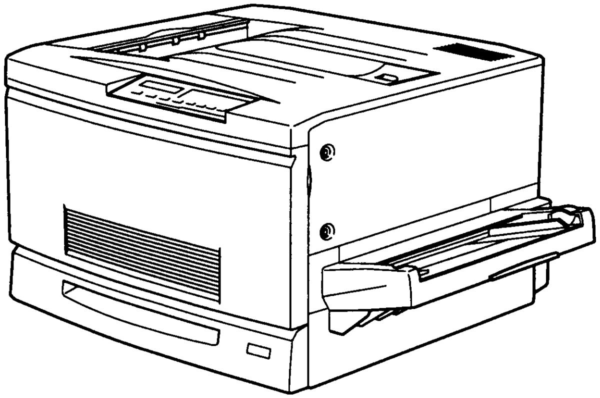
SERVICE MANUAL



Color Laser Printer

EPSON ColorPage EPL-C8200

SEPG99-003

PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1)Personal injury and 2) damage to equipment.

DANGER Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by DANGER Headings.

WARNING Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/ RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.
3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.
4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.
5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NONAPPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.

About this manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of the EPSON EPL-C8200. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Manual Configuration

This manual consists of six chapters and Appendix.

CHAPTER 1. PRODUCT DESCRIPTIONS
Provides a general overview and specifications of the product.

CHAPTER 2. OPERATING PRINCIPLES
Describes the theory of electrical and mechanical operations of the product.

CHAPTER 3. DISASSEMBLY / ASSEMBLY AND ADJUSTMENT
Describes the step-by-step procedures for disassembling/assembling and adjusting the product.

CHAPTER 4. DIAGNOSTICS
Provides Epson-approved methods for diagnostics.

CHAPTER 5. TROUBLESHOOTING
Provides the step-by-step procedures for troubleshooting.

CHAPTER 6. MAINTENANCE
Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

APPENDIX Provides the following additional information for reference:

- Connector pin assignments
- Electric circuit boards components layout
- Exploded diagram
- Electrical circuit boards schematics

Symbols Used in this Manual

Various symbols are used throughout this manual either to provide additional information on a specific topic or to warn of possible danger present during a procedure or an action. Be aware of all symbols when they are used, and always read NOTE, CAUTION, or WARNING messages.

WARNING Indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

CAUTION Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.

CHECK POINT

NOTE May indicate an operating or maintenance procedure, practice or condition that is necessary to accomplish a task efficiently. It may also provide additional information that is related to a specific subject, or comment on the results achieved through a previous action.

Abbreviation

ADC = Automatic Density Control
AG = Analog Ground
ASSY = Assembly
AUX. = Auxiliary
B/W = Black and White
BCR = Bias Charge Roll
Bk = Black
BK = Black
BTR = Bias Transfer Roll
BUR = Back Up Roll
C = Cyan
CART. = Cartridge
CCW = Counterclockwise
CL. = Clutch
CLN = Cleaning (or Cleaner)
CLK = Clock
CONT. = Controller
CR = Charge Roll
CRU = Customer Replaceable Unit
CRUM = CRU Monitor
CW = Clockwise
DB = Developing Bias
DEVE. = Developer
DIAG. = Diagnostic
dpi = dots per inch
DTS = Detach Saw
ELEC. = Electric
EP = Electrophotography

FDR = Feeder
FG = Frame Ground
FRU = Field Replaceable Unit
GND = Ground
H/R = Heat Roll
Hex = Hexadecimal
HVPS = High Voltage Power Supply
I/F = Interface
IBT = Intermediate Belt Transfer
ID = Image Density (or Identification)
L = Left
L/H = Left Hand
L/P = Low Paper
LD = Laser Diode
LEF = Long Edge Feed
LVPS = Low Voltage Power Supply
M = Magenta
MAG. = Magnetic
MCU = Machine Control Unit
MECH. = Mechanical
MOT. = Motor
MSI = Multi Sheet Inserter
N/F = Normal Force
N/P = No Paper
NVM = Non Volatile Memory
O/H = Option Hinge
OHP = Overhead Projector
(In this manual, OHP means OHP film)

OPC = Organic Photo Conductor
P/H = Paper Handling
P/R = Pressure Roll
PCDC = Pixel Count Dispense Control
Pixel = Picture Cell
PPM = Prints Per Minute
PV = Print Volume
PWB = Printed Wiring Board
R = Right
R/H = Right Hand
REGI. = Registration
ROS = Raster Output Scanner
RTN = Return
SEF = Short Edge Feed
SG = Signal Ground
SNR = Sensor
SOL. = Solenoid
SOS = Start Of Scan
SPI = Scans Per Inch
SYNC. = Synchronous
TC = Toner Concentration
TEMP. = Temperature
TR = Transfer
TRANS. = Transport
WDD = Wide Range Dynamic Damper
XERO. = Xerographic
Y = Yellow
YMCBk = Yellow, Magenta, Cyan, Black

Safety Information

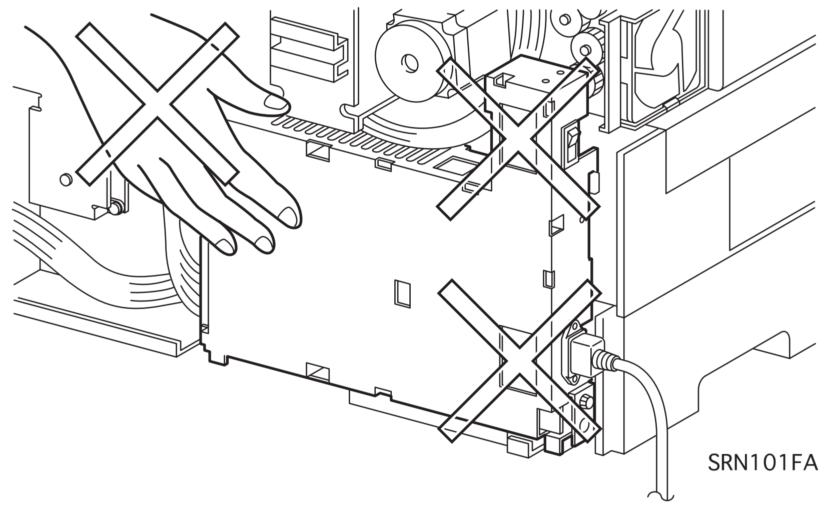
To prevent accidents during a maintenance procedure, strictly observe the Warnings and Cautions. Do not do anything that is dangerous or not within the scope of this document.
Do not do anything that is dangerous even if not specifically described in this manual. In addition to the descriptions below and those given in this manual, there are many situations and circumstances that are dangerous. Be aware of these when you are working with the printer.

Power Supply

Before starting any service procedure, switch off the printer power and unplug the power cord from the wall outlet. If you must service the printer when the power is applied, be aware of the potential for electrical shock and do all tasks by following the procedures in this manual.

WARNING

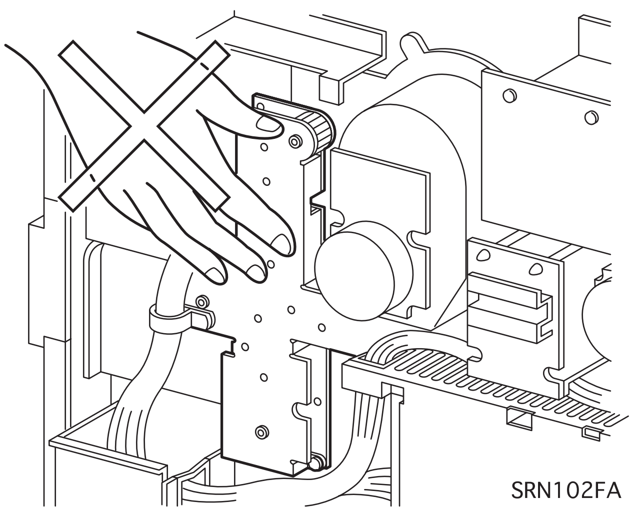
Do not touch any live part unless you are instructed to do so by a service procedure. The LVPS power supply switch/inlet part is live even when the power switch has been turned off. Do not touch any live part.



Mechanical Components

If you service a driving assembly (e.g., gears), first turn off the power and unplug the power cord. Then manually rotate the assembly.

WARNING **Do not touch the driving part (e.g., gears) while the assembly (printer) is being driven.**



SRN102FA

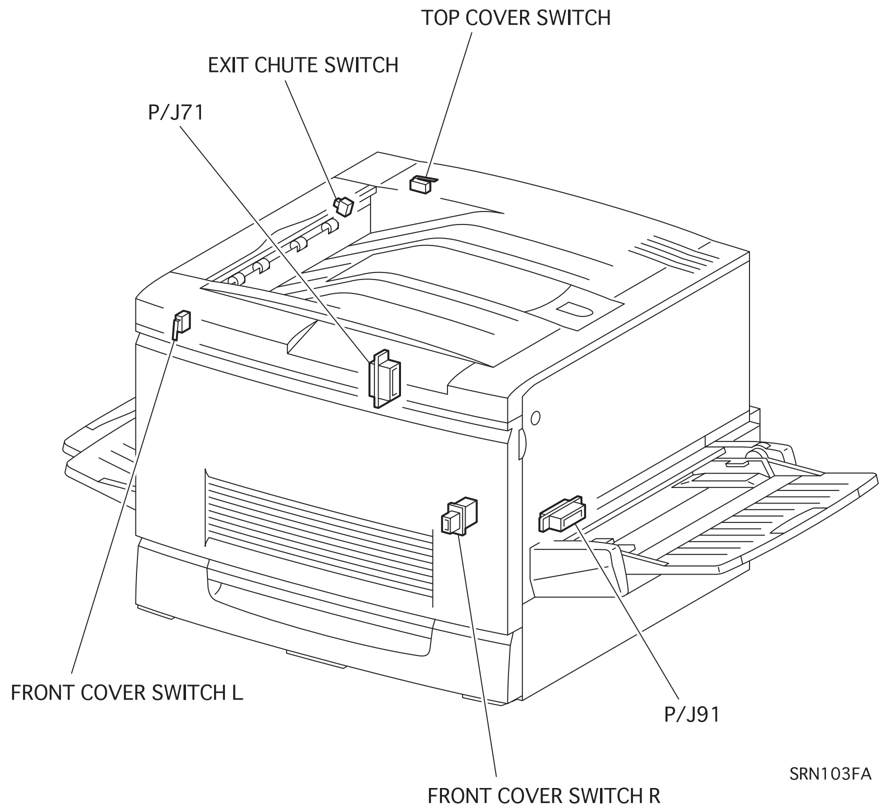
Safety Components

The printer is equipped with safety components (e.g., interlock switches, fuses, thermostat) and safety switches for protecting users and service personnel from injury and the equipment from damage.

The printer has two interlock switches, two safety switches and two interlock connectors that serve as the main safety mechanism.

- ☐ Front Cover Switch R
  This switch is turned off when the Front Cover Assembly is opened. It cuts off the power supply (24VDC, 5VDC-LD) from the power supply unit to stop all operations and disconnects the output (5VDC-LD) circuit from the power supply and stops the laser beam emission.
  This switch consists of the following two switches:
  - ■ A switch that cuts off the power supply (24VDC, 5VDC-LD) to the control circuits and related parts.
  - ■ A switch that directly cuts off the power supply circuit (5VDC-LD) to the laser beam output circuit.
- ☐ Front Cover Switch L
  This is a safety switch. This switch is turned off when the Front Cover Assembly is opened, causing the printer without control units to stop operating.
- ☐ Top Cover Switch
  This is an interlock switch that directly cuts off the power supply (5VDC-LD) circuit to the laser beam output circuit. This switch is turned off when the Top Cover Assembly is removed, cutting off the output (5VDC-LD) circuit from the power supply unit and stopping the laser beam emission.

- Exit Chute Switch
  This switch is a safety switch. This switch is turned off when the Exit Upper Assembly (the cover on the upper left side of the printer) is opened.
- P/J91 (Connector that connects the Main Harness Assembly and Registration Harness Assembly)
  This is an interlock connector that cuts off the power supply (24VDC, 5VDC-LD) to the control circuit and related parts.
  This connector is disconnected when the Main P/H Assembly (pull-out type unit on the right side of the printer) is pulled out, cutting off the output (24VDC, 5VDC-LD) from the power supply and stopping the printer operation without control units.
- P/J71 (Connector that connects the Fuser Connector and Fuser Harness Assembly)
  This is an interlock connector that cuts off the power supply (24VDC, 5VDC-LD) to the control circuit and related parts.
  This connector is disconnected when the Fuser Assembly (pull-out type unit on the left side of the printer) is pulled out, cutting off the output (24VDC, 5VDC-LD) from the power supply and stopping the printer operation without control units.



Laser Beam

The printer has two interlock switches: the Front Cover Switch R and the Top Cover Switch. The purpose of these switches is to turn off the laser beam emission if any of the printer covers have been opened; this protects the user or service personnel from exposure to the laser beam from the ROS Assembly.

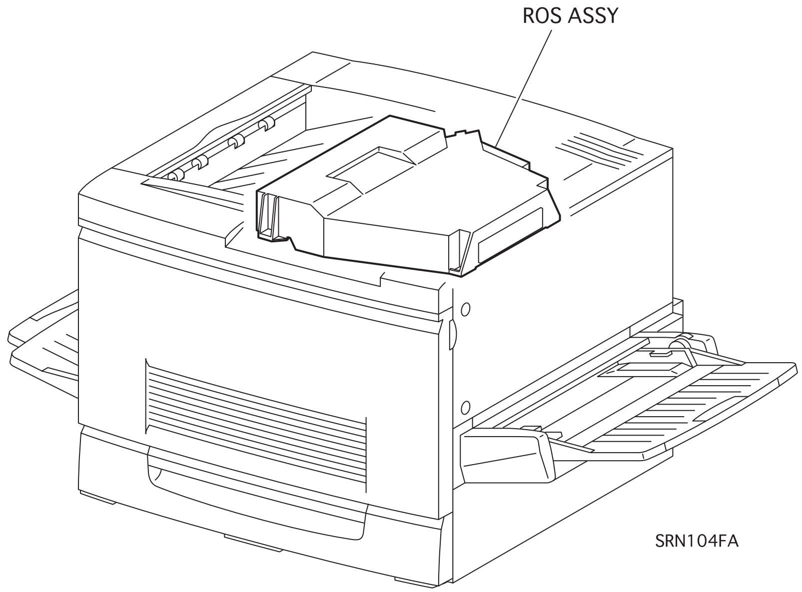
A laser beam may be emitted during a maintenance operation. Do not turn on these interlock switches simultaneously under any circumstances except in a normal operation.

WARNING

- **Do not expose yourself to the laser beam to prevent injury (blindness).**
- **Do not open the cover that has the laser beam warning label.**
- **If you disassemble or assemble the printer, turn off the power.**
- **If you need to work on the printer with power applied, strictly follow the instructions in this manual.**
- **If you have to activate the printer while pressing the Front Cover Switch R by hand or with a tool, remove the Top Cover. (Do not turn on these interlock switches simultaneously under any circumstances except in a normal operation.)**
- **Understand how the laser beam functions and take maximum precautions not to injure yourself or anyone around you.**

NOTE: *The laser beam has a narrower frequency band and more coherent phases than any other light (sunlight, electric light). It has excellent monochromaticity and convergence. A thin laser beam reaches long distances. Because of its convergence characteristic, the laser beam converges into one point, causing high density and high temperature. A laser beam is harmful to the human body.*

NOTE: *The laser beam in this printer is invisible.*

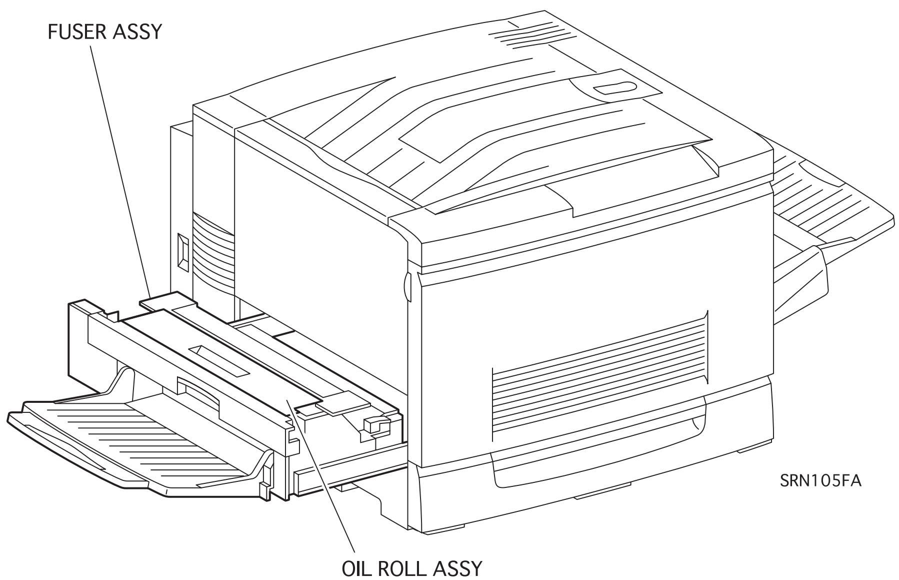


High Temperature Assembly

To prevent you from becoming injured or burned, do the following: Before working with a high temperature Assembly (e.g., Fuser Assembly), turn off the power, unplug the power cord and wait until it cools down.

WARNING

The high temperature Assembly is very hot immediately after any printer operations. Wait at least 40 minutes before you start working on the printer.



Parts

To prevent you from becoming injured, keep the following in mind:

- ☐ When handling heavy parts (including the printer itself), use good posture to protect your back whenever you lift, move or place parts.

WARNING

Do not lift, move or place heavy parts in a body posture that is likely to cause injury to yourself or cause the part to drop.

- ☐ Be careful not to injure yourself with the sharp edges of the parts.
- ☐ Do not work with wet or oily hands-you may drop a part or injure yourself. Dry your hands first.
- ☐ When pulling out a part (including a harness), do not use too much force. Pull out the part carefully and slowly step by step.

Consumables

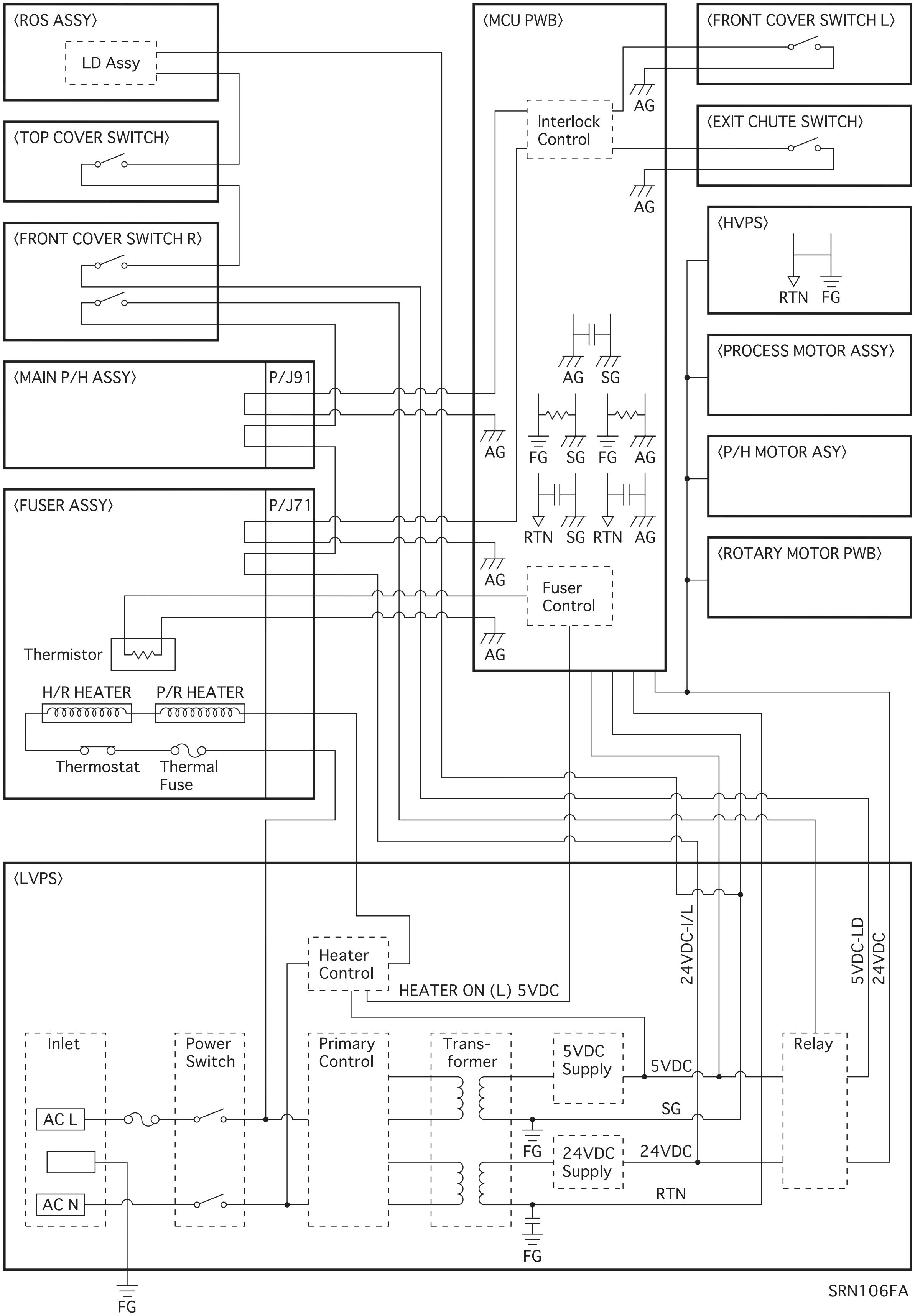
Some parts may cause a particulate explosion or fire if handled improperly. Do not handle these parts near fire or throw into a fire.
Some materials (e.g., Developer or Fuser Oil) may cause bodily injury. Do not swallow or inhale these materials or allow them to come in contact with the eyes.
Help to protect those around you and follow the prohibitions against swallowing or inhaling those materials. Be careful to protect the eyes at all times.
Place a sheet inside or under the printer so that the floor or workbench is protected.
If the Developer or Fuser Oil gets on your clothing, dry it with a cloth and wash with clean water.

NOTE: *The printer has the following consumable parts:*

- *Drum Cartridge*
- *Oil Roll Assembly*
- *Toner Cartridge M*
- *Toner Cartridge Bk*
- *Waste Toner Box*
- *Toner Cartridge Y*
- *Toner Cartridge C*

Improper Printer Use

Modifying, revising, tampering with the printer, especially to the safety mechanism, is strictly prohibited in all circumstances.



⟨ROS ASSY⟩
LD Assy
⟨TOP COVER SWITCH⟩
⟨FRONT COVER SWITCH R⟩
⟨MAIN P/H ASSY⟩
P/J91
⟨FUSER ASSY⟩
P/J71
Thermistor
H/R HEATER
P/R HEATER
Thermostat
Thermal Fuse
⟨MCU PWB⟩
Interlock Control
AG
AG
AG SG
FG SG FG AG
RTN SG RTN AG
AG
Fuser Control
AG
⟨FRONT COVER SWITCH L⟩
⟨EXIT CHUTE SWITCH⟩
⟨HVPS⟩
RTN FG
⟨PROCESS MOTOR ASSY⟩
⟨P/H MOTOR ASY⟩
⟨ROTARY MOTOR PWB⟩
⟨LVPS⟩
Heater Control
HEATER ON (L) 5VDC
24VDC-I/L
5VDC-LD
24VDC
Inlet
AC L
AC N
Power Switch
Primary Control
Trans- former
5VDC Supply
5VDC
SG
FG
24VDC Supply
24VDC
RTN
FG
Relay
FG
SRN106FA

Manual Contents

Revision Status

Revision	Issued Date	Description
(Preliminary revision)		

CHAPTER

1

PRODUCT DESCRIPTIONS

Table of Contents

1.1 Features

The EPSON ColorPage EPL-C8200 is a non-impact color page printer that is designed based on the EPL-C8000. This printer is mainly improved on a controller basis. The main features of the printer are as follows:

Engine features (Same as for EPL-C8000)

1. Designed for performance in true business environments. Supports sizes from A5 to A3W. Printing speed (on A4/Letter) is 4ppm for color printing, 16ppm for monochrome printing.
2. Supports high-resolution full color (True 600dpi).
3. Can generate high-quality prints on special (dedicated) paper.
4. Supports thick sheets and OHP (dedicated OHP sheets).
5. Easy to maintain for a color laser printer.
6. The printer is equipped with the 2 standard paper feed bins; Paper tray (150 sheets; A3W) and standard universal cassette (250 sheets: A3).
7. Installing an optional 500-Sheet Paper Cassette Unit provides 4 bins with a maximum capacity of 900 sheets.
   With a Large Capacity Paper Unit installed, the printer has 5 bins holding up to 1150 sheets.
8. Standard paper ejection is face down (up to 250 sheets). Face-up ejection is also available (up to 150 sheets).

Controller features (Specific to EPL-C8200)

1. Newly developed high-speed controller
   - New 64-bit RISC CPU: R5000- 200MHz
   - 64-bit high speed memory: SDRAM DIMM (Same as EPL-C8000)
   - 64MB RAM standard: expandable up to 256MB (2 expansion slots) (Same as EPL-C8000)
2. Color management technology

   Enhanced ASIC supported
   - Color management technology included in hardware for faster image manipulation
   - AcuLaser Color Halftoning and CRIT (Color RIT) supported
   - New compression technology enables further reduction in RAM use compared to EPL-C8000.
3. Monochrome print technology
   - AcuLaser Color Halftoning (for Color Copy Station 8200) and RIT supported
4. Two standard interfaces
   - Bi-directional parallel I/F: IEEE1284 compliance, ECP
   - Ethernet interface (100Base -TX/10Base-T)
5. installation of expansion RAM (DIMMs) improves the following:
   - AcuLaser Color Halftoning drawing area
   - Print data processing speed
   - Resolution
6. Toner save mode for both black and monochrome prints enabled.
7. ROM update function with a flash DIMM installed (for RCC)
8. HDD (Hard Disk Drive) can be installed.

Software features

1. ESC/Page-Color increases AcuLaser Color Halftoning speed.
2. Bidirectional EJL and MIB can retrieve printer status and monitor the printer environment.
3. Remote panel function using the Web browser (for JAVA JSSK1.1)
4. Electrical sort system with an optional HDD
   Expanded I/F data buffer size (for Ethernet I/F only)
   Font registration in the PostScript3 mode
5. Full compatibility with the EPL-N2700:
   LJ4, GL2, 1239X, ESC/Page (monochrome)
6. Supports PostScript3 when used with an optional EPSON RIP Station XXXX or Adobe PostScrip 3 Module.
7. Used with SC6000 (optional), color copy (EPSON Color Copy Station) is enabled.
8. Font Management function by the EPSON FONT Manager
   Supports 96 screen fonts, including 31 fonts supported by the printer.

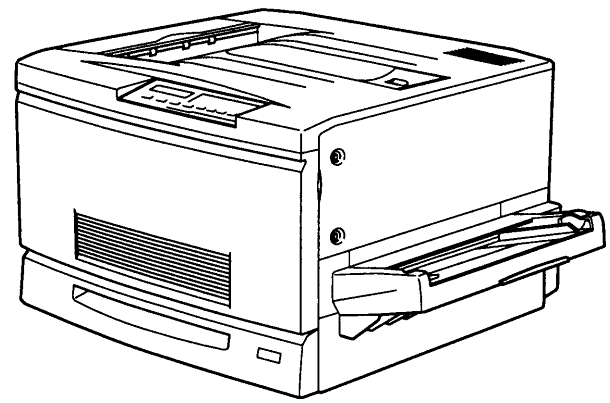


Figure 1-1. Exterior View of the EPL-C8200

1.2 Specifications

This section describes specifications for this printer.

1.2.1 Basic Specifications

- Method: Semi-conductive laser beam scanning and dry electrophotographic process
- Resolution: 600 DPI
- Print mode:
  - B/W mode: Standard monochrome print mode that supports the fastest speed.
  - Color mode: Color mode which uses the color toner of Y, M, C, and BK.
- Speed mode:
  - Standard mode: Transports paper at the highest speed supported by the printer.
  - Half speed mode: Low speed mode that enables better fusing for thick paper (over 105g/m^2) envelopes, and OHP sheet.
- Print speed: See Table 1-1.

Table 1-1. Speed Mode

Print mode	Speed mode	LT/A4 LEF*1 2UP *2	B(LD)/A3 SEF*1
B/W	Standard mode	16 PPM or more	8PPM or more
	Half speed mode	2.7 PPM or more	1.3PPM or more
Color	Standard mode	4 PPM or more	2PPM or more
	half speed mode	1.8 PPM or more	0.9PPM or more

**1: [LEF, or Long Edge Feed]*
The longer edge of the paper is the top toward the paper feed direction.
[SEF, or Short Edge Feed]
The shorter edge of the paper is the top toward the paper feed direction.
**2: In this mode, the printer prints two print images on the IBT belt and the images are transferred in sequence onto two sheets of paper. It is available for LT/A4 (LEF) or smaller.*

- First print*:
  - Face-up: B/W: 20 seconds or less (LT/A4 LEF)
    Color: 42.6 seconds or less (LT/A4 LEF)
  - Face-down: B/W: 24.9 seconds or less (LT/A4 LEF)
    Color: 47.6 seconds or less (LT/A4 LEF)

NOTE: *First print is defined as the duration taken after receiving the start command until outputting the first print. It is applicable when a feeder is selected in the standard mode. (Not applied during the process control operation.)*

- Warm-up time: Within 300 seconds
  (at 22 °C, 55% Rh, rated voltage)

- Paper handling: See Table 1-2.

Table 1-2. Paper Feeding

Paper source		Available feeder	Capacity (Thickness)	Paper size	Available paper thickness
Standard Tray (MSI) *1 *6		—	150 sheets (16mm)	90 x 139.7 - 330.2 x 457.2 mm	60 - 105g/m^2, 16 - 20 lb (Normal paper, Recommended paper)
			75 sheets	90 x 139.7 - 330.2 x 457.2 mm OHP sheet/Labels/Thick paper	105 - 220g/m^2 (Thick paper, Special paper)
			20 sheets	Envelopes *5 Monarch, C10, DL, C6	
Cassette Unit*2 *7	Standard universal cassette	Standard feeder	250 sheets (28mm)	B5 LEF, Letter LEF, A4 LEF, B4, A3, Legal, Executive LEF, Ledger (B)	60 - 105g/m^2 (Normal paper, Recommended paper)
	Optional A3W cassette	Standard feeder	250 sheets (28mm)	A3W (304.8 x 420 - 328 x 453 mm)	60 - 105g/m^2 (Normal paper, Recommended paper)
	Optional Large Capacity Paper Unit *3	250 x 3 feeder (option)	250 sheets (28mm)	Letter LEF, A4LEF, B4, A3, Legal LEF, Executive LEF, Ledger (B)	60 - 105g/m^2 (Normal paper, Recommended paper)
	Optional 500-Sheet Paper Cassette Unit *4	250 x 2 feeder (option)			

**1: Change the side guide position in the MSI tray for paper whose width is more than 304.8mm (12")*
**2: Each casssettes is equipped with the side guide and end guide that also serve to detect paper size. They are set by the user. With an optional Large Capacity Paper Unit installed, 4 cassettes (maximum) can be used and, including a standard tray, up to 1150 sheets can be set.*
**3: Composed of 3 paper cassetts (each holds 250 sheets). Each paper cassette unit is compatible with a standard universal cassette and can be set in any slot.*
**4: Composed of 2 paper cassetts (each holds 250 sheets). Each paper cassette unit is compatible with a standard universal cassette and can be inserted in any slot.*
**5: Note the following points when setting envelopes:*
- *Open flaps and set them facing to the tailing side.*
- *Set envelopes with the longer edges first. Length (excluding flap) must be shorter than width.*
- *The minimum length with a flap open must be 143mm.*
- *The minimum width must be 90mm.*

**6: Paper out condition is detected.*
**7: Paper out and paper near empty conditions are detected for each cassette.*
Paper near empty condition: 40 sheets ± 30 sheets (condition: Fuji Xerox L paper, 64g/m^2)

- Paper size: See Table 1-3 .

Table 1-3. Paper Size / 2-UP Mode Availability

Paper	Size	Paper setting orientation			2UP mode availability	Notes
		Standard tray (MSI)	Standard cassette	A3W cassette		
Normal paper						• LEF: Long edge is loaded first. • SEF: Short edge is loaded first. • 2UP is available only for paper size of LT(LEF) or smaller. For custom size paper, paper length along the loading direction must be 8.5 inch or shorter. As for envelopes, the total length including the opened flap part must be 8.5 inch or shorter. • The minimum size of paper set in the standard universal paper cassette is EXE (LEF). • The maximum size of paper set in the MSI tray is 330.2 x 457.2 mm (13” x 18”). • When setting envelopes (LEF*), open their flaps and set the rear ends of the flaps toward paper feeding direction. • A3W cassette have capability for only A3W paper.
A3W	328 x 453mm	SEF		SEF	Unavailable	
A3	297 x 420mm	SEF	SEF		Unavailable	
A4	210 x 297mm	LEF	LEF		Available	
A5	148 x 210mm	LEF			Available	
B4	257 x 364mm	SEF	SEF		Unavailable	
B5	182 x 257mm	LEF			Available	
I-B5	176 x 250	LEF			Available	
LT	8.5 x 11” (215.9 x 279.4mm)	LEF	LEF		Available	
HLT	5.5 x 8.5” (139.7X215.9mm)	LEF			Available	
LG	8.5 x l4” (215.9X355.6mm)	SEF	SEF		Unavailable	
EXE	7.25 x 10.5” (184.15X266.7mm)	LEF	LEF		Available	
GLG	8.5 x 13” (215.9X330.2mm)	SEF			Unavailable	
GLT	8 x 10.5” (203.2 x 266.7mm)	LEF			Available	
B (LD)	11 x 17” (279.4 x 431.8mm)	SEF	SEF		Unavailable	
F4	210 x 330	SEF			Unavailable	
Special paper						
OHP Sheet	8.5 x 11” (210 x 297mm)	LEF			Available	
MON	3 7/8” x 71/2” (98.43 x 190.5mm)	LEF*			Available	
C10	41/8 x 91/2 (104.78 x 241.3mm)	LEF*			Available	
DL	110 x 220mm	LEF*			Available	
C6	114 x 162	LEF*			Available	

- Paper aligning: Single side aligning (front side) for all sizes (both standard tray (MSI) and each cassette)
- Consumables:
  - TONER CARTRIDGE (Black, Cyan, Magenta, Yellow)
  - DRUM CARTRIDGE (including one WASTE TONER BOX)
  - WASTE TONER BOX
  - OIL ROLL
- Regularly replaced parts:
  - MAIN FUSER ASSEMBLY
  - Air filter (replaced with the MAIN FUSER ASSEMBLY
  - BELT CLEANER ASSEMBLY
  - 2ND BTR ASSEMBLY
- Paper output:
  - Face-down (FD):
    250 sheets (B5/EXE or larger, up to 105g/m^2or 28lb
  - Face-up (FU):
    150 sheets (smaller than A4)
    50 sheets (A4 or larger)

  See Table 1-4 FD availability for each paper size.

Table 1-4. Face-Down Output Availability

	Paper Size	FD Availability	Paper Size	FD Availability
Normal paper	A3W	Available	HLT	Unavailable
	A3	Available	LG	Available
	A4	Available	EXE	Available
	A5	Unavailable	GLG	Available
	B4	Available	GLT	Available
	B5	Available	B(LD)	Available
	LT	Available	F4	Available
	I-B5	Unavailable		
Special paper	OHP sheet	FU*	C10	FU*
	Postcard	FU*	DL	FU*
	MON	FU*	C6	FU*

NOTE

1. *The minimum paper size available for FD ejection is 182 mm in the paper feeding direction x 210 mm vertical to the paper feeding direction.*
2. *"FU*" in the FD availability columns means face-up ejection for OHP, thick paper, and envelope.*

- Dimensions (without option):
  728 (W)* mm x 641 (D)* mm x 490 (H) mm (tolerances: ± 1%)
  ** When the standard tray (MSI) and Output tray (FU) are stored.)*
- Weight: 68.4 kg ± 1% (without option)
- Voltage: 110V/120V ± 10%, 50/60Hz ± 3Hz
  220V/240V ± 10%, 50/60Hz ± 3Hz
- Power consumption, Rated current:See Table 1-5.

Table 1-5. Power Consumption Specifications

Power consumption	Operating (color)	• Average: 400Wh or less • Maximum: 1100W or less (Fuser: On)
	Operating (B/W)	• Average: 500Wh or less • Maximum: 1100W or less (Fuser: On)
	Standby mode	• Average: 250Wh or less • Maximum: 1000W or less (Fuser: On) 100W or less (Fuser: Off)
	Energy save mode 1*1	• Average: 200Wh or less • Maximum: 1000W or less (Fuser: On) 100W or less (Fuser: Off)
	Energy save mode 2*2	• Average: 45Wh or less • Maximum: 1000W or less (Fuser: On) 100W or less (Fuser: Off)
Rated current	• 100 V: 11A or less (at rated voltage) • 115V: 10A or less (at rated voltage) • 240V: 5A or less (at rated voltage)	

*1: *Saves more energy than in standby mode. Time required for warning up is shorter.*
*2: *Completely non-operating condition. Complies with the Energy Star.*

- Product life
  - Printer: Approximately 180,000 printed pages on A4 LEF (450,000 images) or five years, whichever comes first.
  - Standard tray (MSI): 72,000 sheets
  - 250 sheets x 3 feeders: 135,000 sheets (45,000 sheets x 3)
- Acoustic noise: Operating = 54.8dB (A) or less
  Stand-by = 38.3dB (A) or less
  Energy Save mode 1 = 38.3dB (A) or less
  Energy Save mode 2 = 35.0dB (A) or less
- Ozone emission: 0.02 ppm (time waited average value) or less.
- Toxicity: Photo conductor, toner, carrier, plastic material have no effect on human body.

1.2.2 Paper Specification

☐ Paper specifications: See Table 1-6.

Table 1-6. Paper Specifications

	Paper Type
Recommended paper	4024 paper (B/W), X-pression paper (color)
Normal Paper	Normal copier paper, Recycled paper, 60g/m^2 - 105g/m^2 (16lb - 28lb)
Special Paper	OHP film, Card stock, Labels, Color paper, Thick paper (105g/m^2 - 220g/m^2), DTP paper, Envelopes

NOTE: *lb: Ream Weight = lb/500sheets/17” x 22”*
1g/m^2 = 0.2659763 lb

NOTE: *Before purchasing a large amount of paper, try it out and check that it is properly fed.*

NOTE: *Avoid using the types of paper listed below to prevent abnormal printing, paper jam, and printer malfunction.*

- *Carbon paper, non-carbon paper, thermal paper, impact paper, acidic paper*
- *Paper that has gone through a thermal or an ink-jet printer.*
- *Paper that is too thick or thin.*
- *Wet (damp) paper*
- *Paper to which a special coating has been applied, or colored paper that has gone through surface process.*
- *Paper that has been lubricated (too smooth or slippery).*
- *Paper whose texture is different on the front and back.*
- *Paper with holes for binders and perforations.*
- *Paper with irregular shape or not cut with right angles.*
- *Paper with labels that come off and stick easily.*
- *Paper with glue, staples, or paper clips attached.*
- *Special ink-jet paper (Super Fine Paper, glossy film, and so on.)*
- *OHP sheets for other color laser printers, monochrome printers, and photocopiers.*
- *Paper that has gone through other color laser printers, monochrome printers, and photocopiers.*
- *Pasted paper*

- Paper source classification:See Table 1-7.

Table 1-7. Paper Usability for Each Paper Source

Paper source	Recommended paper	Normal paper	Special paper				
			OHP sheet	Postcard	Labels	Thick paper*1	Envelope *2
Standard (MSI) tray	RF	P	P	P	P	P	P
Standard universal cassette	RF	P	N	N	N	N	N
A3W cassette*3	RF	P	N	N	N	N	N
Large Capacity Paper Unit*3 500-Sheet Paper Cassette Unit	RF	P	N	N	N	N	N

NOTE: ***RF**: Reliable feeding and good image quality, **P**: Possible, but limited to paper generally available, **N**: Not supported*
**1: 105 - 220g/m^2*
**2: MON, C10, DL, C6*
**3: Option*

- Guaranteed print area: See Figure 1-2.

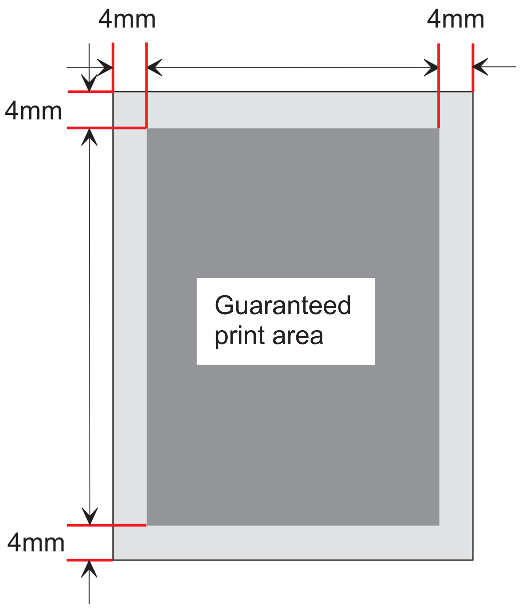


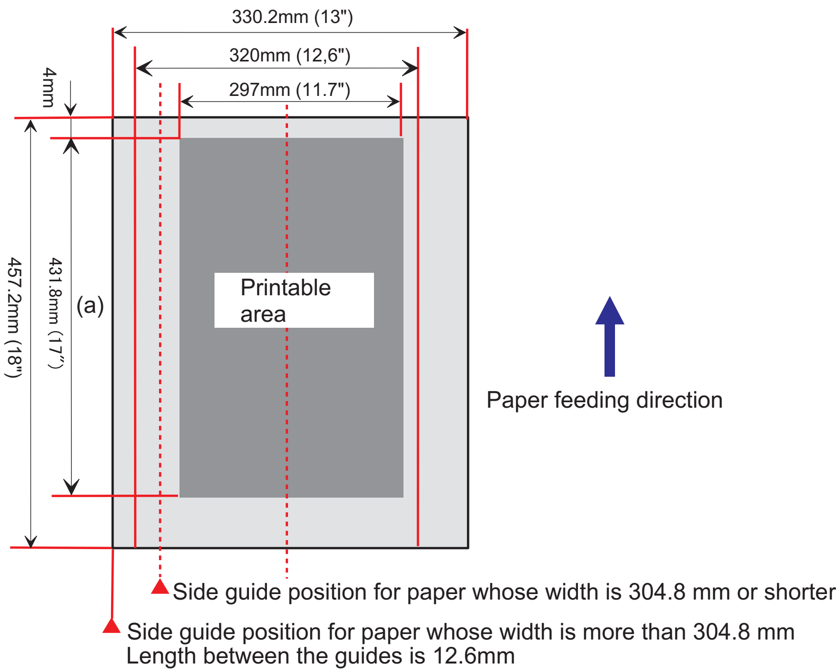
Figure 1-2. Guaranteed Print Area

- Maximum guaranteed print area:
  Area with a margin of 4 mm from each side
  Applied to a paper size up to 297mm (11.7”) width x 431.8mm (17”) length.
- Maximum printable area:
  320mm (12.6”) width x 449.2mm (17.7”) length

- Printable area:
  Paper whose width is 304.8mm (12") or shorter: From the edge
  Paper whose width is longer than 304.8mm (12")*: From the point with a margin of 5mm

  * *When loading paper whose width is more than 304.8 mm (12"), the standard cassette (MSI) is shifted and print position starts with a margin of 5 mm from the paper edge (a). This change is applied to paper loaded from the A3W cassette.*

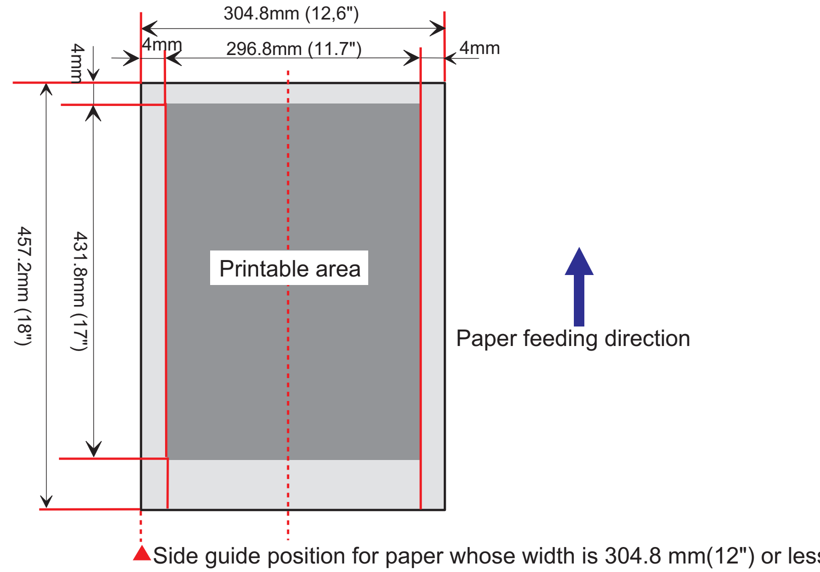
  - When the standard tray (MSI) or A3W cassette is used.



Maximum size of paper: 330.2 mm(13") width x 457.2 mm (18") length
Printable area: 320.0 mm(12.6") width x 449.2 mm (17.7") length
Guaranteed print area: 297 mm(11.7") width x 431.8 mm (17") length

Figure 1-3. Printable Area 1

- When the standard universal cassette, Large Capacity Paper Unit, or 500-Sheet Paper Cassette Unit is used.



Maximum size of paper: 304.8 mm(11.2") width x 457.2 mm (18") length
Printable area: 296.8 mm(11.7") width x 449.2 mm (17.7") length
Guaranteed print area: 296.8 mm(11.7") width x 431.8 mm (17") length

Figure 1-4. Printable Area 2

1.2.3 Reliability and Durability

- MPBF:
  - Printer including standard tray (MSI):
    38,000 pages or more (95,000 images or more*)
  - Printer including optional 250 sheet x 3 feeders:
    32,000 pages or more (80,000 images or more*)

NOTE: *Figured out based on the MPBF in condition that the job ratio of the color and monochrome prints is 1: 1, since 1 page of color print is formed with 4 images.*

- Paper feed reliability: See Table 1-8.

Table 1-8. Paper Feed Reliability

	Recommended paper	Normal paper	Special paper *
Standard paper tray			
Paper jam rate	1/500 or less	1/100 or less	1/100
Multiple feeding rate	1/80 or less	1/50 or less	1/50
Standard universal cassette / Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit(option)			
Paper jam rate	1/3,000 or less	1/2,000 or less	
Multiple feeding rate	1/800 or less	1/500 or less	
A3W cassette (option)			
Paper jam rate	1/2,000 or less		
Multiple feeding rate	1/500 or less		

* *Do not feed envelopes at high temperature to avoid adhering.*
* *Statistics for envelopes only apply to front face feeding under normal temperature. (back side feeding is not included.)*

NOTE: *Paper jam or multiple feeding occurred to the top sheet of an added stack of paper is ignored.*

- Print position accuracy:
  - Main scan direction:Reference position (c) ± 2.5 mm
  - Sub scan direction:Reference position (a) ± 2.0 mm

  See Figure 1-5.
- Paper skew: See Figure 1-5 and Table 1-9.

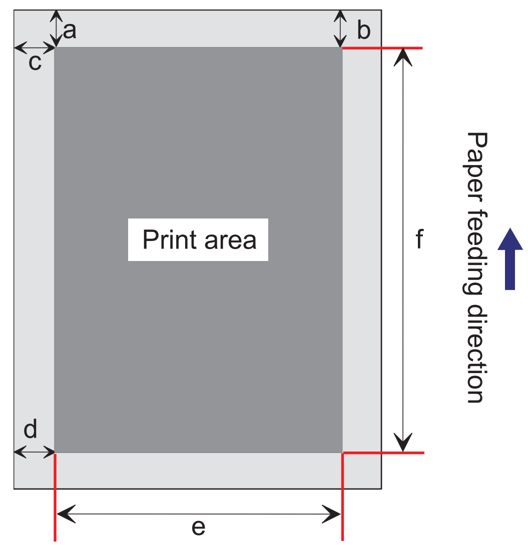


Figure 1-5. Paper Skew

Table 1-9. Paper Skew

Direction	A4 (landscape)	A3
Main scan direction (|c-d|)	±1.5mm(f=196mm)	±3.0mm(f=406mm)
Sub scan direction (|a-b|)	±2.0mm(e=271mm)	±2.0mm(f=271mm)

- Durability:
  - Printer:
    180,000 sheets* (450,000 images) A4 LEF or 5 years, whichever comes first. Parts regularly replaced by the service is ignored.
    ** 450,000 sheets if the printer is used for monochrome print only. In color printing, one page is formed with 4 images, and the value "180,000" sheets is figured out in the condition that the job ratio of monochrome and color printings is 1:1.*
  - Standard tray (MSI): 72,000 sheets
  - 250sheets x 3 feeders: 135,000 sheets (45,000 sheets x 3)
- MTTR: Within 30 minutes (average)
- Curl height at ejection: Less than ± 15mm (Color printing with the image ratio of 5% in non- aligned condition, which varies depending on the image rate and aligning pattern.)

1.2.4 Operating Environment

- Temperature: 10 to 32°C
- Humidity: 15% to 85% RH (without condensation)
- Air pressure (altitude):760 hPa or more (2500 meters or less)
- Levelness:

  Front - rear direction on the table:5mm or less (within 641mm)

  Right - left direction on the table:10 mm or less (within 560mm)
- Luminosity: 3000 lux or less (not to exposed to direct sunlight)
- Surrounding environment:See Figure 1-6.

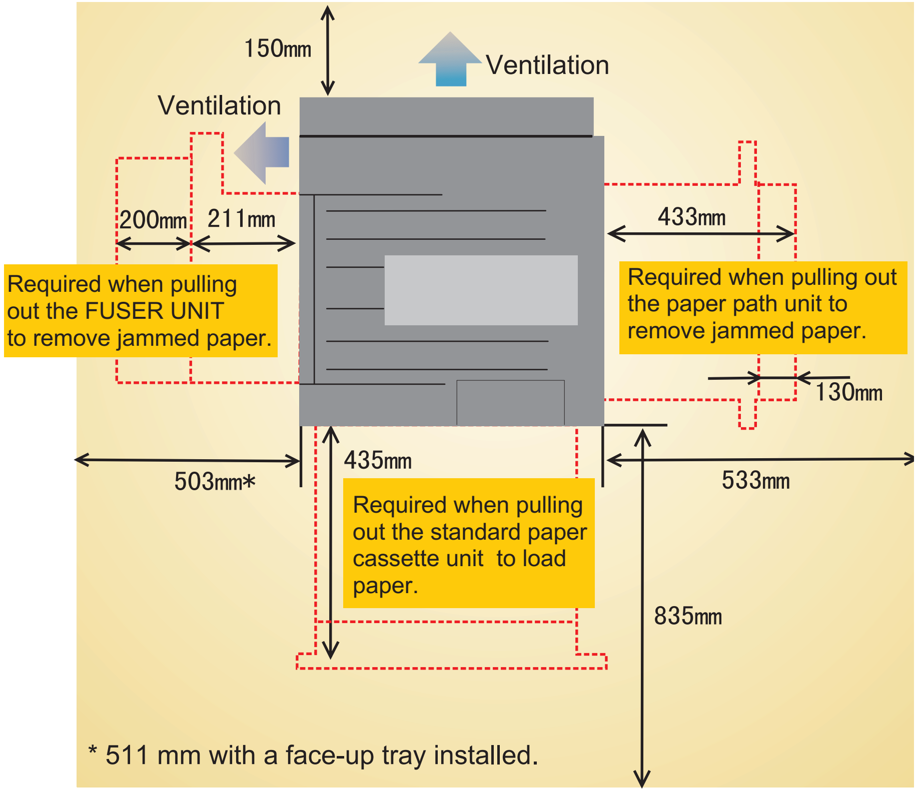


Figure 1-6. Space Requirement

1.2.5 Environmental Conditions for Storage and Transportation

- temperature and Humidity:See Table 1-10.

Table 1-10. Environmental Conditions 1

	Temperature	Humidity	Guaranty
Normal condition	0 - 35 °C	15 - 80%RH[*1]	For 12 months
Extreme condition	High: 35 - 40 °C Low: -20 - 0 °C	High: 80 - 95%RH* Low: 5 - 15%RH*	One month (Max.)

**1: Without condensation.*

- Storage air pressure (altitude)
  0 - 2500 meters (0 up to 15000m is possible during air shipping, but the air pressure in the cargo room must be 0.7 hPA or more.)
- Drop test: See Table 1-11.

Table 1-11. Drop Test

	Height	Test times
Free drop	Bottom: 457 mm (18”)	Once
	Other than bottom: 305mm (12”)	Once for each surface (total of 5 times)
Ridge drop	457 mm (18”)	Once for each side (total of 4 times)

- Resistance to vibration
  - Frequency: 2 - 500 Hz
  - Acceleration: 12.6 m/s^2 (on a vibrating board)[*1]
  - Direction: 3 directions (X, Y, Z)[*2]
  - Duration: 30 minutes (single way)

**1: Overall rms value*
**2: Z=vertical, X and Y=horizontal*

1.2.6 Electrical Specifications

- AC line noise
  - Pulse width: 50 to 1000 ns
  - Pulse polarity: +/–
  - Repeat: Not synchronized
  - Modes: Common/normal
  - Voltage: 1kv (However, the parts can withstand up to 2kv without damage.)
- Instant cutoff: DIP 100% (at rated voltage-10%) for one cycle with normal print quality.
- Electrostatic durability:
  No possibility of any error which affects on print quality under the following conditions.
  - Atmospheric discharging:± 8KV
  - Contact discharging:± 6KV
- Rush current: 1/2 cycle, 100A or less
- Insulation resistance: 10 M Ω or more
- Dielectric strength:
  There is no breakdown when the following voltages are applied for one minute.
  - 100V/120V model:
    AC 2000V (Between primary and secondary sides)
    AC 1000V (Between primary side and chassis)
  - 220V/240V model:
    AC 2000V (Between primary and secondary sides)
    AC 1500V (Between primary side and chassis)

- Leakage current:
  - 100 V model: 0.5mA or less
  - 120V model: 3.5mA or less
  - 220V/240V model: 3.5mmA or less
  - Condition: 1.5K Ω, 0.15uF
    (between non-metallic parts and frames)

1.2.7 Process Specifications

- Printing method: Dry electrophotographic with 2 ingredients
  Using the intermediate belt transfer system
- Light source: Semi-conductive laser beam
- Exposed object: OPC drum (organic photo conductor)
- Charging method: Roller transfer system
- Developing method: Exposed part developing system
- Toner: Single-ingredient nonmagnetic toner with carrier
- 1st transfer: Intermediate belt transfer system
- 2nd transfer: Roller transfer system
- Fusing: Heat roller system
- Density adjustment: Automatic (can not be set by user)

1.2.8 Applicable Standards

- Safety standards
  - 100V/120V:
    UL1950 2nd Edition, CSA C22.2 No. 950-M89
  - 220V/240V:
    IEC950 2nd Edition/1991 by VDE with GS-mark
- Safety regulations
  - 100V/120V:
    FDA21CFR Chapter 1, Subchapter L, Section 1010, 1040
  - 220V/240V:
    IEC825 Class I Laser Product

NOTE: *Laser power: 5mW (rated)*
Wavelength: 785nm +10/-15nm (at 25 °C)

- EMI
  - US: FCCPart15 SubpartB, ClassB(ANSI 63.4/11.4D)
  - Europe: EN55022(CISPR Pubilication22), ClassB
    Followings will become effective in January, 2001:
    EN61000-3-2 (Hamonics)
    EN61000-3-3 (Flicker)
- Others
  - Toner: No effect on human health (OSHA, TSCA, EINECS)
  - Carrier: No effect on human health
  - OPC: No effect on human health (OSHA)
  - Ozone: UL478 (5th edition)
  - Material: SWISS environmental law (must contain no Cds)

1.2.9 Options and Consumable Products

The following table shows the options and consumable products for EPL-C8200.

Table 1-12. Options and Consumable Products for EPL-C8200

Options	Code	Consumable Products	Code
Large Capacity Paper Unit	C81301*	Toner Cartridge (Yellow)	S050016
500-Sheet Paper Cassette Unit	C81335*	Toner Cartridge (Magenta)	S050017
250 Sheet Lower Paper Cassette Unit A3W	C81302*	Toner Cartridge (Cyan)	S050018
Hard Disc Drive	C82377*	Toner Cartridge (Black)	S050019
Adobe PostScript 3 Kit	C83236*	Waste Toner Collector (WASTE TONER BOX)	S050020
EPSON RIP Station XXXX		Fuser Oil Roll	S052002
32KB Serial Interface Card	C82307*	Photoconductor unit (DRUM CARTRIDGE)	S051061
32KB Parallel Interface Card	C82310*	EPSON Color Laser Paper (A4)	S041215
Coax Interface Card	C82314*	EPSON Color Laser Paper (A3)	S041216
Twinax Interface Card	C82315*	EPSON Color Laser Paper (A3W)	S041217
LocalTalk Interface Card	C82312*	EPSON Color Laser Paper (Letter)	S041218
GPIB Interface Card	C82313*	EPSON Color Laser Transparencies (A4)	S041175
-	-	EPSON Color Laser Transparencies (Letter)	S041174

** Asterisk varies depending on the market.*

1.2.9.1 Toner cartridge

- Toner Cartridge life: See Table 1-13.

Table 1-13. Toner Cartridge Life

Item	Life
Toner Cartridge (Black)	4,500 images
Toner Cartridge (Cyan)	6,000 images*
Toner Cartridge (Magenta)	6,000 images*
Toner Cartridge (Yellow)	6,000 images*

**: Defined under the conditions that the image ratio is 5% on A4 (LEF) paper during continuous printing, and different in color printing. Also, life varies depending on the image ratio and printer usage, weather continuous or intermittent.*

- Dimensions and weight:
  See Table 1-14. (Tolerances for dimensions and weight are both ± 1%)

Table 1-14. Dimensions and Weight

	Unpacked	Packed
Dimensions (WxDxH)	50 mm(W) x 400mm (D) x 54.5mm (H)	85 mm(W) x 435mm (D) x 80mm (H)
Weight	Black: 0.39kg Y/M/C: 0.39kg	Black: 0.48kg Y/M/C: 0.48kg

- Environmental conditions for storage and transportation:
  - Temperature/Humidity: See Table 1-15.

Table 1-15. Temperature/Humidity

	Temperature	Humidity	Guaranty *1
Normal condition	0 - 35 °C	15 - 80% RH *1	24 months
Extreme condition	High: 35 - 45 °C Low: -20 - 0 °C	High: 80 - 95% Rh*1 Low: 5 - 15% Rh*1	1 month (Max.)

**1: Without condensation*
**2: 12 months for unpacked cartridges under the used condition.*

- Storage air pressure:
  0 - 2,500m (0 up to 15,000 m is possible during air shipping, but the air pressure in the cargo room must be 0.7 hPA or more.)
- Drop test:
  - Height: 91 cm
    (1 corner, 3 sides, 6 surfaces)
- Resistance to vibration:
  - Frequency: 5 - 100 Hz
  - Acceleration: 0.7G
  - Direction: 3 directions (X, Y, Z) *2
  - Duration: 50 minutes (single way) for each direction
  -

1.2.9.2 Drum Cartridge

- Specifications: See Table 1-16.

Table 1-16. Photoconductor Unit Specifications

	Specifications
Formation	Photoconductor, drum cleaner, waste toner box
Life	20,000 sheets *1 (same for the waste toner box)
Dimension (WxDxH) *2	• Unpacked: 213 mm(W) x510 mm (D) x 181 mm (H) • Packed: 318 mm(W) x 618 mm (D) x 280 mm (H)
Weight	• Unpacked: 2.45 kg • Packed: 3.5 kg
Environmental condition for storage and transportation	Same as for Toner Cartridge

**1: Defined under the conditions that the image ratio is 5% on A4 (LEF) paper during continuous printing, and different in color printing. Also, life varies depending on the image ratio and printer usage, weather continuous or intermittent printing.*
**2: Tolerances for dimensions and weight are both ± 1%*

1.2.9.3 Fuser Oil Roll

- OIL Roll specifications: See Table 1-17.

Table 1-17. Fuser Oil Roll Unit Specifications

	Specifications
Formation	Oil roll
Life	20,000 sheets *1
Dimensions (WxDxH) *2	• Unpacked: 75 mm(W) x 421 mm (D) x 48 mm (H) • Packed: 160 mm(W) x 600 mm (D) x 130 mm (H)
Weight	• Unpacked: 0.68 kg • Packed: 1 kg
Environmental condition for storage and transportation	Same as for Toner Cartridge

**1: Varies depending on the operating conditions, as follows:*
- Operating rate is 120 sheets / day or more: 20,000 sheets
- Operating rate is 120 sheets / day or less: 11,000 sheets
**2: Tolerances for dimensions and weight are both ± 1%*

1.2.9.4 Waste Toner Box

☐ WASTE TONER BOX specifications:See Table 1-18.

Table 1-18. Waste Toner Box

	Specifications
Formation	Waste toner box and others
Life	20,000 sheets *1
Dimensions (WxDxH) *2	• Unpacked: 80 mm(W) x 444 mm (D) x 131 mm (H) • Packed: 149 mm(W) x 495 mm (D) x 192 mm (H)
Weight	• Unpacked: 0.45 kg • Packed: 0.87 kg
Environmental condition for storage and transportation	Same as for Toner Cartridge

**1: Defined under the conditions that the image ratio is 5% on A4 (LEF) printing at 4P/J. Life varies depending on the image ratio and printer usage, weather continuous or intermittent printing.*
**2: Tolerances for dimensions and weight are both ± 1%*

1.2.10 Regularly Replaced Parts

The regularly replaced parts (replaced by service engineers) and their lives are as follows.

- MAIN FUSER ASSEMBLY (including the ventilation filter) 100,000 sheets
- 2ND BTR ASSEMBLY: 100,000 sheets

1.2.11 Exterior Dimensions

Exterior dimensions of the EPL-C8200 are as follows.

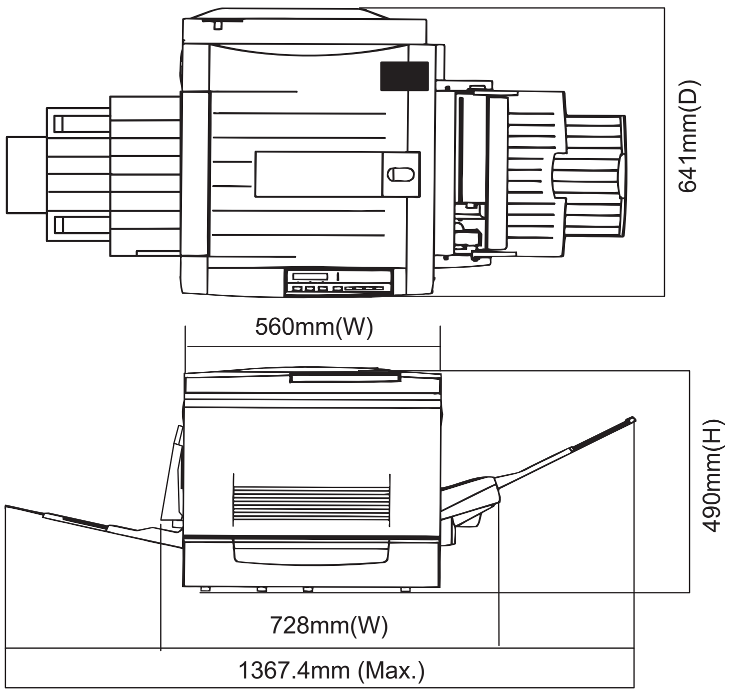


Figure 1-7. Exterior Dimensions of EPL-C8200

1.2.12 Controller Specifications

- CPU: R5000 (200MHz)
- Enhancement technologies:
  AcuLaser Color Halftoning (monochrome print)
  RIT, CRIT
- RAM: SDRAM 64-bit-wide DIMM (168-pin, 3.3V)
  Maximum: 256MB
  3 RAM slots, including 1 used for the standard RAM
  - Standard: 64MB
  - Expansion: 32MB, 64MB, 128MB, 256MB
- ROM: 32-bit-wide
  - Program: 4MB (ROM DIMM)
  - Font: 4MB
- Expansion ROM: 3 slots (ROM DIMM slots)
  - Slot A, B: Font ROM module, PostScript3 module, CM table
  - Slot C: NLSP font ROM module only
- Panel: 1-line 20-Character LCD, 6 LEDs, 8 switches
- Interfaces:
  - Standard: Parallel, 1ch
    - 1EEE-1284-compliant bidirectional
    - B-type connector
    - Compatibility
    - Nibble
    - ECP

    Ethernet
    - 100Base/TX, 10Base/T, 1ch
  - Optional: Type-B - 1 slots (for level 3)
- Printer settings: Made through the panel setting mode, EJL commands, and MIB
- Printer modes:
  - Standard: ESC/Page-Color, ESC/Page (B/W), LJ4 (B/W), GL2 (B/W), ESCP2 (B/W), FX (B/W), 1239X (B/W)
  - Optional: Postscript3 (PostScript3 module, Peacock-B)
  - Others: EJL, PJL, RCC
- Supplementary software:
  Status sheet
  Network Status Sheet
  Opt I/F Status Sheet (with a Type-B level 3 I/F installed)
  Font Sample (each mode)
  Hex dump
  Support Mode
  Maintenance mode (Engine Status Sheet)

1.2.13 Controller Board Jumper Settings

The controller board configuration of this printer can be set for the target market (destination) as indicated below. The settings are made at factory (by jumper resistor).

- Factory paper default switch setting between A4 and Letter:

  [Letter] North/South American

  [A4] European
  Pacific/Russian
  Taiwanese
  Chinese
  Korean

- Paper size switch setting for the cassette:

  [EXE] North/South America
  European
  Pacific/Russia

  [B5] Taiwanese
  Chinese
  Korean

- Short/Open condition for RJ3 and RJ4:

  [RJ3] Open

  [RJ4] Short

1.3 Interface Specifications

The EPL-C8200 supports the following external interfaces.

- Standard: 1. Parallel interface
  2. Ethernet interface

- Optional: Type-B host interfaces (1 slot)

The host interface usage configurations are as follows.

Table 1-19. Host Interface Usage Configurations

	Parallel I/F	Ethernet I/F	Type B (AUX) I/F
1. Automatic I/F switching	Usable	Usable	Usable
2. Fixed I/F (Parallel)	Usable	Not Usable	Not Usable
3. Fixed I/F (Etherent)	Not Usable	Usable	Not Usable
4. Fixed I/F (AUX)	Not Usable	Not Usable	Usable

Figure below shows the locations of these interfaces.

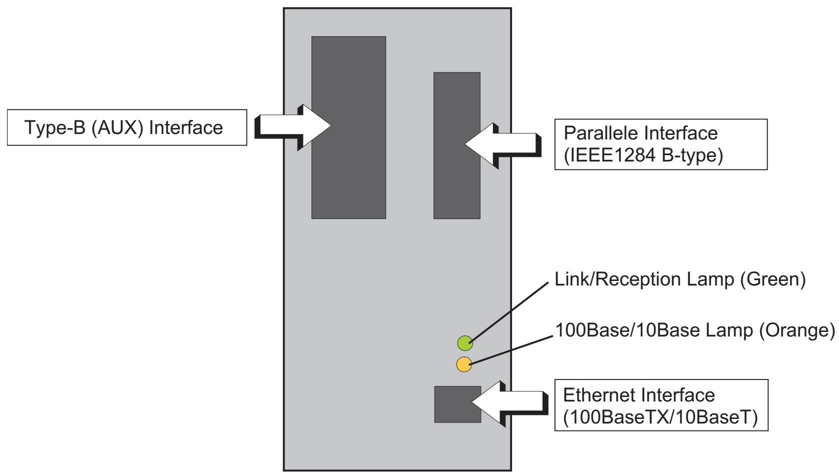


Figure 1-8. Locations of the Interface Slots

1.3.1 Parallel Interface Specification

- Interface type: IEEE 1284 High-Speed Bi-directional Parallel I/F
- Operating modes: Compatibility, Nibble, ECP
- Synchronization: /STROBE pulse
- Connector type: 57RE-40360-830B(D7A)DDK or equivalent
- Plug: Amphenol equivalent
- Data transmission timing: Refer to Table 1-20 and Figure 1-9.
- Device ID: See Table 1-21.

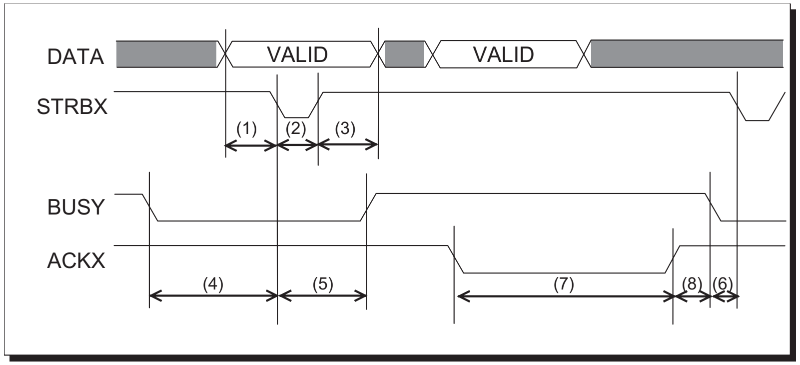


Figure 1-9. Data Transmission Timing

Table 1-20. Data Transmission Timing

		Min.	Typ.	Max
(1)	Data hold setup	0.5 us		
(2)	Data hold	0.5 us		
(3)	Strobe pulse	0.5 us		
(4)	BUSY to STRBX	0 us		
(5)	STROB to BUSY			0.5 us
(6)	BUSY to STRBX	0 us		
(7)	ACKX pulse width	0.5 us	1 us*	
(8)	ACKX to BUSY	0 s		
(9)	BUSY to PE or ERRX	2 ms*		
(10)	PE or ERRX to BUSY	2 ms*		
(11)	Power on to signal output valid			05 s
(12)	PE or ERRX to ACKX	2 ms*		
(13)	STRBX to ACKX	0 s*		

Table 1-21. Device ID

*1;	
MFG:	EPSON;
CMD:	PJL, EJL, ESCPL2, ESCP9, PRPXL24-01, PCL, HPGL2-01, ESCPAGE-04, ESCPAGECOLOR-01*2;
MDL:	*3;
CLS:	PRINTER;
DES:	*4;

**1: Total length of Device ID + 2 (hex)*
2: **POSTSCRIP is added when a PostScript module is installed.*
3: Model name **EPL-C8200*
4: Manufacture and product name **EPSON ColorPage EPL-C8200*

Note the MFG, MDL, DES, and CID can be defined by the users. The CID field, which does not reply at initialized device ID, only replies with a user-defined character string. The device ID at re-definition is as shown below. A “*****” represents a user-defined character string.

MFG: *****;
CMD: Same as above
MDL: *****;
CLS: PRINTER
DES: *****;
CID: *****;

Table 1-22. Centronics Parallel Interface Pin Assignment

Pin #	Signal Names	I/O	Descriptions
1	STRBX	I	Latch pulse used to read data. DATA is valid when the signal is LOW.
2-9	DATA 1-8	I	DATA 8 is MSB and DATA 1 is LSB.
10	ACKNLGX	O	An acknowledge pulse to the host that indicates the data from the host computer has been received.
11	BUSY	O	HIGH status indicates the printer is not ready to accept data.
12	PE	O	Indicates paper empty status in paper tray or cassette selected.
13	SELOT	O	Always HIGH.
14	AUTOX	I	When the signal is LOW, the printer automatically feeds a line as “CR” is input. The “CR” is detected when the printer is turned on or the interface selection is switched from the optional I/F to parallel I/F.
15	NC	-	Not used.
16	GND	-	Ground level for the twisted pair return.
17	CG	-	Connected to the printer chassis. The printer chassis GND and the signal GND are connected each other.
18	NC	-	Not used.
19-30	GND	-	Ground level for the twisted pair return.
31	INITX	I	When the signal is LOW, the STRBX signal is ignored.
32	ERRX	O	The signal is LOW when the printer is in the following condition: User maintenance is required. Service maintenance is required. Another type of error has occurred. The printer is off line.
33	GND	-	Ground level for the twisted pair return.
34	NC	-	Not used.
35	+5V	-	Pulled up to +5V through 1K Ω resistor.
36	SELINX	I	Always LOW.

1.3.2 Ethernet Interface

- Interface type*: 10BaseT
  100BaseTX
  Half Duplex
  Full Duplex

  **: Switched at power on*

- Communication protocol:

  1. IPX/SPX (IPX, SPX, NCP, RIP, SAP, PrintServer, RemotePrinter, NDS, SNMP, ENPC)
  2. NetBIOS (SMB)
     NetBEUI
  3. TCP/IP (IP, UDP, TCP, LPR, FTP, TELNET, APR, ICMP, RARP, BOOTP, DHCP, SNMP, HTTP, ENPC)
  4. AppleTalk (ELAP, DDP, ATP, PAP, AARP, NBP, ZIP, RTMP, SNMP, ENPC)

- Connector type: RJ45
- Applicable cable: 2-pair STP (10BaseT, 100BaseTX)

  NOTE: *Use a shielded cable to meet FCC Class B, EN55022 Class B, and VCCI Class B.*

- Pin configuration: See Table 1-23.
- Entity type: See Section 3.3.3 Type B Interface.

Table 1-23. Pin Configuration for the Ethernet I/F

Pin	Signal Name	I/O
1	Tx+	O
2	Tx-	O
3	Rx+	I
4	N.C.	-
5	N.C.	-
6	Rx-	I
7	N.C.	-
8	N.C.	-

1.3.3 Type B Interface

This printer is equipped with a slot for Type B optional interface.

- ☐ Main system type: MTP600dpi, PW774dt600doi, PRG(＊＊＊＊＊)* rev. AP2000ma, SPD0fast, D4
  **: "＊＊＊＊＊"Represents ROM version.*
- ☐ Printer name: Same as the Product name at factory.
- ☐ Product name: EPL-C8200
- ☐ Emulation type / Entity type: See Table 1-24.

Table 1-24. Type B I/F Emulation/Entity Type

Emulation	Emulation Type	Entity Type
PS *1	POSTSCRIPT-00*1	LaserWriter *1
ESC/Page Color	ESCPAGECOLOR-01	EPSONPAGECOLOR1
ESC/Page	ESCPAGE-04	
LJ4	PCL5E-00	EPSONPCL5
RCC*2	-	-
1239X	PRPXL24-01	EPSONPRPXL24
GL2	HPGL24-01	EPSONHPGL2
FX	ESCP9-84	EPSONFX
ESCP2	ESCPL2-00	EPSONLQ2

**1: Added with PostScript3 module attached.*
**2: Can not be selected by users.*

- ■ Emulation type

  1. Emulation = Auto

     When PS is active: AUTO (Emulation Type 1,2,3,...)
     When PS is inactive: EJL(POSTSCRIPT-00, other Emulation Type 1,2,3...)

  2. Emulation Menu = fixed

     EJL (Default Emulation Type, Other Emulation Type 1,2,3, ...)

- ■ Entity type

  1. Emulation = Auto:See Table 1-24.
  2. Emulation Menu = Fixed

     The entity type of the default emulation, EPSONCOLORPAGE is returned.

1.4 Control Panel

This section describes the control panel of this printer and its functions.

1.4.1 Appearance and Descriptions

The control panel of this printer consists of the LCD, 8 buttons, and 6 LEDs. See Figure 1-10 and Table 1-25 for the control panel appearance and its descriptions, respectively.

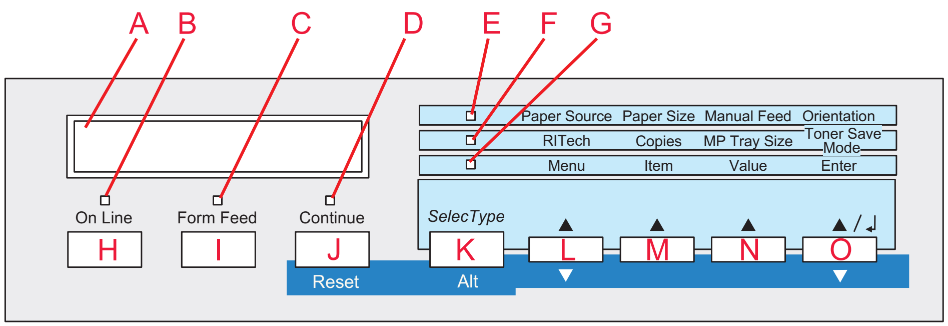


Figure 1-10. Control Panel Appearance

Table 1-25. LEDs and Switches on the Control Panel

LED			Button		
Location	Name	Remarks	Location	Name	Remarks
A	LCD Panel	1 line, 20 characters (5 x 7 dot matrix)	H	On Line button	
B	On Line LED	Green	I	Form Feed button	
C	Data LED	Yellow	J	Continue button	
D	Continue LED	Red	K	SelecType/Alt button	Also serves as the Shift button
E	OneTouch Mode 1 LED		L	Menu Select button	
F	OneTouch Mode 2 LED		M	Item Select button	
G	SelecType Mode LED		N	Value Select button	
-	-		O	Enter button	

1.4.1.1 LED Description

- LCD (Liquid Crystal Display) (A)

  One-line display for 20 characters (5 x 7 dot matrix)
  Normally displays printer status.
  In panel setting mode, LCD displays various setting values.

- On Line LED (B)
  - On: The printer is on-line.
  - Off: The printer is a pause status.

- Form Feed LED (C)
  - On: Unprinted data remains in the printer. However, the lamp is not lit if the remaining data is not effective print data but other data such as control codes including commands.
  - Off: No effective print data remains in the printer. If control codes are not terminated, the indicator is lit.
  - Blinking: The printer is processing data.

- Continue LED (D)
  - Blinking: An error has occurred which can be cleared by pressing the Continue button.

- OneTouch Setting Mode 1 LED (E)
  - On: OneTouch mode 1 is enabled. The following 4 items can be set in this mode:
    - Paper Source
    - Paper Size
    - Manual Feed
    - Orientation

- OneTouch Mode 2 LED (F)
  - On: OneTouch mode 2 is enabled. The following 4 items can be set in this mode:
    - RITech
    - Copies
    - Mp Tray Size
    - Toner Save Mode

- SelecType Mode (G)
  - On: SelecType mode is enabled.

- All LEDs

  All LEDs come on when a service-call error has occurred.

1.4.2 Button Functions

- **On Line button (H)**

When the printer is on-line, pressing this button puts the printer in off-line to prevent printing. Pressed during panel setting mode, it immediately terminates the setting mode and brings the printer back to on-line status.

- **Form Feed button (I)**

If the Form Feed lamp is lit in off-line status, pressing this button causes the printer to print a page of data. If data for multiple pages has been received, it is printed. If the Form Feed LED is lit because the control codes are not terminated, the data received up to that point is printed. The printer does not eject paper when the Form Feed LED is on.

- **Continue button (J)**

While the Continue LED is on, pressing this button clears the error. Also, a warning message indicated during on-line status can be cleared by pressing this button.

- **SelecType button (K) (or Shift button)**

Used to select OneTouch mode 1 / OneTouch mode 2 / SelecType mode, as follows:

- The first push of the button puts the printer in OneTouch mode 1.
- Pressing this button in the OneTouch mode 1 puts the printer in OneTouch mode 2.
- Pressing this button in the OneTouch mode 2 activates the SelecType mode to enter the initial level of SelecType mode. (The “Test Menu” appears.)

- **Menu button (L)**

- Pressing this button activates the SelecType mode, and the initial level of the mode (“Test Menu”) appears. In the SelecType mode, this button is used to select the setting menu, the primary level of the mode.
- In OneTouch mode 1, used to select the value for “Paper Source”.
- In OneTouch mode 2, used to select the item for “RITech”.
- In SelecType mode, used to select the setting menu.

NOTE: *If this button is pressed with the Shift button held down, setting values and items scroll backward.*

- **Item button (M)**

Pressing this button brings up the item that was last selected.

- In OneTouch mode 1, this button is used to select the value for “Paper Size”.
- In OneTouch mode 2, this button is used to select the value for “Copies”.
- In SelecType mode, this button is used to select the setting item.

NOTE: *If this button is pressed with the Shift button held down, setting values and items scroll backward.*

- **Value button (N)**

Pressing this button enables the item that was last selected.

- In OneTouch mode 1, used to select the value for “Manual Feed”.
- In OneTouch mode 2, used to select the value for “MP Tray Size”.
- In SelecType mode, used to select the value for the currently selected setting item. The next available value for the item is indicated.

NOTE: *If this button is pressed with the Shift button held down, setting values and items scroll backward.*

- **Enter button (O)**

  Pressing this button generates “Status Sheet” in “Test Menu”.

  - In OneTouch mode 1, used to select the value for “Orientation”.
  - In OneTouch mode 2, used to select the value for “Toner Save Mode”.
  - In SelecType mode, the setting value is confirmed and printing or other functions are activated.

  NOTE: *If this button is pressed with the Shift button held down, setting values and items scroll backward.*

- **Reset button (Continue button + Alt button) (K + J)**

  Pressing this button with the Alt button held down causes the printer to stop printing and reset. After the message “Reset” is indicated on the LCD, if the both buttons are kept pressed for more 5 seconds, “Reset All” is indicated and warm boot is performed.

1.5 Service Functions

Turning the printer on while pressing the specified button(s) until RAM check is completed provides several service functions. The service functions supported with this printer are as listed below.

- Hex Dump Mode
- Support Mode
- EEPROM Initialization
- Panel Setting Initialization
- Formatting the Flash ROM Module
- Updating the Program ROM
- ROM Module Copy
- Maintenance Mode
- CPU Reset During Service-Call Error
- Error Sheet Print

NOTE: *Following modes are not supported.*

- Total page counter clear
  Total Counter Clear in the Maintenance Menu is substituted.
- Toner level reset
  Remaining toner level is evaluated based on the dispense time on the engine side.

1.5.1 Hex Dump Mode

- Buttons: Form Feed + Power on
- Functions: "Hex Dump" is indicated. Received data is converted into hex ASCII. This is valid for all interfaces. The hex damp sheet contains the following information:

  -Dump list with the received data in hex ASCII format
  -Data list with 1-byte code characters (Unreadable characters are expressed by *.*.)
  -Page number
  -Termination:Press "Reset" button to perform warm boot or turn the printer off and back on.

1.5.2 Support Mode

- Buttons: Value + Power on
- Functions: Adds the support mode to the setting menu list. Once it is added, the printer performs warm-boot, then the support mode can be selected and executed. The support mode enables servicers to set items, including HDD initialization, that are normally not set by users.

1.5.3 EEPROM Initialization

- Buttons: On Line + Continue + Menu + Power on
- Functions: Clears the EEPROM to 00h and writes factory default values. All values except for the values below are cleared; IBT Cleaner, 2ND BTR, Fuser Unit, and accumulated printed pages counter value. (Refer to Section 1.5.8.)
- Termination: After initializing, the printer performs warm boot and returns to the normal states.

1.5.4 Formatting the Flash ROM Module

- Buttons: Alt + Item + Value + Enter + Power on
- Functions: Clears the flash ROM module inserted in the slot A. It starts as the message “DIMM A ERASING” appears.
- Termination: After formatting the flash ROM module, the printer performs warm boot and returns to the normal states.

1.5.5 Updating the Program ROM

- Buttons: On Line + Alt + Value + Power on
- Functions: Updates the DIMM inserted in the program socket.

1.5.6 ROM Module Copy

- Buttons: On Line + Alt + Enter + Power on
- Functions: Copies the contents of the ROM module in the socket B to the flash ROM module in the socket A. If there is no module in the socket B, the contents of the ROM module in the code ROM socket is copied. As the indication “DIMM COPY MODE” appears, press the Enter button. The contents of the ROM is erased and copy process is carried out.
- Termination: After copying, the printer performs warm boot and returns to the normal states.

1.5.7 Panel Setting Initialization

- Buttons: Continue + Power on
- Functions: All panel settings for total environment and interface-specific environment are reset to the factory defaults. Information such as accumulated printed pages to which users have no access is not initialized.
- Termination: After initializing, the printer performs warm boot and returns to the normal states.

1.5.8 Maintenance Mode

- Buttons: On Line + Form Feed + Continue + Power on
- Functions: Adds the Maintenance menu to the setting menu. After this operation, the printer automatically performs warm boot and the Maintenance menu is enabled. To eliminate this menu from the setting menus, turn the printer off and back on. Note that all engine-related Service-Call Errors (Service-Call Error e f f f f) are ignored (No Service-Call Error occurs.) while the Maintenance menu is generated. (Same as for EJL) Note the following points in the Maintenance mode:
  - Interfaces are always open. (Disconnected)
  - Before entering the Maintenance mode to print an engine status sheet, make sure no engine-related error is indicated in a normal mode (other than Maintenance mode).
  - In this mode, the printer only prints engine status sheet. In case other printouts such as normal status sheet is needed, be sure to check that no engine related error is indicated in a normal mode (other than Maintenance mode), as described above.
- Termination: Turn the printer off and back on.

1.5.9 Error Recovery Operation

By pressing the specified buttons, the following functions are activated.

a) CPU reset when E*** or C2000 Service call error is indicated**

- Buttons: Alt + Menu + Item + value + Enter
- Functions: Returns the printer to the normal states without turning off and back on the printer.

NOTE: *If the message "Printing SysErr?>" appears after this operation, an error sheet can be printed by pressing the Enter button. If any other button is pressed, the printer returns to the normal status without outputting an error sheet.*

b) Display of error details when E*** or C2000 Service-call error is indicated**

Step 1: Press the Continue, Alt, and Menu buttons.
"ERR Y x x x x 0x********" (code and address) appears. - *1

Step 2: Press any button.
"ERR TYPE 0x********" (error type) appears.

Step 3: Press any button. The display returns to *1.

NOTE: *See Chapter 5 / Section 5.1.3 for Service-call Error code list.*

1.6 Panel Setting

This printer is equipped with the 2 types of panel setting functions; the OneTouch mode and SelecType mode. The OneTouch mode allow the users to get directly to the specific setting items in the SelecType mode. Therefore, this manual only lists the setting items for the SelecType mode.

- OneTouch mode 1, 2
  There are two OneTouch modes, OneTouch mode 1 and 2. This mode enables users to make selection by pressing a button in the panel design matrix.
- SelecType mode
  The SelecType mode has two levels.
  1. Setting menu
     Panel setting items fall into numbers of categories called setting menus.
  2. Setting item
     This is the lowest level of the panel setting mode. Some items have values to be selected and others are just executed directly.

1.6.1 Setting Methods

1.6.1.1 OneTouch mode

NOTE: *OneTouch mode is effective when the printer is free from any error condition.*

1. Enter the OneTouch mode 1 or 2 by pressing the **SelecType** button. (The current values for 4 items are shown on the LCD.)
2. Scroll the setting value list by pressing the **OneTouch** button*.
3. When the desired value is indicated, exit the OneTouch mode, and the new value is stored.
4. To return to the On Line status from the OneTouch mode, perform one of the followings:
   1) Press the **On Line** button.
   2) Perform panel setting initialization.
   3) Run a status sheet.
   4) Press the **SelecType** button.

**: "Menu", "Item", "Value" and "Enter" buttons serve as the OneTouch buttons in this mode.*

1.6.1.2 SelecType mode

NOTE: *SelecType mode is effective when no error has occurred.*

1. To enter the SelecType mode, perform one of the following operations:
   1) Press the **SelecType** button to enter the SelecType mode through the One touch mode 1 and 2.
   2) Press the **Menu** button, **Item**, **Value**, or **Enter** button.

   NOTE: *SelecType mode is effective when the printer is free from any error condition.*

2. Follow the next steps to operate the SelecType mode.

 2-1) In the setting menu select mode, select the desired menu by pressing the **Menu** button. The menus are shown left-aligned on the LCD.

 2-2) To enter the setting item select mode, press the **Item** button. The initial item appears in the format below:

 "Setting Item = Current setting value *"

 NOTE: *The trailing * means the current setting value.*

 2-3) In the setting item select mode, press the **Item** button to bring up the desired item. With each push of the Item button, the item is switches to the next item, again shown in the format below:

 "Setting Item = Current setting value *"

 NOTE: *The trailing * means the current setting value.*

 2-4) To select the value for the selected item, press the **Value** button. Each value available appears in the format below:

 "Setting Item = Current setting value *"

 NOTE: *The trailing * means the current setting value.*

 NOTE: *Using the **Alt** button + **Menu/Item/Value** button, it is possible to cycle through the lists backward.*

 NOTE: *Keeping the **Value** button (+ Alt button) depressed for a certain length of time causes the values to change continuously.*

 2-5) In the value select mode, press the Enter button when the desired value is displayed. The value is stored as the new setting or executed directly. (For the value previously set, pressing the Enter button has no effect.)

 2-6) In the item select mode, pressing the Menu button brings back the setting menu select mode and the next menu is displayed.

 2-7) In the value select mode, pressing the Menu or Item button, the item select mode is brought back.

3. To return to the On Line status from the SelecType mode, perform one of the following operations:

 1) Press the **On Line** button.
 2) Perform panel setting initialization.
 3) Run a status sheet.
 4) Press the **SelecType** button.

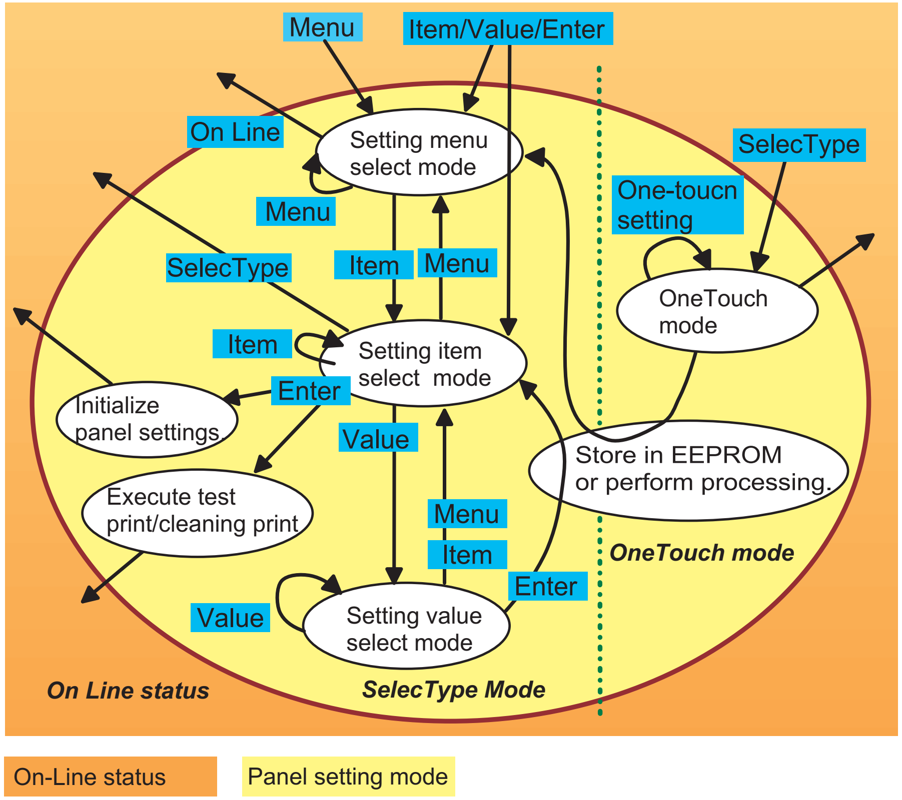


Figure 1-11. Panel Setting Mode Diagram

1.6.2 SelecType Setting Menu List

This section contains the tables which list the SelecType setting menus. The factory defaults values are shown in Bold Italic style. The menus selected through the One-touch mode are shaded.

Table 1-26. Panel Setting Menu List (1/8)

Menu	Item	Value
Test Menu	Status sheet Network Status Sheet[*1] AUX Status Sheet[*2*3] PS3 Status Sheet[*4] PS3 Font Sample[*4] ESC/Page Font Sample[*5] LJ4 Font Sample ESCP2 Font Sample FX Font Sample 1239X Font sample	
Emulation Menu	Parallel	***Auto***, LJ4, ESCP2, FX, 1239X, PS3[*4] GL2
	Network	***Auto***, LJ4, ESCP2, FX, 1239X, PS3[*4] GL2
	AUX[*6]	***Auto***, LJ4, ESCP2, FX, 1239X, PS3[*4] GL2
Printing Menu	Paper Source	***Auto***, MP, LC1, LC2[*7], LC3[*7] LC4[*8]
	Page Size	***A4***[*9], A3, A5, B4, B5, ***LT***[*10], B, HLT, LGL, GLT, GLG, EXE, F4, MON, C10, DL, C6, IB5, CTM, A3W
	Wide A4	***Off***, On
	Orientation	***Port,*** Land
	Out Bin	***Face-down***, Face-Up
	Copies	***1*** ~999
	Quantity[*11]	***1*** ~999
	Manual Feed	***Off***, On
	Resolution	***600***, 300
	Skip Blank Page[*12]	***Off***, On
	Auto Eject Page	***Off***, On

Table 1-27. Panel Setting Menu List (2/8)

Menu	Item	Value
Tray Menu	MP Mode	***Normal***, Last
	MP Tray Size	***A4***[*9], A3, A5, B4, B5, ***LT***[*10], B, HLT, LGL, GLT, GLG, EXE, F4, MON, C10, DL, C6, IB5, A3W
	LC1 Size[*13]	With a standard 250-sheet cassette mounted: A4, A3, B4, B5[*14], LT, LGL, B, EXE[*15] With a 250-sheet lower paper cassette unit A3 W mounted: A3W
	LC2 Size[*7*13]	A4, A3, B4, B5[*14], LT, LGL, B, EXE[*15]
	LC3 Size[*7*13]	A4, A3, B4, B5[*14], LT, LGL, B, EXE[*15]
	LC4 Size[*8*13]	A4, A3, B4, B5[*14], LT, LGL, B, EXE[*15]
	MP Type	***Plain***, Letterhead, Bond, Recycled, Color, Transprncy, Labels
	LC1 Type	***Plain***, Letterhead, Bond, Recycled, Color
	LC2 Type[*7]	***Plain***, Letterhead, Bond, Recycled, Color
	LC3 Type[*7]	***Plain***, Letterhead, Bond, Recycled, Color
	LC4 Type[*8]	***Plain***, Letterhead, Bond, Recycled, Color
Config Menu	RITech	***On,*** Off
	Toner Save	***Off,*** On
	Top Offset	-5.0 ~ ***0.0*** ~ 6.0 mm step 0.5 mm
	Left Offset	-5.0 ~ ***0.0*** ~ 6.0 mm step 0.5 mm
	Size Ignore	***Off,*** On
	Auto Cont	***Off,*** On
	Page Protect	***Auto***, On
	Image Optimum	***Auto***, Off, On
	Paper Type	***Normal,*** Thick, Trmsprnc,
Setup Menu	Interface	***Auto,*** Parallel, Network, AUX[*6]
	Time Out	0, 5 ~ ***60*** ~ 300 step1
(Continues to the next table)	Standby[*16]	***Enable***, Disable

Table 1-28. Panel Setting Menu List (3/8)

Menu	Item	Value
Setup Menu (Continued)	Lang Lang Sprache LINGUA LENG SPRAK Sprog Taal LANG Ling	***English*** Francais Deutsch ITALIANO ESPANOL SVENSKA Dansk Nederl. SUOMI Portugues
	Panel Lock[*17]	***Off,*** On
	C Toner[*13]	E * * * * F, E * * * □ F, E * * □ □ F, E * □ □ □ F, E □ □ □ □ F
	M Toner[*13]	
	Y Toner[*13]	
	K Toner[*13]	
	Total Pages[*13]	0 ~ 99999999
	Color Pages[*13]	0 ~ 99999999
	B/W Pages[*13]	0 ~ 99999999
	SelcType Init	
Parallel Menu	Speed	***Fast***, Normal
	Bi-D	***Nibble,*** ECP, Off
	Buffer Size	***Normal,*** Maximum, Minimum
Network Menu	Network Confiig[*18]	***No***, Yes
	Get IPAddress[*19]	***Panel***, Auto, PING
	IP Byte 1[*19]	0 - ***192*** - 255
	IP Byte 2[*19]	0 - ***168*** - 255
	IP Byte 3[*19]	0 - ***192*** - 255
	IP Byte 4[*19]	0 - ***168*** - 255
	SM Byte 1[*19]	0 - ***255***
	SM Byte 2[*19]	0 - ***255***
	SM Byte 3[*19]	0 - ***255***
	SM Byte 4[*19]	***0*** - 255
(Continues to the next table)	GW Byte 1[*19]	0 - ***255***
	GW Byte 2[*19]	0 - ***255***

Table 1-29. Panel Setting Menu List (4/8)

Menu	Item	Value
Network Menu (Continued)	GW Byte 3[*19]	0 - ***255***
	GW Byte 4[*19]	0 - ***255***
	Buffer Size	***Normal***, Maximum, Minimum
AUX Menu[*6]	AUX Confiig[*2*18]	***No***, Yes
	Get IPAddress[*2*19*20]	Panel, Auto, PING
	IP Byte 1[*2*19*20]	0 - 255
	IP Byte 2[*2*19*20]	0 - 255
	IP Byte 3[*2*19*20]	0 - 255
	IP Byte 4[*2*19*20]	0 - 255
	SM Byte 1[*2*19*20]	0 - 255
	SM Byte 2[*2*19*20]	0 - 255
	SM Byte 3[*2*19*20]	0 - 255
	SM Byte 4[*2*19*20]	0 - 255
	GW Byte 1[*2*19*20]	0 - 255
	GW Byte 2[*2*19*20]	0 - 255
	GW Byte 3[*2*19*20]	0 - 255
	GW Byte 4[*2*19*20]	0 - 255
	Netware[*2*19*20]	ON, Off
	AppleTalk[*2*19*20]	On, Off
	NetBEUI[*2*19*20]	On, Off
	AUX Init[*2*19]	
	Buffer Size	Normal, Maximum, Minimum
ESC/Page Menu[*5]	Auto CR	***On***, Off
	Auto FF	***On***, Off
	CR Function	***CR***, CR+LF
	LF Function	***CR+LF***, LF
	FF Function	***CR+FF***, FF
	Error Code	***Ignore***, Space
	Avoid Error	***Off***, On
	PGI	***On***, Off
	TriColorSpace	***Normal***, sRGB
	CM Media Type	***Off***, Opt1, Opt2

Table 1-30. Panel Setting Menu List (5/8)

Menu	Item	Value
LJ4 Menu	FontSource	***Resident***, Download, ROM A[*21], ROM B[*21]
	Font Number	***0*** ~ available (Max 65535)
	Pitch[*22]	0.44 ~ ***10.00*** ~ 99.99 cpi step 0.01 cpi
	Height[*22]	4.00 ~ ***12.00*** ~ 999.75 pt step 0.25 pt
	SymSet	***IBM-US***, Roman-8, ECM94-1, 8859-2 ISO, 8859-9 ISO, 8859-15ISO, IBM-DN, PcMultiling, PcE.Europe, PcTk437, PcEur858, WiAnsi, WiE.Europe, WiTurkish, DeskTop, PsText, VeInternati,VeUS, MsPublishin, Math-8, PsMath, VeMath, PiFont, Legal, UK, ANSI ASCII, Swedis2, Italian, Spanish, German, Norweg1, French2, Windows, PcIcelandic[*23], PcLt774[*23], PcTurk1[*23], PcPortugues[*23], PcEt850[*23], PcTurk2[*23], PcCanFrench[*23], PcSl437[*23], PcNordic[*23], 8859-3 ISO[*23], 8859-4 ISO[*23], WiBaltic[*23], WiEstonian[*23], WiLatvian[*23], Mazowia[*23], CodeMJK[*23], BpBRASCII[*23], BpAbicomp[*23], PcGK437[*23], PcGk851[*23], PcGk869[*23],8859-7 ISO[*23], WiGreek[*23], Europe3[*23], PcCy855[*23], PcCy866[*23], PcLt866[*23], 8859-5 ISO[*23], WiCyrillic[*23], Bulgarian[*23], PcUkr866[*23], Hebrew7[*23], 8859-8 ISO[*23], Hebrew8[*23], PcHe862[*23], Arabic8[*23], PcAr864[*23], 8859-6 ISO[*23], OCR A[*23], OCR B[*23]
	Form	5 ~ ***60***[*10]~ ***64***[*9] ~ 128 lines
	Source SymSet	0 ~ ***277*** ~ 3199
	Dest SymSet	0 ~ ***277*** ~ 3199
	CR Function	***CR***, CR+LF
	LF Function	LF, ***CR+LF***
GL2 Menu	GLMode	***LJ4GL2***, Gllike
	Scale	***Off***, A0, A1, A2, A3
	Origin	***Corner***, Center
	Pen	***Pen0***, Pen1, Pen2[*24] Pen3[*24], Pen4[*24], Pen5[*24], Pen6[*24]
	End	***Butt***, Square, Triangular, Round
(Continues to the next table)	Join	***Mitered***, Miteredbeveled, Triangualr, Round, Beveled, None

Table 1-31. Panel Setting Menu List (6/8)

Menu	Item	Value
GL2 Menu (Continued)	Pen0	0.05 ~ ***0.35*** ~ 5.00 mm step 0.05 mm
	Pen1	0.05 ~ ***0.35*** ~ 5.00 mm step 0.05 mm
	Pen2[*24]	0.05 ~ ***0.35*** ~ 5.00 mm step 0.05 mm
	Pen3[*24]	0.05 ~ ***0.35*** ~ 5.00 mm step 0.05 mm
	Pen4[*24]	0.05 ~ ***0.35*** ~ 5.00 mm step 0.05 mm
	Pen5[*24]	0.05 ~ ***0.35*** ~ 5.00 mm step 0.05 mm
	Pen6[*24]	0.05 ~ ***0.35*** ~ 5.00 mm step 0.05 mm
PS3 Menu[*4]	Error Sheet	***Off***, On
	Coloration	***Color***, Mono, TrueCol.
	Image Protect	***Off***, On
ESCP2 Menu	Font	***Courier***, Prestige, Roman, Sans serif, Roman T, Orator S, Sans H, Script, OCR A, OCR B
	Pitch	***10 cpi,*** 12 cpi,15 cpi, Prop.
	Condensed	***Off,*** On
	T.Margin	0.40 ~ ***0.50*** ~ 1.50 inch step 0.05 inch
	Text	1 ~ ***62***[*10] ~ ***66***[*9] ~ available (Max:111) Lines
	CGTable	***PcUSA***, Italic, PcMultilin, PcPortugue, PcCanFrenc, PcNordic, PcTurkish2, PcE.Europe, BpBRASCII, BpAbicomp, 8859-15ISO, PcEur858, PcSl437, PcTurkish1, PcIcelandic, 8859-9 ISO, Mazowia, CodeMJK, PcGk437, PcGK851, PcGk869, 8859-7 ISO, PcCy855, PcCy866, Bulgarian, PcUkr866, Hebrew7, Hebrew8, PcAr864, PcHe862
	Country	***USA,*** France, Germany, UK, Denmark, Sweden, Italy, Spain1, Japan, Norway, Denmark2, Spain2, LatinAmeric, Korea, Legal
	Auto CR	***On***, Off
	Auto LF	***Off,*** On
	Bit Image	***Dark***, Light, Barcode
	ZeroChar	***0***, Ø

Table 1-32. Panel Setting Menu List (7/8)

Menu	Item	Value
FX Menu	Font	***Courier***, Prestige, Roman, Sans serif, Script, Orator S, OCR A, OCR B
	Pitch	***10 cpi***, 12 cpi,15 cpi, Prop.
	Condensed	***Off***, On
	T. Margin	0.40 ~ ***0.50*** ~ 1.50 inch step 0.05 inch
	Text	1 ~ ***62***[*10] ~ *66*[*9] ~ available (Max:111) Lines
	CGTable	***PcUSA***, Italic, PcMultilin, PcPortugue, PcCanFrenc, PcNordic, PcTurkish2, PcE.Europe, BpBRASCII, BpAbicomp, 8859-15ISO, PcEur858
	Country	***USA***, France, Germany, UK, Denmark, Sweden, Italy, Spain1, Japan, Norway, Denmark2, Spain2, LatinAmeric
	Auto CR	***On***, Off
	Auto LF	***Off,*** On
	Bit Image	***Dark***, Light, Barcode
	ZeroChar	***0***, θ
1239X Menu	Font	***Courier***, Prestige, Gothic, Orator, Script, Presentor, Sans serif
	Pitch	***10 cpi,*** 12cpi,15cpi, 17cpi, 20cpi, 24cpi, Prop.
	Code Page	***437***, 850, 860, 863, 865
	T. Margin	0.30 ~ ***0.40*** ~ 1.50 inch step 0.05 inch
	Text	1 ~ ***63***[*10] ~ ***67*** [*9]~ available (Max:111) Lines
	Auto CR	***Off***, On
	Auto LF	***Off,*** On
	Alt. Graphics	***Off,*** On
	Bit Image	***Dark***, Light
	ZeroChar	***0***, θ
	Character Set	***1***[*10], ***2***[*9]
Support Menu[*25]	HDD Format[*27]	
	PS3 HDD Init[*27*4]	

Table 1-33. Panel Setting Menu List (8/8)

Menu	Item	Value
Maintenance Menu[*26]	Engine Status Sheet	
	2nd BTR Clear	
	IBT Cleaner Clear	
	Fuser Counter Clear	
	Total Count Clear	
	Error Log Clear	

**1: Appears only when activated with “Setup Menu” > “Interface” set to “Auto” or “Network”.*

**2: Appears only when an Type-B level 3 is installed.*

**3: Appears only when activated with “Setup Menu” > “Interface” set to “Auto” or “AUX”.*

**4: Appears only when an optional PostScript3 module is installed.*

**5: Indicated neither on the panel nor status sheet. Can be set in EJL. Not intended for users.*

**6: Appears only when an optional Type-B I/F card.*

**7: Appears only when an optional Large Capacity Paper Unit or 500-Sheet Paper Cassette Unit is installed.*

**8: Appears only when an optional Large Capacity Paper Unit is installed.*

**9: Factory default for the European, Pacific/Russian, Taiwanese, Chinese, and Korean models.*

**10: Factory default for the North/South American models.*

**11: Indicated neither on the panel nor status sheet. Can be set in EJL or PJL.*

**12: Effective only in the LJ4, ESC/Page, or ESC/Page-Color modes.*

**13: Indicated only. Not to be changed.*

**14: Appears only for the Taiwanese, Chinese, and Korean models.*

**15: Appears only for the North/South American models.*

**16: STANDBYTIME command for EJL is also supported. Default is 60 (minutes).*

**17: Indicated neither on the panel nor status sheet. Can be set in EJL.*

**18: The value is automatically changed to "No" after the printer returns to an on-line status.*

**19: Appears only when "Network Config = Yes" or "AUX Config = Yes".*

**20: Setting condition depends on the setting conditions for the Type-B level 3 board.*

**21: Appears only when an optional font module is inserted in the optional ROM DIMM socket.*

**22: Either "Pitch" of "Height" is indicated, which varies depending on the type of the font selected, as shown below.*
"Pitch": A fixed-pitch font is selected.
"Height": A proportional-spacing font is selected.

**23: If "LJ4 Menu" >"SymSet" value is changed to this symbol set, "Font Source" changes to "Resident" and "Font Number" changes to "0". To print with this symbol set, therefore, "Font Source" and "Font Number" must be set to a font that supports this symbol set.*

**24: Appears only in the GLlike mode.*

**25: Appears only when the Support Mode is activated with the power-on service function.*

**26: Appears only when the Maintenance Mode is activated with the power-on service function. Always printed in English regardless of the selected language in "Setup menu".*

**27: Appears only when HDD Unit is installed.*

Table 1-34 shows the user setting items that are not included in the SelecType setting menu.

Table 1-34. User Setting Items

Setting items	Setting value	Initial value	Setting method
Printer Name	32-byte character string	EPL-C8200	EJL, PrinterName command
MFG of the Device ID	32-byte character string	(Undefined)	EJL
MDL of the Device ID	32-byte character string	(Undefined)	EJL
DES of the Device ID	32-byte character string	(Undefined)	EJL
CID of the Device ID	32-byte character string	(Undefined)	EJL

1.6.3 Details of Menus and Settings

This section contains the EPL-C8200-specific information on the menus and settings.

Printing Menu

1. Paper Source
   Selects the paper source when "Paper Type" = "Normal".

   Auto: Paper is fed from the paper source that holds the selected paper type and size.

   MP: Paper is fed from the MP tray.

   LC1: Paper is fed from the 1st paper cassette.

   LC2: Paper is fed from the 2nd paper cassette.

   LC3: Paper is fed from the 3rd paper cassette.

   LC4: Paper is fed from the 4th paper cassette.

   - If paper size is set to an envelope size, paper is fed from the MP tray.
   - If "Paper Type" is set to "Thick" or "Trnsprnc", paper is fed from the MP tray.

2. Wide A4

   Effective only in the LJ4 mode.

   Off: Printable area for graphics remains the ordinal size.

   On: Printable area for graphics is expanded.

3. Out Bin
Selects the ejection tray.

Face-down:	Ejects into face-down tray. Note that for certain paper sizes and types, the printer will force ejection into the face-up tray regardless of this setting.
Face-up:	Ejects into face-up tray.

4. Quantity
Number of copies can be set for collating. Since it has priority over the setting made for “Copies”, the value set for “Copies” is ignored when the selected number of copies for “Quantity” is two or more. This setting is made only by the PJL, EJL, ESC/Page, or ESC/PageColor mode only. The setting value is not stored. If one-job data is too large, the printer indicates “Collate was disabled” and prints one copy. In the ESC/Page or Esc/PageColor mode, if a HDD unit is not installed, the printer always operates with “Quantity” set to “1”.

5. Manual Feed
Determines whether or not to generate the message “Manual Feed xxx yyyy” before printing.

Off:	Manual Feed is disabled.
On:	Manual Feed is abled. “Check Paper Size” error is not generated regardless of the setting for “Size Ignore” for “Config Menu”. With “Manual Feed” on, the printer prints in 1-UP mode only.

Tray Menu

1. MP Type
Specifies the type of the paper set in the MP tray.

Plain:	Ordinal paper such as copy paper
Letterhead:	Letter paper
Bond:	Bond paper
Recycled:	Recycled paper
Color:	Color paper
Trnsprncy:	OHP film
Labels:	Labels

When “Paper Size” = “Normal” and “Paper Source” = “Auto”, the printer refers to the values set for this item to search the paper sources that hold the selected paper type and then the one that also matches the selected paper size.

- Envelopes are always fed from the MP tray.
- When “Paper Type” = “Thick” or “Trnsprncy”, paper is always fed from the MP tray.
- When “Paper Type” = “Normal”, the printer refers to the values to determine the printing speed.
- Type of paper that is selected at paper source selection is only designated by the ESC/Page, ESC/PageColor, or LJ4 command.

2. LC1 - 4 Type
Specifies the types of paper that are set in LC1 - LC4. Available setting values are “Plain”, “Letterhead”, “Bond”, “Recycled”, and “Color”. See ‘‘MP Type” above for details.

Config Menu

1. RITech
Turns on/off the RITech function. For B/W printing, RITech works in the general way for monochrome page printers. For color printing, RITech is effective in the AcuLaser Color Halftoning mode by using CRIT function.

2. Toner Save
If this function is turned on for color printing, toner is saved by controlling halftoning level for lower density.

3. Size Ignore
Determines whether or not to ignore the messages “Paper Set aaaaa bbbbb” (error) and “Check Paper Size” (warning).

   Off: The printer generates the above messages when detecting the corresponding conditions.

   On: The above mentioned messages are not shown. In this case, make sure the image should not be larger than the page size.

   This printer, specifically, prints in the 1-UP mode only with this item set to “On”.

4. Paper Type
Specifies the paper type, to which the printer refers to determine the printing speed and CM.

   Normal (Copy paper, Recycled paper, J paper)

   <Condition 1>
   “Paper Source” = “MP”, “LC1”, “LC2”, “LC3”, or “LC4” or “Paper Source” = “Auto” without any paper type specified

   - Printing speed: Standard
   - CM: Varies depending on the value set for “ESC Page Menu” > “CM Media Type”, as shown below:

CM Media Type	*CM*
Off	Normal paper
Opt1	Option1
Opt2	Option2

<Condition 2>
“Paper Source” = “Auto” with a paper type specified

- Printing speed: Varies depending on the paper type (selected by “Tray Menu” > “MP, LC1 - LC4 Type”) set in the currently used paper source, as shown below.

Paper Type	*Printing Speed*
Plain	Standard mode
Letterhead	Standard mode
Bond	Standard mode
Recycled	Standard mode
Color	Standard mode
Trnsprincy	Half speed mode
Labels	Half speed mode

- CM: Varies depending on the setting for “ESC/Page Menu” > “CM Media Type”, as shown below:

CM Media Type	*CM*
Off	See the NOTE below.
Opt1	Option1
Opt2	Option2

NOTE: *When “CM Media Type” = “Off”, the CM varies depending on the selected paper type, as shown below:*

Paper Type	CM
Plain	Normal paper
Letterhead	Normal paper
Bond	Normal paper
Recycled	Normal paper
Color	Normal paper
Trnsprincy	OHP
Labels	Normal paper

Note there is a possibility that the paper types which determine the printing speed and CM differ. In this case, “Check Paper Type” is indicated.

Thick (Envelopes, Thick paper)

- Printing Speed: Half speed mode
- CM: Normal paper

Trnsprnc (OHP sheet)

- Printing Speed: Half speed mode
- CM: OHP

Setup Menu

1. Standby
   Turns on/off the standby mode for saving energy while the printer is idle.

   Enable: The standby mode is enabled.

   Disable: The standby mode is disabled.

   When the standby mode is on, the printer enters the standby mode 1 or 2 according to the printer conditions listed below.

   1) After emulation changeover, at least one printable images is completed.
   2) Print request
   3) Reset through the control panel
   4) Warm-boot
   5) “Standby” is set to “Disable”.

   After any of the conditions above occurs, if a half of the specified time-out interval has passed without any occurrence of the conditions above, the printer enters the standby mode 1. While in this status, if any of the conditions above still does not occur within another half of the specified time-out interval, the standby mode 2 takes over. When any of the conditions above occurs, the energy save function is temporarily disabled (the printer returns to the normal standby mode or printing mode) to clear the total standby mode time to zero.

   Standby mode 1
   The printer uses less power than in the normal standby mode by controlling the fuser temperature within the specified range. This mode does not meet the energy-star requirement. Warm-up time (60 minutes to recover to the normal standby mode) is shorter than in standby mode 2.

   Standby mode 2
   The standby mode 2 keeps the Fuser Unit and the mechanism circuits turned off constantly and maximally, respectively, to manage further energy save than the standby mode 1. This mode, complying with the energy star program (45 W or less), can minimize power consumption but requires approximately 300 seconds for warm-up time (standby mode 2 → normal standby mode), which is longer than standby mode 1.

2. C/M/Y/K Toner
   Shows the remaining level of each toner in five steps.
   Values are to be read only.

E ■■■■ F	100% ≥ Toner level > 75%
E ■■■□ F	75% ≥ Toner level > 50%
E ■■□□ F	50% ≥ Toner level > 25%
E ■□□□ F	25% ≥ Toner level > 0%
E □□□□ F	Toner level = 0%

NOTE: *The remaining level of each toner is evaluated based on the dispense time of each toner cartridge. According to the dispense time, which is stored on the engine side, the engine generates such an error as "Toner Out".*

3. Total Pages
   Indicates the total number of sheets that the printer has printed on. (To be indicated only) Values within a range of 0 to 99999999 (increment: one page) are indicated. The sheets over 99999999 are not counted. The printer shows the value counted on the engine side.

4. Color Pages
   Indicates the total number of color-printing sheets that the printer has printed. (To be indicated only) Values within a range of 0 to 99999999 (increment: one page) are indicated. The sheets over 99999999 are not counted. The printer shows the value counted on the controller side.

5. B/W Pages
   Indicates the total number of B/W-printing sheets that the printer has printed. (To be indicated only) Since the value is a difference between the "Total Pages" and the "Color Pages", if the total pages has exceeded 99999999, the indicated value is not correct. Values within a range of 0 to 99999999 (increment: one page) are indicated.

6. SelecType Init
   Clears the panel setting values to the factory setting values. The following counters are not reset; page counter, C/M/Y/K toner counter, 2nd BTR counter, IBT Cleaner counter, Fuser Unit counter, the printer 1/printer 2 counters that are on the engine side, and the settings for "Parallel Menu", "Network Menu", and "AUX Menu".

Parallel Menu

1. Buffer Size
   Sets the amount of installed memory that operates as a receive buffer.

   Normal: Balances between draw processing and buffer.

   Maximum: Allocates more memory for use as receive buffer.

   Minimum: Allocates less memory for use as receive buffer.

   See Table 1-35 for details.

Table 1-35. Buffer Size Specifications

Installed memory (MB)	Parallel / AUX			Network		
	Normal	Max.	Min.	Normal	Max.	Min.
64	1167	4300	8	1167	4300	16
96	1822	7577	8	1822	7577	16
128	2478	10854	8	2478	10854	16
160	3133	14131	8	3133	14131	16
192	3788	17408	8	3788	17408	16
224	4444	20684	8	4444	10684	16
256	5099	23961	8	5099	23961	16

Setting change does not become effective until next warm-boot or power-on. Buffer size can be calculated as follows.

- Parallel, AUX
  Normal: Buffer size = 512 KB + 2% of the expanded memory size
  Maximum: Buffer size = 1024 KB + 10% of the expanded memory size
  Minimum: Buffer size = 8 KB (regardless of the installed memory and number of interfaces)

- Network
  Normal: Buffer size = 512 KB + 2% of the expanded memory size
  Maximum: Buffer size = 1024 KB + 10% of the expanded memory size
  Minimum: Buffer size = 16 KB (regardless of the installed memory and number of interfaces)

  Note if a HDD unit is installed for the Network I/F, job spool to the HDD is enabled. With this unit installed, the printer can spool data whose size is larger than buffer size to the HDD unit.

NOTE: *The expanded memory size is defined as follows:*
Total installed RAM memory size - Standard RAM size

Network Menu

1. Buffer Size
   Sets the memory size allocated to the receive buffer out of the installed memory. See “Parallel Menu” for details.

AUX Menu

1. Buffer Size
   Sets the memory size allocated to the receive buffer out of the installed memory. See “Parallel Menu” for details.

Maintenance Menu

This menu is indicated and selected only while the Maintenance Mode is activated by the power-on operation. To eliminate this menu from the setting menu option, turn the printer off and then back on, and the printer returns to the normal mode. This menu is intended for servicers only.

1. Engine Status Sheet
   Pressing the Enter button lets the printer print Engine Status Sheet. If language data is still in the printer, the sheet will eject. Make sure the printer is free from any engine related service-call error in the normal mode (any mode other than the maintenance mode) before entering and executing the “Maintenance Menu”. Engine Status Sheet will be printed with RIT, toner-save, and resolution remained in the current settings; and all other set to their factory defaults. The user-default environment remains in effect after printing is completed. The indication on the LED blinks while printing is in progress. The printed sheet will show the count values of the counter on each unit in the engine. The Engine Status Sheet is always printed in English regardless of the Setup menu’s Lang setting.

2. 2nd BTR Clear
   Resets the 2nd BTR counter. The maintenance engineer must reset this counter after replacing the 2nd BTR during maintenance.

3. IBT Cleaner Clear
   Resets the IBT Cleaner counter. Since IBT Cleaner is not a periodically replaced part, however, this function is not normally used.

4. Fuser Counter Clear
   Resets the Fuser Unit counter. The maintenance engineer must reset this counter after replacing the Fuser Unit.

5. Total Counter Clear
   Clears the engine’s printer 1 and printer 2 counters to reset “Total Page” to 0. It also clears “Color Page”.

6. Error Log Clear
   Clears Error Log List stored to be printed on Engine Status Sheet. The Error Log lists the latest 20 errors.

1.6.4 RAM Expansion

This printer generates the following errors when it detects insufficient memory condition.

“Mem Overflow”, “Image Optimum”, “Need Memory”

In this case, try taking any of the actions below.

- For B/W print, lower the resolution to 300 dpi.
- For color print, use a non-reciprocal compression format.
- Reduce the size of the data buffer.
- Fix the interface.

To avoid these errors without fail, however, adding memory is recommended.

CHAPTER

2

OPERATING PRINCIPLES

Table of Contents

2.1 Print Process

2.1.1 Print Process Overview

This is a full-color laser printer using the Xerographic process. This process forms an image of toner (Yellow, Magenta, Cyan and Black) on the surface of the drum. The image of one color is then transferred onto the IBT Belt Assembly (Belt). On the belt, this process is repeated four times, resulting in a full-color image. The print process is summarized as follows:

(1)	Charge:	Charges the drum surface.
(2)	Exposure:	Exposes the image with a laser beam.
(3)	Development:	Develops the image with the toner.
(4)	First transfer:	Transfers the toner image on the drum to the belt.
(5)	Cleaning:	Cleans the drum.
(6)	Repeat:	In the YMCBk mode, steps [1-5] are repeated for each toner. At the end, the belt has a full-color image. (The steps are not repeated in the B/W mode.)
(7)	Second transfer:	Transfers the image on the belt onto the paper.
(8)	Detach:	Removes the electrical charge from the paper.
(9)	Cleaning:	Cleans the belt.
(10)	Fusing:	Fixes the toner image to the paper by heat and pressure.

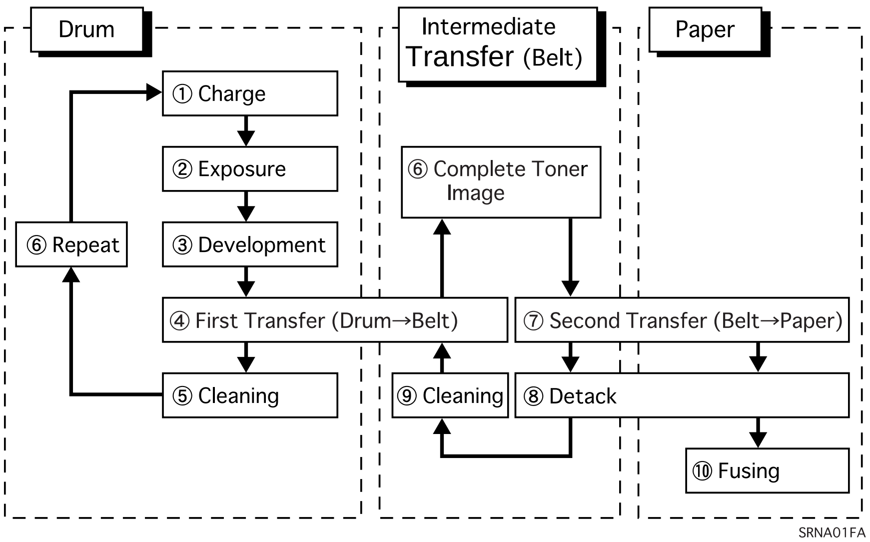


Figure 2-1. Print Process Flowchart

2.1.2 Print Process - Major Components

The major components of the printer are shown in the figure below.

NOTE: *In this document Developer Assembly Y, Developer Assembly M, Developer Assembly C, and Developer Assembly Bk are termed Developer Assembly.*

NOTE: *In this document Toner Cartridge Y, Toner Cartridge M, Toner Cartridge C and Toner Cartridge Bk are termed Toner Cartridge.*

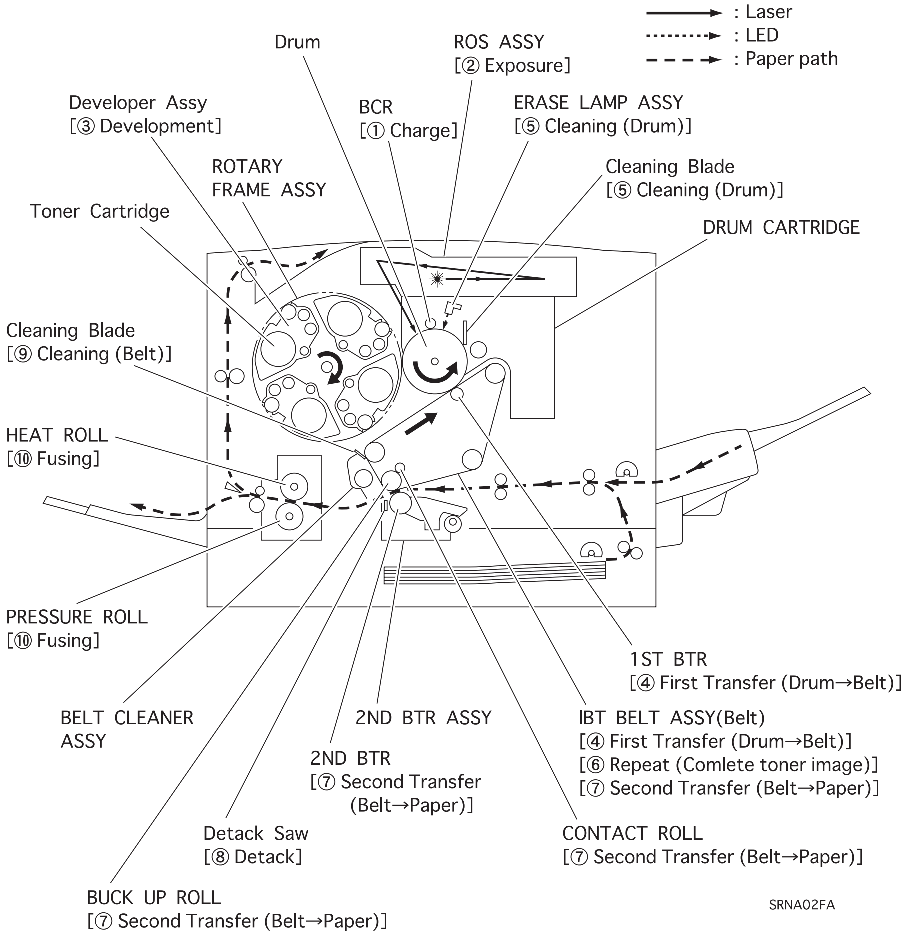


Figure 2-2. Major Components

2.1.3 Print Process Description

2.1.3.1 (1) Charge

In the Charge step, the surface of the drum rotates at a constant speed and is uniformly charged (negative) by the discharge of the BCR (Bias Charge Roll) in the Drum Cartridge.

- The BCR is always in contact with the surface of the drum, driven by the drum rotation. The BCR is a conductive roll, receiving discharge voltage from the HVPS. The discharge voltage is negative DC voltage to which AC voltage has been superimposed. The discharge occurs in the very small gap between the BCR and the drum surface. The drum surface is uniformly charged (negative) with DC bias voltage. The drum surface consists of photoconductive material (on the surface) and an aluminum cylinder (inside the drum). (The photoconductive material becomes conductive when it receives light; it becomes an insulator in the dark.)

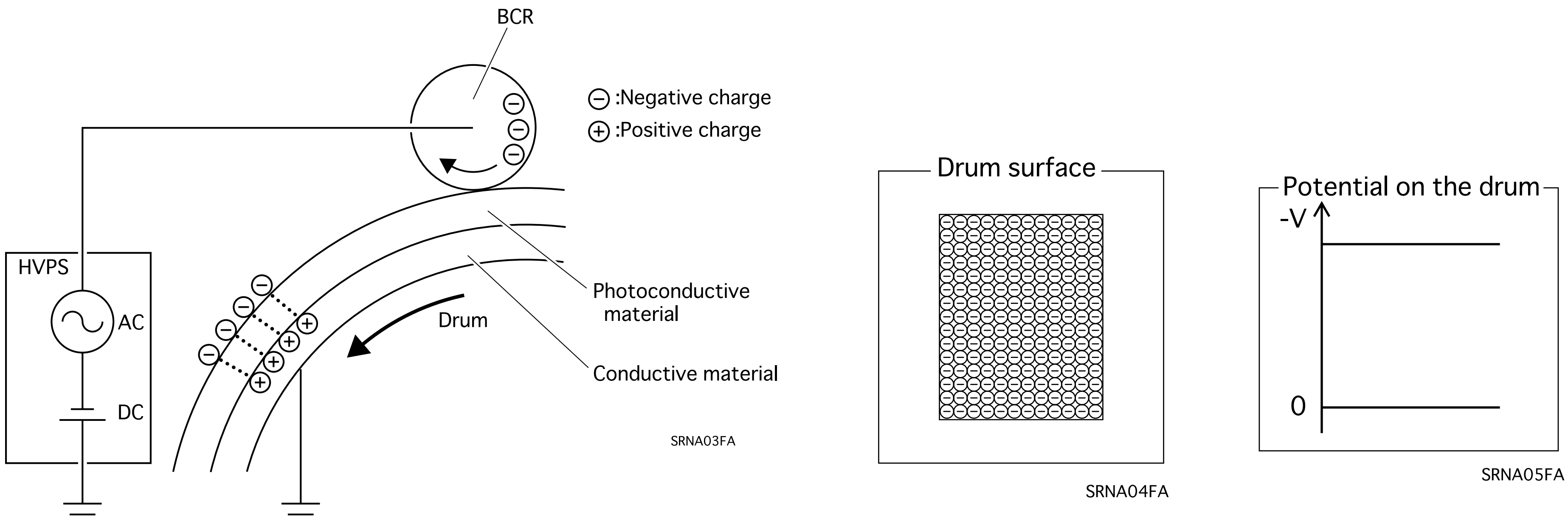


Figure 2-3. Charge

2.1.3.2 (2) Exposure

In the exposure step, the system scans the drum surface (negatively charged) with a laser beam and forms an invisible electrostatic latent image on the drum surface.

- The printer controller outputs the data (image data) to the laser beam unit. As determined by the data from the printer controller, the laser beam unit emits a laser beam onto the drum surface, the area of which is determined by data from the printer controller. (That is, areas on the drum surface where the laser is emitted will be developed with toner; areas on the drum surface where the laser is not emitted will not be developed.)
  The laser beam is emitted from the laser diode in the ROS Assembly. The laser beam goes through the Scanner Assembly in the ROS Assembly, the rotating polygon mirror, fixed mirror and lens, and scans the drum surface from one end to the other in the axis direction of the drum.

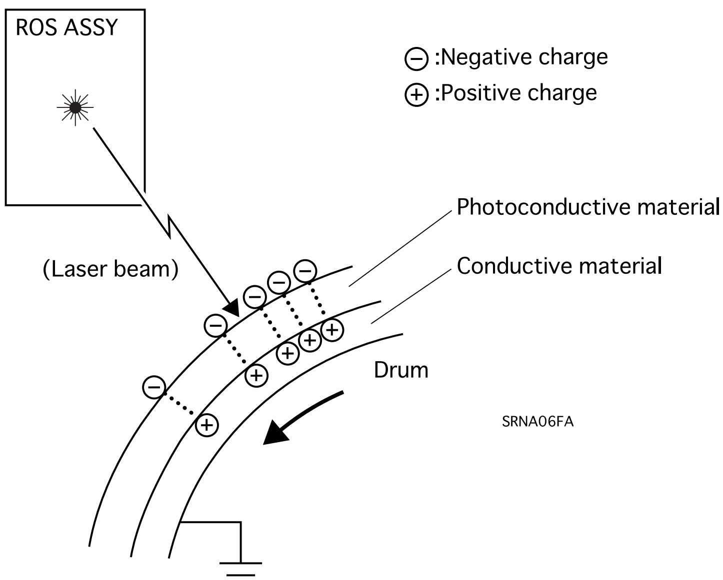


Figure 2-4. Lase beam emission

The laser beam irradiated on the drum surface generates electron-hole pairs in the photoconductive layer. (Excited electrons create a hole in the conductive band.) The electrons are attracted by the electric field and move toward the inner conductor of the drum and flow into it. The holes move toward the outside surface of the photoconductive layer and recombine with the negative charges (electrons) on the drum surface, thus decreasing the negative charges on the surface. The resultant less negatively charged areas on the drum surface forms an invisible electrostatic latent image (printed image).

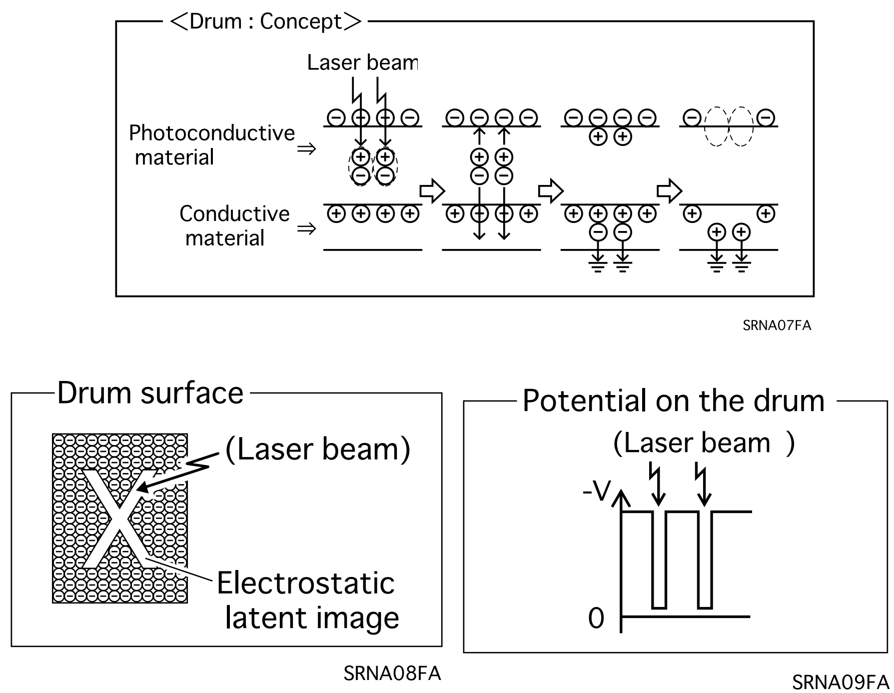


Figure 2-5. Exposure process

2.1.3.3 (3) Development

In the development step, toner particles are attracted to the invisible electrostatic latent image on the drum surface to form a visible toner image.

- This printer employs the rotary and trickle development methods. In rotary development, four Developer Assemblies rotate in sequence; trickle development uses developer consisting of carrier and toner.
  The developer in the Developer Assembly is agitated by the Auger. (The auger is a spiral agitator.) The developer is sent to the Magnet Roll near the surface of the drum. The toner particles and carrier particles (that make up the developer) are charged by agitation; toner particles are negatively charged, carrier particles are positively charged and thus electrically attracted each other. The carrier particles are magnetic and are attracted to the Magnet Roll (magnetized). The carrier particles go through the Trimmer Blade, resulting in a uniform carrier layer.
  The Magnet Roll surface is covered with a thin semiconductive sleeve. The HVPS applies the DB (Developing Bias) voltage to this sleeve. The DB voltage is negative DC voltage to which AC voltage has been superimposed. Using this DC voltage, the Magnet Roll retains constant negative voltage on the photoconductive layer of the drum. As a result, areas where negative potential on the drum surface has not been decreased have lower electric potential than the Magnet Roll; areas where negative potential has been decreased have higher electric potential. The AC voltage shakes developer onto the Magnet Roll so that it is easy for the toner particles to be attracted to the drum surface.
  The negatively charged toner particles are attracted only toward areas where negative potential on the drum surface has decreased, thus forming a toner image on the drum surface. When the toner particles adhere to the drum surface, the negative potential at that area where the toner particles are adhering decreases, resulting in a decrease in force in attracting toner particles to that area.

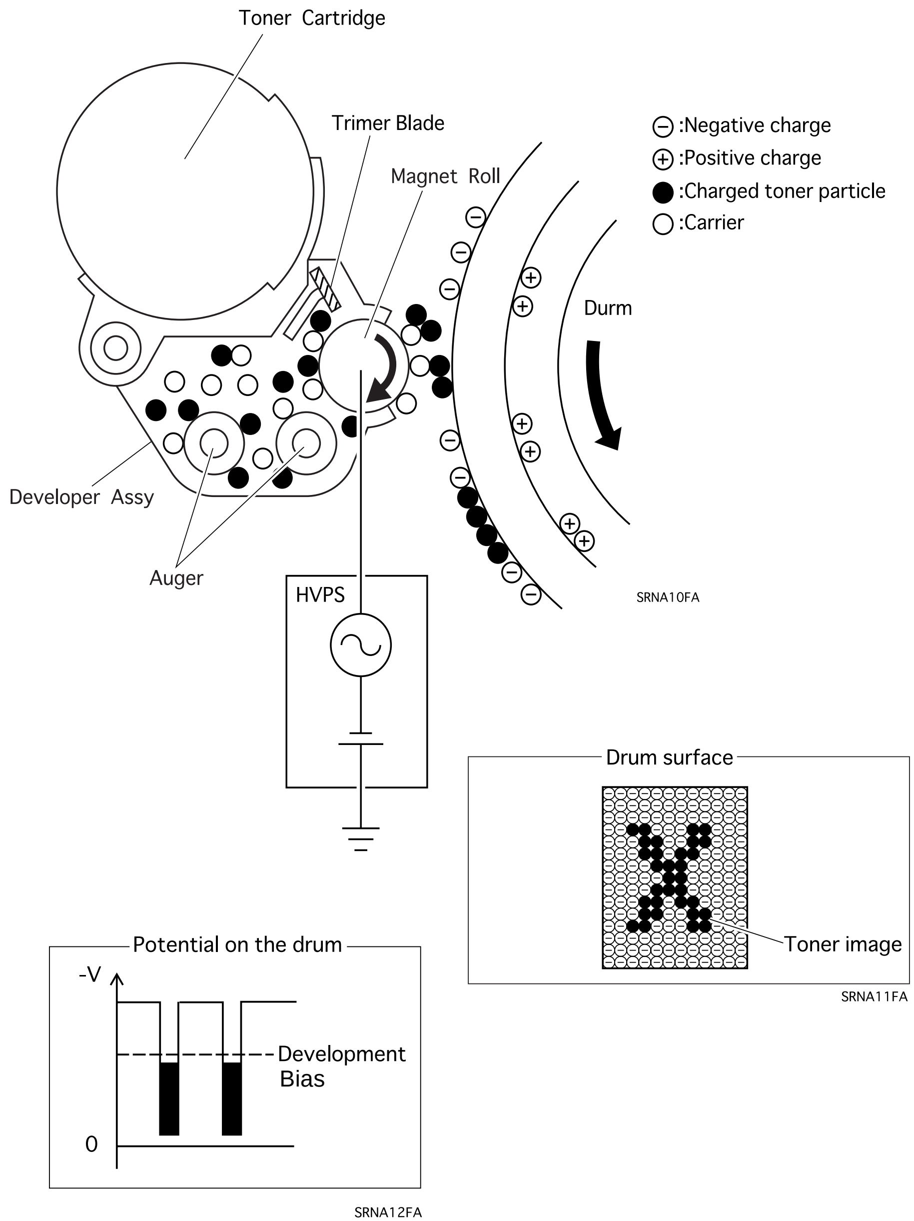


Figure 2-6. Development (1)

- As the printer prints more pages, the toner in the developer decreases. To maintain proper developer density, it is necessary to resupply toner to the Developer Assembly from the Toner Cartridge. This is called ‘Toner Dispensing.’ The Toner Dispensing mechanism uses two types of controls (PCDC and ADC). For details on PCDC and ADC, See Section 2.7.5.
- To obtain a full-color image (of 4-color toner), four toner images (YMCBk) must be formed on the drum’s surface in sequence. This printer uses the rotary development method to form images. The rotary development method uses the Rotary Frame Assembly. The Rotary Frame Assembly has four Developer Assemblies which are installed every 90° (see figure below). For each image, the appropriate Develop Assembly faces the drum surface to form an image. (For more details, see Section 2.7.7.)

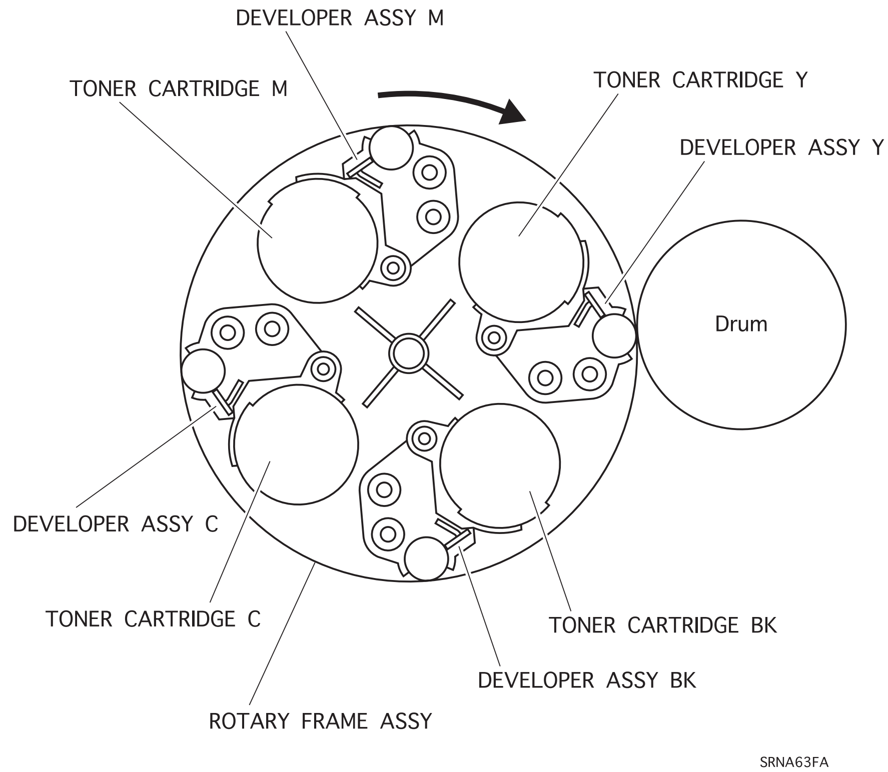
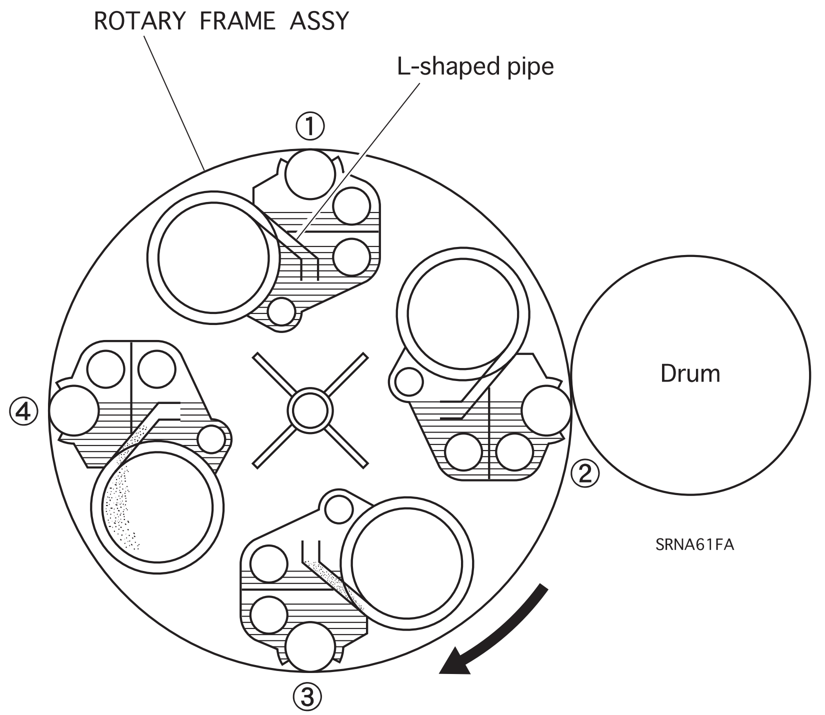


Figure 2-7. Development (2)

- The carrier looses its electrical charges. This occurs because the surface of a carrier particle may be covered with a toner particle or may be damaged by agitation. To maintain the electrical charge of carrier particles, a small amount of carrier is mixed in the toner; when the toner is dispensed, carrier is also supplied.
  The carrier in the Developer Assembly, however, is collected into a different chamber in the Toner Cartridge, so that the developer (mostly carrier) is replaced little by little, resulting in a constant electrical charge being maintained. This is called the trickle development method. The trickle development method uses the rotation of the Rotary Frame Assembly.
  The trickle development process is as follows:

  1. An L-shaped pipe is inserted in the developer.
  2. A small amount of carrier moves into the pipe.
  3. The carrier is sucked in and moves deeper into the pipe.
  4. The carrier is collected in the Toner Cartridge.



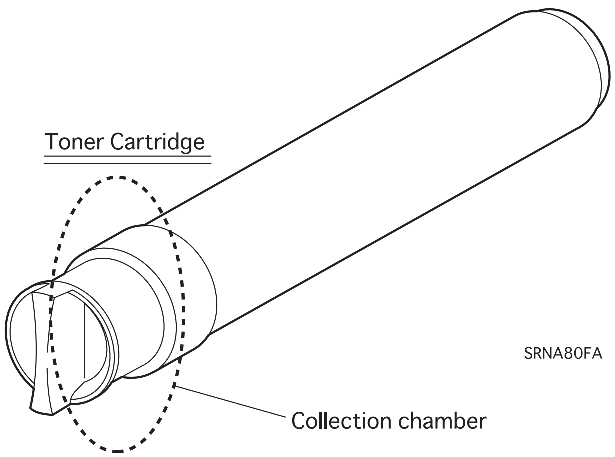
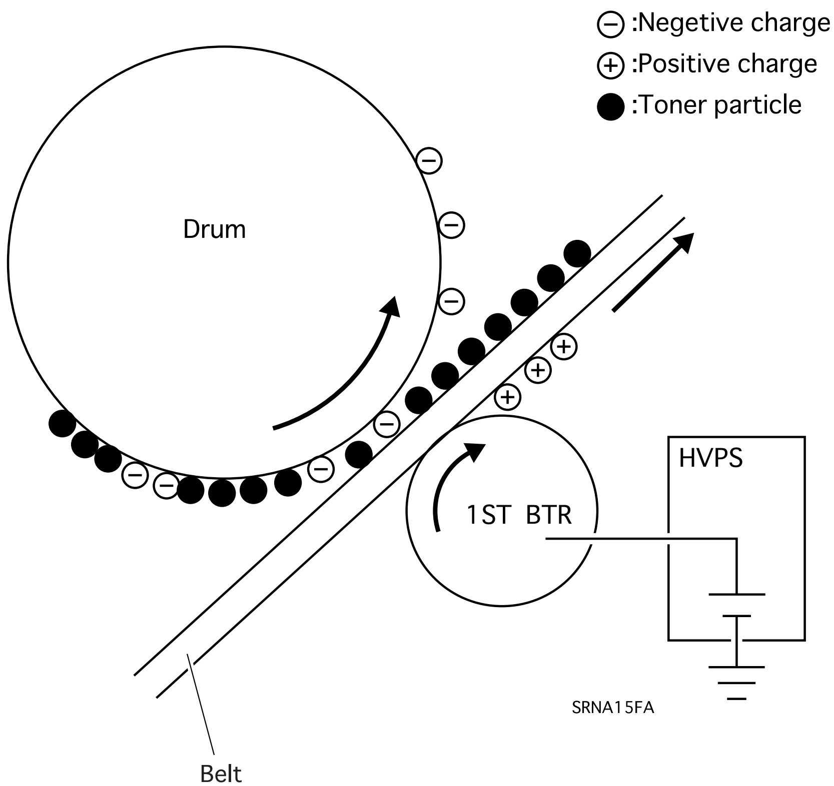


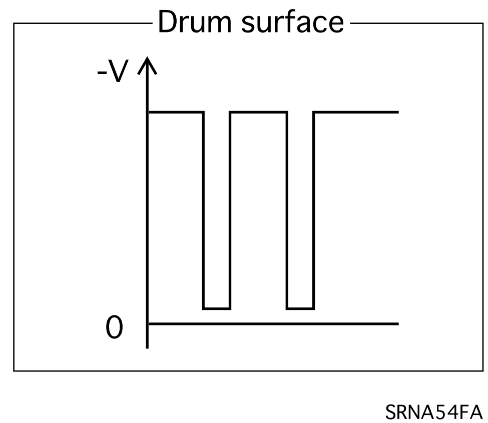
Figure 2-8. Development (3)

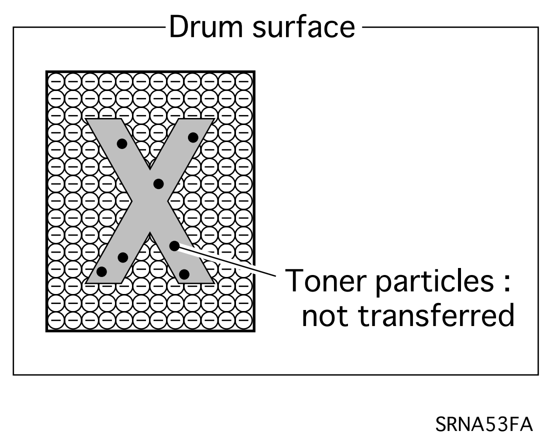
2.1.3.4 (4) First Transfer (Drum → Belt)

In the first transfer step, the toner image formed on the drum surface is transferred onto the belt (Transfer Assembly) by the 1st BTR (First Bias Transfer Roll).

- The 1st BTR is a conductive roll, receiving positive high voltage from the HVPS. The 1st BTR touches the back of the belt. Following the rotation of the belt, the 1st BTR gives a positive charge to the back of the belt. The toner image on the drum surface (negatively charged) is attracted to the positive charge on the back of the belt. The image is transferred from the drum surface to the belt.







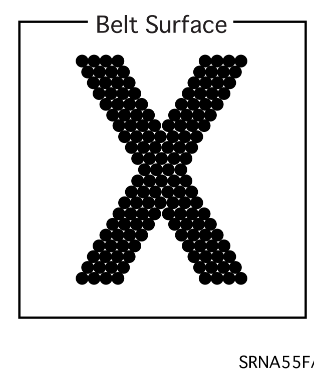
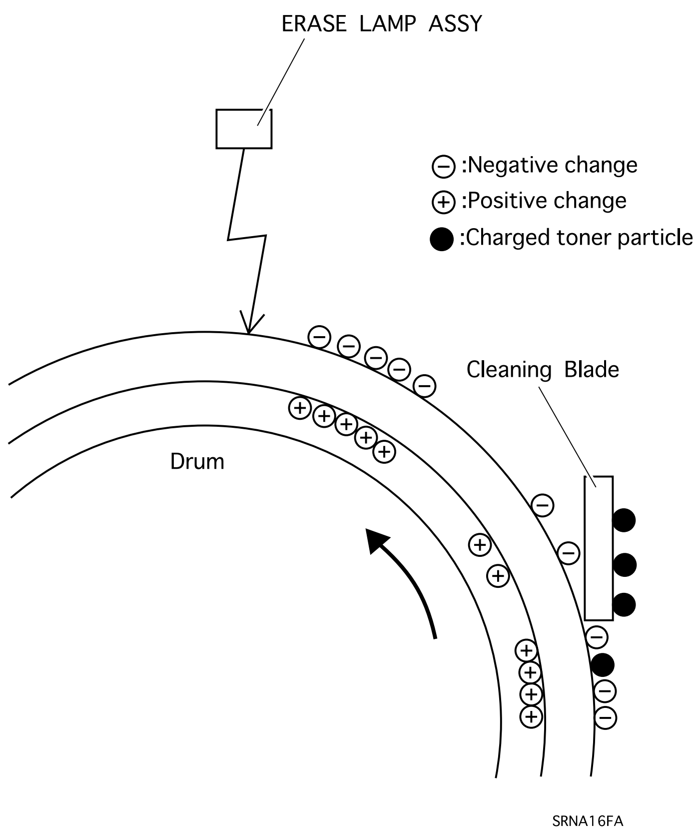


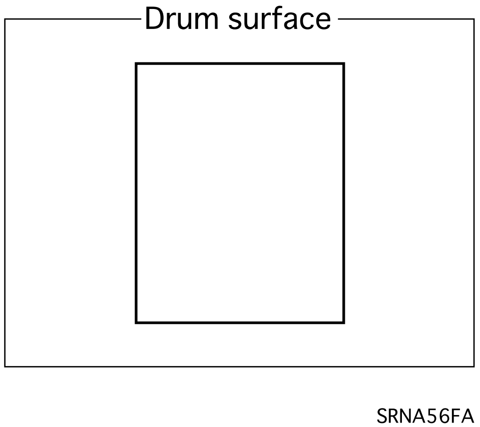
Figure 2-9. First Transfer

2.1.3.5 (5) Cleaning (Drum)

In the Cleaning (Drum) step, the residual toner on the drum surface is scraped off and the residual charge is cleaned off.

- Physical drum cleaning
  Toner that is not transferred in the 1st Transfer step remains on the drum surface. This residual toner is scraped off by the Cleaning Blade. It is then transported to the Waste Toner Box by the Auger in the Drum Cartridge.
- Electrical drum cleaning
  An electrical charge still remains on the drum surface after the residual toner has been scraped off. This residual electrical charge is removed by the LED beam output from the Erase Lamp Assembly.





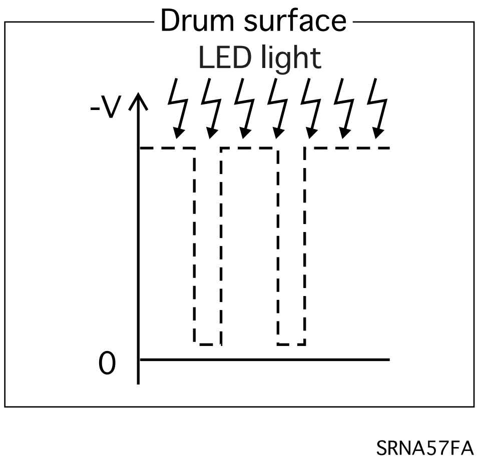


Figure 2-10. Cleaning (Drum)

2.1.3.6 (6) Repeat (Forming a complete full-color toner image)

In the Repeat step (forming a complete full-color toner image), the toner image of each color on the drum surface is transferred onto the belt and is repeated four times, resulting in a complete full-color toner image on the belt.

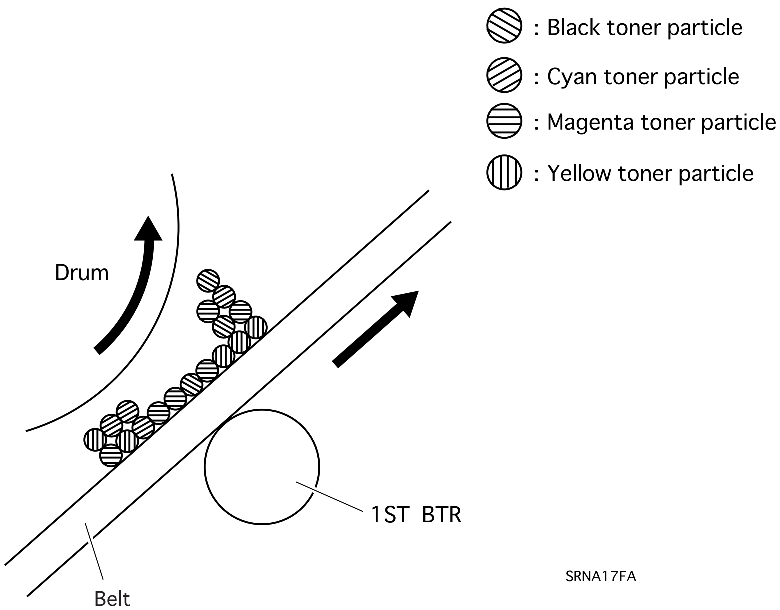


Figure 2-11. Repeat (1)

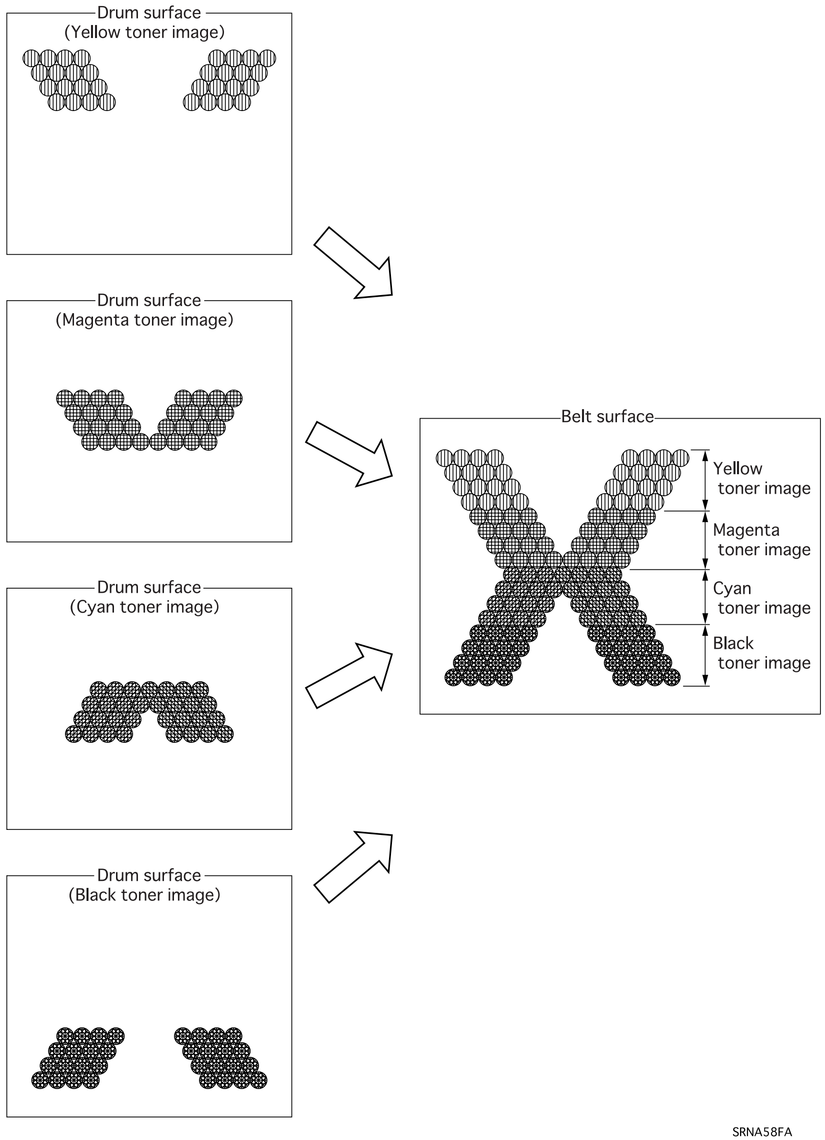


Figure 2-12. Repeat (2)

2.1.3.7 (7) Second Transfer (Belt → Paper)

In the Second Transfer step, the complete image on the belt is transferred onto the paper. This is done by supplying voltage to the Contact Roll, Back Up Roll and 2nd BTR (Second Bias Transfer Roll).

- The Contact Roll is a small-diameter metal roll and is in contact with the Back Up Roll. The Back Up Roll is a conductive roll and is in contact with the back of the belt. It faces the 2nd BTR where the belt is in between. The 2nd BTR is also a conductive roll and is grounded to the frame via the metal shaft in the center.
- The Contact Roll receives negative high voltage (DC) and gives the potential to the Back Up Roll. The negative potential given to the Back Up Roll neutralizes the positive charge on the back of the belt, and induces a positive charge on the 2nd BTR through the belt and the paper. The Back Up Roll, belt and 2nd BTR have resistance and the paper functions as a capacitor, resulting in induction of a positive charge on the 2nd BTR.
  When the back of the belt is neutralized, the belt looses the ability to retain toner and the complete toner image on the belt is transferred onto the paper by the positive charge induced on the 2nd BTR.
- The paper (adhering to the belt) is transferred at the correct time so that the complete toner image on the belt will be transferred onto the paper in the proper position. When the paper reaches the point the 2nd BTR and the Back Up Roll face each other, the HVPS outputs high voltage.

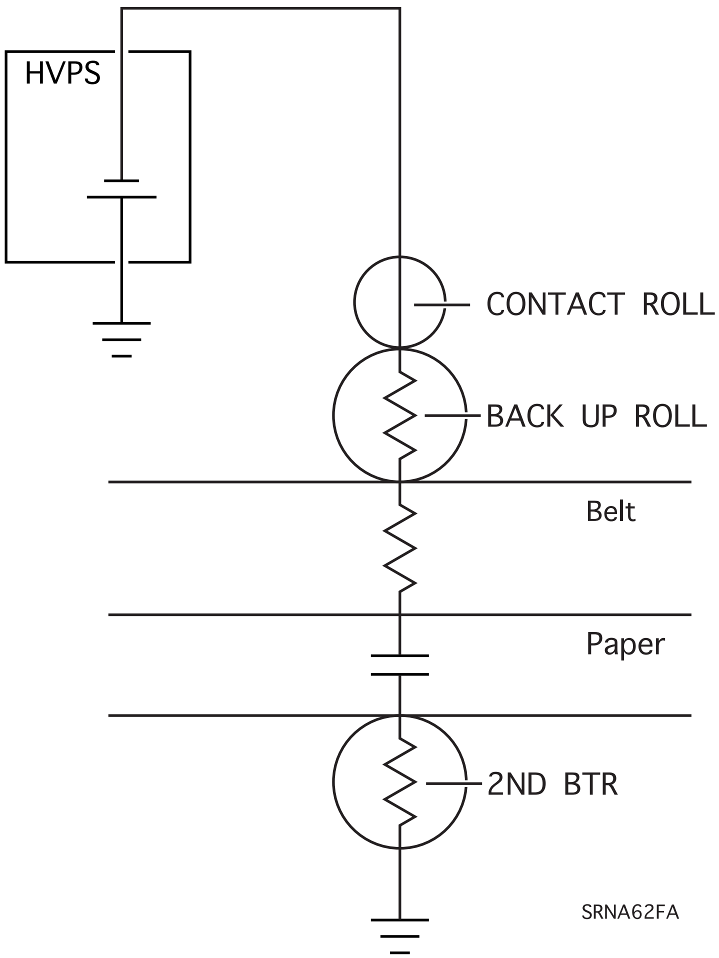
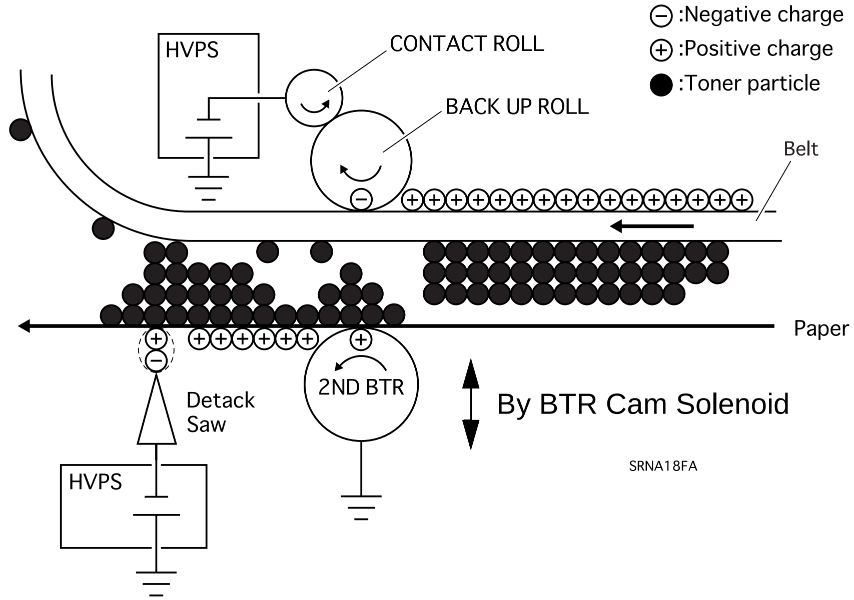


Figure 2-13. Second Transfer (1)

- ☐ In the Repeat step (forming a complete full-color toner image), the toner image is transferred onto the belt from the drum surface four times. If, during these transfers, the 2nd BTR is touching the belt, the toner image created up to this point will be destroyed. This means the 2nd BTR must touch (advance to) the belt only after the complete toner image has been transferred onto the paper. At other times, the 2nd BTR must be retracted from the belt. This Advance/ Retract switching operation is carried out by the BTR Cam Solenoid.



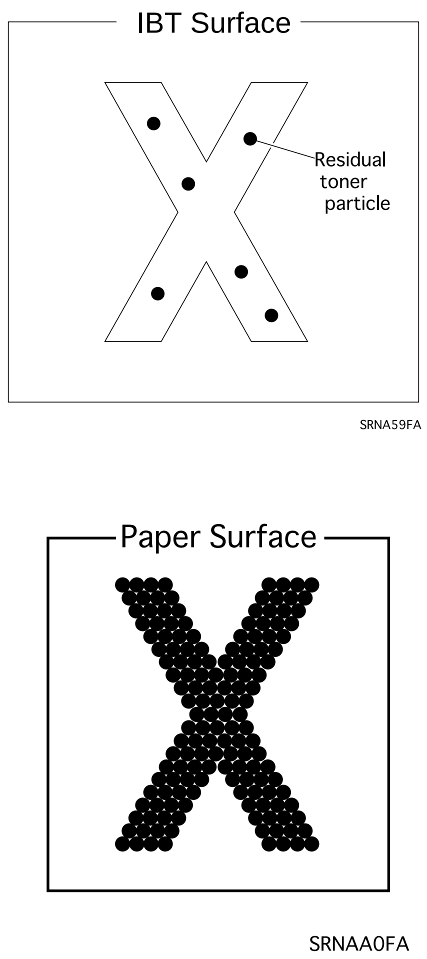


Figure 2-14. Second Transfer (2)

2.1.3.8 (8) Detach

In the detach step, the charge on the paper is neutralized/removed. This is done when the Detach Saw gives negative DC voltage to the back side of the paper.

- The Detach Saw receives high voltage from the HVPS.
  In the 2nd Transfer step, if there is a positive charge, the toner may scatter, resulting in a damaged image. To prevent this, the Detach Saw removes the charge on the paper.

2.1.3.9 (9) Cleaning (Belt)

In the Cleaning (Belt) step, the belt is cleaned after the image has been transferred onto the paper.

- The belt has residual toner that was not transferred onto the paper in the 2nd Transfer step. The residual toner is scraped off by the Cleaning Blade (in the Belt Cleaner Assembly) which is touching the belt. The scraped toner is transferred through the Auger High Assembly to the Waste Toner Box.
- In the Repeat step (forming a complete full-color toner image), the toner images are transferred from the drum surface to the belt four times. If, during these transfers, the Cleaning Blade is touching the belt, the toner image created up to this point will be destroyed. So the Cleaning Bade must touch (advance to) the belt only after the complete image has been transferred onto the paper. At other times, the Cleaning Blade must be retracted from the belt. This Advance/Retreat switching operation is carried out by the Cleaner Cam Solenoid.

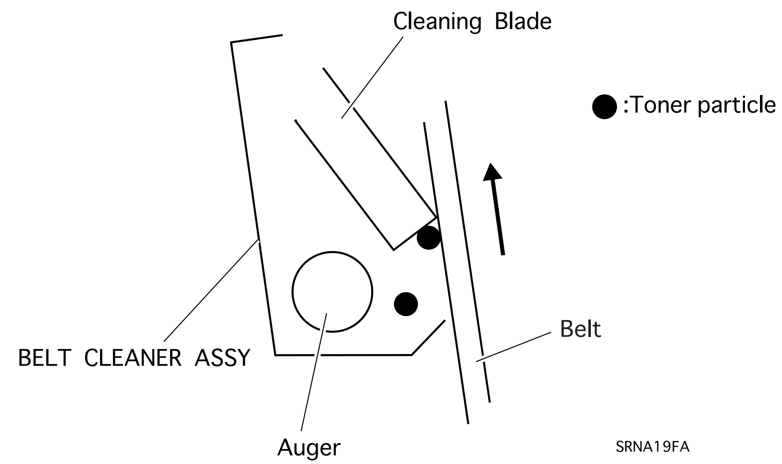


Figure 2-15. Cleaning (Belt)

2.1.3.10 (10) Fusing

In the Fusing step, the toner (image) is fused onto the paper by heat and pressure.

- The complete full-color toner image transferred onto the paper form the belt is very fragile, so it must be fused onto the paper by the Fuser Assembly. The toner is melted with heat from the Heat Roll and fused under pressure between the Pressure Roll and the Heat Roll. (The Heat Roll is heated by the H/R Heater.) As auxiliary heat, the Pressure Roll has a P/R Heater.
- When the toner image is fused, the toner becomes adhesive, causing the paper to adhere to the Heat Roll. To prevent this, the Oil Roll Assembly supplies Fuser Oil to the Heat Roll. This allows the paper to be peeled off easily from the Heat Roll.
- If the Oil Roll (Oil Roll Assembly) is continuously touching the Heat Roll, the Fuser Oil may degrade or cause oil spots on the paper. To prevent this, the Oil Roll touches (advances) the Heat Roll only when the toner is fused; at other times it is retracted from the Heat Roll. This Advance/Retract switching operation is carried out by the Oil Cam Solenoid.

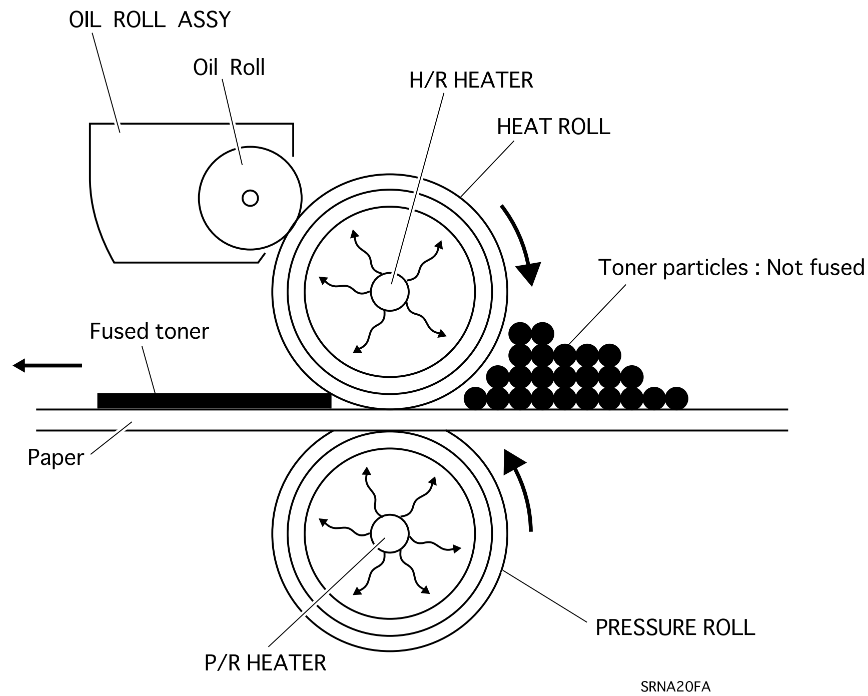


Figure 2-16. Fusing

2.2 Print Data Flow

2.2.1 Data Flow

The print data (electrical signals) from the printer controller goes through the processes shown below to form a final print image on the paper.

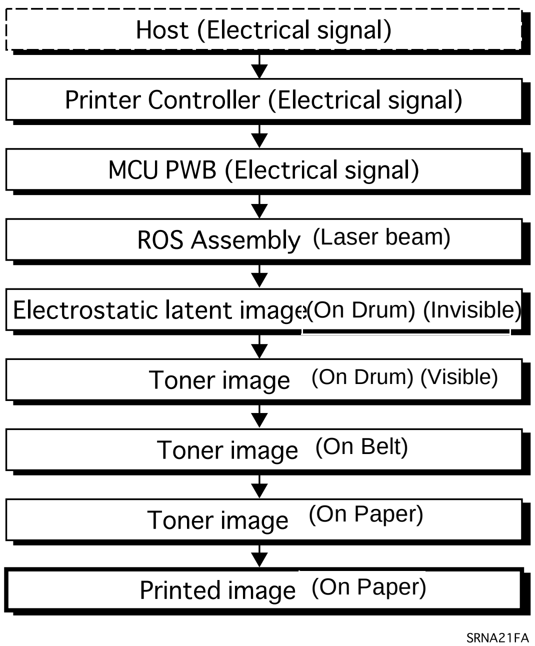


Figure 2-17. Data Flow

NOTE: *How a two-dimensional image is formed*
Scanning the laser beam over the drum's surface from one side to the other by switching the laser beam ON and OFF produces a dot image of one line. A single-color, two-dimensional dot image is produced by repeating the scanning of the laser beam for one page. To obtain a full-color image, a single-color image is generated for each color (YMCBk).

The resolution is determined by the following two factors:
- Main scanning direction: Dots/inch
- Subscanning direction: Number of scanned lines/inch

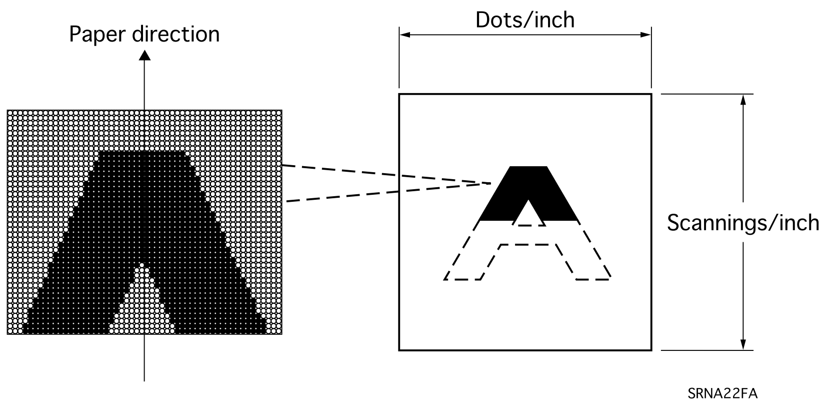


Figure 2-18.

2.3 Driver Power Transmission Path

2.3.1 Process Motor Assembly

The rotational force of the Process Motor Assembly is transmitted to the Process WDD Assembly and then transmitted to various units as shown below.

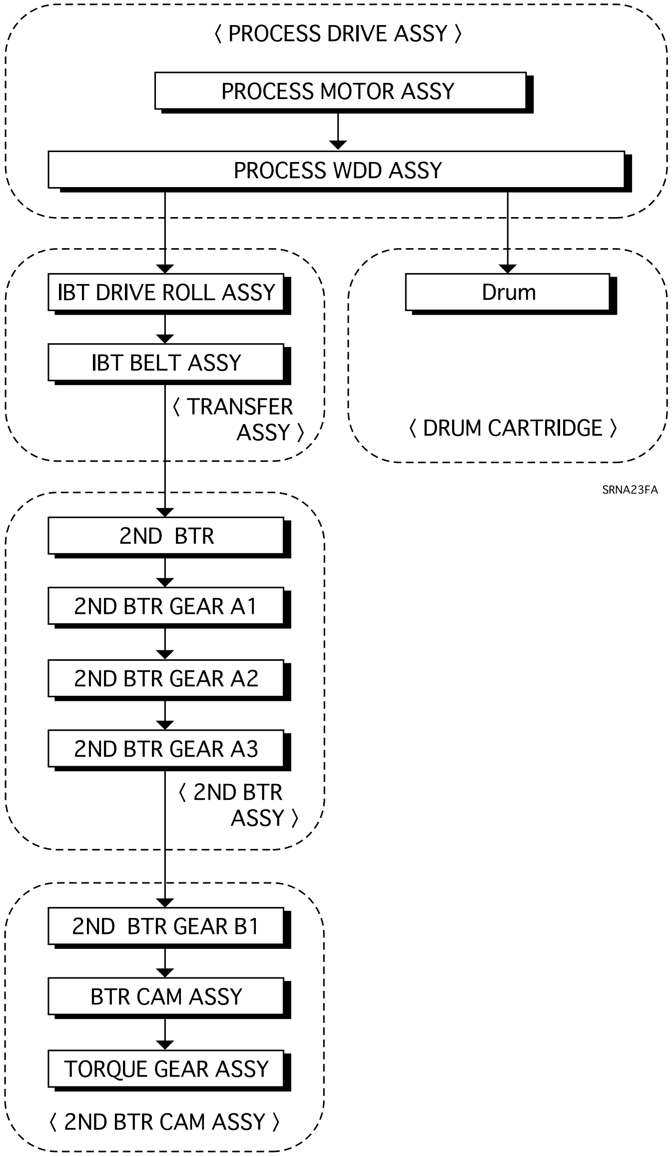


Figure 2-19. Drive Transmission in Process Motor Assembly

2.3.2 P/H Motor Assembly

The rotational force of the P/H Motor Assembly is transmitted to the Fuser Drive Assembly and P/H Drive Assembly and then to various units as shown on the right.

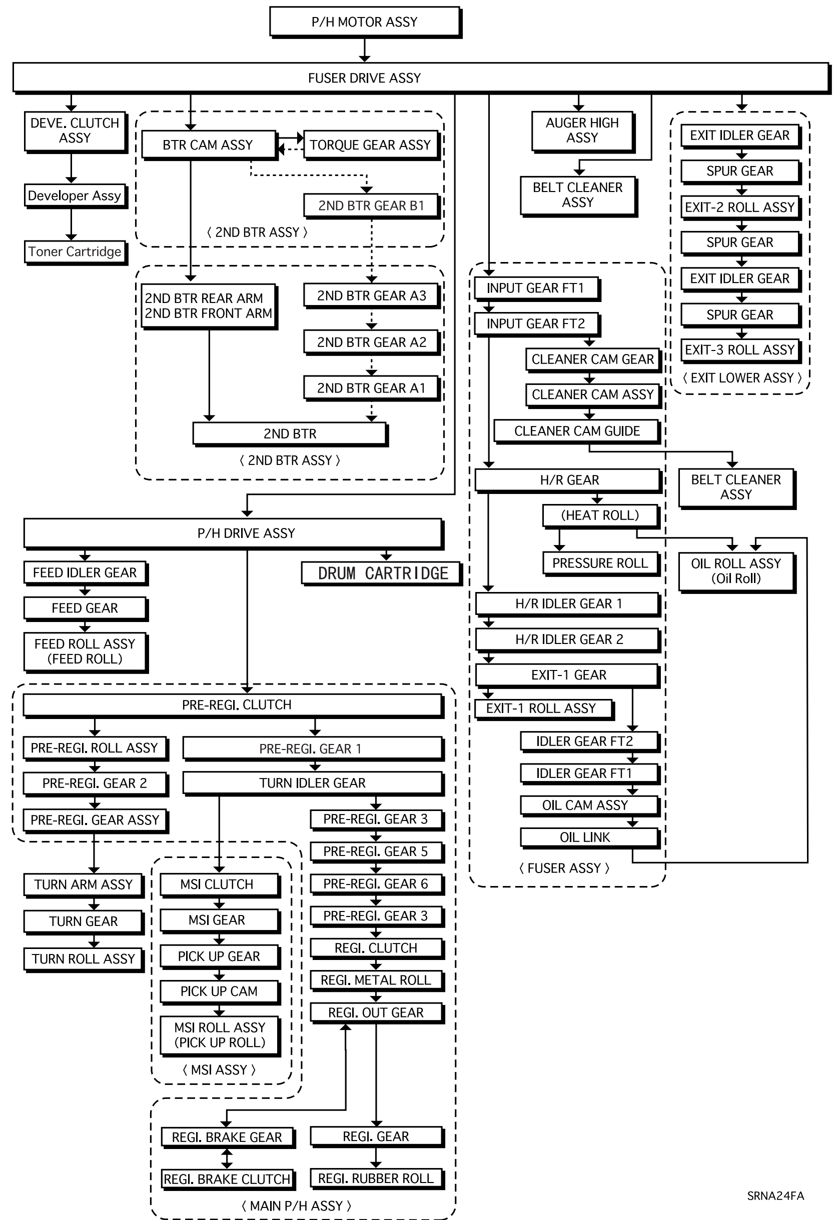


Figure 2-20. Drive Transmission in P/H Motor assembly

2.3.3 Dispense Motor Assembly

The Dispense Motor Assembly drives the Auger in the Developer Assembly. (The Auger supplies the toner from the Toner Cartridge to the Developer Assembly.)

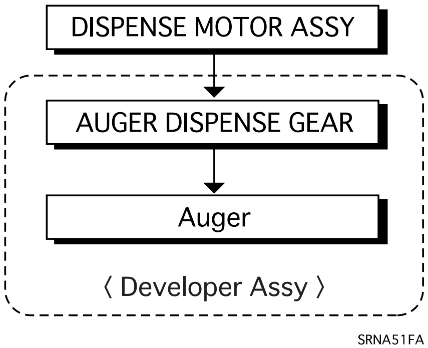


Figure 2-21.
Drive Transmission in Dispense Motor Assembly

2.3.4 Rotary Motor Assembly

The Rotary Motor Assembly drives the Rotary Frame Assembly.

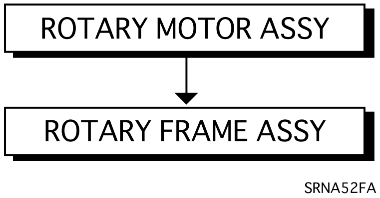


Figure 2-22.
Transmission in Rotary Motor Assembly

2.3.5 Gear Layout

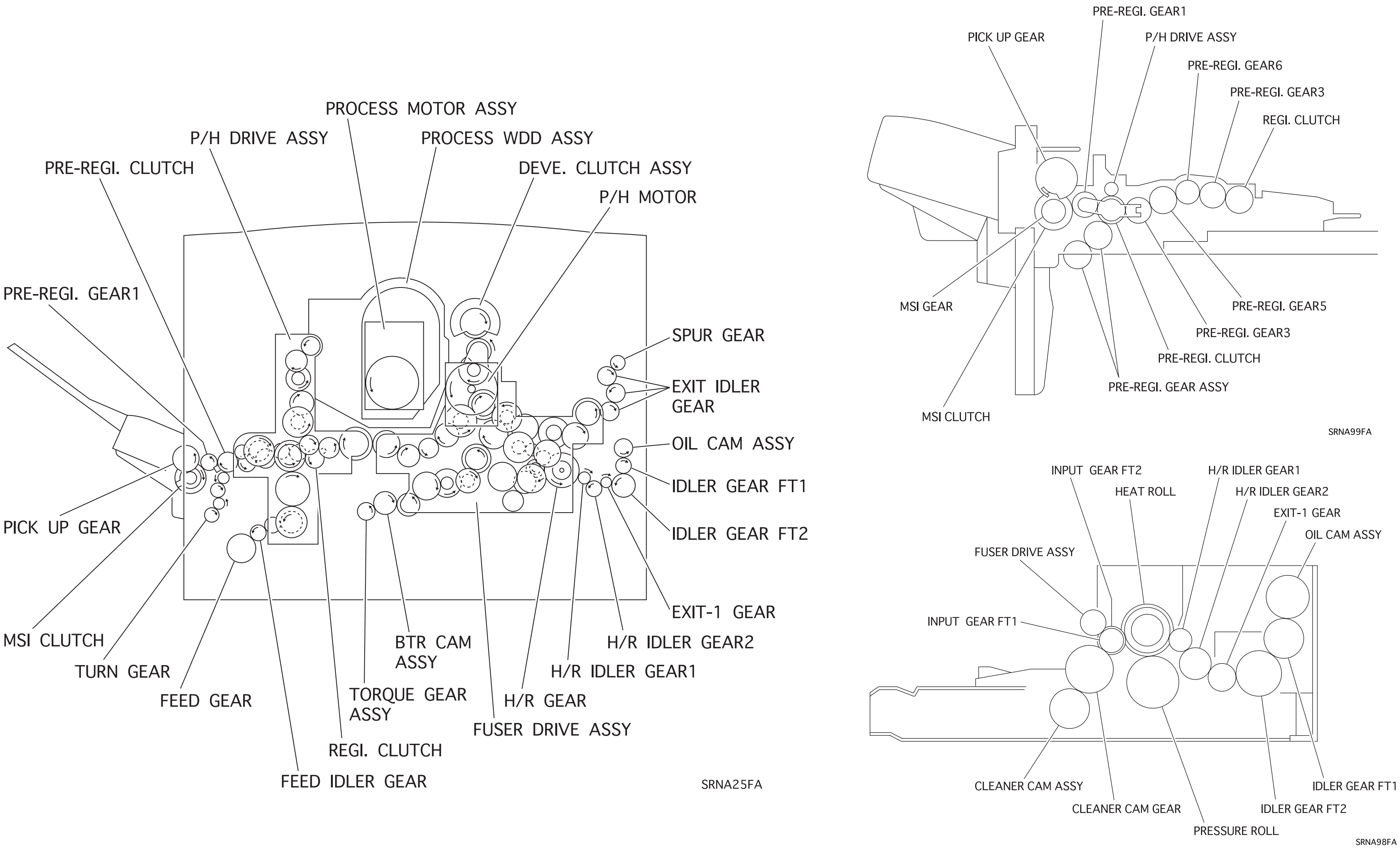


Figure 2-23. Gear Layout

2.4 Paper Transportation

2.4.1 Paper Transportation Path (No Option)

NOTE: *In this document, Cassettes 1 - 4 are defined as follows:*

Cassette 1 (LC1): Standard universal cassette
Cassette 2 (LC2): Top tray (Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit)
Cassette 3 (LC3): Middle tray (Large Capacity Paper Unit)
Bottom tray (500-Sheet Paper Cassette Unit)
Cassette 4 (LC4): Bottom tray (Large Capacity Paper Unit)

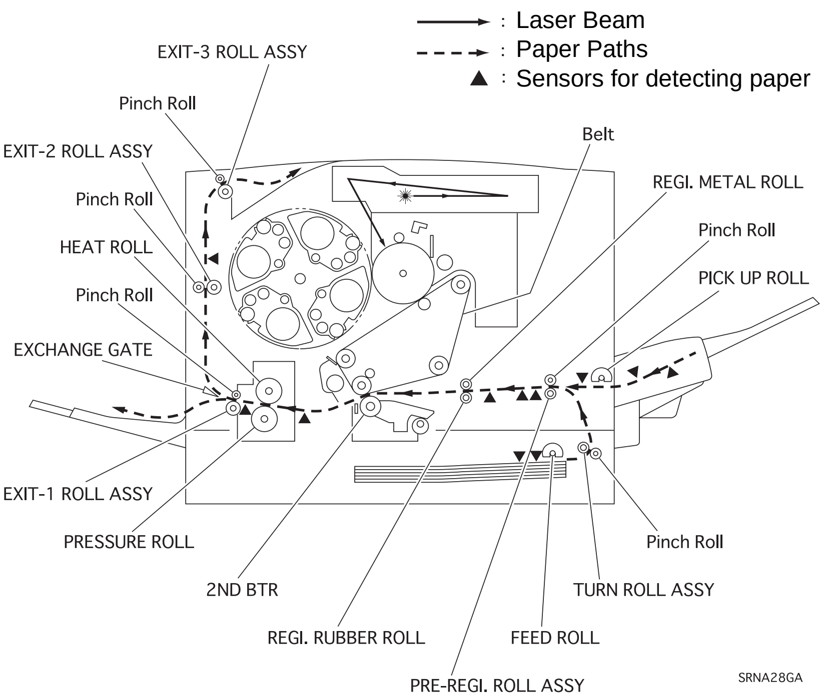


Figure 2-24. Paper Transportation Path Layout

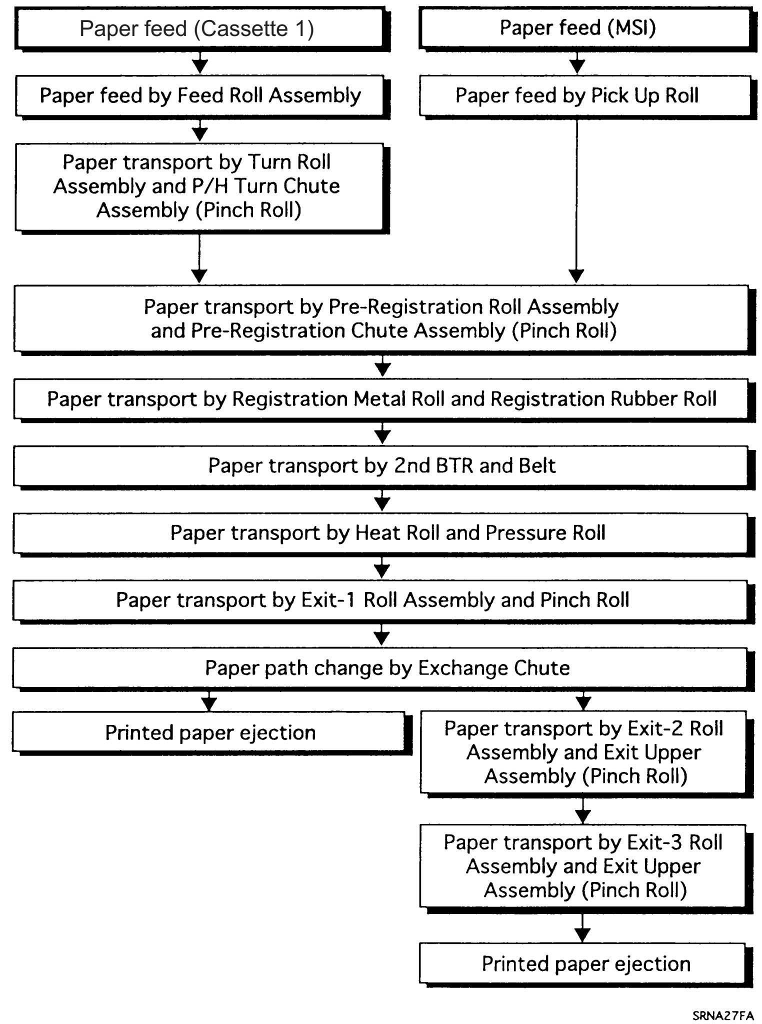


Figure 2-25. Paper Transportation Flow

2.5 Main Components

This section describes the main components and their functions. Each subsection has a figure illustrating the component and its function. The major components are listed below.

- Paper Tray
- Paper Feeder
- Multi Sheet Inserter
- Paper Transportation
- Xerographics-I
- Xerographics-II
- Development
- IBT-I
- IBT-II
- Fusing-I
- Fusing-II
- Paper Exit
- Frame & Drive
- Electrical

2.5.1 Paper Tray

1. Universal Tray

- The End Guide can be moved toward the paper feed and holds the paper stack in place. By moving the End Guide, the moving force is transmitted to the Sector Gear and the position of the Tray Size Actuator changes. The Tray Size Actuator pushes down (turns on) the Paper Size Switches (on the Size Switch Assembly). If the Tray Size Actuator position changes, the combinations of ON/OFF of the four Paper Size Switches change. The printer recognizes the paper size from the ON/OFF combinations.
- The Rear Guide Assembly moves in a direction perpendicular to the direction of the paper feed and holds the paper stack horizontally.
- The Bottom Plate Assembly pushes the paper stack onto the Feed Roll so that one sheet is pulled out by friction. The Tray N/F Springs push up the Bottom Plate Assembly.
- The bottom of the Bottom Plate Assembly has a magnet that detects the low paper state (Low Paper Sensor).
- The Front Snubber pushes down a corner of the paper so that only one sheet of paper is pulled out. (This mechanism uses the stiffness of the paper to prevent more than one sheet of paper from being pulled out.)

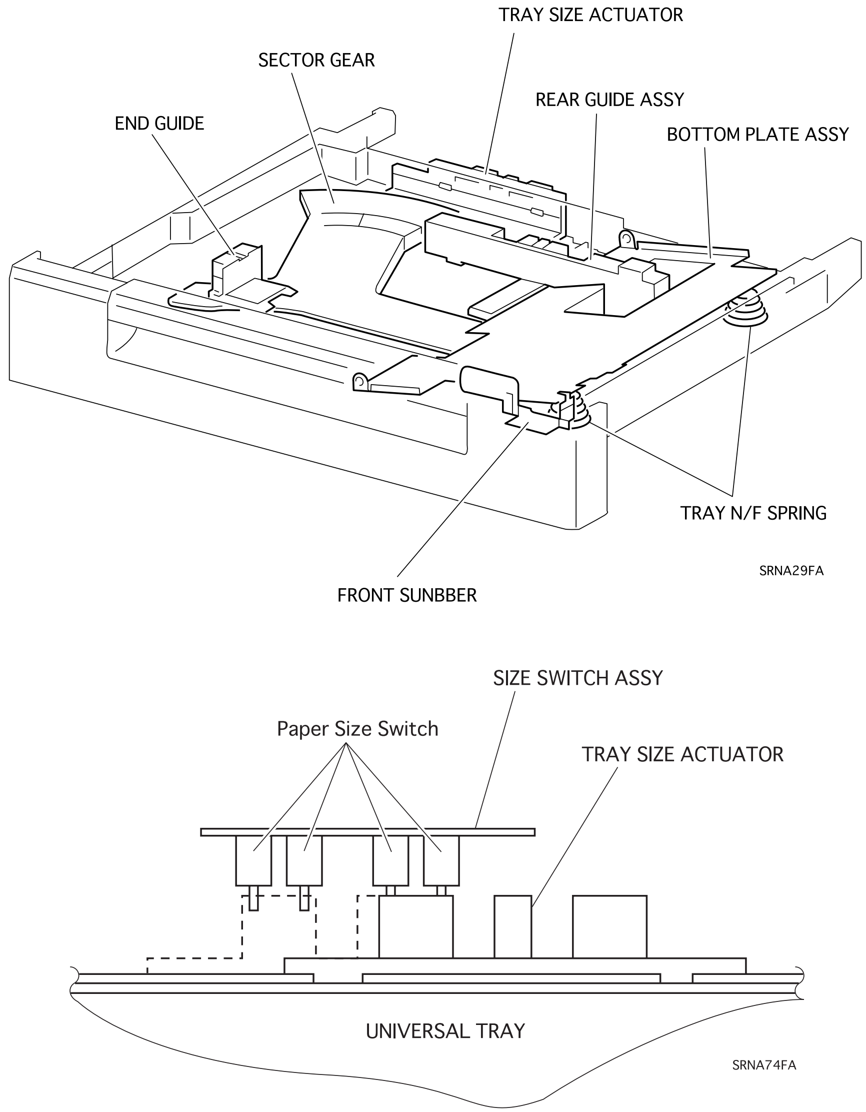


Figure 2-26. Paper Tray

2.5.2 Paper Feeder

1. Size Switch Assembly
   The Size Switch Assembly consists of four Paper Size Switches. (The switches are directly mounted on the circuit board.) When the Tray Size Actuator position changes, the ON/OFF combinations of these switches change and the printer detects the paper size and the paper tray.
2. Tray No Paper Sensor
   From the Tray N/P Actuator position, the printer detects paper in the paper tray.
3. Low Paper Sensor
   If the paper in the paper tray gets low, the distance between the Bottom Plate Assembly and the Low Paper Sensor is shortened. That is, the Magnet behind the Bottom Plate Assembly gets closer; the Low Paper Sensor detects the magnetism from the Magnet, determining that the supply of paper is getting low.
4. Feed Solenoid
   By controlling the rotation of the Feed Gear, the operation (rotation/stop) of the Feed Roll Assembly is controlled.
5. Feed Roll Assembly
   When the Feed Solenoid is activated, the Feed Spring force causes the Feed Gear and Feed Idler Gear to mesh. The Feed Roll Assembly then receives the driving force from the P/H Motor Assembly and starts rotating, causing the Feed Roll to pull a sheet of paper from the Paper Tray.
   The Feed Gear has a notch that, after it rotates once, dislodges the Feed Gear and the Feed Idler, causing the Feed Roll Assembly to stop rotating. This mechanism ensures that only one sheet of paper is pulled out.
6. Turn Roll Assembly
   The Turn Roll Assembly receives the driving force from the P/H Motor Assembly (via the Main P/H Assembly); it rotates and sends the paper pulled out from the Paper Tray to the Main P/H Assembly.

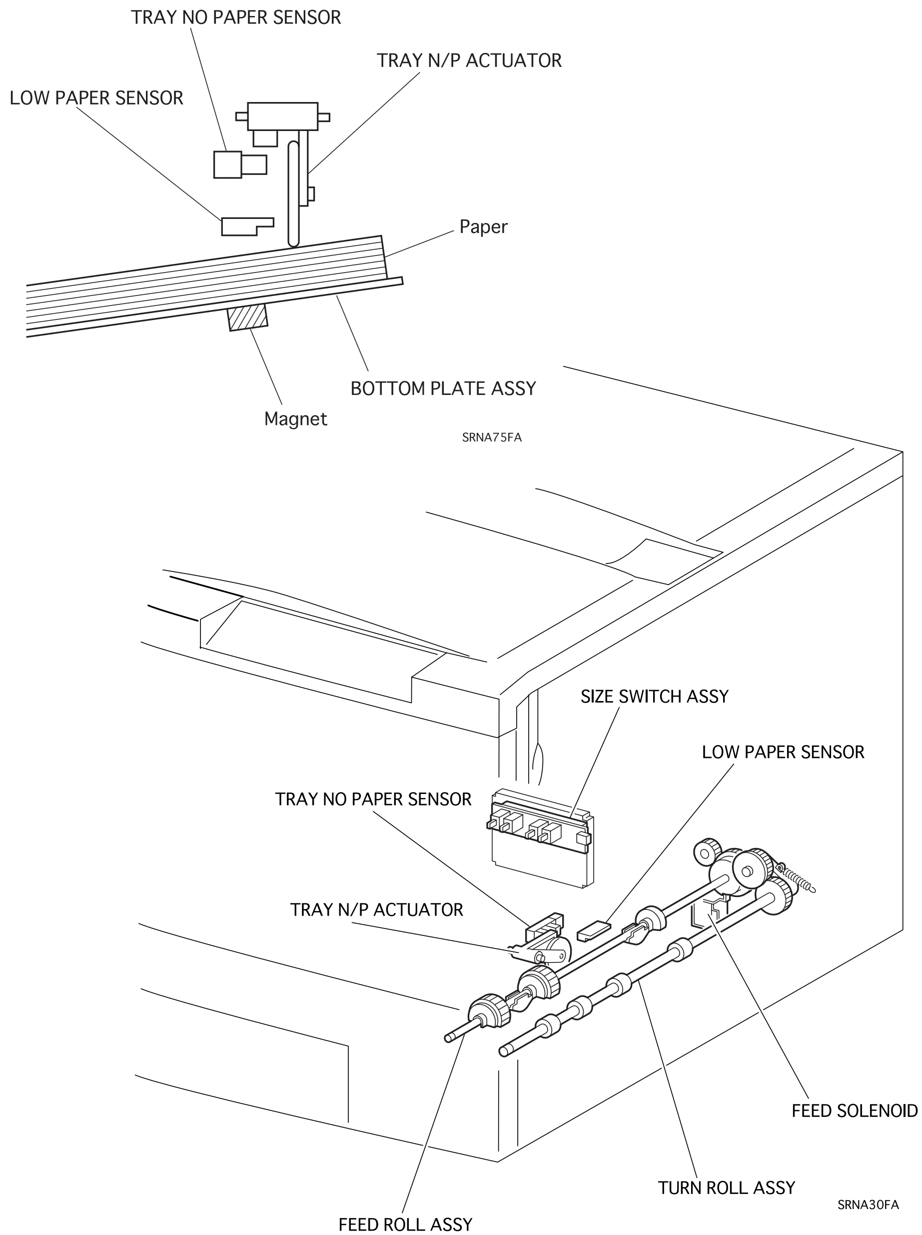


Figure 2-27. Paper Feeder

2.5.3 Multi Sheet Inserter (MSI)

1. MSI Assembly
   The MSI Assembly feeds paper from the MSI Tray. The MSI Assembly consists of the MSI Edge Sensor, Pick Up Solenoid, MSI Clutch and others.

   (a) MSI Edge Sensor

   The MSI Edge Sensor detects the paper interval (from the bottom edge of the preceding sheet to the top edge of the next sheet) in the 2UP mode. If the paper interval is too short, printing is not done properly in the 2UP mode. If the paper interval detected by the MSI Edge Sensor is shorter than the predetermined interval, the system turns off the MSI Clutch. This causes temporarily cuts the driving force to the Pick Up Rolls so that the paper transportation timing is adjusted.

   (b) Pick Up Solenoid

   The MSI Roll Assembly operation (rotation/stop) is controlled by controlling the rotation of the Pick Up Cam Gear.

   (c) MSI Clutch

   If the paper interval detected by the MSI Edge Sensor is shorter than the predetermined interval, the paper transportation timing needs to be adjusted. If the paper interval is too short, the MSI Clutch temporarily cuts off the driving force to the Pick Up Rolls transportation timing. (to adjust the paper interval) and corrects the paper.

   (d) MSI Short N/P Sensor

   When the MSI N/P Actuator position changes, the MSI Short N/P Sensor detects paper on the MSI Assembly. The MSI Short N/P Sensor only functions when the printer controller sends a signal indicating short paper size (shorter than 150mm) in the feeding direction.

   (e) MSI Long N/P Sensor

   The MSI Long N/P Sensor detects paper on the MSI Assembly by detecting the light reflected from the paper's surface. The sensor is horizontally attached to the MSI Tray Assembly. It can detect light from the light emitter which is reflected on the paper's surface. (A transparent OHP sheet can be detected by this method.) The sensor only functions when the printer controller sends a signal indicating long paper size (150mm or longer) in the feeding direction.

   (g) Retard Pad Assembly

   When the Pick Up Roll pulls out a sheet of paper, the friction between the paper and the Retard Pad Assembly prevents more than one sheet of paper from being pulled out.

   (h) Pick Up Roll

   The MSI Roll Assembly receives the force from the Pick Up Solenoid and the MSI Clutch and starts rotating and the Pick Up Roll pulls out a sheet of paper. Both the Pick Up Gear and the Pick Up Cam Gear have a notch that, after rotating once, disengages the Pick Up Cam Gear and MSI Gear, thus causing the MSI Roll Assembly to stop rotating. This mechanism ensures that only one sheet of paper is pulled out.

2. MSI Tray Assembly
   The MSI Tray Assembly hold the paper stack on the MSI Assembly.

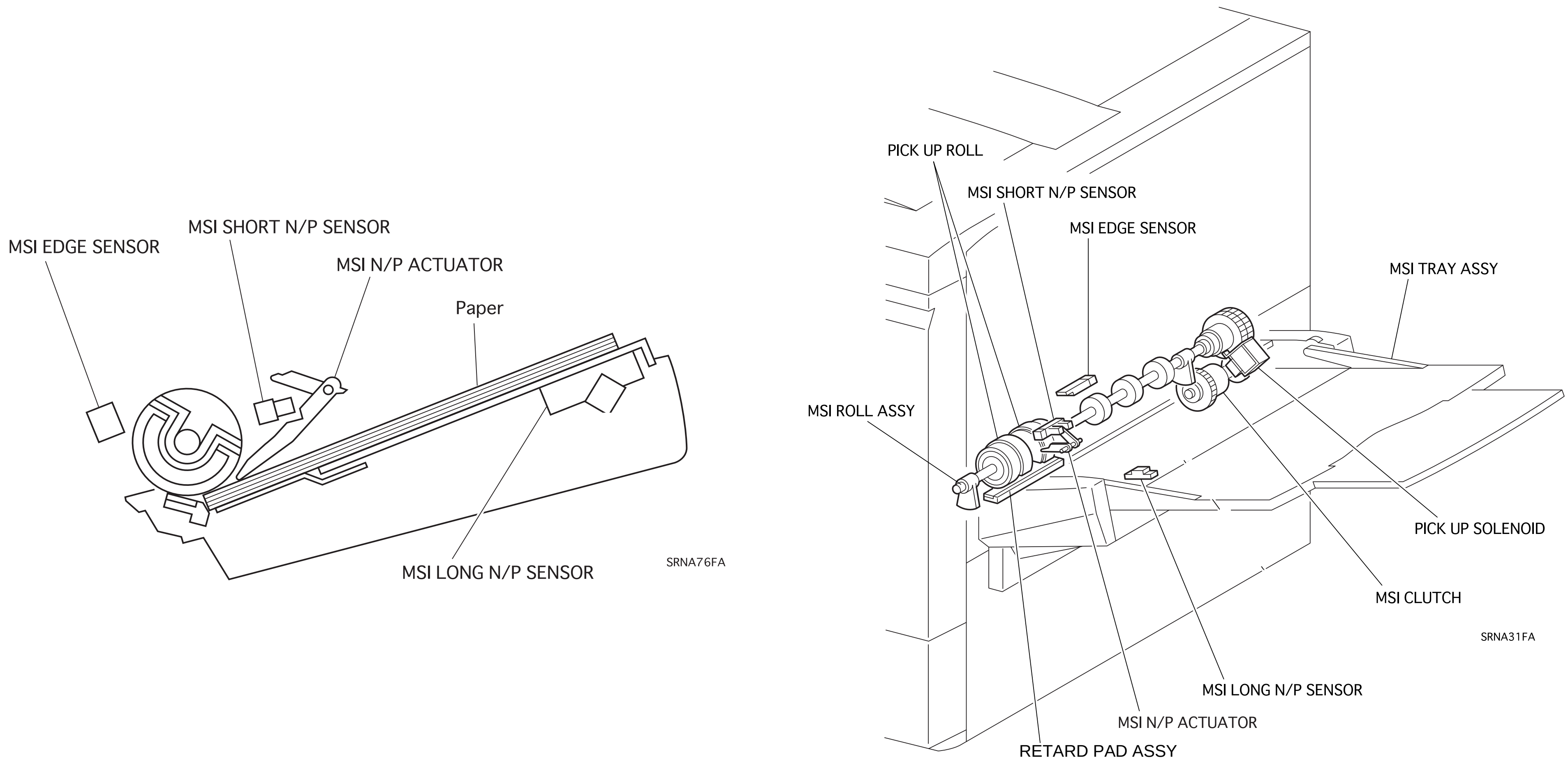


Figure 2-28. Multi Sheet Inserter

2.5.4 Paper Transportation

1. Main P/H Assembly
   The Main P/H Assembly consists of the following components:
   - Pre-Registration Roll Assembly
   - Registration Clutch
   - Pre-Registration Clutch
   - Registration Brake Clutch
   - Registration Sensor
   - Front OHP Sensor
   - Rear OHP Sensor
   - Registration Brake Clutch
   - Registration Metal Roll
   - Registration Rubber Roll

   (a) The Registration Metal Roll and Registration Rubber Roll pull out the paper in synchronization with the IBT Belt Assembly timing so that the paper will be positioned properly for the complete toner image on the IBT Belt Assembly to be correctly transferred onto the paper.

   (b) Pre-Registration Roll Assembly transfers paper from the paper tray or the MSI Assembly onto the Registration Metal Roll and Registration Rubber Roll. Until the top of the paper reaches the Registration Metal Roll and Registration Rubber Roll and until those rolls start rotating, the Pre-Registration Roll Assembly keep transferring the rear part of the paper by making a paper loop and correcting the skew at the top of the paper.

   (c) The Registration Brake Clutch controls (applies the brake to) the Registration Metal Roll.
   When the top of the paper reaches the Registration Metal Roll and Registration Rubber Roll it forms a loop. However, hard paper (such as an OHP sheet) may go through the Registration Metal Roll and the Registration Rubber Roll without making a loop. By turning on the Registration Brake Clutch, the Registration Metal Roll and the Registration Rubber Roll are constricted and the paper cannot go through—and that causes a paper loop.

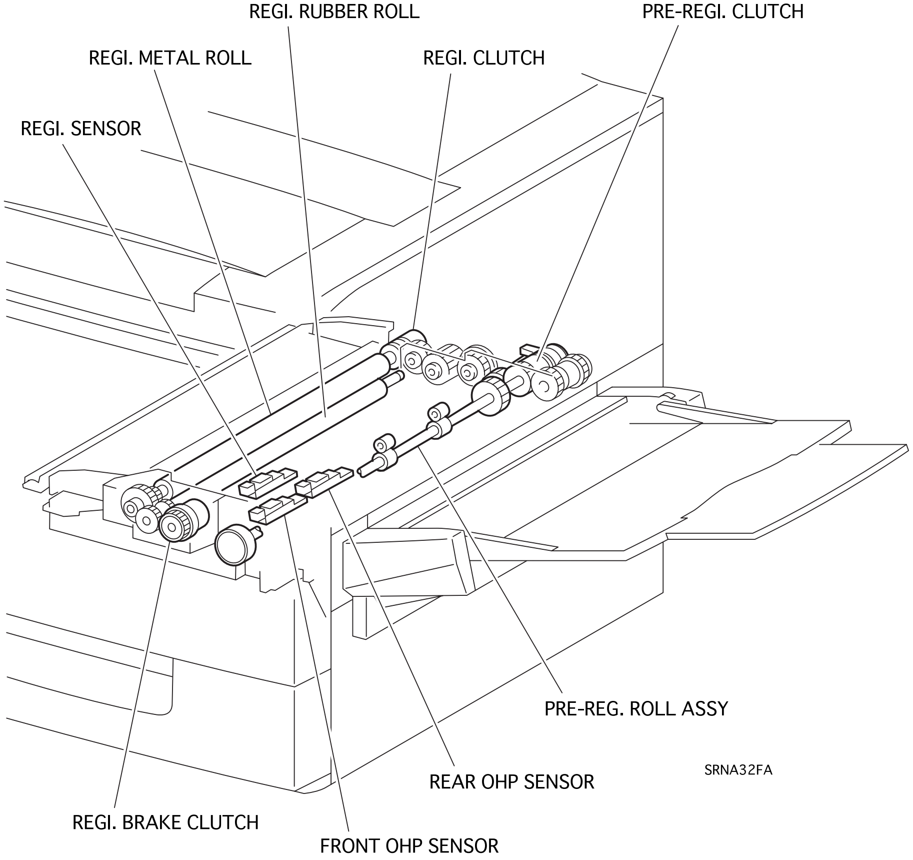
   (d) The Registration Clutch transmits the driving force from the P/H Motor Assembly to the Registration Metal Roll and Registration Rubber Roll so that the paper and the IBT Belt Assembly are properly positioned for a secondary image transfer.

   (e) The Pre-Registration Clutch transmits the driving force from the P/H Motor Assembly to the Pre-Registration Roll Assembly.

   (f) The Registration Sensor detects when the top of the paper has reached the Registration Metal Roll and the Registration Rubber Roll. To determine the paper size, the system detects the bottom edge of the paper. (The paper size is determined by the system keeping track of the time from when the Registration Clutch is turned on to when the Registration Sensor detects no paper.)

   (g) The printer detects the front and back of an OHP sheet* from the combined results of the Front OHP Sensor and the Rear OHP Sensor. (For more details, see “7.3 OHP Side Detection Control” in Section 10.)
   **The printer can use EPSON Color Laser Transparencies (S041175, S041174) only.*

   (h) The resistor and the capacitor installed on the front of the Main P/H Assembly maintain the potential of the Registration Metal Roll at the time of image transfer. If the Registration Metal Roll is directly grounded, the potential of the paper escapes to the ground via the Registration Metal Roll. This means that the paper will not have enough potential for an image to be transferred correctly.



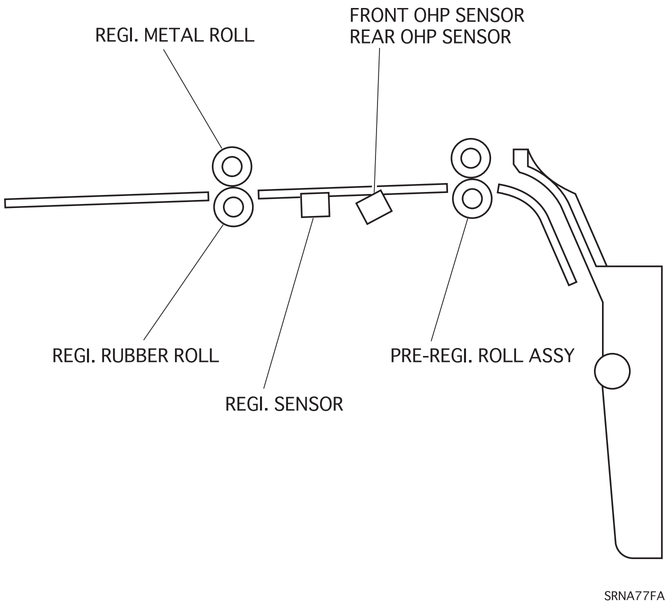


Figure 2-29. Paper Transportation

2.5.5 Xerographics I

1. ROS Assembly
   The ROS (Raster Output Scanner) Assembly outputs laser beam to form an electrostatic latent image on the drum's surface. The ROS Assembly consists of the following components.

   - LD Assembly
   - Scanner Assembly
   - SOS PWB
   - Lens
   - Mirror
   - Window

   (a) The image data is sent to the ROS Assembly as electrical signals. (High and low voltage indicates data in the electrical signals.). The LD (Laser Diode) Assembly converts the electrical signals (of the image data) to optical signals (laser beam ON/OFF). If the laser light quantity changes, a proper electrostatic latent image cannot be obtained. To obtain a stable laser amount, the LD Assembly (monitor circuit) always monitors and controls the LD output (LD Power). This is called the APC (Auto Power Control). For details, see Section 2.7.4.2.

   (b) The Scanner Assembly consists of the Scanner Motor and Polygon Mirror. (The Scanner Motor rotates at a constant rotational speed; the Polygon Mirror is on the rotational axis of the Scanner Motor.). The laser beam output from the LD Assembly is projected onto the Polygon Mirror. The Polygon Mirror has 12 reflecting surfaces; as the Scanner Motor rotates, the reflection angle of the laser beam changes. This change causes the laser beam to scan the drum's surface in the drum axis direction. One reflecting surface of the mirror scans one line.

   (c) The laser beam reflected by the Polygon Mirror arrives on the drum surface via the lens, mirror and window. The lens corrects any aberrations and the mirror ensures light passage. The window prevents any foreign objects from entering the ROS.

   (d) To form a proper electrostatic latent image on the drum surface, the laser scanning timing and the writing timing of the image data must be coordinated. The SOS Sensor on the SOS PWB (Start Of Scan Printed Wiring Board) converts the laser beam into electrical signals (SOS signals) which detect the initial position (scan start position) in each line that the laser will scan.

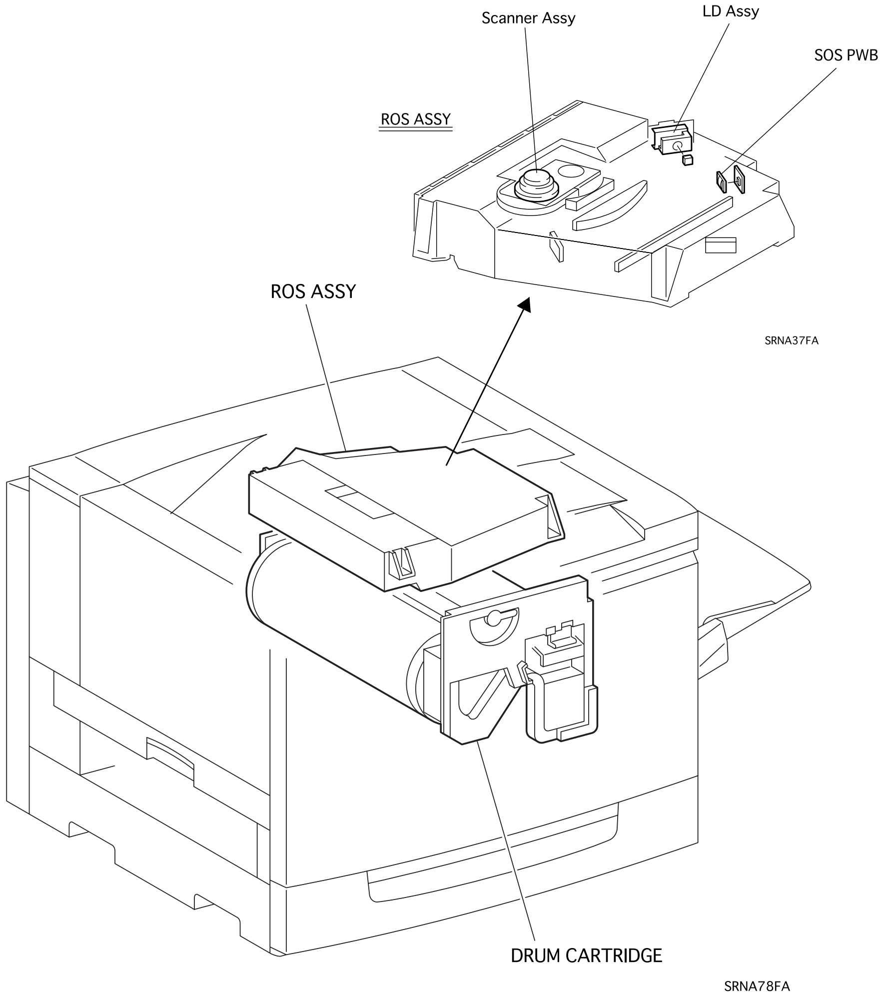


Figure 2-30. Xerographics I

2.5.6 Xerographics II

1. Drum Cartridge
   The Drum Cartridge consists of the Xero. Cartridge, Waste Toner Box and others.

   (a) The Xero. Cartridge consists of the Drum, BCR, Cleaning Blade, and others.
   - The Drum is an aluminium cylinder on which the OPC (Organic Photoconductor) material has been painted. The OPC material is photoconductive so a laser scanning the drum's surface forms an electrostatic latent image on the drum. (Photoconductive: A photoconductive material is an insulator (holds potential in the dark) that, when it receives light, becomes conductive and the potential is grounded.)
   - The BCR uniformly charges the drum surface in the Charge step in the print process.
   - The Cleaning Blade scrapes off the residual toner particles in the First transfer process in the print process.

   (b) The Waste Toner Box collects the toner scraped off the drum's surface by the Cleaning Blade and the other toner sent by the Auger High Assembly (the toner scraped off from the IBT Belt Assembly by the Belt Cleaner Assembly).

2. Erase Lamp Assembly
   The Erase Lamp Assembly emits a light onto the drum's surface to remove the residual charges remaining from the previous Charge process.

3. Waste Toner Sensor
   The Waste Toner Sensor detects when the Waste Toner Box is full of discarded toner.

4. Toner Box Sensor
   The Toner Box Sensor detects the Waste Toner Box.

5. ADC Sensor Assembly
   The ADC Sensor Assembly consists of the ADC Sensor, ADC Solenoid and others.

   (a) ADC Sensor
   The ADC (Automatic Density Control) Sensor detects the toner density of the image on the drum's surface or toner density of the drum's surface itself, and sends the density data to the Process Control Unit.
   (For more details, see Section 2.7.5.)

   (b) ADC Solenoid
   If the ADC Sensor light emitter or receptacle is dirty with toner, the sensor cannot detect the toner density of the image or the drum's surface. So, the ADC Sensor light emitter and receptacle are cleaned by the cleaning lever when the ADC Solenoid is activated.

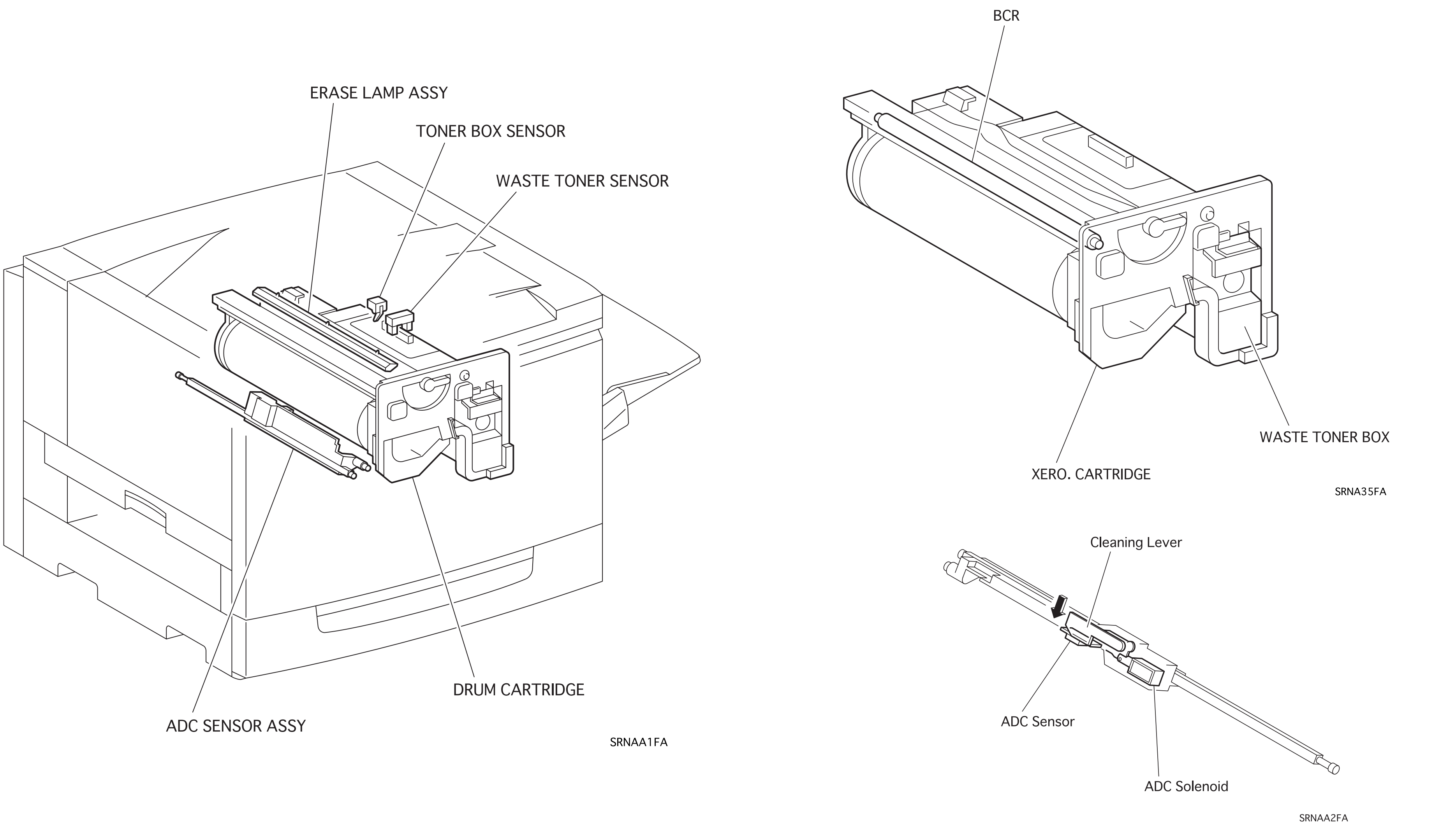


Figure 2-31. Xerographics II

2.5.7 Development

1. Used Cartridge Sensor
   The Used Cartridge Sensor detects whether the toner cartridge is new or used for the color in each toner cartridge. In the trickle development method, the used developer is collected in the collection chamber in the Toner Cartridge. A reflection seal has been pasted on a wall inside the chamber; when collected and accumulated in the collection chamber, the used developer covers the reflection seal. The Used Cartridge Sensor is a reflection type photo sensor. If it detects a reflected light from the Toner Cartridges for each color, it determines that the used developer has not filled up the collection box, meaning that the Toner Cartridge is still new. If it does not detect a reflected light from the Toner Cartridge, the Toner Cartridge is old.

2. Cartridge Sensor
   The Cartridge Sensor is a reflection type photo sensor. It detects a reflection light from the Toner Cartridges. If it detects a reflected light, it determines that the Toner Cartridge has been mounted. If it does not detect a reflected light, it determines that the Toner Cartridge has not been mounted.

3. Rotary Sensor
   The Rotary Sensor detects the home position of the Rotary Frame Assembly. The Developer control is done based on the home position.
   (For more details, see “7.8 Developer Control.”)

4. Developer Assembly Y, Developer Assembly M, Developer Assembly C, Developer Assembly Bk
   The major components of each of these Developer Assemblies (Y, M, C and Bk) are the Augers, Magnet Roll, Trimmer Blade and Tracking Roll.
   (a) The three Augers in the Developer Assembly:
   - Supplies toner from the Toner Cartridge to the Developer Assembly.
   - Agitates the developer in the Developer Assembly.
   - Supplies the developer from the Developer Assembly to the Magnet Roll.

   (b) The Magnet Roll has the following functions:
   - Attracts the carrier particles.
   - Forms an even developer layer.
   - Supplies toner to the drum.

   (c) The Trimmer Blade is positioned so that a gap is maintained between the Magnet Roll and the Trimmer Blade; it forms an even developer layer on the Magnet Roll.

   (d) The Tracking Roll maintains a gap between the drum and the Magnet Roll.

5. The Toner Cartridges (Y, M, C and Bk) have toner (including carriers) and collect the used developer (carriers).

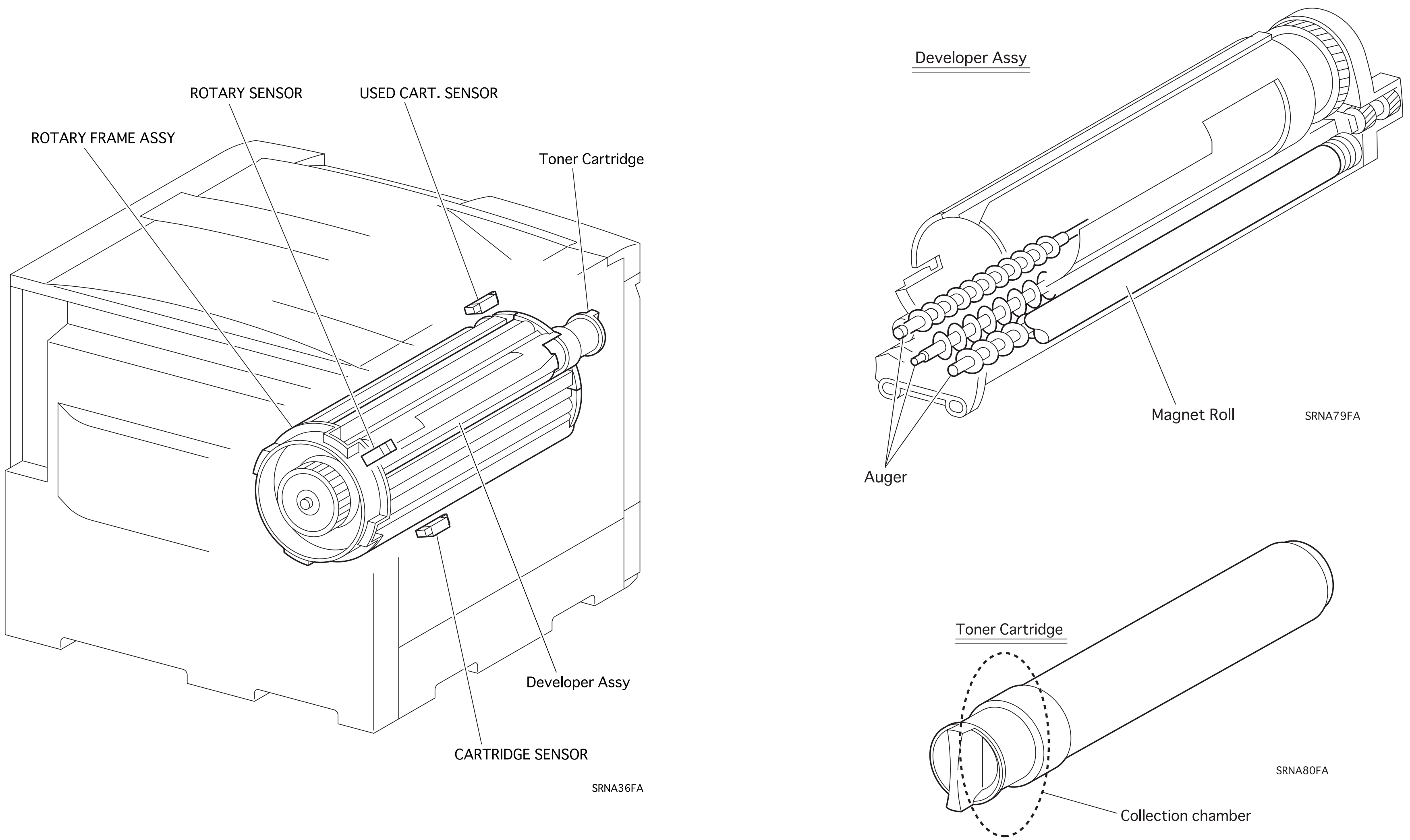


Figure 2-32. Development

2.5.8 IBT-I

1. Transfer Assembly
   The Transfer Assembly consists of the following components:

   - 1st BTR
   - Back Up Roll
   - Contact Roll
   - IBT Drive Roll Assembly
   - TRO Sensor
   - IBT Belt Assembly

   (a) The 1st BTR (First Bias Transfer Roll) is a conductive roll, facing the drum. (The IBT Belt Assembly is in the middle.) The 1st BTR transfers the toner image on the drum to the IBT Belt Assembly.
   (b) The Contact Roll is a metal roll (small diameter). It is in contact with the Back Up Roll and provides the 2nd transfer voltage to the Back Up Roll.

   (c) The Back Up Roll is a conductive roll, facing (from inside) the 2nd BTR. (The IBT Belt Assembly is in the middle). When the paper passes through, the Back Up Roll provides the 2nd transfer voltage to the paper from the inside of the IBT Belt Assembly.

   (d) The IBT Drive Roll Assembly transfers the driving force of the Process Motor Assembly to the IBT Belt Assembly. (The Process Motor Assembly receives the driving force from the Process WDD Assembly.)

   (e) The silver marks (TRO marks) is pasted at the rear end of the IBT Belt Assembly. This is because the toner images transferred onto the IBT Belt Assembly must match precisely. The TRO Sensor detects this mark every time the IBT Belt Assembly makes one rotation. When the sensor detects the mark, the system waits for a predetermined period and then generates a TRO signal (which indicates the reference point and the image transfer reference point to form an image.) The IBT Belt Assembly has two TRO marks. As a result, every time the Process Motor runs, the transfer reference marks are alternately detected. This prevents the image from being transferred onto the same location on the belt all the time—something that leads to image degradation.

   (f) A one-color toner image on the drum is transferred onto the IBT Belt Assembly. This process is repeated four times (for four colors). At the end, a 4-color overlaid toner image has been formed on the IBT Belt Assembly. When the complete toner image is formed on the belt, the 2nd BTR provides negative transfer voltage to the belt and the belt transfers the image (of 4-color toner) onto the paper (2nd transfer).

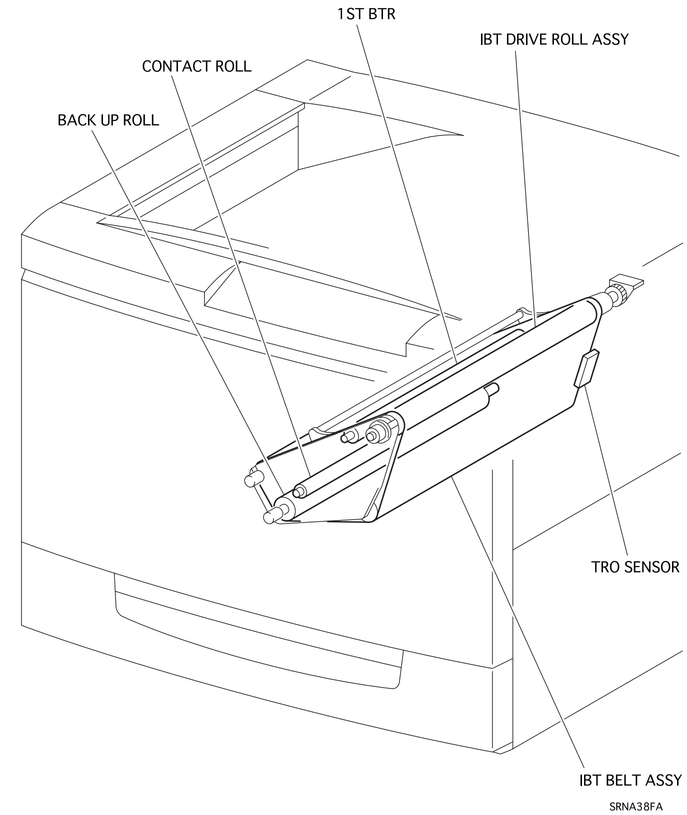


Figure 2-33. IBT-I

2.5.9 IBT-II

1. 2nd BTR Assembly
   The 2nd BTR Assembly consists of the following components:
   - 2nd BTR
   - 2nd BTR Cleaner
   - Detach Saw (Charge Removable board)

   (a) The 2nd BTR (Second Bias Transfer Roll) is a conductive roll. It faces the Back Up Roll from outside the belt. (The IBT Belt Assembly is in the middle.) The 2nd BTR induces the transfer voltage from the voltage provided by the Back Up Roll and transfers the toner image on the IBT Belt Assembly onto the paper (2nd transfer).
   (b) The 2nd BTR Cleaner is in contact with the 2nd BTR and scrapes off the toner from the surface of the 2nd BTR. (The scraped toner is collected in the toner chamber in the 2nd BTR Assembly.)

   (c) The Detach Saw (Charge Removal Plate) provides the charges on the back of the paper and neutralizes/removes the charges on the paper.

2. BTR Cam Solenoid
   The BTR Cam Solenoid transfers the drive force from the P/H Motor Assembly, via the P/H Drive Assembly, to the 2nd BTR Cam Assembly, and controls the advance/retract movement of the 2nd BTR Assembly. (Advance: The 2nd BTR Cleaner moves forward to the IBT Belt Assembly; Retract: The 2nd BTR Cleaner moves away from the IBT Belt Assembly.)

3. BELT Cleaner Assembly
   The Belt Cleaner Assembly consists of the following components:
   - Cleaning Blade
   - Auger

   (a) The Cleaning Blade moves forward to the IBT Belt Assembly after the 2nd transfer process and scrapes off the remaining toner on the belt.
   (b) The Auger transfers the scraped toner to the Auger High Assembly.
   (The Auger High Assembly transfers the toner to the Waste Toner Box.)

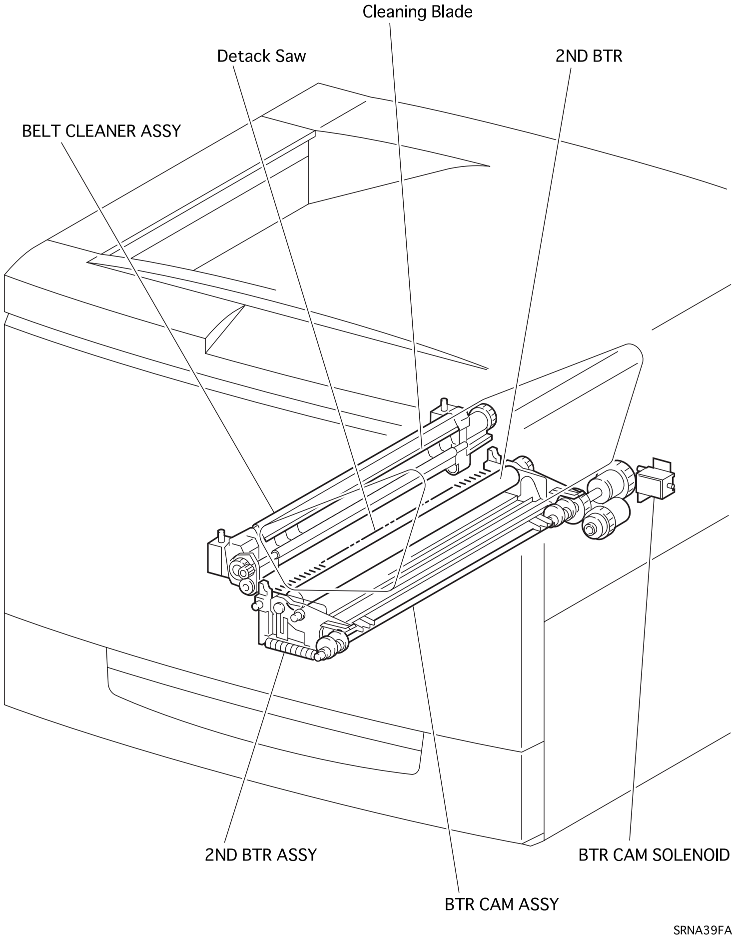


Figure 2-34. IBT-II

2.5.10 Fusing-I

1. Fuser Assembly

   The Fuser Assembly fuses the toner on the paper with heat and pressure, and transfers the paper in and out, to and from the Fuser Assembly. The Fuser Assembly consists of the Main Fuser Assembly and the Fuser Tray Assembly.

   ■ Main Fuser Assembly

   The Main Fuser Assembly consists of the Heat Roll, Pressure Roll, H/R Heater, P/R Heater, Temperature Sensor Assembly and others.

   - The Heat Roll is a cylindrical metal roll with a rubber layer on the surface. It applies heat to the paper to fuse the toner onto the paper.
   - The Pressure Roll is a cylindrical metal roll with the rubber layer on the surface. It applies heat and pressure on the paper to fuse the toner on the paper.
   - The H/R Heater is a halogen lamp in which heating coils have been sealed. (The heating coils provide the heat source for the Heat Roll.) The H/R Heater is installed inside the Heat Roll and heats the Heat Roll to the fusing temperature.
   - The P/R Heater is a halogen lamp in which heating coils have been sealed. (The heating coils provide the heat source for the Pressure Roll.) The P/R Heater is installed inside the Pressure Roll and heats the Pressure Roll to the fusing temperature.
   - The Temperature Sensor Assembly is a thermistor sensor. It always touches the Heat Roll and detects the temperature on the Heat Roll's surface. (A thermistor is an element that changes its resistance by temperature.) From the detected temperature, the Temperature Sensor Assembly controls the ON/OFF of the H/R Heater and P/R Heater and prevents overheating (primary overheating prevention mechanism).
   - The Thermostat is connected (in series) to the power supply circuits of the H/R Heater and P/R Heater. If the primary overheating prevention mechanism of the Temperature Sensor Assembly fails, the contact point in the Thermostat opens, shutting off the power supply to the H/R Heater and P/R Heater (secondary overheating prevention mechanism).
   - The Thermal Fuse is connected in series to the power supply circuits of the H/R Heater and P/R Heater. If the primary and secondary overheating prevention mechanisms fail, the Thermal Fuse is melted by the heat, shutting off the power supply to the H/R Heater and P/R Heater (tertiary overheating prevention mechanism).
   - The Fuser Exit Sensor detects a paper pass from the position change of the Fuser Exit Actuator.
   - The H/R Finger prevents paper from being rolled into the Heat Roll.
   - The P/R Finger prevents paper from being rolled into the Pressure Roll.

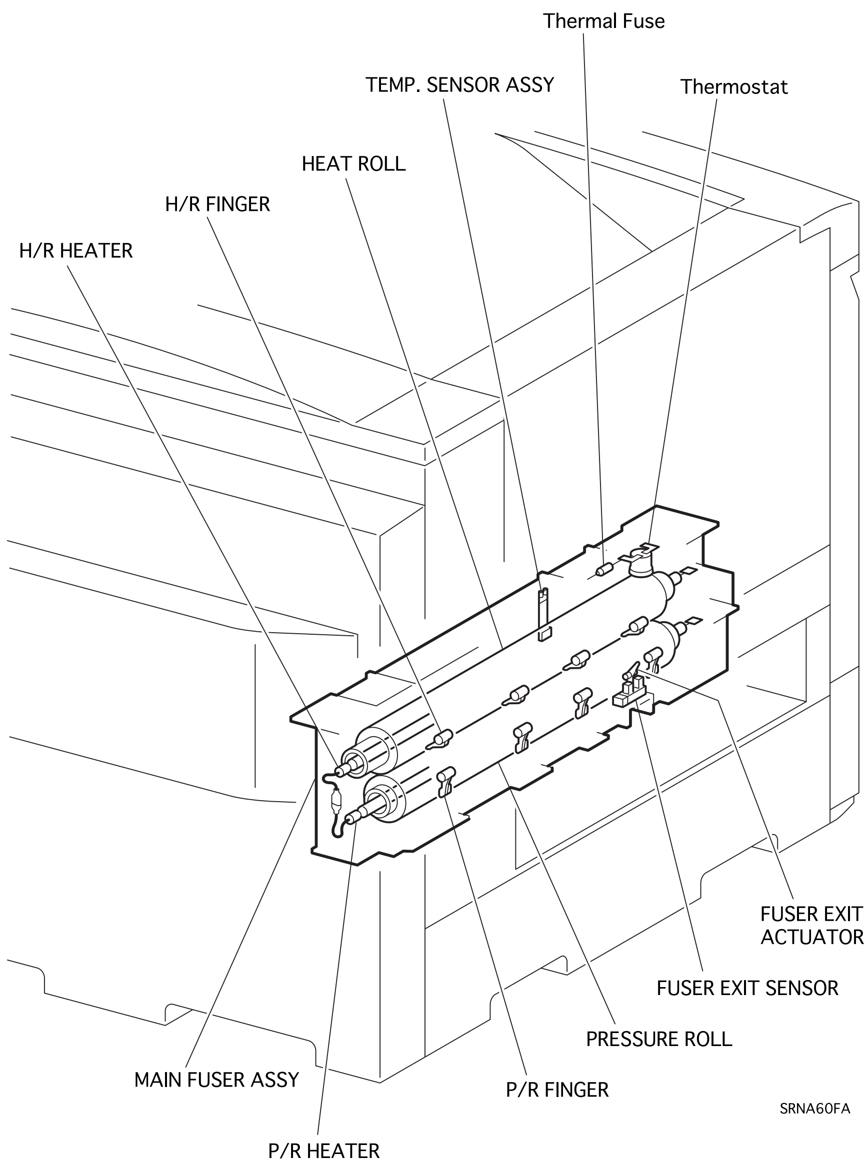


Figure 2-35. Fusing-I

2.5.11 Fusing-II

1. Fuser Assembly

   The Fuser Assembly fuses the toner on the paper with heat and pressure and transfers the paper to and from the Fuser Assembly. The Fuser Assembly consists of the Main Fuser Assembly and Fuser Tray Assembly.

   (a) Fuser Tray Assembly

   The Fuser Tray Assembly consists of the Fuser In Sensor, the Oil Cam Solenoid and the Exchange Solenoid. It transfers the paper to and from the Main Fuser Assembly.

   - Fuser In Sensor
     The Fuser In Sensor detects a paper pass status from the position change of the Fuser In Actuator. (It detects the paper tip based on the detection timing of the Fuser Exit Sensor.)
   - Fuser Chute Fan
     The Fuser Chute Fan pulls down the paper to the Fuser Paper Guide and the Horizontal Chute. This is necessary to position the paper correctly so that the paper is properly transferred to the Fuser Main Assembly.
   - Cleaner Cam Solenoid
     The Cleaner Blade in the Belt Cleaner Assembly needs to touch the IBT Belt Assembly only immediately after the 2nd toner transfer. It must not touch the belt at any other time. (If the Cleaning Blade is touching the IBT Belt Assembly while the toner image is being formed on the IBT Belt Assembly, the toner image is damaged.)
     The Cleaner Cam Solenoid transfers the driving force from the P/H Main Assembly, via the P/H Drive Assembly, to the Cleaner Cam Assembly and the Cleaner Cam Guide, and controls the advance/retract operation of the Belt Cleaner Assembly. (Advance: The Cleaning Blade moves forward to the IBT Belt Assembly; Retract: The Cleaning Blade moves away from the IBT Belt Assembly.)
   - Oil Cam Solenoid
     If the Oil Roll in the Oil Roll Assembly is constantly touching the Heat Roll, the Fuser Oil may degrade and oil stains may appear on the paper. The Oil Roll needs to touch the Heat Roll only during the fusing operation; at other times, the Oil Roll must remain separated from the Heat Roll.
     The Oil Cam Solenoid transfers the driving force from the P/H Main Assembly, via the P/H Drive Assembly, to the Oil Cam Assembly, and controls the advance/retract operations of the Oil Roll Assembly. (Advance: The Oil Roll of the Oil Roll Assembly moves forward to the Heat Roll; Retract: The Oil Roll moves away from the Heat Roll.)
   - Exchange Solenoid
     After fusing, the paper may be ejected face up or face down. The Exchange Solenoid switches the Exchange Chute and controls the paper ejection modes.
   - Exit-1 Roll Assembly
     The Exit-1 Roll Assembly transfers the fused paper from the Fuser Main Assembly.

2. Oil Roll Assembly

   The Oil Roll Assembly has an Oil Roll in which Fuser Oil has been impregnated. The Oil Roll in the Oil Roll Assembly follows the Heat Roll rotation and applies the Fuser Oil evenly onto the Heat Roll surface. The Fuser Oil prevents the following:

   - Paper from being rolled into the Heat Roll.
   - Heat Roll wear caused by contact with the Temperature Sensor Assembly and the H/R Fingers.

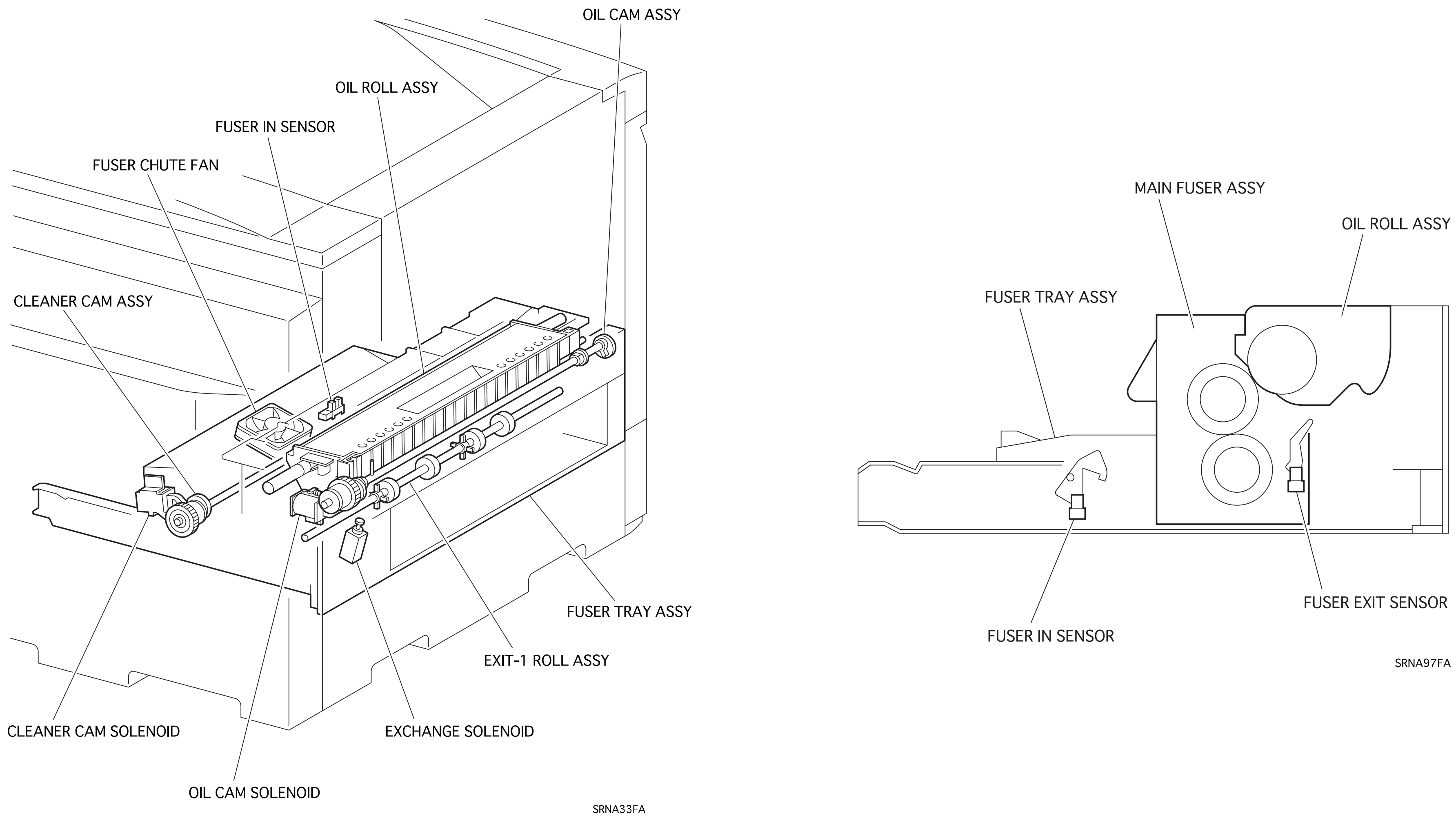


Figure 2-36. Fusing-II

2.5.12 Paper Exit

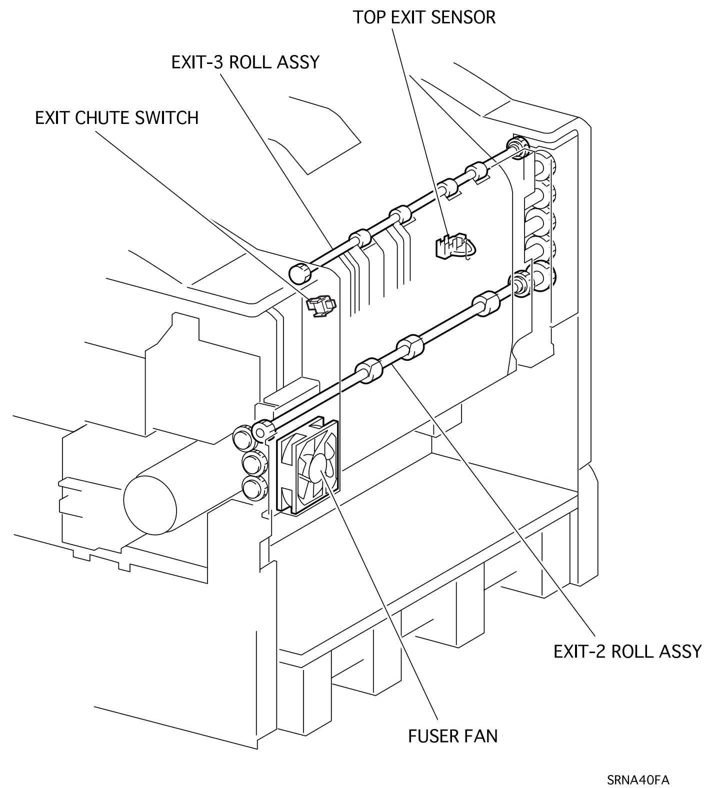
1. Exit-2 Roll Assembly
   The Exit-2 Roll Assembly transfers the fused paper to the Top Cover Assembly (face down paper ejection).

2. Exit-3 Roll Assembly
   The Exit-3 Roll Assembly transfers the fused paper to the Top Cover Assembly (face down paper ejection).

3. Exit Chute Switch
   The Exit Chute Switch detects the open/close of the Exit Upper Assembly. If open, the Exit Chute Switch halts the printer operation (a safety feature). (The Exit Chute Switch is turned ON when the rib of the Exit Upper Assembly is pushed in.)

4. Fuser Fan
   The Fuser Fan exhausts the heat from the Fuser Assembly to prevent overheating in the printer.

5. Top Exit Sensor
   The Top Exit Sensor detects the fused paper's pass status. The sensor detects the paper pass status from the position change of the actuator.



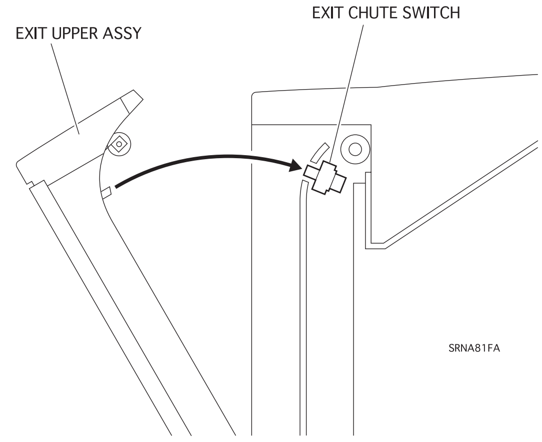


Figure 2-37. Paper Exit

2.5.13 Drives

1. Process Drive Assembly
   The Process Drive Assembly consists of the Process Motor Assembly and Process WDD Assembly. It provides the driving force to the Drum Cartridge and the Transfer Assembly.

   (a) Process Motor Assembly
   Process Motor Assembly provides the driving force to the following components via the Process WDD Assembly:
   - Drum Cartridge
   - Transfer Assembly

   (b) Process WDD Assembly
   The Process WDD Assembly transfers the driving force from the Process Motor Assembly to the Drum Cartridge and the Transfer Assembly.

2. P/H Motor Assembly
   The P/H Motor Assembly consists of the Motor unit and the drive circuit board. It provides the driving force to the following components via the P/H Drive Assembly and the Fuser Drive Assembly:

   - Main P/H Assembly
   - Developer Assembly
   - Fuser Assembly
   - 2nd BTR Assembly
   - Belt Cleaner Assembly
   - Exit Lower Assembly
   - Auger High Assembly
   - Drum Cartridge

3. P/H Drive Assembly
   The P/H Drive Assembly transfers the driving force from the P/H Motor Assembly to the Main P/H Assembly and the Drum Cartridge.

4. Fuser Drive Assembly
   The Fuser Drive Assembly transfers the driving force from the P/H Motor Assembly to the Fuser Assembly, the 2nd BTR Assembly and the Developer Assembly.

5. Dispense Motor Assembly
   The Dispense Motor Assembly provides the driving force to the Auger. (The Auger conveys the toner from the Toner Cartridge in the Developer Assembly to the Developer Assembly.)

6. Developer Clutch Assembly
   The Developer Clutch Assembly transfers the driving force from the P/H Motor Assembly to the Developer Assembly (Magnet Roll and 2 Augers).

7. Rotary Motor Assembly
   The Rotary Motor Assembly provides the driving force to the Rotary Frame Assembly.

8. Rotary Motor PWB
   The Rotary Motor PWB controls the rotation of the Rotary Motor Assembly and provides the power to the Rotary Motor Assembly.

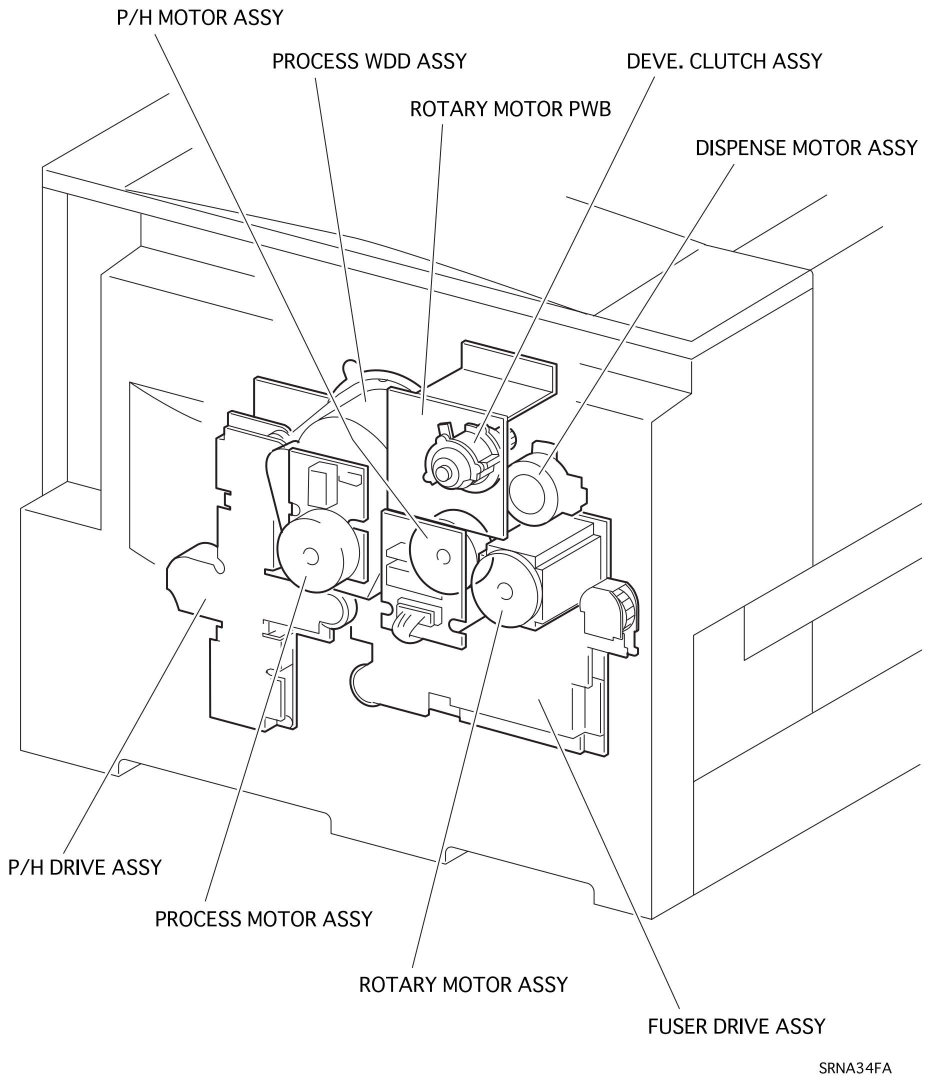


Figure 2-38. Drives

2.5.14 Electrical

1. Front Cover Switch R
   The Front Cover Switch R (interlock switch) detects whether the Front Cover Assembly is opened or closed. If open, the interlock switch shuts off the 24 VDC-I/L and 5 VDC-LD circuits to cut off the output (24VDC/5VDC-LD) from the LVPS. The Front Cover Switch R has two switches for the 2 circuits above.

2. Front Cover Switch L
   The Front Cover Switch L detects whether the Front Cover Assembly is opened or closed. If it detects that the Front Cover Assembly is open, it halts the printer operation (a safety switch).

3. Top Cover Switch
   The Top Cover Switch (interlock switch) detects the Top Cover Assembly. If it detects no Top Cover Assembly, it cuts off the 5VDC-LD circuit.

4. Developer Fan
   The Developer Fan exhausts the heat from inside the printer, preventing overheating.

5. LVPS
   The LVPS provides the AC power (from the power supply unit) to the H/R Heater and P/R Heater (Fuser Assembly), and generates stable low voltage DC power which is used by the logic circuits and others. The LVPS includes the power supply circuit, control circuit (for H/R Heater and P/R Heater), inlet and power switch.

6. HVPS
   The HVPS provides high voltage to the following components. The high voltage is needed for the various printing processes (Charging, Developing, 1st Transfer, 2nd Transfer, Detach).

   - BCR (Drum Cartridge)
   - Magnet Roll (Developer Assembly)
   - 1st BTR/Contact Roll (Transfer Assembly)
   - Detach Saw (2nd BTR Assembly)

7. MCU PWB
   The MCU PWB controls the print operation using the data from the printer controller and the sensors and switches.
   Its main functions are as follows:

   - Communication with the PWB Controller
   - Receiving data from the sensors and switches.
   - Controlling the ROS Assembly, Fuser Assembly and Motors (Process Motor Assembly, P/H Motor Assembly, Dispense Motor Assembly, Rotary Motor Assembly).
   - Print sequence control
   - Distribution of low voltage (DC) power from the LVPS to various components.

8. Environment Sensor
   The Environment Sensor detects the temperature in the printer. (It detects the temperature using its internal thermistor. A thermistor is an element that changes its resistance by temperature.) Based on the detected temperature, this sensor controls the supply voltage to the BCR and the Warm-up Fuser control temperature.

9. Controller Fan
   The Controller Fan exhausts the heat from inside the Controller PWB, preventing the Controller PWB from overheating.

10. Controller PWB
    The Controller PWB receives data from the host, does the printing operation, and controls the whole printer.

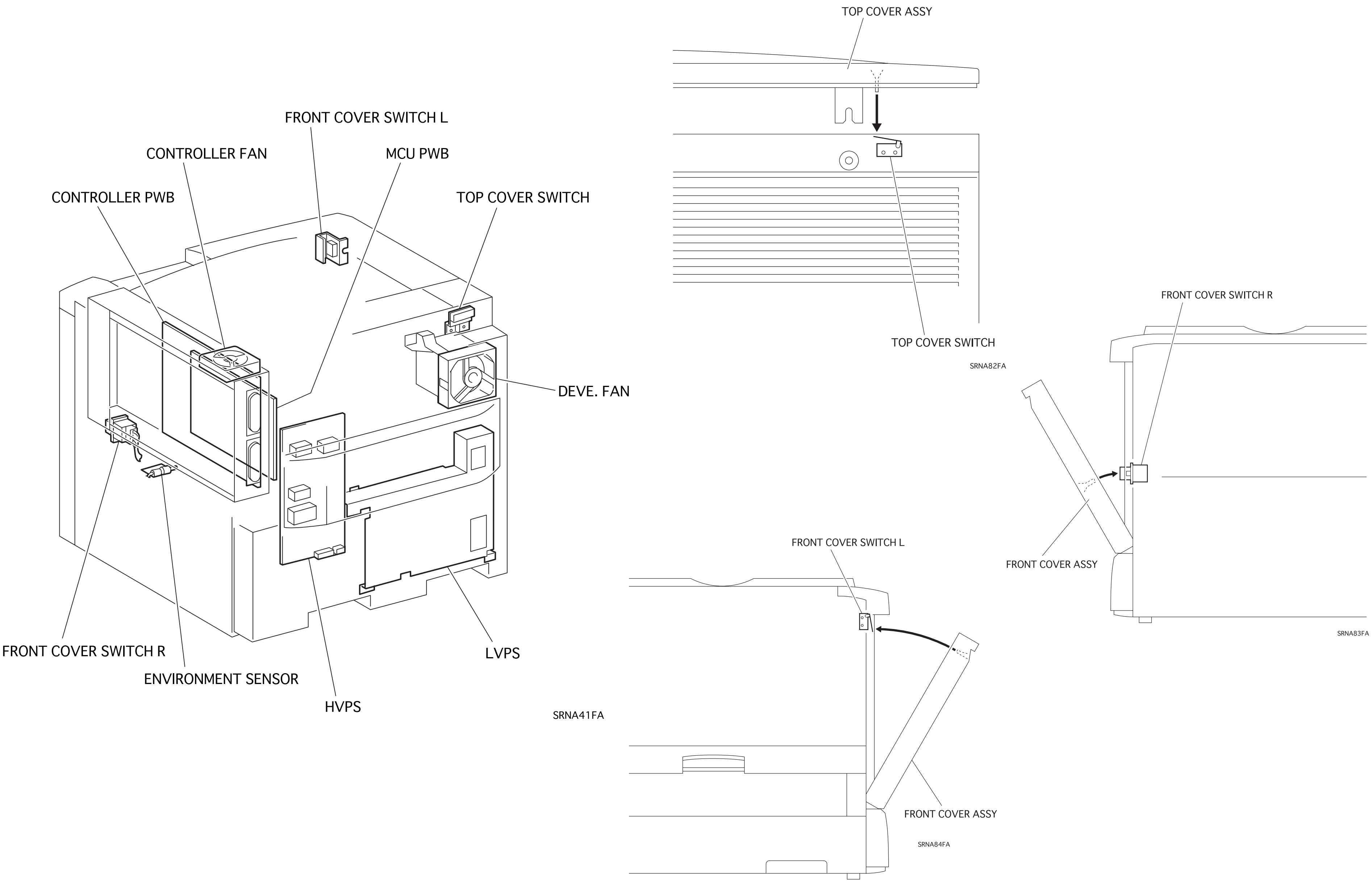


Figure 2-39. Electrical

2.6 Operation Modes

The printer has the following 7 operation modes:

- WARM-UP: The printer is warming up to be print ready.
- READY: After warm-up, the printer is waiting to print.
- PRINTING: The printer is printing.
- LIGHT SLEEP: Standby level 1 (Energy save mode 1)
  The printer is in a mode in which, to save energy, the Fuser control temperature is low.
- DEEP SLEEP: Standby level 2 (Energy save mode 2)
  The printer is in a mode in which, to save energy, power is not supplied to the Fuser, Fuser Fan or Developer Fan.
- DIAGNOSTIC TEST: The printer can accept a diagnostic command or is running a diagnostic.
- ERROR: The printer has detected an error (exceptions: Empty Tray error, No Paper error, end of life errors).

The following shows the transition paths among the modes.

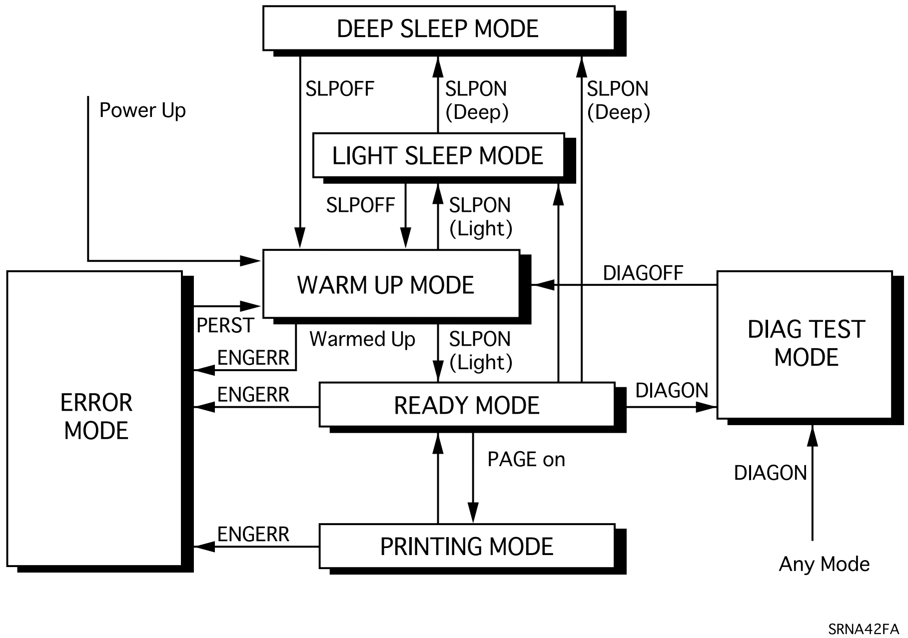


Figure 2-40. Transition Paths among the Modes

2.7 Controls

2.7.1 Paper Size Control

The following table shows the Paper Size Switch status (ON/OFF), Diagnostic Data (Analog Input Test data), and voltage for the Size Switches for the corresponding paper sizes.

NOTE: *The Paper Size Switches are SW1, SW2, SW3, and SW4 (viewed from the left when facing the printer); the ON switch is "1" and the OFF switch is "0."*

Table 2-1. Paper Size Control

Paper size	Paper Size Switch				Diagnostic display data	Voltage (V DC)
	SW1	SW2	SW3	SW4		
No paper tray	0	0	0	0	0E - 0F	0.275 - 0.293
B5 (LEF) *1	1	1	0	0	BB - BE	3.671 - 3.715
EXECUTVE (LEF) *2						
A4 (LEF)	0	1	0	0	47 - 4A	1.396 - 1.445
LETTER (LEF)	1	0	0	0	9D - A1	3.098 - 3.152
A4 (SEF) *1	0	1	1	1	72 - 76	2.248 - 2.298
LETTER (SEF) *2						
LEGAL14" (SEF)	1	1	1	0	B8 - DB	4.247 - 4.276
B4 (SEF)	0	1	0	1	55 - 59	1.680 - 1.730
A3 (SEF)	0	0	1	0	2A - 2D	0.834 - 0.871
LEDGER (SEF)	0	0	1	1	3A - 3C	1.116 - 1.157
12" x 8" (SEF)	0	0	0	1	1C - 1E	0.554 - 0.583
Irregular	1	1	1	1	E7 - E9	4.537 - 4.554
<Reserved>	1	0	0	0	-	--
<Reserved>	1	0	0	1	-	--
<Reserved>	0	1	1	0	-	-
<Reserved>	1	0	1	1	-	-
<Reserved>	1	1	0	1	-	-

* *If the Paper Size Switch ON/OFF state is the same, one of the two will be selected according to the printer specifications. (*1: A printer with specifications in millimeters (mm) /*2: A printer with specifications in inches.)*

2.7.2 Paper Tray Selection Control

If the paper tray is not controlled by the Printer Controller, the tray will be selected at the Power ON defined in the table below.

Table 2-2. Paper Tray Selection Control

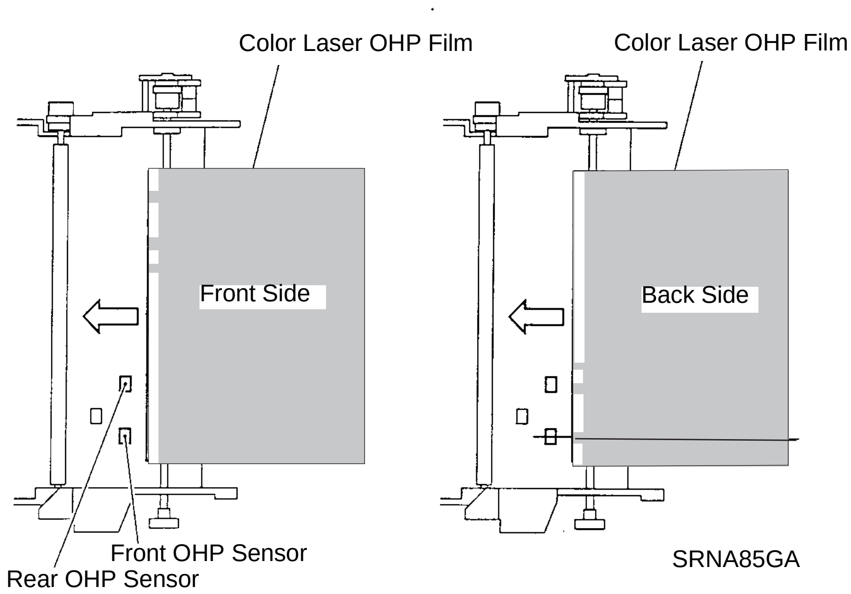
Priority	Selected tray	Conditions
1	Cassette 1	Cassette 1: Paper Cassette: Yes / Paper: Yes Or all paper cassettes: No paper
2	Cassette 2	Cassette 1: Not selected. Cassette 2: Paper Cassette: Yes / Paper: Yes
3	Cassette 3	Cassette 1/Cassette 2: Not selected. Cassette 3: Paper Cassette: Yes / Paper: Yes
4	Cassette 4	Cassette1/Cassette2/Cassette3: Not selected Cassette 4: Paper Cassette: Yes / Paper: Yes
5	MSI tray	Cassette1/Cassette2/Cassette3/Cassette 4: Not selected MSI tray: Paper: Yes

NOTE: *In this document, Cassettes 1 - 4 are defined as follows:*

Cassette 1 (LC1): Standard universal cassette
Cassette 2 (LC2): Top tray (Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit)
Cassette 3 (LC3): Middle tray (Large Capacity Paper Unit)
Bottom tray (500-Sheet Paper Cassette Unit)
Cassette 4 (LC4): Bottom tray (Large Capacity Paper Unit)

2.7.3 OHP Side Detection Control

The printer detects the side (back/front) of the OHP set in the printer. If the back side of the transparency is set facing the belt (top side), the transparency will be rolled into the Heat Roll. The OHP Side Detection Control function prevents an OHP film from being rolled up with the Heat Roll. The printer detects the side of the OHP from the signals sent by the Front OHP Sensor and the Rear OHP Sensor. Epson exclusive OHP transparency film (S041175/4) has a white edge with a notch on it. The sensors detect the notch and the printer determines whether the film is set properly (based on the signals sent from the sensors). If any OHP film other than specified one is used, the printer indicates the message “Check OHP sheet” and stops printing.



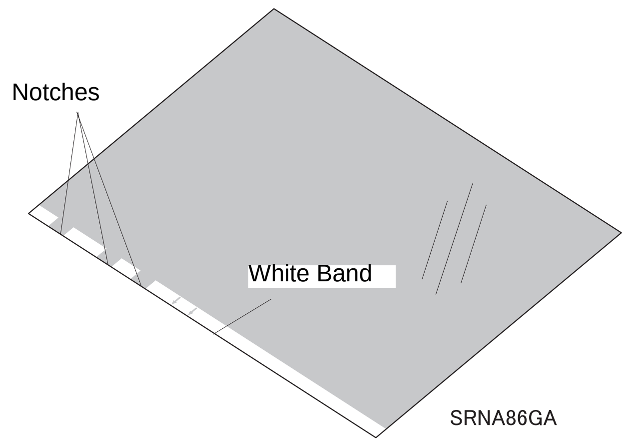


Figure 2-41. OHP Film Side Detection Control

2.7.4 ROS Control

2.7.4.1 Scanner Motor Rotation

The following table defines the Scanner Motor Rotation ON/OFF control in the printer modes.

Table 2-3. Scanner Motor Rotation Control

Mode	Scanner Motor: ON/OFF
WARM-UP	OFF
READY	OFF
PRINTING	ON
LIGHT SLEEP	OFF
DEEP SLEEP	OFF
DIAG TEST	ON in the following case: • Diagnostic tool: Test print • Diagnostic tool: Executing ROS_MOT in Digital Output Test
ERROR	OFF

NOTE: *The Scanner Motor rotates when the PMSTT (Printing/Status Control) is executed in any mode.*

2.7.4.2 Light Quantity Control

Image data is input to the ROS (LD Assembly) as electrical signals. (The data is represented by the high/low voltage of the electrical signals). The LD Assembly converts the electrical signals into light signals. (A light signal represents data by turning the laser beam on/off.) To obtain a correct electrostatic latent image, the LD Power for the laser light, the optical system (lens, etc.), and the drum sensitivity must be stable. Based on the feedback from the electric potential control (See Section 2.7.5.1 Electric Potential Control), the LD Assembly monitors and controls the laser light quantity to obtain a correct electrostatic latent image. This control is called APC (Automatic Power Control).

2.7.5 Process Control

For a stable printing process, it is necessary to adjust the image parameters. This parameter adjustment is called Process Control.

There are three types of process controls:

- Electric potential control
- Toner density control (PCDC)
- Toner density control (ADC)

2.7.5.1 Electric Potential Control

For a stable printed image, it is necessary to maintain the correct BCR (drum charge) voltage and laser quantity. The electric potential control does the following

- Measures the development density of the image (Cin50% patch in each color: Y, M, C and Bk) and the non-development density on the drum. (The image is formed on the drum by the BCR voltage, laser, and development voltage.) (The ADC Sensor detects the densities.)
- Computes a correct BCR voltage and laser quantity.
- Sends the data to the HVPS and ROS. (Feedback)

NOTE: *A Cin50% patch is an image that has been developed for every 3 dots. The image may be monochrome (Bk) or color (YMCBk) and is determined by the color mode. In color image formation, a 2-color image is formed in one belt rotation in the Bk → Y → M → C sequence.*

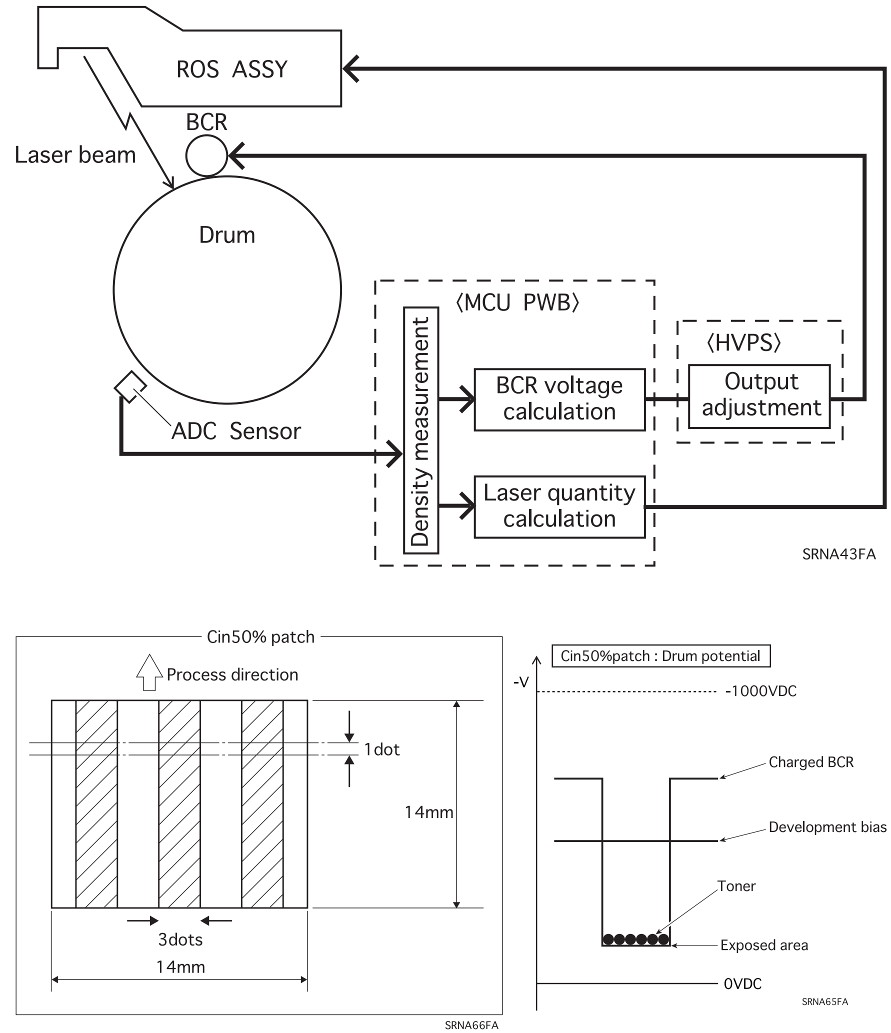


Figure 2-42. Electric Potential Control

2.7.5.2 Toner Density Control (PCDC)

The toner density in the developer becomes degraded as more printings are done. To obtain a stable printed image, stable toner density in the developer must be maintained. The PCDC (Pixel Count Dispense Control) counts the number of video signals that are input to the ROS Assembly and computes the consumed toner amount in the development process. Based on data from the PCDC, the system provides toner to the Developer Assembly. The toner is supplied to the Developer Assembly from the Toner Cartridge when the system rotates the Dispense Motor (Dispense Motor Assembly) (driving the Auger in the Developer Assembly) for the calculated duration (dispense time). The PCDC counts the capacitor charges/discharges for the video signals in the CR circuit that has been implemented parallel to the video signal cable.

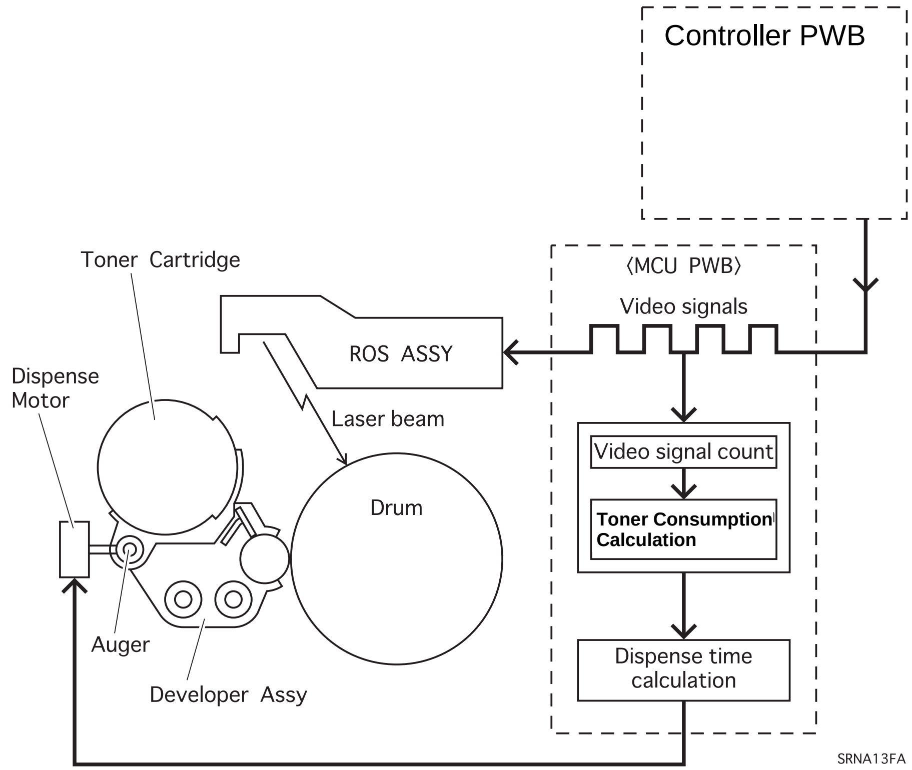


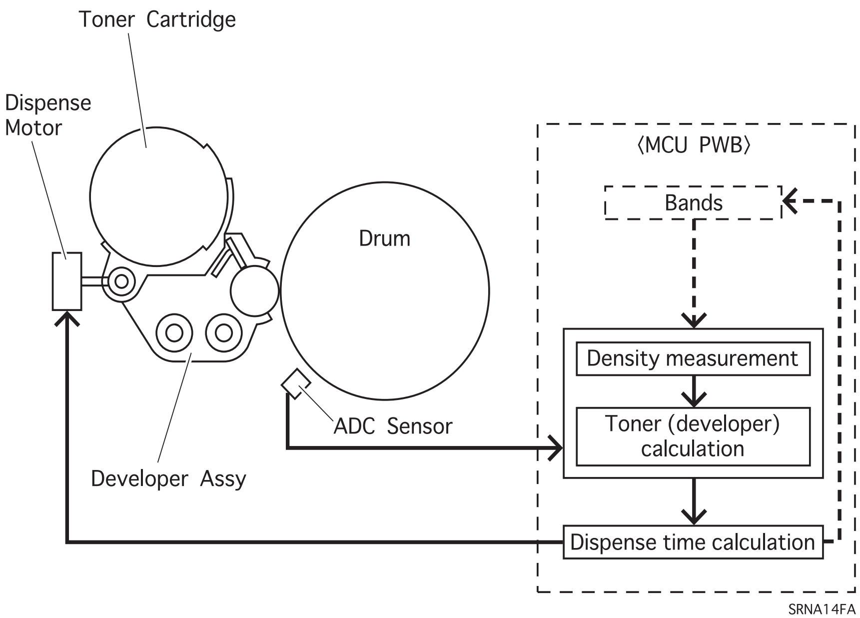
Figure 2-43. Toner Density Control (PCDC)

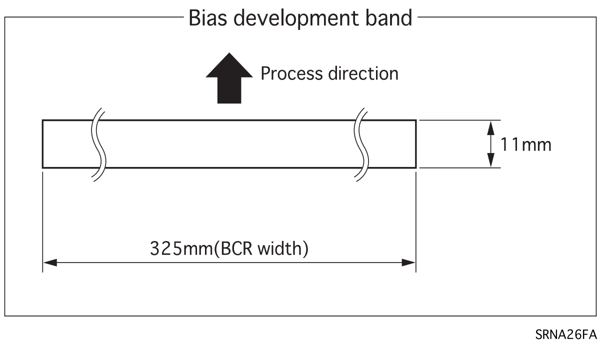
2.7.5.3 Toner Density Control (ADC)

To obtain stable print quality, it is necessary to maintain constant toner density in the developer. (The toner density must be detected correctly in the actual developer without being affected by the laser.) The ADC (Auto Density Control) forms BIAS development bands (for each color: YMCBk) on the drum and measures the density of the bands with the ADC Sensor. (The BIAS development bands are formed with the standard BCR voltage and development voltage and are different from the printing voltages.)

When detecting low toner, the system rotates the Dispense Motor (Dispense Motor Assembly) (driving the Auger in the Developer Assembly) for the calculated duration (dispense time) to supply toner to the Developer Assembly from the Toner Cartridge. If too much toner (toner density in the developer is too high) is detected, the system forms numbers of BIAS development bands to consume the toner until the right toner density is detected.

NOTE: *The BIAS development bands are images developed on the BCR charged area that has negatively charged toner. This is done by raising the BCR voltage higher than the development voltage.*





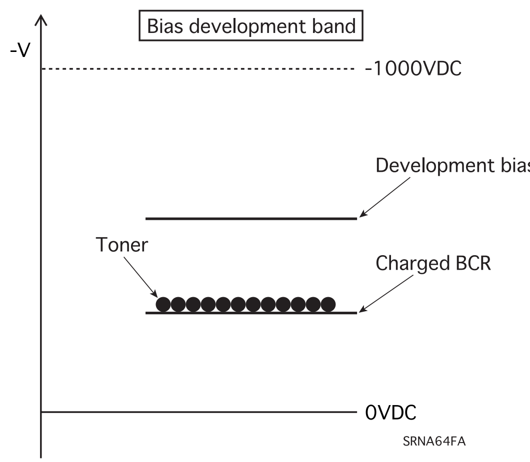


Figure 2-44. Toner Density Control (ADC)

2.7.5.4 ADC Solenoid Operation

The ADC Solenoid turns on/off (ON: 0.5 sec/OFF: 0.5 sec) twice (nominal) every 300 counts (nominal). This operation causes the Cleaning Lever to clean the ADC Sensor emitter/receptor.

NOTE: *The count described above is based on the following:*
1 count:
Printing a sheet that has a length (feed direction) of 219mm (LETTER/LEF) or smaller
2 counts:
Printing a sheet that is larger than the above.

2.7.5.5 Process Sequence

The process sequences are as follows:

Table 2-4. Process Sequence

Sequence	Description	Errors Detected
Power Up Sequence	Warm-UP sequence (Power ON).	• ADC sensor error • Toner out • Low density error
Cycle Up Sequence	Sequence in READY mode (before printing after receiving a print signal).	• PCDC error • High density error
Print Sequence	Printing sequence	• PCDC error • High density error
Cycle Down Sequence	Print-end (print job end) sequence	-

During these sequences, the following errors are detected.

- Toner out
- ADC sensor error
- Abnormal density (too low) error
- Abnormal density (to high) error
- PCDC error

The printer indicates the corresponding message on the LCD panel and stops printing.

2.7.6 Xerographic Control

2.7.6.1 BCR/Erase Lamp Control

BCR/Erase lamp control in the BCR and the Erase Lamp Control is defined in the following table (ON/OFF in the process control is not included.):

Table 2-5. BCR/Erase Lamp Control

Status	Control item	Description
Warm-up mode starting	BCR	Turns BCR ON as the Warm-up mode starts at power on. In A1 second after ON, turns the BCR OFF.
	Erase lamp	Turns BCR ON as the Warm-up mode starts at power on. In A1 second after ON, turns the BCR off. Turns the Erase lamp ON as the Warm-up mode starts with power on. In B1 second after ON, turns the Erase lamp OFF.
Print job starting	BCR	After Cycle-up sequence is complete, turns the BCR ON with the first TRO signal.
	Erase lamp	Receiving the print signal, turns the Erase lamp ON as Cycle-up sequence starts.
During printing	BCR	[Standard speed mode] Keeps the BCR ON. [Half speed mode] After forming the image (electrostatic latent image) with the last color, turns the BCR OFF with the second TRO signal, and turns it ON with the TRO signal which is a basis for switching the Developer assembly.
	Erase lamp	[Standard speed mode] Keeps the Erase lamp On. [Half speed mode] Turns the Erase lamp OFF with the first TRO signal after forming the image with the last color. Then turn the lamp ON with the next TRO signal and turn it OFF in B2 seconds. Turns the erase lamp ON with the TRO signal which is a basis for switching the Developer assembly.
Print job ending	BCR	Turns the BCR OFF in A2 seconds after TRO signal is sent when the imaging with the last color is complete.
	Erase lamp	Turns the Erase lamp OFF in [A2 + B3] seconds. (Half speed mode: [A2 + B3] x 2 seconds)

2.7.6.2 Drawing Cartridge Replacement

CAUTION

Whenever removing the Drum Cartridge, the printer must be turned off.

When the Drum Cartridge is replaced with a new and the printer is on, the printer generates the following image on the furface of the PPC drum so that the Cleaning Blade does not rotate in the reverse direction. Since the image is not transferred (1st), the toner adheres to the Cleaning Blade. (The toner acts as a lubricant.) This prevents Cleaning Blade from rotating in reverse.

Image generated when the Drum Cartridge is replaced

The following image is generated several times (the number of generations has been predefined/Nominal: 5 times) in three colors (Yellow, Magenta and Cyan).

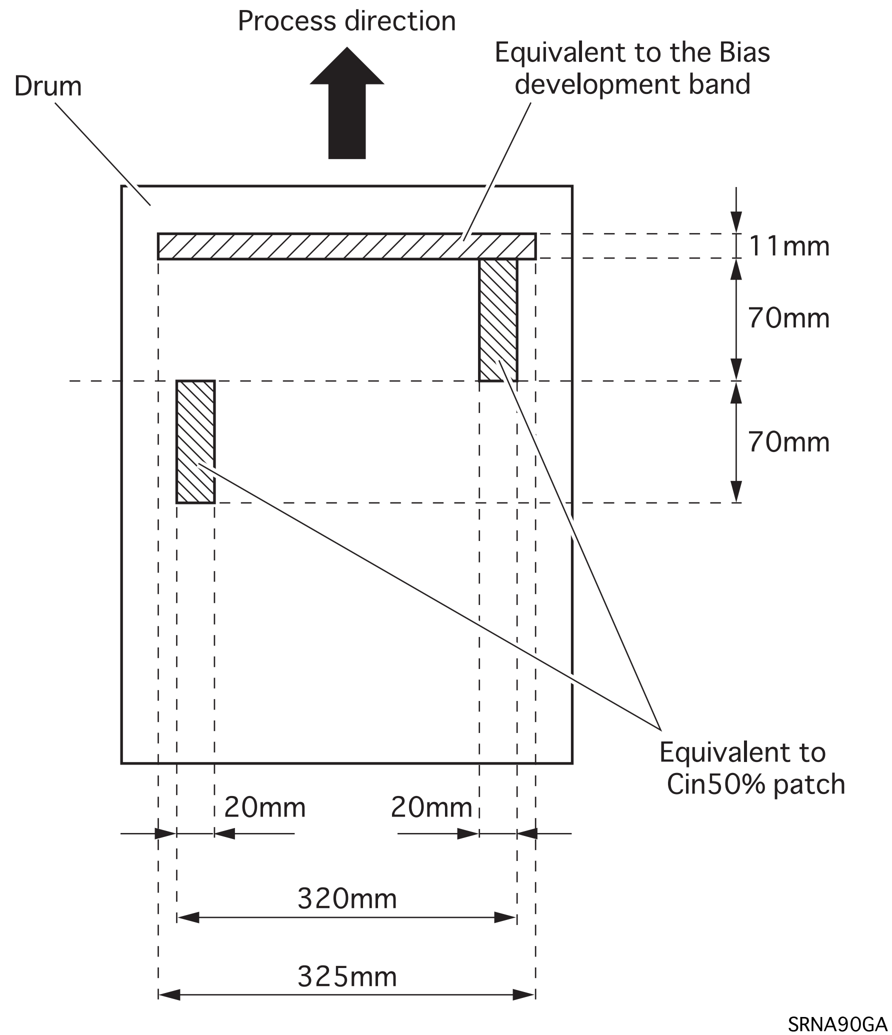


Figure 2-45. Image Generated

2.7.6.3 Drum Cartridge End of Life Detection

1. End of life detection
   The life of the Drum Cartridge is determined by the number of Drum rotations. By accumulating the belt rotation counts (this data is sent from the TRO sensor), the Drum Cartridge life is detected.
   The conditions for Drum Cartridge life are defined in the following table:

Table 2-6. Conditions for Drum Cartridge Life

Drum Cartridge end of life warning (“Warning Photocondctr”)	100,100 counts (standard)
Drum Cartridge life - exceeded (“Replace Photocondctr”)	110,000 counts (standard)

NOTE: *The above counts are incremented by 2 and accumulated every time the TRO signal is generated while the Process Motor Assembly is in operation. (The drum rotates twice for one belt rotation.)*

CAUTION

Whenever you remove the Drum Cartridge, turn the printer off.

2.7.6.4 Waste Toner Box Full Detection

When the Waste toner box is almost full, the waste toner sensor detects the status (Signal: High) and the message “Waste T Box Nearfull” is indicated on the LCD panel. The printer continues to perform the specified printing (toner dispense time*1) and stops printing when the message “Replace Waste T Box” appears on the LCD panel. The counter is reset when a new waste toner box is installed.

**1: See the table below for the reference values which show how many pages can be printed until “Replace Waste T Box” is displayed.*

Table 2-7. Available Print Pages

Print Mode	Page Length	
	215.9 mm or less	More than 215.9 mm
Monochrome	1250 or less	625 or less
Color	312 or less	156 or less

2.7.7 Developer Control

2.7.7.1 Home Position Detection

The Home Position is the starting point for Development Control. The following position is the Home Position of the Rotary Frame Assembly.

Home Position: 30° in the opposite direction of the rotation direction from the Bk development position on the Developer Assembly.

The Home Position is the location where the Rotary Frame Assembly has been rotated 46° after the Rotary Sensor detected the protruding section of the Rotary Frame Assembly.

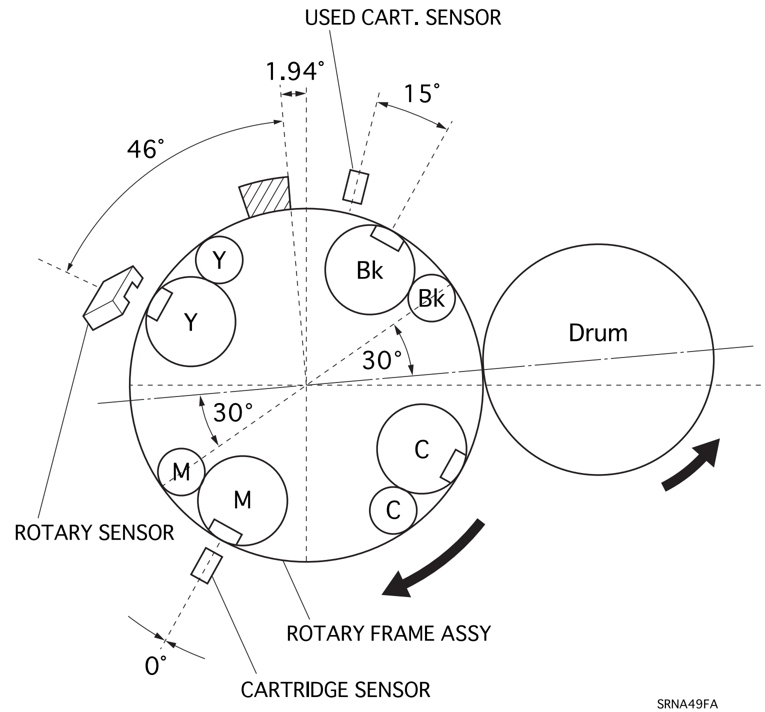


Figure 2-46. Home Position Detection

2.7.7.2 Toner Cartridge Detection Position

The Toner Cartridges are detected by the Cartridge Sensor. The Cartridge Sensor detects the Toner Cartridges at the appropriate detection position. Each Toner Cartridge is moved to its detection position by the Rotary Frame Assembly rotation.

Table 2-8. Toner Cartridge Detection Position

Toner Cartridge - Y detection position	270° from the Home Position (rotational position)
Toner Cartridge - M detection position	0° from the Home Position (rotational position)
Toner Cartridge - C detection position	90° from the Home Position (rotational position)
Toner Cartridge - Bk detection position	180° from the Home Position (rotational position)

2.7.7.3 Toner Cartridge: Old/New Detection

The Toner Cartridges (new/old) are detected by the Used Cartridge Sensor. The Used Cartridge Sensor detects the Toner Cartridges (new/old) at the appropriate detection position. Each Toner Cartridge is moved to its detection position by the Rotary Frame Assembly rotation.

Table 2-9. Development Position

Toner Cartridge - Y (new/old) detection position	75° from the Home Position (rotational position)
Toner Cartridge - M (new/old) detection position	165° from the Home Position (rotational position)
Toner Cartridge - C (new/old) detection position	255° from the Home Position (rotational position)
Toner Cartridge - Bk (new/old) detection position	345° from the Home Position (rotational position)

2.7.7.4 Development Position

The Developer Assemblies are moved to their development positions by the Rotary Frame Assembly rotation.

Table 2-10. Development Position

Toner Cartridge - Y development position	120° from the Home Position (rotational position)
Toner Cartridge - M development position	210° from the Home Position (rotational position)
Toner Cartridge - C development position	300° from the Home Position (rotational position)
Toner Cartridge - Bk development position	390° (30°) from the Home Position (rotational position)

2.7.7.5 Development Control: Detection Methods

1. Toner Cartridge detection
   The Cartridge Sensor detects the Toner Cartridges at the detection positions. A photo sensor, it detects reflected light from a Toner Cartridge and determines the following:

   Reflection: Toner Cartridge has been installed.

   No reflection: Toner Cartridge has not been installed.

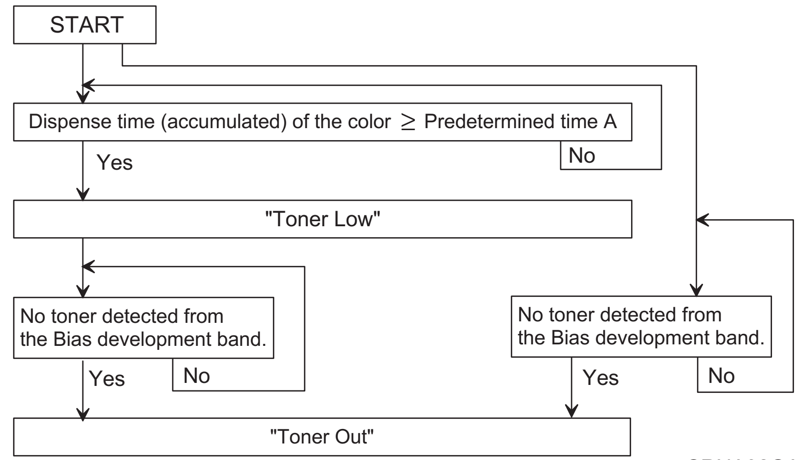
2. Toner Cartridge (new/old) detection
   The Used Cartridge Sensor detects the Toner Cartridge (new/old) at the detection position. In the trickle development method, used developer is collected in the collection chamber in the Toner Cartridge. A reflection seal is pasted on the wall of the collection chamber. As the developer is collected, the seal is covered with developer; it does not reflect light. The Used Cartridge Sensor is a photo sensor and detects reflected light from the collection chamber of the toner cartridges.

   Reflection: Toner cartridge is still new.

   No reflection: Toner cartridge is old. (Used carrier is collected.)

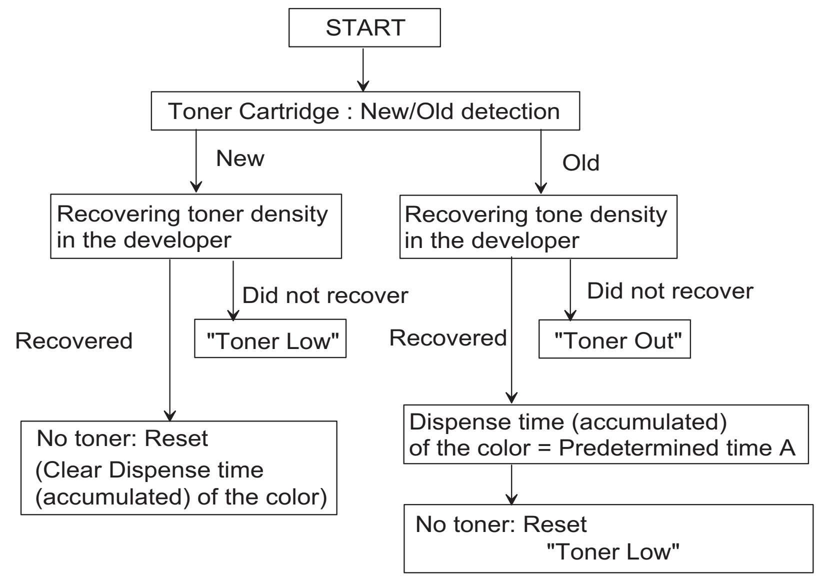
3. Toner Cartridge (no toner) detection
   The No Toner status is detected by the process control.
   The following shows the No Toner Detection flow, No Toner Reset flow, and Toner End of Life Warning Reset flow.

(a) No Toner Detection flow



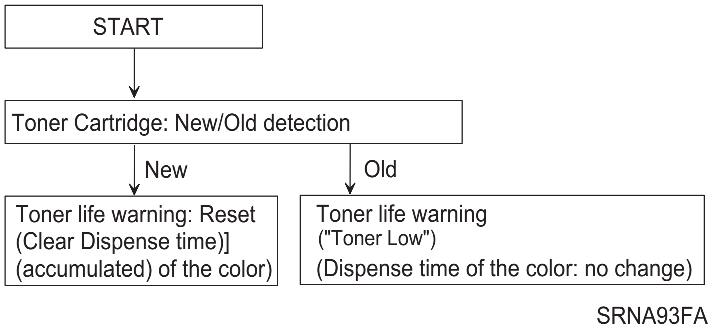
SRNA92GA

(b) No Toner Reset flow



SRNA91FA

(c) Toner End of Life Warning Reset flow



2.7.8 IBT Control

2.7.8.1 First Transfer (Drum → Belt)

Transferring the toner image on the drum onto the belt is called the First Transfer. The First Transfer is done when the HVPS outputs power to the 1st BTR.

(1) First Transfer Current (Flow)

The resistance of the 1st BTR changes due to time and environment. To obtain a stable transfer, it is necessary to adjust this resistance by adjusting the transfer current. The following is a flowchart showing how 1st transfer current is determined.

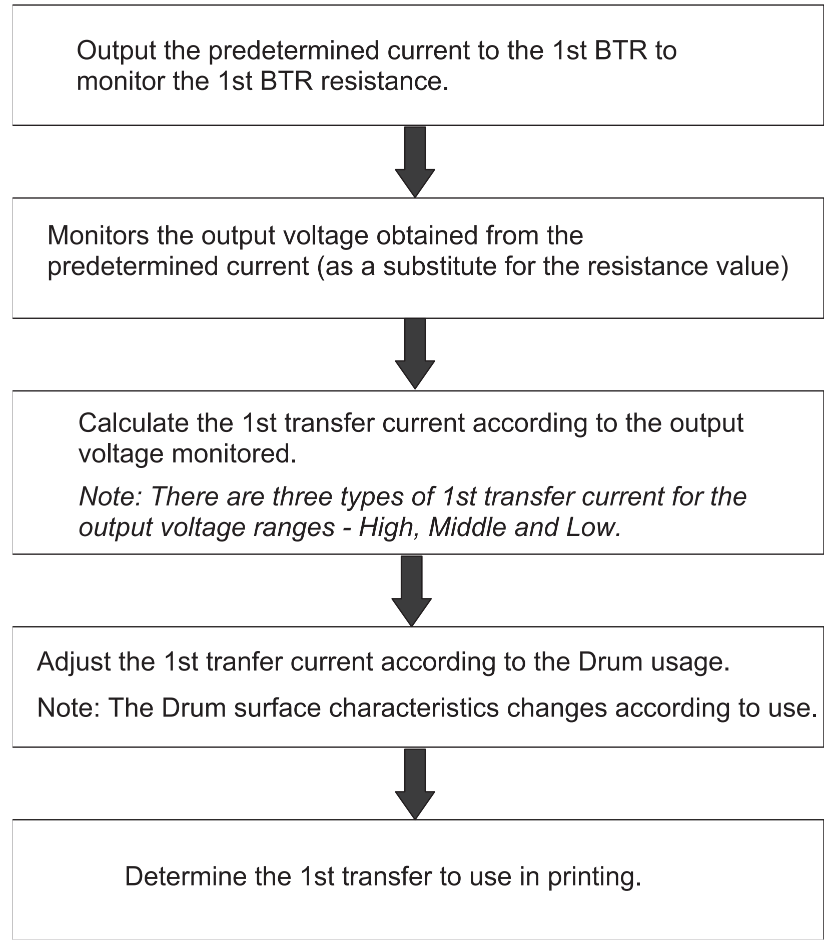


Figure 2-47. First Transfer Current Flow

2.7.8.2 Second Transfer (Belt → Paper)

Transferring the toner image on the belt onto the paper is called 2nd Transfer. 2nd transfer is done when the HVPS outputs the power to the Contact Roll.

1. 2nd Transfer Current

   The resistance of the 2nd BTR and Back Up Roll changes due to time and environment. To obtain a stable transfer, it is necessary to adjust the resistance by adjusting the transfer current. The following is a flowchart showing how 2nd transfer current is determined.

NOTE: *If the output current is not valid, including the case that the 2nd BTR does not perform advance/retract control because of the 2nd BTR malfunction, it causes the 2nd BTR bad resistance and a service call error is indicated on the LCD panel.*

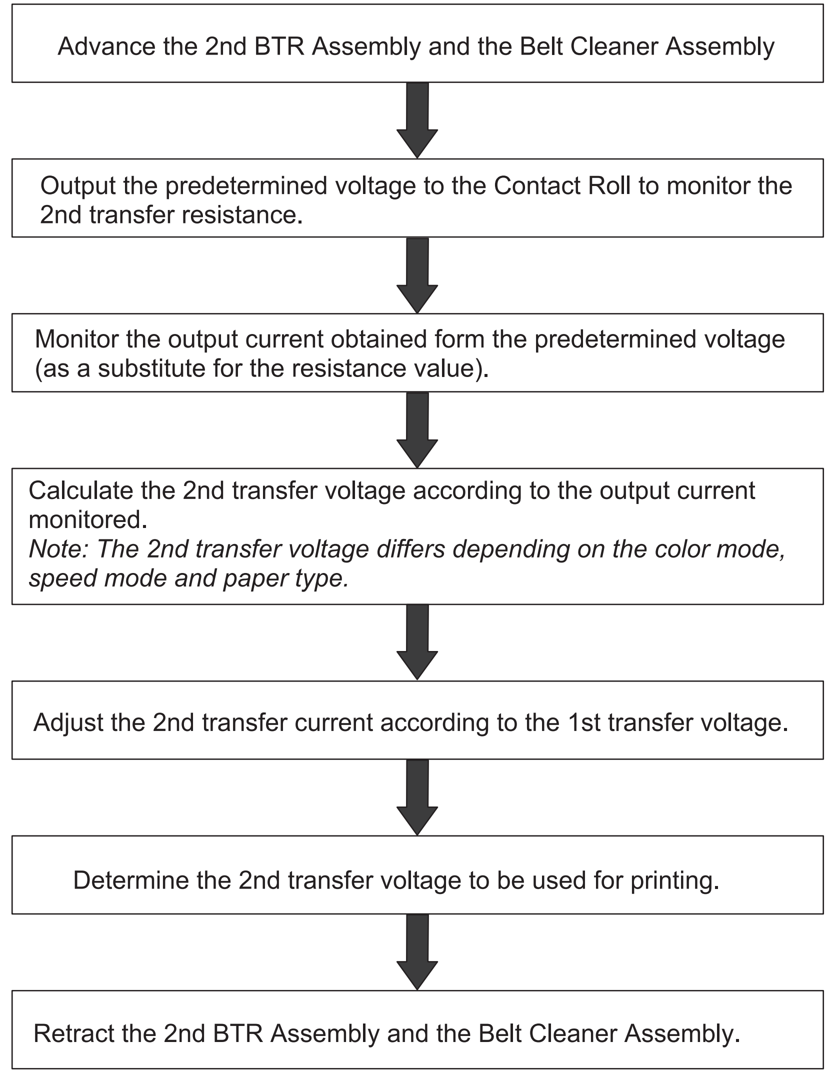


Figure 2-48. Second Transfer Current Flow

2. 2nd BTR Advance/Retract control

In a 2nd transfer, the 2nd BTR must be in the Advance position. (Otherwise it must be in the Retracted position.) The 2nd BTR Advance/Retract is controlled by the BTR Cam Solenoid.

NOTE: *To advance the 2nd BTR, the system continuously turns on the BTR Cam Solenoid. To retract the 2nd BTR, the system continuously turns off the BTR Cam Solenoid. (The mode is changed by the P/H Motor Assembly rotation.)*

BTR cam solenoid On/Off timing is as shown in the table below:

Table 2-11. 2nd BTR Advance/Retract Control

Standard speed mode		
ON timing		Comes ON E1 second before the top edge of the image (printed area) passes the 2nd transfer position.
OFF timing	Normal state	Comes ON E3 seconds before the top edge of the image (printed area) passes the 2nd transfer position.
	Abnormal state	In case the rear edge of the image (printed area) passes the 2nd transfer position after the rear edge of the paper, the solenoid comes OFF E3 seconds before the rear edge of the paper passes the 2nd transfer position.
Half speed mode		
ON timing		Comes ON E2 second before the top edge of the image (printed area) passes the 2nd transfer position.
OFF timing	Normal state	Comes ON E4 seconds before the top edge of the image (printed area) passes the 2nd transfer position.
	Abnormal state	In case the rear edge of the image (printed area) passes the 2nd transfer position after the rear edge of the paper, the solenoid comes OFF E4 seconds before the rear edge of the paper passes the 2nd transfer position.

NOTE: *If there is not sufficient time from when the BTR Cam Solenoid is turned on from its off state—because there is not enough time between the bottom edge of the previous image and the top edge of the next image (for example, the time between the 1st print in the LETTER [LEF] (1 side of the belt) in the 2-UP mode and the 2nd print)— the BTR Cam Solenoid stays ON and the HVPS continues to supply power to the Contact Roll.*

NOTE: *The time required for the 2nd BTR advance operation is 1.2 seconds (standard speed mode) and 2.4 seconds (half-speed mode) since the 2nd BTR receives the BTR Cam Solenoid ON signal. The time required for the 2nd BTR retract operation is 1 second (standard speed mode) and 2 seconds (half-speed mode) since the 2nd BTR receives the BTR Cam OFF signal.*

3. 2nd BTR Assembly end of life detection

(a) End of life detection

The life expectancy of the 2nd BTR Assembly is determined by the number of printings (number of 2nd BTR transfer rotations). By accumulating the 2nd BTR rotation counts, the life expectancy of the 2nd BTR Assembly (2nd BTR) is determined. The conditions for 2nd BTR end of life detection is defined in the following table (See the next page):

Table 2-12. 2nd BTR End of Life Detection

2nd BTR Assembly end of life warning (Maintenance-call error xxxx)	98,000 counts (standard)
2nd BTR life - exceeded (Service-call error: E0024)	100,000 counts (standard)

NOTE: *The count described above is based on the following:*

1 count:

- Printing a sheet that has a length (feed direction) of 219mm (LETTER/LEF) or smaller

2 counts:

- Printing a sheet that is larger than the above.

(b) Processes after replacement

CAUTION

Do the following operations after you replace the 2nd BTR Assembly with a new one. Doing any of these operations before replacing the 2nd BTR Assembly may result in damage to the system or cause the system to malfunction.

- Life expectancy exceeded - Service-call error
  After replacing the 2nd BTR Assembly with a new one, peform the “2nd BTR Reset” in the maintenance menu.
- End of life warning - Maintenance service-call error
  After replacing the 2nd BTR Assembly with a new one, peform the “2nd BTR Reset” in the maintenance menu.

2.7.8.3 Discharging

Discharging is to neutralize/remove the charge on paper after 2nd transfer. It is done by applying high voltage from the HVPS to the Detach Saw in the “2nd BTR Assembly.

2.7.8.4 Belt Cleaning

The belt surface must be clean for an image to be formed. The belt surface is cleaned by the Belt Cleaner Assembly. The Belt Cleaner Assembly needs to advance to the belt surface to clean it. The Belt Cleaner Assembly Advance/Retract is controlled by the Cleaner Cam Solenoid.

NOTE: *To advance the Belt Cleaner Assembly, the system continuously turns on the Cleaner Cam Solenoid. To retract the Belt Cleaner Assembly, the system continuously turns off the Cleaner Cam Solenoid. (The mode is changed by the P/H Motor Assembly rotation.)*

NOTE: *If there is not sufficient time from when the Cleaner Cam Solenoid is turned on from its off state—because there is not enough time between the bottom edge of the previous image and the top edge of the next image (for example, in a continuous printing in the standard speed mode or B/W mode)—the Cleaner Cam Solenoid stays ON and the Belt Cleaner Assembly continue to be in the advanced position.*

NOTE: *The time required for the Belt Cleaner Assembly advance operation is 1.0 seconds (standard speed mode) and 2.1 seconds (half-speed mode) since the Belt Cleaner Assembly receives the Cleaner Cam Solenoid ON signal. The time required for the Belt Cleaner Assembly retract operation is 0.9 seconds (standard speed mode) and 1.8 seconds (half-speed mode) since the Belt Cleaner receives the Cleaner Cam Solenoid OFF signal.*

Toner (excess toner) may be on the belt surface:

- Residual toner from the 2nd transfer.
- Residual toner from the Cin50% patch and BIAS development bands.
- Untransferred toner on the belt because of a paper jam.

1. Belt Cleaning types
   There are three types of belt cleaning

   (a) Normal cleaning

   The Belt is cleaned during a normal print operation. The maximum printable area (18 inches in the process direction) is cleaned.

   (b) Irregular cleaning

   An irregular cleaning is done when the Warm-up mode is started (except recovering from an image generation error) after a Cin50% patch or BIAS development bands have been generated. One circumference of the belt is cleaned.

   (c) Error cleaning

   When the system is recovering from an image generation error, toner may be on the belt; the belt is cleaned when the Warm-up mode is started. One circumference of the belt is cleaned.

2. Cleaner solenoid ON/OFF timing

NOTE:*The top edge of the image in the 2UP mode is defined as the top edge of the first page on the IBT 1 surface.*

(a) Normal cleaning

Table 2-13. Normal Cleaning On/Off Timing

ON timing	Comes ON G1 second before the top edge of the image (printed area) on the IBT surface after the 2nd transfer advances to the position where the Belt cleaner assembly cleans the belt.
OFF timing	Goes from ON to OFF G2 seconds before the top edge of the next image (printed area) on the IBT surface advances to the position where the Belt cleaner assembly cleans the belt.

NOTE:*The time specified above only applies to the standard speed mode. The time required for the half speed mode will be doubled.*

NOTE:*If there is not sufficient time for the Cleaner Cam Solenoid to switch from OFF to ON—because there is not enough time between the bottom edge of the previous image and the top edge of the next image (for example, in a continuous printing in the standard speed mode or B/W mode)—the Cleaner Cam Solenoid stays ON and the Belt Cleaner Assembly continues to be in the advanced condition.*

NOTE:*The time required for the Belt Cleaner Assembly advance operation is 1.0 seconds (standard speed mode) and 2.1 seconds (half-speed mode) since the Belt Cleaner Assembly receives the Cleaner Cam Solenoid ON signal. The time required for the Belt Cleaner Assembly retract operation is 0.9 seconds (standard speed mode) and 1.8 seconds (half-speed mode) since the Belt Cleaner receives the Cleaner Cam Solenoid OFF signal.*

(b) Irregular cleaning

Table 2-14. Irregular Cleaning On/Off Timing

ON timing	While the IBT is driven, the solenoid comes ON G3 seconds before the top edge of the image (printed area) on the IBT surface advances to the position where the Belt cleaner assembly cleans the belt.
OFF timing	Goes from ON to OFF G2 seconds before the top edge of the next image (printed area) on the IBT surface advances to the position where the Belt cleaner assembly cleans the belt.

(c) Error cleaning

Table 2-15. Error Cleaning On/Off Timing

ON timing	While the IBT is driven, the solenoid comes ON G1 second before the top edge of the image (printed area) on the IBT surface advances to the position where the Belt cleaner assembly cleans the belt.
OFF timing	Goes from ON to OFF G2 seconds before the top edge of the next image (printed area) on the IBT surface advances to the position where the Belt cleaner assembly cleans the belt.

3. Belt Cleaner Assembly end of life detection

The life of the Belt Cleaner Assembly is the same as the printer life. Note the number of printed sheets (=IBT cleaning times) is counted but not to detect the end of life.

2.7.9 1-UP/2-UP Control

This section describes the print sequence for 1-UP and 2-UP modes.

Table 2-16. 1-UP/2-UP Control

Mode	Image for 1 Belt Circumference	Paper size
1-UP	1 print	All paper sizes
2-UP	2 prints	A4 (LEF)/LETTER (LEF) or smaller

1. 1-UP mode
   One sheet is transported the distance equivalent to one belt circumference. The image (toner image) is formed in the following color sequence: Yellow, Magenta, Cyan and Black.

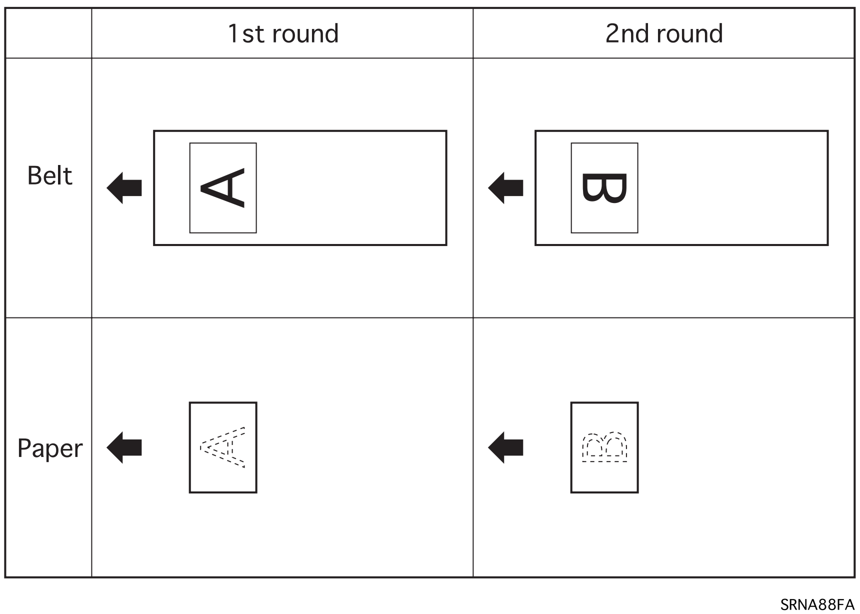


Figure 2-49. 1-UP Mode

2. 2-UP mode
   Two sheets are transported the distance equivalent to one belt circumference. The image (toner image) is formed as follows:

   Yellow (1st sheet) → Yellow (2nd sheet) → Magenta (1st sheet) → Magenta (2nd sheet) → Cyan (1st sheet) → Cyan (2nd sheet) → Black (1st sheet) → Black (2nd sheet)

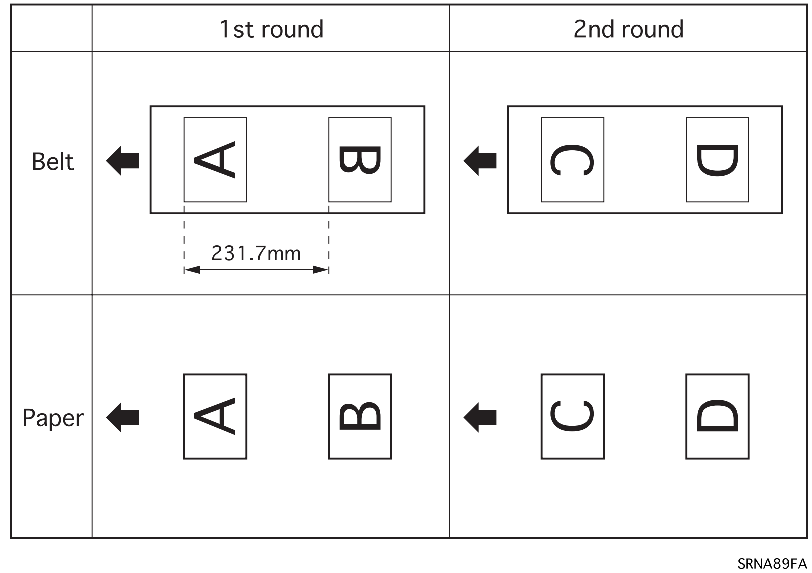


Figure 2-50. 2-UP Mode

2.7.10 Fuser Control

2.7.10.1 Fuser Control Method

The Fuser temperature is controlled by turning the H/R Heater and the P/R Heater ON/OFF as follows:

1. If the temperature on the surface of the Heat Roll is higher than the Fuser control temperature, the power supplied to the H/R Heater and P/R Heater is turned off. (Fuser temperature: Thermistor detected temperature in the Temperature Sensor Assembly)

2. If the temperature on the surface of the Heat Roll is lower than the Fuser control temperature, the power supplied to the H/R Heater and P/R Heater is turned on. (Fuser temperature: Thermistor detected temperature in the Temperature Sensor Assembly)

2.7.10.2 Warm-up Control

When Fuser Warm-up (Warm-up mode) starts, the H/R Heater and P/R Heater are turned on. When the Fuser temperature reaches the Fuser control temperature, Fuser Warm-up ends. The Fuser control temperature in the Warm-up mode changes (described in the table below) according to the Heat Roll surface temperature at Power ON.

Table 2-17. Warm-up Control

Heat Roll surface temperature at Power ON	Fuser control temperature	Description
[Standard temperature: H] °C or higher	[Temp.1]°C	Temp. 1 has been defined by the NVM (MCU PWB).
Less than [Standard temperature: H] °C	[0.1t+b]°C	Warm-up ends after 30 seconds from when the Heat Roll surface temperature becomes [0.1t+b]°C (after Power ON) and the Fuser control temperature becomes [Temp.1]°C. t: Fuser temperature at Power On b: Compensation (Defined in NVM on the MCU PWB.)

NOTE: *The Fuser temperature in the Warm-up is corrected according to the environment temperature (detected by the Environment Sensor).*

NOTE: *When Fuser Warm-up is started, the Heater turns ON/OFF for a predetermined duration and then remains ON.*

NOTE: *Thermal fuser and the thermostat are activated under the following conditions:*

- *Thermal fuse: 141°C*
- *Thermostat: 180°C*

2.7.10.3 Mode Control: READY, LIGHT SLEEP, DEEP SLEEP

The ON/OFF controls for the H/R Heater and P/R Heater are defined as follows:

Table 2-18. Mode Control

Mode	Heater ON/OFF control
READY	• If the Fuser temperature is lower than the Fuser control temperature (Temp 1), then Heater On. • If the Fuser temperature is the Fuser control temperature (Temp 1) or higher, then Heater OFF.
LIGHT SLEEP (Energy save mode 1)	• If the Fuser temperature is lower than the Fuser control temperature (Temp.0) in the Light Sleep mode, then Heater ON. • If the Fuser temperature is Fuser control temperature (Temp.0) or higher in the Light Sleep mode, then Heater OFF.
DEEP SLEEP (Energy save mode 2)	Always Heater OFF.

2.7.10.4 Printing Mode Control

The Fuser control temperature for the Printing mode has been determined by the paper type (regular paper, OHP, etc.), color mode (YMCBk mode/BW mode), environment temperature (detected by the Environment Sensor) and the number of continuous printings. The H/R Heater and P/R Heater are turned ON/OFF as determined by the Fuser control temperature.

NOTE: *Before and after the Printing mode is enabled, a compulsive heater ON/OFF is executed.*

2.7.10.5 Not Ready State Detection During Printing

A Not Ready state is generated to maintain constant and correct print quality. When a Not Ready state is detected, the system halts the print job.

1. A Not Ready state occurs during printing if the following occurs

   (a) More than 30 sheets are printed during a predefined period when the paper size is B4 (SEF) or smaller and the mode is B/W.
   (b) Continuous printings are ordered in the B/W mode immediately after YMCBk mode.

2. Not Ready detection timing
   Each time the Fuser Exit Sensor detects a sheet of paper, the system check whether all paper has been ejected. If so, the system issues a Not Ready state and stops printing.

3. Not Ready state: Canceling
   When the system is determining whether to cancel a Not Ready state, it cancels the state after running the P/H Motor Assembly for a predetermined period. The following describes how a Not Ready state is canceled:

   (a) The system has already accepted a print signal in the B/W mode after printing the last page in the YMCBk mode.
   When the Fuser Exit Sensor detects the last sheet (YMCBk mode), the system turns on the Heater and inhibits printing for a period requiring 2 circumferences (nominal) of the belt. The system then cancels the Not Ready state.
   (b) The system has not accepted any B/W mode printing signal after printing the last page in the YMCBk mode.
   If a B/W mode print signal comes within 1 minute after the YMCBk mode printing has completed, the system turns on the Heater and inhibits printing for a period requiring 2 circumferences (nominal) of the belt. The system then cancels the Not Ready state. (If a Cycle Down Sequence is executed after YMCBk mode printing, the Not Ready state is not canceled.)

2.7.10.6 Oil Roll Control

If the Oil Roll in the Oil Roll Assembly continuously touches the Heat Roll, the Fuser Oil may degrade and oil stains may appear on the paper. The Oil Roll needs to touch (advance to) the Heat Roll only during the fusing operation; at all other times, the Oil Roll must be separated (retracted) from the Heat Roll. The Oil Cam Solenoid controls the advancement/retraction of the Oil Roll Assembly.

NOTE: *To advance the Oil Roll, the system continuously turns ON the Oil Cam Solenoid. To retract the Oil Roll, the system continuously turns OFF the Oil Cam Solenoid.*
(The mode is changed by the rotation of the P/H Motor Assembly.)

NOTE: *After receiving the Oil Cam Solenoid ON/OFF signal, the time required for Oil Roll advancing and retracting is 1.1 seconds in standard speed mode and 2.2 seconds in half-speed mode.*

1. Oil Roll: Advance/Retract control
   The Oil Roll advanced period is determined by the print count and the waiting time (between print jobs) in the Ready mode. (The Oil Roll advanced period is from when the Oil Roll starts advancing to when the Oil Roll starts retracting.) The Oil Roll Assembly starts advancing before the paper tip enters the Fuser Nip section (where the Heat Roll and the Pressure Roll come into contact) and starts retracting when the bottom of the paper passes the Fuser Nip section.

NOTE: *The advance time has been defined as follows:*
Advance time = A + B
Where:
A: From the start of advancement to when the paper top enters the Fuser.
B: From when the bottom of the paper passes the Fuser to the end of retraction.

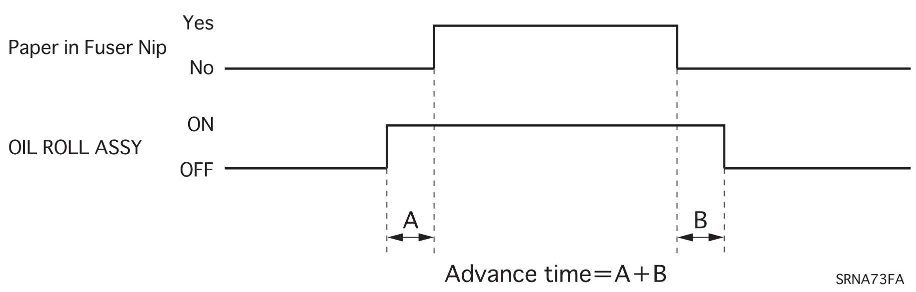


Figure 2-51. Advance Time

2. Emergencies

   (a) Emergency stop
   If the printer stops (shuts down) because of an emergency such as a paper jam, the printer turns off the Oil Cam Solenoid.

   (b) Operation after recovery from a paper jam (paper remains in the Fuser)
   The system advances the Oil Roll Assembly when the P/H Motor Assembly is activated (restarted) after removing the jammed paper. The advancing time is 15 seconds (maximum). The Oil Roll stops advancing when the P/H Motor Assembly stops. In the subsequent operation, the system executes a regular Oil Roll advance/retract control from the next print job.

   (c) Operation after recovery from a paper jam (no paper in the Fuser)
   The system executes a regular Oil Roll advance/retract control from the next print job.

2.7.10.7 Fuser Fan Control

The Fuser Fan is controlled (ON/OFF or High/Low rotations) by the operation modes as follows:

Table 2-19. Fuser Fan Control

Warm-up	Fuser Fan: OFF
Ready	Fuser Fan: ON (Rotation: Low)
Printing	Fuser Fan: ON (Rotation: High)
Light Sleep	Fuser Fan: OFF

NOTE: *The Fuser Fan control differs in the Error mode and Diagnostic Test mode according to the errors and diagnostics. For example, if a paper jam error has occurred, the Fuser Fan is turned ON and the rotation is set to Low.*

NOTE: *If the mode transition (to the Deep Sleep or Light Sleep modes) has been set and the time for the transition is shorter than normal, the Fuser Fan remains ON for the predetermined period to prevent the printer from overheating.*

2.7.10.8 Detection Controls in Fuser

1. Oil Roll Assembly end of life detection
   The life of the Oil Roll Assembly is determined by the number of printings (oil quantity being used). Two counters (PV and Oil Rate) are used to detect the life of the Oil Roll Assembly. If either counter reaches a predetermined value, an end of life warning or No Fuser Oil (life expectancy exceeded) error is detected.

   (a) PV Counter
   The PV Counter counts the number of printings. The counter detects the following.

Table 2-20. PV Counter

Oil Roll Assembly end of life warning (“Oil Roll Near Empty”)	19,000 counts (standard)
No Fuser Oil (“Replace Oil Roll”)	20,000 counts (standard)

NOTE:
The count described above is based on the following:

1 count:
- Printing a sheet that has a paper length (feed direction) of 219mm (LETTER/LEF) or smaller
2 counts:
- Printing a sheet that is larger than the above.

(b) Oil Rate Counter
The Oil Rate Counter accumulates the amount of oil being used. The oil rate is calculated from the following:

- The printing counts (PV counts) for one hour after a Power ON
- The Fuser Oil amount calculated for 1 print (A4 (LEF)) from the PV counts.

The Oil Rate Counter detects an end of life warning or No Fuser Oil. The counter detects the following:↑

Table 2-21. Oil Rate Counter

Oil Roll Assembly end of life warning (“Oil Roll Near Empty”)	130,000 counts (standard)
No Fuser Oil (“Replace Oil Roll”)	133,000 counts (standard)

(c) Process after replacement
The PV Counter and the Oil Rate Counter are reset only if the system detects a new Oil Roll Assembly.

2. New/Old Oil Roll Assembly detection
The CRU Switch Assembly detects a new/old Oil Roll Assembly. Metal foil has been attached to the Oil Roll Assembly. The CRU Switch Assembly checks the conductivity of the foil.

Conductive: Oil Roll Assembly is new.

Not conductive: Oil Roll Assembly is old.

(When the Oil Cam Assembly rotates, the Oil Cam Assembly pin cuts the metal foil. This action activates the PV Counter and Oil Rate Counter.)

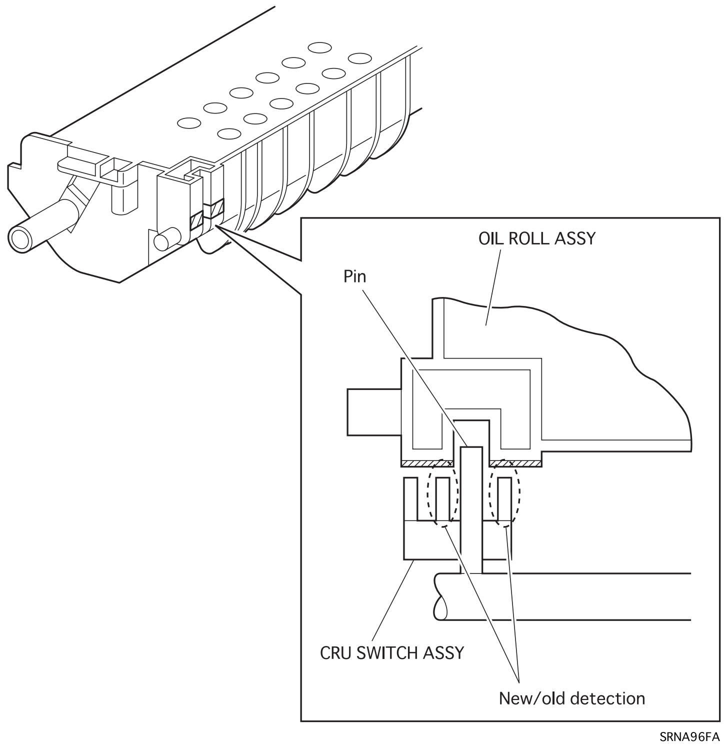


Figure 2-52. New/Old Oil Roll Assembly detection

3. Oil Roll Assembly detection
   The CRU Switch Assembly detects the Oil Roll Assembly. Metal foil has been attached to the Oil Roll Assembly. The CRU Switch Assembly checks the conductivity of the foil.

   Conductive: Oil Roll Assembly has been installed

   Not conductive: Oil Roll Assembly has not been installed

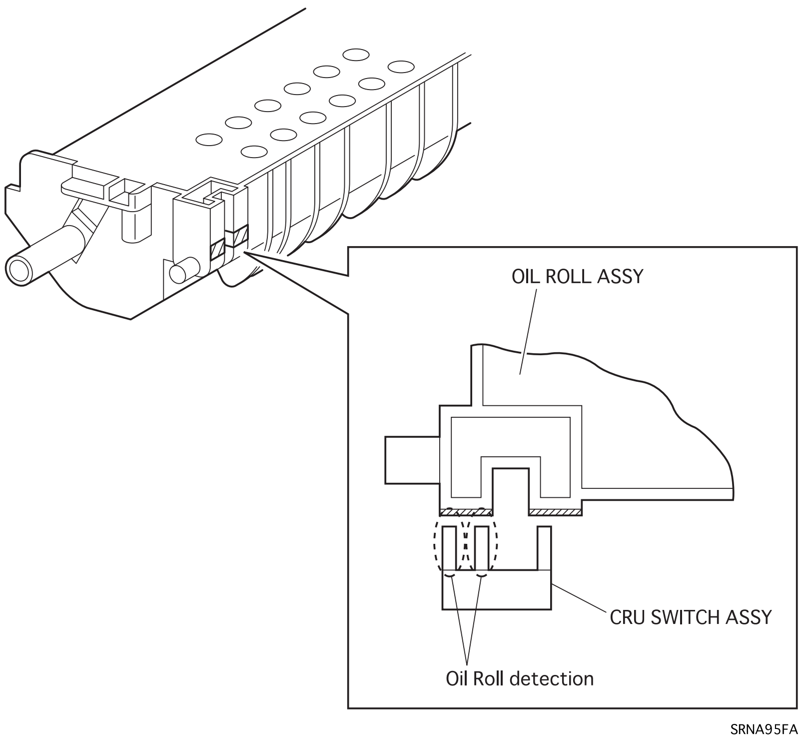


Figure 2-53. Oil Roll Assembly detection

4. Main Fuser Assembly end of life detection

   (a) End of life detection
   The life of the Main Fuser Assembly is determined by the print image density being fused. Life expectancy is determined from the accumulated dispense time and the number of images (image count) being fused. If either reaches a predetermined value, an end of life warning or a life exceeded error is detected.

   (b) Dispense time
   The dispense time is the accumulated hours that the Dispense Motor has been in use. This data can be used to calculate toner consumption (PDCD or ADC). The conditions for the Main Fuser Assembly end of life detection are defined in the following table:

Table 2-22. MAIN FUSER ASSEMBLY Counter (sec.)

Main Fuser Assembly end of life warning (Maintenance-call error xxxx)	69,152 seconds (standard)
Main Fuser Assembly life - exceeded (Service-call error 0003)	70,564 seconds (standard)

   (c) Image count
   A toner image for one color is counted as one image. The image count accumulates the number of images being formed.

Table 2-23. MAIN FUSER ASSEMBLY Counter (sheet)

Main Fuser Assembly end of life warning (Maintenance-call error xxxx)	245,000 counts (standard)
Main Fuser Assembly life - exceeded (Service-call error 0003)	250,000 counts (standard)

***NOTE:** One printing in the YMCBk mode consist of 4 images (4 counts); one printing in the B/W mode is 1 image (1 count).*

(d) Processes after replacement

CAUTION

Do the following operations after you replace the Main Fuser Assembly with a new one. Doing any of these operations before replacing the Main Fuser Assembly may result in damage to the system or cause the system to malfunction.

- Life expectancy exceeded - Service-call error
  After replacing the Main Fuser Assembly with a new one, perform “Fuser Unit Reset” in the maintenance menu.
- End of life warning - Maintenance service-call error
  After replacing the Main Fuser Assembly with a new one, perform “Fuser Unit Reset” in the maintenance menu.

2.8 Controller Operating Principles

This section describes the C287MAIN board, the MAIN CONTROLLER PWB of the EPL-C8200.

The CONTROLLER PWB (C287 MAIN Board) consists of three versions due to the available kinds of paper in the market. (Refer to Table 2-24.)

Table 2-24. Three varieties of C287 MAIN Board

Market	Part Number	Default Paper Size i *1)	Default Paper Size II*2)
Europe	2032287	A4	EXE
North America	2032288	Letter	EXE
China, Taiwan, Korea	2032289	A4	B5

***Note 1**:Either A4 or Letter is selected for the default and cassette paper size.*
***Note 2**: Either A4 or Letter is selected for the cassette paper size.*

The main functions of the C287MAIN board are as follows:

- Processing print commands and print data sent from the host computer.
- Producing image video signals
- Controlling and driving each mechanism in the engine to print image on paper, synchronizing with the signals from the engine controller side (MCU PWB).

The printer uses a data bus 64-bit RISC CPU “R5000-200MHz” for the processor. A168-pin SDRAM module (CLK:66.7MHz), which is becoming one of the major modules used for desk top personal computers, is used for memory. Combining those equipments, the printer has succeeded in processing data on the C287MAIN board at a higher speed.

To run one page of color image, the printer generally processes more than 4 times as large data as for monochrome image. This printer, however, has a high speed image processor ASIC (E05B64) on the C287MAIN board. Since the ASIC allows the printer to give less duty to the PC as well as to the CPU on the C287MAIN board, the printer manages to process color image data at a higher speed than ever.

For communication with the host, this printer has a built-in parallel interface and network interface (10BASE-T/100BASE-TX).

See Figure 2-54 for the C287MAIN board circuit diagram and Table 2-25, Table 2-26, and Table 2-27 for the major components on the C287MAIN board and their functions.

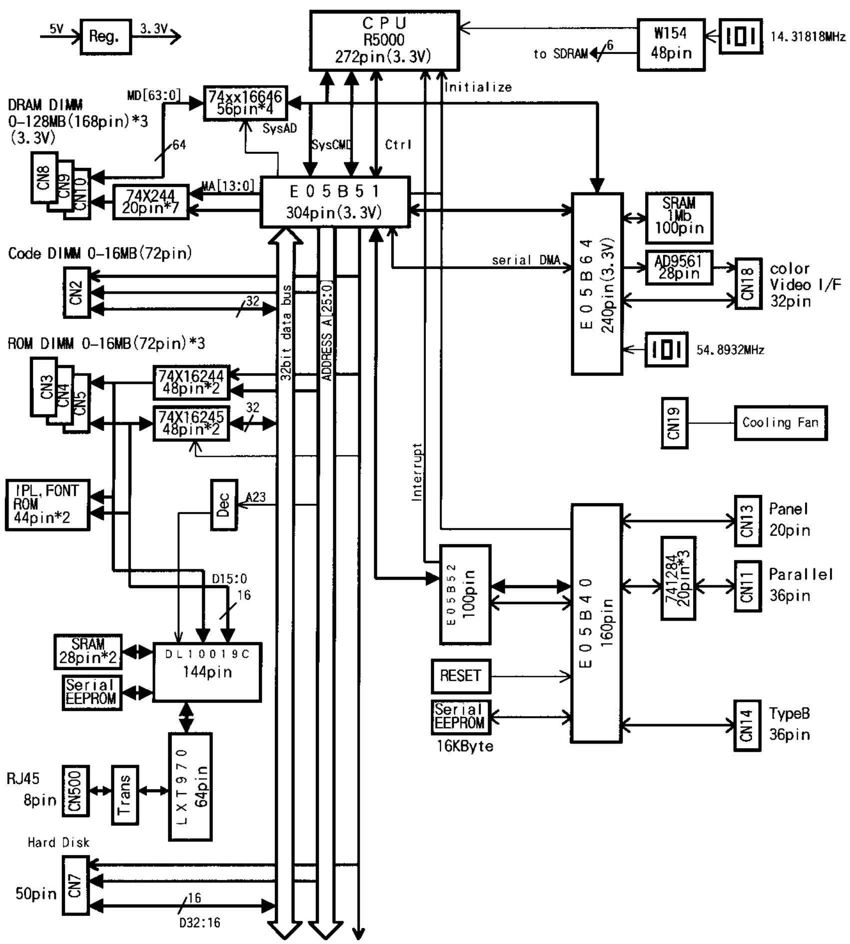


Figure 2-54. C287MAIN Board Circuit Diagrams

Table 2-25. C287MAIN Board Major Components (1/3)

Components	Location	Function	Refer to: *2
RISC-CPU R5000-200	IC1	A RISC*-type CPU, which operates at 200 MHz (internal) and 3.3V. (External: 66.7 MHz) *RISC: Reduced Instruction Set Computer*	1/7
E05B51 (ASIC) *1	IC2	• Interface for the CPU. Controls the following: • Memory areas (SDRAM, Code-DIMM, IPL/FONT ROM, Option ROM DIMM) • DMA • CPGI and RIT/CRIT of the E05B64 • Network circuit • Optional HDD (Hard Disk Drive)	1/7
E05B64	IC24	Manages the following: • CPGI (Color Photo & Graphics Improvement) • PGI (Photo & Graphics Improvement) • CCNV (Color CoNVersion) (RGB -> CMYK) • RIT/CRIT (Color RIT) • Controls video signals • Video I/F for the engine controller board (MCU PWB)	5/7
E05B40 *1	IC21	Manages the following: • Controls the IEEE1284 Parallel B • Controls the EEPROM (IC20) • Controls the I/O of the control panel • Controls the Type-B I/F board	4/7
E05B52 *1	IC19	Interface for E05B51 and E05B40	4/7
IPL/CG	IC13/14	• IPL and FONT (upper 16BIt data / lower 16Bit data) • Two 512kbit x 16bit (1MB) mask ROMs are directly attached.	2/7

**1: Common to the EPL-C8000.*

**2: The number of the C287MAIN circuit diagram to refer to.*

Table 2-26. C287MAIN Board Major Components (2/3)

Components	Location	Function	Refer to: *2
AD9561	IC26	8-bit PWM controller (directly connected to E05B64)	5/7
TC55V1325FF *1	IC25	S-RAM (1M-bit) Directly connected to E05B64.	5/7
X25128SI	IC20	128K-bit EEPROM, which stores various printer setting information.	4/7
SG-8002	CR2	Video clock operating at 54.8932MHz. (→ E05B64)	5/7
MA-406	CR3	Master clock operating at 66.7000MHz. (→ CPU, SDRAM, E05B51, E05B53, and so on.)	6/7
ACT1284	IC23/39/40	Bus driver for IEEE1284ECP	4/7
NDB6020P	QF1	FET driven at 3.3 VDC	6/7
M51953B *1	IC5	Reset IC	1/7
LM3411	IC27	Regulator (3.3 VDC)	6/7
W154H	IC42	Clock driver	6/7
Code DIMM (C269 PROG)	CN2	Socket P. DIMM with a 4MB FLASH ROM mounted.	2/7
	CN3/4/5	Sockets A/B/C. Specific optional ROMs are installed.	2/7
SDRAM DIMM *1	CN8/9/10	• Slots S0/S1/S2 (Standard: 64MB DIMM is installed in S0.) • S0: A DIMM must be always set in this slot. • S1/S2: A DIMM whose space area is 32, 64, or 128MB can be set in each slot. • The maximum memory size recognized by the C287MAIN board is 256MB.	3/7
DL10019C	IC500	Network controller IC	7/7
LXT970A	IC501	PHY	7/7

**1: Common to the EPL-C8000.*

**2: The number of the C287MAIN circuit diagram to refer to.*

Table 2-27. C287MAIN Board Major Components (3/3)

Components	Location	Function	Refer to: *2
W24257AJ-15	IC502/IC503	S-RAM (256k-bit). A high speed working RAM for DL10019C.	7/7
NM93CS56	IC504	EEPROM. Stores network controller settings, MAC address, and hardware revision.	7/7
SG-8002JCPT	CR500	Network clock operating at 50.000 MHz. (→ Network circuit)	7/7
PE-68517	T500	Transistor	7/7

**1: Common to the EPL-C8000.*

**2: The number of the C287MAIN circuit diagram to refer to.*

CHAPTER

3

DISASSEMBLY AND ASSEMBLY/ADJUSTMENT

Table of Contents

3.1 Overview

This chapter describes procedures for disassembly, assembly, and adjustment of the EPL-C8200. Note the procedures are applicable only when the printer has no options installed. For information on removing/installing the options, please see the EPL-C8200 Setup Guide.

3.1.1 Precautions for disassembly, assembly and adjustment

Precautions for disassembly, assembly and adjustment are as follows:

WARNING

- **Before starting, be sure to turn the printer off and unplug the power cable from the AC power socket.**
- **As this printer weighs as much as 70Kg, make sure that it is always carried carefully by 4 people or more.**
- **When working on the FUSER ASSEMBLY or nearby parts, be sure to wait until the temperature of the parts cool down to a safe level.**
- **When printing, make sure that all the outer covers are installed.**
- **In case you need to print before assembling, note the cautions below:**
  1. Be careful not to get your hands and clothes caught in the rotating parts such as rollers and cooling fans.
  2. Never touch any electrical terminal or high voltage components such as HVPS and LVPS.

CAUTION

- **When servicing, avoid handling any parts forcibly. Doing so might damage the parts and cause printer malfunction.**
- **Various types of screws are used to assemble the printer, and wrong usage might crush tapped hole and cause troubles. Therefore, be sure to mount the right screws to the specified positions.**

3.1.2 Tools

Table below shows the tools used for servicing.

Table 3-1. Tools

Must	Recommended
Phillips screw driver (#1)	Soldering iron
Phillips screw driver (#2)	E-ring holder
Tweezers	Mini screw driver
Pliers	
#F728 SELF TRAINING KIT (Code: 1050686)	
#F691 DIAGNOSTIC TOOL (Part Code: 1042425	

3.1.3 Items to check after assembly

Performs the items described below when completing assembly after repairing the printer or replace any parts.

- Clean the housings and the interior of the engine. (Refer to Chapter 6.)
- After assembling or adjust the printer, print an engine status sheet to check the counters for the consumables and other parts which need periodical replacing. If any of them is close to its life, replace it with a new one.

NOTE: *After replacing any part which needs periodical replacement, clear the corresponding counter using the “Maintenance Menu”. (Refer to Chapter 6.) The parts replaced and the corresponding operations to be performed are as listed below:*

- 2ND BTR ASSEMBLY: 2ND BTR Clear
- MAIN FUSER ASSEMBLY: FUSER Counter Clear

NOTE: *When replacing MAIN FUSER ASSEMBLY, replace FILTER ASSEMBLY as well.*

- Check the program ROM version, and update it if necessary. (Refer to Section 3.2.3.)
- Print several status sheets and check print quality.
- Send a few pages of data from the host computer and check for proper functions of the printer.

3.2 Disassembly/Assembly Procedures

This section describes procedures for disassembling/assembling the printer. Unless otherwise specified, assembly can be performed by reversing the disassembly procedure. Refer to Section 3.3 for adjustment procedure. In principle, you are to remove all options before servicing. However, you can leave them if possible.

CAUTION

Some parts are listed as spare parts but not mentioned in disassembly/assembly procedure. Therefore, look carefully how they are installed before you removing them.

NOTE: *Directions used in this section are defined as shown in the figure below:*

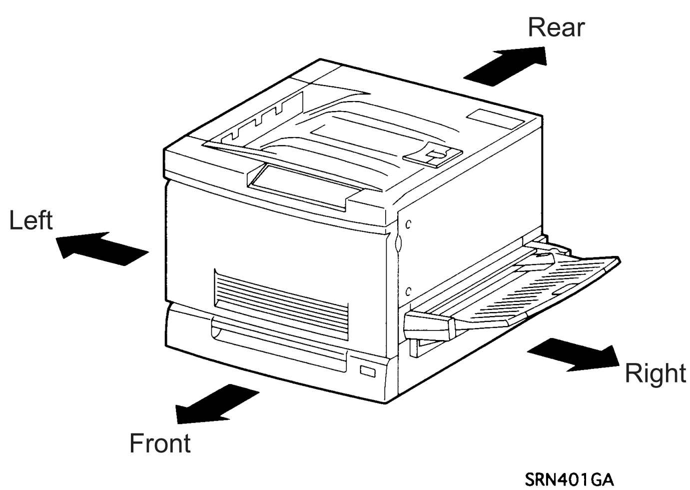


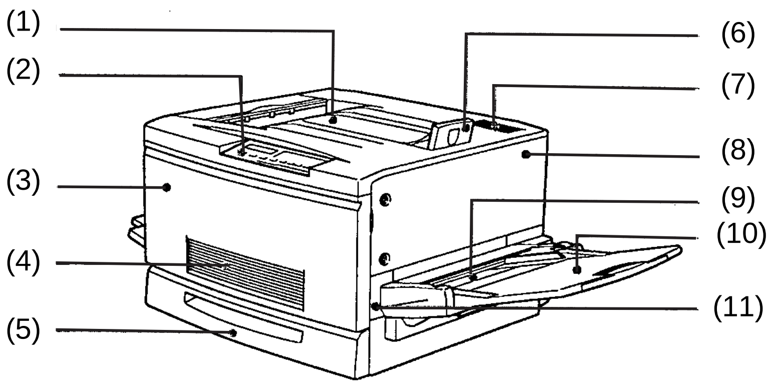
Figure 3-1. Directions

Refer to the followings which explain descriptions used in this chapter.

- ☐ Regarding "(PL X, Y, Z)" at the end of each heading of removal sections, it corresponds to the numbers in the part list in Appendix. Referring to the numbers, you can find the appearance and location of the parts efficiently.
- ☐ Directions are described as mentioned below. (See Figure 3-1.)
  - ■ Front: Front side viewing the printer toward its front side
  - ■ Back: Rear side viewing the printer toward its front side
  - ■ Left: Left hand side viewing the printer toward its front side
  - ■ Right: Right hand side viewing the printer toward its front side
- ☐ Screws are mentioned with descriptions including "(mounting location, color, feature, thread part length, and so on)".
- ☐ "Z)" in a drawing corresponds to the step "Z" of the section.
- ☐ Fasten the screws in the drawings using a Philips screw driver if no instruction is given.
- ☐ If black arrows are shown with numbers, they show the order to act for the step.
- ☐ White arrows (FRONT) in the drawings show the front side of the printer.
- ☐ Refer to Appendix for the connector (P/J) locations and harness routings.
- ☐ The generic term "Developer Assembly" is used for "DEVELOPPER ASSEMBLY Y", "DEVELOPER ASSEMBLY M", "DEVELOPER ASSEMBLY C", AND "DEVELOPER ASSEMBLY K".
- ☐ The generic term "TONER CARTRIDGE" is used for "TONER CARTRIDGE Y", "TONER CARTRIDGE M", "TONER CARTRIDGE C", and "TONER CARTRIDGE K".

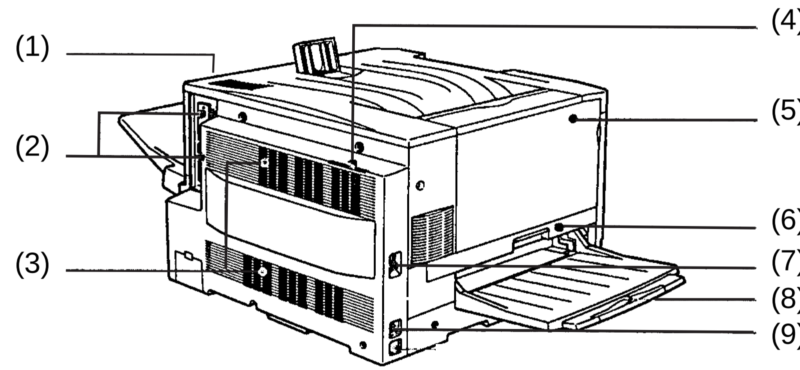
3.2.1 Exterior View and Part Names

The part names used in this manual are based on the after service part names. (They differ from the ones used in Users Guide.)
The names of the parts which are frequently handled by the users are shown below. (The terms used in User's Guide are also shown with brackets, however, some may not be mentioned.)



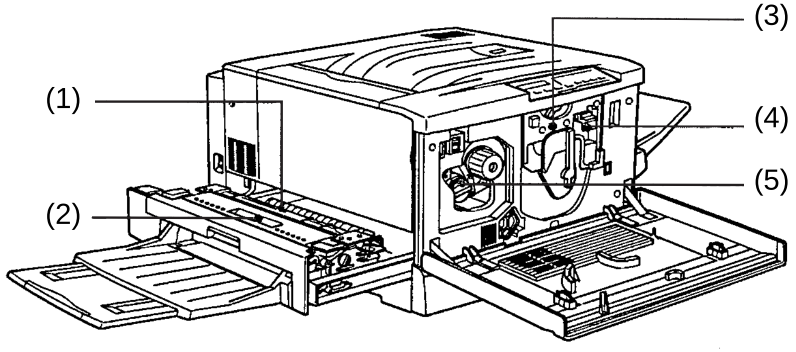
(1) TOP COVER (Face-down tray)	(7) - (Top ventilation grill)
(2) PANEL UNIT (Control Panel)	(8) RIGHT COVER ASSEMBLY (Right Side Cover))
(3) FRONT COVER (Front Cover)	(9) MSI ASSEMBLY (MP Tray)
(4) - (Front ventilation grill)	(10) MSI TRAY ASSEMBLY (Expansion Tray)
(5) UNIVERSAL TRAY (Paper Cassette)	(11) MAIN P/H ASSEMBLY (Paper Path Unit)
(6) STOPPER COVER (Stopper)	

Figure 3-2. Printer viewed from the front right



(1) - (Parallel interface connector)	(6) FUSER ASSEMBLY (Fuser Unit)
(2) - (Connector cover)	(7) - (Power Switch)
(3) - (Right ventilation grill)	(8) EXIT TRAY ASSEMBLY (Face-up Tray)
(4) FILTER ASSEMBLY (-)	(9) - (AC Inlet)
(5) EXIT UPPER ASSEMBLY (Eject Cover)	

Figure 3-3. Printer viewed from the rear left



(1) MAIN FUSER ASSEMBLY (Fuser)	(4) WASTE TONER BOX (Waste Toner Collector)
(2) OIL ROLL ASSEMBLY (Fuser Oil Roll)	(5) TONER CARTRIDGE (Toner Cartridge)
(3) DRUM CARTRIDGE (Photoconductor Unit)	

Figure 3-4. Interior view of the printer

3.2.2 Removing/Replacing the Consumables

The consumables available (can be replaced by users) for this printer are as shown below. Refer to Section 6-3 in Chapter 6 for the procedures.

- TONER CARTRIDGE
- OIL ROLL ASSEMBLY
- DRUM CARTRIDGE (including WASTE TONER BOX)
- WASTE TONER BOX

3.2.3 Updating the Program ROM

The program ROM of this printer is a flash ROM module and can be updated in one of the following 2 ways:

1. Transferring the ROM updating program data (*.RCC) from the host computer via the standard parallel interface.
2. Copying the program ROM from the flash ROM module which has the most updated program.

Also, when you failed to write the program into the flash ROM and perform the same writing operation again or when you copy the program from the flash ROM module to another flash ROM module. you need to perform:

3. Formatting Flash ROM module

See the following sections for the procedures of each operation.

3.2.3.1 Updating the ROM using a standard parallel interface

Follow the instruction below to update the program ROM using a standard parallel interface.

- Preparation

Copy the data file (program ROM source file: “file name. RCC”) in the route directory (HDD).

NOTE: *The personal computer to be used should be able to send binary data from DOS prompt via a parallel interface.*

- Procedure

1. Print a status sheet.
2. Turn off the printer and the personal computer, and connect an interface to each of them. Be sure to disconnect all interface cables except for the parallel interface cable so the printer will not receive data from any other interfaces.
3. Turn on the printer then the personal computer. The printer starts initializing and warm-up is completed within 5 minutes.

   If the OS is Windows95, follow the steps below:

   1. Click “Start”, then choose “Shut Down”.
   2. In the Shut Down Window, select “Reset the computer in MS DOS mode?” to reset the computer.
   3. MS-DOS starts up. (Continue to the steps below.)
4. Check that the message “**Ready**” is indicated on the LCD panel of the printer.
5. To transfer the program data file from the computer to the printer, type the command (shown below) on the DOS prompt (from the directory that has “*.RCC”) and press Enter key.

   COPY /B file name.RCC PRN:
6. You see the messages changing as follows:

   “Writing DIMM P” → “Reset “→ “Ready”

   (Takes about 10 minutes to complete.)
7. When the message is “**Ready**”, the program has been downloaded. Then turn the printer off.
8. Turn the printer back on and print a status sheet. Then, referring to the status sheet you printed in step 1, check that the program firmware version printed beside the left column of the new status sheet has been updated.

3.2.3.2 Updating by copying from the FLASH ROM module

Follow the steps below.

1. Insert the ROM module which has the program ROM source to the socket B of the CONTROLLER PWB.

   NOTE: *Leave the ROM module in the socket P of the CONTROLLER PWB as it is.*

2. Set the ROM module in which the program is to be written in the socket A of the CONTROLLER PWB.

   NOTE: *Format this ROM module in the way describe in Section 3.2.3.3.*

3. Turn the printer on while pressing the “On Line”, “Alt”, and “Enter” buttons. (Keep the buttons down until proceeding to Step 4.) All the LED lamps and LCD on the panel come on and the LCD indicates the message below:

RAM CHECK**.*MB

   Numeric is shown in place of **.* and starts counting up, then the engine initialization takes place.

4. When the printer enters the program ROM copy mode, the LCD message shown below appears.

DIMM COPY MODE

   Then press the Enter button. You see the message below:

DIMM B>A COPYING □□□□

5. When the program has been properly updated, the printer enters the Ready status. If an error occurs, one of the following messages appears.

DIMM COPY B>A ERROR

FORMAT ERROR DIMM A

6. Turn the printer power off and remove the ROM module from the both sockets A and B.

7. Replace the updated ROM module with the ROM module in the socket P.

3.2.3.3 Formatting the FLASH ROM Module

Flash ROM module can be formatted as instructed below.

1. Install the ROM module to be formatted to the socket A of the CONTROLLER PWB.

   NOTE: *Leave the ROM module in the socket P of the CONTROLLER PWB as it is.*

2. Turn the printer on while pressing down the “Alt”, “Item”, “Value”, and “Enter” buttons, and keep the buttons down until instructed to release them. The LCD and all the LED lamps on the control panel come on and the message bellow appears.

RAM CHECK **.*MB

   Numeric is shown in place of **.* and starts increasing, then the engine initialization begins.

   When the printer is in the ROM formatting mode, the following messages are indicated consequently.

DIMM A ERASING

   Release the buttons at this point. The message below appears.

DIMM A ERASING □□□□

3. After while, the message below appears and the ROM has been formatted.

DIMM A ERASED

4. When an error has occurred, the message bellow appears.

ERASE ERROR

3.2.4 Cover

3.2.4.1 FRONT COVER ASSEMBLY Removal (PL1.1.1)

1. Take out the UNIVERSAL TRAY about 20cm. (See Section 3.2.5.1.)

   NOTE: *Be sure to perform Step 1 to support the FRONT COVER ASSEMBLY.*

2. Open the FRONT COVER ASSEMBLY.
3. Remove 2 screws (gold, with a washer, 8mm) securing the right and left COVER SUPPORTs.
4. Remove 2 screws (black, tapped, 10mm) securing the FRONT COVER ASSEMBLY and right and left HINGE PLATES. Then remove the FRONT COVER ASSEMBLY and right and left HINGE PLATES.

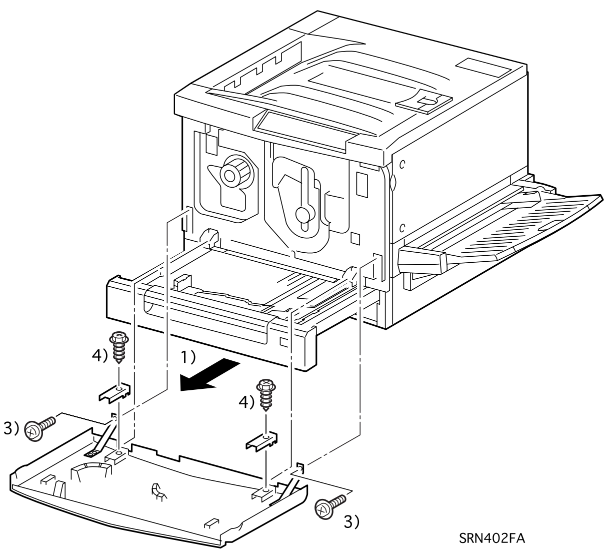


Figure 3-5. Front Cover Assembly Removal

3.2.4.2 FRONT LOWER COVER Removal (PL1.1.5)

1. Remove the UNIVERSAL TRAY.
2. Remove 2 screws (silver, cup head, 8mm) securing the FRONT LOWER COVER, and remove the FRONT LOWER COVER.

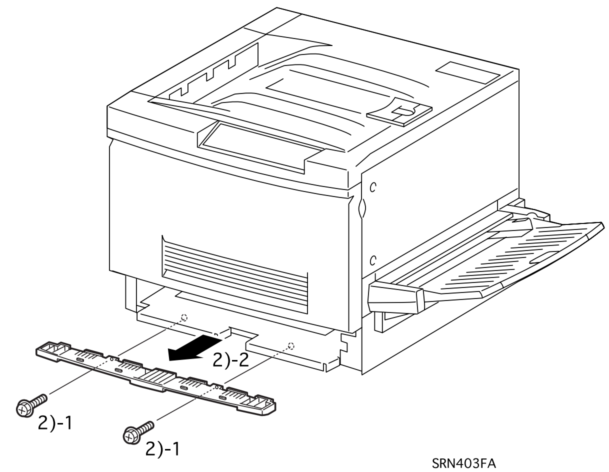
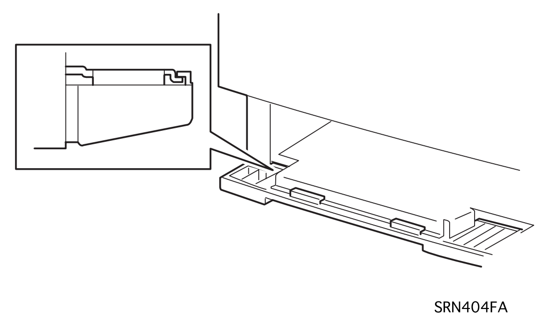


Figure 3-6. FRONT LOWER COVER Removal

CHECK POINT

When installing the FRONT LOWER COVER, fit the front edge to 4 hooks in the frame to set the cover to the correct position.



3.2.4.3 TOP COVER ASSEMBLY Removal (PL1.1.20)

1. Open the FRONT COVER ASSEMBLY.
2. Open the EXIT UPPER ASSEMBLY.

   NOTE: *In the following step, the TOP COVER ASSEMBLY is kept connected to the printer body with a harness. Therefore, do not move the TOP COVER ASSEMBLY too away from the printer.*

3. Remove 4 screws (silver, cup head, 8mm) securing the TOP COVER ASSEMBLY.
4. Disconnect 2 connectors (P/J317) from the OPERATION PANEL and remove the TOP COVER ASSEMBLY along with the OPERATION PANEL.
5. Remove the OPERATION PANEL from the TOP COVER ASSEMBLY. (See Section 3.2.4.9.)

CHECK POINT

When installing the TOP COVER ASSEMBLY, be sure to fasten the 2 screws at the back to secure TOP COVER ASSEMBLY and REAR COVER ASSEMBLY together. Pay special attention to the left screw. Fasten the screw with the TOP COVER ASSEMBLY securely pressed down so that the rib in the TOP COVER presses the TOP COVER SWITCH (PL13.1.3) without fail.

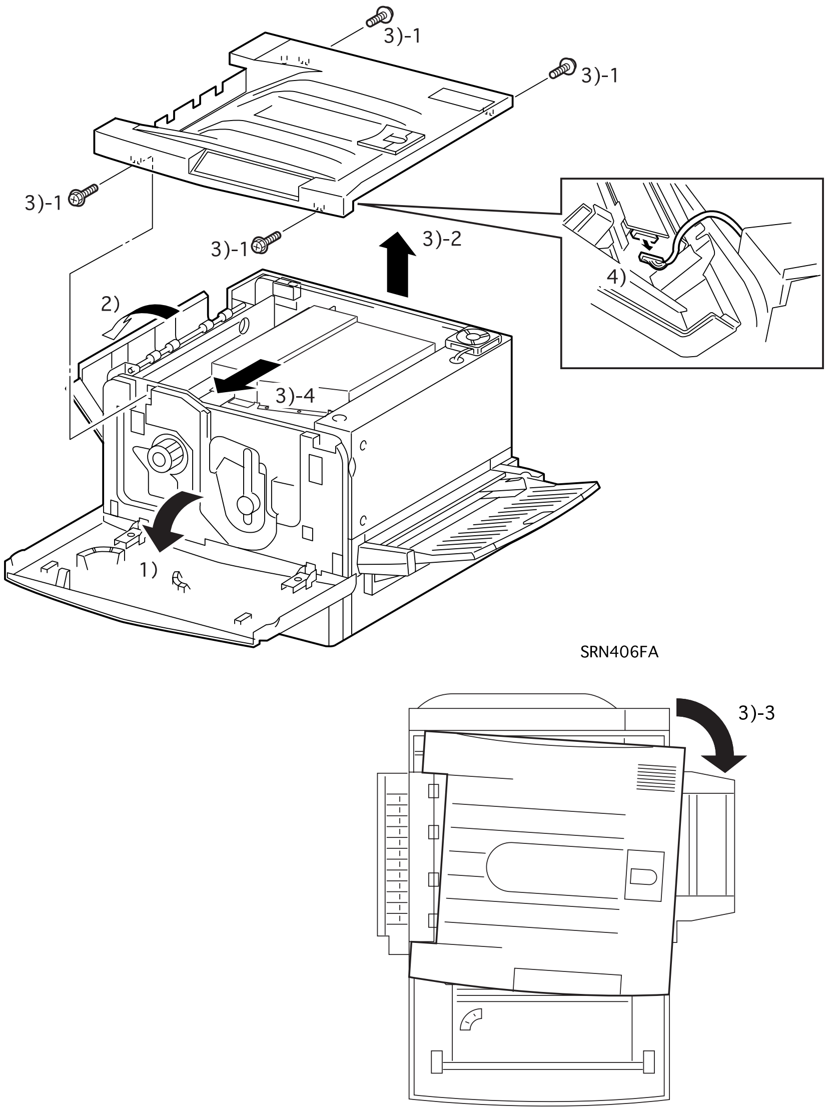


Figure 3-7. TOP COVER Removal

3.2.4.4 INNER COVER ASSEMBLY Removal (PL1.1.10)

NOTE: *Be sure to perform Step 1 to support the FRONT COVER ASSEMBLY.*

1. Take out the UNIVERSAL TRAY about 20cm.
2. Open the FRONT COVER ASSEMBLY.
3. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
4. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
5. Remove the TENSION LEVER. (See Section 3.2.11.1.)

   NOTE: *As a result of the next step, the FRONT COVER ASSEMBLY will be supported with 2 hinge parts only. Therefore, be careful not to add excess force to the cover when handling it.*

6. Remove 2 screws (black, cup head, 6mm) securing the right and left COVER SUPPORT in the FRONT COVER ASSEMBLY to the printer body.
7. Remove 7 screws (black, cup head, 6mm) securing the INNER COVER to the printer body. Then tilt the INNER COVER ASSEMBLY forward and lift it up to remove.

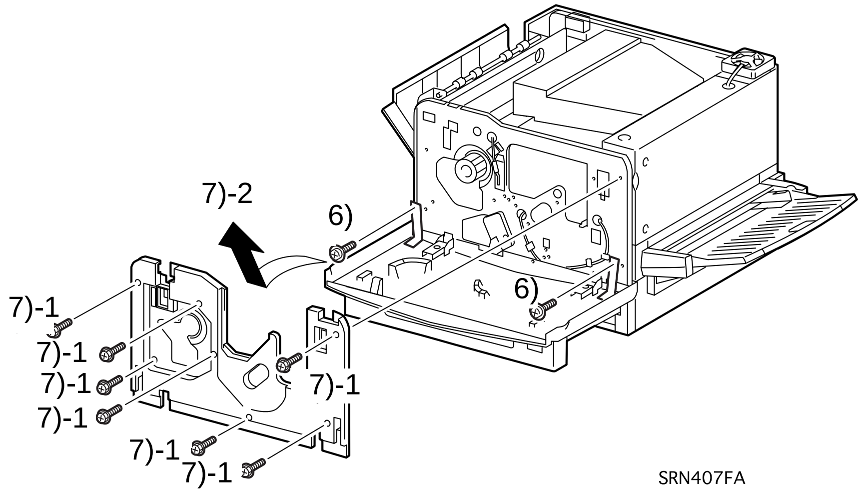


Figure 3-8. INNER COVER ASSEMBLY REMOVAL

3.2.4.5 REAR COVER ASSEMBLY Removal (PL1.1.30)

1. Take out the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)
2. Pressing the tub at the upper edge of the O/H COVER, pull the O/H COVER down to release the hook attaching the cover to the REAR COVER ASSEMBLY. Then move the O/H COVER backward to remove it.
3. Remove 6 screws (silver, cup head, 8mm) securing the REAR COVER ASSEMBLY and remove the REAR COVER ASSEMBLY.

CHECK POINT

- **When installing the REAR COVER ASSEMBLY, be sure to fasten the 2 screws at the top to secure both TOP COVER ASSEMBLY and REAR COVER ASSEMBLY. Pay special attention to the left screw. Fasten the screw with the TOP COVER ASSEMBLY securely pressed down so that the rib in the TOP COVER presses the TOP COVER SWITCH (PL13.1.3) without fail.**
- **When installing the REAR COVER ASSEMBLY, be careful not to get the harness caught.**

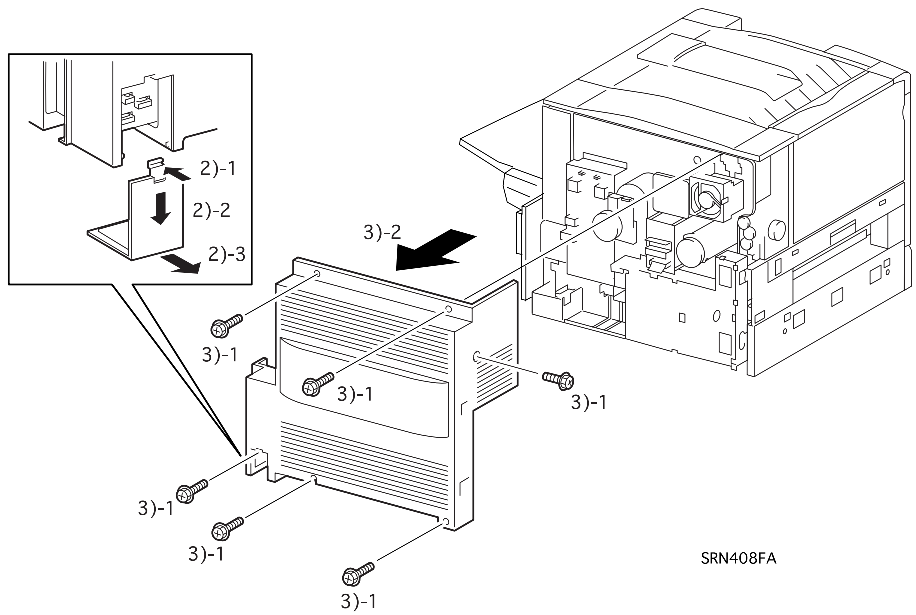


Figure 3-9. REAR COVER ASSEMBLY Removal

3.2.4.6 FILTER ASSEMBLY Removal (PL1.1.32)

1. Hold the tab of the FILTER ASSEMBLY at the back and unlock it from the REAR COVER.

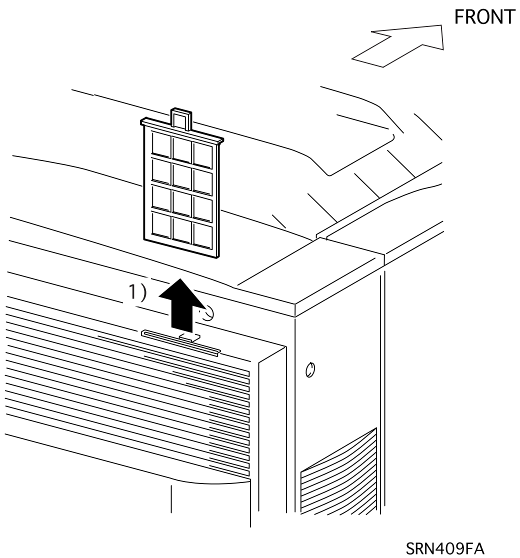


Figure 3-10. FILTER ASSEMBLY Removal

3.2.4.7 LEFT LOWER COVER Removal (PL1.1.40)

1. Take the UNIVERSAL TRAY out.
2. Remove the FRONT LOWER COVER. (See Section 3.2.4.2.)
3. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
4. Remove 2 screws (silver, cup head, 8mm) securing the LEFT LOWER COVER.

   NOTE: *In the following step, be careful not to break the hooks in the LEFT LOWER COVER since they might be too tight.*

5. Shift the LEFT LOWER COVER forward to release the hooks securing the LEFT LOWER COVER. Then remove the cover.

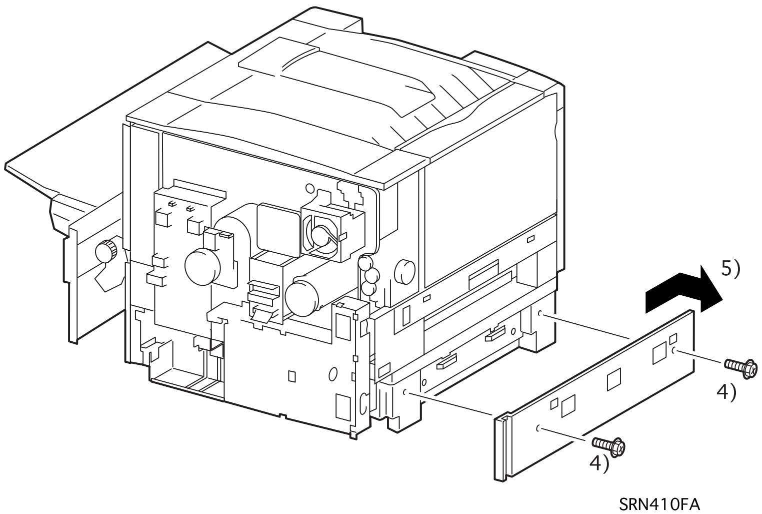


Figure 3-11. LEFT LOWER COVER Removal

3.2.4.8 RIGHT COVER ASSEMBLY Removal (PL1.1.50)

1. Open the FRONT COVER ASSEMBLY.
2. Take the MAIN P/H ASSEMBLY out.
3. Remove 2 screws (silver, cup head, 8mm) securing the RIGHT COVER ASSEMBLY and open the front side of the cover. Then shift the cover to the rear and remove it.

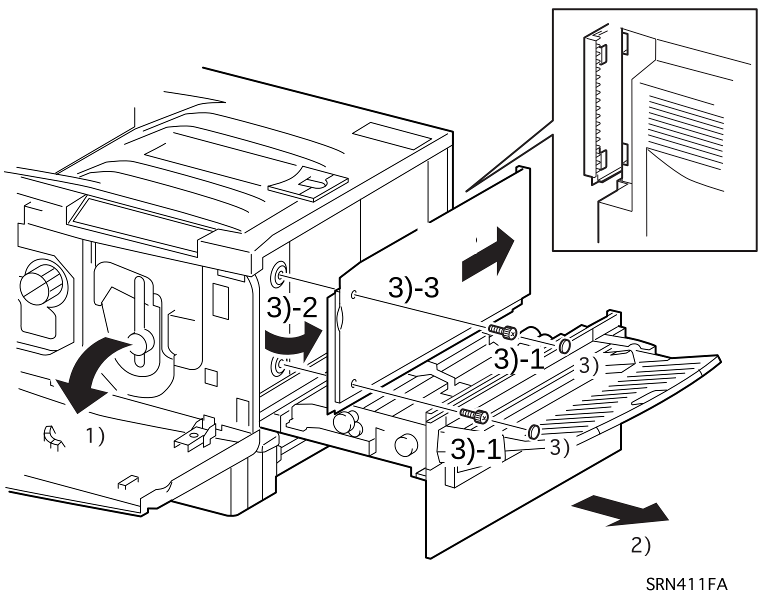


Figure 3-12. RIGHT COVER ASSEMBLY Removal

CHECK POINT **When installing the RIGHT COVER ASSEMBLY, fit the hooks in the assembly in the positioning holes at the rear part of the printer to set the assembly to the correct position.**

3.2.4.9 OPERATION PANEL Removal (PL1.1.60)

1. Remove the TOP COVER along with the OPERATION PANEL. (See Section 3.2.4.3.)

   NOTE: *In the following step, be careful not to break the hooks in the OPERATION PANEL.*

2. Release the hooks in the OPERATION PANEL and remove the panel from the TOP COVER ASSEMBLY.

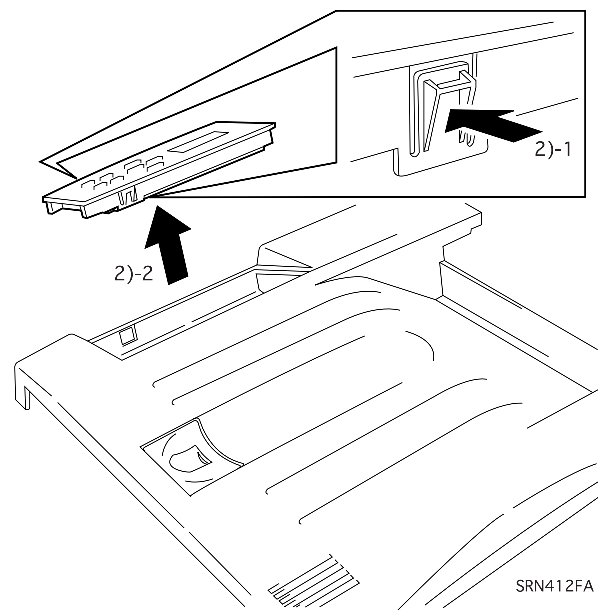


Figure 3-13. OPERATION PANEL Removal

3.2.5 Paper Tray

3.2.5.1 UNIVERSAL TRAY Removal (PL2.1.1)

NOTE: *In the following step, be careful not to drop the UNIVERSAL TRAY.*

1. Draw out the UNIVERSAL TRAY and lift it up. Then take the tray out further as it is held up and remove it.

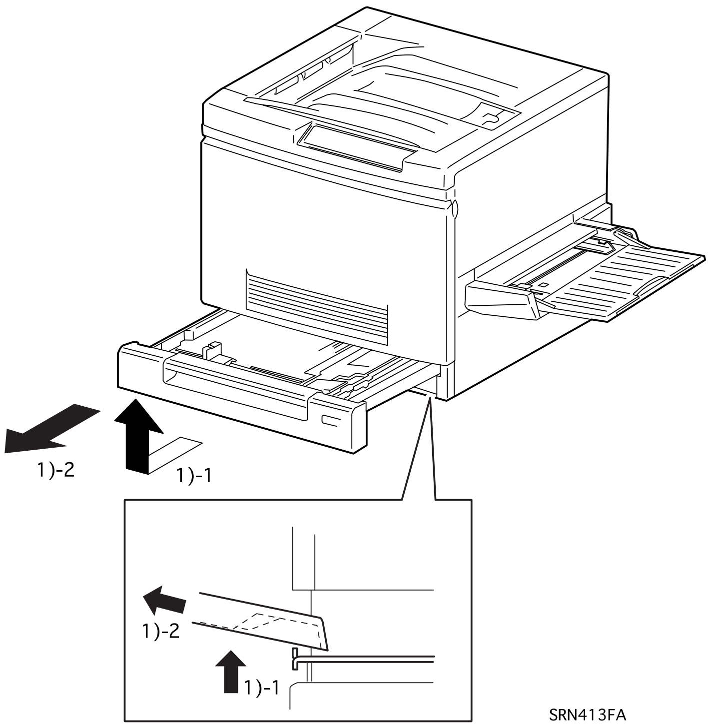


Figure 3-14. UNIVERSAL TRAY Removal

3.2.5.2 FRONT SNUBBER Removal (PL2.2.9)

1. Take the UNIVERSAL TRAY out. (See Section 3.2.5.1.)

   NOTE: *In the following steps, be careful not to bend the edge of the FRONT SNUBBER where paper is placed.*

2. Remove 2 screws (black, tapped, 8mm) securing the FRONT GUIDE ASSEMBLY and remove the FRONT GUIDE ASSEMBLY.

3. Using a tool such as pliers, release the hooks securing the FRONT SNUBBER and remove the SNUBBER SUPPORT. Then remove the FRONT SNUBBER.

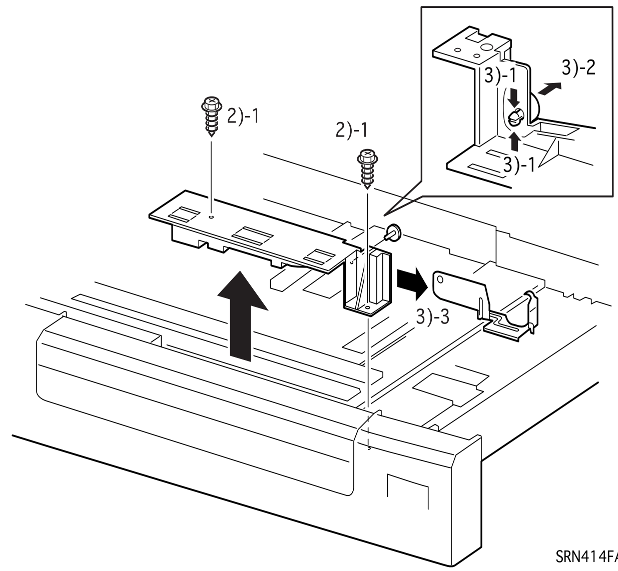


Figure 3-15. FRONT SNUBBER Removal

CHECK POINT

When installing the FRONT SNUBBER, fit the snubber to the rear slit in the FRONT GUIDE ASSEMBLY.

3.2.5.3 END GUIDE (PL2.2.16), SECTOR GEAR (PL2.2.17) Removal

1. Take the UNIVERSAL TRAY out. (See Section 3.2.5.1.)
2. Move the END GUIDE to the right end. (= minimum paper size fits)
   NOTE: *After removing the FRONT GUIDE ASSEMBLY, hold the BOTTOM PLATE ASSEMBLY down.*
3. Remove 2 screws (black, tapped, 8mm) securing the FRONT GUIDE ASSEMBLY and remove the FRONT GUIDE ASSEMBLY.
4. Push down the BOTTOM PLATE ASSEMBLY to lock it at the bottom.
5. Turn the UNIVERSAL TRAY over and remove 5 screws (gold, tapped, 8mm) securing the TRAY BOTTOM COVER. Then remove the TRAY BOTTOM COVER.
6. Remove the SECTOR GEAR SPRING from the TRAY HOUSING and SECTOR GEAR.
7. Release the joint for the hole in the SECTOR GEAR and the swivel peg in the UNIVERSAL TRAY, and slide the SECTOR GEAR along the groove to fit the round end of the groove to the peg in the END GUIDE. Then remove the SECTOR GEAR.

(Continues to the next page.)

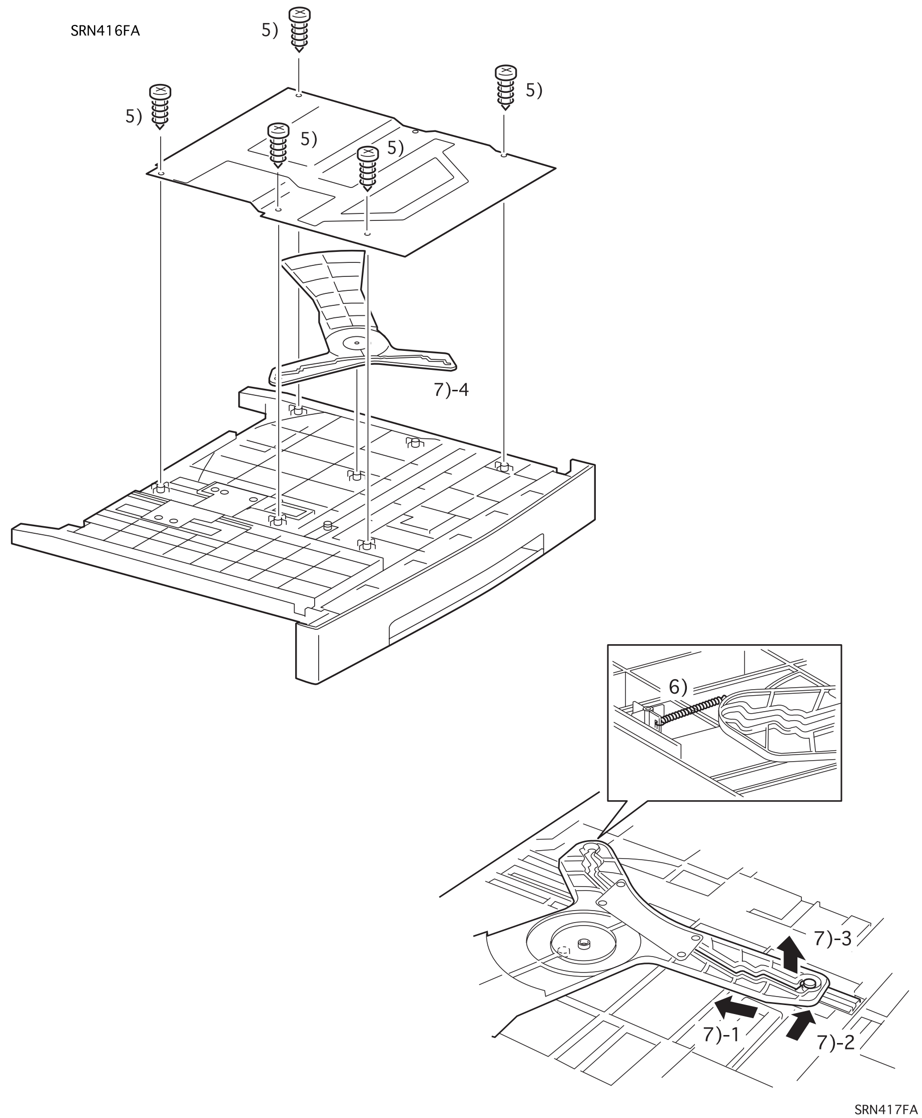


Figure 3-16.
END GUIDE (PL2.2.16), SECTOR GEAR (PL2.2.17) Removal (1)

8. Remove 2 screws (black, cup head, 8mm) securing the LOCK PLATE by the right edge.

9. Remove 2 screws (black, cup head, 8mm) securing the LOCK PLATE by the left edge, and remove the LOCK PLATE.

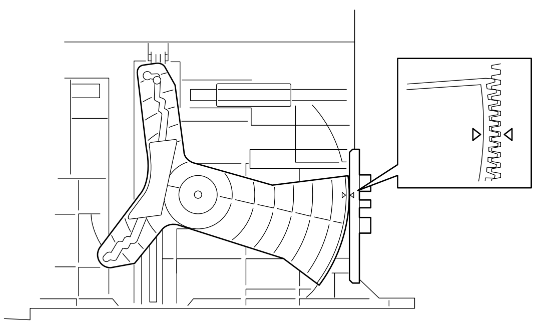
10. Remove 2 screws (gold, tapped, 8mm) securing the REAR GUIDE PLATE L.
    NOTE: *In the following step, hold the REAR GUIDE while removing the REAR GUIDE PLATE R. so that the REAR GUIDE will not drop.*

11. Remove 1 screw (gold, tapped, 8mm) securing the REAR GUIDE PLATE R and remove the REAR GUIDE R and the REAR GUIDE.
    NOTE: *In the following step, TRAY N/F SPRINGS will spring out. Therefore, be careful not to lose them.*

12. Moving the PLATE LINK, unlock the BOTTOM PLATE ASSEMBLY and open it. Then slide the END GUIDE further right and remove it.

CHECK POINT

When installing the SECTOR GEAR, make sure that the triangle marks on the SECTOR GEAR and TRAY SIZE ACTUATOR are aligned.



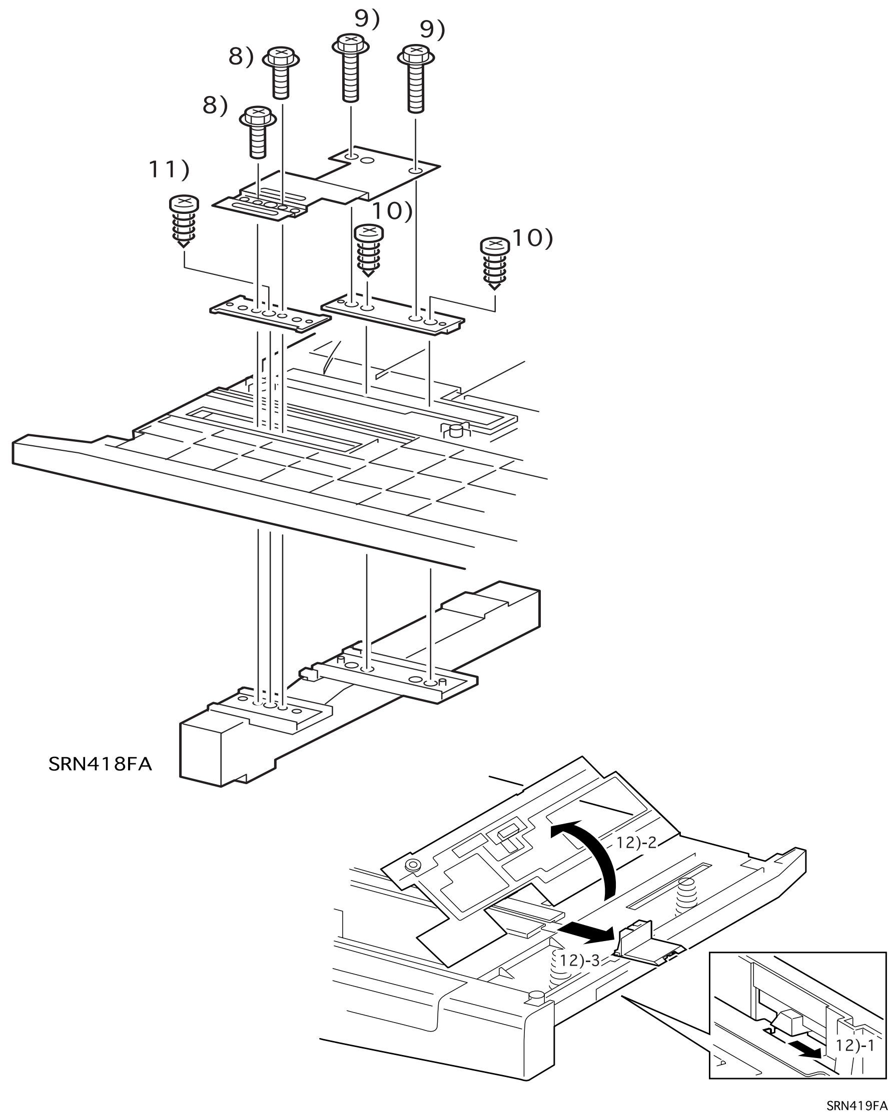


Figure 3-17. END GUIDE (PL2.2.16), SECTOR GEAR (PL2.2.17) Removal (2)

3.2.6 Paper Feeder

3.2.6.1 TURN IN CHUTE Removal (PL3.1.18)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MAIN P/H ASSEMBLY with the MSI TRAY installed on it.

   NOTE: *In the next step, be careful not to damage the hinge part of the TURN IN CHUTE.*

3. Press the hinge at the rear part of the TURN IN CHUTE to release the peg and swivel the TURN IN CHUTE right around the front side as the supporting point.

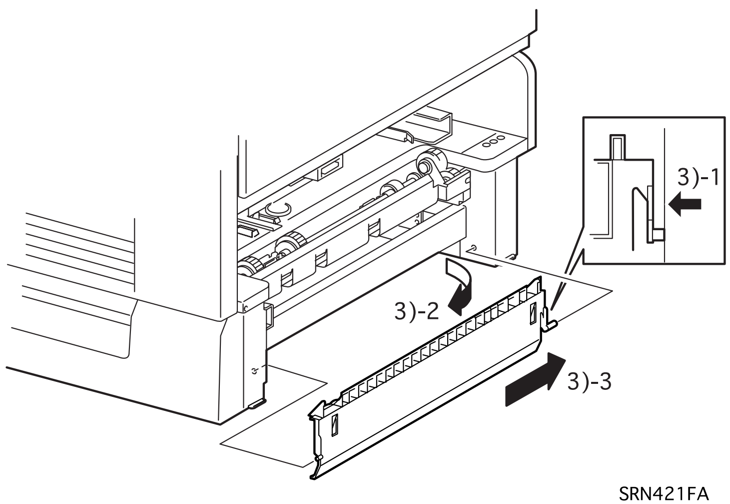


Figure 3-18. TURN IN CHUTE Removal

3.2.6.2 TURN ROLL ASSEMBLY Removal (PL3.1.11)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Remove the UNIVERSAL TRAY. (See Section 3.2.5.1.)
3. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
4. Remove the MAIN P/H ASSEMBLY with the MSI TRAY ASSEMBLY installed on it. (See Section 3.2.8.1.)
5. Remove the TURN IN CHUTE. (See Section 3.2.6.1.)
6. Remove 2 screws (silver, 6mm) securing the TURN CHUTE and remove the TURN CHUTE.
7. Remove 1 screw (silver, 8mm) securing the FEED GUIDE SHAFT and remove the FEED GUIDE SHAFT.
8. Remove 2 screws (gold, cup head, 8mm) securing the TRAY STOPPER and remove the TRAY STOPPER.
9. Remove TURN ARM SPRING from the TURN ARM ASSEMBLY and the frame.
10. Remove the E-ring securing the TURN ROLL ASSEMBLY.
11. Shift the TURN FRONT BEARING to the rear and remove the bearing.
12. Shift the TURN ROLL ASSEMBLY forward to release the rear end and shift the rear part of the assembly to the right. Then, shifting the assembly to the rear, remove it along with the TURN FRONT BEARING, TURN REAR BEARING, and TURN ARM ASSEMBLY.
13. Remove the TURN FRONT BEARING AND TURN REAR BEARING from the TURN ROLL ASSEMBLY.

NOTE: *In the next step, the pulley and the gear in the TURN ROLL ASSEMBLY will dislocate. Therefore, be careful not to drop and lose them.*

14. Remove the E-ring securing the TURN ARM ASSEMBLY and the TURN ARM SUPPORT, and remove the TURN ARM ASSEMBLY.
15. Remove the TURN GEAR, TURN GEAR PIN, and the TURN ARM STOPPER from the TURN ROLL ASSEMBLY.

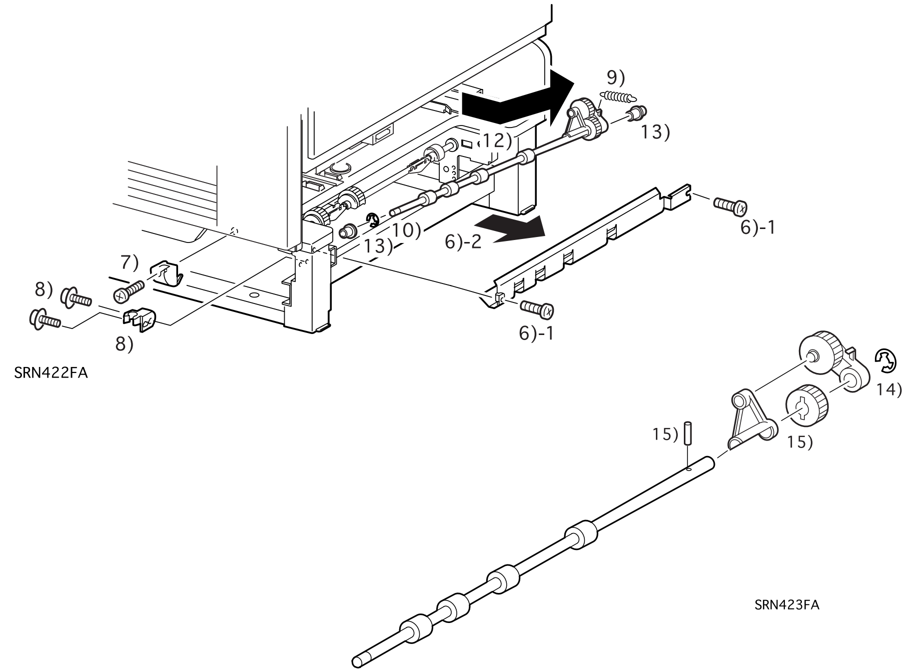


Figure 3-19. TURN ROLL ASSEMBLY Removal

When installing the TRAY STOPPER, verify that the stopper is at the right position by moving the MSI tray in and out to see if the tray is securely supported.

3.2.6.3 FEED ROLL Removal (PL3.1.3)

1. Remove the UNIVERSAL TRAY. (See Section 3.2.5.1.)

2. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)

3. Remove the MAIN P/H ASSEMBLY with the MSI TRAY ASSEMBLY installed on it. (See Section 3.2.8.1.)

   NOTE: *In the following step, be careful with the metal plate as you maybe hurt with its sharp edge.*

4. Inserting your hand into the opening in the UNIVERSAL TRAY, release the hook securing the FEED ROLL and remove the FEED ROLL.

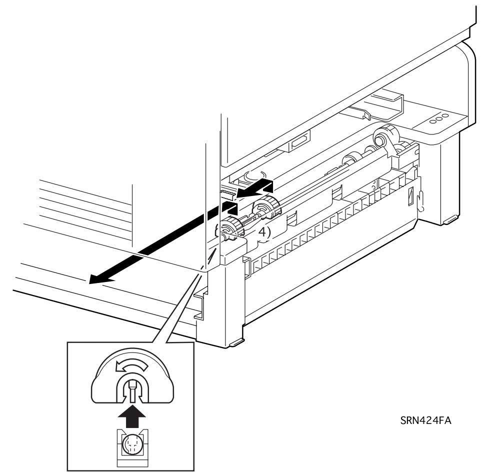


Figure 3-20. FEED ROLL Removal

CHECK POINT

When installing the FEED ROLL, make sure the arrow marked on the side of the roll is facing to the rotating direction.

3.2.6.4 FEED SOLENOID Removal (PL3.1.9)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)

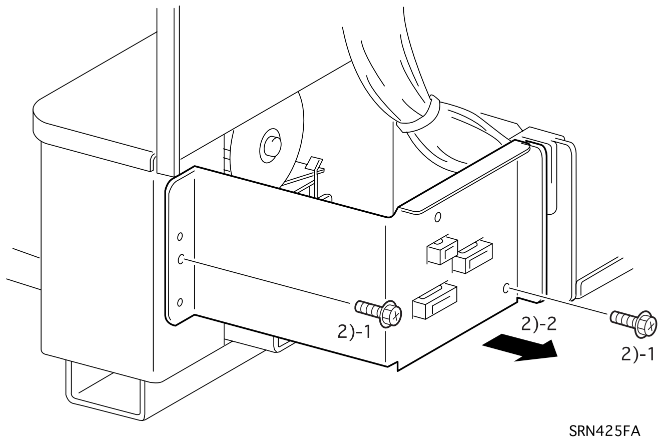
   NOTE: *In the following step, the OPTION BRACKET is kept connected to the printer body with a harness. Therefore, do not move the OPTION BRACKET too away from the printer.*

2. Remove 2 screws (black, cup head, 8mm) securing the OPTION BRACKET and separate the OPTION BRACKET from the printer body.

   NOTE: *In the following step, be careful with the sharp edges of the OPTION BRACKET when handling it. Remove the bracket if necessary.*

3. Disconnect the connector (P/J103B) for the FEED SOLENOID and release its harness from the clump.

4. Remove the screw (silver, 6mm) securing the FEED SOLENOID and remove the FEED SOLENOID.



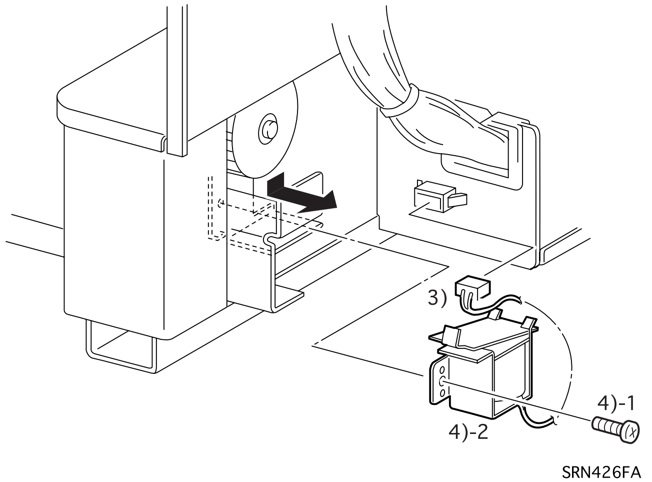


Figure 3-21. FEED SOLENOID Removal

- **Make sure the protrusion on the FEED GEAR and the arm of the FEED SOLENOID are securely engaged.**
- **After installing the solenoid, verify that the notch of the FEED GEAR is held at the arm of the solenoid.**

3.2.6.5 FEED ROLL ASSEMBLY Removal (PL3.1.1)

1. Remove the REAR COVER ASSEMBLY.
2. Remove the UNIVERSAL TRAY. (See Section 3.2.5.1.)
3. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
4. Remove the MAIN P/H ASSEMBLY with the MSI TRAY ASSEMBLY installed on it. (See Section 3.2.8.1.)
5. Remove the FEED SOLENOID. (See Section 3.2.6.4.)
6. Remove the FEED SPRING from the FEED GEAR and the frame.
7. Remove the E-ring securing the FEED GEAR and remove the FEED GEAR.
8. Remove the screw (silver, 8mm) securing the FEED SHAFT GUIDE and remove the FEED SHAFT GUIDE and FEED BEARING on the front.
9. Shift the FEED ROLL ASSEMBLY forward to release the rear end from the frame. Then move the end downward and move the FEED ROLL ASSEMBLY backward, avoiding contact with the TRAY N/P SENSOR ASSEMBLY, and remove it along with the FEED BEARING.
10. Remove the E-ring and the FEED BEARING from the REED ROLL ASSEMBLY.

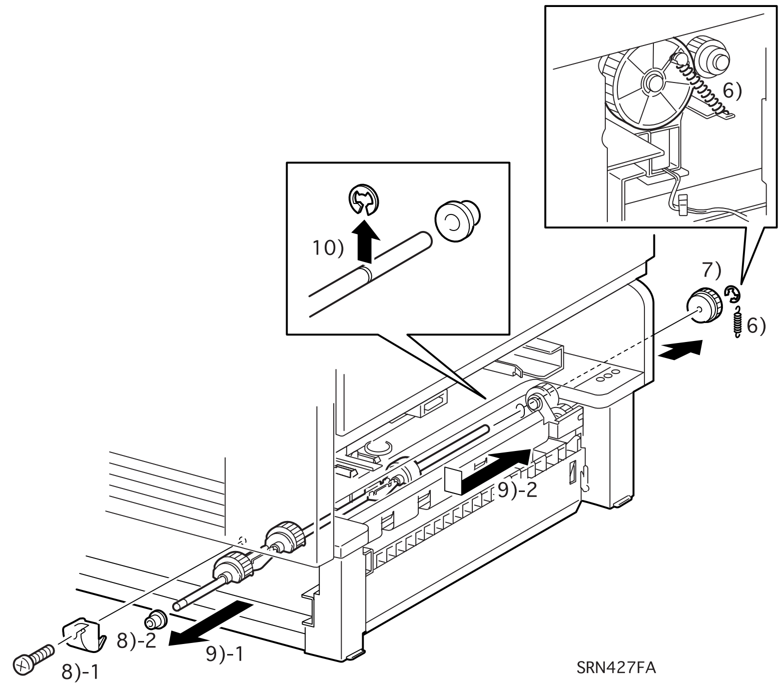


Figure 3-22. FEED ROLL ASSEMBLY Removal

CHECK POINT

After installing the FEED ROLL ASSEMBLY, check that the notch of the FEED GEAR is held at the arm of the FEED SOLENOID.

3.2.6.6 SIZE SWITCH ASSEMBLY Removal (PL3.1.9)

1. Draw the UNIVERSAL TRAY out.
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Remove the LVPS. (See Section 3.2.16.1.)

   NOTE: *In the following step, the OPTION BRACKET is kept connected to the printer body with a harness. Therefore, do not move the SIZE BRACKET ASSEMBLY too away from the printer.*

4. Remove 2 screws (black, cup head, 8mm) securing the SIZE BRACKET ASSEMBLY and separate the SIZE BRACKET ASSEMBLY from the printer body.
5. Disconnect the connector (P/J102) for the SIZE SWITCH ASSEMBLY and remove the SIZE BRACKET ASSEMBLY.
6. Remove the screw (black, cup head, 12mm) securing the SIZE SWITCH ASSEMBLY and remove the SIZE SWITCH ASSEMBLY from the SIZE SWITCH ASSEMBLY.

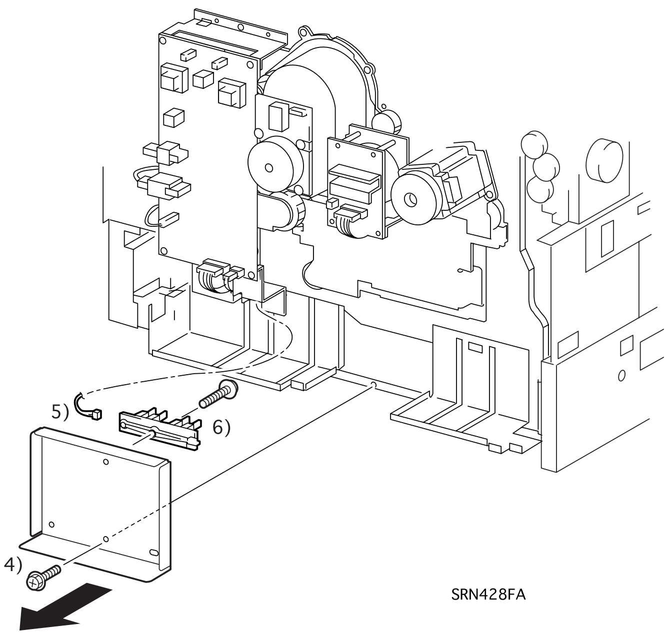


Figure 3-23. SIZE SWITCH ASSEMBLY Removal

3.2.6.7 TRAY N/P SENSOR ASSEMBLY Removal (PL3.1.30)

1. Remove the UNIVERSAL TRAY. (See Section 3.2.5.1.)
2. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
3. Remove the MAIN P/H ASSEMBLY with the MSI TRAY ASSEMBLY installed on it. (See Section 3.2.8.1.)
4. Disconnect the following connectors;
   - P/J106 for LOW PAPER SENSOR and MAIN HARNESS ASSEMBLY
   - P/J101 for TRAY N/P HARNESS and MAIN HARNESS ASSEMBLY
5. Unhook the TRAY N/P SENSOR ASSEMBLY from the frame and remove it.

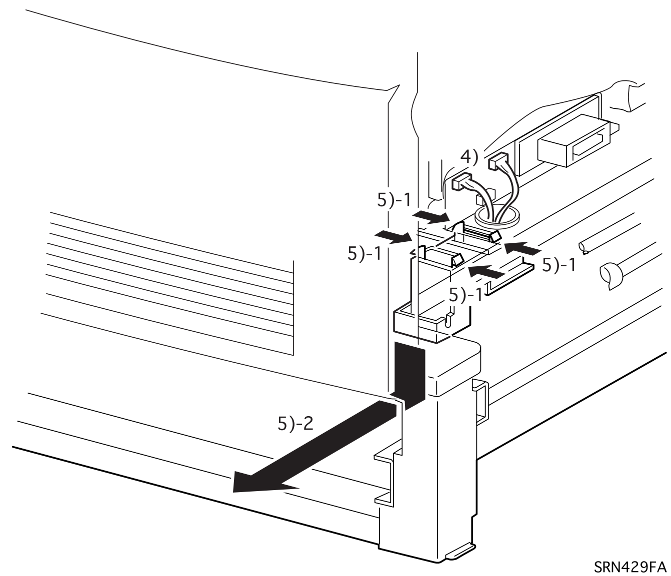


Figure 3-24. TRAY N/P SENSOR ASSEMBLY Removal

CHECK POINT

Route the harness carefully so that the harness don't float.

3.2.6.8 LOW PAPER SENSOR Removal (PL3.1.35)

1. Remove the UNIVERSAL TRAY. (See Section 3.2.5.1.)
2. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
3. Remove the MAIN P/H ASSEMBLY with the MSI TRAY ASSEMBLY installed on it. (See Section 3.2.8.1.)
4. Remove TRAY N/P SENSOR ASSEMBLY. (See Section 3.2.6.7.)
5. Remove the screw (gold, tapped, 8mm) securing the LOW PAPER SENSOR, and remove the LOW PAPER SENSOR.

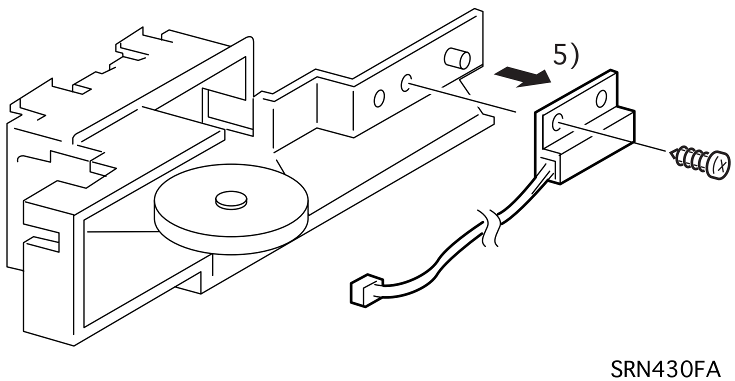


Figure 3-25. LOW PAPER SENSOR Removal

CHECK POINT

When installing the LOW PAPER SENSOR, be sure to align the peg on the TRAY N/P SENSOR with the location hole in the LOW PAPER SENSOR.

3.2.6.9 TRAY NO PAPER SENSOR Removal (PL3.1.32)

1. Remove the UNIVERSAL TRAY. (See Section 3.2.5.1.)
2. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
3. Remove the MAIN P/H ASSEMBLY with the MSI TRAY ASSEMBLY installed on it. (See Section 3.2.8.1.)
4. Remove TRAY N/P SENSOR ASSEMBLY. (See Section 3.2.6.7.)
5. Disconnect the connector (P/J107) for the TRAY NO PAPER SENSOR and remove the harness.
6. Release the hooks securing the TRAY NO PAPER SENSOR from the TRAY N/P BRACKET and remove the TRAY NO PAPER SENSOR.

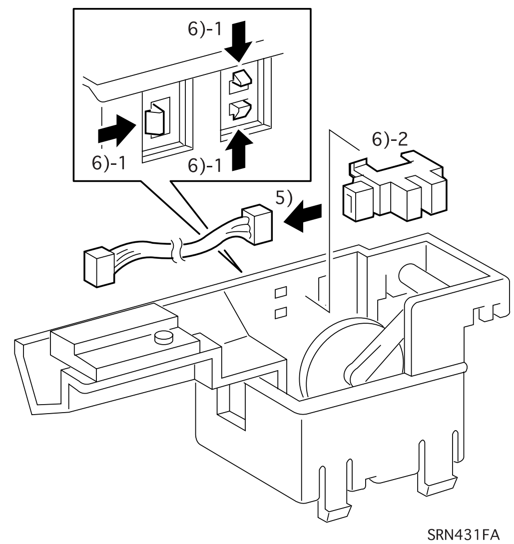


Figure 3-26. TRAY NO PAPER SENSOR Removal

CHECK POINT

When installing the TRAY NO PAPER SENSOR, set the TRAY N/P ACTUATOR staying above the TRAY NO PAPER SENSOR.

3.2.7 Multi Sheet Inserter

3.2.7.1 MSI TRAY ASSEMBLY Removal (PL4.1.10)

1. Using a Phillips screw driver, push the lock in the front arm of the MSI TRAY ASSEMBLY to the rear, and release the front arm of the MSI FRAME.

2. Release the rear arm from the MSI FRAME, remove the MSI TRAY ASSEMBLY.

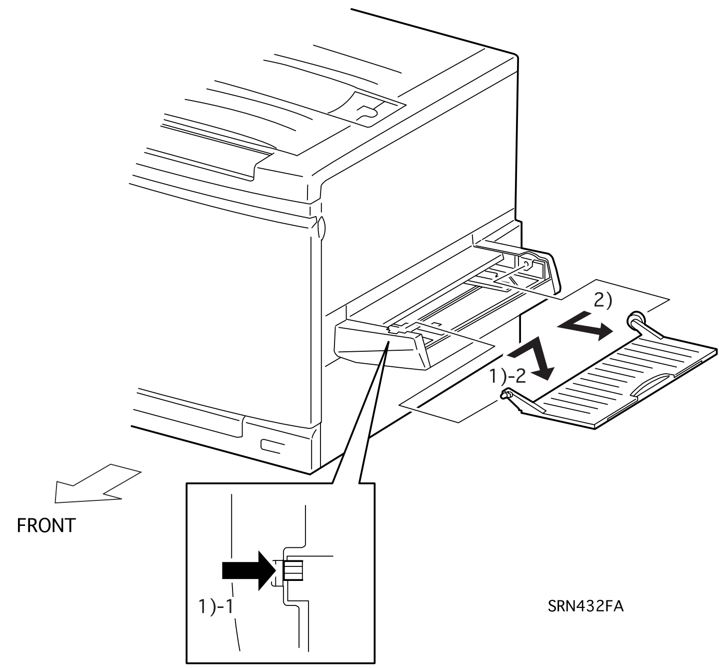


Figure 3-27. MSI TRAY ASSEMBLY Removal

3.2.7.2 MSI ASSEMBLY Removal (PL4.1.1)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Draw the MAIN P/H ASSEMBLY out.
3. Disconnect 2 connectors (P/J92B and 113B) connecting the MSI ASSEMBLY and MSI P/H ASSEMBLY.
4. Remove the screws (gold, tapped, 8mm) securing the MSI EARTH WIRE to the REGI. BRAKE BRACKET.

   NOTE: *In the next step, hold the MAIN P/H COVER ASSEMBLY when you remove MAIN P/H COVER ASSEMBLY, or the P/H COVER ASSEMBLY will be dislocated. (You can remove the MAIN P/H COVER if necessary.)*

5. Remove 2 screws (black, cup head, 12mm) securing the MSI ASSEMBLY, and then remove the assembly by lifting it to the upper right.

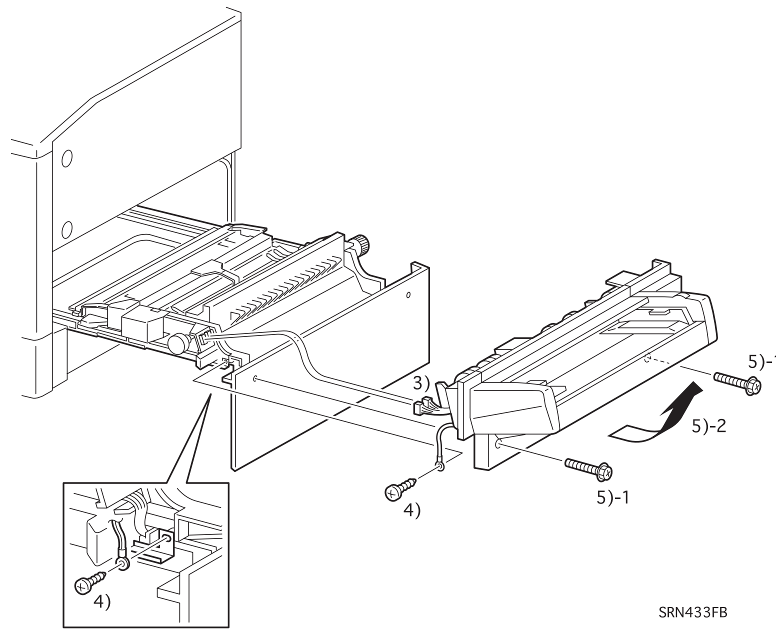


Figure 3-28. MSI ASSEMBLY Removal

CHECK POINT

When installing the MSI ASSEMBLY, make sure that the MSI CLUTCH gear in the MSI ASSEMBLY securely meshes with the MAIN P/H ASSEMBLY PRE-REGI. GEAR1.

3.2.7.3 MSI FRONT COVER Removal (PL4.1.3)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the screw (silver, tapped, 14mm) securing the MSI FRONT COVER.

   NOTE: *In the following step, be careful not to break the hooks.*

4. Release 2 hooks at the top of the MSI FRONT COVER and the at the bottom of the MSI FRAME, and remove the MSI FRONT COVER.

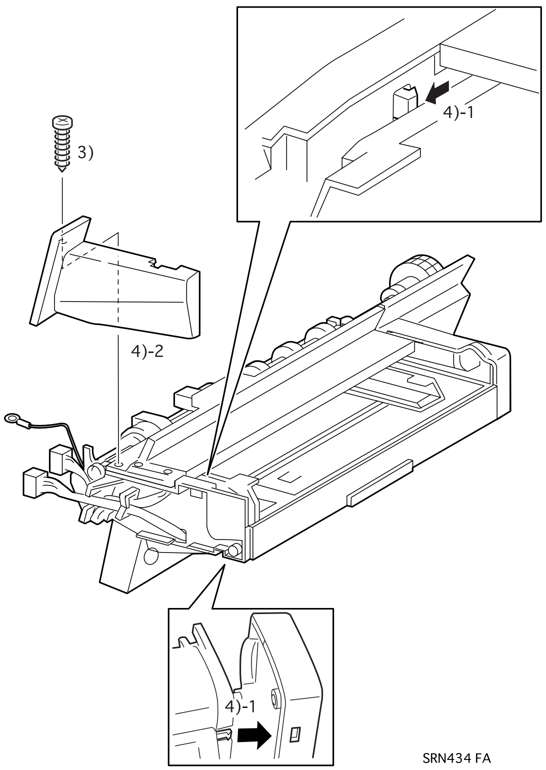


Figure 3-29. MSI FRONT COVER Removal

3.2.7.4 MSI REAR COVER Removal (PL4.1.4)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the screw (silver, tapped, 14mm) securing the MSI REAR COVER.

   NOTE: *In the following step, be careful not to break the hooks for the MSI REAR COVER and MSI FRAME.*

4. Release 2 hooks at the top of the MSI REAR COVER and the at the bottom of the MSI FRAME and remove the MSI REAR COVER.

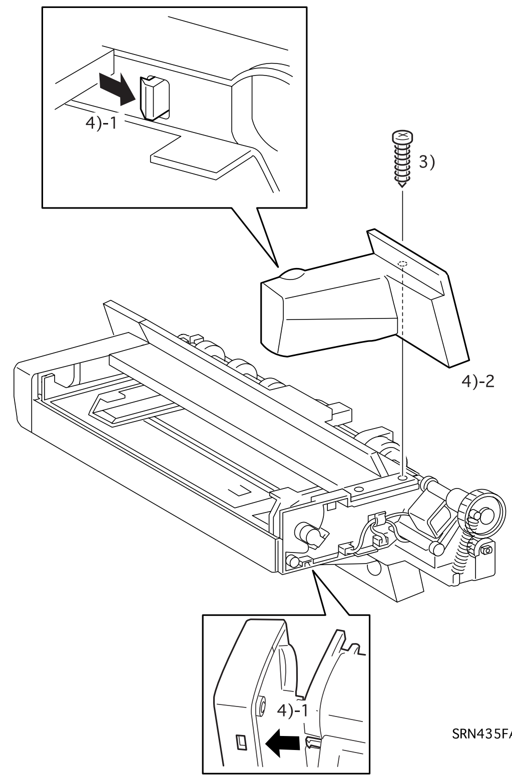


Figure 3-30. MSI REAR COVER Removal

3.2.7.5 MSI TOP COVER ASSEMBLY Removal (PL4.2.4)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MSI FRONT COVER. (See Section 3.2.7.4.)
4. Remove the MSI REAR COVER. (See Section 3.2.7.3.)

   NOTE: *In the following step, MSI TOP COVER ASSEMBLY is kept connected with MSI FRAME by a harness. Therefore, do not leave them too far.*

5. Remove 2 screws (silver, tapped, 14mm) securing the MSI TOP COVER ASSEMBLY, and remove the MSI TOP COVER ASSEMBLY along with the MSI HARNESS COVER from the MSI FRAME.
6. Release 2 hooks securing the MSI HARNESS COVER to the MSI TOP COVER ASSEMBLY, and remove the MSI HARNESS COVER.
7. Disconnect 2 connectors P/J203 and P/J204 (for the MSI EDGE SENSOR and MSI SHORT N/P SENSOR, respectively), and remove the MSI TOP COVER ASSEMBLY.

When installing the MSI TOP COVER ASSEMBLY, make sure that the harness is not caught between the MSI TOP COVER ASSEMBLY and MSI HARNESS COVER.

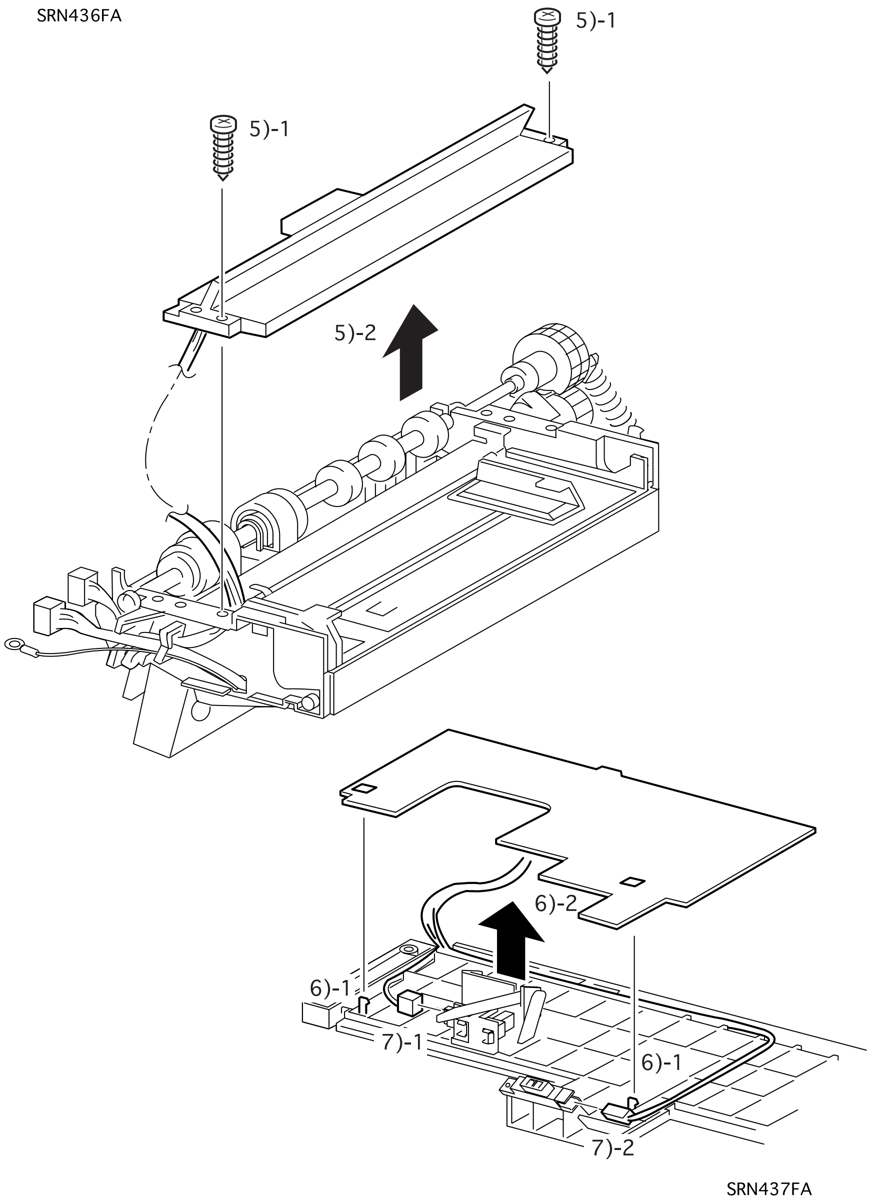


Figure 3-31. MSI TOP COVER ASSEMBLY Removal

3.2.7.6 MSI EDGE SENSOR Removal (PL4.2.6)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MSI FRONT COVER. (See Section 3.2.7.3.)
4. Remove the MSI REAR COVER. (See Section 3.2.7.4.)
5. Remove the MSI TOP COVER ASSEMBLY. (See Section 3.2.7.5.)
6. Remove 2 screws (gold, tapped, 8mm) securing the MSI EDGE SENSOR, and remove the EDGE SENSOR.

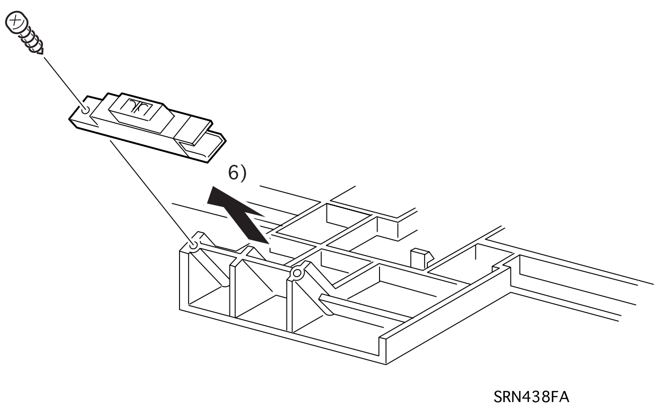


Figure 3-32. MSI EDGE SENSOR Removal

3.2.7.7 MSI SHORT N/P SENSOR Removal (PL4.2.7)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MSI FRONT COVER. (See Section 3.2.7.3.)
4. Remove the MSI REAR COVER. (See Section 3.2.7.4.)
5. Remove the MSI TOP COVER ASSEMBLY. (See Section 3.2.7.5.)

NOTE: *In the following step, be careful not to break the hooks for the MSI SHORT N/P SENSOR.*

6. Release the hooks securing the MSI SHORT N/P SENSOR to the MSI TOP COVER, and remove the MSI SHORT N/P SENSOR.

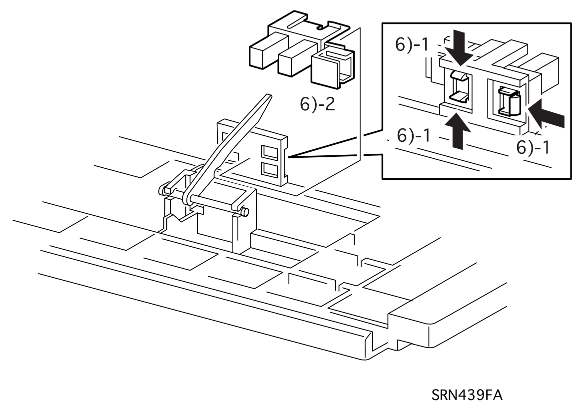


Figure 3-33. MSI SHORT N/P SENSOR Removal

3.2.7.8 PICK UP ROLL Removal (PL4.2.11)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)

   NOTE: *In the following step, be careful not to break the hooks for the FRONT CORE ROLL.*

3. Release 2 hooks securing the front and rear FRONT CORE ROLLs in the MSI ROLL ASSEMBLY from the groove on the PICK UP SHAFT, and move each FRONT CORE ROLL away from the PICK UP ROLL 20mm or more.
4. Slide each PICK UP ROLL toward the corresponding FRONT CORE ROLL, and lift them up to remove.

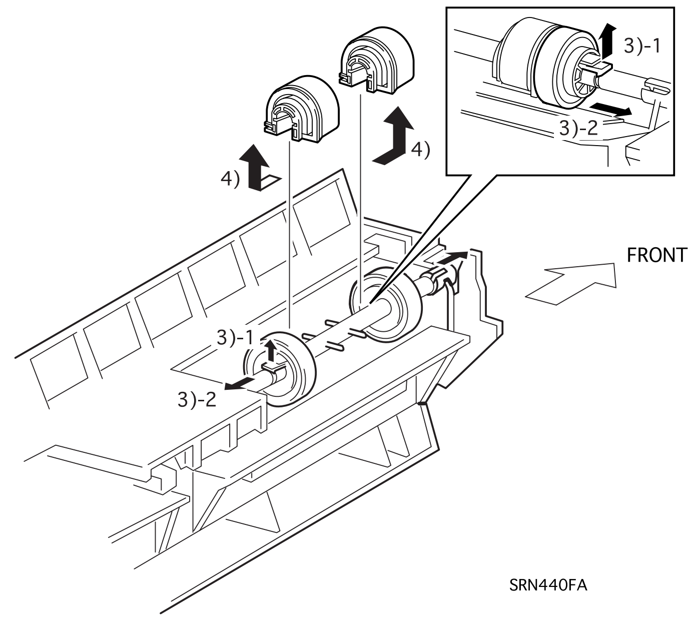


Figure 3-34. PICK UP ROLL Removal

CHECK POINT

When installing the PICK UP ROLL, set it in the following condition:

- **Set the roll surface facing to the opposite side of the cam of the PICK UP CAM.**
- **The arrow marked on the side of the PICK UP ROLL is indicating the rotating direction.**

While turning the FRONT CORE ROLL back to the position, hold the RETARD PAD ASSEMBLY down.

3.2.7.9 RETARD PAD ASSEMBLY Removal (PL4.3.3)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MSI FRONT COVER. (See Section 3.2.7.3.)
4. Remove the MSI REAR COVER. (See Section 3.2.7.4.)
5. Remove the MSI TOP COVER ASSEMBLY. (See Section 3.2.7.5.)
6. Remove the PICK UP ROLL. (See Section 3.2.7.8.)
7. Hold the MSI BOTTOM ASSEMBLY down.

   NOTE: *In the following step, if the FRONT CORE ROLL is above the RETARD PAD ASSEMBLY, shift it further away until it is not above the RETARD PAD ASSEMBLY.*

   NOTE: *In the following steps, note the following:*
   - Be careful not to break the hook and hinge.
   - Be careful not to drop and lose the RETARD SPRING as it may dislocate.

8. Using the standard driver or equivalent, push the hook on the RETARD PAD ASSEMBLY to release the hook from the MSI FRAME, and turn the RETARD PAD ASSEMBLY to the right.
9. Set the pad surface of the RETARD PAD ASSEMBLY vertical, then remove the RETARD PAD ASSEMBLY along with the RETARD SPRING pulling them out to the right.
10. Remove 2 RETARD SPRINGs from the RETARD PAD ASSEMBLY.

CHECK POINT

After installing the RETARD PAD ASSEMBLY, align the RETARD SPRING with the groove on the MSI FRAME by using tweezers.

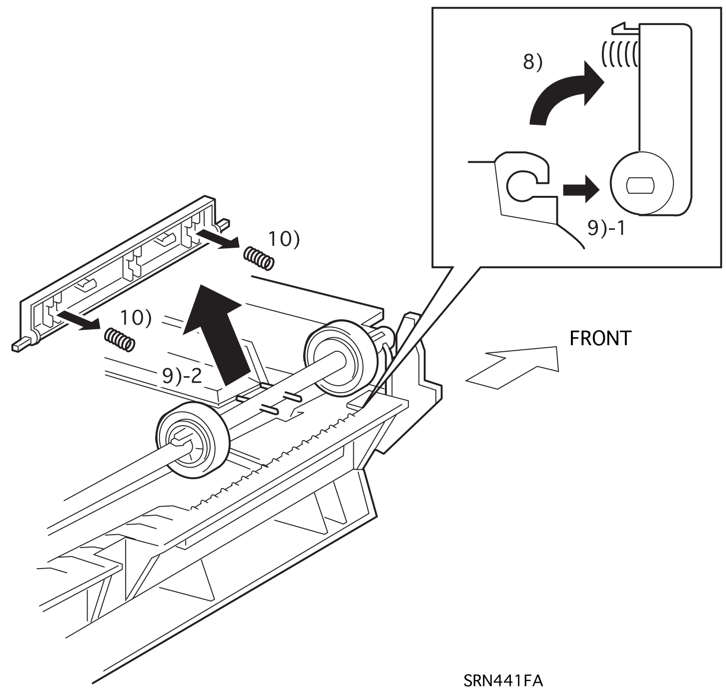


Figure 3-35. RETARD PAD ASSEMBLY Removal

3.2.7.10 PICK UP SOLENOID Removal (PL4.2.21)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MSI REAR COVER. (See Section 3.2.7.4.)
4. Disconnect the connector (P/J201B) for the PICK UP SOLENOID and release the harness from the clamp.
5. Remove the screw (gold, tapped, 8mm) securing the PICK UP SOLENOID and remove it.

CHECK POINT

- **When routing the harness, make sure it is not touching any gear.**
- **When installing the PICK UP SOLENOID, be sure to engage the notch on the PICK UP CAM GEAR and the arm of the PICK UP SOLENOID securely.**
- **After installing the PICK UP SOLENOID, check that the notch on the PICK UP CAM GEAR is held at the arm of the PICK UP SOLENOID. (with the PICK UP ROLL top and the cam of the PICK UP CAM bottom)**

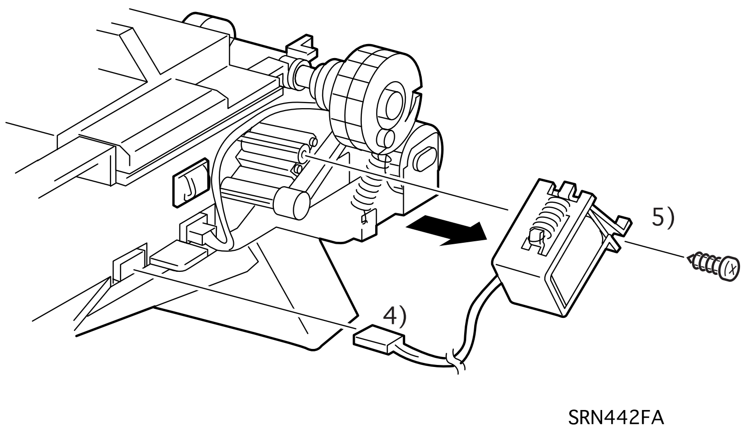


Figure 3-36. PICK UP SOLENOID Removal

3.2.7.11 MSI CLUTCH Removal (PL4.2.26)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MSI FRONT COVER. (See Section 3.2.7.3.)
4. Remove the MSI REAR COVER. (See Section 3.2.7.4.)
5. Remove the MSI TOP COVER ASSEMBLY. (See Section 3.2.7.5.)
6. Disconnect the connector (P/J202B) for the MSI CLUTCH and release the harness from the clamp.
7. Remove 3 screws (gold, tapped, 12mm) securing the MSI HOLDER, and remove the MSI HOLDER.

   NOTE: *In the following step, be careful not to drop and lose the PICK UP SPRING.*

8. Remove the PICK UP SPRING from the CLUTCH BRACKET and PICK UP GEAR.

   NOTE: *In the following step, be careful not to drop the MSI FRONT BEARING as it will come off.*

9. Remove 3 screws (gold, tapped, 8mm) securing the CLUTCH BRACKET and remove it along with the MSI CLUTCH.

   NOTE: *In the following step, be careful not to drop the MSI REAR BEARING as it will come off.*

10. Remove the MSI CLUTCH, MSI GEAR, and the MSI SHAFT from the CLUTCH BRACKET.
11. Remove the MSI GEAR from the MSI SHAFT.
12. Remove the E-ring securing the MSI SHAFT and remove the shaft from the MSI CLUTCH.

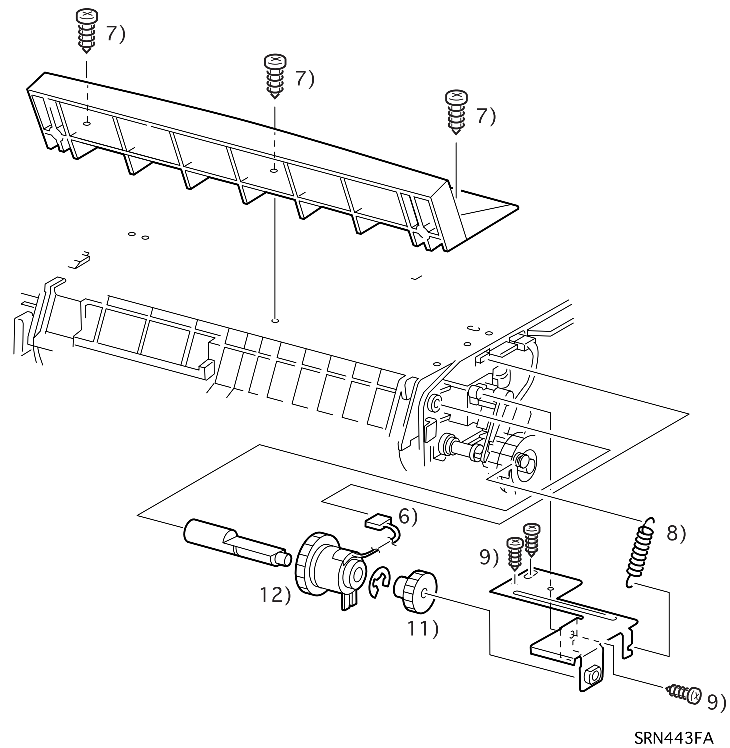


Figure 3-37. MSI CLUTCH Removal

- **When routing the harness, make sure it is not touching any gear.**
- **When installing the MSI CLUTCH, fit the pin on the CLUTCH BRACKET with the notch on the MSI CLUTCH.**

3.2.7.12 MSI ROLL ASSEMBLY Removal (PL4.2.9)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MSI FRONT COVER. (See Section 3.2.7.3.)
4. Remove the MSI REAR COVER. (See Section 3.2.7.4.)
5. Remove the MSI TOP COVER ASSEMBLY. (See Section 3.2.7.5.)
6. Remove the PICK UP SPRING from the CLUTCH BRACKET and PICK UP GEAR.
7. Release the hook for the PICK UP GEAR from the shaft and remove the PICK UP GEAR from the MSI ROLL ASSEMBLY.
8. Remove the PICK UP CAM GEAR, LEVER STOPPER, and CAM GEAR SPRING by one unit.

   NOTE: *In the following step, be careful with MSI BOTTOM ASSEMBLY, as it springs up while the MSI ROLL ASSEMBLY is being removed.*

9. Remove 2 E-rings securing the MSI ROLL ASSEMBLY, and remove 2 MSI BEARINGs.
10. Lift up the MSI ROLL ASSEMBLY and remove the MSI ROLL ASSEMBLY.

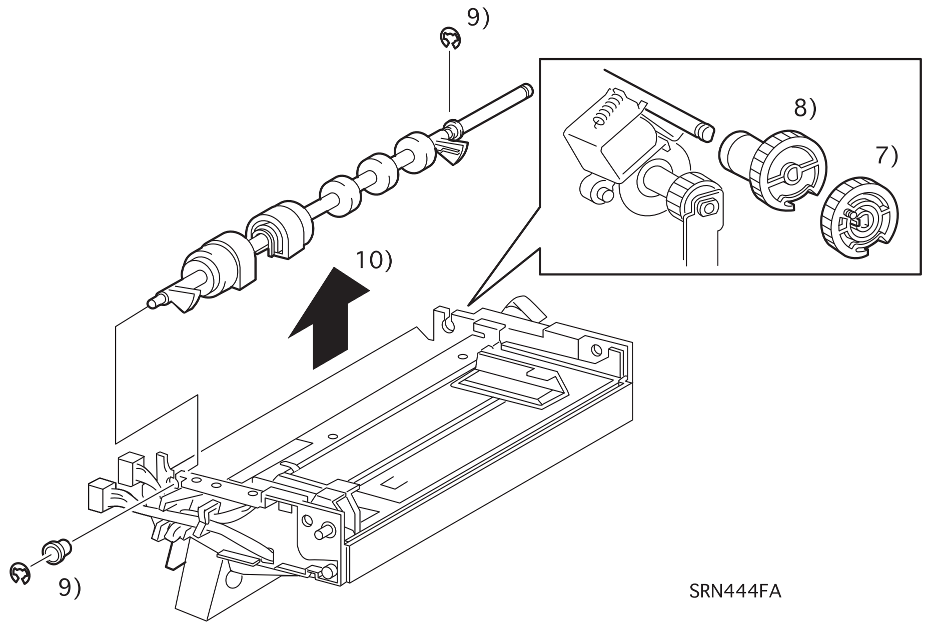


Figure 3-38. MSI ROLL ASSEMBLY Removal

CHECK POINT

- **Install the PICK UP CAM GEAR to the MSI ROLL ASSEMBLY with the arm of the PICK UP SOLENOID and the GEAR LEVER pressed down.**
- **After installing the MSI ROLL ASSEMBLY, check that the notch on the PICK UP CAM GEAR is held at the arm of the PICK UP SOLENOID. (with the PICK UP ROLL top and the cam of the PICK UP CAM bottom)**
- **When installing the MSI BEARING in the front, note following:**
  - **Do not bend the earth plate of the MSI FRAME.**
  - **The bearing is in full contact with the grounding plate.**

3.2.7.13 MSI BOTTOM ASSEMBLY Removal (PL4.3.9)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MSI FRONT COVER. (See Section 3.2.7.3.)
4. Remove the MSI REAR COVER. (See Section 3.2.7.4.)
5. Remove the MSI TOP COVER ASSEMBLY. (See Section 3.2.7.5.)
6. Remove the MSI ROLL ASSEMBLY. (See Section 3.2.7.12.)

   NOTE: *In the following steps, MSI N/F FRONT SPRING and MSI N/F REAR SPRING will be free from pressure. So, be careful not to drop and lose the springs.*

   NOTE: *In the following step, MSI BOTTOM ASSEMBLY and MSI FRAME will be connected with a harness. Therefore, do not leave them too far.*

7. Release the pegs on the rear then front sides of the MSI BOTTOM ASSEMBLY from the MSI FRAME, and remove the MSI BOTTOM ASSEMBLY.
8. Remove the screw (gold, tapped, 6mm) securing the MSI EARTH WIRE to the MSI BOTTOM PLATE.
9. Disconnect the connectors P/J206 for MSI LONG N/P SENSOR and release the harness from the clump. Then remove the MSI BOTTOM ASSEMBLY.

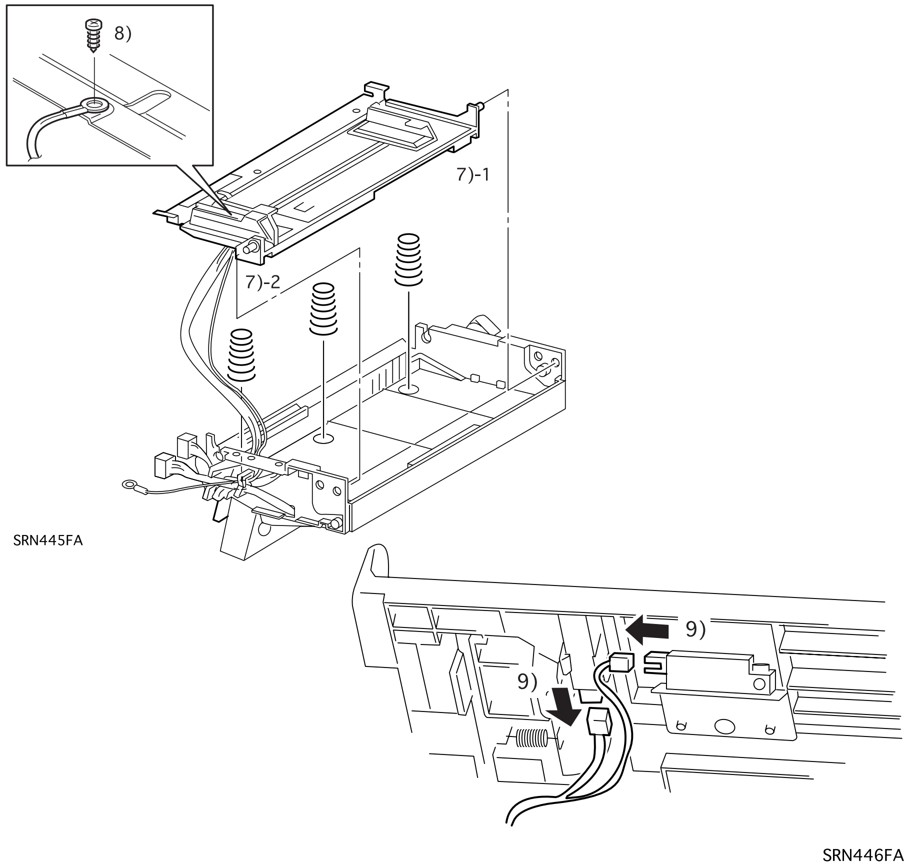


Figure 3-39. MSI BOTTOM ASSEMBLY Removal

CHECK POINT

- **Be sure to route the harness properly. Otherwise, the harness is slack and interferes with MSI BOTTOM ASSEMBLY.**
- **Set the MSI N/F FRONT SPRING (2 in front, color: silver) and the MSI N/F REAR SPRING (1 at the rear, color: black) securely so they operate properly.**

3.2.7.14 MSI LONG N/P SENSOR Removal (PL4.3.16)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MSI FRONT COVER. (See Section 3.2.7.3.)
4. Remove the MSI REAR COVER. (See Section 3.2.7.4.)
5. Remove the MSI TOP COVER ASSEMBLY. (See Section 3.2.7.5.)
6. Remove the MSI ROLL ASSEMBLY. (See Section 3.2.7.12.)
7. Remove the MSI BOTTOM ASSEMBLY. (See Section 3.2.7.13.)

   NOTE: *In the following step, be careful not to break the hooks for the MSI BASE TRAY.*

8. Release the MSI LONG N/P SENSOR from the hook in the MSI BASE TRAY, and remove the MSI LONG N/P SENSOR.

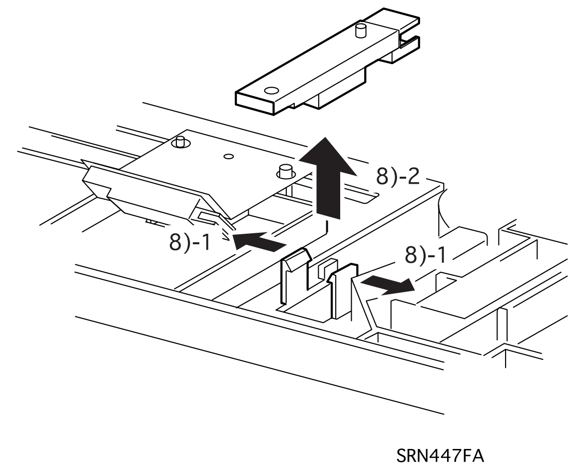


Figure 3-40. MSI LONG N/P SENSOR Removal

3.2.8 Paper Transportation

3.2.8.1 MAIN P/H ASSEMBLY Removal (PL5.1.1)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MAIN P/H COVER from the MAIN P/H ASSEMBLY.

   NOTE: *In the following steps, be careful not to drop the MAIN P/H ASSEMBLY.*

4. Among the slide rails securing the MAIN P/H ASSEMBLY to the printer, loosen following 2 screws well:
   -1 (black, cup head, 8mm) on the P/H FRONT RAIL S
   -1 (black, cup head, 8mm) on the P/H REAR RAIL S
   (They are securing the P/H FRAME ASSEMBLY, P/H FRONT RAIL S, and P/H REAR RAIL S.)
5. Leaving the P/H FRONT RAIL S, P/H FRONT RAIL L, P/H REAR RAIL S, and P/H REAR RAIL L in the printer, take out the MAIN P/H ASSEMBLY and remove it.
6. Using a standard driver or equivalent, push the stopper in the P/H FRONT RAIL L inward to remove the stopper from the frame in the printer, and remove the P/H FRONT RAIL S along with the P/H FRONT RAIL L.
7. Using a standard driver or equivalent, push the stopper in the P/H REAR RAIL L inward to remove the stopper from the frame in the printer, and remove the P/H REAR RAIL S along with the P/H REAR RAIL L.

Fasten well the screws preventing the P/H FRONT RAIL S and P/H FRONT RAIL L from coming off the P/H FRAME ASSEMBLY.

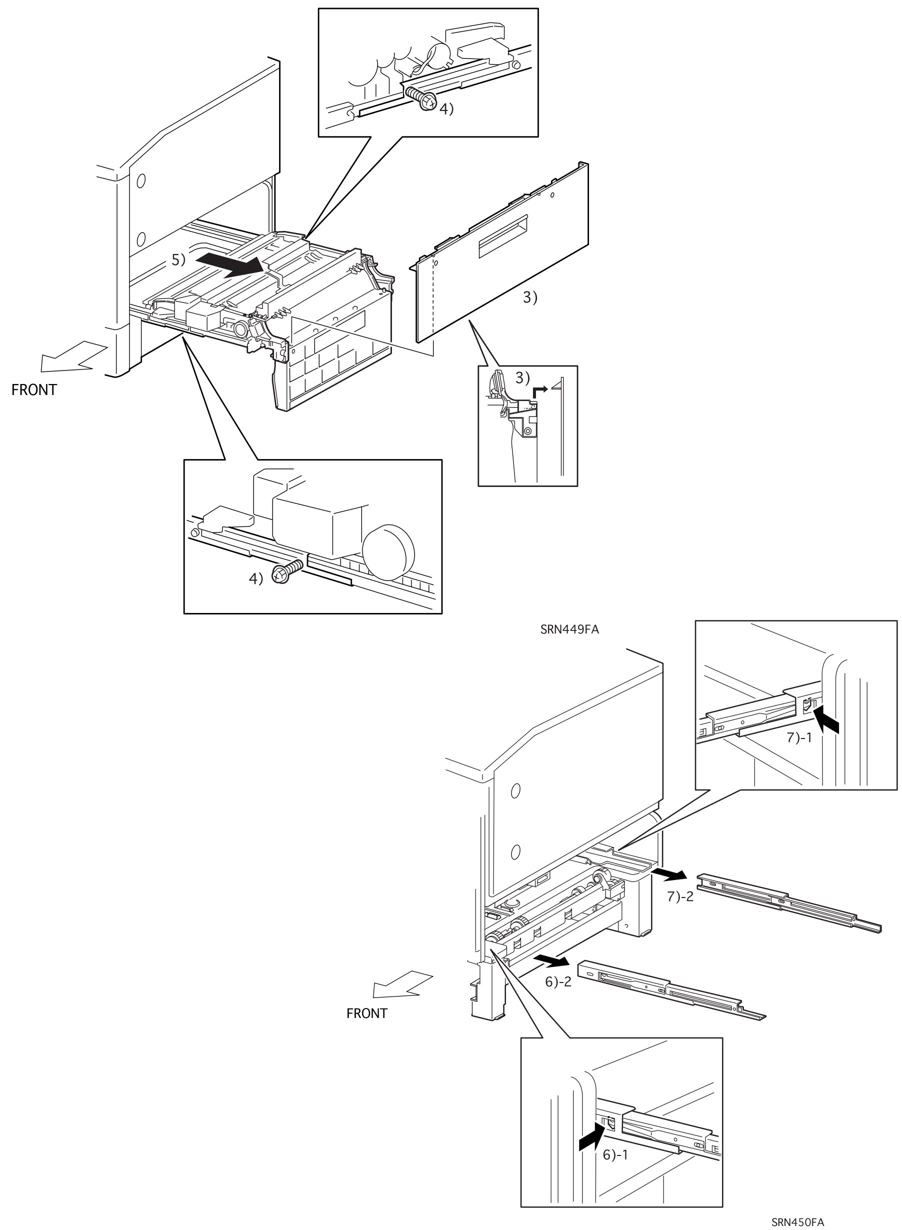


Figure 3-41. MAIN P/H ASSEMBLY Removal

3.2.8.2 PRE-REGI. CHUTE ASSEMBLY Removal (PL5.1.5)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)
4. Remove 2 screws (gold, tapped, 8mm) securing the PRE-REGI. CHUTE ASSEMBLY and remove the PRE-REGI. CHUTE ASSEMBLY.

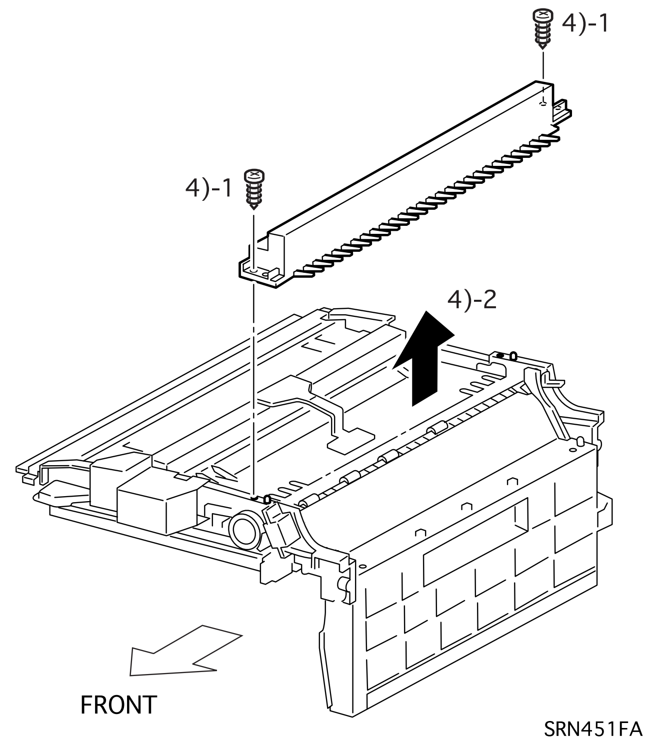


Figure 3-42. PRE-REGI. CHUTE ASSEMBLY Removal

3.2.8.3 P/H TURN CHUTE ASSEMBLY Removal (PL5.1.4)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)
4. Remove the PRE-REGI. CHUTE ASSEMBLY. (See Section 3.2.8.2.)

   NOTE: *In the following steps, be careful not to damage the housing which will be widen forcibly.*

5. Pulling the socket areas in the P/H FRAME ASSEMBLY where the pegs in the P/H TURN CHUTE ASSEMBLY fit in, turn the P/H TURN CHUTE ASSEMBLY in the direction indicated with the arrow (5)-1 (See the figure below.) to release the lower pegs from the P/H FRAME ASSEMBLY.

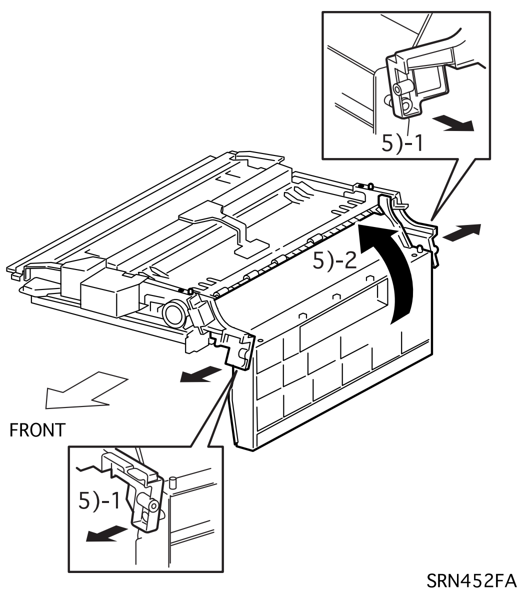


Figure 3-43. P/H TURN CHUTE ASSEMBLY Removal (1/2)

6. Push the upper pegs in the P/H TURN CHUTE ASSEMBLY inward and remove the P/H TURN CHUTE ASSEMBLY from the P/H FRAME ASSEMBLY

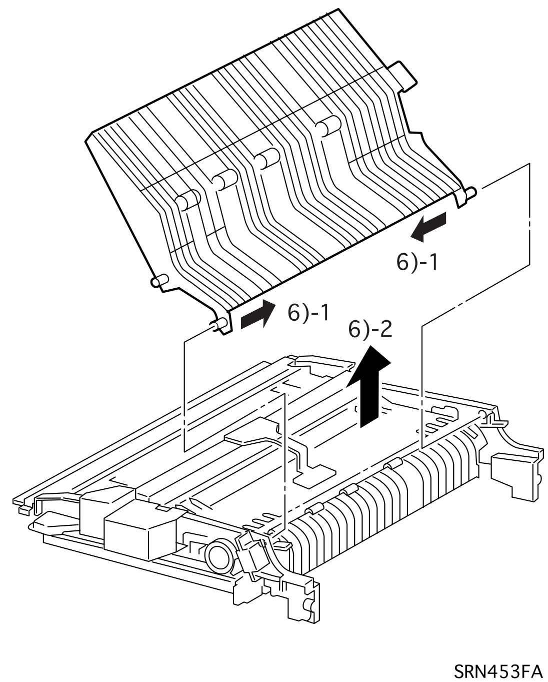


Figure 3-44. P/H TURN CHUTE ASSEMBLY Removal (2/2)

3.2.8.4 REGI. CHUTE ASSEMBLY Removal (PL5.1.6)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)
4. Remove the screw (silver, 6mm) securing the REGI. EARTH WIRE to the REGI. CHUTE ASSEMBLY and release the wire.
5. Remove the E-ring securing the REGI. CHUTE ASSEMBLY.

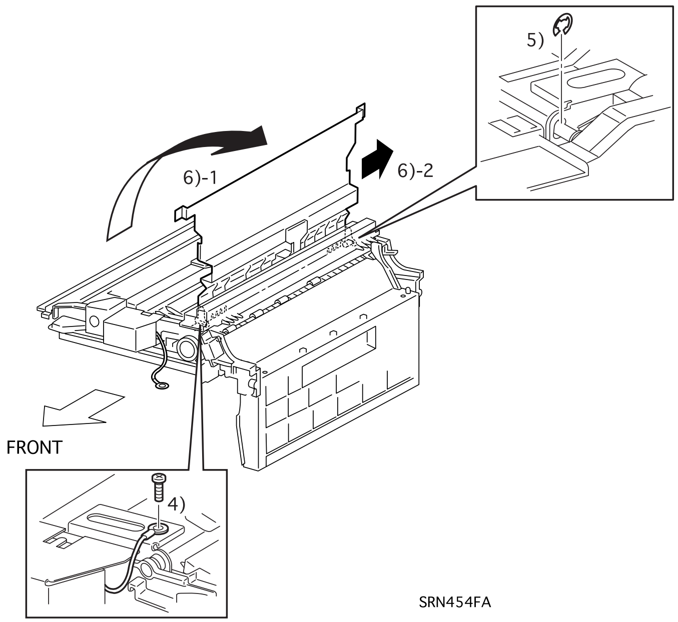


Figure 3-45. REGI. CHUTE ASSEMBLY Removal (1/2)

6. Open the REGI. CHUTE ASSEMBLY vertically and shift it to the rear until it touches the bottom of the rear stud to release the hole in the front from the front stud. Then lift up the front end and pull it out to the upper front to remove the REGI. CHUTE ASSEMBLY.

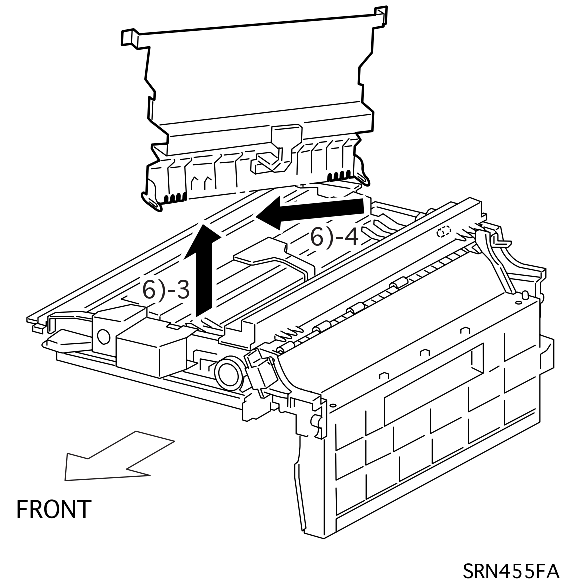


Figure 3-46. REGI. CHUTE ASSEMBLY Removal (2/2)

3.2.8.5 PRE-REGI. CLUTCH Removal (PL5.2.8)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)

   NOTE: *In the following step, hold the REGI. CHUTE ASSEMBLY to keep it closed while turning over the MAIN P/H ASSEMBLY.*

4. Remove 2 screws (gold, tapped, 8mm) securing the PRE-REGI. GEAR ASSEMBLY and remove it.

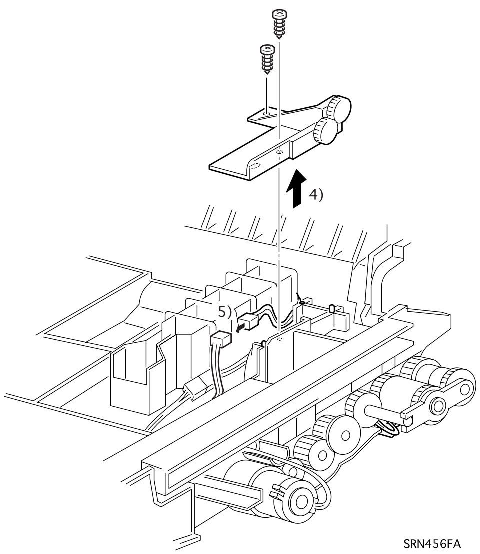


Figure 3-47. PRE-REGI. CLUTCH Removal (1/2)

5. Disconnect the connector (P/J95) for the PRE-REGI. CLUTCH from the back of the MAIN P/H ASSEMBLY, and release the harness.

   NOTE: *In the following step, be careful not to drop gears as they will be disengaged.*

6. Remove 2 E-rings fixing the PRE-REGI. SUPPORT and remove the PRE-REGI. SUPPORT toward the rear.
7. Among 2 PRE-REGI. GEAR 1, remove the outer one to the rear from the stud.
8. Disconnect the connector (P/J95) for the PRE-REGI. CLUTCH through the hole to the back of the MAIN P/H ASSEMBLY.
9. Remove the PRE-REGI. CLUTCH from the stud and remove the PRE-REGI CLUTCH.

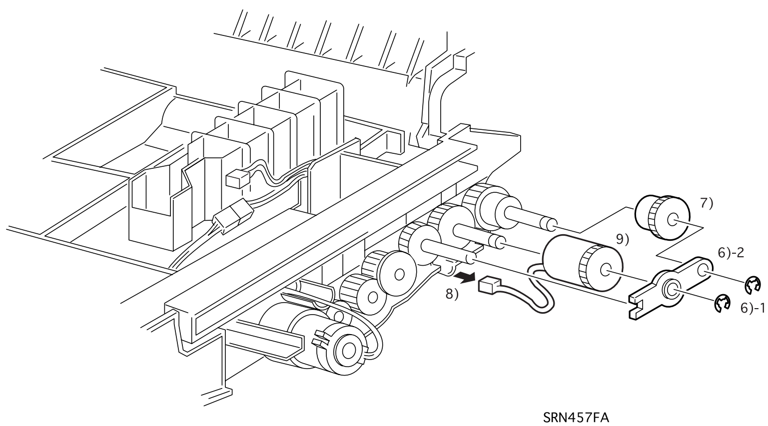


Figure 3-48. PRE-REGI. CLUTCH Removal (2/2)

CHECK POINT

- **When installing the PRE-REGI. CLUTCH, make sure the notch on the clutch is properly aligned with the pin on the MSI FRAME ASSEMBLY.**
- **Route the harness carefully so it does not touch any gear.**
- **If it is hard to connect the PRE-REGI CLUTCH connector, release the harness from the clump, then connect the connector.**

3.2.8.6 PRE-REGI. ROLL ASSEMBLY Removal (PL5.2.4)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)
4. Remove the PRE-REGI. CHUTE ASSEMBLY. (See Section 3.2.8.4.)
5. Remove the PRE-REGI. CLUTCH. (See Section 3.2.8.5.)
6. Remove the E-ring fixing the TURN IDLER GEAR, and then remove the TURN IDLER GEAR and the PRE-REGI. BEARING on the rear.
7. Pull the PRE-REGI. KNOB ASSEMBLY out of the PRE-REGI. ROLL ASSEMBLY to remove.

   NOTE: *In the following step, make sure you won't leave the MSI OUT HOLDER too far from the MSI FRAME ASSEMBLY, since they are kept connected with the harness.*

8. Remove 2 screws (gold, tapped, 8mm) securing the MSI OUT HOLDER and separate the MSI OUT HOLDER from the MSI FRAME ASSEMBLY.
9. Remove the E-ring in the front securing the PRE-REGI. ROLL ASSEMBLY, and then, using a standard screw driver, remove the PRE-REGI. BEARING in the front.
10. Lifting the PRE-REGI. ROLL ASSEMBLY up keeping it level, turn the assembly to align the pin on it with the cutout in the P/H FRAME ASSEMBLY, and shift the assembly backward.
11. Lift up the front end of the PRE-REGI. ROLL ASSEMBLY and pull it out to the upper front, and remove the PRE-REGI. GEAR 2 and PRE-REGI ROLL ASSEMBLY respectively.

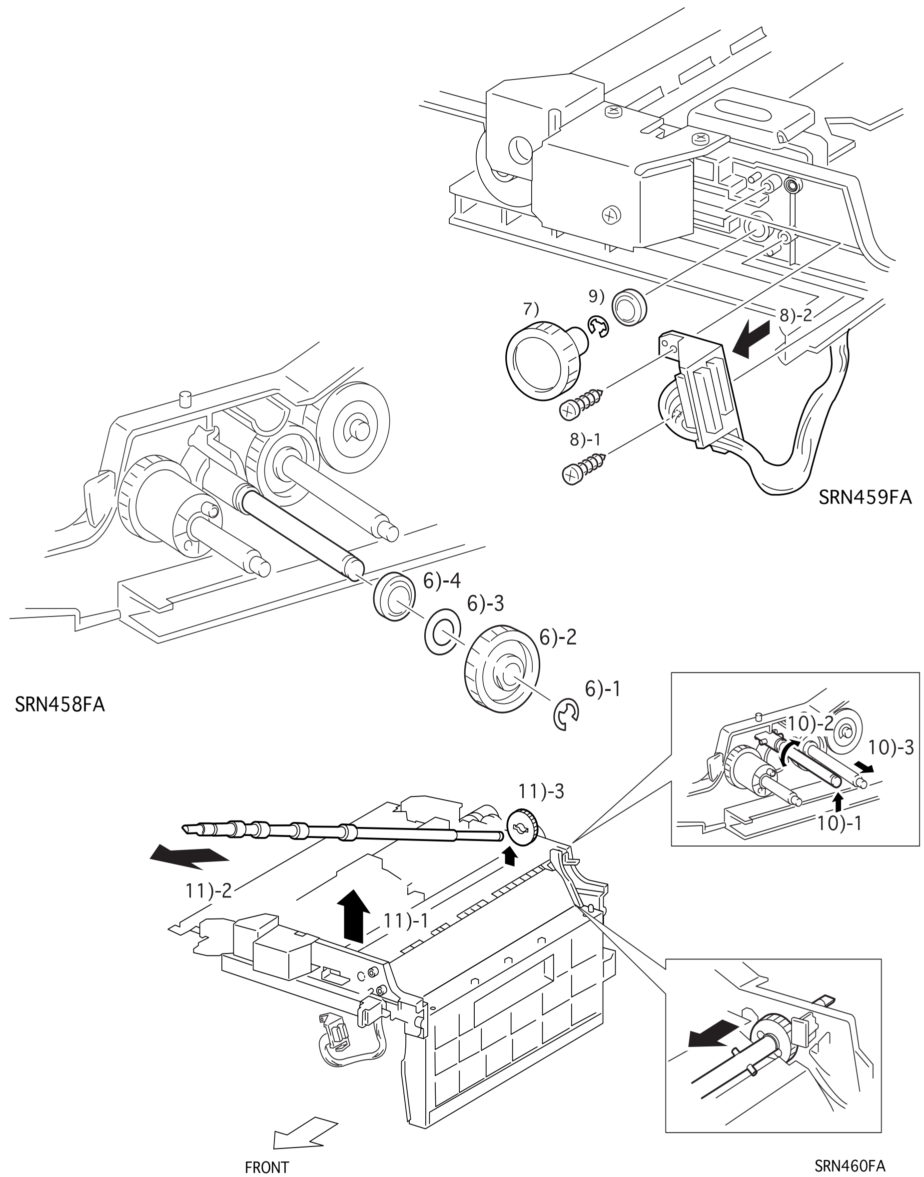


Figure 3-49. PRE-REGI. ROLL ASSEMBLY Removal

3.2.8.7 REGI. CLUTCH Removal (PL5.2.15)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)

   NOTE: *In the following step, hold the REGI. CHUTE ASSEMBLY to keep it closed while turning over the MAIN P/H ASSEMBLY.*

4. Disconnect the connector (P/J94) for the REGI. CLUTCH from the back of the MAIN P/H ASSEMBLY and release the harness.

   NOTE: *In the following step, be careful not to lose the REGI. UPPER BEARING, since it may come off when the REGI. CLUTCH is removed.*

   NOTE: *In the following step, be careful not to lose the REGI. SPACER.*

5. Pull the connector (P/J94) through the harness hole to the rear side of the MAIN P/H ASSEMBLY.
6. Remove the E-ring fixing the REGI. CLUTCH, and remove the REGI. SPACER and REGI. CLUTCH from the stud to the rear.

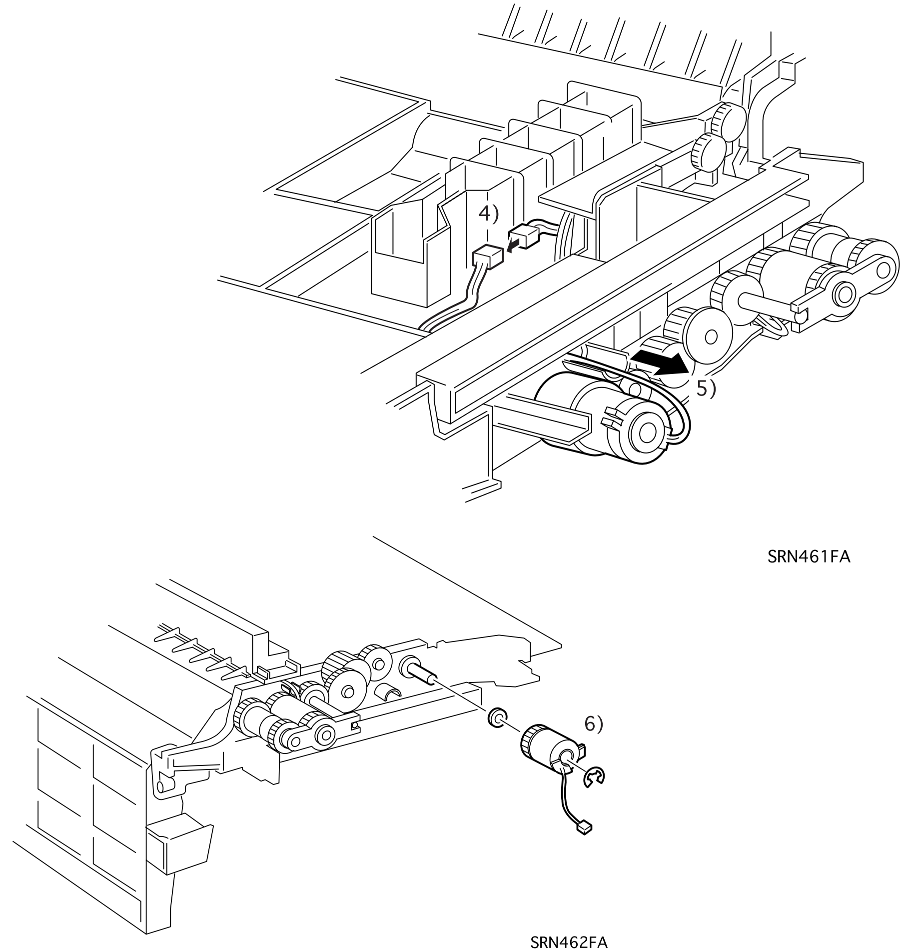


Figure 3-50. REGI. CLUTCH Removal

CHECK POINT

When installing the REGI. CLUTCH, align the notch on the REGI. CLUTCH with the pin on the P/H FRAME ASSEMBLY.

3.2.8.8 REGI. BRAKE CLUTCH Removal (PL5.2.20)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)

2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)

3. Remove the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)

   NOTE: *In the following step, hold the REGI. CHUTE ASSEMBLY to keep it closed while turning over the MAIN P/H ASSEMBLY.*

4. Disconnect the connector (P/J109) for the REGI. BRAKE CLUTCH from the back of the MAIN P/H ASSEMBLY and release the harness.

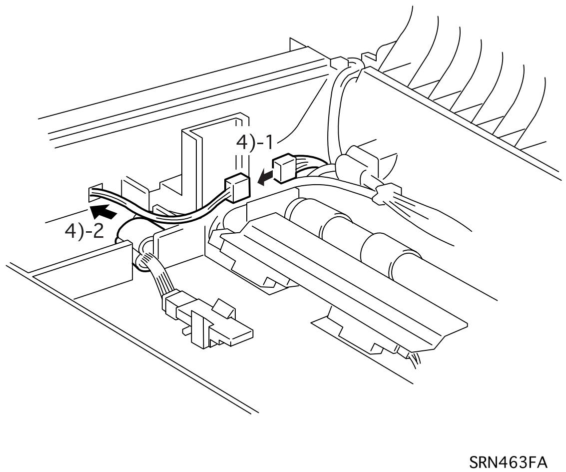
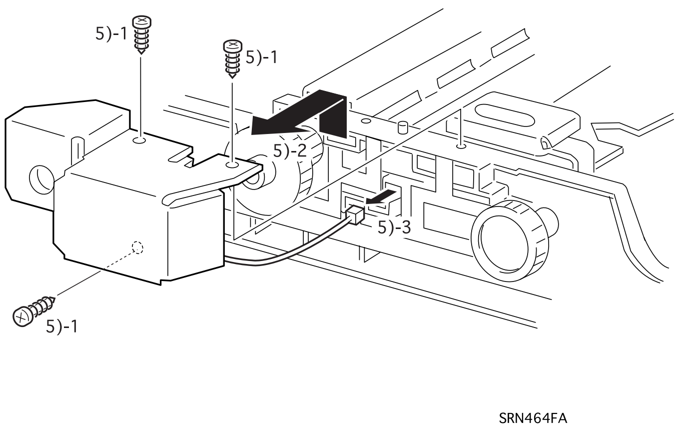


Figure 3-51. REGI. BRAKE CLUTCH Removal (1/2)

5. Remove 3 screws (gold tapped, 8mm) securing the REGI. BRAKE ASSEMBLY, and remove the REGI. BRAKE ASSEMBLY.

6. Remove 2 E-rings; one securing the REGI. BRAKE CLUTCH and the other securing the REGI BRAKE GEAR.

7. Remove the REGI. BRAKE CLUTCH and REGI. BRAKE GEAR from the REGI. BRAKE BRACKET.



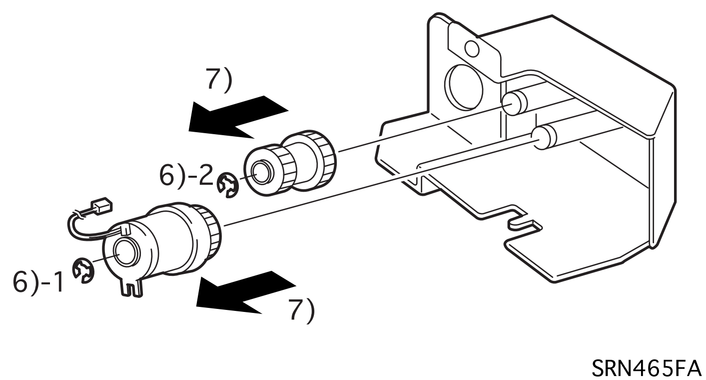


Figure 3-52. REGI. BRAKE CLUTCH Removal (2/2)

3.2.8.9 REGI. METAL ROLL Removal (PL5.2.16)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)
4. Remove the REGI. CLUTCH. (See Section 3.2.8.7.)
5. Using the standard driver or equivalent, remove the REGI UPPER BEARING at the back of the REGI. METAL ROLL.
6. Remove the REGI. BRAKE ASSEMBLY. (Refer to Section 3.2.8.8.)
7. Remove the E-ring fixing the REGI. OUT GEAR and remove the REGI. OUT GEAR.
8. Using a standard driver or equivalent, remove the REGI. UPPER BEARING in front of the REGI. METAL ROLL.
9. Open the REGI. CHUTE ASSEMBLY.
10. Lift up the rear part of the REGI. METAL ROLL and shift it to the rear. Then remove the REGI. METAL ROLL.

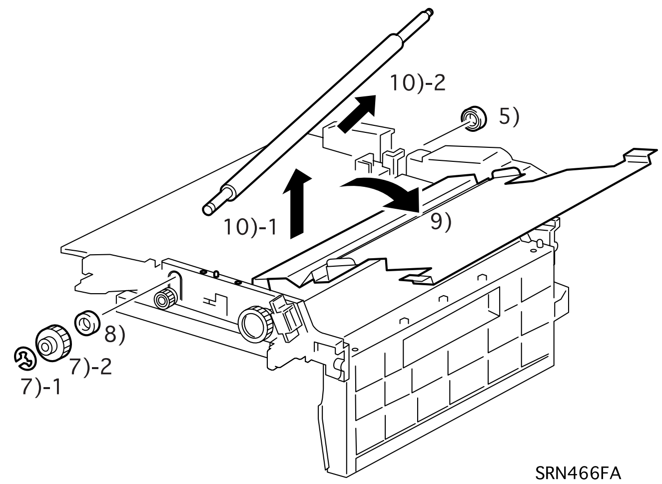


Figure 3-53. REGI. METAL ROLL Removal

CHECK POINT

When installing the REGI. METAL ROLL the side whose end with shorter diameter is longer than the other must come to the front.

3.2.8.10 REGI. RUBBER ROLL Removal (PL5.2.24)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)
4. Remove the REGI. CLUTCH. (See Section 3.2.8.7.)
5. Remove the REGI. BRAKE CLUTCH ASSEMBLY. (Refer to Section 3.2.8.8.)
6. Remove the REGI. METAL ROLL. (Refer to Section 3.2.8.9.)

   NOTE: *In the following steps, be careful not to drop and lose the REGI. FRONT SPRING and REGI. REAR SPRING.*

7. Remove the front E-ring fixing the REGI. RUBBER ROLL to remove the REGI. GEAR.
8. Taking out the front REGI. LOWER BEARING, remove the REGI. FRONT SPRING and REGI. LOWER BEARING.
9. Remove the E-ring securing the REGI. RUBBER ROLL by the rear end. Then, taking out the rear REGI. LOWER BEARING, remove the REGI. LOWER BEARING and the REGI. REAR SPRING.

   NOTE: *In the following step, be careful not to damage the mylar film attached onto the P/H FRAME ASSEMBLY.*

10. Lifting up the rear end of the REGI. RUBBER ROLL, pull out the roll to the upper rear to remove.

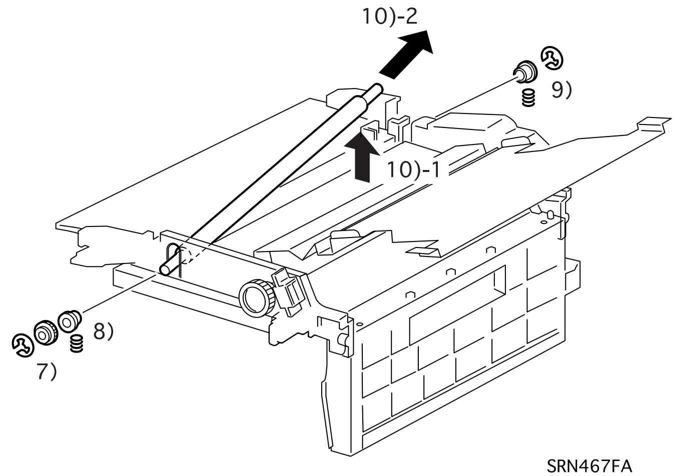


Figure 3-54. REGI. RUBBER ROLL Removal

CHECK POINT

When installing the REGI, RUBBER ROLL, be careful not to damage the mylar film attached onto the P/H FRAME ASSEMBLY.

3.2.8.11 REGI. SENSOR Removal (PL5.2.28)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)

   NOTE: *In the following step, hold the REGI. CHUTE ASSEMBLY to keep it closed while turning over the MAIN P/H ASSEMBLY.*

4. Disconnect the connector (P/J93) for REGI. SENSOR from the back of the MAIN P/H ASSEMBLY.

   NOTE: *In the following step, be careful not to break the hooks in the P/H FRAME ASSEMBLY.*

5. Release the hooks on the P/H FRAME ASSEMBLY securing the REGI. SENSOR and lift the sensor up vertically to remove.

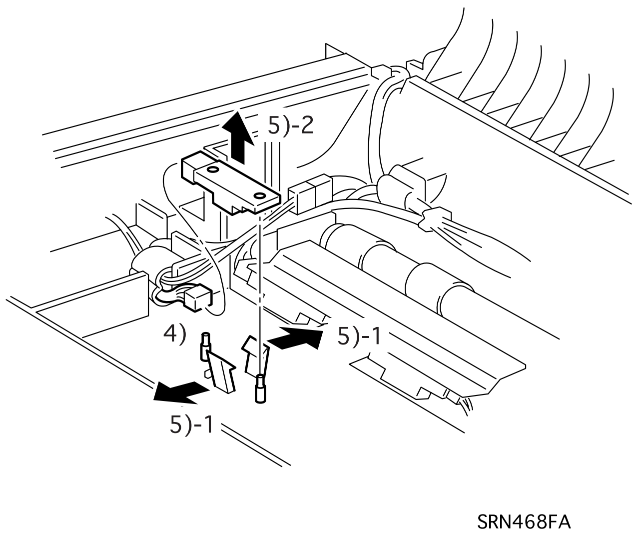


Figure 3-55. REGI. SENSOR Removal

CHECK POINT

When installing the REGI. SENSOR, make sure the sensor is securely hooked to the P/H FRAME ASSEMBLY.

3.2.8.12 FRONT OHP SENSOR Removal (PL5.2.31)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)

   NOTE: *In the following steps, hold the REGI. CHUTE ASSEMBLY to keep it closed while turning over the MAIN P/H ASSEMBLY.*
   NOTE: *In the following step, do not move the OHP SENSOR ASSEMBLY too far from the P/H FRAME ASSEMBLY, since they are connected with the harness.*

4. Remove the screw (gold, tapped, 8mm) securing the OHP SENSOR ASSEMBLY, and remove the OHP SENSOR ASSEMBLY from the P/H FRAME ASSEMBLY.
5. Disconnect the connectors P/J98 for the FRONT OHP SENSOR
6. Remove the screw (gold, 6mm) securing the FRONT OHP SENSOR and remove the FRONT OHP SENSOR.

CHECK POINT

When installing the OHP SENSOR ASSEMBLY, make sure the harnesses are not caught between the OHP SENSOR ASSEMBLY and P/H FRAME ASSEMBLY.

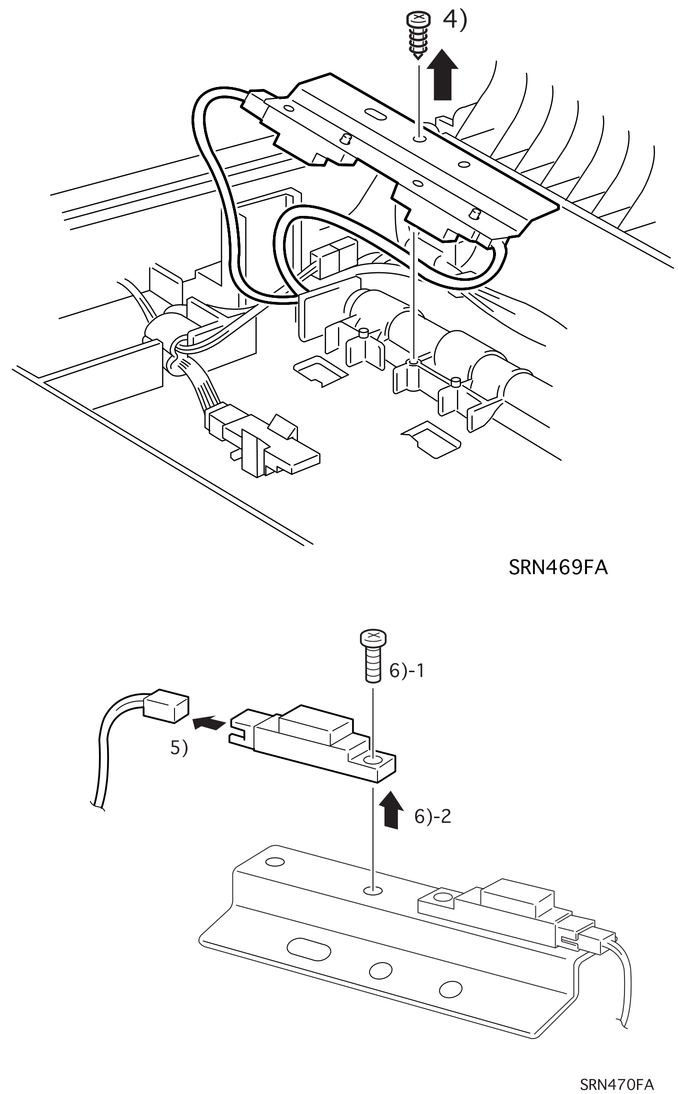


Figure 3-56. FRONT OHP SENSOR Removal

3.2.8.13 REAR OHP SENSOR Removal (PL5.2.32)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MSI ASSEMBLY. (See Section 3.2.7.2.)
3. Remove the MAIN P/H ASSEMBLY. (See Section 3.2.8.1.)

   NOTE: *In the following steps, hold the REGI. CHUTE ASSEMBLY to keep it closed while turning over the MAIN P/H ASSEMBLY.*

   NOTE: *In the following step, do not move the OHP SENSOR ASSEMBLY too away from the P/H FRAME ASSEMBLY, since they are connected with the harness.*

4. Remove the screw (gold, tapped, 8mm) securing the OHP SENSOR ASSEMBLY, and remove the OHP SENSOR ASSEMBLY from the P/H FRAME ASSEMBLY.
5. Disconnect the connectors P/J99 for the REAR OHP SENSOR.
6. Remove the screw (gold, 6mm) securing the REAR OHP SENSOR and remove the REAR OHP SENSOR.

CHECK POINT

When installing the OHP SENSOR ASSEMBLY, make sure the harnesses are not caught between the OHP SENSOR ASSEMBLY and P/H FRAME ASSEMBLY.

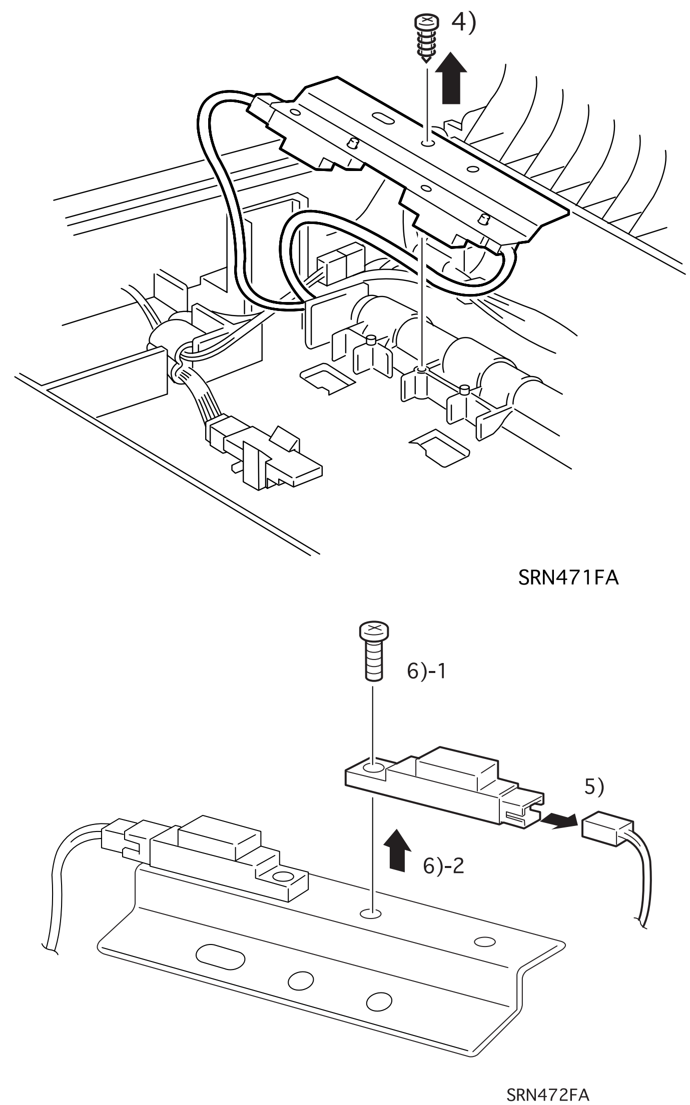


Figure 3-57. REAR OHP SENSOR Removal

3.2.9 Xerographics

3.2.9.1 DRUM CARTRIDGE Removal (PL6.1.10)

1. Open the FRONT COVER ASSEMBLY.
2. Turn the TENSION LEVER to the unlocking position to release the DRUM CARTRIDGE from the IBT BELT ASSEMBLY.

   NOTE: *In the following step, do not touch the drum surface of the DRUM CARTRIDGE.*
   NOTE: *After removing the DRUM CARTRIDGE, place the cartridge level on a safe place and keep it out direct sunlight.*

3. Turn the drum cartridge lock lever to the unlocking position and draw the DRUM CARTRIDGE enough to hold the belt on the top, then take out the DRUM CARTRIDGE horizontally and remove it.

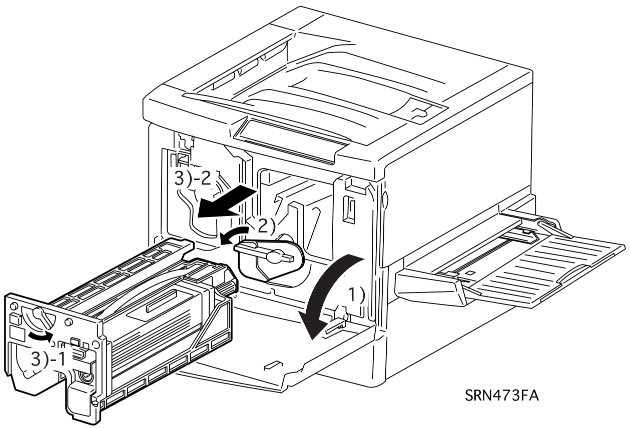


Figure 3-58. DRUM CARTRIDGE Removal

When installing the drum cartridge, make sure the positioning labels on the drum cartridge are properly aligned wit the corresponding labels on the XL RAIL ASSEMBLY.

3.2.9.2 WASTE TONER BOX Removal (PL6.1.12)

1. Open the FRONT COVER ASSEMBLY.

   NOTE: *After removing the WASTE TONER BOX in the following step, place it level on a safe place.*

2. Push down the tab on the hook of the WASTE TONER BOX and take out the WASTE TONER BOX horizontally to remove.

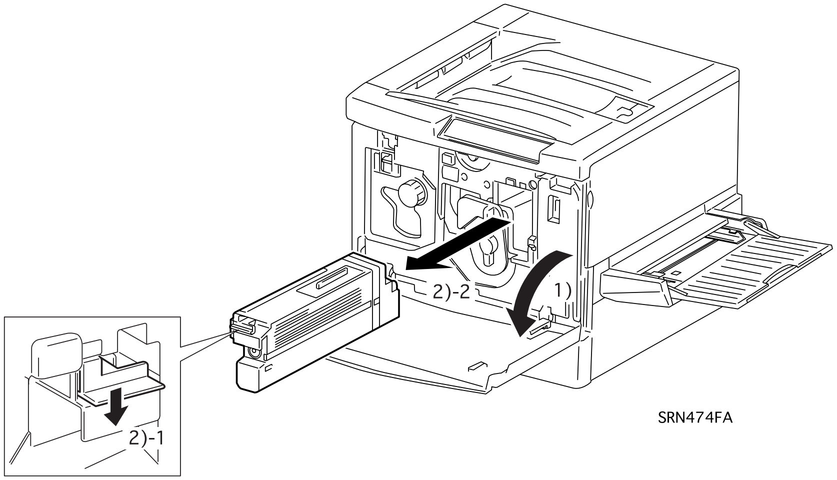


Figure 3-59. WASTE TONER BOX Removal

When installing the WASTE TONER BOX, make sure the hook for the WASTE TONER BOX securely fits in the locking position.

3.2.9.3 ROS ASSEMBLY Removal (PL6.1.1)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove 8 screws (silver, cup head, 6mm) securing the ROS COVER and remove the ROS COVER.
3. Disconnect 3 connectors (P/J121, 122, and 124) for the ROS ASSEMBLY.

   NOTE: *In the following step, ROS ASSEMBLY is kept connected to the XL RAIL ASSEMBLY with the harness. Do not move the ROS ASSEMBLY to away from the XL RAIL ASSEMBLY.*

   NOTE: *In the following steps, keep your hands away from the window part of the ROS ASSEMBLY, where laser beam is emitted, and other functioning parts such as motor shaft.*

4. Remove 4 screws (black, cup head, 12mm) securing the ROS ASSEMBLY and remove the ROS ASSEMBLY from the printer.
5. Remove the connector (P/J123) at bottom of the ROS ASSEMBLY and remove the ROS ASSEMBLY carefully.

CHECK POINT

- **Keep the harness away from the motor shaft of the Scanner assembly in the ROS ASSEMBLY.**
- **Do not get the harnesses caught between the ROS ASSEMBLY and the frame.**

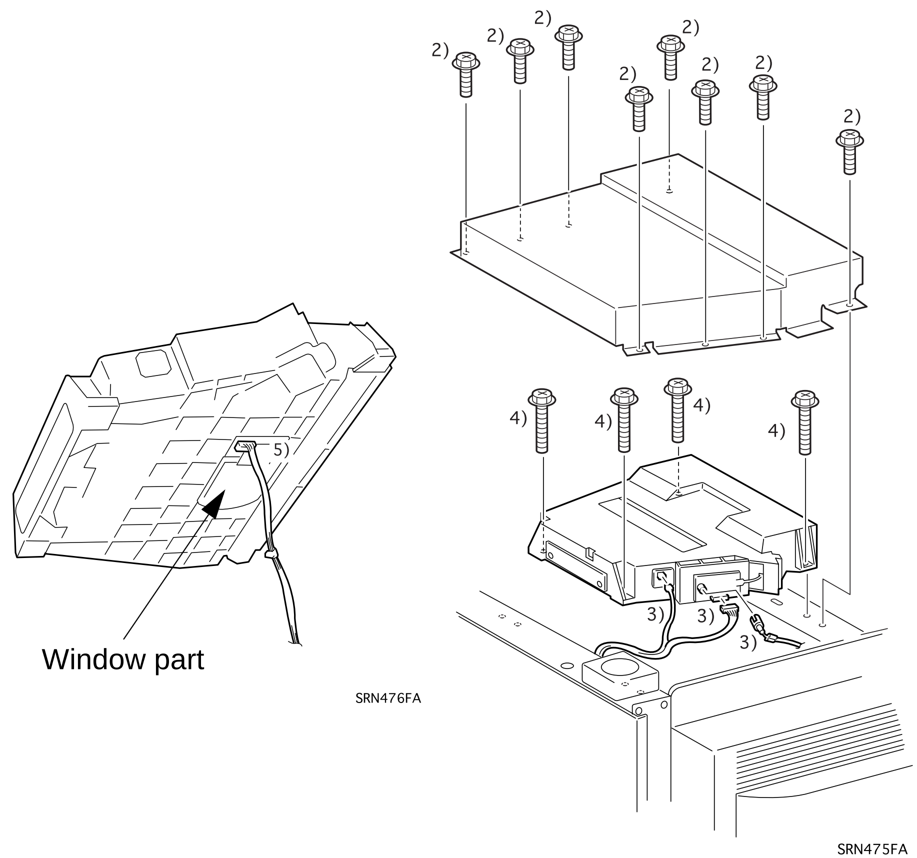


Figure 3-60. ROS ASSEMBLY Removal (2/2)

3.2.9.4 ADC SENSOR ASSEMBLY Removal (PL6.1.20)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
3. Remove the TENSION LEVER. (See Section 3.2.11.1.)
4. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.4.)
5. Disconnect the connector (P/J81) for the ADC SENSOR ASSEMBLY. Then release the harness from the clamp and pull it out from the harness hole to bring it to the inner side.

   NOTE: *In the following step, keep your hands off the IBT BELT ASSEMBLY and the Magnet roll in the DEVELOPER ASSEMBLY.*

6. Remove the E-ring securing the ADC SENSOR ASSEMBLY.
7. Shift the ADC SENSOR ASSEMBLY to the rear to release the front end from the frame. Then release the rear end of the shaft from the frame, and take the ADC SENSOR ASSEMBLY out to the front.

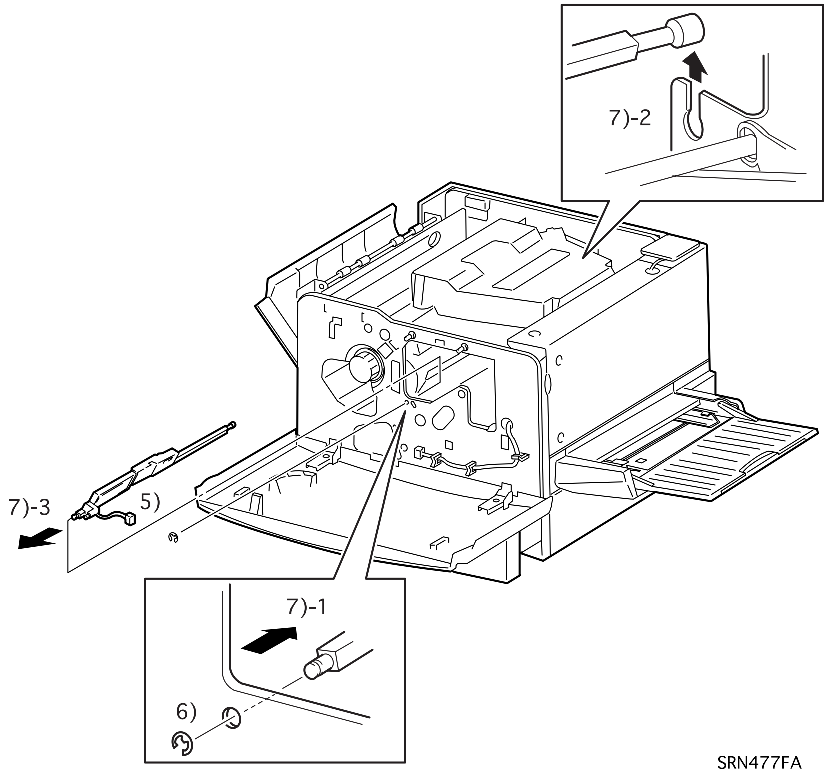


Figure 3-61. ADC SENSOR ASSEMBLY Removal

CHECK POINT

When installing the ADC SENSOR ASSEMBLY, be sure to set the shaft of the assembly securely to the front and rear frames of the printer body.

3.2.9.5 XL RAIL ASSEMBLY Removal (PL6.1.40)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
3. Remove the ROS ASSEMBLY. (See Section 3.2.9.3.)
4. Remove the connectors P/J86 and P/J116 for the ERASE LAMP ASSEMBLY and the TONER BOX HARNESS, respectively.
5. Release the harnesses for the ERASE LAMP, ROS HARNESS, and VIDEO HARNESS from the clamps.

   NOTE: *In the following step, be sure not to damage the IBT BELT ASSEMBLY and the Magnet Rolls in the Developer Assembly with such parts as XL RAIL ASSEMBLY and the harnesses.*

   NOTE: *In the following step, be sure to keep your hands off the IBT BELT ASSEMBLY and the Magnet Roll surface.*

6. Remove 4 screws (sliver, cup head, 8mm) securing the XL RAIL ASSEMBLY, and then remove the XL RAIL ASSEMBLY.

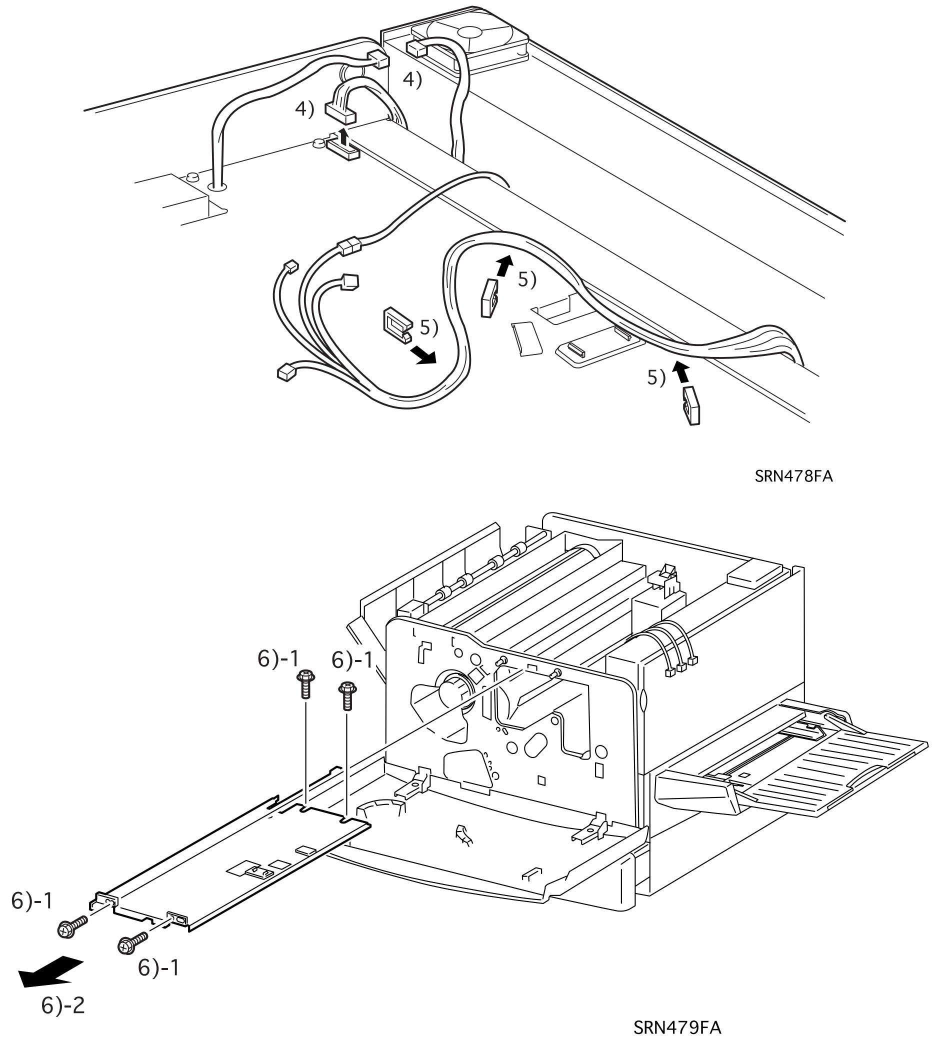


Figure 3-62. XL RAIL ASSEMBLY Removal

CHECK POINT

- **When installing the XL RAIL ASSEMBLY, be sure not to damage the IBT BELT ASSEMBLY and the Magnet Rolls in the Developer Assembly with such parts as XL RAIL ASSEMBLY and the harnesses.**
- **When installing the XL RAIL ASSEMBLY, be sure to keep your hands off the IBT BELT ASSEMBLY and the Magnet Roll surface.**

3.2.9.6 WASTE TONER SENSOR Removal (PL6.1.42)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
3. Remove the ROS ASSEMBLY. (See Section 3.2.9.3.)
4. Remove the XL RAIL ASSEMBLY. (See Section 3.2.9.5.)
5. Release the harness from the hook on the XL RAIL ASSEMBLY and the clamp.
6. Disconnect the connector (P/J88) for the WASTE TONER SENSOR.
7. Release the hooks securing the WASTE TONER SENSOR from the XL RAIL ASSEMBLY, and remove the WASTE TONER SENSOR.

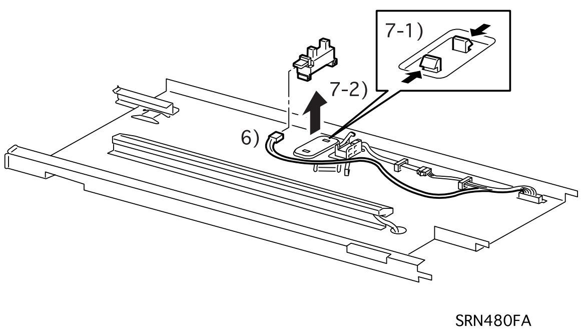


Figure 3-63. WASTE TONER SENSOR Removal

CHECK POINT

When installing the WASTE TONER SENSOR, make sure the harness is not loosely routed.

3.2.9.7 TONER BOX SENSOR Removal (PL6.1.43)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
3. Remove the ROS ASSEMBLY. (See Section 3.2.9.3.)
4. Remove the XL RAIL ASSEMBLY. (See Section 3.2.9.5.)
5. Release the harness for the TONER BOX SENSOR from the clamp.
6. Disconnect the connector (P/J83A) for the TONER BOX SENSOR.
7. Unhook the TONER BOX SENSOR from the XL RAIL ASSEMBLY, and remove the TONER BOX SENSOR.

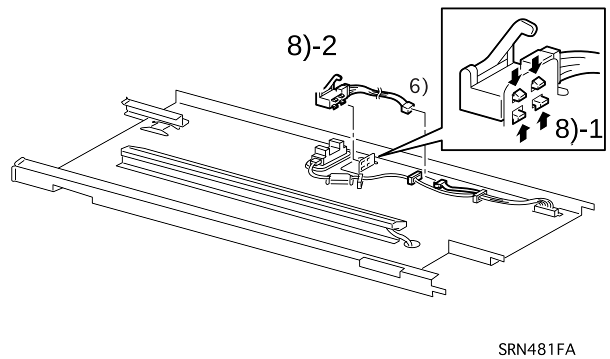


Figure 3-64. TONER BOX SENSOR Removal

CHECK POINT

When installing the TONER BOX SENSOR, make sure the harness is not loosely routed.

3.2.9.8 ERASE LAMP ASSEMBLY Removal (PL6.1.30)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
3. Remove the ROS ASSEMBLY. (See Section 3.2.9.3.)
4. Remove the XL RAIL ASSEMBLY. (See Section 3.2.9.5.)
5. Take the harness for the ERASE LAMP ASSEMBLY out of the hole to release it.
6. Using a standard driver, release the hooks securing the ERASE LAMP ASSEMBLY from the XL RAIL and remove the ERASE LAMP ASSEMBLY.

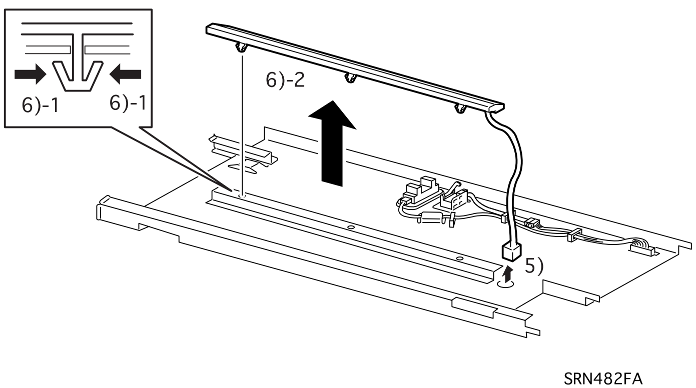


Figure 3-65. ERASE LAMP ASSEMBLY Removal

3.2.10 Development

NOTE: *The generic term “Toner Cartridge” is used for “TONER Cartridge Y”, “TONER CARTRIDGE M”, “TONER CARTRIDGE C”, and “TONER CARTRIDGE K”.*

3.2.10.1 Toner Cartridge Removal (PL7.1.1 ~ PL7.1.4)

1. Open the FRONT COVER ASSEMBLY.
2. Push up the ROTARY LATCH LEVER and turn the ROTARY KNOB ASSEMBLY to set the Toner Cartridge to be replaced to the replacing position.

   NOTE: *After removing the toner cartridge, place it level on a safe surface.*

3. Turn the lever on the cartridge to the unlocking position and take the Toner Cartridge out.

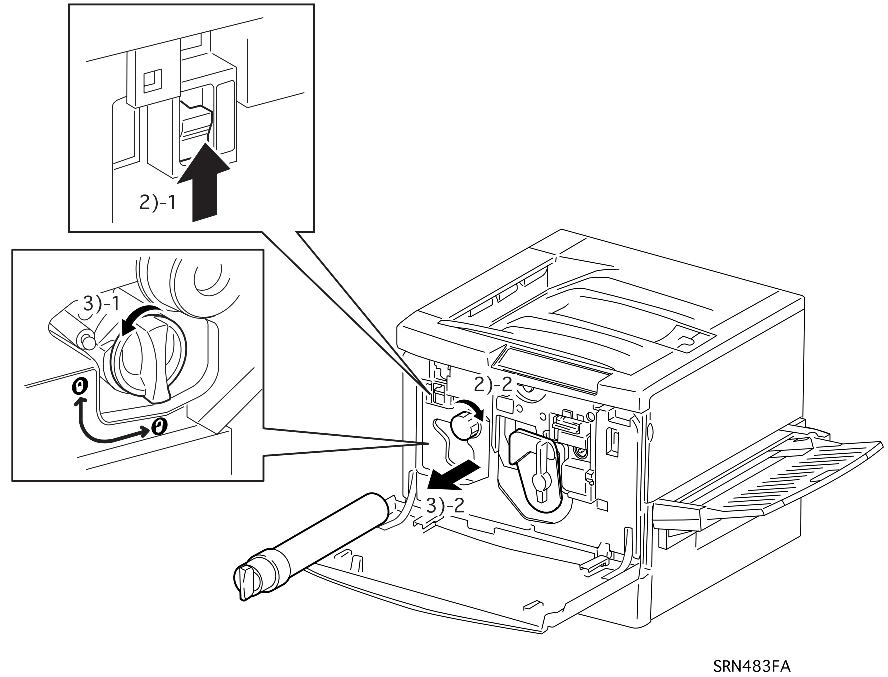


Figure 3-66. Toner Cartridge Removal

CHECK POINT

Installing the Toner Cartridge with the arrow mark on it facing upward.

3.2.10.2 Developer Assembly Removal (PL7.1.10, PL7.1.20, PL7.1.30, PL7.1.40)

NOTE: *The generic term “Developer Assembly” is used for “DEVELOPPER ASSEMBLY Y/M/C/K”.*

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
3. Remove the TENSION LEVER. (See Section 3.2.11.1.)
4. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.4.)
5. Remove the Toner Cartridge from the Developer Assembly in the replacing position. (See Section 3.2.10.1.)
6. Remove the FRONT COVER SWITCH L. (See Section 3.2.16.8.)
7. Remove the screw (silver, 8mm) securing the ROTARY LATCH ASSEMBLY. Then shift the ROTARY LATCH ASSEMBLY right to release the hook and remove the ROTARY LATCH ASSEMBLY.
   NOTE: *In the following step, be sure not to drop the screw.*
8. Turn the ROTARY FRAME ASSEMBLY until the screw (silver, M4, 22mm) securing the Developer Assembly is aligned with the round cutout in the frame in front. Then, remove the screw inserting a driver.

   NOTE: *In the following step, note the points below.*
   - *Never touch the Magnet Roll in the Developer Assembly.*
   - *The ROTARY FRAME ASSEMBLY will rotate in the next step since the ROTARY LATCH ASSEMBLY has been removed.*
   - *After removing the Developer Assembly, place it level on a safe surface.*
9. Shift the Developer Assembly forward first. Then lift up the front part of the Developer Assembly and remove it.

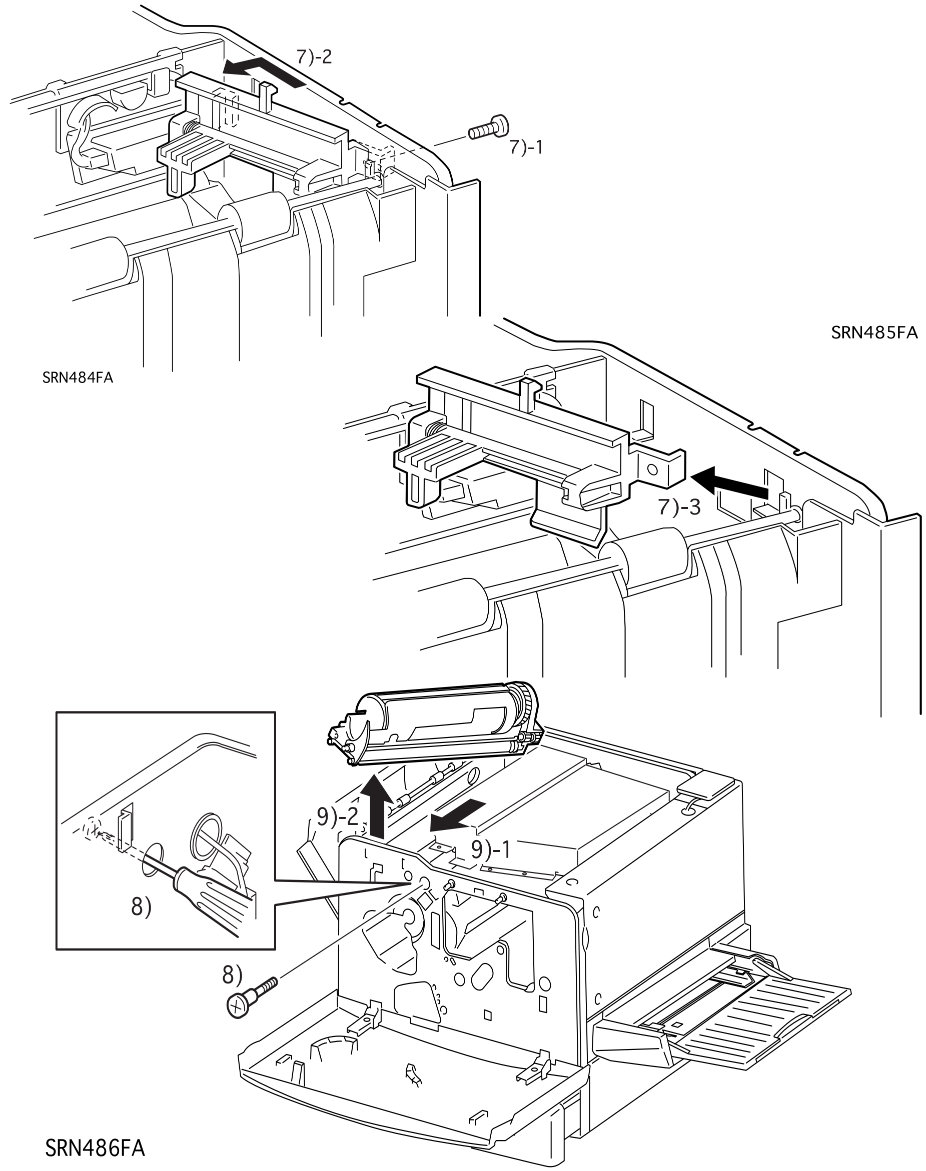


Figure 3-67. Developer Assembly Removal

3.2.10.3 Developer Removal (PL7.1.13, PL7.1.23, PL7.1.33, PL7.1.43)

NOTE: *The generic term “Developer” is used for “DEVELOPER Y/M/C/K”.*

NOTE: *The generic term “Deve. Upper Assembly” is used for “DEVE. UPPER ASSEMBLY Y/M/C/K”.*

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
3. Remove the TENSION LEVER. (See Section 3.2.11.1.)
4. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.4.)
5. Remove the Toner Cartridge from the Developer Assembly in the replacing position. (See Section 3.2.10.1.)
6. Remove the TOP COVER SWITCH. (See Section 3.2.16.3.)
7. Remove the Developer Assembly that has the Developer to be removed. (See Section 3.2.10.2.)

   NOTE: *Before proceeding to the next step, note the points below.*
   - *Do not scatter toner.*
   - *Place the Developer Assembly on a sheet of paper set on a desk or floor.*
   - *Get a sheet of paper on which you place the Developer.*
   - *Be careful not to drop and lose the gear as it may dislocate when the bracket of the developer is removed.*

8. Remove 2 screws (gold, tapped, 8mm) and 1 screw (gold, 6mm) securing the bracket.
9. Remove 4 screws (gold, tapped, 8mm) securing the Deve. Upper Assembly. Then release 4 hooks on the Deve. Upper Assembly and shift the Deve. Upper Assembly forward to remove.
10. Place the Developer on a sheet of paper.

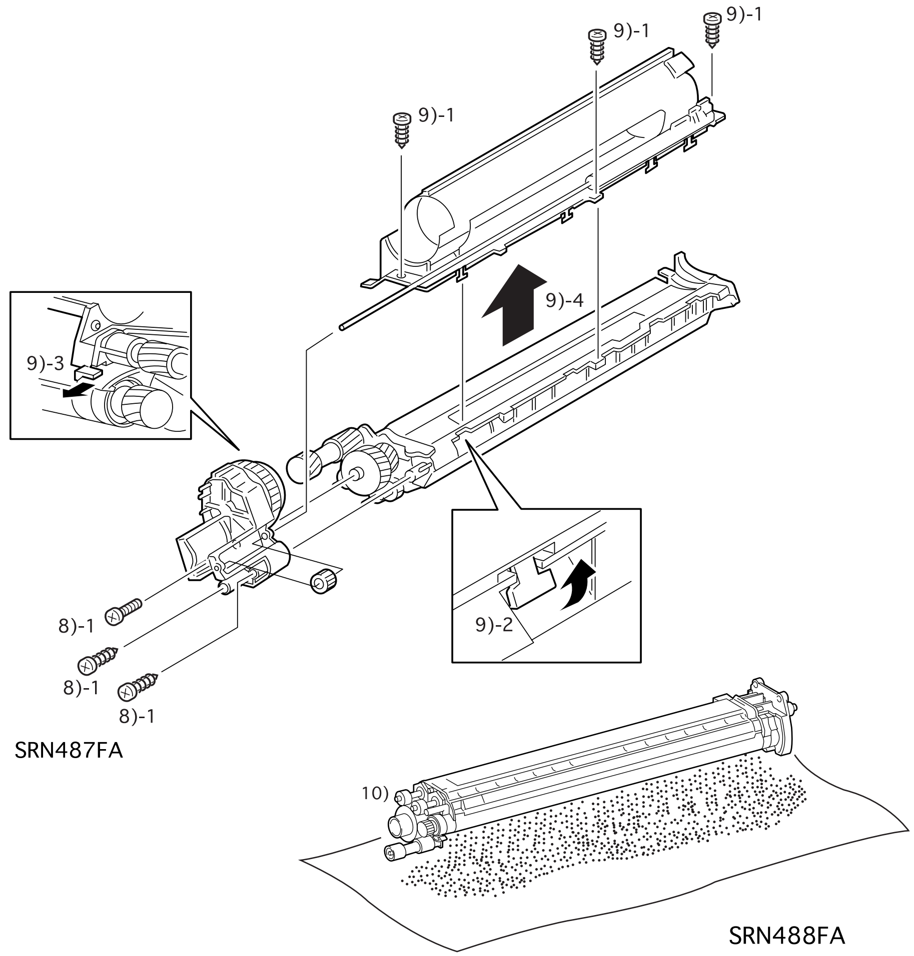


Figure 3-68. Developer Removal

CHECK POINT **Do not use the Developer that is once taken out.**

3.2.10.4 ROTARY SENSOR Removal (PL7.2.22)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Release the harness from the hook on the FAN DUCT.
3. Disconnect the connector (P/J82) for the DEVE. FAN.
4. Remove the screw (black, cup head, 8mm) securing the FAN DUCT, and shift the FAN DUCT upward to release the hooks from the frame. Then remove the FAN DUCT along with the DEVE. FAN.

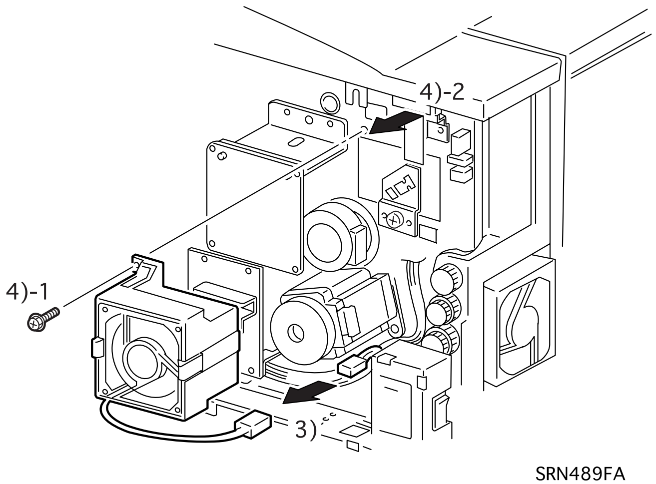


Figure 3-69. ROTARY SENSOR Removal (1/2)

5. Disconnect the connector (P/J58) for the ROTARY SENSOR.
6. Remove the screw (silver, 6mm) securing the ROTARY SENSOR ASSEMBLY and remove the ROTARY SENSOR ASSEMBLY.
7. Unhook the ROTARY SENSOR from the ROTARY SENSOR PLATE and remove the ROTARY SENSOR.

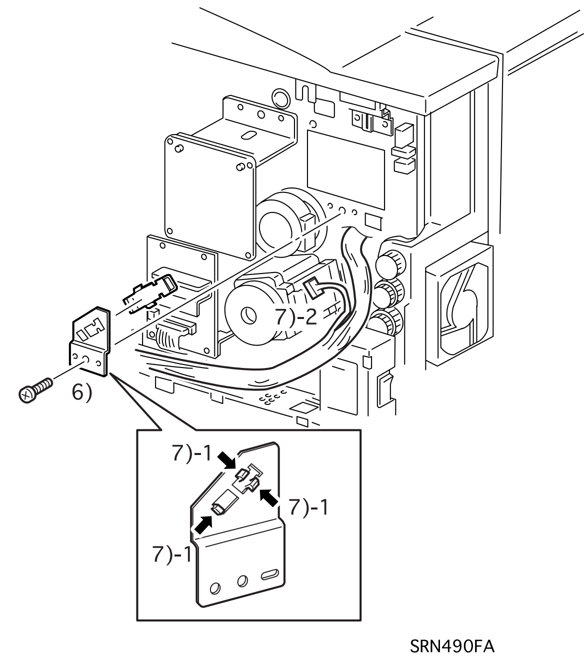


Figure 3-70. ROTARY SENSOR Removal (2/2)

CHECK POINT

When routing the harnesses, do not let it touch the gears.

3.2.10.5 ROTARY FRAME ASSEMBLY Removal (PL7.2.2)

1. Remove the FRONT COVER ASSEMBLY. (See Section 3.2.4.1.)
2. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
3. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
4. Remove the TENSION LEVER. (See Section 3.2.11.1.)
5. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.4.)
6. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
7. Remove all Toner Cartridges. (See Section 3.2.10.1.)
8. Remove the FRONT COVER SWITCH L. (See Section 3.2.16.8.)
9. Remove all Developer Assemblies. (See Section 3.2.10.2.)
10. Remove the ROTARY SENSOR. (See Section 3.2.10.4.)
11. Remove the FUSER ASSEMBLY with the EXIT TRAY ASSEMBLY and OIL ROLL ASSEMBLY installed. (See Section 3.2.12.1.)
12. Remove the EXIT UPPER ASSEMBLY. (See Section 3.2.13.2.)
13. Remove the EXIT LOWER ASSEMBLY. (See Section 3.2.13.3.)
14. Remove the P/H MOTOR ASSEMBLY. (See Section 3.2.14.2.)
15. Remove the ROTARY MOTOR PWB. (See Section 3.2.14.3.)
16. Remove the ROTARY MOTOR ASSEMBLY. (See Section 3.2.14.4.)
17. Remove the DISPENSE MOTOR ASSEMBLY. (See Section 3.2.14.5.)
18. Remove the LVPS. (See Section 3.2.16.1.)
19. Remove the FUSER DRIVE ASSEMBLY. (See Section 3.2.14.6.)
20. Remove the DEVE. CLUTCH ASSEMBLY. (See Section 3.2.14.9.)
21. Remove the DEVE. TIE PLATE. (See Section 3.2.15.1.)
22. Remove the screw (black, cup head, 8mm) securing the ROTARY KNOB ASSEMBLY.
23. Using a standard driver, remove the ROTARY KNOB ASSEMBLY.

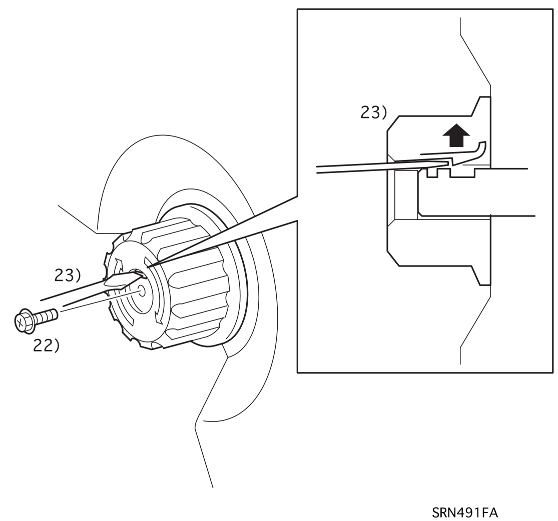


Figure 3-71. ROTARY FRAME ASSEMBLY Removal (1/2)

NOTE: *As the ROTARY FRAME ASSEMBLY weighs heavily, note the points below when handling it in the following steps:*

- *Avoid dropping the ROTARY FRAME ASSEMBLY.*
- *Keep the ROTARY FRAME ASSEMBLY well away from adjacent parts.*

24. Remove the E-ring securing the ROTARY FRAME ASSEMBLY at the rear side, and remove the ROTARY REAR BEARING.

    NOTE: *In the following step, support the front part of the ROTARY FRAME ASSEMBLY as the front end of the shaft in the ROTARY FRAME ASSEMBLY will be released from the base frame.*

25. Remove the ROTARY FRONT BEARING in the front.

26. Release the front end of the shaft in the ROTARY FRAME ASSEMBLY from the U-cut in the base frame. Then shift the ROTARY FRAME ASSEMBLY forward to release the rear end of the shaft, and lift up the rear part of the ROTARY FRAME ASSEMBLY and remove it.

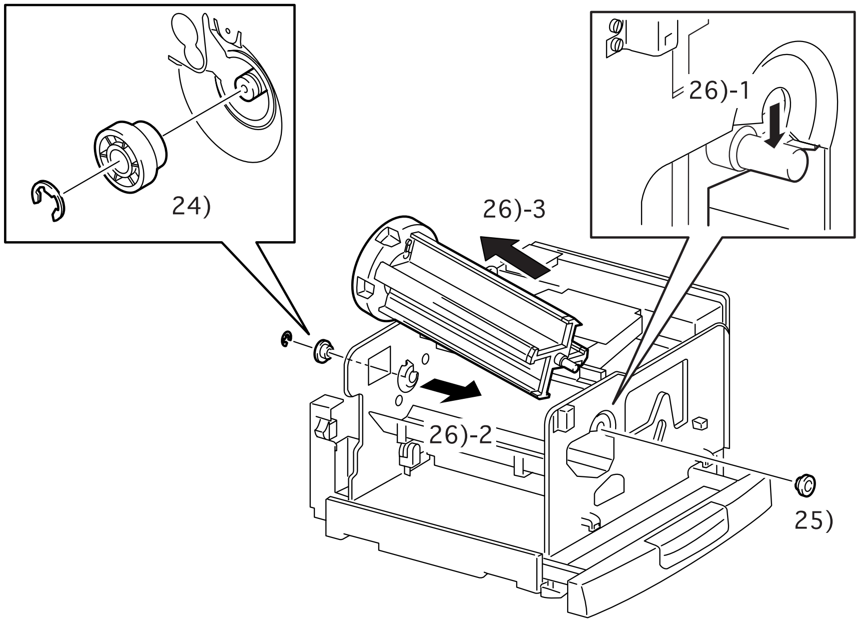


Figure 3-72. ROTARY FRAME ASSEMBLY Removal (2/2)

3.2.10.6 CARTRIDGE SENSOR Removal (PL7.2.26)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Remove the FUSER ASSEMBLY with the EXIT TRAY ASSEMBLY and OIL ROLL ASSEMBLY installed. (See Section 3.2.12.1.)
4. Remove the EXIT UPPER ASSEMBLY. (See Section 3.2.13.2.)
5. Remove the EXIT LOWER ASSEMBLY. (See Section 3.2.13.3.)
6. Release the harness from the clamp holding the CART. SENSOR HARNESS to the DEVE. TIE PLATE.
7. Using a mini driver, push inside of 2 concaves in the CART. SENSOR ASSEMBLY to release hooks from the frame. Then shift the CART. SENSOR ASSEMBLY to the left and remove it.
8. Disconnect the connector (P/J168) for the CARTRIDGE SENSOR and remove the CART. SENSOR HARNESS.

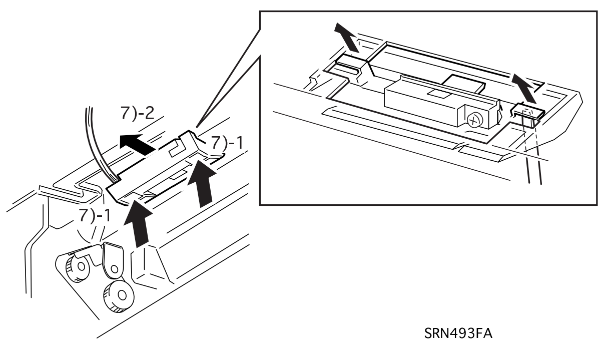


Figure 3-73. CARTRIDGE SENSOR Remove (1/2)

9. Remove the screw (gold, tapped, 10mm) securing the CARTRIDGE SENSOR, and remove the CARTRIDGE SENSOR from the CART. SENSOR HOLDER.

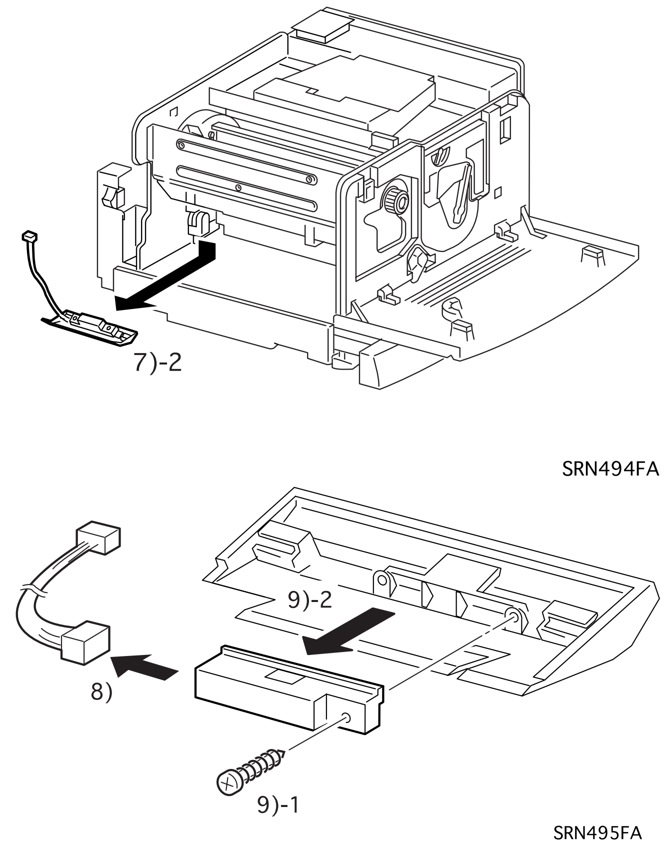


Figure 3-74. CARTRIDGE SENSOR Removal (2/2)

CHECK POINT

- **Route the harness carefully so it will not be caught.**
- **Make sure the harness is not slack in the CART. SENSOR HOLDER.**

3.2.10.7 USED CART. SENSOR Removal (PL7.2.30)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Disconnect the connector P/J87 and P/J197 for the USED CART. SENSOR and the FRONT COVER SWITCH L, respectively, and release the harnesses from the USED SENSOR PLATE.
3. Remove the screw (gold, tapped, 8mm) securing the USED SENSOR ASSEMBLY and remove the USED SENSOR ASSEMBLY.
4. Remove the screw (gold, tapped, 8mm) securing the USED CART. SENSOR and remove the USED CART. SENSOR from the USED SENSOR PLATE.

CHECK POINT

Route the harness tightly via the USED SENSOR PLATE and the hook in the ROTARY LATCH ASSEMBLY.

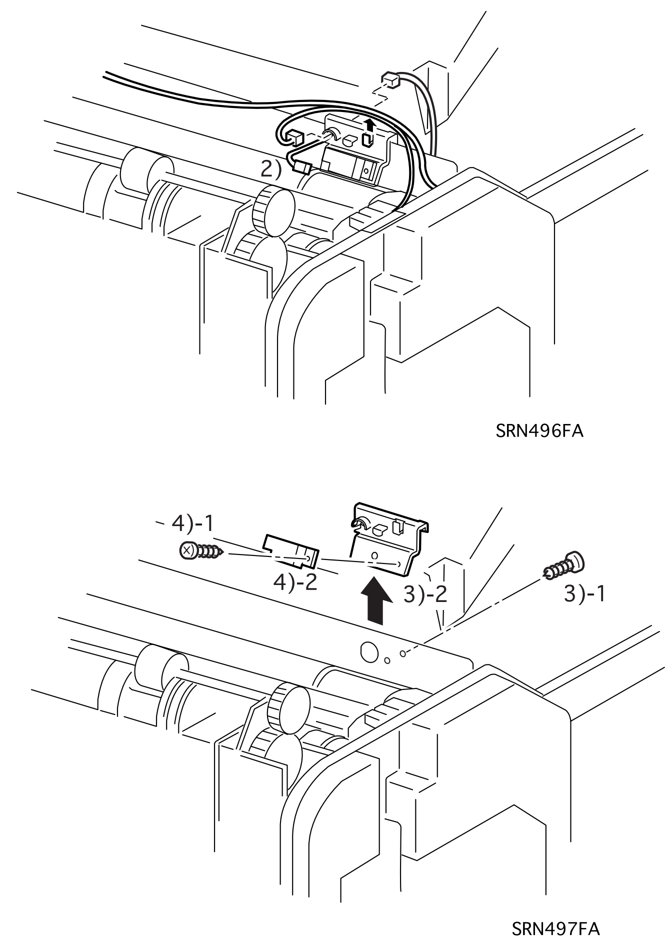


Figure 3-75. USED CART. SENSOR Removal

3.2.11 IBT

3.2.11.1 TENSION LEVER Removal (PL8.1.4)

1. Open the FRONT COVER ASSEMBLY.
2. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)

   NOTE: *In the following step, keep your hands off the IBT BELT ASSEMBLY.*

3. Turn the TENSION LEVER to the locking position and remove the screw (gold, with a washer, 12mm) securing the TENSION LEVER.

   NOTE: *It is better to use a magnetic forced screw driver to avoid dropping screw inside the printer.*

4. Take the TENSION LEVER out to remove.

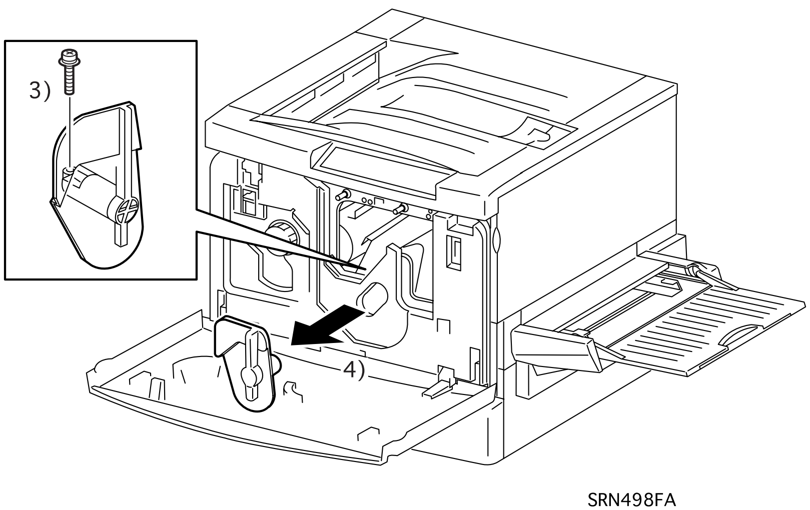


Figure 3-76. TENSION LEVER Removal

3.2.11.2 TRANSFER ASSEMBLY Removal (PL8.1.3)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
4. Remove the TENSION LEVER. (See Section 3.2.11.1.)
5. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.4.)
6. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
7. Draw out the MAIN P/H ASSEMBLY and remove it along with the MSI ASSEMBLY. (See Section 3.2.8.1.)
8. Remove the ROS ASSEMBLY. (See Section 3.2.9.3.)
9. Remove the ADC SENSOR ASSEMBLY. (See Section 3.2.9.4.)
10. Remove the XL RAIL ASSEMBLY. (See Section 3.2.9.5.)
11. Remove the HVPS. (See Section 3.2.16.2.)
12. Install the TENSION LEVER and turn it to the unlocking position, then remove the lever again.
13. Release the 1ST BTR WIRE and the CONTACT ROLL WIRE from the clamp and leave it on the inner side of the frame.
14. Disconnect the connector (P/J57) for the TRO SENSOR.
15. Loosen the screw (gold, with a washer, 8mm) securing the AUGER HIGH ASSEMBLY at the back of the printer, and shift the AUGER HIGH ASSEMBLY right. Then fasten the screw back to fix the AUGER HIGH ASSEMBLY.

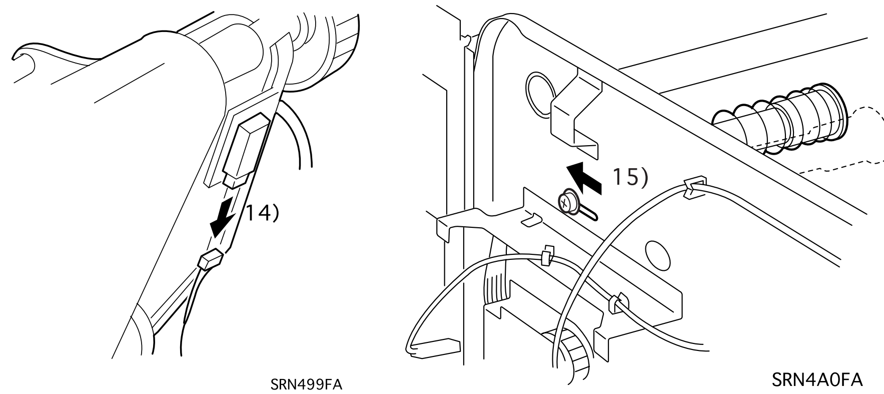


Figure 3-77. TRANSFER ASSEMBLY Removal (1/2)

16. Remove 2 screws (black, cup head, 12mm) securing the TRANSFER ASSEMBLY by the rear end.
17. Remove the KL clip securing the SLIDE COLLAR at the front end of the TRANSFER ASSEMBLY.

NOTE: *In the following step, note the points below.*

- *Never get other parts come in contact with the IBT BELT ASSEMBLY.*
- *Never touch the IBT BELT surface with your hands.*
- *Do not catch the wire in other parts such as frames.*
- *Place the removed TRANSFER ASSEMBLY on a piece of paper spread on a flat level surface.*
- *To protect the IBT BELT ASSEMBLY, you can cover the both right and left frames in the TRANSFER ASSEMBLY with paper.*

18. Shift the SLIDE COLLAR inward and remove the IBT BEARING-4 from the frame.

19. Lift up the both ends of the IBT DEVE ROLL ASSEMBLY in the TRANSFER ASSEMBLY about 20mm, then shift the front part of the IBT DRIVE ROLL ASSEMBLY left and lift up the TRANSFER ASSEMBLY to remove.

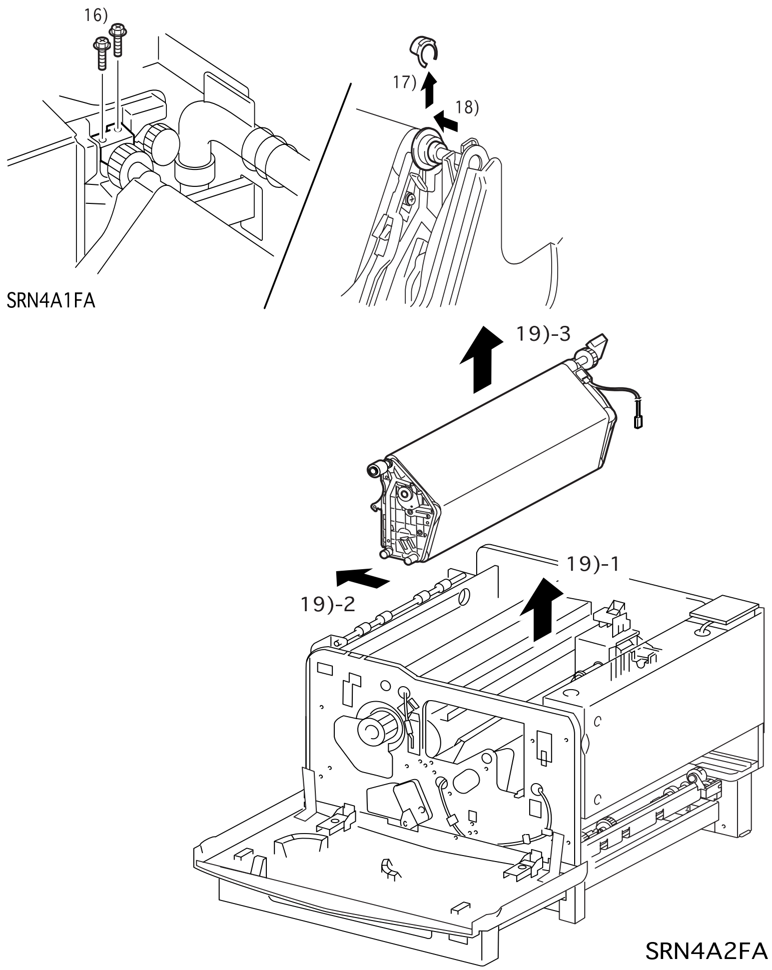


Figure 3-78. TRANSFER ASSEMBLY Removal (2/2)

CHECK POINT

- **When installing the IBT BELT ASSEMBLY, cover the belt surface with paper to protect it.**
- **When installing the TRANSFER ASSEMBLY, put the TRANSFER ASSEMBLY wire inside the printer first, then align the COLLAR-BUR in the TRANSFER ASSEMBLY with the IBT FRONT BRACKET and the IBT REAR BRACKET.**

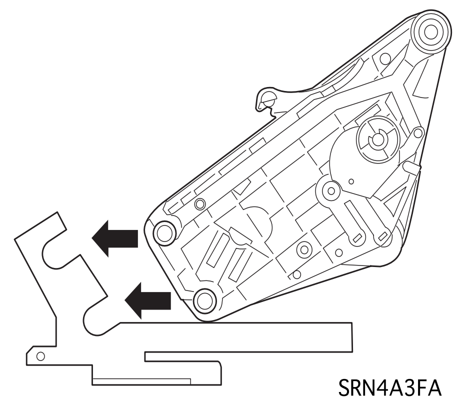


Figure 3-79. TRANSFER ASSEMBLY Installation

- **Route the harnesses tightly via the clamp.**

3.2.11.3 BTR CAM SOLENOID Removal (PL8.1.15)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Remove the HVPS. (See Section 3.2.16.2.)
3. Disconnect the connector (P/J63) for the BTR CAM SOLENOID and release the harness from the clamp.
4. Remove the screw (gold, 6mm) securing the BTR CAM SOLENOID and remove the BTR CAM SOLENOID.

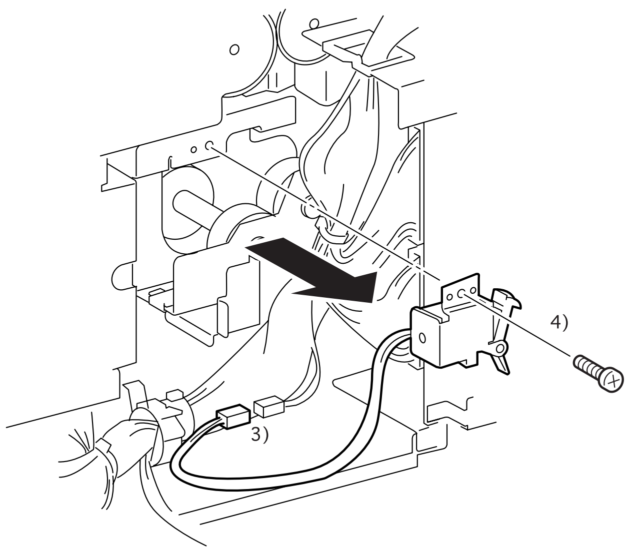


Figure 3-80. BTR CAM SOLENOID Removal

When installing the BTR CAM SOLENOID, make sure it is under the following condition:

- **The arm of the BTR CAM SOLENOID is in induced condition.**
- **The lower end of the arm is in contact with the Spring Clutch in the BTR CAM ASSEMBLY.**

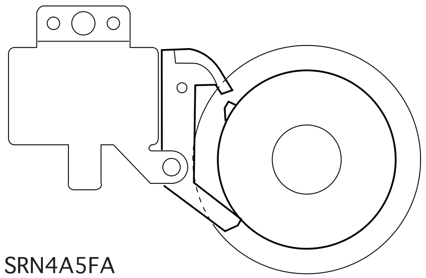


Figure 3-81. BTR CAM SOLENOID Installation

3.2.11.4 BELT CLEANER ASSEMBLY Removal (PL8.1.30)

1. Remove the FRONT COVER ASSEMBLY. (See Section 3.2.4.1.)
2. Remove the FUSER ASSEMBLY along with the EXIT TRAY ASSEMBLY and OIL ROLL ASSEMBLY. (See Section 3.2.12.2.)

   NOTE: *In the following steps, toner might spill from the BELT CLEANER ASSEMBLY. Be sure to place a sheet of paper over the lower frame that is located under the BELT CLEANER ASSEMBLY and handle the assembly carefully to prevent toner from spilling.*

3. Loosen the screw in the CLEANER SUPPORT ASSEMBLY securing the CLEANER SUPPORT ASSEMBLY and remove the CLEANER SUPPORT ASSEMBLY.

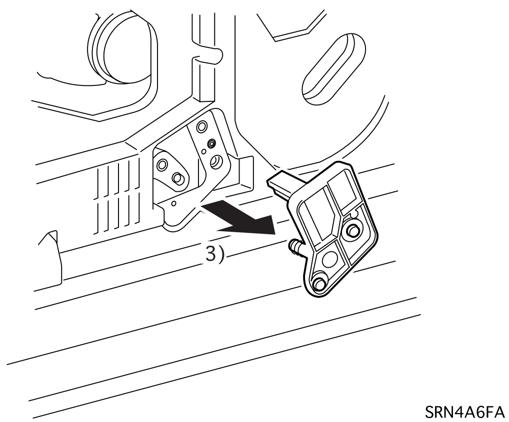


Figure 3-82. BELT CLEANER ASSEMBLY Removal (1/2)

NOTE: *In the following step, keep your hands off the IBT BELT ASSEMBLY and Cleaning Blade in the BELT CLEANER ASSEMBLY. Also, do not get the Cleaning Blade touch any other parts.*

NOTE: *In the following step, place the removed BELT CLEANER ASSEMBLY on a sheet of paper as toner may spill.*

4. Take the BELT CLEANER ASSEMBLY out from the left side of the printer.

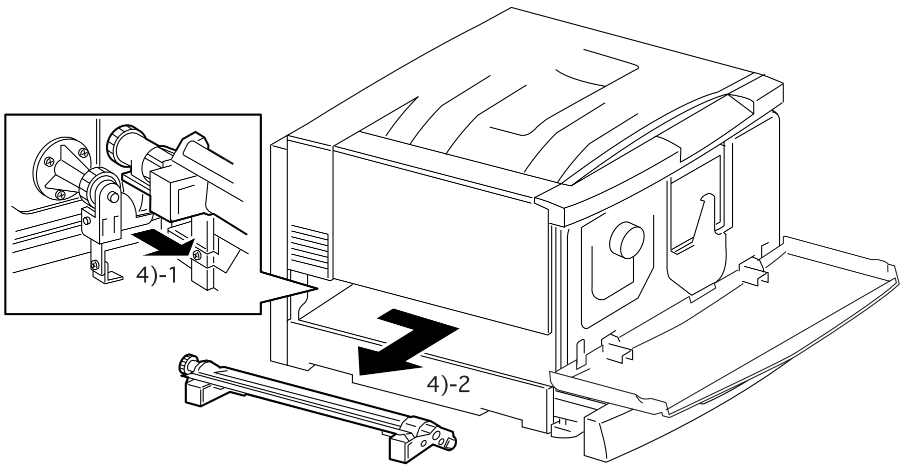


Figure 3-83. BELT CLEANER ASSEMBLY Removal (2/2)

CHECK POINT

- **After replacing the BELT CLEANER ASSEMBLY with a new one, perform "IBT Cleaner Reset". (See Section 6.2 in Chapter 6 "Maintenance".)**
- **When installing the BELT CLEANER ASSEMBLY, make sure the toner inlet part of the AUGER HIGH ASSEMBLY and the toner outlet part of the BELT CLEANER ASSEMBLY are properly connected.**
- **Set the CLEANER SUPPORT ASSEMBLY vertically against the frame.**

3.2.11.5 2ND BTR ASSEMBLY Removal (PL8.1.20)

1. Remove the FUSER ASSEMBLY with the EXIT TRAY ASSEMBLY and the OIL ROLL ASSEMBLY installed on it. (See Section 3.2.12.2.)
2. Remove the BELT CLEANER ASSEMBLY. (See Section 3.2.11.4.)

   NOTE: *In the following step, do not touch the IBT BELT ASSEMBLY and the 2ND BTR ASSEMBLY. Also do not get any other parts touch the 2ND BTR ASSEMBLY.*

3. Take the 2ND BTR ASSEMBLY out from the left side of the printer.

CHECK POINT

- **After replacing the 2ND BTR ASSEMBLY with a new one, perform “2ND BTR Reset”. (See Section 6.2 in Chapter 6 “Maintenance”.)**
- **When installing the 2ND BTR ASSEMBLY, push it all the way into the printer.**

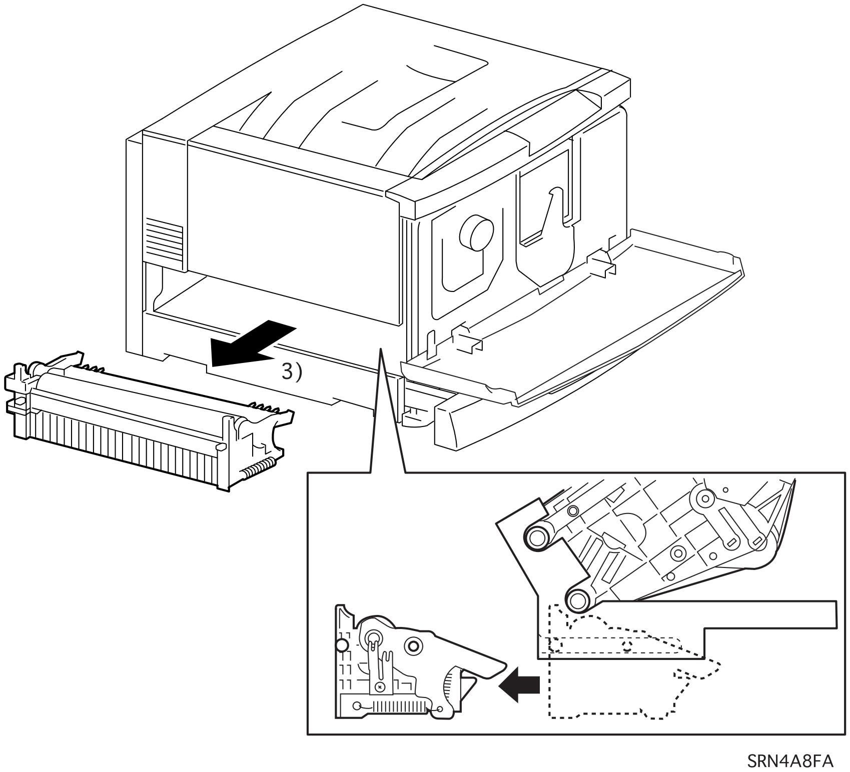


Figure 3-84. 2ND BTR ASSEMBLY Removal

3.2.11.6 2ND BTR CAM ASSEMBLY Removal (PL8.1.10)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
4. Remove the TENSION LEVER. (See Section 3.2.11.1.)
5. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.4.)
6. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
7. Pull out the MAIN P/H ASSEMBLY with the MSI ASSEMBLY on it. (See Section 3.2.8.1.)
8. Remove the ROS ASSEMBLY. (See Section 3.2.9.3.)
9. Remove the ADC SENSOR ASSEMBLY. (See Section 3.2.9.4.)
10. Remove the XL RAIL ASSEMBLY. (See Section 3.2.9.5.)
11. Remove the FUSER ASSEMBLY with the EXIT TRAY ASSEMBLY and the OIL ROLL ASSEMBLY. (See Section 3.2.12.2.)
12. Remove the HVPS. (See Section 3.2.16.2.)
13. Remove the TRANSFER ASSEMBLY. (See Section 3.2.11.2.)
14. Remove the BTR CAM SOLENOID. (See Section 3.2.11.3.)
15. Remove the BELT CLEANER ASSEMBLY. (See Section 3.2.11.4.)
16. Remove the 2ND BTR ASSEMBLY. (See Section 3.2.11.5.)
17. Release the DTS WIRE from all clamps and bring it to the inner side of the frame.
18. Remove 3 screws (gold, cup head, 4mm) securing the 2ND BTR CAM ASSEMBLY.

    NOTE: *In the following step, be careful not to drop and lose the BTR BEARING-4 and the BTR BEARING-6 as they will come off.*

19. Shift the 2ND BTR CAM ASSEMBLY to the front and remove the TORQUE GEAR SHAFT and the BTR CAM ASSEMBLY from the BTR BEARING-4 and the BTR BEARING-6, respectively.

    NOTE: *In the following step, be careful not to catch the wire in the frame.*

20. Lift the 2ND BTR CAM ASSEMBLY up to remove.

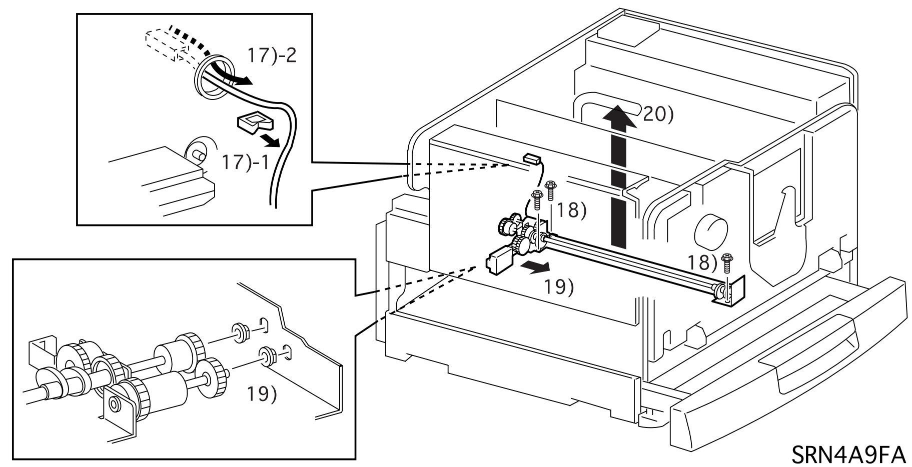


Figure 3-85. 2ND BTR CAM ASSEMBLY Removal

CHECK POINT

Route the wire tightly via the clamps.

3.2.11.7 AUGER HIGH ASSEMBLY Removal (PL8.1.40)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
4. Remove the TENSION LEVER. (See Section 3.2.11.1.)
5. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.4.)
6. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
7. Pull out the MAIN P/H ASSEMBLY with the MSI ASSEMBLY on it. (See Section 3.2.8.1.)
8. Remove the ROS ASSEMBLY. (See Section 3.2.9.3.)
9. Remove the ADC SENSOR ASSEMBLY. (See Section 3.2.9.4.)
10. Remove the XL RAIL ASSEMBLY. (See Section 3.2.9.5.)
11. Remove the FUSER ASSEMBLY with the EXIT TRAY ASSEMBLY and the OIL ROLL ASSEMBLY. (See Section 3.2.12.2.)
12. Remove the HVPS. (See Section 3.2.16.2.)
13. Remove the TRANSFER ASSEMBLY. (See Section 3.2.11.2.)
14. Remove the BTR CAM SOLENOID. (See Section 3.2.11.3.)
15. Remove the BELT CLEANER ASSEMBLY. (See Section 3.2.11.4.)
16. Remove the 2ND BTR ASSEMBLY. (See Section 3.2.11.5.)
17. Remove the 2ND BTR CAM ASSEMBLY. (See Section 3.2.11.6.)
18. Remove the RIGHT COVER ASSEMBLY. (See Section 3.2.4.8.)
19. Remove the CONTROLLER PWB. (See Section 3.2.17.1.)
20. Remove the CONT. CHASSIS ASSEMBLY. (See Section 3.2.17.3.)
21. Remove the screw (silver, 6mm) securing the CRUM CONNECTOR ASSEMBLY and remove the CRUM CONNECTOR ASSEMBLY.
22. Remove the screw (gold, with a washer, 8mm) securing the AUGER HIGH ASSEMBLY at the back.

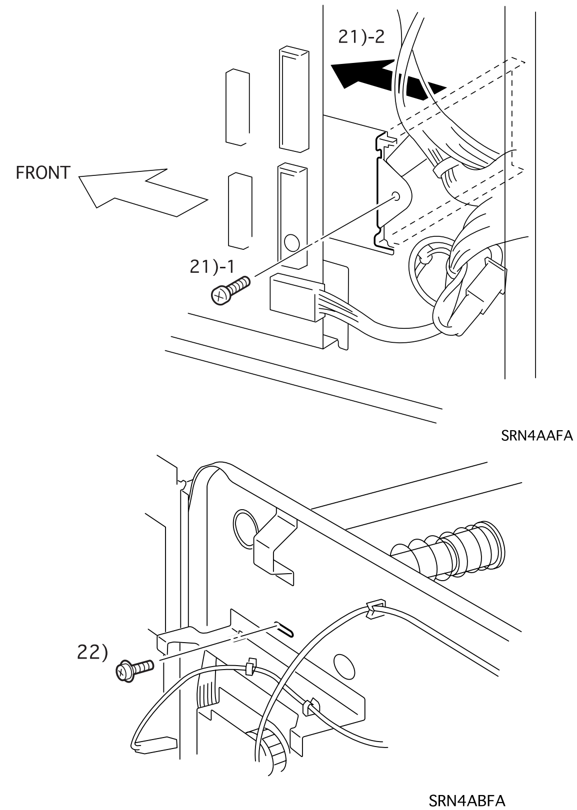


Figure 3-86. AUGER HIGH ASSEMBLY Removal (1/3)

23. Remove the screw (gold, cup head, 8mm) and the E-ring securing the AUGER HIGH ASSEMBLY at the left inner side (lower) of the printer.

24. Remove the screw (gold, 6mm) securing the AUGER HIGH ASSEMBLY at the middle inner side (upper) of the printer.

NOTE: *In the following steps, toner might spill from the AUGER HIGH ASSEMBLY. Be sure to place a sheet of paper over the lower frame in the AUGER HIGH ASSEMBLY and handle the assembly carefully to prevent toner from spilling.*

NOTE: *In the following step, place the removed AUGER HIGH ASSEMBLY on a sheet of paper to receive spilt toner.*

25. Move the AUGER HIGH ASSEMBLY forward to release it from the peg and remove the AUGER HIGH ASSEMBLY.

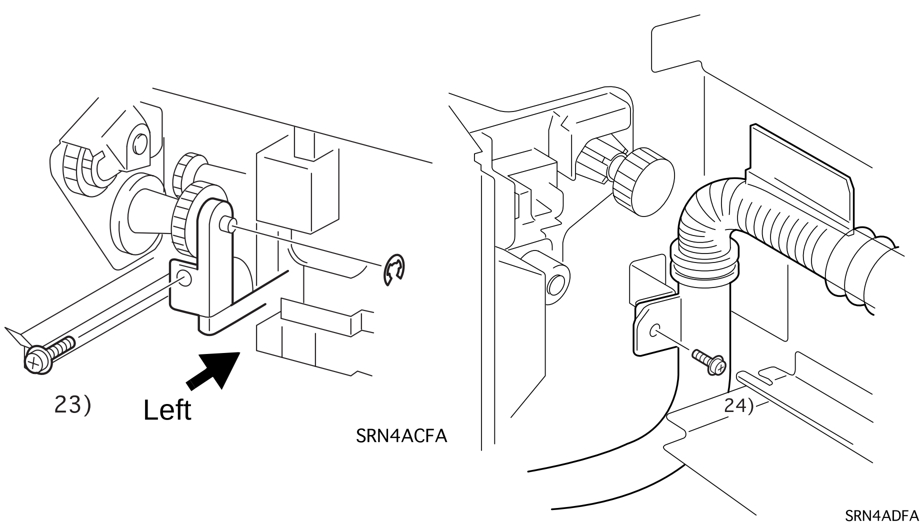


Figure 3-87. AUGER HIGH ASSEMBLY Removal (2/3)

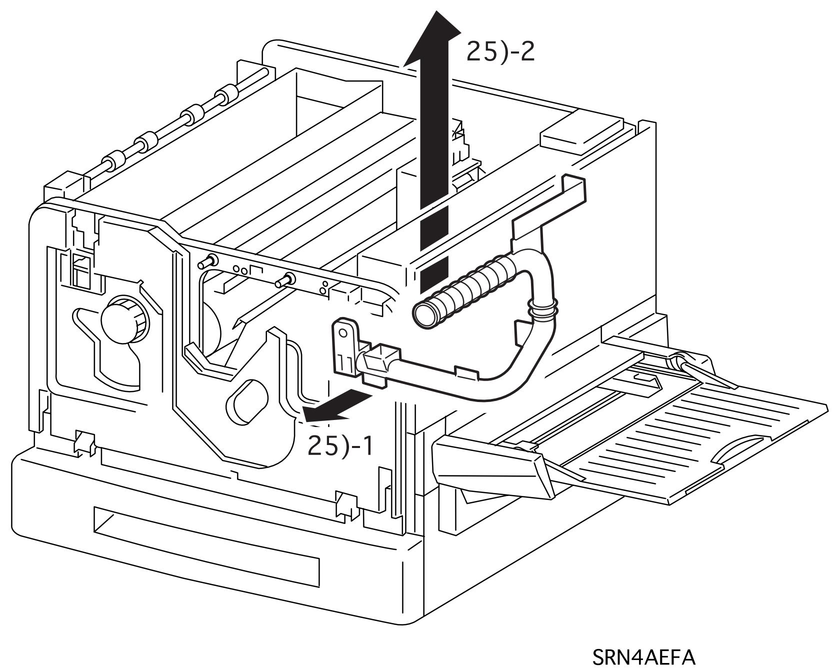


Figure 3-88. AUGER HIGH ASSEMBLY Removal (3/3)

3.2.11.8 IBT BELT ASSEMBLY Removal (PL8.2.2)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
4. Remove the TENSION LEVER. (See Section 3.2.11.1.)
5. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.4.)
6. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
7. Pull out the MAIN P/H ASSEMBLY with the MSI ASSEMBLY on it. (See Section 3.2.8.1.)
8. Remove the ROS ASSEMBLY. (See Section 3.2.9.3.)
9. Remove the ADC SENSOR ASSEMBLY. (See Section 3.2.9.4.)
10. Remove the XL RAIL ASSEMBLY. (See Section 3.2.9.5.)
11. Remove the HVPS. (See Section 3.2.16.2.)

    NOTE: *In the following step, never touch the IBT BELT surface but the ribs on the sides.*

12. Remove the TRANSFER ASSEMBLY. (See Section 3.2.11.2.)
13. Install the TENSION LEVER and lift up the PUSH IN SHAFT.
14. Wide the arms on the TRANSFER ASSEMBLY to remove the PUSH IN SHAFT.

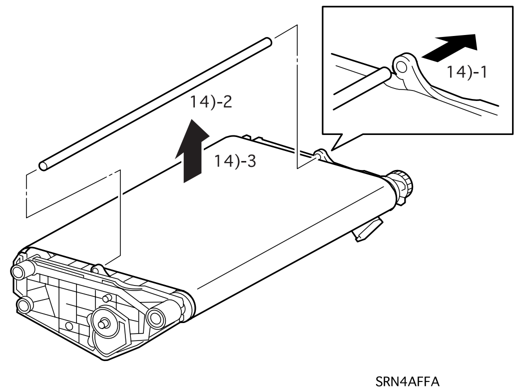


Figure 3-89. IBT BELT ASSEMBLY Removal (1/3)

15. Turn the TENSION LEVER and push down the arms for the PUSH IN SHAFT, then remove the TENSION LEVER.
16. Push the metallic cam on the both sides of the TRANSFER ASSEMBLY inward and insert a hex driver (allen wrench) through the hole on the side to lock the cam.
17. In a side of a table, put up the IBT DRIVE ROLL ASSEMBLY of the TRANSFER ASSEMBLY with its gear part sticking out.

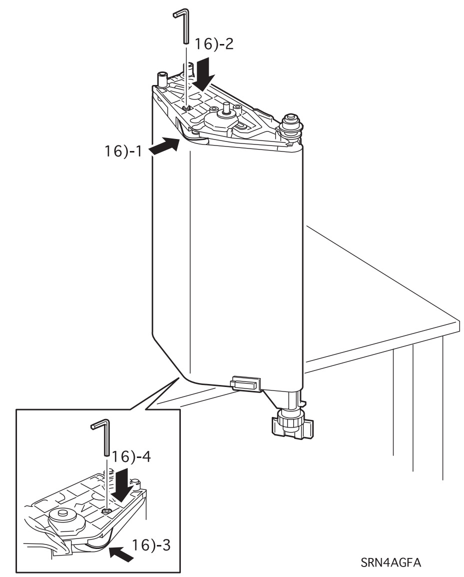


Figure 3-90. IBT BELT ASSEMBLY Removal (2/3)

18. Remove the IBT BELT ASSEMBLY from the TRANSFER ASSEMBLY.

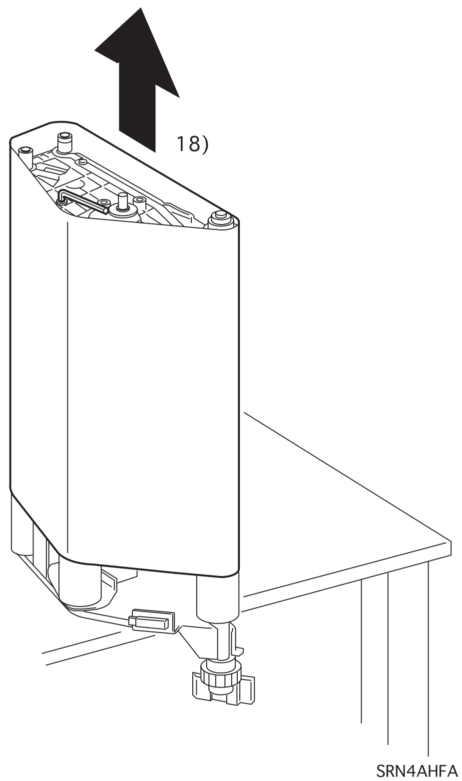


Figure 3-91. IBT BELT ASSEMBLY Removal (3/3)

CHECK POINT

- **When installing the IBT BELT ASSEMBLY, be careful not to damage or stain it.**
- **Before installing the PUSH IN SHAFT, clean the shaft to remove any oil and foreign matter.**

3.2.11.9 TRO SENSOR Removal (PL8.2.12)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
4. Remove the TENSION LEVER. (See Section 3.2.11.1.)
5. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.4.)
6. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
7. Pull out the MAIN P/H ASSEMBLY with the MSI ASSEMBLY on it. (See Section 3.2.8.1.)
8. Remove the ROS ASSEMBLY. (See Section 3.2.9.3.)
9. Remove the ADC SENSOR ASSEMBLY. (See Section 3.2.9.4.)
10. Remove the XL RAIL ASSEMBLY. (See Section 3.2.9.5.)
11. Remove the HVPS. (See Section 3.2.16.2.)
12. Remove the TRANSFER ASSEMBLY. (See Section 3.2.11.2.)
13. Remove the screw (gold, tapped, 10mm) securing the TRO SENSOR and remove the TRO SENSOR.

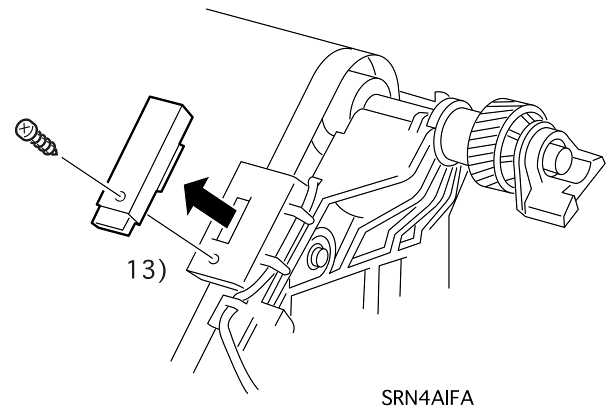


Figure 3-92. TRO SENSOR Removal

3.2.12 Fusing

3.2.12.1 OIL ROLL ASSEMBLY Removal (PL9.1.10)

1. Draw out the FUSER ASSEMBLY.

CAUTION

Be careful when handling the OIL ROLL ASSEMBLY. If it is still very hot, you may get burnt. Therefore, always check that the OIL ROLL ASSEMBLY has cooled down enough for servicing.

NOTE: *In the following step, place the removed OIL CAM ASSEMBLY in a stable, level condition with its roller side facing upward.*

2. Remove the OIL ROLL ASSEMBLY by holding its handles.

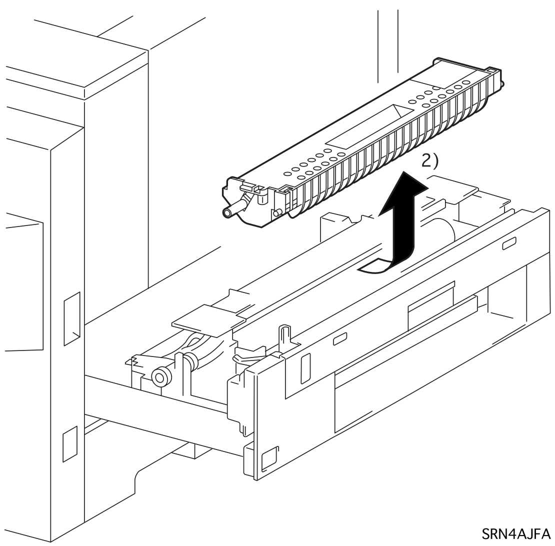


Figure 3-93. OIL ROLL ASSEMBLY Removal

3.2.12.2 FUSER ASSEMBLY Removal (PL9.1.1)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Draw out the UNIVERSAL TRAY.
3. Draw out the FUSER ASSEMBLY.
4. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)

   NOTE: *FUSER ASSEMBLY weighs quite heavily. Therefore, in the following step, be careful not drop it or get it touch with other parts.*

5. Loosen the screw (black, cup head, 8mm) at the front left of the printer, and lift up the FUSER ASSEMBLY to the upper left and remove the FUSER ASSEMBLY.

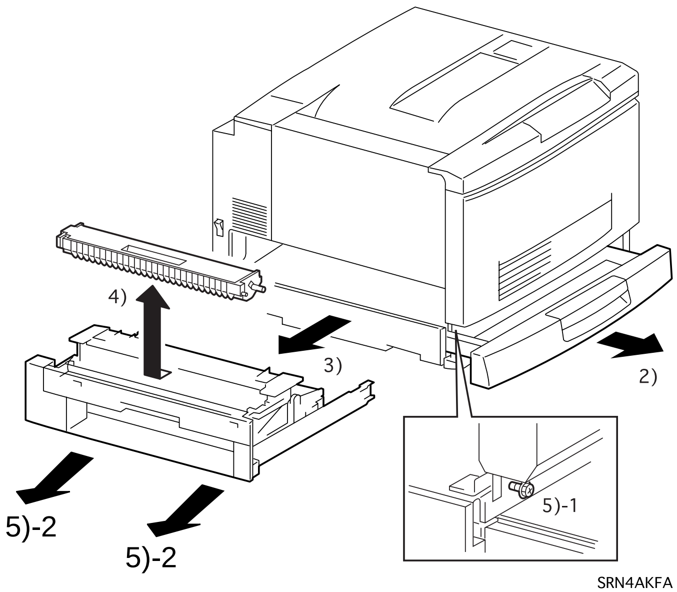


Figure 3-94. FUSER ASSEMBLY Removal

3.2.12.3 MAIN FUSER ASSEMBLY Removal (PL9.1.2)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Disconnect 2 connectors (P/J72B, P/J79) for the MAIN FUSER ASSEMBLY.
5. Remove 2 screws (gold, with a washer, 8mm) securing the MAIN FUSER ASSEMBLY, and remove the MAIN FUSER ASSEMBLY.

CHECK POINT

After replacing the MAIN FUSER ASSEMBLY with a new one, perform "Fuser Unit Reset". (See Chapter 6.)

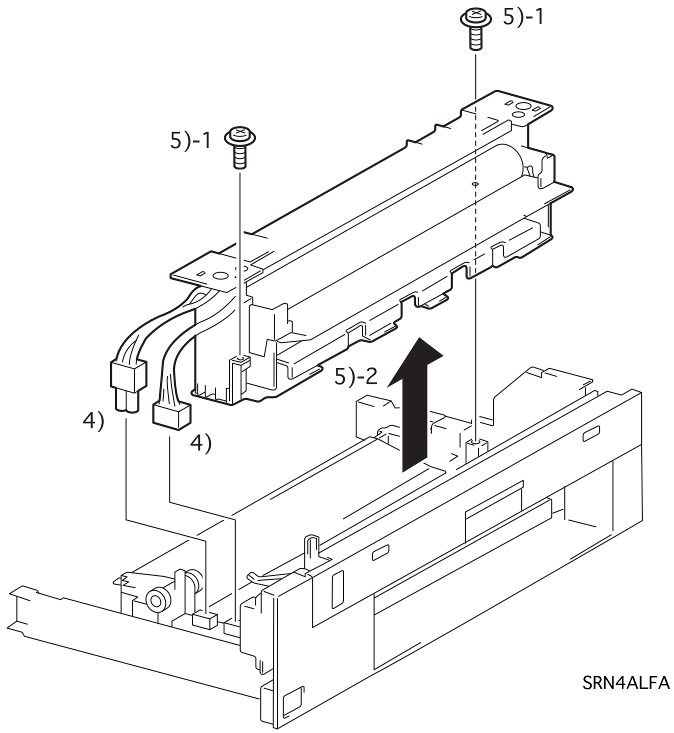


Figure 3-95. MAIN FUSER ASSEMBLY Removal

3.2.12.4 FUSER UPPER ASSEMBLY Removal (PL9.2.23)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)

   NOTE: *In the following step, be careful not to damage the HEAT ROLL surface with a driver when remove the TEMP. SENSOR ASSEMBLY.*

5. Remove the screw (silver, tapped, 14mm) securing the TEMP. SENSOR ASSEMBLY and release the harness from the hook on the FUSER UPPER ASSEMBLY.

   NOTE: *In the following step, be careful not to drop the FUSER FRONT COVER and the FUSER REAR COVER since they will not be supported as the FUSSER UPPER ASSEMBLY is removed.*

6. Remove the following 4 screws securing the FUSER UPPER ASSEMBLY.
   -2 outer screws (gold, with a washer, 8mm) sealed with black tapes
   -2 inner screws (silver, 6mm)

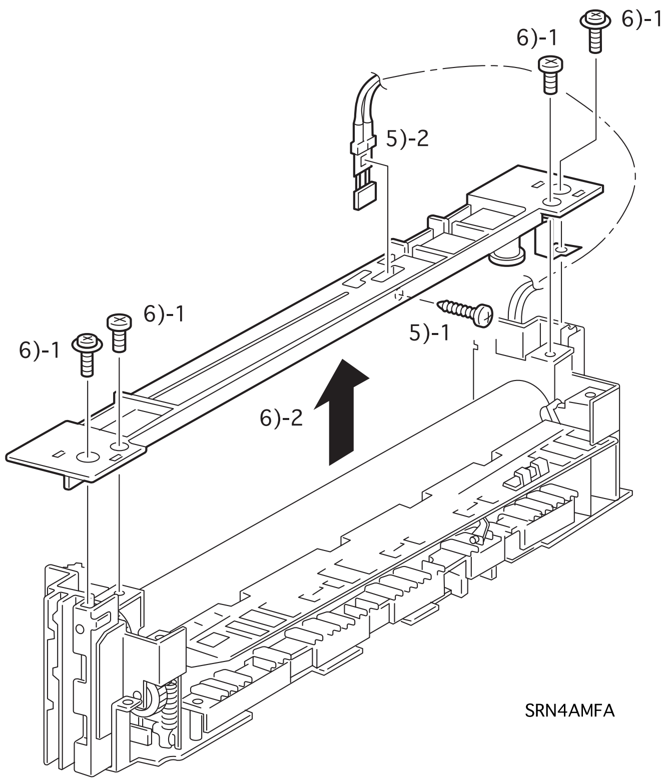


Figure 3-96. FUSER UPPER ASSEMBLY Removal

CHECK POINT

When installing the FUSER UPPER ASSEMBLY, fasten the screws (Step 6) with the following parts:

- **Outer screws: H/R HEATER**
- **Inner screws: HEATER WIRE**

3.2.12.5 H/R HEATER Removal (PL9.2.20)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the FUSER UPPER ASSEMBLY. (See Section 3.2.12.4.)
6. Supporting the terminal part in the front part of the H/R HEATER with a driver or equivalent, remove the FUSER FRONT COVER and place it inside the HEAT ROLL carefully.

   NOTE: *In the following step, avoid damaging the H/R HEATER and the P/R HEATER when disconnecting the connector (P/JF791) which is tightly connected.*

7. Release the wire and harness from the hook on the FUSER REAR COVER and disconnect the connector (P/JF791) for the P/R HEATER and the H/R HEATER.

   NOTE: *In the following step, gear will be released as the FUSER REAR COVER is removed. Be careful not to drop and lose the gear.*

8. Remove the FUSER REAR COVER getting the rear terminals of the P/H HEATER and H/R HEATER through the holes in the cover.

   NOTE: *In the following step, do not touch the H/R HEATER surface when removing the H/R HEATER.*

9. Pull out the H/R HEATER to the rear keeping it level.

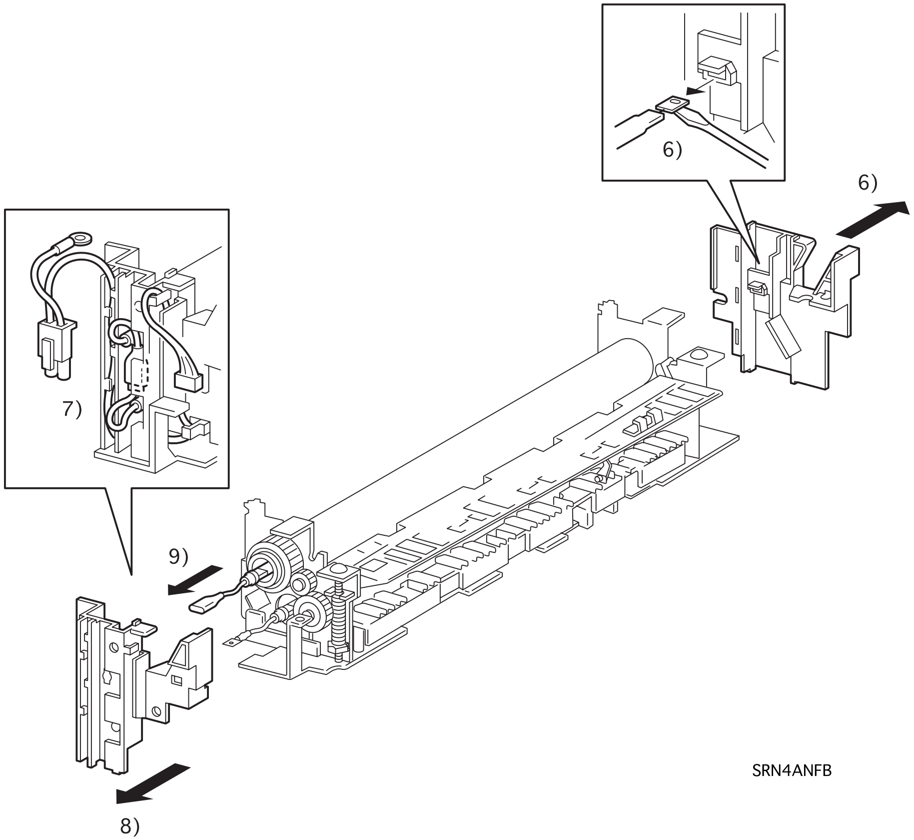


Figure 3-97. H/R HEATER Removal

3.2.12.6 P/R HEATER Removal (PL9.2.19)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the FUSER UPPER ASSEMBLY. (See Section 3.2.12.4.)
6. Supporting the terminal part in the front part of the H/R HEATER with a driver or equivalent, remove the FUSER FRONT COVER and place it in side the HEAT ROLL gently.

   NOTE: *The connector (P/JF791) to be disconnected in the next step is firmly connected. Therefore, be careful not to break the H/R HEATER and the P/R HEATER when disconnecting the connector.*

7. Release the wire and harness from the hook on the FUSER REAR COVER and disconnect the connector (P/JF791) for the P/R HEATER and the H/R HEATER.

   NOTE: *In the following step, gear will be released as the FUSER REAR COVER is removed. Therefore, be careful not to drop and lose the gear.*

8. Remove the FUSER REAR COVER getting the rear terminals of the H/R HEATER and P/R HEATER through the holes in the cover.

   NOTE: *In the following step, do not touch the H/R HEATER surface when removing the P/R HEATER.*

9. Remove the screw (gold, with a washer, 8mm) securing the P/R HEATER and take out the P/R HEATER backward to remove.

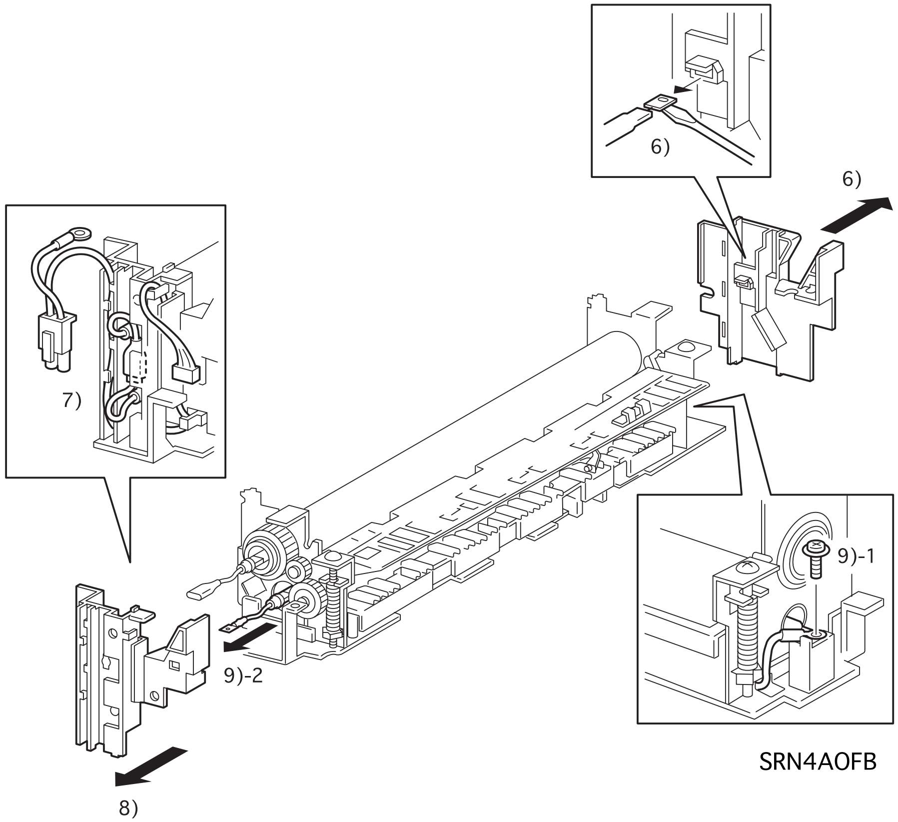


Figure 3-98. P/R HEATER Removal

3.2.12.7 LOWER GUIDE ASSEMBLY Removal (PL9.2.26)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Open the UPPER GUIDE ASSEMBLY.

   NOTE: *When removing the LOWER GUIDE ASSEMBLY in the following step, be careful not to damage the PRESSURE ROLL with the P/R FINGERs.*

   NOTE: *When removing the LOWER GUIDE ASSEMBLY in the following step, make sure that the FUSER EXIT ACTUATOR does not come off interfering with the FUSER EXIT SENSOR.*

6. Remove the screw (gold, tapped, 12mm) securing the LOWER GUIDE ASSEMBLY. Then shift LOWER GUIDE ASSEMBLY backward to remove.

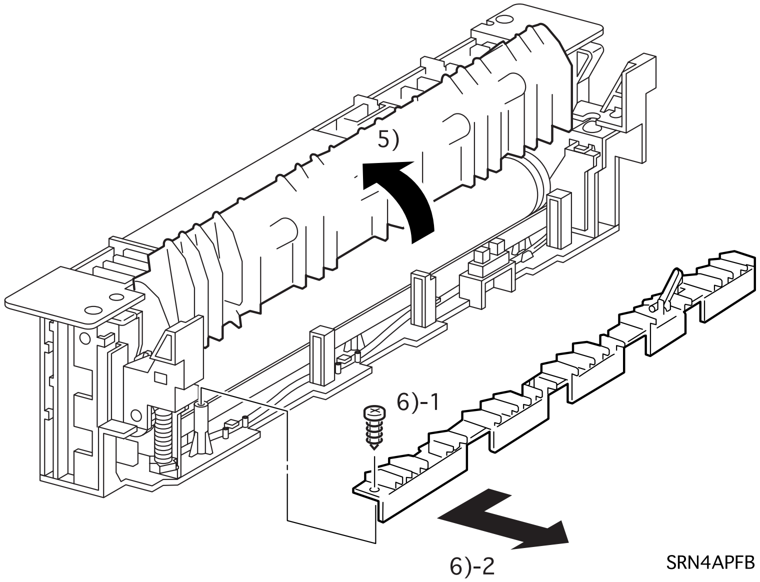


Figure 3-99. LOWER GUIDE ASSEMBLY Removal

CHECK POINT

- **When installing the LOWER GUIDE ASSEMBLY, leave the P/R FINGERs open.**
- **When servicing the MAIN FUSER ASSEMBLY, keep it with its right side down.**

3.2.12.8 FUSER EXIT SENSOR Removal (PL9.2.25)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the LOWER GUIDE ASSEMBLY. (See Section 3.2.12.7.)
6. Disconnect the connector (P/J75) for the FUSER EXIT SENSOR.
7. Release the hooks securing the FUSER EXIT SENSOR from the FUSER BOTTOM PLATE and remove the FUSER EXIT SENSOR.

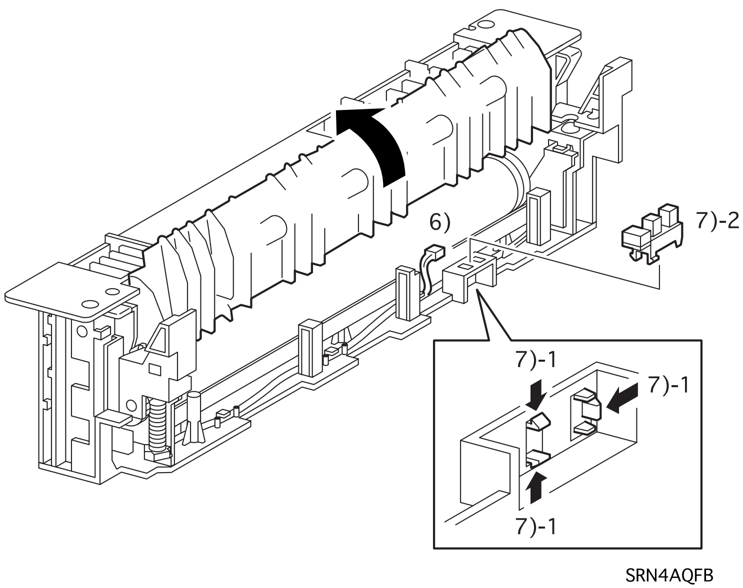


Figure 3-100. FUSER EXIT SENSOR Removal

3.2.12.9 UPPER GUIDE ASSEMBLY Removal (PL9.2.32)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the FUSER UPPER ASSEMBLY. (See Section 3.2.12.4.)
6. Open the UPPER GUIDE ASSEMBLY and align the hinges with the cutouts in the front and rear frames, and lift up the UPPER GUIDE ASSEMBLY to remove.

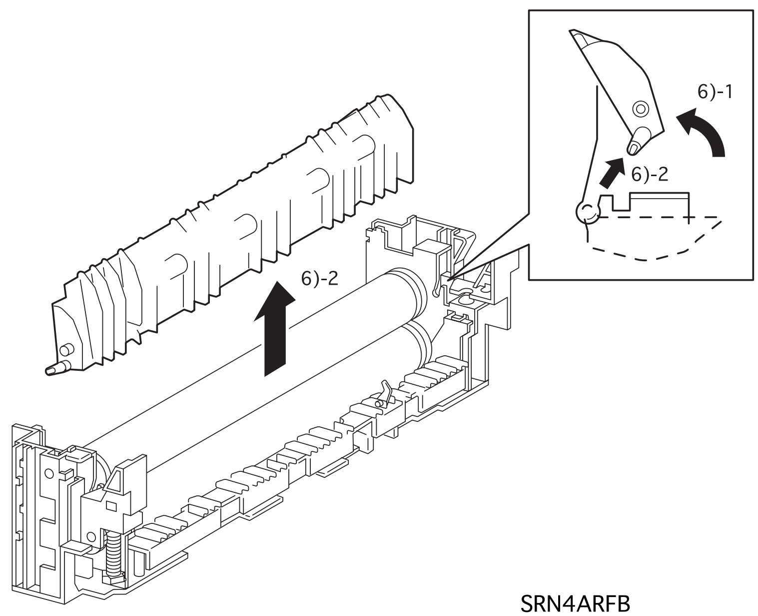


Figure 3-101. UPPER GUIDE ASSEMBLY Removal

3.2.12.10 HEAT ROLL Removal (PL9.2.12)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the FUSER UPPER ASSEMBLY. (See Section 3.2.12.4.)
6. Remove the H/R HEATER. (See Section 3.2.12.5.)
7. Open the UPPER GUIDE ASSEMBLY.
8. Release the nuts securing the front and rear NIP SPRINGs.
9. Remove the NIP SPRINGs.
10. Remove the H/R RING securing the rear H/R GEAR and remove the rear H/R GEAR and the REAR H/R BEARING.
11. Remove the front H/R RING and remove the front H/R BEARING.

    NOTE: *In the following step, be careful not to damage the HEAT ROLL surface.*

12. Shift the HEAT ROLL backward to release the front end from the frame. Then shift the roll forward and remove the HEAT ROLL.

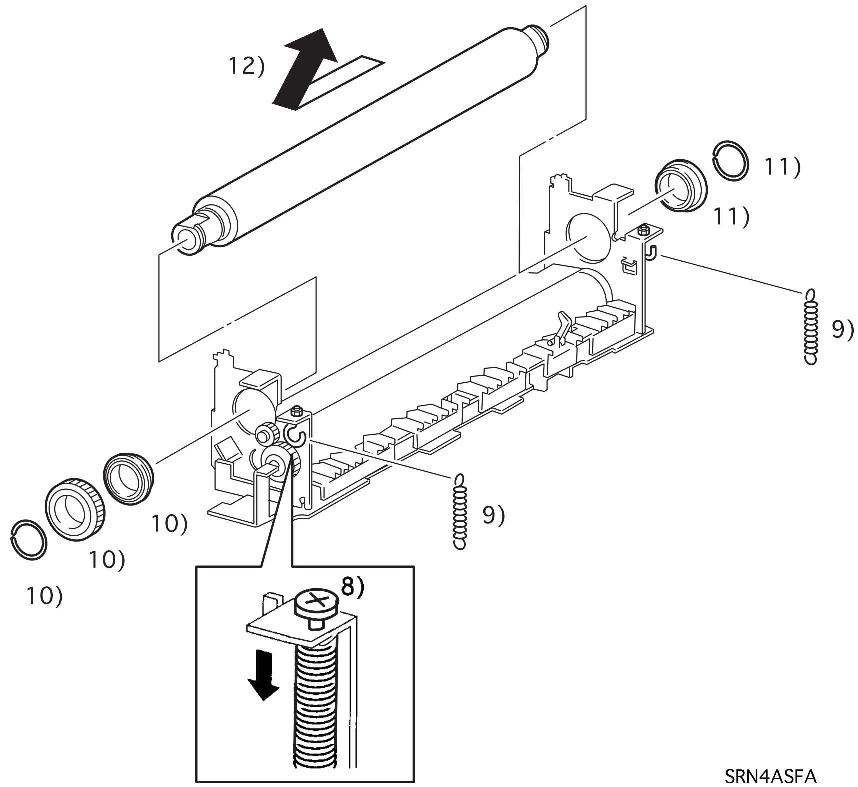


Figure 3-102. HEAT ROLL Removal

CHECK POINT

- **After installing the HEAT ROLL, perform the adjustment “NIP adjustment of the MAIN FUSER ASSEMBLY”. (See Section 3.3.1.)**

3.2.12.11 PRESSURE ROLL Removal (PL9.2.9)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the FUSER UPPER ASSEMBLY. (See Section 3.2.12.4.)
6. Remove the H/R HEATER. (See Section 3.2.12.5.)
7. Remove the P/R HEATER. (See Section 3.2.12.6.)
8. Remove the LOWER GUIDE ASSEMBLY. (See Section 3.2.12.7.)
9. Remove the UPPER GUIDE ASSEMBLY. (See Section 3.2.12.9.)
10. Remove the HEAT ROLL. (See Section 3.2.12.10.)
11. Remove the screw (gold, 5mm) securing the FUSER INLET PLATE and remove the FUSER INLET PLATE.

    NOTE: *In the following step, be careful not to damage the PRESSURE ROLL surface.*

12. Lift up the PRESSURE ROLL along with the P/H BEARING on the front and rear ends, then remove the P/R BEARING from the PRESSURE ROLL.

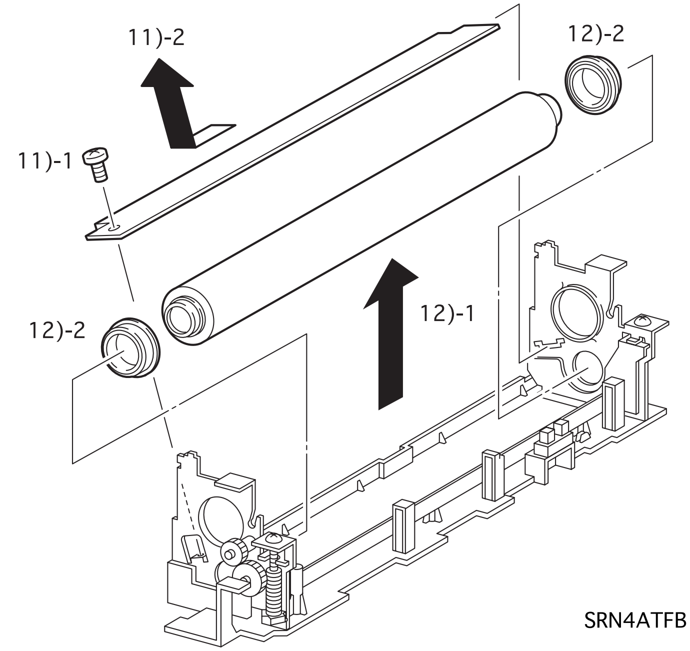


Figure 3-103. PRESSURE ROLL Removal

CHECK POINT

After installing the PRESSURE ROLL, perform the adjustment "NIP adjustment of the MAIN FUSER ASSEMBLY". (See Section 3.3.1.)

3.2.12.12 TEMP. SENSOR ASSEMBLY Removal (PL9.2.24)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the FUSER UPPER ASSEMBLY. (See Section 3.2.12.4.)
6. Remove the H/R HEATER. (See Section 3.2.12.5.)
7. Remove the P/R HEATER. (See Section 3.2.12.6.)
8. Remove the LOWER GUIDE ASSEMBLY. (See Section 3.2.12.7.)
9. Remove the UPPER GUIDE ASSEMBLY. (See Section 3.2.12.9.)
10. Remove the HEAT ROLL. (See Section 3.2.12.10.)
11. Remove the PRESSURE ROLL. (See Section 3.2.12.11.)
12. Remove the screw (black, cup head, 16mm) securing the FUSER REAR FRAME and remove the FUSER REAR FRAME and the FUSER REAR BRACKET along with 2 gears.
13. Remove the screw (black, cup head, 16mm) securing the FUSER FRONT FRAME and remove the FUSER FRONT FRAME and the FUSER FRONT BRACKET along with the NIP SCREWs.
14. Disconnect the connector (P/J75) from the FUSER EXIT SENSOR and release the harness from the hook on the FUSER BOTTOM PLATE. Then remove the TEMP. SENSOR ASSEMBLY.

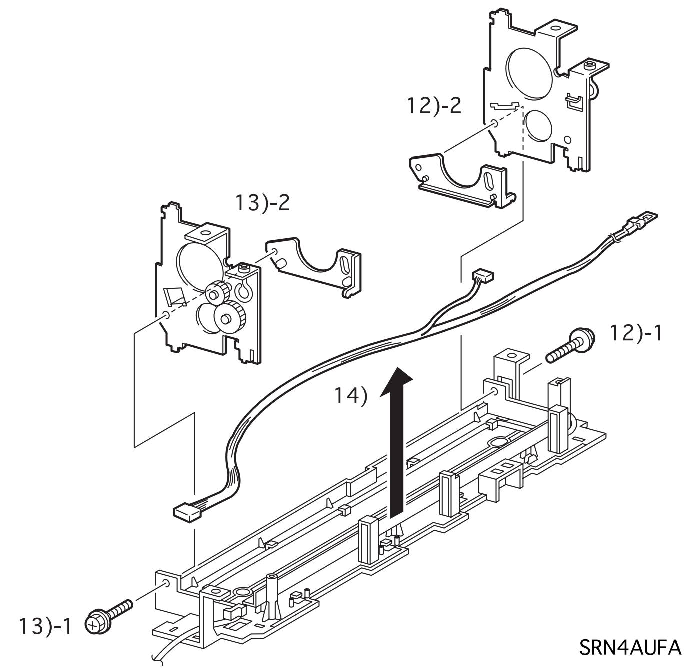


Figure 3-104. SENSOR ASSEMBLY Removal

- **After installing the TEMP. SENSOR ASSEMBLY, perform the adjustment “NIP adjustment of the MAIN FUSER ASSEMBLY”. (Refer to Section 3.3.1.)**
- **Route the harness tightly via the hook on the FUSER BOTTOM PLATE.**

3.2.12.13 EXCHANGE CHUTE Removal (PL9.3.10)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the EXCHANGE SPRING from the EXCHANGE CHUTE.
6. Remove the screw (gold, tapped, 10m) securing the EXCHANGE STOPPER-F, and then remove the EXCHANGE STOPPER-F.
7. Remove the screw (gold, tapped, 10mm) securing the EXCHANGE STOPPER-R, and then remove the EXCHANGE STOPPER-R.

   NOTE: *In the following step, be careful not to break the front and rear hinges in the EXCHANGE CHUTE.*

8. Remove the EXCHANGE CHUTE by taking it out to the right horizontally.

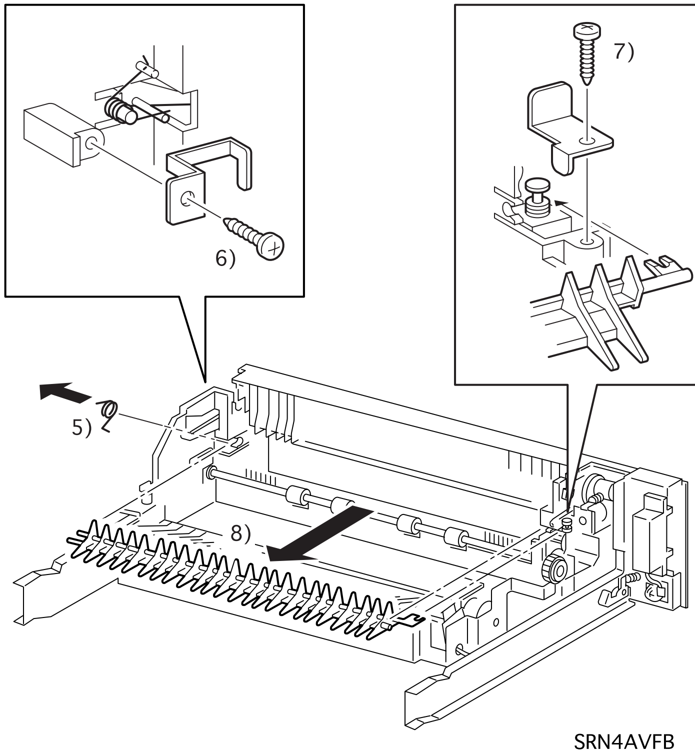


Figure 3-105. EXCHANGE CHUTE Removal

CHECK POINT

When installing the EXCHANGE CHUTE, fit the notch at the rear end of the EXCHANGE CHUTE in the plunger in the EXCHANGE SOLENOID.

3.2.12.14 OIL CAM SOLENOID Removal (PL9.3.21)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)

   NOTE: *In the following step, FUSER REAR RAIL will be kept connected to the FUSER TRAY ASSEMBLY. Do not move the FUSER REAR RAIL too far from the FUSER TRAY ASSEMBLY.*

5. Remove 2 screws (gold, tapped, 10mm) securing the FUSER REAR RAIL, and separate the FUSER REAR RAIL from the FUSER TRAY ASSEMBLY.
6. Disconnect the connector (P/J73) for the OIL CAM SOLENOID and release the harness from the clamp.
7. Remove 2 screw (gold, tapped, 10mm) securing the OIL CAM SOLENOID and remove the OIL CAM SOLENOID.

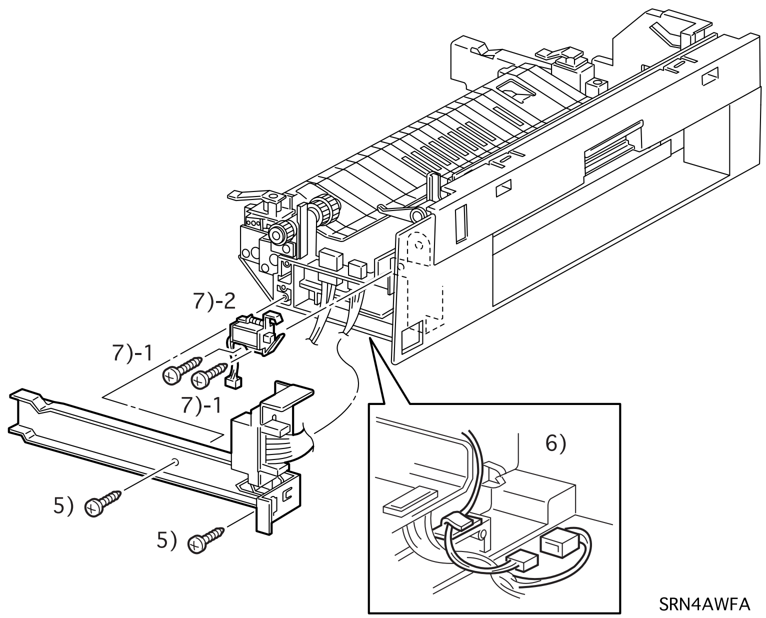


Figure 3-106. OIL CAM SOLENOID Removal

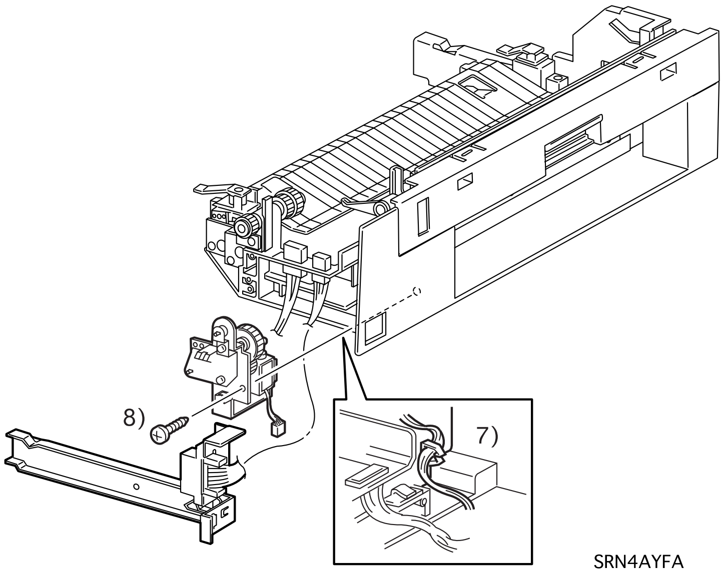
- **When installing the OIL CAM SOLENOID, make sure the arm on the OIL CAM SOLENOID lines up with the T-shaped protrusion on the OIL CAM ASSEMBLY.**
- **After installing the OIL CAM SOLENOID, ensure that the protrusion on the OIL CAM ASSEMBLY stays in contact with the arm on the OIL CAM SOLENOID.**

3.2.12.15 EXCHANGE SOLENOID Removal (PL9.3.16)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the EXCHANGE CHUTE. (See Section 3.2.12.13.)
6. Remove the OIL CAM SOLENOID. (See Section 3.2.12.14.)
7. Disconnect the connector (P/J74) for the EXCHANGE SOLENOID and release the harness from the clamp.

   NOTE: *In the following step, be careful not to drop the gear since it will be disengaged when the EXCHANGE BRACKET is removed.*

8. Remove the screw (gold, tapped, 10mm) securing the SOLENOID ASSEMBLY and remove the SOLENOID ASSEMBLY along with the FUSER EARTH-B.
9. Remove 2 screws (silver, 3mm) securing the EXCHANGE SOLENOID to the EXCHANGE BRACKET. Then remove the EXCHANGE SOLENOID.



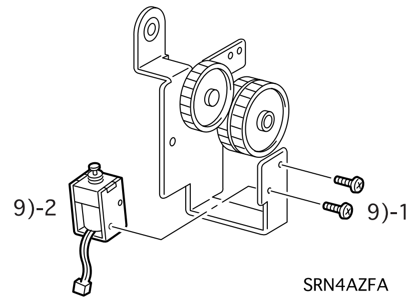


Figure 3-107. EXCHANGE SOLENOID Removal

3.2.12.16 OIL CAM ASSEMBLY Removal (PL9.3.22)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the OIL CAM SOLENOID. (See Section 3.2.12.14.)
6. Remove the EXCHANGE SOLENOID. (See Section 3.2.12.15.)

   NOTE: *In the following step, be careful not to break the hook on the OIL CAM ASSEMBLY.*

7. Release 4 hooks on the FUSER TRAY LEVER and remove the FUSER TRAY LEVER.
8. Remove the OIL CAM ASSEMBLY by pulling it out to the left horizontally.

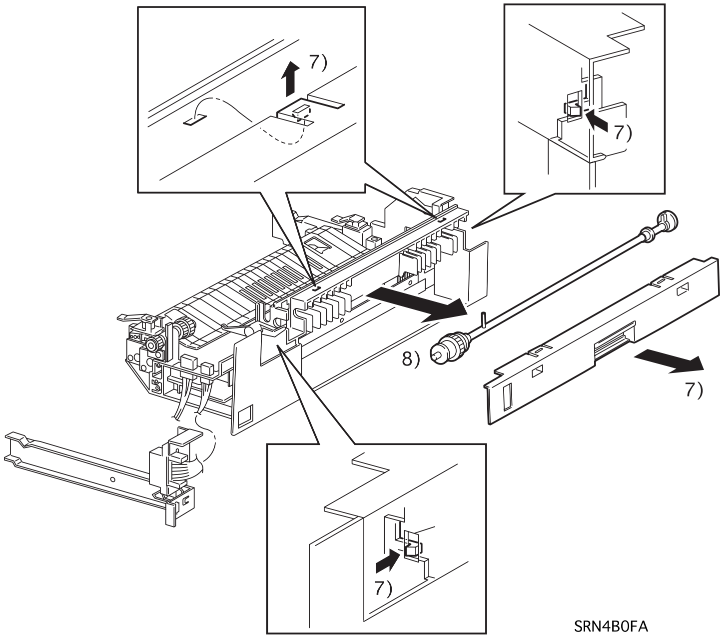


Figure 3-108. OIL CAM ASSEMBLY Removal

3.2.12.17 CLEANER CAM SOLENOID Removal (PL9.4.23)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)

   NOTE: *In the following step, the FUSER REAR RAIL and the FUSER TRAY ASSEMBLY will be kept connected with the harness. Therefore, do not leave the FUSER TRAY ASSEMBLY too far from the fuser rear rail.*

5. Remove 2 screws (gold, tapped, 10mm) securing the FUSER REAR RAIL, and separate the FUSER REAR RAIL from the FUSER TRAY ASSEMBLY.
6. Disconnect the connector (P/J62) for the CLEANER CAM SOLENOID and release the harness from the frame.
7. Remove 2 screws (gold, tapped, 10mm) securing the INPUT BRACKET FT and remove the INPUT BRACKET FT along with the FUSER EARTH-A.
8. Remove 2 screws (gold, tapped, 10mm) securing the CLEANER CAM SOLENOID and remove the CLEANER CAM SOLENOID.

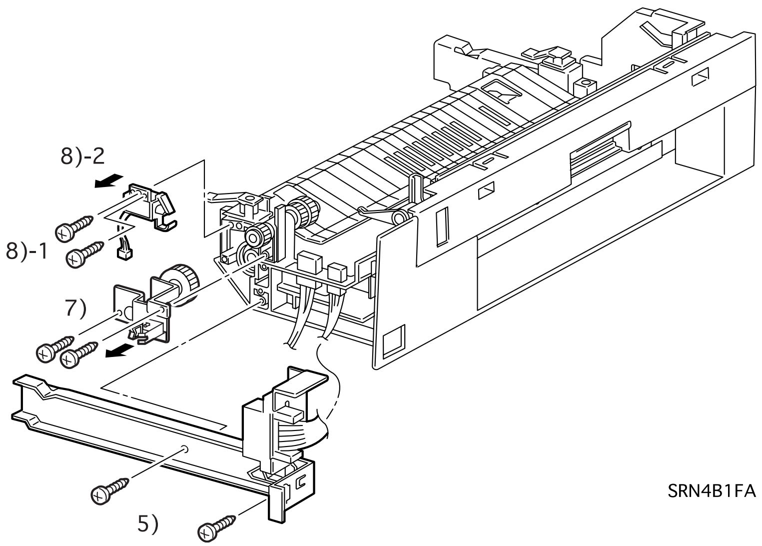


Figure 3-109. CLEANER CAM SOLENOID Removal

Follow the steps below when installing the CLEANER CAM SOLENOID:

1. **The arm on the CLEANER CAM ASSEMBLY is in the induced position.**
2. **Set the lower side of the tip of the arm staying in contact with the Spring Clutch of the CLEANER CAM ASSEMBLY, and fix the solenoid.**

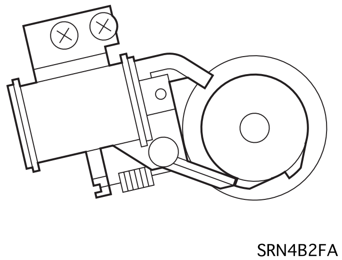


Figure 3-110. CLEANER CAM SOLENOID Installation

3.2.12.18 CLEANER CAM ASSEMBLY Removal (PL9.4.26)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the CLEANER CAM SOLENOID. (See Section 3.2.12.17.)
6. Remove 2 screws (gold, tapped, 10mm) securing the FUSER FRONT RAIL, and remove the FUSER FRONT RAIL from the FUSER TRAY ASSEMBLY.

   NOTE: *When removing the CLEANER CAM in the following step, be careful not to drop and lose the CLEANER CAM PIN.*

7. Remove the E-ring securing the CLEANER CAM and remove the CLEANER CAM, CLEANER CAM PIN, CLN CAM BEARING-F.
8. Pull out the CLEANER CAM ASSEMBLY backward and remove tit along with the CLN CAM BEARING-F.
9. Remove the CLN CAM BEARING-F from the CLEANER CAM ASSEMBLY.

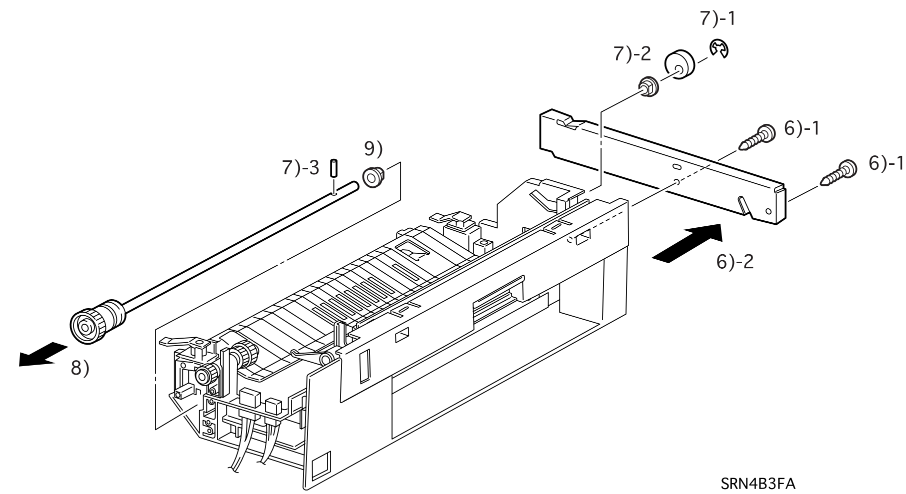


Figure 3-111. CLEANER CAM ASSEMBLY Removal

CHECK POINT

When installing the both right and left cams, set them in the same proper direction.

3.2.12.19 EXIT-1 ROLL ASSEMBLY Removal (PL9.3.7)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the E-ring securing the EXIT-1 ROLL ASSEMBLY.
6. Push the front EXIT-1 BEARING to the rear and slide the front part of the EXIT-1 ROLL ASSEMBLY to the right.

   NOTE: *In the following step, be careful not drop the EXIT-1 BEARING at the rear end of the EXIT-1 ROLL ASSEMBLY since it will be released from the FUSER TRAY.*

7. Shift the EXIT-1 ROLL ASSEMBLY forward to release the rear end and remove the EXIT-1 ROLL ASSEMBLY to the rear along with the EXIT-1 BEARING and the EXIT-1 GEAR.
8. Remove the EXIT-1 BEARING and the EXIT-1 GEAR from the EXIT-1 ROLL ASSEMBLY.

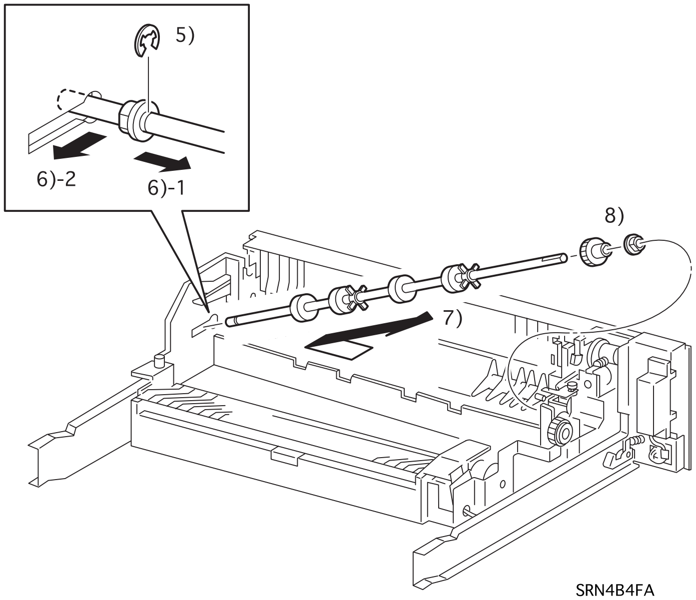


Figure 3-112. EXIT-1 ROLL ASSEMBLY Removal

3.2.12.20 CRU SWITCH ASSEMBLY Removal (PL9.3.25)

1. Remove the EXIT TRAY ASSEMBLY. (See Section 3.2.13.1.)
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the FUSER ASSEMBLY. (See Section 3.2.12.2.)
4. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.3.)
5. Remove the EXCHANGE CHUTE. (See Section 3.2.12.13.)
6. Remove the EXCHANGE SOLENOID. (See Section 3.2.12.15.)
7. Remove the FUSER TRAY LEVER. (See Section 3.2.12.16.)
8. Disconnect the connector (P/J77) for the CRU SWITCH ASSEMBLY and release the harness from the clamp.

   NOTE: *Be careful not to damage the contact parts of the CRU SWITCH ASSEMBLY.*

9. Release the hooks securing the CRU SWITCH ASSEMBLY from the FUSER TRAY and remove the CRU SWITCH ASSEMBLY.

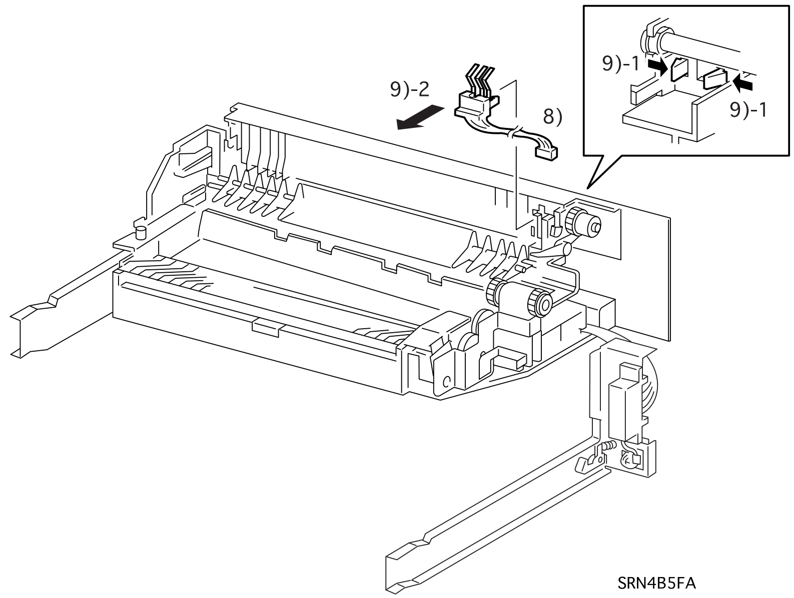


Figure 3-113. CRU SWITCH ASSEMBLY Removal

3.2.13 Paper Exit

3.2.13.1 EXIT TRAY ASSEMBLY Removal (PL10.1.10)

1. Push the hinge at the rear end of the EXIT TRAY ASSEMBLY inward to release the peg from the FUSER TRAY. Then release the front peg and remove the EXIT TRAY ASSEMBLY.

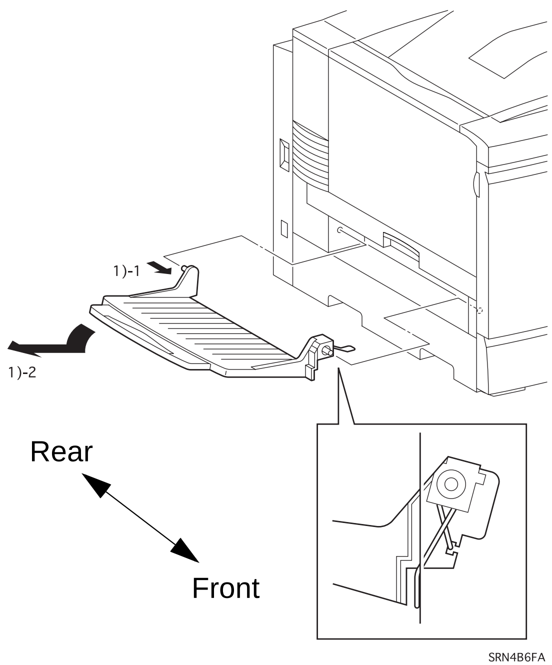


Figure 3-114. EXIT TRAY ASSEMBLY Removal (PL10.1.10)

CHECK POINT **When installing the EXIT TRAY ASSEMBLY, hang the hinge spring longer end to the outer side of the frame.**

3.2.13.2 EXIT UPPER ASSEMBLY Removal (PL10.1.2)

1. Open the exit upper assembly.

   NOTE: *In the following step, be careful not to break the hinge in the EXIT UPPER ASSEMBLY.*

2. Push the front hinge part of the EXIT UPPER ASSEMBLY inward to release it from the peg on the EXIT LOWER ASSEMBLY. Then release the rear hinge and remove the EXIT UPPER ASSEMBLY.

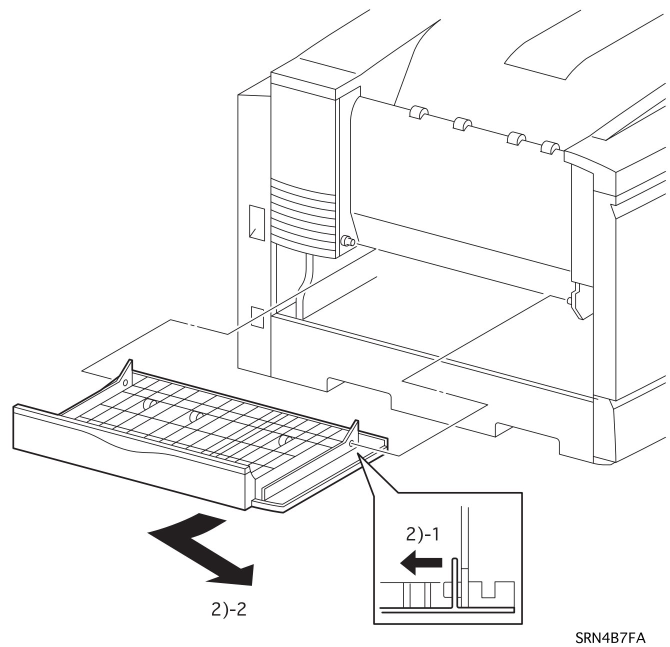


Figure 3-115. Figure 3-94. EXIT UPPER ASSEMBLY Removal

3.2.13.3 EXIT LOWER ASSEMBLY Removal (PL10.1.1)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Remove the FUSER ASSEMBLY with the EXIT TRAY ASSEMBLY and the OIL ROLL ASSEMBLY on it. (See Section 3.2.12.2.)
4. Remove the EXIT UPPER ASSEMBLY. (See Section 3.2.13.2.)
5. Disconnect 3 connectors (P/J111B, P/J161B, P/J89) for the EXIT LOWER ASSEMBLY.
6. Remove 5 screws (black, cup head, 8mm) securing the EXIT LOWER ASSEMBLY, and remove the EXIT LOWER ASSEMBLY by lifting it up.

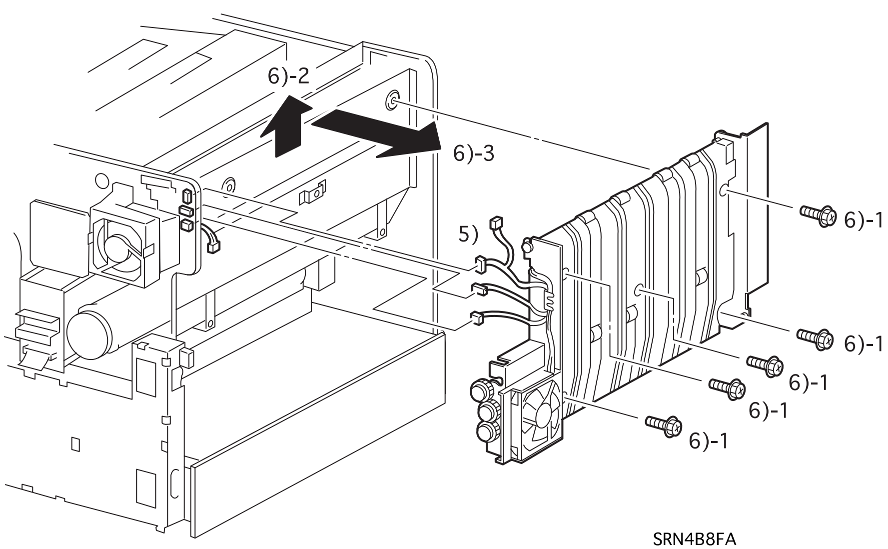


Figure 3-116. EXIT LOWER ASSEMBLY Removal

3.2.13.4 EXIT-2 ROLL ASSEMBLY Removal (PL10.2.5)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Remove the FUSER ASSEMBLY with the EXIT TRAY ASSEMBLY and the OIL ROLL ASSEMBLY on it. (See Section 3.2.12.2.)
4. Remove the EXIT UPPER ASSEMBLY. (See Section 3.2.13.2.)
5. Remove the EXIT LOWER ASSEMBLY. (See Section 3.2.13.3.)
6. Remove 2 E-rings securing the EXIT-2 ROLL ASSEMBLY by the front and rear ends, and remove 2 SPUR GEARs, EXIT FRONT BEARING, and the EXIT REAR BEARING.
7. Remove the EXIT-2 ROLL ASSEMBLY.

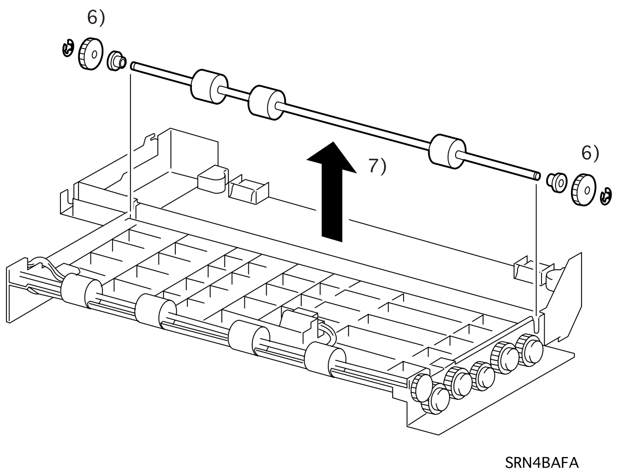


Figure 3-117. EXIT-2 ROLL ASSEMBLY Removal

3.2.13.5 EXIT-3 ROLL ASSEMBLY Removal (PL10.2.7)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove front and rear E-rings securing the EXIT-3 ROLL ASSEMBLY.
3. Remove the SPUR GEAR, EXIT FRONT BEARING and EXIT REAR BEARING.
4. Remove the EXIT-3 ROLL ASSEMBLY.

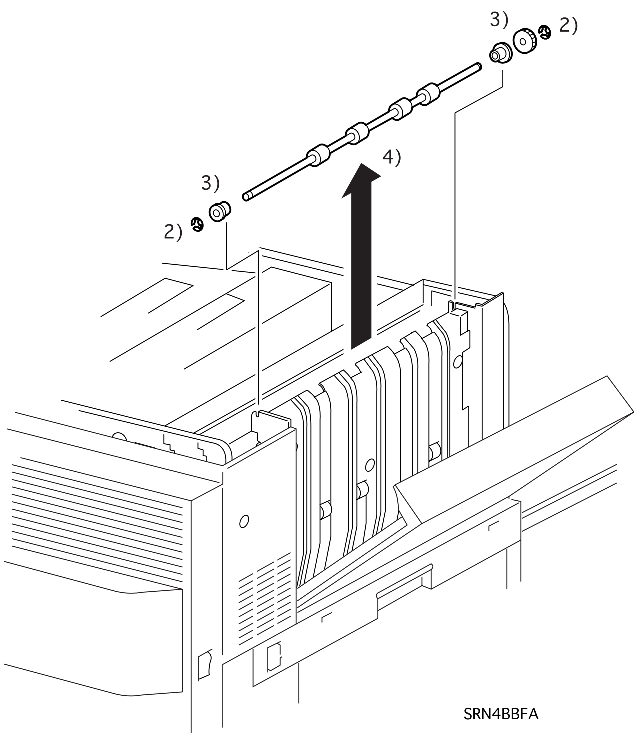


Figure 3-118. EXIT-3 ROLL ASSEMBLY Removal

3.2.13.6 FUSER FAN Removal (PL10.2.15)

1. Draw out the FUSER ASSEMBLY.
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Disconnect the connector (P/J111B) for the FUSER FAN and release the harness from the clamp.
4. Widen the hooks securing the FUSER FAN and remove the FUSER FAN.

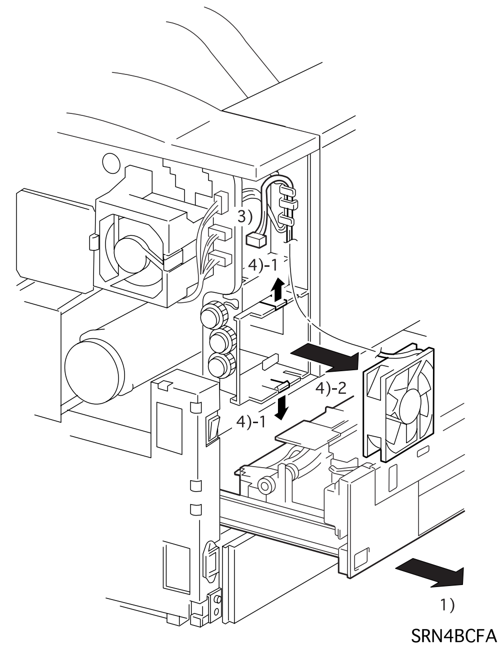


Figure 3-119. FUSER FAN Removal

CHECK POINT

When placing the FUSER FAN, make sure the fan is installed with the maker label facing outward.

3.2.13.7 TOP EXIT SENSOR Removal (PL10.2.12)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Remove the FUSER ASSEMBLY with the EXIT TRAY ASSEMBLY and the OIL ROLL ASSEMBLY on it. (See Section 3.2.12.2.)
4. Remove the EXIT UPPER ASSEMBLY. (See Section 3.2.13.2.)
5. Remove the EXIT LOWER ASSEMBLY. (See Section 3.2.13.3.)
6. Disconnect the connector (P/J165) for the TOP EXIT SENSOR.
7. Release the hooks securing the TOP EXIT SENSOR and remove the TOP EXIT SENSOR.

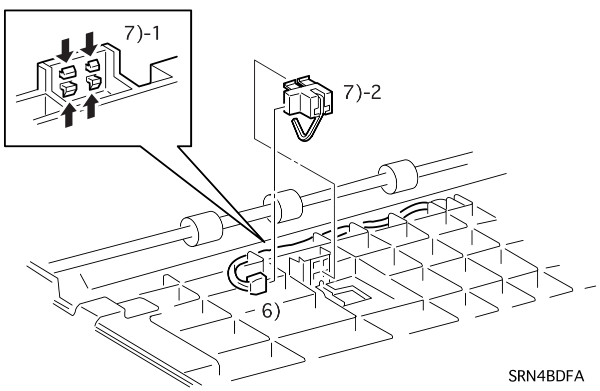


Figure 3-120. TOP EXIT SENSOR Removal

3.2.13.8 EXIT CHUTE SWITCH Removal (PL10.2.13)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Remove the FUSER ASSEMBLY with the EXIT TRAY ASSEMBLY and the OIL ROLL ASSEMBLY on it. (See Section 3.2.12.2.)
4. Remove the EXIT UPPER ASSEMBLY. (See Section 3.2.13.2.)
5. Remove the EXIT LOWER ASSEMBLY. (See Section 3.2.13.3.)
6. Disconnect the connector (P/J166) for the EXIT CHUTE SWITCH.
7. Release the hooks securing the EXIT CHUTE SWITCH and remove the EXIT CHUTE SWITCH.

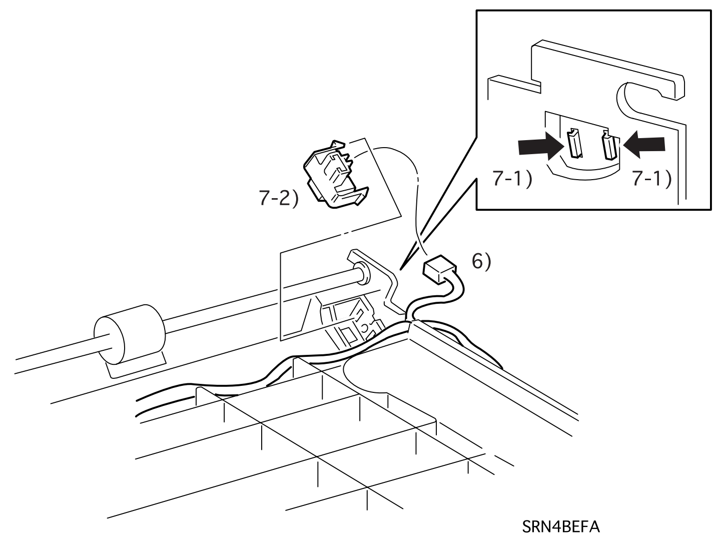


Figure 3-121. EXIT CHUTE SWITCH Removal

3.2.14 Drive

3.2.14.1 P/H DRIVE ASSEMBLY Removal (PL11.1.1)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Remove the HVPS. (See Section 3.2.16.2.)
3. Release 3 harnesses from the clamp on the P/H DRIVE ASSEMBLY.
4. Remove the screw (silver, cup head, 8mm) securing the DRIVE CLAMP-N.

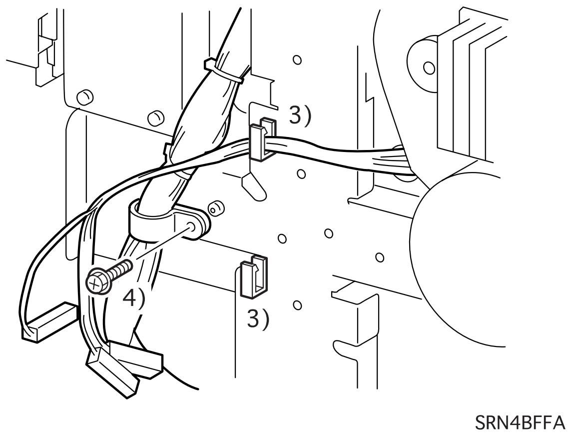


Figure 3-122. P/H DRIVE ASSEMBLY Removal (1/2)

5. Remove 5 screws (black, cup head, 10mm) securing the P/H DRIVE ASSEMBLY, and remove the P/H DRIVE ASSEMBLY along with 2 DRIVE CLAMP-Ys.
6. Remove the both 2 DRIVE CLAMP-Ys from the P/H DRIVE ASSEMBLY.

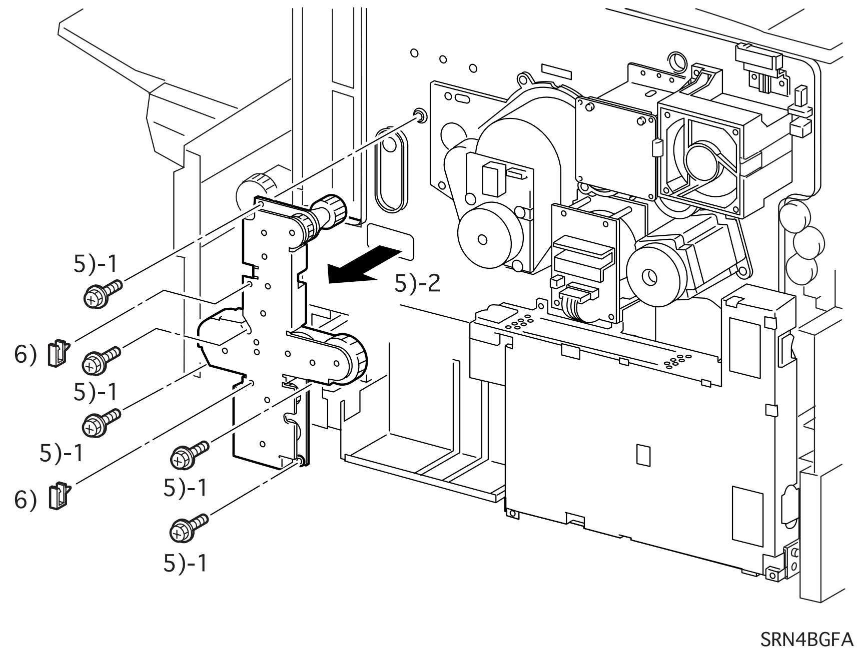


Figure 3-123. P/H DRIVE ASSEMBLY Removal (2/2)

3.2.14.2 P/H MOTOR ASSEMBLY Removal (PL11.1.3)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Disconnect 2 connectors (P/J49 and P/J50) from the P/H MOTOR ASSEMBLY.
3. Remove 5 screws (black, cup head, 4mm) securing the P/H MOTOR ASSEMBLY and remove the P/H MOTOR ASSEMBLY along with 2 P/H MOTOR SUPPORTs.
4. Using pliers, remove the 2 P/H MOTOR SUPPORTs from the P/H MOTOR ASSEMBLY.

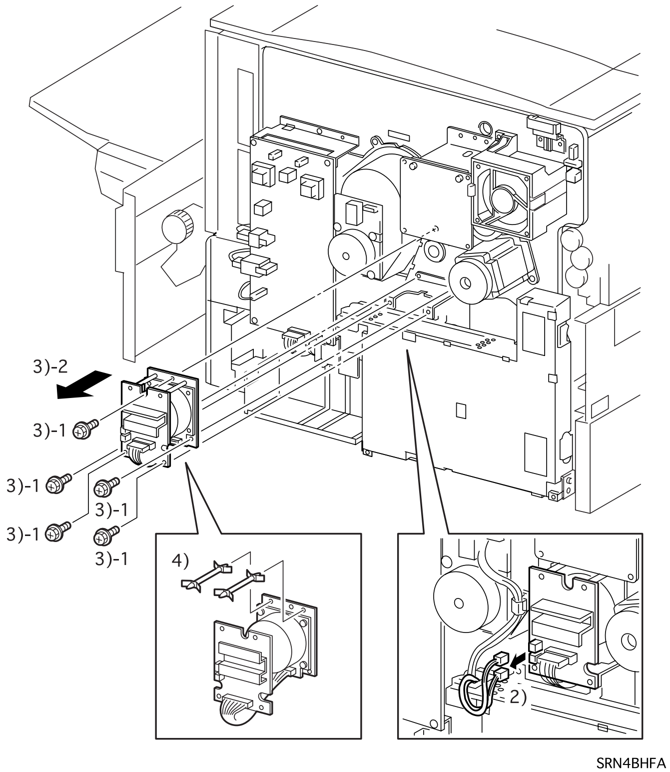


Figure 3-124. P/H MOTOR ASSEMBLY Removal

3.2.14.3 ROTARY MOTOR PWB Removal (PL11.1.21)

1. Remove the REAR COVER ASSEMBLY.(See Section 3.2.4.5.)

   ***NOTE:** In the following step, the ROTARY MOTOR PWB will be kept connected to the printer body with the harness. Therefore, be careful not to leave the ROTARY MOTOR PWB too far from the printer.*

2. Remove the screw (silver, cup head, 8mm) securing the ROTARY MOTOR PWB and separate the ROTARY MOTOR PWB from the printer body.
3. Disconnect 3 connectors (P/J245, P/J246, P/J247) for the ROTARY MOTOR PWB and remove the ROTARY MOTOR PWB.

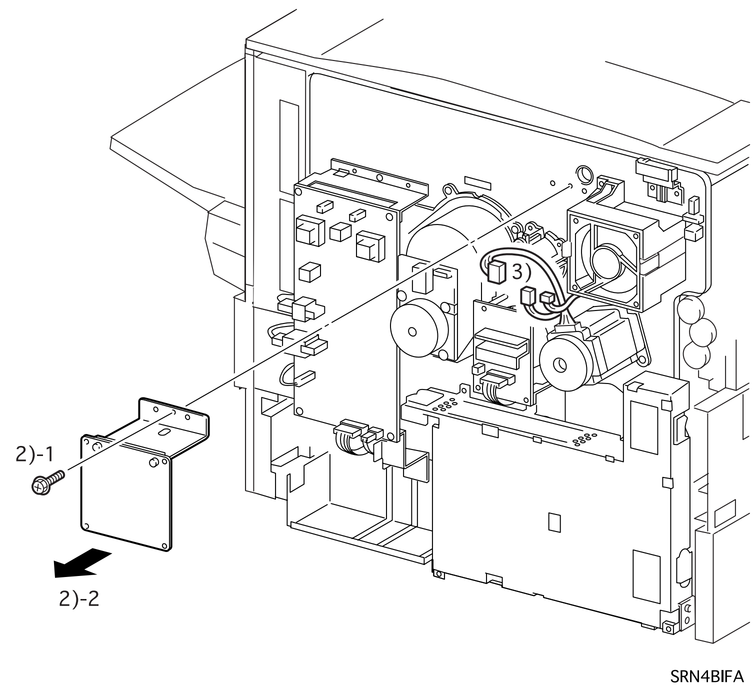


Figure 3-125. ROTARY MOTOR PWB Removal

3.2.14.4 ROTARY MOTOR ASSEMBLY Removal (PL11.1.20)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Disconnect the connector (P/J247) for the ROTARY MOTOR ASSEMBLY.
3. Remove 3 screws (gold, 6mm) securing the ROTARY MOTOR ASSEMBLY and remove the ROTARY MOTOR ASSEMBLY.

CHECK POINT

When installing the ROTARY MOTOR ASSEMBLY, do not catch the harness between the parts.

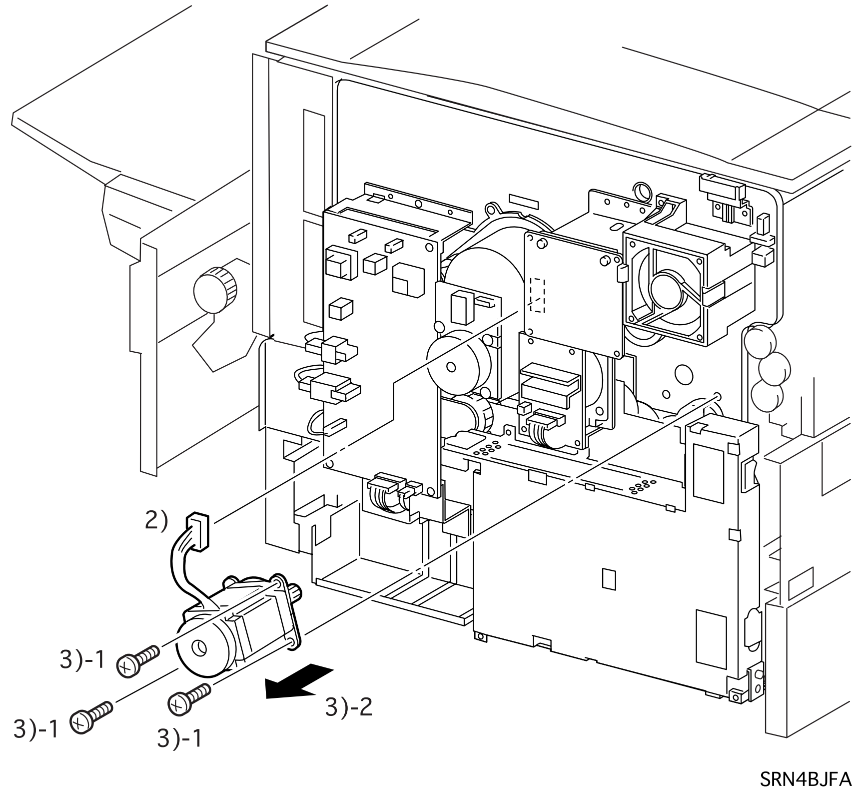


Figure 3-126. ROTARY MOTOR ASSEMBLY Removal

3.2.14.5 DISPENSE MOTOR ASSEMBLY Removal (PL11.1.22)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Remove the P/H MOTOR ASSEMBLY. (See Section 3.2.14.2.)
3. Remove the ROTARY MOTOR PWB. (See Section 3.2.14.3.)
4. Remove the ROTARY MOTOR ASSEMBLY. (See Section 3.2.14.4.)
5. Disconnect the connector (P/J55) for the DISPENSE MOTOR ASSEMBLY.
6. Remove 2 screws (silver, 6m) securing the DISPENSE MOTOR ASSEMBLY. Then shift the DISPENSE MOTOR ASSEMBLY to align the gear with the cutout in the frame, and remove the DISPENSE MOTOR ASSEMBLY.

CHECK POINT

When installing the DISPENSE MOTOR ASSEMBLY, use the marked holes for the both top and bottom screws.

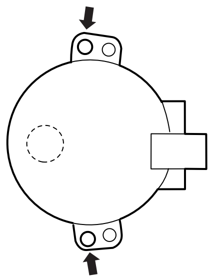


Figure 3-127.
DISPENSE MOTOR ASSEMBLY INSTALLATION

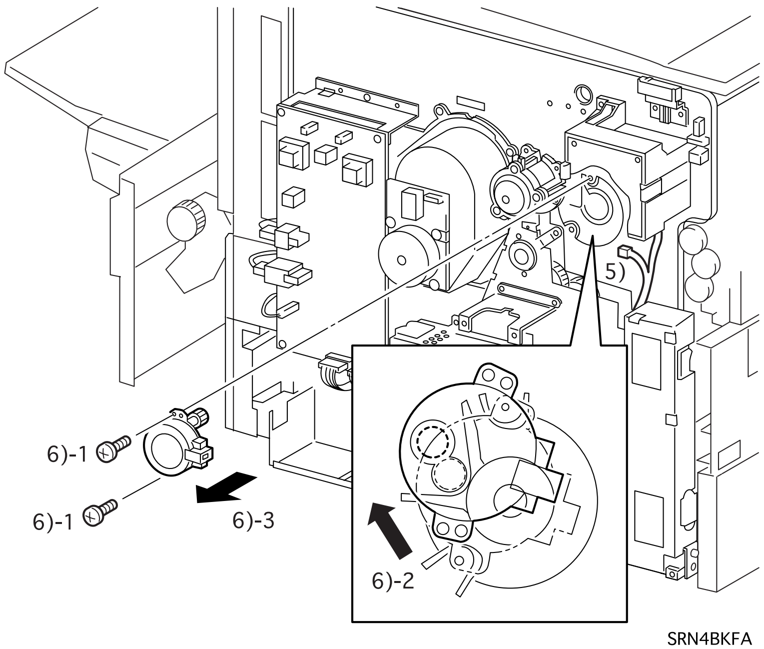


Figure 3-128. DISPENSE MOTOR ASSEMBLY Removal

3.2.14.6 FUSER DRIVE ASSEMBLY Removal (PL11.1.2)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Remove the FUSER ASSEMBLY with the EXIT TRAY ASSEMBLY and the OIL ROLL ASSEMBLY on it. (See Section 3.2.12.2.)
3. Remove the P/H MOTOR ASSEMBLY. (See Section 3.2.14.2.)
4. Remove the LVPS. (See Section 3.2.16.1.)
5. Release the harness from the clamp on the P/H MOTOR BRACKET.
6. Remove the screw (black, cup head, 4mm) securing the P/H MOTOR BRACKET, and remove the P/H MOTOR BRACKET.
7. Remove the KL clip securing the AUGER HIGH ASSEMBLY.
8. Remove 5 screws (black, cup head, 4mm) securing the FUSER DRIVE ASSEMBLY, and remove the FUSER DRIVE ASSEMBLY.

When installing the FUSER DRIVE ASSEMBLY, be careful not to catch the harness between the parts.

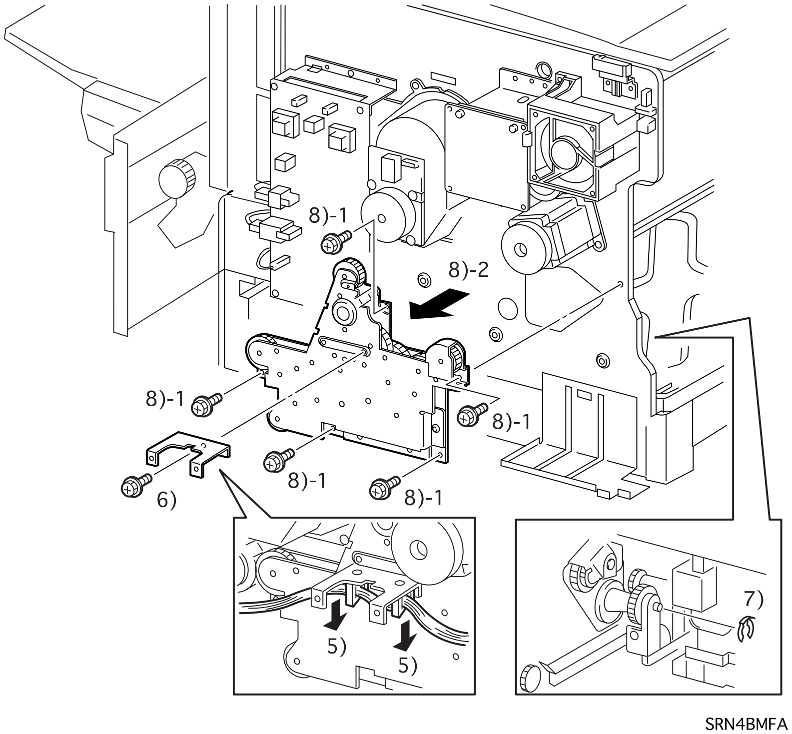


Figure 3-129. FUSER DRIVE ASSEMBLY Removal

3.2.14.7 PROCESS MOTOR ASSEMBLY Removal (PL11.1.12

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Disconnect 2 connectors (P/J51 and P/J52) for the PROCESS MOTOR ASSEMBLY.
3. Remove 4 screws (gold, 8mm) securing the PROCESS MOTOR ASSEMBLY, and remove the PROCESS MOTOR ASSEMBLY.

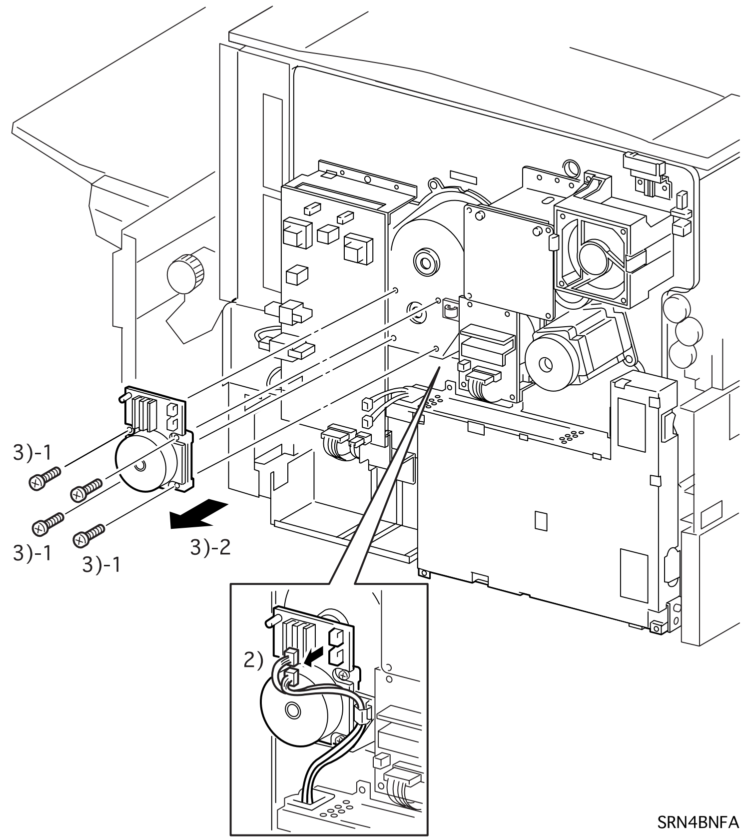


Figure 3-130. PROCESS MOTOR ASSEMBLY Removal

3.2.14.8 PROCESS DRIVE ASSEMBLY Removal (PL11.1.10)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
4. Remove the TENSION LEVER. (See Section 3.2.11.1.)
5. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.3.)
6. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
7. Remove the MAIN P/H ASSEMBLY with the MSI ASSEMBLY installed on it. (See Section 3.2.8.1.)
8. Remove the ROS ASSEMBLY. (See Section 3.2.9.3.)
9. Remove the ADC SENSOR ASSEMBLY. (See Section 3.2.9.4.)
10. Remove the XL RAIL ASSEMBLY. (See Section 3.2.9.5.)
11. Remove the HVPS. (See Section 3.2.16.2.)
12. Remove the TRANSFER ASSEMBLY. (See Section 3.2.11.2.)
13. Remove the P/H DRIVE ASSEMBLY. (See Section 3.2.14.1.)
14. Remove the P/H MOTOR ASSEMBLY. (See Section 3.2.14.2.)
15. Remove the screw (black, cup head, 8mm) securing the HVPS BRACKET-1, and remove the HVPS BRACKET-1 along with 2 ELEC. CLAMP-Ss.
16. Disconnect 2 connectors (P/J51 and P/J52) for the PROCESS MOTOR ASSEMBLY and release the harnesses from the clamp.
17. Remove 7 screws (black, cup head, 8mm) securing the PROCESS DRIVE ASSEMBLY and remove the PROCESS DRIVE ASSEMBLY.

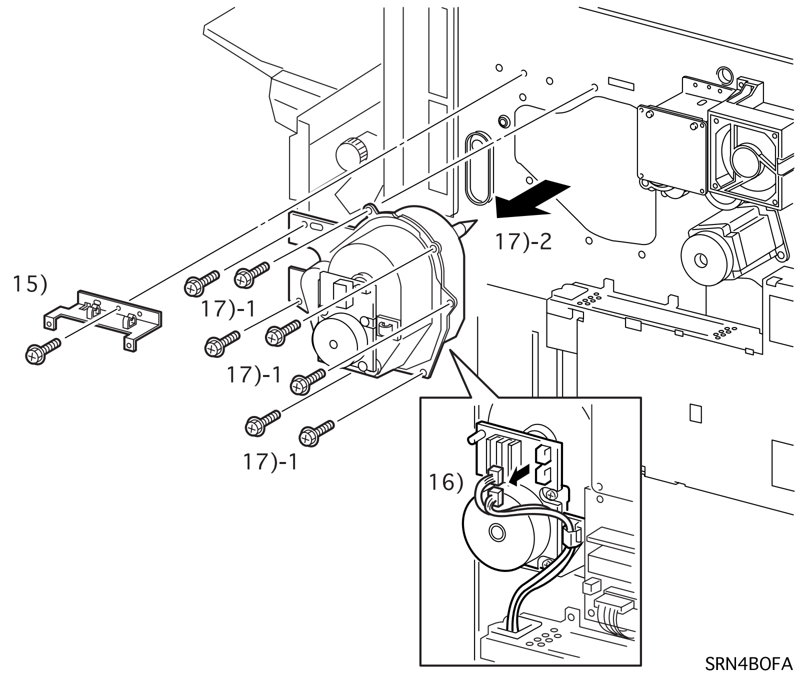


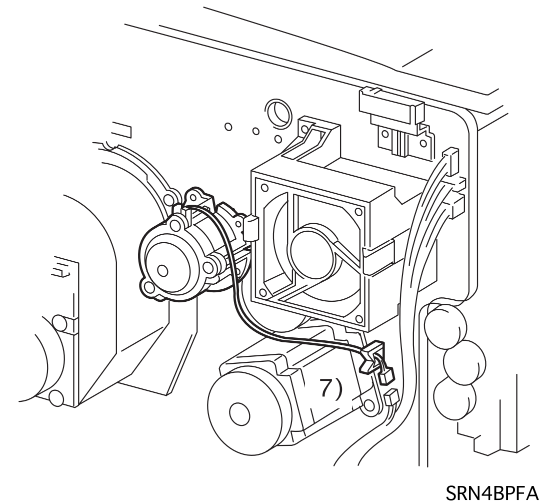
Figure 3-131. PROCESS DRIVE ASSEMBLY Removal

CHECK POINT

When installing the PROCESS DRIVE ASSEMBLY, make sure the location hole in the PROCESS DRIVE ASSEMBLY fits in the protrusion on the base frame.

3.2.14.9 DEVE. CLUTCH ASSEMBLY Removal (PL11.1.23)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Remove the FUSER ASSEMBLY with the EXIT TRAY ASSEMBLY and the OIL ROLL ASSEMBLY installed on it. (See Section 3.2.12.2.)
3. Remove the P/H MOTOR ASSEMBLY. (See Section 3.2.14.2.)
4. Remove the ROTARY MOTOR PWB. (See Section 3.2.14.3.)
5. Remove the LVPS. (See Section 3.2.16.1.)
6. Remove the FUSER DRIVE ASSEMBLY. (See Section 3.2.14.6.)
7. Disconnect the connector (P/J56) for the DEVE. CLUTCH ASSEMBLY and release the harness from the clamp.
8. Remove 4 screws (silver, cup head, 8mm) securing the DEVE. CLUTCH ASSEMBLY, and remove the DEVE. CLUTCH ASSEMBLY.



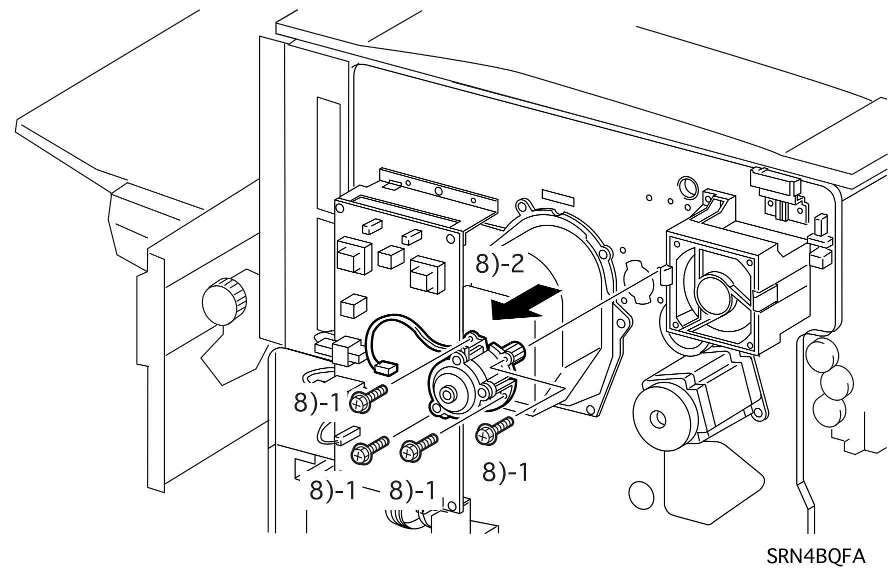


Figure 3-132. DEVE. CLUTCH ASSEMBLY Removal

3.2.15 Frame

3.2.15.1 DEVE. TIE PLATE Removal (PL12.1.4)

1. Remove the FRONT COVER ASSEMBLY. (See Section 3.2.4.1.)
2. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
3. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
4. Remove the TENSION LEVER. (See Section 3.2.11.1.)
5. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.3.)
6. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
7. Remove the EXIT UPPER ASSEMBLY. (See Section 3.2.13.2.)
8. Remove the EXIT LOWER ASSEMBLY. (See Section 3.2.13.3.)
9. Remove the FRONT COVER SWITCH L. (See Section 3.2.16.8.)
10. Remove the FRAME CLAMP-PS.

    NOTE: *In the following step, be careful not to damage the connector connected to the rear frame in the printer by touching it with the DEVE. TIE PLATE.*

11. Remove 4 screws (black, cup head, 8mm) securing the DEVE. TIE PLATE, and lift the DEVE. TIE PLATE up to remove.

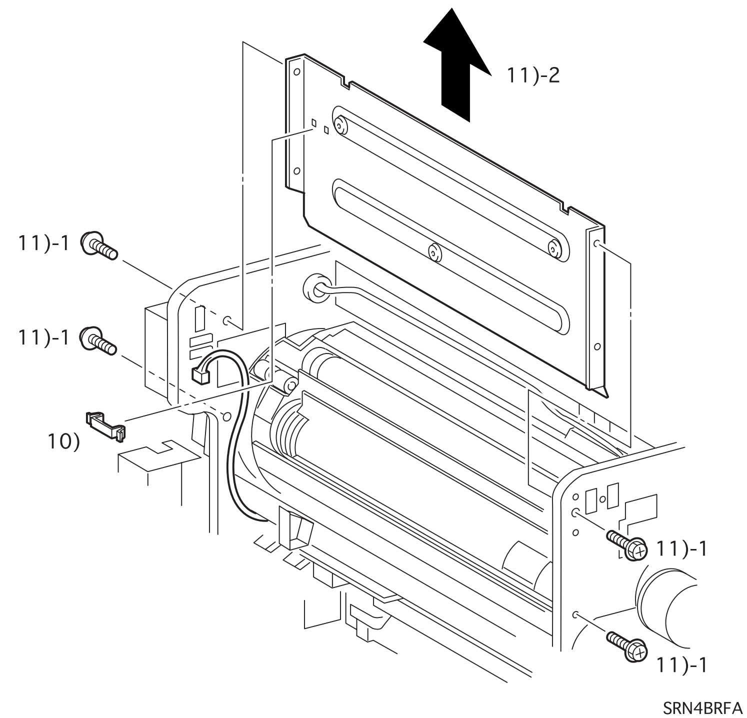


Figure 3-133. DEVE. TIE PLATE Removal

3.2.16 Electrical

3.2.16.1 LVPS Removal (PL13.1.1)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Disconnect 3 connectors (P/J32, P/J33, P/J35) for the LVPS and release the harnesses from the clamp.
3. Remove 4 screws (silver, cup head, 8mm) securing the LVPS.
4. Lift up the LVPS to release the hook on the left and remove the LVPS.

CHECK POINT

- **When installing the LVPS, route the harnesses properly so they won't be caught in the gears and the plates.**
- **When installing the LVPS, be sure to join the LVPS to the frame of the printer body by the hook on the left edge.**

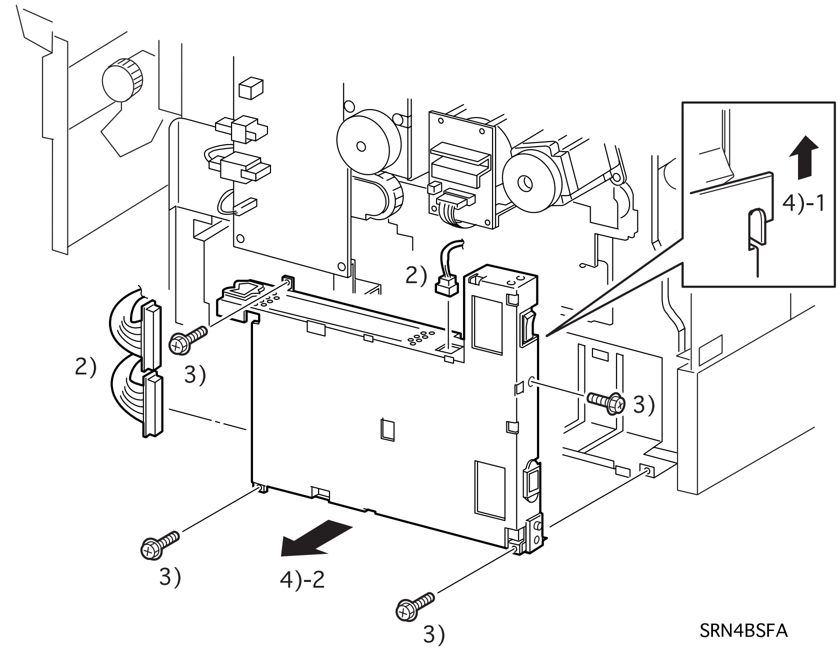


Figure 3-134. LVPS Removal

3.2.16.2 HVPS Removal (PL13.1.2)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Disconnect 7 connectors (P/J41, P/J42, P/JA, P/JC, P/JD, P/JF, P/JG) for the HVPS.
3. Remove 4 screws (silver, cup head, 8mm) securing the HVPS and remove the HVPS.

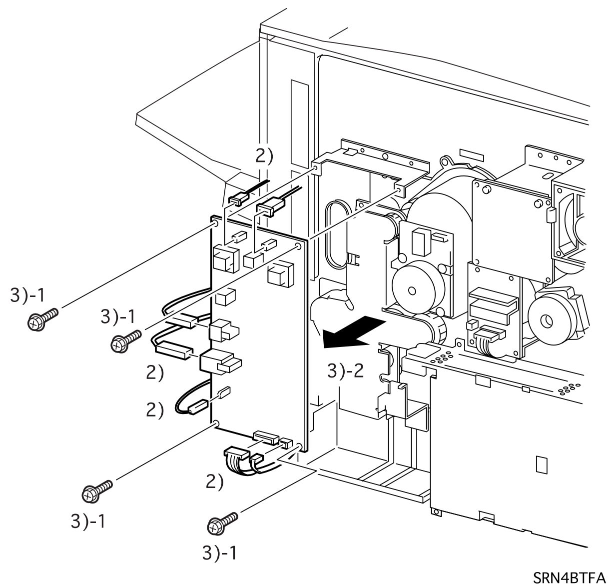


Figure 3-135. HVPS Removal

CHECK POINT **When installing the HVPS, route the harnesses properly so that they won't be caught in the gears and the plates.**

3.2.16.3 TOP COVER SWITCH Removal (PL13.1.3)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
3. Disconnect the connector (P/J195) for the TOP COVER SWITCH.
4. Remove the screw (black, cup head, 6mm) securing the TOP COVER SWITCH, and remove the TOP COVER SWITCH.

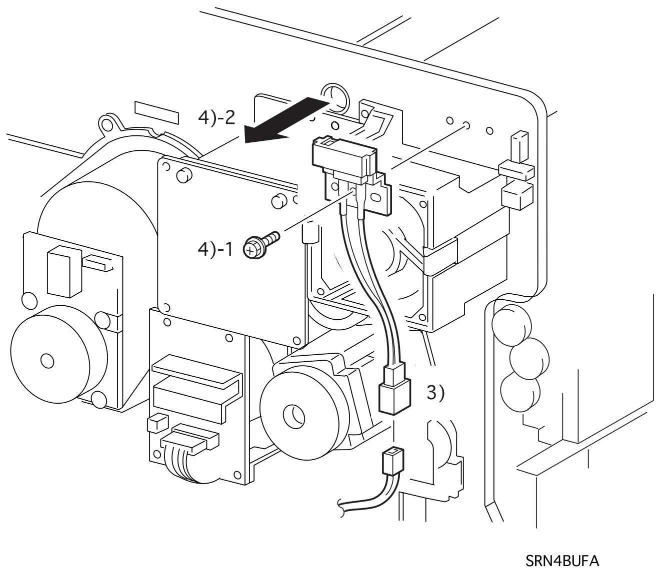


Figure 3-136. TOP COVER SWITCH Removal

3.2.16.4 DEVE. FAN Removal (PL13.1.5)

1. Remove the REAR COVER ASSEMBLY. (See Section 3.2.4.5.)
2. Disconnect the connector (P/J82) for the DEVE. FAN and release the harness from the FAN DUCT.
3. Widen the hooks on the FAN DUCT and remove the DEVE. FAN.

CHECK POINT

- **When installing the DEVE. FAN, set the side with the maker label on it facing outside.**
- **When installing the DEVE. FAN, route the harness properly.**

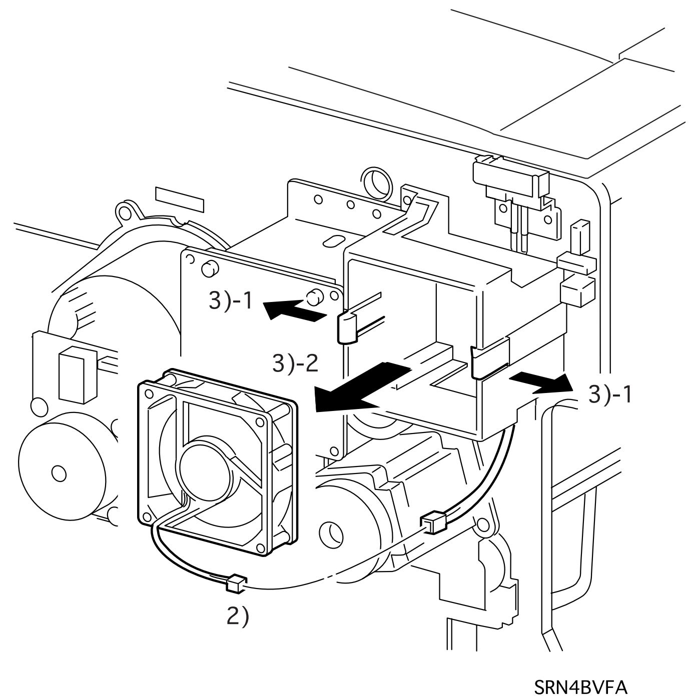


Figure 3-137. DEVE. FAN Removal

3.2.16.5 MCU PWB Removal (PL13.2.1)

When replacing the MCU PWB, perform the following operations referring to Chapter 4 "Diagnostics".

- **Read data prior to replacement, then write the read data when the replacement is completed.**
- **Perform "NVM Write" after replacement.**

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the RIGHT COVER ASSEMBLY. (See Section 3.2.4.8.)
3. Remove the CONTROLLER PWB. (See Section 3.2.17.1.)
4. Remove the CONT. CHASSIS ASSEMBLY. (See Section 3.2.17.3.)
5. Disconnect 9 connectors (P/J12, P/J13, P/J14, P/J15, P/J16, P/J17, P/J18, P/J19, P/J20, and P/J21) for the MCU PWB.
6. Remove 4 screws (silver, cup head, 8mm) securing the MCU PWB to the printer body and remove the MCU PWB.

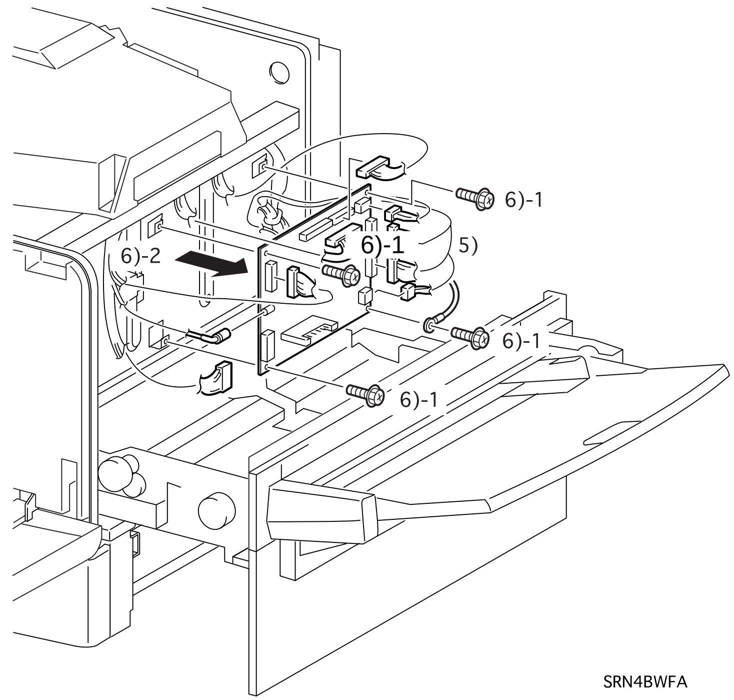


Figure 3-138. MCU PWB Removal

Among the screws securing the MCU PWB, fasten the bottom rear one to attach the earth wire together.

3.2.16.6 COMMUNICATION ASSEMBLY Removal (PL13.2.2)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the RIGHT COVER ASSEMBLY. (See Section 3.2.4.8.)
3. Draw out the MAIN P/H ASSEMBLY.
4. Remove the CONTROLLER PWB. (See Section 3.2.17.1.)
5. Remove the CONT. CHASSIS ASSEMBLY. (See Section 3.2.17.3.)
6. Disconnect the connector (P/J105) for the COMMUNICATION ASSEMBLY and release the harness from the clump.
7. Remove the screw (silver, 6mm) securing the COMMUNICATION ASSEMBLY and remove the COMMUNICATION ASSEMBLY.

CHECK POINT

When installing the COMMUNICATION ASSEMBLY, align the location hole in the COMMUNICATION ASSEMBLY with the protrusion on the frame of the printer body.

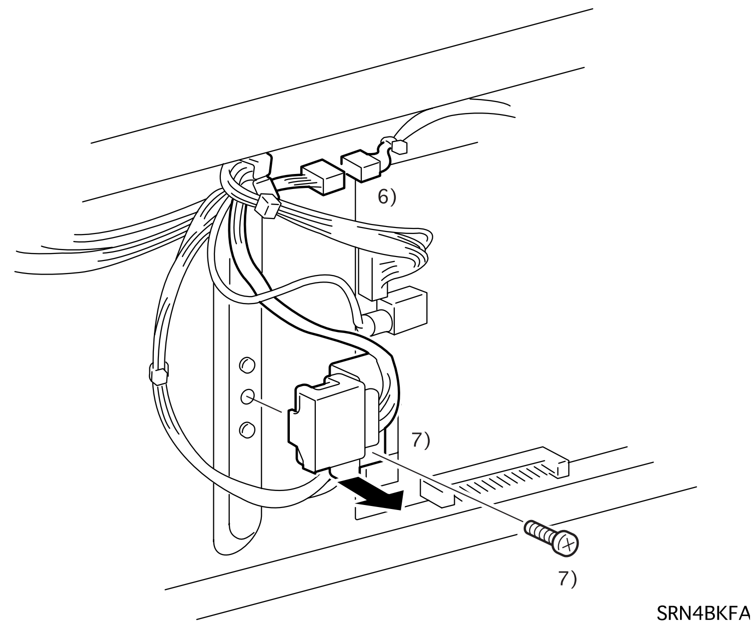


Figure 3-139. COMMUNICATION ASSEMBLY Removal

3.2.16.7 FRONT COVER SWITCH R Removal (PL13.2.3)

1. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
2. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
3. Remove the TENSION LEVER. (See Section 3.2.11.1.)
4. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.3.)
5. Remove the RIGHT COVER ASSEMBLY. (See Section 3.2.4.8.)
6. Remove the CONTROLLER PWB. (See Section 3.2.17.1.)
7. Remove the CONT. CHASSIS ASSEMBLY. (See Section 3.2.17.3.)

   NOTE: *In for following step, remember the correct connecting position for each connector.*

8. Disconnect 4 connectors (P/J191, P/J192, P/J193, P/J194) for the FRONT COVER SWITCH R.
9. Release the hooks securing the FRONT COVER SWITCH R from the frame. Then push the FRONT COVER SWITCH R forward to remove.

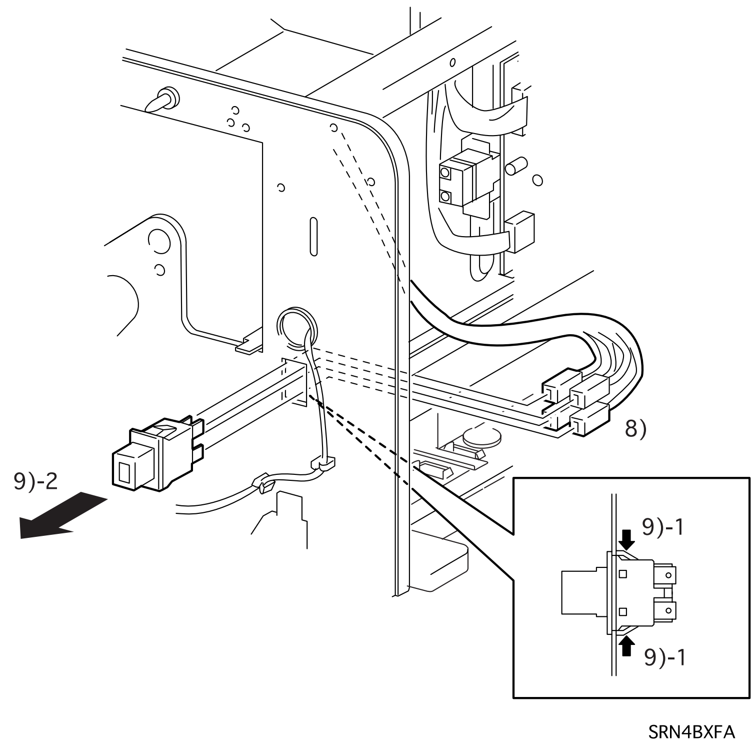


Figure 3-140. FRONT COVER SWITCH R Removal

CHECK POINT

Be sure to install the FRONT COVER SWITCH R securely.

3.2.16.8 FRONT COVER SWITCH L Removal (PL13.2.4)

1. Remove the DRUM CARTRIDGE. (See Section 3.2.9.1.)
2. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
3. Remove the TENSION LEVER. (See Section 3.2.11.1.)
4. Remove the INNER COVER ASSEMBLY. (See Section 3.2.4.3.)
5. Disconnect the connector (P/J197) for the FRONT COVER SWITCH L and release the harness from the hooks.
6. Remove the screw (black, cup head, 6mm) securing the FRONT COVER SWITCH L. Then pull out the harness through the cutout in the frame and remove the FRONT COVER SWITCH L.

CHECK POINT

When installing the FRONT COVER SWITCH L, make sure the harness is properly routed.

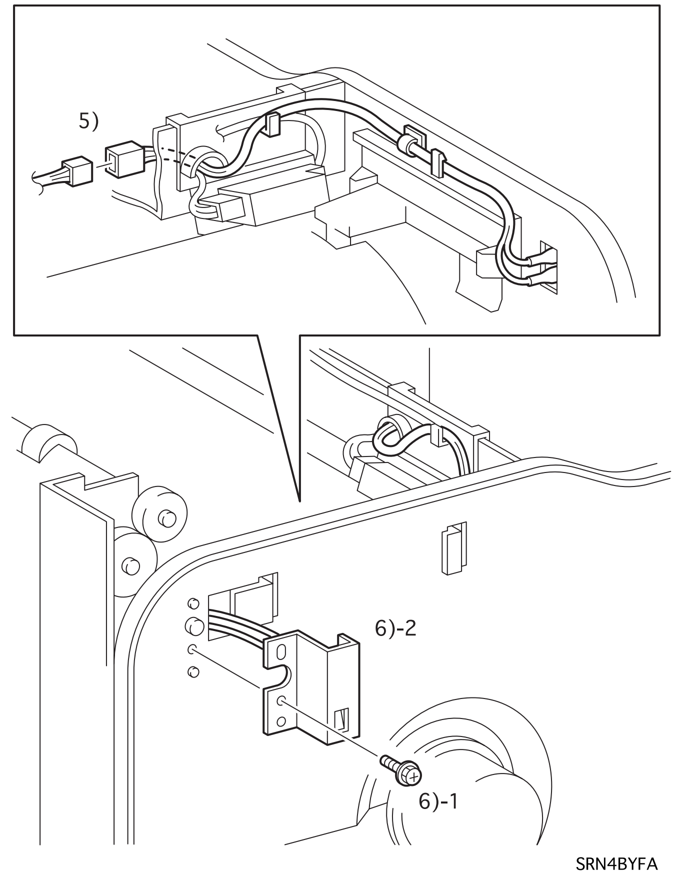


Figure 3-141. FRONT COVER SWITCH L Removal

3.2.16.9 ENVIRONMENT SENSOR Removal (PL13.2.5)

1. Remove the MSI TRAY ASSEMBLY. (See Section 3.2.7.1.)
2. Remove the MAIN P/H ASSEMBLY along with the MSI ASSEMBLY. (See Section 3.2.8.1.)
3. Disconnect the connector (P/J105) for the ENVIRONMENT SENSOR and release the harness from the clamp.

   NOTE: *In the following steps, never touch the IBT BELT ASSEMBLY.*

4. Remove the screw (silver, cup head, 8mm) securing the ENVIRONMENT SENSOR and remove the ENVIRONMENT SENSOR.

CHECK POINT

When fastening the screw, install the earth wire together.

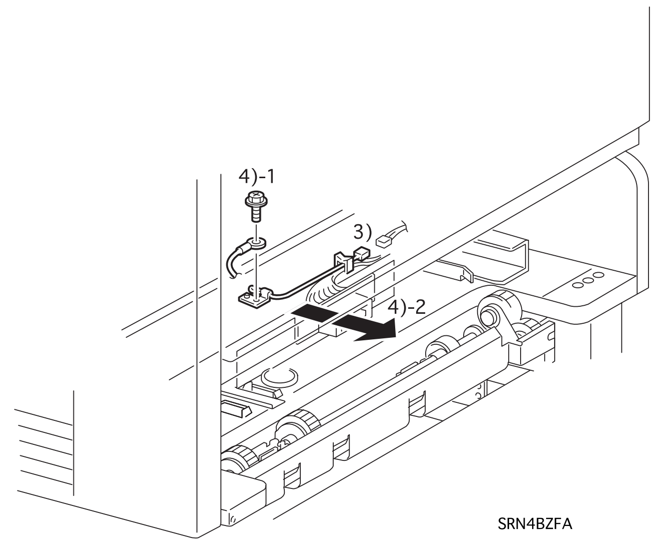


Figure 3-142. ENVIRONMENT SENSOR Removal

3.2.17 Controller

3.2.17.1 CONTROLLER PWB Removal (PL 14.1.10)

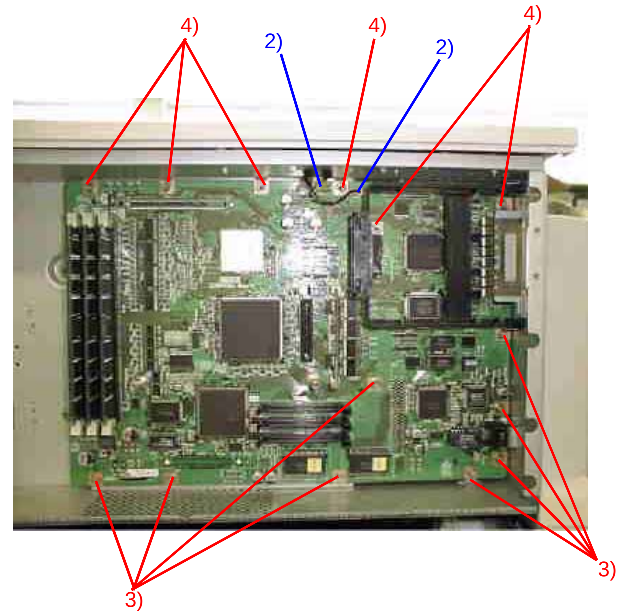
1. Remove the RIGHT COVER ASSEMBLY. (See Section 3.2.4.8.)
2. Disconnect 2 connectors (P/J310 and P/J314) for the CONTROLLER PWB.
3. Remove 8 screws (silver, cup head, 8mm) securing the CONTROLLER PWB by the bottom area.
4. Remove 6 screws (silver, cup head, 8mm) securing the CONTROLLER PWB by the top are.
5. Remove 4 screws (silver, cup head, 8mm) securing the CONT. PLATE ASSEMBLY.
6. Remove the CONTROLLER PWB slowly, watching the connector for the CONTROLLER PWB and the MCU PWB behind the CONTROLLER PWB to avoid damage.

CHECK POINT

When replacing the Controller PWB, be sure to move the following items from the current board to the new one.

- **Standard**
  Code DIMM (socket P), SD-RAM DIMM (slot S0), EEPROM (IC504)
- **Option**
  SD-RAM DIMM (slot S1, S2), DIMM module* (socket A, B, C), HDD Unit, Type-B I/F card

***: Do not instal the DIMM to a wrong slot, since the DIMM must be set to the specified slot.**



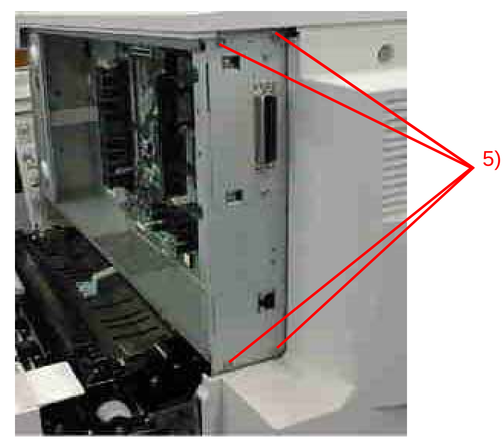


Figure 3-143. CONTROLLER PWB Removal

3.2.17.2 CONTROLLER FAN Removal (PL 14.1.2)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the RIGHT COVER ASSEMBLY. (See Section 3.2.4.8.)
3. Disconnect the connector (P/J314) for the CONTROLLER FAN.
4. Remove 2 screws (gold, 20mm) securing the CONTROLLER FAN, and remove the CONTROLLER FAN.

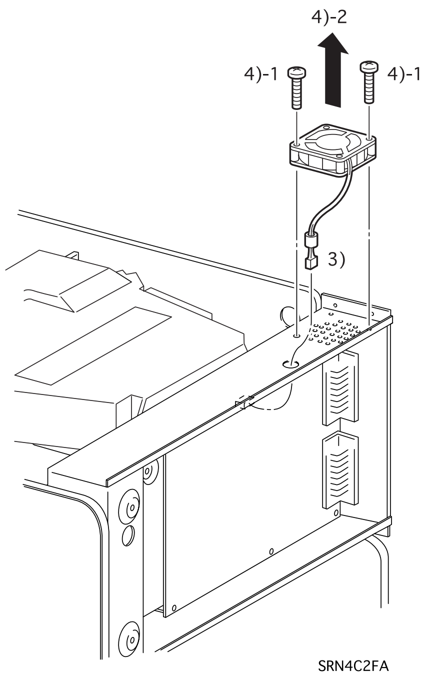


Figure 3-144. CONTROLLER FAN Removal

CHECK POINT

When installing the CONTROLLER FAN, route the harness properly so the harness will not be caught between the parts.

3.2.17.3 CONT. CHASSIS ASSEMBLY Removal (PL 14.1.1)

1. Remove the TOP COVER ASSEMBLY. (See Section 3.2.4.3.)
2. Remove the RIGHT COVER ASSEMBLY. (See Section 3.2.4.8.)
3. Remove the CONTROLLER PWB. (See Section 3.2.17.1.)
4. Remove the CONTROLLER FAN. (See Section 3.2.17.2.)
5. Remove 9 screws (silver, cup head, 8mm) securing the CONT. CHASSIS ASSEMBLY and remove the CONT. CHASSIS ASSEMBLY.

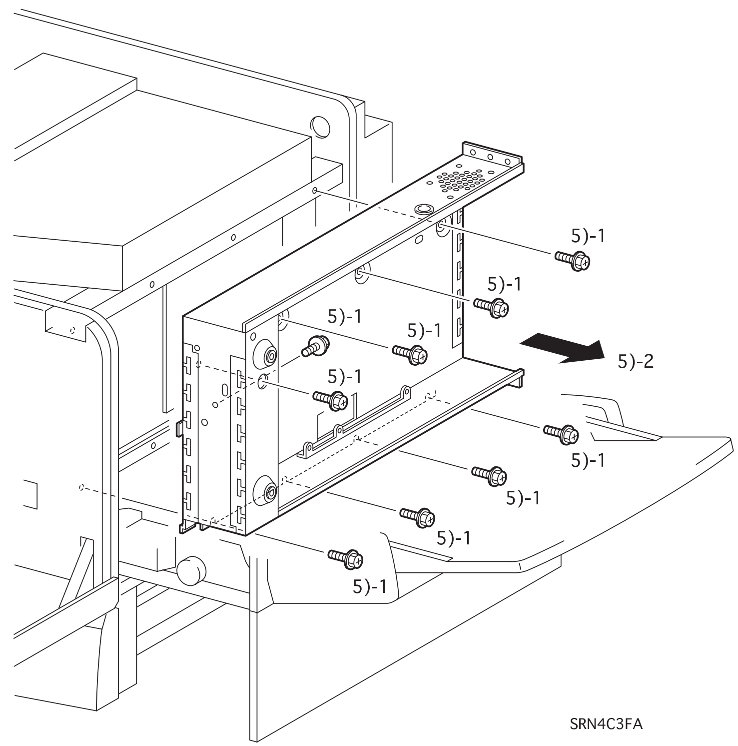


Figure 3-145. CONT. CHASSIS ASSEMBLY Removal

3.3 Adjustment

This section describes how to maintain the proper fuser level, which is required for stable paper feeding.

3.3.1 NIP Pressure Adjustment of the MAIN FUSER ASSEMBLY

WARNING **As the fuser can be very hot, be sure to perform the adjustment carefully to avoid getting burnt.**

1. Draw out the FUSER ASSEMBLY well enough for servicing.
2. Remove the OIL ROLL ASSEMBLY. (See Section 3.2.12.1.)
3. Remove the MAIN FUSER ASSEMBLY. (See Section 3.2.12.1.)
4. Turn the screws (A) securing the NIP SPRINGs by the right and left ends of the MAIN FUSER ASSEMBLY to set the NIP SPRINGs under the following condition (reference position):

   The distance (B) between the head bottom of the screw and the top surface of the metal above the NIP SPRING is 13.1mm.

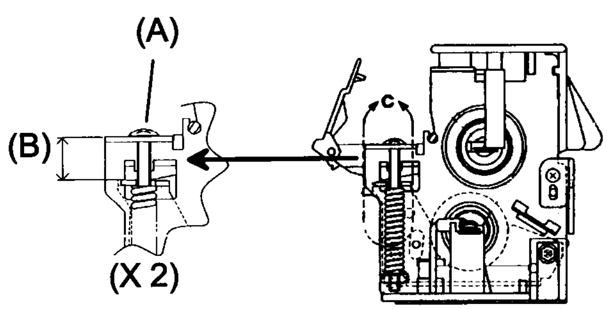


Figure 3-146. MAIN FUSER ASSEMBLY Adjustment (1/3)

5. Install the MAIN FUSER ASSEMBLY and the OIL ROLL ASSEMBLY, and close the FUSER ASSEMBLY.
6. Print a solid black belt (approximately 80mm × 289mm) in a A-4 paper (orientation: SEF). (\TOOL\FUSER\FUSE_TST.PRN file in the SELF TRAINING KIT CD.)
7. Take out the FUSER ASSEMBLY.

   NOTE: *Perform the following steps promptly.*

8. Turning the green knob in the front, quickly insert the printout with the black belt on it between the HEAT ROLL and the PRESSURE ROLL.
   Make sure the paper is set in SEF orientation with the printed side facing to the HEAT ROLL (upward).
9. Remove the paper 10 seconds after insertion.

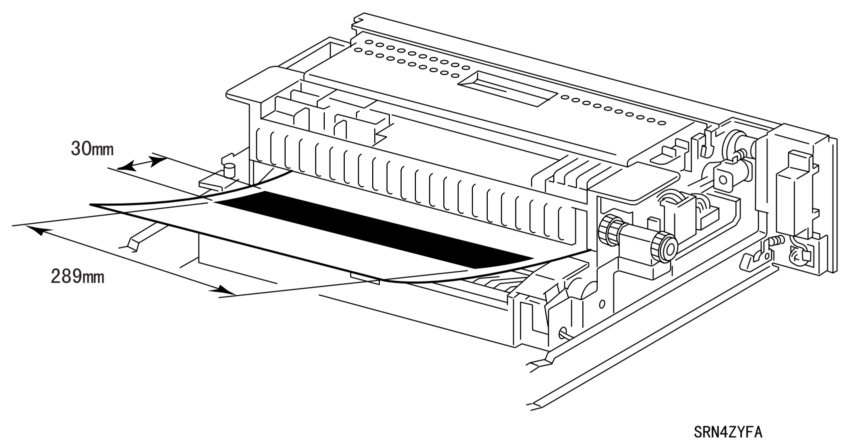


Figure 3-147. MAIN FUSER ASSEMBLY Adjustment (2/3)

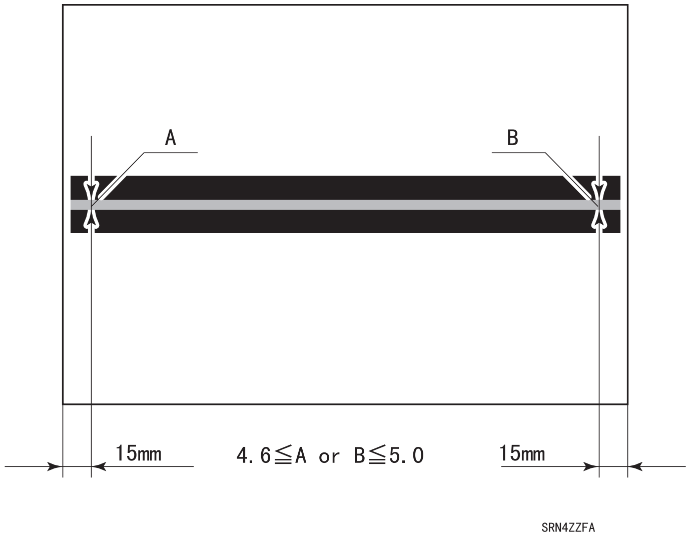
10. See the output and check that the darkness of the area which was pressed has changed. Measure the width of the changed area at the following 2 points:

    Points: 1) 15mm inward from the right edge.
    2) 15mm inward from the left edge

    If the result satisfies the following 2 points, adjustment is correctly done.

    -The width of each end is 4.8 mm ± 0.2mm

    - The difference in the width between 2 ends is 0.2 mm or less.



MAIN FUSER ASSEMBLY Adjustment (3/3)

11. If the result is not satisfactory, return to the step 4 and turn the NIP (A) in the direction shown below according to the result:

    The width is too narrow: Turn the screw clockwise

    The width is too wide: Turn the screw counterclockwise

12. Perform the steps 7 to 10 until the result is good.

NOTE: *Repeat the procedure promptly while the MAIN FUSER ASSEMBLY is still hot enough.*

CHAPTER

4

DIAGNOSTICS

Table of Contents

4.1 Overview

You can perform a test print by using off-line diagnostics to check the printer operation.

- ☐ Test print using the jumper setting on MCU PWB: Section 4.1.1
- ☐ Test print using the diag board DIP switch setting: Section 4.2.1.3

4.1.1 Test print by MCU PWB

Test printing procedures using the MCU PWB is as shown below.

1. Remove the RIGHT COVER ASSEMBLY. (See Chapter 3.)
2. Remove the CONTROLLER PWB. (See Chapter 3.)
3. Remove the MCU PWB ACCESS COVER of the CONT. CHASSIS ASSEMBLY. (See Chapter 3.)
4. Connect the two pins on the test print connector (JP3) on the MCU PWB. Use a short connector to connect the pins. If the MCU PWU has DIP switches, turn on the switches.

   NOTE: *Do not touch the live components or driving units when doing the following steps.*

5. Set the paper (A3 size) in the cassette. Turn on the power.
6. After the printer enters the READY mode, start the test print. (The printer outputs test patterns continuously.)
7. To stop printing, disconnect the short connector that connects the two pins. If the MCU PWB has a DIP switch, turn it off.

NOTE: *When disconnecting the short connector or turning the DIP switch off, do not touch any other components.*

NOTE: *The paper feeder is selected with the previous panel setting.*

NOTE: *The paper size is selected with the previous panel setting when MSI tray is selected.*

NOTE: *If the printer is in an error state, it will not print.*

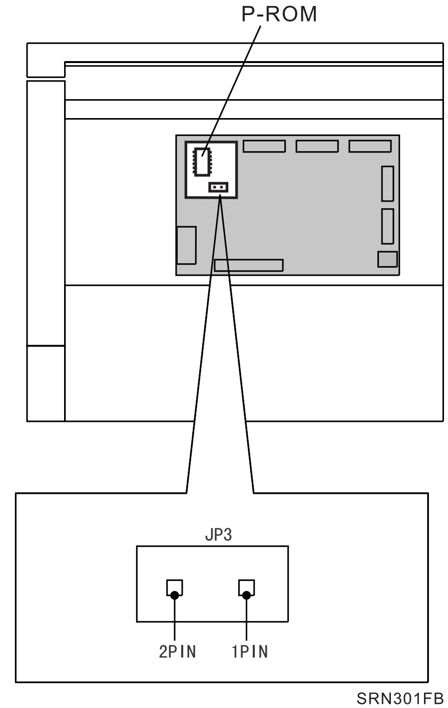


Figure 4-1. Test Print Procedure

4.1.2 Test Print Pattern

The off-line diagnostic prints out the pattern shown below. (Four colors are printed on one page - One color on each quarter of the page)

NOTE: *The black portion of the test print may runover from the paper depending on the printer specifications. (There is not the top margin.)*

NOTE: *If Wide has been set in the Image Area Selection in the MCU PWB EEPROM (NVM), the images are printed without top, right and left margins.*

NOTE: *The straight lines in the paper transport direction jitter because MCU PWB circuit clocks are used. Do not use the straight lines to evaluate print quality.*

- Straight lines with 1 dot width in the laser beam scanning direction are printed every 128 dots. (The line at the last part of each color may not have the 128-dot interval.)
- Straight lines with about a 5.49 dot width in the paper transport direction are printed every 5.49 x 128 dots. (The lines at the right and left edge in each color may not have the 5.49 x 128-dot interval.)

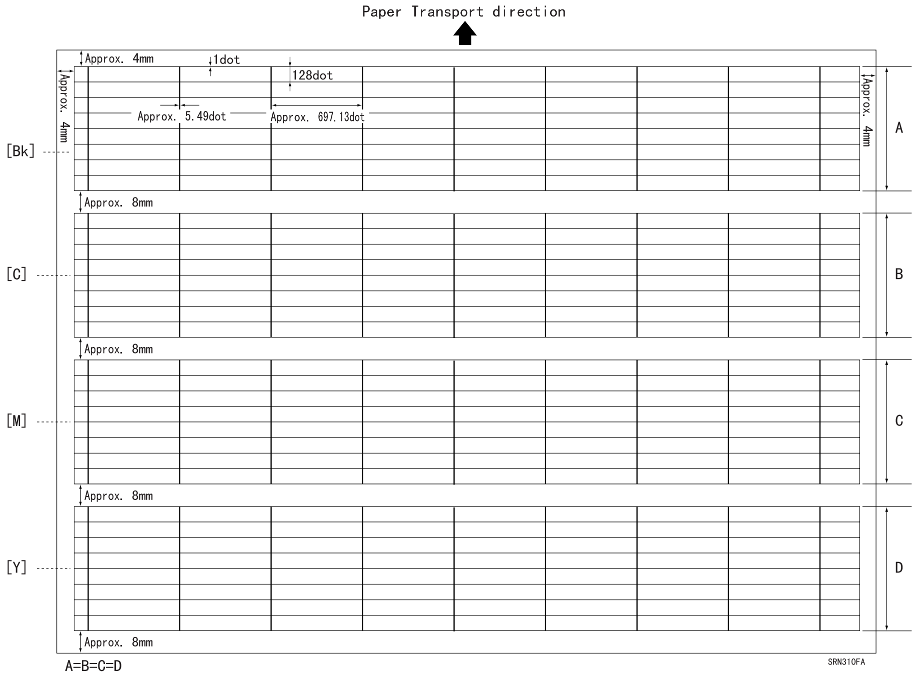


Figure 4-2. Test Print Pattern

4.2 Diagnostics by the Diagnostic Commander

4.2.1 Introduction

The diagnostic system is included on the CONTROLLER PWB, and the diagnostic commander is not always performed.
However, if you have replaced the MCU PWB, you need to perform [Service] function using the Diagnostic Commander.

4.2.1.1 Configuration

You can run the various diagnostic routines and execute/set the various settings for the printer using the diagnostic tool (maintenance tool). The following figure shows the system configuration to perform the diagnostics. You can run the diagnostic commander (application software) on a personal computer and control the Diagnostic PWB to send a command to the MCU PWB.

NOTE: *The Diagnostic PWB, RS-232C cable, personal computer, and Diagnostic Commander are collectively called the diagnostic tool (maintenance tool). Diagnostic tool provided by SEIKO EPSON is as shown in the following table:*

Table 4-1. Diagnostic Commander Tools

Tool Name	Part Code	Description
#F691 DIAGNOSTIC TOOL	1042425	Diagnostic PWB (board) and Diagnostic Commander (2 floppy disks)
SELF TRAINING KIT #F728	1050686	

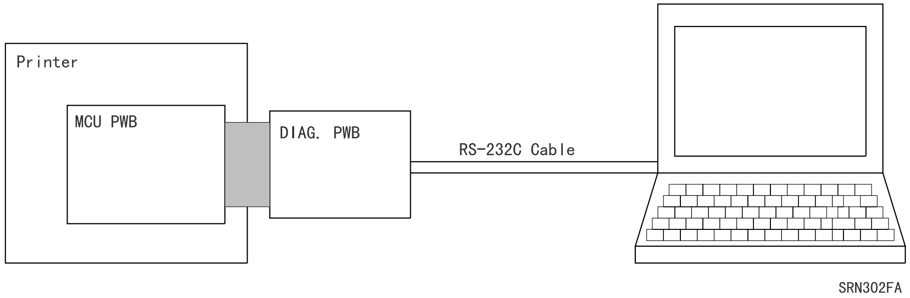


Figure 4-3. DIAG Tool Configuration

4.2.1.2 Diagnostic Commander

The Diagnostic Commander takes the place of the Printer Controller (CONTROLLER PWB) and controls the printer by sending and receiving the data (commands and status) which is exchanged between the CONTROLLER PWB and MCU PWB.
The Diagnostic Commander sends a diagnostic command to run the diagnostics. The Diagnostic Commander can also send/receive a command and status that are not the part of the diagnostics.

4.2.1.3 Diagnostic PWB

The following components are mounted on the Diagnostic PWB:

- Connector to the MCU PWB.
- RS-232C cable connector (D-sub 25-pin female/D-sub 9-pin female), DIP-Switches (6), LEDs (3)

☐ DIP-Switch functions

Table 4-2. DIP-SWITCH Function

DIP-Switch	Default	Description
1	ON	/CRDY signal (Do not change.)
2	ON	RS-232C cable type (ON: Straight cable/OFF: Cross cable)
3	OFF	RS-232C cable type (ON: Cross cable/OFF: Straight cable)
4	OFF	RS-232C cable type (ON: Cross cable/OFF: Straight cable)
5	ON	RS-232C cable type (ON: Straight cable/OFF: Cross cable)
6	OFF	Off-line test print (ON: Start the test print/OFF: Stop the test print.) (You can set this switch similarly to the JP3* on MCU PWB.) ** Close = DIP-switch: ON, Open = DIP-SWITCH: OFF*

☐ LED functions

The LEDs indicate the following signal.

Table 4-3.

LED	Description
CR1	/VSYNC signal
CR2	/READY signal
CR3	/HSYNC signal

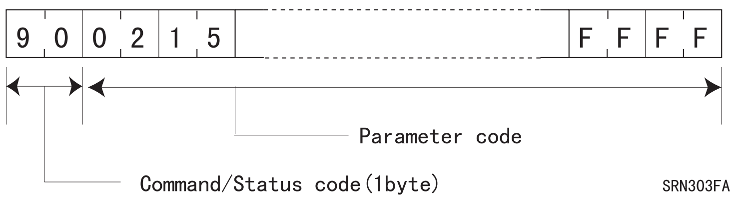
4.2.2 Command/Status

4.2.2.1 Introduction

The commands and statuse are exchanged between the Printer Controller and MCU PWB. Using the data (commands and statuse), the Printer Controller controls the printer.

NOTE: *The communication direction of the commands and statuse are defined as follows: (These definitions are used throughout this section.)*
- Command: Printer Controller (diagnostic tool) → MCU PWB
- Status: MCU PWB → Printer Controller (diagnostic tool)

4.2.2.2 Data Format

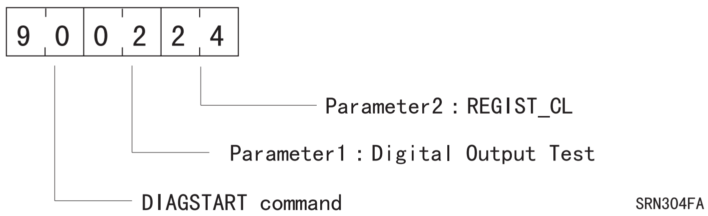


The data format is defined as follows:

- 1st byte: Command/status code
- 2nd byte and the following bytes: Parameter code(s)

The parameter code bytes are variable. (Some commands/status may not have any parameter.)
The codes are in HEX.

Example) Diagnostic (REGIST_CL) start command



4.2.2.3 Command/Status Categories

Commands and status are categorized into 4 groups according to the printer controls.

(1) Paper, Media & Output Control

Paper feed method (position), paper type, paper size setting/ check, paper ejection method (position), etc.

(2) Print/Status Control

Print control, Operation mode setting, Error/Status code (printer status) check, etc.

(3) Parameter Control

Life counters setting and check, etc.

(4) Diagnostic Control

Various diagnostics start/stop, EEPROM read/write, Test print parameter settings, etc.

4.2.3 Preparation

4.2.3.1 Personal Computer

Use a personal computer that can run the Diagnostic Commander and set the communication port (RS-232C).

(1) Personal Computer: Specifications

Table 4-4. Personal Computer Specifications

Item	Description
Model	IBM PC compatible
CPU	Pentium133MHz or higher
Memory	16 Mbytes or more
Display	Resolution: 640x480 or higher (Color or monochrome)
OS	Windows 95
Recommended PC	IBM Think Pad 535

NOTE: *The IBM Think Pad 535 has been verified for running the Diagnostic Commander. Any IBM PC compatible machine should be able to run the Diagnostic Commander, though it does not fully guarantee its operation.*

(2) Communication Port

Table 4-5. Communication Port

Item	Format	Item	Format
Port No.	1	Parity	Odd
Speed	9600bps	Stop bit	1
Start bit	1	Transfer control	Full duplex
Data length	8 bits	Flow control	Yes (RTS/CTS)

4.2.3.2 Installing the Diagnostic Commander

The following describes how to install the Diagnostic Commander:

1. Start Windows 95. Select [Start] > [Settings] > [Control Panel].
2. Double-click the [Add/Remove Programs] icon in the [Control Panel] window.
3. Insert the Diagnostic Commander installation disk “DIAG. TOOL-1 Disk 1” in the floppy disk drive.
4. Click [Setup (I)] button in the [Add/Remove Programs Properties] window.
5. Follow the instructions and install the Diagnostic Commander.
6. Execute [Start] > [Program] > [Renoir Service Commander V2.01] > [Registry Entry].
7. From the SELF TRAINING KIT CD, select TOOL>DIAG>Disk3> XXXX.DAT. Then copy the selected XXXX.DAT file to the DAT folder under the folder in which you installed Diagnostic Commander.

4.2.3.3 Uninstalling the Diagnostic Commander

The following describes how to uninstall the Diagnostic Commander in the computer.

1. Start Windows 95. Select [Settings] from the [Start] menu. Select [Control Panel] in [Settings].
2. Double-click the [Add/Remove Programs] icon in the [Control Panel] window.
3. Select [Renoir Service Commander V2.01] in the [Add/Remove Programs Properties] window. Click the [Add/Remove (R)] button.
4. Follow the instructions and complete uninstalling the program.

NOTE: *The RS-232C cable must be the correct cable for the DIP switch setting on the Diagnostic PWB and the connector. The cable must be properly shielded and the length must be 2 meters or shorter.*

4.2.3.4 Connecting the Diagnostic Tool

The following describes how to connect the diagnostic tool.

1. Remove the RIGHT COVER ASSEMBLY. (See Chapter 3.)
2. Remove the Controller PWB. (See Chapter 3.)

   NOTE: *In the following procedures, makes sure that the soldered side of the Diagnostic PWB do not touch the Chassis Assembly. If needed, insert an insulator (such as paper folded into fourths) between the PWB and the sheet metal.*

3. Remove the MCU PWB ACCESS COVER in the CONT. CHASSIS ASSEMBLY. (See Chapter 3.)
4. Connect the Diagnostic PWB to the MCU PWB interface connector (P11). Make sure that the Diagnostic PWB LEDs are visible from the outside.
5. Connect the RS-232C cable between the Diagnostic PWB and the personal computer.

   NOTE: *The RS-232C cable must be the correct cable for the DIP switch setting on the Diagnostic PWB and the connector. The cable must be properly shielded and the length must be 2 meters or shorter.*

4.2.4 Diagnostic Commander: Operations

4.2.4.1 Starting the Diagnostic Commander

Start/End the Diagnostic Commander as follows:

1. Start Windows 95, select [Start]-[Programs] from the [Start] menu, then select the [Renoir Service Commander V2.01]-[RCV2].
2. Turn on the printer.
3. To close the Diagnostic Commander, click the [Close] button.

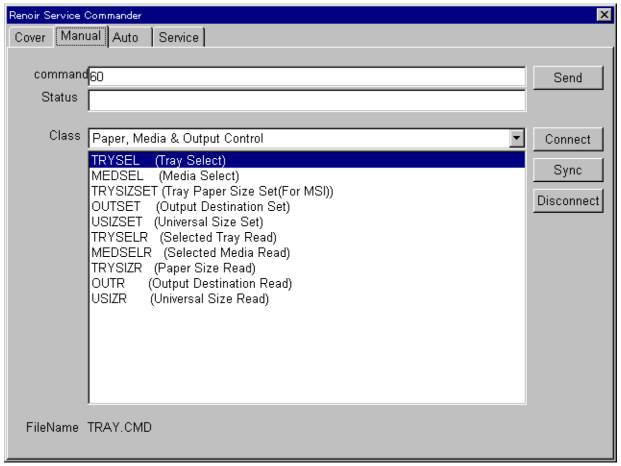
4.2.4.2 Setting Up the Communication

Establish communication between the computer and the Diagnostic Commander as follows:

1. Select [Manual] or [Auto] depending on the menu you want to select.
2. Click the [Connect] button to set up and connect the communication port.
3. Click the [Sync] button to establish communication.

   NOTE:*Click the [Service] button to establish the communication.*
   NOTE:*Click the [Disconnect] button first to go to another menu from the [Manual] or [Auto] menu.*

   [Manual] tab window



4.2.4.3 Sending/receiving commands/status

NOTE: *A command must be sent after the communication has been established.*

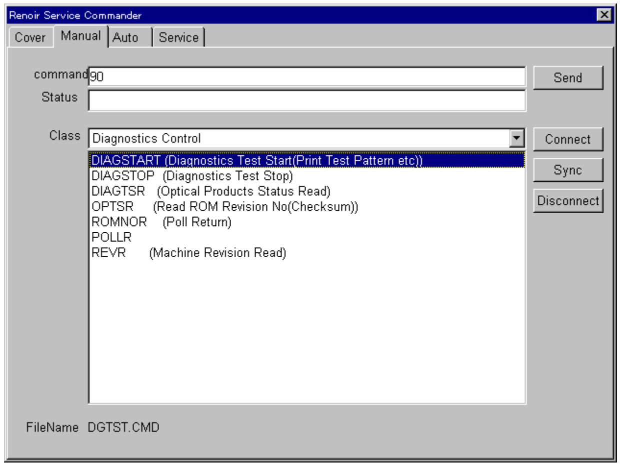
NOTE: *For details, Section 4.2.7 “Commands/Status List” in this section.*

Selecting From the Pull-down Menu

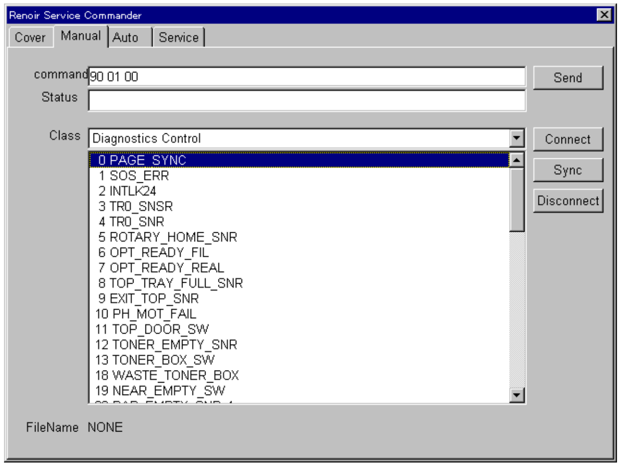
NOTE: *Some command codes and parameter codes are not displayed in the pull-down menu.*

1. Click the [Manual] tab. The Manual screen appears.
2. Establish the communication. (See Section 4.2.4.2 “Setting up the Communication”.)
3. Click the [Class] box. Select the category that has the command you want to send. (There are four categories, described in Section 4.2.2.3 “Command/Status categories”.)
4. Select the command code that you want to send from the command code list.
5. The selected command code is displayed in the [Command] box.

- A single click only displays the command code in the [Command] box.



- A double-click displays the command code in the [Command] box; if the selected command code has a parameter, the appropriate parameter code is also displayed.



6. As the same manner, the parameter code is displayed in the [Command] box. When you select a parameter code from the list, if you double-click the command code and the command code does not have a parameter code in the lower level, the [Error] window appears.

7. Click the [Send] button to send the command.

   NOTE: *If you want to select another command without sending the selected command, move the cursor into the parameter code selection window. Click the right mouse button. The [Go Back] button appears. Click the [Go Back] button to return to the previous parameter code. Repeat this step until you find the desired command.*

8. If the selected command has its corresponding status, the status is displayed in the [Status] box in HEX.

   NOTE: *When you want to go to either the ([Auto] or [Service]) menu, first disconnect the connection (by clicking on the [Disconnect] button), then go to another menu.*

Inputting a Command Directly in the [Command] Box.

You can input a command into the [Command] box as follows:

1. Click the [Manual] tab. The Manual screen appears.
2. Establish the communication. (See Section 4.2.4.2 “Setting up the communication”.)
3. Enter a command code and parameter code in HEX in the [Command] box. Enter a space as a delimiter within the code.
4. Click the [Send] button to send the command.
5. If the selected command has its corresponding status, the status is displayed in the [Status] box in HEX.

NOTE: *When you want to go to either the ([Auto] or [Service]) menu, first disconnect the connection (by clicking the [Disconnect] button), then go to another menu.*

4.2.4.4 Automatically executing a command

NOTE: *A command must be sent after the communication has been established.*

NOTE: *If you want to automatically execute a command, you need to create an automatic command execution file.*

You can continuously send two or more commands in the automatic command execution mode. Run the automatic command execution file as follows:

1. Click the [Auto] tab. The [Auto] screen appears.
2. Establish the communication. (See Section 4.2.4.2 “Setting up the communication”.)
3. Click the [File Open] button. The [Auto Run File Open] window appears.
4. Select the automatic command execution file and click [Open].
5. Only comment lines of the file appear.
6. Click the [Start] button to automatically execute commands in the order they are listed in the file.

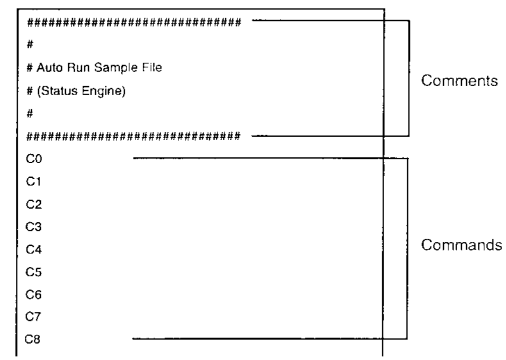
NOTE: *To cancel the execution of the file, click the [Stop] button.*

NOTE: *When you want to go to the ([Auto] or [Service]) menu, first disconnect the connection (by clicking the [Disconnect] button), then go to another menu.*

Creating an Automatic Command Execution File

NOTE: *Use an editor (e.g., WordPad, etc.) to create a file.*

As shown in the figure below, enter a command in HEX on one line. Each byte must be delimited by a space.
A file name must be in alphanumeric characters; the file extension must be “.AT”. Save the file in the [Auto] folder in the same folder installed in the Diagnostic Commander.
A line with a “#” at the beginning is a comment line for describing the file. A line with a “#” is displayed on the [Auto] screen.



Sample Automatic Command Execution File

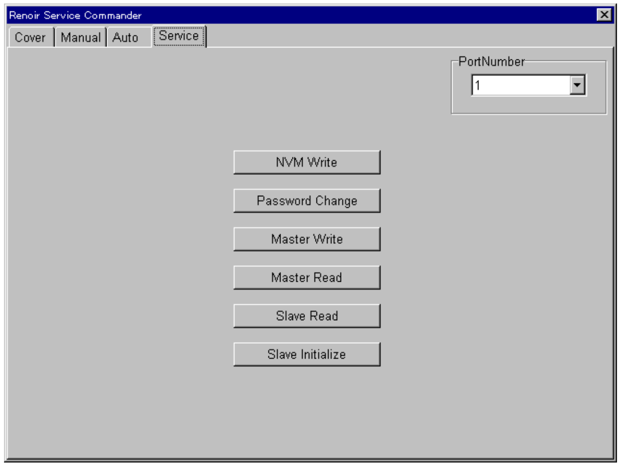
As a sample, an automatic command execution file (Test.AT) that sends the above commands has been provided.

4.2.4.5 [Service] tab

On the [Service] tab page, you can write data (specifications) in the MCU PWB EEPROM (NVM), set a password, read/write the Master and read/initialize the Slave.

NOTE: *Master: COMMUNICATION ASSEMBLY*
Slave: MCU PWB NVM

If you click the [Service] tab, the communication is established and the following screen appears.



NVM Write

You can write data (specifications) in the MCU PWB EEPROM (NVM).

NOTE: *If you have replaced the MCU PWB, you need to run the [NVM Write]. If you do not run [NVM Write], the specification settings differ and the printer may not function properly.*

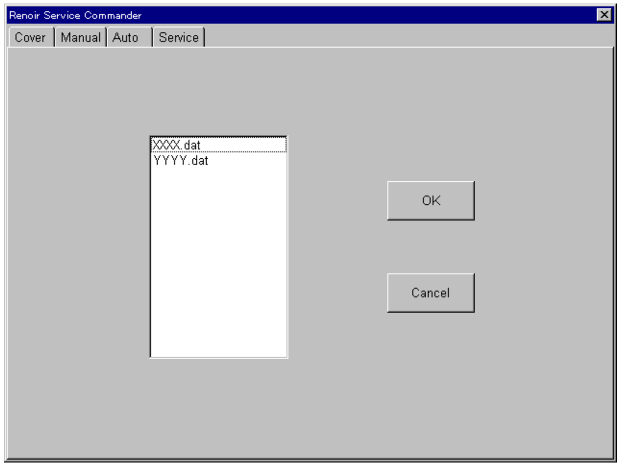
1. Click the [NVM Write] button.
2. The specification (data file) selection screen appears.
3. From the list, select the data file (XXXX.DAT) that has the correct specifications.

NOTE: *"XXXX.DAT" files must be located in "\Renoir Service Commander2.01\dat" folder, otherwise they are not displayed.*

Table 4-6. Data File List

File Name	Serial No. Header	For the Market
GQ98.dat	BTN0xxxxxx	Japan
GR86.dat	BYM0xxxxxx	North America
GR87.dat	BYN0xxxxxx	Standard Europe
GR88.dat	BYP0xxxxxx	"North Europe, Australia, S.E. Asia"

4. Click the [OK] button.



Password Change

Not available for servicing.

Master Write

Not available for servicing.

Master Read

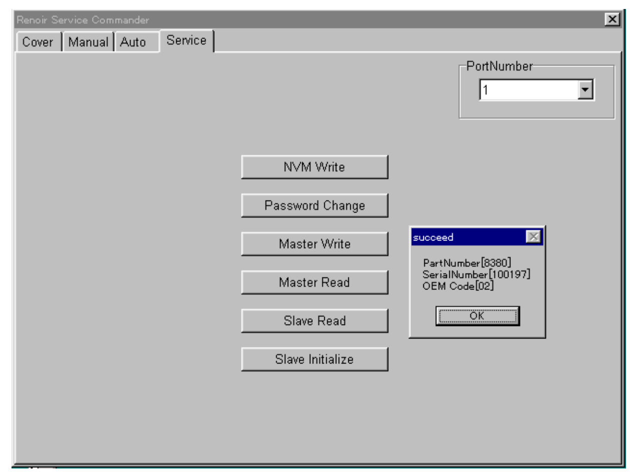
In the [Master Read] page, you can read the contents of the [Master].

NOTE: *Before you run [Master Read], make sure that the communication has been established. If you run [Master Read] when the communication has not been established, the Diagnostic Commander may hang up.*

1. Click the [Master Read] button.
2. The data read from the [Master] is displayed, as shown below:

Table 4-7. Contents of the Master

	Serial No. Header (top 4-digit)			
	BTN0	BYM0	BYN0	BYP0
[OEM Code]	03	03	03	03
[Part No.]	62042	62025	62026	62027
[Serial No.]	A unique Serial No. for the product (last 6-digit.).			



Slave Read

In the [Slave Read] page, you can read the contents of the [Slave].

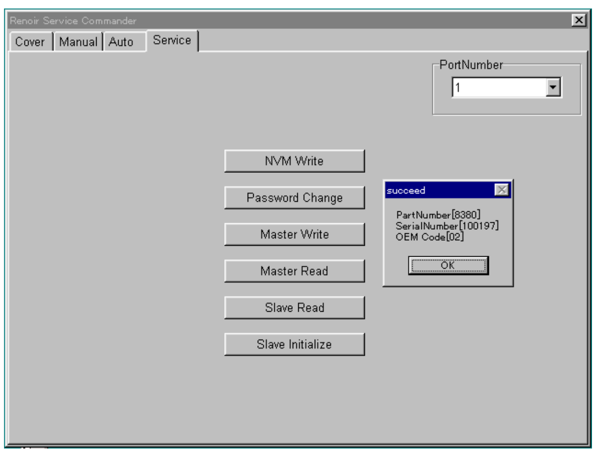
NOTE: *Before you run [Slave Read], make sure that the communication has been established. If you run [Slave Read] when the communication has not been established, the Diagnostic Commander may hang up.*

1. Click the [Slave Read] button.
2. The data read from the Slave is displayed, as shown below:

Table 4-8. Contents of the Master

	Serial No. Header (top 4-digit)			
	BTN0	BYM0	BYN0	BYP0
[OEM Code]	03	03	03	03
[Part No.]	62042	62025	62026	62027
[Serial No.]	A unique Serial No. for the product (last 6-digit.).			

These values must be the same as appeared in [Master Read]. If not, you need to perform [Slave Initialize] described in the next section.



Slave Initialize

In the [Slave Initialize] page, you can initialize (erase) the [Slave] data.

CAUTION

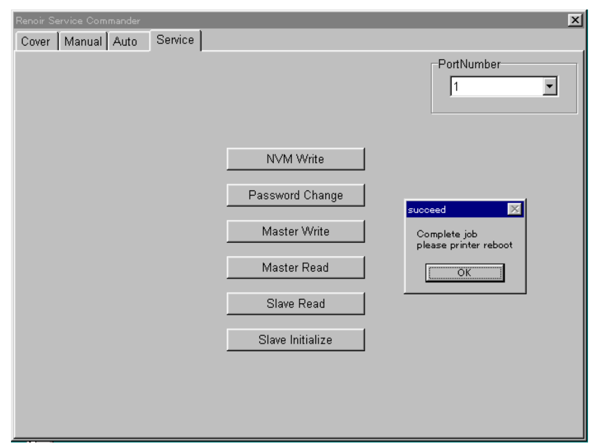
Do not run [Slave Initialize] unless instructed to do so in this manual.

NOTE: *Before you run [Slave Initialize], make sure that the communication has been established. If you run [Slave Initialize] when the communication has not been established, the Diagnostic Commander may hang up.*

1. Click the [Slave Initialize] button.
2. The [Slave] is initialized.

NOTE: *After you initialize the [Slave], turning the power ON/OFF automatically writes the data in the Slave.*

NOTE: *There may be more tasks you need to do before turning the power ON/OFF after the Slave initialization. Follow the instructions in this manual.*



4.2.4.6 Displaying the log

The communication log shows you how the commands and status are exchanged between the Diagnostic Commander and the MCU PWB. Run [Log Window] to see the log.

Displaying the Log Window

1. Move the cursor to the white area (blank area) in the main window of the [Renoir Service Commander]. Click the right mouse button. The [Log Window Open] button appears.
2. Click the [Log Window Open] button. The [Log Window] appears.
3. The commands and status that have been sent/received are displayed in HEX in the [Log Window].
4. In the [Log Window], a voluntary status from the printer which does not require a command is also displayed. (A voluntary status is not shown in the [Status] box.)

NOTE: *The following shows the voluntary status that are not displayed in the [Status] box.*

- IGNORED40 XX (CMD) XX (REASON)

- PPOUT20 XX (DEST) XX (DOPT) XX (SHEET)

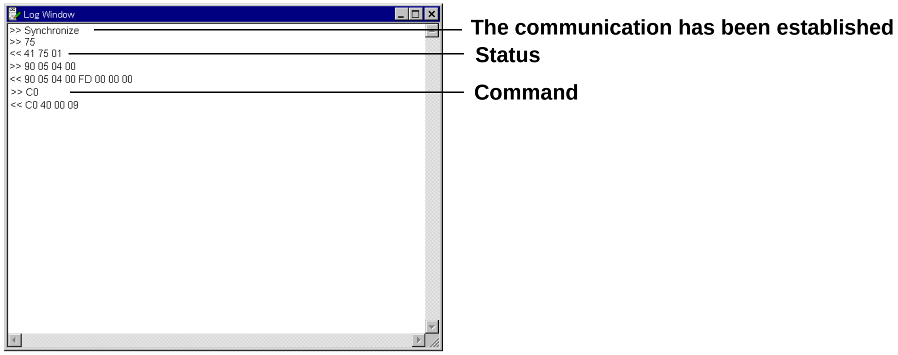
- PCH21 XX (CASSETTE) XX (SIZE) XX (MEDIA)

- PFA30 XX (AMODE) XX (SHEET1) XX (SHEET2)

- ENGERR31

- ERRRV32

- ENGWRN33



>>: Command, <<: Status

Operating the Log Window

Move the cursor inside the Log Window. Click the right mouse button. The [Log Clear], [Log Save] and [Log Window Close] buttons appear. Click the appropriate button.

- [Log Clear]
  Clears the log and erases the display in the Log Window.
- [Log Save]
  Saves the log. If you click this button, the [Log Save] window appears. Specify a file name and click the [Save] button. If you do not specify the file extension, the system automatically adds the file extension (.LOG).
- [Log Window Close]
  Closes the Log Window.

NOTE: *You can open the saved log file by using an editor (e.g., WordPad).*

4.2.5 Life Counter Read/Write

You can read the life counter data from the MCU PWB EEPROM (NVM) or write the data in the EEPROM (NVM) using the Parameter Control commands/status.

NOTE: *Before you replace the MCU PWB, do the following:*

(1) Read the data from the life counters in the MCU PWB before replacement.

(2) Replace the MCU PWB.

(3) Write the life counter data in the MCU PWB after replacement.

NOTE: *If you cannot read the data from the new MCU PWB after replacement, write an expected value (estimated from future usage conditions) in the MCU PWB.*

NOTE: *If you replace a regularly replaced part (in the MAIN FUSER ASSEMBLY or 2nd BTR ASSEMBLY) or DRUM CARTRIDGE (without CRUM function specifications) with a new one, write "0" in V1 through V4.*

NOTE: *You can do the same in the EEPROM Read/Write function described in Section 4.2.6 "Executing Diagnostics". If you run the EEPROM Read/Write function after replacing the MCU PWB, you do not need to read/write the life counter data using the Parameter Control function.*

NOTE: *You can use the Parameter Control commands and status to read/write the setting values in the registrations.*

4.2.5.1 Read

Table 4-9. Life Counter Read Specifications

Item	Command	Note
Drum Cartridge	D0 00	
Toner Cartridge Y	D0 01	Accumulated dispense time
Toner Cartridge M	D0 02	Accumulated dispense time
Toner Cartridge C	D0 03	Accumulated dispense time
Toner Cartridge Bk	D0 04	Accumulated dispense time
Main Fuser Assembly (1)	D0 06	Accumulated dispense time
Main Fuser Assembly (2)	D0 0C	Image counts
2nd BTR Assembly	D0 09	
Belt Cleaner Assembly	D0 0A	
Oil Roll Assembly	D0 0B	PV counts
Whole printer (1)	D0 05	Accumulated prints
Whole printer (2)	D0 07	Accumulated image counts

NOTE: *The status conditions for the above commands have 4 bytes as shown below:*

Example)
Command: D0 09
Status D0 09 V1 V2 V3 V4
V1 through V4 are decimal values, indicating the accumulated counts.
"123, 456": "00 12 34 56"

4.2.5.2 Write

Table 4-10. Life Counter Write Specifications

Item	Command	Note
Drum Cartridge	80 00 V1 V2 V3 V4	Do not send this command if the printer has the CRUM function. Clear the counter if you replace the Drum Cartridge with a new one in the printer without the CRUM function.
Toner Cartridge Y	80 01 V1 V2 V3 V4	
Toner Cartridge M	80 02 V1 V2 V3 V4	
Toner Cartridge C	80 03 V1 V2 V3 V4	
Toner Cartridge Bk	80 04 V1 V2 V3 V4	
Main Fuser Assembly (1)	80 06 V1 V2 V3 V4	Clear the counter if you replace the Main Fuser Assembly with a new one.
Main Fuser Assembly (2)	80 0C V1 V2 V3 V4	Clear the counter if you replace the Main Fuser Assembly with a new one.
2nd BTR Assembly	80 09 V1 V2 V3 V4	
Belt Cleaner Assembly	80 0A V1 V2 V3 V4	
Oil Roll Assembly	80 0B V1 V2 V3 V4	
Whole printer (1)	80 05 V1 V2 V3 V4	
Whole printer (2)	80 07 V1 V2 V3 V4	

NOTE: *For V1 through V4, write the values you have read in the previous section. If any of the values is larger than the life over value (threshold value), replace the part that has the large value and write the value “00 00 00 00". If you cannot replace the part, write the life over value.*

4.2.6 Executing Diagnostics

4.2.6.1 Diagnostic execution steps

Run the diagnostics by sending the following command using the command transmission function in the Diagnostic Commander.

1. Send the DIAGON command (75h) to go into the DIAG TEST mode where you can run the diagnostics. (The DIAGON command is one of the Printing/Status Control Command Class commands.)
2. Set the parameters in the DIAGSTART command (90h) and send the command to run the diagnostics. (The DIAGSTART command is one of the Diagnostics Control Command Class commands.) By setting a diagnostic code as a parameter, you can run various diagnostics.
3. Set the parameters in the DIAGSTOP command (91h) and send the command to stop the diagnostics. (The DIAGSTOP command is one of the Diagnostics Control Command Class commands.)
4. Send the DIAGOFF command (76h) to exit the DIAG TEST mode. (The DIAGOFF command is a Printing/Status Control command class command.)

4.2.6.2 Diagnostics functions

There are a total of 8 diagnostic functions (9 if you include the diagnostics stop function).

Table 4-11. Diagnostics Functions

Parameter (HEX)	Diagnostic function	Description
00	Test Print	Sets the parameters for the built-in test print.
01	Digital Input Test	Input test to check the sensors and switches that have digital signals.
02	Digital Output Test	Output test to check the digital components (e.g., motor, solenoid, etc.) that are controlled by the digital signals.
03	Analog Input Test	Input test to check the sensor and output monitor that has an analog signal.
04	Analog Output Test	Output test to check the analog components (e.g., HVPS) that are controlled by the analog signals.
05	EEPROM Read	Reads each data item from the MCU PWB EEPROM (NVM).
06	EEPROM Write	Writes each data item into the MCU PWB EEPROM (NVM).
07	EEPROM Initialize	Initializes all data in the MCU PWB EEPROM (NVM).
FF	All Tests Stop	Stops all diagnostic functions.

4.2.6.3 Test Print

You can set the parameters for the built-in test print function.

Table 4-12. Test Print Parameters

DIAGON command: 75	DIAGOFF command: 76	
DIAGSTART command (Test Print): 90 00 XX XX		
DIAGSTOP command (Test Print): Unnecessary		
Parameter	**Function**	**Data (Hex)**
1	Diagnostic type	00: Test Print
2	Image	01: Grids, 05: Patches
3	Color	Command: 01: Black only, 0F: All colors (YMCBk)
	DGST	Status: 06: Passed, 07: Failed
With status (90 00 XX XX)		

Example) Command

90 00 05 0F

- 0F: All colors (YMCBk)
- 05: Patches
- 00: Test Print
- 90: DIAGSTART command

Example) Status

90 00 05 06

- 06: Passed
- 05: Patches
- 00: Test Print
- 90: DIAGSTART command

NOTE: *After setting the parameters for the test print, you have to send the DIAGOFF command (76) and then the PFC command (70 00 F0 01) to run the test print.*

NOTE: *The grids in the above table are the same as the patterns shown in Section 4.1.2 "Test Print Pattern".*

NOTE: *If "Wide" has been set in the Image Area Selection for the MCU PWB EEPROM (NVM), there will not be right/left margins in the test print pattern.*

Patch Test Print Pattern

The printer prints the patch test print patterns (Cin50% patch) as shown below.

NOTE: *Cin50% patch: Image that has been developed for every 3 dots. For more details, see Chapter 2.*

NOTE: *Depending on the specifications, there may not be a top margin and the top part of the image may be out of the paper area.*

NOTE: *Use paper longer than 210mm in the paper feed direction.*

NOTE: *If "Wide" has been set in the Image Area Selection for the MCU PWB EEPROM (NVM), there will not be right/left margins in the test print pattern.*

Figure 4-4. Patch Test Print Pattern

4.2.6.4 Digital Input Test

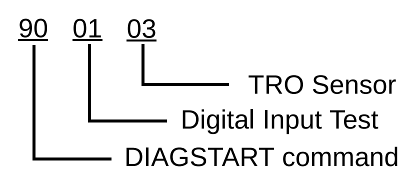
You can detect the High/Low level in the signals output from a switch or sensor that has a digital signal.

Table 4-13. Digital Input Test Parameter

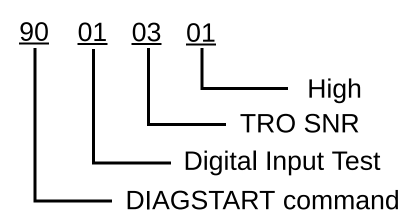
DIAGON command: 75	DIAGOFF command: 76	
DIAGSTART command (Digital Input Test): 90 01 XX XX		
DIAGSTOP command (Digital Input Test): Unnecessary		
Parameter	**Function**	**Data (Hex)**
1	Diagnostic type	01: Digital Input Test
2	Code_DI	Device code (see Section 4.2.6.5.)
3	Data	Status: 00: Low, 01: High or XX (Data)
With status (90 01 XX XX) only		

NOTE: *The status parameter 3 (data) is 1 byte data (Hex) in the device code 32, 3F, 43, 44 and 45.*

Example) Command



Example) Status



4.2.6.5 Digital Input Test: Device codes

Table 4-14. Digital Input Test Device Codes (1/7)

Digital Input Test [DIAGSTART: 90 01 XX, DIAGSTOP: Unnecessary]			
Name	**Code (Hex)**	**Function item** / **Status data: High**	**Check**
PAGE_SYNC	00	/VSYNC signal /VSYNC signal: High	-
SOS_ERR	01	ROS error detected (ROS Assembly [SOS PWB]) ROS error internal signal: High (error)	Check during printing
INTLK24	02	MCU PWB 24 VDC 24VDC (Between LVPS-MCU PWB): High	Check the power status by opening/closing the Front Cover.
TR0_SNSR	03	TR0 Sensor TR0 signal in MCP PWB: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper.
TR0_SNR	04	TR0 Sensor TR0-M SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper.
ROTARY_HOME_ SNR	05	Rotary Sensor ROTARY HOME SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper.
OPT_READY_FIL	06	Not used.	-
TOP_TRAY_FULL_ SNR	08	Full Stack Sensor FULL STACK SENSE signal	Check the sensor by blocking/opening the light path to the sensor using the Full Stack Sensor Actuator.
EXIT_TOP_SNR	09	TOP EXIT SENSOR TOP EXIT PAPER SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using the Top Exit Sensor Actuator.

Table 4-15. Digital Input Test Device Codes (2/7)

Digital Input Test [DIAGSTART: 90 01 XX, DIAGSTOP: Unnecessary]			
Name	**Code (Hex)**	**Function item** / **Status data: High**	**Check**
PH_MOT_FAIL	0A	P/H Motor Assembly P/H MOTOR FAIL signal: High	Remove the P/H Motor Assembly connector (P/J49) and check by running the motor.
TOP_DOOR_SW	0B	Exit Chute Switch EXIT CHUTE SENSE signal: High	Check the switch by opening/closing the Exit Upper Assembly.
TONER_EMPTY_ SNR	0C	Used Cartridge Sensor USED CARTRIDGE SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper. (Turn on the Sensor ON signal in the Digital Output Test 3C.)
TONER_BOX_SW	0D	Cartridge Sensor CARTRIDGE SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor by installing/detaching the Toner Cartridge. (Turn on the Sensor ON signal in the Digital Output Test 3C.)
WASTE_TONER_ BOX	12	Toner Box Sensor TONER BOX SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor by installing/detaching the Waste Toner Box.
NEAR_EMPTY_ SW	13	Low Paper Sensor (Cassette 1) [1] LOW PAPER SENSE signal: High	Check the sensor by removing/adding the paper in Cassette 1.

Table 4-16. Digital Input Test Device Codes (3/7)

Digital Input Test [DIAGSTART: 90 01 XX, DIAGSTOP: Unnecessary]			
Name	**Code (Hex)**	**Function item / Status data: High**	**Check**
PAP_EMPTY_ SNR_1	14	Tray N/P Sensor (Cassette 1) [1] TRAY PAPER SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using the Tray N/P Actuator Tray 1.
OHP_SNR_1	15	Not used.	-
CHEAT_SW	16	Not used.	-
MSI_PAP-SNR	17	MSI Short N/P Sensor MSI SHORT PAPER SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using the MSI N/P Actuator.
MSI_PAP2_SNR	18	MSI LONG N/P Sensor MSI LONG PAPER SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper.
MSI_OHP_SNR	19	MSI OHP Sensor MSI OHP SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper.
OHP_REAR_SNR	1B	Rear OHP Sensor REAR OHP WHITE SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper.
OHP_FRONT_SNR	1D	Front OHP Sensor FRONT OHP WHITE SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper.
MSI_PITCH_SNR	1E	MSI Edge Sensor MIS EDGE PAPER SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper.
REGIST_SNR	1F	Registration Sensor REGISTRATION PAPER SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper.

Table 4-17. Digital Input Test Device Codes (4/7)

Digital Input Test [DIAGSTART: 90 01 XX, DIAGSTOP: Unnecessary]			
Name	**Code (Hex)**	**Function item / Status data: High**	**Check**
PH_UNIT_SW	20	Main P/H Assembly MAIN P/H ASSEMBLY SENSE signal: High	Check the switch by opening/closing the Main P/H Assembly.
TONER_FULL_SNR	21	Waste Toner Sensor WASTE TONER SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper.
OIL_LIFE_SW	22	Oil Roll Assembly (CRU Switch Assembly) NEW OIL ROLL SENSE signal: High	Not allowed.
OIL_ROLL_SW	23	Oil Roll Assembly (CRU Switch Assembly) OIL ROLL SENSE signal: High	Check the switch by installing/detaching the Oil Roll Assembly. (Keep the Fuser Assembly closed.)
FUSER_UNIT_SW	24	Fuser Assembly FUSER ASSEMBLY SENSE signal: High	Check the switch by opening/closing the Fuser Assembly.
FUSER_EXIT_SNR	25	Fuser Exit Sensor FUSER EXIT PAPER SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper.
TEST_PIN	26	JP3 (or DIP-Switches) TEST PRINT ON signal: High	Check the pin by connecting/disconnecting the JP3 (MCU PWB) using the shorting connector. Check the DIP switches by turning the switches ON/OFF.

Table 4-18. Digital Input Test Device Codes (5/7)

Digital Input Test [DIAGSTART: 90 01 XX, DIAGSTOP: Unnecessary]			
Name	**Code (Hex)**	**Function item / Status data: High**	**Check**
FRONT_DOOR_SW	27	Front Cover Switch L FRONT COVER SWITCH ON signal: High	Check the switch by opening/closing the Front Cover.
FUSER_ENT_SNR	28	Fuser In Sensor FUSER IN PAPER SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using a sheet of paper.
OPT_STATUS	32	Feeder Unit * HRX signal: 1 byte data	-
OPT_TRAY_READY	33	Feeder Unit * READY signal: High	-
OPT-DUP_READY	34	Not used.	-
OPT_SW_DOOR_DUP	35	Not used.	
OPT_SW_TRAY_DUP	36	Not used.	-
OPT_SENS_INVERT_IN	37	Not used.	-
OPT_SENS_DUP_IN	38	Not used.	-
OPT_SENS_DUP_OUT	39	Not used.	-
OPT_SW_DUP	3A	Not used.	-
OPT_SW_NEAR_END_3	3B	Low Paper Sensor (Cassette 3) [3] LOW PAPER SENSE signal: High	Check the sensor by removing/adding the paper in Cassette 3.
OPT_SW_DOOR_FEEDER	3C	Feeder Chute Switch FEEDER CHUTE SWITCH ON signal: High	Check the switch by opening/closing the Feeder Chute Assembly.

Table 4-19. Digital Input Test Device Codes (6/7)

Digital Input Test [DIAGSTART: 90 01 XX, DIAGSTOP: Unnecessary]			
Name	**Code (Hex)**	**Function item / Status data: High**	**Check**
OPT_SENS_EMPTY_3	3D	Tray No Paper Sensor (Cassette 3) [3] TRAY PAPER SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using the Tray N/P Actuator (Cassette 3).
OPT_SENS_EMPTY_4	3E	Tray No Paper Sensor (Cassette 4) [4] TRAY PAPER SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using the Cassette N/P Actuator (Cassette 4).
OPT_SW_FEEDER	3F	Feeder Unit * HRX signal: 1 byte data	-
OPT_SENS_EMPTY_2	40	Tray No Paper Sensor (Cassette 2) [2] TRAY PAPER SENSE signal: High	Check the sensor by blocking/opening the light path to the sensor using the Tray N/P Actuator (Cassette 2).
OPT_SW_NEAR_END_4	41	Low Paper Sensor (Cassette 4) [4] LOW PAPER SENSE signal: High	Check the sensor by removing/adding the paper in Cassette 4.
OPT_SW_NEAR_END_2	42	Low Paper Sensor (Cassette 2) [2] LOW PAPER SENSE signal: High	Check the sensor by removing/adding the paper in Cassette 2.

Table 4-20. Digital Input Test Device Codes (7/7)

Digital Input Test [DIAGSTART: 90 01 XX, DIAGSTOP: Unnecessary]			
Name	**Code (Hex)**	**Function item**	**Check**
		Status data: High	
OPT_SIZE2	43	Size Switch Assembly (Cassette 2)	Check the assemblies by turning ON/OFF the 4 Paper Size Switches (Cassette2, Cassette 3, Cassette 4) and check the data in this diagnostic function. (See Section 2. 7.1 Paper Size Control.)
		* [2] SIZE SWITCH signal: 1 byte data	
OPT_SIZE3	44	Size Switch Assembly (Cassette 3)	
		* [3] SIZE SWITCH signal: 1 byte data	
OPT_SIZE4	45	Size Switch Assembly (Cassette 4)	
		* [4] SIZE SWITCH signal: 1 byte data	

4.2.6.6 Digital Output Test

Components controlled by the digital signals can be turned ON/OFF.

Table 4-21. Digital Output Test Parameter

DIAGON command: 75		DIAGOFF command: 76
DIAGSTART command (Digital Output Test): 90 02 XX		
DIAGSTOP command (Digital Output Test): 91 02 XX		
Parameter	**Function**	**Data**
1	Diagnostic type	02: Digital Output Test
2	Code_D0	Device code (See 4.2.6.7.)
3	DGST	[Status only] 06: Passed, 07: Failed
With status (90 02 XX XX)		

Example) Command

90 02 21

- 21 — MSI_CL
- 02 — Digital Output Test
- 90 — DIAGSTART command

Example) Status

90 02 21 06

- 06 — Passed
- 21 — MSI_CL
- 02 — Test Print
- 90 — DIAGSTART command

WARNING

- **Do not touch live parts when high voltages are output.**
- **Install all covers when the laser beam is active and exposed.**
- **Do not touch motors and drive assemblies when they are running.**

NOTE: *Do not turn on the BCR, Erase Lamp Assembly and the LD in the ROS Assembly with the Process Motor Assembly turned OFF to prevent fatigue in the Drum Cartridge.*

NOTE: *After having replaced the Drum Cartridge with a new one, do not turn on the Process Motor Assembly ON to prevent the Cleaning Blade from rotating in reverse.*

NOTE: *While the Process Motor Assembly, P/H Motor Assembly and Developer Clutch Assembly are on, and the Developer Assembly is in the development position, do not turn on the DB output (AC component) or DB output (AC component) and DB output (DC component) at the same time.*

NOTE: *Do not keep the Dispense Motor Assembly turned on for more than 10 seconds to prevent toner from being clogged too much in the developer assembly and gears from being damaged.*

NOTE: *While the Process Motor Assembly is turned off and the P/H Motor Assembly on, do not set the 2nd BTR in the advanced position to prevent the IBT Belt Assembly from being damaged.*

NOTE: *While the 2nd BTR is set in the advanced position, do not turn on the Process Motor Assembly to prevent the IBT Belt Assembly from being damaged.*

NOTE: *Do not turn on the 1st BTR with the Process Motor Assembly turned off to prevent the IBT Belt Assembly from being damaged.*

NOTE: *When the Process Motor Assembly and the P/H Motor Assembly are turned off, do not turned on the 2nd BTR to prevent the IBT Belt Assembly from being damaged.*

NOTE: *Do not turn on the P/H Motor Assembly without the Drum Cartridge or the Waste Toner Box, otherwise the toner will spill.*

NOTE: *Do not turn on the P/H Motor Assembly or the Developer Clutch Assembly when the Development Assembly is out-of-place to prevent the inside of the printer from contaminated and the gears from being damaged due to improper engagement.*

NOTE: *Do not turn on the H/R Heater and the P/R Heater for more than 3 seconds to prevent the Main Fuser from being damaged.*

4.2.6.7 Digital Output Test: Device codes

CAUTION

If there is a <Warning!> or <Caution!> in the Check column, first confirm the warnings and cautions listed on the previous page to prevent problems.

Table 4-22. Device Codes for Digital Output Test (1/8)

Digital Output Test [DIAGSTART: 90 02 XX, DIAGSTOP: 91 02 XX]				
Name	**Code (Hex)**	**Function item**	**Function**	**Check**
HR_CUT_SEL	00		Not allowed.	-
VDENB	01	ROS Assembly	Sets the LD ENB signal to Low.	Check the LD ENB signal.
LD_ON	05	ROS Assembly	Sets the VDATA signal to High	Check the VDATA signal.
WD_CAN	09		Not allowed.	-
OPT_TRAY2	0A		Not allowed.	-
DUP_START	0C		Not allowed.	-
RTS_CL	0D		Not allowed.	-
OPT_TRAY	0E		Not allowed.	-
MAIN_MOT_SPEED	0F	Process Motor Assembly	Sets the PROCESS MOTOR HALF-SPEED signal to Low.	<Warning!><Caution!> Check visually and auditorially that the Process Motor Assembly rotation speed has been reduced to half. (By executing this test with Code 10, the Process Motor Assembly rotation speed is reduced to half.)

Table 4-23. Device Codes for Digital Output Test (2/8)

Digital Output Test [DIAGSTART: 90 02 XX, DIAGSTOP: 91 02 XX]				
Name	**Code (Hex)**	**Function item**	**Function**	**Check**
MAIN_MOT	10	Process Motor Assembly	Sets the PROCESS MOTOR ON signal to Low.	<Warning!><Caution!> Check visually and auditorially that the Process Motor Assembly is functioning.
ROTARY_MOT_POWER	15	Rotary Motor Assembly	Sets the ROTARY MOTOR HOLD signal to Low	<Warning!><Caution!> Check the Rotary Motor Hold signal. (By executing this test with Code 16, the Rotary Motor Assembly is put on hold.
ROTARY_MOT	16	Rotary Motor Assembly	Sets the ROTARY MOTOR ON signal to Low.	<Warning!><Caution!> Check the Rotary Motor ON signal. (The Rotary Motor Assembly is ready for rotation.)
BTR_2ND	17	HVPS	Sets the 2ND BTR ON signal to Low.	<Warning!><Caution!> Do not check the 2nd BTR output. Check the 2nd BTR ON signal.
BTR_1ST	18	HVPS	Sets the 1ST BTR ON signal to Low.	<Warning!><Caution!> Do not check the 1st BTR output. Check the 1st BTR ON signal.
DEVE_DC	19	HVPS	Sets the DB DC ON signal.	<Warning!> Do not check the DB output. Check the DB DC ON signal.

CAUTION

If there is a <Warning!> or <Caution!> in the Check column, first confirm the warnings and cautions listed on the previous page to prevent problems.

Table 4-24. Device Codes for Digital Output Test (3/8)

Digital Output Test [DIAGSTART: 90 02 XX, DIAGSTOP: 91 02 XX]

Name	Code (Hex)	Function item	Function	Check
DEVE_AC	1A	HVPS	Sets the DB AC ON signal to Low.	<Warning!> Do not check the DB output. Check the DB AC ON signal.
BCR_DC	1B	HVPS	Sets the BCR ON signal to Low.	<Warning!><Caution!> Do not check the BCR output. Check the BCR ON signal.
DTCK_SAW	1C	HVPS	Sets the DTS ON signal to Low.	<Warning!><Caution!> Do not check the DTS output. Check the DTS ON signal.
PH_MOT	1D	P/H Motor Assembly	Sets the P/H MOTOR ON signal to Low.	<Warning!><Caution!> Check visually and auditorially that the P/H Motor Assembly is functioning.
PRE_TR0	1E	Not allowed.		-
HR_LAMP_SSR	1F	H/R Heater, P/R Heater	Sets the HEATER ON signal to Low.	<Warning!><Caution!> Check the Heater ON signal. (The H/R Heater and P/R Heater are turned on.)
ROS_MOT	20	ROS Assembly	Sets the SCANNER MOTOR ON signal to Low.	Check the Scanner Motor ON signal. (The Scanner Motor in the ROS is rotating)

Table 4-25. Device Codes for Digital Output Test (4/8)

Digital Output Test [DIAGSTART: 90 02 XX, DIAGSTOP: 91 02 XX]

Name	Code (Hex)	Function item	Function	Check
MSI_CL	21	MSI Clutch	Sets the MSI CLUTCH ON signal to Low.	By corresponding the clicking sound, check if the clutch or solenoid has been activated.
MSI_FEED_SOL	22	Pick Up Solenoid	Sets the PICK UP SOLENOID ON signal to Low.	
TAKE_AWAY_CL	23	Pre-Registration Clutch	Sets PRE-REGI. CLUTCH ON signal to Low.	
REGIST_CL	24	Registration Clutch	Sets the REGI. CLUTCH ON signal to Low.	
DISPENSE_MOT	25	Dispense Motor Assembly	Sets the DISPENSE MOTOR ON signal to Low.	<Warning!><Caution!> Check auditorially that the Dispense Motor Assembly is functioning.
REAR_FAN	26	Developer Fan	Sets the DEVE. FAN ON signal to High.	<Warning!><Caution!> Check visually or auditorially that the Developer Fan is functioning.
FUSER_FAN	27	Fuser Fan	Sets the FUSER FAN ON signal to High.	<Warning!><Caution!> Check visually or auditorially that the Fuser Fan is functioning.

If there is a <Warning!> or <Caution!> in the Check column, first confirm the warnings and cautions listed on the previous page to prevent problems.

Table 4-26. Device Codes for Digital Output Test (5/8)

Digital Output Test [DIAGSTART: 90 02 XX, DIAGSTOP: 91 02 XX]

Name	Code (Hex)	Function item Function	Check
CST1_FEED_SOL	28	Feed Solenoid (Cassette 1) [1] Sets the FEED SOLENOID ON signal to Low.	By corresponding the clicking sound, check if the clutch or solenoid has been activated. By corresponding the clicking sound, check if the clutch or solenoid has been activated.
REGI_BRK	2C	Registration Brake Clutch Sets the REGI. BRAKE CLUTCH ON signal to Low.	
MAG_ROLL_CL	2D	Developer Clutch Assembly Sets the DEVE. CLUTCH ON signal to Low.	
BTR_2ND_SOL	2E	BTR CAM Solenoid Sets the BTR CAM SOLENOID ON signal to Low.	
OIL_ROLL_SOL	2F	Oil Cam Solenoid Sets the OIL CAM SOLENOID ON signal to Low.	
IBT_CLEANER_SOL	30	Cleaner CAM Solenoid Sets the CLEANER CAM SOLENOID ON signal to Low.	

Table 4-27. Device Codes for Digital Output Test (6/8)

Digital Output Test [DIAGSTART: 90 02 XX, DIAGSTOP: 91 02 XX]

Name	Code (Hex)	Function item Function	Check
REAR_FAN_SPEED	31	Developer Fan Sets the DEVE. FAN HALF-SPEED signal to High.	<Warning!> Check visually or auditorially that the Developer Fan rotation has been reduced. (By executing this test with Code 26, the Developer Fan rotation speed is reduced.)
FUFSER_FAN_SPEED	32	Fuser Fan Sets the FUSER FAN HALF-SPEED signal to High.	<Warning!> Check visually or auditorially that the Fuser Fan rotation has been reduced. (By executing this test with Code 27, the Fuser Fan rotation speed is reduced.)
ADC_LED	33	ADC Sensor Assembly Sets the LED ON signal to Low.	Turn the ADC Sensor ON/OFF the light emitter in this diagnostic function. Run the ADC Sensor input test in the Analog Input Test.
PATH_SOL_PUSH	34	Exchange Solenoid Turns on the EXCHANGE SOLENOID PUSH ON signal.	Check visually or auditorially (clicking sound) that the Exchange Solenoid is functioning. (You can change the Face Up/Face Down with the Exchange Chute that is controlled by the Exchange Solenoid.)
PATH_SOL_PULL	35	Exchange Solenoid Turns on the EXCHANGE SOLENOID PULL ON signal.	

CAUTION

If there is a <Warning!> or <Caution!> in the Check column, first confirm the warnings and cautions listed on the previous page to prevent problems.

Table 4-28. Device Codes for Digital Output Test (7/8)

Digital Output Test [DIAGSTART: 90 02 XX, DIAGSTOP: 91 02 XX]

Name	Code (Hex)	Function item	Function	Check
ADC_CLEAN_SOL	36	ADC Sensor Assembly	Sets the ADC SOLENOID ON signal to Low.	By the clicking sound, check that the ADC Solenoid in the ADC Sensor Assembly is functioning.
ERASE_LAMP	37	Erase Lamp Assembly	Sets the ERASE LAMP ON signal to Low.	Remove the Top Cover. Visually check that the Erase Lamp Assembly has been turned on.
CART_PHOTO_LED	3C	Used Cartridge Sensor, Cartridge Sensor	Sets the SENSOR ON signal to High.	Turn ON/OFF the light emitter in the sensors in this diagnostic function. Run the Digital Input Test for each sensor.
OPT_DUP_MOT_SPEED	50	Not allowed.		-
OPT_DUP_MOT	51	Not allowed.		-
OPT_ROLL_FRONT_CL	52	Not allowed.		-
OPT_ROLL_BACK_CL	53	Not allowed.		-
OPT-REVERSE_CL	54	Not allowed.		-
OPT_FORWARD_CL	55	Not allowed.		-
OPT_DUP_PATH_SOL_PUSH	56	Not allowed.		-
OPT_DUP_PATH_SOL_PULL	57	Not allowed.		-

Table 4-29. Device Codes for Digital Output Test (8/8)

Digital Output Test [DIAGSTART: 90 02 XX, DIAGSTOP: 91 02 XX]

Name	Code (Hex)	Function item	Function	Check
OPT_FEEDER_MOT	58	Feeder Motor	Sets the FEEDER MOTOR ON signal to Low.	Check visually and auditorially that the Feeder Motor is functioning.
OPT_TRAY2_SOL	59	Feed Solenoid-3T	Sets the [2] FEED SOLENOID ON signal to Low.	By the clicking sound, check if the clutch or solenoid are functioning.
OPT_TRAY3_SOL	5A	Feed Solenoid-3T	Sets the [3] FEED SOLENOID ON signal to Low.	
OPT_TRAY4_SOL	5B	Feed Solenoid-3T	Sets the [4] FEED SOLENOID ON signal to Low.	
OPT_TURN_ROLL_2_CL	5C	Turn Clutch-3T	Sets the [2] TURN CLUTCH ON signal to Low.	By the clicking sound, check if the clutch or solenoid has been activated.
OPT_TURN_ROLL_3_CL	5D	Turn Clutch-3T	Sets the [3] TURN CLUTCH ON signal to Low.	
OPT_TURN_ROLL_4_CL	5E	Turn Clutch-3T	Sets the [4] TURN CLUTCH ON signal to Low.	

4.2.6.8 Analog Input Test

You can run this test to detect the signal levels of the sensors and output monitors that output an analog signal.

CAUTION

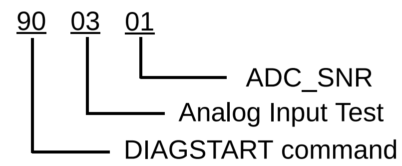
Do not run this test unless specified in this manual or instructed to do so.

Table 4-30. Analog Input Test Specifications

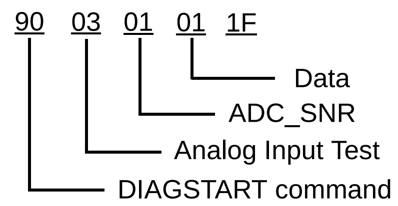
DIAGON command: 75		DIAGOFF command: 76
DIAGSTART command (Analog Input Test): 90 03 XX		
DIAGSTOP command (Analog Input Test): Unnecessary		
Parameter	**Function**	**Data (Hex)**
1	Diagnostic type	03: Analog Input Test
2	Code_AI	Device code (See 4.2.6.9.)
3	Data	[Status only] Data
4	Data	[Status only] Data
With status (90 03 XX XX)		

NOTE: *The status data consists of 2 bytes; the lower byte is displayed first.*

Example) Status



Example) Command



4.2.6.9 Analog Input Test: Device codes

CAUTION

If there is a <Warning!> or <Caution!> in the Check column, first confirm the warnings and cautions listed on the previous page to prevent problem.

Table 4-31. Device Codes of the analog Input Test (1/2)

Analog Input Test [DIAGSTART: 90 03 XX, DIAGSTOP: Unnecessary]					
Name	**Code (Hex)**	**Function item**	**Signal**	**Data range**	**Check**
BTR_2ND_IN	00	HVPS (2nd transfer current monitor)	2BTR MONI signal	0000 - 0400h (0 - 4.1[V])	<Warning!><Caution!> Run the Digital Output Test [17] and Analog Output Test [01] for 2nd BTR output. Check the data in this diagnostic function.
ADC_SNR	01	ADC Sensor (ADC Sensor Assembly)	ADC SIG signal	0000 - 0400h (0 - 4.1[V])	Turn on the light emitter of the sensor and check the data in this diagnostic function.
PAP_SIZE_SW_1	02	Size Switch Assembly (Cassette 1)	[1] SIZE SWITCH signal	See Section 2. 7.1 Paper Size Control	Turn ON/OFF the Paper Size Switches (4) in the Size Switch Assembly (Cassette 1). Check the data in this diagnostic function.
HR_THERMISTER	03	Temperature Sensor Assembly	TEMP. signal	0000 - 00FFh (0 - 4.1[V])	Check the data.

Table 4-32. Device Codes of the analog Input Test (2/2)

Analog Output Test [DIAGSTART: 90 03 XX, DIAGSTOP: Unnecessary]					
Name	**Code (Hex)**	**Function item**	**Signal**	**Data range**	**Check**
ENV_THERM	04	Environment Sensor	ENVIRONMENT TEMP. signal	0000 - 00FFh (0 - 4.1[V])	Check the data.
_5V_BUNATSU	05	Not used.			-
BTR_1ST_IN	06	HVPS (1st transfer voltage monitor)	1 BTR MONI signal	0000 - 00FFh (0 - 4.1[V])	<Warning!><Caution!> Run the Digital Output Test [18] and Analog Output Test [00] for 1st BTR output. Check the data in this diagnostic function

4.2.6.10 Analog Output Test

Components controlled by the analog signals can be turned ON/OFF.

Table 4-33. Analog Output Test Specifications

DIAGON command: 75		DIAGOFF command: 76
DIAGSTART command (Analog Output Test): 90 04 XX XX		
DIAGSTOP command (Analog Output Test): 91 04 XX XX		
Parameter	**Function**	**Data (Hex)**
1	Diagnostic type	04: Analog Output Test
2	Code_A0	Device code (See 4.2.6.11.)
3	Data	[Command] Data: (Output level)
3	DGST	[Status] 06: Passed, 07: Failed
With status (90 04 XX XX)		

Example) Command

90 04 02 01

- 01: Data
- 02: BCR_DC_OUT
- 04: Analog Output Test
- 90: DIAGSTART command

Example) Status

90 04 02 06

- 06: Passed
- 02: BCR_DC_OUT
- 04: Analog Output Test
- 90: DIAGSTART command

WARNING

- **Do not touch live parts when high voltages are output.**
- **Install all covers when the laser beam is active and exposed.**
- **Do not touch motors and drive assemblies when they are running.**

CAUTION

- **Do not turn on the BCR, Erase Lamp Assembly and the LD in the ROS Assembly with the Process Motor Assembly turned OFF to prevent fatigue in the Drum Cartridge.**
- **While the Process Motor Assembly, P/H Motor Assembly and Developer Clutch Assembly are on, and the Developer Assembly is in the development position, do not turn on the DB output (AC component) or DB output (AC component) and DB output (DC component) at the same time.**
- **Do not keep the Dispense Motor Assembly turned on for more than 10 seconds to prevent toner from being clogged to much in the developer assembly and gears from being damaged.**
- **Do not turn on the 1st BTR with the Process Motor Assembly turned off to prevent the IBT Belt Assembly from being damaged.**
- **When the Process Motor Assembly and the P/H Motor Assembly are turned off, do not turned on the 2nd BTR to prevent the IBT Belt Assembly from being damaged.**
- **Do not turn on the P/H Motor Assembly or the Developer Clutch Assembly when the Development Assembly is out-of-place to prevent the inside of the printer from contaminated and the gears from being damaged due to improper engagement.**

4.2.6.11 Analog Output Test: Device codes

CAUTION

If there is a <Warning!> or <Caution!> in the Check column, first confirm the warnings and cautions listed on the previous page to prevent problem.

Table 4-34. Analog Output Test: Device codes (1/2)

Analog Output Test [DIAGSTART: 90 04 XX, DIAGSTOP: 91 04 XX XX]

Name	Code (Hex)	Function item	Function	Data range	Check
BTR_1ST_OUT	00	HVPS	Outputs the 2BTR CONT signal that has the value based on the data.	00 - FFh (0 - 4.1[V])	<Warning!> <Caution!> Check the HVPS by reading the 2BTR Controller signal.
BTR_2ND_OUT	01	HVPS	Outputs the 1BTR CONT signal that has the value based on the data.	00 - FFh (0 - 4.1[V])	<Warning!><Caution!> Check the HVPS by reading the 1BTR Controller signal.
BCR_DC_OUT	02	HVPS	Outputs the BCR DC CONT signal that has the value based on the data.	00 - FFh (0 - 4.1[V])	<Warning!><Caution!> Check the HVPS by reading the BCR DC Controller signal.
DEVE_DC_OUT	03	HVPS	Outputs the DB DC CONT signal that has the value based on the data.	00 - FFh (0 - 4.1[V])	<Warning!><Caution!> Check the HVPS by reading the DB DC Controller signal.

Table 4-35. Analog Output Test: Device codes (2/2)

Analog Output Test [DIAGSTART: 90 04 XX, DIAGSTOP: 91 04 XX XX]

Name	Code (Hex)	Function item	Signal	Data range	Check
LD_POWER	04	ROS Assembly	Outputs the VREF signal that has the value based on the data.	00 - FFh (0 - 4.1[V])	<Warning!><Caution!> Check the ROS Assembly by reading the VREF signal.
DTCK_SAW_OUT	05	HVPS	Outputs the DTS CONT signal that has the value based on the data.	00 - FFh (0 - 4.1[V])	<Warning!><Caution!> Check the HVPS by reading the DTS Controller signal.
Deve Rotary Motor	0A	Rotary Motor Assembly	Outputs the Rotary Motor Clock signal that has the value based on the data.	00h: Home position 01h: 30°, 02h: 45°, 03h: 60°, 04h: 90°, 05h: 120°, 06h: 150°, 07h: 210°, 08h: 240°, 09h: 300°, 0Ah: 330°, 0Bh: 360°, 0Ch: 90°, 0Dh: 15°	<Warning!><Caution!> Check visually that the Rotary Motor Assembly rotates at the specified angle. (Simultaneously running this test with Digital Output Test 16 rotates the Rotary Motor Assembly.)

4.2.6.12 EEPROM Read

You can read and check the data in the MCU PWB EEPROM (NVM).

Table 4-36. EEPROM Read Parameters

DIAGON command: 75		DIAGOFF command: 76
DIAGSTART command (EEPROM Read): 90 05 XX XX		
DIAGSTOP command (EEPROM Read): Unnecessary		
Parameter	**Function**	**Data (Hex)**
1	Diagnostic type	05: EEPROM Read
2	Code_EP	NVM number (See 4.2.6.15: NVM List.)
3	Code_EP	NVM number (See 4.2.6.15: NVM List.)
4	Data	[Status only] Data
5	Data	[Status only] Data
6	Data	[Status only] Data
7	Data	[Status only] Data
With status (90 05 XX XX XX XX XX XX)		

NOTE: *Enter the lower byte of the 2 bytes in Code_EP (NVM number) first, then enter the second byte.*

NOTE: *Enter the lowest byte of the 4 bytes in the status data first, then enter the second, third and fourth bytes.*

Example) Command

90 05 CC 01 A0 86 01 00

- A0 86 01 00: Data: 100000 (186A0h)
- CC 01: NVM No. 460 (1 CCH): Life counter accumulated count
- 05: EEPROM read
- 90: DIAGSTART command

Example) Status

90 05 CC 01 A0 86 01 00

- A0 86 01 00: Data: 100000 (186A0h)
- CC 01: NVM No. 460 (1CCh): Life counter accumulated counts for 2nd BTR Assembly
- 05: EEPROM read
- 90: DIAGSTART command

CAUTION

Before replacing the MCU PWB, make sure to read and record the following NVM numbers:

- **60 (0044h):** Oil Rate count (accumulated counts) to detect the Oil Roll Assembly life end.
- **122 (007Ah):** Counter B to detect a full Waste Toner Box.
- **324 (0144h):** Counter C to detect a full Waste Toner Box.
- **356 (0164h):** Overall image counts (accumulated counts) of the printer.
- **378 (017Ah):** Accumulated dispense time to detect the life end of the Toner Cartridge Bk.
- **380 (017Ch):** Accumulated dispense time to detect the life end of the Toner Cartridge Y.
- **382 (017Eh):** Accumulated dispense time to detect the life end of the Toner Cartridge M.
- **384 (0180h):** Accumulated dispense time to detect the life end of the Toner Cartridge C.
- **404 (0194h):**Image counts (accumulated counts) to detect the life end of the Main Fuser Assembly.
- **424 (01A8h):** Accumulated counts to detect the life end of the Belt Cleaner Assembly.
- **440 (01B8h):** Overall prints (accumulated time) of the printer.
- **444 (01BCh):** Dispense time (accumulated counts) to detect the life end of the Main Fuser Assembly.
- **448 (01C0h):** PV accumulated counts to detect the life end of the Oil Roll Assembly.
- **452 (01C4h):** Accumulated counts to detect the life end of the Drum Cartridge.

NOTE: *Read the data only if the printer has the CRUM function.*

- **460 (01CCh):**Accumulated counts to detect the life end of the 2nd BTR Assembly.
- **474 (01DAh):** Counter A to detect a full Waste Toner Box.

CAUTION

If you replace a periodically replaced parts (i.e., Main Fuser Assembly, 2nd BTR Assembly, Belt Cleaner Assembly) or the Drum Cartridge for the printer without the CRUM function, write “0” in the following NVM number data. (Setting a “0” in the life counter is described as a “Counter Clear” in this manual.)

- **If you replaced the Drum Cartridge (without CRUM) with a new one: 452 (01C4h)**
- **<Do not write data for the printer with the CRUM function.>**
- **If you replaced the Main Fuser Assembly with a new one: 404 (0194h), 444 (01BCh)**
- **If you replaced the Belt Cleaner Assembly with a new one: 424 (01A8h)**
- **If you replaced the 2nd BTR Assembly with a new one: 460 (01CCh)**

NOTE: *You can read some of the data items above in “2.5 Life Counters: Read/Write.” If you read/write data when you replace the MCU PWB, you do not need to run the EEPROM Read/ Write.*

4.2.6.13 EEPROM Write

You can change the data in the MCU PWB EEPROM (NVM) by writing new data in it.

CAUTION

Do not modify any NVM numbers except when instructed to do so in this manual. If you change any of the other NVH numbers, the system setting may be corrupted.

NOTE: *You need to send a DIAGOFF command to actually write the data in the EEPROM.*

Table 4-37. EEPROM Write Parameters

DIAGON command: 75		DIAGOFF command: 76
DIAGSTART command (EEPROM Write): 90 06 XX XX XX XX XX XX		
DIAGSTOP command (EEPROM Write): Unnecessary		
Parameter	**Function**	**Data (Hex)**
1	Diagnostic type	06: EEPROM Write
2	Code_EP	NVM No. (See 4.2.6.15: NVM List.)
3	Code_EP	NVM No. (See 4.2.6.15: NVM List.)
4	Data	[Command] Data
	DGST	[Status] 06: Passed, 07: Failed
5	Data	[Command only] Data
6	Data	[Command only] Data
7	Data	[Command only] Data
With status (90 06 XX XX XX)		

NOTE: *Enter the lower byte of the 2 bytes in the Code_EP (NVM number) first, then enter the second byte.*

NOTE: *Enter the lowest byte of the 4 bytes in the status data first, then enter the second, third and fourth bytes.*

NOTE: *If the data is a negative value, -1 is represented as FFh, -2 is FEh,... and so on.*

Example) Command

90 06 A8 01 A0 86 01 00

- A0 86 01 00: Data: 100000 (186A0h)
- A8 01: NVM No. 424 (1A8h)
- 06: EEPROM Write Life counter (accumulated counts) for the Belt Cleaner Assembly
- 90: DIAGSTART command

Example) Status

90 06 A8 01 06

- 06: Passed
- A8 01: NVM No. 424 (1A8h)
- 06: EEPROM Write: Life counter (accumulated counts) for the Belt Cleaner Assembly
- 90: DIAGSTART command

CAUTION

If you replace a periodically replaced parts (i.e., Main Fuser Assembly or 2nd BTR Assembly) or the Drum Cartridge for the printer without the CRUM function, write “0” in the following NVM number data. (Setting a “0” in the life counter is described as a “Counter Clear” in this manual.)

- **If you replaced the Drum Cartridge (without CRUM) with a new one: 452 (01C4h)**
- **<Do not write data for the printer with the CRUM function.>**
- **If you replaced the Main Fuser Assembly with a new one: 404 (0194h), 444 (01BCh)**
- **If you replaced the Belt Cleaner Assembly with a new one: 424 (01A8h)**
- **If you replaced the 2nd BTR Assembly with a new one: 460 (01CCh)**

NOTE: *You can read some of the data items listed in Section 4.2.5 “Life Counter Read/Write” If you read/write data when you replace the MCU PWB, you do not need to run the EEPROM Read/Write.*

4.2.6.14 EEPROM Initialize

You can initialize the MCU PWB EEPROM (NVM).

CAUTION

Do not initialize the EEPROM unless instructed to do so in this manual.

CAUTION

If you initialize the EEPROM, do the following:

- **Read the NVM numbers using the EEPROM Read.**
- **Execute the NVM Write in the [Service] tab.**
- **Write the data (that has been read) using the EEPROM Write. (Also execute the NVM Write in the [Service] tab.)**

You need to send the DIAGOFF command to actually initialize the EEPROM.

Table 4-38. EEPROM Initialize Parameters

DIAGON command: 75		DIAGOFF command: 76
DIAGSTART command (EEPROM Initialize): 90 07		
DIAGSTOP command (EEPROM Initialize): Unnecessary		
Parameter	**Function**	**Data (Hex)**
1	Diagnostic type	07: EEPROM Initialize
2	DGST	[Status only] 06: Passed, 07: Failed
With status (90 70 XX)		

Example) Command

90 07

07 — EEPROM Initialize

90 — DIAGSTART command

Example) Status

90 07 06

06 — Passed

07 — EEPROM Initialize

90 — DIAGSTART command

4.2.6.15 NVM List

CAUTION

- **The NVM numbers that are not listed in the table below are used by the system. Do not write data in those NVM numbers.**
- **Do not modify any NVM number with an “X” in the Access Permission Yes/No column unless instructed to do so. These NVM numbers are critical to the system settings.**
- **Before replacing the MCU PWB, read and record the data in the NVM numbers with an * (asterisk) and write the data in those NVM numbers.**

NOTE: *The default values (Hex) may differ depending on the specification of the printer.*

Table 4-39. NVM List (1/8)

EEPROM Read [90 05 XX XX], EEPROM Write [90 06 XX XX XX XX XX XX]				
Access Permission Yes/No	**NVM Number (Hex)**	**Function**	**Range (Hex)**	**Default (Hex)**
		Data	**Unit**	
(Read only)	0 (0000)	MCU PWB Version	(0F)	-
		0F: Firmware version	-	
x	1 (0001)	Fuser dummy rotation (Belt Cycle)	0 - 4 (00 - 04)	1 (01)
		Number of dummy rotations for continuous printing in each color mode (plain paper)	Belt circumference	
	3 (0003)	Top registration adjustment	-12 - +28 (F4 - 1C)	4 (04)
			6.91msec	
x	4 (0004)	Registration loop amount: time adjustment (plain paper)	-5 - +5 (FB - 05)	-3 (FD)
			6.91msec	
x	5 (0005)	Registration loop amount: time adjustment (thick paper)	-5 - +5 (FB - 05)	0 (00)
		]	6.91msec	
x	6 (0006)	Oil Roll Advance/Retract control counter: Clear time setting (1)	1 - 10 (01 - 0A)	5 (05)
			1 min	
x	7 (0007)	Registration loop amount: time adjustment (envelope)	-12 - -2 (F4 - FE)	-7 (F9)
			6.91 msec	
x	8 (0008)	Fuser Exit On Jam (C4-20-00): time adjustment	-10 - +10 (F6 - 0A)	3 (03)
			48.37 msec	

Table 4-40. NVM List (2/8)

EEPROM Read [90 05 XX XX], EEPROM Write [90 06 XX XX XX XX XX XX]				
Access Permission Yes/No	NVM Number (Hex)	Function / Data	Range (Hex) / Unit	Default (Hex)
x	9 (0009)	Oil Roll Advance/Retract control counter: Clear time setting (2)	1 - 30 (01 - 1E)	10 (10)
x	10 (000A)	Top Exit On Jam(C4-80-00): time adjustment	-10 - +10 (F6 - 0A)	1 (01)
			48.37 msec	
x	11 (000B)	Top Exit Off Jam(C4-80-00): time adjustment	-10 - +10 (F6 - 0A)	0 (00)
			48.37 msec	
x	12 (000C)	Top Exit Off Jam(C4-20-00): time adjustment	-10 - +10 (F6 - 0A)	2 (02)
			48.37 msec	
x	13 (000D)	MSI Paper feed interval: time adjustment	-70 - +70 (BA- 46)	0 (00)
			6.916 msec	
x	14 (000E)	MSI Feed Jam (C4-00-00): time adjustment	0 - 20 (00 - 14)	10 (0A)
			50ms	
x	15 (000F)	Cassette 1 paper feed interval: time adjustment	-35 - +35 (DD - 23)	-5 (FB)
			13.82 msec	
x	16 (0010)	Cassette 2 Feed Jam (C4-40-00): time adjustment	-10 - +10 (F6 - 0A)	0 (00)
			50 msec	

Table 4-41. NVM List (3/8)

EEPROM Read [90 05 XX XX], EEPROM Write [90 06 XX XX XX XX XX XX]				
Access Permission Yes/No	NVM Number (Hex)	Function / Data	Range (Hex) / Unit	Default (Hex)
x	17 (0011)	Jam detection: Enable/ Disable	0,1,2,3	0 (00)
		0: Jam and size mismatch detection 1: No Jam detection 2: No size mismatch detection 3: No Jam detection and no size mismatch detection	-	
x	18 (0012)	OHP Front/Back detection: Enable/Disable	0,1	0 (00)
		0: Enable, 1: Disable	-	
x	21 (0015)	Country code	0,1	1 (01)
			-	
	24 (0018)	Image area selection	0,1	0 (00)
		0: Standard, 1: Wide	-	
x	25 (0019)	Oil Roll Advance/Retract control counter: Clear time setting (3)	1 - 60 (01 - 3C)	30 (1E)
			1 min	
	26 (001A)	Side registration adjustment (Cassette 1)	0 - 64 (00 - 40)	37 (25)
			0.17mm	
	32 (0020)	Side registration adjustment (Cassette 2)	0 - 64 (00 - 40)	32 (20)
			0.17mm	
	33 (0021)	Side registration adjustment (Cassette 3)	0 - 64 (00 - 40)	32 (20)
			0.17mm	

Table 4-42. NVM List (4/8)

EEPROM Read [90 05 XX XX],
EEPROM Write [90 06 XX XX XX XX XX XX]

Access Permission Yes/No	NVM Number (Hex)	Function / Data	Range (Hex) / Unit	Default (Hex)
	34 (0022)	Side registration adjustment (MSI)	0 - 64 (00 - 40)	44 (2C)
			0.17mm	
	46 (002E)	Side registration adjustment (Cassette 4)	0 - 64 (00 - 40)	32 (20)
			0.17mm	
*	68 (0044)	Oil Roll Assembly life counter (2)		0 (0000)
		Oil Roll accumulated counts	-	
	76 (004C)	Oil Roll Assembly life counter (2) data		0 (0000)
		Accumulated PV counts for one hour	-	
*	122 (007A)	Waste Toner Box life counter (2)		0 (0000)
		Counter B	-	
x	158 (009E)	Print counter (for ADC Sensor cleaning)	1 - 1000 (0001 - 03E8)	0 (0000)
			1 print	
x	176 (00B0)	OHP (color) reverse insertion detection: Enable/ Disable	0, 1	0 (0000)
		0: Enable, 1: Disable	-	
x	324 (0144)	Waste Toner Box life counter (3)	0 - 65535 (0000 - FFFF)	0 (0000)
		Counter C	1 sec	
x	356 (0164)	Printer life counter (2)		0 (0000)
		Overall image accumulated counts	1 image	

Table 4-43. NVM List (5/8)

EEPROM Read [90 05 XX XX],
EEPROM Write [90 06 XX XX XX XX XX XX]

Access Permission Yes/No	NVM Number (Hex)	Function / Data	Range (Hex) / Unit	Default (Hex)
*	378 (017A)	Toner Cartridge Bk life counter		0 (0000)
		Black dispense: accumulated time	100 msec	
*	380 (017C)	Toner Cartridge Y life counter		0 (0000)
		Yellow dispense: accumulated time	100 msec	
*	382 (017E)	Toner Cartridge M life counter		0 (0000)
		Magenta dispense: accumulated time	100 msec	
*	384 (0180)	Toner Cartridge C life counter		0 (0000)
		Cyan dispense: accumulated time	100 msec	
x	386 (0182)	Toner Cartridge Bk: Life end warning		9800 (2648)
		Dispense time	100 msec	
x	388 (0184)	Toner Cartridge Y: Life end warning		8000 (1F40)
		Dispense time	100 msec	
x	390 (0186)	Toner Cartridge M: Life end warning		8000 (1F40)
		Dispense time	100 msec	
x	392 (0188)	Toner Cartridge C: Life end warning		8000 (1F40)
		Dispense time	100 msec	
x	394 (018A)	Toner Cartridge Bk: Life over - gas cage		12250 (2FDA)
		Dispense time	100 msec	

Table 4-44. NVM List (6/8)

EEPROM Read [90 05 XX XX], EEPROM Write [90 06 XX XX XX XX XX XX]				
Access Permission Yes/No	NVM Number (Hex)	Function / Data	Range (Hex) / Unit	Default (Hex)
x	396 (018C)	Toner Cartridge Y: Life over - gas cage		10000 (2710)
		Dispense time	100 msec	
x	398 (018E)	Toner Cartridge M: Life over - gas cage		10000 (2710)
		Dispense time	100 msec	
x	400 (0190)	Printer life end warning		450000 (0006DDD0)
		Number of prints	1 print	
*	404 (0194)	Main Fuser Assembly life counter (2)		0 (00000000)
		Accumulated image counts	-	
*	408 (0198)	Main Fuser Assembly: Life end warning	-	67036 (000105DC)
		Dispense time	1 sec	
*	412 (019C)	Main Fuser Assembly: Life over value	-	70564 (000113A4)
		Dispense time		
x	416 (01A0)	Oil Roll Assembly: Life end warning	-	19000 (000A438)
		PV counts	-	
x	420 (01A4)	Oil Roll Assembly: Life over value	-	20000 (0004E20)
		PV counts	-	
*	424 (01A8)	Belt Cleaner Assembly: Life counter	-	0 (00000000)
		Accumulated counts	-	
x	428 (01AC)	Drum Cartridge: Life end warning	-	90000 (00015F90)
		Counts	-	

Table 4-45. NVM List (7/8)

EEPROM Read [90 05 XX XX], EEPROM Write [90 06 XX XX XX XX XX XX]				
Access Permission Yes/No	NVM Number (Hex)	Function / Data	Range (Hex) / Unit	Default (Hex)
x	432 (01B0)	Drum Cartridge: Life over value	-	110000 (0001ADB0)
		Counts	-	
x	436 (01B4)	Belt Counter Assembly: Life end warning	-	100000 (000186A0)
		Counts	-	
x	440 (01B8)	Printer life counter		0 (00000000)
		Accumulated total number of prints	1 print	
*	444 (01BC)	Main Fuser Assembly: Life counter (1)		0 (00)
		Accumulated dispense time	1 sec	
*	448 (01C0)	Oil Roll Assembly: Life counter (1)		0 (00000000)
		Accumulated PV counts	-	
CRUM x	452 (01C4)	Drum Cartridge: Life counter		0 (00000000)
No CRUM *		Accumulated counts	-	
x	456 (01C8)	Belt Cleaner Assembly: Life over value	-	180000 (0002BF20)
		Counts		
*	460 (01CC)	2nd BTR Assembly: Life counter		0 (00000000)
		Counts	-	
x	464 (01D0)	2nd BTR: Life end warning		100000 (000186A0)
		Accumulated counts	-	
x	468 (01D4)	2nd BTR: Life over value	-	180000 (0002BF20)
		Counts	-	

Table 4-46. NVM List (8/8)

EEPROM Read [90 05 XX XX], EEPROM Write [90 06 XX XX XX XX XX XX]				
Access Permission Yes/No	**NVM Number (Hex)**	**Function**	**Range (Hex)**	**Default (Hex)**
		Data	**Unit**	
x	472 (01D8)	Toner Cartridge C: Life over - gas cage	-	10000 (2710)
		Dispense time 3	100 msec	
*	474 (01DA)	Waste Toner Box: Life counter (1)		0 (0000)
		Counter A	-	
*	448 (01C0)	Oil Roll Assembly: Life counter (1)		0 (00000000)
		Accumulated PV counts	-	
CRUM x	452 (01C4)	Drum Cartridge: Life counter		0 (00000000)
No CRUM *		Accumulated counts	-	
x	456 (01C8)	Belt Cleaner Assembly: Life over value	-	180000 (0002BF20)
		Counts		
*	460 (01CC)	2nd BTR Assembly: Life counter		0 (00000000)
		Counts	-	
x	464 (01D0)	2nd BTR: Life end warning		100000 (000186A0)
		Accumulated counts	-	
x	468 (01D4)	2nd BTR: Life over value	-	180000 (0002BF20)
		Counts	-	

4.2.7 Commands/Status List

4.2.7.1 Paper, Media & Output Control

(1) Commands

Table 4-47. Command List

Name	Command code (Hex)	Parameter code	Description
TRYSEL #	60	1. TRAY	Selects the paper feeder (Cassette).
MEDSEL #	61	1. MEDIA	Selects the paper type.
TRYSIZSET #	62	1. TRAY, 2. SIZE	Selects the paper size.
USIZESET #	64	1. TRAY, 2. FSIZEU, 3. FSIZEL, 4. SSIZEU 5. SSIZEL	Sets the irregular paper size by dots.
OUTSET #	63	1. DEST, 2. DOPT	Selects the paper ejection position.
TRYSELR	B0	None	Requests the data of the selected paper feeder (Cassette).
MEDSELR	B1	None	Requests the data of the selected paper type.
TRYSIZSER	B2	1. TRAY	Requests the data of the paper in the specified paper feeder (Cassette).
USIZR	B4	1. TRAY	Requests the paper size by dots in the specified paper feeder (Cassette).
OUTR	B3	None	Requests the ejection position data.
A command with “#” is a command without a responding status.			

(2) Status

Table 4-48. Status List

Name	Status code (Hex)	Parameter code	Description
PPOUT %	20	1. DEST, 2. DOPT, 3. SHEET	Paper ejection data
PCH %	21	1. TRAY, 2. SIZE, 3. MEDIA	Selected paper feeder (Cassette), Paper size, Paper type
TRYSELR	B0	1. TRAY	[Response] Currently selected paper feeder (Cassette)
MEDSELR	B1	1. MEDIA	[Response] Currently selected paper type
TRYSIZSER	B2	1. TRAY, 2. SIZE, 3. MEDIA	[Response] Paper in the specified paper feeder (Cassette).
USIZR	B4	1. TRAY, 2. FSIZEU, 3. FSIZEL, 4. SSIZEU 5. SSIZEL	[Response] Irregular paper size by dots in the specified paper feeder (Cassette)
OUTR	B3	1. DEST, 2. DOPT	[Response] Paper ejection
A status with “#” is a voluntary status from the printer.			

(3) Parameter codes

Table 4-49. Parameter Code Description (1/2)

Parameter code	Description
SHEET	Number of ejected paper sheets: 1 byte (Hex)
FSIZEU	Laser beam scanning direction size: Upper 1 byte (Hex) [Unit: 0.1mm]
FSIZEL	Laser beam scanning direction size: Lower 1 byte (Hex) [Unit: 0.1mm]
SSIZEU	Paper transport direction size: Upper 1 byte (Hex) [Unit: 0.1mm]
SSIZEL	Paper transport direction size: Upper 1 byte (Hex) [Unit: 0.1mm]

Table 4-50. Parameter Code Description (2/2)

Data (Hex)	CASSETTE		SIZE			MEDIA		DEST	DOPT
	Cassette	Paper size setting Enable/Disable	Paper size	SEF/ LEF	Detect in the Cassette	Paper type	Detect in the Cassette Enable/Disable	Destination	Optional stacker
00	-	-	No Cassette	-	O		x	Face Up ejection	-
01	Cassette 1	x	MONARCH	LEF	x	Normal	x	Face Down ejection	-
02	Cassette 2	x	Post card	SEF	x	OHP	0 (MSI only)	-	-
03	Cassette 3	x	COM-10	LEF	x	Label 1	x	-	-
04	MSI	O	DL	LEF	x	Cover	x	-	-
05	Cassette 4	x	STATEMENT	LEF	x	Label 2	x	-	-
06	-	-	A5	LEF	x	Thick paper - Postcard - Envelope	x	-	-
07	-	-	C5	SEF	x	-	-	-	-
08	-	-	B5	LEF	O	-	-	-	-
09	-	-	EXECUTIVE	LEF	O	-	-	-	-
0A	-	-	8" x 10"	LEF	x	-	-	-	-
0B	-	-	A4	LEF	O	-	-	-	-
0C	-	-	LETTER	LEF	O	-	-	-	-
0D	-	-	LETTER	SEF	O	-	-	-	-
0E	-	-	Tab (Letter)	LEF	x	-	-	-	-
0F	-	-	A4	SEF	O	No paper	O	-	-
10	-	-	Tab (A4)	LEF	x	-	-	-	-
11	-	-	Sp. Folio	SEF	x	-	-	-	-
12	-	-	Folio	SEF	O	-	-	-	-
13	-	-	LEGAL 14"	SEF	O	-	-	-	-
14	-	-	B4	SEF	O	-	-	-	-
15	-	-	A3	SEF	O	-	-	-	-
16	-	-	LEDGER	SEF	O	-	-	-	-
17	-	-	312.5mm x 440mm	SEF	x	-	-	-	-
18	-	-	12" x 18"	SEF	x	-	-	-	-
19	-	-	12.5" x 18"	SEF	x	-	-	-	-
1A	-	-	13" x 18"	SEF	x	-	-	-	-
1B	-	-	Irregular (Normal paper)	-	O (Cassette 1 only)	-	-	-	-
1C	-	-	Irregular (Envelope)	-	x	-	-	-	-

Note: o: Enable, x: Disabled

4.2.7.2 Printing/Status Control

(1) Commands

Table 4-51. Command List of the Printing/Status Control

Name	Command code (Hex)	Parameter code	Description
PFC #	70	1. PMODE, 2. CMODE 3. SHEET	Requests paper.
PMSTT #	71	None	Requests to start Scanner Motor rotation.
PERST #	72	None	Requests an error reset.
SLPON #	73	1. SLEEPMODE	Requests to enter the specified SLEEP mode.
SLPOFT #	74	None	Requests to exit from the specified SLEEP mode.
DIAGON #	75	None	Requests to enter the DIAG TEST mode.
DIAGOFF #	76	None	Requests to exit from the DIAG TEST mode.
STOP #	77	None	Requests to stop the printing operation.
ABORT #	78	None	Requests to ejects the fed paper and stop the operation.
SSENG	C0	None	Requests the error data on the printer status.
SSCONS	C1	None	Requests the error data on the consumables.
SSTRAY	C2	None	Requests the error data on the paper feeder.
SSCRUM	C3	None	Requests the error data on the Drum Cartridge CRUM function.
SSJAM	C4	None	Requests the error data on paper jam.
SSHW	C5	None	Requests the error data on the hardware.
SSLIFE	C6	None	Requests the error data on life.
SSOPEN	C7	None	Requests the error data on opening (cover, etc.)
SSWARN	C8	None	Requests the error data on warning.
A command with “#” is a command without a responding status.			

(2) Status

Table 4-52. Status List of the Printing/Status Control

Name	Status code (Hex)	Parameter code	Description
PFA %	30	1. AMODE 2. SHEET1 3. SHEET2	Allows paper feed.
ENGERR %	31	None	Printer error.
ERRRV %	32	None	Cancels the printer error.
ENGWRN %	33	None	Printer warning.
SSENG	C0	1. STSMODE 2. STSMODE2 3. STSCALL	[Response] Error data on printer status.
SSCONS	C1	1. STSCONS	[Response] Error data on the consumables.
SSTRAY	C2	1. STSTRAY	[Response] Error data on the paper Cassette
SSCRUM	C3	1. STSCRUM	[Response] Error data on the Drum Cartridge CRUM function.
SSJAM	C4	1. STSJAM 2. STSPAPER	[Response] Error data on paper jam.
SSHW	C5	1. STSHW1 2. STSHW2 3. STSHW3 4. STSHW4	[Response] Error data on the hardware.
SSLIFE	C6	1. STSLIFE	[Response] Error data on life.
SSOPEN	C7	1. STSOPEN	[Response] Error data on opening (cover, etc.)
SSWARN	C8	1. STSWARN1 2. STSWARN2 3. STSWARN3	[Response] Error data on warning.
A status with “%” is a voluntary status from the printer.			

(3) Parameter codes

- SLPON command parameters

Table 4-53. SLPON Command Parameters

SLPON command code: 73	
Data (Hex)	SLEEPMODE
00	LIGHT SLEEP mode
01	DEEP SLEEP mode

- PFC command/PFA status parameters

NOTE:*The following parameters have been defined by bits.*

Table 4-54. PFC command/PFA sTatus Parameters

PFC command code: 70 PFA status code: 30						
Data (Bit)	PMODE		CMODE		AMODE	
	Field	Logic	Field	Logic	Field	Logic
7	Transfer layout mode	0 = 1UP mode 1 = 2UP mode	Colors	0 = None 1 = Yellow	Transfer Layout	0 = 1 UP 1 = 2 UP
6	-	-		0 = None 1 = Magenta	-	-
5	-	-		0 = None 1 = Cyan	-	-
4	-	-		0 = None 1 = Black		-
3	-	-		-	Colors	0 = None 1 = Yellow
2	-	-	-	-		0 = None 1 = Magenta
1	-	-		-		0 = None 1 = Cyan
0	-	-		-		0 = None 1 = Black

- SSENG status parameters

NOTE:The following parameters have been defined by bits.

Table 4-55. SSENG Status Parameters

SSENG status code: C0			
Data (Bit)	**STSMODE**	**STSMODE2**	**STSCALL**
7	-	LIGHT SLEEP mode	Consumable error -> (SSCONS command: C1)
6	DIAG TEST mode	DEEP SLEEP mode	No paper -> (SSTRAY command: C2)
5	WARM UP mode	-	CRUM error -> (SSCRUM command: C3)
4	Acknowledge Print Quality mode	-	Paper jam -> (SSJAM command: C4)
3	READY mode	-	Hardware error -> (SSHW command: C5)
2	PRINTING mode	-	Life over -> (SSLIFE command: C6)
1	ERROR mode	-	Cover open -> (SSOPEN command: C7)
0	-	-	Warning -> (SSWARN command: C8)

- SSCONS/SSTRAY/SSCRUM status parameters

NOTE:The following parameters have been defined by bits.

Table 4-56. SSCONS/SSTRAY/SSCRUM Status Parameters

SSCONS status code: C1 SSTRAY status code: C2 SSCRUM status code: C3			
Data (Bit)	**STSCONS**	**STSTRAY**	**STSCRUM**
7	No Yellow toner	No paper in Cassette 1	Communication error
6	No Magenta toner	No paper in Cassette 2	Verification error
5	No Cyan toner	No paper in Cassette 3	Used Drum Cartridge was installed.
4	No Black toner	No paper in MSI	ID error
3	Full Waste Toner Box	No paper in Cassette 4	Count error
2	No Fuser Oil	-	Dummy error 1
1	-	-	Dummy error 2
0	-	-	-

- SSJAM status parameters

NOTE:The following parameters have been defined by bits.

Table 4-57. SSJAM Status Parameters

SSJAM status code: C4		
Data (Bit)	**STS JAM**	**STS PAPER**
7	Paper jam in the Exit Upper Assembly/Exit Lower Assembly	Remaining paper in the Exit Upper Assembly/Exit Lower Assembly
6	Paper jam in the Main P/H Assembly	Remaining paper in the Main P/H Assembly
5	Paper jam in the Fuser Assembly	Remaining paper in the Fuser Assembly
4	-	-
3	-	-
2	Size mismatch	-
1	OHP Front/Back: wrong setting	-
0	Static jam (remaining paper) -> (STSPAPER)	-

- SSHW status parameters

NOTE:The following parameters have been defined by bits.

Table 4-58. SSHW Status Parameters (1/2)

SSHW status code: C5		
Data (Bit)	**STSHW1**	**STSHW2**
7	-	Fuser overheat error
6	Option error	Ross Assembly error
5	2nd BTR error	Process Motor Assembly error
4	Fuser warm-up error	Recognition function error
3	Oil Roll Assembly: Not installed	Paper Cassette 2 is not set.
2	Main Fuser Assembly error	Paper Cassette 3 is not set.
1	-	Heater error
0	High density error	Paper Cassette 1 is not set.

Table 4-59. SSHW Status Parameters (2/2)

SSHW status code: C5		
Data (Bit)	**STSHW3**	**STSHW4**
7	High density error	Toner Cartridge Y: Not installed.
6	Low density error	Toner Cartridge M: Not installed.
5	P/H Motor Assembly error	Toner Cartridge C: Not installed.
4	Environment Sensor error	Toner Cartridge Bk: Not installed.
3	Rotary Motor Assembly error	PCDC error
2	Fuser low temperature error	Contamination ADC Sensor
1	Waste Toner Box: Not installed.	Paper Cassette 4 is not set.
0	MCU PWB error	-

- SSLIFE/SSOPEN status parameters

NOTE:*The following parameters have been defined by bits.*

Table 4-60. SSLIFE/SSOPEN Status Parameters

SSLIFE status code: C6 SSOPEN status code: C7		
Data (Bit)	**STSLIFE**	**STSOPEN**
7	Drum Cartridge: Life over	Front Cover Assembly: Open
6	-	Main P/H Assembly: Open
5	-	Exit Upper Assembly: Open
4	2nd BTR Assembly: Life over	Main Fuser Assembly: Open
3	Belt Cleaner Assembly: Life over	-
2	Main Fuser Assembly: Life over	-
1	-	Feeder Chute Assembly: Open
0	-	-

- SSWARN status parameters

NOTE:*The following parameters have been defined by bits.*

Table 4-61. SSWARN Status Parameters

SSWARN status code: C8			
Data (Bit)	**STSWARN1**	**STSWARN2**	**STSWARN3**
7	Yellow toner: Life warning	Drum Cartridge: Life warning	Cassette 1: Remaining paper warning
6	Magenta toner: Life warning	-	Cassette 2: Remaining paper warning
5	Cyan toner: Life warning		Cassette 3: Remaining paper warning
4	Black toner: Life warning	Belt Cleaner Assembly: Life warning	Cassette 4: Remaining paper warning
3	Waste Toner Box: Full warning	2nd BTR Assembly warning	Full paper in Top Cover Assembly
2	Oil Roll Assembly: Life warning	Printer: Life warning	-
1	Main Fuser Assembly: Life warning	-	-
0	-	-	-

4.2.7.3 Parameter Control

CAUTION

- **Do not use any other commands except LIFCNTSET (80), CTLSET (85), LIFCNTR (D0), LIFLIMR (D1) and CTLSETR (D7) unless instructed to do so in this manual.**
- **Before replacing the MCU PWB, run the LIFCNTR (D0) and CTLSETR (D7). Record the data from the commands. After installing the new MCU PWB, write the data.**

NOTE: *If the life counter value read by the LIFCNTR command is larger than the life over value read by the LIFLIMR, write the life over value in the LIFCNTSET command.*

(1) Commands

Table 4-62. Command List of the Parameter Control (1/2)

Command	Command code (Hex)	Parameter code	Description
LIFCNTSET #	80	1.LIFE, 2.V1, 3.V2, 4.V3, 5.V4	Writes data in the life counter.
LIFLIMSET #	81	1.LIFE, 2.V1, 3.V2, 4.V3, 5.V4	<Do not use this command unless instructed!> Changes the life over value.
LIFDEF #	82	1.LIFE	Changes the life over value to the default.
TIMSET #	83	1.TIM, 2.V1, 3.V2, 4.V3	<Do not use this command unless instructed!> Changes the time out value.
TIMDEF #	84	1.TIM	Changes the time-out value to the default.
CTLSET #	85	1.CTL, 2.V1, 3.V2, 4.V3	Changes the control value.
CTLDEF #	86	1.CTL	Changes the control value to the default.
STSSET #	87	1.STC, 2.V1, 3.V2, 4.V3	Writes data in the statistical counter.
LIFWNGSET #	88	1.LIFE, 2.V1, 3.V2, 4.V3, 5.V4	<Do not use this command unless instructed!> Changes the life warning value.
LIFWNGDEF #	89	1.LIFE	Changes the life warning value to the default.
LIFCNTR	D0	1.LIFE	Reads the life counter.
LIFLIMR	D1	1.LIFE	Reads the life over value
TIMSETR	D2	1.TIM	Reads the time-out value.
TIMUNITR	D3	1.TIM	Reads the time-out unit.

Table 4-63. Command List of the Parameter Control (2/2)

Command	Command code (Hex)	Parameter code	Description
TIMMINR	D4	1.TIM	Reads the minimum time-out value.
TIMMAXR	D5	1.TIM	Reads the maximum time-out value.
CTLVALR	D6	1.CTL	Reads the controlled value (that changes).
CTLSETR	D7	1.CTL	Reads the control value.
CTLACCSR	D8	1.CTL	Reads the privilege to access the control value.
CTLMINR	D9	1.CTL	Reads the minimum control value.
CTLMAXR	DA	1.CTL	Reads the maximum control value.
STCCNR	DB	1.STC	Reads the statistical counter.
LIFEDEFR	DC	1.LIFE	Reads the default life-over value.
TIMDEFR	DD	1.TIM	Reads the default time-out value.
CTLDEFR	DE	1.CTL	Reads the default control value.
LIFWNGR	F0	1.LIFE	Reads the life warning value.
LIFWDEFR	F1	1.LIFE	Reads the default life warning value.
CRIDR	F2	None	Reads the CRUM ID.
CRMDR	F3	None	Reads the CRUM data.
A command with “#” is a command without a responding status.			

Note: The parameter codes V1 through V4 are in decimal. Enter a value from the upper byte so that it can be read normally.

(2) Status

Table 4-64. Status List of the Parameter Control

Status	Status code (Hex)	Parameter code	Description
LIFCNTR	D0	1.LIFE, 2.V1, 3.V2, 4.V3, 5.V4, 6.V5, 7.V6, 8.V7, 9.V8	[Response] Life counter
LIFLIMR	D1	1.LIFE, 2.V1, 3.V2, 4.V3, 5.V4, 6.V5, 7.V6, 8.V7, 9.V8	[Response] Life-over value
TIMSETR	D2	1.TIM, 2.V1, 3.V2, 4.V3	[Response] Time-out value
TIMUNITR	D3	1.TIM, 2.UNIT	[Response] Time-out unit
TIMMINR	D4	1.TIM, 2.V1, 3.V2, 4.V3	[Response] Minimum time-out value
TIMMAXR	D5	1.TIM, 2.V1, 3.V2, 4.V3	[Response] Maximum time-out value
CTLVALR	D6	1.CTL, 2.V1, 3.V2, 4.V3	[Response] Controlled value by the control value.
CTLSETR	D7	1.CTL, 2.V1, 3.V2, 4.V3	[Response] Control value.
CTLACCSR	D8	1.CTL, 2.ACCESS	[Response] Privilege to access the control value.
CTLMINR	D9	1.CTL, 2.V1, 3.V2, 4.V3	[Response] Minimum control value
CTLMAXR	DA	1.CTL, 2.V1, 3.V2, 4.V3	[Response] Maximum control value
STCCNTR	DB	1.STC, 2.V1, 3.V2, 4.V3	[Response] Statistical counter
LIFEDEFR	DC	1.LIFE, 2.V1, 3.V2, 4.V3, 5. V4	[Response] Default life-over value
TIMDEFR	DD	1.TIM, 2.V1, 3.V2, 4.V3	[Response] Default time-out value
CTLDEFR	DE	1.CTL, 2.V1, 3.V2, 4.V3	[Response] Default control value
LIFWNGR	F0	1.LIFE, 2.V1, 3.V2, 4.V3, 5. V4	[Response] Life warning
LIFWDEFR	F1	1.LIFE, 2.V1, 3.V2, 4.V3, 5. V4	[Response] Default life warning
CRIDR	F2	1.ID	[Response] CRUM ID
CRMDR	F3	1.V1, 2. V2, 3.V3, 4. V4, 5. V5, 6. V6, 7. V7	[Response] CRUM data

NOTE: *The parameter codes V1 through V8 are in decimal. Display the values from the upper byte so that it can be read normally.*

(3) Parameter codes

- UNIT/ACCESS parameter codes

NOTE: *The contents of the ACCESS parameters have been defined by bits.*

Table 4-65. UNIT/ACCESS Parameter Codes (1/2)

TIMUNITR status code: D3	
Data (Hex)	**UNIT (Time Unit)**
00	Milliseconds
01	Seconds
02	Minutes
03	Hours

Table 4-66. UNIT/ACCESS Parameter Codes (2/2)

CTLACCSR status code: D8	
Data (Bit)	**ACCESS (Access Allowed)**
2	Write Set Point Allowed
1	Read Set Point Allowed
0	Read Value Allowed

☐ LIFE/TIM/CTL/STC parameter codes

Table 4-67. LIFE/TIM/CTL/STC Parameter Codes

Command/ Status code	80, D0, 81, 82, 88, 89, D1, DC, F0, F1	83, 84, D2, D3, D4, D5, DD	85, D7, 86, D6, D8, D9, AA, DE	87, D3
Data (Hex)	**LIFE (Life counters)**	**TIM (Time-out [sec])**	**CTL (Control value/Set point)**	**STC (Status counts)**
00	Drum Cartridge	Polygon Time-out		-
01	Toner Cartridge Y	-	Cycle Down Wait Timer	-
02	Toner Cartridge M	-	-	-
03	Toner Cartridge C	-	-	-
04	Toner Cartridge Bk	-	-	-
05	Printer1: Accumulated number of total prints	-	-	-
06	Main Fuser Assembly Accumulated dispense time	-	-	-
07	Printer2: Accumulated number of total images	-	-	-
08	-	-	Y Toner Concentration	-
09	2nd BTR Assembly	-	M Toner Concentration	-
0A	Belt Cleaner Assembly	-	C Toner Concentration	-
0B	Oil Roll Assembly (Accumulated PV count)	-	Bk Toner Concentration	-
0C	Main Fuser Assembly (Accumulated Image count)	-	-	-
11	-	-	Top registration adjustment (applies to all paper feeders - Unit: 0.5mm)	-
16	-	-	Side registration adjustment (Cassette 1 - Unit: Approx. 0.17mm)	-
17	-	-	Side registration adjustment (Cassette 2 - Unit: Approx. 0.17mm)	-
18	-	-	Side registration adjustment (Cassette 3 - Unit: Approx. 0.17mm)	-
19	-	-	Side registration adjustment (MSI - Unit: Approx. 0.17mm)	-
1A	-	-	-	-
1B	-	-	Size mismatch: Enable (0)/Disable (1)	-
1C	-	-	Image area selection (0:Standard, 1:Wide)	-
1E			Side registration adjustment (Cassette 4 - Unit: Approx. 0.17mm)	-
FF	All Life Counters	All Timeouts	All Control Set Points	All State Counters

Note: Do not use the FF command/status code unless instructed in this manual. The FF code initializes all values

4.2.7.4 Diagnostics control

(1) Commands

Table 4-68. Command List of the Diagnostic Control

Command	Status code (Hex)	Parameter code	Description
DIAGSTART	90	See 4.2.6 Executing Diagnostic Function.	
DIAGSTOP	91	See 4.2.6 Executing Diagnostic Function.	
DIAGTSR	E0	1.DGTST	Requests the diagnostic status.
OPTSR	E1	None	Requests the option status.
ROMNOR	E2	None	Reads the MCU PWB firmware version.
POLLR	E3	None	Polling
REVR	E4	None	Reads the printer version.

(2) Status

Table 4-69. Status List of the Diagnostic Control

Status	Status code (Hex)	Parameter code	Description
IGNORED %	41	1.CMD, 2.REASON	Rejects the command. (Displays the command code corresponding to the CMD.)
DIAGSTART	90	See4.2.6 Executing Diagnostic Function.	
DIAGSTOP	91	See4.2.6 Executing Diagnostic Function.	
DIAGTSR	E0	1.DGTST, 2.DGST	[Response] Diagnostic status
OPTSR	E1	1.OPTION	[Response] Option status
ROMNOR	E2	1.V1, 2.V2, 3.V3	[Response] MCU PWB firmware version
POLLR	E3	None	Polling
REVR	E4	1. MACREV	[Response] Printer version.
A status with “%” is a voluntary status from the printer.			

(3) Parameters

- DGTST parameter codes

Table 4-70. DGTST parameter codes

Data (Hex)	DGTST (Diag Test)
00	Test Print
01	Digital Input Test
02	Digital Output Test
03	Analog Input Test
04	Analog Output Test
05	EEPROM Read
06	EEPROM Write
07	EEPROM Initialize
0F	-
FF	All Tests (To Stop all tests)

- DGST/MACREV parameter codes

Table 4-71. DGST/MACREV parameter codes

Data (Hex)	DGST (Diag State)	MACREV (Machine Revision)
06	Pass (Finished Successfully)	-
07	Fail (Finished with Failure)	The printer

- REASON/OPTION parameter codes

NOTE: *The contents of the following parameters have been defined by bits.*

Table 4-72. REASON/OPTION parameter codes

Data (Bit)	REASON (Reason Ignored)	OPTION (Option Status) [0 = Off, 1 = Installed]
7	-	-
6	-	-
5	Full paper on the Top Cover Assembly.	-
4	Paper jam	MSI Assembly
3	Life over	Feeder Unit (Cassette 2, Cassette 3, Cassette 4)
2	Size mismatch	-
1	No paper	-
0	Unknown command	-

4.2.8 Error/Status Code

You can identify an error/status code of this printer from the following statuse in the Printing/Status Control in the command/status category: SSENG, SSCONS, SSTRAY, SSJAM, SSHW, SSLIFE, SSOPEN and SSWARN.
A detection error is set by bit in the parameter in each status. (For details on the parameters, see Section 4.2.7 “Command/Status List”.)
Section 2 Troubleshooting lists the error/status codes that have the same status codes.

NOTE: *In Section 2 Troubleshooting, a “-” is used in place of a space between bytes.*

Example)

C1-04

Parameter 1 -> 04h (Bit 2: ON): No Fuser Oil

SSCON status

Example)

C5-00-20-00-00

Parameter 2 -> 20h (Bit 5: ON):
Process Motor Assembly error

Parameter 1 -> 00h

SSHW status

Transfer the previous MCU PWB Engine Status to the new MCU PWB

4.2.9 Transfer MCU PWB Board NVRAM Engine Status to a New Board

Follow the steps below to transfer the engine status data in the previous MCU PWB NVRAM to the new MCU PWB.

1. Locate the C_READ_E.AT and CVTLOGAT.EXE files in the “TOOL\DIAG\AT_FILE” folder of the SELF TRAINING KIT CD-ROM, and copy the files to the “Renoir Service Commander 2.01\AUTO“ in the folder that contains Diagnostic Commander.
2. Install the Diagnostic Board instead of the MAIN CONTROLLER PWB to the printer, connect it to the PC with a serial I/F, and turn the printer on. Then execute the “”Renoir Service Commander” on the Windows 95.
3. From the “Auto” menu, click “File Open”, and open the “C_READ_E.AT” file.
4. Select “Connect”, “Sync”, and then “Start”. The printer performs the engine initialization when the printer accept the program.
5. Right-click in the background (gray area) inside the Auto menu's frame, and click “Log Window Open”. The current data stored in the installed MCU PWB NVRAM appears in the “Log Window”.
6. After checking the data in the Log Window, right-click in the window and then click “Log Save”. Give the file a name, up to eight characters long and ending with the .LOG extension, and save it in the Auto folder.
7. Select and execute the “CVTLOGAT.EXE” file in the “Renoir Service Commander 2.01\AUTO“ folder, and in the menu that appears enter the full name of the log file you saved in the previous step. Then press the Return key following the menu. A message appears confirming that the “LOG file has been edited as AT file” and saved with the “.AT” extension. Press the Return key again to close this program.
8. Turn the printer off, and replace the old MCU PWB with a new one.
9. Install the Diagnostic Board in the printer, connect it to the PC again, and turn the printer on. Execute the Diagnostic Commander again.
10. Choose “NVM Write” from the “Service” menu.*
11. Right-click in the background (gray area) to open “Log Window”, and choose “Log Clear” to close the “Log Window”.
12. Choose “File Open” on the Auto menu, and in the Auto folder open the file you named and saved in a previous step (xxxxxxxx.AT).
13. Select Connect, Sync, and then Start. The printer performs the engine initialization when the printer accepts the program.
14. Close the Diagnostic Commander, and turn off the printer.
15. Replace the Diagnostic Board with the CONTROLLER PWB.
16. Print an engine status sheet, and make sure that all of the old counter readings have been transferred to the new MCU PWB.

** If the newly installed MCU PWB has been used before, choose Slave Initialize and turn the printer off and back on before executing NVM Write.*

CHAPTER

5

TROUBLESHOOTING

Table of Contents

5.1 Overview

Types of error occur to a page printer vary widely, such as poor print quality or abnormal operation, and it makes identification of failed part and component more difficult. For easy and efficient repair, this section describes troubleshooting procedures using LCD messages and typical types of abnormal output.

5.1.1 Troubleshooting Procedure

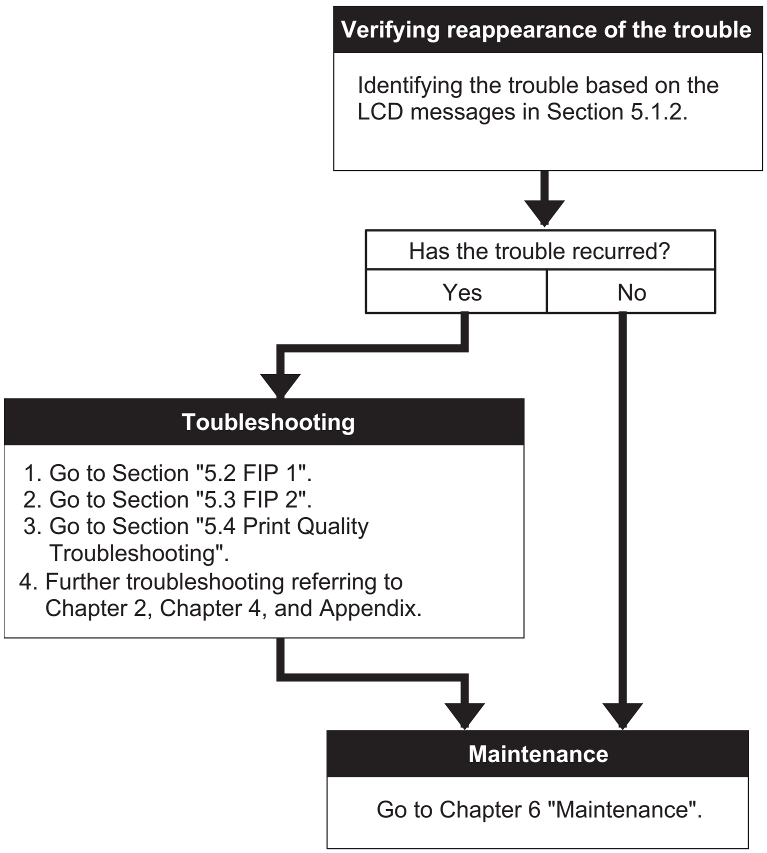


Figure 5-1. Troubleshooting Flowchart

5.1.2 Self-Diagnostic Function by LCD Message

This printer is equipped with a self-diagnostic function. If the printer detects an error, it indicates the error information with the LED lamps on the LCD panel.

The LED messages fall into the following 4 categories:

- Status message: Shows the printer status.
- Error message: Shows the error status.
- Warning message: Shows the warning status.
- Service-call error message: Shows the fatal error status.

The following tables list the LCD messages.

Table 5-1. LCD Message List (1/3)

Message	LED Description		Category	Refer to:
	On Line	Continue		
Calibrating Printer	On	Off	Status	Page 5-3
Check OHP Sheet	Off	Off	Error	Page 5-5
Check Paper Size	On	Off	Warning	Page 5-11
Check Paper Type	On	Off	Warning	Page 5-12
Collate was disabled	On	Off	Warning	Page 5-11
Exit Cover Open	Off	Off	Error	Page 5-7
Feeder Cover Open	Off	Off	Error	Page 5-7
Form Feed (Displayed during test print)	Off	Off	Status	Page 5-3
Format Error ROM A	On	Off	Warning	Page 5-13
Format Error ROM B	On	Off	Warning	Page 5-13
Front Cover Open	Off	Off	Error	Page 5-7
Fuser Unit Open	Off	Off	Error	Page 5-7
Image Optimum	On	Off	Warning	Page 5-12
Insert Oil Roll	Off	Off	Error	Page 5-6
Insert Photocondctr	Off	Off	Error	Page 5-6

Table 5-2. LCD Message List (2/3)

Message	LED Description		Category	Refer to:
	On Line	Continue		
Insert sss *1	Off	Off	Error	Page 5-8
Insert Waste T Box	Off	Off	Error	Page 5-6
Invalid AUX I/F Card	Off	Off	Error	Page 5-10
Invalid HDD	Off	Off	Error	Page 5-10
Invalid PS3	Off	Off	Error	Page 5-10
Invalid ROM A	Off	Off	Error	Page 5-10
Invalid ROM B	Off	Off	Error	Page 5-10
Irregular Density	Off	Off	Error	Page 5-5
Jam xxxxxxxxxxxxxxx *2	Off	Off	Error	Page 5-5
Job Cancel	Off	Off	Status	Page 5-3
Maintenance Req hhhh *3	On	Off	Warning	Page 5-13
Manual Feed sss tttt *4 *5	Off	Blinking	Error	Page 5-8
Mem Overflow	Off	Blinking	Error	Page 5-9
Menus Locked (Panel-setting display)	On	Off	Warning	Page 5-11
Need Memory	On	Off	Warning	Page 5-12
Oil Roll Near Empty	On	Off	Warning	Page 5-14
Offline	Off	Off	Status	Page 5-4
Outbin Select Error	On	Off	Warning	Page 5-12
Paper Out sss ttt *4*6	Off	Off	Error	Page 5-8
Paper Set sss ttt *4 *6	Off	Blinking	Error	Page 5-9
Paper Unit Open	Off	Off	Error	Page 5-7
Photocondctr Trouble	Off	Off	Error	Page 5-6
Print Overrun	Off	Blinking	Error	Page 5-9
PS3 Hard Disk full	On	Off	Warning	Page 5-11
RAM Check	Off	Off	Status	Page 5-3
Ready	On	Off	Status	Page 5-4
Replace Oil Roll	Off	Off	Error	Page 5-7
Replace Photocondctr	Off	Off	Error	Page 5-7
Replace Waste T Box	Off	Off	Error	Page 5-7
Reset	Off	Off	Status	Page 5-3

Table 5-3. LCD Message List (3/3)

Message	LED Description		Category	Refer to:
	On Line	Continue		
Reset All	Off	Off	Status	Page 5-3
Reset to Save	Off	Off	Status	Page 5-3
ROM Check	Off	Off	Status	Page 5-3
Self Test	Off	Off	Status	Page 5-3
Service Req effff *6	On	On	Service-call error	Page 5-15
Standby Levelv *8	On	Off	Status	Page 5-4
Time Exceeded	On	Off	Warning	Page 5-11
Turn Paper sss *1	Off	Off	Error	Page 5-7
uuuu Toner Crtg Out *8	Off	Off	Error	Page 5-6
uuuu Toner Low *8	On	Off	Warning	Page 5-14
uuuu Toner Out *8	Off	Off	Error	Page 5-6
Warning Photocondctr	On	Off	Warning	Page 5-14
Warming Up	On	Off	Status	Page 5-3
Waste T Box Nearfull	On	Off	Warning	Page 5-14
Write Error ROM A	Off	Off	Error	Page 5-10
Write Error ROM P	Off	Off	Error	Page 5-10
Writing ROM A	Off	Off	Status	Page 5-3
Writing ROM P	Off	Off	Status	Page 5-3
Wrong Photoconductor	Off	Off	Error	Page 5-6

*1: *"sss" represents a value other than "Auto" and "MP" for "Paper Source" in the "Printing Menu".*
*2: *"xxxxxxxxxxxxxxx" represents the location(s) where paper is jamming. When jams are detected at multiple locations, they are displayed with spaces between each other.*
*3 *"hhhh" represents a service-call error code. (See Section 5.1.3.)*
*4: *"sss" represents a value other than "Auto" for "Paper Source" in "Printing Menu".*
*5: *"ttt" represents the corresponding value for "Page Size" in "Printing Menu".*
*6: *"ttt" represents the corresponding value for the selected paper source "sss" in "Tray Menu".*
*7: *effff: See Section 5.1.3 for details.*
*8: *"v" represents Standby mode "1" or "2".*
*9: *uuuu = CMYK. Displays corresponding letters only.*

5.1.2.1 Status Message

The printer shows the status message when:

- The printer is free from any error.
- The printer is initializing. Note only one status message is applied to describe the current printer status.

ROM Check

Indicates that ROM check and format check are in process.

RAM Check

Indicates that RAM’s operation and memory checks are in process.

Self Test

Testing and initializing the printer.

Reset All

The printer is warmbooting, which is followed by reset operation with the message “Reset” indicated.

Reset

Resets the printer.

Job Cancel

Job is being canceled.

Reset To Save

Appears when the print settings were changed during printing. Perform one of the following to clear the message.

1. Press the On Line button to override the error and continue printing. However, the changes are not effective until the ongoing job is completed.
   Note pressing the “Continue” button is not effective.
2. Reset the printer or perform a warm boot for a instant change of the setting, but be aware that this erases any print data in the printer's memory.

Writing ROM A

The printer is writing data to the form overlay ROM module. Do not remove the module or switch off power until finished.

Writing ROM P

The printer is writing program data to the program ROM module. Do not remove the module or switch off power until finished.

Form Feed

The “Form Feed” button has been pressed to forcibly print out the remaining print data and eject the sheet.

Warming Up

A “Ready” message that indicates the printer is warming up.

Calibrating Printer

A “Ready” message that indicates the engine is calibrating.

Offline

The printer receives data and produces printing data but does not print. To return the printer to the ready status, press the On Line or Continue button. Note performing reset or rest all operation erases all printing data.

Standby Levelv

A Ready message. Indicates in which energy save mode the printer is; level 1 or 2.

- v=1: Standby level 1
- v=2: Standby level 2

Ready

The printer is in an on-line status.

5.1.2.2 Error Message

Error messages are indicated according to priority. Therefore, if multiple errors have been detected, the message with the highest priority appears in the LCD.
See the following pages for the error messages and their descriptions and solutions.

Check OHP Sheet

LED: On Line = off, Continue = off

Description: An OHP sheet was fed upside down. An irregular OHP sheet was fed into the printer, which caused a paper jam in the MSI entry slot.

Remedy: If a correct OHP sheet is set, try turning the sheet over. If an irregular OHP sheet is used, replace it with a proper OHP sheet. Then open the feed unit, remove the jammed OHP sheet, and close the unit. (You must open the feed unit to clear the error.) The printer starts warming up and resumes printing the page affected by the error.

Jam xxxxxxxxxxxxxxx

LED: On Line = off, Continue = off

Description: Paper(s) is jamming at indicated position(s) xxxxxxxxxxxxxxx (Feed, Fuser, or Exit). If multiple positions are indicated, it means paper(s) is jamming near the indicated positions, so the numbers of the indicated positions and jammed papers do not necessarily match.

NOTE: *If EJL is used, only one location is indicated in the following priority; 1) Exit 2) Fuser 3) Feed.*

Remedy: <**Feed**>
Remove the jammed paper near the paper source and open the paper feeding unit (and the feeder cover if Large Capacity Paper Unit or 500-Sheet Paper Cassette Unit is installed) to check that there is no paper, then close the unit. You must open the paper feeding unit (or the feeder if Large Capacity Paper Unit or 500-Sheet Paper Cassette Unitis installed) to clear the error. After warming-up, the printer resumes printing the page that was affected by the error.
<**Fuser**>
Open the Fuser Unit, remove the jammed paper, and close the unit. The error will be automatically cleared. After warming up, the printer resumes printing the page that was affected by the error.
<**Exit**>
Open the paper exit cover, remove the jammed paper, and close the cover. The error will be automatically cleared. After warming up, the printer resumes printing the page that was affected by the error.

Irregular Density

LED: On Line = off, Continue = off

Description: The print data sent to the printer requires too much toner, CMYK density exceeds 280%, near the top edge, which causes the printer to print making paper jam around a paper source slot.

Remedy: Open the paper feed unit, clear the jam, and then close the unit. Abandon the print job and turn the printer off and back on.

uuuu Toner Crtg Out

LED: On Line = off, Continue = off

Description: One or more Toner Cartridges are not installed. The uuuu area identifies which Toner Cartridge is not installed in the order C M Y K. (Note the only missing Toner Cartridge(s) are indicated.)

Remedy: Open the front cover, install the missing cartridge(s), and close the cover. The error will be automatically cleared.

Insert Photocondctr

LED: On Line = off, Continue = off

Description: The photoconductor unit is not installed or it is installed incorrectly.

Remedy: Turn the printer off, open the front cover, install (or reinstall) the photoconductor unit, close the cover, and turn the printer back on.

Insert Waste T Box

LED: On Line = off, Continue = off

Description: The Waste Toner Box is not installed.

Remedy: Open the front cover, install the Waste Toner Box, and close the cover to clear the error.

Insert Oil Roll

LED: On Line = off, Continue = off

Description: The Fuser Oil Roll is not installed.

Remedy: Open the Fuser Unit, install the Fuser Oil Roll, and close the unit to clear the error.

Wrong Photoconductor

LED: On Line = off, Continue = off

Description: A wrong photoconductor unit is installed.

Remedy: Turn the printer off, open the front cover, replace the wrong photoconductor unit with a correct one, close the front cover, and turn the printer back on.

Photocondctr Trouble

LED: On Line = off, Continue = off

Description: The Photoconductor unit is not working properly.

Remedy: Turn the printer off, open the front cover if closed, replace the photoconductor unit with a good one, close the cover, and turn the printer back on to clear the error.

uuuu Toner Out

LED: On Line = off, Continue = off

Description: The printer detected that one or more Toner Cartridges are empty and need to be replaced. The printer stops printing to prevent the engine from being damaged. Pressing the Continue button does not clear the error. The uuuu area identifies which Toner Cartridge is empty.

Remedy: Open the front cover, replace the empty Toner Cartridge with a new one, and close the cover to clear the error.

Replace Photocondctr

LED: On Line = off, Continue = off

Description: The engine has detected that the photoconductor has expired. Printing stopped.

Remedy: Open the front cover, replace the photoconductor unit with a new one, and close the cover. Then turn the printer off and back on.

Replace Waste T Box

LED: On Line = off, Continue = off

Description: The engine has detected that the Waste Toner Box is full. Printing stopped.

Remedy: Open the front cover, replace the Waste Toner Box with a new one, and close the cover to clear the error.

Replace Oil Roll

LED: On Line = off, Continue = off

Description: Engine detected that fuser oil has run out. Print stopped.

Remedy: Open the fuser unit, replace the Fuser Oil Roll with a new one, and close the cover to clear the error.

Front Cover Open

LED: On Line = off, Continue = off

Description: The front cover is open.

Remedy: Close the cover to clear the error.

Exit Cover Open

LED: On Line = off, Continue = off

Description: The exit cover is open.

Remedy: Close the cover to clear the error.

Fuser Unit Open

LED: On Line = off, Continue = off

Description: The fuser unit is open.

Remedy: Close the unit to clear the error.

Paper Unit Open

LED: On Line = off, Continue = off

Description: The paper feed unit is open.

Remedy: Close the unit to clear the error.

Feeder Cover Open

LED: On Line = off, Continue = off

Description: The feeder cover is open.

Remedy: Close the feeder cover. The error is automatically cleared.

Turn Paper sss

LED: On Line = off, Continue = off

Description: Paper is set with the short edge first.

Remedy: Set the paper with the long edge first.

Manual Feed sss ttt

LED: On Line = off, Continue = Blinks

Description: When “Manual Feed” is enabled by the command or panel operation, this error occurs when print is requested.

Remedy:

1) Set paper in the indicated paper source and press the Continue or On Line button, and the printer prints on and indicates the same error when loading paper for the next page. When copy was selected, result varies depending on the button pressed, Continue or On Line, as shown below:
   <Continue>
   The error does not occur during copying, except for the case paper has run out.
   <On Line>
   The error message appears after each page including copied page. A “Check Paper Size” error does not occur if “Size Ignore” in Config menu is disabled.
2) Press the Continue button or On Line button without setting any paper in the indicated paper source. Paper is loaded from the available paper source with the highest priority. If neither of the paper sources has paper in it, the same error occurs. (This circumstance does not generate a “Paper Out” error.) Other actions affect the same as for the remedy 1).
3) Perform Reset or Warm boot.

Insert sss

LED: On Line = off, Continue = off

Description: Paper feed cassette indicated by sss is out.

Remedy: Instal the missing cassette. The error is automatically cleared.

Paper Out sss ttt

LED: On Line = off, Continue = off

Description:

1) There is no paper loaded in the selected paper source sss.
2) Paper is set in none of the paper sources. (In this case, the paper source previously used is indicated. If this condition is detected at power on, however, “LC1” is indicated.)
   “ttt” shows the paper size selected for the paper source sss.

Remedy:

1) Load the correct size of paper ttt in the paper source sss to clear the error.
2) Load the correct size of paper in any of the paper sources to clear the error.

Paper Set sss ttt

LED: On Line = off, Continue = blinking

Description: The paper loaded in the selected paper source sss does not match the specified paper size ttt.

Remedy: When “Size Ignore” in the “Config” menu = Off and “Auto Cont” in the “Config” menu = Off, take any of the following actions:

1. Set the paper of size ttt in the paper source sss and press the Continue button. The error is cleared and the printer feeds paper from the paper source sss to resume printing.
2. Press the Continue button without changing the paper. The error is cleared and the printer resumes printing on paper from the paper source sss.
3. Reset the printer or perform a warm boot.

When “Size Ignore” in the “Config” menu = Off and “Auto Cont” in the “Config” menu = On, the printer will automatically override the paper mismatch error after a specified period of time and resume printing on paper from the paper source sss.

Print Overrun

LED: On Line = off, Continue = blinking

Description: The print data is so complicated that the printer cannot process the data quickly enough.

Remedy: When “Auto Cont” in “Config” menu = Off, perform any of the following:

1. If the printer has enough memory, it will attempt to print one more time, which may bring up the same error. If there is not enough memory or if the Print Overrun error recurs, however, the data for that page will be lost and the printer will begin processing the next page of data.
2. Reset the printer or perform a warm boot.

When “Auto Cont” in “Config” menu = On, the printer will automatically override the error after a specified period of time and undergo the same process as described above.

Mem Overflow

LED: On Line = off, Continue = blinking

Description: While processing a print job, the printer ran out of memory.

Remedy: When “Auto Cont” in “Config” menu = Off, perform either of the following:

1. Press the Continue button. The action follows varies depending on the cause of the error. If the size of the graphic data has exceeded the buffer size, the printer ejects the page before the error, ignoring the command that caused the error. If the cause of the error is a failure in registering the font macro pattern or so, the printer ignores the bad command and continues to print.
2. Reset the printer or perform a warm boot.

When “Auto Cont” in “Config” menu = On, the printer will automatically override the error after a specified period of time and undergo the same process as described above.

Invalid HDD

LED: On Line = off, Continue = off

Description: A fatal problem relating the HDD (Hard Disc Drive) unit has occurred.

Remedy: Turn the printer off and replace the HDD Unit with a valid one.

Invalid PS3

LED: On Line = off, Continue = off

Description: A fatal problem has occurred to the HDD unit.

Remedy: Turn the printer off and replace the HDD Unit with a valid one.

Invalid AUX I/F Card

LED: On Line = off, Continue = off

Description: The I/F card currently installed can not be used with this printer.

Remedy: Turn the printer off and remove the card.

Invalid ROM A

LED: On Line = off, Continue = off

Description: The ROM module in slot A can not be used with this printer.

Remedy: Turn the printer off and remove the card.

Invalid ROM B

LED: On Line = off, Continue = off

Description: The ROM module in slot B can not be used with this printer.

Remedy: Turn the printer off and remove the card.

Write Error ROM A

LED: On Line = off, Continue = off

Description: Write was attempted to despite the ROM module in the slot A is write-protected. Write process was not completed successfully. There is no ROM module inserted in slot A.

Remedy:
1. Turn the printer off and remove the ROM module.
2. Perform a warm boot.

Write Error ROM P

LED: On Line = off, Continue = off

Description: Write was attempted to a write-protected ROM module. Write process was not completed successfully. Data reception failed. Check sum of the received data is incorrect. There was not enough memory for a batch data.

Remedy:
1. Turn the printer off and remove the ROM module.
2. Perform a warm boot.

5.1.2.3 Warning Message

Warning errors have no effect on printer operation.

Menus Locked

LED: No effect on LED state.

Explanation: Panel setting change was attempted despite “Panel Lock” is effective in EJL.

Solution: Press the Continue button.

PS3 Hard Disk full

LED: No effect on LED state.

Explanation: When a HDD unit is used for PS3, the area for PS3 has reached the limit.

Solution: Press the Continue button or reset the printer.

Collate was disabled

LED: No effect on LED state.

Explanation: There is not enough memory to save a whole 1-job data when copy is designated. The warning message appears during the 1st copy.

Solution: Press the Continue button. Adding optional memory is recommended.

Check Paper Size

LED: No effect on LED state.

Condition: “Size Ignore” in the “Config” menu = Off

Explanation: The selected paper size (PAGE SIZE) and the size of the paper fed do not match. If this error does not occur when the paper is fed from the paper tray, the value for MP tray size in the printing menu is replaced with the value for the Page Size. Depending on the paper sizes, the printer may not be able to detect paper size mismatches.

NOTE: *When this warning occurs, be sure to check if any pages (of the wrong size) were printed before the printer detected the paper size mismatch.*

Solution: Perform either of the following to clear the warning.

1. Press the Continue button to clear the error.
2. Perform a Reset operation or warm boot.

Time Exceeded

LED: No effect on LED state.

Explanation: Paper was forcibly output blank as the print data did not arrive within the specified time (set on the engine side) even though the paper was pre-fed.

Solution: The printer attempts printing again using the same data. If the same problem occurs, the printer ejects the pre-fed paper and continues to print with the next data. Perform any of the following to clear the message.

1. Press the Continue button.
2. Perform a Reset operation.

Image Optimum

LED: No effect on LED state.

Explanation: There was not enough memory to process the print data and the printer optimized the data (reduced the resolution).

Solution: This message remains even after the print job has finished printing. Perform either of the following to clear the warning.

1. Press the Continue button to clear the warning.
2. Perform a Reset operation or warm boot to exit while the printer is processing data.

Check Paper Type

LED: No effect on LED state.

Explanation: There is no paper source that has the selected paper size and type. Ignoring the paper type, the printer selects the paper source that has the paper of the selected size.

Solution: Press the Continue button.

Outbin Select Error

LED: No effect on LED state.

Explanation: Paper is output from the outbin that was not designated due to limiting condition.

Solution: Press the Continue button.

Need Memory

LED: No effect on LED state.

Explanation: While processing print data, the printer ran out of memory. The printer attempted to compress the data, however, the printer reached the threshold* and generated this warning. If the data is still processing, the printer continues to print. In some cases, the printer can process the data and print even after this warning message appears. If the user presses the Continue button and the printer reaches the threshold again while processing the same page of data, the printer will show the same warning. In case the printer prints by reducing the resolution after the warning, the warning “Image Optimum” will be indicated. (This message has higher priority.)

**: The printer-specific value that is not to be changed.*

Solution: This message remains even after the print job has finished printing. Perform one of the following to clear the warning.

1. Press the Continue button.
2. To force out from the warning during data processing, perform a reset operation or warm boot.

NOTE: *Installation of additional memory is recommended.*

Format Error ROM A

LED: No effect on LED state.

Explanation: If the ROM inserted in the slot A is new, take a necessary action. If the message appears after a writing operation, however, it means writing was not executed properly or memory was damaged. In this case, attempt writing again or turn the printer off and remove the ROM module.

Solution: Perform either of the following.

1. Press the Continue button.
2. Turn the printer off and remove the ROM module.

Format Error ROM B

LED: No effect on LED state.

Explanation: If the ROM inserted in the slot B is new, take a necessary action. If the message appears after a writing operation, however, it means writing was not executed properly or memory was damaged. In this case, attempt writing again or turn the printer off and remove the ROM module.

Solution: Perform either of the following.

1. Press the Continue button.
2. Turn the printer off and remove the ROM module.

Maintenance Req hhhh

LED: No effect on LED state.

Explanation: A warning condition that cannot be corrected by the user has occurred, and this condition requires maintenance. Specifically, one or more of the internal units that cannot be replaced by the user is approaching the end of its life.

Solution: Although the user can continue to operate the printer until the “Service Req effff” error occurs, the user should write down the warning code and call for service before the service required state is reached; otherwise the printer may stop working partway through a print job. Do either of the following to clear the warning message.

1. Press the Continue button.
2. Perform a Reset operation.

See the table below for the Maintenance-Call Error codes.

A: Warning is active.
I: Warning is inactive.

Table 5-4. Maintenance-Call Error Message List

Warning content Code: hhhh	Fuser Unit near end of life	IBT Cleaner near end of life*	2nd BTR near end of life
0001	A	I	I
0002	I	A	I
0003	A	A	I
0004	I	I	A
0005	A	I	A
0006	I	A	A
0007	A	A	A

**: The printer does not detect this condition because the printer’s life ends earlier.*

uuuu Toner Low

LED: No effect on LED state.

Explanation: The engine has detected (by measuring the dispense time) the toner level for one or more Toner Cartridges has fallen below 80%. The uuuu area indicates which Toner Cartridge is low, Y, M, C, or K.

Solution: Do one or more of the following to clear the warning message.

1. Press the Continue button.
2. Perform a Reset operation.
3. Replace the indicated toner cartridge with a new one.

Warning Photocondctr

LED: No effect on LED state.

Explanation: The photoconductor unit is approaching the end of its life. The engine's detection system calculates the remaining lifetime, and generates this message when the number of pages left approaches:

- Color print: 1,125 pages (A4, 4.5% duty)
- Black print: 4,500 pages (A4, 4.5% duty)

Solution: It is recommended that the photoconductor unit be replaced when this message appears (although it is possible to continue using the existing unit until the “Replace Photocondctr” error occurs). Do any of the following to clear the warning message.

1. Press the Continue button.
2. Perform a Reset operation.
3. Replace the photoconductor unit with a new one.

Waste T Box Nearfull

LED: No effect on LED state.

Explanation: The Waste Toner Box is almost full. (The engine's detection system calculates the level of waste toner, and generates this message when the Waste Toner Box is almost full.)

Solution: It is recommended that the Waste Toner Box be replaced when this message appears (although it is possible to continue using the existing box until the “Replace Waste T Box” error occurs). Do any of the following to clear the warning message.

1. Press the Continue button.
2. Perform a Reset operation.
3. Replace the Waste Toner Box with a new one.

Oil Roll Near Empty

LED: No effect on LED state.

Explanation: The fuser oil is running low. (The engine's detection system calculates the remaining level of fuser oil, and generates this message when it determines that the fuser oil will run out after printing 1,000 more pages (A4, 5% duty, black print: color print=1:1).

Solution: It is recommended that the Fuser Oil Roll be replaced when this message appears (although it is possible to continue using the existing oil roll until the “Replace Oil Roll” error occurs). Do any of the following to clear the warning message.

1. Press the Continue button.
2. Perform a Reset operation.
3. Replace the Fuser Oil Roll with a new one.

5.1.3 Service-Call Error Messages

If the indicated message is “Service Req effff”, it means the printer is in a service-call error condition, and all LEDs on the LCD panel light up. The types of the error vary depending on the location and condition, and error types are identified by the error codes shown on the LCD panel. Make a note of the error information currently indicated and turn the printer off and back on. If the same error is still indicated, service the printer by checking/replacing the relevant part(s).

Table 5-5. Service-Call Error Classification

Service Call Error effff	
LED condition	All on
Explanation	The “effff” codes vary to indicate the nature of the service call. e = error classification code E = engine related error C = controller related error ffff: error code (see tables 5-10 and 5-11)
Solution	1. Turn off the printer. 2. Check the following regarding the RAM, DIMM, ROM module, and optional interface card. Make sure all boards are installed in the proper locations. Make sure all boards meet the specifications and are compatible with the printer's controller. Make sure all boards are connected properly. 3. Turn the printer back on. 4. If the same error appears, write down the code and service the printer accordingly. ***NOTE**: See Chapter 1 / Section 1.5.9 for instruction on how to display error details.*

See the following tables for the detailed information on the Service-Call Error messages.

Table 5-6. Engine Related Service-Call Error

Error Type e	Error Code ffff	Explanation	Refer to:
E	0003	Fuser Unit error (end of life)	FIP-1.36
E	0008	Bad Engine NVRAM	FIP-1.24
E	0014	Engine communication error	FIP-1.47
E	0020	ADC sensor is dirty	FIP-1.35
E	0022	Bad PCDC	FIP-1.34
E	0023	IBT Cleaner end of life*1	FIP-1.36
E	0024	2nd BTR end of life	FIP-1.36
E	0025	Reserved	–
E	0030	Fuser Unit abnormality (timeout)	FIP-1.16
E	0031	Fuser Unit abnormality (no fuser unit)	FIP-1.18
E	0032	Fuser Unit abnormality (overheat)	FIP-1.21
E	0033	Fuser Unit abnormality (lamp)	FIP-1.16
E	0034	Fuser Unit abnormality (temperature low)	FIP-1.16
E	0035	Error at Large Capacity Paper Unit or 500-Sheet Paper Cassette Unit	FIP-1.25
E	0036	Bad resistance at 2nd BTR	FIP-1.15
E	0037	Reserved	–
E	0038	MCU PWB memory error	FIP-1.32
E	0039	Environment sensor error	FIP-1.29
E	0040	ROS motor error	FIP-1.22
E	0041	PROCESS MOTOR ASSY (IBT) error	FIP-1.23
E	0042	P/H motor error	FIP-1.28
E	0043	Abnormal toner density (too high)	FIP-1.26
E	0044	Abnormal toner density (too low)	FIP-1.27
E	0045	ROTARY Home-Position sensor error	FIP-1.30

**1: Does not appear with this printer because the printer’s life ends earlier.*

Table 5-7. Controller Related Service-Call Error (1/2)

Error Type	Error Code	Explanation	Refer to:
C	0017	CPU error (undefined interrupt)	FIP-1.47
C	0081	CPU error (TLB correction exception)	FIP-1.47
C	0082	CPU error (TLB miss exception [Load/Fetch])	FIP-1.47
C	0083	CPU error (TLB miss exception [Store])	FIP-1.47
C	0084	CPU error (Address-error exception [Load/ Fetch])	FIP-1.47
C	0085	CPU error (Address-error exception [Store])	FIP-1.47
C	0086	CPU error (Bus error exception [Fetch])	FIP-1.47
C	0087	CPU error (Bus error exception [Load/Store])	FIP-1.47
C	0088	CPU error (SYSCALL exception)	FIP-1.47
C	0089	CPU error (Break exception)	FIP-1.47
C	0090	CPU error (Reserved command exception)	FIP-1.47
C	0091	CPU error (Coprocessor-not-in-use exception)	FIP-1.47
C	0092	CPU error (FPU exception)	FIP-1.47
C	0093	CPU error (TLB exception)	FIP-1.47
C	0094	CPU error (XTLB exception)	FIP-1.47
C	0095	CPU error (cache exception)	FIP-1.47
C	0096	CPU error (Trap exception)	FIP-1.47
C	0097	CPU error (FPU exception)	FIP-1.47
C	0098	CPU error (Watch exception)	FIP-1.47
C	0128~ 0254	CPU error (Undefined trap)	FIP-1.47
C	0255	CPU error (NMI exception)	FIP-1.47
C	0256	CPU error (Division by zero)	FIP-1.47
C	0257	CPU error (Operation overflow)	FIP-1.47
C	0258	CPU error (break)	FIP-1.47
C	0800	IPL error (Controller problem)	FIP-1.42
C	1002	Error in standard RAM (Capacity below standard, or other)	FIP-1.41
C	1010	Verify error	FIP-1.41
C	1020	RAM DIMM error (Slot 0)	FIP-1.41

Table 5-8. Controller Related Service-Call Error (2/2)

Error Type	Error Code	Explanation	Refer to:
C	1021	RAM DIMM error (Slot 1)	FIP-1.41
C	1022	RAM DIMM error (Slot 2)	FIP-1.41
C	1100	ROM (font) checksum error (IC14) (bit 0 to 15)	FIP-1.42
C	1101	ROM (font) checksum error (IC13) (bit 16 to 31)	FIP-1.42
C	1120	ROM (program) checksum error (bit 0 to 7)	FIP-1.43
C	1121	ROM (program) checksum error (bit 8 to 15)	FIP-1.43
C	1122	ROM (program) checksum error (bit 16 to 23)	FIP-1.43
C	1123	ROM (program) checksum error (bit 24 to 31)	FIP-1.43
C	1170	Checksum error: optional font ROM	FIP-1.44
C	1180	Checksum error: optional ROM module A	FIP-1.44
C	1181	Checksum error: optional ROM module B	FIP-1.44
C	1182	Checksum error: optional ROM module C	FIP-1.44
C	1185	Unsupported ROM module	FIP-1.44
C	1200	EEPROM (IC20) write error	FIP-1.45
C	1210	EEPROM (IC20) write limit (number of writes reached limit)	FIP-1.45
C	1400	Engine initialization error	FIP-1.47
C	1500	CCNV (IC24) hardware error	FIP-1.46
C	1550	Compression SRAM initialization hardware error	FIP-1.45
C	1600	Video hardware error (including PWMIC calibration error) (IC24 or IC26)	FIP-1.46
C	1700	Integrated netware hardware error	FIP-1.49
C	1999	Other hardware errors	FIP-1.47
C	2000	Software error*	FIP-1.47

**: If software errors occur, you may want to use the #F691 Diagnostic Tool to perform "Slave Initialize" (from the service menu). After performing the command, turn the printer off and back on. For details, see Chapter 4.*

5.2 Level 1 FIP (Fault Isolation Procedure)

This section describes how to isolate the faulty unit (assembly) by using the Level 1 FIPs.

<Preliminary inspection>
In each FIP, you are required to perform the "Preliminary inspection" prior to any other actions.
The Preliminary inspection involves the following:

- **Check for any part that does not meet the specifications.**
- **Check if any part has been installed improperly.**
- **Check for part that is damaged, deformed, smeared, or lodged with foreign matter.**

FIP-1.1 Y/M/C/K TONER CARTRIDGE TONER is Out

Step	Check point	Finding & Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** Developer Assy, DISPENSE MOTOR ASSY, DEVE.CONTACT ASSY, ADC SENSOR ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or controller?** Run the Engine test print or diagnostic test print. (10 pages for each single and continuous print) ● Is the result normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: Dispense Motor installation** Is the Dispense Motor installed properly?	• With the diagnostic tool, go to step 4. • Without the diagnostic tool, go to FIP-2.36 "DISPENSE MOTOR ASSY is Defective". If the problem still occurs, go to step 5.	Reinstall the DISPENSE MOTOR ASSY.
4	Check: Dispense Motor ● Is the Dispense motor working properly? (Check it by using the diagnostic tool.) *Diag Tool: Digital Output Test, Device Code: 25*	Go to Step 5.	Go to FIP-2.36 "DISPENSE MOTOR ASSY is Defective".
5	**Check: DEVE. CONTACT ASSY** ● Is the contact area deformed or lodged with any foreign matter?	Replace the DEVE. CONTACT ASSY.	Go to FIP-2.38 "HVPS is Defective" If the problem still occurs, go to FIP-2.19 "ROS ASSY is Defective".
6	**Check: Photo sensor surface of the ADC SENSOR** ● Is the sensor surface smeared or lodged with any foreign matter?	• With the diagnostic tool, go to step 8. • Without the diagnostic tool, go to FIP-2.21 "ADC SOLENOID is Defective". If the problem still occurs, go to step 5.	• With the diagnostic tool, go to step 7. • Without the diagnostic tool, go to FIP-2.20 "ADC SENSOR is Defective".
7	**Check: ADC SENSOR** ● Is the ADC SENSOR functioning properly? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test, Device Code: 18, 33*	Replace the PCU PWB.	Go to FIP-2.20 "ADC SENSOR is Defective".
8	**Check: ADC SOLENOID** ● Is the ADC SOLENOID functioning properly? *Diag Tool: Digital Output test, Device code: 36*	Replace the PCU PWB.	Go to FIP-2.21 "ADC SOLENOID is Defective".
9	**Check: Developer Assy** Replace the relevant Developer Assy. ● Does the problem still occur?	Replace the MCU PWB.	Problem solved.

FIP-1.2 WASTE TONER BOX is Full

	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** WASTE TONER SENSOR, WASTE TONER BOX, TONER BOX, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Transparency area of the WASTE TONER BOX** ● Is the transparency are in the upper part of the WASTE TONER BOX smeared or lodged with any foreign matter? ● Is the sensor flag part inside the box floating?	Replace or clean the WASTE TONER BOX.	• With the diagnostic tool, go to step 3. • Without the diagnostic tool, go to FIP-2.17 "WASTE TONER SENSOR is Defective".
3	**WASTE TONER SENSOR** ● Is the WASTE TONER SENSOR functioning properly? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test* *Device Code: 21*	Replace the MCU PWB.	Go to FIP-2.17 "WASTE TONER SENSOR is Defective".

FIP-1.3 FUSER OIL in the OIL ROLL ASSY is Out

	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** OIL ROLL ASSY, CRU SWITCH ASSY, OIL CAM ASSY	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: CRU SWITCH ASSY** ● Is the terminal in the CRU SWITCH ASSY properly connected?	Go to Step 3.	Replace the defective part.
3	**Check: CRU SWITCH ASSY electrical continuity** ● Does the CRU SWITCH ASSY have continuity at the point below? - Between the terminal in the CRU SWITCH ASSY and P77	Go to Step 4.	Replace the CRU SWITCH ASSY.
4	**Check: OIL CAM ASSY** ● Is the shaft in the OIL CAM ASSY bent? ● Is the pin in the OIL CAM ASSY at an incorrect position?	Replace the OIL CAM ASSY.	Go to Step 5.
5	**Check: FUSER HARNESS ASSY electrical continuity** ● Does the FUSER HARNESS ASSY have proper continuity at the point below? - J71<=>J77	Go to Step 6.	Replace the FUSER HARNESS ASSY.
6	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the point below? - P71<=>J19	Go to Step 7.	Replace the FUSER CONNECTOR.
7	**Check: OIL ROLL ASSY** Replace the OIL ROLL ASSY. ● Does the problem still occur?	Replace the MCU PWB.	Problem solved.

FIP-1.4 Paper Out - Cassette 1

	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** TRAY N/P ACTUATOR, TRAY NO PAPER SENSOR, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: BOTTOM PLATE ASSY** Remove the TURN IN CHUTE and insert the UNIVERSAL CASSETTE. ● Does the BOTTOM PLATE ASSY properly lift up?	Go to Step 4.	Replace the defective part, such as the paper cassette.
4	**Check: TRAY N/P ACTUATOR** ***NOTE:*** *Be sure to remove the MAIN P/H ASSY and insert the Cassette 1 properly before the operation.* ● Is the actuator properly functioning depending on the conditions below? - Paper is set: The TRAY N/P ACTUATOR is away from the detection area of the TRAY NO PAPER SENSOR. - No paper is set: The TRAY N/P ACTUATOR is blocking the detection area of the TRAY NO PAPER SENSOR? ● Does the actuator move smoothly?	• With the diagnostic tool, go to step 5. • Without the diagnostic tool, go to FIP-2.3 "TRAY NO PAPER SENSOR is Defective".	Replace the defective part.
5	**Check: TRAY NO PAPER SENSOR** ● Is the TRAY NO PAPER SENSOR functioning properly? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test* *Device Code: 14*	Replace the MCU PWB.	Go to FIP-2.3 "TRAY NO PAPER SENSOR is Defective".

FIP-1.5 Paper Out - MSI Tray

	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** MSI LONG N/P SENSOR, MSI SHORT N/P SENSOR, MCU PWB, MSI N/P ACTUATOR	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	Run the test print again using LETTER size or smaller. ● Are the outputs still abnormal?	Go to Step 4.	Go to Step 6.
4	**Check: MSI N/P ACTUATOR** ● Is the actuator functioning properly depending on the conditions below? - Paper is set: The MSI N/P ACTUATOR is away from the detection area of the MSI SHORT N/P SENSOR. - No paper is set: The MSI N/P ACTUATOR is blocking the detection area of the MSI SHORT N/P SENSOR? ● Does the actuator move smoothly?	• With the diagnostic tool, go to step 7. • Without the diagnostic tool, go to FIP-2.7 "MSI SHORT N/P SENSOR is Defective".	Replace the defective part, such as MSI N/P ACTUATOR.
5	**Check: MSI SHORT N/P SENSOR** ● Is the MSI SHORT N/P SENSOR functioning properly? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test, Device Code: 17*	Replace the MCU PWB.	Go to FIP-2.7 "MSI SHORT N/P SENSOR is Defective".

(To be continued)

(Continued)

FIP-1.5 "Paper Out - MSI Tray"

	Check point	Remedy	
		Yes	No
6	**MSI LONG N/P SENSOR installation** ● Is the MSI N/P ACTUATOR properly functioning depending on the conditions below? - Paper is set: The actuator is away from the detection area of the MSI SHORT N/P SENSOR. - No paper is set: The actuator is blocking the detection area of the MSI SHORT N/P SENSOR? ● Does the actuator move smoothly?	• With the diagnostic tool, go to step 7. • Without the diagnostic tool, go to FIP-2.8 "MSI LONG N/P SENSOR is Defective".	Replace the defective part.
7	**Check: MSI LONG N/P SENSOR** ● Is the MSI LONG N/P SENSOR properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test, Device Code: 18*	Replace the MCU PWB.	Go to FIP-2.8 "MSI LONG N/P SENSOR is Defective".

FIP-1.6 DRUM CARTRIDGE Related Problem

	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** DRUM CARTRIDGE, CRUM CONNECTOR ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: CRUM CONNECTOR ASSY electrical continuity** ● Does the CRUM CONNECTOR ASSY have proper continuity at the point below? - J23<=>P22	Go to Step 3.	Replace the CRUM CONNECTOR ASSY.
3	**Check: DRUM CARTRIDGE** Replace the DRUM CARTRIDGE with a specified one. ● Does the problem still occur?	Replace the MCU PWB.	Problem solved.

FIP-1.7 Paper Jam - Exit

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** MSI LONG N/P SENSOR, MSI SHORT N/P SENSOR, MCU PWB, MSI N/P ACTUATOR	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	Is the current paper curled or easy to curl?	Change the paper.	Go to Step 4.
4	**Check: EXIT LOWER ASSY** ● Is there any foreign matter or defective parts along the paper path?	Clean or replace the defective part.	• With the diagnostic tool, go to step 5. • Without the diagnostic tool, go to FIP-2.32 "TOP EXIT SENSOR is Defective".
5	**Check: TOP EXIT SENSOR** ● Is the TOP EXIT SENSOR functioning properly? (Check it by using the diagnostic tool.) ***Diag Tool:*** *Digital Input Test* ***Device Code:*** *09*	Go to Step 6.	Go to FIP-2.32 "TOP EXIT SENSOR is Defective".
6	**Check: EXIT-2 ROLL ASSY** ● Is there any worn-out area or foreign matter in the EXIT-2 ROLL ASSY?	Clean or replace the EXIT-2 ROLL ASSY.	Go to Step 7.
7	**Check: EXIT LOWER ASSY for drive transmission** ● Does the EXIT LOWER ASSY transmit drive properly? ● Is there any damaged gear or worn-out area in the EXIT LOWER ASSY?	Replace the defective part.	Go to Step 8.
8	**Check: P/H DRIVE ASSY** ● Is P/H DRIVE ASSY installed improperly? ● Is any gear damaged?	Replace or reinstall the P/H DRIVE ASSY.	Replace the MCU PWB.

FIP-1.8 Paper Jam - REGI.

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** REGI. SENSOR, MAIN P/H ASSY, TURN ROLL ASSY, FEED ROLL, P/H DRIVE ASSY, FEED SOLENOID, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	● Is curled paper or paper that is easy to curl used?	Change the paper.	Go to Step 4.
4	**Check: MAIN P/H ASSY** ● Is there any foreign matter or defective part along the paper path in the MAIN P/H ASSY?	• With the diagnostic tool, go to step 5. • Without the diagnostic tool, go to FIP-2.14 "REGI. SENSOR is Defective".	Clean or replace the defective part.
5	**Check: REGI. SENSOR** ● Is the REGI. SENSOR properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test* *Device Code: 1F*	Go to Step 6.	Go to FIP-2.14 "REGI. SENSOR is Defective".
6	**Check: MAIN P/H ASSY for drive transmission** ● Does the MAIN P/H ASSY transmit drive properly? ● Is there any damaged gear or worn-out area in the MAIN P/H ASSY?	Replace the defective part.	Go to Step 7.
7	**Check: TURN ROLL ASSY** ● Is there any worn-out area or foreign matter in the TURN ROLL ASSY?	Clean or replace the TURN ROLL ASSY.	Go to Step 8.
8	**Check: FEED ROLL** ● Is there any worn-out area or foreign matter in the FEED ROLL?	Clean or replace the FEED ROLL.	Go to Step 9.
9	**Check: P/H DRIVE ASSY** ● Is the P/H DRIVE ASSY installed improperly or is any gear damaged?	Replace or reinstall the P/H DRIVE ASSY.	Go to Step 10.
10	**Check: FEED SOLENOID** ● Is the FEED SOLENOID properly functioning?	Replace the MCU PWB.	Go to FIP-2.6 "FEED SOLENOID is Defective".

FIP-1.9 Paper Jam - FUSER

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** FUSER EXIT ACTUATOR, FUSER EXIT SENSOR, FUSER IN ACTUATOR, FUSER IN SENSOR, FUSER DRIVE ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	Is the current paper curled or easy to curl?	Change the paper.	Go to Step 4.
4	**Check: FUSER EXIT ACTUATOR** ● Is the FUSER EXIT ACTUATOR properly functioning depending on the conditions below? - Paper is set: The actuator is away from the detection area of the FUSER EXIT SENSOR. - No paper is set: The MSI N/P ACTUATOR is blocking the detection area of the FUSER EXIT SENSOR? ● Does the actuator move smoothly?	• With the diagnostic tool, go to step 5. • Without the diagnostic tool, go to FIP-2.28 "FUSER EXIT SENSOR is Defective". If the problem still occurs, go to FIP-2.27 "FUSER IN SENSOR is Defective".	Replace the defective part.
5	**Check: FUSER EXIT SENSOR** ● Is the FUSER EXIT SENSOR properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test* *Device Code:* 25	Go to Step 6.	Go to FIP-2.28 "FUSER EXIT SENSOR is Defective".

(To be continued.)

(Continued)

FIP-1.9 "Paper Jam - FUSER"

Step	Check point	Remedy: Yes	Remedy: No
6	**Check: FUSER IN ACTUATOR** ● Is the FUSER IN ACTUATOR functioning properly depending on the conditions below? - Paper is set: The actuator is away from the detection area of the FUSER IN SENSOR. - No paper is set: The MSI N/P ACTUATOR is blocking the detection area of the FUSER IN SENSOR. ● Does the actuator move smoothly?	• With the diagnostic tool, go to step 7. • Without the diagnostic tool, go to FIP-2.27 "FUSER IN SENSOR is Defective".	Replace the defective part.
7	**Check: FUSER IN SENSOR** ● Is the FUSER IN SENSOR properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test* *Device Code: 28*	Go to Step 8.	Go to FIP-2.27 "FUSER IN SENSOR is Defective".
8	**Check: FUSER DRIVE ASSY** ● Is the FUSER DRIVE ASSY installed improperly? ● Is there any damaged gear?	Replace or reinstall the FUSER DRIVE ASSY.	Go to Step 9.
9	**Check: FUSER ASSY** Replace the FUSER ASSY. ● Does the problem still occur?	Replace the MCU PWB.	Problem solved.

FIP-1.10 Wrong Paper Size

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** SIZE SWITCH ASSY, MAIN P/H ASSY, REGI. SENSOR, TRAY SIZE ACTUATOR, END GUIDE, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occur, go to step 3.	Go to Step 3.
3	**Check: Paper size** ● Does the size of the paper in use meet the specifications?	Go to Step 4.	Use a specified size of paper.
4	● Is the paper fed from the MSI tray?	Go to Step 5.	Go to Step 6.
5	**Check: Setting size selected for the MSI** ● Does the paper size selected by the Diagnostic tool or controller PWB match the paper size in the MSI Tray?	Go to Step 8.	Match the sizes of the paper selected and set in the cassette.
6	**Check: Paper size detection mechanism** ● Is the combination of the On/Off setting of the paper size switches on the SIZE SWITCH ASSY corresponding to the size of the paper in the paper cassette in use? - Check that the TRAY SIZE ACTUATOR move in accordance with the END GUIDE. - Check that the TRAY SIZE ACTUATOR properly pushes the Paper Size Switches. ***NOTE:*** *Insert a sheet of paper from the rear side onto the SIZE SWITCH ASSY, then set the cassette and pull out the sheet. If you feel resistance, it means the switches are pushed.*	• With the diagnostic tool, go to step 7. • Without the diagnostic tool, go to step 8. If the problem still occurs, go to FIP-2.5 "SIZE SWITCH ASSY is Defective".	Replace the defective part.
7	**Check: Paper Size** ● Is the output data corresponding to the size of the paper set in the paper cassette in use? *Diag Tool: Analog Input Test* *Device Code: 02*	• With the diagnostic tool, go to step 8. • Without the diagnostic tool, go to FIP-2.14 "REGI. SENSOR is Defective".	Go to FIP-2.5 "SIZE SWITCH ASSY is Defective".
8	**Check: REGI. SENSOR** ● Is the REGI. SENSOR properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test, Device Code: 1F*	Replace the MCU PWB.	Go to FIP-2.14 "REGI. SENSOR is Defective".

FIP-1.11 OHP Sheet is Improperly Set

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** FRONT OHP SENSOR, REAR OHP SENSOR, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: White edge of the OHP sheet** ● Is a break in the white edge of the OHP sheet smeared or lodged with any foreign matter?	Replace the OHP sheet.	Go to Step 4.
4	**Check: FRONT OHP SENSOR, REAR OHP SENSOR** ● Is the surface of the FRONT OHP SENSOR or REAR OHP SENSOR smeared or lodged with any foreign matter?	Remove the smear/ foreign matter.	Go to Step 5.
5	**Check: Paper path** ● Is the paper path smeared or lodged with any foreign matter?	Remove the smear/ foreign matter.	• With the diagnostic tool, go to step 6. • Without the diagnostic tool, go to FIP-2.12 "FRONT OHP SENSOR is Defective". If the problem still occurs, go to FIP-2.13 "REAR OHP SENSOR is Defective".
6	**Check: FRONT OHP SENSOR** ● Is the FRONT OHP SENSOR properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test* *Device Code: 1D*	Go to Step 7.	Go to FIP-2.12 "FRONT OHP SENSOR is Defective".
7	**Check: REAR OHP SENSOR** ● Is the REAR OHP SENSOR properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test* *Device Code: 1B*	Replace the MCU PWB.	Go to FIP-2.13 "REAR OHP SENSOR is Defective".

FIP-1.12 Paper Exit - Static Jam

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** TOP EXIT SENSOR, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: TOP EXIT SENSOR for remainder** ● Is there any remaining paper, paper debris, or foreign matter on the TOP EXIT SENSOR?	Remove the remaining paper, paper debris, or foreign matter.	• With the diagnostic tool, go to step 3.
3	**Check: TOP EXIT SENSOR** ● Is the TOP EXIT SENSOR properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test* *Device Code: 09*	Replace the MCU PWB.	Go to FIP-2.32 "TOP EXIT SENSOR is Defective".

FIP-1.13 Paper REGI. - Static Jam

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** FUSER EXIT ACTUATOR, FUSER EXIT SENSOR, FUSER IN ACTUATOR, FUSER IN SENSOR, FUSER DRIVE ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: REGI. SENSOR for remainder** ● Is there any paper, paper debris, or foreign matter remaining on the REGI. SENSOR?	Remove the remaining paper, paper debris, or foreign matter.	• With the diagnostic tool, go to step 3. • Without the diagnostic tool, go to FIP-2.14 "REGI. SENSOR is Defective".
3	**Check: REGI. SENSOR** ● Is the REGI. SENSOR properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test* *Device Code: 1F*	Replace the MCU PWB.	Go to FIP-2.14 "REGI. SENSOR is Defective".

FIP-1.14 PAPER Static Jam - FUSER

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** FUSER EXIT ACTUATOR, FUSER EXIT SENSOR, FUSER IN ACTUATOR, FUSER IN SENSOR, FUSER DRIVE ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: FUSER EXIT SENSOR and FUSER IN SENSOR for remainder** Is there any paper, paper debris, or foreign matter remaining on the sensors?	Remove the remaining paper, paper debris, or foreign matter.	Go to step 3.
3	**Check: FUSER EXIT ACTUATOR** ● Is the FUSER EXIT ACTUATOR properly functioning depending on the conditions below? - Paper set: The actuator is away from the detection area of the FUSER EXIT SENSOR. - No paper is set: The actuator is blocking the detection area of the FUSER EXIT SENSOR. ● Does the actuator move smoothly?	• With the diagnostic tool, go to step 4. • Without the diagnostic tool, go to FIP-2.28 "FUSER EXIT SENSOR is Defective". If the problem still occurs, go to FIP-2.27 "FUSER IN SENSOR is Defective"	Replace the defective part.
4	**Check: FUSER EXIT SENSOR** ● Is the FUSER EXIT SENSOR functioning properly? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test, Device Code:* 25	Go to Step 5.	Go to FIP-2.28 "FUSER EXIT SENSOR is Defective"
5	**Check: FUSER IN ACTUATOR** ● Is the FUSER IN ACTUATOR properly functioning depending on the conditions below? - Paper is set: The actuator is away from the detection area of the FUSER IN SENSOR. - No paper is set: The actuator is blocking the detection area of the FUSER IN SENSOR. ● Does the actuator move smoothly?	• With the diagnostic tool, go to step 6. • Without the diagnostic tool, go to FIP-2.27 "FUSER IN SENSOR is Defective".	Replace the defective part.
6	**Check: FUSER IN SENSOR** ● Is the FUSER IN SENSOR functioning properly? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test* *Device Code: 28*	Replace the MCU PWB.	Go to FIP-2.27 "FUSER IN SENSOR is Defective"

FIP-1.15 2ND BTR Resistance Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** 2ND BTR, BTR CAM SOLENOID, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: 2ND BTR ASSY for its retract motion** ● Does the 2ND BTR ASSY retract properly during the test print? ***NOTE:*** *Inspect the BTR CAM SOLENOID’s action from the rear.*	Go to Step 4.	• With the diagnostic tool, go to step 9. • Without the diagnostic tool, go to FIP-2.26 "BTR CAM SOLENOID is Defective".
4	**Check: 2ND BTR CAM SOLENOID installation** ● Is the BTR CAM SOLENOID properly installed?	Go to Step 5.	Reinstall the BTR CAM SOLENOID.
5	**Check: 2ND BTR CAM ASSY** Is the BTR CAM ASSY bent or deformed?	Replace the 2ND BTR CAM ASSY.	Go to Step 6.
6	**Check: 2ND BTR ASSY installation** ● Is the 2ND BTR ASSY properly installed?	Go to Step 7.	Reinstall the 2ND BTR ASSY.
7	**Check: TRANSFER ASSY installation** ● Is the TRANSFER ASSY properly installed?	Go to Step 8.	Reinstall the TRANSFER ASSY.
8	**Check: MCU PWB replacement** Replace the MCU PWB. ● Does the problem still occur?	Go to FIP-2.38 "HVPS is Defective".	Problem solved.
9	**Check: BTR CAM SOLENOID** ● Is the BTR CAM SOLENOID properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Output Test* *Device Code: 2E*	Replace the MCU PWB.	Go to FIP-2.26 "BTR CAM SOLENOID is Defective".

FIP-1.16 MAIN FUSER ASSY Related Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** FUSER ASSY, MCU PWB, FUSER HARNESS ASSY, FUSER CONNECTOR, FUSER ASSY, TEMP. SENSOR ASSY, H/R HEATER, P/R HEATER, LVPS, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: TEMP. SENSOR ASSY** ● Does the problem occur when the printer is turned on?	Go to FIP-2.29 "TEMP. SENSOR ASSEMBLY is Defective".	Go to Step 4.
4	**Check: H/R HEATER, P/R HEATER** ***NOTE:*** *Make sure the FUSER ASSY is cool before starting this operation.* ● Do the both H/R HEATER and P/R HEATER come on when the printer is turned on?	Go to Step 5.	Replace the H/R HEATER/P/R HEATER.
5	Does the problem occur while the FUSER is warming up?	Go to FIP-2.29 "TEMP. SENSOR ASSEMBLY is Defective".	Go to Step 6.
6	**Check: MAIN HARNESS ASSY** ● Does the MAIN HARNESS ASSY have proper continuity at the point below? - J21<=>J32	Go to Step 7.	Replace the MAIN HARNESS ASSY.
7	**Check: LVPS** ● Is the voltage level correct at the pins below? - P21-3PIN<=> P21-2PIN: 4.5VDC	Go to Step 8.	Replace the LVPS.
8	**Check: HEATER ROD for ON signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J32-12PIN<=>P/J32-13PIN - During FUSER's warming-up: 0VDC - At completion of FUSER's warming-up: Changes from 0VDC to 4.5VDC.	Replace the LVPS.	Replace the MCU PWB.

FIP-1.17 OIL ROLL ASSY is Out

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** OIL ROLL ASSY, CRU SWITCH ASSY, FUSER HARNESS ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: OIL ROLL ASSY installation** Install the OIL ROLL ASSY properly. ● Does the problem still occur?	Go to Step 3.	Problem solved.
3	**Check: Conductive part in the OIL ROLL ASSY** ● Is the conductive part (metal foil) in the OIL ROLL ASSY damaged? (Check it visually.)	Replace the OIL ROLL ASSY.	Go to Step 4.
4	**Check: Conductive part of the CRU SWITCH ASSY** ● Are the conductive terminals in the CRU SWITCH ASSY smeared, dusty, or deformed?	Replace/Clean the CRU SWITCH ASSY.	Go to Step 5.
5	**Check: OIL ROLL ASSY electrical continuity** ● Is continuity status correct depending on the conditions below? - Pins: J19-17PIN<=> J19-18PIN - OIL ROLL ASSY is installed: Detected - OIL ROLL ASSY is not installed: Cut off	Replace the MCU PWB.	Go to Step 6.
6	**Check: FUSER HARNESS ASSY electrical continuity** ● Does the FUSER HARNESS ASSY have proper continuity at the pins below? - J77<=>J71	Go to Step 7.	Replace the FUSER HARNESS ASSY.
7	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J71<=>J19	Replace the MCU PWB.	Replace the MAIN HARNESS ASSY.

FIP-1.18 MAIN FUSER ASSY is Out

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** FUSER ASSY, MCU PWB, FUSER HARNESS ASSY, FUSER CONNECTOR	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: FUSER ASSY** ● Is the FUSER ASSY properly set? (Check it by inserting and removing the FUSER ASSY.)	• With the diagnostic tool, go to step 4. • Without the diagnostic tool, go to step 5.	Replace the defective part.
4	**Check: FUSER ASSY detection circuit** ● Is the FUSER ASSY detection circuit properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test, Device Code: 24*	Replace the MCU PWB.	Go to Step 5.
5	**Check: Power supply to the FUSER ASSY detection circuit** ● Is the voltage level correct at the pins below? - P19-16PIN<=>P19-15PIN: 5VDC	Go to Step 6.	Replace the MCU PWB.
6	**Check: FUSER ASSY detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J19-16PIN<=>P/J19-15PIN - FUSER ASSY is installed: 0VDC - FUSER ASSY is not installed: 5VDC	Replace the MCU PWB.	Go to Step 7.
7	**Check: FUSER HARNESS ASSY electrical continuity** ● Does the FUSER HARNESS ASSY have proper continuity at J71<=>J78?	Go to Step 8.	Replace the FUSER HARNESS ASSY.
8	**Check: FUSER CONNECTOR electrical continuity** ● Does the FUSER CONNECTOR have proper continuity at P71<=>J19?	Go to Step 9.	Replace the FUSER CONNECTOR.
9	**Check: FUSER ASSY replacement** Replace the FUSER ASSY. ● Does the problem still occur?	Replace the MCU PWB.	Problem solved.

FIP-1.19 DRUM CARTRIDGE is Out

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** TONER BOX SENSOR, TONER BOX HARNESS, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: WASTE TONER BOX installation** ● Is the WASTE TONER BOX properly installed?	Go to Step 3.	Install the WASTE TONER BOX properly.
3	**Check: DRUM CARTRIDGE installation** ● Is the DRUM CARTRIDGE properly installed?	Go to Step 4.	Install the DRAM CARTRIDGE properly.
4	**Check: CRUM CONNECTOR ASSY electrical continuity** ● Does the CRUM CONNECTOR ASSY have proper continuity at the pins below? - J23<=>P22	Go to Step 5.	Replace the CRUM CONNECTOR ASSY.
5	**Check: DRUM CARTRIDGE replacement** Replace the DRUM CARTRIDGE. ● Does the problem still occur?	Go to Step 6.	Problem solved.
6	**Check: TONER BOX SENSOR installation** ● Is the TONER BOX SENSOR properly installed?	• With the diagnostic tool, go to step 7. • Without the diagnostic tool, go to FIP-2.18 "TONER BOX SENSOR is Defective".	Install the TONER BOX SENSOR properly.
7	**Check: TONER BOX SENSOR** ● Is the TONER BOX SENSOR properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test* *Device Code: 0D*	Replace the MCU PWB.	Go to FIP-2.18 "TONER BOX SENSOR is Defective".

FIP-1.20 High Resolution Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect: MCU PWB**	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: MCY PWB replacement** Replace the MCU PWB. ● Does the problem still occur?	Go to FIP-2.39 "Electrical Noise".	Problem solved.

FIP-1.21 MAIN FUSER ASSY Overheat Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** FUSER CONNECTOR, TEMP. SENSOR ASSY, H/R HEATER, P/R HEATER, FUSER ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: FUSER CONNECTOR** ● Is the FUSER CONNECTOR securely connected when the FUSER ASSY is installed?	Go to Step 4.	Check the FUSER CONNECTOR.
4	**Check: TEMP. SENSOR ASSY** ● Does the problem occur when the printer is turned on?	Go to FIP-2.29 "TEMP. SENSOR ASSEMBLY is Defective".	Go to Step 5.
5	**Check: H/R HEATER, P/R HEATER** ***NOTE:*** *Make sure the FUSER ASSY is cool.* ● Do the H/R HEATER and P/R HEATER come on when the printer is turned on?	Go to Step 6.	Replace the H/R HEATER, P/R HEATER.
6	● Does the problem occur while the FUSER is warming up?	Go to FIP-2.29 "TEMP. SENSOR ASSEMBLY is Defective".	Go to Step 7.
7	**Check: MAIN HARNESS ASSY** ● Does the MAIN HARNESS ASSY have proper continuity at J21<=>J32?	Go to Step 8.	Replace the MAIN HARNESS ASSY.
8	**Check: LVPS** ● Is the voltage level correct at the pins below? - P21-3PIN<=> P21-2PIN: 4.5VDC	Go to Step 9.	Replace the LVPS.
9	**Check: HATER ROD for ON signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J32-12PIN<=>P/J32-13PIN - FUSER is warming-up: 0VDC - Warming up is completing: Changes from 0VDC to 4.5VDC	Replace the LVPS.	Replace the MCU PWB.

FIP-1.22 ROS ASSY Related Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** ROS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to FIP-2.19 "ROS ASSY is Defective".	Go to FIP-2.19 "ROS ASSY is Defective".

FIP-1.23 PROCESS MOTOR ASSY Related Error

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** PROCESS MOTOR ASSY, PROCESS WDD ASSY, TRANSFER ASSY, TRO SENSOR, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: Process Motor rotation** ● Does the Process Motor rotate during the test print?	Go to Step 4.	Go to Step 9.
4	**Check: PROCESS WDD ASSY Installation** ● Is the PROCESS WDD ASSY securely installed?	Go to Step 5.	Install the PROCESS WDD ASSY properly.
5	**Check: TRANSFER ASSY installation** ● Is the TRANSFER ASSY securely installed?	Go to Step 6.	Install the TRANSFER ASSY properly.
6	**Check: PROCESS WDD ASSY** Rotate the rotor of the PROCESS MOTOR ASSY. ● Does the output shaft smoothly rotate without any irregular sound?	Go to Step 7.	Replace the PROCESS DRIVE ASSY.
7	**Check: TRO SENSOR installation** ● Is the TRO SENSOR properly installed?	• With the diagnostic tool, go to step 8. • Without the diagnostic tool, go to FIP-2.25 "TRO SENSOR is Defective".	Install the TRO SENSOR properly.
8	**Check: TRO SENSOR** ● Is the TRO SENSOR properly functioning? *Diag Tool: Digital Input Test, Device code: 04*	Replace the MCU PWB.	Go to FIP-2.25 "TRO SENSOR is Defective".
9	**Check: PROCESS MOTOR ASSY for foreign matter** ● Is any foreign matter interfering with rotation of the PROCESS MOTOR ASSY?	Remove the foreign matter.	• With the diagnostic tool, go to step 10. • Without the diagnostic tool, go to FIP-2.33 "PROCESS MOTOR ASSY is Defective".
10	**Check: PROCESS MOTOR ASSY** ● Is the PROCESS MOTOR ASSY properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Output Test, Device Code: 10*	Replace the MCU PWB.	Go to FIP-2.33 "PROCESS MOTOR ASSY is Defective".

FIP-1.24 MCU PWB EEPROM Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** COMMUNICATION ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: MAIN HARNESS ASSY** ● Does the MAIN HARNESS ASSY have continuity between the COMMUNICATION ASSY and the MCU PWB?	Go to Step 4.	Replace the MAIN HARNESS ASSY.
4	**Check: COMMUNICATION ASSY replacement** Replace the COMMUNICATION ASSY. ● Does the problem still occur?	Go to Step 5.	Problem solved.
5	**Check: MCU PWB replacement** Return the COMMUNICATION ASSY and replace the MCU PWB with a new MCU PWB (ASP). ● Does the problem still occur?	Go to Step 6.	Problem solved.
6	● Does the problem occur when the printer is turned on?	Go to Step 7.	If any other error/status message appears, go to the relevant FIP.
7	Replace the installed MCU PWB with another new one (ASP) and then turn the printer back on. ● Does the problem still occur?	Go to Step 8.	Problem solved.
8	1. Replace the MCU PWB with the originally installed MCU PWB. 2. Activate the Diagnostic commander and execute the “Slave Initialize”. (Refer to Section 4.2.4.5.) 3. Execute the “NVM Write”. (Refer to Section 4.2.4.5.) 4. Turn the printer on. ● Does the problem occur when the printer is turned on?	Go to Step 9.	Problem solved.
9	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J16<=>J22	Problem solved.	Replace the MAIN HARNESS ASSY.

FIP-1.25 CASSETTE 1 is Out

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** UNIVERSAL CASSETTE, TRAY SIZE ACTUATOR, SIZE SWITCH ASSY, FEEDER PWB, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: UNIVERSAL CASSETTE** Can you insert the UNIVERSAL CASSETTE smoothly?	Go to Step 4.	
4	**Check: TRAY SIZE ACTUATOR** 1. Insert a sheet of paper from the rear side onto the SIZE SWITCH ASSY. 2. Install the cassette 1. 3. Pull out the sheet. If you feel resistance, it means the Paper Size Switches are pushed. ● Does the TRAY SIZE ACTUATOR push the Paper Size Switches when the cassette 1is installed?	• With the diagnostic tool, go to step 5. • Without the diagnostic tool, go to FIP-2.5 "SIZE SWITCH ASSY is Defective".	Replace the defective part.
5	**Check: Paper size** ● Is the SIZE SWITCH ASSY functioning properly? Check the paper size using the diagnostic tool. *Diag Tool: Analog Input Test* *Device Code: 02*	• If an optional Large Capacity Paper Unit or 500-Sheet Paper Cassette Unit, go to Step 6. • Replace the MCU PWB.	Go to FIP-2.5 "SIZE SWITCH ASSY is Defective".
6	**Check: FEEDER PWB replacement** Replace the FEEDER PWB with a good one. ● Does the problem still occur?	Replace the MCU PWB.	Problem solved.

FIP-1.26 High Density Error

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** DEVE.CONTACT ASSY, ADC SENSOR ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: DEVE. CONTACT ASSY** ● Is the contact surface of the DEVE. CONTACT ASSY bent, deformed, or lodged with any foreign matter?	Replace the DEVE.CONTACT ASSY.	Go to FIP-2.38 "HVPS is Defective" If the problem still occurs, go to FIP-2.19 "ROS ASSY is Defective".
4	**Check: ADC Sensor surface** ● Is the ADC Sensor surface smeared or lodged with any foreign matter?	• With the diagnostic tool, go to step 6. • Without the diagnostic tool, go to FIP-2.21 "ADC SOLENOID is Defective".	• With the diagnostic tool, go to step 5. • Without the diagnostic tool, go to FIP-2.20 "ADC SENSOR is Defective".
5	**Check: ADC Sensor** ● Is the ADC Sensor properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Input Test* *Device Code: 18, 33*	Replace the MCU PWB.	Go to FIP-2.20 "ADC SENSOR is Defective".
6	**Check: ADC Solenoid** ● Is the ADC Solenoid properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Output Test* *Device Code: 36*	Go to Step 7.	Go to FIP-2.21 "ADC SOLENOID is Defective".
7	**Check: MCU PWB replacement** Replace the MCU PWB. ● Does the problem still occur?	Go to FIP-2.38 "HVPS is Defective".	Problem solved.

FIP-1.27 Low Density Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** DISPENSE MOTOR ASSY, DEVE CONTACT ASSY, Developer Assy, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: Image on the Drum surface** ● Is the toner image of each color properly developed? ***NOTE:*** *During printing, turn the printer off when transfer is assumed to process; and check for Cin50% on the drum surface visually.*	Go to Step 8.	Go to Step 4.
4	**Check: Image on the Drum surface** ● Are the image densities of all colors on the drum low? ***NOTE:*** *During printing, turn the printer off when transfer is assumed to process; and check for Cin50% on the drum surface visually.*	Go to Step 5.	Go to Step 11.
5	**Check: Dispense Motor installation** ● Is the Dispense Motor properly installed?	• With the diagnostic tool, go to step 6. • Without the diagnostic tool, go to FIP-2.36 "DISPENSE MOTOR ASSY is Defective". If the problem still occurs, go to step 7.	Install the DISPENSE MOTOR ASSY properly.
6	**Check: Dispense Motor** ● Is the Dispense Motor properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Output Test* *Device Code: 25*	Go to Step 7.	Go to FIP-2.36 "DISPENSE MOTOR ASSY is Defective".
7	**Check: DEVE. CONTACT ASSY** ● Is the contact surface of the DEVE. CONTACT ASSY deformed or lodged with any foreign matter?	Replace the DEVE. CONTACT ASSY.	Go to FIP-2.38 "HVPS is Defective". If the problem still occurs, go to FIP-2.19 "ROS ASSY is Defective".

(To be continued)

(Continued)
FIP-1.27 "Low Density Error"

Step	Check point	Remedy	
		Yes	**No**
8	**Check: ADC Sensor surface** ● Is the ADC Sensor surface smeared or lodged with any foreign matter?	• With the diagnostic tool, go to step 10. • Without the diagnostic tool, go to FIP-2.21 "ADC SOLENOID is Defective".	• With the diagnostic tool, go to step 9. • Without the diagnostic tool, go to FIP-2.20 "ADC SENSOR is Defective".
9	**Check: ADC Sensor** ● Is the ADC Sensor properly functioning? (Check it by using the diagnostic tool.) *Diag Tool: Digital Output Test* *Device Code: 18,33*	Replace the MCU PWB.	Go to FIP-2.20 "ADC SENSOR is Defective".
10	**Check: ADC Solenoid** ● Is the ADC Solenoid properly functioning? *Diag Tool: Digital Output Test* *Device Code: 36*	Replace the MCU PWB.	Go to FIP-2.21 "ADC SOLENOID is Defective".
11	**Check: Developer Assy replacement** ● Does the problem still occur when the Developer Assy corresponding to the color is replaced?	Replace the MCU PWB.	Problem solved.

FIP-1.28 P/H MOTOR Related Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** P/H MOTOR ASSY, HEAT ROLL, PRESSURE ROLL, FUSER ASSY, BELT CLEANER ASSY, EXIT LOWER ASSY, FEED ROLL ASSY, MAIN P/H ASSY, WASTE TONER BOX, 2ND BTR CAM ASSY, AUGER HIGH ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: P/H Motor rotation** ● Does the P/H Motor rotate slightly and then stops during the test print?	Go to Step 5.	Go to Step 4.
4	**Check: P/H Motor rotation** ● Is the P/H Motor motionless at all during the test print?	Go to FIP-2.34 "P/H MOTOR ASSY is Defective".	Replace the MCU PWB.
5	**Check: Drive transmission** Rotate the rotor in the P/H MOTOR ASSY manually counterclockwise. ● Does the rotor in the P/H MOTOR ASSY rotate smoothly?	Go to FIP-2.34 "P/H MOTOR ASSY is Defective".	Go to Step 6.
6	**Check: FUSER ASSY** Rotate the INPUT GEAR FT1 manually. ● Do the HEAT ROLL and PRESSURE ROLL rotate smoothly?	Go to Step 7.	Replace the interfering part.
7	**Check: BELT CLEANER ASSY** Turn the gear manually. ● Does the BELT CLEANER ASSY rotate smoothly?	Go to Step 8.	Replace the BELT CLEANER ASSY.

(To be continued.)

(Continued)

FIP-1.28 "P/H MOTOR Related Error"

Step	Check point	Remedy: Yes	Remedy: No
8	**Check: EXIT LOWER ASSY** Rotate the EXIT IDLER GEAR manually. ● Does the EXIT LOWER ASSY rotate smoothly?	Go to Step 9.	Replace the interfering part.
9	**Check: MAIN P/H ASSY** Rotate the PRE-REGI. KNOB ASSY manually. ● Does the MAIN P/H ASSY rotate smoothly?	Go to Step 10	Replace the interfering part.
10	**Check: WASTE TONER BOX** 1. Remove the WASTE TONER BOX. 2. Rotate the rotor in the P/H MOTOR ASSY counterclockwise manually. ● Does the rotor in the P/H MOTOR ASSY rotate smoothly?	Go to Step 11.	Replace the WASTE TONER BOX.
11	**Check: FEED ROLL ASSY** 1. Push down the FEED SOLENOID arm. 2. Mesh the gears. 3. Manually rotate the rotor in the P/H MOTOR ASSY counterclockwise. ● Dose the FEED ROLL ASSY rotate smoothly?	Go to Step 12.	Replace the interfering part.
12	**Check: 2ND BTR CAM ASSY** 1. Remove the FUSER ASSY, BELT CLEANER ASSY, and 2ND BTR ASSY. 2. Manually rotate the rotor in the P/H MOTOR ASSY counterclockwise. ● Does the BTR CAM ASSY rotate smoothly?	Go to Step 13.	Replace the interfering part.
13	**Check: AUGER HIGH ASSY** 1. Remove the FUSER ASSY, BELT CLEANER ASSY, and 2ND BTR ASSY. 2. Manually rotate the rotor in the P/H MOTOR ASSY counterclockwise. ● Does the AUGER HIGH ASSY rotate smoothly?	Replace the MCU PWB.	Replace the AUGER HIGH ASSY.

FIP-1.29 ENVIRONMENT SENSOR Related Error

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** ENVIRONMENT SENSOR, P/H HARNESS ASSY, MCU PWB	Replace the defective part.	• With the diagnostic tool, go to step 2. • Without the diagnostic tool, go to step 3.
2	**Check: ENVIRONMENT SENSOR** ● Is the ENVIRONMENT SENSOR properly functioning? (Check it by using the diagnostic tool.) ***Diag Tool:*** *Analog Input Test* ***Device Code:*** *04*	Replace the MCU PWB.	Go to Step 3.
3	**Check: ENVIRONMENT SENSOR resistance** ● Does the thermistor have proper resistance at the pins below? - J105-1PIN<=>J105-2PIN: 5 kΩ ***NOTE:*** *Measure the resistance at the room temperature 18 to 20 °C.*	Go to Step 4.	Replace the ENVIRONMENT SENSOR.
4	**Check: P/H HARNESS ASSY electrical continuity** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - J71<=>J105	Replace the MCU PWB.	Replace the P/H HARNESS ASSY.

FIP-1.30 ROTARY MOTOR ASSY (HP Detection) Related Error

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** ROTARY MOTOR ASSY, ROTARY FRAME ASSY, ROTARY SENSOR ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: Rotary Motor** Run the test print. ● Does the Rotary Motor rotate?	Go to Step 4.	Go to Step 8.
4	**Check: ROTARY FRAME ASSY rotation** ● Is anything interfering with rotation of the ROTARY FRAME ASSY?	Remove the interfering matter.	Go to Step 5.
5	**Check: ROTARY SENSOR ASSY installation** ● Is the ROTARY SENSOR ASSY properly installed?	Go to Step 6.	Install the ROTARY SENSOR ASSY properly.
6	**Check: ROTARY MOTOR ASSY installation** ● Is the ROTARY MOTOR ASSY properly installed?	• With the diagnostic tool, go to step 7. • Without the diagnostic tool, go to FIP-2.24 "ROTARY SENSOR is Defective".	Install the ROTARY MOTOR ASSY properly.
7	**Check: ROTARY SENSOR ASSY** ● Is the ROTARY SENSOR ASSY properly functioning? *Diag Tool: Digital Input Test* *Device code: 05*	Replace the MCU PWB.	Go to FIP-2.24 "ROTARY SENSOR is Defective".
8	**Check: ROTARY FRAME ASSY** ● Is anything interfering with rotation of the ROTARY FRAME ASSY?	Remove the foreign matter.	With the diagnostic tool, go to step 9. Without the diagnostic tool, go to FIP-2.35 "ROTARY MOTOR ASSY is Defective".
9	**Check: ROTARY MOTOR ASSY** ● Is the ROTARY MOTOR ASSY properly functioning? *Diag Tool: Digital Output Test* *Device code: 16*	Replace the MCU PWB.	Go to FIP-2.35 "ROTARY MOTOR ASSY is Defective".

FIP-1.31 WASTE TONER BOX is Out

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** WASTE TONER BOX, DRAM CARTRIDGE, TONER BOX SENSOR, TONER BOX HARNESS, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	● Is the WASTE TONER BOX securely set?	Go to Step 3.	Set the WASTE TONER BOX securely.
3	**Check: DRAM CARTRIDGE** ● Is the DRAM CARTRIDGE securely set?	Go to Step 4.	Set the DRAM CARTRIDGE securely.
4	**Check: TONER BOX SENSOR installation** ● Is the TONER BOX SENSOR properly installed?	• With the diagnostic tool, go to step 5. • Without the diagnostic tool, go to FIP-2.18 "TONER BOX SENSOR is Defective".	Install the TONER BOX SENSOR properly.
5	**Check: TONER BOX SENSOR** ● Is the TONER BOX SENSOR properly functioning? *Diag Tool: Digital Input Test* *Device code: 12*	Replace the MCU PWB.	Go to FIP-2.18 "TONER BOX SENSOR is Defective".

FIP-1.32 MCU PWB MEMORY (RAM) Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** COMMUNICATION ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	● Does the problem occur the instance the printer is turned on?	Go to Step 3.	If another error/status message appears, go to the relevant FIP.
3	Replace the MCU PWB and turn the printer back on. ● Does the problem still occur?	Go to FIP-2.39 "Electrical Noise". *1	Problem solved. *2

**1: Take this step first though some external cause can be considered.*

**2: If the problem still occurs after replacing the MCU PWB, go to FIP-2.39 "Electrical Noise".*

FIP-1.33 TONER CARTRIDGE Y/M/C/K is Out

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** Toner Cartridge, CARTRIDGE SENSOR, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Sticker on a Toner Cartridge** ● Is a white reflective sticker attached to the relevant Toner Cartridge?	Go to Step 3.	Replace the relevant Toner Cartridge.
3	**Check: CARTRIDGE SENSOR installation** ● Is the CARTRIDGE SENSOR properly installed?	Go to Step 4.	Install the CARTRIDGE SENSOR properly.
4	**Check: Toner Cartridge replacement** Replace the relevant Toner Cartridge with a new one. ● Does the problem still occur?	• With the diagnostic tool, go to step 5. • Without the diagnostic tool, go to FIP-2.22 "CARTRIDGE SENSOR is Defective".	Problem solved.
5	**Check: CARTRIDGE SENSOR** ● Is the CARTRIDGE SENSOR properly functioning? *Diag Tool: Digital Input Test* *Device code: 0D*	Replace the MCU PWB.	Go to FIP-2.22 "CARTRIDGE SENSOR is Defective".

FIP-1.34 PCDC Error

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: MCU PWB replacement** Replace the MCU PWB. ● Does the problem still occur?	Go to FIP-2.39 "Electrical Noise".	Problem solved.

FIP-1.35 ADC SENSOR Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** ADC SENSOR ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: ADC Sensor surface** ● Is the ADC Sensor surface smeared or lodged with any foreign matter?	• With the diagnostic tool, go to step 6. • Without the diagnostic tool, go to FIP-2.21 "ADC SOLENOID is Defective".	Go to Step 4.
4	**Check: ADC SENSOR ASSY installation** ● Is the ADC SENSOR ASSY properly installed?	• With the diagnostic tool, go to step 5. • Without the diagnostic tool, go to FIP-2.20 "ADC SENSOR is Defective".	Install the ADC SENSOR ASSY properly.
5	**Check: ADC Sensor** ● Is the ADC Sensor properly functioning? *Diag Tool: Digital Output Test* *Device code: 18, 33*	Replace the MCU PWB.	Go to FIP-2.20 "ADC SENSOR is Defective".
6	**Check: ADC Solenoid** ● Is the ADC Solenoid properly functioning? *Diag Tool: Digital Output Test* *Device code: 36*	Replace the MCU PWB.	Go to FIP-2.21 "ADC SOLENOID is Defective".

FIP-1.36 Periodically Replaced Part - End Of Life

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Error Reset** In the Maintenance menu, perform the required counter reset: - 2nd BTR Reset - Fuser Unit Reset - IBT Cleaner Reset (Refer to Chapter 6.) ● Does the problem still occur after “Error Reset”?	Go to Step 3.	Problem solved.
3	Replace the relevant part. ● Does the problem still occur?	Go to Step 4.	Replace the relevant part.
4	● Does the problem occur when the printer is turned on?	Go to Step 7.	Go to Step 5.
5	● Does the problem still occur when the printer is turned on again?	Go to Step 7.	Go to Step 6.
6	● Does the problem occur when the printer is turned off and on repeatedly?	Go to Step 7.	Go to FIP-2.39 "Electrical Noise"
7	**Check: MCU PWB replacement** Replace the MCU PWB. ● Does the problem still occur?	Replace the MCU PWB.	Check the Controller PWB.

FIP-1.37 No Power is Applied.

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** P/H HARNESS ASSY, REGI. HARNESS ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Controller PWB for power supply voltage** 1. Remove the Controller PWB and turn the printer on after a few minutes. 2. Measure the voltage at the pins below to confirm that there is no electrical shortage: •P33-6PIN<=>P33-8PIN: 5VDC •P33-5PIN<=>P33-7PIN: 5VDC •P33-3PIN<=>P33-4PIN: 5VDC ● Is there electrical shortage in any part?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: Power supply voltage for short-circuited parts** 1. Disconnect any connector but J12 and J21 and turn the printer on. 2. After a few minutes, measure the voltage at the pins below: •P33-6PIN<=>P33-8PIN: 5VDC •P33-5PIN<=>P33-7PIN: 5VDC •P33-3PIN<=>P33-4PIN: 5VDC 3. Repeat the steps 1 and 2 until all connectors except for J12 and J21 are removed. ● Is there electrical shortage in any part?	Replace the short-circuited part.	Replace the MCU PWB.

FIP-1.38 Abnormal Print Motion

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** LVPS, HVPS, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	Does the printer exhibit any print motion at all?	Go to Step 4.	Go to Step 3.
3	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Replace the Controller PWB. If the problem still occurs, go to step 4.	Check the Controller PWB. If the problem still occurs, go to Step 4.
4	● Does the printer enter reset condition during printing?	Go to FIP-2.39 "Electrical Noise".	Go to Step 5.
5	**Check: Interface cable** Replace the interface cable. ● Does the problem still occur?	Go to Step 6.	Problem solved.
6	Check: MCU PWB replacement Replace the MCU PWB. ● Does the problem still occur?	Check the host computer.	Problem solved.

FIP-1.39 CONTROLLER PWB Firmware Related Error

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection below.** • Remove all optional electrical unit modules to return the printer to the standard condition. • Check that all connectors are properly connected to the CONTROLLER PWB. • Check that the DIMM is inserted properly.	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Updating the CONTROLLER PWB environment** Update the DIMM with the latest program. ● Does the problem still occur?	Replace/reinstall the defective part.	Problem solved.

FIP-1.40 DIMM (SLOT P) Related Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection below:** • Remove all optional electrical unit modules to return the printer to the standard condition. • Check that all connectors are properly connected to the CONTROLLER PWB. • Check that the DIMM is inserted properly.	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: DIMM** • Format the DIMM and write the control program to it. ***NOTE**: Make sure DIMM is installed in the correct direction and locked in the socket securely.* ● Does the problem still occur?	Replace/reinstall the defective part.	-

FIP-1.41 SD-RAM (SLOT S0, S1, S2) Related Error

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection below:** • Remove all optional electrical unit modules to return the printer to the standard condition. • Check that all connectors are properly connected to the CONTROLLER PWB.	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: SD-RAM** 1. Remove all SD-RAMs from the SD-RAM slots 0, 1, and 2. 2. Check that the printer is turned off. 3. Install a SD-RAM to slot 1 and turn the printer on. 4. Repeat the steps 2 and 3 to add other SD-RAMs one by one to the slot 1 and 2. ● Is there any defective SD-RAM? ***NOTE:*** • *Be sure to install a SD-RAM whose memory is more than 32MB in the slot 0.* • *Before reinstalling each SD-RAM, verify the correct direction for installing it; and insert it to the socket until it is locked.*	Replace/reinstall the defective part.	-

FIP-1.42 CONTROLLER PWB (IC13, IC14) Related Error

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection below:** • Remove all electrical unit modules to return the printer to the standard condition. • Check that all connectors are properly connected to the CONTROLLER PWB.	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Defective IC** Replace IC according to the error type as follows: - Error C1100: Replace IC14. - Error C1101: Replace IC13. ● Does the problem still occur?	Replace the CONTROLLER PWB.	Problem solved.

FIP-1.43 DIMM (P) Related Error

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection below:** • Remove all electrical unit modules to return the printer to the standard condition. • Check that all connectors are properly connected to the CONTROLLER PWB.	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: DIMM** Replace the DIMM as described below: • Format the currently installed DIMM and then load the latest program. • Format a new DIMM and load the latest program. ● Does the problem still occur?	Replace the CONTROLLER PWB.	Problem solved.

FIP-1.44 DIMM (Slot A, B) Related Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection below:** • Remove all electrical unit modules to return the printer to the standard condition. • Check that all connectors are properly connected to the CONTROLLER PWB.	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: DIMM** • Check that the DIMM is installed in the correct direction and locked in the socket securely? • Check that the DIMM meets the specifications? ● Does the problem still occur?	Replace the CONTROLLER PWB.	Problem solved.

FIP-1.45 CONTROLLER PWB EEPROM (IC20) Related Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection below:** • Remove all electrical unit modules to return the printer to the standard condition. • Check that all connectors are properly connected to the CONTROLLER PWB.	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: IC20** - Error C1200: Replace IC20. - Error C1210: Replace IC20. ● Does the problem still occur?	Replace the CONTROLLER PWB.	Problem solved.

FIP-1.46 CONTROLLER PWB ASIC (IC24, IC26) Related Error

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection below:** • Remove all electrical unit modules to return the printer to the standard condition. • Check that all connectors are properly connected to the CONTROLLER PWB.	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: IC replacement** Replace the relevant IC according to the error code. - Error C1500: Replace IC24. - Error C1600: Replace IC26. ● Does the problem still occur?	Replace the CONTROLLER PWB.	Problem solved.

FIP-1.47 CONTROLLER PWB and Other Hardware Related Errors

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection below:** • Remove all electrical unit modules to return the printer to the standard condition. • Check that all connectors are properly connected to the CONTROLLER PWB.	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: MCU PWB initialization** Using the diagnostic commander, execute “Slave Initialize”, and then turn the printer off and back on. ● Does the problem still occur?	Replace the CONTROLLER PWB.	Problem solved.

FIP-1.48 SRAM (IC25) Initialization Error

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection below:** • Remove all electrical unit modules to return the printer to the standard condition. • Check that all connectors are properly connected to the CONTROLLER PWB.	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: CONTROLLER PWB or IC25 replacement** Replace the CONTROLLER PWB or IC25. ● Does the problem still occur?	-	Problem solved.

FIP-1.49 Built-in Network Hardware Error

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection below:** • Remove all electrical unit modules to return the printer to the standard condition. • Check that all connectors are properly connected to the CONTROLLER PWB.	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Network setting** • Check that the current network is operating properly. • Run a network status sheet and check that each setting is correct. • Check that each setting on the client side is correct. ● Does the problem still occur?	Replace the CONTROLLER PWB.	Problem solved.

FIP-1.50 “FRONT COVER OPEN”

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** FRONT COVER SWITCH R, FRONT COVER SWITCH L, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: FRONT COVER SWITCH L for its pushing motion** ● Is the actuator in the FRONT COVER ASSY functioning properly as follows? - FRONT COVER ASSY is closed: Turns on the FRONT COVER SWITCH L. - FRONT COVER ASSY is open: Turns off the FRONT COVER SWITCH L.	• With the diagnostic tool, go to step 4. • Without the diagnostic tool, go to step 5.	Replace the defective part.
4	**Check: FRONT COVER SWITCH L** ● Is the FRONT COVER SWITCH L properly functioning? *Diag Tool: Digital Input Test* *Device code: 27*	Replace the MCU PWB.	Go to Step 5.
5	**Check:** **Power supply to the FRONT COVER SWITCH L** ● Is the voltage level correct at the pins below? - P19-2PIN<=>P19-3PIN: 5VDC	Go to Step 6.	Go to FIP-2.1 "LVPS 5VDC is Defective".
6	**Check: FRONT COVER for the detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P19-2PIN<=>P19-3PIN - FRONT COVER ASSY is closed: 0VDC - FRONT COVER ASSY is open: 5VDC	Replace the MCU PWB.	Go to Step 7.
7	**Check: MSI HARNESS ASSY electrical continuity** ● Does the MSI HARNESS ASSY have proper continuity at the pins below? - J19<=>P197	Replace the FRONT COVER SWITCH L.	Replace the MAIN HARNESS ASSY.

FIP-1.51 “PAPER UNIT OPEN”

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** MAIN P/H ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: MAIN P/H ASSY insertion** Is the MAIN P/H ASSY properly inserted?	• With the diagnostic tool, go to step 4. • Without the diagnostic tool, go to step 5.	Replace the interfering part.
4	**Check: MAIN P/H ASSY detection** ● Is the MAIN P/H ASSY detection mechanism properly functioning? *Diag Tool: Digital Input Test* *Device code: 20*	Replace the MCU PWB.	Go to Step 5.
5	**Check: Power supply to the MAIN P/H ASSY** ● Is the voltage level correct at the pins below? - P20-30PIN<=>P20-31PIN: 5VDC	Go to Step 6.	Go to FIP-2.1 "LVPS 5VDC is Defective".
6	**Check: MAIN P/H ASSY detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P20-30PIN<=>P20-31PIN - MAIN P/H ASSY is installed: 0VDC - MAIN P/H ASSY is not installed: 5VDC	Replace the MCU PWB.	Go to Step 7.
7	**Check: P/H HARNESS ASSY electrical continuity** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - J20<=>P91	Replace the MAIN P/H ASSY.	Replace the P/H HARNESS ASSY.

FIP-1.52 “EXIT COVER OPEN”

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** MAIN P/H ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: EXIT CHUTE SWITCH’s pushing motion** ● Is the actuator in the EXIT UPPER ASSY properly functioning depending on the conditions below? - EXIT UPPER ASSY is closed: Turns the EXIT CHUTE SWITCH ON. - EXIT UPPER ASSY is open: Turns the EXIT CHUTE SWITCH OFF.	• With the diagnostic tool, go to step 4. • Without the diagnostic tool, go to step 5.	Replace the defective part.
4	**Check: EXIT CHUTE SWITCH** ● Is the EXIT CHUTE SWITCH properly functioning? *Diag Tool: Digital Input Test* *Device code: 0B*	Replace the MCU PWB.	Go to Step 5.
5	**Check: Power supply to the EXIT CHUTE SWITCH** ● Is the voltage level correct at the pins below? - P17-10PIN<=>P17-11PIN: 5VDC	Go to Step 6.	Go to FIP-2.1 "LVPS 5VDC is Defective".
6	**Check: EXIT CHUTE SWITCH for signals** ● Is the voltage level correct depending on the conditions below? - Pins: P17-10PIN<=>P17-11PIN - EXIT UPPER ASSY is closed: 0VDC - EXIT UPPER ASSY is open: 5VDC	Replace the MCU PWB.	Go to Step 7.
7	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J17<=>P161	Replace the EXIT CHUTE SWITCH.	Replace the MAIN HARNESS ASSY.

FIP-1.53 “FUSER UNIT OPEN”

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** MAIN FUSER ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: MAIN FUSER ASSY insertion** ● Is the MAIN FUSER ASSY securely inserted?	• With the diagnostic tool, go to step 4. • Without the diagnostic tool, go to step 5.	Replace the interfering part.
4	**Check: MAIN FUSER ASSY detection** ● Is the MAIN FUSER ASSY detection mechanism properly functioning? *Diag Tool: Digital Input Test* *Device code: 24*	Replace the MCU PWB.	Go to Step 5.
5	**Check: Power supply to the MAIN FUSER ASSY** ● Is the voltage level correct at the pins below? - P19-16PIN<=>P19-15PIN: 5VDC	Go to Step 6.	Go to "This section describes how to isolate the faulty unit (assembly) by using the Level 2 FIPs.".
6	**Check: MAIN FUSER ASSY detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P19-16PIN<=>P19-15PIN - MAIN FUSER ASSY is installed: 0VDC - MAIN FUSER ASSY is not installed: 5VDC	Replace the MCU PWB.	Go to Step 7.
7	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - J19<=>P71	Replace the MAIN FUSER ASSY.	Replace the MAIN HARNESS ASSY.

FIP-1.54 “PAPER OUT LC1”

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** UNIVERSAL CASSETTE, BOTTOM PLATE ASSY, LOW PAPER SENSOR, FEEDER PWB, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Isolation: Engine or Controller?** Run the Engine test print or diagnostic test print. (10 sheets for each of single and continuous print) ● Are the outputs normal?	Check the Controller PWB. If the problem still occurs, go to step 3.	Go to Step 3.
3	**Check: UNIVERSAL CASSETTE** Is the UNIVERSAL CASSETTE smoothly inserted?	Go to Step 4.	Replace the defective part.
4	**Check: BOTTOM PLATE ASSY** Remove the TURN IN CHUTE-3T and then insert the UNIVERSAL CASSETTE. ● Does the BOTTOM PLATE ASSY properly lift up when the UNIVERSAL CASSETTE is inserted?	Go to Step 5.	Replace the defective part.
5	**Check: LOW PAPER SENSOR installation** ● Is the LOW PAPER SENSOR properly installed?	With the diagnostic tool, go to step 6. Without the diagnostic tool, go to FIP-2.4 "LOW PAPER SENSOR is Defective".	Install the LOW PAPER SENSOR properly.
6	**Check: LOW PAPER SENSOR** ● Is the LOW PAPER SENSOR properly functioning? *Diag Tool: Digital Input Test* *Device code: 13*	Go to Step 7.	Go to FIP-2.4 "LOW PAPER SENSOR is Defective".
7	**Check: FEEDER PWB** Replace the FEEDER PWB. ● Does the problem still occur?	Replace the MCU PWB.	Problem solved.

5.3 Level 2 FIP (Fault Isolation Procedure)

This section describes how to isolate the faulty unit (assembly) by using the Level 2 FIPs.

CHECK POINT

<Preliminary inspection>
In each FIP, you are required to perform the "Preliminary inspection" prior to any other actions.
The Preliminary inspection involves the following:

- **Check for any part that does not meet the specifications.**
- **Check if any part has been installed improperly.**
- **Check for part that is damaged, deformed, smeared, or lodged with foreign matter.**

FIP-2.1 LVPS 5VDC is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** LVPS, MCU PWB, MAIN HARNESS ASSY	Replace/reinstall the defective part(s).	Go to Step 2.
2	● Check: LVPS Is the voltage level correct at the pins below? - P33-6PIN<=>P33-8PIN: 5VDC - P33-5PIN<=>P33-7PIN: 5VDC - P33-3PIN<=>P33-4PIN: 5VDC	Go to Step 3.	Replace the LVPS.
3	● Check: MAIN HARNESS ASSY electrical continuity Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J33<=>J12	Replace the MCU PWB.	Replace the MAIN HARNESS ASSY.

FIP-2.2 LVPS 24VDC is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** LVPS, MCU PWB, MAIN HARNESS ASSY, FUSER ASSY, MAIN P/H ASSY, FRONT COVER SWITCH R, P/H HARNESS ASSY, FUSER CONNECTOR	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: LVPS** Is the voltage level correct at the pins below? - P32-11PIN<=>P32-12PIN: 24VDC	Go to Step 3.	Replace the LVPS.
3	**Check: Interlock path** Close the FUSER ASSY, MAIN P/H ASSY, and FRONT COVER ASSY. ● Is the voltage level correct at the pins below? - P32-6PIN<=>P32-12PIN: 24VDC	Go to Step 4.	Go to Step 6.
4	**Check: LVPS relay circuit** Close the FUSER ASSY, MAIN P/H ASSY, and FRONT COVER ASSY. ● Is the voltage level correct at the pins below? - P32-11PIN<=>P32-12PIN: 24VDC	Go to Step 5.	Replace the LVPS.
5	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J32<=>J21	Replace the MCU PWB.	Replace the MAIN HARNESS ASSY.
6	**Check: FUSER ASSY installation/removal** ● Is the FUSER ASSY securely set?	Go to Step 7.	Replace the interfering part.
7	**Check: MAIN P/H ASSY installation/removal** ● Is the MAIN P/H ASSY securely set?	Go to Step 8.	Replace the interfering part.
8	**Check: Power supply to the FRONT COVER SWITCH R** ● Is the voltage level correct at the pins below? - J192-1PIN<=>P32-12PIN: 24VDC	Go to Step 9.	Replace the MAIN HARNESS ASSY.

(To be continued.)

(Continued)

FIP-2.2 LVPS is Defective

Step	Check point	Remedy	
		Yes	No
9	**Check: FRONT COVER SWITCH R** Close the FRONT COVER ASSY. ● Is the voltage level correct at the pins below? - P/J191-1PIN<=>P32-12PIN: 24VDC	Go to Step 10.	Replace the FRONT COVER SWITCH R.
10	**Check: MAIN HARNESS ASSY** Close the FRONT COVER ASSY. ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - P97-1PIN<=>P32-12PIN	Go to Step 11.	Replace the MAIN HARNESS ASSY.
11	**Check: Power supply to the P/H ASSY** Close the FUSER ASSY, FRONT COVER ASSY, and TOP COVER ASSY. ● Is the voltage level correct at the pins below? - P91-1PIN<=>P32-12PIN: 24VDC	Go to Step 12.	Replace the P/H HARNESS ASSY.
12	**Check: Power supply to the FUSER ASSY** Close the MAIN P/H ASSY and FRONT COVER ASSY. ● Is the voltage level correct at the pins below? - P71-3PIN<=>P32-12PIN: 24VDC	Go to Step 13.	Go to Step 16.
13	**Check: MAIN HARNESS ASSY** Close the MAIN P/H ASSY, FUSER ASSY, and FRONT COVER ASSY. ● Is the voltage level correct at the pins below? - J70-2PIN<=>P32-12PIN: 24VDC	Go to Step 15.	Go to Step 14.
14	**Check: MCU PWB** Close the MAIN P/H ASSY, FUSER ASSY, and FRONT COVER ASSY. ● Is the voltage level correct at the pins below? - P/J32-6PIN<=>P/J32-12PIN: 24VDC	Replace the MCU PWB.	Replace the MAIN HARNESS ASSY.

(To be continued)

(Continued)

FIP-2.2 LVPS is Defective

Step	Check point	Remedy	
		Yes	No
15	**Check: FUSER ASSY electrical continuity** ● Does the FUSER ASSY have proper continuity at the pins below? - J71-3PIN<=>J71-4PIN	Replace the FUSER CONNECTOR.	Replace the FUSER ASSY.
16	**Check: MAIN P/H ASSY electrical continuity** ● Does the MAIN P/H ASSY have proper continuity at the pins below? - J91-1PIN<=>J91-2PIN	Go to Step 17.	Replace the MAIN P/H ASSY.
17	**Check: P/H HARNESS ASSY electrical continuity** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - P91-1PIN<=>J97-2PIN	Go to Step 18.	Replace the P/H HARNESS ASSY.
18	**Check: FUSER CONNECTOR electrical continuity** ● Does the FUSER CONNECTOR have proper continuity at the pins below? - P91-1PIN<=>J70-2PIN	Replace the MAIN HARNESS ASSY.	Replace the FUSER CONNECTOR.

FIP-2.3 TRAY NO PAPER SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** TRAY NO PAPER SENSOR, REGI. HARNESS ASSY, TRAY N/P HARNESS, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check:** **Power supply to the TRAY NO PAPER SENSOR** ● Is the voltage level correct at the pins below? - P20-15PIN<=>P20-16PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check:** **Power supply to the TRAY NO PAPER detection signal** ● Is the voltage level correct at the pins below? - P20-17PIN<=>P20-16PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: TRAY NO PAPER detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J20-17PIN<=>P/J20-16PIN - Passed (paper is set): 0VDC - Blocked (no paper is set): 5VDC	Replace the MCU PWB.	Go to Step 5.
5	**Check: TRAY N/P HARNESS electrical continuity** ● Does the TRAY N/P HARNESS have proper continuity at the pins below? - J107<=>P101	Go to Step 6.	Replace the TRAY N/P HARNESS.
6	**Check: P/H HARNESS ASSY electrical continuity** Does the P/H HARNESS ASSY have proper continuity at the pins below? - J101<=>J20	Replace the TRAY NO PAPER SENSOR.	Replace the P/H HARNESS ASSY.

FIP-2.4 LOW PAPER SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** LOW PAPER SENSOR, TRAY N/P HARNESS, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to LOW PAPER detection signal** ● Is the voltage level correct at the pins below? - P20-18PIN<=>P20-19PIN: 5VDC	Go to Step 3.	Replace the MCU PWB.
3	**Check: LOW PAPER detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J20-18PIN<=>P/J20-19PIN - 20 sheets of paper are set: 0VDC - 200 sheets of paper are set: 5VDC	Replace the MCU PWB.	Go to Step 4.
4	**Check: P/H HARNESS ASSY** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - J107<=>P101	Replace the LOW PAPER SENSOR ASSY.	Replace the P/H HARNESS ASSY.

FIP-2.5 SIZE SWITCH ASSY is Defective

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** SIZE SWITCH ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the SIZE SWITCH ASSY** ● Is the voltage level correct at the pins below? - P19-27PIN<=>P19-26PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check: REGI. detection signal** ● Is the correct voltage output at the pins below depending on the paper size? - Pins: P/J19-28PIN<=>P/J19-26PIN ***NOTE:*** *For the correct voltages, refer to Chapter 2/Section 2.7.1 “Paper Size Control”.*	Replace the MCU PWB.	Go to Step 4.
4	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J102<=>J19	Replace the SIZE SWITCH ASSY.	Replace the MAIN HARNESS ASSY.

FIP-2.6 FEED SOLENOID is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** FEED SOLENOID, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the FEED SOLENOID** ● Is the voltage level correct at the pins below? - P/J19-29PIN<=>P/J21-2PIN: 24VDC	Go to Step 3.	Go to FIP-2.2 "LVPS 24VDC is Defective".
3	**Check: FEED SOLENOID** ● Does the FEED SOLENOID have proper continuity at the pins below? - Pins: J19-29PIN<=>J19-30PIN - Resistance: 90Ω	Replace the MCU PWB.	Go to Step 4.
4	**Check: MAIN HARNESS ASSY** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J19<=> J103PIN	Replace the FEED SOLENOID.	Replace the MAIN HARNESS ASSY.

FIP-2.7 MSI SHORT N/P SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** MSI SHORT N/P SENSOR, MSI HARNESS ASSY, REGI. HARNESS ASSY, P/H HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: MSI SHORT N/P detection signal** ● Is the voltage level correct at the pins below? - P20-32PIN<=>P20-33PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check:** **Power supply to the MSI SHORT N/P detection signal** ● Is the voltage level correct at the pins below? - P20-34PIN<=>P20-33PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: MSI SHORT N/P detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J20-34PIN<=>P/J20-33PIN - Passed condition (paper is set): 0VDC - Blocked condition (no paper is set): 5VDC	Replace the MCU PWB.	Go to Step 5.
5	**Check: MSI HARNESS ASSY electrical continuity** ● Does the MSI HARNESS ASSY have proper continuity at the pins below? - J203<=>P113	Go to Step 6.	Replace the MSI HARNESS ASSY.
6	**Check: REGI. HARNESS ASSY electrical continuity** ● Does the REGI. HARNESS ASSY have proper continuity at the pins below? - J113<=>J91	Go to Step 7.	Replace the REGI. HARNESS ASSY.
7	**Check: P/H HARNESS ASSY** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - P91<=>J20	Replace the MSI SHORT N/P SENSOR.	Replace the P/H HARNESS ASSY.

FIP-2.8 MSI LONG N/P SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** MSI LONG N/P SENSOR, MSI HARNESS ASSY, REGI. HARNESS ASSY, P/H HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the MSI LONG N/P SENSOR** ● Is the voltage level correct at the pins below? - P20-11PIN<=>P20-13PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check:** **Power supply to the MSI LONG N/P detection signal** ● Is the voltage level correct at the pins below? - P20-14PIN<=>P20-13PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: MSI LONG N/Pdetection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J20-14PIN<=>P/J20-13PIN - Reflecting condition (paper is set): 0VDC - Unreflecting condition (no paper is set): 5VDC	Replace the MCU PWB	Go to Step 5.
5	**Check: MSI HARNESS ASSY** ● Does the MSI HARNESS ASSY have proper continuity at the pins below? - J206<=>P92	Go to Step 6.	Replace the MSI HARNESS ASSY.
6	**Check: REGI. HARNESS ASSY electrical continuity** ● Does the REGI. HARNESS ASSY have proper continuity at the pins below? - J92<=>J91	Go to Step 7.	Replace the REGI. HARNESS ASSY.
7	**Check: P/H HARNESS ASSY** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - 91<=>J20	Replace the MSI LONG N/P SENSOR.	Replace the P/H HARNESS ASSY.

FIP-2.9 MSI EDGE SENSOR is Defective

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** MSI EDGE SENSOR, MSI HARNESS ASSY, REGI. HARNESS ASSY, P/H HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the MSI EDGE SENSOR** ● Is the voltage level correct at the pins below? - P20-11PIN<=>P20-13PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check:** **Power supply to the MSI EDGE detection signal** ● Is the voltage level correct at the pins below? - P20-10PIN<=>P20-13PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: MSI EDGE detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J20-10PIN<=>P/J20-13PIN - Reflecting condition (paper is set): 0VDC - Unreflecting condition (no paper is set): 5VDC	Replace the MCU PWB.	Go to Step 5.
5	**Check: MSI HARNESS ASSY** Does the MSI HARNESS ASSY have proper continuity at the pins below? - J204<=>P92	Go to Step 6.	Replace the MSI HARNESS ASSY.
6	**Check: REGI. HARNESS ASSY** Does the REGI. HARNESS ASSY have proper continuity at the pins below? - J92<=>J91	Go to Step 7.	Replace the REGI. HARNESS ASSY.
7	**Check: P/H HARNESS ASSY** Does the P/H HARNESS ASSY have proper continuity at the pins below? - P91<=>J20	Replace the MSI EDGE SENSOR.	Replace the P/H HARNESS ASSY.

FIP-2.10 MSI CLUTCH is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** MSI CLUTCH, P/H HARNESS ASSY, REGI. MAIN HARNESS, MSI HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the MSI CLUTCH** ● Is the voltage level correct at the pins below? - P/J20-36PIN< =>P/J20-35PIN: 24VDC	Go to Step 3.	Go to FIP-2.2 "LVPS 24VDC is Defective".
3	**Check: MSI CLUTCH** ● Does the MSI CLUTCH have proper continuity at the pins below? - Pins: J20-36PIN<=>J20-35PIN - Resistance: 169 Ω	Replace the MCU PWB.	Go to Step 4.
4	**Check: P/H HARNESS ASSY** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - Pins: J20<=>P91	Go to Step 5.	Replace the P/H HARNESS ASSY.
5	**Check: REGI. HARNESS** ● Does the REGI. HARNESS have proper continuity at the pins below? - Pins: J91<=>J113PIN	Go to Step 6.	Replace the REGI. HARNESS.
6	**Check: MSI HARNESS ASSY** ● Does the MSI HARNESS ASSY have proper continuity at the pins below? - Pins: P113<=>J202	Replace the MSI CLUTCH.	Replace the MSI HARNESS ASSY.

FIP-2.11 PICK UP SOLENOID is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** PICK UP SOLENOID, P/H HARNESS ASSY, REGI. MAIN HARNESS, MSI HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check:** Power supply to the PICK UP SOLENOID ● Is the voltage level correct at the pins below? - P/J20-37PIN<=>P/J20-38PIN: 24VDC	Go to Step 3.	Go to FIP-2.2 "LVPS 24VDC is Defective".
3	**Check: PICK UP SOLENOID** ● Is proper resistance output at the pins below? - Pins: J20-37PIN<=>J20-38PIN - Resistance: 89Ω	Replace the MCU PWB.	Go to Step 4.
4	**Check: P/H HARNESS ASSY** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - Pins: J20<=>P91	Go to Step 5.	Replace the P/H HARNESS ASSY.
5	**Check: REGI. MAIN HARNESS** ● Does the REGI. MAIN HARNESS have proper continuity at the pins below? - J91<=>J113	Go to Step 6.	Replace the REGI. MAIN HARNESS.
6	**Check: MSI HARNESS ASSY** ● Does the MSI HARNESS ASSY have proper continuity at the pins below? - P113<=>J201	Replace the PICK UP SOLENOID.	Replace the MSI HARNESS ASSY.

FIP-2.12 FRONT OHP SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to check:** FRONT OHP SENSOR, REGI. HARNESS ASSY, P/H HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the FRONT OHP SENSOR** ● Is the voltage level correct at the pins below? - P20-6PIN<=>P20-4PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check:** **Power supply to the FRONT OHP detection signal** ● Is the voltage level correct at the pins below? - P20-5PIN<=>P20-4PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: FRONT OHP detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J20-5PIN<=>P/J20-4PIN - Photo reflecting status (paper is set): 0VDC - Photo unreflecting status (no paper is set): 5VDC ***NOTE:*** *When setting the conditions, reflecting and unreflecting, use white paper, not OHP sheet. Use of OHP sheet causes failure in judgement since it is transparent.*	Replace the MCU PWB.	Go to Step 5.
5	**Check: REGI. HARNESS ASSY electrical continuity** ● Does the REGI. HARNESS ASSY have proper continuity at the pins below? - J98<=>J91	Go to Step 6.	Replace the REGI. HARNESS ASSY.
6	**Check: P/H HARNESS ASSY** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - P91<=>J20	Replace the FRONT OHP SENSOR.	Replace the P/H HARNESS ASSY.

FIP-2.13 REAR OHP SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** REAR OHP SENSOR, REGI. HARNESS ASSY, P/H HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the REAR OHP SENSOR** ● Is the voltage level correct at the pins below? P20-9PIN<=>P20-7PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check:** **Power supply to the REAR OHP detection signal** ● Is the voltage level correct at the pins below? - P20-8PIN<=>P20-7PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: REAR OHP detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J20-8PIN<=>P/J20-7PIN - Photo reflecting status (paper is set): 0VDC - Photo unreflecting status (no paper is set): 5VDC ***NOTE:*** *When setting the conditions, reflecting and unreflecting, use white paper, not OHP sheet. Use of OHP sheet will cause failure in judgement since it is transparent.*	Replace the MCU PWB.	Go to Step 5.
5	**Check: REGI. HARNESS ASSY electrical continuity** ● Does the REGI. HARNESS ASSY have proper continuity at the pins below? - J99<=>J91	Go to Step 6.	Replace the REGI. HARNESS ASSY.
6	**Check: P/H HARNESS ASSY** ● Does the REGI. HARNESS ASSY have proper continuity at the pins below? - P91<=>J20	Replace the REAR OHP SENSOR.	Replace the P/H HARNESS ASSY.

FIP-2.14 REGI. SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** REGI.SENSOR, REGI. HARNESS ASSY, P/H HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the REGI. SENSOR** ● Is the voltage level correct at the pins below? - P20-3PIN<=>P20-1PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check: Power supply to the REGI. detection signal** ● Is the voltage level correct at the pins below? - P20-2PIN<=>P20-1PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: REGI. detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J20-2PIN<=>P/J20-1PIN - Reflecting condition (paper is set): 0VDC - Unreflecting condition (no paper is set): 5VDC	Replace the MCU PWB.	Replace the Go to Step 5.
5	**Check: REGI. HARNESS ASSY electrical continuity?** ● Does the REGI. HARNESS ASSY have proper continuity at the pins below? - J93<=>J91	Go to Step 6.	Replace the REGI. HARNESS ASSY.
6	**Check: P/H HARNESS ASSY** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - P91<=>J20	Replace the REGI.SENSOR.	Replace the P/H HARNESS ASSY.

FIP-2.15 REGI. CLUTCH is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** REGI. CLUTCH, P/H HARNESS ASSY, REGI. HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the REGI. CLUTCH** ● Is the voltage level correct at the pins below? - P/J20-25PIN<=>P/J20-27PIN: 24VDC	Go t step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check: REGI. CLUTCH** ● Does the REGI. CLUTCH have proper continuity at the pins below? - Pins: J20-25PIN<=>J20-27PIN - Resistance: 171 Ω	Replace the MCU PWB.	Go to Step 4.
4	**Check: P/H HARNESS ASSY** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - J20<=>P91	Go to Step 5.	Replace the P/H HARNESS ASSY.
5	**Check: REGI. HARNESS ASSY** ● Does the REGI. HARNESS ASSY have proper continuity at the pins below? - J91<=>P110PIN	Replace the REGI. CLUTCH.	Replace the REGI. HARNESS ASSY.

FIP-2.16 PRE-REGI. CLUTCH is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** REGI. CLUTCH, P/H HARNESS ASSY, REGI. HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the REGI. CLUTCH** ● Is the voltage level correct at the pins below? - P/J20-25PIN<=>P/J20-27PIN: 24VDC	Go to Step 3.	Go to FIP-2.2 "LVPS 24VDC is Defective".
3	**Check: REGI. CLUTCH** ● Does the REGI. CLUTCH have proper continuity at the pins below? - Pins: J20-25PIN<=>J20-27PIN - Resistance: 174Ω	Replace the MCU PWB	Go to Step 4.
4	**Check: P/H HARNESS ASSY** ● Does the P/H HARNESS ASSY have proper continuity at the pins below? - J20<=>P91	Go to Step 5.	Replace the P/H HARNESS ASSY.
5	**Check: REGI. HARNESS ASSY** ● Does the REGI. HARNESS ASSY have proper continuity at the pins below? - J91<=>P110PIN	Replace the REGI. CLUTCH.	Replace the REGI. HARNESS ASSY.

FIP-2.17 WASTE TONER SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** WASTE TONER SENSOR, WASTE TONER BOX, TONER BOX HARNESS, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the WASTE TONER SENSOR** ● Is the voltage level correct at the pins below? - P18-A3PIN<=>P18-A1PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check:** **Power supply to the WASTE TONER detection signal** ● Is the voltage level correct at the pins below? - P18-A2PIN <=>P18-A1PIN: 5VDC	Go to Step 4.	Go to Step MCU PWB
4	**Check: WASTE TONER detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J18-A2PIN <=>P/J18-A1PIN - Passed condition: 0VDC (=Waste toner level is Low.) - Blocked condition: 5VDC (=Waste toner level is High = Full)	Go to Step MCU PWB	Go to Step 5.
5	**Check: TONER BOX HARNESS electrical continuity** ● Does the TONER BOX HARNESS have proper continuity at the pin below? - J88<=>P116	Go to Step 6.	Replace the TONER BOX HARNESS.
6	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pin below? - J116<=>J18	Replace the WASTE TONER SENSOR.	Replace the MAIN HARNESS ASSY.

FIP-2.18 TONER BOX SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** TONER BOX SENSOR, TONER BOX HARNESS, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the TONER BOX SENSOR** ● Is the voltage level correct at the pins below? - P18-A6PIN<=>P18-A5PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check: TONER BOX detection signal** ● Is the voltage level correct at the pins below? - P18-A6PIN<=>P18-A5PIN: 5VDC	Go go step 4.	Replace the MCU PWB.
4	**Check: TONER BOX detection signal** ● Is the voltage level correct depending on the conditions below? - Pin: P/J18-A6PIN<=>P/J18-A5PIN - Passed condition: 0VDC (=WASTE TONER BOX is installed) - Blocked condition: 5VDC (=WASTE TONER BOX is not installed.)	Replace the MCU PWB.	Go to Step 5.
5	**Check: TONER BOX HARNESS electrical continuity** ● Does the TONER BOX HARNESS have proper continuity at the pins below? - J83<=>P116	Go to Step 6.	Replace the TONER BOX HARNESS.
6	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J116<=>J18	Replace the TONER BOX SENSOR.	Replace the MAIN HARNESS.

FIP-2.19 ROS ASSY is Defective

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** ROS ASSY, MAIN HARNESS ASSY, EXIT HARNESS, TOP EXIT SENSOR, FRONT COVER SWITCH R, MAIN HARNESS, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the SOS SENSOR** ● Is the voltage level correct at the pins below? - P14-1PIN<=>P14-3PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check: Power supply to the SOS detection signal** ● Is the voltage level correct at the pins below? - P14-2PIN<=>P14-3PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: Rotation of the Scanner Motor** ● Does the Scanner Motor rotate when the printer is turned on? (Check that the motor is making a sound.)	Go to Step 7.	Go to Step 5.
5	**Check: Power supply to the Scanner Motor** ● Is the voltage level correct at the pins below? - P14-10PIN<=>P14-11PIN: 24VDC	Go to Step 6.	Go to FIP-2.2 "LVPS 24VDC is Defective"
6	**Check: Scanner Motor ON signal** ● Does the voltage level changes correctly when the scanner motor is turned on? - P14-12PIN<=>P14-13PIN - Changes from 24VDC to 0VDC	Go to Step 7.	Go to Step 15.
7	**Check: Power supply to the LDD** ● Is the voltage level correct at the pins below? - P33-1PIN<=>P33-2PIN: 5VDC	Go to Step 8.	Replace the LVPS.
8	**Check: LDD electrical continuity** ● Does the LDD have proper continuity at the pins below? - J33-1PIN<=> J33-2PIN	Go to Step 15.	Go to Step 9.

(To be continued.)

FIP-2.19 "ROS ASSY is Defective" (Continued)

Step	Check point	Remedy	
		Yes	No
9	**Check: MAIN HARNESS ASSY continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J33-2PIN<=>P195-2PIN - P195-1PIN<=>J196-2PIN - P196-1PIN<=>J194-1PIN - J193-1PIN<=>J33-1PIN	Go to Step 10.	Replace the MAIN HARNESS ASSY.
10	**Check: TOP COVER SWITCH electrical continuity** ● Does the TOP COVER SWITCH have proper continuity status depending on the conditions below? - Pins: J195-1PIN<=>J195-2PIN - Contact area is pushed: Close - Contact area is released: Open	Go to Step 11.	Replace the TOP COVER SWITCH.
11	**Check: TOP COVER ASSY for its notche's operation** ● Is the notch in the TOP COVER ASSY pushing in the contact area of the TOP COVER SWITCH when the TOP COVER ASSY is installed?	Go to Step 12.	Replace the interfering part.
12	**Check: FRONT COVER SWITCH R electrical continuity** ● Do the terminals in the FRONT COVER SWITCH R have proper continuity status depending on the conditions below? - FRONT COVER is closed: Close - FRONT COVER is open: Open	Go to Step 13.	Replace the FRONT COVER SWITCH R.
13	**Check: FRONT COVER ASSY for notche's action** ● Is the notche in the COVER ASSY pushing in the contact point in the FRONT COVER SWITCH R when the FRONT COVER ASSY is closed?	Go to Step 14.	Replace the interfering part.
14	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J116<=>J18	Go to Step 15	Replace the MAIN HARNESS.
15	**Check: MCU PWB replacement** ● Does the problem still occur after replacing the MCU PWB?	Replace the ROS ASSY.	Problem solved.

FIP-2.20 ADC SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** ADC SENSOR ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the ADC Sensor** ● Is the voltage level correct at the pins below? - P17-18PIN<=>P17-21PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J17<=>J81	Go to Step 4.	Replace the MAIN HARNESS ASSY.
4	**Check: ADC SENSOR ASSY replacement** ● Does the problem still occur after replacing the ADC SENSOR ASSY?	Replace the MCU PWB.	Problem solved.

FIP-2.21 ADC SOLENOID is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** ADC SENSOR ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the ADC Solenoid** ● Is the voltage level correct at the pins below? - P/J17-22PIN<=>P/J17-23PIN: 24VDC	Go to Step 3.	Go to FIP-2.2 "LVPS 24VDC is Defective".
3	**Check: ADC Solenoid** ● Does the ADC Solenoid have proper continuity at the pins below? - Pins: J17-22PIN<=> 17-23PIN - Resistance: 36 Ω	Replace the MCU PWB.	Go to Step 4.
4	**Check: MAIN HARNESS ASSY** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J17<=>P81	-	Replace the MAIN HARNESS ASSY.

FIP-2.22 CARTRIDGE SENSOR is Defective

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** CARTRIDGE, FUSER CONNECTOR, FUSER HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the CARTRIDGE SENSOR** ● Is the voltage level correct at the pins below? - P17-6PIN<=>P17-4PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check:** **Power supply to the CARTRIDGE detection signal** ● Is the voltage level correct at the pins below? - P17-5PIN<=>P17-4PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: CARTRIDGE detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J17-5PIN<=>P/J17-4PIN - Passed condition (cartridge is installed): 0VDC - Blocked condition (cartridge is not installed): 5VDC	Replace the MCU PWB.	Go to Step 5.
5	**Check: CART. SENSOR HARNESS electrical continuity** ● Does the CART. SENSOR HARNESS have proper continuity at the pins below? - J168<=>P89	Go to Step 6.	Replace the CART. SENSOR H-ASSY.
6	**Check: EXIT HARNESS electrical continuity** ● Does the EXIT HARNESS have proper continuity at the pins below? - J89<=>J161	Go to Step 7.	Replace the EXIT HARNESS.
7	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J161<=>J17	Replace the MCU PWB.	Replace the MAIN HARNESS ASSY.

FIP-2.23 USED CART. SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** USED CART. SENSOR, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the USED CART. SENSOR** ● Is the voltage level correct at the pins below? - P17-3PIN<=>P17-1PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check:** **Power supply to the USED CART. detection signal** ● Is the voltage level correct at the pins below? - P17-2PIN<=>P17-1PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: USED CART. detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J17-2PIN<=>P/J17-1PIN - Passed condition (Cartridge is new): 0VDC - Blocked condition (Cartridge is old): 5VDC	Replace the MCU PWB.	Go to Step 5.
5	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J17<=>J87	Replace the USED CART. SENSOR.	Replace the MAIN HARNESS.

FIP-2.24 ROTARY SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** ROTARY SENSOR, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check:** **Power supply to the ROTARY SENSOR. SENSOR** ● Is the voltage level correct at the pins below? - P19-6PIN<=>P17-4PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check: Power supply to the ROTARY SENSOR detection signal** ● Is the voltage level correct at the pins below? - P19-5PIN<=>P17-4PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: ROTARY SENSOR detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J19-5PIN<=>P/J17-4PIN - Penetrated condition: 0VDC (= The notch is not detected.) - Blocked condition: 5VDC (=The notche is detected.)	Replace the MCU PWB.	Go to Step 5.
5	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J19<=>J58	Replace the ROTARY SENSOR.	Replace the MAIN HARNESS.

FIP-2.25 TRO SENSOR is Defective

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** TRO SENSOR, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the TRO SENSOR** ● Is the voltage level correct at the pins below? - P17-12PIN<=>P17-14PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check: Power supply to the TRO detection signal** ● Is the voltage level correct at the pins below? - P17-13PIN<=>P17-14PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: TRO detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J17-13PIN<=>P/J17-14PIN - Reflecting condition: 0VDC (TRO mark in the IBT BELT ASSY is detected.) - Unreflecting condition: 5VDC (Area other than TRO mark in the IBT BELT ASSY is detected.)	Replace the MCU PWB.	Go to Step 5.
5	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J116<=>J18	Replace the TRO SENSOR.	Replace the MAIN HARNESS.

FIP-2.26 BTR CAM SOLENOID is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** BTR CAM SOLENOID, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the BTR CAM SOLENOID** ● Is the voltage level correct at the pins below? - P/J19-39PIN<=>P/J21-2PIN: 24VDC	Go to Step 3.	Go to FIP-2.2 "LVPS 24VDC is Defective".
3	**Check: BTR CAM SOLENOID electrical continuity** ● Does the BTR CAM SOLENOID have proper continuity at the pins below? - Pins: J19-39PIN<=>J19-40PIN - Resistance: 215Ω	Replace the MCU PWB.	Go to Step 4.
4	**Check: MAIN HARNESS ASSY** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J19<=> J63PIN	Replace the BTR CAM SOLENOID.	Replace the MAIN HARNESS ASSY.

FIP-2.27 FUSER IN SENSOR is Defective

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** FUSER IN SENSOR, MAIN HARNESS ASSY, FUSER HARNESS ASSY, FUSER IN HARNESS, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the FUSER IN SENSOR** ● Is the voltage level correct at the pins below? - P19-7PIN<=>P19-8PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check: Power supply to the FUSER IN detection signal** ● Is the voltage level correct at the pins below? - P19-8PIN<=>P19-9PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: FUSER IN detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J19-8PIN<=>P/J19-9PIN - Passed condition (paper is set.): 0VDC - Blocked condition (no paper is set.): 5VDC	Replace the MCU PWB.	Go to Step 5.
5	**Check: FUSER IN HARNESS electrical continuity** ● Does the FUSER IN HARNESS have proper continuity at the pin below? - J117<=>P76	Go to Step 6.	Replace the FUSER IN HARNESS.
6	**Check: FUSER HARNESS ASSY electrical continuity** ● Does the FUSER HARNESS ASSY have proper continuity at the pins below? - J71<=>J76	Go to Step 7.	Replace the FUSER HARNESS ASSY.
7	**Check: MAIN HARNESS ASSY electrical continuity** - P71<=>J19	Replace the FUSER IN SENSOR.	Replace the MAIN HARNESS ASSY.

FIP-2.28 FUSER EXIT SENSOR is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** FUSER EXIT SENSOR, MAIN HARNESS ASSY, FUSER HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the FUSER EXIT SENSOR** ● Is the voltage level correct at the pins below? - P19-12PIN<=>P19-13PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check:** **Power supply to the FUSER EXIT detection signal** ● Is the voltage level correct at the pins below? - P19-13PIN<=>P19-14PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: FUSER EXIT detection signal** ● Is the voltage level correct depending on the conditions below? - Pins: P/J19-13PIN<=>P/J19-14PIN - Penetrated condition (paper is set.): 0VDC - Blocked condition (no paper is set.): 5VDC	Replace the MCU PWB	Go to Step 5.
5	**Check: MAIN HARNESS electrical continuity** ● Does the MAIN HARNESS have proper continuity at the pins below? - J75<=>J72	Go to Step 6.	Replace the HARNESS.
6	**Check: FUSER HARNESS ASSY** ● Does the FUSER HARNESS ASSY have proper continuity at the pins below? - J71<=>J72	Go to Step 7.	Replace the FUSER HARNESS ASSY.
7	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - P71<=>J19	Replace the FUSER EXIT SENSOR.	Replace the MAIN HARNESS ASSY.

FIP-2.29 TEMP. SENSOR ASSEMBLY is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** TEMP. SENSOR ASSY, MAIN HARNESS ASSY, FUSER HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Thermistor in the TEMP. SENSOR ASSY** ● Is the detection area of the thermistor smeared or lodged with any foreign matter?	Replace/clean the TEMP. SENSOR ASSY.	Go to Step 3.
3	**Check:** **TEMP. SENSOR ASSY for thermistor resistance** ● Is the resistance correct at the pins below? - Pins: P72-4PIN<=>P72-5PIN - Resistance: 240 kΩ (at 18 – 20°C)	Go to Step 4.	Replace/clean the TEMP. SENSOR ASSY.
4	**Check: FUSER HARNESS ASSY electrical continuity** ● Does the FUSER HARNESS ASSY have proper continuity at the pins below? - J71<=>J72	Go to Step 5.	Replace the FUSER HARNESS ASSY.
5	**Check: MAIN HARNESS ASSY** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - P71<=>J19	Replace the MCU PWB.	Replace the MAIN HARNESS ASSY.

FIP-2.30 OIL CAM SOLENOID is Defective

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** OIL CAM SOLENOID, FUSER HARNESS ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the OIL CAM SOLENOID** ● Is the voltage level correct at the pins below? - P/J18-B3PIN<=>P/J21-2PIN: 24VDC	Go to Step 3.	Go to FIP-2.2 "LVPS 24VDC is Defective".
3	**Check: OIL CAM SOLENOID** ● Does the OIL CAM SOLENOID have proper continuity at the pins below? - Pins: J18-B3PIN<=>J18-B4PIN - Resistance: 215Ω	Replace the MCU PWB.	Go to Step 4.
4	**Check: FUSER HARNESS ASSY electrical continuity** ● Does the FUSER HARNESS ASSY have proper continuity at the pins below? - J73<=>J71PIN	Go to Step 5.	Replace the FUSER HARNESS ASSY.
5	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - P71<=>J18PIN	Replace the OIL CAM SOLENOID.	Replace the MAIN HARNESS ASSY.

FIP-2.31 CLEANER CAM SOLENOID is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** CLEANER CAM SOLENOID, FUSER HARNESS ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check:** **Power supply to the CLEANER CAM SOLENOID** ● Is the voltage level correct at the pins below? - P/J18-B5PIN<=>P/J21-2PIN: 24VDC	Go to Step 3.	Go to FIP-2.2 "LVPS 24VDC is Defective".
3	**Check: CLEANER CAM SOLENOID** ● Does the CLEANER CAM SOLENOID have proper continuity at the pins below? - J18-B5PIN<=>J18-B4PIN - 215Ω	Replace the MCU PWB.	Go to Step 4.
4	**Check: FUSER HARNESS ASSY** ● Does the FUSER HARNESS ASSY have proper continuity at the pins below? - J73<=> J71PIN	Go to Step 5.	Replace the FUSER HARNESS ASSY.
5	**Check: MAIN HARNESS ASSY** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - P71<=> J18PIN	Replace the CLEANER CAM SOLENOID.	Replace the MAIN HARNESS ASSY.

FIP-2.32 TOP EXIT SENSOR is Defective

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** TOP EXIT SENSOR, MAIN HARNESS ASSY, EXIT HARNESS, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the TOP EXIT SENSOR** ● Is the voltage level correct at the pins below? - P17-7PIN<=>P17-8PIN: 5VDC	Go to Step 3.	Go to FIP-2.1 "LVPS 5VDC is Defective".
3	**Check: Power supply to the TOP EXIT** ● Is the voltage level correct at the pins below? • P17-9PIN<=>P17-8PIN: 5VDC	Go to Step 4.	Replace the MCU PWB.
4	**Check: TOP EXIT detection signal** ● Is the voltage level correct depending on the conditions below? - P/J17-9PIN<=>P/J17-8PIN - Passed condition (Paper is set): 0VDC - Blocked condition (No paper is set): 5VDC	Replace the MCU PWB.	Go to Step 5.
5	**Check: EXIT HARNESS electrical continuity** ● Does the EXIT HARNESS have proper continuity at the pins below? - J165<=>J161	Go to Step 6.	Replace the EXIT HARNESS.
6	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J161<=>J17	Replace the TOP EXIT SENSOR.	Replace the MAIN HARNESS ASSY.

FIP-2.33 PROCESS MOTOR ASSY is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** PROCESS MOTOR ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the PROCESS MOTOR ASSY** ● Is the voltage level correct at the pins below? - P/J51-2<=>P/J51-1: 24VDC	Go to Step 4.	Go to Step 3.
3	**Check: Power supply to the LVPS** ● Is the voltage level correct at the pins below? - J32-9<=>J32-10: 24VDC	Replace the MAIN HARNESS ASSY.	Go to FIP-2.2 "LVPS 24VDC is Defective".
4	**Check:** **Power supply to the PROCESS MOTOR's ON signal** ● Is the voltage level correct at the pins below? - P17-31<=>P17-33: 24VDC	Go to Step 5.	Replace the MCU PWB.
5	**Check:** **Power supply to the PROCESS MOTOR SPEED signal** ● Is the voltage level correct at the pins below? - P17-32<=>P17-33: 24VDC	Go to Step 6.	Replace the MCU PWB.
6	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J52<=>J17	Replace the PROCESS MOTOR ASSY.	Replace the MAIN HARNESS ASSY.

FIP-2.34 P/H MOTOR ASSY is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** P/H MOTOR ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the P/H MOTOR ASSY** ● Is the voltage level correct at the pins below? - P/J49-2<=>P/J49-1: 24VDC	Go to Step 4.	Go to Step 3.
3	**Check: Power supply to the LVPS** ● Is the voltage level correct at the pins below? - J32-8<=>J32-7: 24VDC	Replace the MAIN HARNESS ASSY.	Go to FIP-2.2 "LVPS 24VDC is Defective".
4	**Check: Power supply to the P/H MOTOR ON signal** ● Is the voltage level correct at the pins below? - P17-26<=>P17-28: 24VDC	Go to Step 5.	Replace the MCU PWB.
5	**Check: Power supply to the P/H MOTOR SPEED signal** ● Is the voltage level correct at the pins below? - P17-27<=>P17-28: 24VDC	Go to Step 6.	Replace the MCU PWB.
6	**Check: MAIN HARNESS ASSY electrical continuity** ● Is there proper continuity at the pin below? - J50<=>J17	Replace the P/H MOTOR ASSY.	Replace the MAIN HARNESS ASSY.

FIP-2.35 ROTARY MOTOR ASSY is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** ROTARY MOTOR ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the ROTARY MOTOR ASSY** ● Is the voltage level correct at the pins below? - P/J246-3<=>P/J246-1: 24VDC	Go to Step 4.	Go to Step 3.
3	**Check: Power supply to the LVPS** ● Is the voltage level correct at the pins below? - J32-3<=>J32-2: 24VDC	Replace the MAIN HARNESS ASSY.	Go to FIP-2.2 "LVPS 24VDC is Defective".
4	**Check: Power supply to the ROTARY MOTOR ASSY** ● Is the voltage level correct at the pins below? - P16-12<=>P16-11: 5VDC	Go to Step 5.	Go to FIP-2.1 "LVPS 5VDC is Defective".
5	**Check:** **Voltage level of the ROTARY MOTOR ON signal** ● Is the voltage level correct at the pins below? - P16-9<=>P16-11: 24VDC	Go to Step 6.	Replace the MCU PWB.
6	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J50<=>J17	Replace the ROTARY MOTOR ASSY.	Replace the MAIN HARNESS ASSY.

FIP-2.36 DISPENSE MOTOR ASSY is Defective

Step	Check point	Remedy	
		Yes	No
1	**Perform the preliminary inspection.** **Parts to inspect:** DISPENSE MOTOR ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the DISPENSE MOTOR ASSY** ● Is the voltage level correct at the pins below? - P18-A8PIN<=>P18-A9PIN: 24VDC	Go to Step 3.	Go to FIP-2.2 "LVPS 24VDC is Defective".
3	**Check: Power supply to the MAIN HARNESS ASSY** ● Is the voltage level correct at the pins below? - J18<=>J55	Go to Step 4.	Replace the MAIN HARNESS ASSY.
4	**Check: MCU PWB replacement** ● Does the problem still occur after replacing the MCU PWB?	Replace the DISPENSE MOTOR ASSY.	Problem solved.

FIP-2.37 DEVE. CLUTCH ASSY is Defective.

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** DEVE. CLUTCH ASSY, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: Power supply to the DEVE. CLUTCH ASSY** ● Is the voltage level correct at the pins below? - P19-31PIN<=>P19-32PIN: 24VDC	Go to Step 3.	Go to FIP-2.2 "LVPS 24VDC is Defective".
3	**Check: Power supply to the DEVE. CLUTCH ASSY** ● Does the have proper continuity at the pins belowIs the voltage level correct at the pins below? - J19-31PIN<=>J19-32PIN 150Ω	Replace the MCU PWB.	Go to Step 4.
4	**Check: MAIN HARNESS ASSY** ● Does the MAIN HARNESS ASSY have proper continuity at the pins below? - J19<=>J56	Replace the DEVE. CLUTCH ASSY.	Replace the MAIN HARNESS ASSY.

FIP-2.38 HVPS is Defective

Step	Check point	Remedy	
		Yes	**No**
1	**Perform the preliminary inspection.** **Parts to inspect:** BCR WIRE, DEVE. WIRE, BCR CONNECTOR ASSY, DEVE. CONTACT ASSY, DTS WIRE, DTS PLATE, 2ND BTR ASSY, TRANSFER ASSY, 2ND BTR CAM ASSY, HVPS, MAIN HARNESS ASSY, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	**Check: BCR WIRE** ● Do the terminals on the BCR WIRE have continuity?	Go to Step 3.	Replace the BCR WIRE.
3	**Check: DEVE. WIRE** ● Do the terminals on the DEVE. WIRE have proper continuity?	Go to Step 4.	Replace the DEVE. WIRE.
4	**Check: BCR CONNECTOR ASSY** ● Is the BCR CONNECTOR ASSY deformed, damaged, or installed improperly?	Reinstall /replace the BCR CONNECTOR ASSY.	Go to Step 5.
5	**Check: DEVE. CONTACT ASSY** ● Is the DEVE. CONTACT ASSY deformed or damaged? ● Is the DEVE. CONTACT ASSY installed improperly?	Go to Step 6.	Reinstall/replace the DEVE. CONTACT ASSY.
6	**Check: DTS WIRE** ● Do the terminals on the DEVE. WIRE have continuity?	Go to Step 7.	Replace the 2ND BTR CAM ASSY.
7	**Check: DTS PLATE** ● Is the DTS PLATE deformed damaged, or installed improperly?	Replace the 2ND BTR CAM ASSY.	Go to Step 8.
8	**Check: 2ND BTR ASSY** ● Do the terminals in the high voltage lead in the 2ND BTR ASSY have proper continuity?	Go to Step 9.	Replace the 2ND BTR ASSY.
9	**Check: TRANSFER ASSY** ● Does the high voltage flow in the TRANSFER ASSY have proper continuity? (Check the points below for continuity.) - 1ST BTR WIRE terminal<=>1ST BTR - CONTACT ROLL WIRE terminal<=>1ST BTR	Go to Step 10.	Replace the TRANSFER ASSY.

(To be continued.)

(Continued)

FIP-2.38 "HVPS is Defective"

Step	Check point	Remedy	
		Yes	No
10	**Check: Power supply to the HVPS** ● Is the voltage level correct at the pins below? - P/J41-1<=>P/J41-3: 24VDC	Go to Step 12.	Go to Step 11.
11	**Check: Power supply to the LVPS** ● Is the voltage level correct at the pins below? - J32-4<=>J32-5: 24VDC	Replace the MAIN HARNESS ASSY.	Go to FIP-2.2 "LVPS 24VDC is Defective".
12	**Check: MAIN HARNESS ASSY electrical continuity** ● Does the MAIN HARNESS ASSY have continuity at the pins below? - J16<=>J42	Go to Step 13.	Replace the MAIN HARNESS ASSY.
13	**Check: MCU PWB replacement** ● Does the problem still occur after replacing the MCU PWB?	Go to Step HVPS	Problem solved.

FIP-2.39 Electrical Noise

Step	Check point	Remedy: Yes	Remedy: No
1	**Perform the preliminary inspection.** **Parts to inspect:** LVPS, BCR CONNECTOR ASSY, DEVE. CONTACT ASSY, 2ND BTR ASSY, H/R HEATER, P/R HEATER, DRUM CARTRIDGE, MCU PWB	Replace/reinstall the defective part(s).	Go to Step 2.
2	● Is the printer properly grounded?	Go to Step 3.	Ground the printer properly.
3	● Is another electrical product near the printer making a noise?	Move the printer and the electrical product away from each other.	Go to Step 4.
4	**Check: LVPS** ● Is the grounding wire securely connected to the power switch/inlet part in the LVPS?	Go to Step 5.	Fix the grounding wire securely.
5	**Check: BCR CONNECTOR ASSY** ● Is the BCR CONNECTOR ASSY deformed, damaged, or installed improperly?	Reinstall/replace the BCR CONNECTOR ASSY.	Go to Step 6.
6	**Check: DEVE. CONTACT ASSY** ● Is the DEVE. CONTACT ASSY deformed, damaged, or installed improperly?	Reinstall/replace the DEVE. CONTACT ASSY.	Go to Step 7.
7	**Check: 2ND BTR ASSY** ● Does the high voltage flow in the 2ND BTR ASSY have proper continuity?	Go to Step 8.	Replace the 2ND BTR ASSY.
8	**Check: H/R HEATER, P/R HEATER** ● Are the both ends of the H/R HEATER, P/R HEATER securely fixed?	Go to Step 9.	Fix them properly.
9	**Check: DRUM CARTRIDGE replacement** ● Does the problem still occur after replacing the DRUM CARTRIDGE?	Go to Step 10.	Problem solved.
10	**Check: MCU PWB replacement** ● Does the problem still occur after replacing the MCU PWB?	Go to Step 11.	Problem solved.
11	Check the parts listed for the preliminary inspection and other relevant parts for any abnormality. ● Is any of the parts defective?	Replace/reinstall the defective part.	Problem solved. *1

**1: If the problem still occurs after all steps, you can wait and see what happens, since some external cause of the problem is considered.*

5.4 Print Quality Troubleshooting

This section describes how to solve the print quality problems by using the Level 3 FIPs.

CHECK POINT

<Preliminary inspection>
In each FIP, you are required to perform the "Preliminary inspection" prior to any other actions.
The Preliminary inspection involves the following:

- **Check for any part that does not meet the specifications.**
- **Check if any part has been installed improperly.**
- **Check for part that is damaged, deformed, smeared, or lodged with foreign matter.**

5.4.1 Print Quality Troubleshooting Entry Chart

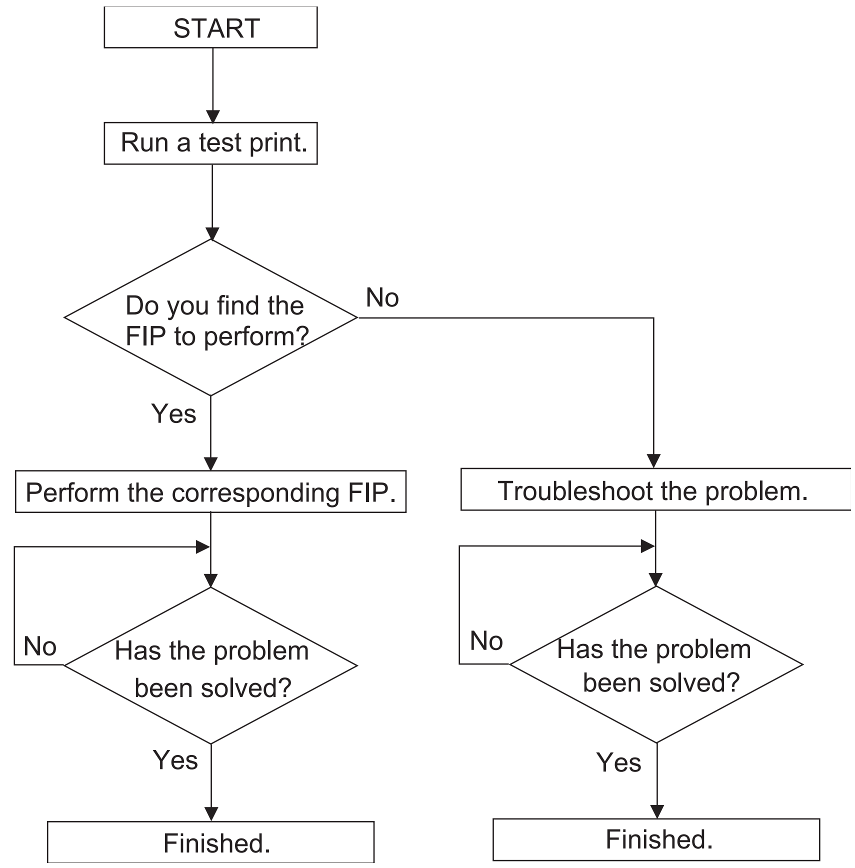


Figure 5-2. Print Quality Troubleshooting Entry Chart

5.4.2 Print Quality FIP

NOTE: *The Print Quality FIP is applicable on the condition that the printer controller (Controller PWB) is functioning properly. To isolate the cause of the problem, whether the engine side or controller side, you can run a test print using the engine or diagnostic board. (Some print problems can not be explained by the test print.)*

If the test print using the engine or diagnostic board is performed properly, it means the Controller PWB is faulty. On the other hand, if neither test runs abnormally, it means the fault is on the engine side.

If “a fault on the Controller PWB side” is assumed, replace the Controller PWB and the interface; and check the performance. If the same trouble occurs after replacement, check the host computer and perform troubleshooting efficiently using the following print quality FIPs.

When you find a print quality problem, output an image on a A4 or A3 paper to grasp and understand the troubled condition well and apply the appropriate solution.

If the problem is not solved using the FIP, repeat the FIP again, and replace the parts listed in the “Preliminary inspection” one by one to troubleshoot.

The FIPs for the common problems are as listed below:

- 1. "Low image density"
- 2. "Blank prints"
- 3. "Black prints"
- 4. "White/light deletion along the Paper Feed Direction"
- 5. "White/Shady deletion lines appear vertically to the paper feeding direction"
- 6. "Black/Color Spots"
- 7. "Toner Smearing"
- 8. "Skew"
- 9. "Creased paper"
- 10. "Improper fusing"

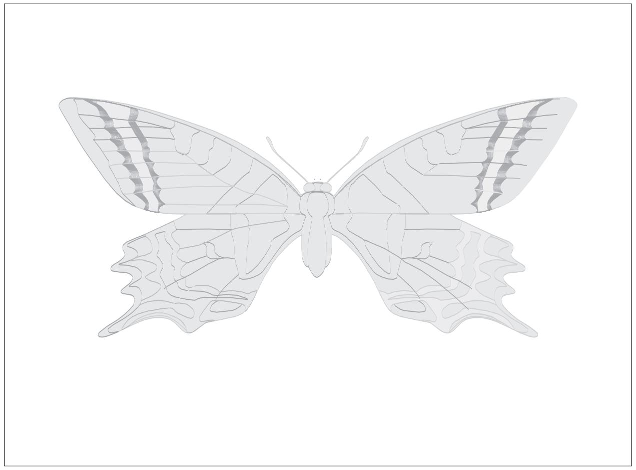
NOTE: *Refer to the table below which shows the circumference (= printed cycle) of each roll that is related in the print quality troubleshooting.*

Table 5-9. . Roller Circumferences

Parts (Higher Assembly)	Cycle
Magnet Roll (DEVELOPER ASSY.)	28 mm
Drum (DRUM CARTRIDGE)	264 mm
BCR (DRUM CARTRIDGE)	44 mm
1ST BTR (TRANSFER ASSY)	59 mm
BACK UP ROLL (TRANSFER ASSY)	88 mm
2ND BTR (2ND BTR ASSY)	88 mm
HEAT ROLL (MAIN FUSER ASSY)	117 mm
PRESSURE ROLL (MAIN FUSER ASSY)	117 mm
OIL ROLL (OIL ROLL ASSY)	107 mm
FEED ROLL	90 mm

1. Low image density

Phenomenon: Overall Image density is lower than normally.		
Perform the preliminary inspection. **Parts to inspect:** Toner Cartridge, DRUM CARTRIDGE, HVPS, ROS ASSY, MCU PWB		
Item	Check Points	Remedy (When abnormal)
1	**Toner Cartridge for its toner level** ● Does the Toner Cartridge have enough toner?	Replace the Toner Cartridge.
2	**Laser beam path condition** ● Is there any foreign matter or smear along the laser beam transmission path between the ROS ASSEMBLY and the Drum?	Remove the foreign matter / smear along the laser beam transmission path between the ROS ASSEMBLY and the DRUM.
3	**Improper Charging/Development** During the image transfer, turn the printer off and examine the toner image on the drum surface (point before the transfer) visually. ● Is the toner image on the drum developed properly?	Refer to “FIP-2.38 "HVPS is Defective".
4	**Improper 1st transfer** During the image transfer, turn the printer off and examine the image on the TRANSFER BELT ASSY visually. ● Is the image on the drum properly transferred to the TRANSFER BELT ASSY?	Refer to “FIP-2.38 "HVPS is Defective".
5	**Improper 2nd transfer** During the image transfer, turn the printer off and examine the image on the paper visually. ● Is the image on the TRANSFER BELT ASSY properly transferred to the paper?	Refer to “FIP-2.38 "HVPS is Defective".
6	**DRUM CARTRIDGE malfunction** Replace the DRUM CARTRIDGE with a new one. ● Has the problem been solved?	Replace the DRUM CARTRIDGE.



SER576X

2. Blank prints

Phenomenon: The entire print is blank.

Perform the preliminary inspection.
Parts to inspect:
DRUM CARTRIDGE, Toner Cartridge, HVPS, ROS ASSY, MCU PWB

Item	Check Points	Remedy (When abnormal)
1	**Toner Cartridge for its toner level** ● Does the Toner Cartridge have enough toner?	Replace the Toner Cartridge.
2	**Laser beam path condition** ● Is there any foreign matter or smear along the laser beam transmission path between the ROS ASSEMBLY and the Drum?	Remove the foreign matter / smear along the laser beam transmission path between the ROS ASSEMBLY and the DRUM.
3	**Improper Charging/Development** During the image transfer, turn the printer off and examine the toner image on the drum surface (point before the transfer) visually. ● Is the toner image on the drum developed properly?	Refer to “FIP-2.38 "HVPS is Defective".
4	**Improper 1st transfer** During the image transfer, turn the printer off and examine the image on the TRANSFER BELT ASSY visually. ● Is the image on the drum properly transferred to the TRANSFER BELT ASSY?	Refer to “FIP-2.38 "HVPS is Defective".
5	**Improper 2nd transfer** During the image transfer, turn the printer off and examine the image on the paper visually. ● Is the image on the TRANSFER BELT ASSY properly transferred to the paper?	Refer to “FIP-2.38 "HVPS is Defective".
6	**DRUM CARTRIDGE malfunction** Replace the DRUM CARTRIDGE with a new one. ● Has the problem been solved?	Replace the DRUM CARTRIDGE.

3. Black prints

Phenomenon: Entire page is completely black.

Perform the preliminary inspection.
Parts to inspect:
DRUM CARTRIDGE, HVPS, ROS ASSY, MCU PWB

Item	Check Points	Remedy (When abnormal)
1	**Improper charging** Using a sheet of paper, cover the laser beam emission window and run a print. ● Does the problem still occur?	Refer to “FIP-2.38 "HVPS is Defective".
2	**ROS ASSY malfunction** Using a sheet of paper, cover the laser beam emission window half way and run a print. ● Does the problem still occurs?	Refer to “FIP-1.22 "ROS ASSY Related Error".
3	**DRUM CARTRIDGE malfunction** Replace the DRUM CARTRIDGE with a new one. ● Has the problem been solved?	Replace the DRUM CARTRIDGE.

4. White/light deletion along the Paper Feed Direction

Phenomenon:
White/light bands run along the direction of paper feeding.

Perform the preliminary inspection.
Parts to inspect:
DRUM CARTRIDGE, HVPS, ROS ASSY, MCU PWB, FUSER ASSY, MAIN FUSER ASSY

Item	Check Points	Remedy (When abnormal)
1	**Improper charging** Replace the DRUM CARTRIDGE. ● Has the problem been solved?	Replace the DRUM CARTRIDGE.
2	**ROS ASSY malfunction** Using a sheet of paper, cover the laser beam emission window half way and run a print. ● Does the problem still occurs?	Refer to “FIP-1.22 "ROS ASSY Related Error".
3	**FUSER ASSY malfunction** Is the HEAT ROLL/PRESSURE ROLL in the FUSER ASSY damaged, smeared, or lodged with any foreign matter?	Replace the FUSER ASSY.
4	**Developer Assy malfunction** Is the trimmer gap in the Developer Assy of the relevant color clogged?	Replace the relevant Developer Assy.

SER577X

5. White/Shady deletion lines appear vertically to the paper feeding direction

Phenomenon:
White/light deletion lines run vertically to the paper feeding direction.

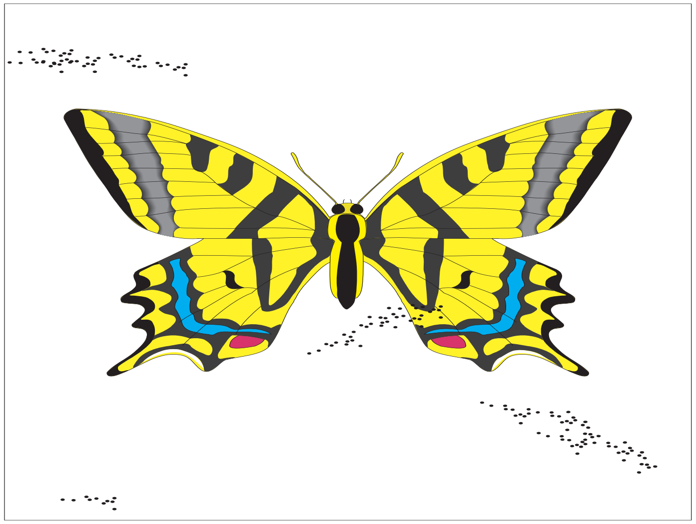
Perform the preliminary inspection.
Parts to inspect:
Developer ASSY, DRUM CARTRIDGE, BELT TRANSFER ASSY, 2ND BTR, HEAT ROLL, PRESSURE ROLL, OIL ROLL ASSY, FEED ROLL ASSY

Item	Check Points	Remedy (When abnormal)
1	**Periodicity** ● Do the lines appear periodically?	Replace the faulty part. ***Note:*** *You can find the faulty part based on the periodicity and the roller circumference.*
2	**Controller PWB malfunction** Replace the Controller PWB with a new one. ● Has the problem been solved?	Replace the Controller PWB.

SER578X

6. Black/Color Spots

Phenomenon: Black/Color spots appear in the output.		
Perform the preliminary inspection. **Parts to inspect:** DRUM CARTRIDGE, HVPS, 2ND BTR ASSY, FUSER ASSY, (HEAT ROLL/PRESSURE ROLL)		
Item	Check Points	Remedy (When abnormal)
1	**Damp paper** Replace the paper with new one. ● Has the problem been solved?	Replace the paper. (Instruct the customer to store paper in a dry place.)
2	**Improper Charging/Development** During the image transfer, turn the printer off and examine the toner image on the drum surface (point before the transfer) visually. ● Is the toner image on the drum developed properly?	Refer to “FIP-2.38 "HVPS is Defective".
3	**Improper 1st transfer** During the image transfer, turn the printer off and examine the image on the TRANSFER BELT ASSY visually. ● Is the image on the drum properly transferred to the TRANSFER BELT ASSY?	Refer to “FIP-2.38 "HVPS is Defective".
4	**HEAT ROLL, PRESSURE ROLL malfunction** ● Is the HEAT ROLL/PRESSURE ROLL in the FUSER ASSY damaged, smeared, or lodged with any foreign matter?	Clean or replace the HEAT ROLL / PRESSURE ROLL in the FUSER ASSY.
5	**DRUM CARTRIDGE malfunction** Replace the DRUM CARTRIDGE with a new one. ● Has the problem been solved?	Replace the DRUM CARTRIDGE.



SER582X

7. Toner Smearing

Phenomenon: Non-printed area on the paper is smeared with toner.		
Perform the preliminary inspection. **Parts to inspect:** DRUM CARTRIDGE, HVPS, Developer ASSY, DEVE. CONTACT ASSY		
Item	Check Points	Remedy (When abnormal)
1	**Deteriorated carrier** Replace the relevant Developer assy with a new one. ● Has the problem been solved?	Replace the Developer assy.
2	**DEVE. CONTACT ASSY installation** ● Is the DEVE. CONTACT ASSY properly installed?	Install the DEVE. CONTACT ASSY properly.
3	**HVPS malfunction** Replace the HVPS. ● Has the problem been solved?	Replace the HVPS.
4	**DRUM CARTRIDGE malfunction** Replace the DRUM CARTRIDGE with a new one. ● Has the problem been solved?	Replace the DRUM CARTRIDGE.

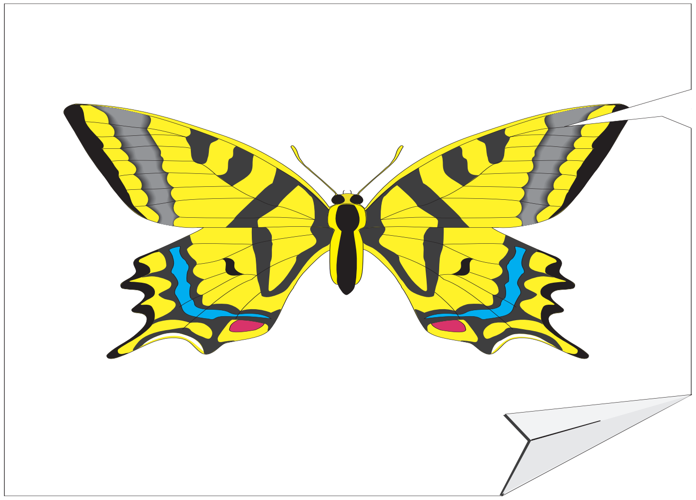
8. Skew

Phenomenon: The printed image is skewed.		
Perform the preliminary inspection. **Parts to inspect:** MAIN FUSER ASSY, PICK UP ROLL, FEED ROLL ASSY, TURN ROLL ASSY, MAIN P/H ASSY		
Item	Check Points	Remedy (When abnormal)
1	**Improper paper setting** ● Is paper or paper cassette set properly?	Set paper or paper cassette properly. (Instruct the customer to set paper and paper cassette properly.)
2	**Bad paper path condition** ● Is the paper path damage, smeared, or lodged with any foreign matter?	Clean the defective part or replace it.
3	**Defective Paper loading rollers** ● Do the paper loading rollers load paper?	Clean or replace the defective roll.
4	**Defective paper feeding rollers** ● Is any of the paper feeding rollers deformed, smeared, or lodged with any foreign matter? ● Are the paper feeding rollers operating improperly?	Clean or replace the defective roll.
5	**ROS ASSY installation** ● Is the ROS ASSY positioned properly?	Reinstall the ROS ASSY.
6	**DRUM CARTRIDGE malfunction** Replace the DRUM CARTRIDGE with a new one. ● Has the problem been solved?	Replace the DRUM CARTRIDGE.

SER585X

9. Creased paper

Phenomenon: The image is printed on a creased paper.		
Perform the preliminary inspection. **Parts to inspect:** MAIN FUSER ASSY, HEAT ROLL, PRESSURE ROLL, MCU PWB, DRUM CARTRIDGE, RETARD PAD ASSY, TURN ROLL ASSY, FEED ROLL ASSY, Paper cassettes		
Item	Check Points	Remedy (When abnormal)
1	**Damp paper** Replace the paper with new ones. ● Does the problem still occur?	Replace the Paper. (Instruct the customer to store paper in a dry place.)
2	**HEAT ROLL/PRESSURE ROLL in the FUSER ASSY malfunction** ● Is the HEAT ROLL/PRESSURE ROLL in the FUSER ASSY damaged, smeared, lodged with any foreign matter?	Clean or replace the HEAT ROLL/ PRESSURE ROLL in the FUSER ASSY.
3	**Paper skew** ● Is paper fed aslant?	Refer to 8. "Skew".
4	**Bad paper path condition** ● Is the paper path damaged, smeared, or lodged with any foreign matter?	Clean or replace the defective part.
5	**Paper path rolls malfunction** ● Is any roll in the paper path deformed, smeared, lodged with any foreign matter, or functioning improperly?	Clean or replace the defective part.



SER586X

10. Improper fusing

Phenomenon: Output image is easily rubbed off the paper.		
Perform the preliminary inspection. **Parts to inspect:** TEMP. SENSOR ASSY, MAIN FUSER ASSY, HEAT ROLL, PRESSURE ROLL, MCU PWB		
Item	Check Points	Remedy (When abnormal)
1	**Damp paper** Replace the paper with new one. ● Has the problem been solved?	Replace the Paper. (Instruct the customer to store paper in a dry place.)
2	**TEMP. SENSOR ASSY** ● Is the TEMP. SENSOR ASSY surface dirty?	Clean or replace the TEMP. SENSOR ASSY.
3	**HEAT ROLL, PRESSURE ROLL malfunction** ● Is the HEAT ROLL/PRESSURE ROLL in the FUSER ASSY damaged, smeared, or lodged with any foreign matter?	Clean or replace the HEAT ROLL/ PRESSURE ROLL in the FUSER ASSY.
5	**MAIN FUSER ASSY malfunction** ● Are the HEAT ROLL and PRESSURE ROLL in the FUSER ASSY pressing paper with proper pressure?	Make adjustment described in Chapter 3/Section 3.3. Replace the MAIN FUSER ASSY.

SER587X

CHAPTER

6

MAINTENANCE

Table of Contents

6.1 About On-Site Servicing

This section contains information you need when visiting your customer for on-site servicing including preventive maintenance required to prevent any potential printer malfunction as well as normal maintenance. To prevent accident during servicing, observe the “WARNING” and “CAUTION” carefully and avoid servicing in a dangerous situation.

WARNING

- **Before servicing, be sure to turn the printer off and unplug the power code from the wall outlet before to prevent injury, burnt, and electrification. If you must keep the power applied to measure voltage, be aware of the potential for electrical shock and do all tasks with the most care.**
- **Never inspect any motor, sprocket, and gear while the printer is operating.**
- **Weight**
  This printer weighs quite heavily (about 69Kg). Be sure to carry it by 4 people or more and take a good posture keeping your back low.
- **Safety Components**
  Make sure the safety components function properly. The safety devices include fuses, interlock switches and others such as panels and covers for protecting users.
- **Do not touch the FUSER ASSEMBLY (Fusing unit) while it is still very hot shortly after operation. After servicing, note the following points when turning on the printer for operation.**
  (Continues to the next page.)

WARNING

- Do not catch your hands and clothes in the rotating parts such as rollers and fans.

- Keep your hands off the electrical terminals and high voltage components such as HVPS and LVPS.

- **Be aware that this printer emits laser beam when the printer is under the both of the following conditions.**

- The printer power switch is on and the printer is in “Ready” status.

- Interlock switches are off (The TOP COVER and the FRONT COVER are closed.)

CAUTION

- **Be careful of sharp edges of the metal frames used in many parts of this printer.**
- **Do not disassembly the TONER CARTRIDGE.**
- **Do not leave the DRUM CARTRIDGE in direct sun light.**
- **Do not disassembly the ROS ASSEMBLY.**
- **Avoid touching IC and other electrical element with your bare hands to protect them from static electricity.**
- **Do not turn off the power until all motors stop.**
- **In case you need to transport the printer:**
  1. Remove the DRUM CARTRIDGE from the printer.
  2. Pack the printer using the exclusive packing materials and on a pallet.
- **Do not dispose of any replaced parts and cousumabels at your customer’s place.**
- **Once color toner gets on a floor, it is hardly cleaned out. Therefore, be sure to place a sheet or cloth inside the printer so that the floor is protected.**

6.1.1 On-site Service Flow

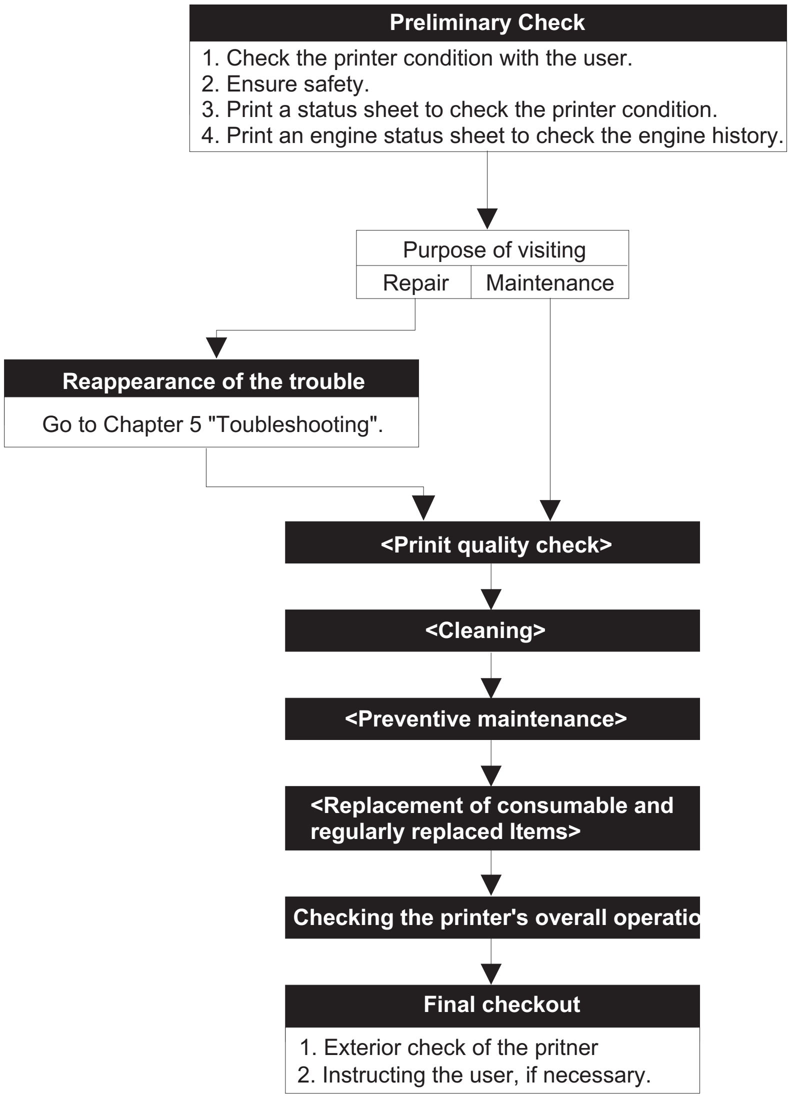


Figure 6-1. On-site Service Flowchart

6.1.2 Description of the On-site Service

This section gives instruction on the on-site service in detail.

☐ **Preliminary Check**

1. Ask the users the following:
   - How often paper feed malfunction occurs.
   - What the printer is used like. (paper, volume, environment, etc.)
   - Output quality

☐ **Reappearance of the trouble**

Perform troubleshooting described in Chapter 5.

1. Using diagnostic function, identify the trouble and perform necessary troubleshooting.
2. If necessary, proceed to “Level 1 FIP” and “Level 2 FIP”.
3. If a print quality problem (completely blank/black page), a fatal problem, due to engine malfunction is identified, go to “Print quality troubleshooting”.

☐ **Print quality check**

1. Print several pages of monochrome and color status sheet to check print quality.

   <Points to check>

   - Color balance
   - Improper color position
   - Too dark/light printing
   - Abnormal reappearance at low density
   - Others

2. If any abnormality is found in the listed check points:
   - Check the life counters of the consumables and regularly replaced parts. (See Section 6.2.)
   - Perform the adjustment. (See Chapter 3.)

☐ **Cleaning**

1. Remove any foreign matter lodged in the 2ND BTR ASSEMBLY, MAIN P/H ASSEMBLY, FUSER ASSEMBLY, and rollers in the paper paths and so on. Then clean the dirt using a brush or dry soft cloth.

   NOTE: *To remove severe dirt, remove it with a moistened cloth then wipe with a dry cloth. Be sure not to mar the dirty part during cleaning.*

2. Using a soft cloth, clean out the spilt toner in the following parts: DEVELOPER, TONER CARTRIDGE (including their installing positions), inside of the FRONT COVER, WASTE TONER BOX installation point and its adjacent parts, BELT CLEANER ASSEMBLY and its adjacent parts.

3. Clean the fan ducts. Remove the REAR COVER and remove the dust adhered to the DEVE. FAN, FUSER FAN, and REAR COVER with a brush. Also, remove the dust accumulated on the CONTROLLER FAN and the TOP COVER by removing the TOP COVER.

   NOTE: *Clogged dust around the fan ducts and fans can heat up the air inside of the printer, which may cause a printer malfunction.*

☐ **Preventive maintenance** (Checking the consumables and regularly replaced parts)

In addition to repair and maintenance of the printer, preventive maintenance is required to maintain the printer's good operation and to prevent any potential problem in other parts that the serviced parts.

1. After repairing or maintenance, output several status sheets and check that the printer operates normally.
2. After repairing or maintenance, output an engine status sheet.

   NOTE: *Referring the total number of the printed pages, determine if any regularly replaced part needs replacing, and replace it if necessary.*

☐ **Replacing the consumables and regularly replaced parts**

Replace any regularly replaced part if necessary. (See Section 6.3 "Consumable Replacement" and Section 6.4 "Regularly Replaced Parts Replacement".)

☐ **Checking overall printer operation**

After servicing, give an overall checking to the printer. Print some status sheets and a test prints with data sent from the host computer. Check the following:

- Print quality: Check that print quality is good.
- Operation: Check that paper is fed properly and there is no abnormal noise.

☐ **Final checkout**

1. Check exterior view of the printer.
2. If necessary, give an instruction to the users.
   - How to clear the paper jam error
   - How to replace the consumables
   - What kind of paper can be used for the printer.

6.2 Maintenance Menu

Maintenance Menu contains the following functions:

- ☐ Shows life counter values for consumables and regularly replaced parts and total number of printed pages and color print pages
- ☐ Resets the counter values for the regularly replaced parts
- ☐ Resets the counter values for total printed page number and total color print pages.

6.2.1 Entry to the Maintenance Menu

CAUTION

- **Make sure the following conditions before entering the Maintenance menu:**
  - **All interface cables are disconnected.**
  - **"Service Call Error" is not indicated.**
- **Before exiting the menu, ensure the engine is not live. If not, you can turn the printer off.**

1. Turn the printer on while pressing the "On Line", "Form Feed", and "Continue". All LED lamps and the LCD come on and the following messages appears consequently in the LCD. (Keep the buttons down until instructed to do so.)

RAM CHECK **.*

Note: ***.* represents numeric which counts up.*
Note: *Do not release the bu*ttons until the next message appears.

MAINTENANCE MODE
Ready

(The printer is in a usual ready status.)

2. Referring to the flowchart below, activate the desirable function through the panel operation.

NOTE:

1. *Consumable and regularly replaced items for the EPL-C8200 can be also used with the EPL-C8000.*
2. *BELT CLEANER ASSY of the EPL-C8200 is not a regularly replaced part but a general after service part. Therefore, "Maintenance Req hhhh" for the IBT Belt Cleaner near end warning does not occur, and, accordingly, "IBT Cleaner Clear" in the Maintenance Mode does not need to be performed.*

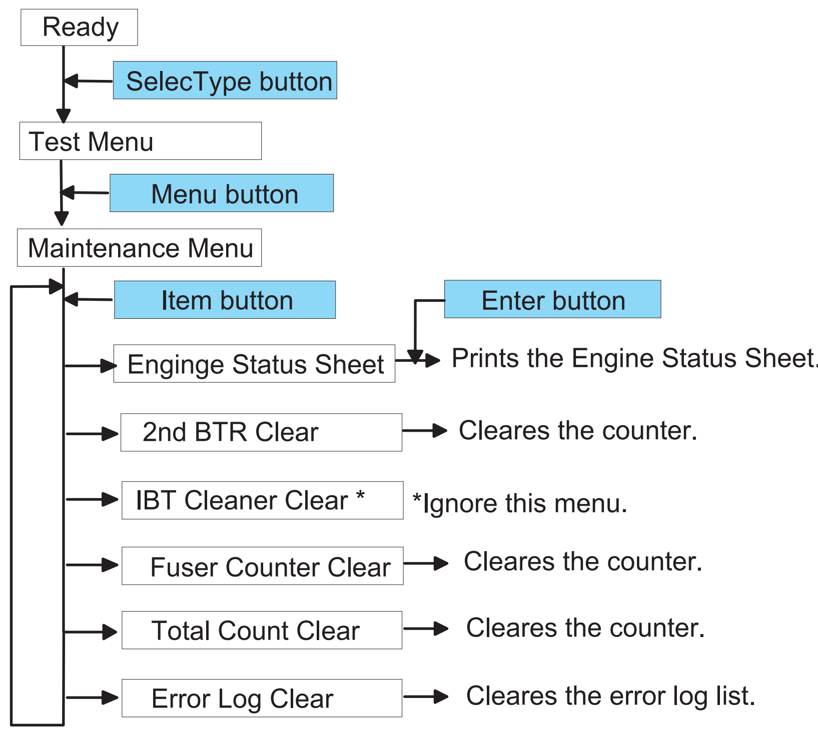


Figure 6-2. Maintenance Menu Operation

6.2.2 Engine Status Sheet

Figure 6-3 shows an Engine Status Sheet sample.

Engine Status Sheet		
Total Counts		
Total Sheets	99 , 999 , 999	sheets
Total Planes	99 , 999 , 999	Planes
Color Sheets	99 , 999 , 999	sheets
Jam Counts	100 , 000	
ET Cartridge		
C Toner	12 , 000	(100msec)
M Toner	11 , 200	(100msec)
Y Toner	12 , 000	(100msec)
K Toner	12 , 250	(100msec)
Xero CRU	110 , 000	cycle
Fuser		
Fuser Oil	20 , 000	sheets
Fuser Oil (rate)	133 , 300	sheets
Fuser (Dispense)	70 , 564	(100msec)
Fuser (Planes)	250 , 000	Planes
2nd BTR	100 , 000	sheets
IBT Cleaner	999 , 999	sheets
Engine Version		
MCU	30147	
Error Log		
Panel Message	Code	Page
zzzzzzzzzzzzzzzzzzzz	xxxx	yyyyyyyy
≀	≀	≀
zzzzzzzzzzzzzzzzzzz	xxxx	yyyyyyyy

Figure 6-3. Engine Status Sheet Sample

Total Counts

Total sheets	Shows the same value as for Total Pages in the Setup Menu. Sheets are counted regardless of the sizes.
Total Plaes	Shows the total number of planes. 1 plane = A4 LEF (each color)
Color Sheets	Shows the same values as for the Color Page in the Setup Menu. Sheets are counted regardless of the sizes.

Jam Counts Shows the number of jams occurred.

ET Cartridge

C/M/Y/K Toner	Indicates the dispense time (toner independent) to show the C/M/Y/K Toner consumption amount. (Unit: 100m seconds) Each counter is automatically cleared when a new Toner cartridge of the corresponding color is installed.

Xero CRU Shows a Photoconductor Unit usage condition. The counter adds 1 point (cycle) for each additional rotation of the photoconductor unit. The counter value is kept by the photoconductor unit it self.

Fuser

Fuser Oil — Shows a consumption condition of the Fuser oil. The indicated counter value is the same as for the Total Page in Setup Menu. The counter is uatomatically reset when a new Fuser Oil Roll is installed.

Fuser Oil (rate) — Shows a consumption condition of the Fuser oil. The counter value changes according to printer conditions such as continuous non-printed time. The counter is ceared when a new Fuser Oil Roll is installed.

Fuser (Dispense) — Shows a usage condition of the Fuser Unit. The indicated value is the total dispense time of all toners after “Fuser Counter Clear” is executed in the Maintenance Mode. (Unit: 100m seconds)

Fuser (Planes) — Shows a usage condition of the Fuser Unit. The indicated value is the total number of the planes after “Fuser Counter Clear” is executed in the Maintenance Mode.

2nd BTR — Shows a usage condition of the 2nd BTR. The indicated value is the number of sheets printed (= Total Pages in the Setup Menu) after “2nd BTR Clear” is executed in the Maintenance Mode.

IBT Cleaner — Shows a usage condition of the IBT Cleaner. The indicated value is the number of sheets printed (= Total Pages in the Setup Menu) after “IBT Cleaner Clear” is executed in the Maintenance Mode. (Note the IBT Cleaner life is longer than the printer’s, so the life near end warning for the IBT Cleaner does not occur.)

MCU — Indicates the version of the P-ROM on the MCU PWB. (Example: Version3.01.47 = 30147)

Error Log — Lists the latest 20 errors indicating the corresponding panel messages, EJL status codes, and Total Pages. The most recent error appears at the top of the list, and then the rest in order of recentness. The errors appear are “Service Req effff “ (excluding ones that occur during warming-up) and “Jam xxxxx”. If an error occurs when another error is already recorded for the same Total Pages, the recent one is not included in the list.

Table 6-1. Engine Status Sheet Information Details

Information	Kept by:	Counter limit *1	Count unit	When to count	Conditions for clearing the counter	Where to store
Total Sheets Total Planes Color Sheets	Engine Engine Controller	~ 99,999,999 ~ 99,999,999 ~ 99,999,999	Sheets Planes Sheets	Printing Transferring Printing	Maintenance Menu>Total Counter Clear Maintenance Menu>Total Counter Clear EJL, (EEPROM Initialization)*2, Maintenance Menu>Total Counter Clear	MCU PWB MCU PWB CONTROLLER PWB
Jam Counts	Controller	~ 100,000	Times	Jam occurrence	(EEPROM Initialization) *2	CONTROLLER PWB
C Toner M Toner Y Toner K Toner	Engine Engine Engine Engine	~ 12,000 ~ 11,200 ~ 12,000 ~ 12,250	100msec 100msec 100msec 100msec	Supplying toner to the Developer Assy	Detection of a new C Toner Cartridge Detection of a new M Toner Cartridge Detection of a new Y Toner Cartridge Detection of a new K Toner Cartridge	MCU PWB
Xero CRU	Engine	~ 110,000	Cycle	The photoconductor unit rotates.	Detection of a new Photoconductor	DRUM CARTRIDGE
Fuser Oil Fuser Oil (Rate) Fuser (Dispense) Fuser (Planes)	Engine Engine Engine Engine	~ 20,000 ~ 133,300 ~ 70,564 ~ 250,000	Sheets Sheets 100msec Planes	Printing Printing Supplying toner to the Developer Assy Transferring	Detection of a new Fuser Oil Roll Detection of a new Fuser Oil Roll SelecType, Maintenance Menu>Fuser Counter Clear Maintenance Menu>Fuser Counter Clear	MCU PWB
2nd BTR	Engine	~ 100,000	Sheets	Printing	Maintenance Menu>2nd BTR Clear	MCU PWB
IBT Cleaner	Engine	~ 999,999	Sheets	Printing	Maintenance Menu>IBT Cleaner Clear	MCU PWB
MCU	Engine	–	–	–	–	MCU PWB
Error Code 1 Error Page 1 : Error Code 20 Error Page 20	Controller Controller Controller Controller	– – – –	– – – –	Error occurrence Error occurrence Error occurrence Error occurrence	Maintenance Menu>Error Log Clear, (EEPROM Initialization) *2	CONTROLLER PWB

**1: If the counter kept by the controller reaches the limit, it will not add point anymore.*

**2: Means the counter is cleared as a result of the “EEPROM Initilization”, one of the power-on operations.*

6.3 Consumable Replacement

This printer allows the users to replace the cunsumables. The consumables includes the following 4 items:

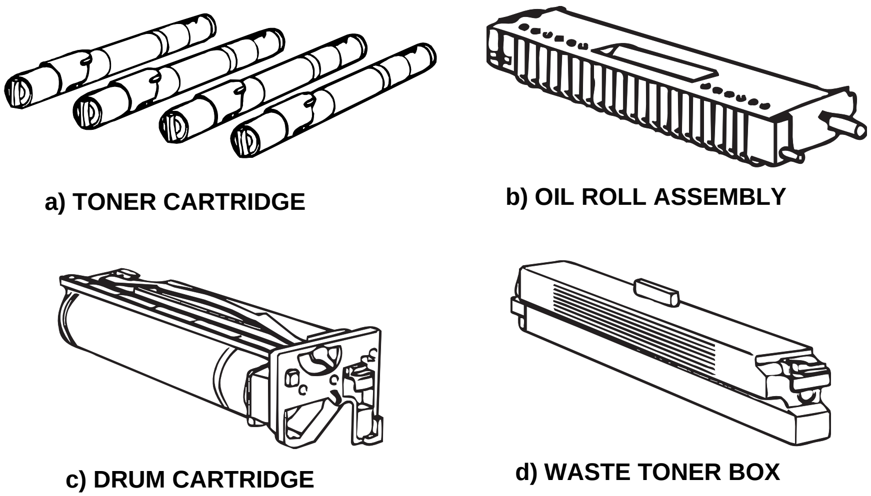


Figure 6-4. Consumables

Life information on these consumables is informed as follows:

Step 1: Warning indication (near end) on the LCD
Step 2: Life end indication on the LCD

As for toner level, users can check by printing a status sheet or panel operation.

Servicers, on the other hand, can access to detailed information, including the life end warning, by using the Maintenance Mode. Referring to the statistics, replacement timing for each item is assumed. The following sections show how to replace each consumable item.

6.3.1 TONER CARTRIDGE Replacement

TONER CARTRIDGE includes Yellow, Magenta, Cyan, and K (Black) Toner cartridges.

CAUTION

- **Ensure that the colors of the TONER CARTRIDGE to be installed and the toner cartridge installation position are the same.**
- **Never use the TONER CARTRIDGE once taken out.**
- **If you have moved the TONER CARTRIDGE from a warm place into a cold place, leave it in a room temperature for 1 hour or more. Otherwise, the printer may produce abnormal printing due to condensation.**
- **If toner gets on your hands or cloth, wash it off with water. Toner is harmless to human body but hard to come off once left on skin or clothes.**
- **You must put used TONER CARTRIDGEs in a plastic bag and disposed of them as inflammable, strictly following the local regulation.**

1. Referring to the LCD message, check the color of the TONER CARTRIDGE which needs to be replaced.

2. Open the FRONT COVER.

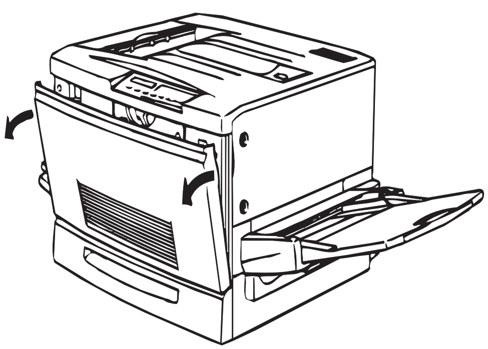


Figure 6-5. FRONT COVER Open

3. If you can see the color that you need to replace at the installation window, go to Step 4. If you the cartridge to be replaced is not in the installation window, move it into the window by repeating the operation described in the figure below.

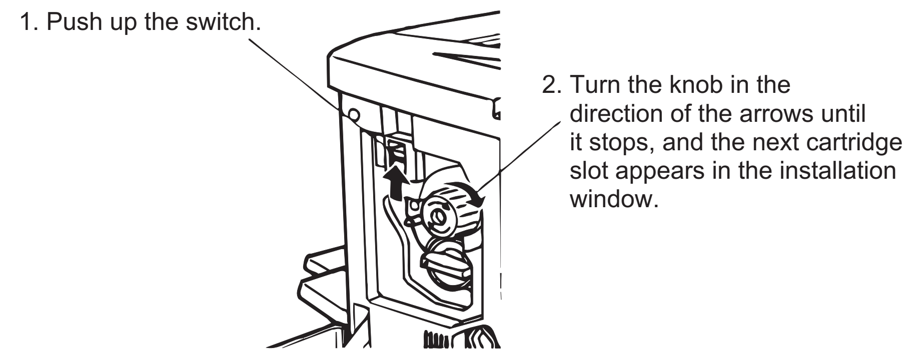


Figure 6-6. TONER CARTRIDGE Replacement 1

4. Remove the cartridge following the steps below:

   1) Turn the cartridge knob counterclockwise 90 degrees so that the ● symbol on the knob is aligned with the unlocking symbol.
   2) Pull the cartridge horizontally out of the slot.

   NOTE:*Put the cartridge in a plastic bag and dispose of it as inflammable.*

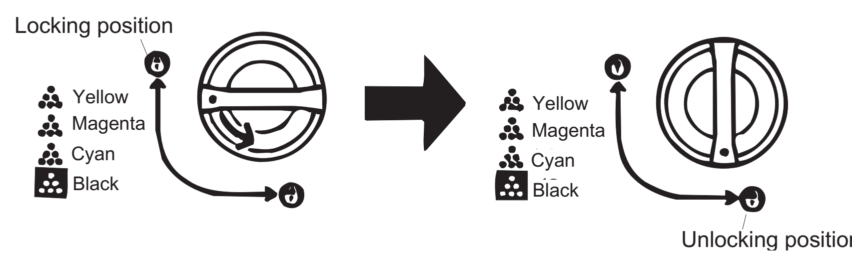


Figure 6-7. TONER CARTRIDGE Replacement 2

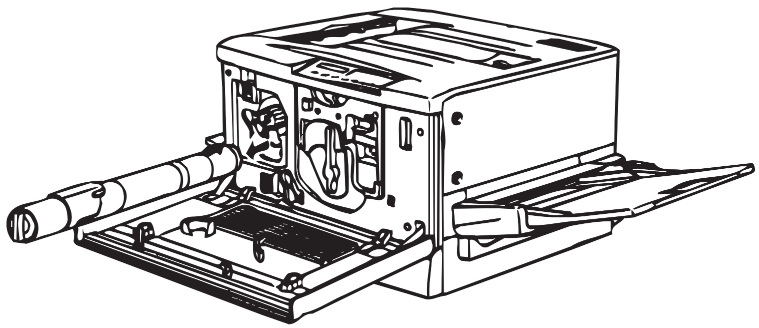


Figure 6-8. TONER CARTRIDGE Replacement 3

5. Hold a new TONER CARTRIDGE by the right and left ends and gently shake it up and down to distribute toner evenly.

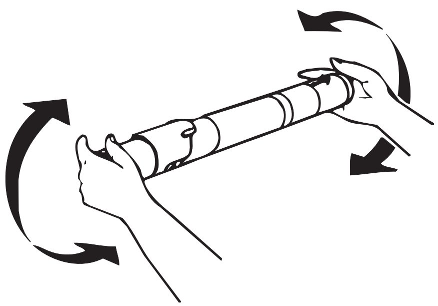


Figure 6-9. TONER CARTRIDGE Replacement 4

6. Hold the cartridge arrow side up. Insert it all the way into the cartridge slot. Then turn the cartridge knob clockwise 90 degrees so that the ● symbol on the knob is aligned with the locking symbol.

***NOTE:** If the TONER CARTRIDGE is not properly positioned, it may cause toner to spill inside the printer and brings out low print quality and printer malfunction and errors.*

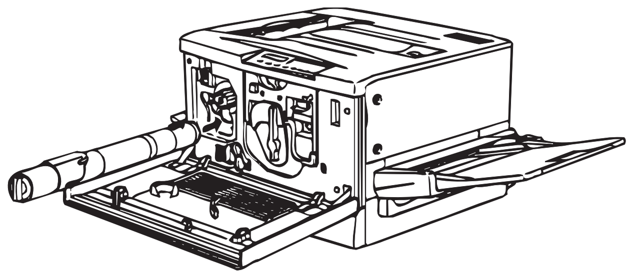


Figure 6-10. TONER CARTRIDGE Replacement 5

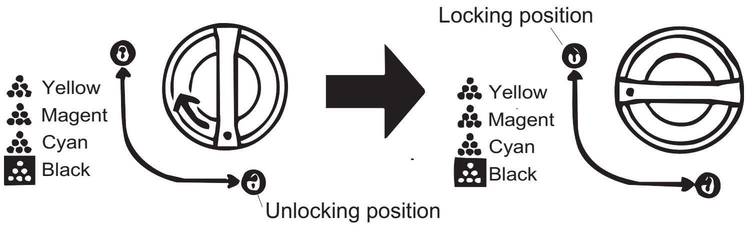


Figure 6-11. TONER CARTRIDGE Replacement 6

7. To replace the TONER CARTRIDGEs of other colors, perform the same operations described step 3 to 6.

8. Close the FRONT COVER and check that the LCD is indicating "Ready".

***NOTE:** The TONER CARTRIDGE counter is automatically reset when a new TONER CARTRIDGE is detected.*

6.3.2 OIL ROLL ASSEMBLY Replacement

OIL ROLL ASSEMBLY is equipped to fix toner image exactly on a paper with oil, without sticking a paper to the heat roll.

CAUTION

- **Never touch the OIL ROLL ASSEMBLY directly. Oil on the roll surface is harmless but should be washed away immediately if it gets on skin or clothes.**
- **Do not touch or mar the roll surface. Doing so may cause abnormal printing.**
- **Do not lean the OIL ROLL ASSEMBLY against anything.**
- **You must put the used OIL ROLL ASSEMBLY in a plastic bag and disposed of it as inflammable, strictly following the local regulation.**
- **Be sure to avoid touching the fuser and nearby parts, since you may get burnt if it if is still very hot.**

1. Draw out the FUSER ASSEMBLY all the way.
2. Hold the handle on the OIL ROLL ASSEMBLY and remove it.

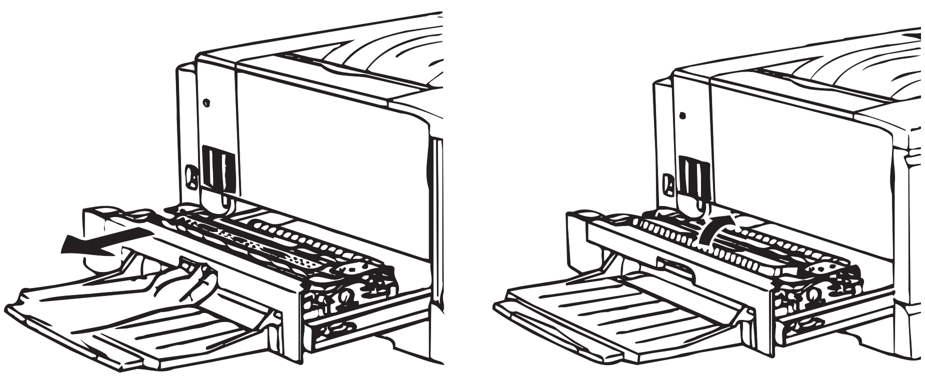


Figure 6-12. OIL ROLL ASSEMBLY Replacement 1

3. Remove the cover from a new OIL ROLL ASSEMBLY.
4. Remove 2 shipping pins from both sides of the OIL ROLL ASSEMBLY.

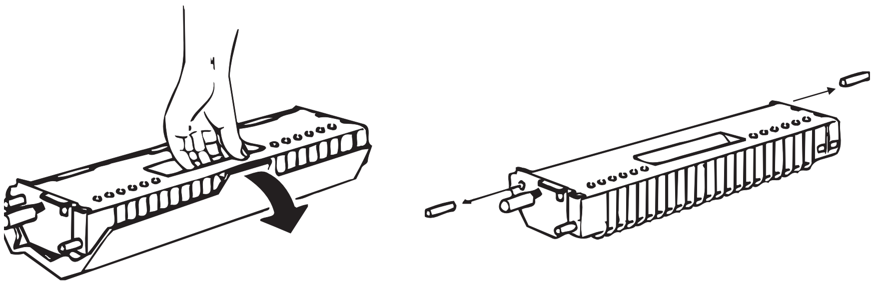


Figure 6-13. OIL ROLL ASSEMBLY Replacement 2

5. Inert the OIL ROLL ASSEMBLY into the printer body.

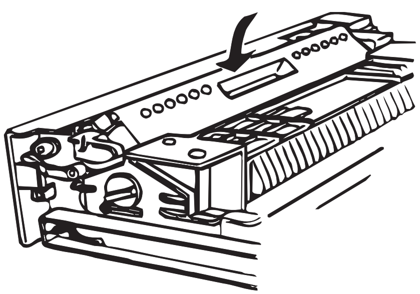


Figure 6-14. OIL ROLL ASSEMBLY Replacement 3

6. Close the FUSER ASSEMBLY.

6.3.3 DRUM CARTRIDGE Replacement

The photoconductor of the DRUM CARTRIDGE is exposed by the ROS ASSEMBLY and developed by the DEVELOPER ASSEMBLY, and transmits images onto the IBT.
A consumable DRUM CARTRIDGE ASSEMBLY contains the WASTE TONER BOX.

- **When replacing the DRUM CARTRIDGE, be sure to turn the printer power off.**
- **Never touch the surface of the photoconductor (a blue cylindrical part) with your hands. Also handle it with a care since scratches and oil from your skin can damage its surface and may affect print quality.**
- **Avoid exposing the DRUM CARTRIDGE to direct sunlight and strong light. Even in room light, do not leave it for more than 5 minutes.**
- **To avoid mar the photo conductor surface, work with it on a flat table.**
- **Never use toner in the WASTE TONER BOX again.**
- **Be sure to put the used DRUM CARTRIDGE in a plastic bag and disposed of it as inflammable, strictly following the local regulation.**

1. Turn the printer power on.
2. Open the FRONT COVER.

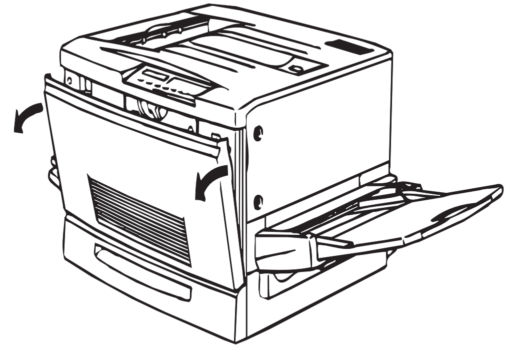


Figure 6-15. DRUM CARTRIDGE Replacement 1

3. Turn the TENSION LEVER in the direction indicated with the arrow. (See the left figure below.)
4. Turn the DRUM CARTRIDGE LEVER in the direction indicated with the arrow. (See the right figure below.)

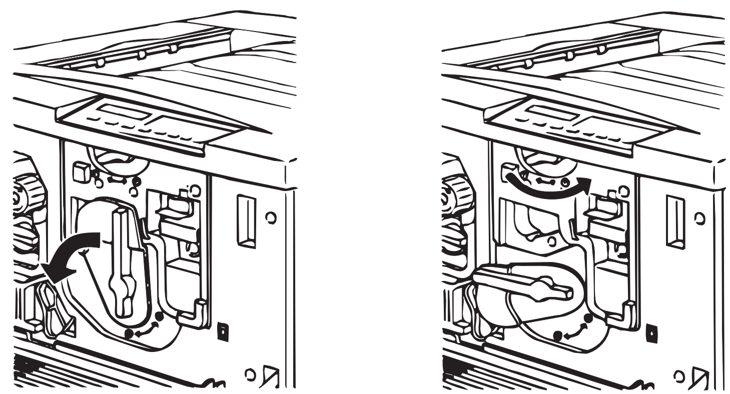


Figure 6-16. DRUM CARTRIDGE Replacement 2

5. Hold the handle in the DRUM CARTRIDGE and draw the DRAM CARTRIDGE out half way.
6. Hold the handle at the top of the DRUM CARTRIDGE and draw the DRUM CARTRIDGE all the way out carefully.

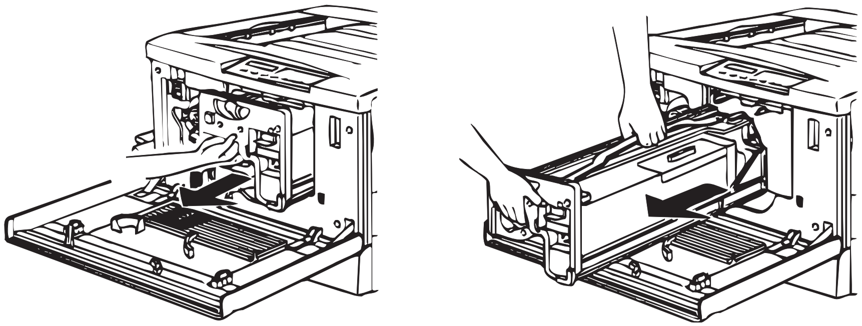


Figure 6-17. DRUM CARTRIDGE Replacement 3

7. Remove the protective sheet on a new DRUM CARTRIDGE.

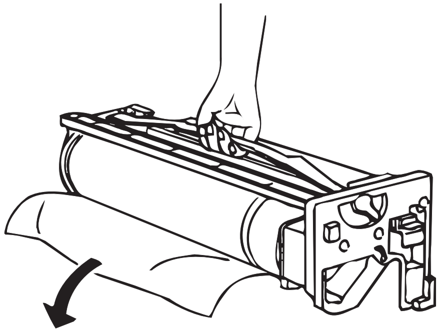


Figure 6-18. DRUM CARTRIDGE Replacement 4

8. Hold the handle of the top of the DRUM CARTRIDGE and place the right and left guide edges on the rails in the printer, and insert the DRUM CARTRIDGE straight into the printer. Be sure to push it enough to feel resistance.

NOTE: *Ensure that the photo conductor (a blue cyrindrical part) is not in contact with any parts inside the printer during its installation.*

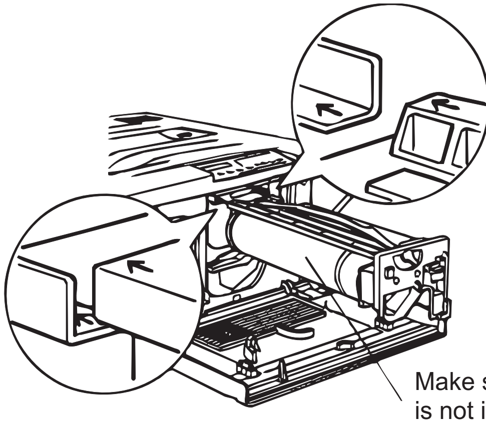


Figure 6-19. DRUM CARTRIDGE Replacement 5

9. Turn the lever on the DRUM CARTRIDGE in the direction indicated with the arrow.

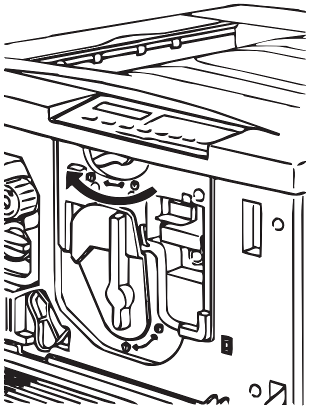


Figure 6-20. DRUM CARTRIDGE Replacement 6

10. Turn the TENSION LEVER in the direction indicated with the arrow to align it with the ● symbol.

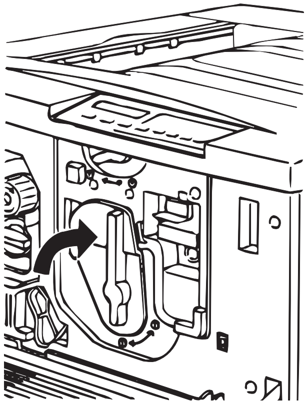


Figure 6-21. DRUM CARTRIDGE Replacement 6

11. Close the FRONT COVER.

6.3.4 WASTE TONER BOX Replacement

WASTE TONER BOX is used to collect toner that was not used for printing. It is not necessary to change the WASTE TONER BOX when the DRUM CARTRIDGE is also replaced, because a consumable DRUM CARTRIDGE contains a WASTE TONER BOX.

CAUTION

- **Never reuse the toner in the WASTE TONER BOX.**
- **Be sure to put the used WASTE TONER BOX in a plastic bag and disposed of it as inflammable, strictly following the local regulation.**

1. Open the FRONT COVER.
2. Hold the lever and push down the tab of the WASTE TONER BOX.

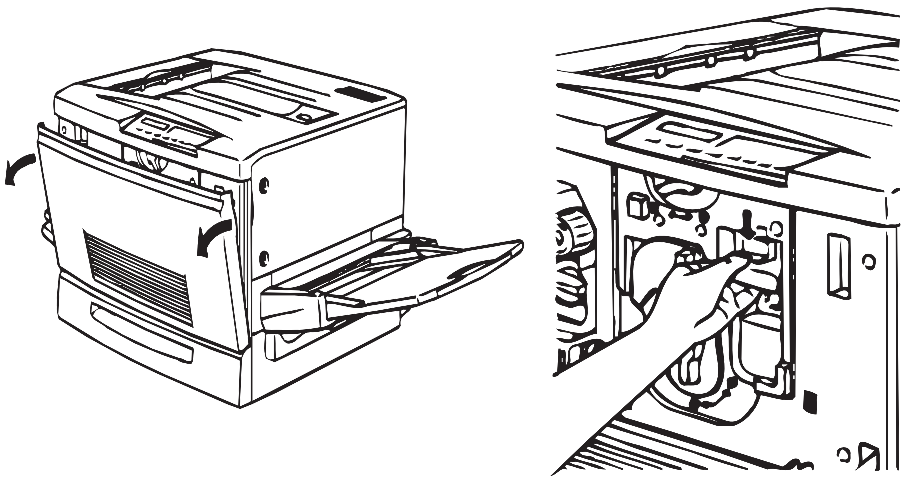


Figure 6-22. WASTE TONER BOX Replacement 1

3. Pull the WASTE TONER BOX straight out.

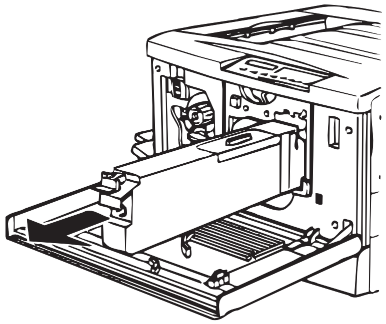


Figure 6-23. WASTE TONER BOX Replacement 2

4. Hold the handle on a new WASTE TONER BOX and insert it into the printer all the way until the tab clicks.

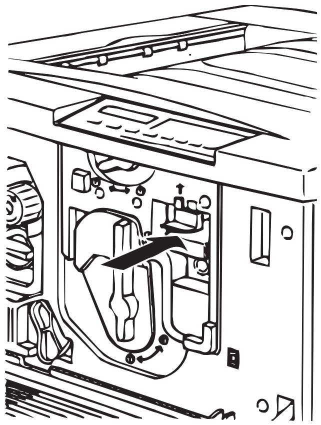


Figure 6-24. WASTE TONER BOX Replacement 3

5. Close the FRONT COVER. The printer automatically return to a ready status.

6.4 Regularly Replaced Parts Replacement

Table below list the regularly replaced parts and the corresponding reference sections.

If you have replaced any of the regularly replaced parts, perform the relevant counter reset in the Maintenance Menu.

Table 6-2. Regularly Replaced Part

Unit	Reference Section
2ND BTR ASSEMBLY	Section 3.2.11.5
MAIN FUSER ASSEMBLY	Section 3.2.12.3

6.5 Installation

This section describes provides a guideline for installing the printer on its place.

- Power

  Connect the printer power cable to a dedicated wall outlet. Do not share the outlet power with other extension cords. Make sure the power meets the power specifications defined for this printer. (The maximum power consumption of this printer is 1100W.)

WARNING

Plug the cord directly into the wall outlet which can provide more than the maximum demand power for the printer.

- Ground

  The printer must be properly grounded.

WARNING

Ground the printer by one of the following methods:
- **Wall outlet ground terminal**
- **Buried conductive material such as copper in the ground 650mm or deeper**
- **Grounded terminal (Type 3).**

NOTE:*Do not ground the printer to the following:*
-Gas pipes
-Telephone line grounding terminal
-Water pipes partially made of plastic

- Location
  - To operate properly, a certain amount of space around the printer is required. (For details, see Chapter 1/Section 1.2.4.)
  - The printer is located in an area where the temperature and humidity are moderate and stable.
  - The printer is located in an area away from water outlets, steamers, heaters, air conditioners or open flame.
  - The printer is located in an area that is free of dust, volatile gases or flammable gases.
  - The printer is shielded from the direct ray of the sun.
  - The printer has recommended space around all sides for proper ventilation.
  - The printer is sitting on a level and stable surface.
- Unpacking

  When unpacking the printer from the carton, make sure the packed items listed below and that they are not damaged.

  1) Printer (Including the UNIVERSALLY TRAY)
  2) DRUM CARTRIDGE
  3) TONER CARTRIDGE Y
  4) TONER CARTRIDGE M
  5) TONER CARTRIDGE C
  6) TONER CARTRIDGE BK
  7) OIL ROLL ASSEMBLY
  8) MSI TRAY ASSEMBLY
  9) EXIT TRAY ASSEMBLY
  10) Power Cord
  11) Accessory box

- Installation Procedure

  The following describes the installation procedures. For details, see the User's Guide.

CAUTION

- **The printer weighs about 69 kg. To prevent injury, the printer should be carried by four persons.**
- **Lift the printer with both hands putting into the dented holds. If you hold on to any other parts, you may drop or damage the printer.**
- **Lift the printer with your knees bent to prevent back injuries.**

NOTE:*Keep the protection sheet, spacers and packing materials in case of moving the printer in future.*

1) Open the carton and remove the packing materials. Place the printer where it is to be installed.
2) Remove the protective tapes securing the printer.
3) Check the items that are packed with the printer.
4) Install the MSI TRAY ASSEMBLY on the MSI ASSEMBLY.
5) Install the EXIT TRAY ASSEMBLY on the FUSER ASSEMBLY.
6) Open the FRONT COVER ASSEMBLY.

NOTE:*Do not touch the drum surface of the Drum Cartridge.*

7) Install the DRUM CARTRIDGE in the printer.
8) Remove the spacer from the area where the toner cartridges are installed. (The spacer prevents the toner cartridges from rotating.)

9) Remove a total of 4 spacers from where the toner cartridges are inserted.

10) Unpack the TONER CARTRIDGEs. Hold both ends of each cartridge and shake several times.

11) Rotate the ROTARY FRAME ASSEMBLY and install the TONER CARTRIDGEs.

NOTE:*Install each TONER CARTRIDGE by matching the toner color with the color of the installation window.*

NOTE:*To rotate the ROTARY FRAME ASSEMBLY, press up the ROTARY LATCH LEVER and rotate the ROTARY KNOB ASSEMBLY clockwise.*

12) Close the FRONT COVER ASSEMBLY.

13) Open the MAIN P/H ASSEMBLY. Remove the two spacers from the MAIN P/H ASSEMBLY.

14) Close the MAIN P/H ASSEMBLY.

15) Open the FUSER ASSEMBLY. Remove the packing materials (expanded polystyrene).

16) Open the OIL ROLL ASSEMBLY. Remove the protective cover and locking pins.

NOTE:*Keep the OIL ROLL ASSEMBLY on a level position as it is installed in the printer. The internal fuser oil may leak if the OIL ROLL ASSEMBLY is in a vertical or inclined position.*

NOTE:*Do not touch the surface of the white roll in the OIL ROLL ASSEMBLY because the white roll is filled with fuser oil.*

17) Install the OIL ROLL ASSEMBLY above the FUSER ASSEMBLY.

18) Close the FUSER ASSEMBLY.

19) Draw out the UNIVERSAL TRAY. Remove the packing material (expanded polystyrene) from the UNIVERSAL TRAY.

20) Press down the BOTTOM PLATE ASSEMBLY in the UNIVERSAL TRAY and lock it at the bottom.

21) Put paper in the UNIVERSAL TRAY.

NOTE:*When putting paper in the tray, be sure to:*

- Align the four corners of the paper before putting it in the tray.
- Place all paper under the pawls at the front right corner of the tray.
- Set the paper guide corresponding to the paper size.

22) Push in the UNIVERSAL TRAY.

23) Put paper in the MSI ASSEMBLY.

NOTE:*When putting paper in the tray, be sure to:*

- Align the four corners of the paper before putting it in the tray.
- Set a stack of paper under the stopper in the front right corner of the tray.
- Set the paper guide corresponding to the paper size.

24) Connect the power cord.

25) Turn on the printer by the power switch.

26) Run a test print from each paper cassette to confirm that the printer works fine.

27) Connect the printer to the PC and send print data to the printer.

CHAPTER

A

APPENDIX

Table of Contents

A.1 Parts List

This chapter describes the printer parts. The parts are grouped into 14 major plates. These plates are divided further into the following 27 smaller plates. Each plate has an illustration and a corresponding parts list.

* PL1.1	Cover
* PL2.1	Paper Tray I
* PL2.2	Paper Tray II
* PL3.1	Paper Feeder
* PL4.1	Multi Sheet Inserter I
* PL4.2	Multi Sheet Inserter II
* PL4.3	Multi Sheet Inserter III
* PL5.1	Paper Transportation I
* PL5.2	Paper Transportation II
* PL6.1	Xerographics
* PL7.1	Development I
* PL7.2	Development II
* PL8.1	IBT I
* PL8.2	IBT II
* PL8.3	IBT III
* PL8.4	IBT IV
* PL9.1	Fusing I
* PL9.2	Fusing II
* PL9.3	Fusing III
* PL9.4	Fusing IV
* PL10.1	Paper Exit I
* PL10.2	Paper Exit II
* PL11.1	Drive
* PL12.1	Frame
* PL13.1	Electrical I
* PL13.2	Electrical II
* PL14.1	Controller

A.1.1 How to Use the Parts List

Followings are the points to note when using the part list and exploded diagrams.

- The numbers in each illustration correspond to the parts list number for that illustration.
- PL “X.Y.Z” indicates part Z in Plate “X.Y.”
- The capital letters shown in the illustrations stand for the following:

  S: screw
  E: E ring
  KL: KL clip
  C: C ring
  N: nut

- The arrowheads in the illustrations indicate assemblies made up of lower parts with their numbers.
- A circled capital letter is connected to the same circled capital letter in the illustration.
- A “with 2-5” in the illustrations or list shows that the part includes items 2, 3, 4 and 5. A “with 2-5, PL6.1.1” shows that the part includes items 2, 3, 4 and 5 of the plate and also includes item 1 of plate 6.1.
- An asterisk (*) indicates that there is a note about the part on the same page.

NOTE: *For spare parts, see the Spare Parts List (published separately).*

NOTE: *For harness and wire connectors (P/J), see Section A.3 “Wiring Diagrams”.*

A.1.2 Parts List Tables

Table A-1. Parts List (1/9)

No.	PL No.	Part Name	Reference
1	PL 1.1.1	FRONT COVER ASSY	3.2.4.1
2	PL 1.1.4	HINGE PLATE	
3	PL 1.1.5	FRONT LOWER COVER	3.2.4.2
4	PL 1.1.10	INNER COVER ASSY (With 11-13)	3.2.4.4
5	PL 1.1.12	ROTARY LATCH LEVER	
6	PL 1.1.13	ROTARY LATCH SPRING	
7	PL 1.1.20	TOP COVER ASSY (With 21, 22)	3.2.4.3
8	PL 1.1.22	STOPPER COVER	
9	PL 1.1.30	REAR COVER ASSY	3.2.4.5
10	PL 1.1.32	FILTER ASSY	3.2.4.6
11	PL 1.1.33	O/H COVER	3.2.4.5
12	PL 1.1.40	LEFT LOWER COVER	3.2.4.7
13	PL 1.1.50	RIGHT COVER ASSY	3.2.4.8
14	PL 1.1.60	OPERATION PANEL	3.2.4.9
15	PL 2.1.1	UNIVERSAL TRAY	3.2.5.1
16	PL 2.2.3	PLATE LINK SPRING	
17	PL 2.2.4	PLATE LINK	
18	PL 2.2.5	BOTTOM PLATE ASSY	3.2.5.3
19	PL 2.2.6	TRAY N/F SPRING	3.2.5.3
20	PL 2.2.8	FRONT GUIDE	3.2.5.2
21	PL 2.2.9	FRONT SNUBBER	3.2.5.2
22	PL 2.2.10	SNUBBER STOPPER	
23	PL 2.2.11	REAR GUIDE ASSY	3.2.5.3
24	PL 2.2.12	REAR GUIDE SPRING	
25	PL 2.2.16	END GUIDE	3.2.5.3
26	PL 2.2.17	SECTOR GEAR	3.2.5.3
27	PL 2.2.18	TRAY SIZE ACTUATOR	3.2.5.3
28	PL 3.1.1	FEED ROLL ASSY (With 2-5)	3.2.6.5
29	PL 3.1.3	FEED ROLL	3.2.6.3
30	PL 3.1.6	BEARING	3.2.6.5

Table A-2. Parts List (2/9)

No.	PL No.	Part Name	Reference
31	PL 3.1.7	FEED GEAR	3.2.6.4/5
32	PL 3.1.8	FEED SPRING	3.2.6.5
33	PL 3.1.9	FEED SOLENOID	3.2.6.4
34	PL 3.1.10	FEED IDLER GEAR	
35	PL 3.1.11	TURN ROLL ASSY	3.2.6.2
36	PL 3.1.12	BEARING	
37	PL 3.1.13	TURN REAR BEARING	
38	PL 3.1.14	TURN GEAR	
39	PL 3.1.15	TURN ARM ASSY	
40	PL 3.1.16	TURN ARM SPRING	3.2.6.2
41	PL 3.1.17	TURN CHUTE	3.2.6.2
42	PL 3.1.18	TURN IN CHUTE	3.2.6.1
43	PL 3.1.19	FEED SHAFT GUIDE	3.2.6.2/5
44	PL 3.1.20	TRAY STOPPER	3.2.6.2
45	PL 3.1.23	SIZE SWITCH ASSY	3.2.6.6
46	PL 3.1.30	TRAY N/P SENSOR ASSY (With 31-35)	3.2.6.7
47	PL 3.1.32	TRAY NO PAPER SENSOR	3.2.6.9
48	PL 4.1.1	MSI ASSY (With 2-5)	3.2.7.2
49	PL 4.1.3	MSI FRONT COVER	3.2.7.3
50	PL 4.1.4	MSI REAR COVER	3.2.7.4
51	PL 4.1.5	MSI HOLDER	3.2.7.11
52	PL 4.1.10	MSI TRAY ASSY	3.2.7.1
53	PL 4.2.3	MSI HARNESS COVER	3.2.7.5
54	PL 4.2.4	MSI TOP COVER ASSY (With 5-8)	3.2.7.5
55	PL 4.2.5	MSI TOP COVER	
56	PL 4.2.6	MSI EDGE SENSOR	3.2.7.6
57	PL 4.2.7	MSI SHORT N/P SENSOR	3.2.7.7
58	PL4.2.8	MSI N/P ACTUATOR	
59	PL4.2.9	MSI ROLL ASSY (With 10-14)	3.2.7.12

Table A-3. Parts List (3/9)

No.	PL No.	Part Name	Reference
60	PL 4.2.11	PICK UP ROLL	3.2.7.8
61	PL 4.2.15	BEARING	3.2.7.12
62	PL 4.2.16	LEVER STOPPER	
63	PL 4.2.17	PICK UP CAM GEAR	3.2.7.10/12
64	PL 4.2.18	CAM GEAR SPRING	
65	PL 4.2.19	PICK UP GEAR	3.2.7.11/12
66	PL 4.2.20	PICK UP SPRING	3.2.7.11/12
67	PL 4.2.21	PICK UP SOLENOID	3.2.7.10
68	PL 4.2.22	GEAR LEVER	
69	PL 4.2.23	GEAR LEVER SPRING	
70	PL 4.2.24	BEARING	
71	PL 4.2.25	MSI SHAFT	3.2.7.11
72	PL 4.2.26	MSI CLUTCH	3.2.7.11
73	PL 4.2.27	MSI GEAR	3.2.7.11
74	PL 4.2.28	MSI REAR BEARING	
75	PL 4.2.29	CLUTCH BRACKET	3.2.7.11/12
76	PL 4.3.3	RETARD PAD ASSY	3.2.7.9
77	PL 4.3.4	RETARD SPRING	3.2.7.9
78	PL 4.3.5	OIL DAMPER GEAR	
79	PL 4.3.6	MSI HARNESS ASSY	
80	PL 4.3.7	MSI N/F FRONT SPRING	3.2.7.13
81	PL 4.3.8	MSI N/F REAR SPRING	3.2.7.13
82	PL 4.3.9	MSI BOTTOM ASSY (With 10-20)	3.2.7.13
83	PL 4.3.10	MSI BOTTOM PLATE	
84	PL 4.3.11	MSI BASE TRAY	3.2.7.14
85	PL 4.3.12	MSI FRONT GUIDE	
86	PL 4.3.13	MSI GUIDE SPRING	
87	PL 4.3.14	MSI REAR GUIDE	
88	PL 4.3.15	GUIDE BLOCK	

Table A-4. Parts List (4/9)

No.	PL No.	Part Name	Reference
89	PL 4.3.16	SENSOR	3.2.7.14
90	PL 5.1.1	MAIN P/H ASSY (With 2-20)	3.2.8.1
91	PL 5.1.4	P/H TURN CHUTE ASSY	3.2.8.3
92	PL 5.1.5	PRE-REGI. CHUTE ASSY	3.2.8.6
93	PL 5.1.6	REGI. CHUTE ASSY	3.2.8.4
94	PL 5.1.7	P/H FRONT RAIL-S	3.2.8.1
95	PL 5.1.8	P/H FRONT RAIL-L	3.2.8.1
96	PL 5.1.9	P/H REAR RAIL-S	3.2.8.1
97	PL 5.1.10	P/H REAR RAIL-L	3.2.8.1
98	PL 5.1.20	MAIN P/H COVER	3.2.7.2
99	PL 5.1.30	LATCH ARM ASSY	
100	PL 5.2.3	PRE-REGI. KNOB ASSY	3.2.8.6
101	PL 5.2.4	PRE-REGI. ROLL ASSY	3.2.8.6
102	PL 5.2.5	PRE-REGI. BEARING	3.2.8.6
103	PL 5.2.6	PRE-REGI. GEAR2	3.2.8.6
104	PL 5.2.7	TURN IDLER GEAR	3.2.8.6
105	PL 5.2.8	PRE-REGI. CLUTCH	3.2.8.5
106	PL 5.2.10	PRE-REGI. GEAR 1	3.2.8.5
107	PL 5.2.11	PRE-REGI. GEAR ASSY	3.2.8.5
108	PL 5.2.12	PRE-REGI. GEAR 3	
109	PL 5.2.13	PRE-REGI. GEAR 5	
110	PL 5.2.14	PRE-REGI. GEAR 6	
111	PL 5.2.15	CLUTCH	3.2.8.7
112	PL 5.2.16	REGI. METAL ROLL	3.2.8.9
113	PL 5.2.17	REGI. UPPER BEARING	3.2.8.7/9
114	PL 5.2.18	REGI. OUT GEAR	3.2.8.9
115	PL 5.2.19	REGI. BRAKE ASSY (With 20-22)	3.2.8.8/9/10
116	PL 5.2.20	CLUTCH	3.2.8.8
117	PL 5.2.21	REGI. BRAKE GEAR	3.2.8.8
118	PL 5.2.23	REGI. GEAR	3.2.8.10
119	PL 5.2.24	REGI. RUBBER ROLL	3.2.8.10

Table A-5. Parts List (5/9)

No.	PL No.	Part Name	Reference
120	PL 5.2.25	REGI. LOWER BEARING	3.2.8.10
121	PL 5.2.26	REGI. FRONT SPRING	3.2.8.10
122	PL 5.2.27	REGI. REAR SPRING	3.2.8.10
123	PL 5.2.28	REGI. SENSOR	3.2.8.11
124	PL 5.2.31	FRONT OHP SENSOR	3.2.8.12
125	PL 5.2.32	REAR OHP SENSOR	3.2.8.13
126	PL 5.2.33	REGI. HARNESS ASSY	
127	PL 6.1.1	ROS ASSY	3.2.9.3
128	PL 6.1.10	DRUM CARTRIDGE *1	3.2.9.1
129	PL 6.1.12	WASTE TONER BOX (With 11-13)*1	3.2.9.2
130	PL 6.1.20	ADC SENSOR ASSY	3.2.9.4
131	PL 6.1.30	ERASE LAMP ASSY	3.2.9.8
132	PL 6.1.40	XL RAIL ASSY (With 41-46)	3.2.9.5
133	PL 6.1.42	WASTE TONER SENSOR	3.2.9.6
134	PL 6.1.43	TONER BOX SENSOR	3.2.9.7
135	PL 6.1.44	TONER BOX HARNESS	
136	PL 6.1.50	BCR CONNECTOR ASSY	
137	PL 6.1.70	CRUM CONNECTOR ASSY	3.2.11.7
138	PL 7.1.1	TONER CARTRIDGE Y *1	3.2.10.1
139	PL 7.1.2	TONER CARTRIDGE M *1	3.2.10.1
140	PL 7.1.3	TONER CARTRIDGE C *1	3.2.10.1
141	PL 7.1.4	TONER CARTRIDGE BK *1	3.2.10.1
142	PL 7.1.10	DEVELOPER ASSY Y (With 11-13, 50)	3.2.10.2
143	PL 7.1.13	DEVELOPER Y	3.2.10.3
144	PL 7.1.20	DEVELOPER ASSY M (With 21-23, 50)	3.2.10.2
145	PL 7.1.23	DEVELOPER M	3.2.10.3
146	PL 7.1.30	DEVELOPER ASSY C (With 31-33, 50)	3.2.10.2
147	PL 7.1.33	DEVELOPER C	3.2.10.3
148	PL 7.1.40	DEVELOPER ASSY BK (With 41-43, 50)	3.2.10.2
149	PL 7.1.44	DEVELOPER BK	3.2.10.3

**1: Consumables*

Table A-6. Parts List (6/9)

No.	PL No.	Part Name	Reference
150	PL 7.2.4	ROTARY REAR BEARING	3.2.10.5
151	PL 7.2.5	ROTARY LATCH ASSY	3.2.10.7/2
152	PL 7.2.10	DEVE. DISCHARGE ASSY	
153	PL 7.2.11	DEVE. CONTACT ASSY	
154	PL 7.2.22	ROTARY SENSOR	3.2.10.4
155	PL 7.2.26	CARTRIDGE SENSOR (With 29, 30)	3.2.10.6
156	PL 7.2.27	CART. SENSOR HARNESS	3.2.10.6
157	PL 7.2.30	USED CART. SENSOR	3.2.10.7
158	PL 8.1.3	TRANSFER ASSY	3.2.11.2
159	PL 8.1.4	TENSION LEVER	3.2.11.1
160	PL8.1.10	2ND BTR CAM ASSY	3.2.11.6
161	PL 8.1.11	2ND BTR GEAR B3	
162	PL 8.1.12	BTR BEARING-4	3.2.11.6
163	PL 8.1.13	BTR BEARING-6	3.2.11.6
164	PL 8.1.15	SOLENOID	3.2.11.3
165	PL 8.1.20	2ND BTR ASSY *2	3.2.11.5
166	PL 8.1.30	BELT CLEANER ASSY	3.2.11.4
167	PL 8.1.31	CLEANER SUPPORT ASSY	
168	PL 8.1.40	AUGER HIGH ASSY	3.2.11.7
169	PL 8.2.2	IBT BELT ASSY	3.2.11.8
170	PL 8.2.12	TRO SENSOR	3.2.11.9
171	PL 8.3.5	TORQUE GEAR ASSY	
172	PL 9.1.1	FUSER ASSY (With 2,3)	3.2.12.2
173	PL 9.1.2	MAIN FUSER ASSY *2	3.2.12.3
174	PL 9.1.3	FUSER TRAY ASSY	
175	PL 9.2.9	PRESSURE ROLL	3.2.12.11
176	PL 9.1.10	OIL ROLL ASSY *1	3.2.12.1

**1: Consumables*
**2: Part requires periodical replacement*

Table A-7. Parts List (7/9)

No.	PL No.	Part Name	Reference
177	PL 9.2.10	BEARING	3.2.12.14/17/ 18/20
178	PL 9.2.12	HEAT ROLL	3.2.12.10
179	PL 9.2.13	BEARING	3.2.12.10
180	PL 9.2.14	H/R GEAR	3.2.12.10
181	PL 9.2.15	H/R RING	3.2.12.10
182	PL 9.2.19	P/R HEATER	3.2.12.6
183	PL 9.2.20	H/R HEATER	3.2.12.5
184	PL 9.2.23	FUSER UPPER ASSY	3.2.12.4
185	PL 9.2.24	TEMP. SENSOR ASSY	3.2.12.12
186	PL 9.2.25	SENSOR	3.2.12.8
187	PL 9.2.26	LOWER GUIDE ASSY (With 27-31)	3.2.12.7
188	PL 9.2.32	UPPER GUIDE ASSY (With 33-37)	3.2.12.9
189	PL 9.2.33	EXIT UPPER GUIDE	3.2.12.9
190	PL 9.3.3	FUSER TRAY LEVER	3.2.12.16/20
191	PL 9.3.4	FUSER TRAY CAP-B	
192	PL 9.3.7	EXIT-1 ROLL ASSY	3.2.12.19
193	PL 9.3.8	EXIT-1 GEAR	3.2.12.19
194	PL 9.3.9	BEARING	3.2.12.19
195	PL 9.3.10	EXCHANGE CHUTE	3.2.12.13
196	PL 9.3.11	EXCHANGE SPRING	
197	PL 9.3.12	F/U EXIT ELIMINATOR	
198	PL 9.3.16	EXCHANGE SOLENOID	3.2.12.15
199	PL 9.3.17	IDLER GEAR FT1	
200	PL 9.3.18	IDLER GEAR FT2	
201	PL 9.3.19	BEARING	
202	PL 9.3.21	SOLENOID	3.2.12.14
203	PL 9.3.22	OIL CAM ASSY	3.2.12.16
204	PL 9.3.25	CRU SWITCH ASSY	3.2.12.20
205	PL 9.3.26	FUSER HARNESS ASSY	
206	PL 9.4.3	FUSER TRAY CAP-A	

Table A-8. Parts List (8/9)

No.	PL No.	Part Name	Reference
207	PL 9.4.4	SENSOR	
208	PL 9.4.5	FUSER IN HARNESS	
209	PL 9.4.6	FUSER IN HOLDER	
210	PL 9.4.14	FUSER COLLAR	
211	PL 9.4.15	INPUT GEAR FT1	3.3.1
212	PL 9.4.16	INPUT GEAR FT2	
213	PL 9.4.17	INPUT STUD	
214	PL 9.4.18	BEARING	
215	PL 9.4.22	CLEANER CAM GEAR	
216	PL 9.4.23	SOLENOID	3.2.12.17
217	PL 9.4.24	BEARING	3.2.12.18
218	PL 9.4.25	BEARING	
219	PL 9.4.26	CLEANER CAM ASSY	3.2.12.18
220	PL 9.4.27	CLEANER CAM PIN	3.2.12.18
221	PL 9.4.28	CLEANER CAM	3.2.12.18
222	PL 9.4.29	CLN CAM GUIDE	
223	PL 9.4.30	CLN CAM GUIDE HOLDER	
224	PL 10.1.1	EXIT LOWER ASSY	3.2.13.3
225	PL 10.1.2	EXIT UPPER ASSY	3.2.13.2
226	PL 10.1.10	EXIT TRAY ASSY (With 11-15)	3.2.13.1
227	PL 10.2.5	EXIT-2 ROLL ASSY	3.2.13.4
228	PL 10.2.6	BEARING	3.2.13.5
229	PL 10.2.7	EXIT-3 ROLL ASSY	3.2.13.5
230	PL 10.2.8	BEARING	3.2.13.5
231	PL 10.2.9	SPUR GEAR	3.2.13.4/5
232	PL 10.2.10	EXIT IDLER GEAR	
233	PL 10.2.12	TOP EXIT SENSOR	3.2.13.7
234	PL 10.2.13	EXIT CHUTE SWITCH	3.2.13.8
235	PL 10.2.14	EXIT HARNESS	
236	PL 10.2.15	FUSER FAN	3.2.13.6
237	PL 11.1.1	P/H DRIVE ASSY	3.2.14.1

Table A-9. Parts List (9/9)

No.	PL No.	Part Name	Reference
238	PL 11.1.20	ROTARY MOTOR ASSY	3.2.14.4
239	PL 11.1.21	ROTARY MOTOR PWB	3.2.14.3
240	PL 11.1.22	DISPENSE MOTOR ASSY	3.2.14.5
241	PL 11.1.23	DEVE. CLUTCH ASSY	3.2.14.9
242	PL 12.1.3	FRAME FOOT	
243	PL 12.1.4	DEVE. TIE PLATE	3.2.15.1
244	PL 13.1.1	LVPS	3.2.16.1
245	PL 13.1.2	HVPS	3.2.16.2
246	PL 13.1.3	TOP COVER SWITCH	3.2.16.3
247	PL 13.1.5	DEVE. FAN	3.2.16.4
248	PL 13.1.13	FUSER CONNECTOR	
249	PL 13.1.22	MAIN HARNESS ASSY	
250	PL 13.1.30	POWER CODE	
251	PL 13.2.1	MCU PWB	3.2.16.5
252	PL 13.2.1.1	MCU ROM	
253	PL 13.2.2	COMMUNICATION ASSY	
254	PL 13.2.3	FRONT COVER SWITCH R	3.2.16.6
255	PL 13.2.4	FRONT COVER SWITCH L	3.2.16.7
256	PL 13.2.5	ENVIRONMENT SENSOR	3.2.16.8
257	PL 13.2.20	P/H HARNESS ASSY	
258	PL 13.2.21	VIDEO HARNESS	
259	PL 13.2.22	ROS HARNESS	
260	PL 14.1.1	CONT. CHASSIS ASSY	3.2.17.3
261	PL 14.1.2	CONTROLLER FAN	3.2.17.2
262	PL 14.1.10	CONTROLLER PWB	3.2.17.1
263	PL 14.1.32	OPTION PLATE	

A.1.3 Exploded Diagrams

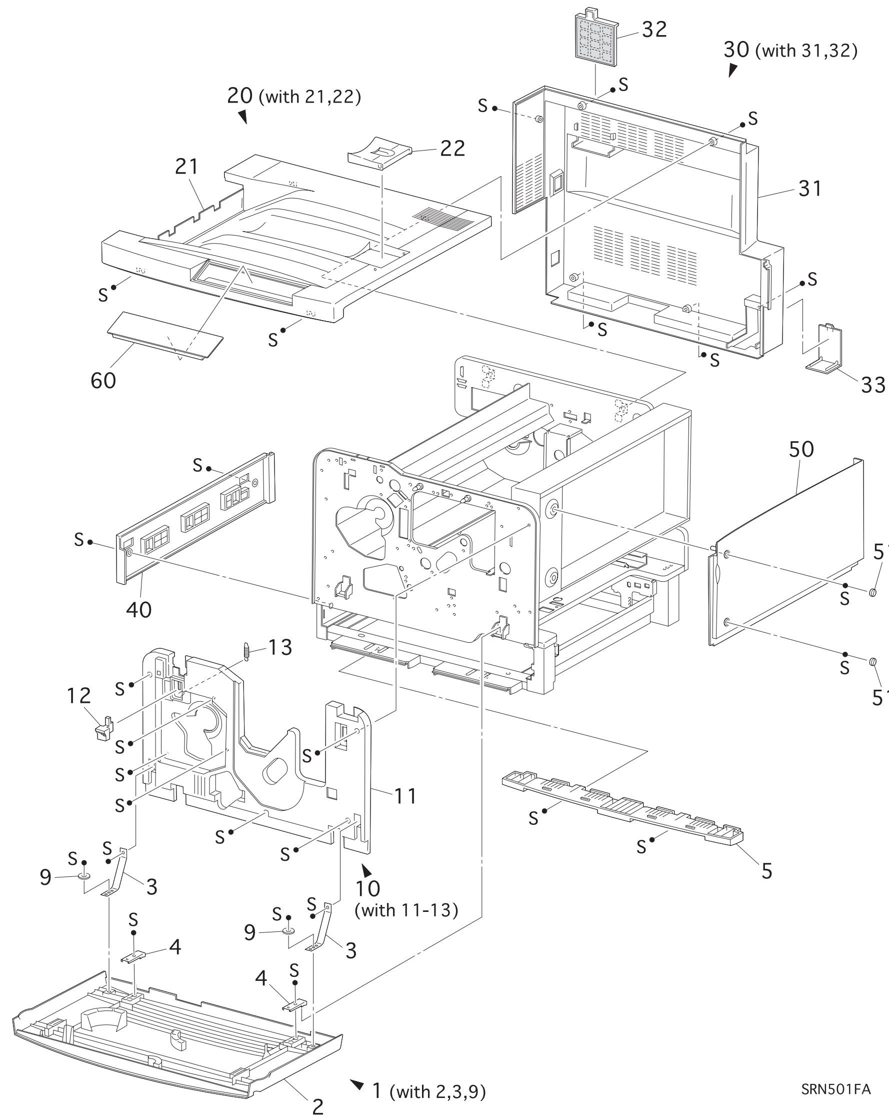


Figure A-1. PL1.1 Cover

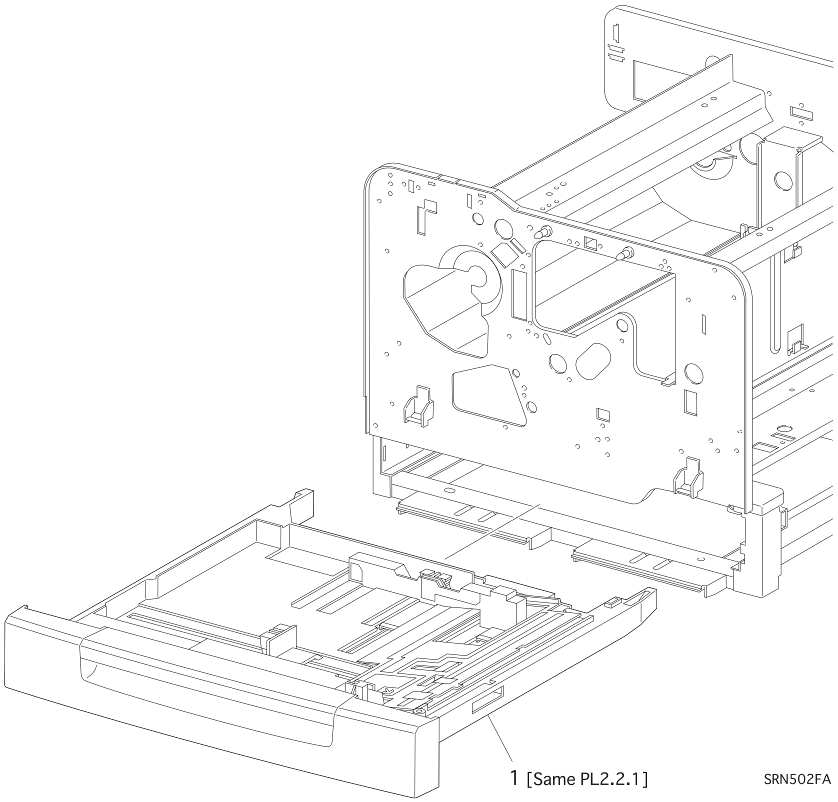


Figure A-2. PL2.1 Paper Tray I

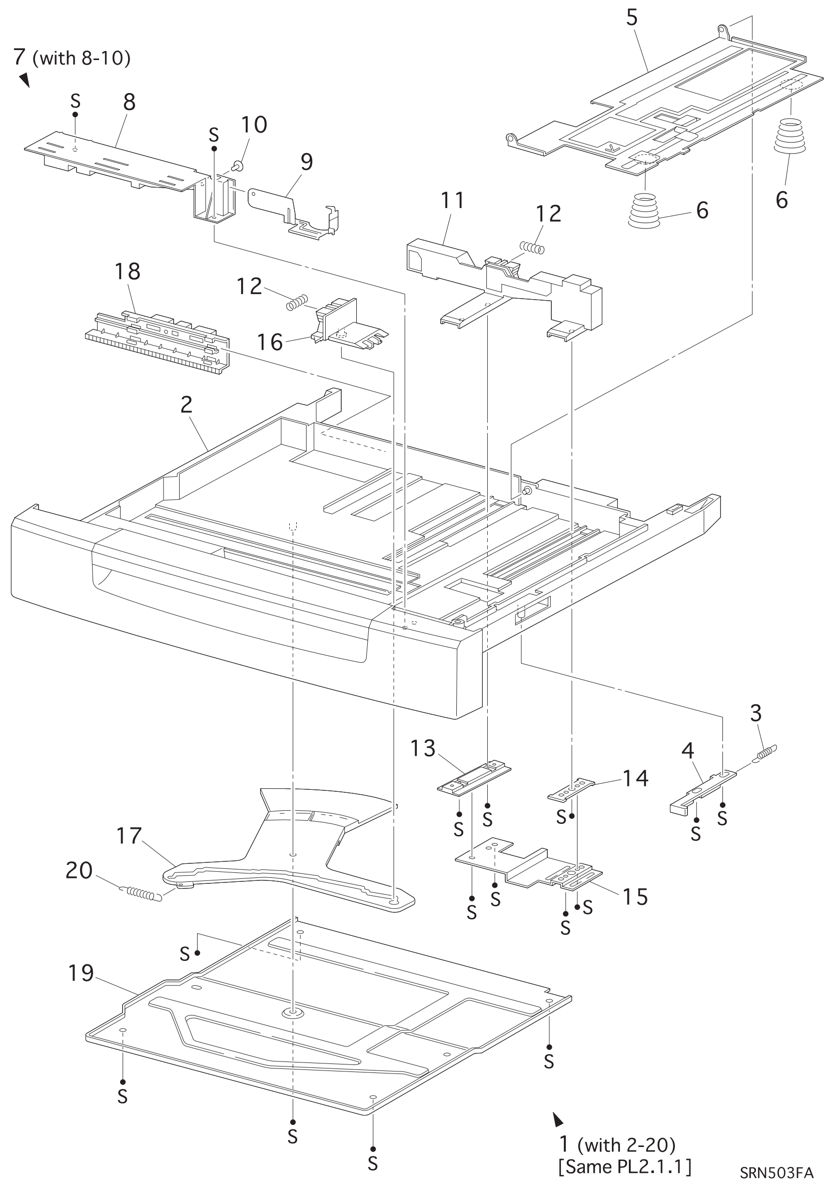


Figure A-3. PL2.2 Paper Tray II

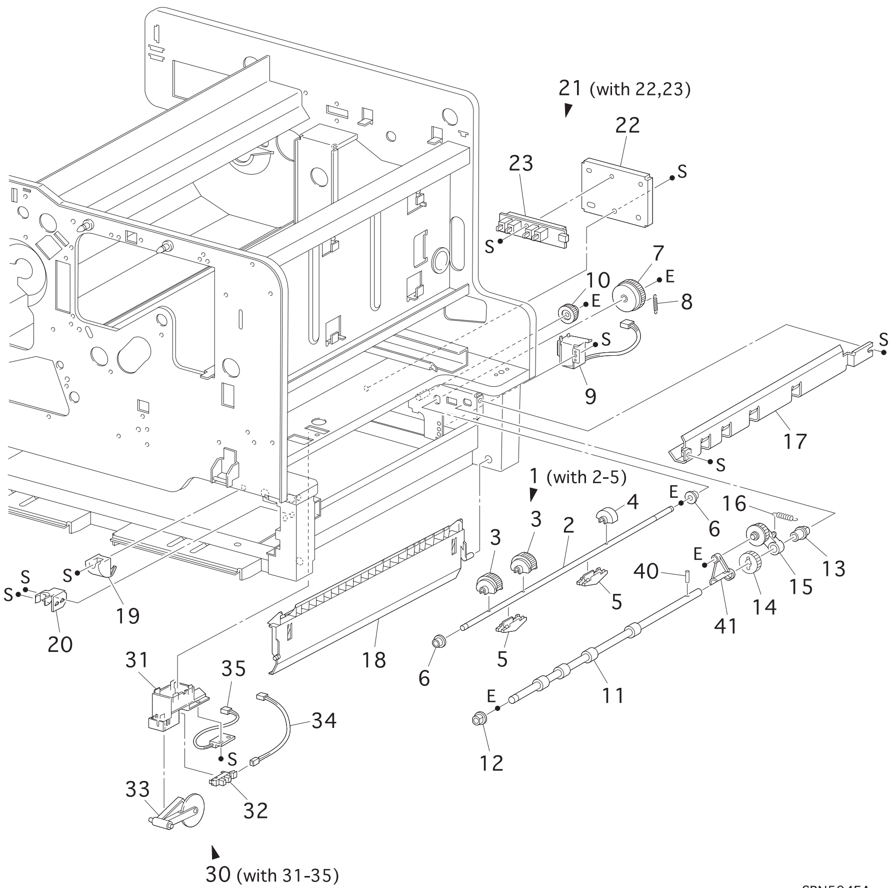


Figure A-4. PL3.1 Paper Feeder

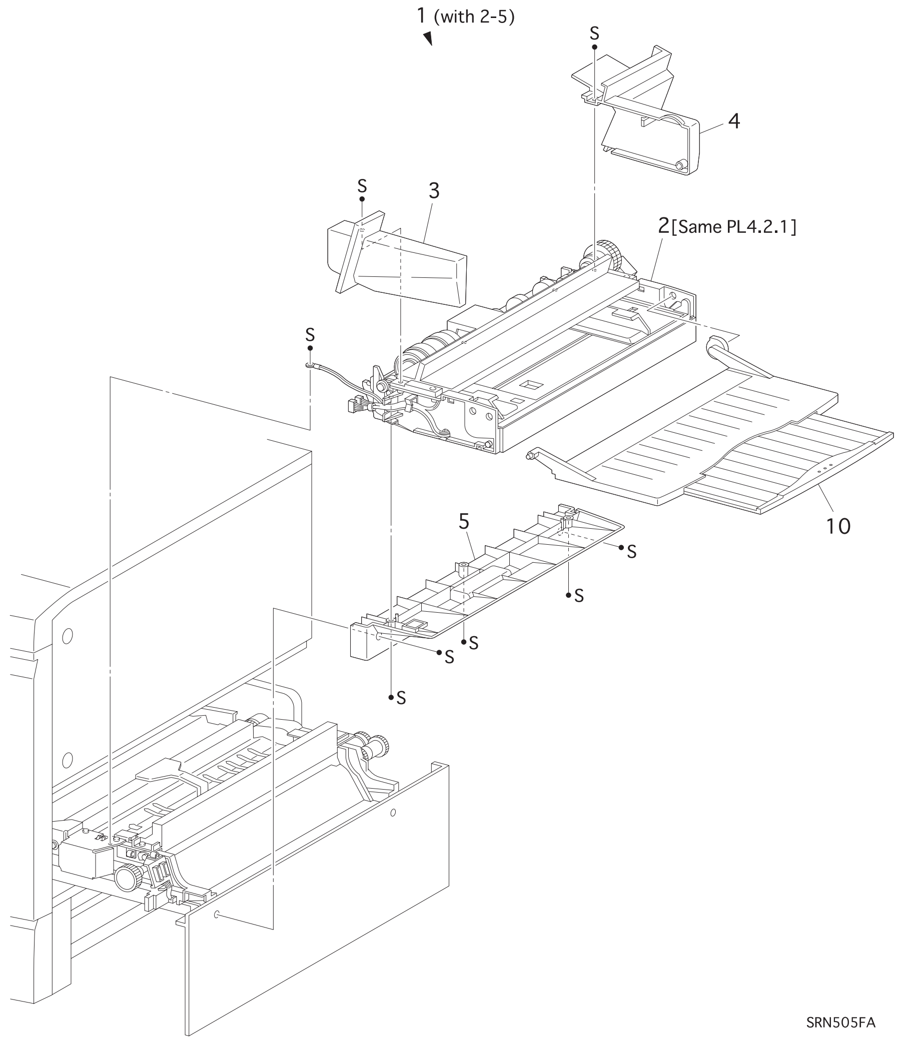


Figure A-5. PL4.1 Multi Sheet Insert I

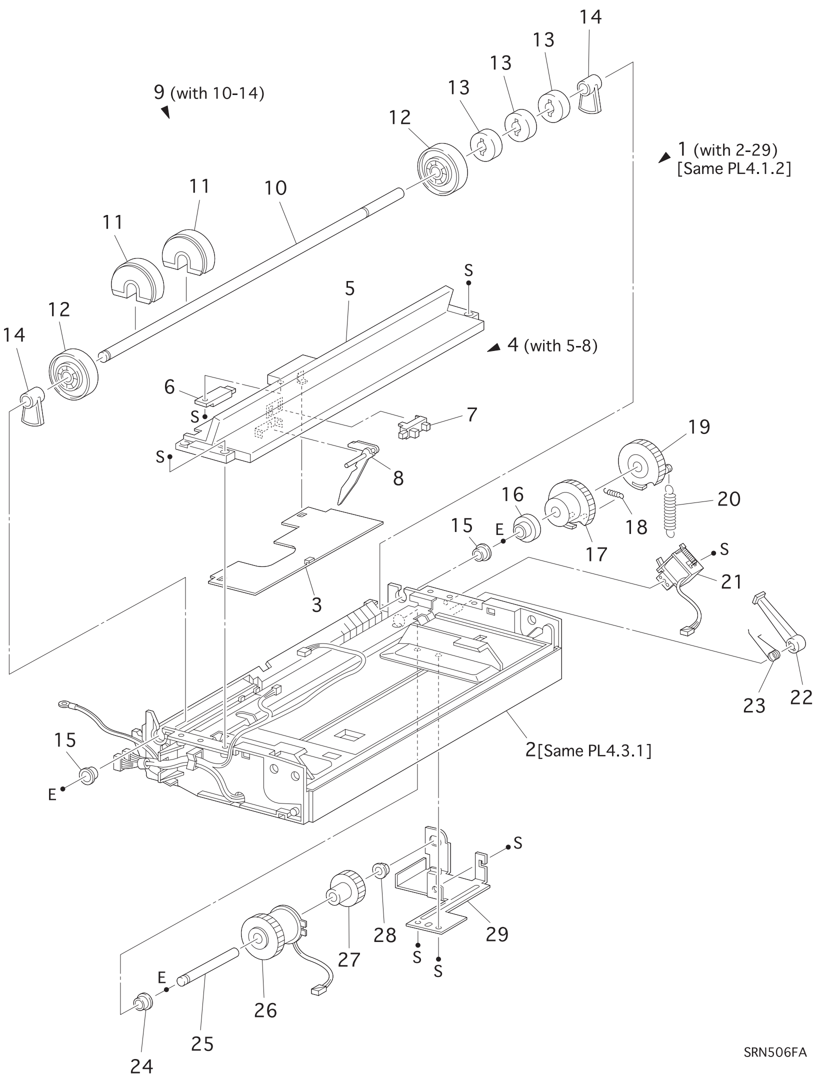


Figure A-6. PL4.2 Multi Sheet Insert II

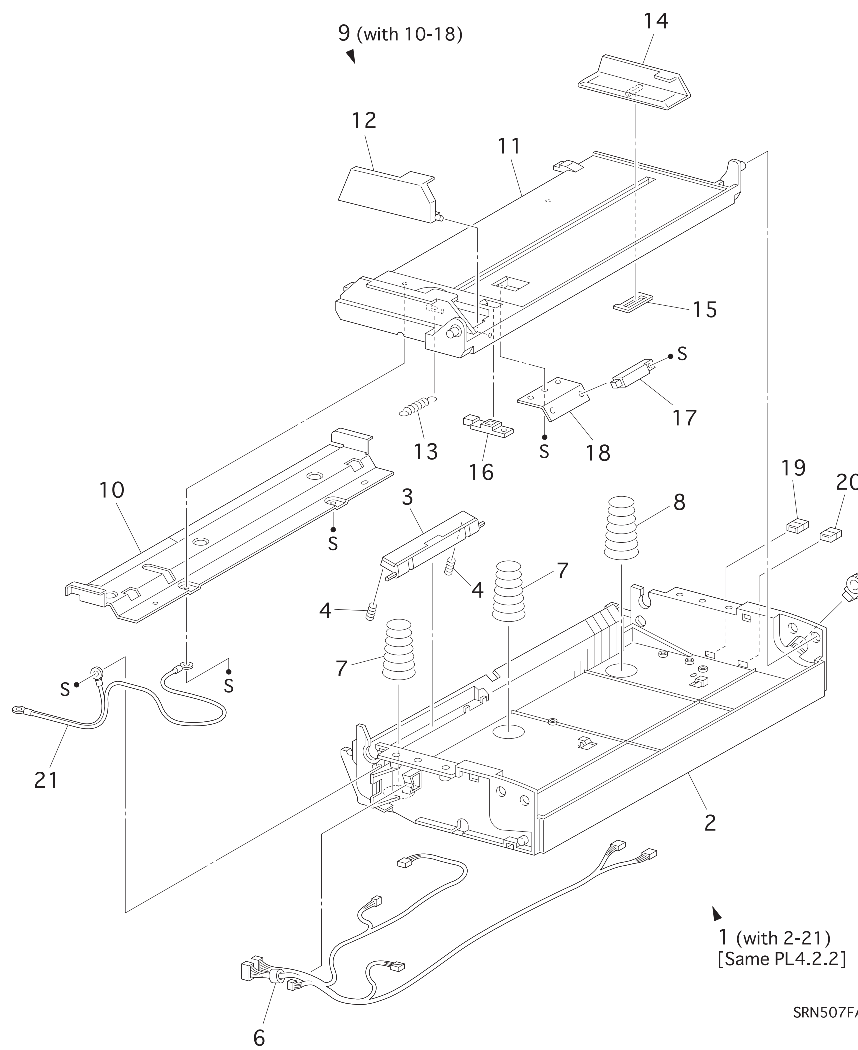


Figure A-7. PL4.3 Multi Sheet Insert III

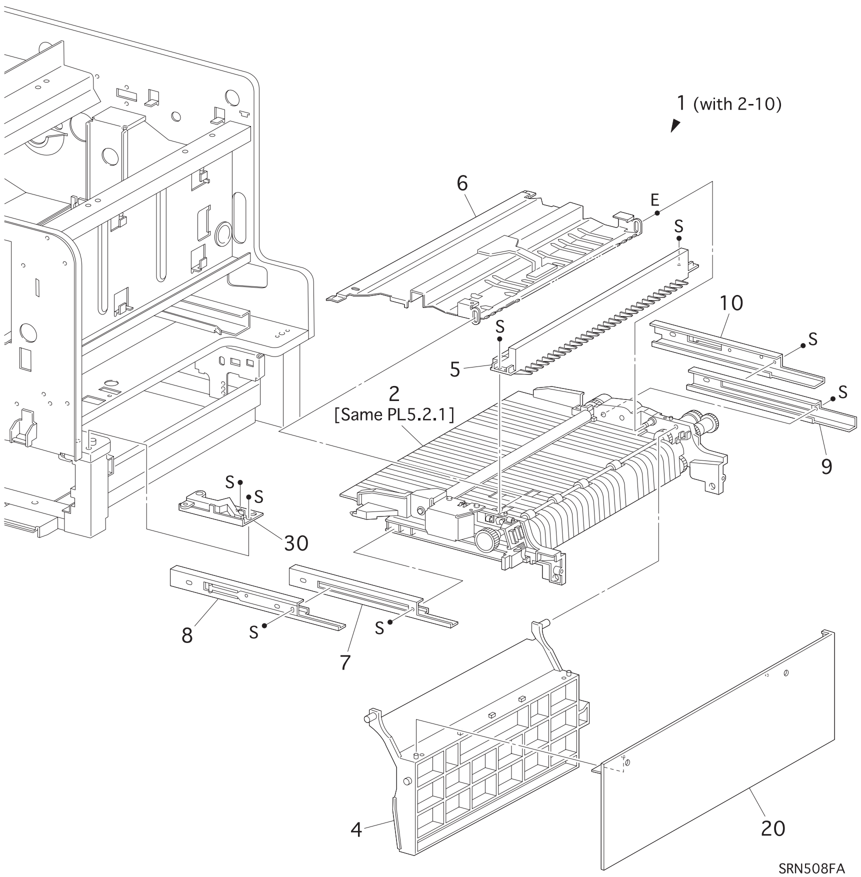


Figure A-8. PL5.1 Paper Transportation I

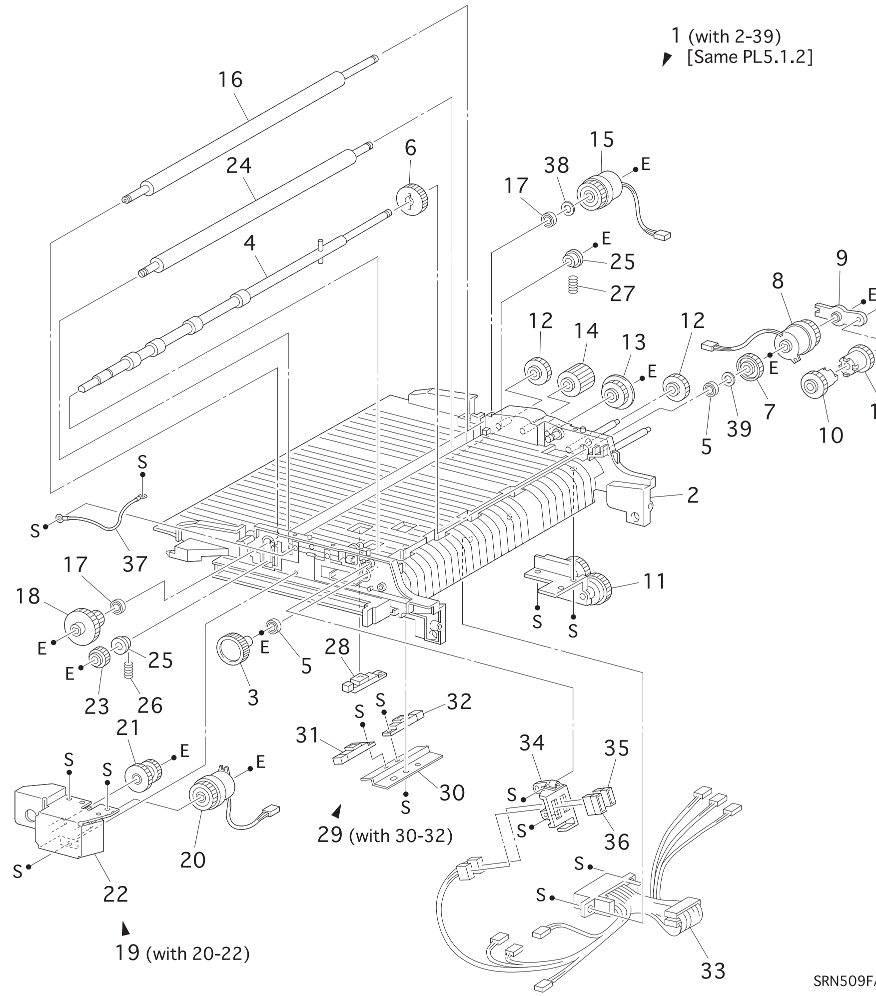


Figure A-9. PL5.2 Paper Transportation II

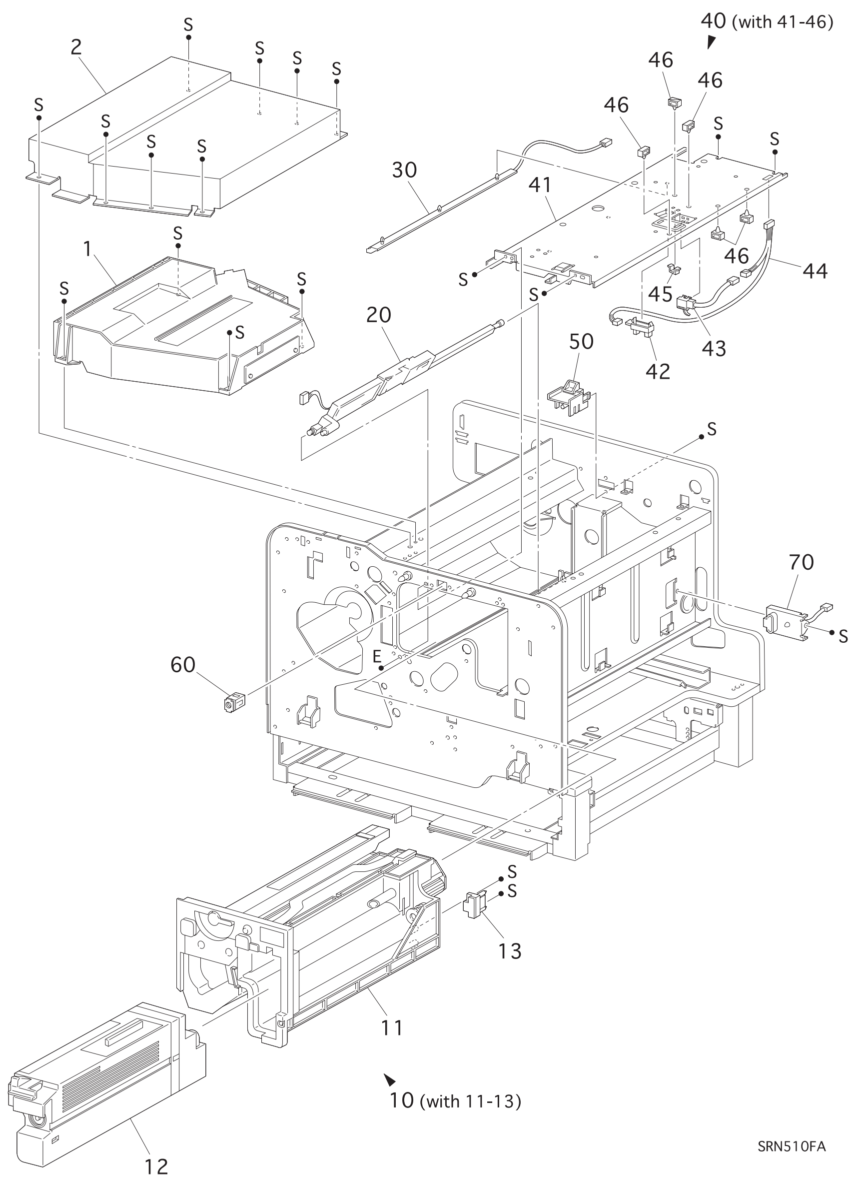


Figure A-10. PL6.1 Xerographics

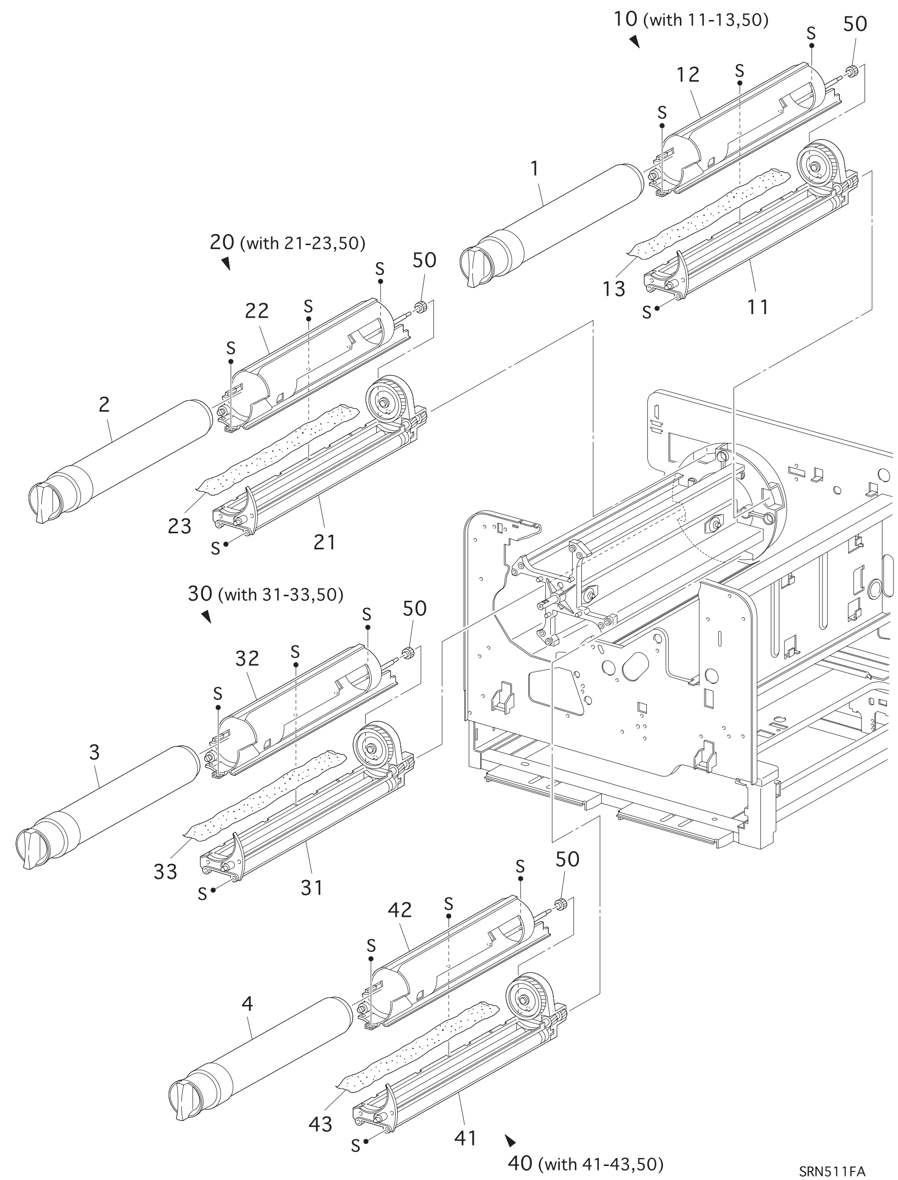


Figure A-11. PL7.1 Development I

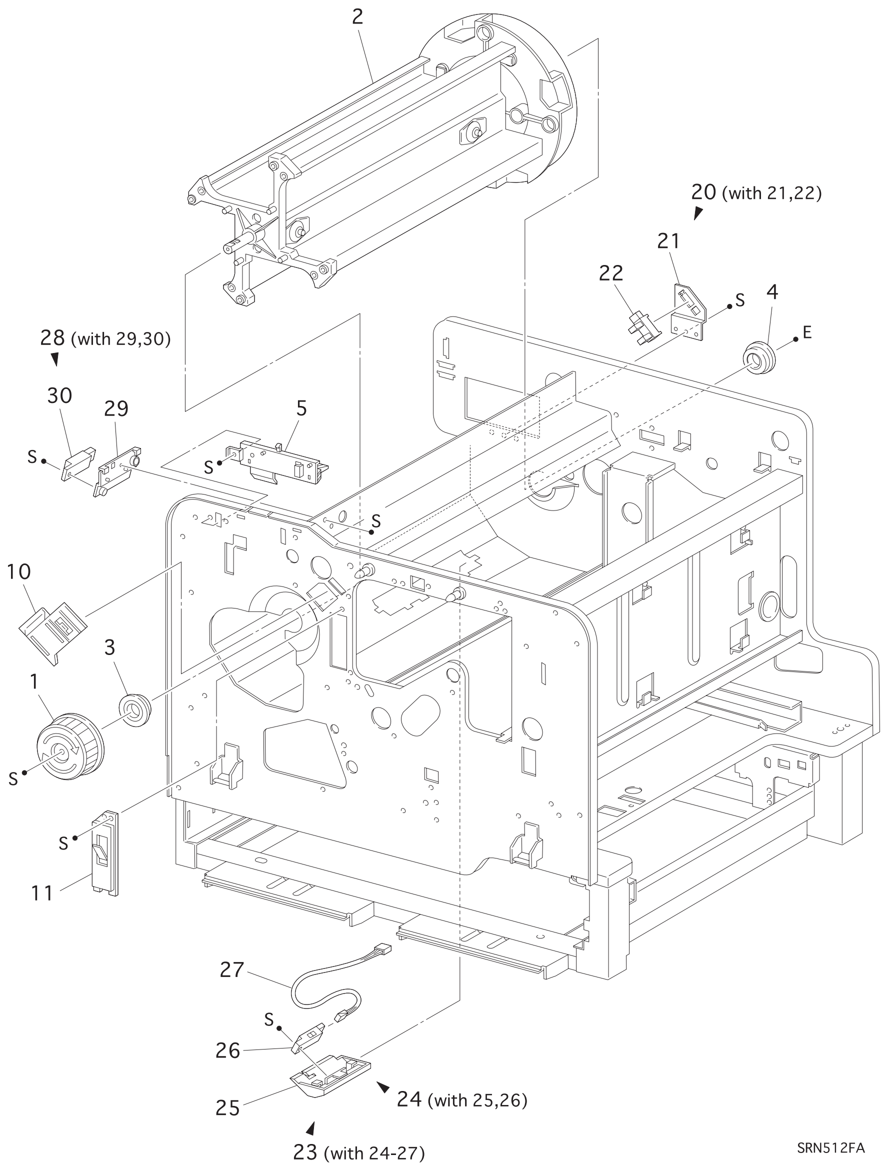


Figure A-12. PL7.2 Development II

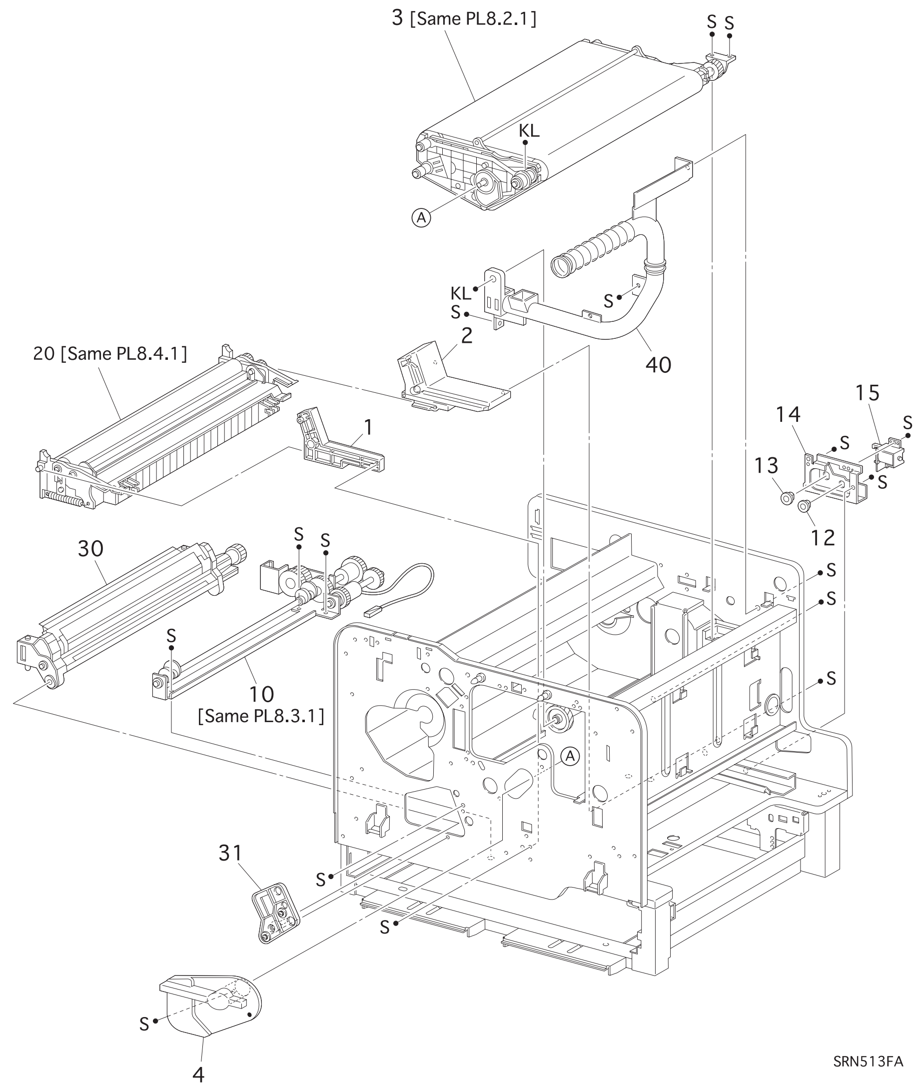


Figure A-13. PL8.1 IBT I

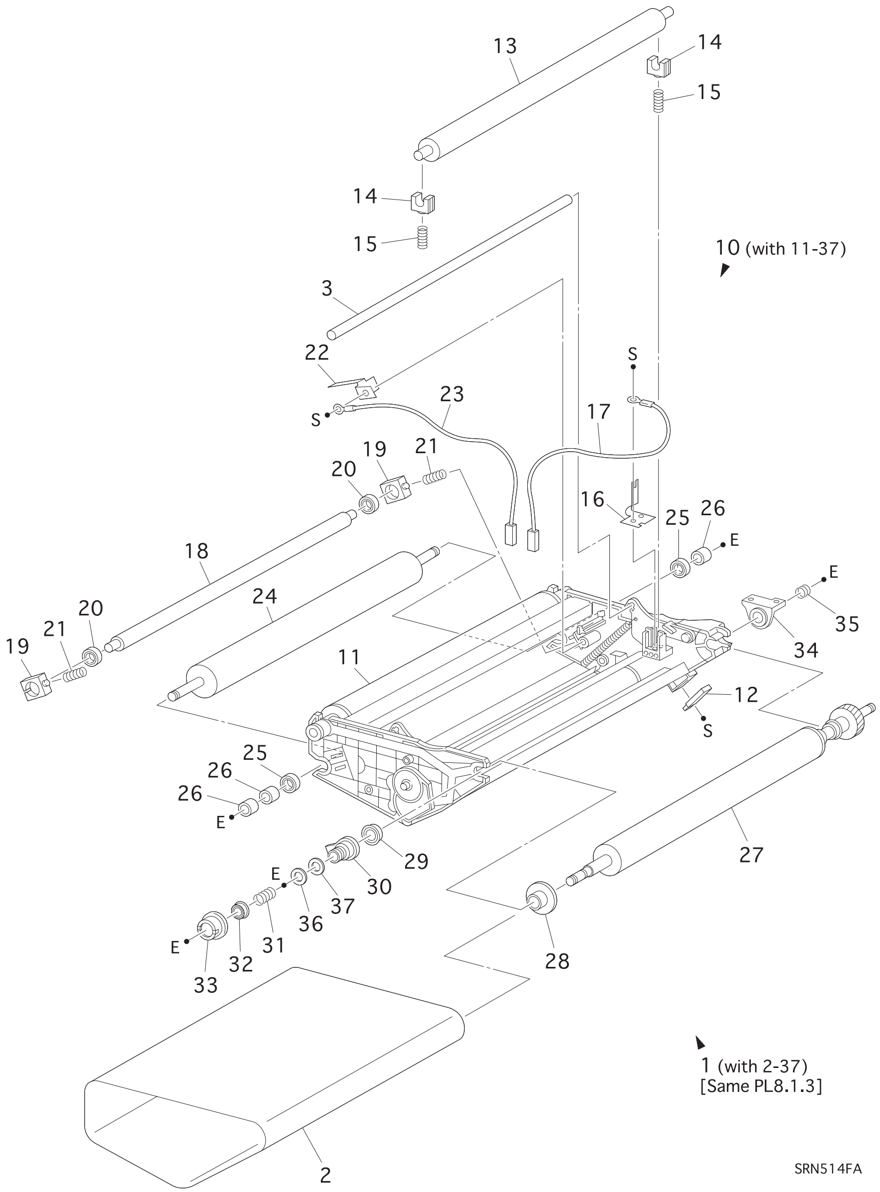


Figure A-14. PL8.2 IBT II

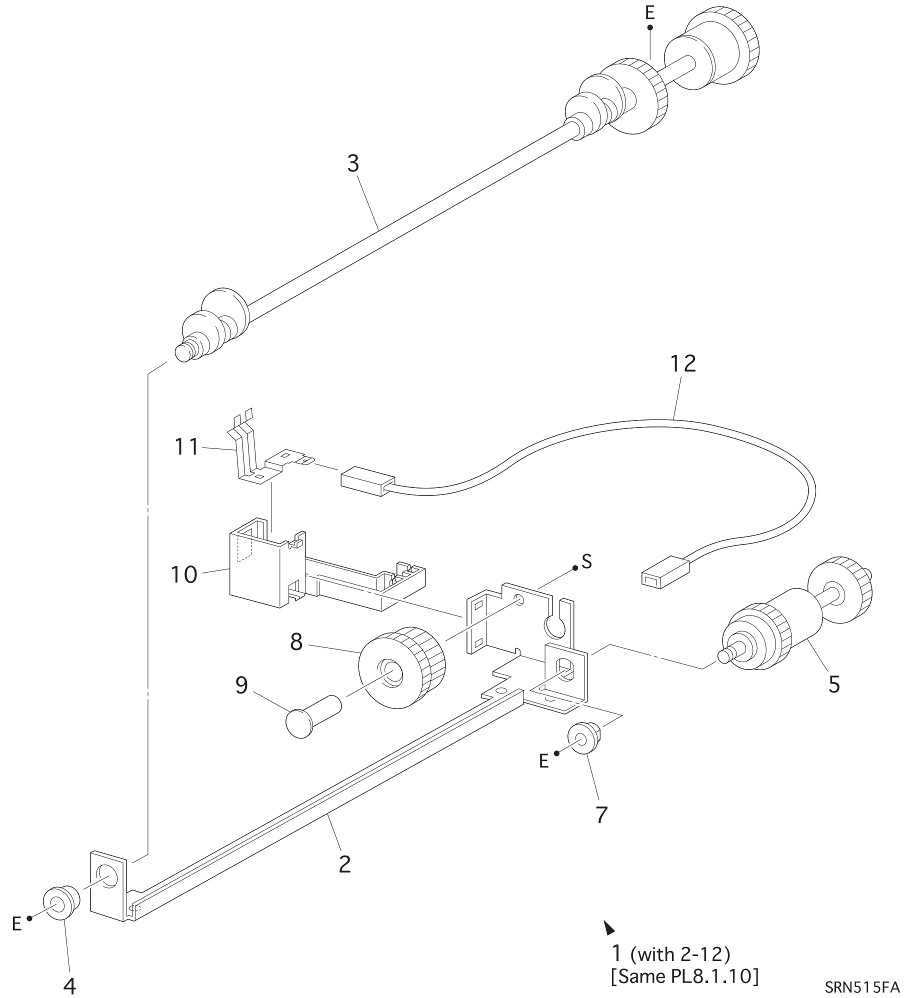


Figure A-15. PL8.3 IBT III

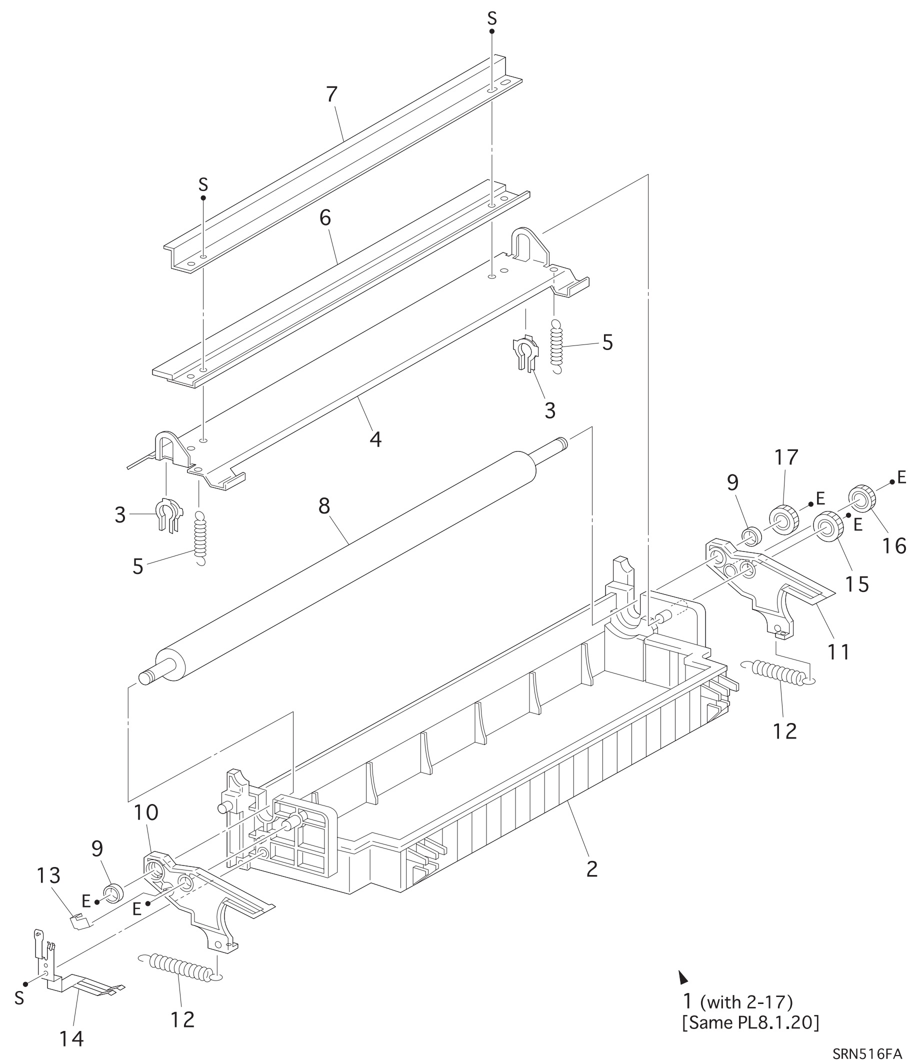


Figure A-16. PL8.4 IBT IV

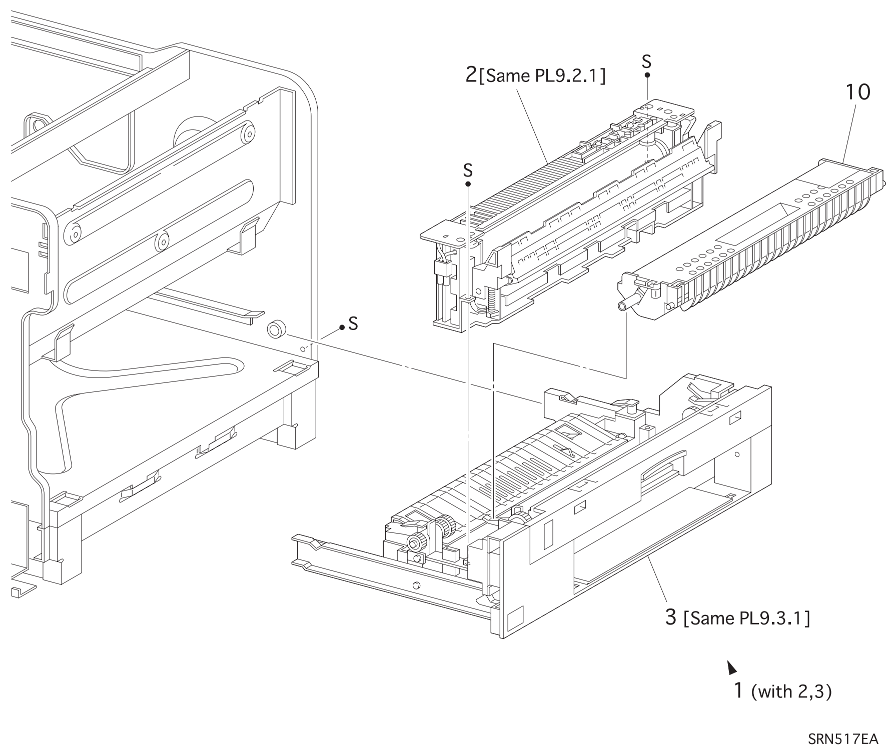


Figure A-17. PL9.1 Fusing I

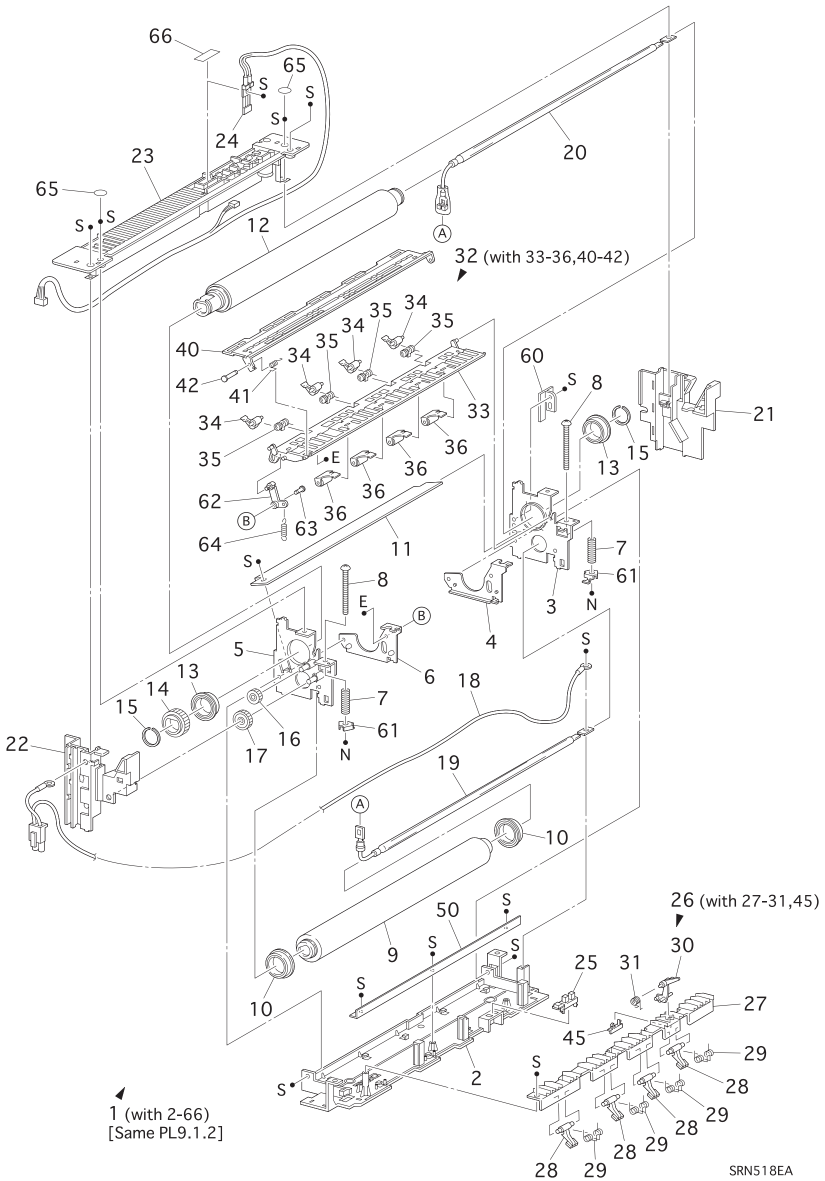


Figure A-18. PL9.2 Fusing II

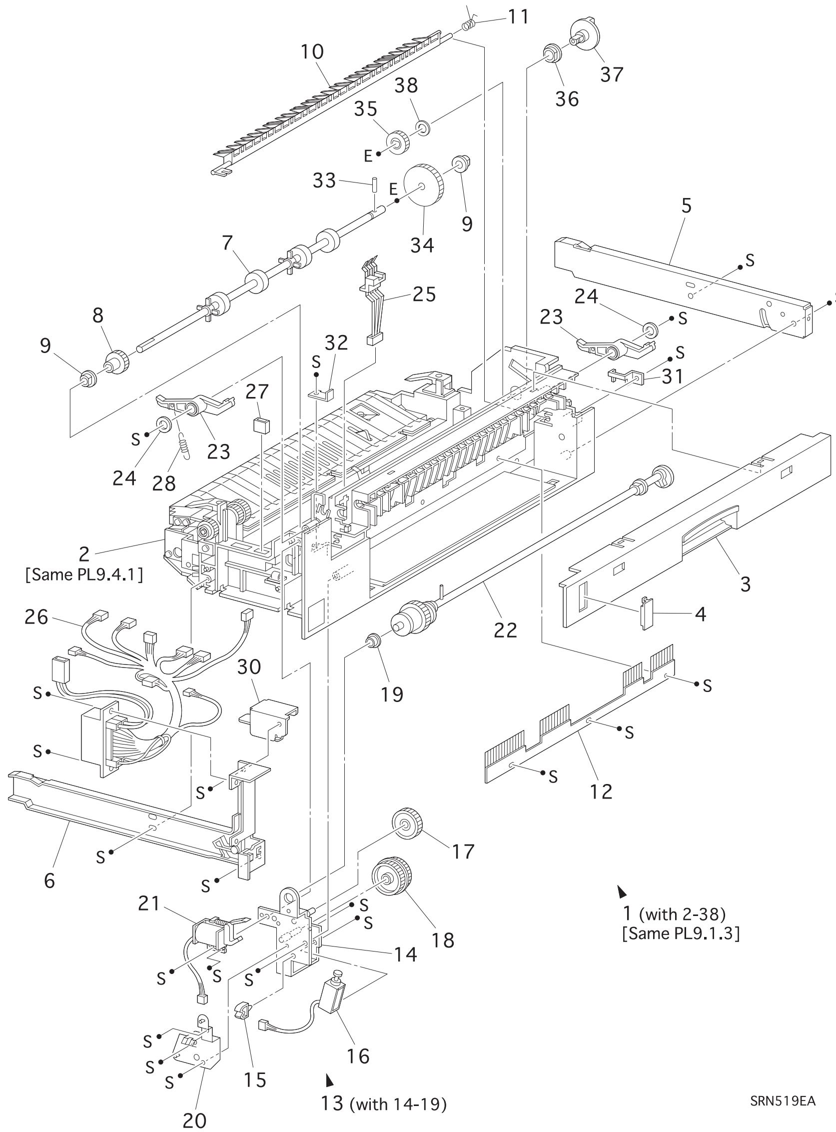


Figure A-19. PL9.3 Fusing III

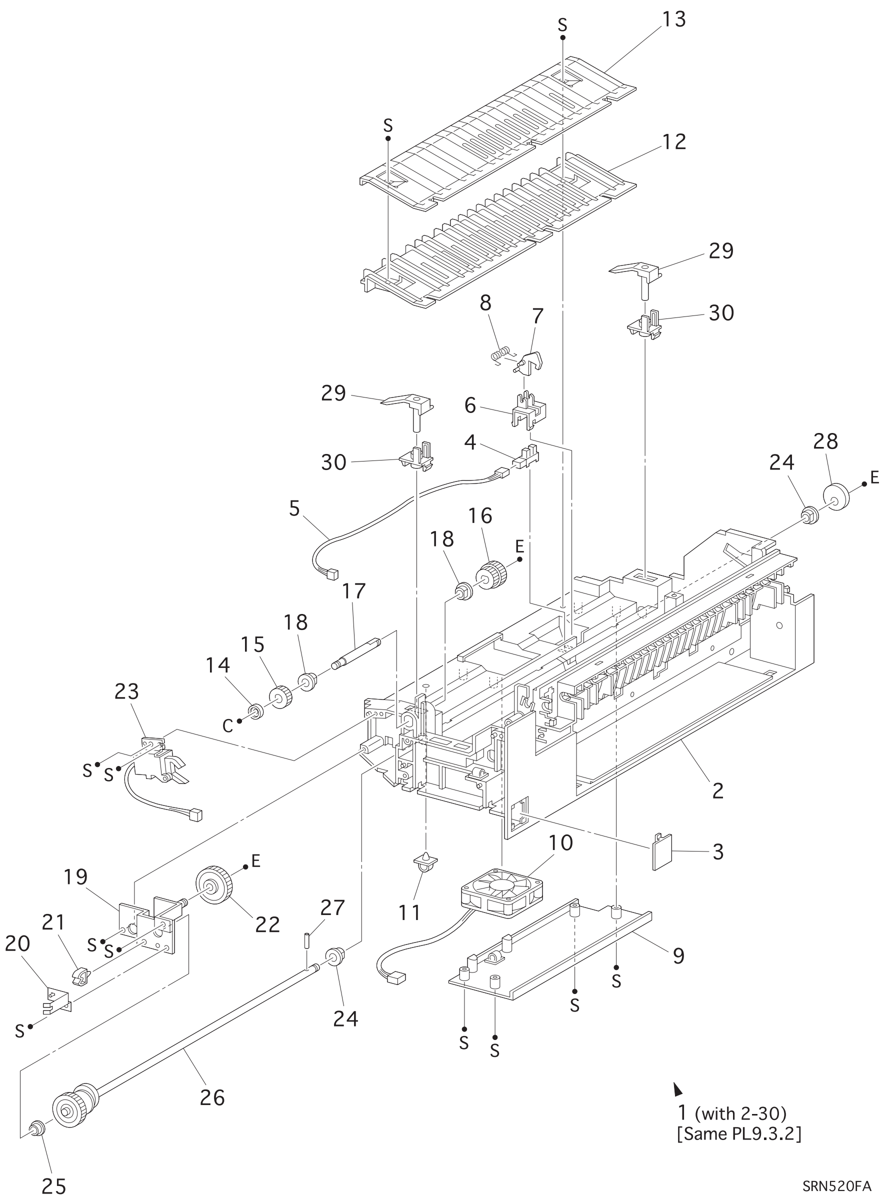


Figure A-20. PL9.4 Fusing IV

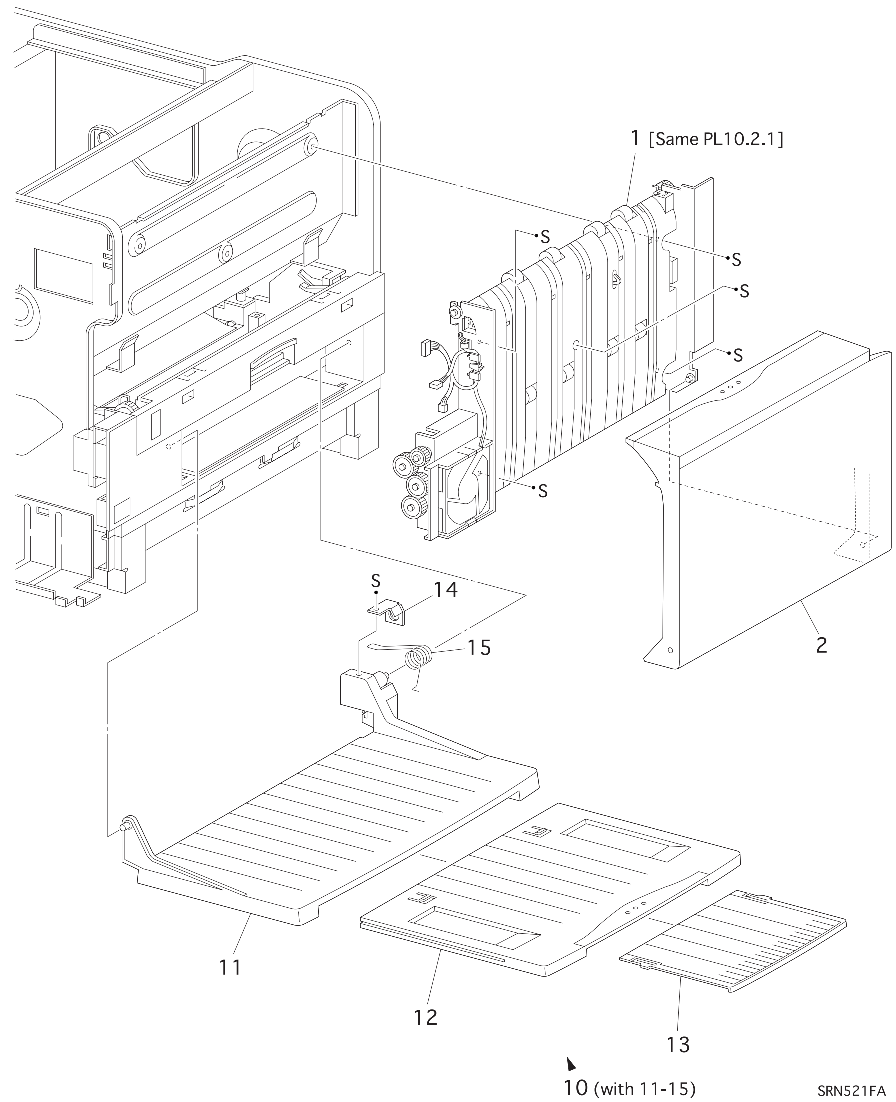


Figure A-21. PL10.1 Paper Exit I

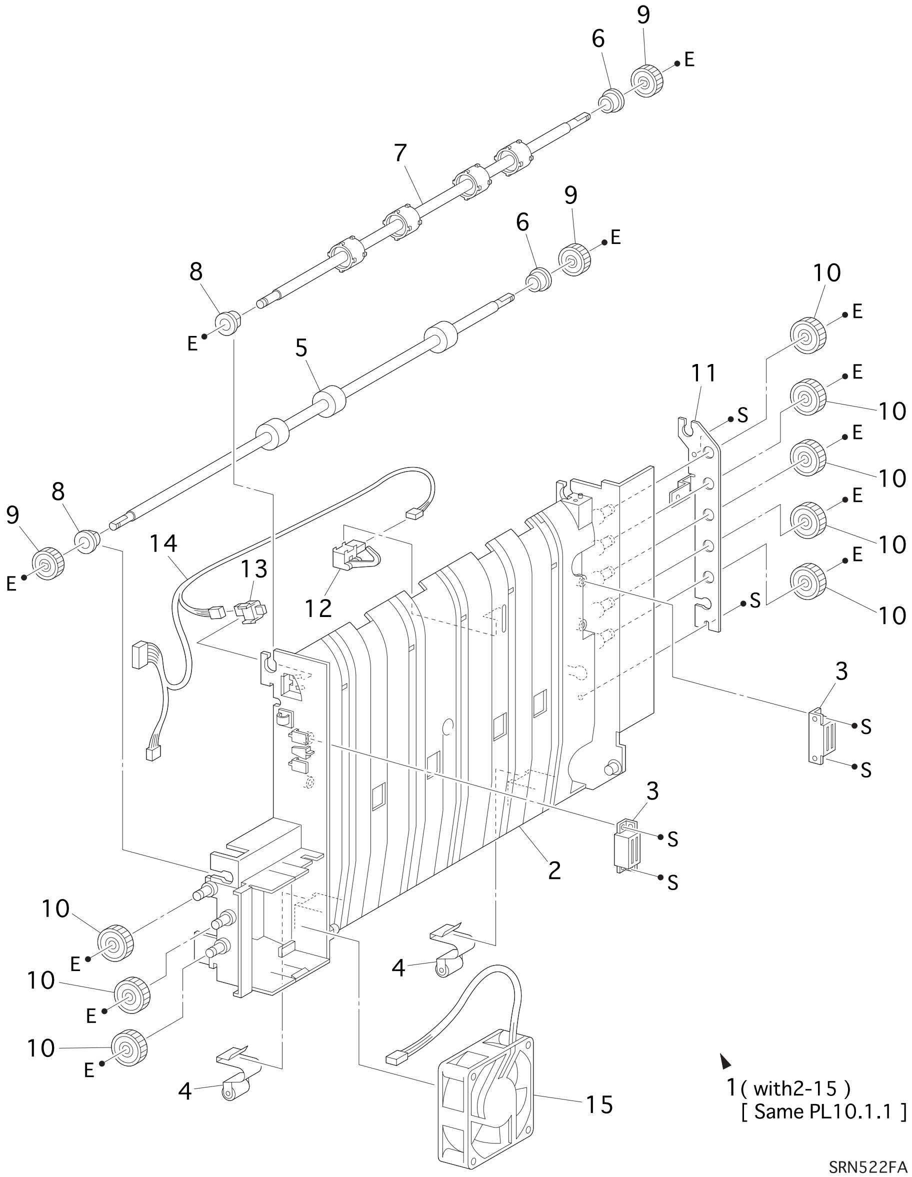


Figure A-22. PL10.2 Paper Exit II

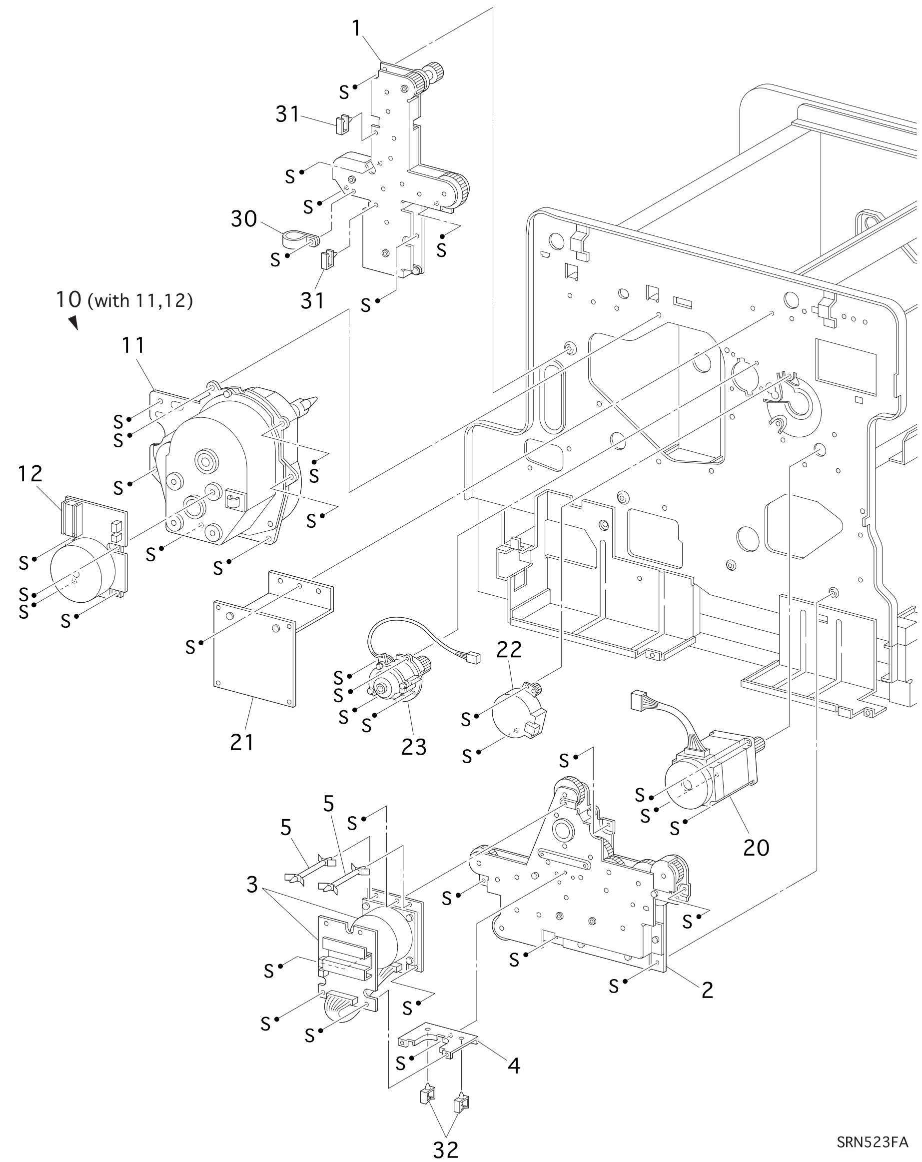


Figure A-23. PL11.1 Drive

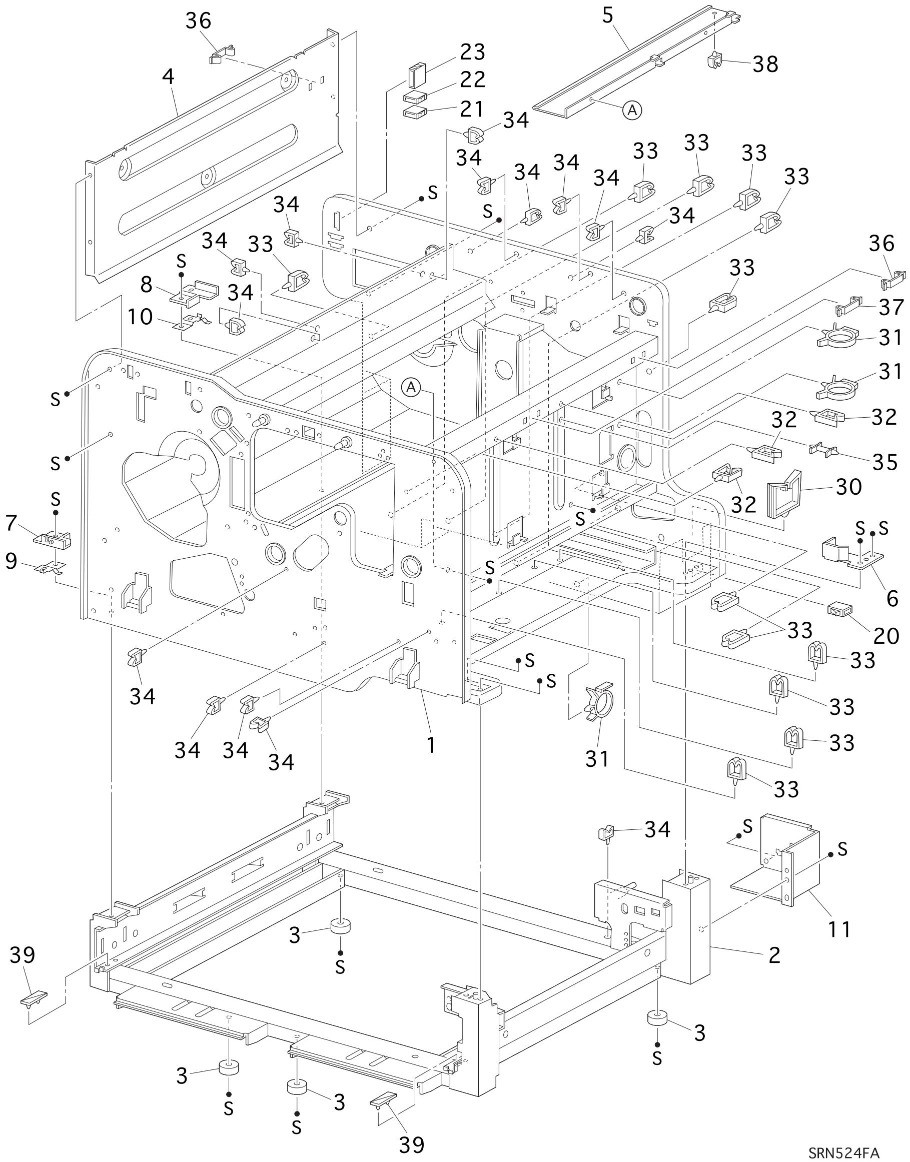


Figure A-24. PL12.1 Frame

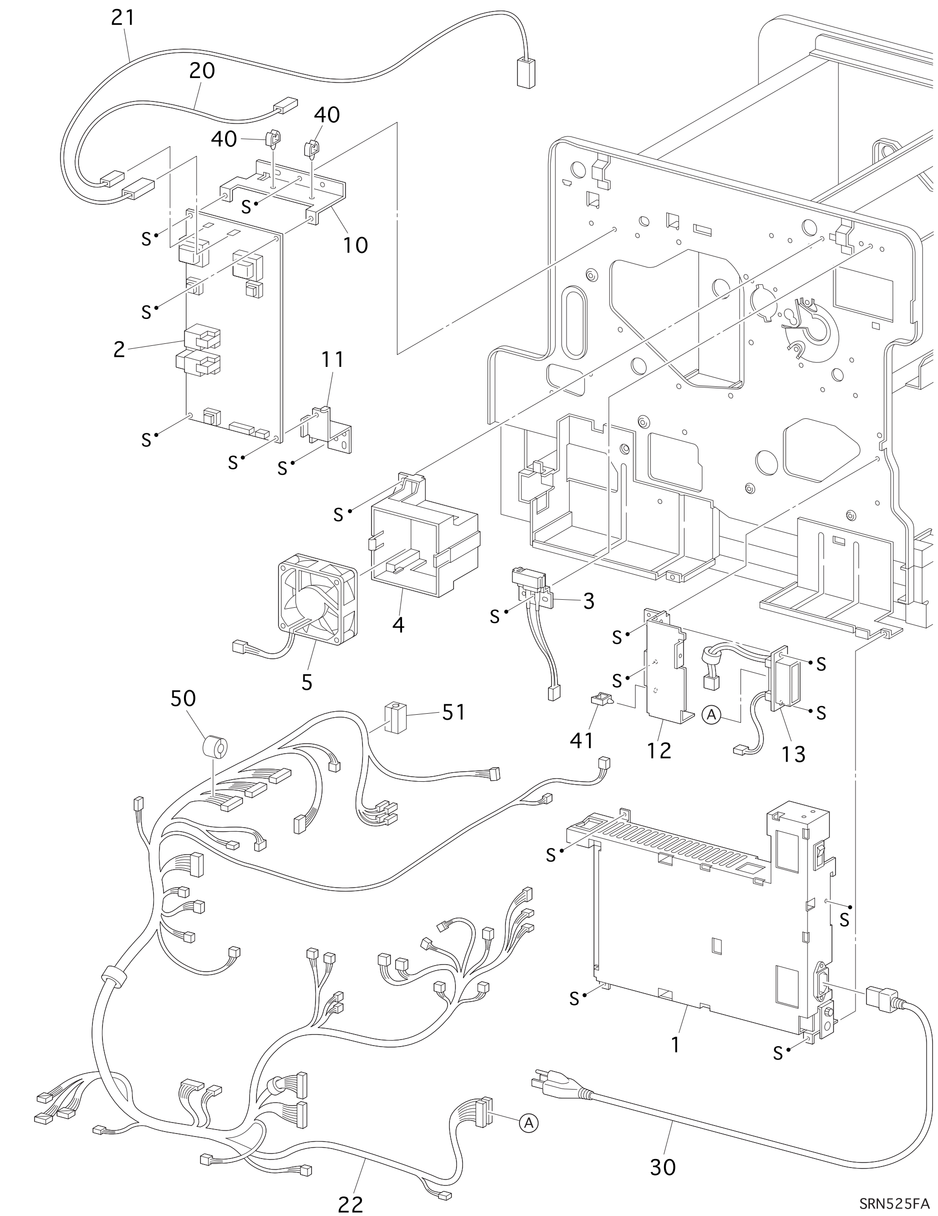


Figure A-25. PL 13.1 Electrical I

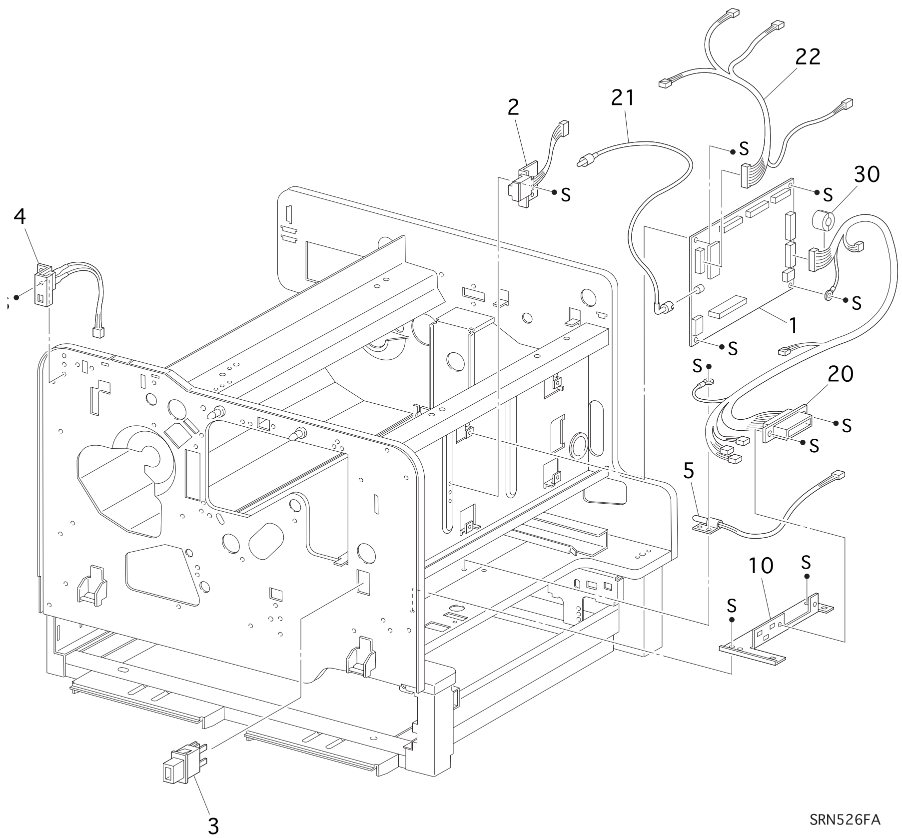


Figure A-26. PL13.2 Electrical II

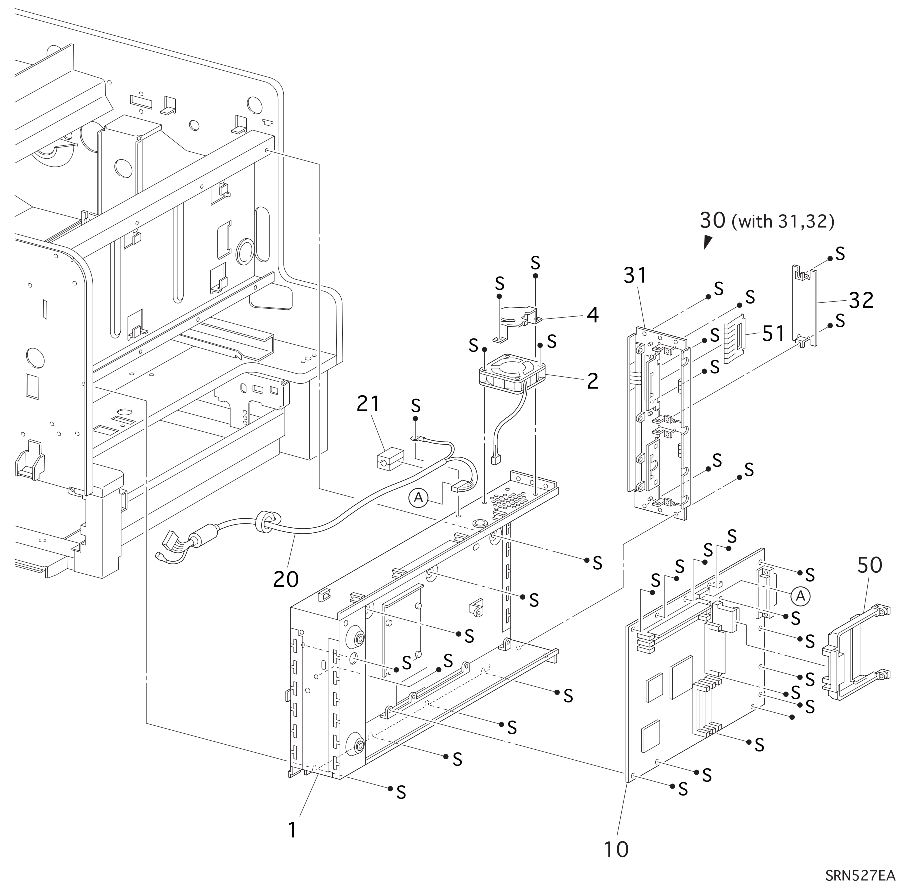


Figure A-27. PL14.1 Controller

A.2 Wiring Diagrams

This section describes the connector locations.
"P" and "J" stand for "Plug" and "Jack", respectively.

A.2.1 P/J Locations

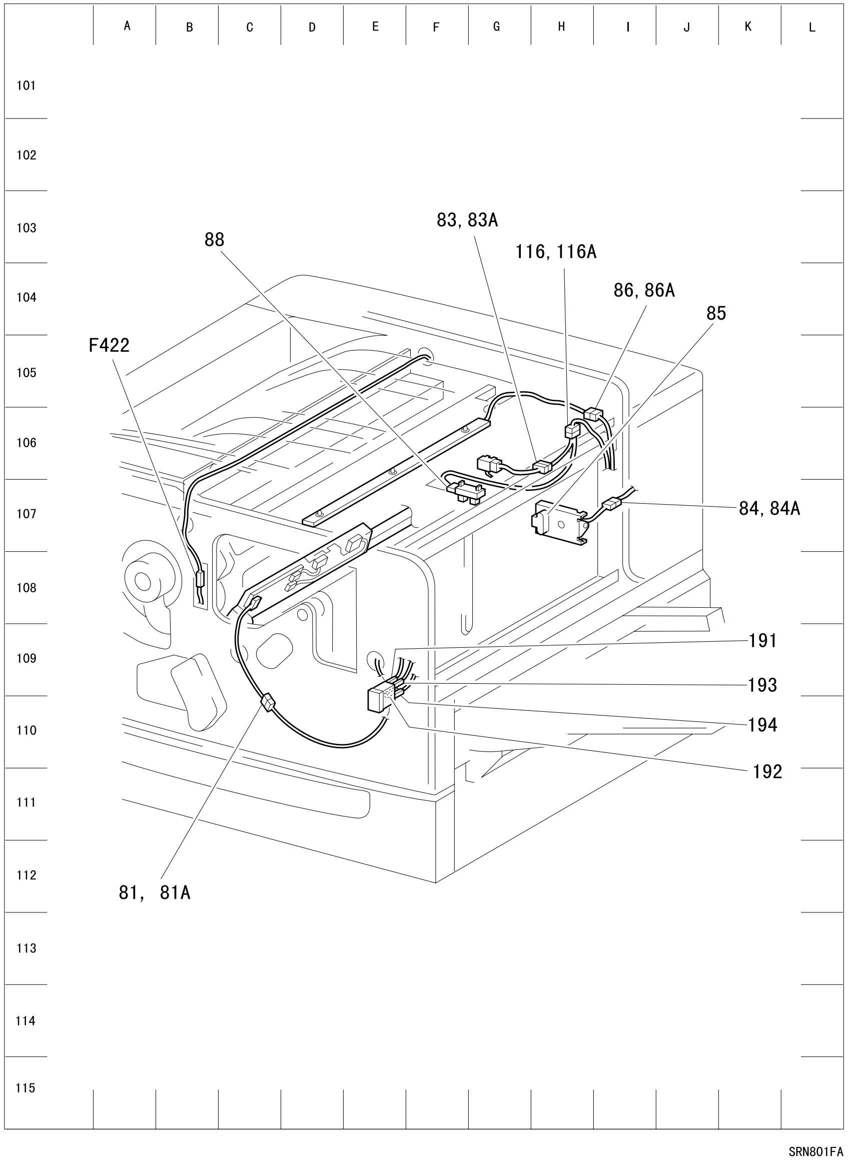


Figure A-28. P/J Location (1)

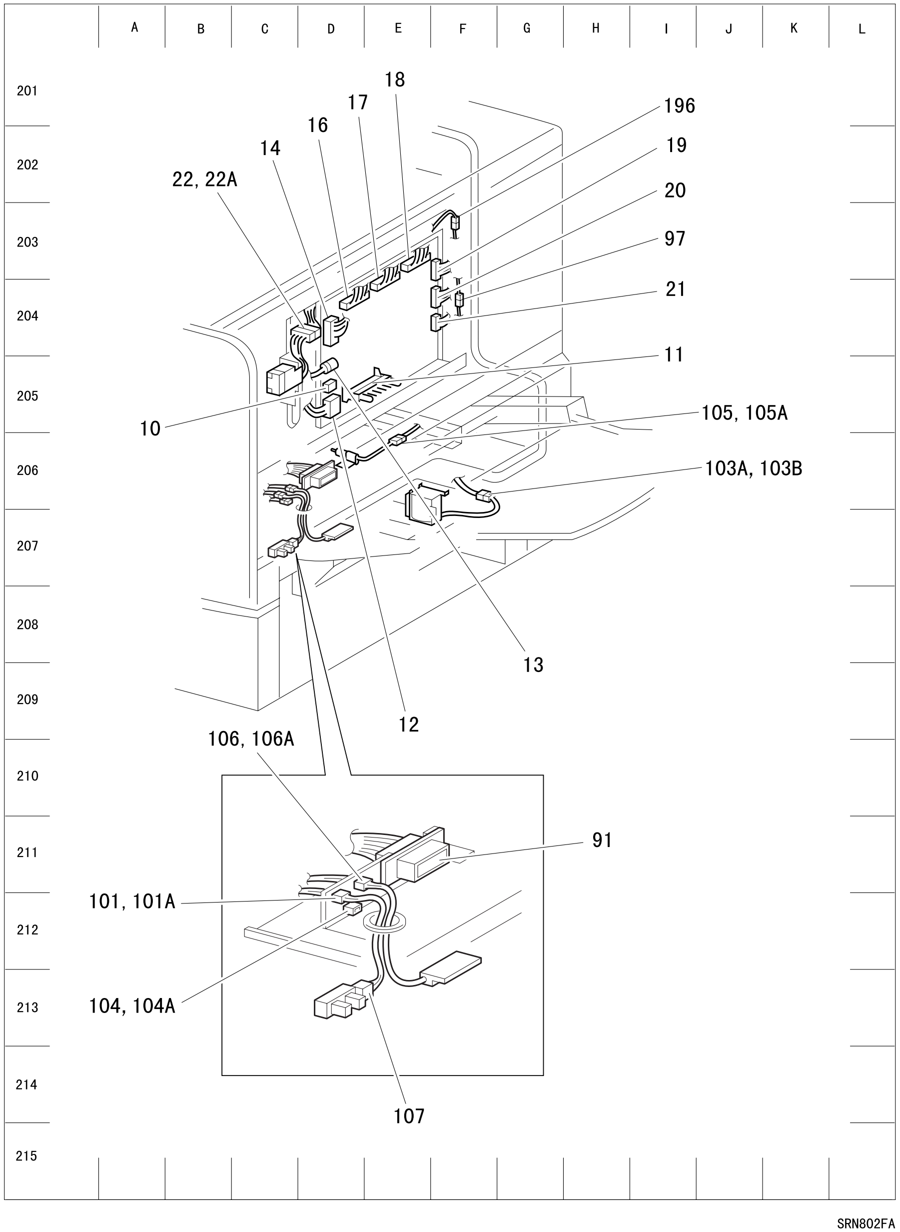


Figure A-29. P/J Location (2)

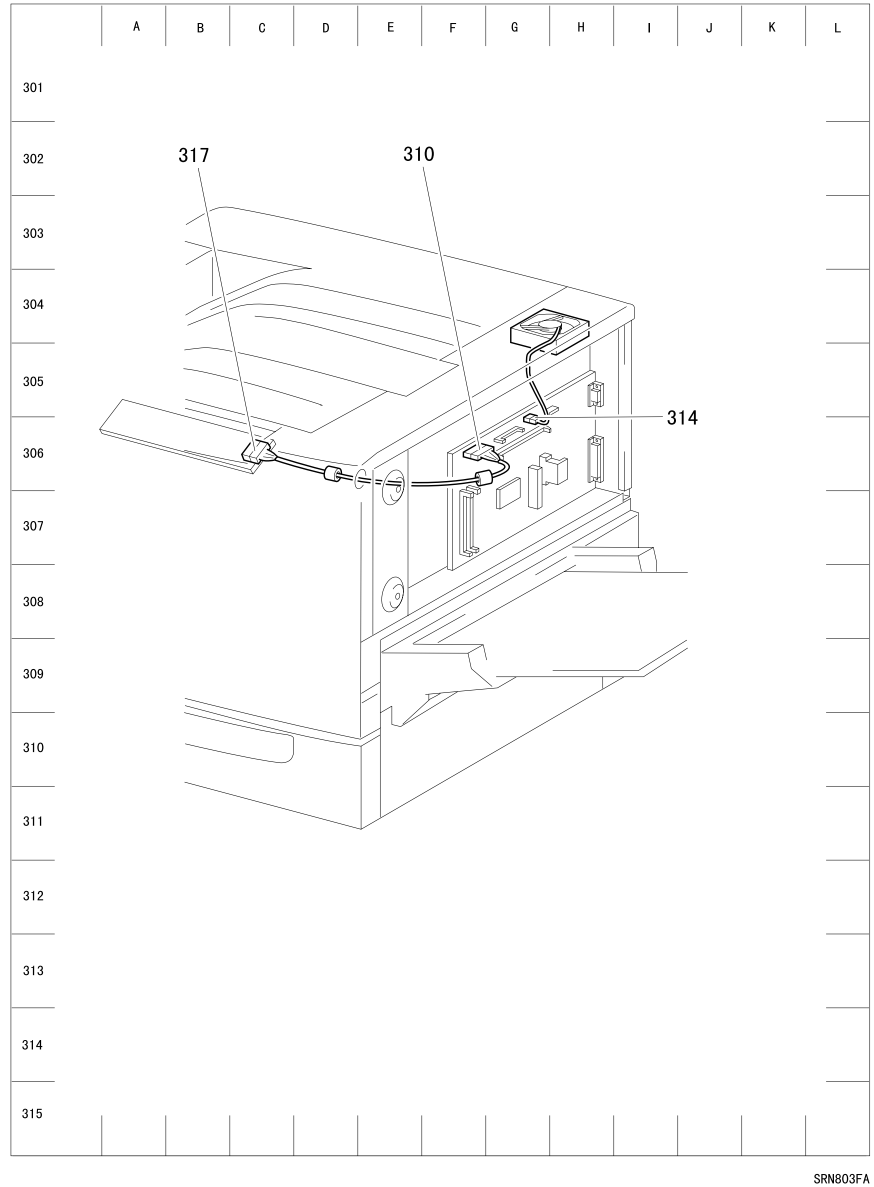


Figure A-30. P/J Location (3)

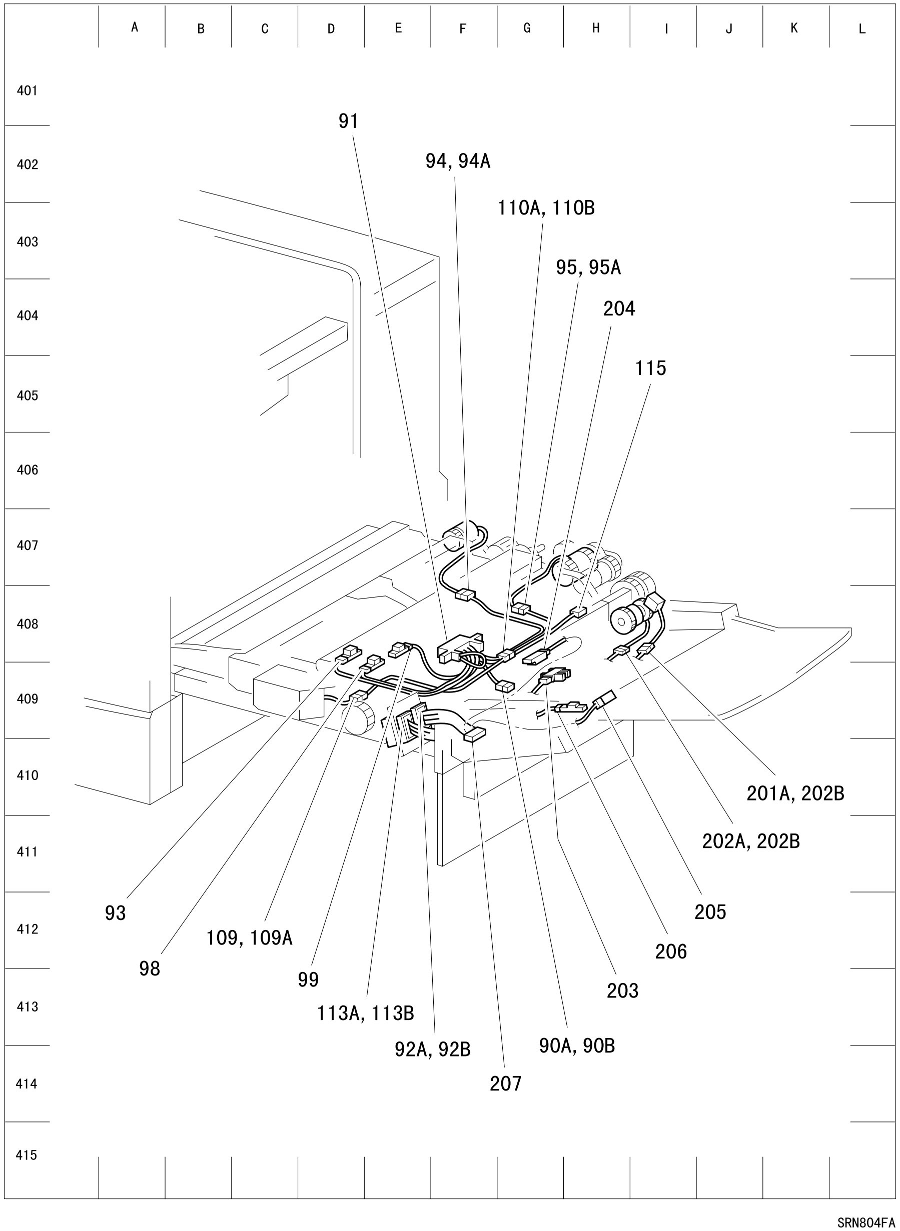


Figure A-31. P/J Location (4)

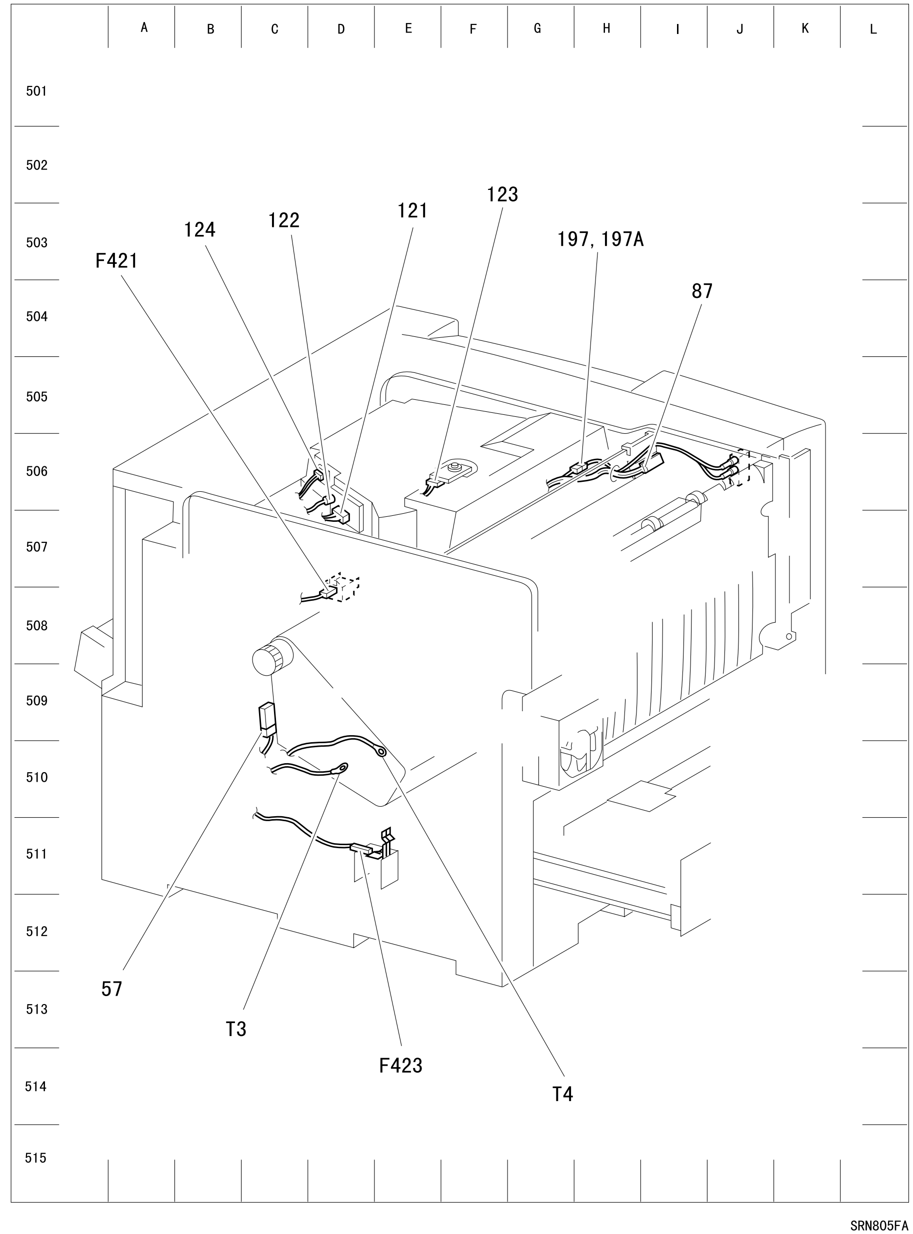


Figure A-32. P/J Location (5)

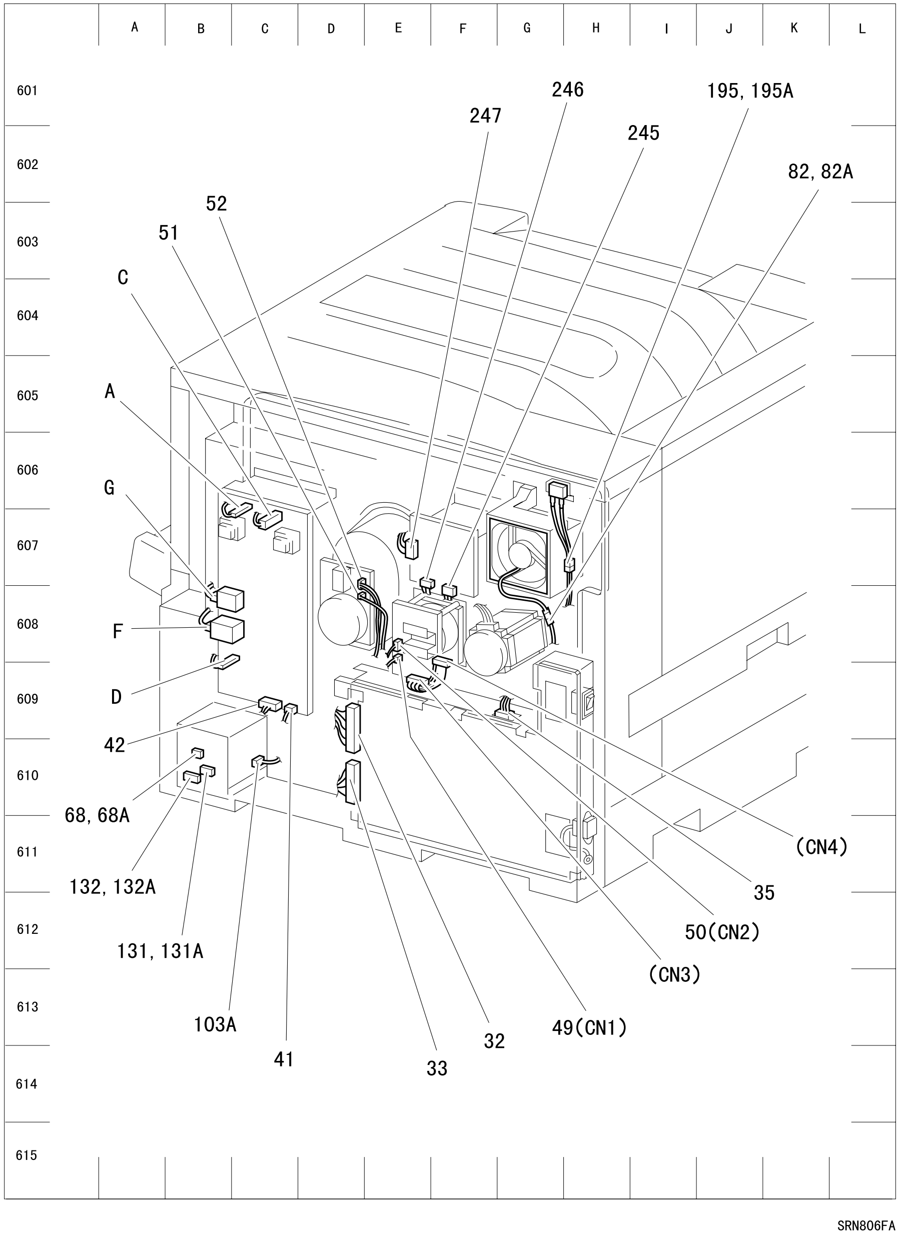


Figure A-33. P/J Location (6)

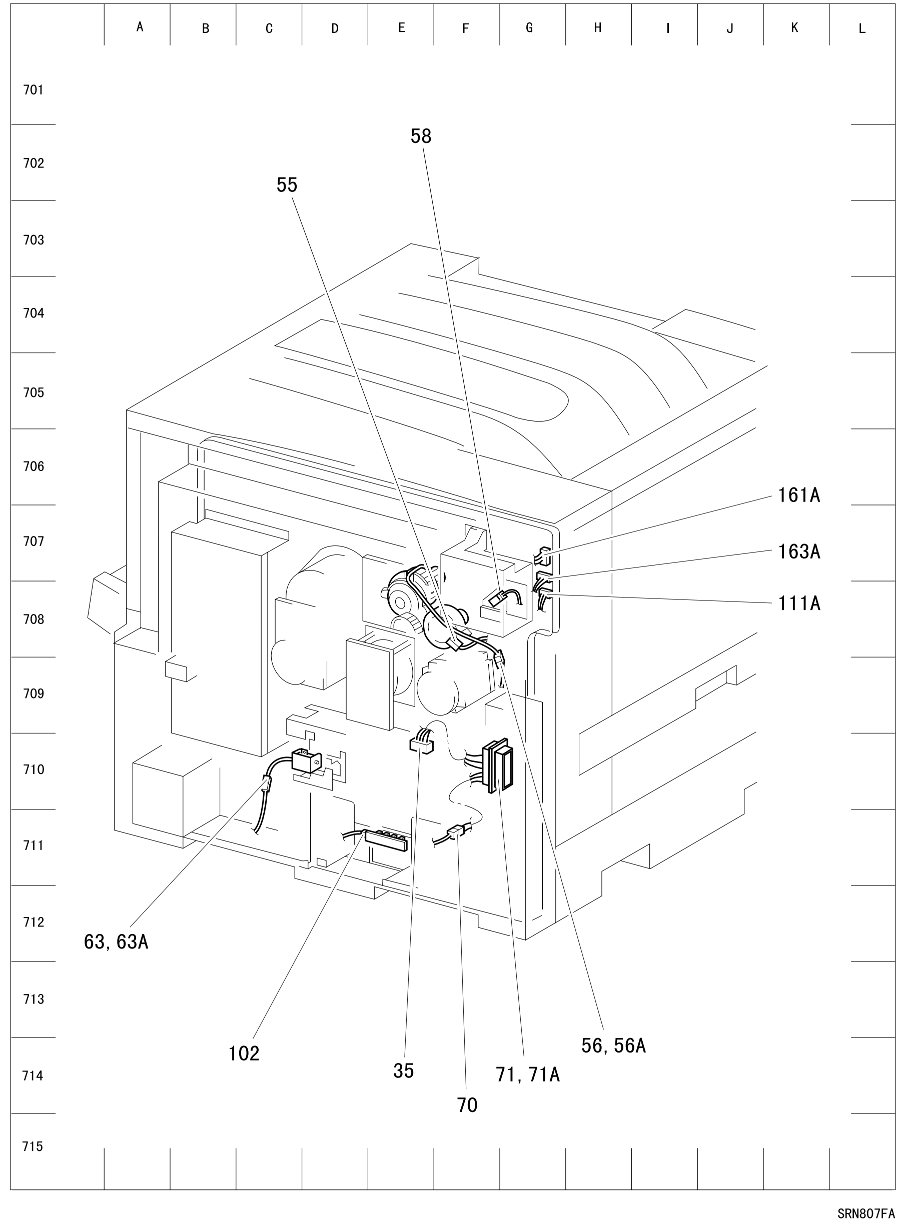


Figure A-34. P/J Location (7)

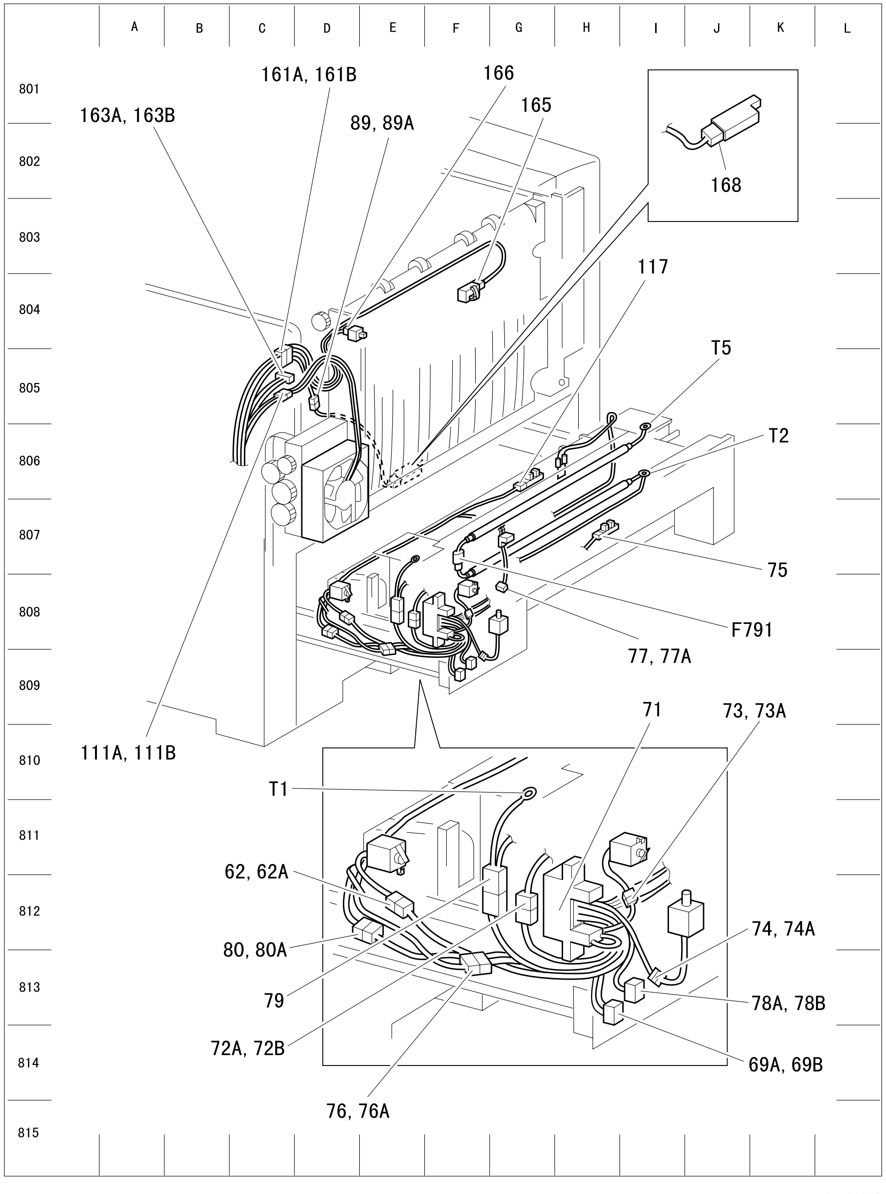


Figure A-35. P/J Location (8)

A.2.2 Plug and Jack (P/J) Location Table

The following lists the coordinates of the connectors (P/J) described in 1.1 P/J Locations. (

Table A-10. Plug and Jack (P/J) Location Table (1/7)

P/J	Coordinate	Notes
11	E-205	Connects MCU PWB and Controller PWB.
12	D-205	Connects MCU PWB and Main Harness Assembly.
13	D-205	Connects MCU PWB and Video Harness.
14	D-204	Connects MCU PWB and ROS Harness.
16	D-204	Connects MCU PWB and Main Harness Assembly.
17	E-203	Connects MCU PWB and Main Harness Assembly.
18	E-203	Connects MCU PWB and Main Harness Assembly.
19	F-203	Connects MCU PWB and Main Harness Assembly.
20	F-204	Connects MCU PWB and P/H Harness Assembly.
21	F-204	Connects MCU PWB and Main Harness Assembly.
22	C-204	Connects Communication Assembly and Main Harness Assembly.
22A	C-204	Connector in Main Harness Assembly.
32	D-609	Connects LVPS and Main Harness Assembly.
33	D-610	Connects LVPS and Main Harness Assembly.
35	G-609	Connects LVPS and Fuser Connector.
41	C-609	Connects HVPS and Main Harness Assembly.
42	C-609	Connects HVPS and Main Harness Assembly.
49 (CN1)	E-609	Connects P/H Motor Assembly and Main Harness Assembly.
50 (CN2)	E-608	Connects P/H Motor Assembly and Main Harness Assembly.
(CN3)	E-609	Connector in P/H Motor Assembly (directly mounted on the PWB).
(CN4)	F-608	Connector in P/H Motor Assembly (directly mounted on the PWB).
51	D-608	Connects Process Motor Assembly and Main Harness Assembly.

Table A-11. Plug and Jack (P/J) Location Table (2/7)

P/J	Coordinate	Notes
52	D-607	Connects Process Motor Assembly and Main Harness Assembly.
55	E-708	Connects Dispense Motor Assembly and Main Harness Assembly.
56	F-708	Connects Developer Clutch Assembly and Main Harness Assembly.
56A	F-708	Connector in Main Harness Assembly.
57	C-509	Connects TR0 Sensor and Main Harness Assembly.
58	F-708	Connects Rotary Sensor and Main Harness Assembly.
62	E-812	Connects Cleaner Cam Solenoid and Fuser Harness Assembly.
62A	E-812	Connector in Fuser Harness Assembly.
63	C-710	Connects BTR Cam Solenoid and Main Harness Assembly.
63A	C-710	Connector in Main Harness Assembly.
68	B-610	Connects Main Harness Assembly and Option.
68A	B-610	Connector in Main Harness Assembly.
69A	G-814	Connects Fuser Harness Assembly and Fuser Rear Rail Relay Connector.
69B	G-814	Connects Fuser Rear Rail Relay Connector and Option.
70	F-711	Connects Main Harness Assembly and Fuser Connector.
71	F-710	Connects Fuser Harness Assembly and Fuser Connector.
71A	F-710	Connects Fuser Connector and Main Harness Assembly.
72A	G-812	Connects Fuser Harness Assembly and Connector-5PW.
72B	G-812	Connects Connector-5PW and Temperature Sensor Assembly.
73	I-812	Connects Oil Cam Solenoid and Fuser Harness Assembly.
73A	I-812	Connector in Fuser Harness Assembly.
74	I-813	Connects Exchange Solenoid and Fuser Harness Assembly.
74A	I-813	Connector in Fuser Harness Assembly.
75	H-808	Connects Fuser Exit Sensor and Temperature Sensor Assembly.
76	F-813	Connects Fuser In Harness and Fuser Harness Assembly.

Table A-12. Plug and Jack (P/J) Location Table (3/7)

P/J	Coordinate	Notes
76A	F-813	Connector in Fuser Harness Assembly.
77	G-808	Connects CRU Switch Assembly and Fuser Harness Assembly.
77A	G-808	Connector in Fuser Harness Assembly.
78A	I-813	Connector in Fuser Harness Assembly.
78B	I-813	Connector in Fuser Harness Assembly.
79	E-812	Connects Heater Wire and Fuser Harness Assembly.
80	D-813	Connects Fuser Chute Fan and Fuser Harness Assembly.
80A	D-813	Connector in Fuser Harness Assembly.
81	C-110	Connects ADC Sensor Assembly and Main Harness Assembly.
81A	C-110	Connector in Main Harness Assembly.
82	G-608	Connects Developer Fan and Main Harness Assembly.
82A	G-608	Connector in Main Harness Assembly.
83	G-106	Connects Toner Box Sensor and Toner Box Harness.
83A	G-106	Connector in Toner Box Harness.
84	I-107	Connects Main Harness Assembly and CRUM Connector Assembly.
84A	I-107	Connector in Main Harness Assembly.
85	H-107	Connects CRUM Connector Assembly and CRUM Assembly.
86	I-105	Connects Erase Lamp Assembly and Main Harness Assembly.
86A	I-105	Connector in Main Harness Assembly.
87	I-506	Connects Used Cartridge Sensor and Main Harness Assembly.
88	F-106	Connects Waste Toner Sensor and Toner Box Harness.
89	D-805	Connects Cartridge Sensor Harness and Exit Harness.
89A	D-805	Connector in Exit Harness.
90A	G-409	Connector in Registration Harness Assembly.
90B	G-409	Connector in Registration Harness Assembly.

Table A-13. Plug and Jack (P/J) Location Table (4/7)

P/J	Coordinate	Notes
91	D-211	Registration Harness Assembly and P/H Harness Assembly. (P/H Harness Assembly side)
	E-408	Registration Harness Assembly and P/H Harness Assembly. (Registration Harness Assembly side)
92A	E-409	Connects Registration Harness Assembly and Connector-6PW.
92B	E-409	Connects MSI Harness Assembly and Connector-6PW.
93	D-408	Connects Registration Sensor and Registration Harness Assembly.
94	F-408	Connects Registration Clutch and Registration Harness Assembly.
94A	F-408	Connector in Registration Harness Assembly.
95	G-408	Connects Pre-Registration Clutch and Registration Harness Assembly.
95A	G-408	Connector in Registration Harness Assembly.
97	F-204	Connects MSI Harness Assembly and P/H Harness Assembly.
98	D-409	Connects Front OHP Sensor and Registration Harness Assembly.
99	E-408	Connects Rear OHP Sensor and Registration Harness Assembly.
101	D-212	Connects Tray N/P Harness and P/H Harness Assembly.
101A	D-212	Connector in P/H Harness Assembly.
102	D-711	Connects Size Switch Assembly and Main Harness Assembly.
103A	F-206	Connects Main Harness Assembly and Feeder Connector-2P.
103B	F-206	Connects Feed Solenoid and Feeder Connector-2P.
104	D-212	Empty Connector in P/H Harness Assembly.
104A	D-212	Connector in P/H Harness Assembly.
105	D-205	Connects Environment Sensor and P/H Harness Assembly.
105A	D-205	Connector in P/H Harness Assembly.

Table A-14. Plug and Jack (P/J) Location Table (5/7)

P/J	Coordinate	Notes
106	E-211	Connects Low Paper Sensor and P/H Harness Assembly.
106A	E-211	Connector in P/H Harness Assembly.
107	E-213	Connects Tray N/P Sensor and Tray N/P Harness.
109	D-409	Connects Registration Brake Clutch and Registration Harness Assembly.
109A	D-409	Connector in Registration Harness Assembly.
110A	G-408	Connector in Registration Harness Assembly.
110B	G-408	Connector in Registration Harness Assembly.
111A	G-708	Connects Main Harness Assembly and Exit Connector-3P.
	D-805	
111B	D-806	Connects Fuser Fan and Exit Connector-3P.
113A	E-410	Connects Registration Harness Assembly and Connector-7PW.
113B	E-410	Connects MSI Harness Assembly and Connector-7PW.
115	H-408	Connector in Registration Harness Assembly.
116	H-106	Connects Toner Box Harness and Main Harness Assembly.
116A	H-106	Connector in Toner Box Harness.
117	H-807	Connects Fuser In Sensor and Fuser In Harness.
121	D-507	Connects ROS Assembly (LD Assembly) and ROS Harness.
122	D-506	Connects ROS Assembly (LD Assembly) and Video Harness.
123	E-506	Connects ROS Assembly (Scanner Assembly) and ROS Harness.
124	C-506	Connects ROS Assembly (SOS PWB) and ROS Harness.
131	B-610	Connects Main Harness Assembly and Option.
131A	B-610	Connector in Main Harness Assembly.
132	B-610	Connects Main Harness Assembly and Option.
132A	B-610	Connector in Main Harness Assembly.
161A	G-707	Connects Main Harness Assembly and Exit Connector-8P.
	D-805	
161B	D-805	Connects Exit Harness and Exit Connector-8P.

Table A-15. Plug and Jack (P/J) Location Table (6/7)

P/J	Coordinate	Notes
163A	G-707	Connects Main Harness Assembly and Exit Connector-4P.
	D-805	
163B	D-805	Connects Full Stack Harness and Exit Connector-4P.
165	G-804	Connects Top Exit Sensor and Exit Harness.
166	E-805	Connects Exit Chute Switch and Exit Harness.
167	G-305	Connects Full Stack Sensor and Full Stack Harness.
168	J-802	Connects Cartridge Sensor and Cartridge Sensor Harness.
191	E-109	Connects Front Cover Switch R and Main Harness Assembly.
192	E-109	Connects Front Cover Switch R and Main Harness Assembly.
193	E-109	Connects Front Cover Switch R and Main Harness Assembly.
194	E-109	Connects Front Cover SwitcH R and Main Harness Assembly.
195	H-607	Connects Top Cover Switch and Main Harness Assembly.
195A	H-607	Connector in Main Harness Assembly.
196	F-203	Connects ROS Harness and Main Harness Assembly.
197	H-506	Connects Front Cover Switch L and Main Harness Assembly.
197A	H-506	Connector in Main Harness Assembly.
201A	I-408	Connects MSI Harness Assembly and Connector-2PB.
201B	I-408	Connects Pick Up Solenoid and Connector-2PB.
202A	H-408	Connects MSI Harness Assembly and Connector-2PW.
202B	H-408	Connects MSI Clutch and Connector-2PW.
203	G-409	Connects MSI Short N/P Sensor and MSI Harness Assembly.
204	G-408	Connects MSI Edge Sensor and MSI Harness Assembly.
205	H-409	Connects MSI OHP Sensor and MSI Harness Assembly.
206	G-409	Connects MSI Long N/P Sensor and MSI Harness Assembly.
207	F-409	Connector in MSI Harness Assembly.

Table A-16. Plug and Jack (P/J) Location Table (7/7)

P/J	Coordinate	Notes
245	F-608	Connects Rotary Motor PWB and Main Harness Assembly.
246	F-607	Connects Rotary Motor PWB and Main Harness Assembly .
247	E-607	Connects Rotary Motor PWB and Rotary Motor Assembly.
F421	D-508	Connects BCR Wire and BCR Connector Assembly.
F422	B-108	Connects Developer Wire and Developer Contact Assembly.
F423	D-511	Connects DTS Wire and DTS Plate.
F791	F-808	Connects H/R Heater and P/R Heater.
A	B-606	Connects HVPS and BCR Wire.
C	C-607	Connects HVPS and Developer Wire.
D	B-609	Connects HVPS and 1st BTR Wire.
F	B-608	Connects HVPS and Contact Roll Wire.
G	B-608	Connects HVPS and DTS Wire.
T1	F-811	Connects Heater Wire and Fuser Upper Assembly.
T2	I-807	Connects P/R Heater and Heater Wire.
T3	D-510	Connects 1st BTR Wire and 1st BTR Bias Plate.
T4	E-510	Connects Contact Roll Wire and Contact Plate.
T5	I-806	Connects H/R Heater and Fuser Upper Assembly.
310	F-306	Connects Panel Harness and Controller PWB.
314	G-306	Connects Controller Fan and Controller PWB.
317	C-306	Connects Operation Panel and Panel Harness.

A.3 Wiring Diagrams and Signal Information

A.3.1 Master Wiring Diagram

The following table gives the notations used in the wiring diagrams on the next page.

Table A-17. Notation Used

	Indicates a connection between parts (e.g., harness, wire, etc.).
	Indicates a connection between conductive parts (e.g., plate spring).
XX	Indicates a path from a connector (P/J) and screw if no part name is inside the box. A number inside the box indicates a connector number.
XX	Indicates a connector (P/J) that is used in more than one place. A number inside the box indicates a connector number.
MCU PWB PL X. Y. Z	Indicates the part name, the plate (PL) X.Y and item number Z that are described in Section 5 "Parts List".
Thermostat	Indicates the functional component of the part.
§ 1	Indicates the block diagram number after the sign § in "2. Wiring Diagrams for Parts".
A A	Indicates that A and A are connected in the same block diagram.
B B	Indicates that B and B are connected in different block diagrams.

SRN901FA

NOTE: *On the following pages, the Developer Assembly Y, Developer Assembly M, Developer Assembly C, Developer Assembly Bk are called the Developer Assembly.*

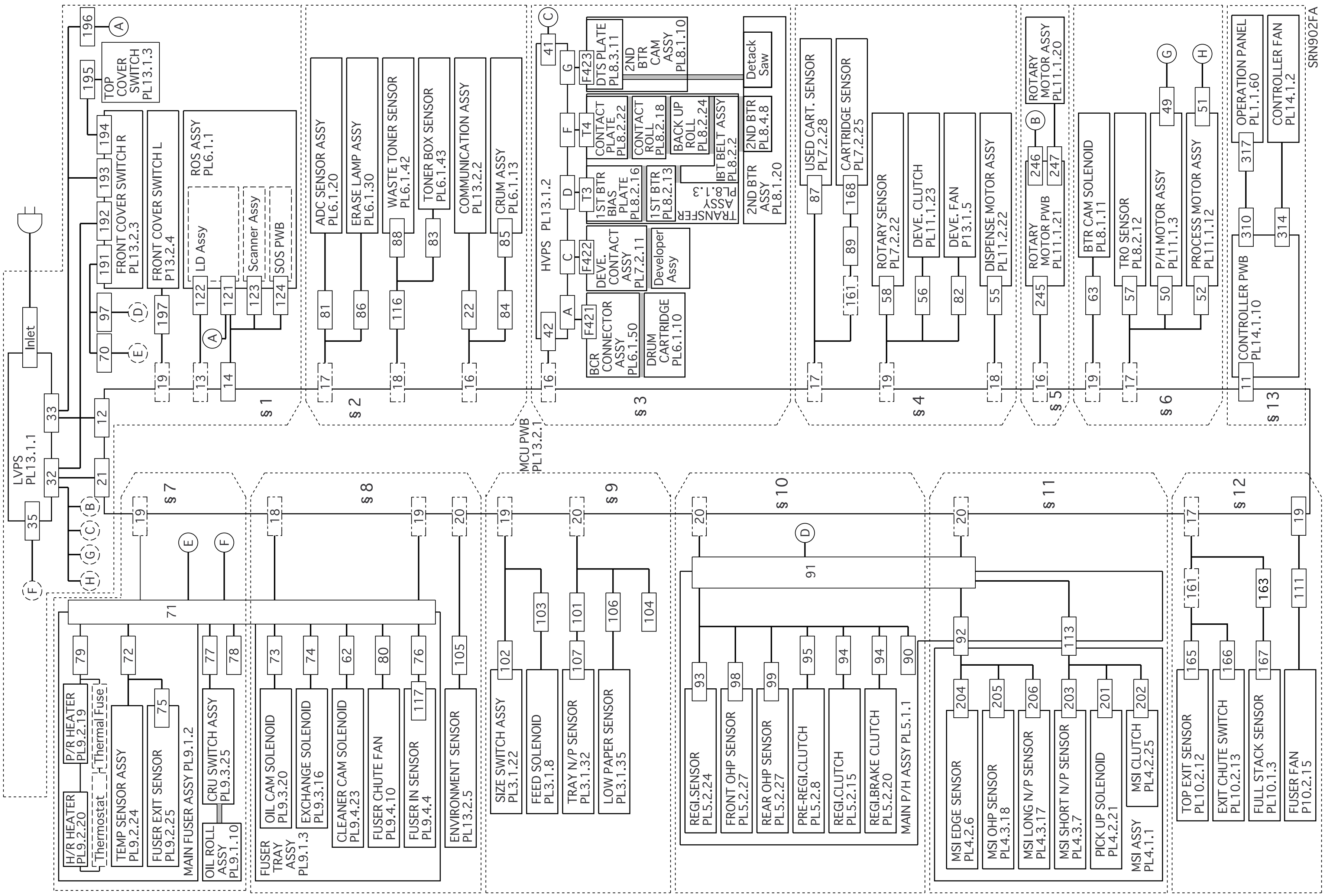


Figure 1-36. Master Wiring Diagram

A.3.2 Wiring and Signal Description Between Components

A.3.2.1 Organization

The wiring diagram is divided into the following 13 sections. The signal names, pin numbers and other information are given in detailed diagrams by sections.

§1. MCU PWB, LVPS, ROS Assembly, Fuser Assembly, Main P/H Assembly, Front Cover Switch R, Front Cover Switch L, Top Cover Switch

Connection between:
- MCU PWB and LVPS
- MCU PWB and ROS Assembly
- MCU PWB and Front Cover Switch L
- LVPS and Fuser Assembly
- LVPS and Main P/H Assembly
- LVPS and Front Cover Switch R
- LVPS and Top Cover Switch
- LVPS and ROS Assembly

§2. MCU PWB, ADC Sensor Assembly, Erase Lamp Assembly, Waste Toner Sensor, Toner Box Sensor, Communication Assembly, CRUM Assembly

Connection between:
- MCU PWB and ADC Sensor Assembly
- MCU PWB and Erase Lamp Assembly
- MCU PWB and Waste Toner Sensor
- MCU PWB and Toner Box Sensor
- MCU PWB and COMMUNICATION Assembly
- MCU PWB and CRUM Assembly

§3. MCU PWB, HVPS, LVPS, BCR Connector Assembly, Developer Contact Assembly, Transfer Assembly, 2nd BTR Cam Assembly, Drum Cartridge, 2nd BTR Assembly

Connection between:
- MCU PWB and HVPS
- LVPS and HVPS
- HVPS and BCR Connector Assembly
- HVPS and Developer Contact Assembly
- HVPS and Transfer Assembly
- HVPS and 2nd BTR Cam Assembly
- BCR Connector Assembly and Drum Cartridge
- Transfer Assembly and 2nd BTR Assembly

§4. MCU PWB, Used Cartridge Sensor, Cartridge Sensor, Rotary Sensor

Connection between:
- Developer Clutch, Developer Fan, Dispense Motor Assembly
- MCU PWB and Used Cartridge Sensor
- MCU PWB and Cartridge Sensor
- MCU PWB and Rotary Sensor
- MCU PWB and Developer Clutch
- MCU PWB and Developer Fan
- MCU PWB and Dispense Motor Assembly

§5. MCU PWB, LVPS, Rotary Motor PWB, Rotary Motor Assembly

Connection between:
- MCU PWB and Rotary Motor PWB
- LVPS and Rotary Motor PWB
- Rotary Motor PWB and Rotary Motor Assembly

§6. MCU PWB, LVPS, BTR Cam Solenoid, TRO Sensor, P/H Motor Assembly, Process Motor Assembly

Connection between:
- MCU PWB and BTR Cam Solenoid
- MCU PWB and TR0 Sensor
- MCU PWB and P/H Motor Assembly
- MCU PWB and Process Motor Assembly
- LVPS and P/H Motor Assembly
- LVPS and Process Motor Assembly

§7. MCU PWB, LVPS, Main Fuser Assembly, CRU Switch Assembly, Oil Roll Assembly

Connection between:
- LVPS and Main Fuser Assembly
- MCU PWB and Main Fuser Assembly
- MCU PWB and CRU Switch Assembly
- CRU Switch Assembly and Oil Roll Assembly

§8. MCU PWB, Fuser Tray Assembly, Environment Sensor

Connection between:
- MCU PWB and Fuser Tray Assembly
- MCU PWB and Environment Sensor

§9. MCU PWB, Size Switch Assembly, Feed Solenoid, Tray N/P Sensor, Low Paper Sensor

Connection between:
- MCU PWB and Size Switch Assembly
- MCU PWB and Feed Solenoid
- MCU PWB and Tray N/P Sensor
- MCU PWB and Low Paper Sensor

§10. MCU PWB, Main P/H Assembly

Connection between:
- MCU PWB and Main P/H Assembly

§11. MCU PWB, Main P/H Assembly, MSI Assembly

Connection between:
- MCU PWB and Main P/H Assembly
- Main P/H Assembly and MSI Assembly

§12. MCU PWB, Top Exit Sensor, Exit Chute Switch, Full Stack Sensor, Fuser Fan

Connection between:
- MCU PWB and Top Exit Sensor
- MCU PWB and Exit Chute Switch
- MCU PWB and Full Stack Sensor
- MCU PWB and Fuser Fan

§13. MCU PWB, Controller PWB, Operation Panel, Controller Fan

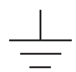
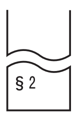
Connection between:
- MCU PWB and Controller PWB
- Controller PWB and Operation Panel
- Controller PWB and Controller Fan

A.3.3 Notations on the Diagrams for the Wiring and Signal Descriptions between Components

The following table gives the notations used in the wiring diagrams on the following pages.

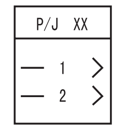
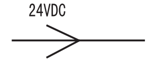
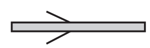
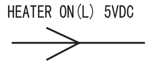
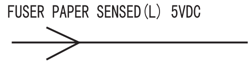
NOTE: *Standard and common symbols are not described.*

Table A-18. Notaions in Use (1/2)

24VDC	Indicates the measured DC voltage on the negative probe of the meter touched to the ground (SG, AG, or PIN).
SG	Indicates the signal ground.
AG	Indicates the analog ground.
FG 	Indicates the frame ground.
RTN	Indicates a return.
	Indicates that one connector is used in different block diagrams or is divided in the same diagram. The lower part indicates the block diagram number that follows a sign § where this connector is used.
◆	Indicates a note regarding the block diagram.

SRN904FA

Table A-19. Notations in Use (2/2)

	Indicates a connector. The upper box indicates the connector number; the lower box indicates the pin number(s). P, -: Indicates the connector plug. J, >: Indicates the connector jack.
MCU PWB PL X. Y. Z	Indicates the part name, the plate (PL) X.Y and item number Z that are described in Section 5 "Parts List".
Scanner Assy	Indicates the functional component of the part.
	Indicates a connection (e.g., wire connection).
(T1) 	Indicates a connection locked with a screw and the terminal (connector) name in ( ).
	Indicates that A and A are connected.
24VDC 	Indicates a connection between parts (e.g., harness, wire, etc.) and the signal name/contents. An arrow < or > indicates the signal direction.
CR 	Indicates a connection between conductive parts (e.g., plate spring) and the signal name/contents. An arrow < or > indicates the signal direction.
HEATER ON(L) 5VDC 	Indicates the signal name, the voltage level (L:low or H:high) when the signal is on, and the voltage value at the high level .
FUSER PAPER SENSED(L) 5VDC 	Indicates the signal name, the voltage level (L:low or H:high) when the function (FUSER PAPER SENSOR) is in sensing, and the voltage value at the high level .
FRONT COVER SWITCH ON(L) 5VDC 	Indicates the signal name, the voltage level (L:low or H:high) when the switch is on, and the voltage value at the high level .

SRN903FA

A.3.3.1 Wiring Diagram - §1

Table A-20. Signal Description - §1

Signal Name	Description
HEATER ON (L) 5VDC	Control signal to turn the P/R Heater and H/R Heater ON/OFF.
24VDC-I/L	Relay control signal to detect the interlock switches and interlock connectors. Relay control signal in the LVPS.
5VDC-LD	Power source voltage for the LD Assembly in the ROS Assembly.
SOS	Scan start reference signal based on the light input to the SOS Sensor in the SOS PWB.
VREF	Reference voltage for the target light quantity.
LD ENB	Control signal that enables the LD to turn on or forces it to turn off. (High: OFF/Low: ON)
SCANNER MOTOR ON (L) 5V	Control signal to turn the Scanner Motor in the ROS Assembly ON/OFF.
PCONT	Mode control signal to control the LD light quantity (APC). (Low: Sample mode/High: Hold mode)
VDATA	Pixel data signal to turn the LD ON/OFF. (High: ON/ Low: OFF)
FRONT COVER SWITCH ON (L) 5VDC	Signal to detect the Front Cover open (OFF)/close (ON) from the Front Cover Switch L.

- LVPS overcurrent protection circuit
  If the power voltage (24VDC/5VDC) is shorted, all power is turned off. After the shorted state is canceled, the system recovers by turning off the power and by turning on again after 2 or 3 minutes later.
- LVPS overvoltage protection circuit
  If the power voltage (24VDC/5VDC) becomes overvoltage, all power is turned off. The operating point is 7VDC or less for 5VDC and 27~36VDC (reference) for 24VDC. The system recovers by turning off the power and by turning on again after 2 or 3 minutes later.
- Power off by Front Cover Switch R
  When the Front Cover Switch R is turned off, the 24VDC-I/L circuit is shut off, and the power supply to the MCU PWB (24VDC) and the ROS Assembly (LD Assembly) (5VDC-LD) is turned off. If the Front Cover Switch R is turned on, the 24VDC-I/L is input to the LVPS Relay circuit and the 24VDC and 5VDC-LD are output from the LVPS. The Front Cover Switch R is also an interlock switch for the 5VDC-LD circuit.

WARNING

The Front Cover Switch R and Top Cover Switch are interlock switches that prevent exposure to the laser beam. Never tamper with these switches. Direct eye exposure to the laser beam may cause eye injury or blindness. For any operation involving these switches, follow the instructions in this manual.

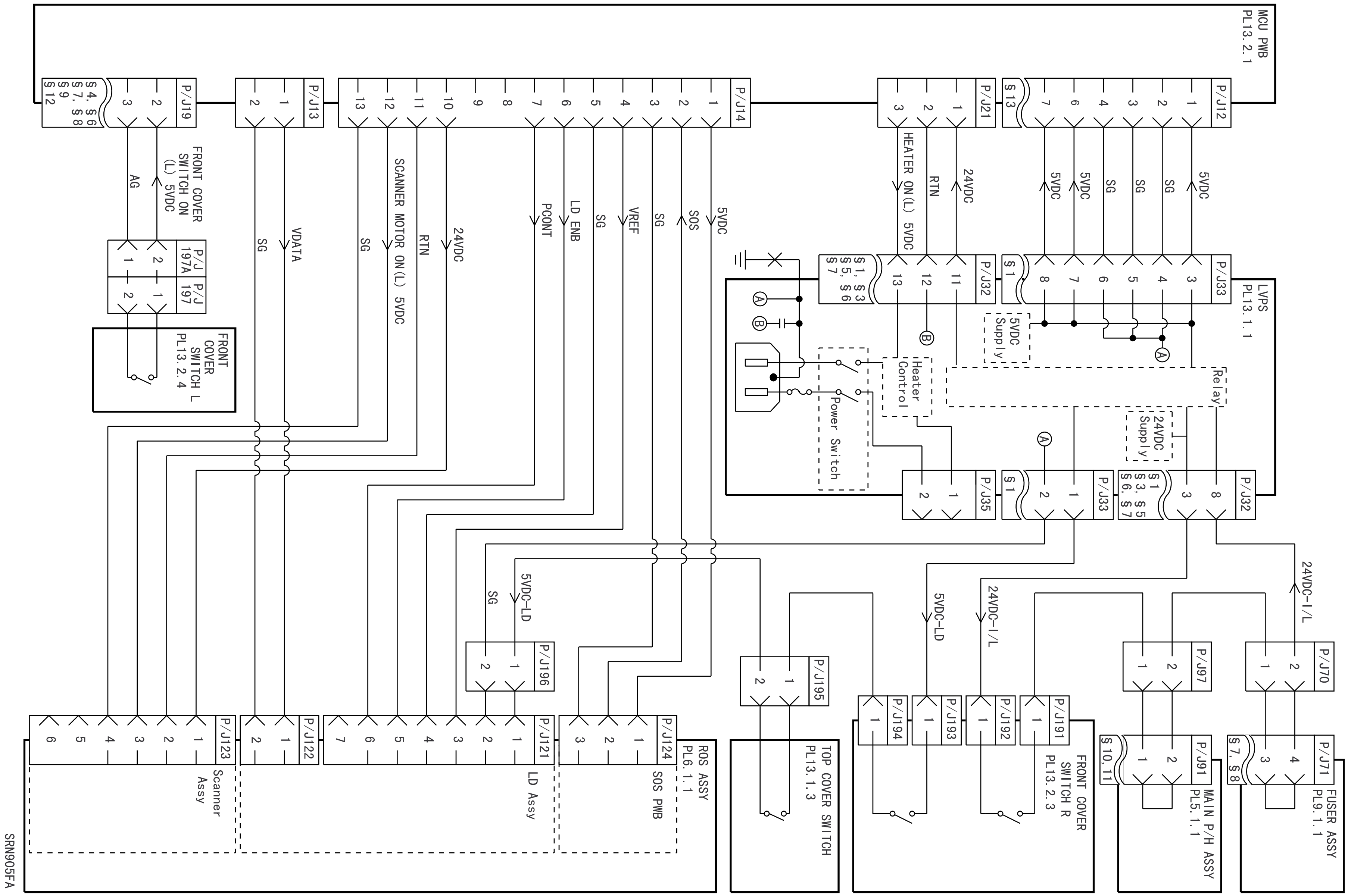


Figure 1-37. Wiring Diagram - §1

A.3.3.2 Wiring Diagram - §2

Table A-21. Signal Description - §2

Signal Name	Description
LED ON (L) 5VDC	Control signal to turn the LED ON/OFF in the ADC Sensor (ADC Sensor Assembly).
ADC SIG	Measurement signal from the ADC Sensor (ADC Sensor Assembly). (Analog)
ADC SOLENOID ON (L) 24VDC	Control signal to turn the ADC Solenoid (ADC Sensor Assembly) ON/OFF.
ERASE LAMP ON (H) 5VDC	Control signal to turn the LED ON/OFF in the Erase Lamp Assembly.
WASTE TONER SENSED (H) 5VDC	Signal from the Waste Toner Sensor to detect the full Waste Toner Box.
TONER BOX SENSED (L) 5VDC	Signal from the Toner Box Sensor to detect the Waste Toner Box (Low: Waste Toner Box/High: No Waste Toner Box).
CRUM DATA	Write/read data to/from the Crum Assembly (Drum Cartridge).
CRUM CLOCK	Clock signal in the Crum Assembly (Drum Cartridge).

- ☐ ADC SIG signal
  The voltage on the normal drum surface without a toner image is about 3.5VDC.
- ☐ ADC Solenoid coil resistance: 36Ω ±10% (20°C)

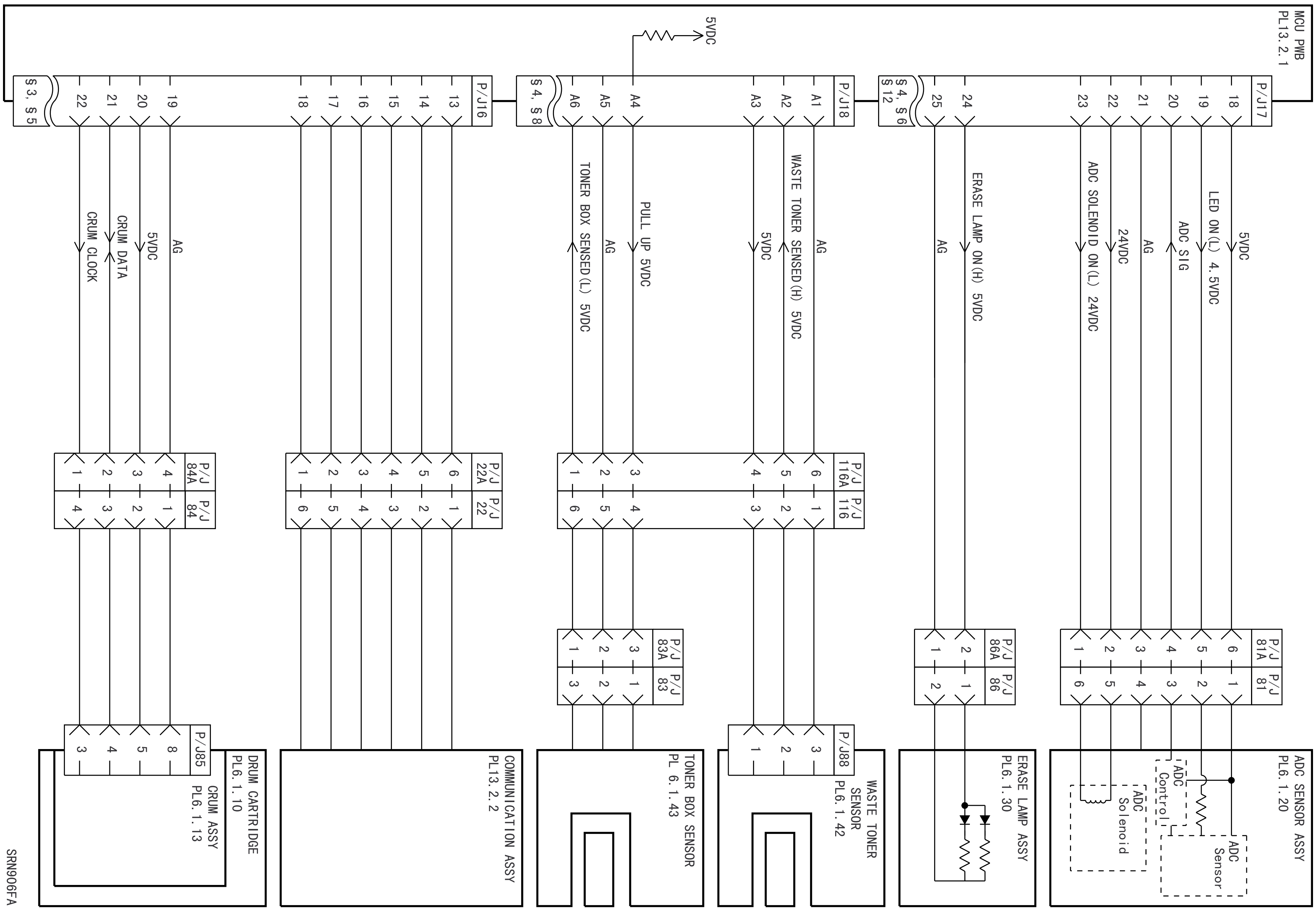


Figure 1-38. Wiring Diagram - §2

A.3.3.3 Wiring Diagram - §3

Table A-22. Wiring Diagram - §3

Signal Name	Description
DTS CONT	Output control signal for the DTS output. (Analog)
DTS ON (L) 24VDC	Control signal to turn the DTS output ON/OFF.
2BTR MONI	Current monitor signal for the 2nd BTR output. (Analog)
2BTR CONT	Output control signal for the 2nd BTR output. (Analog)
2BTR ON (L) 24VDC	Control signal to turn the 2nd BTR output ON/OFF.
1BTR MONI	Voltage monitor signal for the 1st BTR output. (Analog)
1BTR CONT	Output control signal for the 1st BTR output. (Analog)
1BTR ON (L) 24VDC	Control signal to turn the 1st BTR output ON/OFF.
DB DC CONT	Output control signal for the DB output (DC component). (Analog)
DB DC ON (L) 24VDC	Control signal to turn the DB output (DC component) ON/OFF.
DB AC ON (L) 24VDC	Control signal to turn the DB output (AC component) ON/OFF.
BCR DC CONT	Output control signal for the BCR output (DC component). (Analog)
BCR ON (L) 24VDC	Control signal turn the BCR output ON/OFF.
BCR	Charging output to the BCR (Drum Cartridge) from HVPS. • This is output in response to the BCR DC CONT signal when the BCR ON(L) 24VDC signal is turned on.
DB	Output from the HVPS to the Developer Contact Assembly (Magnet Roll in the Developer Assembly). • This signal is output after overlaying the AC component (DB AC) on the DC component. • This is output in response to the DB DC CONT signal when the DB DC ON(L) 24VDC signal is turned on.
1st BTR	Output for the 1st transfer from the HVPS to the 1st BTR (Transfer Assembly) • This signal is output in response to the 1BTR CONT signal when the 1BTR ON(L) 24VDC signal is turned on.
2nd BTR	Output for the 2nd transfer from the HVPS to the Contact Roll (Back Up Roll) (Transfer Assembly). • This signal is output in response to the 2BTR CONT signal when the 2BTR ON(L) 24VDC signal is turned on.
DTS	Output from the HVPS to discharge the electricity on the Detack Saw (2nd BTR Assembly). • This signal is output in response to the DTS CONT signal when the DTS ON(L) 24VDC signal is turned on.

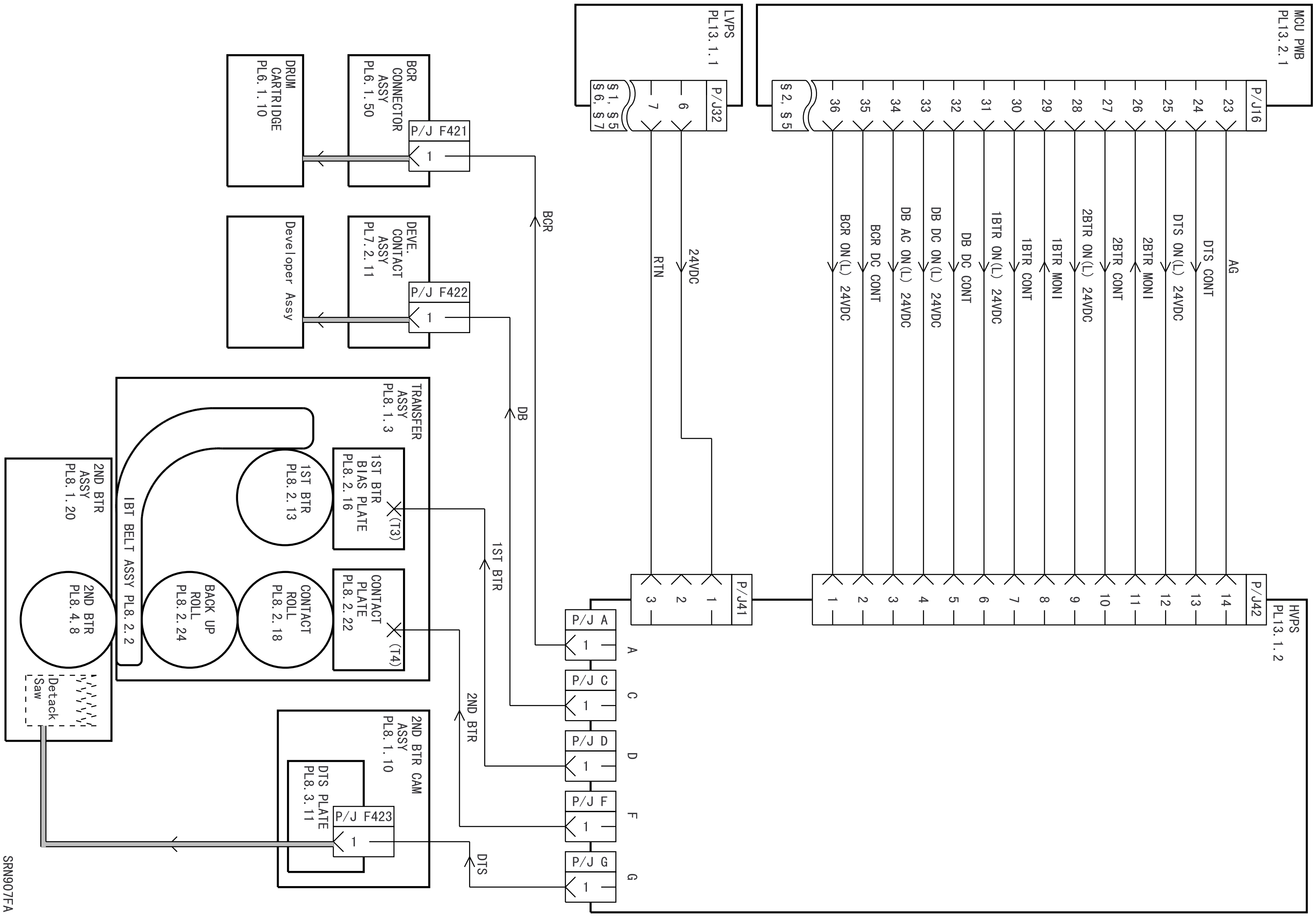


Figure 1-39. Wiring Diagram - §3

A.3.3.4 Wiring Diagram - §4

Table A-23. Signal Description - §4

Signal Name	Description
USED CARTRIDGE SENSED (H) 5VDC	Signal to detect new/old Toner cartridge (Low: New/ High: Old).
SENSOR ON (H) 5VDC	Sensor power ON/OFF signal for the Used Cartridge Sensor and Cartridge Sensor (High: ON/Low: OFF).
CARTRIDGE SENSED (L) 5VDC	Toner Cartridge detection signal (Low: Toner Cartridge/High: No Toner Cartridge).
ROTARY HOME SENSED (H) 5VDC	Signal from the Rotary Sensor to detect the Rotary Frame Assembly protrusion.
DEVELOPER CLUTCH ON (L) 24VDC	Control signal to turn the Developer Clutch ON/OFF.
DEVELOPER FAN HALF-SPEED (H) 24VDC	Signal to detect the rotation of the Developer Fan (Low: Fast/High: Slow).
DEVELOPER FAN ON (H) 24VDC	Control signal to turn the Developer Fan ON/OFF.
DISPENSE MOTOR ON(L) 24VDC	Control signal to turn the Dispense Motor Assembly ON/OFF.

- Developer Clutch coil resistance: 150Ω ±10% (20°C)
    - Developer Fan
    - Number of polarities: 4
    - Number of rotations: 3400 ±200rpm (Fast) / 2500 ±250rpm (Slow)
- Dispense Motor Assembly
    - Motor type: DC synchronous motor
    - Number of polarities: 8
    - Number of rotations (motor controlled): 113.9 ±11.4rpm
    - Rotation direction: Counterclockwise (viewed from the rear)

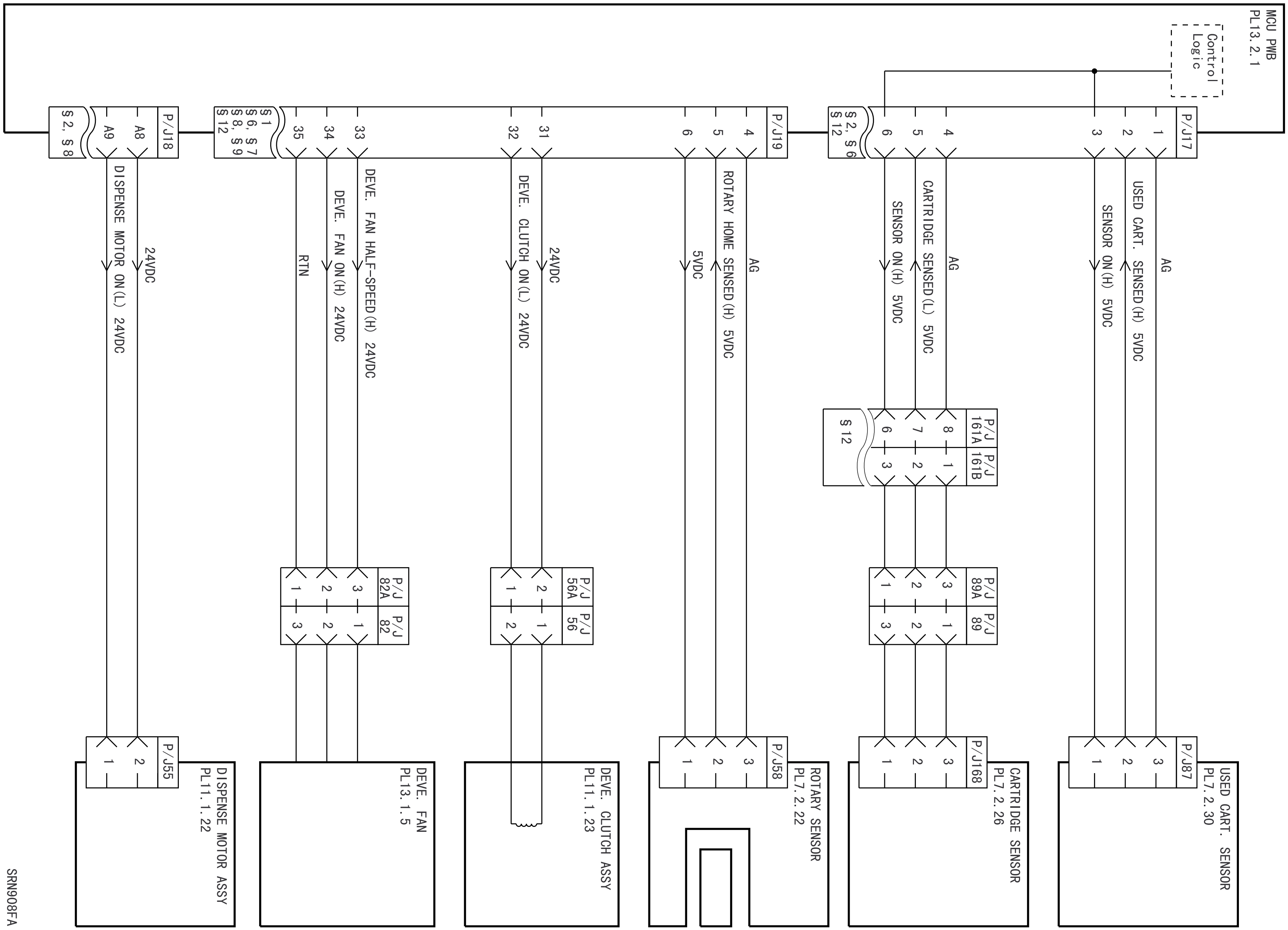


Figure 1-40. Wiring Diagram - §4

A.3.3.5 Wiring Diagram - §5

Table A-24. Wiring Diagram - §5

Signal Name	Description
ROTARY MOTOR HOLD (L) 5VDC	Signal to control the hold current for the Rotary Motor Assembly.
ROTARY MOTOR ON (L) 5VDC	Control signal to turn ON/OFF the driving power for the Rotary Motor Assembly.
ROTARY MOTOR CLOCK	Clock signal for the Rotary Motor Assembly.
A, /A, B, /B	Excitation signala for the Rotary Motor Assembly.

- Rotary Motor Assembly
  - Motor type: Hybrid stepping motor
  - Rotation direction: Clockwise (viewed the rear)
  - Step angle: 1.8°±0.18°
  - Coil resistance: 0.9~0.95Ω ±10% (25°C)
  - Excitation sequence : See the table below. (*: Excitation)

Table A-25. Excitation Sequence

Phase	Step (2-phase excitation)							
	1	2	3	4	5	6	7	8
/B		*	*			*	*	
B	*			*	*			*
A	*	*			*	*		
/A			*	*			*	*

- Rotation/Hold by the signals
  See the table below:

Table A-26. Rotation/Hold by the signals

ROTARY MOTOR ON (L) 5VDC	Rotary Motor Hold (L) 5VDC	Status
Low	High	The Rotary Motor Assembly rotates. (Actual rotation is controlled by the Rotary Motor Clock signal.)
Low	Low	The Rotary Motor Assembly is in the hold state.
High	Low or High	The Rotary Motor Assembly does not rotate and is not in the hold state.

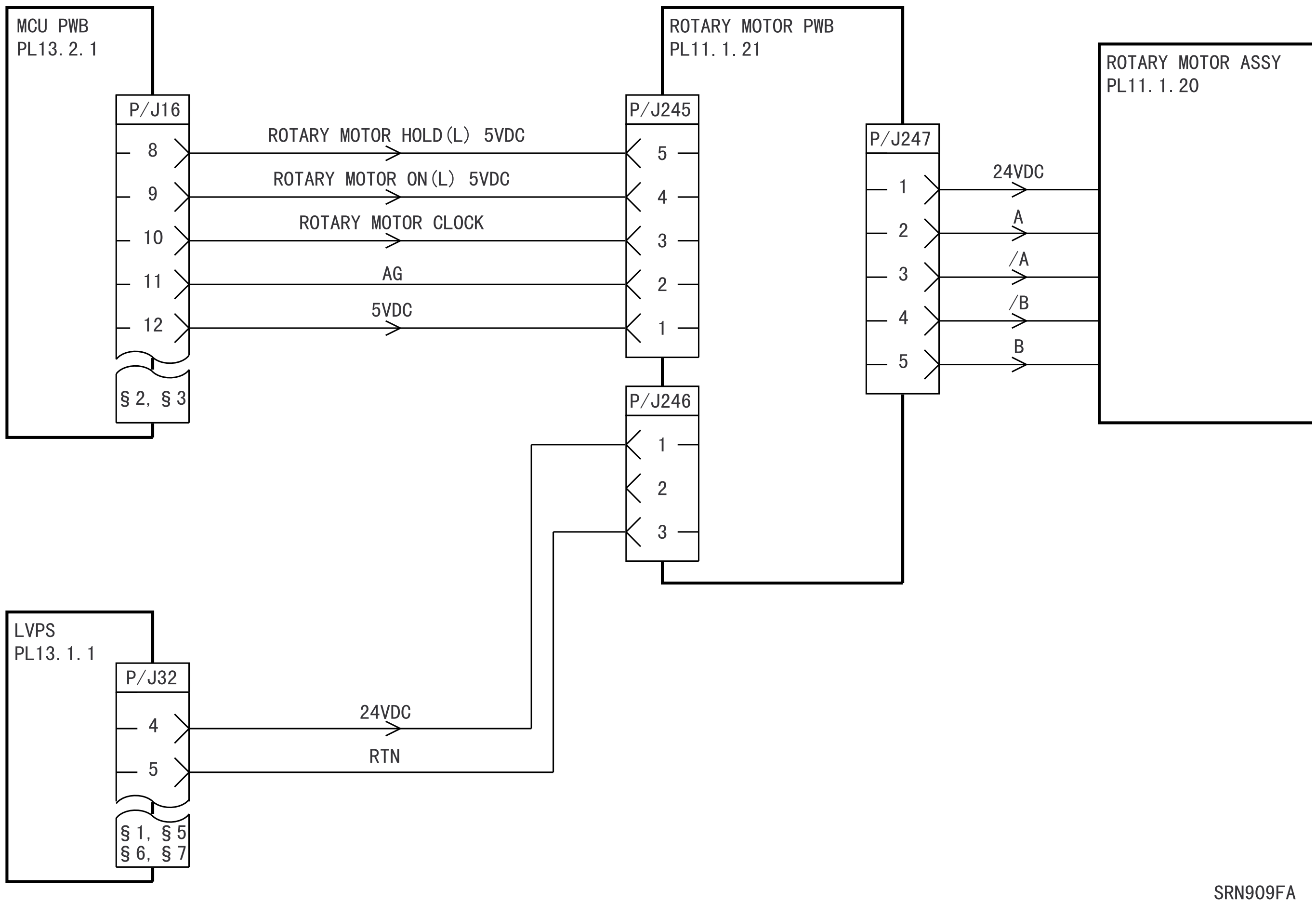


Figure 1-41. Wiring Diagram - §5

A.3.3.6 Wiring Diagram - §6

Table A-27. Wiring Diagram - §6

Signal Name	Description
BTR CAM SOLENOID ON (L) 24VDC	Control signal to turn the BTR Cam Solenoid ON/OFF.
TR0-M SENSED(L) 5VDC	Signal from the TR0 Sensor to detect the TR0 mark on the IBT Belt Assembly.
P/H MOTOR ON (L) 5VDC	Control signal to turn the P/H Motor Assembly ON/OFF.
P/H MOTOR HALF-SPEED (L) 5VDC	Signal to control the speed of the P/H Motor Assembly (High: Standard speed/Low: Half speed).
P/H MOTOR FAIL (H) 5VDC	Fail detection signal for the P/H Motor Assembly (High: Abnormal/Low: Normal)
PROCESS MOTOR ON (L) 5VDC	Control signal to turn the Process Motor Assembly ON/OFF.
PROCESS MOTOR HALF-SPEED (L) 5VDC	Signal to control the speed of the Process Motor Assembly (High: Standard speed/Low: Half speed).
PROCESS MOTOR CLOCK	Clock output signal for the Process Motor Assembly.

- Process Motor Assembly
  - Motor type: Permanent magnet field DC servo motor
  - Number of polarities: 3-phase/12 polarities
  - Number of rotations (motor controlled): 1735.358rpm ±0.5% (Standard speed) / 867.679rpm ±0.5% (Half speed)
  - Rotation direction: Counterclockwise (viewed from the rear)
  - Abnormal rotation detection: When the number of rotations (motor controlled) changes 6.25% or more.
- P/H Motor Assembly
  - Motor type: Permanent magnet field DC servo motor
  - Number of polarities: 3-phase/8 polarities or 3-phase/12 polarities
  - Number of rotations (motor controlled): 1667rpm ±0.5% (Standard speed) / 833.5rpm ±0.5% (Half speed)
  - Rotation direction: Counterclockwise (viewed from the rear)
  - Abnormal rotation detection: When the number of rotations (motor controlled) changes 6.25% or more. (The P/H Motor FAIL signal becomes High.)
- BTR Cam Solenoid coil resistance: 220Ω ±10% (20°C)

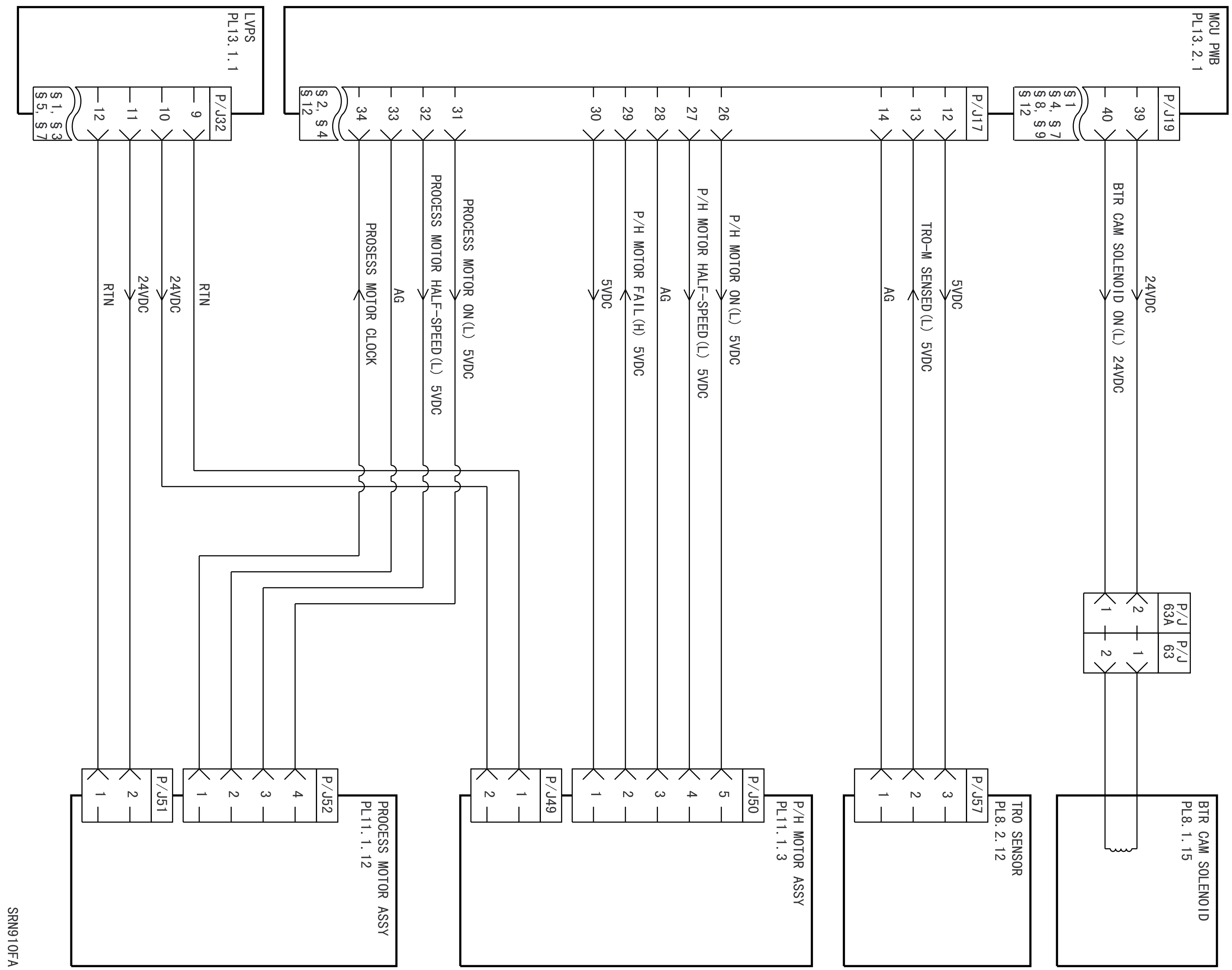


Figure 1-42. Wiring Diagram - §6

A.3.3.7 Wiring Diagram - §7

Table A-28. Wiring Diagram - §7

Signal Name	Description
AC N	Neutral signal in the AC input from the power supply (Heater power supply voltage).
AC L	Line signal in the AC input from the power supply (Heater power supply voltage).
TEMP.	Signal that holds the Heat Roll surface temperature. (Analog) (The temperature is measured by the Thermistor in the Temperature Sensor Assembly. The temperature is used to determine the Fuser control temperature.)
FUSER EXIT PAPER SENSED (L) 5VDC	Signal from the Fuser Exit Sensor to detect the paper in the Fuser.
FUSER ASSEMBLY SENSED (L) 5VDC	Signal to detect the Fuser Assembly connection.
OIL ROLL SENSED (L) 5VDC	Signal to detect the Oil Roll Assembly.
NEW OIL ROLL SENSED (L) 5VDC	Signal to detect New/Old of the Oil Roll Assembly. • When the power is turned on, a conductivity check is performed to detect New/Old of the Oil Roll Assembly.

- ☐ Thermal Fuse fusion temperature: 141°C (+0°C/-6°C)
- ☐ Thermostat contact opening temperature: 150°C ±5.6°C
- ☐ Heater rated power
  - P/R Heater: 480 ±24W (50V)
  - H/R Heater: 360 ±18W (50V)

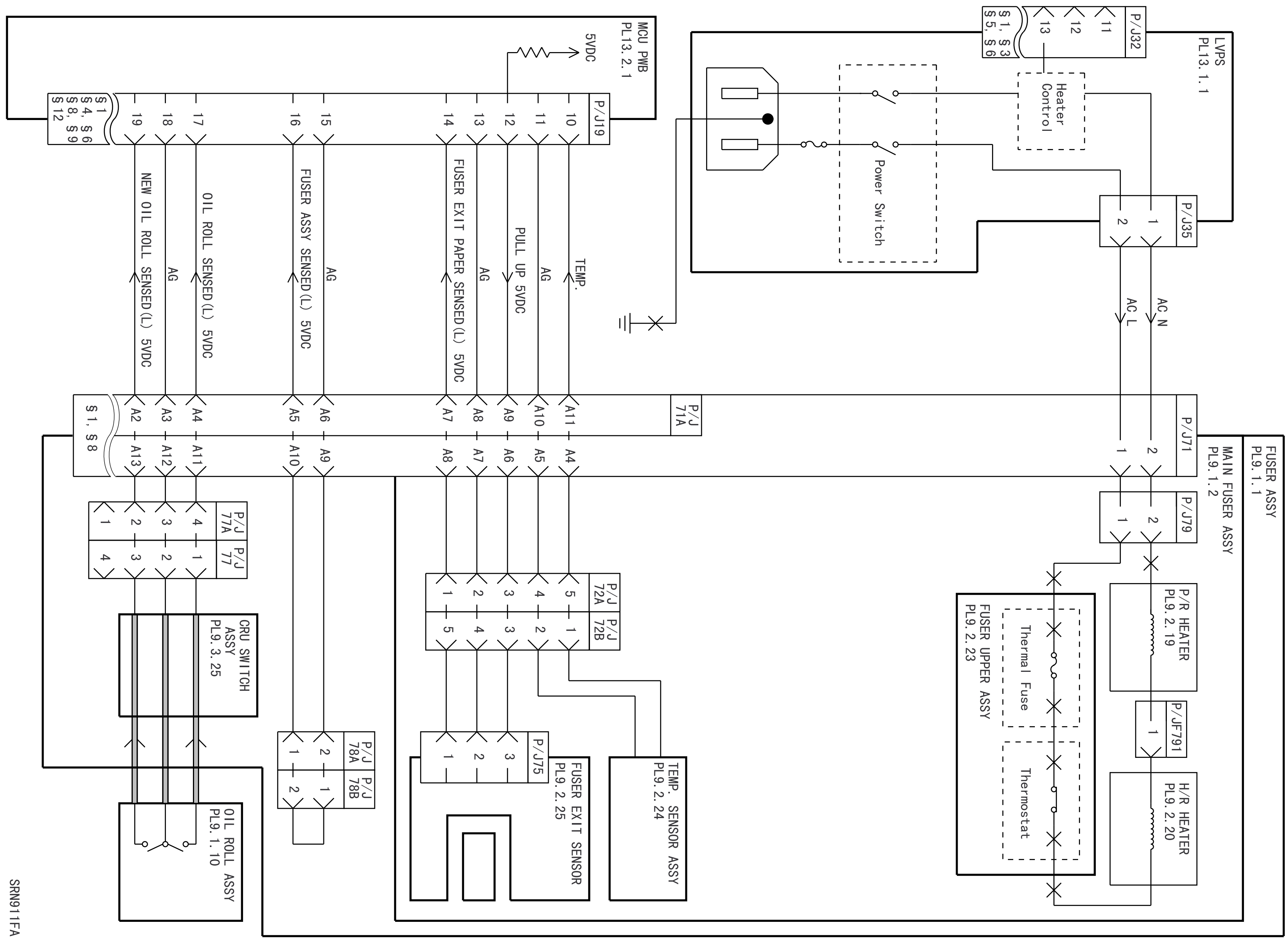


Figure 1-43. Wiring Diagram - §7

A.3.3.8 Wiring Diagram - §8

Table A-29. Wiring Diagram - §8

Signal Name	Description
OIL CAM SOLENOID ON (L) 24VDC	Control signal to turn the Oil Cam Solenoid ON/ OFF.
EXCHANGE SOLENOID PUSH ON (L) 24VDC	Control signal to turn ON/OFF the Exchange Solenoid in the push direction (Face-Up ejection).
EXCHANGE SOLENOID PULL ON (L) 24VDC	Control signal to turn ON/OFF the Exchange Solenoid in the pull direction (Face-Down ejection).
CLEANER CAM SOLENOID ON (L) 24VDC	Control signal to turn the Cleaner Cam Solenoid ON/OFF.
FUSER CHUTE FAN ON (H) 24VDC	Control signal to turn the Fuser Chute Fan ON/ OFF.
FUSER IN PAPER SENSED (L) 5VDC	Signal from the Fuser In Sensor to detect the paper in the Fuser.
ENVIRONMENT TEMP.	Signal that holds the environment temperature data. (Analog) (The temperature is measured by the Thermistor in the Environment Sensor.)

- ☐ Oil Cam Solenoid coil resistance: 220Ω ±10% (20°C)
- ☐ Exchange Solenoid coil resistance: 45Ω ±10% (20°C) [24VDC↔signals]
- ☐ Cleaner Cam Solenoid coil resistance: 220Ω ±10% (20°C)
- ☐ Fuser Chute Fan
  - ■ Number of polarities: 4
  - ■ Number of rotations: 5000 ±1000rpm

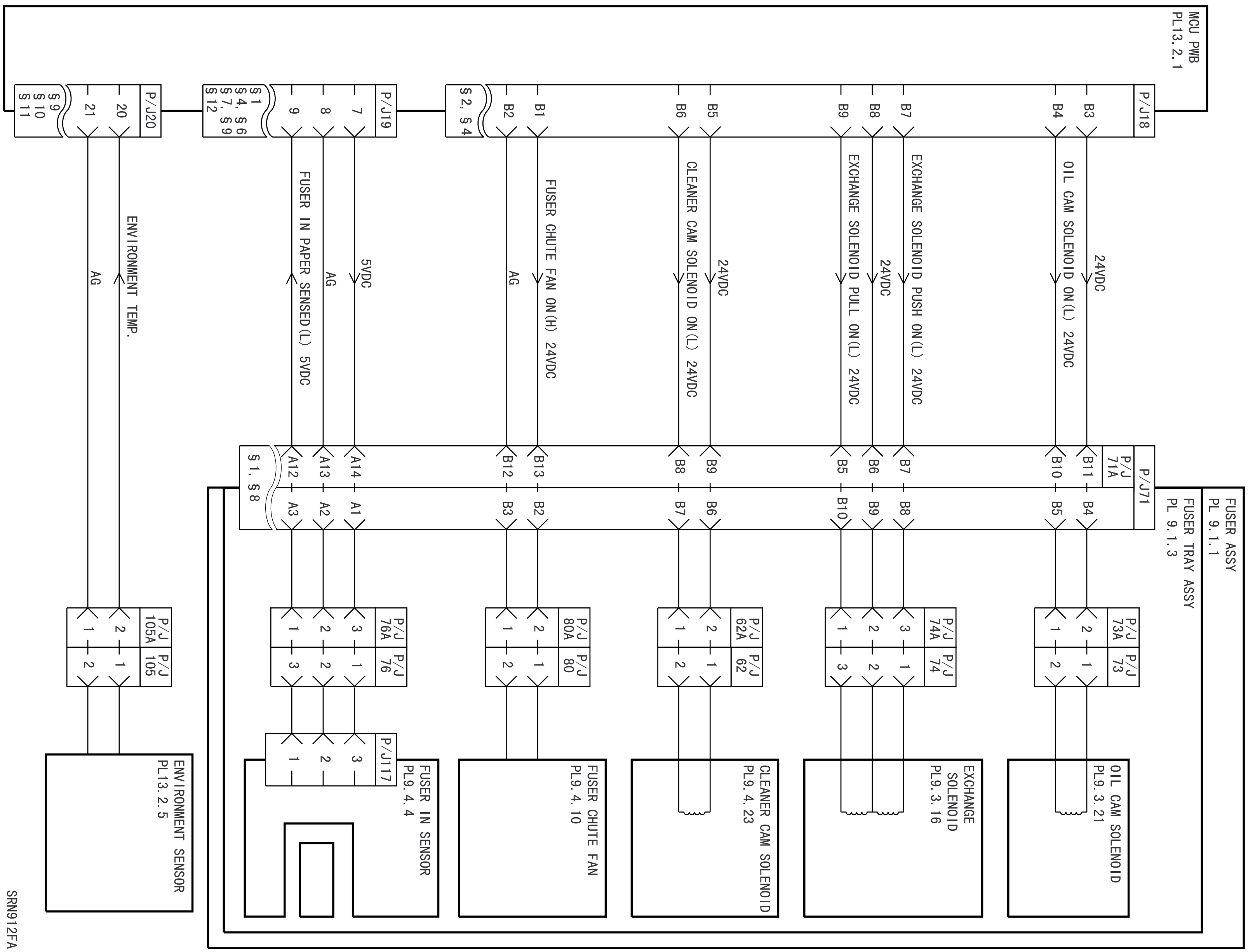


Figure 1-44. Wiring Diagram - §8

A.3.3.9 Wiring Diagram - §9

Table A-30. Wiring Diagram - §9

Signal Name	Description
[1] SIZE SWITCH	Signal to detect the size of the paper in Tray 1. (Analog)
[1] FEED SOLENOID ON (L) 24VDC	Control signal to turn the Feed Solenoid ON/OFF in Tray 1.
[1] TRAY PAPER SENSED (L) 5VDC	Signal from the Tray No Paper Sensor to detect the paper in Tray 1. (High: No paper/Low: Paper in the tray)
[1] LOW PAPER SENSED (L) 5VDC	Signal from the Low Paper Sensor to detect low paper level in Tray 1. (High: Enough paper/Low: Low paper level)

- Feed Solenoid coil resistance: 90Ω ±10% (20°C)
- Size Switch signal
  The paper size in the paper tray is determined by the Paper Size Switch ON/OFF. (The Paper Size Switch is on the Size Switch Assembly). The following table gives the paper sizes, Paper Size Switch states (ON/OFF) and the switch voltages.

  NOTE: *The Paper Size Switches are defined as SW1, SW2, SW3 and SW4 (viewed from the front of the printer). It is defined that ON: 1 and OFF:0.*

Table A-31. Size Switch Signal

Paper size	Paper Size Switch				Voltage (Unit: V DC)
	SW1	SW2	SW3	SW4	
No paper tray	0	0	0	0	0.275~0.293
B5 (LEF) *1 EXECUTIVE (LEF) *2	1	1	0	0	3.671~3.715
A4 (LEF)	0	1	0	0	1.396~1.445
LETTER (LEF)	1	0	1	0	3.098~3.152
A4 (SEF) *1 LETTER (SEF) *2	0	1	1	1	2.248~2.298
LEGAL 14” (SEF)	1	1	1	0	4.247~4.276
B4 (SEF)	0	1	0	1	1.680~1.730
A3 (SEF)	0	0	1	0	0.834~0.871
LEDGER (SEF)	0	0	1	1	1.116~1.157
12” x 8” (SEF)	0	0	0	1	0.554~0.583
Irregular	1	1	1	1	4.537~4.554
<Not used>	1	0	0	0	-
<Not used>	1	0	0	1	-
<Not used>	0	1	1	0	-
<Not used>	1	0	1	1	-
<Not used>	1	1	0	1	-

NOTE: *If the ON/OFF state is the same for the Paper Size Switches, one of the following is selected depending on the specifications of the printer.*
**1: The mm (millimeter) unit specification*
**2: The inch unit specification*

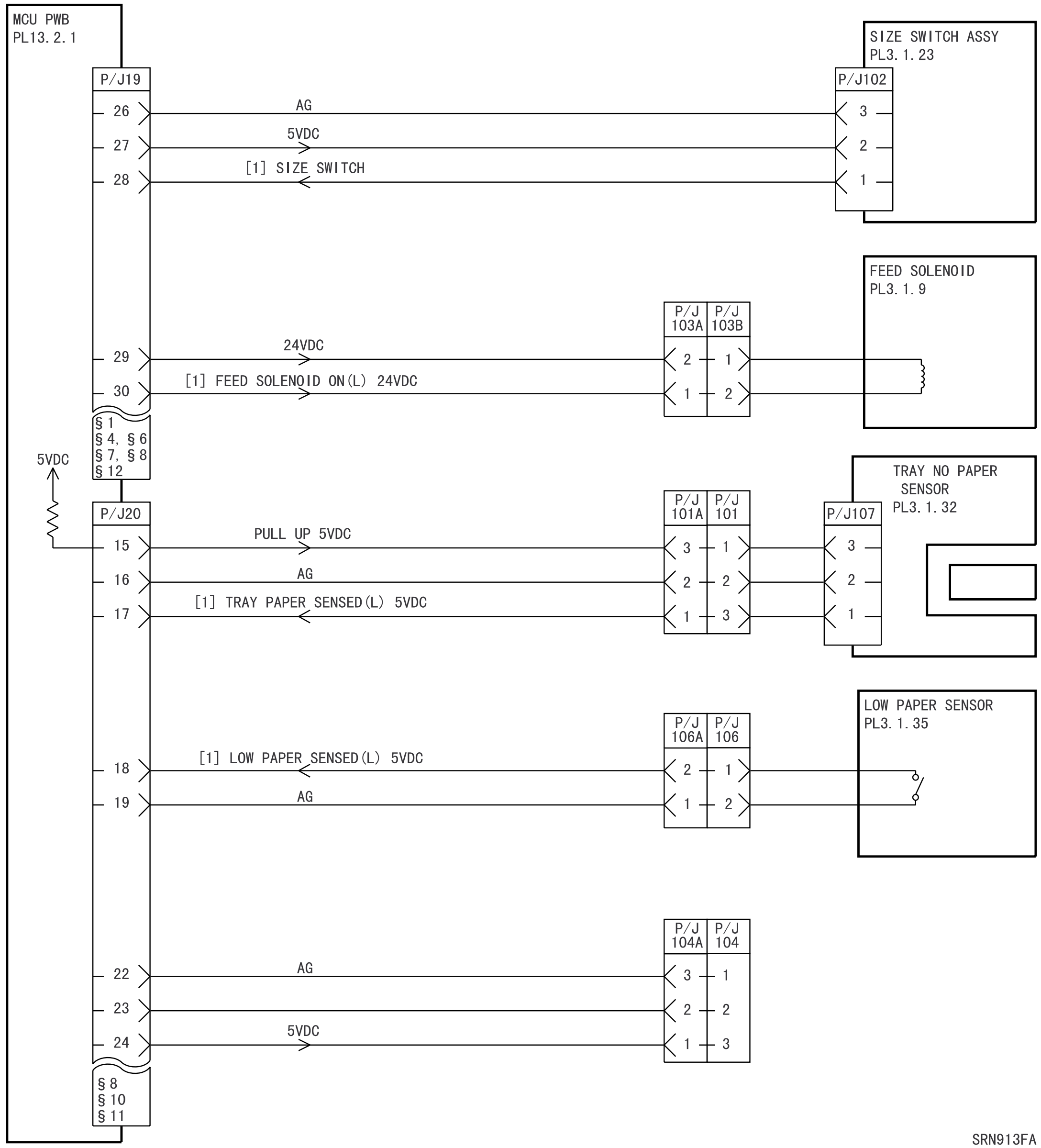


Figure 1-45. Wiring Diagram - §9

A.3.3.10 Wiring Diagram - §10

Table A-32. Wiring Diagram - §10

Signal Name	Description
REGISTRATION PAPER SENSED (L) 5VDC	Signal from the Registration Sensor to detect the paper on the Main P/H Assembly.
FRONT OHP WHITE SENSED (L) 5VDC	Signal from the Front OHP Sensor to detect the white band on the OHP film (for color). • To detect the front/back of an OHP film, see “Section 10: 7.3 OHP Side Detection Control”.
REAR OHP WHITE SENSED (L) 5VDC	Signal from the Rear OHP Sensor to detect the white band on the OHP film (for color). • To detect the front/back of an OHP film, see “Section 10: 7.3 OHP Side Detection”
PRE-REGISTRATION CLUTCH ON (L) 24VDC	Control signal to turn the Pre-Registration Clutch ON/OFF.
REGISTRATION CLUTCH ON (L) 24VDC	Control signal to turn the Registration Clutch ON/ OFF.
REGISTRATION BRAKE CLUTCH ON (L) 24VDC	Control signal to turn the Registration Brake Clutch ON/OFF.
MAIN P/H ASSEMBLY SENSED (L) 5VDC	Signal to detection the Main P/H Assembly connection.

- ☐ Pre-Registration Clutch coil resistance: 172Ω ±10% (20°C)
- ☐ Registration Clutch coil resistance: 172Ω ±10% (20°C)
- ☐ Registration Brake Clutch coil resistance: 172Ω ±10% (20°C)

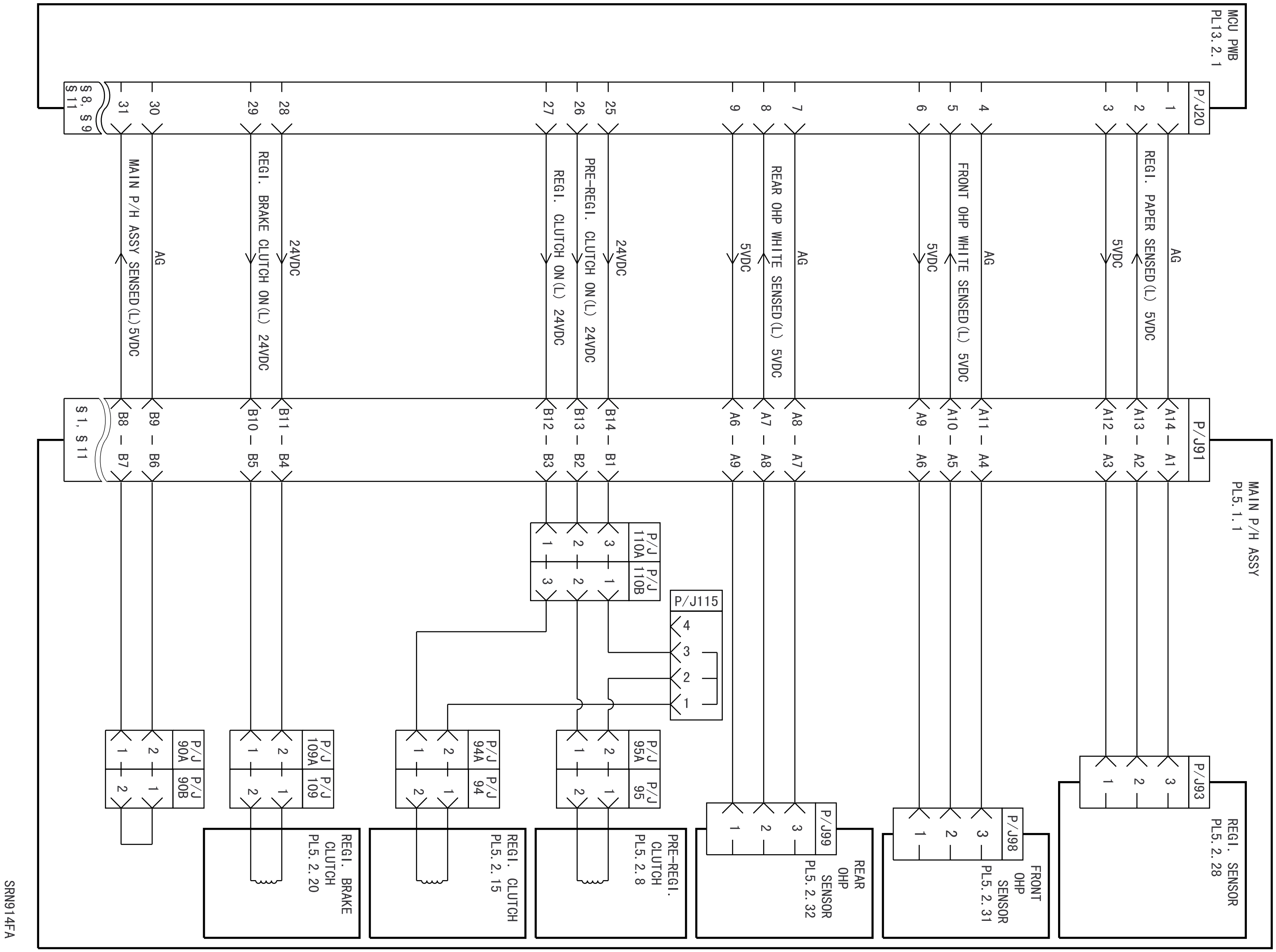


Figure 1-46. Wiring Diagram - §10

A.3.3.11 Wiring Diagram - §11

Table A-33. Wiring Diagram - §11

Signal Name	Description
MSI EDGE PAPER SENSED (L) 5VDC	Signal from the MSI Edge Sensor to detect the paper in the MSI paper feeder. (High: No paper/ Low: Paper in the feeder) • This signal controls the paper feed interval in the 2UP mode.
MSI OHP SENSED (L) 5VDC	Signal from the MSI OPH Sensor to detect the OHP film on the MSI Assembly.
MSI LONG PAPER SENSED (L) 5VDC	Signal from the MSI Long N/P Sensor to detect the paper on the MSI Assembly. (High: No paper/Low: Paper on the MSI Assembly) • This signal is valid only when the print control specifies the paper size 150mm or longer in the transportation direction.
MSI SHORT PAPER SENSED (L) 5VDC	Signal from the MSI Short N/P Sensor to detect the paper on the MSI Assembly. (High: No paper/Low: Paper on the MIS Assembly) • This signal is valid only when the print control specifies the paper size shorter than 150mm in the transportation direction.
MSI CLUTCH ON (L) 24VDC	Control signal to turn the MSI Clutch ON/OF.
PICK UP SOLENOID ON (L) 24VDC	Control signal to turn the Pick Up Solenoid ON/ OFF.

- MSI Clutch coil resistance: 172Ω ±10% (20°C)
- Pick Up Solenoid coil resistance: 90Ω ±10% (20°C)

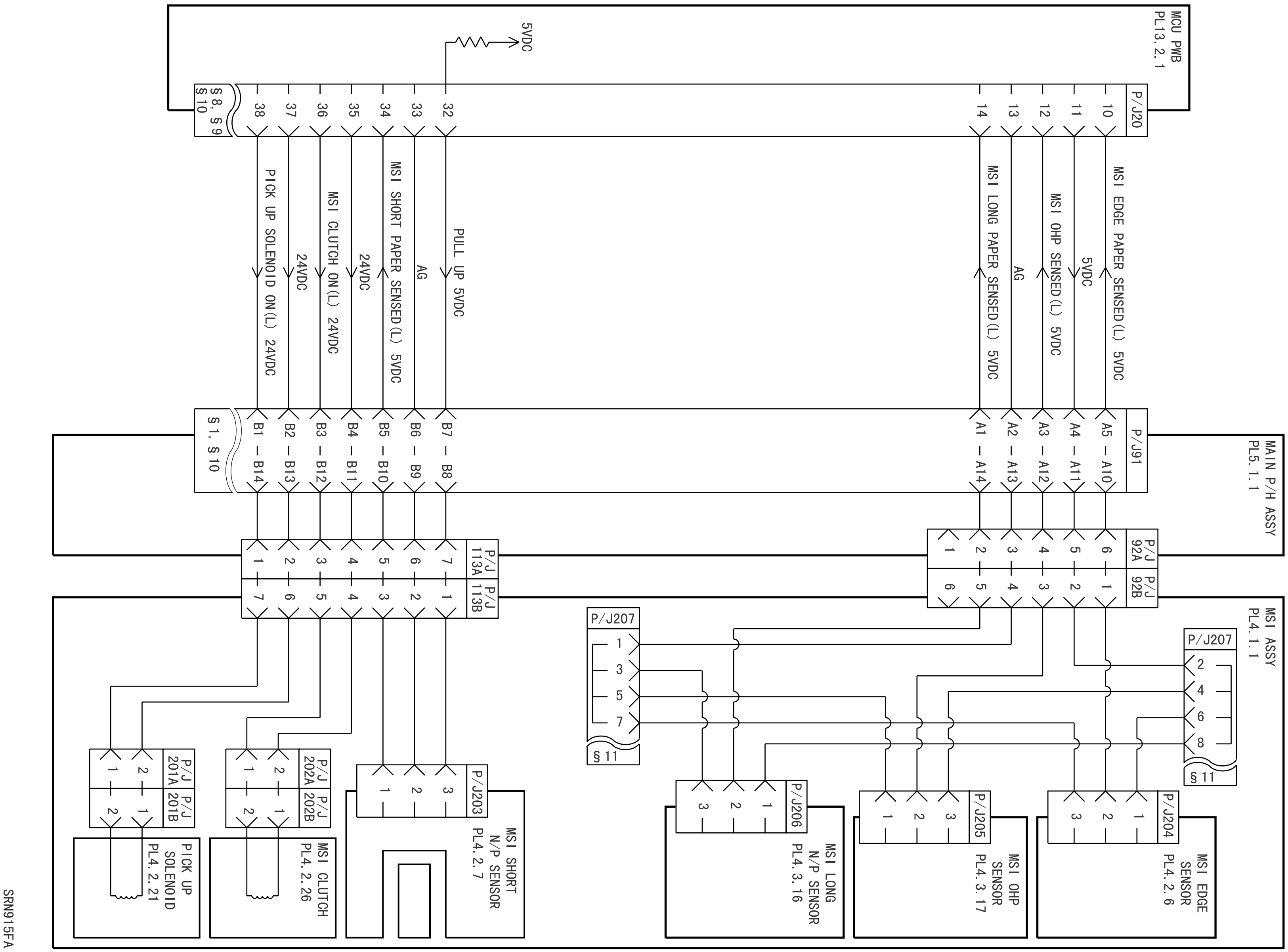


Figure 1-47. Wiring Diagram - §11

A.3.3.12 Wiring Diagram - §12

Table A-34. Wiring Diagram - §12

Signal Name	Description
TOP EXIT PAPER SENSED (L) 5VDC	Signal from the Top Exit Sensor to detect the paper on the Exit Lower Assembly.
EXIT CHUTE SWITCH ON (L) 5VDC	Signal from the Exit Chute Switch to detect open/close of the Exit Upper Assembly. (OFF: Open/ON: Close)
FULL STACK SENSED (L) 5VDC	Signal from the Full Stack Sensor to detect the Full Stack state in the Top Cover. (High: Not Full Stack/ Low: Full Stack)
FUSER FAN HALF-SPEED (H) 24VDC	Signal to control the rotation of the Fuser Fan. (Low: Fast/High: Slow)
FUSER FAN ON (H) 24VDC	Control signal to turn the Fuser Fan ON/OFF.

- Fuser Fan
  - Number of polarities: 4
  - Number of rotations: 3400 ±200rpm (Fast) / 1900 ±250rpm (Slow)

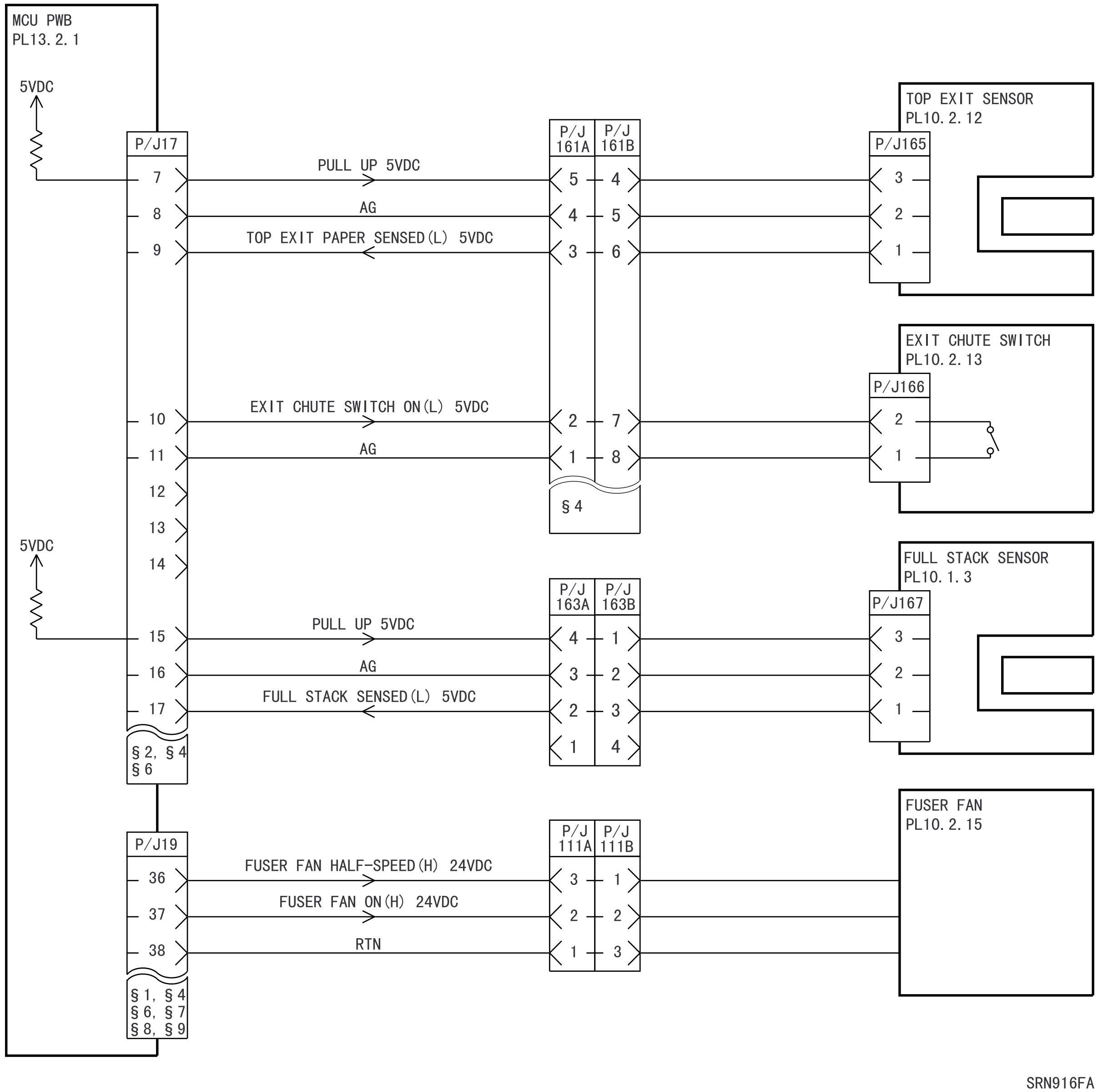


Figure 1-48. Wiring Diagram - §12

A.3.3.13 Wiring Diagram - §13

Table A-35. Wiring Diagram - §13

Signal Name	Description
TEST PRINT ON (L) 5VDC	Setting this signal to LOW (connecting to SG) activates the internal test print.

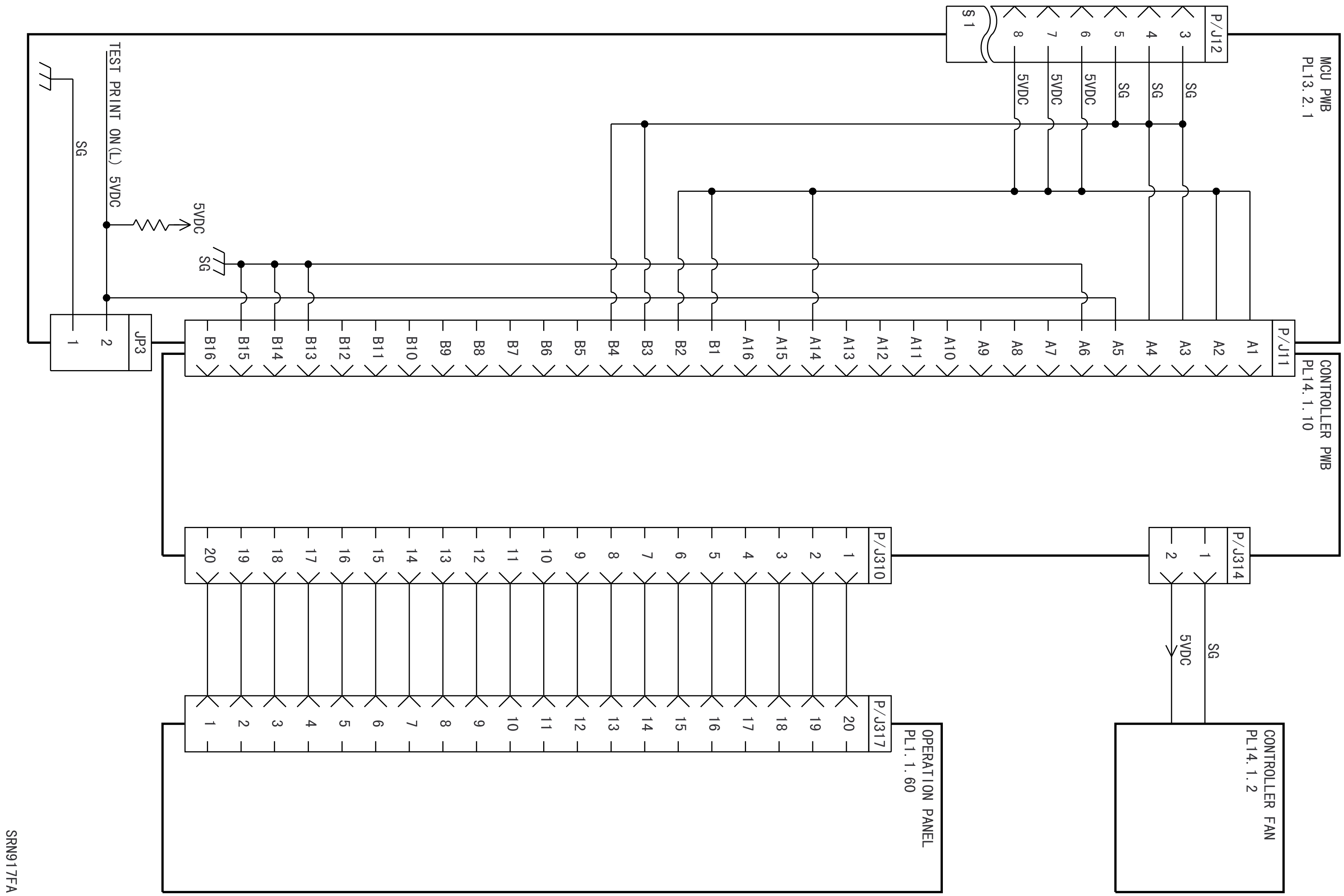


Figure 1-49. Wiring Diagram - §13

A.4 Component Layout

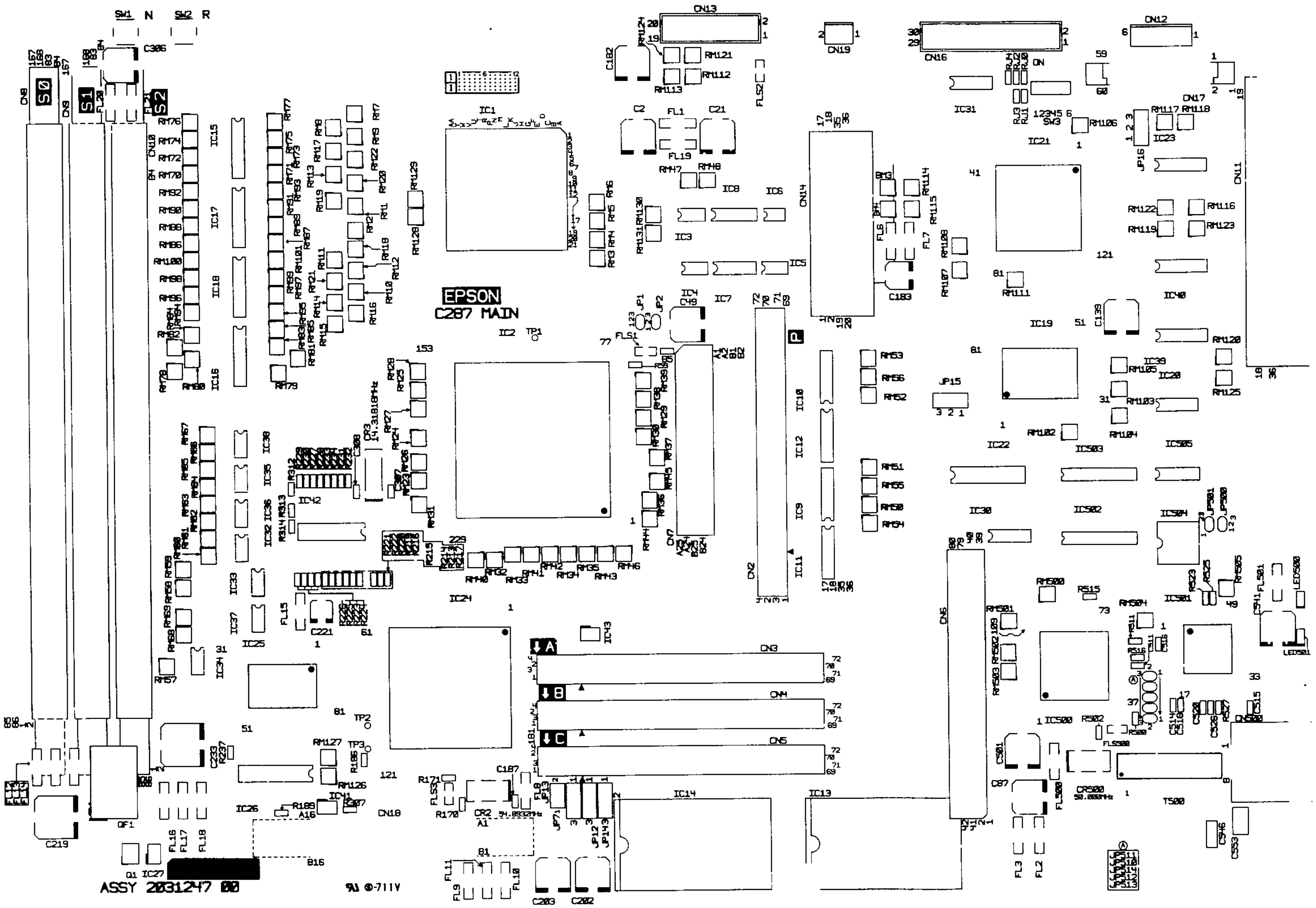


Figure 1-50. C287MAIN (1)

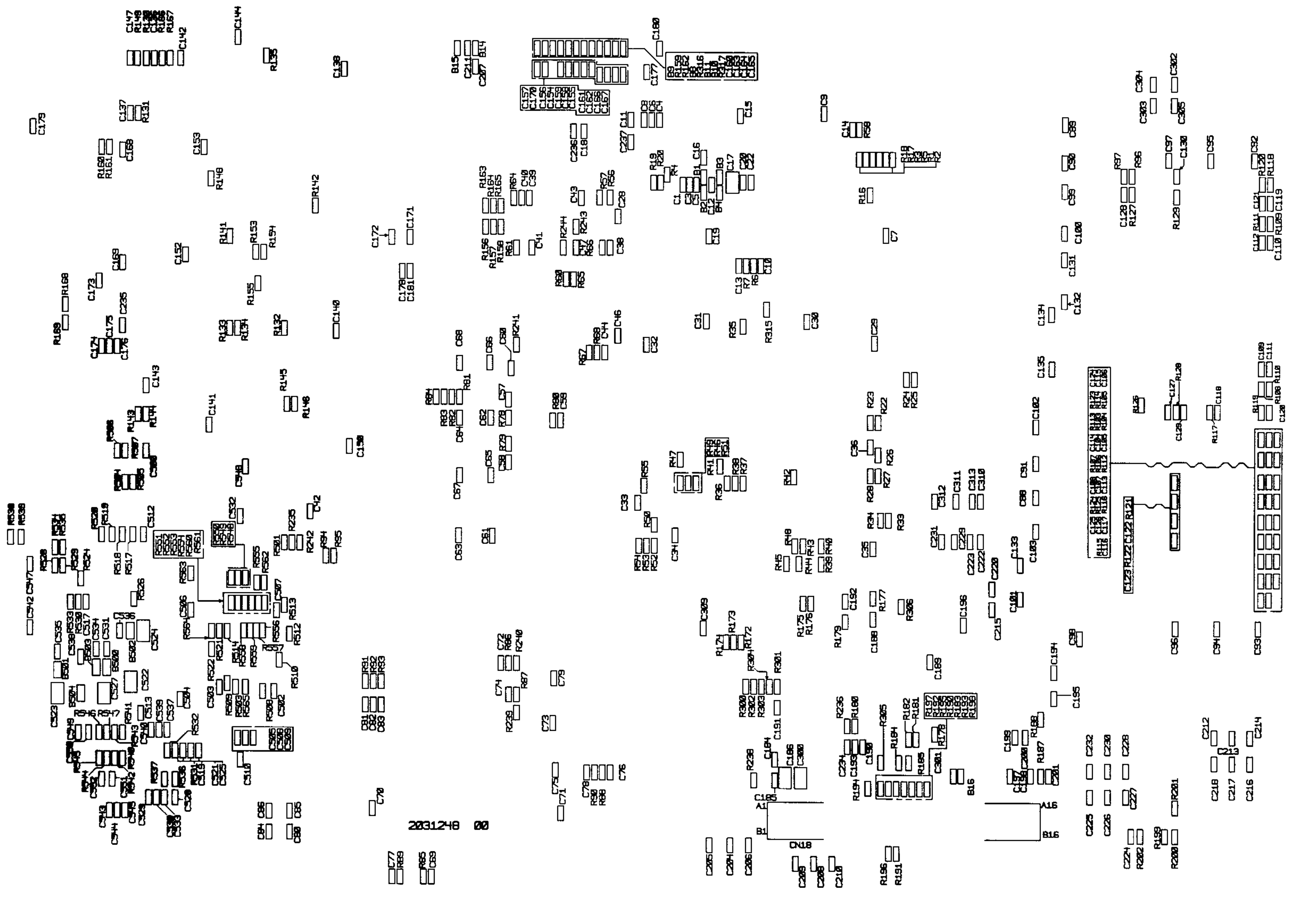
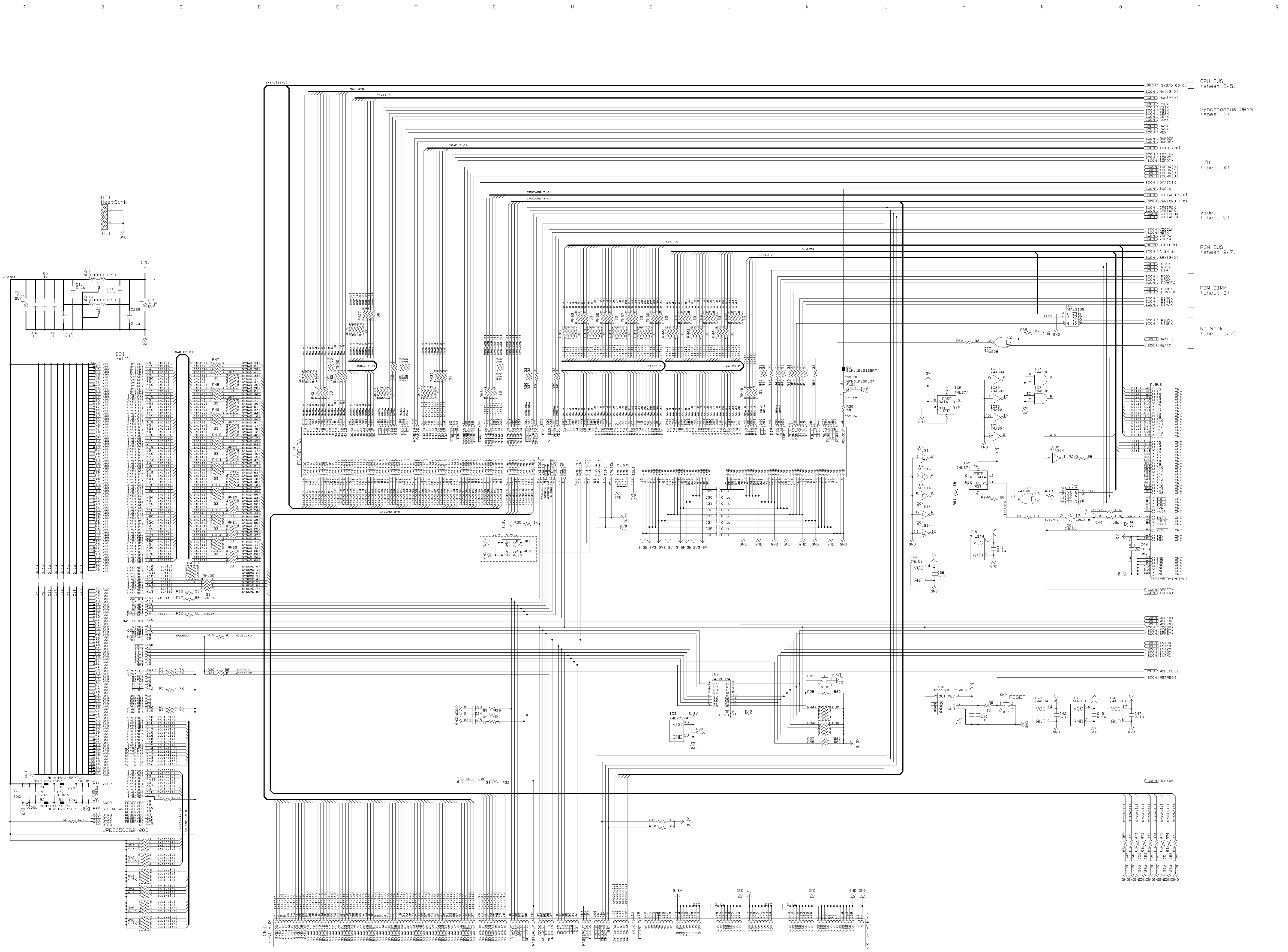


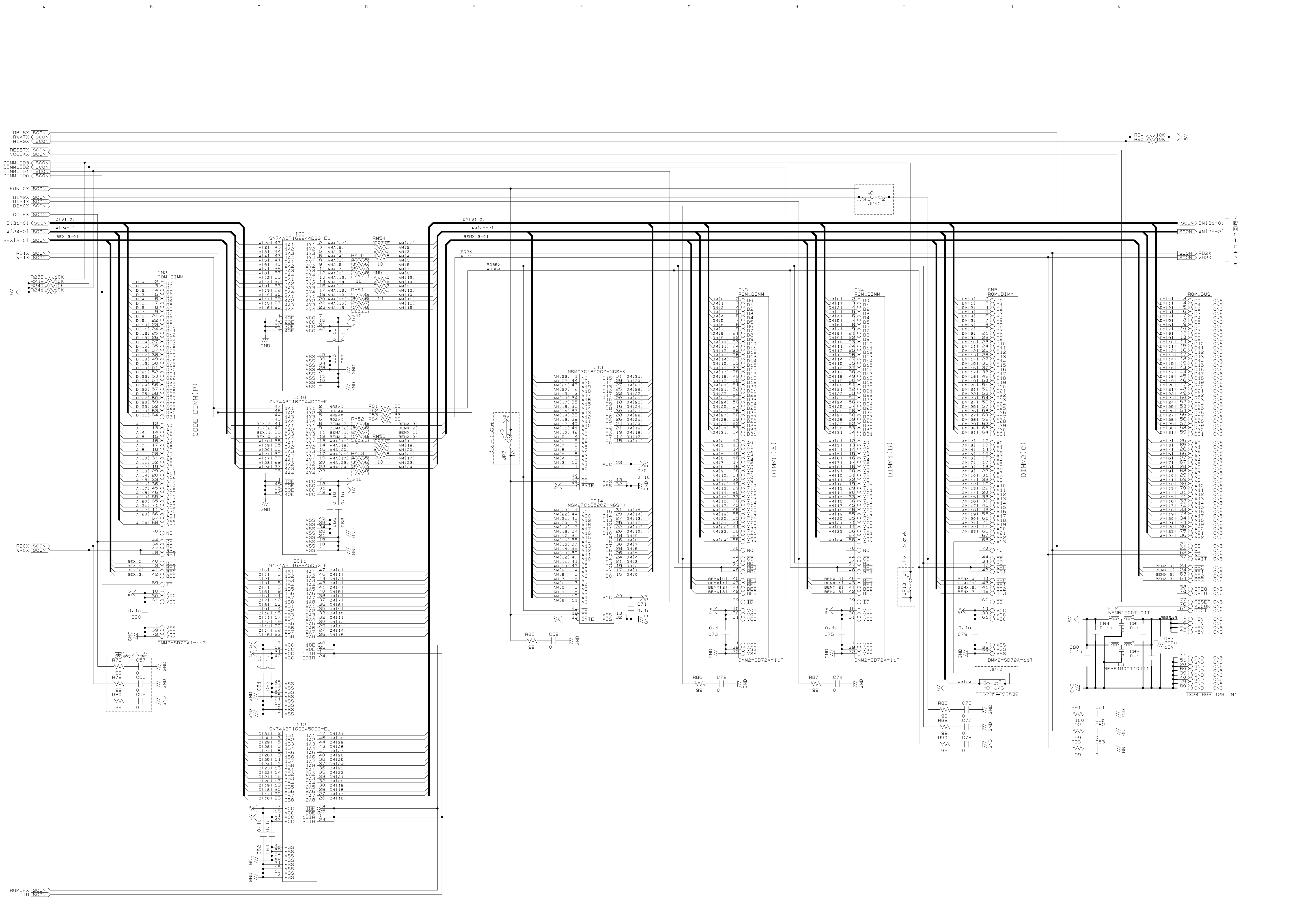
Figure 1-51. C287MAIN (2)

A.5 Circuit Diagrams

See the following pages for the C287MAIN board circuit diagrams.

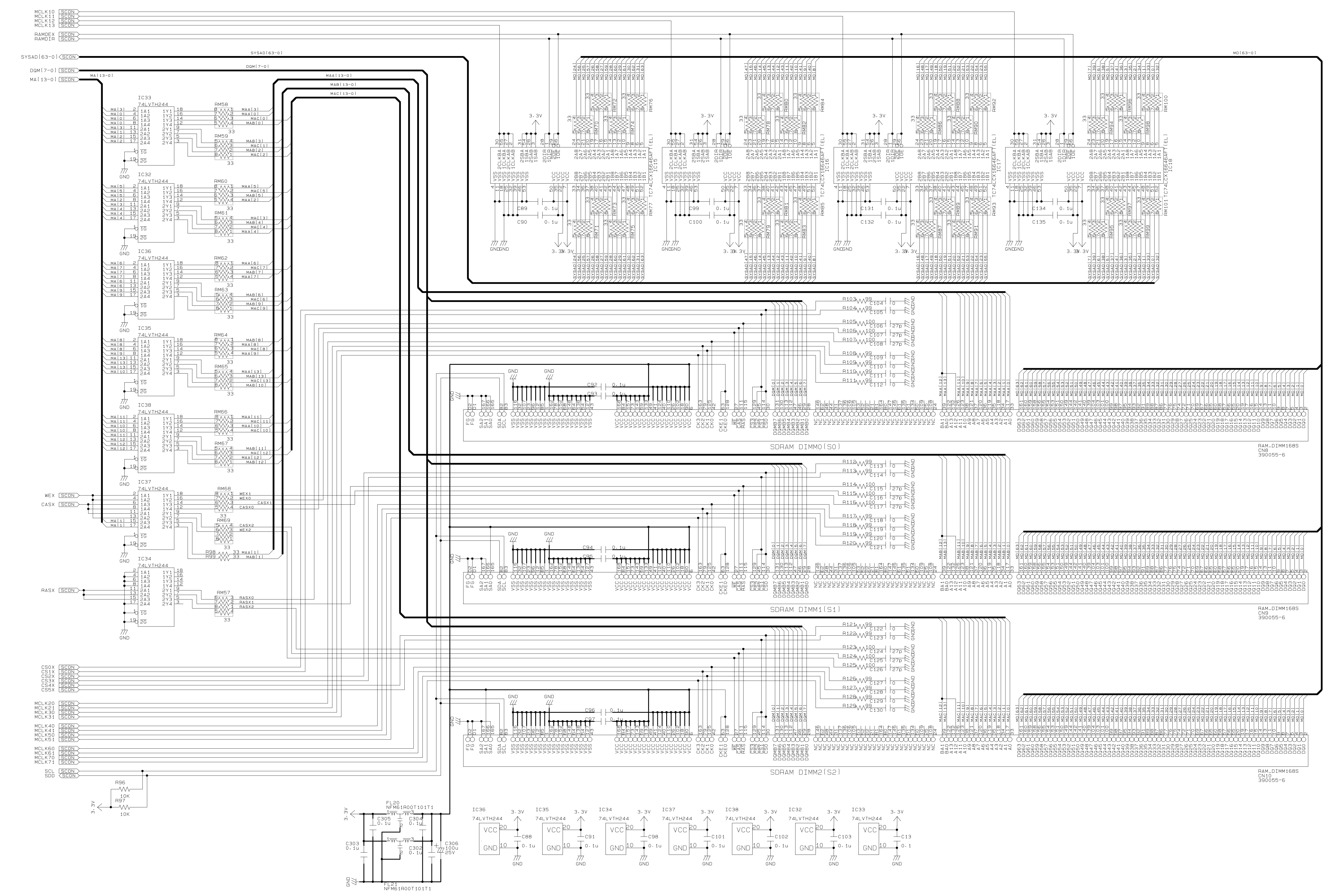

CPU BUS
(sheet 3,5)
Synchronous DRAM
(sheet 3)
I/O
(sheet 4)
Video
(sheet 5)
ROM BUS
(sheet 2,7)
ROM-DIMM
(sheet 2)
Network
(sheet 2,7)
IC1
R5000
IC2
HT1
HeatSink
RESET
NMI

C287MAIN 1/7

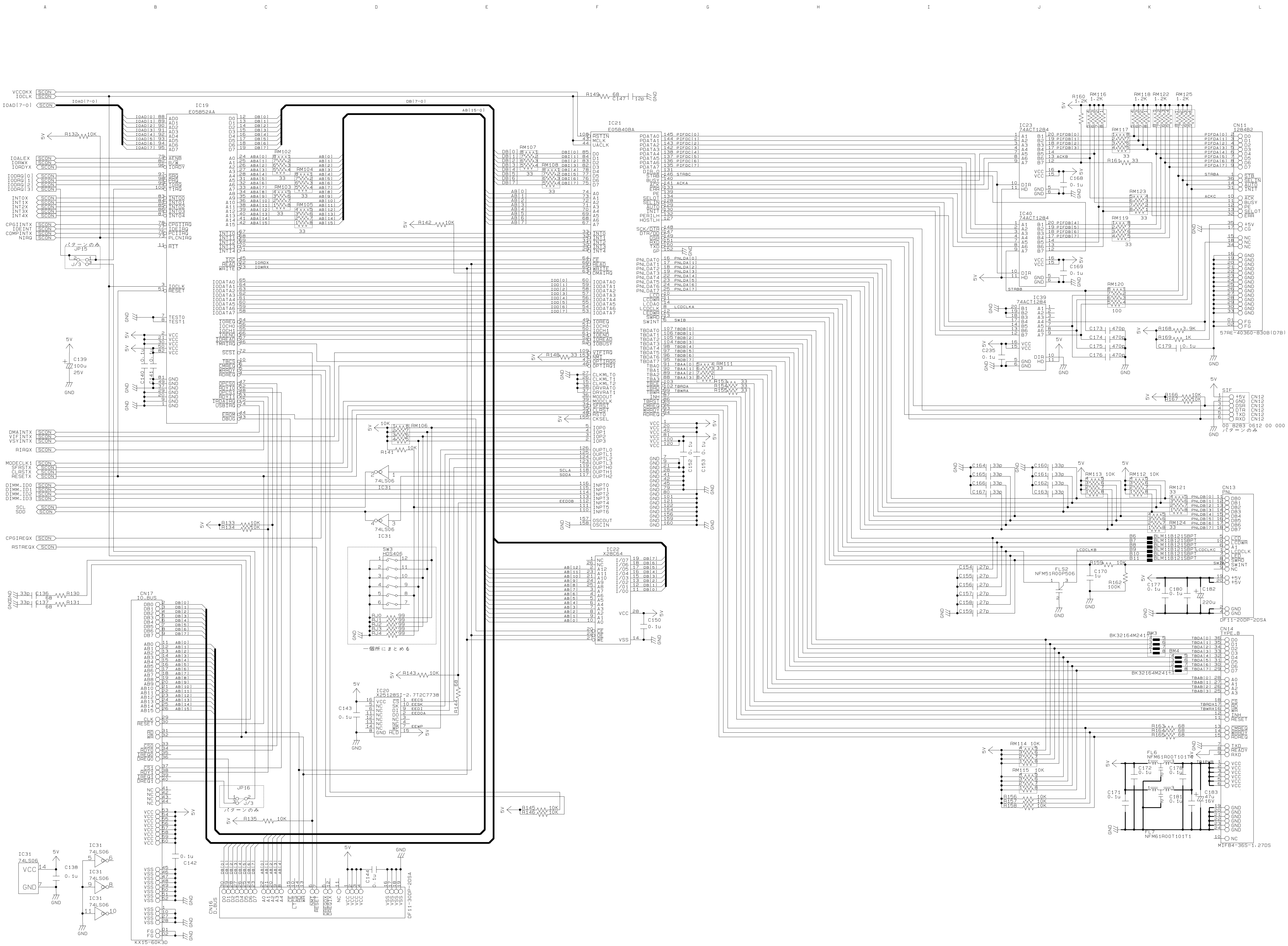


CODE DIMM(P)
DIMM0(A)
DIMM1(B)
DIMM2(C)
IC9 SN74ABT162244DGG-EL
IC10 SN74ABT162244DGG-EL
IC11 SN74ABT162245DGG-EL
IC12 SN74ABT162245DGG-EL
IC13 MSM27C1652CZ-NGS-K
IC14 MSM27C1652CZ-NGS-K
CN2 ROM_DIMM
CN3 ROM_DIMM
CN4 ROM_DIMM
CN5 ROM_DIMM
ROM_BUS
DMM2-SD72A1-113
DMM2-SD72A-11T
TX24-80R-12ST-N1
NFM61R00T101T1
実装不要
パターンのみ

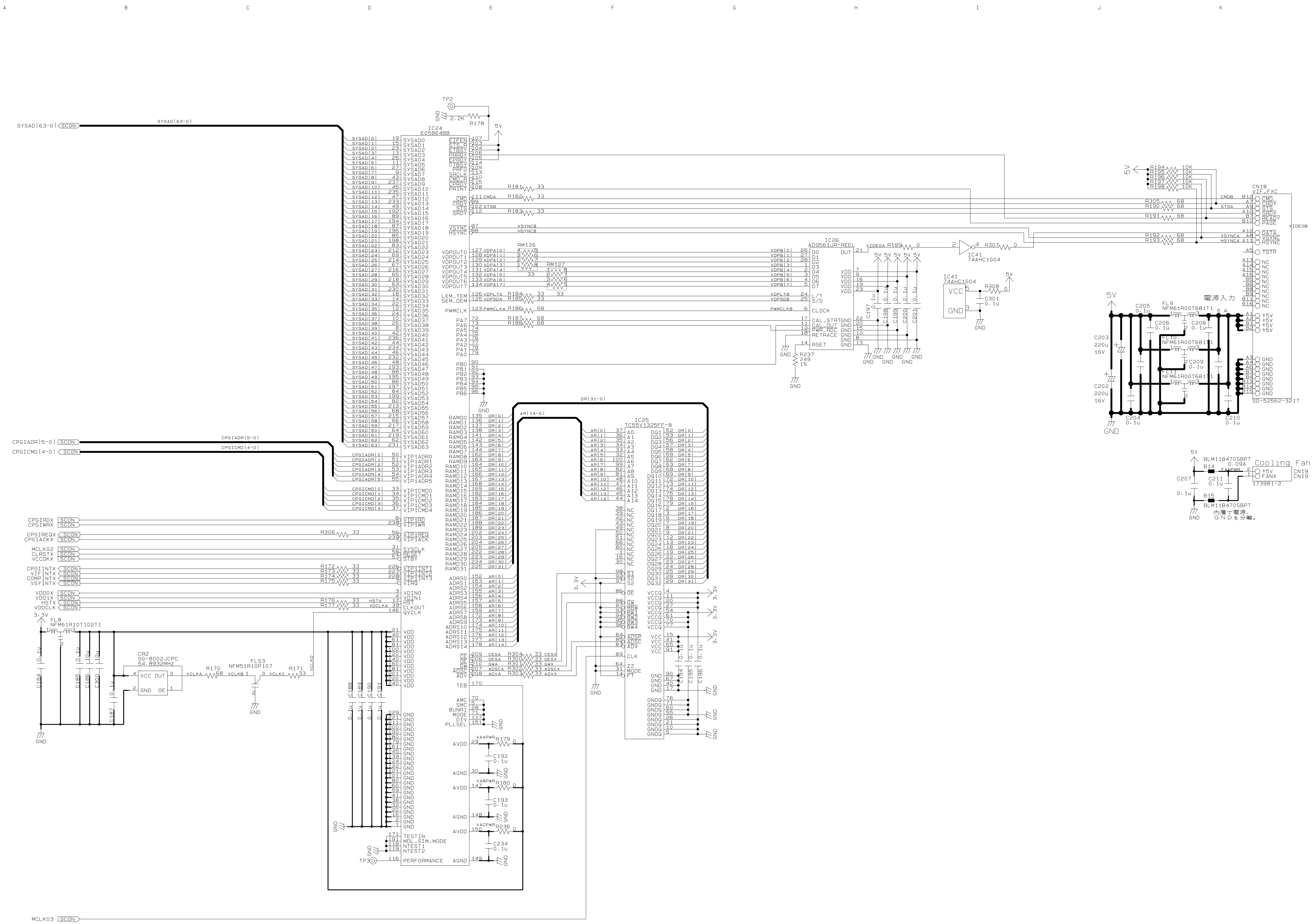
C287MAIN 2/7


MCLK10
MCLK11
MCLK12
MCLK13
RAMOEX
RAMDIR
SYSAD[63-0]
DQM[7-0]
MA[13-0]
MD[63-0]
74LVTH244
TC74LCX16646AFT(EL)
WEX
CASX
RASX
CS0X
CS1X
CS2X
CS3X
CS4X
CS5X
SCL
SDD
SDRAM DIMM0(S0)
RAM_DIMM168S
CN8
390055-6
SDRAM DIMM1(S1)
RAM_DIMM168S
CN9
390055-6
SDRAM DIMM2(S2)
RAM_DIMM168S
CN10
390055-6
NFM61R00T101T1

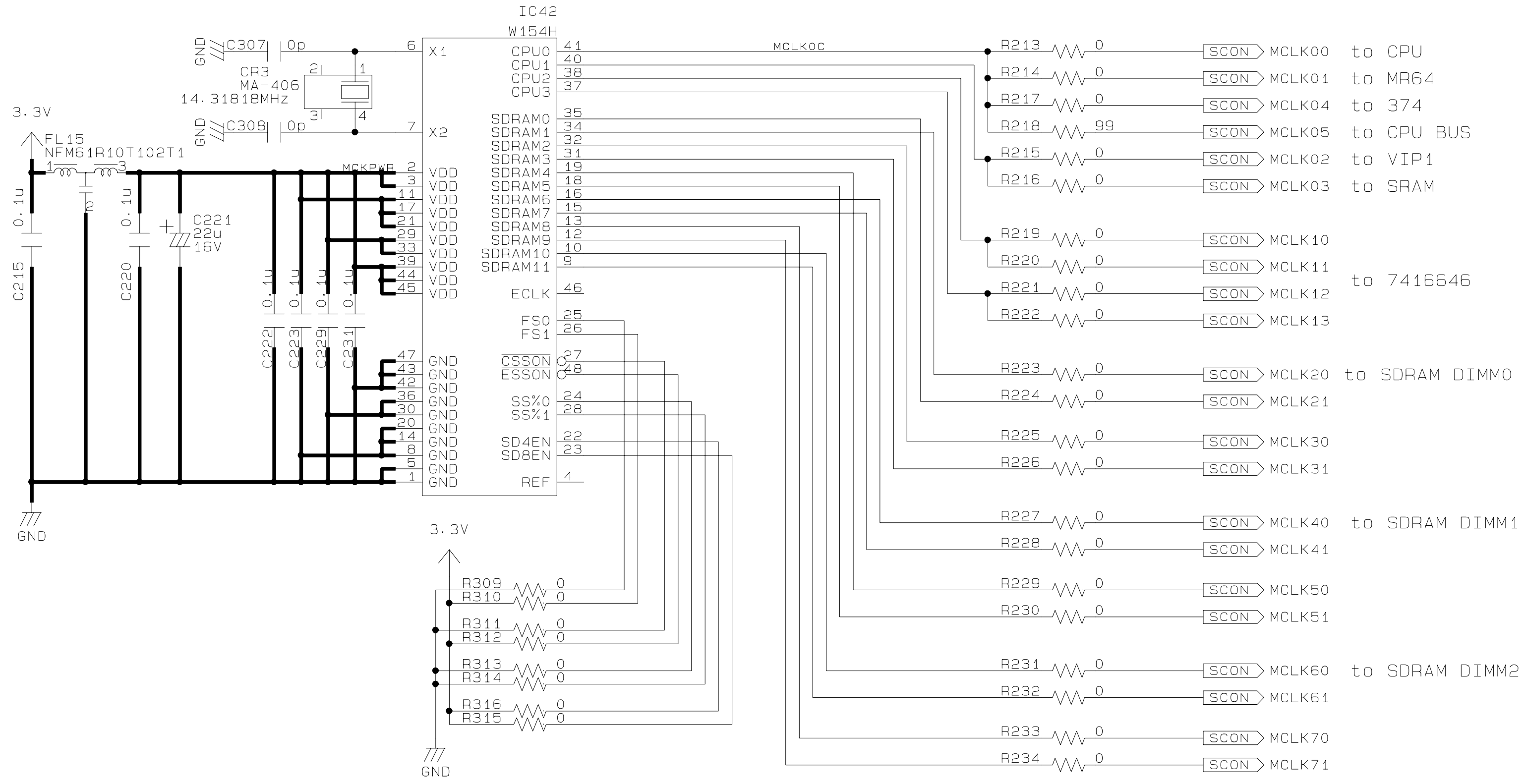
C287MAIN 3/7

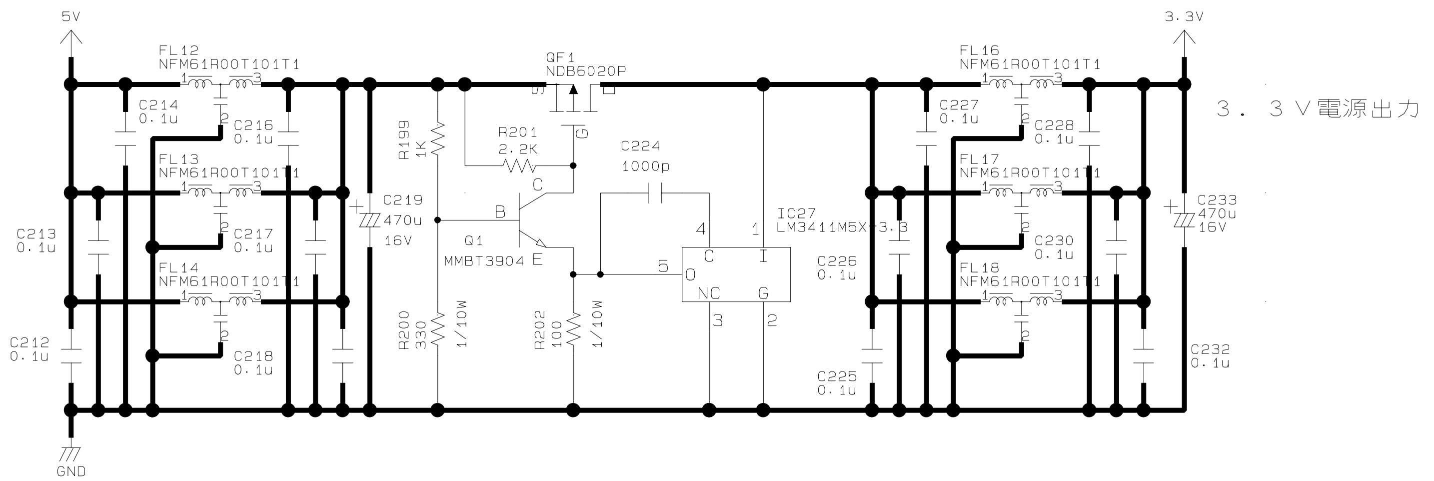


C287MAIN 4/7

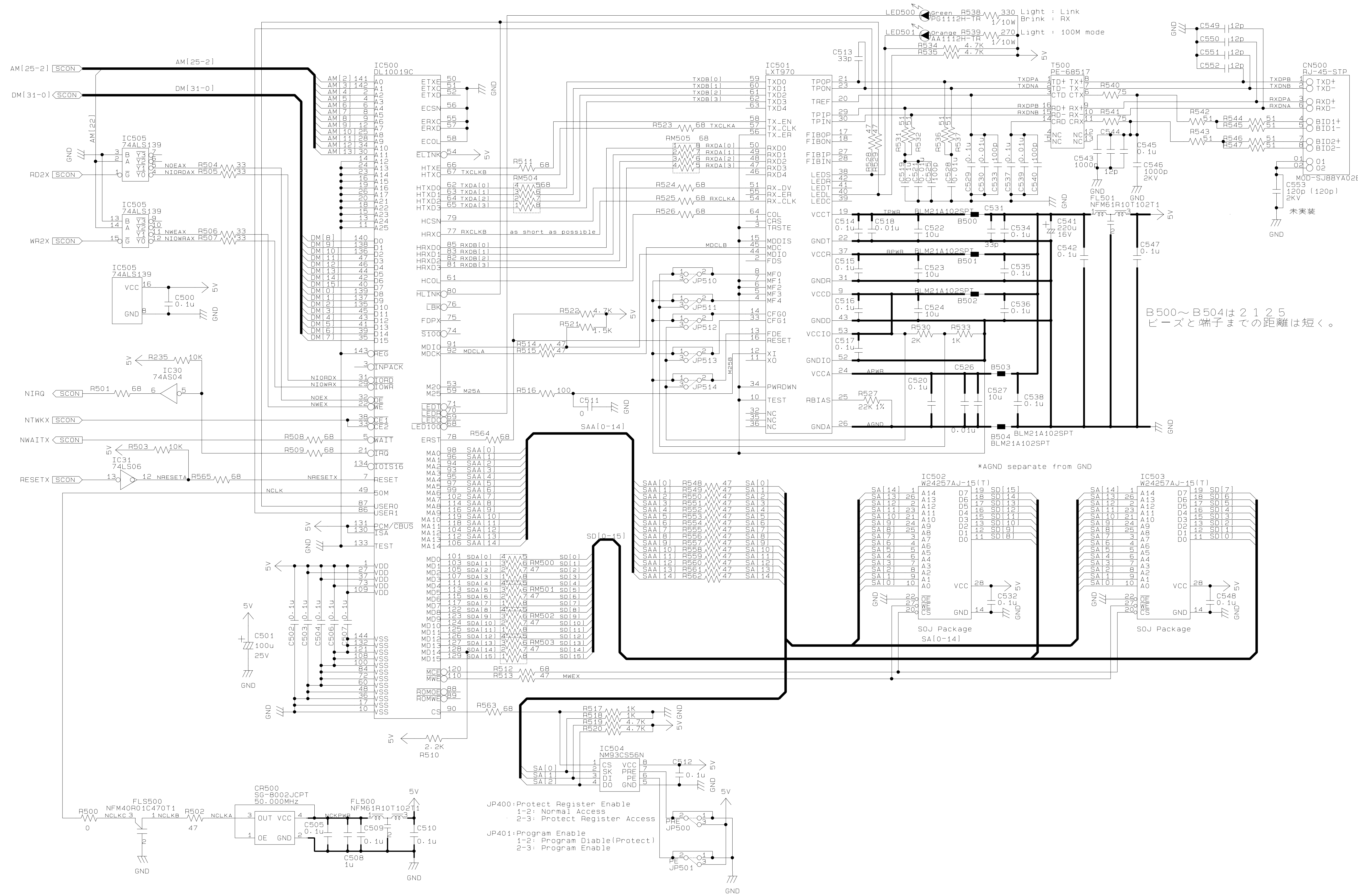


C287MAIN 5/7


IC42
W154H
X1
X2
CPU0
CPU1
CPU2
CPU3
SDRAM0
SDRAM1
SDRAM2
SDRAM3
SDRAM4
SDRAM5
SDRAM6
SDRAM7
SDRAM8
SDRAM9
SDRAM10
SDRAM11
ECLK
FS0
FS1
REF
VDD
GND
MCLK0C
C307
C308
0p
CR3
MA-406
14.31818MHz
3.3V
FL15
NFM61R10T102T1
C215
C220
C221
22u
16V
0.1u
C222
C223
C229
C231
GND
R213
R214
R217
R218
R215
R216
R219
R220
R221
R222
R223
R224
R225
R226
R227
R228
R229
R230
R231
R232
R233
R234
99
SCON
MCLK00 to CPU
MCLK01 to MR64
MCLK04 to 374
MCLK05 to CPU BUS
MCLK02 to VIP1
MCLK03 to SRAM
MCLK10
MCLK11
MCLK12
MCLK13
to 7416646
MCLK20 to SDRAM DIMM0
MCLK21
MCLK30
MCLK31
MCLK40 to SDRAM DIMM1
MCLK41
MCLK50
MCLK51
MCLK60 to SDRAM DIMM2
MCLK61
MCLK70
MCLK71
R309
R310
R311
R312
R313
R314
R316
R315


5V
3.3V
FL12
NFM61R00T101T1
FL13
FL14
FL16
FL17
FL18
C212
C213
C214
C216
C217
C218
C219
470u
16V
QF1
NDB6020P
R199
1K
R201
2.2K
C224
1000p
Q1
MMBT3904
R200
330
1/10W
R202
100
IC27
LM3411M5X-3.3
C225
C226
C227
C228
C230
C232
C233
0.1u
GND
3．3V電源出力

C287MAIN 6/7


IC500
DL10019C
IC501
LXT970
T500
PE-68517
CN500
RJ-45-STP
MOD-SJ88YA0282
IC502
W24257AJ-15(T)
IC503
W24257AJ-15(T)
SOJ Package
IC504
NM93CS56N
CR500
SG-8002JCPT
50.000MHz
IC505
74ALS139
IC30
74AS04
IC31
74LS06
LED500
LED501
Light : Link
Brink : RX
Light : 100M mode
as short as possible
B500～B504は２１２５
ビーズと端子までの距離は短く。
*AGND separate from GND
未実装
JP400:Protect Register Enable
1-2: Normal Access
2-3: Protect Register Access
JP401:Program Enable
1-2: Program Diable(Protect)
2-3: Program Enable

C287MAIN 7/7

A.6 Optional Paper Cassette Units

This section provides information on Large Capacity Paper Unit and 500-Sheet Paper Cassette Unit. Each slot (feeder) holds a standard universal cassette. (Optional A3W cassette can not be used.) The Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit is installed beneath the printer. Since the printer and Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit are electrically connected with connectors, when the printer power is turned on, the printer detects the optinal paper cassette, if installed, and also the paper size and paper presence/absence conditions in the option. Power is supplied via the printer.

A.6.1 Large Capacity Paper Unit

A.6.1.1 Product Specifications

Note the product specifications for the Large Capacity Paper Unit and 500-Sheet Paper Cassette Unit are mostly common.

BASIC SPECIFICATIONS

- Product name: Large Capacity Paper Unit (3-cassette)
- Feeding method: Single-sided separator and roller system (Automatic operation)
- Installation: Beneath the printer
- Driving method: Integrated motor drive system
- Interface: Performs the following:

  1) Sends the following signals to the printer:

  - Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit detection signal
  - Paper presence/absence detection signal
  - Paper near end detection signal
  - Paper size detection signal

  2) Receives the feeding start signal
- Feeding speed: B/W = 16 ppm (A4, LEF, 2UP*)
  Color= 4 ppm (A4, LEF, 2UP*)

  NOTE: *2UP mode enables the printer to run 2 pages at a time. It is available with the A4/LETTER sizes or smaller.*
- Paper Handling: Same as for the standard universal cassette.
- Power source: DC24V and DC5V supplied from the printer
  Maximum =DC24V / 0.6A, DC5V / 0.3A
- Dimensions (Unpacked):

  560 mm (W) x 562 mm (D) x 426 mm (H)
- Weight (Unpacked, including cassettes):

  24.2 kg

  (Each standard universal cassette weighs 2.8 kg.)
- Noise: Same as for the printer.

PAPER SPECIFICATIONS

The specifications for the standard universal paper cassette for the printer are applicable.

ENVIRONMENTAL CONDITION

- ☐ Operating: Same as for the printer.
- ☐ Storage: Same as for the printer.
- ☐ Transportation:
  - Drop test: 460 mm (H) (1 corner, 6 surfaces, 3 sides)
  - Others: Same as for the printer.

RELIABILITY AND DURABILITY

NOTE: *Specifications given here are applicable when the Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit is connected to the printer.*

- ☐ MPBF: 32,000 pages (80,000 images or more *1)
- ☐ Paper feed reliability: See Table A-36.

Table A-36. Paper Feed Reliability

	Recommended paper	General paper
Paper jam rate	1/3000 or less	1/2000 or less
Multiple feeding rate	1/800 or less	1/500 or less

- ☐ Life: 135 kpv (45 kpv / cassette) *2
- ☐ Print position accuracy: Same as for the printer.
- ☐ Paper skew: Same as for the printer.

**1: Converted to 80,000 images when the job ratio between the monochrome and color modes is asummed 1:1, since one page is composed of 4 images (YMCK) in the color mode.*

**2: 135 kpv = 180 kpv x 75%*
(180 kpv: printer life, 75%: estimated usage rate of the Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit.)

ELECTRICAL SPECIFICATIONS

Electrical specifications are the same as for the printer when the Large Capacity Paper Unit or 500-Sheet Paper Cassette Unit is connected to the printer.

APPLICABLE STANDARDS

Applicable standards are the same as for the printer when the Large Capacity Paper Unit or 500-Sheet Paper Cassette Unit is connected to the printer.

A.6.1.2 Installation

Follow the steps below when installing the Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit.

1. Turn the printer off and disconnect the power cable and earth cable.
2. Lock the 4 casters on the Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit.

NOTE: *In the following step, be sure to carry the printer by 4 people or more.*

3. Lift up the printer, keeping it level, and lower it carefully so the pegs on the top of the Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit fit in the sockets in the printer bottom.
4. Draw out the top cassette and lift it up to remove.
5. Turn the 2 screws above the area where the cassettes was to install the Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit to the printer. Then put the cassette back to the position.
6. Open 2 covers; one at the top left of the Large Capacity Paper Unit / 500-Sheet Paper Cassette Unit back and the other one at the lower left of the printer back. Then connect 2 cables to the connectors at the back of the printer, and close the covers.

A.6.1.3 Parts List (Large Capacity Paper Unit)

Table A-37.
Parts List - Large Capacity Paper Unit (1/3)

No.	PL No.	Part Name
1	PL20.1.1	FEEDER UNIT (with 2, 3)
2	PL20.1.2	4TRAY FEEDER ASSEMBLY
3	PL20.1.3	UNIVERSAL TRAY
4	PL21.1.1	FEEDER FRONT COVER
5	PL21.1.2	FEEDER REAR COVER
6	PL21.1.3	FEEDER HARNESS COVER
7	PL21.1.4	COVER BRACKET
8	PL21.1.5	FEEDER HARNESS CLAMP
9	PL21.1.10	FEEDER LEFT COVER
10	PL21.1.20	FEEDER RIGHT COVER
11	PL21.1.30	FEEDER CHUTE ASSEMBLY
12	PL21.1.31	FEEDER CHUTE SUPPORT
13	PL21.1.40	DOUBLE CASTER
14	PL22.1.1	FEEDER HIGH ASSEMBLY
15	PL22.1.2	TRAY STOPPER-3T
16	PL22.1.3	TURN IN CHUTE-3T
17	PL22.1.4	FEEDER TOP CHUTE
18	PL22.1.5	FEEDER MOTOR ASSEMBLY (with 6, 7)
19	PL22.1.6	FEEDER MOTOR
20	PL22.1.7	FEEDER GEAR ASSEMBLY
21	PL22.1.8	FEEDER PWB
22	PL22.1.9	FEEDER HARNESS
23	PL22.1.10	MOTOR HARNESS
24	PL22.1.11	SIZE HARNESS
25	PL22.1.12	SWITCH HARNESS
26	PL22.1.13	SIZE BRACKET ASSEMBLY-3T (with 14, 15)
27	PL22.1.14	SIZE BRACKET-3T

Table A-38.
Parts List - Large Capacity Paper Unit (2/3)

No.	PL No.	Part Name
28	PL22.1.15	SIZE SWITCH ASSEMBLY
29	PL22.1.16	FEEDER CHUTE SWITCH
30	PL22.1.30	3TRAY FEEDER FRAME
31	PL22.1.31	FRONT COVER BRACKET
32	PL22.1.32	SHEET CLAMP
33	PL22.1.33	3TRAY FEEDER CLAMP
34	PL22.1.34	FEEDER EME SPRING
35	PL22.2.1	FEEDER HIGH ASSEMBLY (with 10-34, 40)
36	PL22.2.10	FEEDER DRIVE ASSEMBLY (with 10-34)
37	PL22.2.11	FEEDER BRACKET
38	PL22.2.12	3TRAY IDLER GEAR-1
39	PL22.2.13	FEED ROLL ASSEMBLY-3T (with 14-17)
40	PL22.2.14	FEED SHAFT-3T
41	PL22.2.15	FEED ROLL-3T
42	PL22.2.16	FEED CORE ROLL-3T
43	PL22.2.17	FEED ROLL GUIDE-3T
44	PL22.2.18	FEED BEARING-3T
45	PL22.2.19	FEED GEAR-3T
46	PL22.2.20	FEED SPRING-3T
47	PL22.2.21	FEED SOLENOID-3T
48	PL22.2.22	3TRAY IDLER GEAR-2
49	PL22.2.23	3TRAY IDLER GEAR-3
50	PL22.2.24	TURN ROLL ASSEMBLY-3T
51	PL22.2.25	TURN BEARING-3T
52	PL22.2.26	TURN CLUTCH-3T
53	PL22.2.27	TURN CHUTE-3T
54	PL22.2.28	FEED SHAFT GUIDE-3T
55	PL22.2.29	TRAY SENSOR ASSEMBLY-3T (with 30-32)
56	PL22.2.30	TRAY N/P BRACKET-3T
57	PL22.2.31	TRAY NO PAPER SENSOR

Table A-39.
Parts List - Large Capacity Paper Unit (3/3)

No.	PL No.	Part Name
58	PL22.2.32	TRAY N/P ACTUATOR
59	PL22.2.33	TRAY HARNESS-3T
60	PL22.2.34	FEEDER DRIVE CLAMP
61	PL22.2.4	LOW PAPER SENSOR (Factory setting option)

A.6.1.4 Exploded Diagrams (Large Capacity Paper Unit)

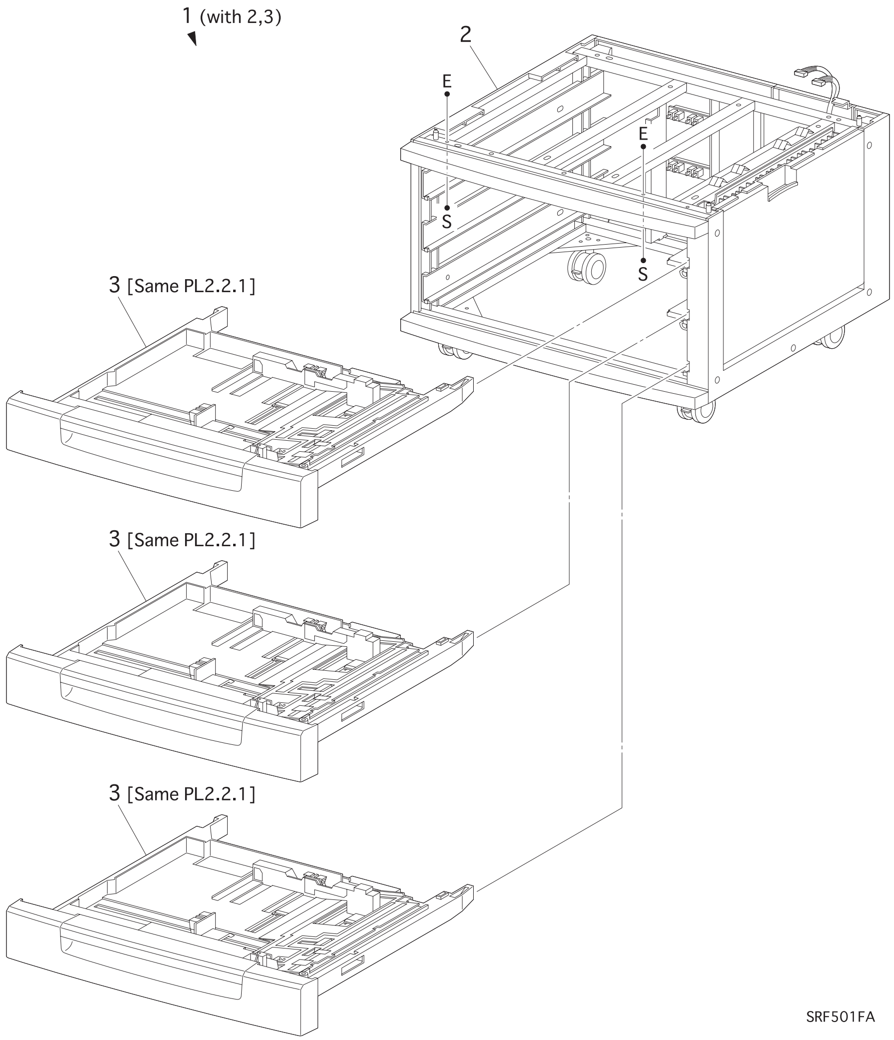


Figure A-52. PL20.1 Feeder 1

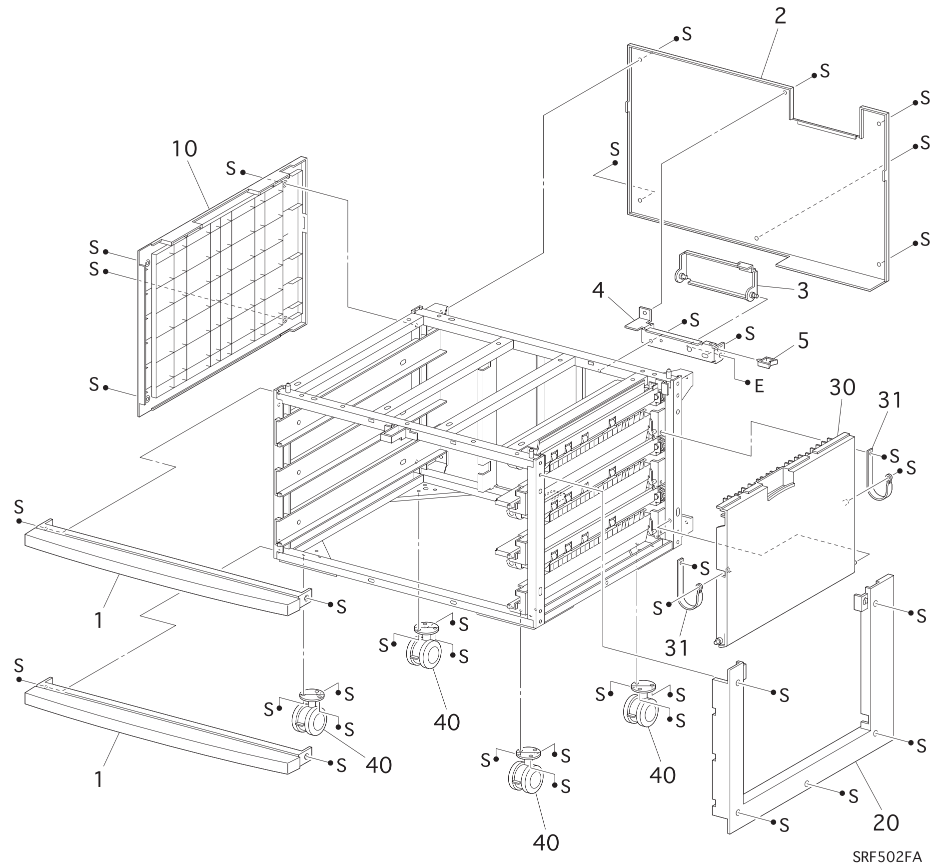


Figure A-53. PL21.1 Feeder 2

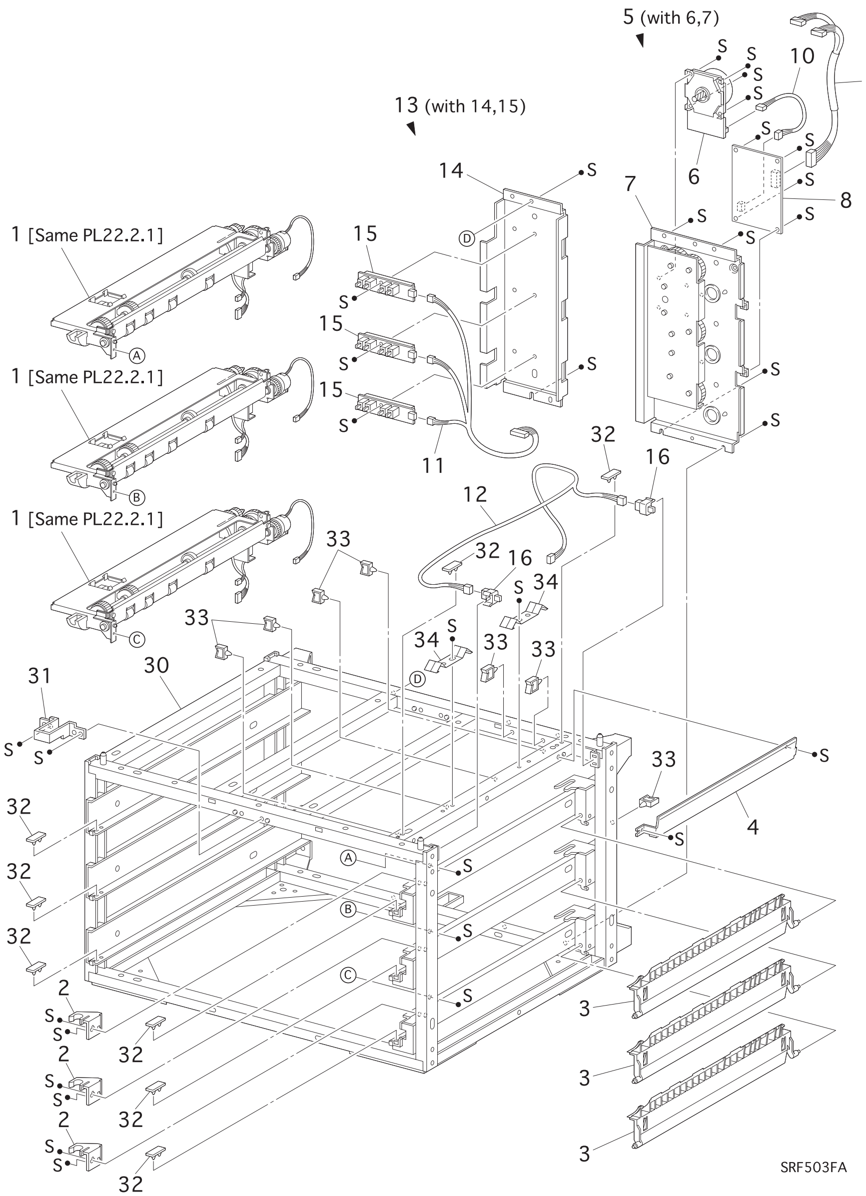


Figure A-54. PL22.1 Feeder 3

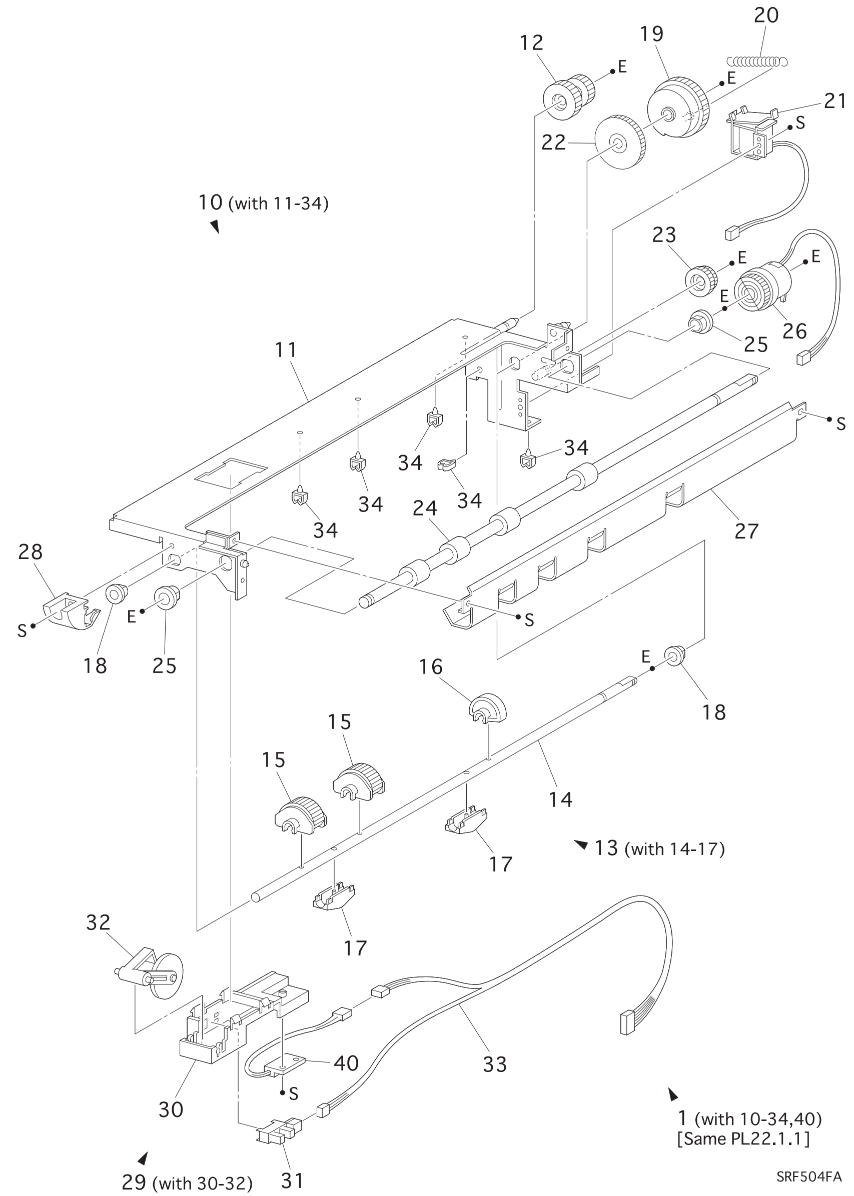


Figure A-55. PL22.2 Feeder 4

A.6.1.5 Wiring Diagrams (Large Capacity Paper Unit)

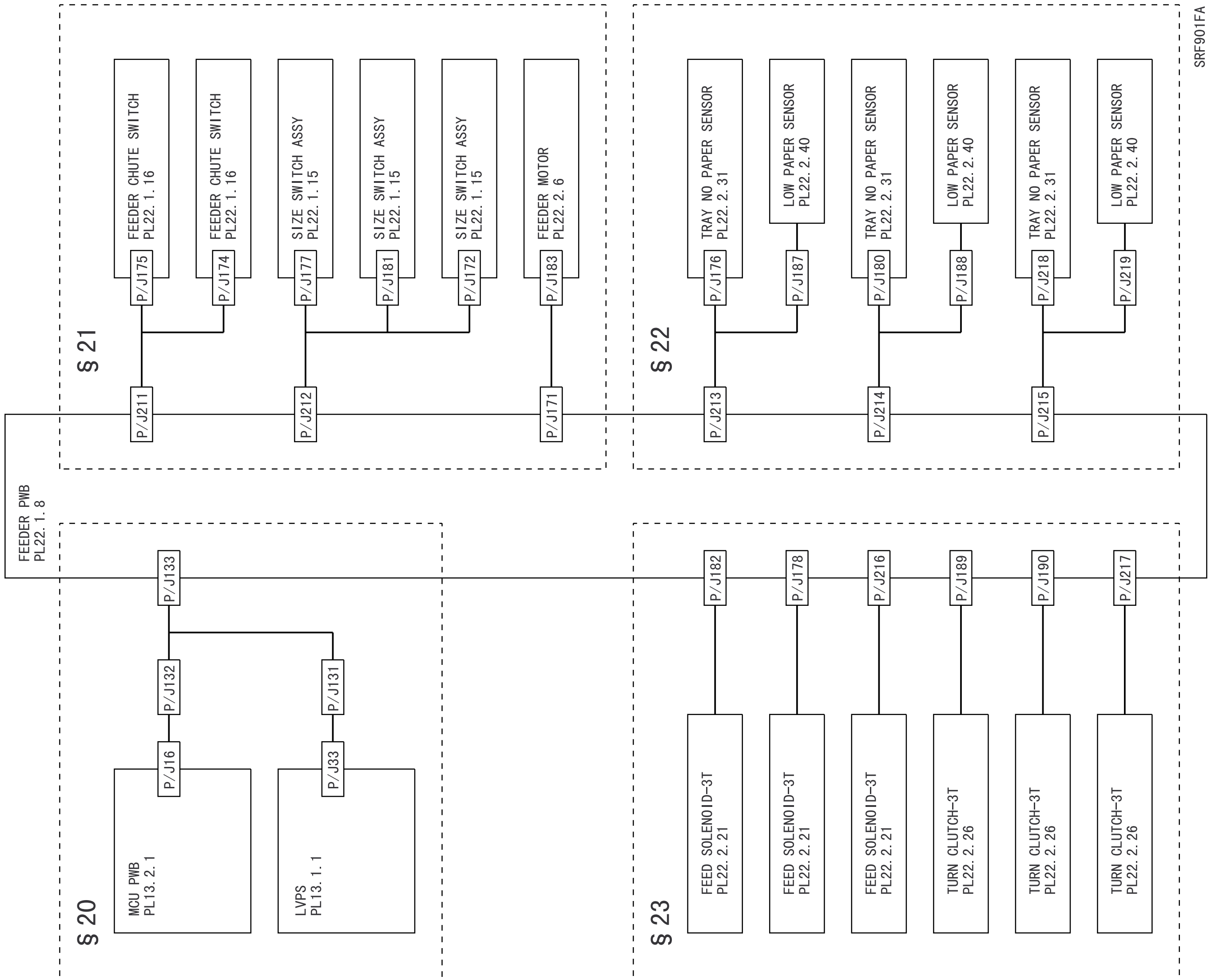


Figure 1-56. Master Wiring Diagram

A.6.2 500-Sheet Paper Cassette Unit

A.6.2.1 Product Specifications

See Section A.6.1.1 for the product specifications for the 500-Sheet Paper Cassette Unit. All specifications except for the items below are common to the Large Capacity Paper Unit.

BASIC SPECIFICATIONS

- Product name:
  500-Sheet Paper Cassette Unit (Holds two cassettes.)
- Dimensions (Unpacked):
  560 mm (W) x 562 mm (D) x 302 mm (H)
- Weight (Unpacked, including cassettes):
  17.5 kg
  (Each standard universal cassette weighs 2.8 kg.)

A.6.2.2 Installation

See Section A.6.2.2.

A.6.2.3 Parts List (500-Sheet Paper Cassette Unit)

Table A-40.
Parts List - 500-Sheet Paper Cassette Unit

No.	PL No.	Part Name
1	PL41.1.30	FEEDER 2 CHUTE ASSEMBLY
2	PL42.1.3	TURN IN CHUTE-2T
3	PL42.1.5	FEEDER 2 MOTOR ASSEMBLY (with 6,7)
4	PL42.1.8	FEEDER PWB
5	PL42.1.15	SIZE SWITHC ASSEMBLY
6	PL42.1.16	FEEDER CHITE SWITCH
7	PL42.2.10	FEEDER DRIVE ASSEMBLY (with 10-34)
8	PL42.2.40	LOW PAPER SENSOR (factory setting option)

A.6.2.4 Exploded Diagrams (500-Sheet Paper Cassette Unit)

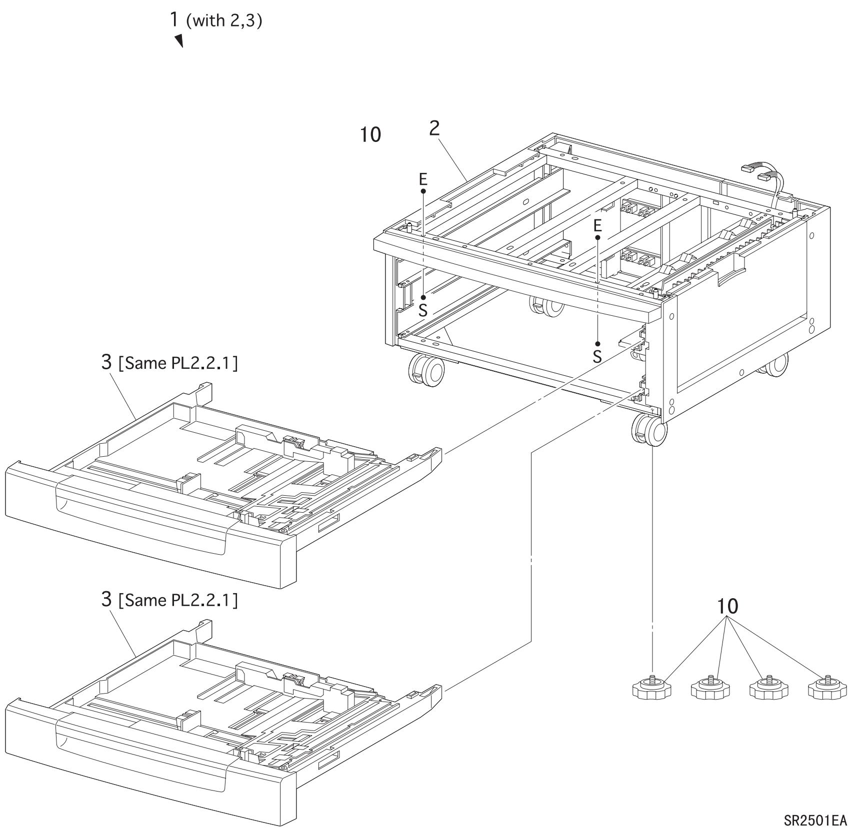


Figure A-57. PL40.1

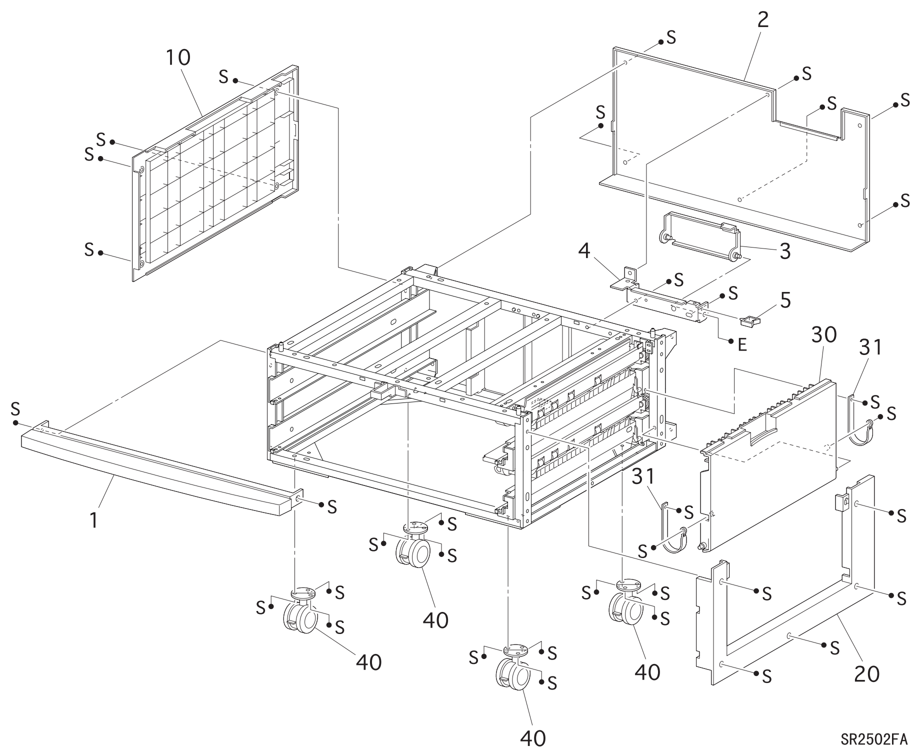


Figure A-58. PL21.1 Feeder 2

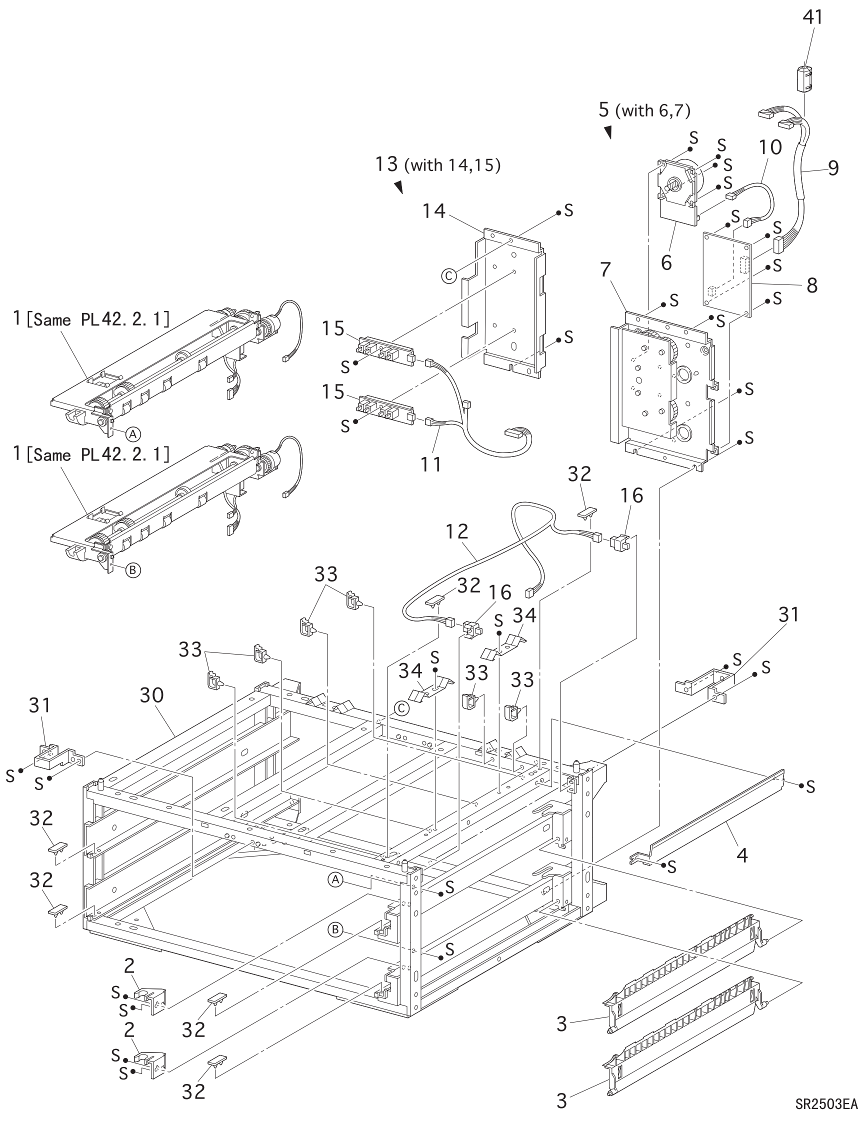


Figure A-59. PL22.1 Feeder 3

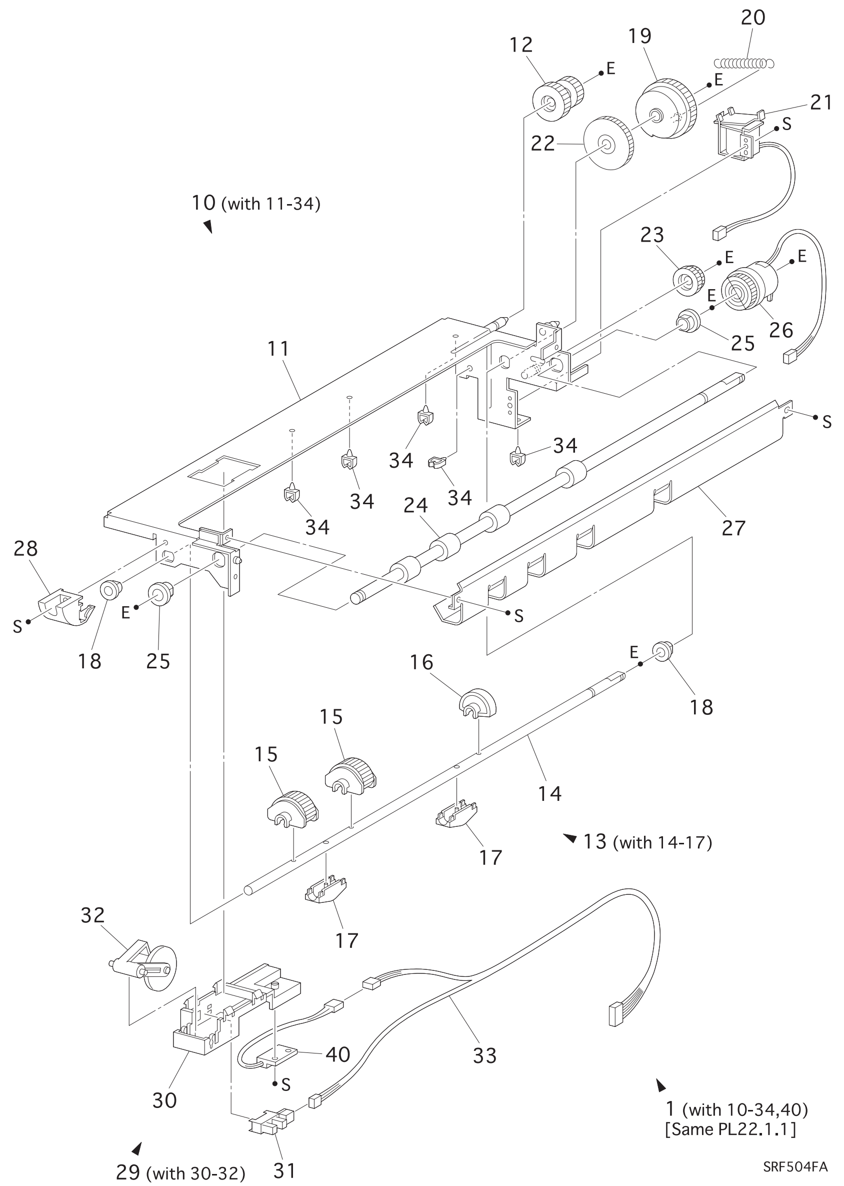


Figure A-60. PL22.2 Feeder 4