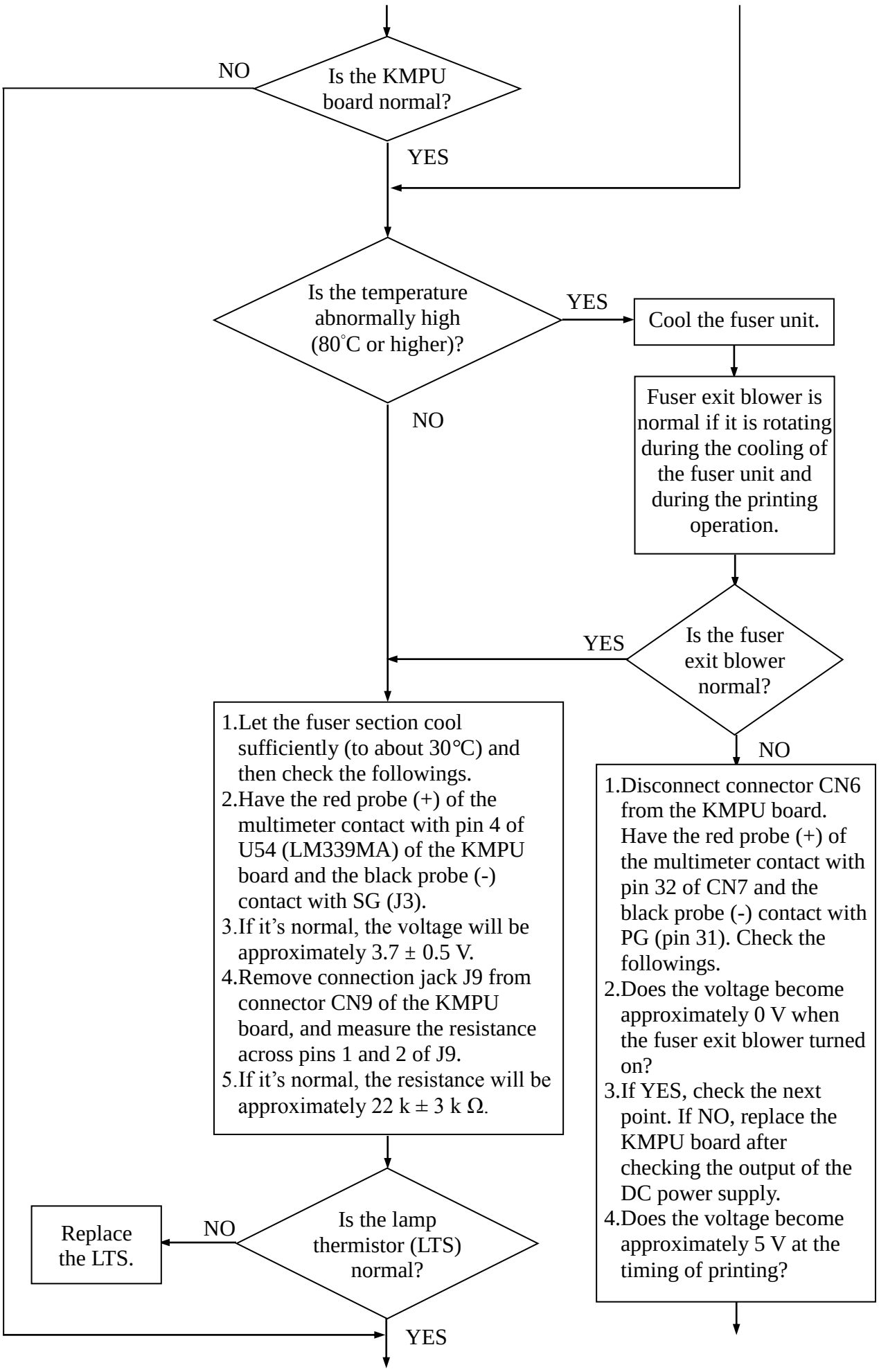
Main Causes:

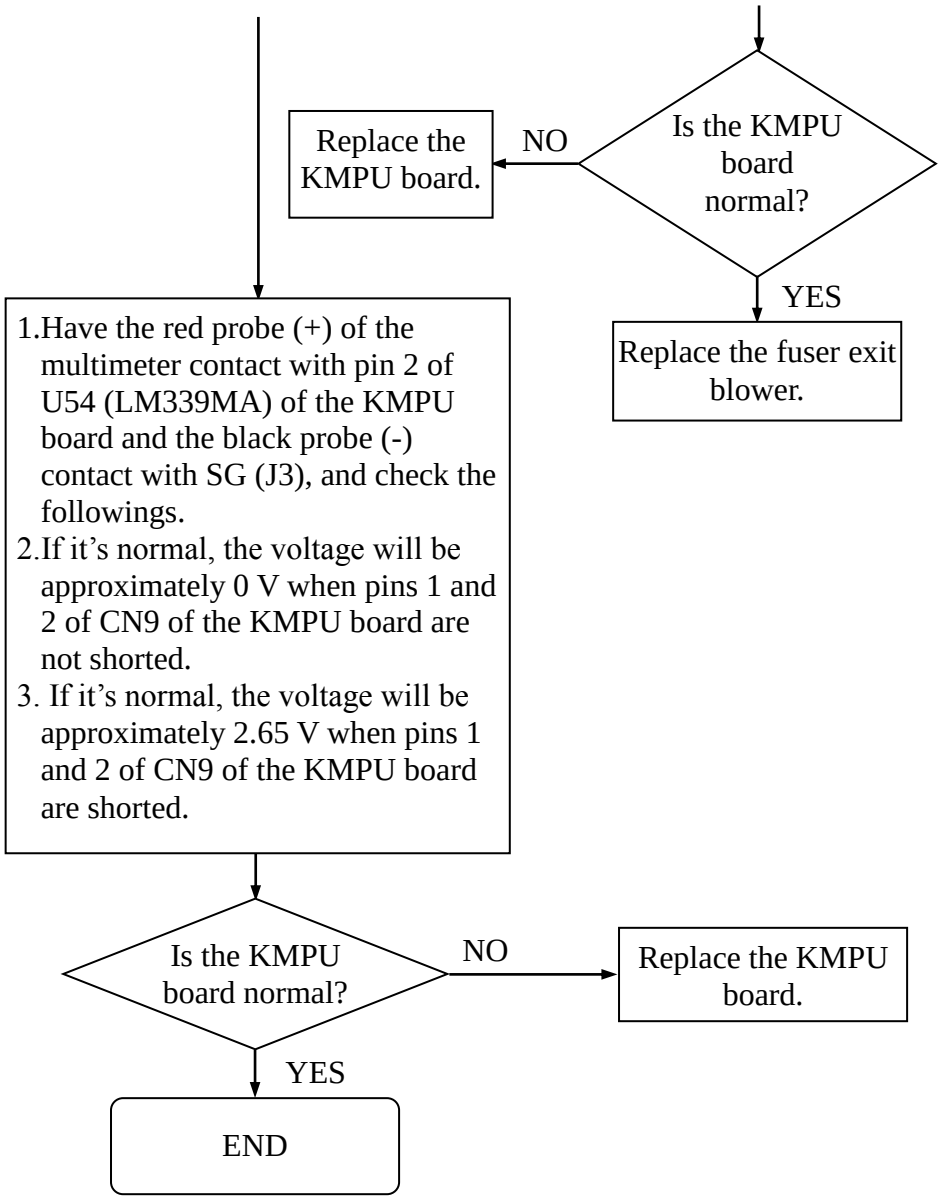
1.The fuser exit blower is stopped. Or the rotation speed of the blower is too low.

2.The fuser cover glass is not installed or is broken.

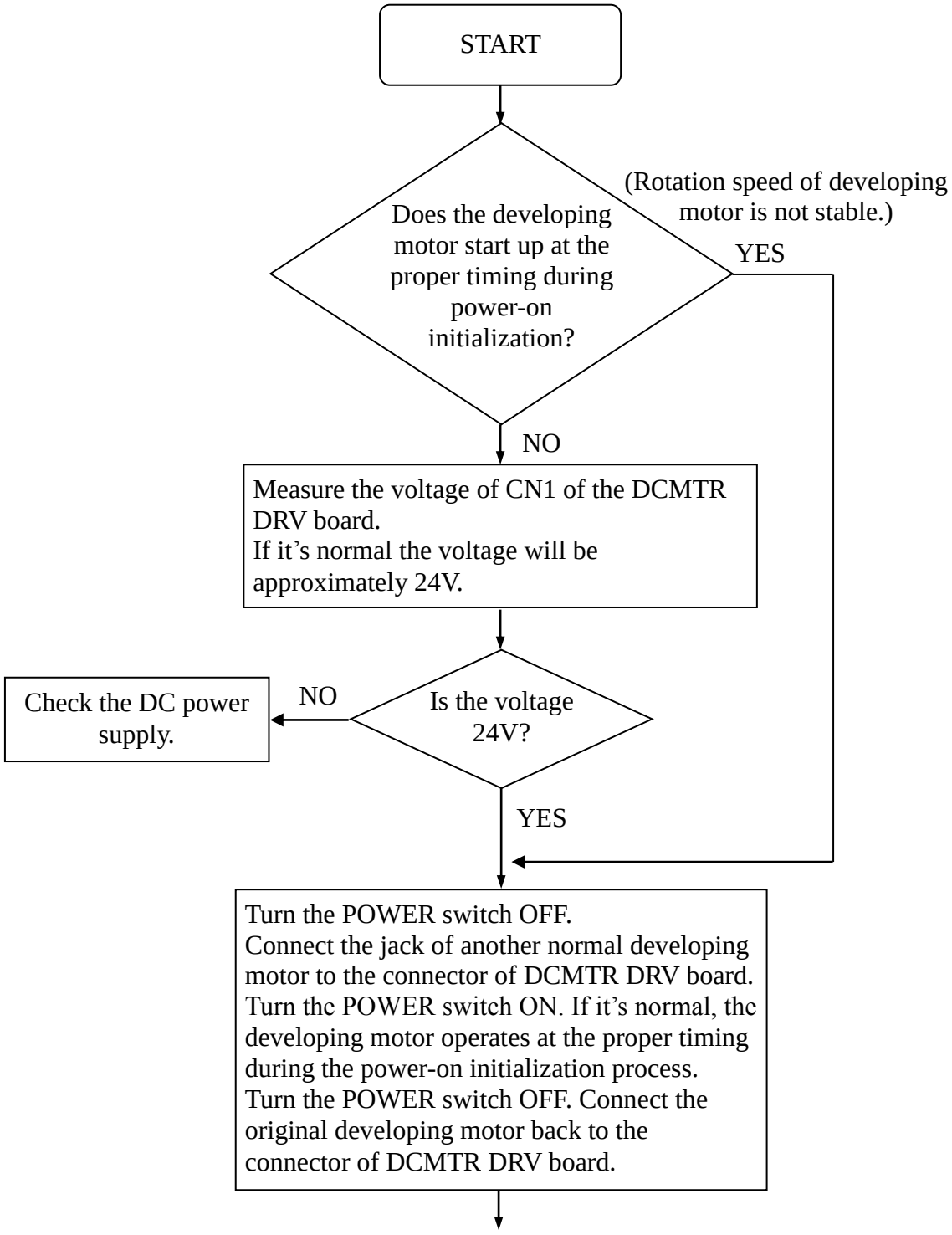
3.The fuser unit upper fan is stopped (check the 24 V power).

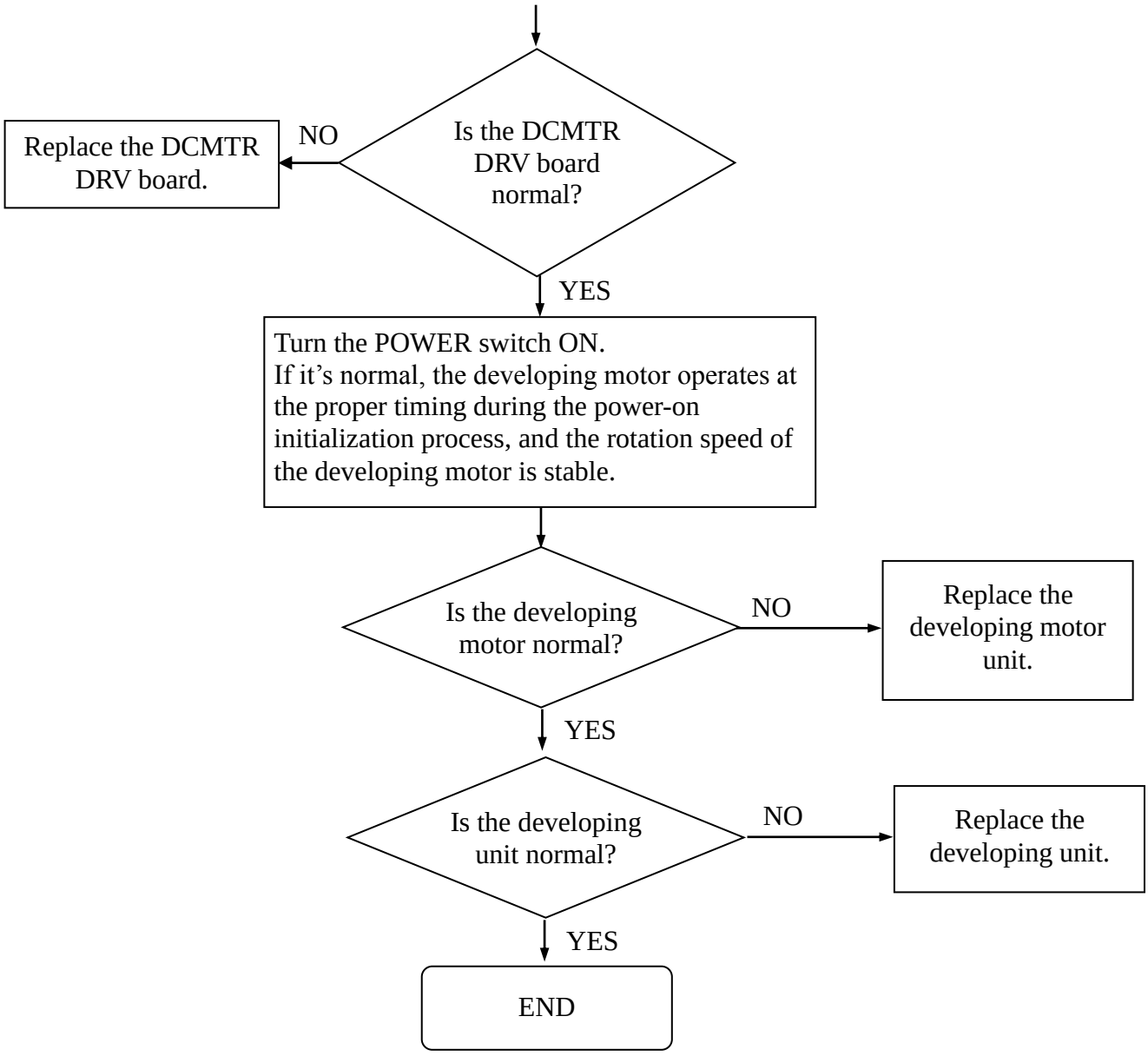



Is the KMPU board normal?
NO
YES
Is the temperature abnormally high (80˚C or higher)?
YES
Cool the fuser unit.
Fuser exit blower is normal if it is rotating during the cooling of the fuser unit and during the printing operation.
NO
Is the fuser exit blower normal?
YES
NO
1.Let the fuser section cool sufficiently (to about 30℃) and then check the followings.
2.Have the red probe (+) of the multimeter contact with pin 4 of U54 (LM339MA) of the KMPU board and the black probe (-) contact with SG (J3).
3.If it's normal, the voltage will be approximately 3.7 ± 0.5 V.
4.Remove connection jack J9 from connector CN9 of the KMPU board, and measure the resistance across pins 1 and 2 of J9.
5.If it's normal, the resistance will be approximately 22 k ± 3 k Ω.
1.Disconnect connector CN6 from the KMPU board. Have the red probe (+) of the multimeter contact with pin 32 of CN7 and the black probe (-) contact with PG (pin 31). Check the followings.
2.Does the voltage become approximately 0 V when the fuser exit blower turned on?
3.If YES, check the next point. If NO, replace the KMPU board after checking the output of the DC power supply.
4.Does the voltage become approximately 5 V at the timing of printing?
Is the lamp thermistor (LTS) normal?
NO
Replace the LTS.
YES

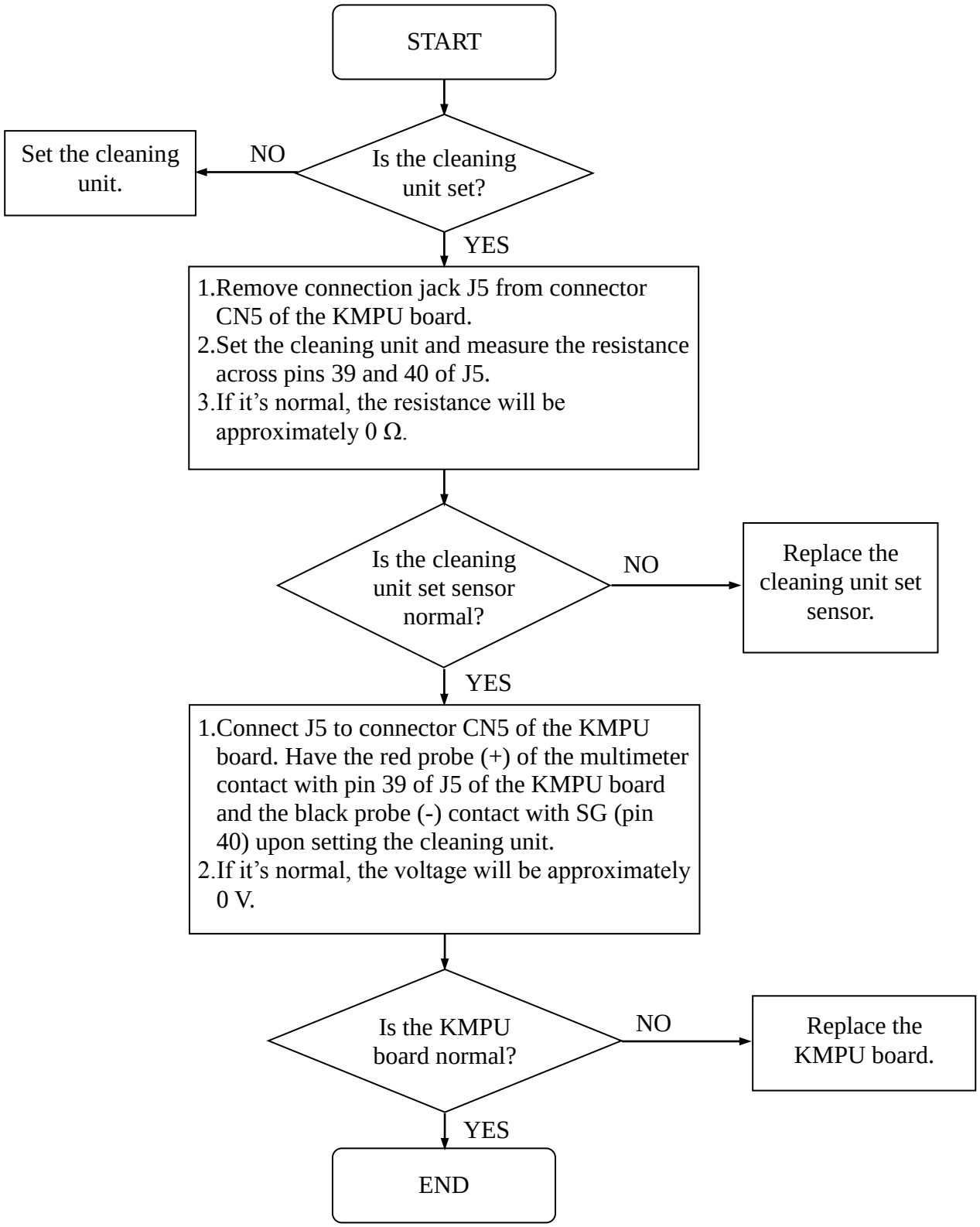

Is the KMPU board normal?
NO
Replace the KMPU board.
YES
Replace the fuser exit blower.
1.Have the red probe (+) of the multimeter contact with pin 2 of U54 (LM339MA) of the KMPU board and the black probe (-) contact with SG (J3), and check the followings.
2.If it's normal, the voltage will be approximately 0 V when pins 1 and 2 of CN9 of the KMPU board are not shorted.
3. If it's normal, the voltage will be approximately 2.65 V when pins 1 and 2 of CN9 of the KMPU board are shorted.
Is the KMPU board normal?
NO
Replace the KMPU board.
YES
END

Error Code 22: Developing motor failure

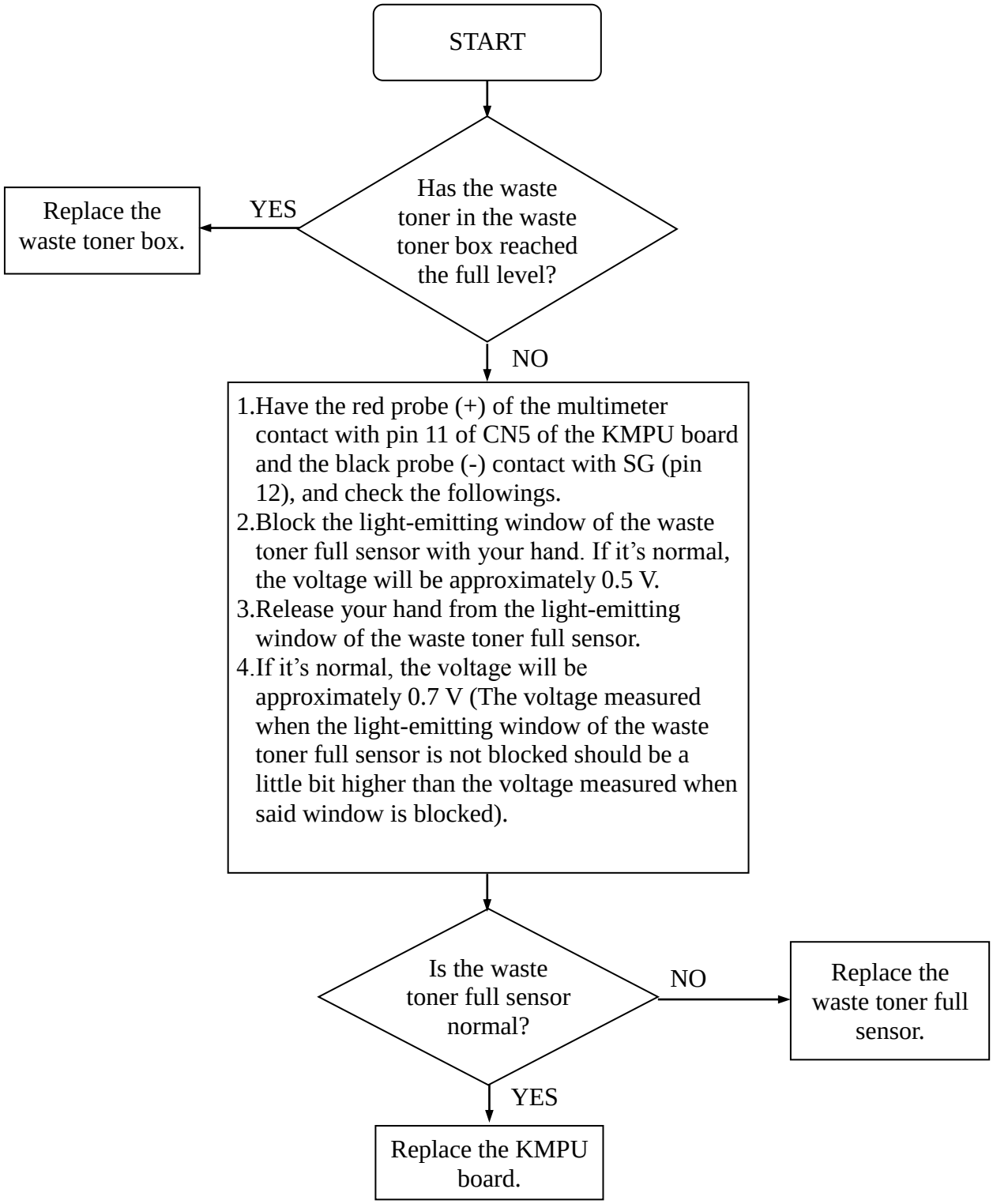



Is the DCMTR DRV board normal?
NO
Replace the DCMTR DRV board.
YES
Turn the POWER switch ON.
If it's normal, the developing motor operates at the proper timing during the power-on initialization process, and the rotation speed of the developing motor is stable.
Is the developing motor normal?
NO
Replace the developing motor unit.
YES
Is the developing unit normal?
NO
Replace the developing unit.
YES
END

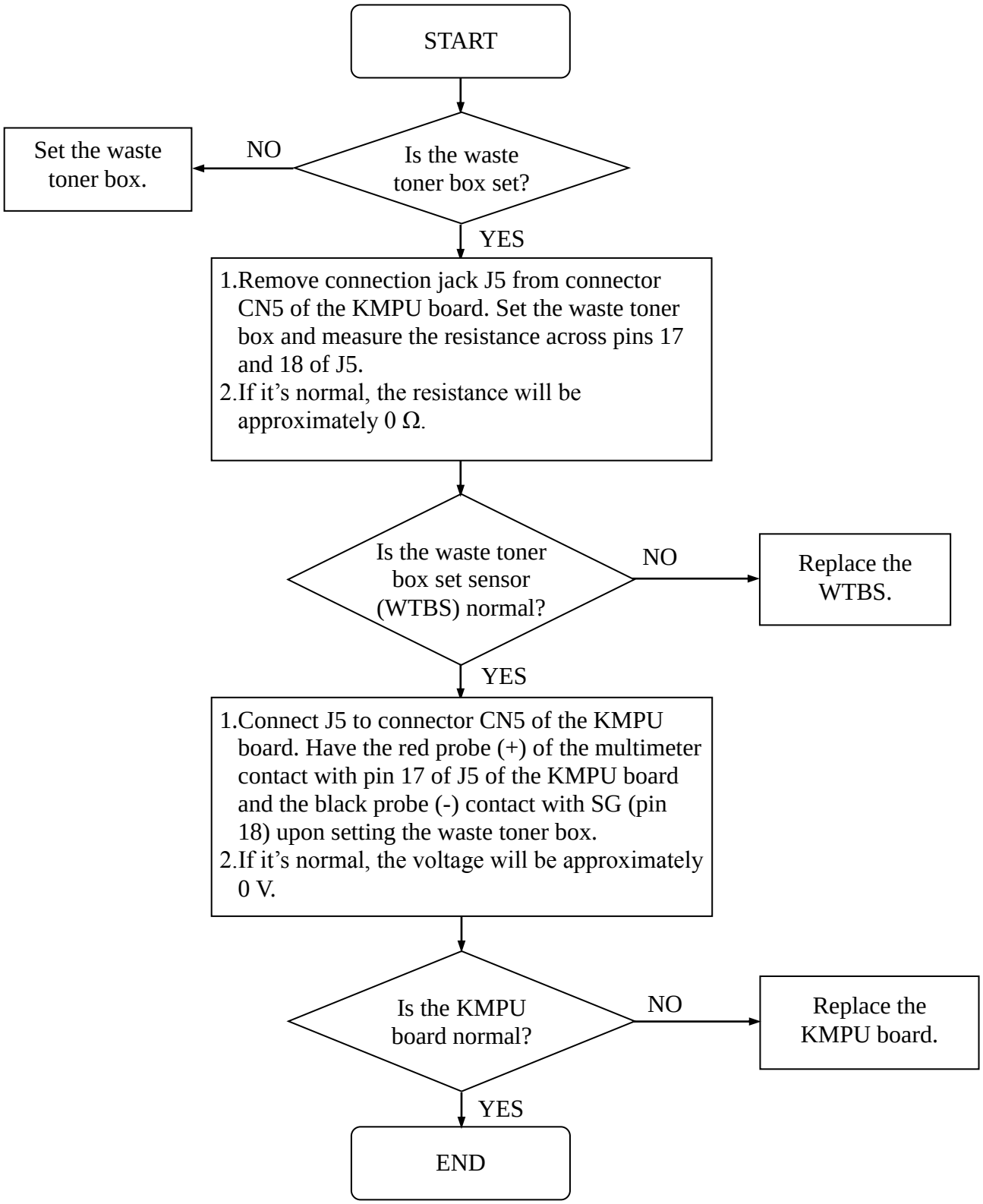
Error Code 26: No cleaning unit



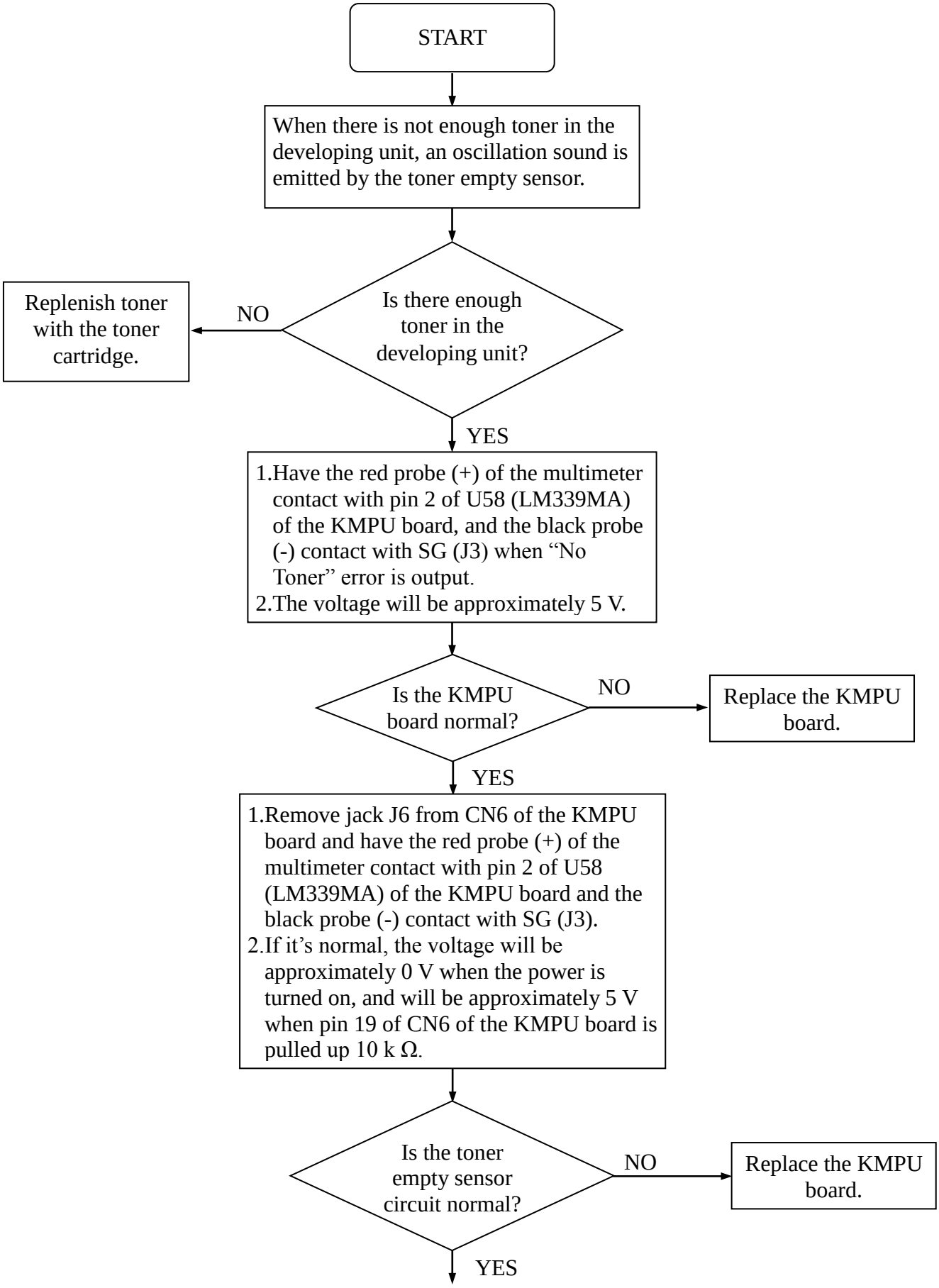
Error Code 28: Waste toner box full

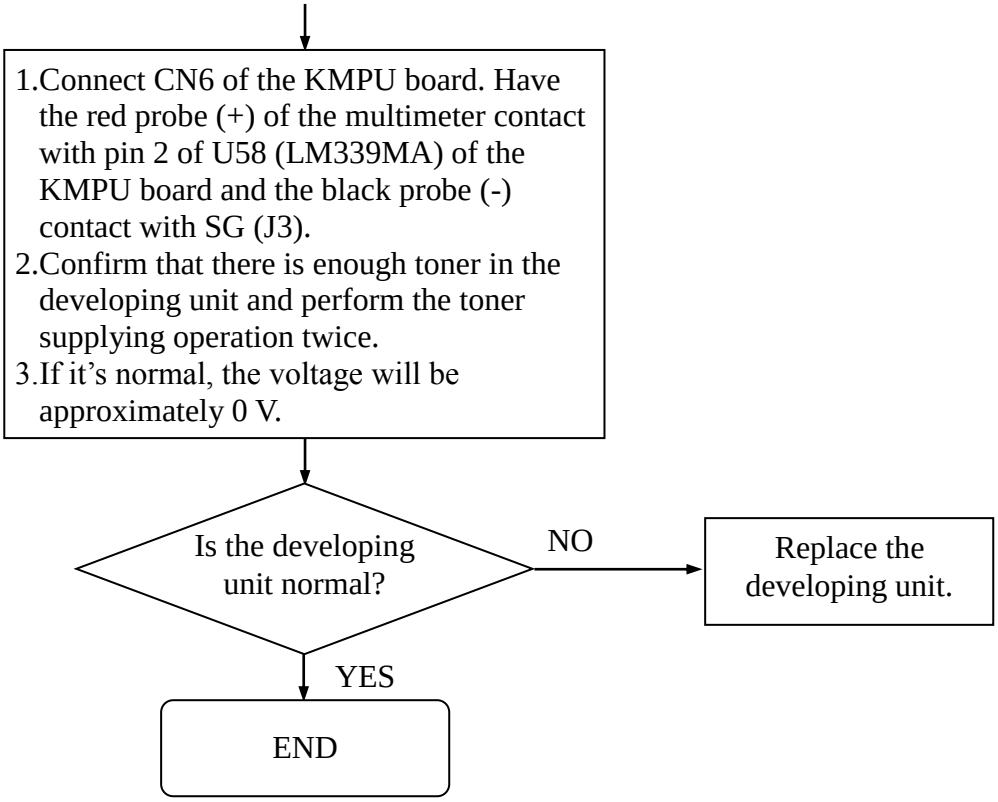


Error Code 29: No waste toner box

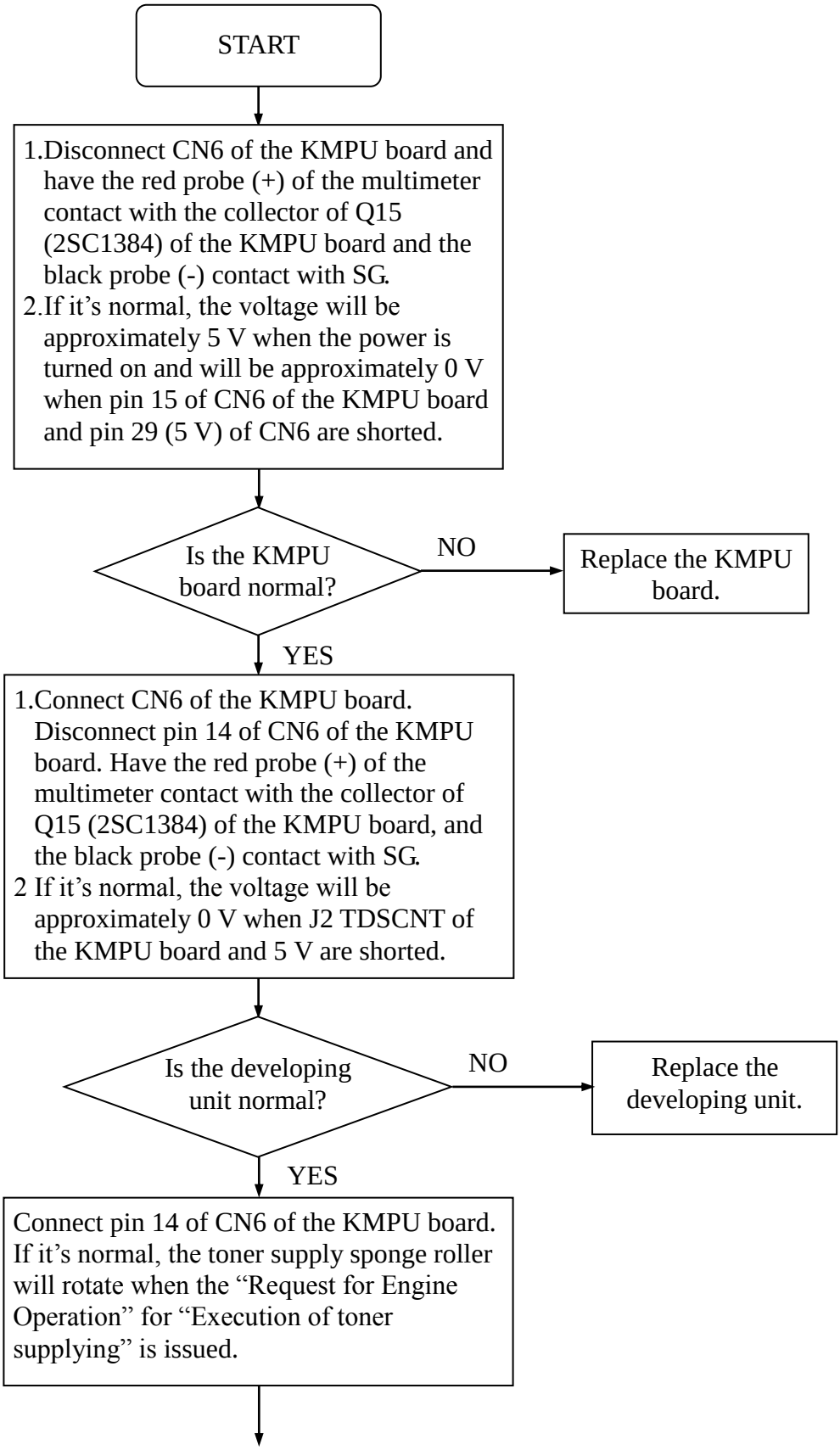


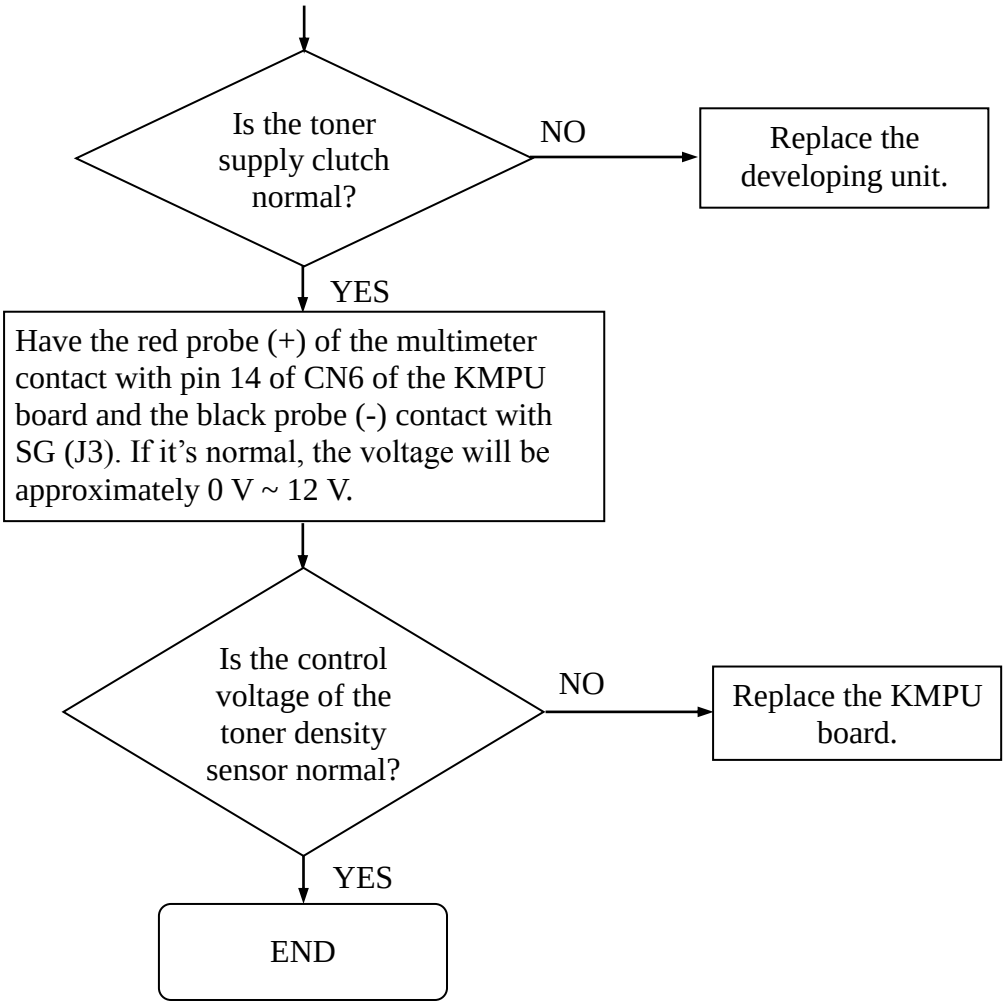
Error Code 2A: No toner




1.Connect CN6 of the KMPU board. Have the red probe (+) of the multimeter contact with pin 2 of U58 (LM339MA) of the KMPU board and the black probe (-) contact with SG (J3).
2.Confirm that there is enough toner in the developing unit and perform the toner supplying operation twice.
3.If it's normal, the voltage will be approximately 0 V.
Is the developing unit normal?
NO
Replace the developing unit.
YES
END

Error Code 2C: Toner density too low




Is the toner supply clutch normal?
NO
Replace the developing unit.
YES
Have the red probe (+) of the multimeter contact with pin 14 of CN6 of the KMPU board and the black probe (-) contact with SG (J3). If it's normal, the voltage will be approximately 0 V ~ 12 V.
Is the control voltage of the toner density sensor normal?
NO
Replace the KMPU board.
YES
END

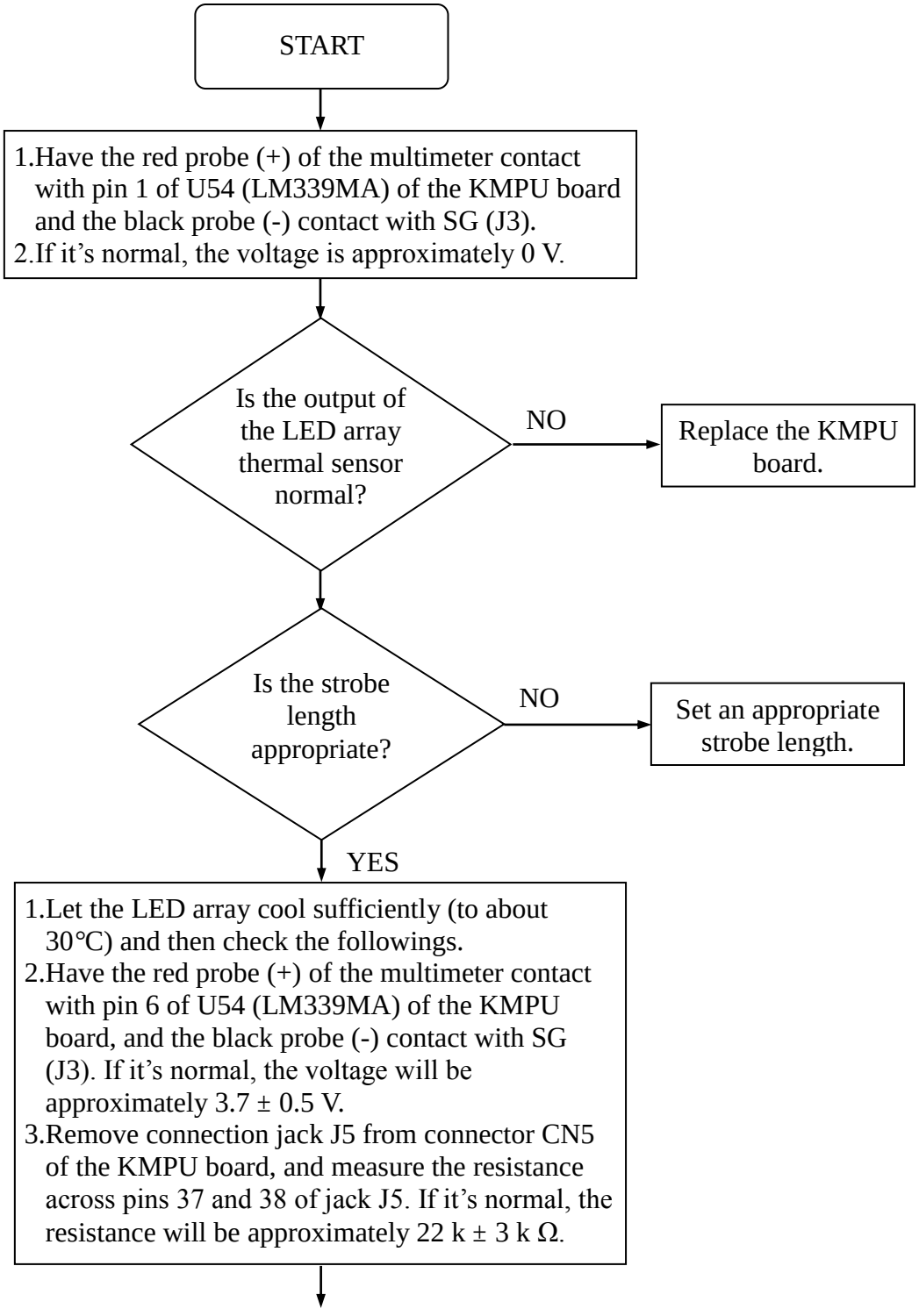
Error Code 32: LED array overheat

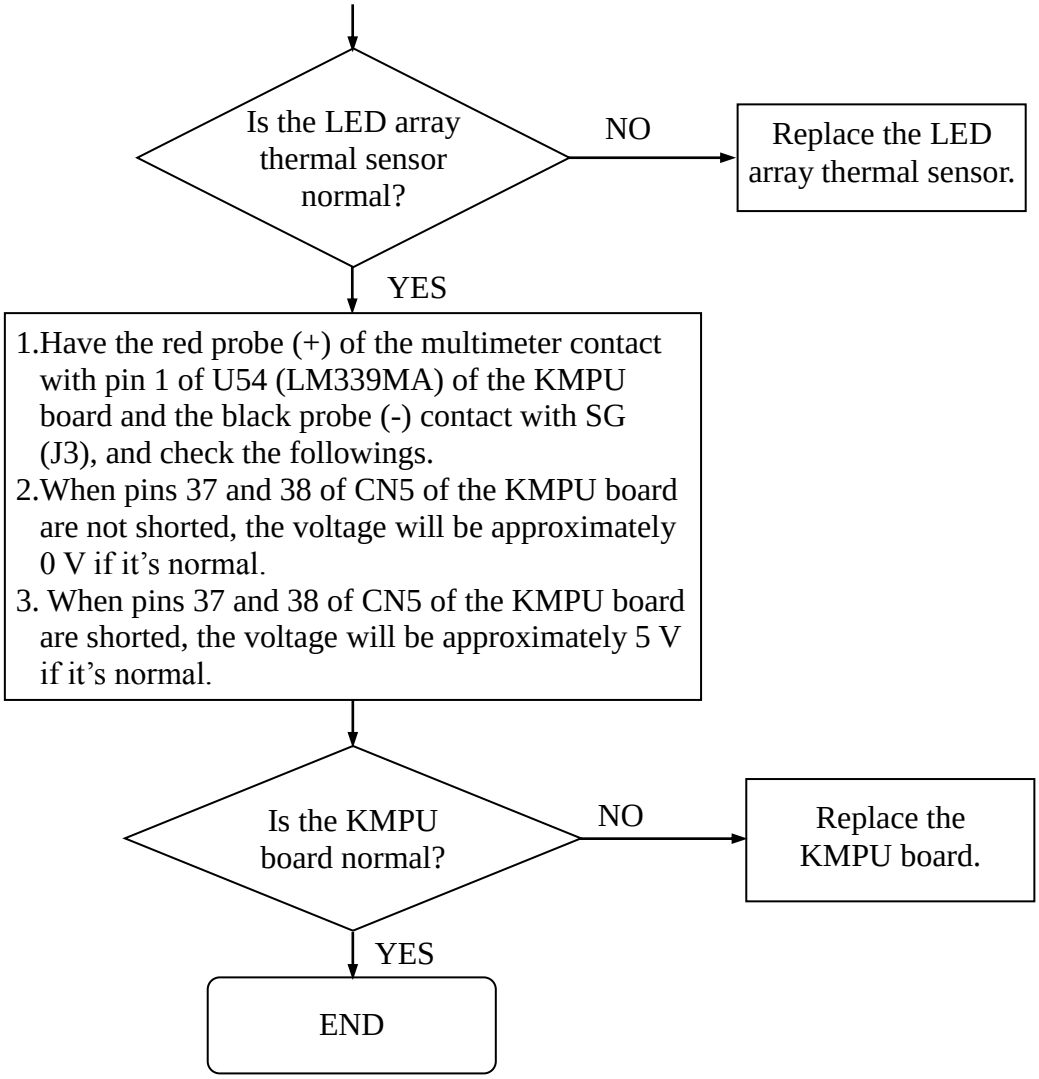
Main Causes:

1.The coverage or the LED strobe duty is abnormally high.

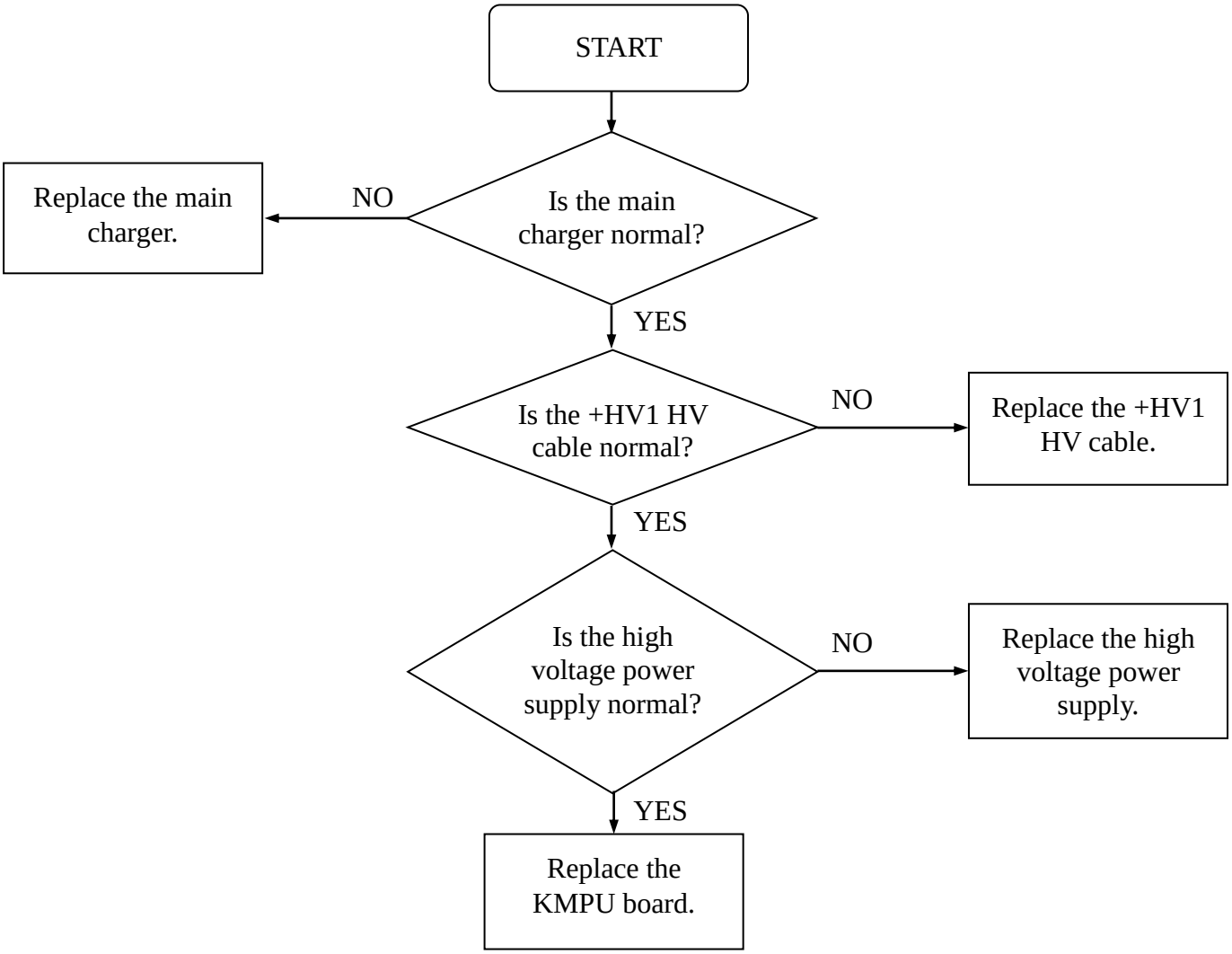
2.The rear face of the printer is too close to the wall.

3.Failure of fuser section cooling (stoppage of fuser exit blower or fuser unit upper fan).

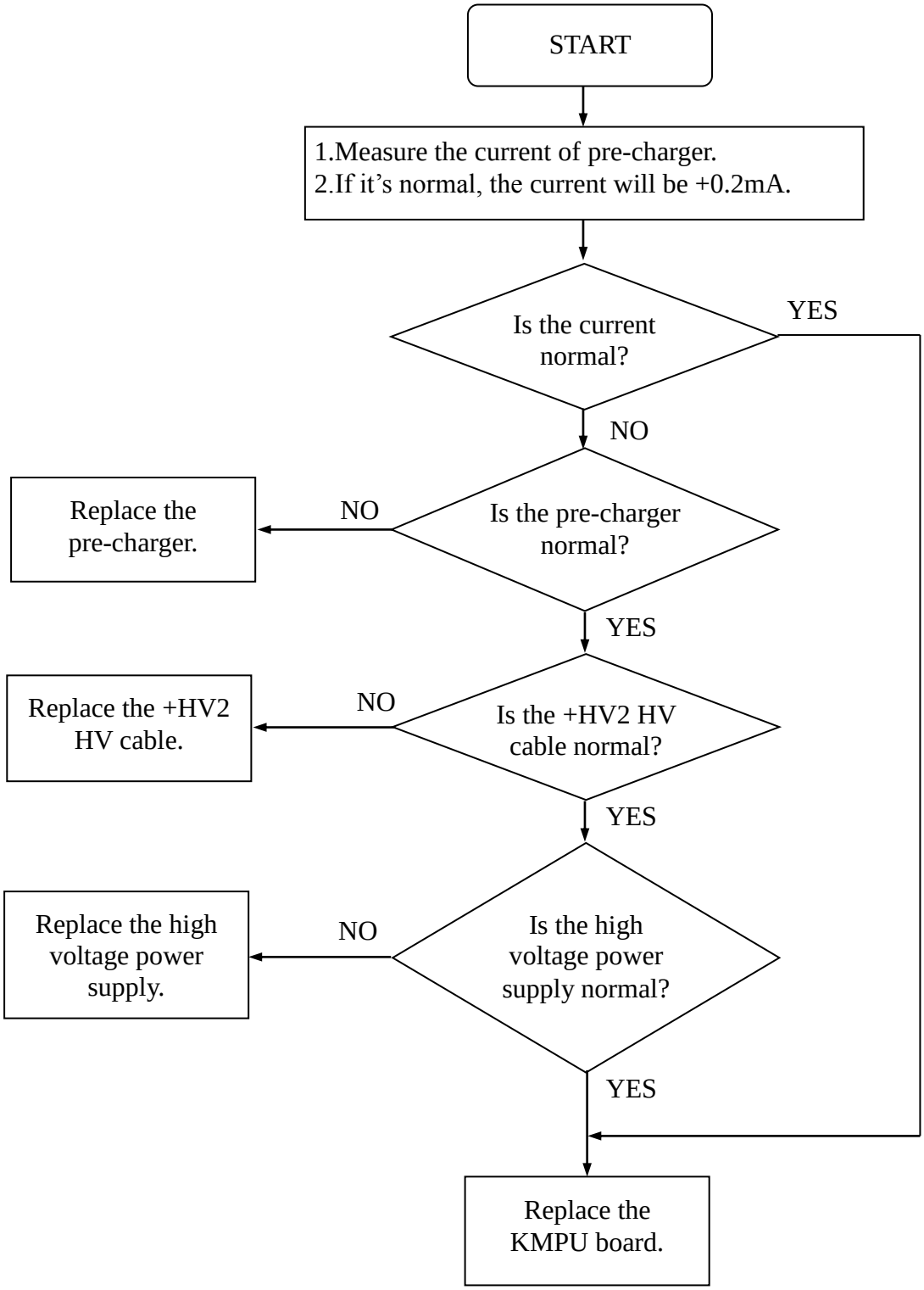



Is the LED array thermal sensor normal?
NO
Replace the LED array thermal sensor.
YES
1.Have the red probe (+) of the multimeter contact with pin 1 of U54 (LM339MA) of the KMPU board and the black probe (-) contact with SG (J3), and check the followings.
2.When pins 37 and 38 of CN5 of the KMPU board are not shorted, the voltage will be approximately 0 V if it's normal.
3. When pins 37 and 38 of CN5 of the KMPU board are shorted, the voltage will be approximately 5 V if it's normal.
Is the KMPU board normal?
NO
Replace the KMPU board.
YES
END

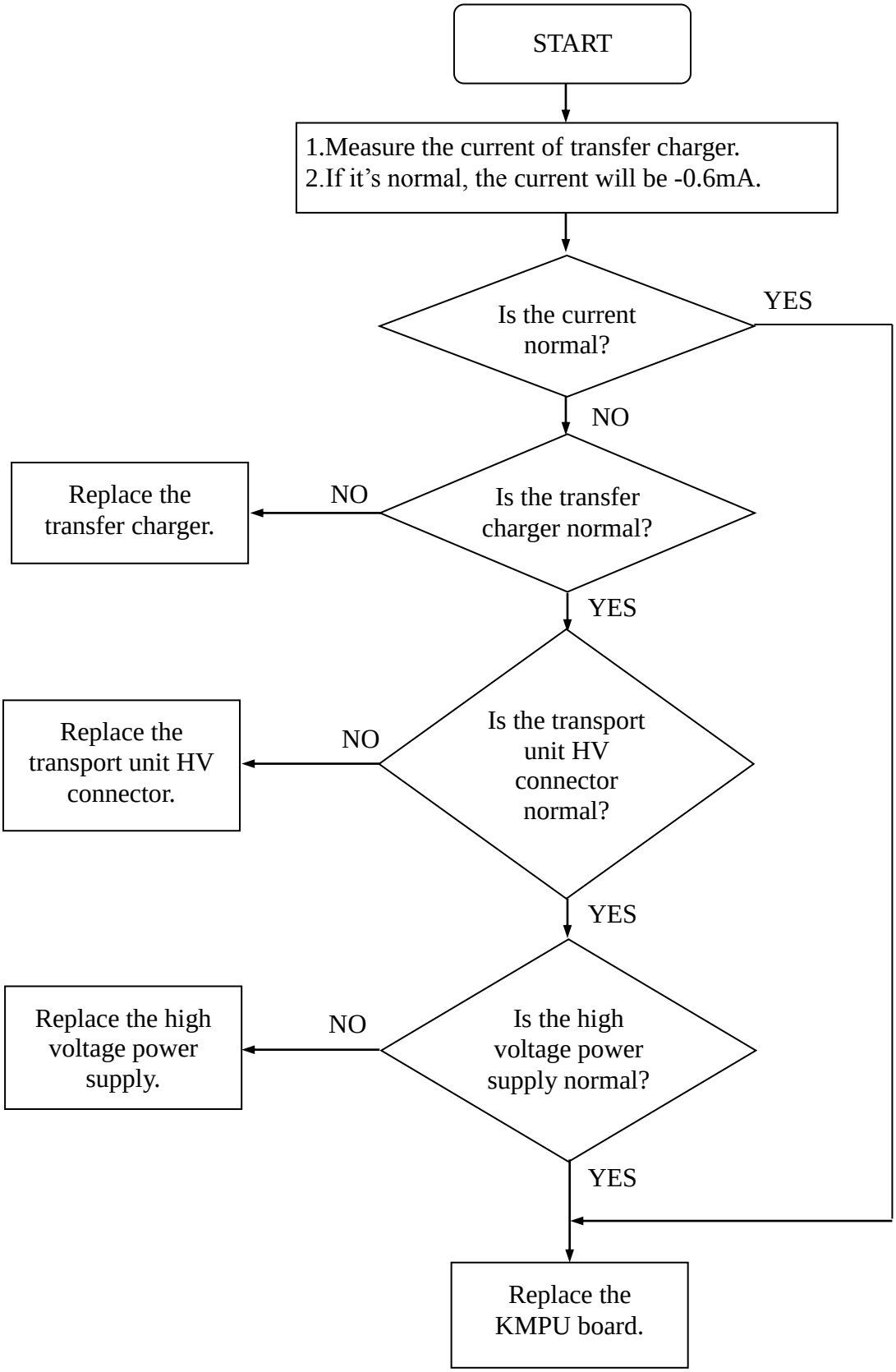
Error Code 39: High Voltage Failure - +HV1 Main Charge



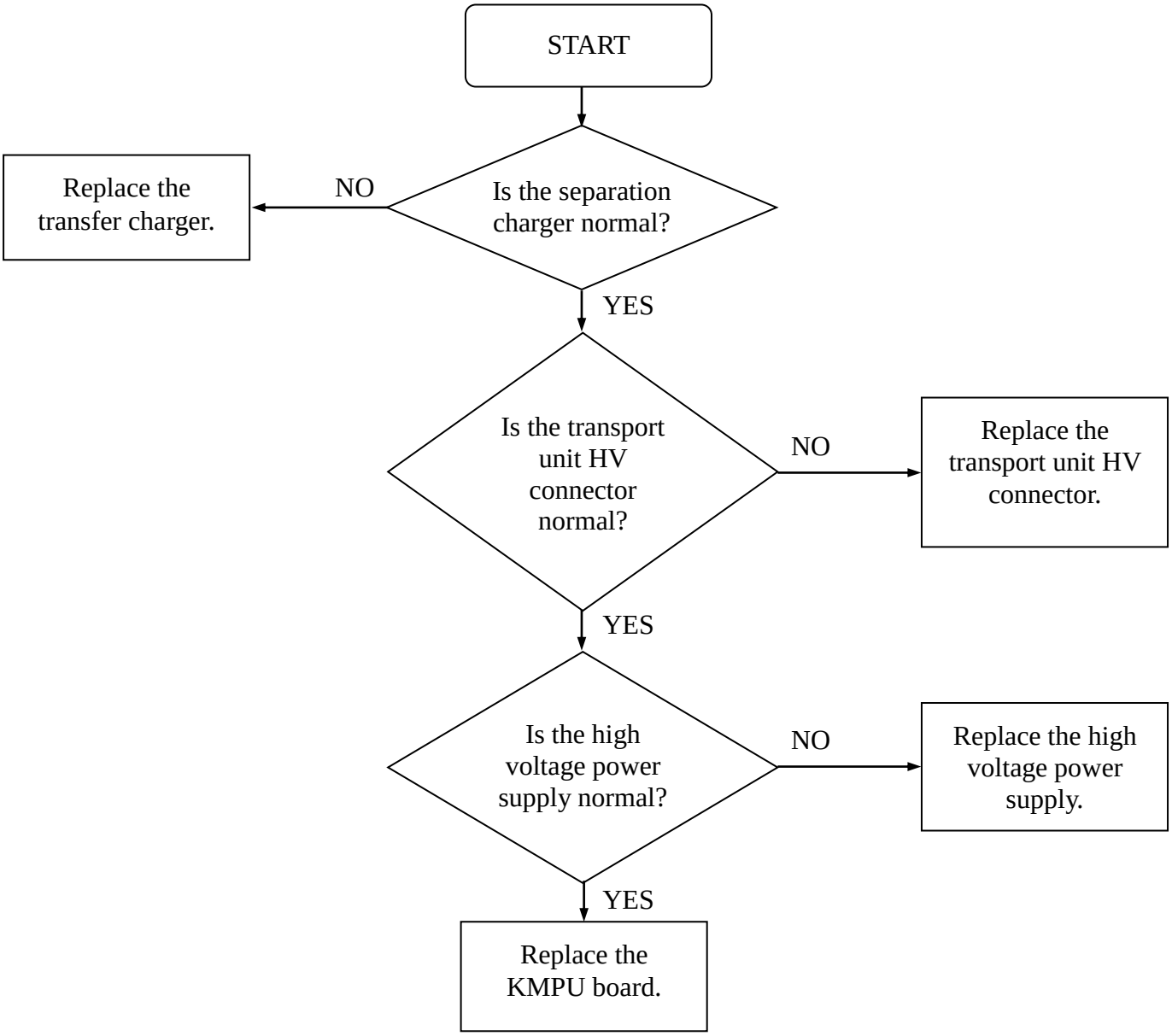
Error Code 3A: High Voltage Failure - +HV2 Pre-Charge



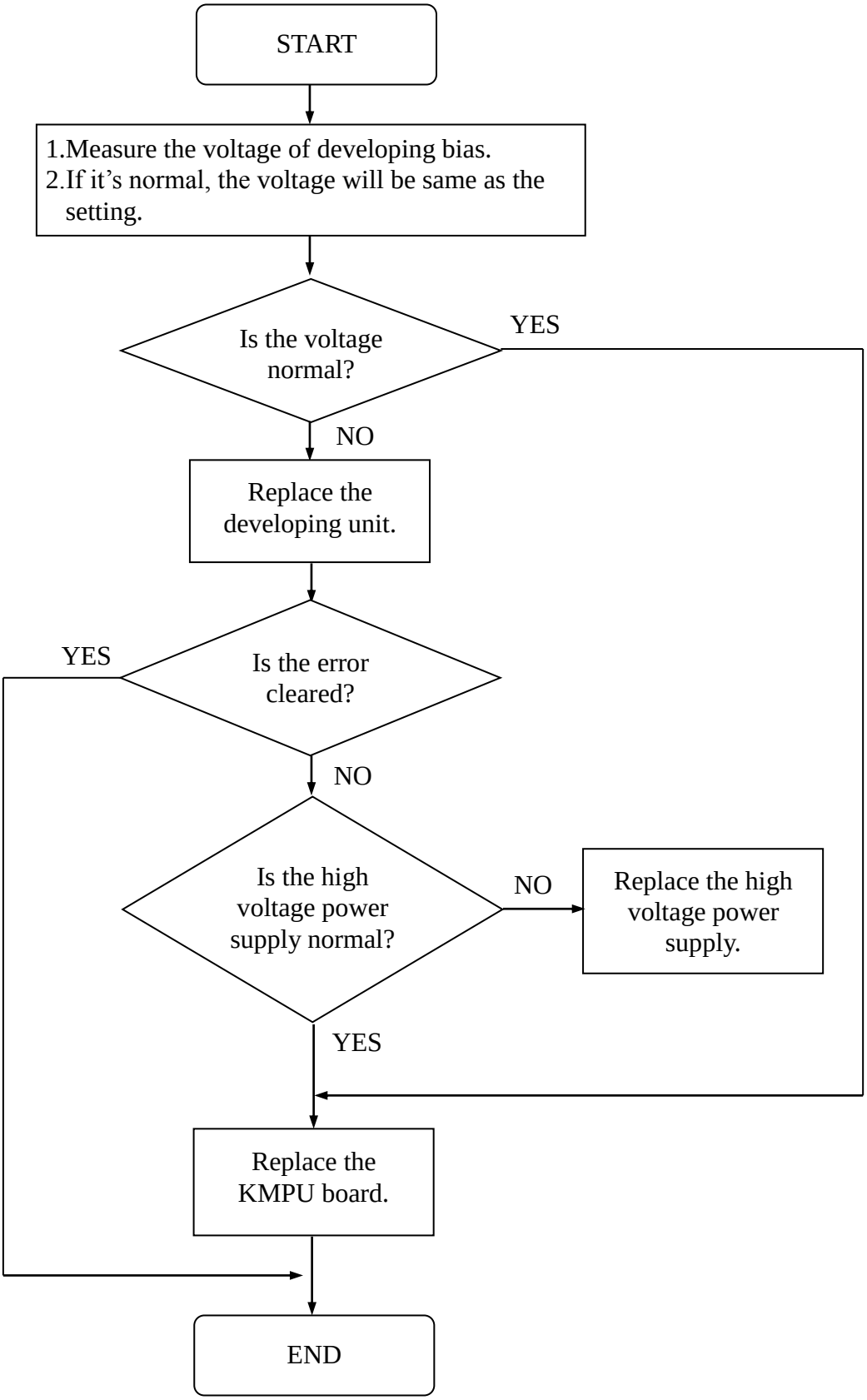
Error Code 3B: High Voltage Failure - +HV Transfer Charge



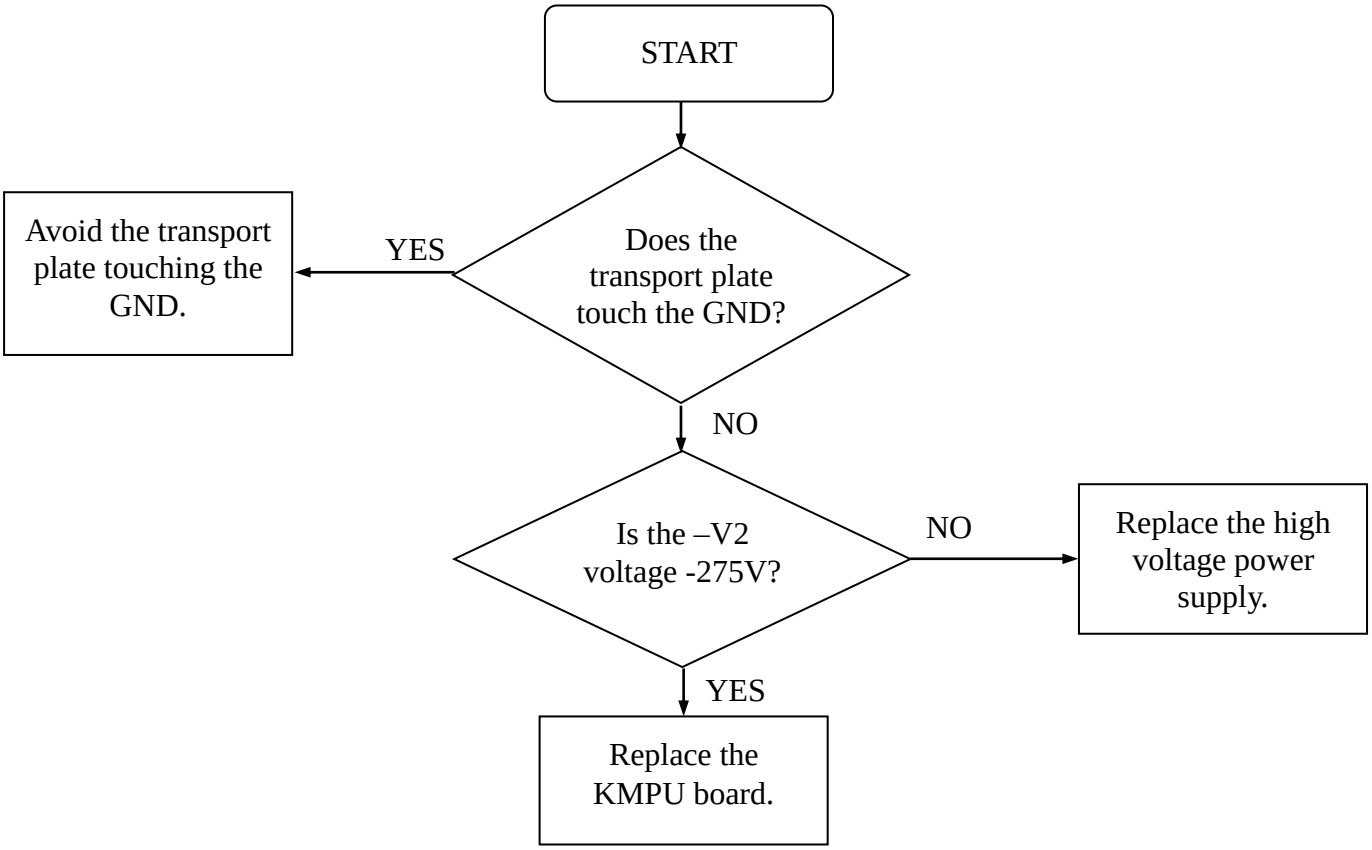
Error Code 3C: High Voltage Failure - +HV3 Separation Charge



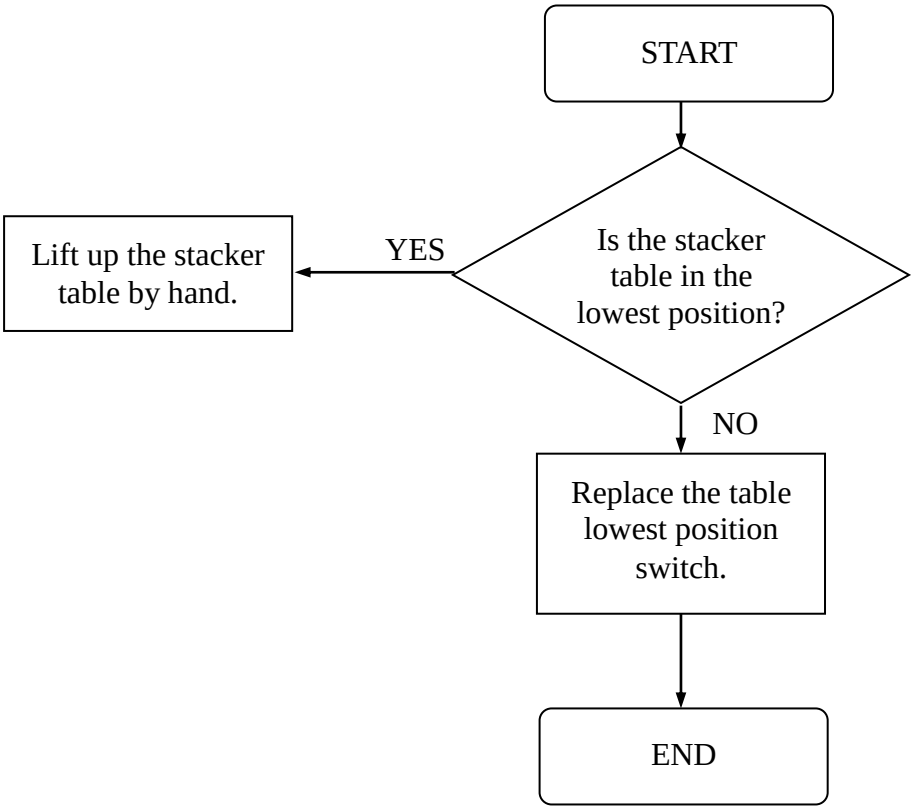
Error Code 3D: High Voltage Failure - +DRL Developing Bias



Error Code 3E: High Voltage Failure - -V1, -V2 Cleaning Bias



Error Code 56: Stacker Full



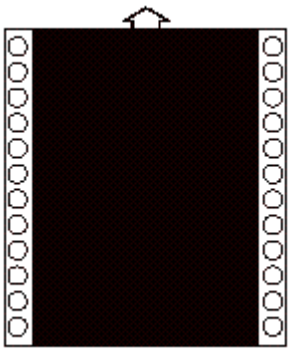
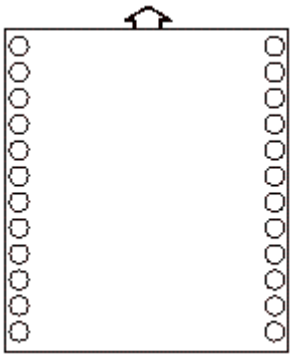
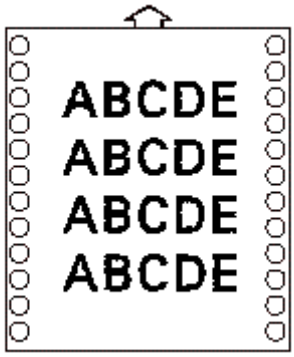
6-2 Developer and Toner Troubleshooting

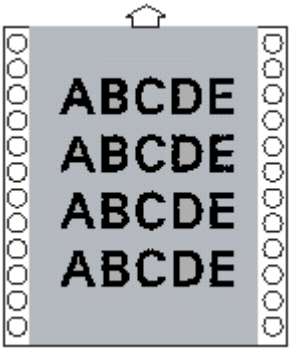
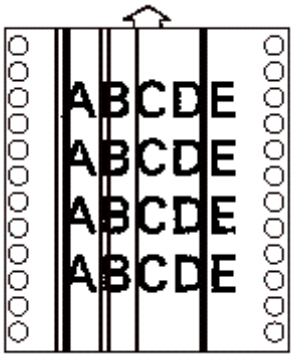
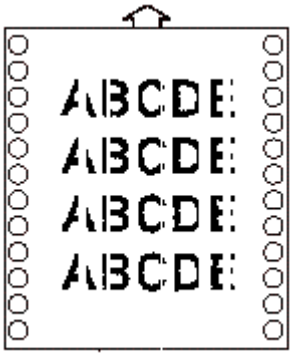
Symptom	Check Point	Possible Cause	Countermeasure
Developer Overflow	Does the developer overflow out to the front face of the developing roller?	The inner magnet roller is rotating, but the rotation of the sleeve roller stops.	Use a vacuum cleaner to clear the overflowed developer. Then replace the developing unit. If there is fault of the driving motor, replace the motor.
Developer Out (sandy on paper surface)	Does the developer fall out on the paper surface?	Drum surface potential voltage is not normal.	Use DSPV diagnostic tool to check drum surface potential voltage (see **"6-5 Usage of Drum Surface Potential Voltage (DSPV) Diagnostic Tool"**)
Toner Discharge	Is small amount of toner discharged from below the developing roller sometimes?	Toner is discharged from where the PU seal on the front face of the developing roller peeled off.	Attach the peeled seal, or replace the developing unit.
Toner Odor	Is the toner oder released during fusing?	The air filter has reached its service life.	Replace the air filter.
	Is the toner oder released from the air filter blower opening?	1.The air filter is not set. 2.The frame of the air filter is strained.	1.Set the air filter correctly. 2.Replace the air filter.
	Is the toner oder released from the fuser exit blower or the rear cover fan (upper)?	1.The air filter blower has stopped. 2.The fuser cover glass is not set or is broken.	1.Check the power source of the air filter blower. On MAINTENANCE menu, select OPERATION sub menu and then select "1E:AIR FILTER" to check the air filter blower. 2.Set the fuser cover glass. Or replace the fuser cover glass if the glass is broken.

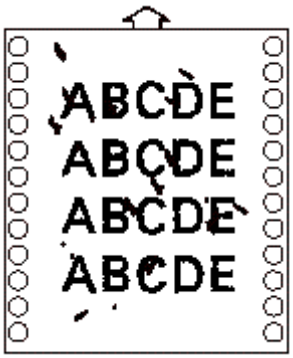
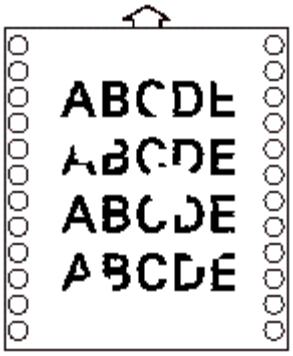
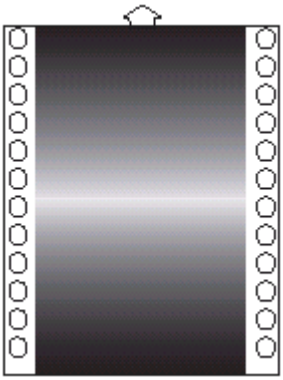
6-3 Fusing Troubleshooting

Symptom	Check Point	Possible Cause	Countermeasure
Fuser Cover Glass Breakage	Fuser cover glass.	1.The fuser cover glass is made dirty by toner or other substance.	1.Use a cotton cloth with alcohol and a scraper to clean the fuser cover glass. Furnish process conditions to prevent the toner and carrier from scattering around. Check whether the voltage of –275 V is applied to the transport unit.
		2.The glass mounting plate has been deformed by heat.	2. Replace the mounting plate for fuser cover glass.
		3.The fuser exit blower has stopped, or the rotation speed of the fuser exit blower is too slow.	3.Replace the DC power supply or the fuser exit blower unit.
Poor Fusing	Is flashing/fusing not performing at all?	1.The Xemon lamp has reached its service life.	1.Replace the Xenon lamp.
	Is flashing/fusing not performing with a click sound from the lamp section?	1.The trigger line of the Xenon lamp is too close to a metal part and is leaking.	1.Rotate the lamp and move the trigger line away from the metal part.
		2.Poor contact of the HV connector for fuser unit.	2.Replace the HV connector for fuser unit.
	Is the fusing strength low?	1.The Xenon lamp is made dirty by attached toner.	1. Furnish process conditions to prevent the toner and carrier from scattering around. Clean or replace the Xenon lamp.
		2.The flash charging voltage is too low.	2.Check if the flash charging voltage is 830 V.
		3.The Xenon lamp has reached its service life.	3.Replace Xenon lamp.
		4.Too much toner becomes attached to the paper due to the toner density is high.	4.If the toner density is abnormally high, replace the developing unit.
		5.Use paper not recommended.	5.Use paper recommended.

6-4 Image Quality Troubleshooting

Symptom	Possible Cause	Countermeasure
Black Print 	1.Main charger is not installed	1.Set the main charger.
Blank Print 	1.Developing unit is not installed properly. 2.Transfer charger is abnormal.	1.Set the developing unit properly. 2. Replace the transfer charger.
Dark Image 	1.OPC drum has reached its service life. 2.The image density setting is not correct.	1.Replace the OPC drum. 2.Correct the image density setting.
Light Image 	1.Moistened paper is used. 2.OPC drum has reached its service life. 3.The image density setting is not correct. 4.The fuser cover glass is dirty. 5.The Xenon lamp has reached its service life. 6.The OPC drum is not completely grounded.	1.Replace the paper. 2.Replace the OPC drum. 3.Correct the image density setting. 4.Clean the fuser cover glass. 5.Replace the Xenon lamp. 6.Clean or replace the drum shaft contact.

Symptom	Possible Cause	Countermeasure
	7.The voltage of main charger is too high. 8.Developing unit has reached its service life.	7.Replace the main charger. 8.Replace the developing unit.
Gray Background 	1.The external light, such as the direct rays of the sun, entering the machine. 2.OPC drum has reached its service life. 3. Drum surface potential voltage is not normal.	1.Shut off the external light. 2.Replace the OPC drum. 3. Use DSPV diagnostic tool to check drum surface potential voltage (see **"6-5 Usage of Drum Surface Potential Voltage (DSPV) Diagnostic Tool"**)
Black Stripe 	1.Main charger is dirty. 2.OPC drum is damaged or stained. 3.Cleaning unit blade is peeled or degraded. 4.Drum surface potential voltage is not normal.	1.Clean the main charger. 2.Clean or replace the OPC drum. 3.Replace cleaning unit blade. 4.Use DSPV diagnostic tool to check drum surface potential voltage (see **"6-5 Usage of Drum Surface Potential Voltage (DSPV) Diagnostic Tool"**)
White Stripe 	1.Transfer charger is dirty. 2.Foreign substance is on OPC drum. 3.OPC drum is damaged. 4.Foreign substance is caught between doctor blade and developing roller.	1.Clean or replace the transfer charger. 2.Clean the OPC drum. 3.Replace the OPC drum. 4.Clean the developing unit.

Symptom	Possible Cause	Countermeasure
Black Spot 	1.Foreign substance is on OPC drum. 2.OPC drum is damaged.	1.Clean the OPC drum. 2.Replace the OPC drum.
Whitening 	1.The paper width of tractor position is not correctly set. 2.Moistened paper is used. 3.Transfer charger is not correctly set.	1.Adjust the tractor to correct position. 2.Replace the paper. 3.Set the transfer charger correctly.
Uneven Density (Inclination) 	1.Moistened paper is used. 2.Developing unit is not correctly set. 3.OPC drum is not correctly set.	1.Replace the paper. 2.Set the developing unit correctly. 3.Set the OPC drum correctly.

6-5 Usage of Drum Surface Potential Voltage (DSPV) Diagnostic Tool

In Kpower engines, there is a close loop to control drum surface potential voltage (DSPV) to keep it at target (setting) value: Drum Surface Potential Sensor (DSPS) => DSPS board => KMPU Board => HV Power => Main Charger => Drum => DSPS.

There is a standard measurement procedure to make sure the DSPS-related configurations are correct: using dummy drum set (dummy drum + DC 600V power supply) to measure the gap (standard is2 mm) between drum surface potential sensor and OPC drum, and to measure the electrical compensation on drum surface potential sensor board to make sure the DSPV is 599V. (see **"5-9 Adjusting Drum Surface Potential Sensor Position"** and **"5-10 Adjusting Drum Surface Potential Voltage"** for details).

6-5-1 Drum Surface Potential Voltage (DSPV) Diagnostic Debug Message

Two modes to get debug message:

V24 Interface (RS232)

1. Power off engine. Remove the rear cover. Remove the KMPU board cover and then set Dip-switch SW2 pin 2 "ON" to enable KMPU output debug message to its P1 connector via V24 (RS232) interface to PC.

2. Connect V24 (RS232) cable to PC. This cable is exactly same as the one used for uploading CPU F/W firmware.

3. Install a free software terminal emulator, such as **Tera Term Pro**, to your PC for reading debug message.

4. Set the **Tera Term Pro** as the following figures show.

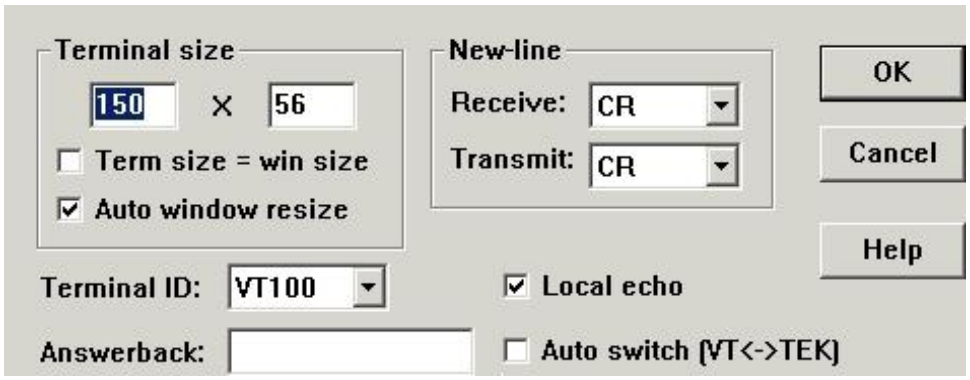


Fig. 6-1

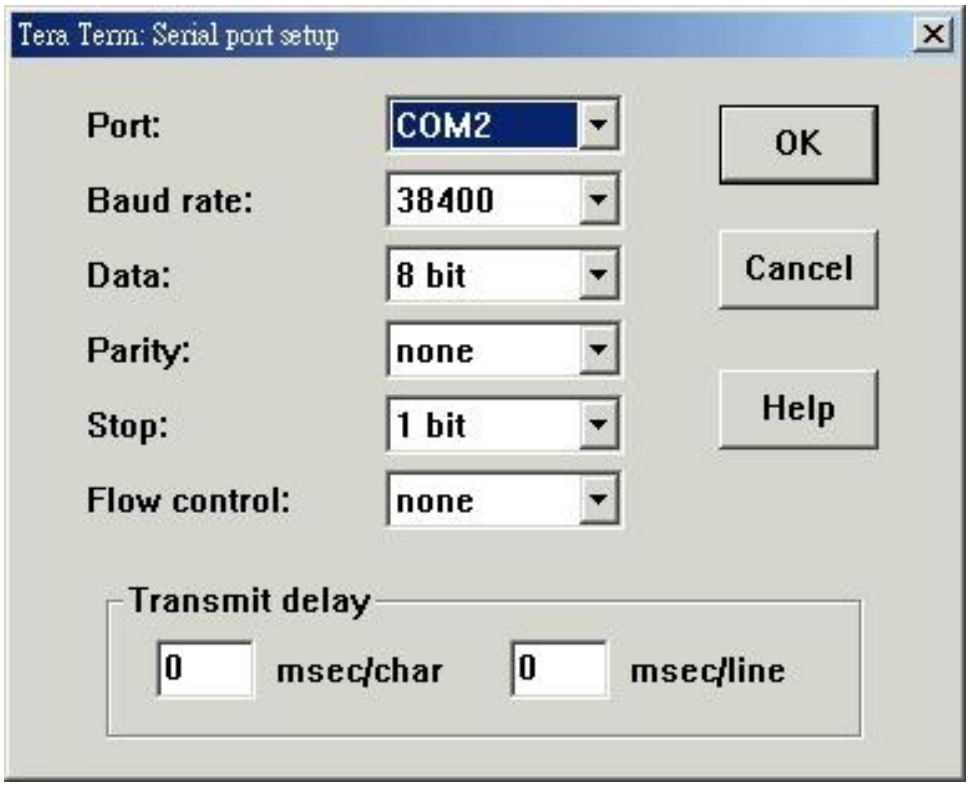


Fig. 6-2

5. Power on engine. Then you can see the debug message as well as engine information.

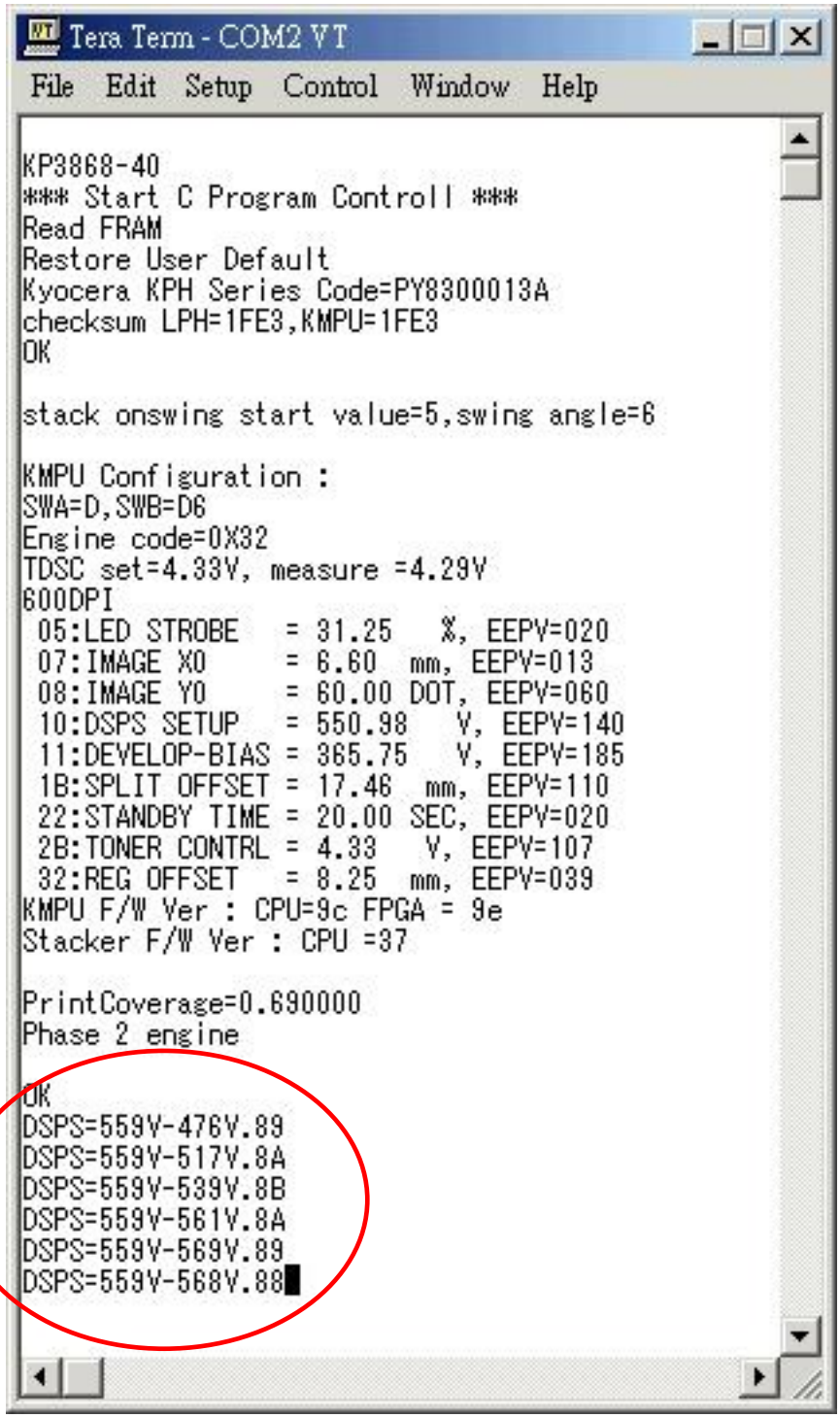


Fig. 6-3

KP3868.EXE Tool

When KPOWER controller program – KP3868.exe is used, you can see the following screen in off-line state. Check the "Show DSPS" box and then the debug message –

SET – DSPS : MCH
550V–566V : 83

will be shown in the right upper corner of the message display box.

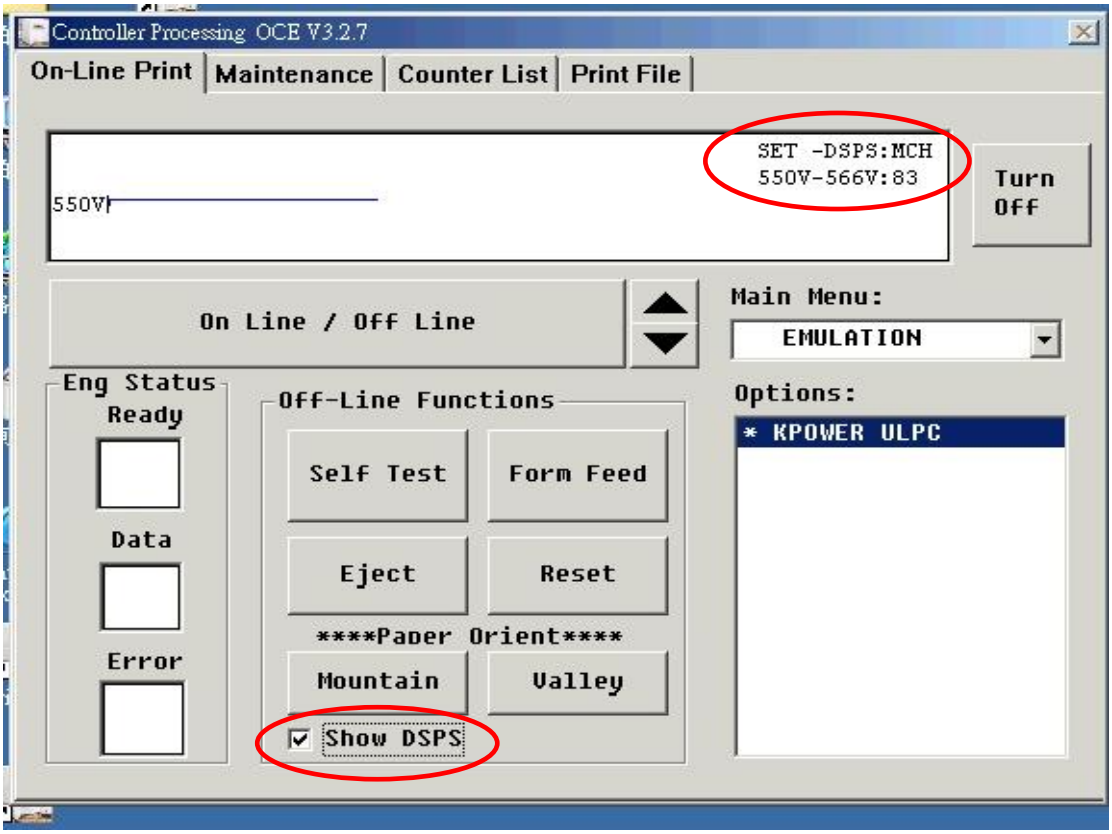


Fig. 6-4

6-5-2 Drum Surface Potential Sensor (DSPS) Message Interpretation

SET–DSPS:MCH

SET: Drum Surface Potential Voltage (DSPV) setting target value. At the beginning of printing, the value is higher than the setting for 8V or more. Then it will be changed to your setting value.

DSPS: Drum Surface Potential Sensor (DSPS) feedback detected DSPV value.

MCH: Main Charger Output-Control Value (0-FF in hexadecimal). The higher the MCH value, the higher the main charger output. For example, if SET > DSPS, then MCH is increasing.
if SET < DSPS, then MCH is decreasing.
if SET = DSPS, then MCH keeps constant.
In normal case, MCH should be in the range of 0x60-B0 depending on the engine speed/consumables age/conditions.

When the DSPS set is normal and the DSPV is correct (confirmed by using dummy drum set):

if the DSPS feedback goes very high, like more than 630V, developer out (sandy on paper surface) will occur.

if DSPS feedback goes very low, like less then 500V, gray background, black stripes and streaking on printout will occur. Usually, in this case, MCH goes up to very high value, which means that the main charger has problem to charge drum surface. Possible causes are DSPS set failure (sporadically fail), main charger grid/wire dirty (covered by toner wax/paper dust), or drum expired.

Note:

1. “Error 0x19 DSPS too High” will be issued under the condition of DSPV ≧700V, more than 4.5 seconds.
2. “Error 0x1A DSPS too Low” will be issued under the condition of DSPV ≦460V, more than 4.5 seconds.