



## *Service Manual*

**Lexmark C510**

**5021-0XX**

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# Class 1 Laser statement label

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Laser Printer  
**Machine Type:** 5021-XXX  
**Serial Number:** 1234567  
**Manufacturer:** XXXXXXXX2004  
**Model:** 5021-0000-000-100  
**Made in:** Japan

Class 1 Laser Product  
Complies with IEC60825-1  
CANADA REGULATED CLASS II

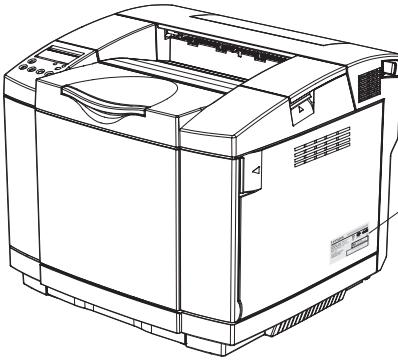
UL  
1129  
5075

CSA  
C22.2  
108.207

MTJ  
NMS

FC  
FCC Class B  
Part 15, Subpart B  
This device meets the requirements of Part 15, Subpart B of FCC Part 15.

PPD Serial Number Bar code  
XXXXXXXXXX



---

## Laser notice

The printer is certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for Class I (1) laser products, and elsewhere is certified as a Class I laser product conforming to the requirements of IEC 60825-1.

Class I laser products are not considered to be hazardous. The printer contains internally a Class IIIb (3b) laser that is nominally a 5 milliwatt gallium arsenide laser operating in the wavelength region of 770-795 nanometers. The laser system and printer are designed so there is never any human access to laser radiation above a Class I level during normal operation, user maintenance, or prescribed service condition.

---

## Laser

Der Drucker erfüllt gemäß amtlicher Bestätigung der USA die Anforderungen der Bestimmung DHHS (Department of Health and Human Services) 21 CFR Teil J für Laserprodukte der Klasse I (1). In anderen Ländern gilt der Drucker als Laserprodukt der Klasse I, der die Anforderungen der IEC (International Electrotechnical Commission) 60825-1 gemäß amtlicher Bestätigung erfüllt.

Laserprodukte der Klasse I gelten als unschädlich. Im Inneren des Druckers befindet sich ein Laser der Klasse IIIb (3b), bei dem es sich um einen Galliumarsenlaser mit 5 Milliwatt handelt, der Wellen der Länge 770-795 Nanometer ausstrahlt. Das Lasersystem und der Drucker sind so konzipiert, daß im Normalbetrieb, bei der Wartung durch den Benutzer oder bei ordnungsgemäßer Wartung durch den Kundendienst Laserbestrahlung, die die Klasse I übersteigen würde, Menschen keinesfalls erreicht.

---

## Avis relatif à l'utilisation de laser

Pour les Etats-Unis : cette imprimante est certifiée conforme aux provisions DHHS 21 CFR alinéa J concernant les produits laser de Classe I (1). Pour les autres pays : cette imprimante répond aux normes IEC 60825-1 relatives aux produits laser de Classe I.

Les produits laser de Classe I sont considérés comme des produits non dangereux. Cette imprimante est équipée d'un laser de Classe IIIb (3b) (arséniure de gallium d'une puissance nominale de 5 milliwatts) émettant sur des longueurs d'onde comprises entre 770 et 795 nanomètres. L'imprimante et son système laser sont conçus pour impossible, dans des conditions normales d'utilisation, d'entretien par l'utilisateur ou de révision, l'exposition à des rayonnements laser supérieurs à des rayonnements de Classe I.

---

## Avvertenze sui prodotti laser

Questa stampante è certificata negli Stati Uniti per essere conforme ai requisiti del DHHS 21 CFR Sottocapitolo J per i prodotti laser di classe 1 ed è certificata negli altri Paesi come prodotto laser di classe 1 conforme ai requisiti della norma CEI 60825-1.

I prodotti laser di classe non sono considerati pericolosi. La stampante contiene al suo interno un laser di classe IIIb (3b) all'arseniuro di gallio della potenza di 5mW che opera sulla lunghezza d'onda compresa tra 770 e 795 nanometri. Il sistema laser e la stampante sono stati progettati in modo tale che le persone a contatto con la stampante, durante il normale funzionamento, le operazioni di servizio o quelle di assistenza tecnica, non ricevano radiazioni laser superiori al livello della classe 1.

---

## Avisos sobre el láser

Se certifica que, en los EE.UU., esta impresora cumple los requisitos para los productos láser de Clase I (1) establecidos en el subcapítulo J de la norma CFR 21 del DHHS (Departamento de Sanidad y Servicios) y, en los demás países, reúne todas las condiciones expuestas en la norma IEC 60825-1 para productos láser de Clase I (1).

Los productos láser de Clase I no se consideran peligrosos. La impresora contiene en su interior un láser de Clase IIIb (3b) de arseniuro de galio de funcionamiento nominal a 5 milivatios en una longitud de onda de 770 a 795 nanómetros. El sistema láser y la impresora están diseñados de forma que ninguna persona pueda verse afectada por ningún tipo de radiación láser superior al nivel de la Clase I durante su uso normal, el mantenimiento realizado por el usuario o cualquier otra situación de servicio técnico.

### Declaração sobre Laser

A impressora está certificada nos E.U.A. em conformidade com os requisitos da regulamentação DHHS 21 CFR Subcapítulo J para a Classe I (1) de produtos laser. Em outros locais, está certificada como um produto laser da Classe I, em conformidade com os requisitos da norma IEC 60825-1.

Os produtos laser da Classe I não são considerados perigosos. Internamente, a impressora contém um produto laser da Classe IIIb (3b), designado laser de arseneto de potássio, de 5 milliwatts, operando numa faixa de comprimento de onda entre 770 e 795 nanómetros. O sistema e a impressora laser foram concebidos de forma a nunca existir qualquer possibilidade de acesso humano a radiação laser superior a um nível de Classe I durante a operação normal, a manutenção feita pelo utilizador ou condições de assistência prescritas.

---

## Laserinformatie

De printer voldoet aan de eisen die gesteld worden aan een laserprodukt van klasse I. Voor de Verenigde Staten zijn deze eisen vastgelegd in DHHS 21 CFR Subchapter J, voor andere landen in IEC 60825-1.

Laserprodukten van klasse I worden niet als ongevaarlijk aangemerkt. De printer is voorzien van een laser van klasse IIIB (3b), dat wil zeggen een gallium arsenide-laser van 5 milliwatt met een golflengte van 770-795 nanometer. Het lasergedeelte en de printer zijn zo ontworpen dat bij normaal gebruik, bij onderhoud of reparatie conform de voorschriften, nooit blootstelling mogelijk is aan laserstraling boven een niveau zoals voorgeschreven is voor klasse 1.

---

## Lasermeddelelse

Printeren er godkendt som et Klasse I-laserprodukt, i overensstemmelse med kravene i IEC 60825-1.

Klasse I-laserprodukter betragtes ikke som farlige. Printeren indeholder internt en Klasse IIIB (3b)-laser, der nominelt er en 5 milliwatt galliumarsenid laser, som arbejder på bølglængdeområdet 770-795 nanometer. Lasersystemet og printeren er udformet således, at mennesker aldrig udsættes for en laserstråling over Klasse I-niveau ved normal drift, brugervedligeholdelse eller obligatoriske servicebetingelser.



---

## Huomautus laserlaitteesta

Tämä kirjoitin on Yhdysvalloissa luokan I (1) laserlaitteiden DHHS 21 CFR Subchapter J -määrityksen mukainen ja muualla luokan I laserlaitteiden IEC 60825-1 -määrityksen mukainen.

Luokan I laserlaitteiden ei katsota olevan vaarallisia käyttäjälle. Kirjoittimessa on sisäinen luokan IIIb (3b) 5 milliwatin galliumarsenidilaser, joka toimii aaltoalueella 770 - 795 nanometriä. Laserjärjestelmä ja kirjoitin on suunniteltu siten, että käyttäjä ei altistu luokan I määrityksiä voimakkaammalle säteilylle kirjoittimen normaalin toiminnan, käyttäjän tekemien huoltotoimien tai muiden huoltotoimien yhteydessä.

VARO! Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.

WARNING! Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

---

## Laser-notis

Denna skrivare är i USA certifierad att motsvara kraven i DHHS 21 CFR, underparagraf J för laserprodukter av Klass I (1). I andra länder uppfyller skrivaren kraven för laserprodukter av Klass I enligt kraven i IEC 60825-1.

Laserprodukter i Klass I anses ej hälsovådliga. Skrivaren har en inbyggd laser av Klass IIIb (3b) som består av en laserenhet av gallium-arsenid på 5 milliwatt som arbetar i våglängdsområdet 770-795 nanometer. Lasersystemet och skrivaren är utformade så att det aldrig finns risk för att någon person utsätts för laserstrålning över Klass I-nivå vid normal användning, underhåll som utförs av användaren eller annan föreskriven serviceåtgärd.

---

## Laser-melding

Skriveren er godkjent i USA etter kravene i DHHS 21 CFR, underkapittel J, for klasse I (1) laserprodukter, og er i andre land godkjent som et Klasse I-laserprodukt i samsvar med kravene i IEC 60825-1.

Klasse I-laserprodukter er ikke å betrakte som farlige. Skriveren inneholder internt en klasse IIIb (3b)-laser, som består av en gallium-arsenlaserenhet som avgir stråling i bølgelengdeområdet 770-795 nanometer. Lasersystemet og skriveren er utformet slik at personer aldri utsettes for laserstråling ut over klasse I-nivå under vanlig bruk, vedlikehold som utføres av brukeren, eller foreskrevne serviceoperasjoner.

---

## Avís sobre el Làser

Segons ha estat certificat als Estats Units, aquesta impressora compleix els requisits de DHHS 21 CFR, apartat J, pels productes làser de classe I (1), i segons ha estat certificat en altres llocs, és un producte làser de classe I que compleix els requisits d'IEC 60825-1.

Els productes làser de classe I no es consideren perillosos. Aquesta impressora conté un làser de classe IIIb (3b) d'arseniür de gal.li, nominalment de 5 mil.liwats, i funciona a la regió de longitud d'ona de 770-795 nanòmetres. El sistema làser i la impressora han sigut concebuts de manera que mai hi hagi exposició a la radiació làser per sobre d'un nivell de classe I durant una operació normal, durant les tasques de manteniment d'usuari ni durant els serveis que satisfacin les condicions prescrites.

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## Japanese laser notice

レーザーに関するお知らせ

このプリンターは、米国ではDHHS 21 CFRサブチャプターJのクラスI (1)の基準を満たしたレーザー製品であることが証明されています。また米国以外ではIEC 825の基準を満たしたクラスIのレーザー製品であることが証明されています。

クラスIのレーザー製品には危険性はないと考えられています。このプリンターはクラスIII b (3 b)のレーザーを内蔵しています。このレーザーは、波長が770 ~ 795ナノメートルの範囲で、通常5ミリワットのガリウム砒化物を放射するレーザーです。このレーザーシステムとプリンターは、通常の操作、ユーザのメンテナンス、規定された修理においては、人体がクラスIのレベル以上のレーザー放射に晒されることのないよう設計されています。

---

## Chinese laser notice

注意：

本打印机被美国认证合乎 DHHS 21 CFR Subchapter I 对分类 I (1) 激光产品的标准，而在其他地区则被认证合乎 IEC 825 的标准。

分类 I 激光产品一般认为不具危险性，本打印机内部含有分类 IIIb (3b) 的激光，在操作过程中会产生 5 毫瓦含镓及砷的微量激光，其波长范围在 770-795 nm 之间。本激光系统及打印机的设计，在一般操作、使用者维护或规定内的维修情况下，不会使人体接触分类 I 以上等级的辐射。

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## Korean laser notice

본프린터는 1등급 레이저 제품들에 대한 DHHS 21 CFR Subchapter 3의 규정을 준수하고 있음을 미국에서 인증받았으며, 그외의 나라에서도 IEC 825 규정을 준수하는 1등급 레이저 제품으로서 인증을 받았습니다.

1등급 레이저 제품들은 안전한 것으로 간주됩니다. 본 프린터는 5 밀리와트 갈륨 아르세나이드 레이저로서 770-795 나노미터의 파장대에서 활동하는 Class III (3b) 레이저를 내부에 갖고 있습니다. 본 레이저 시스템과 프린터는 정상 작동 중이나 유지 보수 중 또는 규정된 서비스 상태에서 상기의 Class I 수준의 레이저 방출에 사람이 절대 접근할 수 없도록 설계되어 있습니다.


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## Safety information

- The safety of this product is based on testing and approvals of the original design and specific components. The manufacturer is not responsible for safety in the event of use of unauthorized replacement parts.
- The maintenance information for this product has been prepared for use by a professional service person and is not intended to be used by others.
- There may be an increased risk of electric shock and personal injury during disassembly and servicing of this product. Professional service personnel should understand this and take necessary precautions.
-  **CAUTION:** When you see this symbol, there is a danger from hazardous voltage in the area of the product where you are working. Unplug the product before you begin, or use caution if the product must receive power in order to perform the task.


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## Consignes de sécurité

- La sécurité de ce produit repose sur des tests et des agréments portant sur sa conception d'origine et sur des composants particuliers. Le fabricant n'assume aucune responsabilité concernant la sécurité en cas d'utilisation de pièces de rechange non agréées.
- Les consignes d'entretien et de réparation de ce produit s'adressent uniquement à un personnel de maintenance qualifié.
- Le démontage et l'entretien de ce produit pouvant présenter certains risques électriques, le personnel d'entretien qualifié devra prendre toutes les précautions nécessaires.
-  **ATTENTION :** Ce symbole indique la présence d'une tension dangereuse dans la partie du produit sur laquelle vous travaillez. Débranchez le produit avant de commencer ou faites preuve de vigilance si l'exécution de la tâche exige que le produit reste sous tension.


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## Norme di sicurezza

- La sicurezza del prodotto si basa sui test e sull'approvazione del progetto originale e dei componenti specifici. Il produttore non è responsabile per la sicurezza in caso di sostituzione non autorizzata delle parti.
- Le informazioni riguardanti la manutenzione di questo prodotto sono indirizzate soltanto al personale di assistenza autorizzato.
- Durante lo smontaggio e la manutenzione di questo prodotto, il rischio di subire scosse elettriche e danni alla persona è più elevato. Il personale di assistenza autorizzato deve, quindi, adottare le precauzioni necessarie.
-  **ATTENZIONE:** Questo simbolo indica la presenza di tensione pericolosa nell'area del prodotto. Scollegare il prodotto prima di iniziare o usare cautela se il prodotto deve essere alimentato per eseguire l'intervento.


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## Sicherheitshinweise

- Die Sicherheit dieses Produkts basiert auf Tests und Zulassungen des ursprünglichen Modells und bestimmter Bauteile. Bei Verwendung nicht genehmigter Ersatzteile wird vom Hersteller keine Verantwortung oder Haftung für die Sicherheit übernommen.
- Die Wartungsinformationen für dieses Produkt sind ausschließlich für die Verwendung durch einen Wartungsfachmann bestimmt.
- Während des Auseinandernehmens und der Wartung des Geräts besteht ein zusätzliches Risiko eines elektrischen Schlags und körperlicher Verletzung. Das zuständige Fachpersonal sollte entsprechende Vorsichtsmaßnahmen treffen.
-  **ACHTUNG:** Dieses Symbol weist auf eine gefährliche elektrische Spannung hin, die in diesem Bereich des Produkts auftreten kann. Ziehen Sie vor den Arbeiten am Gerät den Netzstecker des Geräts, bzw. arbeiten Sie mit großer Vorsicht, wenn das Produkt für die Ausführung der Arbeiten an den Strom angeschlossen sein muß.


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## Pautas de Seguridad


- La seguridad de este producto se basa en pruebas y aprobaciones del diseño original y componentes específicos. El fabricante no es responsable de la seguridad en caso de uso de piezas de repuesto no autorizadas.
- La información sobre el mantenimiento de este producto está dirigida exclusivamente al personal cualificado de mantenimiento.
- Existe mayor riesgo de descarga eléctrica y de daños personales durante el desmontaje y la reparación de la máquina. El personal cualificado debe ser consciente de este peligro y tomar las precauciones necesarias.
-  **PRECAUCIÓN:** este símbolo indica que el voltaje de la parte del equipo con la que está trabajando es peligroso. Antes de empezar, desenchufe el equipo o tenga cuidado si, para trabajar con él, debe conectarlo.

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## Informações de Segurança

- A segurança deste produto baseia-se em testes e aprovações do modelo original e de componentes específicos. O fabricante não é responsável pela segurança, no caso de uso de peças de substituição não autorizadas.
- As informações de segurança relativas a este produto destinam-se a profissionais destes serviços e não devem ser utilizadas por outras pessoas.
- Risco de choques eléctricos e ferimentos graves durante a desmontagem e manutenção deste produto. Os profissionais destes serviços devem estar avisados deste facto e tomar os cuidados necessários.
-  **CUIDADO:** Quando vir este símbolo, existe a possível presença de uma potencial tensão perigosa na zona do produto em que está a trabalhar. Antes de começar, desligue o produto da tomada eléctrica ou seja cuidadoso caso o produto tenha de estar ligado à corrente eléctrica para realizar a tarefa necessária.

## Informació de Seguretat

- La seguretat d'aquest producte es basa en l'avaluació i aprovació del disseny original i els components específics. El fabricant no es fa responsable de les qüestions de seguretat si s'utilitzen peces de recanvi no autoritzades.
- La informació pel manteniment d'aquest producte està orientada exclusivament a professionals i no està destinada a ningú que no ho sigui.
- El risc de xoc elèctric i de danys personals pot augmentar durant el procés de desmuntatge i de servei d'aquest producte. El personal professional ha d'estar-ne assabentat i prendre les mesures convenients.
-  **PRECAUCIÓ:** aquest símbol indica que el voltatge de la part de l'equip amb la qual esteu treballant és perillós. Abans de començar, desendolleu l'equip o extremeu les precaucions si, per treballar amb l'equip, l'heu de connectar.

## 안전 사항

- 본 제품은 원래 설계 및 특정 구성품에 대한 테스트 결과로 안정성이 입증된 것입니다. 따라서 무허가 교체부품을 사용하는 경우에는 제조업체에서 안전에 대한 책임을 지지 않습니다.
- 본 제품에 관한 유지 보수 설명서는 전문 서비스 기술자용으로 작성된 것이므로, 비전문가는 사용할 수 없습니다.
- 본 제품을 해체하거나 정비할 경우, 전기적인 충격을 받거나 상처를 입을 위험이 커집니다. 전문 서비스 기술자는 이 사실을 숙지하고, 필요한 예방 조치를 취하도록 하십시오.
-  **주의:** 이 표시는 해당영역에서 고압전류가 흐른다는 위험 표시입니다. 시작전에 플러그를 뽑으시거나, 주의를 기울여 주시기 바랍니다.



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## 安全信息

本产品的安全性以原来设计和特定产品的测试结果和认证为基础。万一使用未经许可的替换部件，制造商不对安全性负责。

本产品的维护信息仅供专业服务人员使用，并不打算让其他人使用。

本产品在拆卸、维修时，遭受电击或人员受伤的危险性会增高，专业服务人员对这点必须有所了解，并采取必要的预防措施。



**切记：**当您看到此符号时，说明在您工作的产品区域有危险电压的存在。请在开始操作前拔掉产品的电源线，或者在产品必须使用电源来执行任务时，小心从事。

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## Preface

This manual contains maintenance procedures for service personnel. It is divided into the following chapters:

1. **General information** contains a general description of the printer and the maintenance approach used to repair it. Special tools and test equipment are listed, as well as general environmental and safety instructions.
2. **Diagnostic information** contains an error indicator table, symptom tables, and service checks used to isolate failing field replaceable units (FRUs).
3. **Diagnostic aids** contains tests and checks used to locate or repeat symptoms of printer problems.
4. **Repair information** provides instructions for making printer adjustments and removing and installing FRUs.
5. **Connector locations** uses illustrations to identify the connector locations and test points on the printer.
6. **Preventive maintenance** contains the lubrication specifications and recommendations to prevent problems.
7. **Parts catalog** contains illustrations and part numbers for individual FRUs.

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## Definitions

**Note:** A note provides additional information.

**Warning:** A warning identifies something that might damage the product hardware or software.

**CAUTION:** A caution identifies something that might cause a servicer harm.



**CAUTION:** When you see this symbol, there is a danger from hazardous voltage in the area of the product where you are working. Unplug the product before you begin, or use caution if the product must receive power in order to perform the task.

---

# 1. General information

This Lexmark™ C510 color laser printer is the ideal printer for presentations, business graphics, line art, and text. It uses laser diode electrophotographic technology to deliver remarkable quality print images and text. The printer can be used as a shared network or desktop printer.

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## Maintenance approach

The diagnostic information in this manual leads you to the correct field replaceable unit (FRU) or part. Use the error code charts, symptom index, and service checks to determine the symptom and repair the failure. See “**Diagnostic information**” on page 2-1, for location of each section. You may find that the removals in the Repair information chapter will help you identify parts. After you complete the repair, perform tests as needed to verify the repair.

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## Tools required for service

The removal and adjustment procedures described in this manual require the following tools and equipment:

- Analog volt ohmmeter (a digital volt ohmmeter may also be used)
- Flat-blade screwdrivers
- Needle nose pliers
- #1 Phillips screwdriver
- #2 Phillips screwdriver
- Slotted screwdriver #1
- Slotted clock screwdriver #1
- Tweezers, C-ring pliers

When you make voltage readings, always use frame ground unless another ground is specified.



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## Acronyms

ASIC	Application-Specific Integrated Circuit
CS	Customer Ordered
CSU	Customer Setup
DRAM	Dynamic Random Access Memory
EEPROM	Electrically Erasable Programmable Read-Only Memory
EP	Electrophotographic Process
ESD	Electrostatic Discharge
FRU	Field Replaceable Unit
HV	High Voltage
HVPS	High Voltage Power Supply
LAN	Local Area Network
LASER	Light Amplification by Stimulated Emission of Radiation
LCD	Liquid Crystal Display
LED	Light-Emitting Diode
LV	Low Voltage
LVPS	Low Voltage Power Supply
NVRAM	Nonvolatile Random Access Memory
OEM	Original Equipment Manufacturer
PICS	Problem Isolation Charts
PIXEL	Picture Element
POR	Power-On Reset
POST	Power-On Self Test
PQET	Print Quality Enhancement Technology
RIP	Raster Image Processor
ROS	Read-Only Storage
SRAM	Static Random Access Memory
UPR	Used Parts Replacement
VAC	Volts alternating current
VDC	Volts direct current

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## Specifications

### Resolution

600 x 600 dpi  
2400 image quality

### Model differences

	C510	C510n	C510dtn
USB 2.0	X	X	X
Parallel	X		
Ethernet		X	X
Memory (MB)	64	128	128
Options available			
530-sheet drawer (tray 2)	X	X	
Duplex	X	X	
Hard disk	X	X	X

### Technical specifications

#### Toner darkness

There are five settings to balance print darkness and toner savings. The higher the setting, the darker the print. The toner darkness default setting is 4.

The toner darkness setting is available through the operator panel under the Color Menu, Toner Darkness menu.

#### Color correction settings

There are three settings to choose the type of color correction to be applied when printing.

**Auto (default):** Applies different color correction to each object on the printed page depending upon the type of object (text, graphics or image), and how the color for each object is specified.

**Off:** No color correction is implemented.

**Manual:** Allows users to customize color correction output from the operator panel. Setting selectable from the driver.

## Physical specifications and weight

The following table contains the dimensions and weights for each printer model and option. This does not include packaging but does include the print cartridge that ships with the printer.

	Width	Depth	Height	Weight <sup>4</sup>
	inch	inch	inch	lb
	mm	mm	mm	kg
<b>Printers</b>				
Lexmark C510 <sup>1</sup>	19.5	16.5	15.2	67.0
	495	420	385	30.3
Lexmark C510n <sup>2</sup>	19.5	16.5	15.2	67.0
	495	420	385	30.3
Lexmark C510dtn <sup>3</sup>	19.5	20.7	23.2	91.0
	495	525	590	41.2
<b>Paper options</b>				
Duplex unit	14.2	7.1	15.2	11.0
	360	180	385	5.0
530-Sheet drawer	18.1	18.5	7.3	13.3
	460	470	185	6.0
530-Sheet tray	11.2	14.4	4.5	4.2
	285	365	115	1.9
Standard tray	10.8	13.0	2.2	2.2
	275	330	55	1.0
Legal tray	10.8	15.9	2.2	2.5
	275	405	55	1.1
<sup>1</sup> Base model is the base printer with standard 250-sheet input tray and starter cartridges.				
<sup>2</sup> Network model is the network-ready printer with standard input tray and starter cartridges.				
<sup>3</sup> Duplex network model is the network-ready printer plus duplex option and 530-sheet input tray.				
<sup>4</sup> Weight does not include packaging or pubs.				

## Operating clearances

Printer sides	C510 & C510n	C510 & C510n with 530-sheet tray	C510 & C510n with duplex unit	C510dtn with 530-sheet tray
Left side	8 in (203 mm)	8 in (203 mm)	8 in (203 mm)	8 in (203 mm)
Right side	20 in (508 mm)	20 in (508 mm)	20 in (508 mm)	20 in (508 mm)
Front	28 in (711 mm)	28 in (711 mm)	28 in (711 mm)	28 in (711 mm)
Rear	10 in (254 mm)	10 in (254 mm)	14 in (355 mm)	14 in (355 mm)
Top	23 in (584 mm)	29 in (736 mm)	25 in (635 mm)	29 in (736 mm)

## Packaging and shipping dimensions

	Width	Depth	Height	Weight
Printers <sup>1</sup>	in	in	in	lb
	mm	mm	mm	kg
C510	22.6	20.9	22.4	80
	574	530	570	36.4
C510n	22.6	20.9	22.4	80
	574	530	570	36.4
C510dtn <sup>2</sup>	23.4	23.6	46.2	112.2
	594.36	599.44	1173.48	51.0
Options				
Duplex	18.0	20.8	12.0	16.1
	456	528	305	7.3
530-Sheet drawer	21.9	22.4	10.9	18.7
	556	570	277	8.5
530-Sheet tray	17.7	15.1	7.9	6.4
	450	384	200	2.9
250-Sheet tray	13.2	16.2	5.5	3.3
	335	412	140	1.5
Legal tray	13.2	19.0	5.7	5.5
	335	483	144	2.5
<sup>1</sup> Includes start-up kit (supplies)				
<sup>2</sup> C510dtn ships printer, duplex and 1 tray bundled on a pallet.				



## Print speed and performance

	Simplex printing		Duplex printing	
	pages/minute		(sides/minute)	
Media size	Standard tray		Standard tray	
Letter	30	8	15	4
A4	30	8	15	4
Legal	16	8	5	4
Transparencies	3	2	N/S	N/S
Thick card stock	3	2	N/S	N/S
Labels (letter & A4)	5	3	N/S	N/S
Medium thick card stock (letter & A4)	4	3	N/S	N/S
Envelopes	5	3	N/S	N/S
N/S - Media size not supported in this tray				
<b>Note:</b> For media size A4 duplex mode with custom paper sizes, size sensing is turned off.				

## Time to first print

	Simplex		Duplex	
<b>Time from standby mode</b>	13 seconds	19 seconds	19 seconds	27 seconds
<b>Time from power saver mode</b>	45 seconds	45 seconds	45 seconds	45 seconds
Note: Time to first page (TTFP) is the time from the moment when the host sends the print signal until the moment the trailing edge of the first page leaves the exit feed rollers. TTFP is measured using a simple text (single character) page.				
Note: Warm up time, 45 seconds maximum, is the time elapsed from when the power is turned on to when the ready status is reached.				

## Processor

500 MHz

## 5021-0XX

### Duty cycle

Maximum duty cycle-35,000 pages (one month's usage)

Machine life-120,000 pages/300,000 images

### Printer memory

#### Memory configuration

	C510	C510n	C510dtn
Standard DRAM	64MB	128MB	128MB
Max DRAM	320MB		

#### Available memory options

Optional 64MB and 128MB SDRAM DIMMs are available.

#### Flash memory options

Optional 16MB and 32MB DIMMs are available from Lexmark.

#### Memory and expansion slots

	C510	C510n	C510dtn
100pin DIMM slots (1-2 SDRAM, 1 Flash <sup>1</sup> )	2	1	1
PCI Slots (for optional interface cards)	1	1	1
Firmware card slot	1	1	1
User flash card slot	1	1	1
<sup>1</sup> Only one Flash card may be installed.			
Only one DLE/Firmware card is supported at a time, as well as only one User Flash card is supported at a time.			

### Paper and media specifications

#### Print area

The C510 printable area is up to 4.0 mm (0.158 in.) from the top and bottom of the media, and up to 3.0 mm (0.118 in.) from the left and right edges. Any information placed outside this specified printable area will not print. Note: For envelopes, the printable area is up to 4.0 mm (0.158 in.) of the left and right edges, and 3.0 mm(0.118 in.) of the top and bottom edges.

## Input and output configurations

The following table shows the standard number of input sources and output destinations, as well as the estimated capacity of each. Capacity may vary and is subject to media specifications and printer operating environment. The capacities listed are based on plain paper at 75 g/m<sup>2</sup>.

Sources and capacities	C510/C510n	C510dtn <sup>3</sup>
Input sources		
Number of standard sources	1	2
Number of optional input drawers	1	0
Maximum number of input sources <sup>1</sup>	2	2
Input capacities <sup>2</sup>		
Standard input		
Primary tray	250	250
Second tray		530
Total standard	250	780
Optional input		
Optional legal tray	250	250
Optional tray 1	250	250
Optional tray 2	530	530
Output destinations		
Number of standard destinations	1	1
Output capacities		
Standard output bin capacity (top)		
Media up to 20 lb paper	250	250
Other		
Duplex unit	Yes	Standard
<sup>1</sup> Optional input drawer is a 530-sheet capacity drawer. Only one optional drawer may be installed at any time.		
<sup>2</sup> The printer supports top output (face down) as standard. No additional output options are available.		
<sup>3</sup> Includes optional 530-sheet drawer.		
<b>Note:</b> All capacities are based on use of 20 lb paper.		

Media input types and weights

Source	Type	Standard tray Legal tray	530-Sheet tray	Duplex	Printer menu Item	
					Paper type	Paper weight
Paper <sup>1,2</sup> (grain long)	Xerographic or bond paper	60-74 g/m <sup>2</sup> (16-19 lb)	60-74 g/m <sup>2</sup> (16-19 lb)	60-74 g/m <sup>2</sup> (16-19 lb)	Plain paper	Light
	Xerographic or bond paper	75-120 g/m <sup>2</sup> (20-32 lb)	75-120 g/m <sup>2</sup> (20-32 lb)	75-120 g/m <sup>2</sup> (20-32 lb)	Plain paper	Normal
	100% Cotton	75-120 g/m <sup>2</sup> (24-32 lb)	75-120 g/m <sup>2</sup> (24-32 lb)	75-120 g/m <sup>2</sup> (24-32 lb)	Plain paper	Heavy
Card stock	Index	163 g/m <sup>2</sup> (90 lb)	N/A	N/A	Card stock	Normal
	Index	164- 210 g/m <sup>2</sup> (91-110 lb)	N/A	N/A	Card stock	Heavy
Transparency <sup>3</sup>		PN 12A5940 PN 12A5941	N/A	N/A	Transparency	
Labels <sup>2</sup>			N/A	N/A	Label	
Envelopes		75-90 g/m <sup>2</sup> (20-24lb)	N/A	N/A	Envelope	Normal
<sup>1</sup> Punched, embossed, water-marked, perforated, punched, inkjet paper or plastic-coated media should not be used.						
<sup>2</sup> Only occasional use of paper labels in an office environment is supported.						
<sup>3</sup> Only PN 12A5940 and 12A5941 should be used.						

## Media sizes

Media sizes	Dimensions		Input				Output
			Standard 250-sheet tray 1	Optional legal tray	Optional 530-sheet tray 2	Optional duplex unit	Standard 250-sheet bin
	mm	in.					
A4	210 x 297	8.27 x 11.7	X	X	X	X	X
A5	148 x 210	5.83 x 8.27	X			X	X
JIS B5 <sup>3</sup>	182 x 257	7.17 x 10.1	X	X		X	X
Letter	216 x 279.4	8.5 x 11	X	X	X	X	X
Legal	216 x 356	8.5 x 14		X		X	X
Executive	184.2 x 266.7	7.25 x 10.5	X	X	X	X	X
Folio	216 x 330	8.5 x 13	X			X	X
Statement	139.7 x 215.9	5.5 x 8.5	X			X	X
Universal <sup>1</sup>			X	X		X	X
Standard 250-sheet letter tray	104.8x210 to 215.9x297	4.125x8.27 to 8.5x11.7					
Optional 250-sheet legal tray	104.8x210 to 215.9x355.6	4.125x8.27 to 8.5x14					
Optional duplex	148x210 to 215.9x355.6	5.83x8.27 to 8.5x14					
Envelope sizes	Dimensions	Dimensions					
9 Envelope <sup>2</sup>	98.4x225.4	3.875 x 8.9	X	X			X
COM 10 Envelope	104.8 x 241.3	4.12 x 9.5	X	X			X
DL Envelope	110 x 220	4.33 x 8.66	X	X			X
C5 Envelope <sup>2</sup>	162 x 229	6.38 x 9.01	X	X			X
B5 Envelope <sup>2</sup>	176 x 250	6.93 x 9.84	X	X			X
<sup>1</sup> Select Universal when using a non-standard size sheet of print material. The printer formats the page for the maximum size 8.5 X 14 in.(215.9 X 355.6 mm). Set the actual size from your software application.							
<sup>2</sup> Supported through the driver.							
<sup>3</sup> B5 may be supported in optional tray 1, but size sensing must be turned off.							

## Output capacity by media and source

Source	Media	Capacity	Orientation
Standard output bin (top) <sup>1</sup>	Supports all sizes listed in the "Media sizes" table	250 sheets (20 lb paper) 50 Transparencies	Collated Face down

## Media guidelines

With the Lexmark C510 print technology, paper designed for use with xerographic copiers should provide satisfactory print quality and feed reliability. Other media types may be suitable. We recommend that users test any particular brand for suitability to their applications. Refer to the printer User's Reference for additional media specifications.

### Paper

- Rough, highly textured, limp, or pre-curved papers will result in lower print quality and more frequent paper feed failures.
- Colored papers must be able to withstand 338°F (170°C) fusing temperature.
- Preprinted forms and letterheads should be selected using guidelines in the printer User's Reference. The chemical process used in preprinting may render some papers unsuitable for use with the printer.
- Unsuitable papers include punched, embossed, water-marked, perforated media, any kind of inkjet paper or plastic-coated paper.
- Recycled paper less than 75 g/m<sup>2</sup> (20 lb) may cause unacceptable results.

The laser printing process heats paper to high temperatures of 170°C (338°F). Use only paper able to withstand these temperatures without discoloring, bleeding, or releasing hazardous emissions. Check with the manufacturer or vendor to determine whether the paper you have chosen is acceptable for laser printers.

### Envelopes

Should be fed with short edge first, flap down and to the right.

- If envelope wrinkling occurs, refer to the User's Reference for correct loading and stacking of envelopes.
- All envelopes should be new, unused, and without damage.
- Envelopes with excessive curl or twist exceeding 6.0 mm, those stuck together, those with bent corners or nicked edges, or those that interlock should not be used.
- Minimum weight: 90 g/m<sup>2</sup> (24 lb).
- The following envelopes should not be used:
  - Envelopes with windows, holes, perforations, cutouts, or deep embossing
  - Envelopes with metal clasps, string ties, or metal folding bars
  - Envelopes with exposed flap adhesive when the flap is in the closed position
  - Self-seal envelopes
- Under high humidity conditions (over 60%), the envelopes may seal during printing.
- For best results, print on new 90 g/m<sup>2</sup> (24 lb) sulfite or 25% cotton-bond envelope.

## Transparencies

- Use letter (12A5940) or A4-size (12A5941) sheets only.
- Transparencies are only supported in tray 1 (standard or legal trays).

## Labels

- Labels should be selected using guidelines found in the User's Reference, Complete Printer Reference, or the Card stock & Label Guide (located at [www.lexmark.com](http://www.lexmark.com)), and tested for acceptability.
- Vinyl labels are not supported.
- Labels are only supported in tray 1 (standard or legal trays).

## Glossy Paper

- Use letter (12A5950) or A4-size (12A5951) sheets only.

## 5021-0XX

- Glossy paper is only supported from tray 1 (standard or legal trays).

## Connectivity

### Cables

#### Personal computers

- A parallel printer cable is required for attachment of the printer and must be ordered separately.
- For serial attachment, optional RS-232C serial interface card (P/N 11K4602) should be ordered.
- For USB attachment a USB cable is required and must be ordered separately.

#### IBM AS/400

- For parallel attachment, a parallel cable is required.
- For serial attachment, optional RS-232C serial interface card (P/N 11K4602) should be ordered.
- For serial attachment to the IBM AS/400 ASCII Workstation Controller, refer to the IBM AS/400 ASCII Workstation Reference and Example manual (SA41-9922) for specific cable information. The printer requires the optional RS-232C serial interface card (P/N 11K4602).

### Connections

	<b>C510</b>	<b>C510n</b>	<b>C510dtn</b>
Standard local connections	Parallel & USB 2.0	Ethernet & USB 2.0	Ethernet & USB 2.0
Standard network connections	N/A	10/100 Base-TX Ethernet	10/100 Base-TX Ethernet
Optional local connections	RS-232 Serial/Parallel IEEE 1284-C Interface Card		
Optional network connections	10/100Base TX Ethernet, Token-Ring, 802.11b Wireless		



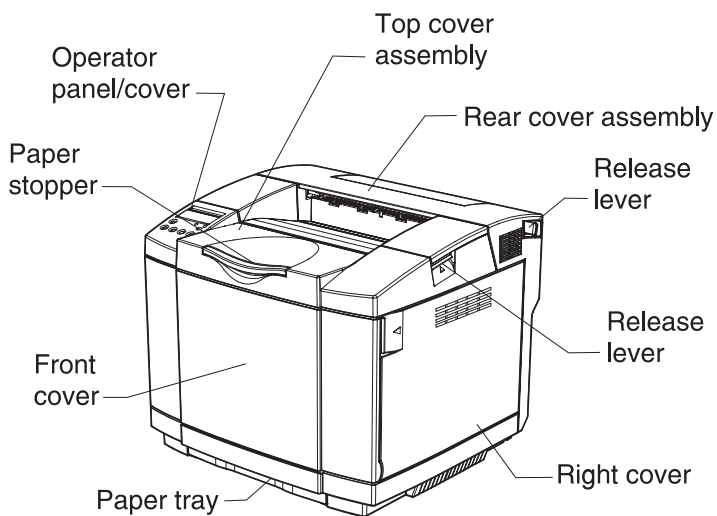
## Power and electrical specifications

Printing states	C510	C510n	C510dtn
Off	0 W	0 W	0 W
<b>Average power while printing</b>			
Continuous mono printing	550 W	550 W	550 W
Continuous color printing	370 W	370 W	370 W
<b>Power consumption, standby</b>			
Power saver on	12 W	13 W	13 W
Power saver off	150 W	150 W	150 W
<b>Maximum current while printing</b>			
100 Volts	8.1 A		
115 Volts	7.2 A		
230 Volts	2.83 A		
<b>Average current while printing</b>			
100 Volts	6.9 A		
115 Volts	5.6 A		
230 Volts	3.0 A		

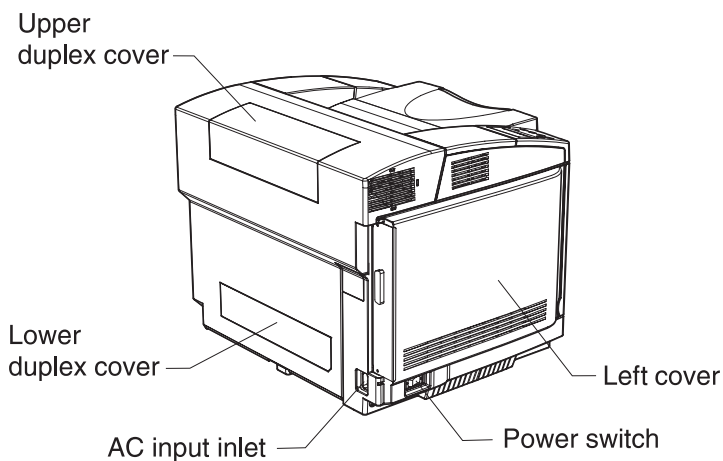
**Environment**

<b>Environment</b>	<b>Specifications</b>
Operating	
Air temperature - product operating	10 to 32.5°C (50 to 90.5°F)
Air temperature - product power off	5 to 35°C (41 to 95°F)
Air relative humidity	15 to 80%
Altitude	0 - 2,500 m (0 - 8,200 ft.)
Ship / Storage	
Temperature-printer and supplies	0 to 35°C (32 to 95°F) <sup>1</sup>
Relative humidity	10 to 90% RH
Atmospheric pressure	613 to 16057 hPa (460 to 800 mm Hg)
<sup>1</sup> Severe High 35 to 40°C (95 to 104°F), Severe Low -10 to 0°C (14 to 32°F). The period under severe shall not be deemed to be continuous, but rather a total of such intermittent periods (48 hours at most for any one period).	

## Printer identification

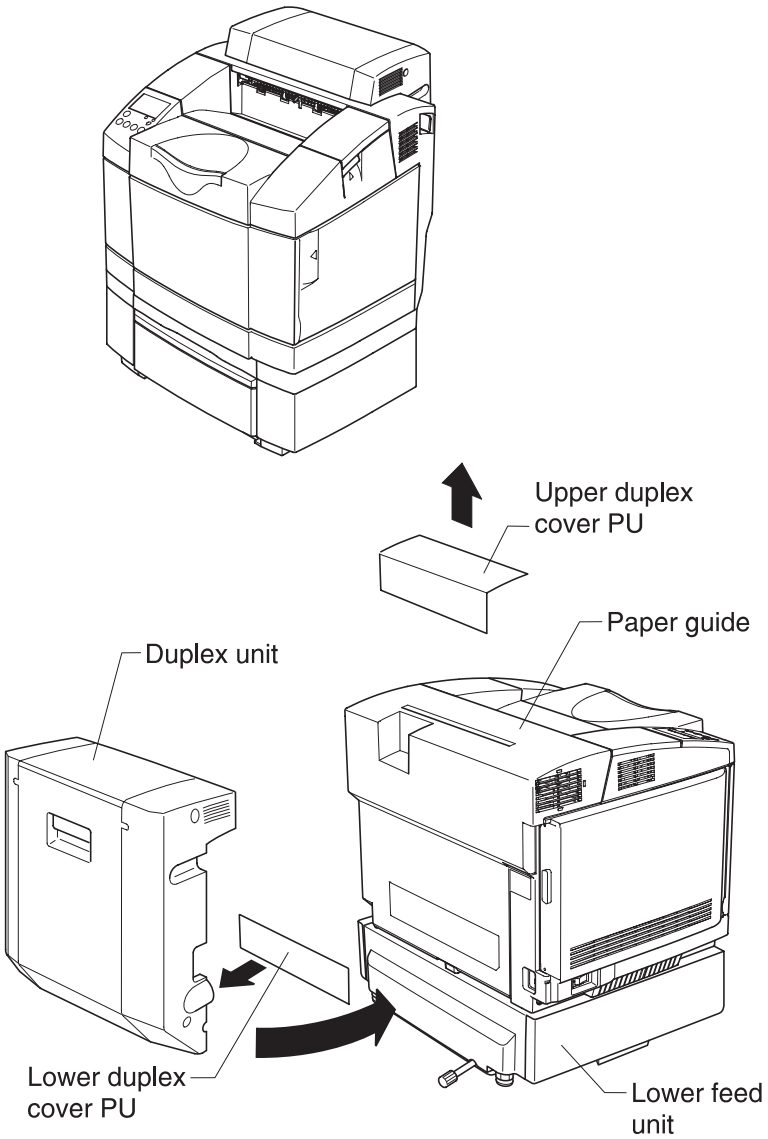


Front view



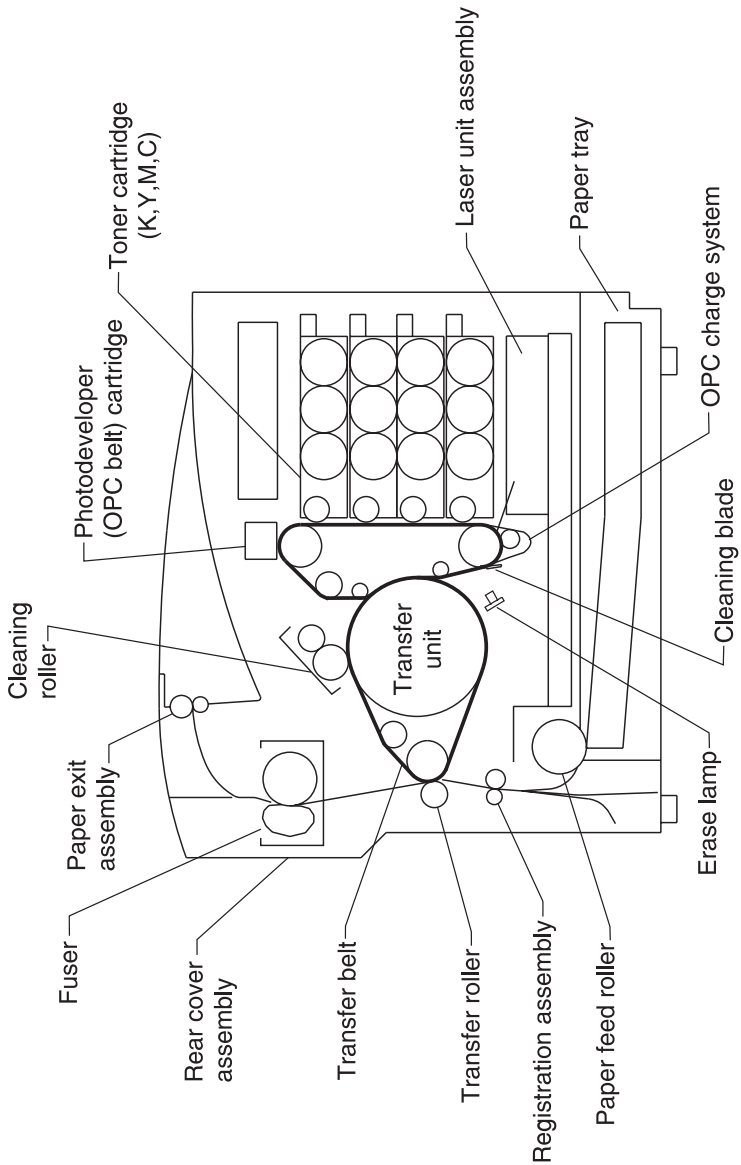
Back view

# Options identification



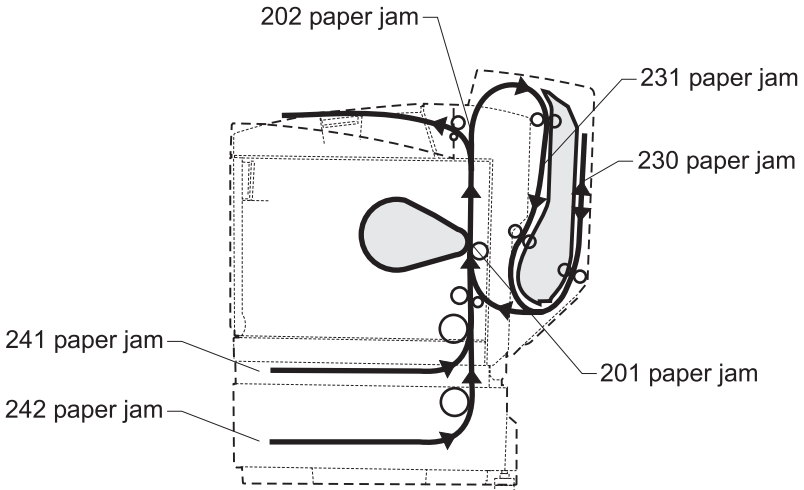
## Printer theory of operation

The following diagram shows the major parts of the printer and paper path.



## Printer paper path

The following illustration shows the paper path and the associated paper jam messages for jams at specific points in the paper path. The printer depicted in the illustration has a duplex unit and secondary paper feed assembly installed:



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## Printer systems description

See the illustration “**Printer component systems**” on page 1-23, for more information.

### Basic principles of color printing

Color printing is made through the subtractive process of combining the three primary colors: yellow, magenta, and cyan.

### Mechanical and electrical structures

This color laser printer consists of five engineering systems: print, transfer, optical, paper transport, and control system.

#### Print system

The print system consists of six functional parts located around the optical photoconductor (OPC) belt and forms a toner image on the OPC belt: charge, expose, develop, first transfer, discharge, and clean.

#### Transfer system

The transfer system consists of three functional parts that transfers the toner image formed on the transfer belt to paper: transfer belt unit, second transfer, and cleaning roller.

#### Optical system

The optical system consists of two functional parts that forms an electrostatic latent image on the OPC belt using a laser light: optical unit and scanner motor (SCM).

#### Paper transport system

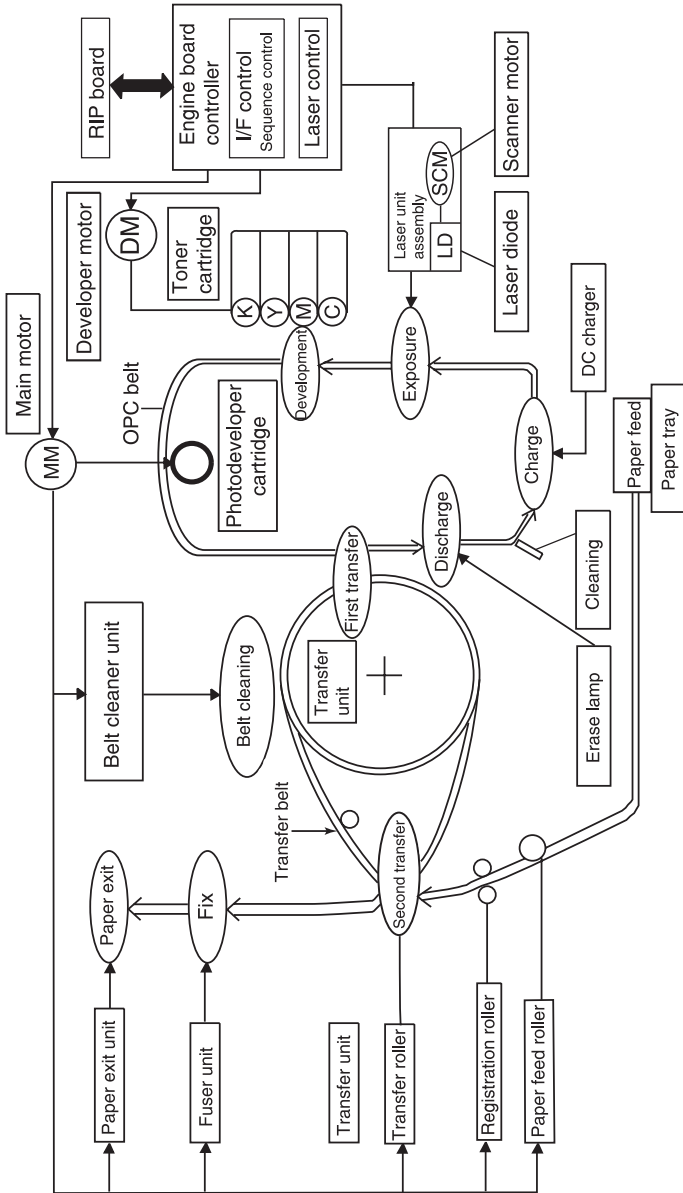
The paper transport system consists of five functional parts that picks up paper from the paper tray, separates the transported paper from the transfer belt, and exits it from the printer after fusing the toner image on the paper: paper tray, transport, fuser, and paper exit.

**Control system**

The control system consists of four control parts and runs the printer by processing the interface signals transmitted from the computer and the other printer systems such as the print, transfer, optical, and transport system: sequence control, laser control, fusing temperature control, and interface control.

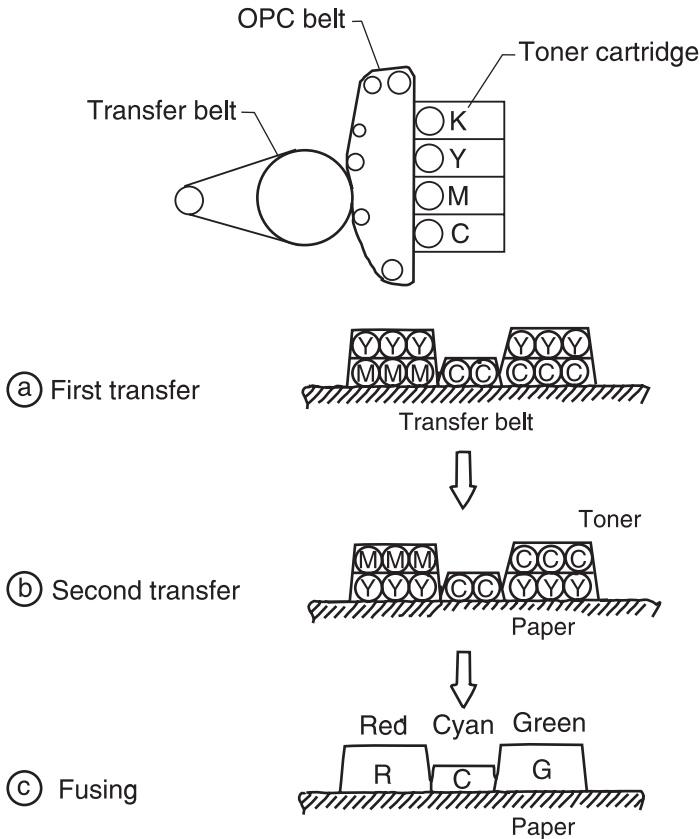


Printer component systems



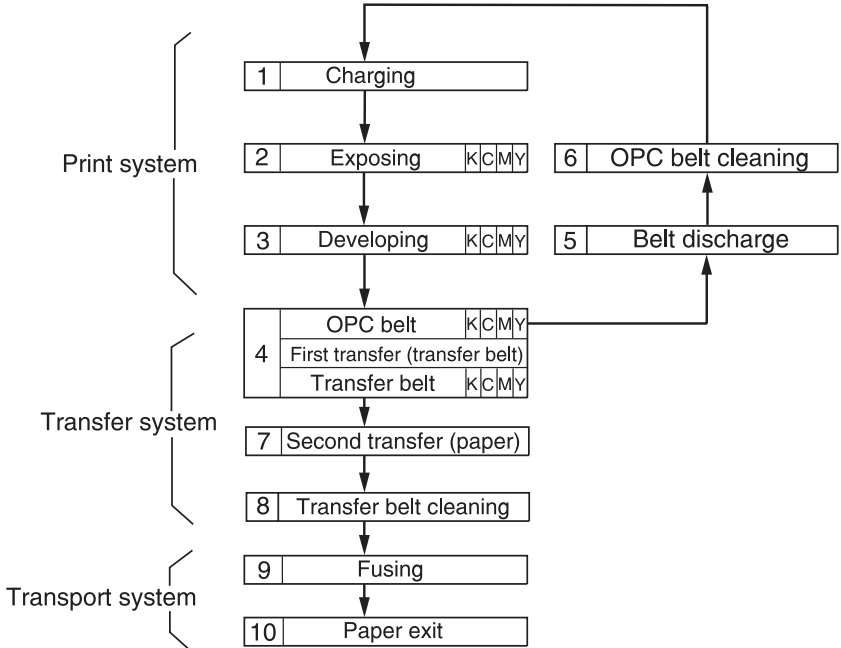
## Basic process of color printing

1. This printer has a toner cartridge for each color — yellow, magenta, cyan, and black.
2. The toner image is developed with primary colors and then transferred to the transfer belt for color combination.
3. The toner image formed on the transfer belt is transferred to paper.
4. The toner is fused to the paper by the thermal fuser unit. During the fusing process, the primary colors mix, yielding the desired color.



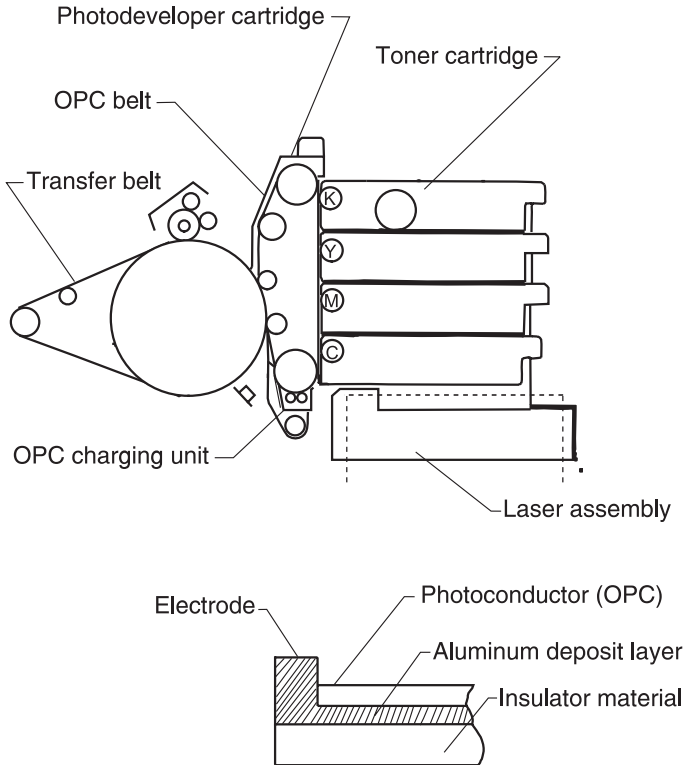
## Print system and transfer system

This illustration shows the basic structure of the print system having the OPC belt as a main function, and the transfer system including the transfer belt. A color print is accomplished by actuating each process in the print system and the transfer system.



## Structure of OPC belt (photo developer cartridge)

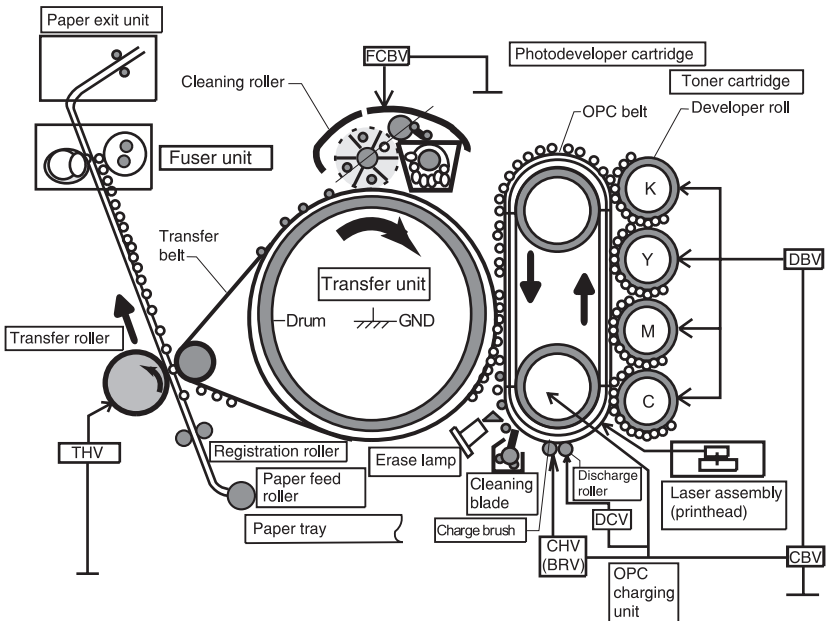
The OPC belt consists of a surface layer having an optical photoconductor (OPC) of organic material, the inner layer consists of an insulator material (PET), and the aluminum deposit layer in between. The OPC belt is a main part of the print system.



## Basic structure of the print system

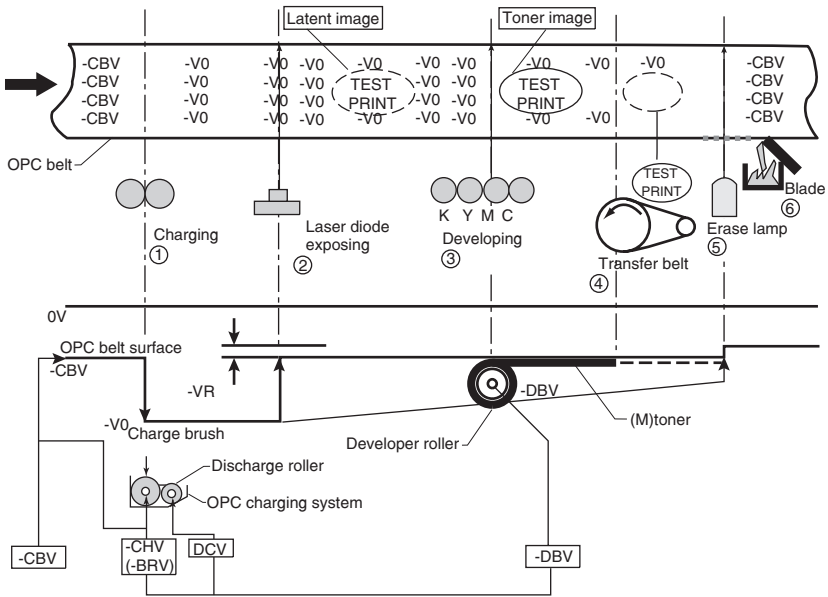
The print system process consists of the following:

1. The OPC belt is biased to the  $-CBV(V)$  by power supply  $CBV$ .
2. The OPC belt is then evenly charged to the negative high voltage by the OPC charging system. The charging system consists of a charging brush that is biased by power supply  $CHV$  and a discharge roller that is biased by power supply  $DCV$ .
3. The developer roller in the toner cartridge is biased to  $-DBV(V)$  by power supply  $DBV$ .
4. Frame potential of transfer drum is  $GND$ .



5. Variation of the OPC belt potential:

- a. The OPC belt is biased to  $-CBV(V)$ .
- b. The OPC belt surface is evenly charged to  $-Vo(V)$  during the charging process.
- c. During the exposing process, the optical unit emits a laser beam that strikes the OPC belt surface forming an electrostatic image. The electrostatic image is at  $-VR(V)$  potential.
- d. The negatively charged toner is moved to the OPC belt in the development process due to the difference between  $-VR(V)$  and  $-DBV(V)$ . A visible image is the result.
- e. The negatively charged toner on the OPC belt is moved to the transfer belt because the potential GND of the transfer belt is greater than  $-VR(V)$  of the OPC belt.
- f. The OPC belt is discharged by the erase lamp radiating on the OPC belt.



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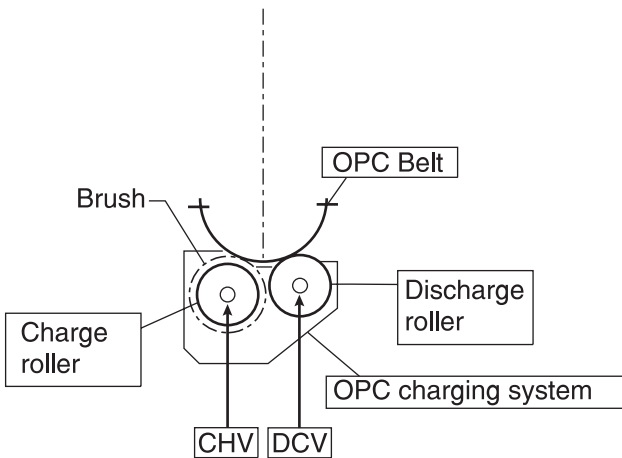
## Details of the print system

### Charging process

In the charging process, the OPC belt is evenly charged by the charger. See “**Printer theory of operation**” on page 1-19 for charger unit location.

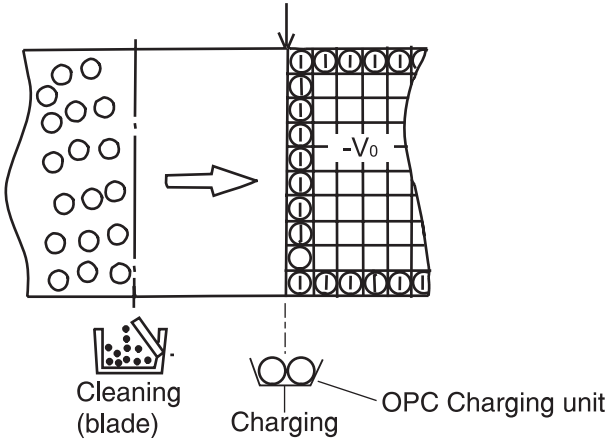
The charger unit consists of a charging brush and a discharge roller.

1. The charge brush charges the OPC belt surface to  $-V_0(V)$  potential. The charge on the surface of the OPC belt is then smoothed to an even  $-V_0(V)$  by the discharge roller.
2. The charger unit controls the grid to a constant voltage of  $ZD(V)$  for even charging.



3. Before charging, the OPC belt surface is  $-CBV(V)$ .

The charger unit evenly charges the OPC belt surface to  $-Vo(V)$  by generating a negative charge.





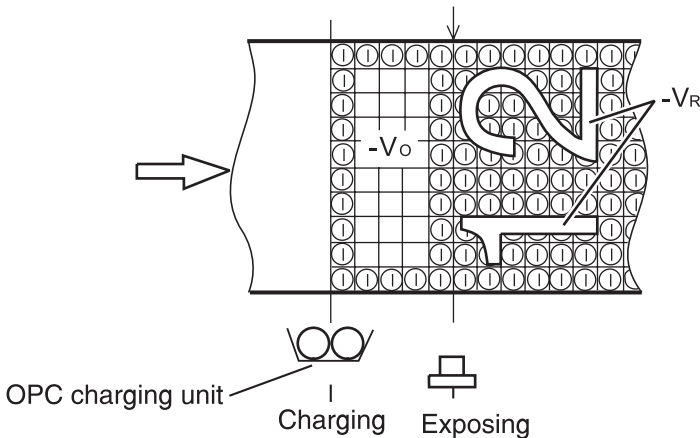
## Exposing process

In the exposing process, the OPC belt surface is exposed to the laser light which forms an electrostatic latent image.

The luminous source of the laser is a semiconductor laser. See **“Printer theory of operation” on page 1-19** for optical unit location.

The laser light scans the OPC belt, forming an electrostatic latent image.

1. The OPC belt surface is charged to  $-V_o(V)$  potential.
  - a. The laser scans the OPC belt in a rectangular pattern during forward movement of the OPC belt.
  - b. High speed switching of the laser matches the transmitted image data.
  - c. The charge of the areas radiated by the laser light is discharged, creating a  $-V_R(V)$  potential.
  - d. An electrostatic latent image is formed (invisible) on the OPC belt.



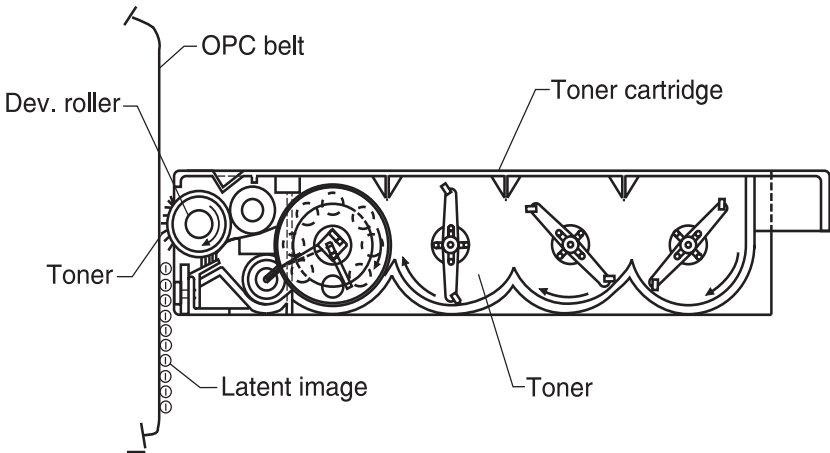
## Developing process

In the developing process, an electrostatic latent image attracts printer toner and becomes visible on the OPC belt.

There are four toner cartridges. See “**Printer theory of operation**” on page 1-19 for toner cartridges location. The toner cartridges are located in the printer from top to bottom in the order of black, yellow, magenta, and cyan.

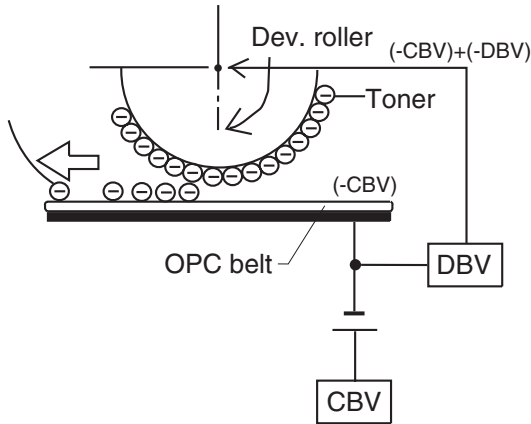
1. Toner adheres to the developer roller.

The developer roller makes contact with the surface of the OPC belt which begins the developing process.

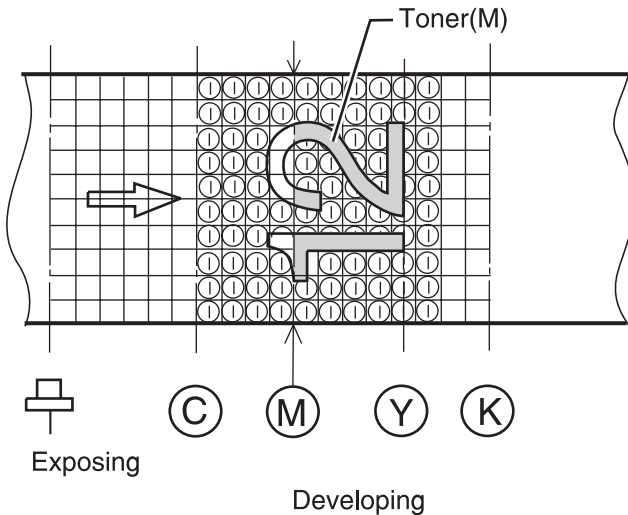


2. The developer roller has been biased to -DBV(V) potential.

The first illustration shows the relationship between the toner, the  $-V_o(V)$  at the non-exposed area of the OPC belt and the  $-V_R(V)$  at the exposed area of the OPC belt.



3. Developing is processed by toner adhering to the OPC belt due to the attraction between the toner and the  $-V_R(V)$  charge at the exposed area of OPC belt. The toner image becomes visible on the OPC belt.

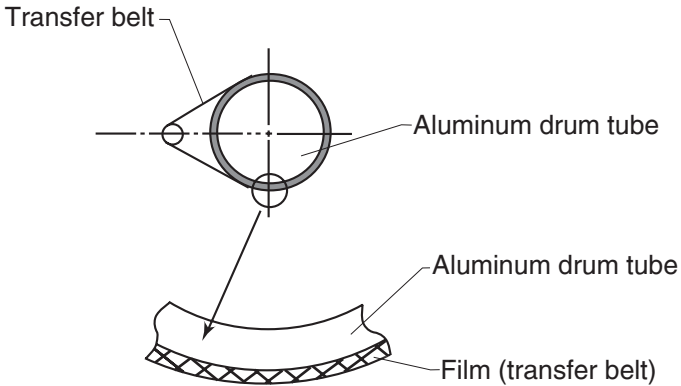


**Note:** No developing takes place on the non-exposed area because the potential of toner and that of the non-exposed area of the OPC belt is an identical pole and therefore, repels.

## First transfer (drum) process

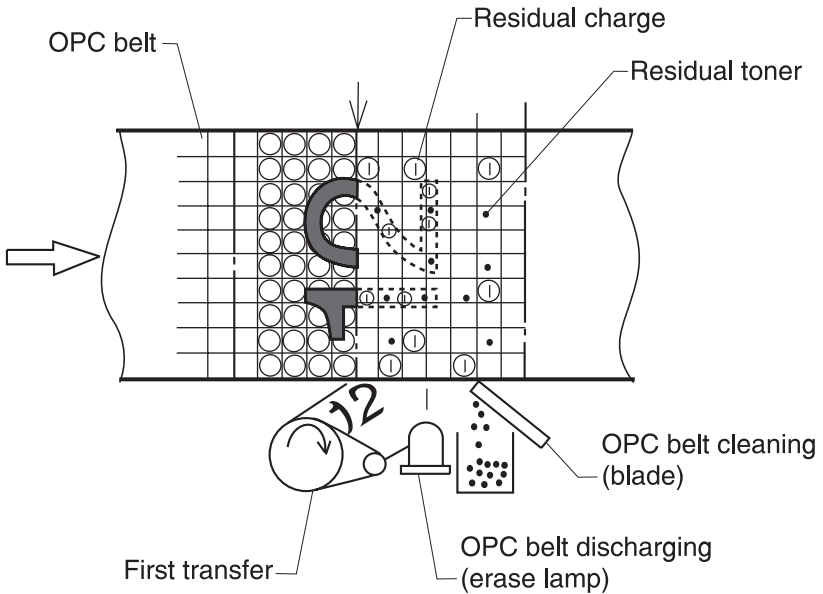
The first transfer process consists of toner images on the OPC belt being transferred to the transfer belt. The transfer belt is composed of a special rubber. See **“Printer theory of operation”** on page 1-19 for transfer belt location.

1. After the development process, the OPC belt rotates making contact and synchronizing with the transfer belt and the aluminum drum.



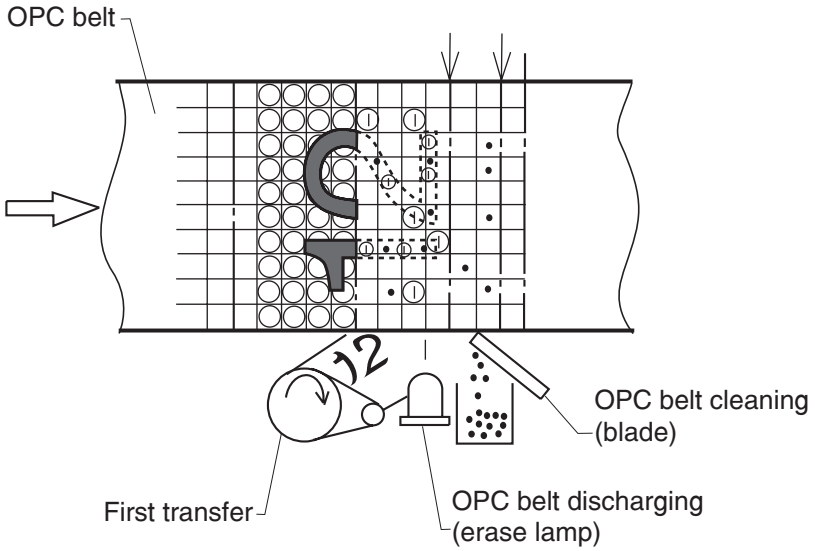
2. The OPC belt has been biased to  $-CBV(V)$  potential. The potential of the transfer belt and drum is nearly GND.
3. Toner on the OPC belt is moved to the transfer belt. This occurs because of the difference of potential between the OPC belt and the transfer belt. Toner that has been developed, in each color, is moved from the OPC belt to the transfer belt and the two color toner image is overlapped on the transfer belt.

4. The toner image is then transferred to paper.



## Belt discharge (erase lamp) process

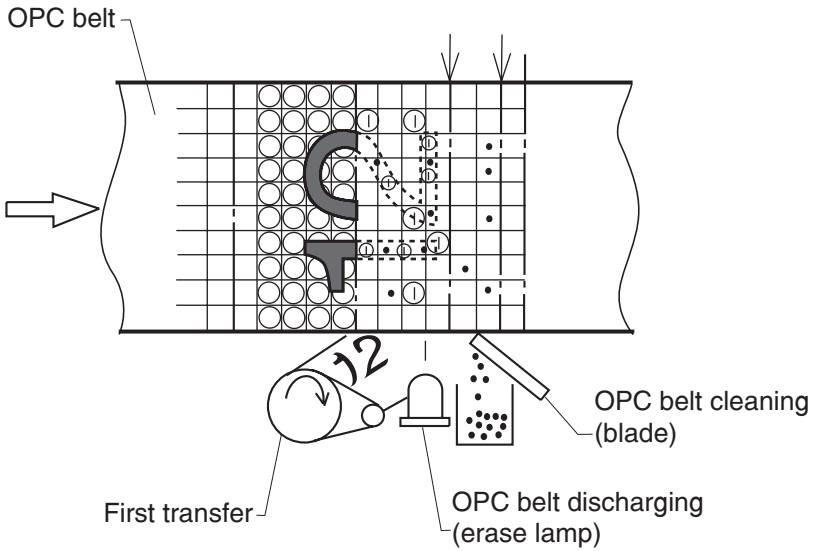
Electrical belt cleaning is accomplished by an erase lamp radiating on the OPC belt. Radiation discharges the residual charge  $-VR(V)$  remaining on the belt after the first transfer process. Electrical cleaning occurs after each toner color transfer. The erase lamp is a luminous source consisting of 24 light emitting diodes. After the electrical belt cleaning, the OPC belt is cleaned with a mechanical blade.



## Belt cleaning process

In the belt cleaning process, residual toner adhering to the OPC belt surface is mechanically removed by a blade edge.

The residual toner is collected in a waste toner container located by the waste toner feeder.



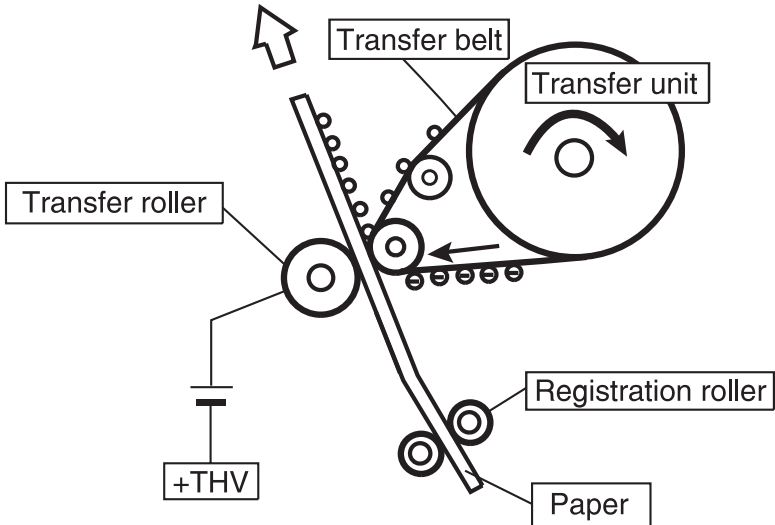
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## Details of the transfer system

### Second transfer (paper) process

In the second transfer process, the toner image on the transfer belt is transferred to paper. See “**Printer theory of operation**” on **page 1-19** for second transfer roller location.

The transfer roller, normally separated from the transfer belt, is positively biased by the power supply THV. The transfer roller contacts the transfer belt as paper passes between the transfer roller and the transfer belt. The positive bias of the transfer roller causes the toner to release from the transfer belt and adhere to the paper.



THV: Power supply for transfer roller bias

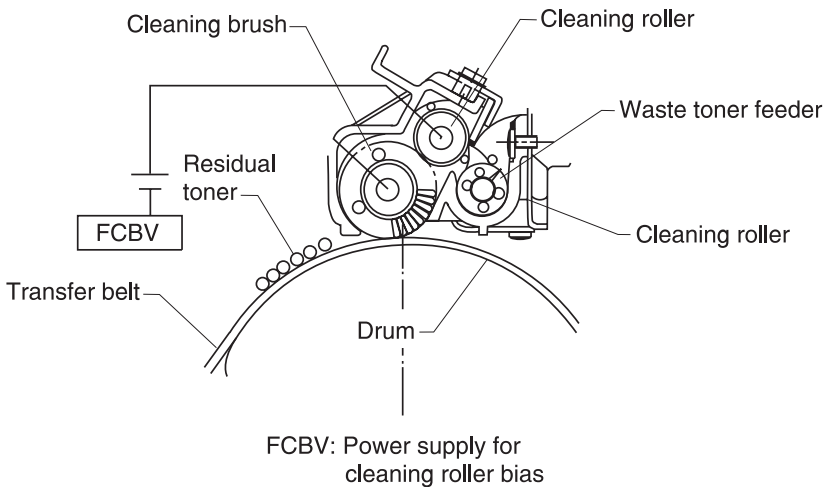


## Transfer belt cleaning process

The residual toner on the surface of the transfer belt is removed after the paper transfer process. See “**Printer theory of operation**” on page 1-19 for transfer belt cleaner unit location.

The belt cleaner brush is a semiconductor-type fur brush. The cleaning roller is charged by voltage FCBV. The resistance of the cleaning brush against the cleaning roller charges the brush. The brush in turn contacts the surface of the rotating transfer belt. The negatively charged toner adheres to the positively charged (FCBV) brush, which cleans the transfer belt. The cleaning brush does not contact the transfer belt during the imaging process.

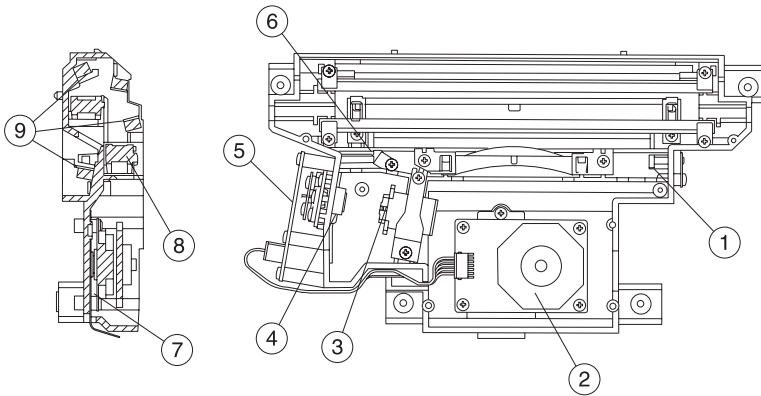
Waste toner, adhering to the surface of the cleaning roller, is removed by the cleaning blade, routed by the waste toner feeder to the waste toner container where it is deposited.



## Details of the optical system

In the optical system process, the printer utilizes a semiconductor laser diode as a light source. This laser diode is controlled by fast switching which matches the transmitted image data (video signal).

The generated laser light scans the OPC belt through a polygon mirror and lens. The electrostatic latent images are formed on the OPC belt.



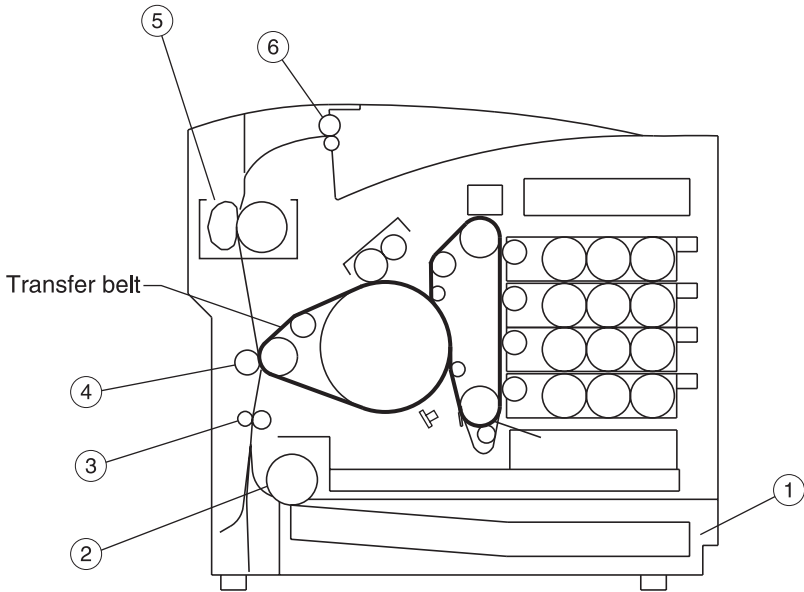
The Optical printhead unit consists of following parts:

No.	Description
1	PD: photo detector
2	Polygon mirror: hexahedral mirror that reflects the laser beam
3	Cylinder lens: laser beam condenser
4	Laser unit: laser diode light emitting source
5	LDC: laser diode control circuit
6	BTD mirror: beam timing detector mirror to guide the laser beam to PD
7	Scanner motor: rotates the polygon mirror

<b>No.</b>	<b>Description</b>
8	F-lens: laser beam focus lens
9	Mirror: laser beam path reflecting mirror

## Details of the paper transportation system

In the paper transportation process, paper is automatically fed by the pick-up roller and transported to the registration roller. The registration roller synchronizes with the transfer belt. The registration roller transports the paper to the transfer roller. During the transfer process, the transfer roller forwards the paper to the fuser rollers. During the fusing process, the fuser rollers transport the fused paper to the exit roller and the exit roller pushes the final paper out of the rear cover assembly.



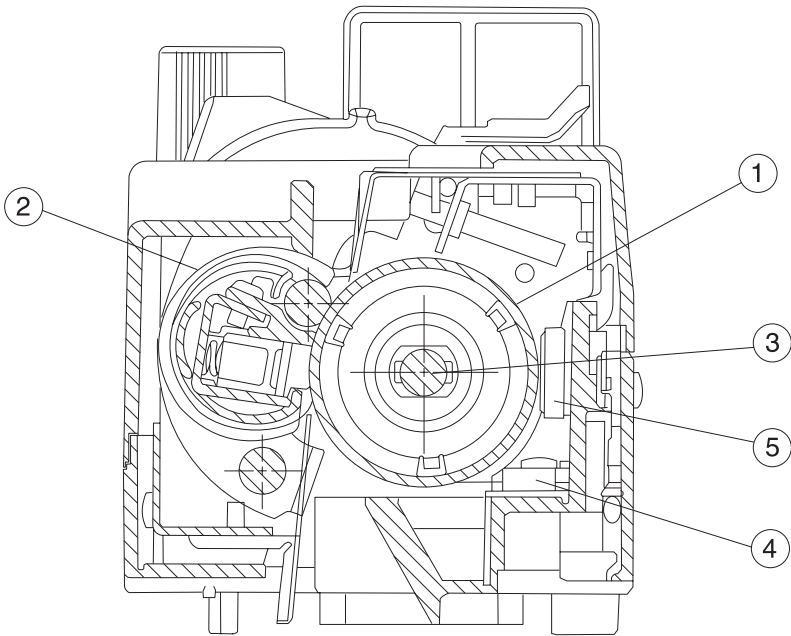
The paper transportation system consists of the following parts:

No.	Part	Function
1	Paper tray	Accommodates paper to be automatically fed through the printer.
2	Pick-up roller	Feeds paper one by one, preventing multi-feed.
3	Registration roller	Transports and synchronizes paper with the transfer belt.

<b>No.</b>	<b>Part</b>	<b>Function</b>
4	Transfer roller	Works in conjunction with the transfer belt to transfer the image to paper and to transport the paper to the fuser.
5	Fuser unit	Utilizes a heat roller to fuse the toner image to the paper.
6	Paper exit roller	Exits the fused paper from the printer.

## Fusing unit

The fusing unit utilizes a thermal fusing system that contains a heated fusing roller and a belt-like backup roller. The heated roller contains an inner heating element. The backup roller contains three pressure members located behind the belt. Paper carrying a toner image passes between the rollers where heat and pressure are applied to the paper to fuse the toner to the paper.



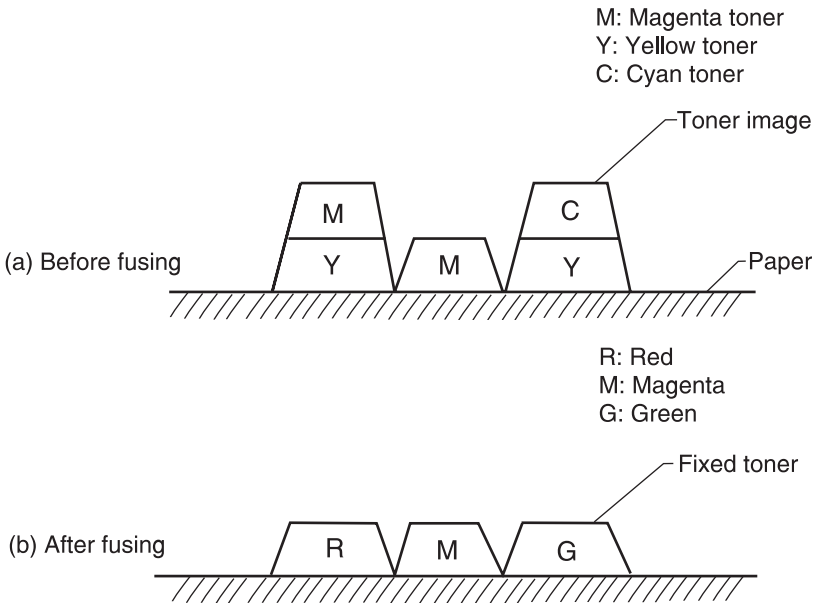
The fusing unit consists of the following components:

No.	Part	Function
1	Fusing roller	Used for fusing, containing a heater.
2	Back-up roller	Pressure roller.
3	Fusing heater	Heating device heated by a halogen lamp.

<b>No.</b>	<b>Part</b>	<b>Function</b>
4	Thermistor	Sensor that detects the temperature of the fuser roller's surface.
5	Thermal fuse	Protective device that prevents the fuser roller from being excessively heated.

## Fusing process

1. When the paper reaches the fuser, the toner image is transferred on the paper, but not yet fused to the paper.
2. The transported paper passes between the heated roller and the back-up roller. The heated roller's temperature is approximately 338°F (170°C).
3. When the paper with toner image passes between the heated roller and the backup roller, the heat from the heated roller in combination with the pressure between the two rollers, melts the toner, fusing it to the paper.
4. The fused paper then separates from the rollers and is transported out of the printer into the output bin or is routed back into the printer for printing on the other side of the duplex print.





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## Control system structure

### Electrical system and function

The engine board controls most of the main electrical parts in this printer.

No.	Control process	Function
1	Print process control	Controls print process from paper feed through paper exit.
2	Laser output control	Automatically controls laser output to the default.
3	Fuser temperature control	Controls fuser heater, allowing heated roller to reach default temperature.
4	Toner sensing control	Controls sensing of toner empty status.
5	Interface control (video signal)	Processes the input and output signal with external controller computer.
6	Operator panel indicator	Displays printer operation status.
7	Error control	Controls safe stop procedures when errors occur.

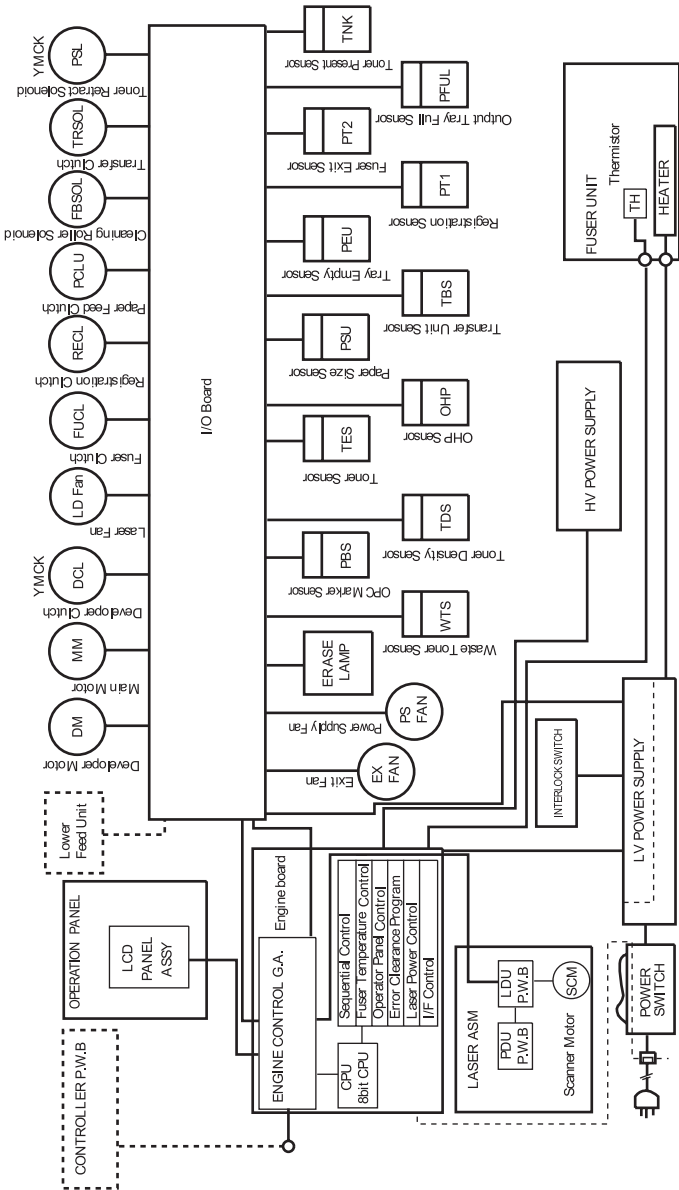
## Control of print process

Control block diagram

No.	Control process	Function
1	Sequence control	Controls print sequence of printer.
2	Temperature control	Controls temperature of fuser unit.
3	Consumables' life control	Controls toner empty status for each toner cartridge and life of periodic replacement parts.
4	Operator panel control	Controls operator panel indication and operator signals.
5	Error processing control	Senses errors occurring as well as stop procedures.
6	Interface control	Controls receipt and transmission of interface signals from external controller.
7	Laser control	Controls laser scanning and laser power.

**Note:** A micro CPU mounted on the engine board controls the print processes.

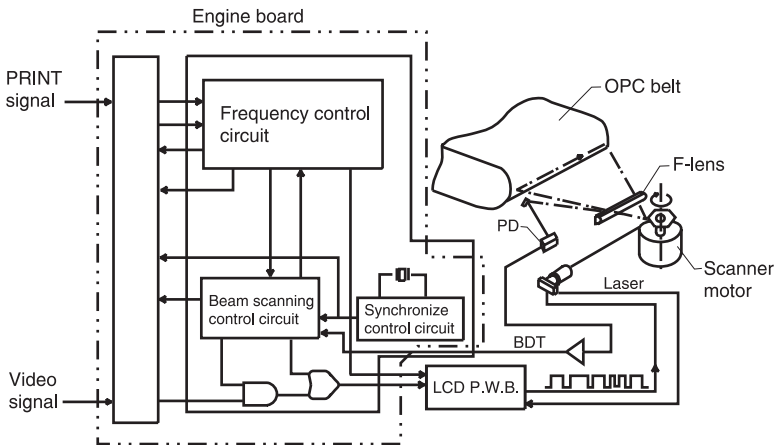
Print sequence diagram



## Laser drive control circuit

The laser drive control circuit (LDC) consists of a video signal input circuit, laser drive circuit, laser diode, output sensing circuit, and output control circuit. See the illustration.

1. When the video signal is received, the laser drive control circuit switches the laser diode switch on and radiates according to the video signal.
2. The radiated laser beam senses the photo detector (PD). The detected signal is returned to the output control circuit.
3. The output control circuit controls the radiated output to a constant, by comparing the laser output default with the feedback value transmitted from the output sensing circuit.
4. The laser beam, scanned by the scanner motor, is sensed by the beam detector (PD), and then outputs the beam detecting timing (BDT) signal.



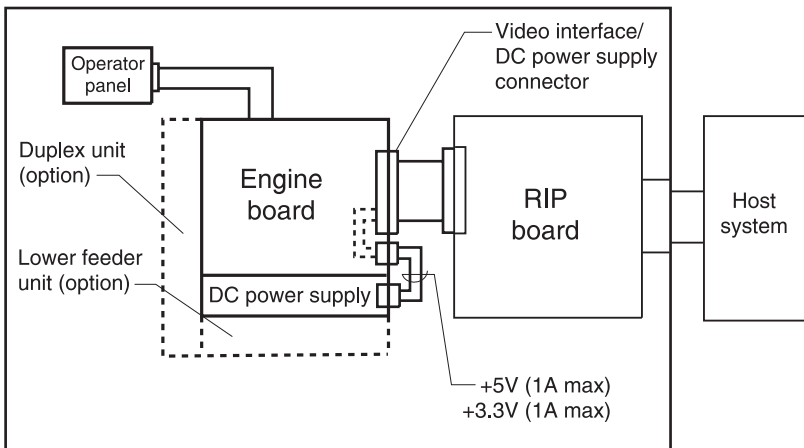
## Interface control

### Interface type

Through the video interface, the RIP controls the printer and operator panel using command/status communication and transmits the synchronized video data to the printer laser diode. The operator panel is physically resident on the engine.

### Interface connection

The interface connector of the laser printer is connected to the host system as shown in the following illustration.



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## 2. Diagnostic information

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### Start

**CAUTION:** Remove power from the printer before you connect or disconnect any cable, electronic board or assembly, for personal safety and to prevent damage to the printer. Always use the hand grips on the side of the printer and be sure your fingers are not under the printer when you set the printer down.

Use the service error codes, user status messages, user error messages, symptom tables, service checks, and diagnostic aids, to determine the corrective action necessary to repair a malfunctioning printer.

Service error codes are indicated by a three-digit error code. If a service error code displays, go to the **“Service error codes” on page 2-2**.

User status messages provide the user with information on the current status of the printer. “Ready” displays on the first line of the display unless Power Saver is invoked, then Power Saver is displayed. If a user status message displays, go to the **“Operator messages” on page 2-9**.

User error messages are indicated by a two- or three-digit error code which provides the user with information explaining a problem with a print cartridge, paper jam, option, port, and so on. If a user error message displays, go to the **“Operator messages” on page 2-9**.

The User Messages section sometimes allows a servicer to isolate printer problems. This section also gives actions to be taken when they do not set or clear.

If you have a failing symptom, go to the **“Symptom tables” on page 2-25**. Locate your symptom and take the appropriate action.

If a service error code appears while you are working on the printer, go to the **“Service error codes” on page 2-2** and take the appropriate action.

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## Service error codes

Error code	Action
900 RIP Software	Contact customer service center, or Lexmark support center
901 Yellow developer clutch error (DCLY)	Go to <b>“901—Yellow developer clutch service check” on page 2-29.</b>
902 Magenta developer clutch error (DCLM)	Go to <b>“902—Magenta developer clutch service check” on page 2-31.</b>
903 Cyan developer clutch error (DCLC)	Go to <b>“903—Cyan developer clutch service check” on page 2-33.</b>
904 Black developer clutch error (DCLK)	Go to <b>“904—Black developer clutch service check” on page 2-35.</b>
905 Yellow toner retract solenoid error (DSLX)	Go to <b>“905—Yellow toner retract solenoid service check” on page 2-37.</b>
906 Magenta toner retract solenoid error (DSLX)	Go to <b>“906—Magenta toner retract solenoid service check” on page 2-39.</b>
907 Cyan toner retract solenoid error (DSLX)	Go to <b>“907—Cyan toner retract solenoid service check” on page 2-41.</b>
908 Black toner retract solenoid error (DSLX)	Go to <b>“908—Black toner retract solenoid service check” on page 2-43.</b>



Error code	Action
910 Developing motor (DM) error	Go to <b>“910—Developer motor service check” on page 2-45.</b>
911 Main motor (MM) error	Go to <b>“911—Main motor service check” on page 2-48.</b>
912 Power supply fan (PSFAN) error	Go to <b>“912—Power supply fan service check” on page 2-51.</b>
913 Fuser fan (FUFAN) error	Go to <b>“913—Fuser fan service check” on page 2-52.</b>
914 Laser fan error	Go to <b>“914—Laser fan service check” on page 2-53.</b>
915 Erase lamp error	Go to <b>“915—Erase lamp service check” on page 2-54.</b>
916 Toner empty sensor connection error 1 (TPD)	Go to <b>“916—Toner empty sensor (sender-TPD) service check” on page 2-56.</b>
917 Toner empty sensor connection error 2 (TTR)	Go to <b>“917—Toner empty sensor (receiver-TTR) service check” on page 2-57.</b>
918 High voltage power supply connection error	Go to <b>“918—HVPS connection service check” on page 2-58.</b>
919 Secondary paper feed assembly error	Go to <b>“919—Lower feed unit (secondary paper assembly) service check” on page 2-59.</b>

Error code	Action
920 Fuser thermistor error	Go to <b>“920—Fuser thermistor service check” on page 2-60.</b>
921/922/923/924/925 Fuser temperature error	Go to <b>“921,922,923,924,925—Fuser assembly service check” on page 2-61.</b>
92X Fuser exhausted	<p>Fuser is in a maintenance state and needs to be replaced before any other action can be taken.</p> <p>Replace fuser assembly (see <b>“Fuser assembly removal” on page 4-9</b>) and note whether any error code exists.</p> <p><b>Note:</b> Fuser is a customer-order supply.</p>
930 Laser power error	<p>Indicates that printhead laser output is low.</p> <p>Go to <b>“930,931,932—Laser unit assembly service check” on page 2-62.</b></p>
931 Beam detector error (BDT)	<p>Indicates that printhead laser scanning beam is not detected by the beam sensor.</p> <p>Go to <b>“930,931,932—Laser unit assembly service check” on page 2-62.</b></p>
932 Scanner motor error (SM)	<p>Indicates abnormal rotation of printhead scanner motor.</p> <p>Go to <b>“930,931,932—Laser unit assembly service check” on page 2-62.</b></p>
939 RIP to engine communication	<p>Indicates that the RIP board processor cannot communicate with processor. Remove and reinstall RIP board. Go to <b>“RIP board removal” on page 4-45.</b> Ensure RIP board makes proper connection with engine controller board connector. Ensure engine controller board is properly installed. If error persists, replace RIP board. If error still persists, replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b></p>
945 Engine board NVRAM error	<p>Turn power off and then back on.</p> <p>If error still exists, replace engine controller board. Go to <b>“Engine controller board removal” on page 4-55.</b></p>

Error code	Action
946 Engine controller hardware error	Turn power off and then back on. If error still exists, replace engine controller board. Go to <b>“Engine controller board removal” on page 4-55.</b>
947 Process timing clock error	Indicates synchronization signal from main motor (MM) is not inputted. Go to <b>“911—Main motor service check” on page 2-48.</b>
953 NVRAM chip failure	Indicates engine board NVRAM failed. Replace engine controller board. Go to <b>“Engine controller board removal” on page 4-55.</b>
954 NVRAM CRC failure	Indicates the operator panel failed CRC check. Replace the operator panel cable. Go to <b>“Operator panel cable removal” on page 4-54.</b>
955 Code CRC	Indicates that on-board NAND flash located on RIP board has failed CRC check. Replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b>
955 Code ECC	Indicates that on-board NAND flash located on RIP board has failed CRC check. Replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b>
956 Processor failure	Indicates a problem with RIP board processor. Replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b>
957 ASIC failure	Indicates a problem with RIP board ASIC. Replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b>
958 NAND failure	Indicates that on-board NAND flash located on RIP board has failed. Replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b>
959 SRAM failure	Indicates a problem with RIP board SRAM. Replace RIP board. See <b>“RIP board removal” on page 4-45.</b>
960 Memory error	Indicates that RIP board soldered RAM is bad. Replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b>

Error code	Action
961 Memory error	Indicates RAM in slot 1 is bad. Replace memory in slot 1. If error persists, replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b>
962 Memory error	Indicates RAM in slot 2 is bad. Replace memory in slot 2. If error persists, replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b>
964 Emulation error	Indicates a failure within a download emulation that is programmed into the firmware card. To troubleshoot, perform the following: <ol style="list-style-type: none"> <li>1. Disable download emulation. Go to <b>“Disabling download emulations” on page 3-1.</b></li> <li>2. Reprogram download emulation into the firmware card.</li> <li>3. If 964 error is still present, replace firmware card and download emulation again.</li> </ol>
975 Unrecognizable network port	Indicates a problem with the network port. <ul style="list-style-type: none"> <li>• Network printer Replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b></li> <li>• Standard printer with INA Replace INA. If error persists, replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b></li> </ul>
976 Unrecognizable software error in network port	Indicates a problem with network port. <p>Network printer</p> <p>Replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b></p> <ul style="list-style-type: none"> <li>• Standard printer with INA Replace INA. If error persists, replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b></li> </ul>
978 Bad checksum while programming network port	Indicates a problem with the network port. <ul style="list-style-type: none"> <li>• Network printer Replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b></li> <li>• Standard printer with INA Replace INA. If error persists, replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b></li> </ul>

Error code	Action
979 Flash parts failed while programming network port	Indicates a problem with the network port. <ul style="list-style-type: none"> <li>• Network printer</li> </ul> Replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b> <ul style="list-style-type: none"> <li>• Standard printer with INA</li> </ul> Replace INA. If error persists, replace RIP board. Go to <b>“RIP board removal” on page 4-45.</b>
980 Duplex controller hardware error 1	Indicates a communication problem between engine controller board and duplex unit. <ul style="list-style-type: none"> <li>• Ensure that duplex cable is connected.</li> <li>• If cable is connected and error persists, replace duplex unit.</li> <li>• If replacing duplex unit does not clear error, replace engine controller board. Go to <b>“Engine controller board removal” on page 4-55.</b></li> </ul>
982 Duplex controller hardware error 1	Indicates a communication problem between engine controller board and duplex unit. <ul style="list-style-type: none"> <li>• Ensure that duplex cable is connected.</li> <li>• If cable is connected and error persists, replace duplex unit.</li> <li>• If replacing duplex unit does not clear error, replace engine controller board. Go to <b>“Engine controller board removal” on page 4-55.</b></li> </ul>
983 Duplex motor error	Indicates a blown motor-protective current fuse located on DCTL board in duplex unit. Replace duplex unit.
984 Outer pass select solenoid error	Indicates a duplex solenoid problem. Replace duplex unit.
985 Duplex connection error 1	Indicates that there is a connection problem between the duplex unit and the low voltage power supply. Go to <b>“985—Duplex connection error 1 service check” on page 2-63.</b>
986 Duplex connection error 2	Indicates that there is a connection problem between the duplex unit and engine controller board. Go to <b>“986—Duplex connection error 2 service check” on page 2-64.</b>

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Error code	Action
990 Transfer belt (transfer unit) error	Indicates unstable transfer belt rotation; color matching cannot be secured. Go to <b>“990—Transfer belt unit service check” on page 2-65.</b>
991 Transfer roller clutch error	Indicates a problem with transfer roller cable connection. Go to <b>“991—Transfer roller clutch service check” on page 2-67.</b>
992 Cleaning roller clutch error	Indicates a problem with transfer unit cleaning roller clutch cable connection. Go to <b>“992—Transfer belt cleaning roller clutch service check” on page 2-68.</b>
993 Fuser clutch error	Indicates a problem with fuser clutch cable connection. Go to <b>“993—Fuser clutch service check” on page 2-69.</b>
994 OPC belt marker sensor error	Indicates marker on OPC belt (photodeveloper cartridge) is not being properly detected by marker sensor. Go to <b>“994—OPC belt marker sensor service check” on page 2-70.</b>
995 Charger HV unit error	Indicates a problem with HVPS charging voltage supplied to the OPC (photodeveloper cartridge) charging unit. Go to <b>“995—High voltage power supply (HVPS) service check” on page 2-72.</b>
996 LVPS error	Go to <b>“996—Low voltage power supply (LVPS) service check” on page 2-74.</b>

## Operator messages

Message	Description	Action
Change Tray <x> <type> <size>	Printer is requesting different media than what is loaded in specified tray or defined by paper size or paper type settings for tray.	Ensure tray contains proper type and size of media for job. Remove tray from machine. Remove paper from tray. Change paper size length. Observe paper size sensor actuator, located on the side of the tray, movement as you change to various paper sizes. Actuator should move back and forth. If actuator does not move back and forth, replace paper tray.  If problem persists, go to <b>“Paper size sensing service check” on page 2-87.</b>
Close Duplex Door	Duplex door is open.	
Close Front Cover	Front cover is open.	Open and reclose front cover. Ensure that strap connecting front cover to printer is attached to printer.  If problem persists, go to <b>“Cover open service check” on page 2-75.</b>
Close Rear Cover	Rear cover assembly is open.	Open and close rear cover assembly.  If problem persists, go to <b>“Cover open service check” on page 2-75.</b>
Close Top Cover	Top cover is open.	Open and reclose top cover.  If problem persists, go to <b>“Cover open service check” on page 2-75.</b>

Message	Description	Action
<p>Did you replace Fuser?</p>	<p>Fuser page counter has exceeded fuser page limit.</p>	<p>Replace fuser.</p> <p><b>Note:</b> This is a customer ordered part.</p> <p>Pressing <b>Select</b> clears maintenance counter.</p> <p>Press <b>Stop</b> to continue printing. This does not clear maintenance counter. Fuser remains in warning state, and message appears again each time rear cover is opened.</p>
<p>Did you replace the Photodev Cart?</p>	<p>This message appears when the top door is closed or when you answer another replacement message, and photodeveloper cartridge is either in a warning or exhausted state requiring that you replace it.</p> <p>Secondary message appears with instructions.</p>	<p>Replace photodeveloper cartridge and press <b>Go</b>. Pressing <b>Go</b> clears maintenance counter.</p> <p>Press <b>Stop</b> to continue printing. This does not clear maintenance counter. Message 83 Photodev Exhausted returns after pressing <b>Stop</b>. Photodeveloper cartridge remains in warning state, and this message appears again each time top cover is opened.</p>



Message	Description	Action
Menus Disabled	<p>Printer menus have been disabled. This occurs when <b>&lt;Menu&gt;</b> is pressed while printer is <b>Ready</b> and menu lockout is active.</p> <p>The printer display shows this message for one second and then returns to <b>Ready</b> message.</p> <p>No button actions are possible while this message is displayed.</p>	<p>If operator has disabled menu and you want to run operator print tests, turn machine Off and then press <b>Return</b> and <b>Select</b> as you turn machine on.</p>
Not Ready	<p>Printer is in not ready state, which means it is not ready to receive or process data.</p> <p>This message displays when <b>Stop</b> is pressed during a print job.</p>	<p>Press <b>Go</b> to take the printer out of the not ready state.</p>
Performing Self Test	<p>Printer is running normal series of start-up tests after it is powered on. When tests are complete, printer returns to <b>Ready</b>.</p> <p>No button actions are possible while this message is displayed.</p>	<p>Printer performs self-test.</p>

Message	Description	Action
Power Saver	Printer is ready to receive and process data. If printer remains inactive for period of time specified in Power Saver menu item (20 minutes is factory default), <b>Power Saver</b> message replaces <b>Ready</b> message on display.	Send a job to print.  Press <b>Go</b> to quickly warm printer to normal operating temperature and display <b>Ready</b> message.
Remove paper Standard bin	Output bin is full. Bin full warning is cleared when output level reported by bin is no longer full.	Go to <b>“Output tray full service check” on page 2-85.</b>
Supplies	At least one printer supply requires attention.	Press <b>Menu</b> to open Supplies Menu and identify which supply item needs replacing.  Replace appropriate printer supply.
TMA	Toner mass adjustment.  Printer is performing a toner mass adjustment. This is a secondary message that appears on second line of operator panel when <b>Engine Warming</b> and <b>Performing Self Test</b> messages appear.	Wait for message to clear.

Message	Description	Action
Tray <x> Empty	Input tray is empty.	Load media of size and type requested in second line of display in specified tray. Printer automatically clears message and continues printing job. If problem persists, go to <b>“Tray empty service check” on page 2-95.</b>
Tray <x> missing	Specified tray is either missing or not fully inserted.	Ensure tray is fully inserted in printer. If problem persists, go to <b>“Paper size sensing service check” on page 2-87.</b>
30 <color> Toner Cart Missing	Specified cartridge (Cyan, Magenta, Yellow, or Black) is not installed in the printer.	Insert cartridge and close front cover to clear message. If message persists, go to <b>“Missing toner cartridge service check” on page 2-81.</b>
32 Unsupported Print Cartridge	Unsupported print cartridge has been installed in printer.	Remove print cartridge and insert a supported print cartridge. If problem persists, go to <b>“Missing toner cartridge service check” on page 2-81.</b>
34 Incorrect Media	Printer has detected a mismatch in requested media type and type loaded.	Remove paper tray. Ensure media selected for print job is in tray. If problem persists, go to <b>“Incorrect media service check” on page 2-78.</b>
34 Short Paper	Printer has determined that length of paper in source specified on second line of display is too short to print formatted data.	Press <b>Go</b> to clear message. Ensure paper size setting in paper menu is correct for paper size. If problem persists, go to <b>“Paper size sensing service check” on page 2-87.</b>

Message	Description	Action
<p>35 Res Save Off Deficient Memory</p>	<p>Printer lacks memory needed to enable Resource Save. This message usually indicates too much memory is allocated for one or more of printer link buffers.</p>	<p>Press <b>Go</b> to disable Resource Save and continue printing.</p> <p>To enable Resource Save after you get this message:</p> <ul style="list-style-type: none"> <li>• Make sure link buffers are set to Auto, and exit menus to activate link buffer changes.</li> <li>• When Ready is displayed, enable Resource Save from the Setup Menu.</li> </ul> <p>Install additional memory.</p>
<p>37 Insufficient Collation Area</p>	<p>Printer memory (or hard disk, if installed) does not have free space necessary to collate print job.</p>	<p>Press <b>Go</b> to print portion of job already stored and begin collating rest of job.</p> <p>Press <b>Menu</b> to open Job Menu and cancel current job.</p>
<p>37 Insufficient Defrag Memory</p>	<p>Printer cannot defragment flash memory, because printer memory used to store undeleted flash resources is full.</p>	<p>Delete fonts, macros, and other data in printer memory.</p> <p>Install additional printer memory.</p>

Message	Description	Action
37 Insufficient Memory	Printer memory is full and cannot continue processing current print jobs.	<p>Press <b>Go</b> to clear message and continue current print job. Printer frees memory by deleting oldest held job and continues deleting held jobs until there is enough printer memory to process job.</p> <p>Press <b>Stop</b> to clear message without deleting any held jobs. Current job may not print correctly.</p> <p>Press <b>Menu</b> to open Job Menu and cancel current job.</p> <p>To avoid this error in future:</p> <ul style="list-style-type: none"> <li>• Delete fonts, macros, and other data in printer memory.</li> <li>• Install additional printer memory.</li> </ul> <p><b>Note:</b> Messages 37 <i>Insufficient Memory</i> and <i>Held Jobs May Be Lost</i> alternate on display.</p>
38 Memory Full	Printer is processing data, but memory used to store pages is full.	<p>Press <b>Go</b> to clear message and continue printing job. Job may not print correctly.</p> <p>Press <b>Menu</b> to open Job Menu and cancel current job.</p> <p>To avoid this error in future:</p> <ul style="list-style-type: none"> <li>• Simplify print job by reducing amount of text or graphics on a page and deleting unnecessary downloaded fonts or macros.</li> <li>• Install additional printer memory.</li> </ul>

Message	Description	Action
39 Complex Page	Page may not print correctly because print information on page is too complex.	<p>Press <b>Go</b> to clear message and continue printing job. Job may not print correctly.</p> <p>Press <b>Menu</b> to open Job Menu and cancel current job.</p> <p>To avoid this error in future:</p> <ul style="list-style-type: none"> <li>• Reduce complexity of page by reducing amount of text or graphics on page and deleting unnecessary downloaded fonts or macros.</li> <li>• Set Page Protect to On in Setup Menu.</li> <li>• Install additional printer memory.</li> </ul>
51 Defective Flash	Printer detects defective flash memory.	Press <b>Go</b> to clear message and continue printing. You must install different flash memory before you can download any resources to flash.
52 Flash Full	There is not enough free space in flash memory to store data you are trying to download.	<p>Press <b>Go</b> to clear message and continue printing. Downloaded fonts and macros not previously stored in flash memory are deleted.</p> <p>Delete fonts, macros, and other data stored on flash memory.</p> <p>Install flash memory with more storage capacity.</p>
53 Unformatted Flash	Printer detects unformatted flash memory.	<p>Press <b>Go</b> to clear message and continue printing. You must format flash memory before you can store any resources on it.</p> <p>If error message remains, flash memory may be defective and require replacing.</p>

Message	Description	Action
54 Serial Option <x> Error 54 Standard Serial Error	Printer has detected a serial interface error on a serial port.	Make sure serial link is set up correctly and you are using appropriate cable.  Press <b>Go</b> to clear message and continue printing. Job may not print correctly.  Press <b>Menu</b> to open Job Menu and reset printer.
54 Network <x> Software Error 54 Std Network Software Error	Printer cannot establish communications with an installed network port.	Press <b>Go</b> to clear message and continue printing. Job may not print correctly.  Program new firmware for network interface by way of parallel port.  Press <b>Menu</b> to open Job Menu and reset printer.
54 Std Par ENA Connection Lost 54 Par <x> ENA Connection Lost	Printer has lost connection to an external print server (also called an external network adapter or ENA).	Make sure cable connecting ENA and printer is securely attached. Turn printer off and then on to reset printer.  Press <b>Go</b> to clear the message. Printer erases any reference to ENA and then resets.
55 Unsupported Option in Slot <x> 55 Unsupported Flash in Slot <x>	An unsupported option card is installed in one of ports or an unsupported flash DIMM is installed in a memory slot.	Turn off and unplug printer. Remove unsupported option. Plug in printer and turn it on.
56 Serial Port <x> Disabled	Data has been sent to printer through a serial port, but serial port is disabled.	Press <b>Go</b> to clear message. Printer discards any data received through serial port.  Make sure Serial Buffer menu item in Serial Menu is not set to Disabled.

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<b>Message</b>	<b>Description</b>	<b>Action</b>
<p>56 Parallel Port &lt;x&gt; Disabled 56 Std Parallel Port Disabled</p>	<p>Data has been sent to printer through a parallel port, but parallel port is disabled.</p>	<p>Press <b>Go</b> to clear message. Printer discards any data received through parallel port.  Make sure Parallel Buffer menu item in Parallel Menu is not set to Disabled.</p>
<p>57 Configuration Change</p>	<p>Printer cannot restore confidential or held jobs on hard disk because print configuration has changed.</p>	<p>Press <b>Go</b> to clear message. <b>Note:</b> Messages 57 <i>Configuration Change</i> and <i>Held Jobs May Not Be Restored</i> alternate on display.</p>
<p>58 Too Many Flash Options</p>	<p>Too many flash memory options are installed on printer.</p>	<p>Turn off and unplug printer. Remove excess flash memory. Plug in printer and turn it on.</p>
<p>61 Defective Disk</p>	<p>Printer detects a defective hard disk.</p>	<p>Press <b>Go</b> to clear message and continue printing.  Install a different hard disk before you perform any operations that require one.</p>
<p>62 Disk Full</p>	<p>There is not enough memory on hard disk to store data sent to printer.</p>	<p>Press <b>Go</b> to clear message and continue processing. Any information not previously stored on hard disk is deleted.  Delete fonts, macros, and other data stored on hard disk.</p>
<p>63 Unformatted Disk</p>	<p>Printer detects an unformatted hard disk.</p>	<p>Press <b>Go</b> to clear message and continue printing.  Format disk before performing any disk operations. To format disk, select Format Disk from Utilities Menu.  If error message remains, hard disk may be defective and require replacing. Install a new hard disk and format it.</p>



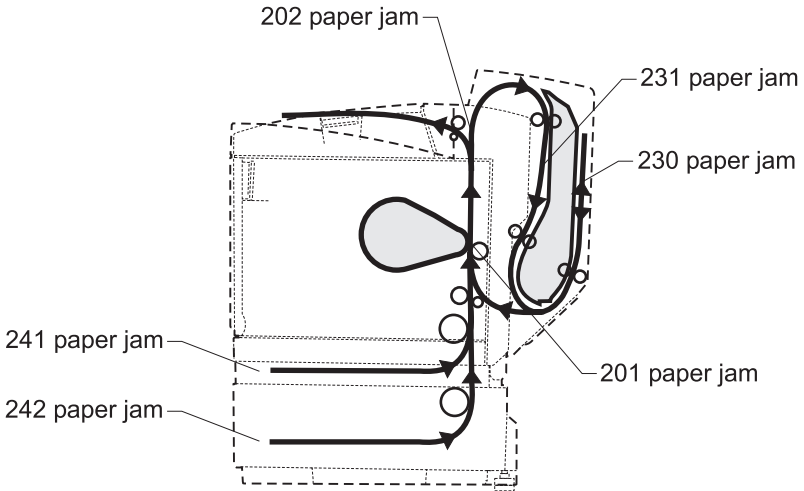
Message	Description	Action
64 Unsupported Disk Format	Printer detects an unsupported disk format.	Press <b>Go</b> to clear message. Format disk. <b>Note:</b> Disk operations are not allowed until disk is formatted.
80 Transfer Roller Missing	Transfer roller is missing or not properly installed.	Ensure transfer roller is properly installed. If problem persists, go to <b>“Transfer roller missing service check” on page 2-93.</b>
82 Waste Bottle Nearly Full	Toner waste bottle is almost full.	Press <b>Go</b> to clear message and continue printing. Replace waste toner bottle. If message does not clear, go to <b>“Waste toner bottle service check” on page 2-97.</b>
82 Waste Toner Bottle Full or Missing	Waste toner bottle is full or missing.	Replace waste toner bottle and press <b>Go</b> to clear message. <b>“Waste toner bottle service check” on page 2-97.</b>
83 Photodev Cart Exhausted	Photodeveloper cartridge is completely used.	Replace photodeveloper cartridge.
83 Photodev Cart Life Warning	Photodeveloper cartridge is nearing end of life.	Press <b>Go</b> to clear message and continue printing. Replace photodeveloper cartridge.
83 Photodev Cart Missing	Photodeveloper cartridge is either missing or incorrectly installed.	Correctly install photodeveloper cartridge to clear message and continue printing.

Message	Description	Action
87 Fuser Exhausted	Fuser is completely used.	<p>Replace fuser.</p> <p>If problem persists, check cable for continuity that connects engine controller board connector FUCN and fuser. If cable is bad, replace cable. Otherwise, replace engine controller board. Go to <b>“Engine controller board removal” on page 4-55.</b></p>
87 Fuser Life Warning	Fuser is nearing end of life.	<p>Press <b>Go</b> to clear message and continue printing.</p> <p>Replace fuser. Go to <b>“Fuser assembly removal” on page 4-9.</b></p> <p><b>Note:</b> Fuser is a customer ordered part.</p> <p>If problem persists, check cable for continuity that connects engine controller board connector FUCN and fuser. If cable is bad, replace cable. Otherwise, replace engine controller board. Go to <b>“Engine controller board removal” on page 4-55.</b></p>
87 Fuser Missing	Fuser is either missing or incorrectly installed.	<p>Correctly install fuser. Go to <b>“Fuser assembly removal” on page 4-9.</b></p> <p>If problem persists, check cable for continuity that connects engine controller board connector FUCN and fuser. If cable is bad, replace cable. Otherwise, replace engine controller board. Go to <b>“Engine controller board removal” on page 4-55.</b></p>

<b>Message</b>	<b>Description</b>	<b>Action</b>
88 <color> Toner Empty	Printer has ceased operating because specified toner cartridge is empty.	Replace specified toner cartridge. If problem persists, go to <b>“Toner low/empty service check” on page 2-92.</b>
88 <color> Toner Low	Printer has detected that toner supply in specified cartridge is low.	Replace specified toner cartridge. If problem persists, go to <b>“Toner low/empty service check” on page 2-92.</b>

## Paper jam messages

The following illustration lists paper jam messages indicating where paper jam occurred.



**CAUTION:** When clearing paper jams, inside of the printer may be hot. Allow printer to cool before touching any internal components.

Message	To locate the jam...	Action
201 Paper Jam Open Rear Door	Open rear cover assembly	<p>Indicates media is jammed in inner area (between paper registration sensor and paper exit sensor) of printer.</p> <ul style="list-style-type: none"> <li>• Open rear cover assembly to access area of paper jam.</li> <li>• Clear all paper from paper path.</li> <li>• Check registration sensor and its actuator. Replace if damaged. See <b>“Paper guide (C) assembly removal” on page 4-47.</b></li> <li>• Ensure connector DCN16 on I/O board is connected. If connector is attached and error persists, replace I/O board. See <b>“I/O board removal” on page 4-70.</b> If error persists, replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b></li> </ul>
202 Paper Jam Open Rear Door	Open rear cover assembly	<p>Indicates media is jammed in outer area (fuser exit sensor) of printer.</p> <ul style="list-style-type: none"> <li>• Open rear cover assembly to access area of paper jam.</li> <li>• Clear all paper from paper path.</li> <li>• Check fuser exit sensor (located in paper exit assembly) and its actuator. Replace if damaged. See <b>“Paper exit assembly removal” on page 4-49.</b></li> <li>• Ensure connector DCN7 on I/O board is connected. If connector is attached and error persists, replace I/O board. See <b>“I/O board removal” on page 4-70.</b> If error persists, replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b></li> </ul>

Message	To locate the jam...	Action
230 Paper Jam Open Duplex Door	Open duplex door	<p>Indicates media is jammed between duplex redrive and duplex door.</p> <ul style="list-style-type: none"> <li>• Open duplex door to access jam.</li> <li>• Clear all paper from paper path.</li> <li>• If error persists, replace duplex unit. See <b>“Duplex unit assembly removal” on page 4-13.</b></li> </ul>
231 Paper Jam Open Duplex Door	Open duplex door	<p>Indicates media is jammed behind duplex redrive.</p> <ul style="list-style-type: none"> <li>• Open duplex door to access jam.</li> <li>• Clear all paper from paper path.</li> <li>• If error persists, replace duplex unit. See <b>“Duplex unit assembly removal” on page 4-13.</b></li> </ul>
241 Paper Jam Check Tray 1	Remove tray 1 to access jam	<p>Indicates media is jammed in or around paper tray 1.</p> <ul style="list-style-type: none"> <li>• If tray is difficult to remove, remove tray above or below to remove jammed pages.</li> <li>• Ensure no paper is jammed at pickup roll.</li> </ul> <p>If clearing paper doesn't resolve problem, see <b>“Paper feed service checks” on page 2-99.</b></p>
242 Paper Jam Check Tray 2	Open the paper tray	<p>Indicates media is jammed in or around paper tray 2.</p> <ul style="list-style-type: none"> <li>• If tray is difficult to remove, remove tray above or below to remove jammed pages.</li> <li>• Ensure no paper is jammed at pickup roll.</li> </ul> <p>If clearing paper doesn't resolve problem, replace secondary paper feed assembly. See <b>“Secondary paper feed assembly removal” on page 4-16.</b></p>

## Symptom tables

### Printer symptom table

Symptom	Action
Operator panel buttons do not work	See <b>“Operator panel service check” on page 2-84.</b>
Operator panel display is blank, printer beeps 5 times	See <b>“Operator panel service check” on page 2-84.</b>
Operator panel continuously displays all diamonds and beeps 5 times	See <b>“Operator panel service check” on page 2-84.</b>
Operator panel display is blank, but printer does not beep	Replace operator panel assembly.
Paper feed problems	See <b>“Paper feed service checks” on page 2-99.</b>
Close door displayed when all doors are closed	See <b>“Operator messages” on page 2-9</b> and follow the action suggested.
Printer does not reset or change user settings	See <b>“Operator messages” on page 2-9</b> and follow the action suggested.
Paper jam messages do not reset after removing paper	See <b>“Operator messages” on page 2-9</b> and follow the action suggested.
Toner cartridge does not turn or does not put toner on the photodeveloper cartridge.	See <b>“Toner feed service check” on page 2-91.</b>
Developer motor makes noise or continuously runs	See <b>“910—Developer motor service check” on page 2-45.</b>
Main motor makes noise or continuously runs	See <b>“911—Main motor service check” on page 2-48.</b>
Transfer belt unit makes noise when rotated or does not rotate at all	See <b>“990—Transfer belt unit service check” on page 2-65.</b>

Symptom	Action
The transfer roll is not transferring images or does not turn	See <b>“White band service check” on page 2-121.</b>
No power	See <b>“Printer no power service check” on page 2-89.</b>
Waste toner feed problems	See <b>“Waste toner feed service check” on page 2-98.</b>
Fans not working or making noise	See <b>“Service error codes” on page 2-2.</b> Find the failing fan and follow the action suggested.
Print/image problems	See <b>“Print quality service checks” on page 2-101.</b>
Printer does not stop when exit tray is full	See <b>“Output tray full service check” on page 2-85.</b>
Photodeveloper cartridge does not rotate or makes noise	See <b>“OPC belt (photodeveloper) cartridge drive service check” on page 2-83.</b>
Wrong color print	Ensure developer clutch connectors (DCLK, DCLY, DCLM, DCLC) on the I/O board are plugged into the correct position.



## Print quality symptom table

Symptom	Action
Background	See <b>“Background service check” on page 2-101.</b>
Missing image at edge	See <b>“Missing image at edge service check” on page 2-110.</b>
Jitter	See <b>“Jitter service check” on page 2-109.</b>
Ribbing	See <b>“Ribbing service check” on page 2-114.</b>
Wrinkle and image migration	See <b>“Wrinkle / image migration service check” on page 2-126.</b>
White line	See <b>“White line II service check” on page 2-123.</b>
White line	See <b>“White line II service check” on page 2-123.</b>
Vertical white band	See <b>“Vertical white band service check” on page 2-120.</b>
Black line	See <b>“Black line service check” on page 2-104.</b>
Vertical line	See <b>“Vertical line service check” on page 2-118.</b>
Vertical staggering image	See <b>“Vertical staggering image service check” on page 2-119.</b>
Banding	See <b>“Banding service check” on page 2-103.</b>
White band	See <b>“White band service check” on page 2-121.</b>
Toner drop	See <b>“Toner drop service check” on page 2-116.</b>
White spots and black spots	See <b>“White spot / black spot service check” on page 2-124.</b>
Mixed color image	See <b>“Mixed color image service check” on page 2-111.</b>

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<b>Symptom</b>	<b>Action</b>
Color misregistration	See <b>“Color misregistration service check” on page 2-105.</b>
Mottle	See <b>“Mottle service check” on page 2-112.</b>
Residual image	See <b>“Residual image service check” on page 2-113.</b>
Insufficient gloss	See <b>“Insufficient gloss service check” on page 2-108.</b>
Back stain	See <b>“Back stain service check” on page 2-102.</b>
White print	See <b>“White print service check” on page 2-125.</b>
Insufficient fusing	See <b>“Insufficient fusing service check” on page 2-107.</b>

## Printer service checks

### 901—Yellow developer clutch service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove right cover. See <b>“Right cover removal” on page 4-22</b> . Is developer clutch cable properly connected?	Go to step 2.	Properly connect cable. Go to step 5.
2	Is developer clutch cable damaged?	Replace developer drive assembly. See <b>“Developer drive assembly removal” on page 4-32</b> .	Go to step 3.
3	Disconnect clutch cable. On clutch side, measure resistance between two outer pins. Is resistance between 139 and 171 ohms?	Go to step 4.	Replace developer drive assembly. See <b>“Developer drive assembly removal” on page 4-32</b> .
4	Remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect cable from DCN10 on I/O board. Check cable continuity from DCN10 pins 21 and 22 to connector that attaches to yellow developer clutch cable. Ensure that pins are not shorted. Is cable okay?	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . Go to step 5.	Replace cable. Go to step 5.

Step	Questions / actions	Yes	No
5	<p>If waste toner bottle is removed, reinsert it.                      Ensure rear cover assembly cover is shut.                      Override top and front cover interlock switches.                      For location, see <b>“Interlock switch locations” on page 5-8.</b>                      Reconnect operator panel.                      Turn printer on. Does 901 error reappear?</p>	Go to step 6.	Problem solved.
6	<p>Turn printer off and remove engine controller board shield. See <b>“Engine controller board removal” on page 4-55</b> for steps to remove shield. Check cable that connects I2CN on engine controller board to DCN3 on I/O board for proper connection, damage, pin shorting and continuity. Is cable okay?</p>	<p>Replace engine controller board.                      See <b>“Engine controller board removal” on page 4-55.</b></p>	Replace cable.

## 902—Magenta developer clutch service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove right cover. See <b>“Right cover removal” on page 4-22</b> . Is developer clutch cable properly connected?	Go to step 2.	Properly connect cable. Go to step 5.
2	Is developer clutch cable damaged?	Replace developer drive assembly. See <b>“Developer drive assembly removal” on page 4-32</b> .	Go to step 3.
3	Disconnect clutch cable. On clutch side, measure resistance between two outer pins. Is resistance between 139 and 171 ohms?	Go to step 4.	Replace developer drive assembly. See <b>“Developer drive assembly removal” on page 4-32</b> .
4	Remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect cable from DCN10 on I/O board. Check cable continuity from DCN10 pins 19 and 20 to connector that attaches to magenta developer clutch cable. Ensure that pins are not shorted. Is cable okay?	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . Go to step 5.	Replace cable. Go to step 5.

Step	Questions / actions	Yes	No
5	<p>If waste toner bottle is removed, reinsert it. Ensure rear cover assembly cover is shut. Override top and front cover interlock switches. For location, see <b>“Interlock switch locations” on page 5-8.</b> Reconnect operator panel. Turn printer on. Does 902 error reappear?</p>	Go to step 6.	Problem solved.
6	<p>Turn printer off and remove engine controller board shield. See <b>“Engine controller board removal” on page 4-55</b> for steps to remove shield. Check cable that connects I2CN on engine controller board to DCN3 on I/O board for proper connection, damage, pin shorting and continuity. Is cable okay?</p>	<p>Replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b></p>	Replace cable.

## 903—Cyan developer clutch service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove right cover. See <b>“Right cover removal” on page 4-22</b> . Is developer clutch cable properly connected?	Go to step 2.	Properly connect cable. Go to step 5.
2	Is developer clutch cable damaged?	Replace developer drive assembly. See <b>“Developer drive assembly removal” on page 4-32</b> .	Go to step 3.
3	Disconnect clutch cable. On clutch side, measure resistance between two outer pins. Is resistance between 139 and 171 ohms?	Go to step 4.	Replace developer drive assembly. See <b>“Developer drive assembly removal” on page 4-32</b> .
4	Remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect cable from DCN10 on I/O board. Check cable continuity from DCN10 pins 17 and 18 to connector that attaches to cyan developer clutch cable. Ensure that pins are not shorted. Is cable okay?	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . Go to step 5.	Replace cable. Go to step 5.

Step	Questions / actions	Yes	No
5	If waste toner bottle is removed, reinsert it. Ensure rear cover assembly cover is shut. Override top and front cover interlock switches. For location, see <b>“Interlock switch locations” on page 5-8.</b> Reconnect operator panel. Turn printer on. Does 903 error reappear?	Go to step 6.	Problem solved.
6	Turn printer off and remove engine controller board shield. See <b>“Engine controller board removal” on page 4-55</b> for steps to remove shield. Check cable that connects I2CN on engine controller board to DCN3 on I/O board for proper connection, damage, pin shorting and continuity. Is cable okay?	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>	Replace cable.



## 904—Black developer clutch service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove right cover. See <b>“Right cover removal” on page 4-22</b> . Is developer clutch cable properly connected?	Go to step 2.	Properly connect cable. Go to step 5.
2	Is developer clutch cable damaged?	Replace developer drive assembly. See <b>“Developer drive assembly removal” on page 4-32</b> .	Go to step 3.
3	Disconnect clutch cable. On clutch side, measure resistance between two outer pins. Is resistance between 139 and 171 ohms?	Go to step 4.	Replace developer drive assembly. See <b>“Developer drive assembly removal” on page 4-32</b> .
4	Remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect cable from DCN10 on I/O board. Check cable continuity from DCN10 pins 23 and 24 to connector that attaches to black developer clutch cable. Ensure that pins are not shorted. Is cable okay?	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . Go to step 5.	Replace cable. Go to step 5.

Step	Questions / actions	Yes	No
5	<p>If waste toner bottle is removed, reinsert it. Ensure rear cover assembly cover is shut. Override top and front cover interlock switches. For location, see <b>“Interlock switch locations” on page 5-8.</b> Reconnect operator panel. Turn printer on. Does 904 error reappear?</p>	Go to step 6.	Problem solved.
6	<p>Turn printer off and remove engine controller board shield. See <b>“Engine controller board removal” on page 4-55</b> for steps to remove shield. Check cable that connects I2CN on engine controller board to DCN3 on I/O board for proper connection, damage, pin shorting and continuity. Is cable okay?</p>	<p>Replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b></p>	Replace cable.

## 905—Yellow toner retract solenoid service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect DCN4 connector from I/O board. Measure resistance between cable pins 3 and 4. Is resistance between 162 and 198 ohms?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b> Go to step 5.	Go to step 2.
2	Remove items to expose toner retract solenoid. See <b>“Toner retract solenoid and cam removal” on page 4-64</b> for steps. Check toner retract solenoid cable connection. Is cable properly connected?	Go to step 3.	Properly connect cable. Reassemble and retest printer.
3	Check toner retract solenoid cable and connecting cable for visible damage. Is either cable damaged?	Replace damaged cable or toner retract solenoid. See <b>“Toner retract solenoid and cam removal” on page 4-64.</b> Reassemble and retest printer.	Go to step 4.
4	Disconnect toner retract solenoid cable from cable that attaches to I/O board. Check cable continuity from DCN4 pins 3 and 4 to connector that attaches to toner retract solenoid. Ensure that pins are not shorted. Is cable okay?	Replace toner retract solenoid. See <b>“Toner retract solenoid and cam removal” on page 4-64.</b> Reassemble and retest printer.	Replace cable. Reassemble and retest printer.

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<b>Step</b>	<b>Questions / actions</b>	<b>Yes</b>	<b>No</b>
5	Reassemble and retest printer. Does 905 error reappear?	Turn printer off and replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>	Problem solved.

## 906—Magenta toner retract solenoid service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect DCN4 connector from I/O board. Measure resistance between cable pins 5 and 6. Is resistance between 162 and 198 ohms?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b> Go to step 5.	Go to step 2.
2	Remove items to expose toner retract solenoid. See <b>“Toner retract solenoid and cam removal” on page 4-64</b> for steps. Check toner retract solenoid cable connection. Is cable properly connected?	Go to step 3.	Properly connect cable. Reassemble and retest printer.
3	Check toner retract solenoid cable and connecting cable for visible damage. Is either cable damaged?	Replace damaged cable or toner retract solenoid. See <b>“Toner retract solenoid and cam removal” on page 4-64.</b> Reassemble and retest printer.	Go to step 4.
4	Disconnect toner retract solenoid cable from cable that attaches to I/O board. Check cable continuity from DCN4 pins 5 and 6 to connector that attaches to toner retract solenoid. Ensure that pins are not shorted. Is cable okay?	Replace toner retract solenoid. See <b>“Toner retract solenoid and cam removal” on page 4-64.</b> Reassemble and retest printer.	Replace cable. Reassemble and retest printer.

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<b>Step</b>	<b>Questions / actions</b>	<b>Yes</b>	<b>No</b>
5	Reassemble and retest printer. Does 906 error reappear?	Turn printer off and replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>	Problem solved.

## 907—Cyan toner retract solenoid service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect DCN4 connector from I/O board. Measure resistance between cable pins 7 and 8. Is resistance between 162 and 198 ohms?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b> Go to step 5.	Go to step 2.
2	Remove items to expose toner retract solenoid. See <b>“Toner retract solenoid and cam removal” on page 4-64</b> for steps. Check toner retract solenoid cable connection. Is cable properly connected?	Go to step 3.	Properly connect cable. Reassemble and retest printer.
3	Check toner retract solenoid cable and connecting cable for visible damage. Is either cable damaged?	Replace damaged cable or toner retract solenoid. See <b>“Toner retract solenoid and cam removal” on page 4-64.</b> Reassemble and retest printer.	Go to step 4.
4	Disconnect toner retract solenoid cable from cable that attaches to I/O board. Check cable continuity from DCN4 pins 7 and 8 to connector that attaches to toner retract solenoid. Ensure that pins are not shorted. Is cable okay?	Replace toner retract solenoid. See <b>“Toner retract solenoid and cam removal” on page 4-64.</b> Reassemble and retest printer.	Replace cable. Reassemble and retest printer.

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<b>Step</b>	<b>Questions / actions</b>	<b>Yes</b>	<b>No</b>
5	Reassemble and retest printer. Does 907 error reappear?	Turn printer off and replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>	Problem solved.



## 908—Black toner retract solenoid service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect DCN4 connector from I/O board. Measure resistance between cable pins 1 and 2. Is resistance between 162 and 198 ohms?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b> Go to step 5.	Go to step 2.
2	Remove items to expose toner retract solenoid. See <b>“Toner retract solenoid and cam removal” on page 4-64</b> for steps. Check toner retract solenoid cable connection. Is cable properly connected?	Go to step 3.	Properly connect cable. Reassemble and retest printer.
3	Check toner retract solenoid cable and connecting cable for visible damage. Is either cable damaged?	Replace damaged cable or toner retract solenoid. See <b>“Toner retract solenoid and cam removal” on page 4-64.</b> Reassemble and retest printer.	Go to step 4.
4	Disconnect toner retract solenoid cable from cable that attaches to I/O board. Check cable continuity from DCN4 pins 1 and 2 to connector that attaches to toner retract solenoid. Ensure that pins are not shorted. Is cable okay?	Replace toner retract solenoid. See <b>“Toner retract solenoid and cam removal” on page 4-64.</b> Reassemble and retest printer.	Replace cable. Reassemble and retest printer.

Step	Questions / actions	Yes	No
5	Reassemble and retest printer. Does 908 error reappear?	Turn printer off and replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>	Problem solved.

## 910—Developer motor service check

Step	Questions / actions	Yes	No
1	Are there any unusual noises heard around developer motor or developer drive assembly before error posts?	Replace toner cartridge (customer ordered supply). Go to step 2.	Go to step 4.
2	Does noise go away?	Problem solved.	Replace developer motor and developer drive assembly. See <b>“Developer motor removal” on page 4-31</b> and <b>“Developer drive assembly removal” on page 4-32</b> . Go to step 3.
3	Does noise go away?	Problem solved.	Go to step 4.
4	Turn printer off and remove right cover. See <b>“Right cover removal” on page 4-22</b> . Is cable properly connected to developer motor?	Go to step 5.	Properly connect cable. Retest printer. If error clears, problem solved, otherwise go to step 5.

Step	Questions / actions	Yes	No
5	<p>If waste toner bottle is removed, reinsert it. Ensure rear cover assembly is shut. Override top and front cover interlock switches. For location, see <b>“Interlock switch locations” on page 5-8</b>. Reconnect operator panel. Turn printer on. Allow printer to run until error posts. Disconnect connector from developer motor and check the following on disconnected cable connector:</p> <p>Pin 4 to pin 5—24VDC  Pin 6 to pin 5—24VDC  Pin 10 to pin 5—5VDC</p> <p>Are voltages present?</p>	<p>Replace developer motor. See <b>“Developer motor removal” on page 4-31</b>. Go to step 8</p>	<p>Go to step 6.</p>
6	<p>Remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect DCN11 from I/O board. Check for continuity and shorted pins on cable that connects DCN11 to developer motor. Is cable okay?</p>	<p>Go to step 7.</p>	<p>Replace cable. Retest printer. If error clears, problem solved, otherwise go to step 7.</p>

Step	Questions / actions	Yes	No
7	<p>Disconnect cable from DCN13 on I/O board. Check the following on disconnected cable connector:</p> <p>Pin 1 to pin 2—24VDC Pin 9 to pin 12—5VDC</p> <p>Are voltages present?</p>	<p>Replace I/O board. See <b>“I/O board removal” on page 4-70.</b> Go step 8.</p>	<p>Replace cable that connects ACN1 on LVPS to DCN13 on I/O board. Remove RIP board cage to gain access to cable. See <b>“RIP board cage removal” on page 4-57.</b> Go to step 8.</p>
8	<p>Reassemble and retest printer. Does error clear?</p>	<p>Problem solved.</p>	<p>Go to step 9.</p>
9	<p>Check cable that connects engine controller board connector I2CN to I/O board connector DCN3 for continuity and pin shorts. Is cable okay?</p>	<p>Replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b></p>	<p>Replace cable.</p>

## 911—Main motor service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove right cover. See <b>“Right cover removal” on page 4-22</b> . Open top cover and override top cover interlock switch. Restart printer and observe main motor and photodeveloper cartridge OPC belt. Does main motor attempt to turn but OPC belt will not rotate?	Replace photodeveloper cartridge.  <b>Note:</b> Photo-developer cartridge is a customer ordered supply.	Go to step 2.
2	Observe main motor and fuser. Does main motor attempt to turn but fuser will not?	Replace fuser assembly. See <b>“Fuser assembly removal” on page 4-9</b> .  <b>Note:</b> Fuser is a customer ordered supply.	Go to step 3.
3	Are there any unusual noises around main motor before error posts?	Replace main motor. Go to step 4.	Go to step 5.
4	Does noise go away?	Problem solved.	Go to step 5.
5	Is cable properly connected to main motor?	Go to step 6.	Properly connect cable. Retest printer. If error clears, problem solved, otherwise go to step 6.

Step	Questions / actions	Yes	No
6	<p>If waste toner bottle is removed, reinsert it.            Ensure rear cover assembly cover is shut.            Override top and front cover interlock switches.            For location, see <b>“Interlock switch locations” on page 5-8.</b>            Reconnect operator panel.            Turn printer on. Allow printer to run until error posts. Disconnect connector from main motor and check the following on disconnected cable connector:</p> <p>Pin 4 to pin 5—24VDC            Pin 6 to pin 5—24VDC            Pin 10 to pin 5—5VDC</p> <p>Are voltages present?</p>	<p>Replace main motor. See <b>“Main motor assembly removal” on page 4-38.</b> Go to step 9.</p>	<p>Go to step 7.</p>
7	<p>Remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect DCN12 from I/O board. Check for continuity and shorted pins on cable that connects DCN12 to main motor. Is cable okay?</p>	<p>Go to step 8.</p>	<p>Replace cable. Retest printer. If error clears, problem solved, otherwise go to step 8.</p>

Step	Questions / actions	Yes	No
8	<p>Disconnect cable from DCN13 on I/O board. Check the following on disconnected cable connector:</p> <p>Pin 1 to pin 2—24VDC Pin 9 to pin 12—5VDC</p> <p>Are voltages present?</p>	<p>Replace I/O board. See <b>“I/O board removal” on page 4-70.</b> Go step 10.</p>	<p>Replace cable that connects ACN1 on LVPS to DCN13 on I/O board. Remove RIP board cage to gain access to cable. See <b>“RIP board cage removal” on page 4-57.</b> Go to step 9.</p>
9	<p>Reassemble and retest printer. Does error clear?</p>	<p>Problem solved.</p>	<p>Go to step 10.</p>
10	<p>Check cable that connects engine controller board connector I2CN to I/O board connector DCN3 for continuity and pin shorts. Is cable okay?</p>	<p>Replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b></p>	<p>Replace cable.</p>



## 912—Power supply fan service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN20?	Go to step 2.	Properly connect cable.
2	Ensure rear cover assembly cover is shut. Override top and front cover interlock switches. For location, see <b>“Interlock switch locations” on page 5-8</b> . Reconnect operator panel. Turn printer on and check for 24VDC between DCN20 pin 1 and power ground (you can touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground.) Is voltage present and correct?	Replace power supply fan assembly. See <b>“Power supply fan removal” on page 4-74</b> . Retest printer. If error clears, problem solved, otherwise go to step 3.	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . Retest printer. If error clears, problem solved, else go to step 3.
3	Turn printer off and check cable that connects engine controller board connector I1CN to I/O board connector DCN1 for continuity and pin shorts. Is cable okay?	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Replace cable.

## 913—Fuser fan service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN7?	Go to step 2.	Properly connect cable.
2	Ensure rear cover assembly cover is shut. Override top and front cover interlock switches. For location, see <b>“Interlock switch locations” on page 5-8</b> . Reconnect operator panel. Turn printer on and check for 24VDC between DCN7pin 10 and power ground (you can touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground.) Is voltage present and correct?	Potentially faulty fuser fan. Replace rear cover assembly. See <b>“Rear cover assembly removal” on page 4-22</b> . Retest printer. If error clears, problem solved, else go to step 3.	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . Retest printer. If error clears, problem solved, else go to step 3.
3	Turn printer off and check cable that connects engine controller board connector I1CN to I/O board connector DCN1 for continuity and pin shorts. Is cable okay?	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Replace cable.

## 914—Laser fan service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN8?	Go to step 2.	Properly connect cable.
2	Ensure rear cover assembly cover is shut. Override top and front cover interlock switches. For location, see <b>“Interlock switch locations” on page 5-8</b> . Reconnect operator panel. Turn printer on and check for 24VDC between DCN8 pin 1 and power ground (you can touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground.) Is voltage present and correct?	Replace laser unit fan assembly. See <b>“Laser unit fan assembly removal” on page 4-26</b> . Retest printer. If error clears, problem solved, otherwise go to step 3.	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . Retest printer. If error clears, problem solved, else go to step 3.
3	Turn printer off and check cable that connects engine controller board connector I2CN to I/O board connector DCN3 for continuity and pin shorts. Is cable okay?	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Replace cable.

## 915—Erase lamp service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove toner cartridges and photodeveloper cartridge. Check erase lamp cable for proper connection. Is erase lamp cable properly connected?	Go to step 2.	Properly connect erase lamp. Retest printer. If error clears, problem solved, otherwise go to step 2.
2	Check erase lamp for any visible damage. Is erase lamp damaged?	Replace erase lamp. See <b>“Erase lamp removal” on page 4-27.</b> Retest printer. If error clears, problem solved, otherwise remove toner cartridges and photodeveloper cartridge and go to step 3.	Go to step 3.
3	Set multimeter to check diodes. Looking at erase lamp through front cover, touch meter positive lead to left LED connection and meter negative lead to right LED connection. LED should illuminate. Check all LEDs on erase lamp board. Do any LEDs fail to illuminate?	Replace erase lamp. See <b>“Erase lamp removal” on page 4-27.</b> Retest printer. If error clears, problem solved, otherwise go to step 4.	Go to step 4.
4	Remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN15?	Go to step 5.	Properly connect cable. Retest printer. If error clears, problem solved, otherwise go to step 5.

Step	Questions / actions	Yes	No
5	Disconnect cable from erase lamp and DCN15. Check DCN15 pin 11 to erase lamp cable connector pin 1 and DCN15 pin 12 to erase lamp cable connector pin 3 for continuity. Check for shorted pins on both sides of cable. Is cable okay?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b> Go to step 6.	Replace cable. Retest printer. If error clears, problem solved, otherwise go to step 6.
6	Retest printer. Does error clear?	Problem solved.	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>

## 916—Toner empty sensor (sender-TPD) service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN15?	Go to step 2.	Properly connect cable. Retest printer. If error clears, problem solved, otherwise go to step 2.
2	Turn printer off and replace I/O board. See <b>“I/O board removal” on page 4-70</b> . Retest printer. Does error clear?	Problem solved.	Go to step 3.
3	Check cable that connects engine controller board connector I1CN to I/O board connector DCN1 for continuity and pin shorts. Is cable okay?	Go to step 4.	Replace cable. Retest printer. If error clears, problem solved, otherwise go to step 4.
4	Turn printer off and replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> . Retest printer. Does error clear?	Problem solved.	Go to step 5.
5	Turn printer off and replace toner empty sensor (sender-TPD). See <b>“Toner sensor (sender) removal” on page 4-35</b> for steps. Retest printer. Does error clear?	Problem solved.	Call Lexmark support.

## 917—Toner empty sensor (receiver-TTR) service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN15?	Go to step 2.	Properly connect cable. Retest printer. If error clears, problem solved, otherwise go to step 2.
2	Turn printer off and replace I/O board. See <b>“I/O board removal” on page 4-70</b> . Retest printer. Does error clear?	Problem solved.	Go to step 3.
3	Check cable that connects engine controller board connector I1CN to I/O board connector DCN1 for continuity and pin shorts. Is cable okay?	Go to step 4.	Replace cable. Retest printer. If error clears, problem solved, otherwise go to step 4.
4	Turn printer off and replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> . Retest printer. Does error clear?	Problem solved.	Turn printer off and replace toner empty sensor (receiver-TTR). See <b>“Toner sensor (receiver) removal” on page 4-64</b> .

## 918—HVPS connection service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove engine controller board shield. See <b>“Engine controller board removal” on page 4-55</b> for steps to remove shield. Is cable properly connected to engine controller board HVCN connector?	Go to step 2.	Properly connect cable. Retest printer. If error clears, problem solved, otherwise go to step 2.
2	Turn printer off and remove items to expose HVPS. See <b>“High voltage power supply (HVPS) removal” on page 4-59</b> for steps. Check for continuity and pin shorts of cable that connects engine controller board HVCN and HVPS CN1. Is cable okay?	Replace HVPS. See <b>“High voltage power supply (HVPS) removal” on page 4-59</b> . Retest printer. If error clears, problem solved, otherwise turn printer off and replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Replace cable. Retest printer. If error clears, problem solved, otherwise turn printer off and replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .



## 919—Lower feed unit (secondary paper assembly) service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN14?	Go to step 2.	Properly connect cable. Retest printer. If error clears, problem solved, otherwise go to step 2.
2	Remove right cover. See <b>“Right cover removal” on page 4-22</b> . Check for continuity and pin shorts of cable that connects I/O board DCN14 and lower feed unit connector. Is cable okay?	Go to step 3	Replace cable. Retest printer. If error clears, problem solved, otherwise go to step 3.
3	Replace lower feed unit. Does error clear?	Problem solved.	Go to step 4.
4	Replace I/O board. Does error clear?	Problem solved.	Go to step 5.
5	Turn printer off and check cable that connects engine controller board connector I1CN to I/O board connector DCN1 for continuity and pin shorts. Is cable okay?	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Replace cable.

## 920—Fuser thermistor service check

Step	Questions / actions	Yes	No
1	Remove and reinstall fuser assembly. See <b>“Fuser assembly removal” on page 4-9</b> . Does error clear?	Problem solved.	Go to step 2.
2	Check fuser connector for damage. Replace if necessary. Does error clear?	Problem solved.	Go to step 3.
3	Turn printer off and check cable that connects engine controller board connector FUCN to fuser for proper connection, continuity and pin shorts. Is cable okay?	Go to step 4.	Properly connect cable or replace if damaged. If error clears, problem solved, otherwise go to step 4.
4	Replace fuser assembly. See <b>“Fuser assembly removal” on page 4-9</b> . Does error clear?  <b>Note:</b> Fuser is a customer order supply.	Problem solved.	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .

## 921,922,923,924,925—Fuser assembly service check

Step	Questions / actions	Yes	No
1	Check for proper input line voltage. Is line voltage correct?	Go to step 2.	Provide proper line voltage.
2	Remove and reinstall fuser assembly. See <b>“Fuser assembly removal” on page 4-9</b> . Does error clear?	Problem solved.	Go to step 3.
3	Check fuser connector for damage. Replace if necessary. Does error clear?	Problem solved.	Go to step 4.
4	Turn printer off and check cable that connects engine controller board connector FUCN to fuser for proper connection, continuity, and pin shorts. Is cable okay?	Go to step 5.	Properly connect cable or replace if damaged. If error clears, problem solved, otherwise go to step 5.
5	Replace fuser assembly. See <b>“Fuser assembly removal” on page 4-9</b> . Does error clear?  <b>Note:</b> Fuser is a customer ordered supply.	Problem solved.	Replace LVPS. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60</b> . If error does not clear, replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .

**930,931,932—Laser unit assembly service check**

Step	Questions / actions	Yes	No
1	Check LCN connection on laser assembly LDU board. Is connector properly connected?	Go to step 2.	Properly connect LCN cable. If error clears, problem solved, otherwise go to step 2.
2	Check LCN connection on engine controller board. Is cable properly connected?	Go to step 3.	Properly connect LCN cable. If error clears, problem solved, otherwise go to step 3.
3	Check cable that connects engine controller board LCN and LDU LCN connectors for continuity and shorted pins. Is cable okay?	Replace laser unit assembly. <b>“Laser unit assembly (printhead) removal” on page 4-24.</b> Go to step 4.	Replace cable. Go to step 4.
4	Does error clear?	Problem solved.	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>

## 985—Duplex connection error 1 service check

Step	Questions / actions	Yes	No
1	Check duplex unit cable. is cable properly connected?	Replace duplex unit. See <b>“Duplex unit assembly removal” on page 4-13</b> . If problem persists, go to step 2.	Properly connect cable. If problem persists, go to step 2.
2	Check cable connection to connector ACN4 located on low voltage power supply. See <b>“Engine controller board removal” on page 4-55</b> for steps required to remove engine controller board cover. This will allow access to ACN4. Is cable properly connected?	Go to step 3.	Properly connect cable. If problem persists, go to step 3.
3	Disconnect cable from ANC4 and check for continuity between ACN4 connector and duplex connector located on back of printer. Is there continuity?	Replace low voltage power supply. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60</b> .	Replace faulty cable.

## 986—Duplex connection error 2 service check

Step	Questions / actions	Yes	No
1	Check duplex unit cable. is cable properly connected?	Replace duplex unit. See <b>“Duplex unit assembly removal” on page 4-13</b> . If problem persists, go to step 2.	Properly connect cable. If problem persists, go to step 2.
2	Check cable connection to connector DPCN located on engine controller board. See <b>“Engine controller board removal” on page 4-55</b> for steps required to remove engine controller board cover. This will allow access to DPCN. Is cable properly connected?	Go to step 3.	Properly connect cable. If problem persists, go to step 3.
3	Disconnect cable and check for continuity between DPCN connector and duplex connector located on back of printer. Is there continuity?	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Replace faulty cable.

## 990—Transfer belt unit service check

Step	Questions / actions	Yes	No
1	Open rear cover assembly and check transfer belt unit markers for stains. Are markers stained?	Clean belt marker area with cotton cloth. If problem persists go to step 2.	Go to step 2.
2	Remove transfer belt unit and observe markers on side. Are belt markers deformed or does transfer belt seem hard to rotate?	Replace transfer belt unit. See <b>“Transfer belt unit removal” on page 4-7.</b>	Reinstall transfer belt unit. Go to step 3.
3	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Are cables DCN13 and DCN16 properly connected to I/O board?	Go to step 4.	Properly connect cables. If problem persists, go to step 4.
4	Ensure rear cover assembly and front cover assembly are closed. Override top interlock switch and turn printer on. Wait until printer displays error and remove DCN16 from I/O board. Check for 5 VDC between DCN16 pin 1 (on I/O board) and ground (you can touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground.) Is voltage present and correct?	I/O board is providing 5 VDC to marker sensor. Replace transfer belt marker sensor. Marker sensor is a part of bracket assembly. See <b>“Bracket assembly removal” on page 4-45.</b> If problem persists, replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>	Go to step 5.

Step	Questions / actions	Yes	No
5	Reconnect DCN16 and disconnect cable from DCN13. On cable, check for 5 VDC from pin 9 to ground (you can touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground.) Is voltage present and correct?	LVPS is providing 5 VDC to I/O board. Replace faulty I/O board. See <b>“I/O board removal” on page 4-70.</b>	Replace LVPS. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60.</b>



## 991—Transfer roller clutch service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove printer right cover. See <b>“Right cover removal” on page 4-22</b> . Disconnect transfer roller clutch from cable. Measure resistance between two outer pins on transfer roller clutch. Does resistance measure between 119 and 145 ohms?	Go to step 2.	Replace faulty transfer roller clutch. See <b>“Clutch removal” on page 4-40</b> .
2	Remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect cable from DCN10 on I/O board. Check cable continuity from DCN10 pins 7 and 8 (cable) to connector that attaches to transfer roller clutch. Ensure that pins are not shorted. Is cable okay?	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . If problem persists, go to step 3.	Go to step 3.
3	Remove engine controller board shield. See <b>“Engine controller board removal” on page 4-55</b> for steps to remove shield. Check cable that connects I2CN on engine controller board to DCN3 on I/O board for proper connection, damage, pin shorting and continuity. Is cable okay?	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Replace cable.

## 992—Transfer belt cleaning roller clutch service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove printer right cover. See <b>“Right cover removal” on page 4-22</b> . Disconnect transfer belt cleaning roller clutch from cable. Measure resistance between two outer pins on cleaning roller clutch. Does resistance measure between 198 and 242 ohms?	Go to step 2.	Replace faulty cleaning roller clutch. See <b>“Cleaning roller clutch removal” on page 4-36</b> .
2	Remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect cable from DCN10 on I/O board. Check cable continuity from DCN10 pins 3 and 4 (cable) to connector that attaches to cleaning roller clutch. Ensure that pins are not shorted. Is cable okay?	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . If problem persists, go to step 3.	Replace cable.
3	Remove engine controller board shield. See <b>“Engine controller board removal” on page 4-55</b> for steps to remove shield. Check cable that connects I2CN on engine controller board to DCN3 on I/O board for proper connection, damage, pin shorting, and continuity. Is cable okay?	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Replace cable.

## 993—Fuser clutch service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove printer right cover. See <b>“Right cover removal” on page 4-22</b> . Disconnect fuser clutch from cable. Measure resistance between two outer pins on fuser clutch. Does resistance measure between 133 and 163 ohms?	Go to step 2.	Replace faulty fuser clutch. See <b>“Clutch removal” on page 4-40</b> .
2	Remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Disconnect cable from DCN10 on I/O board. Check cable continuity from DCN10 pins 5 and 6 (cable) to connector that attaches to cleaning roller clutch. Ensure that pins are not shorted. Is cable okay?	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . If problem persists, go to step 3.	Replace cable.
3	Remove engine controller board shield. See <b>“Engine controller board removal” on page 4-55</b> for steps to remove shield. Check cable that connects I2CN on engine controller board to DCN3 on I/O board for proper connection, damage, pin shorting, and continuity. Is cable okay?	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Replace cable.

## 994—OPC belt marker sensor service check

Step	Questions / actions	Yes	No
1	Remove photodeveloper cartridge and observe markers on side. Are belt markers covered with foreign particles?	Clean marker area with cotton cloth. If problem persists go to step 2.	Go to step 2.
2	Reinstall photodeveloper cartridge. Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Are cables DCN5 and DCN13 properly connected to I/O board?	Go to step 3.	Properly connect cables. If problem persists, go to step 3.
3	Ensure rear cover assembly and front cover assembly are closed. Override top interlock switch and turn printer on. Wait until printer displays error and remove DCN5 from I/O board. Check for 5 VDC between DCN5 pin 1 (on I/O board) and ground (you can touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground.) Is voltage present and correct?	I/O board is providing 5 VDC to marker sensor. Replace OPC marker sensor. See <b>“Marker sensor assembly removal” on page 4-69</b> . If problem persists, replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Go to step 4.

Step	Questions / actions	Yes	No
4	Reconnect DCN5 and disconnect cable from DCN13. On cable, check for 5 VDC from pin 11 to ground (you can touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground.) Is voltage present and correct?	LVPS is providing 5 VDC to I/O board. Replace faulty I/O board. See <b>“I/O board removal” on page 4-70.</b>	Replace LVPS. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60.</b>

## 995—High voltage power supply (HVPS) service check

Step	Questions / actions	Yes	No
1	Remove photodeveloper cartridge and ensure charging unit on bottom of photodeveloper cartridge is not damaged. Is charging unit damaged?	Replace photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b> <b>Note:</b> Photodeveloper cartridge is a customer ordered part.	Go to step 2.
2	Check charging unit high voltage contacts in printer. Are they clean?	Go to step 3.	Clean contacts. If problem persists, go to step 3.
3	Replace photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b> Has error cleared?  <b>Note:</b> Photodeveloper cartridge is a customer ordered part.	Problem solved.	Go to step 4.
4	Check cable for continuity between engine controller board connector HVCN and HVPS CN1 connector and for shorted pins. Is cable okay?	Go to step 5.	Replace cable.

Step	Questions / actions	Yes	No
5	Replace HVPS. See <b>“High voltage power supply (HVPS) removal” on page 4-59</b> . Has error cleared?	Problem solved.	Go to step 6.
6	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> . Has error cleared?	Problem solved.	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> .

## 996—Low voltage power supply (LVPS) service check

Step	Questions / actions	Yes	No
1	Check cable for continuity between engine controller board connector LVCN and HVPS ACN5 connector. Check cable for continuity between I/O board DCN21 and HVPS ACN5 connector. Also check for shorted pins. Is cable okay?	Go to step 2.	Replace cable.
2	Replace LVPS. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60.</b> Does problem persist?	Go to step 3.	Problem solved.
3	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b> Does problem persist?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b>	Problem solved.



## Cover open service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove right cover. See <b>“Right cover removal” on page 4-22</b> . Check all interlock switch (top, rear and front) actuators for proper operation. Are actuators good?	Go to step 2.	<p>Replace appropriate actuator:</p> <p>Front cover for front cover interlock switch. See <b>“Front cover assembly removal” on page 4-19</b>.</p> <p>Top cover assembly for top cover interlock switch. See <b>“Top cover assembly removal” on page 4-18</b>.</p> <p>Rear cover actuator for rear cover interlock switch. Actuator is contained in parts packet.</p>
2	Check each interlock switches (top, rear and front) for proper operation and damage. Listen for switching action. Using an ohmmeter, check switches. When switch is open (cover open), resistance between pin 1 and pin 3 is 0 and pin 1 and 2 is infinite. Closing switch will show 0 resistance between pins 1 and 2 and infinite resistance between pins 1 and 3. Are switches good?	Go to step 3.	Replace switch in question. See <b>“Front door interlock switch removal” on page 4-29</b> for front interlock switch, see <b>“Power supply fan removal” on page 4-74</b> for rear and top interlock switches.

Step	Questions / actions	Yes	No
3	Turn printer on. Check for 5 VDC between front cover interlock switch pin 1 (top pin) and ground. Is 5 VDC present?	Go to step 5.	Go to step 4.
4	Turn printer off and check cable for continuity between LVPS ACN2 pin 1 and cable that connects to front cover interlock switch pin 1. Is cable okay?	Replace LVPS. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60.</b>	Replace cable.
5	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN18?	Go to step 6.	Properly connect cable.
6	Turn printer on and override front cover interlock switch. Check for 5 VDC between I/O board DCN18 pin 3 and ground. Is 5 VDC present?	Go to step 7.	Go to step 8.
7	Override top cover interlock switch in addition to front cover interlock switch. Check for 5 VDC between I/O board DCN18 pin 1 and ground. Is 5 VDC present?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b> If problem persists, replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>	Go to step 8.

Step	Questions / actions	Yes	No
8	<p>Check following cables for continuity:</p> <ul style="list-style-type: none"> <li>• I/O DCN18 pin 1 to rear cover interlock switch pin 3</li> <li>• I/O DCN18 pin 3 to top cover interlock switch pin 3</li> <li>• Top cover interlock switch pin 1 to front cover interlock switch pin 2</li> <li>• Top cover interlock switch pin 2 to rear cover interlock switch pin 1</li> <li>• LVPS ACN2 pin 2 to rear cover interlock switch pin 2.</li> </ul> <p>Are any cables defective?</p>	Replace cable.	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>

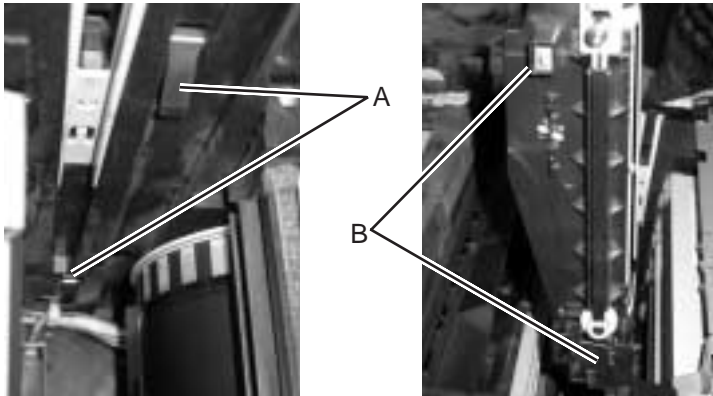
## Incorrect media service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN16?	Go to step 2.	Properly connect cable.
2	Reconnect operator panel. Turn printer on. Touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground. Touch positive lead to DCN16 pin 10 to ensure 5 VDC is being supplied to toner present sensor. Is 5 VDC present?	Go to step 3.	Go to step 6.
3	Remove tray from printer. Remove paper from tray and insert 1 sheet of transparency. Insert paper tray into printer. Check voltage level on DCN16 pin 11. Voltage should measure approximately 4.6 VDC. Is voltage okay?	Go to step 4.	Go to step 5.
4	Remove tray from printer. Remove transparency from tray and insert white paper. Insert paper tray into printer. Check voltage level on DCN16 pin 11. Voltage should measure approximately 1.7 VDC. Is voltage okay?	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . If problem persists, replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Go to step 5.

Step	Questions / actions	Yes	No
5	Turn printer off. Check cable for continuity that connects DCN16 pins 10, 11, 12, and 13 to OHP sensor sensor. Also check for shorted pins. Is cable okay?	Replace OHP sensor. See <b>“Paper guide (C) assembly removal” on page 4-47.</b>	Replace cable.
6	Touch positive lead to DCN13 pin 9 to ensure 5 VDC is being supplied to I/O board. Also check pin 11 for 5 VDC. Is 5 VDC present?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b>	Go to step 7.
7	Check cable continuity between LVPS ACN1 and I/O board DCN13. Also check for shorted pins. Is cable okay?	Replace LVPS. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60.</b>	Replace cable.

## Missing photodeveloper cartridge service check

Step	Questions / actions	Yes	No
1	Check photodeveloper cartridge for proper installation. Is cartridge installed properly?	Go to step 2.	Install properly.
2	Check printer contacts (A) and photodeveloper cartridge contacts (B) for dirt and damage. Are contacts okay?	<p>Replace photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b></p> <p><b>Note:</b> Photodeveloper cartridge is a customer ordered supply.</p> <p>If problem persists, replace HVPS. See <b>“High voltage power supply (HVPS) removal” on page 4-59.</b></p>	<p>Replace photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b></p>



## Missing toner cartridge service check

Step	Questions / actions	Yes	No
1	Remove toner cartridge in question. Holding toner cartridge with developer roller away from you, check toner present sensor actuators located on left rear of toner cartridge. Are actuators damaged?	Replace toner cartridge.	Go to step 2.
2	Insert toner cartridge and ensure toner present sensor flag moves forward. Remove toner cartridge. Toner present sensor flag should spring forward. Does toner present sensor flag operate correctly?	Go to step 3.	Replace toner present sensor. See <b>“Toner present sensor removal” on page 4-63.</b>
3	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN2?	Go to step 4.	Properly connect cable.
4	Reconnect operator panel. Turn printer on. Touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground. Touch positive lead to DCN2 pin 2 to ensure 5 VDC is being supplied to toner present sensor. Is 5 VDC present?	Go to step 5.	Go to step 8.
5	Check voltage level on DCN2 pin 1. Is 5 VDC present?	Go to step 6.	Go to step 7.

Step	Questions / actions	Yes	No
6	Push toner cartridge fully in. Check voltage level on DCN2 pin 1. Is 0 VDC present?	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . If problem persists, replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Replace toner present sensor. See <b>“Toner present sensor removal” on page 4-63</b> .
7	Turn printer off. Check cable for continuity that connects DCN2 pins 1, 2, and 3 to toner present sensor. Also check for shorted pins. Is cable okay?	Replace toner present sensor. See <b>“Toner present sensor removal” on page 4-63</b> .	Replace cable.
8	Touch positive lead to DCN13 pin 9 to ensure 5 VDC is being supplied to I/O board. Also check pin 11 for 5 VDC. Is 5 VDC present?	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> .	Go to step 9.
9	Check cable continuity between LVPS ACN1 and I/O board DCN13. Also check for shorted pins. Is cable okay?	Replace LVPS. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60</b> .	Replace cable.



## OPC belt (photodeveloper) cartridge drive service check

Step	Questions / actions	Yes	No
1	Check photodeveloper cartridge for proper installation. Is cartridge installed properly?	Go to step 2.	Install properly.
2	Check photodeveloper cartridge for damage. Is cartridge damaged?	Replace photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b> <b>Note:</b> Photodeveloper cartridge is a customer ordered supply.	Go to step 3.
3	Check main motor assembly for damage. Is main motor assembly damaged?	Replace main motor assembly. See <b>“Main motor assembly removal” on page 4-38.</b>	Replace main drive assembly. See <b>“Main drive gear assembly removal” on page 4-41.</b>

## Operator panel service check

Printer emits 5 beeps when it detects a problem with operator panel assembly, operator panel cable, controller RIP board or when a POR does not complete. If operator panel operates properly, except for a PEL or a few PELs missing or broken, run “LCD test” in diagnostic mode. See **“LCD test” on page 3-9** for details. If operator panel fails any diagnostic test, replace operator panel.

Step	Questions / actions	Yes	No
1	Ensure operator panel cable is plugged into operator panel and other end of cable is plugged into P2CN on engine controller board. Is cable plugged in?	Go to step 2.	Connect cable.
2	Ensure RIP board is correctly plugged in. Is cable plugged in?	Go to step 3.	Connect cable.
3	Is operator panel display blank, did 5 beeps emit when printer was turned ON and is LED off?	Replace operator panel assembly. If problem persists, go to step 4.	Go to step 6.
4	Replace operator panel cable. Does problem go away?	Problem solved.	Go to step 5.
5	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> . Does problem go away?	Problem solved.	Go to step 6.
6	Does operator panel show all diamonds and were there no beeps when printer was powered on?	Check RIP board for proper installation. If properly installed, replace RIP board. See <b>“RIP board removal” on page 4-45</b> .	Replace operator panel.

## Output tray full service check

Step	Questions / actions	Yes	No
1	Ensure output tray full sensor flag swings with ease and is not broken or damaged. Is flag working properly?	Go to step 2.	Replace paper exit assembly. See <b>“Paper exit assembly removal” on page 4-49.</b>
2	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN7?	Go to step 3.	Properly connect cable.
3	Reconnect operator panel. Turn printer on. Touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground. Touch positive lead to DCN7 pin 7 to ensure 5 VDC is being supplied to output tray full sensor. Is 5 VDC present?	Go to step 4.	Go to step 7.
4	Check voltage level on DCN7 pin 8. Is 5 VDC present?	Go to step 5.	Go to step 6.
5	Activate output tray full sensor flag. Check voltage level on DCN7 pin 8. Is 0 VDC present?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b> If problem persists, replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>	Replace paper exit assembly. See <b>“Paper exit assembly removal” on page 4-49.</b>

Step	Questions / actions	Yes	No
6	Turn printer off. Check cable for continuity that connects DCN7 pins 7, 8, and 9 to output tray full sensor. Also check for shorted pins. Is cable okay?	Replace paper exit assembly. See <b>“Paper exit assembly removal” on page 4-49.</b>	Replace cable.
7	Touch positive lead to DCN13 pin 9 and pin 11 to ensure 5 VDC is being supplied to I/O board. Is 5 VDC present?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b>	Go to step 8.
8	Check cable continuity between LVPS ACN1 and I/O board DCN13. Also check for shorted pins. Is cable okay?	Replace LVPS. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60.</b>	Replace cable.

## Paper size sensing service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN19?	Go to step 2.	Properly connect cable.
2	Reconnect operator panel. Turn printer on and check for 5 VDC between DCN19 pin 1 and ground (you can touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground.) Is 5 VDC present?	Go to step 5.	Go to step 3.
3	Disconnect cable from DCN13 on I/O board. On cable that connects to DCN13, check for 5 VDC between pins 11 and 12. Is 5 VDC present?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b>	Go to step 4.
4	Check cable continuity between LVPS ACN1 and I/O board DCN13. Also check for shorted pins. Is cable okay?	Replace LVPS. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60.</b>	Replace cable.

Step	Questions / actions	Yes	No
5	If paper tray is removed, set paper tray for desired paper size and insert paper tray into printer. Using table below, check for proper paper size sensor action by taking voltage readings between ground and DCN19 pins 2 though 4. Is paper size sensor working properly?	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . If problem persists, replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .	Go to step 6.
6	Check cable for continuity between I/O board DCN19 and paper size sensor. Also check for shorted pins. Is cable okay?	Replace paper size sensor. See <b>“Left tray guide assembly removal” on page 4-65</b> .	Replace cable.

Paper tray setting	DCN19 (all voltages measured from pin to ground)			
	pin 2	pin 3	pin 4	pin 5
Standard tray				
A4	5 VDC	5 VDC	0 VDC	5 VDC
Letter	5 VDC	0 VDC	5 VDC	5 VDC
EXE	0 VDC	5 VDC	0 VDC	5 VDC
B5J	5 VDC	0 VDC	0 VDC	5 VDC
B51	5 VDC	0 VDC	0 VDC	5 VDC
#10	0 VDC	0 VDC	0 VDC	5 VDC
DL	0 VDC	0 VDC	0 VDC	5 VDC
Legal tray	0 VDC	0 VDC	5 VDC	5 VDC

## Printer no power service check

**Note:** If secondary paper feed assembly or duplex unit is installed, disconnect or remove before checking base printer operation.

Step	Questions / actions	Yes	No
1	Reset printer and listen for any activation of motors and for power supply fan. Look at operator panel to see if anything displays. Do you hear sounds or does operator panel display anything?	Go to step 2.	Go to step 3.
2	Ensure RIP board is properly installed. Is RIP board installed correctly?	Go to step 3.	Install RIP board.
3	Replace RIP board. See <b>“RIP board removal” on page 4-45</b> . Does problem persist?	Replace engine board. See <b>“Operator panel cable removal” on page 4-54</b> .	Problem solved.
4	Turn printer off and check line voltage to ensure that it is present and correct. Is voltage present and correct?	Go to step 5.	Inform customer.
5	Disconnect and check continuity of power cord. Is power cord good?	Go to step 6.	Replace power cord.

Step	Questions / actions	Yes	No
6	Remove items (see <b>“RIP board cage removal” on page 4-57</b> ) from left side of printer to expose power supply bracket. Using an ohmmeter, ensure power switch is good. Is power switch good?	Go to step 7.	Replace power supply bracket. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60</b> for steps to remove power supply bracket.
7	Check LVPS ACN1, ACN2, and ACN3 for proper connection. Are cables properly connected to LVPS?	Replace LVPS. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60.</b>	Properly connect cables.



## Toner feed service check

Step	Questions / actions	Yes	No
1	Check toner cartridge for damage. Check to see if toner cartridge moves easily into and out of printer. Is toner cartridge damaged or is there resistance moving in and out of printer?	Replace toner cartridge.	Go to step 2.
2	Is developer motor damaged?	Replace developer motor. See <b>“Developer motor removal” on page 4-31.</b>	Go to step 3.
3	Is developer drive assembly damaged?	Replace developer drive assembly. See <b>“Developer drive assembly removal” on page 4-32.</b>	Replace toner retract system. See <b>“Toner retract solenoid and cam removal” on page 4-64.</b>

## Toner low/empty service check

Step	Questions / actions	Yes	No
1	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN15?	Go to step 2.	Properly connect cable.
2	Reconnect operator panel. Turn printer on. Touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground. Touch positive lead to DCN15 pin 1, 2, 3, or 4 for specific color as dictated by list below:  DCN15 pin1—black(K) pin2—yellow(Y) pin3—magenta(M) pin4—cyan(C)  Slightly remove toner cartridge in question. Voltmeter should read approximately 4.8 VDC. Continue to slowly slide toner cartridge out of printer while noting voltmeter reading. Voltage should slowly decrease until it reads approximately 0 VDC. Is toner sensor system working properly?	Go to step 3.	Check cable for continuity between I/O board DCN15 and toner sensor system (both sender and receiver). Also check for shorted pins. See <b>“Toner sensor (sender) removal” on page 4-35</b> and <b>“Toner sensor (receiver) removal” on page 4-64</b> for steps to expose cable. If cable is okay, replace toner sensor system.
3	Replace I/O board. See <b>“I/O board removal” on page 4-70</b> . Does error clear?	Problem solved.	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> .

## Transfer roller missing service check

Step	Questions / actions	Yes	No
1	Turn printer off and check transfer roller contacts. Are contacts present and not damaged?	Go to step 2.	If contact A has slipped off frame, put it back on. If you cannot see it, remove HVPS cage (see <b>“HVPS cage removal” on page 4-62</b> and put it back in place. If B is damaged, replace registration assembly. See <b>“Registration assembly removal” on page 4-52.</b>



Step	Questions / actions	Yes	No
2	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55</b> . Does error clear?	Problem solved.	Replace HVPS. See <b>“High voltage power supply (HVPS) removal” on page 4-59</b> .

## Tray empty service check

Step	Questions / actions	Yes	No
1	Remove paper tray from printer. Press bottom of spring platform latches located in rear corners of paper tray. This releases spring platform of paper tray. Ensure tray is raising paper after insertion. Is tray working properly?	Go to step 2.	Replace paper tray.
2	Ensure paper empty sensor flag swings with ease and is not broken or damaged. Is flag working properly?	Go to step 3.	Replace paper guide (C) assembly . See <b>“Paper guide (C) assembly removal” on page 4-47.</b>
3	Turn printer off and remove I/O board shield. See <b>“I/O board removal” on page 4-70</b> for steps to remove I/O board shield. Is cable properly connected to I/O board connector DCN16?	Go to step 4.	Properly connect cable.
4	Reconnect operator panel. Turn printer on. Touch negative lead of voltmeter to metal bracket that holds I/O board to obtain ground. Touch positive lead to DCN16 pin 7 to ensure 5 VDC is being supplied to paper empty sensor. Is 5 VDC present?	Go to step 5.	Go to step 8.
5	Insert empty paper tray into printer. Check voltage level on DCN16 pin 8. Is 5 VDC present?	Go to step 6.	Go to step 7.

Step	Questions / actions	Yes	No
6	Remove paper tray, fill with paper and reinsert. Check voltage level on DCN16 pin 8. Is 0 VDC present?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b> If problem persists, replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>	Replace paper guide (C) assembly . See <b>“Paper guide (C) assembly removal” on page 4-47.</b>
7	Turn printer off. Remove paper guide (C) assembly. See <b>“Paper guide (C) assembly removal” on page 4-47.</b> Check cable for continuity that connects DCN16 pins 7, 8, and 9 to paper empty sensor. Also check for shorted pins. Is cable okay?	Replace paper guide (C) assembly . See <b>“Paper guide (C) assembly removal” on page 4-47.</b>	Replace cable.
8	Touch positive lead to DCN13 pin 9 and pin 11 to ensure 5 VDC is being supplied to I/O board. Is 5 VDC present?	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b>	Go to step 9.
9	Check cable continuity between LVPS ACN1 and I/O board DCN13. Also check for shorted pins. Is cable okay?	Replace LVPS. See <b>“Low voltage power supply (LVPS) with cage removal” on page 4-60.</b>	Replace cable.

## Waste toner bottle service check

Step	Questions / actions	Yes	No
1	Remove waste toner bottle from printer. Inside waste toner bottle holder, check sensor flag. Does flag work properly and is it not damaged?	Go to step 2.	Replace waste toner bottle holder. See <b>“Waste toner bottle holder removal” on page 4-32.</b>
2	Reinstall waste toner bottle. Does error clear?	Problem solved.	Go to step 3.
3	Replace waste toner bottle holder. See <b>“Waste toner bottle holder removal” on page 4-32.</b> Does error clear?	Problem solved.	Go to step 4.
4	Replace I/O board. See <b>“I/O board removal” on page 4-70.</b> Does error clear?	Problem solved.	Replace engine controller board. See <b>“Engine controller board removal” on page 4-55.</b>

## Waste toner feed service check

Step	Questions / actions	Yes	No
1	Is transfer belt unit cleaning roller properly installed.	Go to step 2.	Properly install cleaning roller.
2	Check cleaning roller clutch gear (located inside printer) for damage. Is cleaning roller clutch damaged?	Replace cleaning roller clutch.	Go to step 3.
3	Check waste toner bottle for overflow. Is waste toner overflowing?	Go to <b>“Waste toner bottle service check” on page 2-97.</b>	Go to step 4.
4	Check waste toner auger for damage. Is waste toner auger damaged?	Replace waste toner auger. See <b>“Waste toner auger removal” on page 4-72.</b>	Go to step 5.
5	Check waste toner agitator for damage. Is waste toner agitator damaged?	Replace waste toner agitator. See <b>“Waste toner agitator removal” on page 4-73.</b>	Go to step 6.
6	Inspect waste toner feeder and opening in bottom of printer. Is waste toner feeder damaged?	Replace waste toner feeder. See <b>“Waste toner feeder removal” on page 4-42.</b>	Problem solved.



## Paper feed service checks

### Printer paper feed service check

	Problem area	Action
1	Check for recommended paper	<p>Ensure paper being used is recommended.</p> <p>Ensure paper is stored in an area free from high humidity.</p> <p><b>Note:</b> Disconnect secondary paper assembly and duplex unit, if installed, to help isolate a paper transport problem.</p>
2	Paper tray	<p>Ensure paper tray is not damaged.</p> <p>Check for paper caught behind tray in pickup transport roll.</p> <p>Replace any damaged parts.</p>
3	<ul style="list-style-type: none"> <li>• Paper feed roller</li> <li>• Separator pad</li> </ul>	<p>Check paper feed roller and separator pad for wear or damage. <b>“Paper feed roller removal” on page 4-48.</b></p> <p>Replace any damaged parts.</p>
4	<ul style="list-style-type: none"> <li>• Registration roller</li> <li>• Transfer roller</li> </ul>	<p>Check registration roller for damage or binds, and replace if necessary. See <b>“Registration assembly removal” on page 4-52.</b></p> <p>Check transfer roller for damage and replace if necessary. <b>“Transfer roller removal” on page 4-8.</b></p>
5	Transfer belt unit	<p>Ensure transfer unit is not damaged and is free of foreign material.</p> <p><b>Note:</b> Do not touch transfer belt with your hands.</p>
6	Transfer belt unit cleaning roller	<p>Ensure no paper is jammed in cleaning roller.</p> <p>Ensure cleaning roller is not damaged.</p> <p>Replace cleaning roller if necessary.</p>

	Problem area	Action
7	Fuser assembly	<p>Ensure fuser assembly is not damaged or dirty.</p> <p>Ensure fuser assembly guides and gears are not broken and are free of paper.</p> <p><b>Note:</b> Fuser assembly is a customer ordered supply.</p>
8	<ul style="list-style-type: none"> <li>• Paper exit assembly</li> <li>• Gears</li> </ul>	<p>Check rear cover assembly for damage.</p> <p>Ensure paper exit roller located in paper exit assembly is not damaged.</p> <p>Ensure paper exit gears and bearings are good.</p> <p>Ensure paper guides are not bent or dirty.</p> <p>Clean or replace parts if necessary.</p>

## Print quality service checks

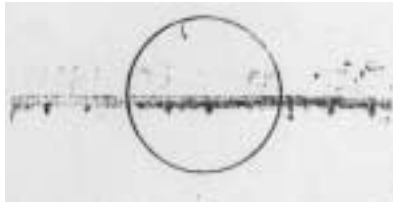
### Background service check



Background is smeared due to toner spread.

	Problem area	Action
1	Toner cartridge	Too small charging amount in the development process.
2	Check developer high voltage contact points.	<p>Insufficient contact of developer roller's primary or secondary high voltage contact points. Ensure primary and secondary contact points are free from contamination and toner debris.</p> <p>Check toner cartridge developer roller bias pole. If contaminated, clean it. If damaged or deformed, replace toner cartridge.</p>
3	Photodeveloper (OPC) cartridge	<p>Photodeveloper cartridge has reached life or is failing. Replace photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b></p> <p><b>Note:</b> Photodeveloper cartridge is a customer ordered supply.</p>
4	High voltage power supply (HVPS)	HVPS has failed. Replace HVPS. See <b>“High voltage power supply (HVPS) removal” on page 4-59.</b>

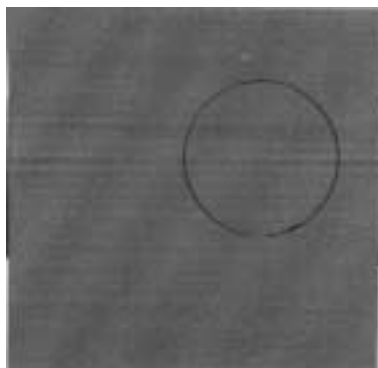
## Back stain service check



Backside of paper is stained.

	<b>Problem area</b>	<b>Action</b>
1	Fuser assembly	<ul style="list-style-type: none"><li>• Fuser roller and back-up roller are stained.</li><li>• Fusing offset error occurred.</li></ul> <p>Replace fuser assembly. See <b>“Fuser assembly removal” on page 4-9.</b></p> <p><b>Note:</b> Fuser assembly is a customer order supply.</p>
2	Transfer roller	Transfer roller is stained. Replace transfer roller. See <b>“Transfer roller removal” on page 4-8.</b>

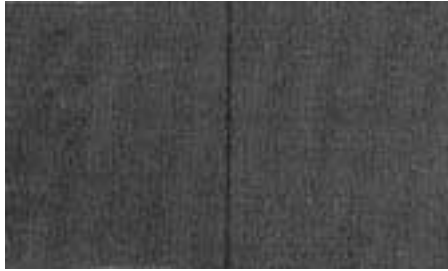
## Banding service check



A banding line appears in horizontal direction.

	<b>Problem area</b>	<b>Action</b>
1	Photodeveloper (OPC) cartridge	Transfer failure due to uneven rotational speed caused by a shock which occurs when the seam of the OPC belt passes over the cleaning blade.  Replace photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b>
2	Toner cartridge	OPC belt and transfer belt fail to maintain regular and proper rotation due to impact created during retract of toner cartridge.  Replace toner cartridge.

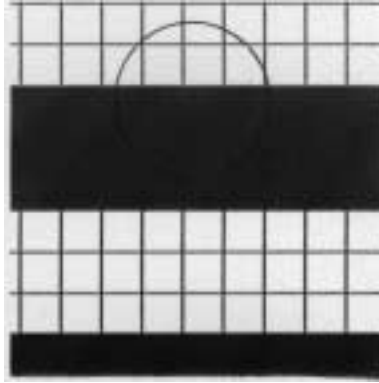
## Black line service check



A fine black line appears in printer image.

	<b>Problem area</b>	<b>Action</b>
1	Toner cartridge	Toner cartridge blade is deformed. Replace toner cartridge.
2	Photodeveloper (OPC) cartridge	OPC belt's surface is damaged. Replace photodeveloper cartridge. See " <b>Photodeveloper cartridge removal</b> " on page 4-11.
3	Debris	Foreign particles (paper dust, and so on) have adhered to perimeter parts of OPC belt and transfer unit belt. Clean perimeter of mounting area of OPC belt and transfer belt.

## Color misregistration service check



Color misregistration between two colors.

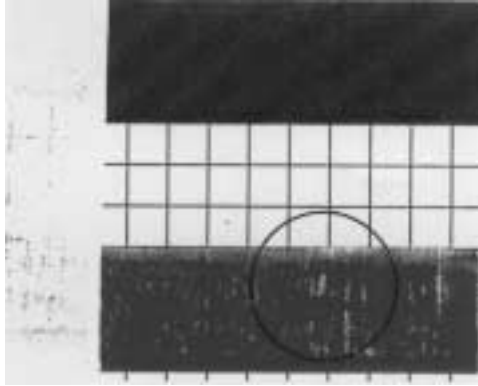
	Problem area	Action
1	Transfer roller and transfer belt cleaning roller	Transfer belt fails to maintain regular and proper rotation due to impact caused when transfer roller or transfer belt cleaning roller contacts transfer belt.  Ensure transfer roller and transfer belt cleaning roller are properly installed.
2	Toner cartridge	Developer cartridge OPC belt fails to maintain regular and proper rotation due to impact caused when toner cartridge contacts OPC belt.  Ensure toner cartridge is properly installed.
3	Photodeveloper cartridge	OPC belt is off track.  Replace photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11</b> .  <b>Note:</b> Photodeveloper cartridge is a customer order supply.

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	<b>Problem area</b>	<b>Action</b>
4	Transfer belt unit	Transfer belt is off track. Replace transfer belt unit. See <b>“Transfer belt unit removal” on page 4-7.</b>



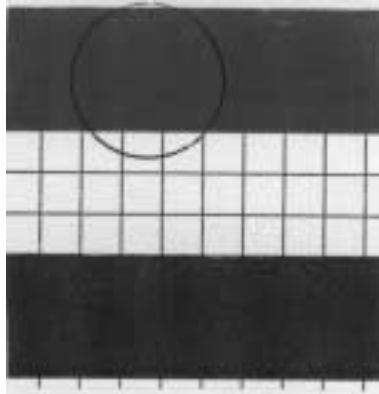
## Insufficient fusing service check



Printed image is partially missing.

	<b>Problem area</b>	<b>Action</b>
1	Fuser tension release lever	Fuser tension release lever is open. Check fuser and remove shipping pieces if still installed. Close release lever.
2	Driver media settings	Driver media setting is wrong. Ensure proper media setting is selected for specific media in use.
3	Nonrecommended paper	Nonrecommended paper is being used. Replace paper with recommended.
4	Fuser	Replace failed fuser. See <b>“Fuser assembly removal” on page 4-9.</b>  <b>Note:</b> The fuser is a customer order supply.

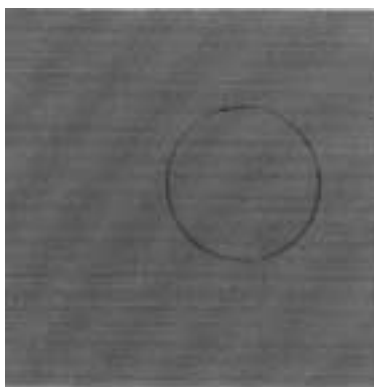
### Insufficient gloss service check



Gloss on paper is not sufficient.

	<b>Problem area</b>	<b>Action</b>
1	Driver media settings	Driver media setting is wrong. Ensure proper media setting is selected for specific media in use.
2	Fuser	Fuser roller is deteriorated. Fuser temperature is not properly controlled. Replace fuser. See <b>“Fuser assembly removal” on page 4-9.</b>  <b>Note:</b> The fuser is a customer order supply.

## Jitter service check



Uneven optical density appears periodically in horizontal direction.

	Problem area	Action
1	Photodeveloper cartridge	<p>Replace faulty photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b></p> <p><b>Note:</b> Photodeveloper cartridge is a customer order supply.</p>
2	Main motor assembly	<ul style="list-style-type: none"> <li>• Irregular rotation of main motor assembly</li> <li>• Main motor assembly gear unit failure</li> <li>• Variation of OPC belt running speed due to failing main motor assembly</li> </ul> <p>Replace main motor assembly. See <b>“Main motor assembly removal” on page 4-38.</b></p>
3	Developer drive assembly	<p>Replace faulty developer drive assembly. See <b>“Developer drive assembly removal” on page 4-32.</b></p>

### Missing image at edge service check

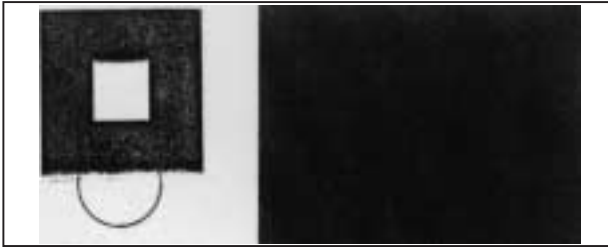
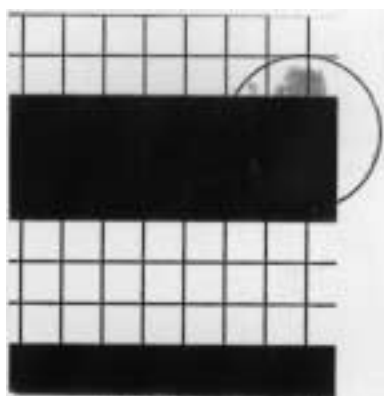


Image has missing or peeling toner at edge.

	<b>Problem area</b>	<b>Action</b>
1	Toner cartridge	Too small a toner mass amount and charging amount in the development process. Replace toner cartridge.
2	Photodeveloper cartridge	OPC belt is deformed and wavy. Replace photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b>  <b>Note:</b> Photodeveloper cartridge is a customer order supply.

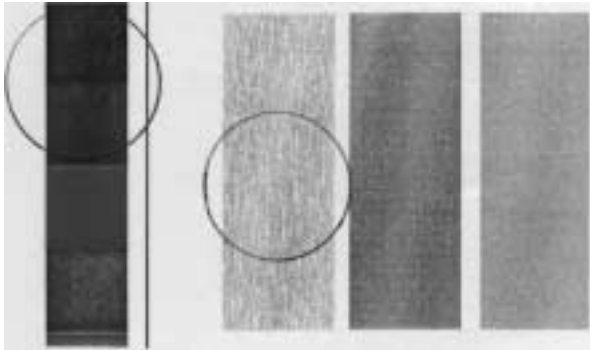
## Mixed color image service check



Mixed color image appears.

	Problem area	Action
1	Toner cartridge	Ensure toner cartridge moves in and out of printer without a lot of resistance. Compare toner cartridge in question with one of the other known working cartridges. Replace toner cartridge if defective.
2	Transfer roller clutch	Replace transfer roller clutch. See <b>“Clutch removal” on page 4-40.</b>
3	Transfer belt unit cleaning roller clutch	Replace transfer belt unit cleaning roller clutch. See <b>“Cleaning roller clutch removal” on page 4-36.</b>
4	Toner retract system	Replace toner retract system. See <b>“Toner retract solenoid and cam removal” on page 4-64.</b>

**Mottle service check**



Variation of optical density is found in image.

	<b>Problem area</b>	<b>Action</b>
1	Rear cover assembly	Rear cover assembly is not fixed in place. Open rear cover assembly and close properly.
2	Transfer roller	Transfer roller is not properly installed. Remove and reinstall transfer roller. See <b>“Transfer roller removal” on page 4-8.</b>
3	Paper	Replace deformed paper.
4	Toner cartridge	Replace defective toner cartridge.
5	HVPS	Replace faulty HVPS. See <b>“High voltage power supply (HVPS) removal” on page 4-59.</b>

## Residual image service check

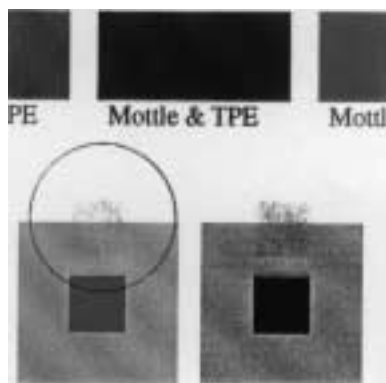
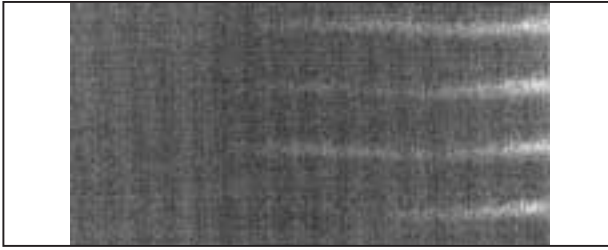


Image of preceding page appears on every other page.

	Problem area	Action
1	Transfer unit cleaning roller	<p>Cleaning roller is not installed properly. Remove and reinstall. Ensure left side of cleaning roller is making good contact with HVPS contact.</p> <p>If error continues to occur after reinstallation, replace cleaning roller. See <b>“Transfer belt cleaning roller removal”</b> on page 4-6.</p>
2	HVPS	<p>Replace faulty HVPS. See <b>“High voltage power supply (HVPS) removal”</b> on page 4-59.</p>

## Ribbing service check



Light print occurs in right or left side of image.

	Problem area	Action
1	Printer is not level	Table printer is sitting on is slightly tilted.  Tilt should be less than 1/2 inch.  Confirm the printer table is large enough and the printer is level.
2	Toner cartridge	Insufficient amount of toner in the toner cartridge.  Shake the toner cartridge horizontally several times to level the toner.
3	Toner cartridge	Toner in the toner cartridge is not level and collects on one side.  Shake the toner cartridge horizontally several times to level the toner. If problem persists, replace toner cartridge.
4	Rear cover assembly	Open rear cover assembly and close properly.
5	Photodeveloper cartridge	Photodeveloper OPC belt is off rack and becomes deformed during operation.  Replace photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b>  <b>Note:</b> Photodeveloper cartridge is a customer order supply.



	<b>Problem area</b>	<b>Action</b>
6	Toner retract system	Toner retract solenoid assembly is failing for specific toner cartridge. Replace toner retract solenoid assembly. See <b>“Toner retract solenoid and cam removal”</b> on <b>page 4-64</b> .

## Toner drop service check

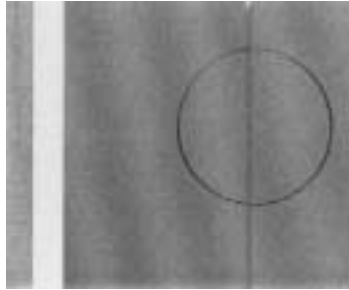


A toner spot stain on paper is caused by ambient toner within printer engine.

	Problem area	Action
1	Waste toner feed system <ul style="list-style-type: none"> <li>• Waste toner auger</li> <li>• Waste toner feeder</li> </ul>	Toner drops on the transfer drum due to a breakdown of the waste toner feed system. <ul style="list-style-type: none"> <li>• Waste toner auger mylar is damaged. Examine and replace if defective. See <b>“Waste toner auger removal” on page 4-72.</b></li> <li>• Waste toner is not properly collected by waste toner feeder. Check to ensure that waste toner feeder is not compacted. If so, replace waste toner feeder. See <b>“Waste toner feeder removal” on page 4-42.</b></li> <li>• Check for waste toner in printer. If found, clean and vacuum printer.</li> </ul>
2	Transfer unit cleaning roller	Cleaning roller is faulty. Remove transfer belt unit (see <b>“Transfer belt unit removal” on page 4-7.</b> ) Replace cleaning roller. See <b>“Transfer belt cleaning roller removal” on page 4-6.</b> Prior to installation of new cleaning roller, thoroughly clean cleaning roller installation area.  Check for waste toner in printer. If found, clean and vacuum printer.

	<b>Problem area</b>	<b>Action</b>
3	Toner cartridge	Replace faulty toner cartridge.

## Vertical line service check



A vertical line appears in printed image.

	<b>Problem area</b>	<b>Action</b>
1	Photodeveloper cartridge (OPC belt) and transfer belt	Foreign particles (dust and so on) adhere to parts located around photodeveloper cartridge and transfer belt unit which consequently contact toner image on transfer belt unit.  Remove and clean photodeveloper cartridge, transfer belt unit, and adjacent areas.
2	Transfer unit cleaning roller and waste toner auger	Cleaning roller and waste toner auger area are dirty.  Remove cleaning roller and clean waste toner auger and area around. Reinstall cleaning roller.

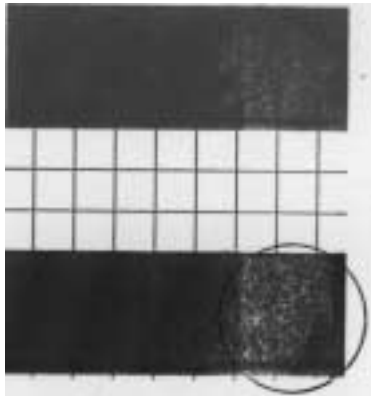
## Vertical staggering image service check



Printed image staggers in vertical direction.

	<b>Problem area</b>	<b>Action</b>
1	Printer vibration	Check for printer vibrations or shock to printer.
2	Laser unit assembly (printhead)	Optical unit failure caused by vibration from scanner motor rotation. Replace laser unit assembly. See <b>“Laser unit assembly (printhead) removal” on page 4-24.</b>

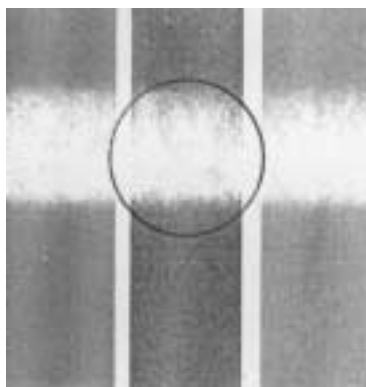
### Vertical white band service check



White band appears in vertical direction of printed image.

	<b>Problem area</b>	<b>Action</b>
1	Toner cartridge	Replace faulty toner cartridge.
2	Photodeveloper cartridge	Replace faulty photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b>
3	Transfer belt unit	TReplace faulty transfer belt unit. See <b>“Transfer belt unit removal” on page 4-7.</b>

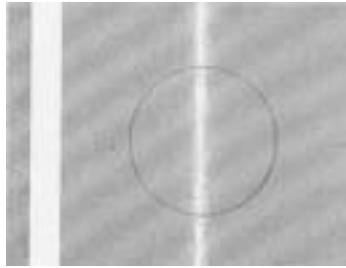
## White band service check



Horizontal white banding creates missing portion of image.

	Problem area	Action
1	Transfer roller	<ul style="list-style-type: none"> <li>• Transfer roller bias pole is not making proper contact with high voltage spring contact. Remove and reinstall transfer roller. Ensure spring contact on left side (looking from front of printer) is not damaged.</li> <li>• Replace faulty transfer roller. See <b>“Transfer roller removal” on page 4-8.</b></li> </ul>
2	Transfer roller clutch	Replace faulty transfer roller clutch. See <b>“Clutch removal” on page 4-40.</b>

## White line I service check

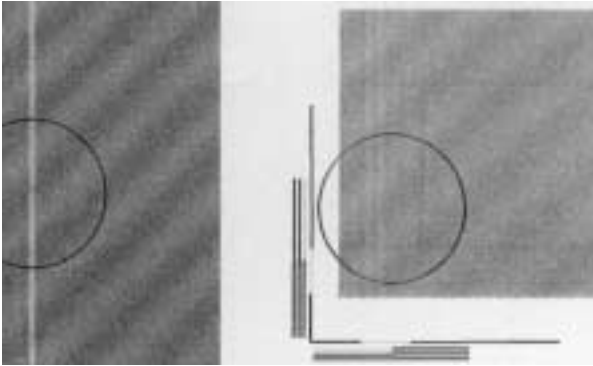


Vertical white line appears in a specific color area when print quality test print is run.

	<b>Problem area</b>	<b>Action</b>
1	Test print	Run print quality test prints. See <b>“Print quality test pages” on page 3-5</b> . White line appears on specific color.
2	Toner cartridge	<ul style="list-style-type: none"><li>• Developer roller of specific toner cartridge is dirty. Remove foreign particle adhering to specific toner cartridge developer roller.</li><li>• Developer roller surface is damaged. Replace problem toner cartridge.</li></ul>



## White line II service check



Vertical white line appears from leading edge to trailing edge of printed image.

	Problem area	Action
1	Laser unit assembly (printhead)	Dust proof glass of laser unit is smeared with toner or foreign particles. Clean glass: <ul style="list-style-type: none"> <li>• Remove toner cartridges and photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b></li> <li>• Open dust-proof glass cover.</li> <li>• Clean glass.</li> </ul> There are foreign particles adhering to laser beam opening of printhead. Clean laser beam opening.
2	Toner cartridge	Foreign particles mixed in toner cartridge. Replace faulty cartridge.

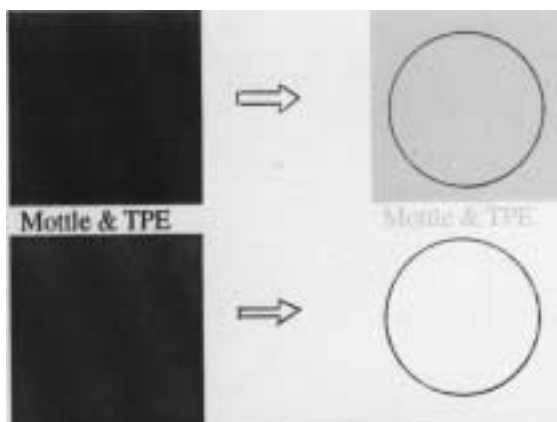
## White spot / black spot service check



A white spot and black spot appear on paper.

	Problem area	Action
1	Photodeveloper cartridge	<p>There are foreign particles adhering to photodeveloper OPC belt. Remove photodeveloper cartridge (see <b>“Photodeveloper cartridge removal” on page 4-11</b>).</p> <p>Lightly wipe off foreign particles using a cotton cloth.</p> <p>If problem persists, replace photodeveloper cartridge.</p>
2	Transfer belt unit	<p>There are foreign particles adhering to transfer belt unit. Remove transfer belt unit (see <b>“Transfer belt unit removal” on page 4-7</b>).</p> <p>Lightly wipe off foreign particles using a cotton cloth.</p> <p>If problem persists, replace transfer belt unit.</p>
3	Toner cartridge	<p>Foreign particles mixed in toner. Replace toner cartridge.</p>
4	Transfer roller	<p>There are foreign particles adhering to transfer roller or transfer roller is deformed. Replace transfer roller. See <b>“Transfer roller removal” on page 4-8</b>.</p>

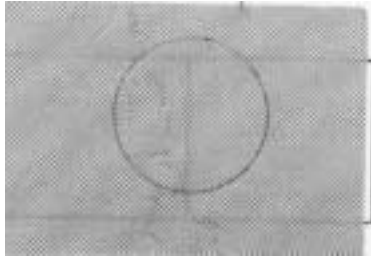
## White print service check



Blank page (no print at all) is printed or a specific color is missing.

	Problem area	Action
Solid white print		
1	Optical Unit (Printhead)	Laser light path is blocked by paper or other material stuck at the opening of the optical unit. Ensure there are no foreign particles stuck at the opening of the optical unit.
2	Transfer roller	Transfer roller is not properly installed. Remove transfer roller and reinstall. See <b>“Transfer roller removal” on page 4-8</b> . Ensure transfer roller bias pole is touching spring contact on left side (as viewed from front of printer) of roller.
3	HVPS	Replace faulty HVPS. See <b>“High voltage power supply (HVPS) removal” on page 4-59</b> .
One color missing		
4	Toner cartridge	Replace faulty toner cartridge.
5	Toner retract system	Replace specific faulty toner retract system. See <b>“Toner retract solenoid and cam removal” on page 4-64</b> .

## Wrinkle / image migration service check



Banding shadows of different optical density appear due to wrinkle, image migration, and color misregistration occurring on paper.

	Problem area	Action
1	Non-recommended paper	Paper being used is not recommended for printer. Replace paper with recommended paper.
2	Rear cover assembly	Open rear cover assembly and reclose, ensuring that both sides properly latch.
3	Fuser assembly	<ul style="list-style-type: none"> <li>• Ensure fuser assembly is properly installed and that both locking levers are locked. See “<b>Fuser assembly removal</b>” on page 4-9.</li> <li>• Replace faulty fuser assembly.</li> </ul> <p><b>Note:</b> Fuser assembly is a customer order supply.</p>

## Uneven density (right and left)

Optical density is different between right and left side of printed image.

	Problem area	Action
1	Rear cover assembly	Open rear cover assembly and reclose, ensuring that both sides properly latch. If rear cover assembly will not properly latch, ensure that white door actuators located at top of rear cover assembly are not damaged. If damaged, replace. These items are part of parts packet. If actuators are not damaged, and door will still not latch, replace rear cover assembly. See <b>“Rear cover assembly removal” on page 4-22.</b>
2	Transfer roller	Transfer roller is not properly installed. Remove transfer roller and reinstall. See <b>“Transfer roller removal” on page 4-8.</b> Ensure transfer roller bias pole is touching spring contact on left side (as viewed from front of printer) of roller.
3	Laser unit assembly (printhead)	Dust-proof glass of laser unit is smeared with toner or foreign particles. Clean glass: <ul style="list-style-type: none"> <li>• Remove toner cartridges and photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b></li> <li>• Open glass cover.</li> <li>• Clean glass.</li> </ul> There are foreign particles adhering to laser beam opening of printhead. Clean laser beam opening.
4	Toner cartridge	Toner cartridge has insufficient amount of toner. Replace toner cartridge.
5	Photodeveloper cartridge	Replace faulty photodeveloper cartridge. See <b>“Photodeveloper cartridge removal” on page 4-11.</b>

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	<b>Problem area</b>	<b>Action</b>
6	Transfer belt unit	Replace faulty transfer belt unit. See <b>“Transfer belt unit removal” on page 4-7.</b>
7	Toner retract system	Replace faulty specific toner retract system. See <b>“Toner retract solenoid and cam removal” on page 4-64.</b>

## Spacing table

### Roller specifications

Name of roller	Diameter (mm)	Number of rotation (rpm)	Repeating defect on print (mm)
Registration assembly rubber roller	∅ 14	283	43
Registration assembly steel roller	∅ 12	321	38
Transfer roller	∅ 20	194	63
Developer roller	∅ 18	345	35
Transfer belt drive roller (part of transfer belt unit)	∅ 30	128	95
Transfer belt cleaning roller	∅ 26	182	67
OPC belt charge brush (part of photodeveloper charging system)	∅ 11	256	47
OPC belt charge roller (part of photodeveloper charging system)	∅ 11	352	34.5
OPC belt drive gear shaft	∅ 5	256	47
OPC belt drive roller	∅ 30	128	95
Fuser roller (part of fuser)	∅ 41	95	128
Fuser belt (part of fuser)	∅ 30	128	95
Paper exit roller (part of paper exit assembly)	∅ 16	246	50
Torque limiter (part of toner retract system-toner retract cam)	N/A	451	27

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## 3. Diagnostic aids

This chapter explains the tests and procedures to identify printer failures and to verify repairs have corrected the problem.

The following diagnostic aids can be initiated at POR by pressing certain button sequences. These tests are also available in diagnostic mode. See “**Diagnostic mode**” on page 3-4, for more information.

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### Disabling download emulations

Error Code 964: Download Emulation CRC Failure. Checksum failure detected in the emulation header or emulation file.

To help resolve Download Emulation problems, the following steps are necessary to instruct the printer to POR without activating any download emulations.

To disable the download emulation:

1. Turn the printer off.
2. Press and hold the **Select** and **Return** buttons.
3. Turn the printer on and release the buttons once “Performing Self Test” displays.

After POR completes, the **CONFIG Menu** is displayed.

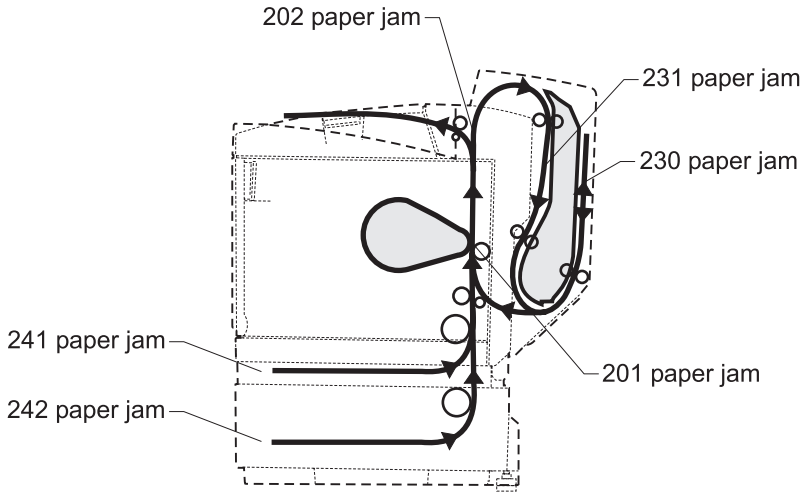
4. Select **Download Emuls** from the menu.
5. Select the **Disable Option**.

The printer automatically exits the configuration menu and initializes as if the download emulator were not installed. Once the printer is idle, a new emulator can be downloaded again.

**Note:** If you power cycle the printer after selecting the disable option, the download emulator will be activated.

## Paper jam sequence

Go to **“Paper jam messages”** on page 2-22 for more information.



**Paper Jam 201** - Indicates media is jammed in inner area (between paper registration sensor and paper exit sensor) of printer.

Open rear cover assembly to access area of paper jam.

**Paper Jam 202** - Indicates media is jammed in outer area (fuser exit sensor) of printer.

- Open rear cover assembly to access area of paper jam.
- Check for pieces of paper or other debris in or around fuser exit sensor area of fuser.
- Check paper exit for signs of damage, contamination, or broken parts.
- If media is jamming at, or over fuser exit sensor, a problem may exist with fuser exit flag.

**Paper Jam 23X**

- 230 Duplex - Indicates that media is jammed between duplex redrive and duplex door. Open duplex door to access jam.
- 231 Duplex - Indicates media is jammed behind duplex redrive. Open duplex door and pull duplex redrive down to access the jam.

**Paper Jam 24X** - Indicates media is jammed in or around paper tray X (X= tray 1 or 2). Remove tray x to access jam.

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## Diagnostic mode

To enter the diagnostic mode:

1. Turn the printer Off.
2. Press and hold the **Go** and **Return** buttons.
3. Turn the printer On.
4. Release the buttons when "Performing Self Test" displays on the operator panel.

The tests display on the operator panel in the order shown:

**Note:** Tray 2 refers to the 530-sheet tray located in the secondary paper feed assembly.

- Print registration
  - Setting Tray 2 left margin (displayed only if Tray 2 is installed)
  - Setting top margin
- Print tests
  - Tray 1
  - Tray 2 (displayed only if Tray 2 is installed)
  - Print quality pages
- Hardware tests
  - LCD test (operator panel)
  - Button test (operator panel)
  - Check engine NVRAM
  - ROM memory test
  - Parallel wrap test (available only if the printer is configured with a standard parallel port)
  - Parallel 1, 2, or 3 wrap test (displayed only if a parallel port is available using PC1 in slot 1)
  - Serial 1, 2 or 3 wrap test (displayed only if a serial port is available using PC1 slot 1)
- Duplex tests (displayed only if duplex unit is installed)
  - Quick test
  - Duplex left margin

- Device tests (displayed only if the flash or disk options are installed)
  - Quick disk test (only when disk is installed)
  - Disk test/clean (only when disk is installed)
  - Flash test (only displayed when a non-defective flash memory option is installed)
- Printer setup
  - Setting the page count
  - Viewing the permanent page count
  - Setting configuration ID
- Error log
  - Viewing, printing, and clearing the error log
- Exit diagnostics

## Diagnostics menu structure

When the diagnostic menu is entered, each diagnostic main menu item displays on the operator panel. When a diagnostic test is selected from the main menu, a sub menu displays and each individual test displays in the order shown. Any options that are referred to in the menus are displayed when the option is installed.

## Print quality test pages

### Print Quality Description

The Print Quality Test consists of 7 pages. Page 1 contains a mixture of graphics and text, whereas pages 2 and 3 only contain graphics.

If Duplex is turned on, then the pages will be duplexed. Otherwise, they are simplexed. The remaining four pages contain color test case information that can be used to help diagnose the source of print defects. Page 1 text consists of the following, and is printed in English:

- Value of the Diagnostic EP SETUP settings.
- Contents of the Diagnostic error log.
- Printer configuration information, (printer serial number, RIP code level, Engine code level, Panel code level, Smart Option code levels, Font version, and so on).

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To run the print quality test pages:

1. Turn the printer Off.
2. Press and hold **Select** and **Return**, while turning On the printer.
3. Release the buttons once "Performing the Self Test" displays.  
After POR completes, the **CONFIG Menu** displays.
4. Select **Prt Quality Pgs** from the menu; one copy of the test page prints.
5. The test pages print one time.

**Note:**

To print additional pages, repeat select **Prt Quality Pgs** from the menu.

---

## Print registration

Print registration provides a method for checking and setting the print position on the page.

Upon first entering the registration menu, your selections are top margin and left margin adj. Tray 2 left margin is set reference to tray 1 left margin.

**Note:** Tray 1 left margin is set by the manufacturer and cannot be changed.

### Setting tray 2 left margin

1. Select **Registration**.
2. Select **Left Margin Adj**.
3. Adjust Tray 2 left margin by increasing the value displayed using **Menu**.

The range is 1 to 15. (Incremented or decremented by one for each button press. Each one is equivalent to .5mm adjustment of left margin.)

4. To save the value press **Select**.

Two alignment pages automatically print for the change made. A correct adjustment is determined when the pages are held to the light and the lines on both pages line up with each other.

**Note:** If you select the Continuous Option under Duplex Quick Test, you will need to press the stop button to cancel the test.

5. Press **Return** to exit the registration menu.

## Setting top margin

1. Select **Registration**.
2. Select **Top Margin**.
3. Adjust the top margin by increasing the value displayed using **Menu**.

The range is 1 to 15. (Incremented or decremented by one for each button press. Each one is equivalent to .7mm adjustment of top margin.)

4. To save the value press **Select**.

A quick test page automatically prints for the change made.

**Note:** If you select the Continuous Option under Duplex Quick Test, you will need to press the Stop button to cancel the test.

5. Press **Return** to exit the registration menu.

---

## Print tests

The purpose of the diagnostic print tests is to verify that the printer can print on media from each of the installed input options.

For each input source selected, the following choices are available:

Single (prints the print test page once).

Continuous (continue printing the print test page until Return or Stop is pressed).

- Tray 1 = single, Tray 1 = continuous
- Tray 2 = single, Tray 2 = continuous (if installed)

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The contents of the print test page vary depending on the media installed in the selected input source. If a source is selected that contains paper, legal, letter and so on, a page similar to the quick test page is printed. However, the page does not contain the print registration diamonds.

If Continuous is selected, all sources printing print the same page continuously until the test is stopped. If continuous is selected for a source containing envelopes, the envelope print test pattern prints on the first envelope and subsequent envelopes are blank.

**Note:** The print test page may be printed on any paper or envelope size, however more than one sheet of some media sizes may be required. The print test page is always single sided, regardless of duplex settings or the presence of the duplex unit.

To run the print test page:

1. Select **Print Tests** from the diagnostic menu.
2. Select the media source.
3. Select **Single** or **Continuous**.

If single is selected, no buttons are active during printing. If continuous is selected, Return or Stop can be selected to cancel the test.

**Note:** The power indicator blinks while the page is printing. Check each test page from each source to assist in print quality and paper feed problems.

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## Hardware tests

The following hardware tests can be selected from this menu:

LCD Test	Button Test
DRAM Memory Test	ROM Memory Test
Parallel Wrap (if available)	Serial Wrap (if available)
Serial 1 Wrap (if available)	Serial 2 Wrap (if available)
Serial 3 Wrap (if available)	



## LCD test

To run the LCD test:

1. Select **LCD Test** from the diagnostic menu.  
The LCD test continually executes the LCD display test.
2. Press **Return** or **Stop** to cancel the test.

## Button test

To run the button test:

1. Select **Button Test** from the diagnostic menu.  
With no buttons pressed, several OP (Open) appear on the display.
2. Press each button one at a time and a CL (Closed) displays in place of an OP.  
The proper operation of each button can be checked.
3. Press **Return** or **Stop** to cancel the test.

## Parallel wrap test

This test is used with a wrap plug to check operation of the parallel port hardware. Each parallel signal is tested.

To run the parallel wrap test:

1. Disconnect the parallel interface cable and install the wrap plug (P/N 1319128).
2. Select the **Parallel Wrap Test** from the menu.

The power indicator blinks indicating the test is in progress. The test runs continuously until canceled.

Each time the test finishes, the screen is updated with the result (Display shows P:##### for pass and F:##### for fail). If the test passes, the pass count increases by 1, however if the test fails, one of the following messages display for approximately 3 seconds and then the fail count increases by one.

Sync Busy Error

Strobe Interrupt Request Error

Byte Interrupt Request Error

Init Fall Error

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Init Busy Error	Init Rise Error
Host Busy Error	RAM Data FF Error
RAM Data AA Error	RAM Data 00 Error
RAM Data 55 Error	DMA Count Error
DMA Address Error	DMA Interrupt Error
DMA Memory Error	DMA Background Error
Clear Init Rise Error	False Init Rise Error
False Init Fall Error	Clear Autofeed Rise Error
Autofeed Rising Interrupt Error	Autofeed Falling Interrupt Error
False Autofeed Rise Error	
Clear Autofeed Fall Error	

Once the maximum pass or fail count is reached, the test stops and the final test results are displayed.

3. Press **Return** or **Stop** to exit the test.

## ROM memory test

The ROM memory test is used to check the validity of the RIP board code and fonts.

To run the ROM memory test:

1. Select **ROM Test** from the menu.

The power indicator blinks indicating the test is in progress. The test runs continuously.

2. Press **Return** or **Stop** to exit the test.

P:##### represents the number of times the memory test has passed and finished successfully. Initially 000000 displays with the maximum pass count being 999,999.

F:##### represents the time the memory test has failed and finished with errors. Initially 00000 displays with the maximum fail count being 99,999.

Each time the test finishes, the screen updates with the result. If the test passes, the pass count increases by 1, however if the test fails, one of the following messages displays for approximately 3 seconds:

- ROM checksum error
- ROM burst read error

Once the maximum pass or fail count is reached, the test stops and the final results display on the screen.

## DRAM memory test

The purpose of this test is to check the validity of DRAM, both standard and optional. The test writes patterns of data to DRAM to verify that each bit in memory can be set and read correctly.

To run the DRAM memory test:

1. Select **DRAM Test** from the menu.

The power indicator blinks indicating the test is in progress.

2. If you need to stop the test before it finishes, turn the printer off.

P:##### represents the number of times the memory test has passed and finished successfully. Initially 000000 displays with the maximum pass count being 999,999.

F:##### represents the time the memory test has failed and finished with errors. Initially 00000 displays with the maximum fail count being 99,999.

Once the maximum pass count or fail count is reached, the test stops, and the final results display. If the test fails, the message DRAM error, displays for approximately three seconds and the fail count increases by 1.

## Serial wrap test

This test is used to check the operation of the serial port hardware using a wrap plug. Each signal is tested.

To run the serial wrap test:

1. Disconnect the serial interface cable and install the wrap plug.
2. Select the appropriate **Serial Wrap Test** from the menu.

The following screen displays: serial X wrap P:#####  
F:#####

- X indicates which serial port is being tested,

blank = standard

1 = optional serial port #1

2 = optional serial port #2

3 = operational serial port #3.

- P represents the number of times the test has passed (finished successfully). Initially 000000 is displayed for #####. The maximum pass count is 999,999.
- F represents the number of times the test has failed or finished with errors. Initially 000000 is displayed for #####. The maximum fail count is 99,999.

**Note:** The power indicator blinks indicating the test is running.

Each time the test finishes, the screen updates with the result. If the test passes, the pass count increases by 1, however if the test fails, one of the following failure messages displays for approximately 3 seconds and the fail count increases by 1:

Receive Status Interrupt Error	Status Error
Receive Data Interrupt Error	Transmit Data Interrupt Error
Transmit Empty Error	Threshold Error
Receive Data Ready Error	Break Interrupt Error
Framing Error	Parity Error
Overrun Error	Data Error
Data 232 Error	Data 422 Error
FIFO Error	DSR Error
DSR PIO Error	DSR Interrupt Error
CTS Error	CTS Interrupt Error
CTS PIO Error	

Once the maximum count is reached the test stops and the final results display.

3. Press **Return** or **Stop** to exit the test.

---

## Duplex tests

### Duplex left margin

The left margin adjust lets the user set the left margin for the duplex option so it matches the base machine left margin, for alignment purposes. It can also be used to print a page for duplex testing.

To set the duplex left margin:

1. Enter diagnostic mode. See **“Diagnostic mode” on page 3-4**, for more information.
2. Select **Duplex Test**.
3. Select **Duplex Left Margin**.
4. Adjust left margin position using **Menu>** or **Menu<**.
5. To save the value press **Select**.

The range is 1 to 15.

An alignment page automatically prints for the change made. A correct adjustment is determined when the page is held to the light and the lines on both sides of the page line up with each other.

6. Press **Return** to exit the diagnostic mode.

**Note:** The duplex feed test can be run using any of the paper sizes supported.

Pressing **Select** causes the alignment pages for the duplex unit to print. Once the pages have printed, the user needs to hold up the two sheets as designated by the headings on the page “Top of Sheet” to show the proper orientation of the page. Hold the pages to the light and set the left margin to the value whose vertical lines most closely align on the sheet. The printing alignment page status message displays and the power indicator blinks, while the pages are being fed through the printer. The duplex left margin cannot be canceled.

---

## Device tests

### Quick disk test

This test performs a non-destructive read/write on one block per track on the disk. The test reads one block on each track, saves the data, and proceeds to write and read four test patterns to the bytes in the block. If the block is good, the saved data is written back to the disk.

To run the quick disk test:

1. Select the **Quick Disk Test** from the device tests menu.  
The power indicator blinks while the test is in progress.
2. The "Quick Disk Test/Test Passed" message displays and the power indicator turns on solid.
3. The "Quick Disk Test/Test Failed" message displays and the power indicator turns on solid.
4. Press **Go**, **Return**, or **Stop** to return to the device test menu.

### Disk test/clean

**Warning:** This test destroys all data on the disk and should not be attempted on a good disk. Normally this test will only be used when the disk contains bad data and is therefore unusable. Also note that this test may be extremely lengthy depending on the disk size.

To run the disk test/clean test:

1. Select **Disk Test/Clean** from the device tests menu.  
"Files will be lost. Go/Stop?" message displays to warn the user that all contents on the disk will be lost.

To exit the test immediately and return to the device tests menu, press **Return** or **Stop**. To continue with the test, press **Go**. If **Go** is selected, "Disk Test/Clean/Testing ... yyy%" message displays. The screen updates periodically indicating the percentage of test completed and the number of bad blocks found.

The power indicator blinks during the test. Because of the nature of this operation, canceling of this test is not allowed.

If the test passes, then the following message is displayed:

- Disk Test/Clean  
Test Passed

If the test fails, then the following message is displayed:

- Disk Test/Clean  
Test Failed

2. Press **Go**, **Return**, or **Stop** to return to the device tests menu after the test is complete.

## Flash test

This test causes the file system to write and read data on the flash to test the flash.

**Warning:** This test leaves the flash unformatted. The flash will be formatted later in this procedure.

To run the flash test:

1. Select **Flash Test** from the device tests menu.
  - The following message is displayed to warn the customer that all flash content will be lost: "Files will be lost. Go/Stop." Press **Go** to continue, **Return** or **Stop** to exit the test immediately.
  - The power indicator blinks while the test is running.
  - "Flash Test/Test Passed" message displays if the test passes and the power indicator turns on solid.
  - "Flash Test/Test Failed" message displays if the test fails and the power indicator turns on solid.
2. Press **Go**, **Return**, or **Stop** to return to the device tests menu.

---

## Printer setup

**Note:** Defaults within this printer can be set to either U.S. or Non-U.S.

### Setting the page count

This lets the servicer change the page count from the diagnostic menu. This is used whenever the operator panel cable is replaced because this contains the printer NVRAM memory where the page count is stored.

To set the page count:

1. Select **Page Counts** from the diagnostic menu. To enter diagnostic mode, see **“Diagnostic mode” on page 3-4**.
2. Select either **Color Page Counts** or **Mono Page Counts**.  
The current page count displays and the leftmost digit blinks, indicating it is the first digit to be changed.
3. Press **Menu** until the value you want appears.
4. Press **Select** to move to the next digit.
5. Press **Menu** until the value you want appears.  
Continue with each digit until you set the page count. You can skip any digit by pressing **Select**.
6. Press **Select** to save the new page count in NVRAM.
7. Press **Return** or **Stop** to exit the diagnostic menu.

### Viewing the permanent page count

**Note:** The permanent page count can only be viewed; it cannot be changed.

To view the permanent page count:

1. Select **Perm Page Count** from the page counts menu.
2. Press **Return/Stop** to exit the diagnostic menu.



## Serial number

The serial number is set at the factory and cannot be changed. This is for viewing the serial number only.

The serial number will be XXXXXXXX (8-digit string)  
Where X=A to Z, or 0 to 9.

If you replace the engine controller board, the serial number needs to be identified from the serial number label on the printer.

## Setting configuration ID

The configuration ID is used to communicate information about certain areas of the printer that cannot be determined using hardware sensors. The configuration ID is originally set at the factory when the printer is manufactured, however it requires resetting whenever you replace the operator panel cable and can be set on the operator panel.

To set the configuration ID:

1. Obtain the configuration ID for this printer by opening the front cover and looking for a sticker on the inner front cover.
2. Enter diagnostics mode, see **“Diagnostic mode” on page 3-4**.
3. Select **Configuration ID** from the printer setup menu.

The current ID displays on the screen. The leftmost digit blinks indicating that it is the first digit to be changed.

4. Press either **Menu** to change to the value you want.
5. Press **Select** to move to the next digit, or press **Select** again to skip a digit.

Change each digit as required.

6. When the last digit is changed, press **Select** to validate the Configuration ID.
  - If the ID is invalid then "INVALID ID" message displays on Line 2 before the ID re-displays. You have to reenter the configuration ID until a valid ID is verified.

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- If the ID is valid then the ID is saved in NVRAM and the printer automatically PORs to activate the new setting.

**Note:** When the printer PORs it does so in the normal mode.

### Parallel strobe adjustment

This setting lets the user adjust the factory setting for the amount of time strobe is sampled. This determines whether valid data is available on the parallel port.

Increasing this value means that strobe is sampled 50ns longer.  
Decreasing this value means that strobe is sampled 50ns shorter.

The range of this setting is -4 to +6.

Example of setting:

- A value of 0 indicates no adjustment is sampled from the factory setting.
- A value of -1 indicates the sample strobe time is reduced by 50ns.
- A value of +3 indicates the sampled strobe time is increased by 150ns.

---

## Error log

### Viewing the error log

The error log provides a history of printer errors. The error log contains the 12 most recent errors that have occurred on the printer. The most recent error displays in position 1 and the oldest error displays in position 12 (if 12 errors have occurred). If an error occurs after the log is full, the oldest error is discarded. Identical errors in consecutive positions in the log are entered. All 2xx and 9xx error messages are stored in the error log.

To view the error log:

1. Select **Display Log** from the error log menu.  
The error log displays on three screens as only four entries display at a time.
2. To move to the next screen press **Menu>** to move forward or **<Menu** to move backward.
3. Press **Return** or **Stop** to exit the error log.

### Printing the error log

The history of printer errors can also be printed. The printout of the log contains the following information for each error in the log:

- Model and serial number of the printer
- Page count when the error occurred
- Code versions of all packages when error occurred
- Panel display when error occurred
- Debug information depending on error (no debug information for 900 service errors)

The extra information is intended to assist in diagnosing problems quicker.

To print the error log:

1. Select **Print Log** from the error log menu.
2. Press **Return** or **Stop** to exit the error log.

## Clearing the error log

To clear the error log:

1. Select **Clear Log** from the error log menu.
2. Select **YES** to clear the error log or **NO** to exit the clear log menu.

If **YES** is selected, the empty error log displays on the screen.

3. Press **Return** or **Stop** to exit the clear log menu.

## Restore EP factory defaults

To restore each of the printer settings contained in the EP setup menu to their factory default value select **Defaults** from the printer setup menu. To exit the menu without restoring the settings to the factory default values, press **Return**. Sometimes this is used to help correct print quality problems.

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## Exiting diagnostic mode

Select **Exit Diagnostics** to exit the diagnostics mode and return to normal mode.

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## 4. Repair information

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### Removal and cleaning precautions

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Observe the following precautions whenever you service the printer:

- Be sure to unplug the printer from the outlet before attempting to service the printer.
- To reassemble the printer, reverse the order of removal unless otherwise specified.
- Do not operate the printer anytime during removals. If it is absolutely necessary to run the printer with its covers removed, use care not to allow your clothing to be caught in revolving parts such as the gears, rollers and fan motor.
- Never touch the terminals of electrical parts or high-voltage parts such as the high voltage power supply.
- Remove the ground wire when removing or replacing the low voltage power supply. After installation is complete, confirm the ground wire is reconnected to the earth mark .
- After part replacement, ensure the wiring harness is not caught or damaged.
- Do not attempt to cut or extend the wiring harness.
- Confirm the wiring harness connector is connected properly.
- Be sure to handle the fuser carefully as it remains hot for a while after the printer stops running. Always unplug connectors by holding the connector housing.
- Remember to install the ground wire or ground plate to ensure positive conduction. Install the screw with a toothed washer in the correct position at reassembly.

---

## Handling the printed circuit boards with MOS ICs

The following precautions must be observed when handling circuit boards with MOS (Metal Oxide Semiconductor) ICs.

### During transportation/storage:

- Do not remove new circuit boards from their protective conductive bags until needed.
- Do not store or place circuit boards in a location exposed to direct sunlight.
- When it becomes necessary to remove a board from its conductive bag or case, always place it on its conductive mat in an area as free as possible from static electricity.
- Do not touch pins of the ICs with your bare hands.

### During replacement:

- Before you unplug connectors from the circuit boards, be sure the power cord has been unplugged from the power outlet.
- When you remove a board from its conductive bag or case, do not touch the pins of the ICs or the printed pattern. Place it in position by holding only the edges of the board.
- Before you plug connectors into the board, be sure the power cord has been unplugged from the power outlet.

### During inspection:

- Avoid checking any IC directly with a multimeter; use connectors on the board.
- Never create a closed circuit across IC pins with a metal tool.
- If it is necessary to touch the ICs and other electrical components on the board, be sure to ground your body.



---

## Photodeveloper cartridge

The following precautions must be observed when handling the photodeveloper cartridge or commonly called OPC (optical photo conductor). The photodeveloper cartridge is a supply item you will have to remove during some of the repair procedures:

### During transportation/storage

Use the specified carton whenever moving or storing the photodeveloper cartridge.

### Handling

- The OPC belt in the photodeveloper cartridge exhibits the greatest light fatigue after being exposed to strong light over an extended period of time. Never expose it to direct sunlight. Cover the photodeveloper cartridge when you remove it from the printer.
- Use care not to contaminate the surface of the OPC belt with oil-base solvent, fingerprints, and other foreign matter.
- Do not scratch the surface of the OPC belt.

### Parts not to be touched

Any part where the mounting screws are used to meet a machine alignment set at the factory must not be removed, disassembled, or adjusted. For example, the paper pickup roll mounting bracket or internal parts not provided as replacement parts.


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## Printer removal procedures

### Precautions to take before maintenance work

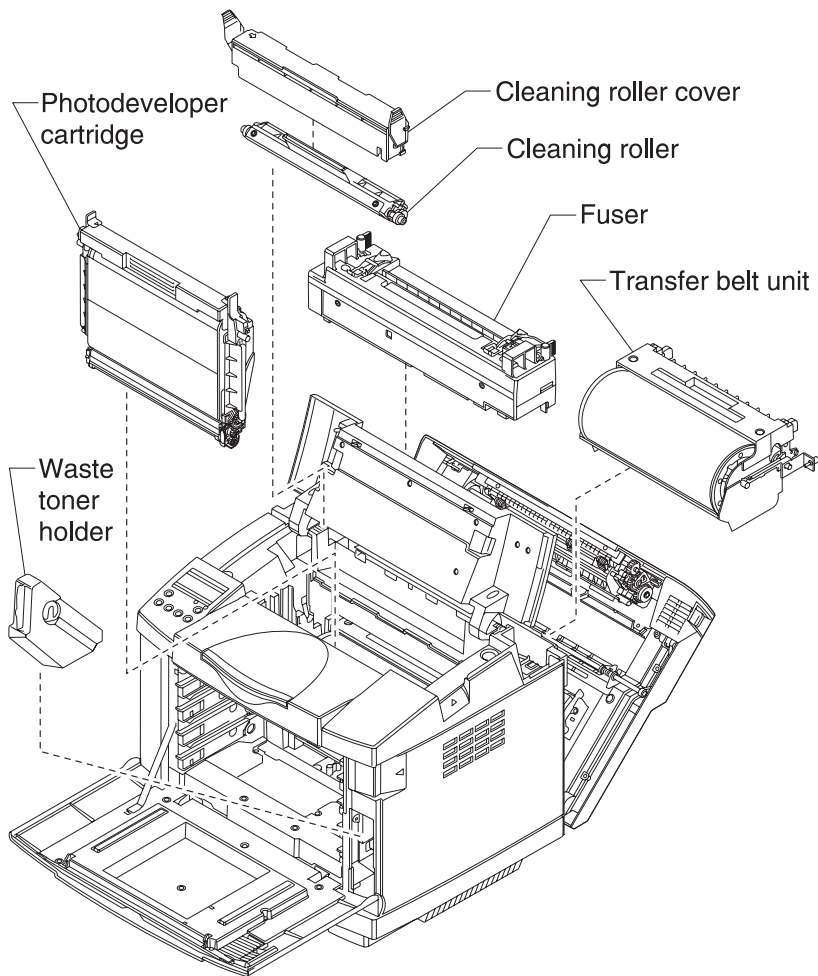
Do not implement any operation, removal, or modification and so on, which are not presented in this manual.

1. Turn the printer power off and unplug the power cable from the outlet prior to starting removals or checks.
2. Prior to starting any repairs, read and understand the warnings in this manual.
  - High temperature
  - High voltage
  - Laser radiation
3. Collect and properly dispose of the waste toner or toner cartridge.
4. Remove the ground wire when removing or replacing the low voltage power supply.

After installation is complete, confirm the ground wire is reconnected to the earth mark .
5. Confirm the direction of all parts and screw length during removal/replacement.
6. Utilize the proper cleaning procedures/solvents during maintenance.
7. Confirm that all parts and covers are properly installed and assembled prior to starting the print test.

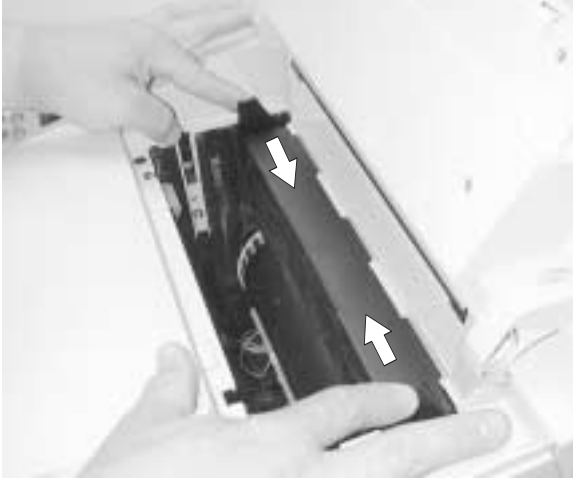
## CRU/FRU and supplies removals

There are FRU/CRUs and supply items that will need to be removed prior to some of the removal procedures. The removal procedure will specify when the part must be removed.



## Cleaning roller cover removal

1. Open top cover.
2. Depress tabs and remove cleaning roller cover.



## Transfer belt cleaning roller removal

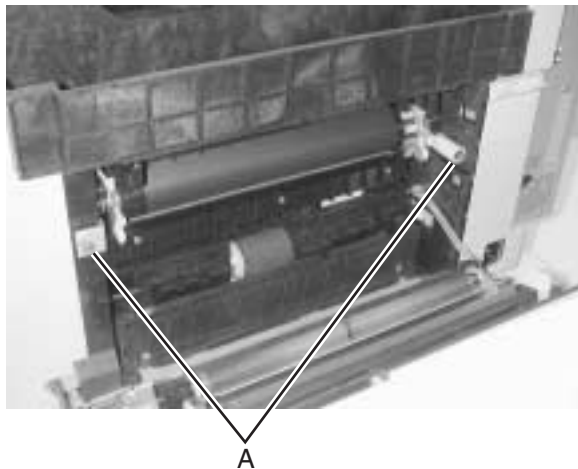
1. Remove cleaning roller cover. See **“Cleaning roller cover removal” on page 4-6.**
2. Lift and remove transfer belt cleaning roller.



## Transfer belt unit removal

**Note:** If the duplex unit is installed, remove it to allow greater rear cover assembly clearance. The captive screw on the right can be removed by pulling out the plastic sleeve and rotating or by using a screwdriver.

1. Open rear cover assembly.
2. Rotate two captive screws (A) counterclockwise until loose.



**Warning:** Take great care when removing the transfer belt unit to prevent scratching the transfer belt. Do not touch or hit the belt during removal.

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3. Pull transfer belt unit toward rear of printer, lift and remove.



### Transfer roller removal

1. Open rear cover assembly.
2. Rotate transfer roller to release; lift and remove.



## Fuser assembly removal

1. Push rear cover assembly latch and lower rear cover assembly.
2. Turn two green fuser release levers (A).



A

3. Lift fuser straight up and away from printer.



## Waste toner bottle removal

1. Open front cover.
2. Remove waste toner bottle.



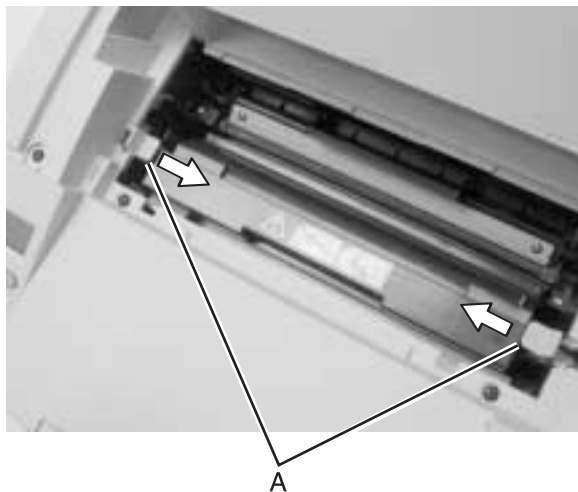
**Warning:** Ensure that waste toner bottle is secured and not allowed to tip over during repair process. Failure to adhere to this warning may result in toner spillage.



## Photodeveloper cartridge removal

**Warning:** Follow precautionary procedures (see **“Photodeveloper cartridge” on page 4-3**) when removing photodeveloper cartridge.

1. Open top cover assembly.
2. Depress release levers (A).
3. Lift and remove photodeveloper cartridge.



4. Lay photodeveloper cartridge as shown in a clean area.



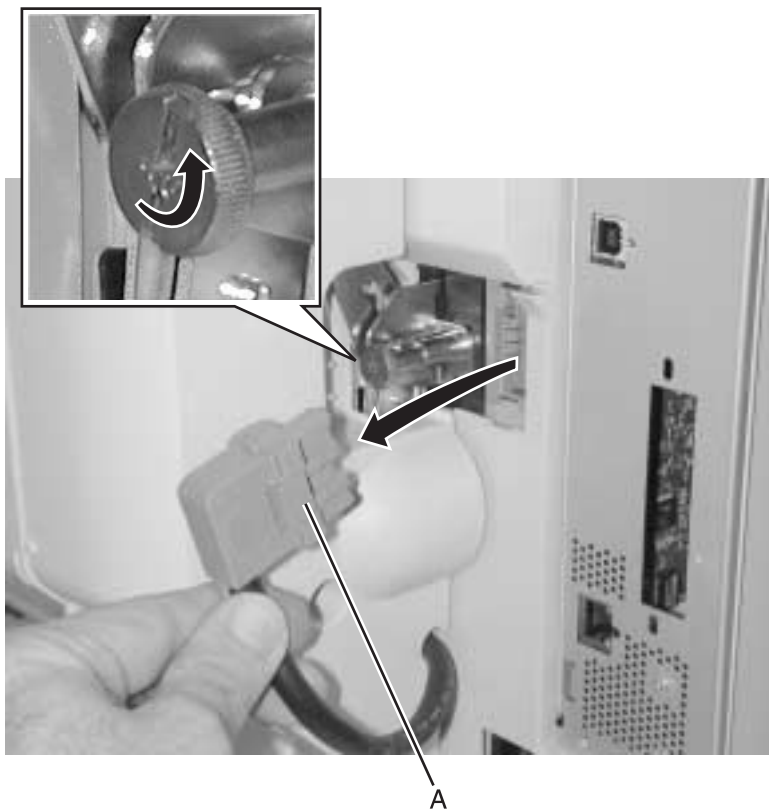
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5. Cover photodeveloper cartridge with a piece of paper as shown.



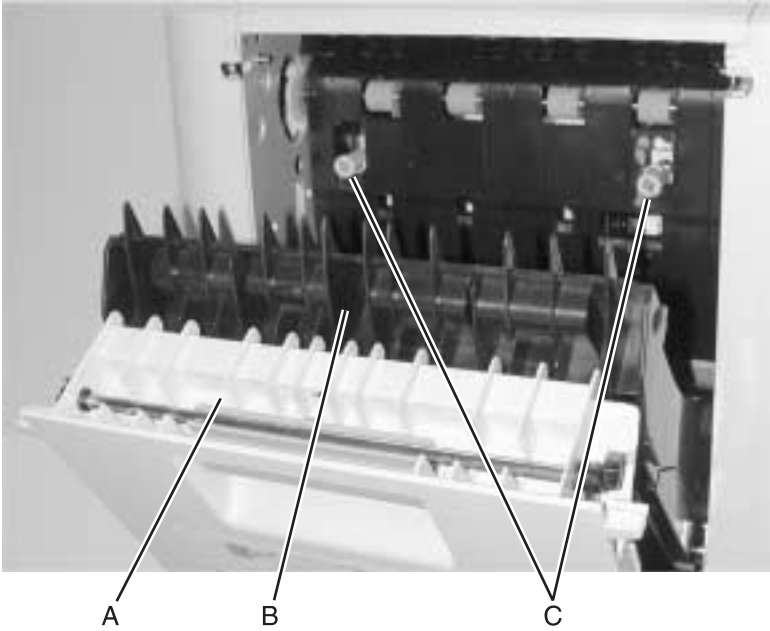
## Duplex unit assembly removal

1. Unplug duplex connector.
2. Turn bracket mounting screw counterclockwise to loosen it. Unhook the bracket (A) from the slot.



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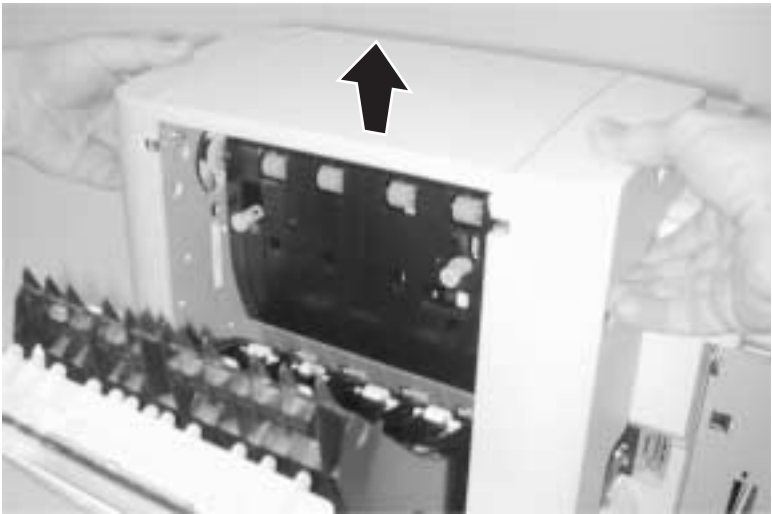
3. Open duplex rear door (A) and pull down redrive assembly (B).
4. Pull green thumbscrews (C) out and turn counterclockwise until loosened.



**Note:** During reinstallation of duplex unit, ensure that thumbscrews are fully depressed after tightening. Failure to fully depress the thumbscrews may result in paper jams.

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5. Lift duplex unit up and away from printer.

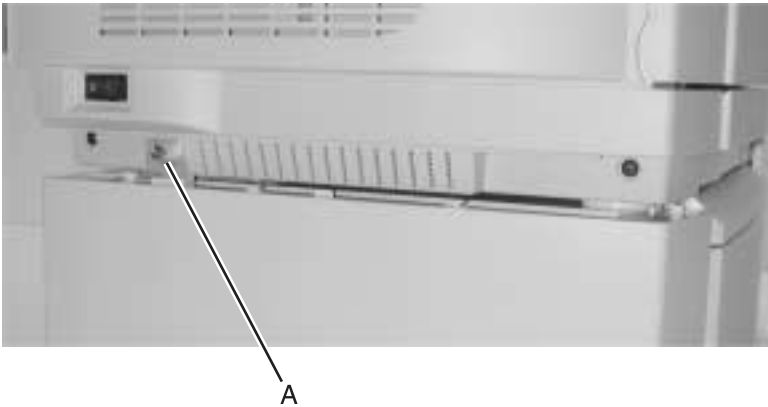


## Secondary paper feed assembly removal

1. Remove left secondary paper feed assembly cover. Repeat for the right side.

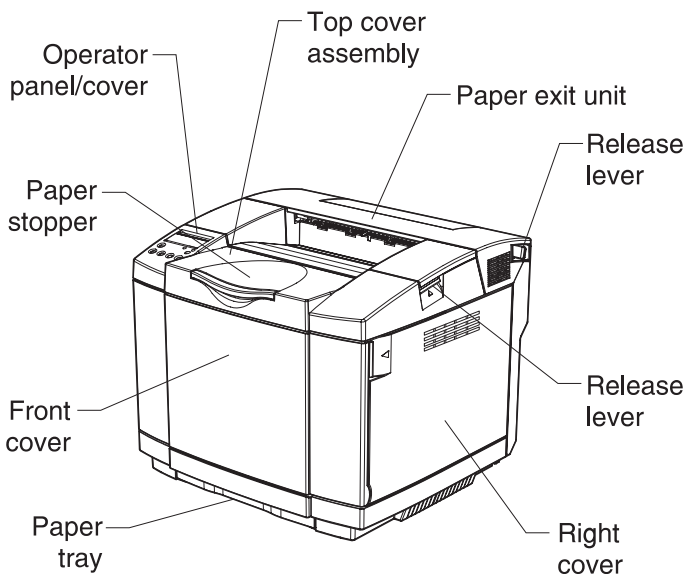


2. Loosen thumbscrew (A) on left bracket and remove bracket. Repeat for right side.

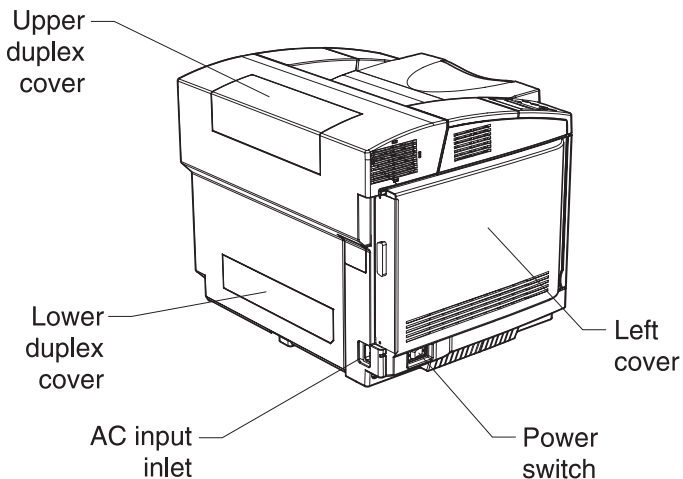


3. With aid from another person, lift printer by recessed handholds and remove from secondary paper feed assembly.

## Cover removals



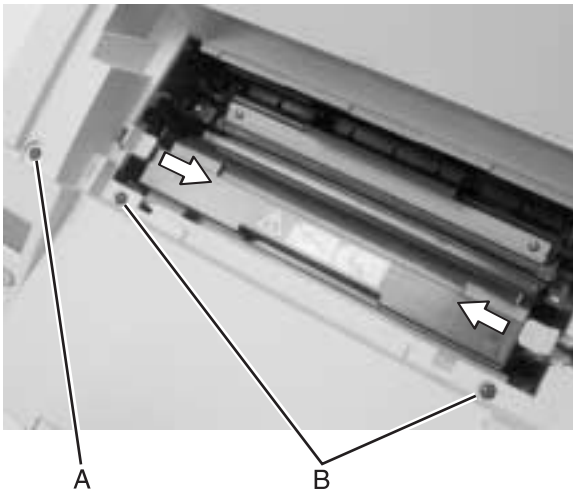
**Front view**



**Back view**

## Top cover assembly removal

1. Remove cleaning roller cover. See **“Cleaning roller cover removal” on page 4-6.**
2. Remove photodeveloper cartridge. See **“Photodeveloper cartridge removal” on page 4-11.**
3. Open rear cover assembly.
4. Open front cover.
5. Remove screw (A) from operator panel.
6. Rotate rear of operator panel and operator panel cover up.
7. Pull operator panel forward and turn it over.
8. Disconnect operator panel cable.
9. Remove two screws (B) from top cover assembly.





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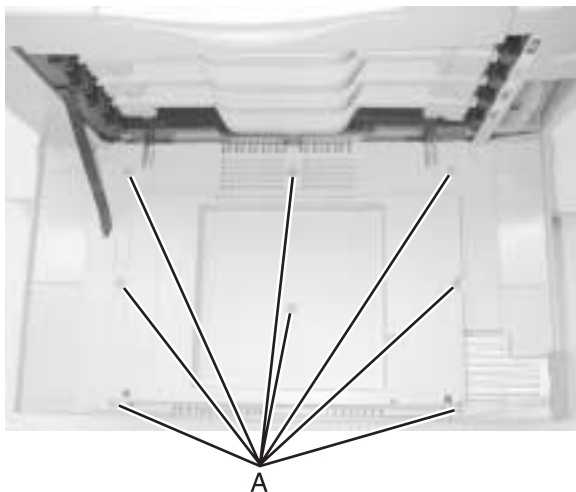
10. Release tabs on front of top cover assembly.



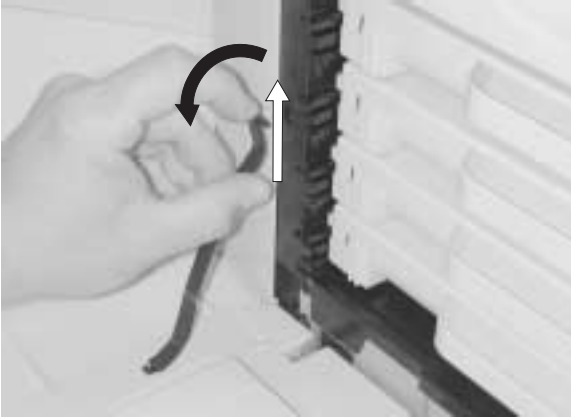
11. Lift top cover assembly and remove.

### Front cover assembly removal

1. Open front cover assembly.
2. Remove 8 screws (A) from inner front cover.



3. Disengage support strap from printer.



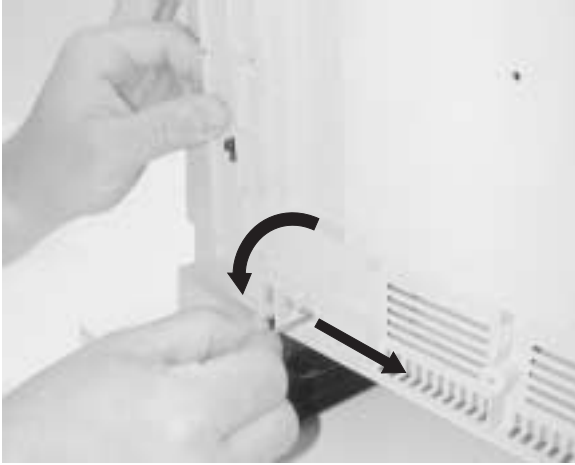
4. Release tabs on front cover.



5. Remove front cover from inner front cover.
6. Raise front inner cover.

## 5021-0XX

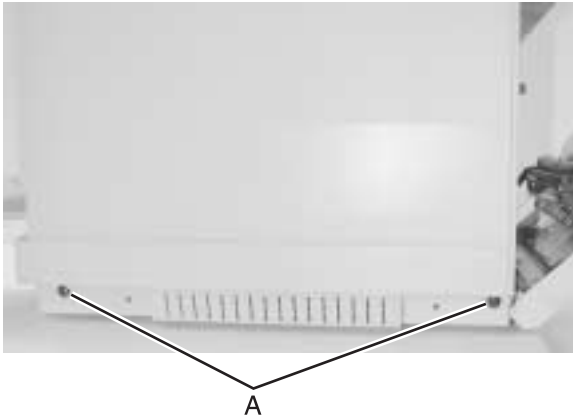
7. Rotate support pin away from printer and slide toward center of printer to remove. Repeat for other support pin.



8. Remove front inner cover from printer.

## Right cover removal

1. Remove waste toner bottle. See **“Waste toner bottle removal” on page 4-10.**
2. Remove top cover assembly. See **“Top cover assembly removal” on page 4-18.**
3. Remove 2 screws (A) from bottom of right cover.



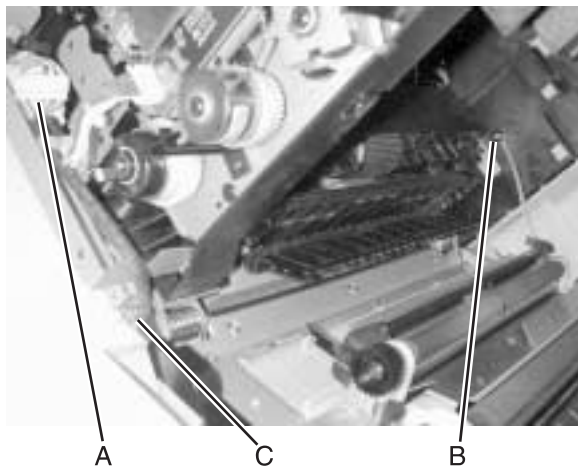
4. Remove right cover from printer. Maneuver front cover for easy removal.

## Rear cover assembly removal

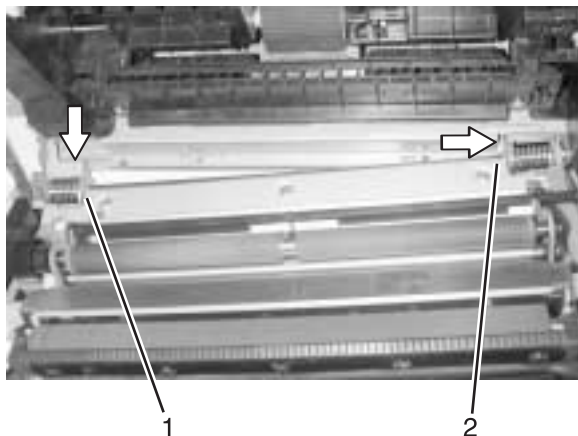
1. Remove fuser assembly. See **“Fuser assembly removal” on page 4-9.**
2. Remove transfer belt unit. See **“Transfer belt unit removal” on page 4-7.**
3. Remove right cover. See **“Right cover removal” on page 4-22.**

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4. Disconnect rear cover assembly connector (A).
5. Remove support pin (B), disconnecting support cable from printer.
6. Remove two screws (C) from rear cover assembly.



7. Slide right side of rear cover assembly away from printer until hinge clears slot.

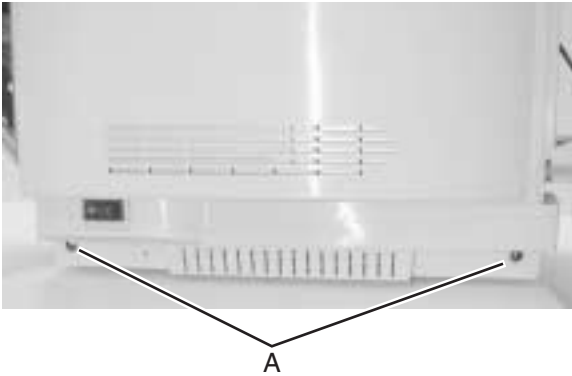


8. Slide rear cover assembly toward right side until captured end of rear cover assembly clears mounting bracket.
9. Remove rear cover assembly by pulling away from printer.

## Left cover removal



1. Remove rip board. See **“RIP board removal” on page 4-45.**
2. Remove top cover assembly. See **“Top cover assembly removal” on page 4-18.**
3. Remove two screws (A) from bottom of left cover.



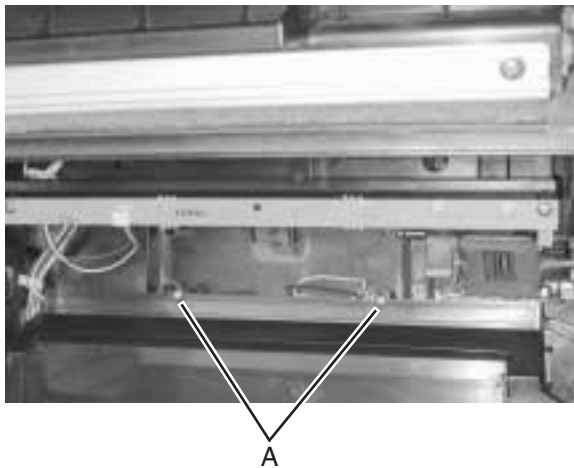
4. Remove left cover from printer.

## Laser unit assembly (printhead) removal

1. Open front cover.
2. Remove toner cartridges.
3. Remove photodeveloper cartridge. See **“Photodeveloper cartridge removal” on page 4-11.**
4. Open top cover assembly.

## 5021-0XX

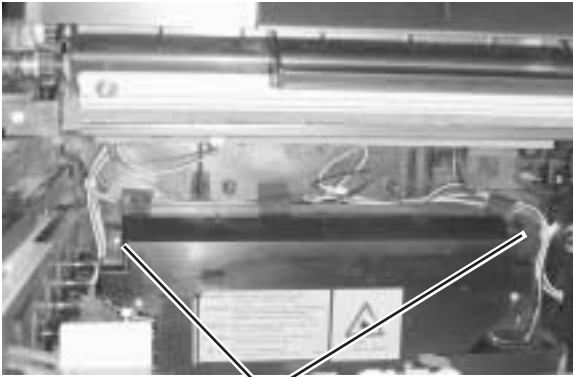
5. Remove two screws (A) from laser unit assembly cover. Photograph shows looking through opening in top cover assembly.



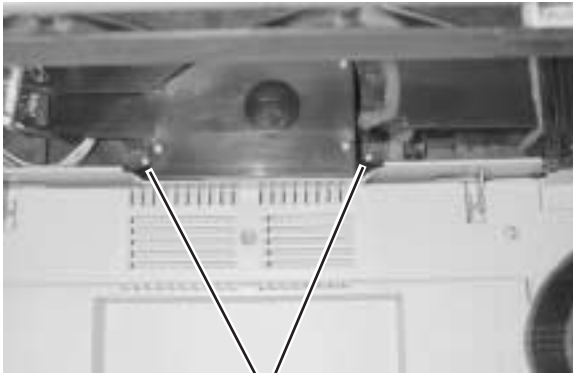
6. Unlatch and remove laser unit assembly cover.



7. Remove four screws (B) from laser unit assembly.



B



B

8. Remove laser unit assembly from printer.
9. Disconnect connector from laser unit assembly.

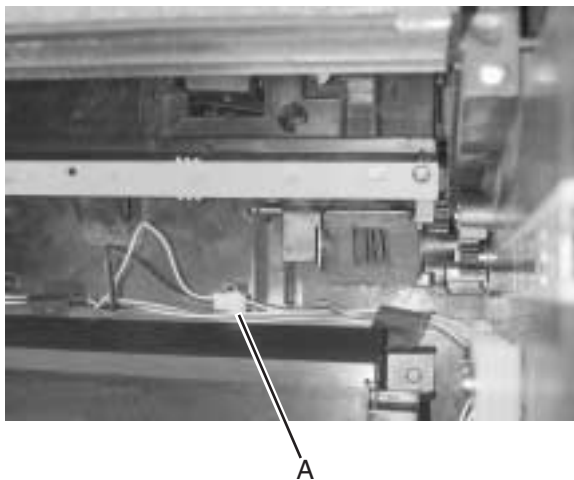
### Laser unit fan assembly removal

1. Open front cover.
2. Remove toner cartridges.
3. Remove photodeveloper cartridge. See **“Photodeveloper cartridge removal” on page 4-11.**
4. Open top cover assembly.

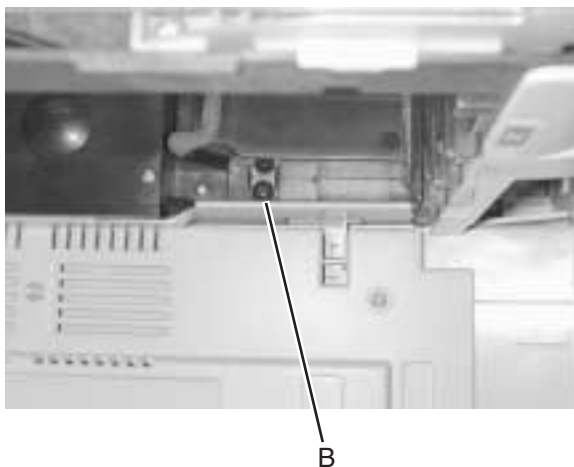


## 5021-0XX

5. Disconnect laser unit fan assembly connector (A).



6. Remove screw (B).



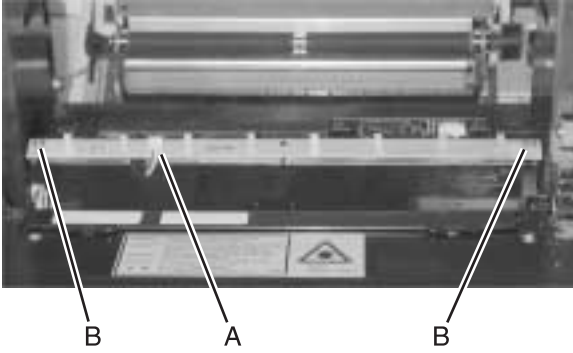
7. Remove fan assembly.

### Eraser lamp removal

1. Remove all toner cartridges.
2. Remove photodeveloper cartridge. See **“Photodeveloper cartridge removal” on page 4-11.**
3. Remove transfer belt unit. See **“Transfer belt unit removal” on page 4-7.**

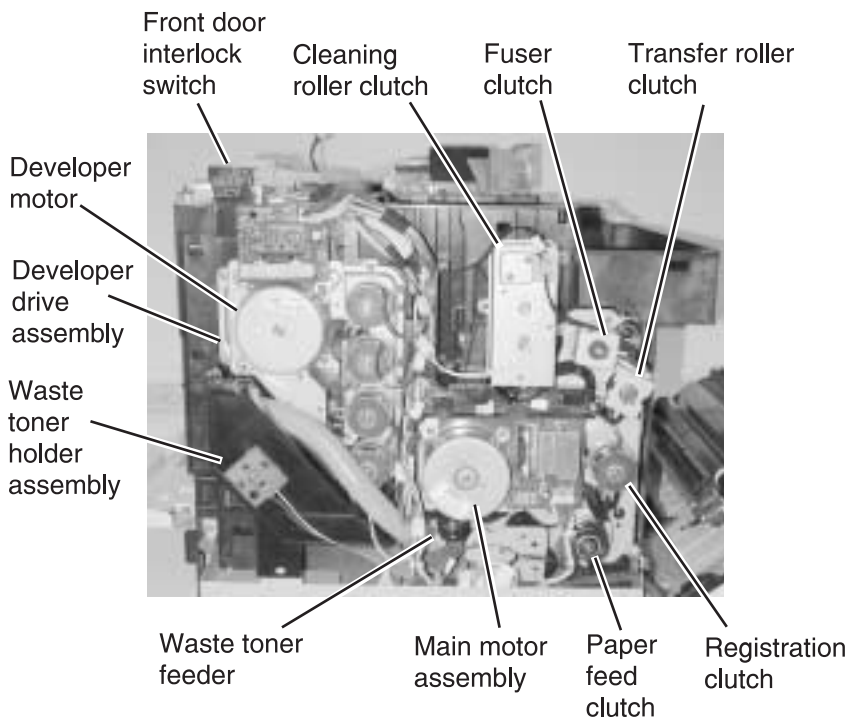
## 5021-0XX

4. Disconnect erase lamp cable (A).
5. Remove two screws (B).



6. Remove erase lamp.

## Right side removals



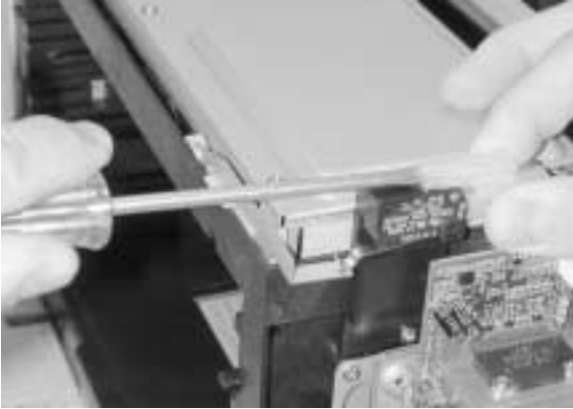
### Front door interlock switch removal

1. Remove top cover assembly. See **“Top cover assembly removal” on page 4-18.**

**Note:** The interlock cable may be difficult to remove. Use a flat tip tool to disengage the mechanical lock between the cable connector and switch contacts. The switch comes with a bracket. If switch is defective, replace only the switch. If bracket is broken, replace the switch with bracket. See **“Front door interlock switch with bracket” on page 4-31.**

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2. Disconnect interlock switch cable from interlock switch.

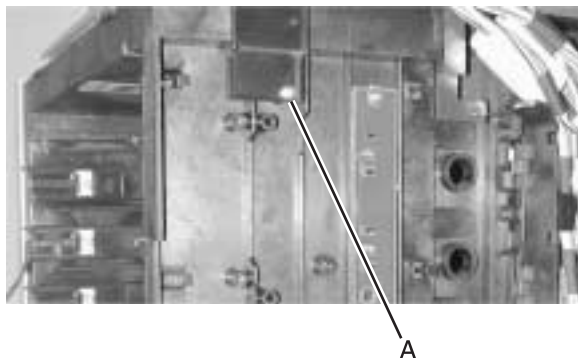


3. Remove interlock switch from switch bracket.



## Front door interlock switch with bracket

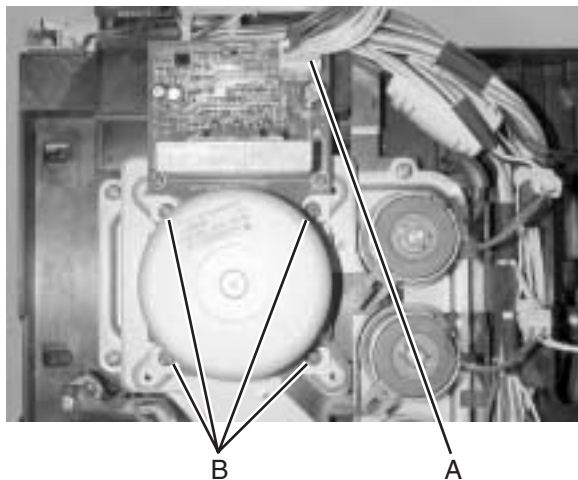
1. Remove developer drive assembly. See **“Developer drive assembly removal” on page 4-32.**
2. Remove screw (A).



3. Remove switch with bracket.

## Developer motor removal

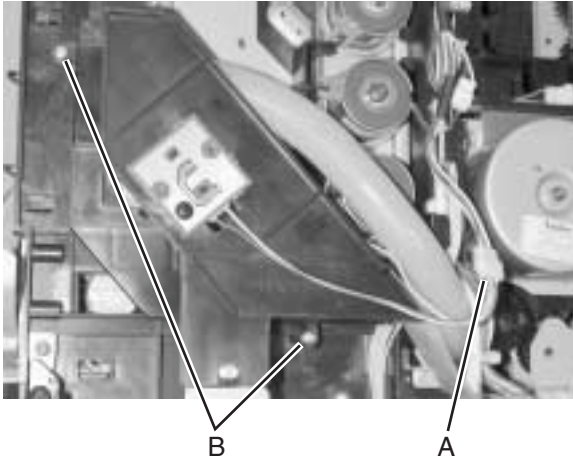
1. Remove right cover. See **“Right cover removal” on page 4-22.**
2. Disconnect developer motor cable (A) from motor.
3. Remove 4 screws (B).



4. Remove developer motor from drive assembly.

## Waste toner bottle holder removal

1. Remove right cover. See **“Right cover removal” on page 4-22.**
2. Disconnect waste toner bottle holder connector (A).
3. Remove two screws (B) from waste toner bottle holder.



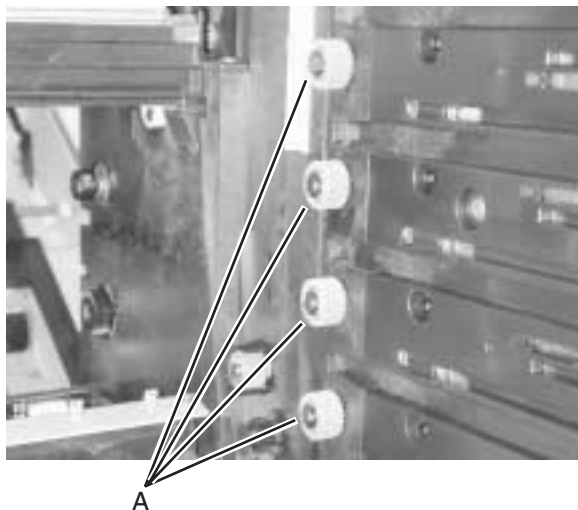
4. Remove waste toner bottle holder from printer.

## Developer drive assembly removal

1. Remove main motor assembly. See **“Main motor assembly removal” on page 4-38.**
2. Remove waste toner bottle holder. See **“Waste toner bottle holder removal” on page 4-32.**

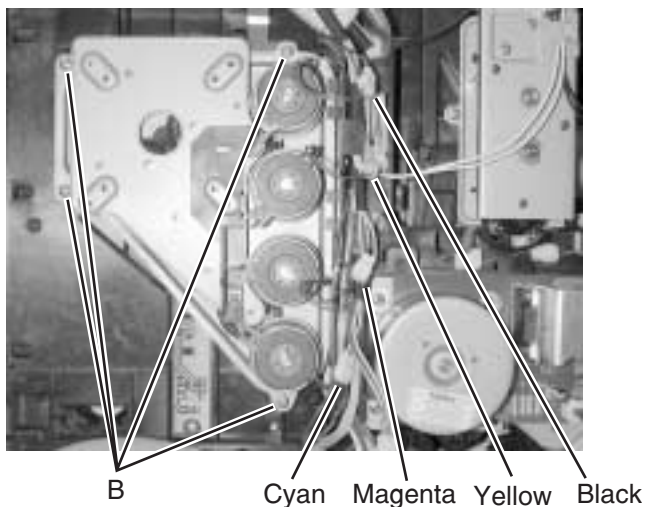
## 5021-0XX

3. Remove four clips and developer drive gears (A) from inside of printer.



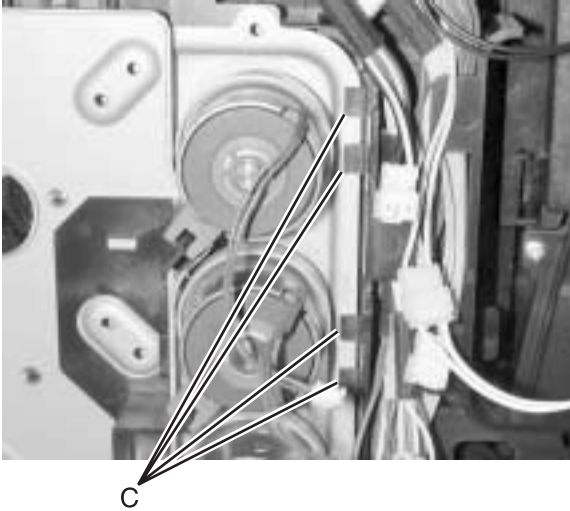
**Note:** The cables that connect to the developer clutches are color coded. One wire of the cable is white while the other wire represents the color of the toner for the associated developer clutch.

4. Disconnect developer clutch cables.
5. Remove four screws (B) from developer drive assembly.



**5021-0XX**

6. Disengage developer drive assembly from retaining tabs (C) and remove developer drive assembly from printer.

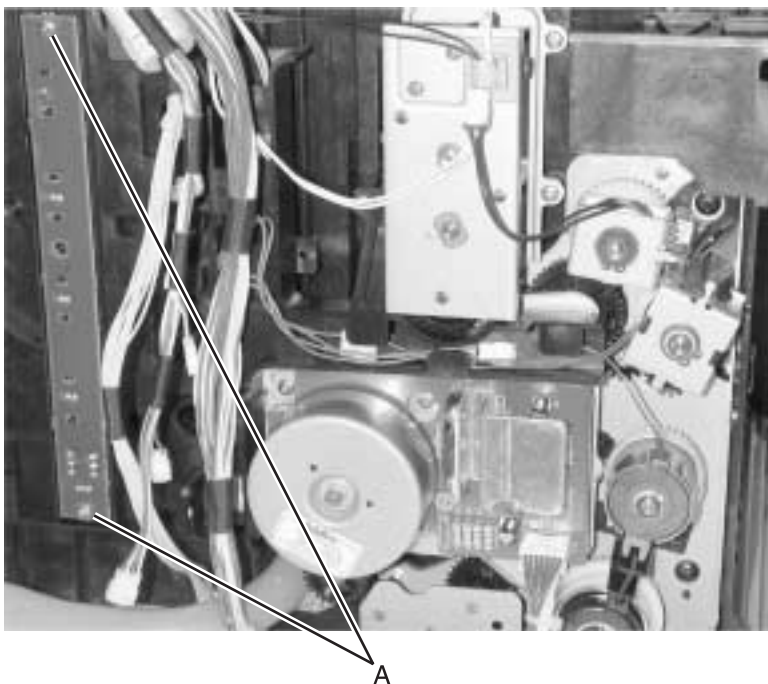




## Toner sensor (sender) removal

1. Remove developer drive assembly. See **“Developer drive assembly removal” on page 4-32.**
2. Remove two screws (A) from toner sensor.

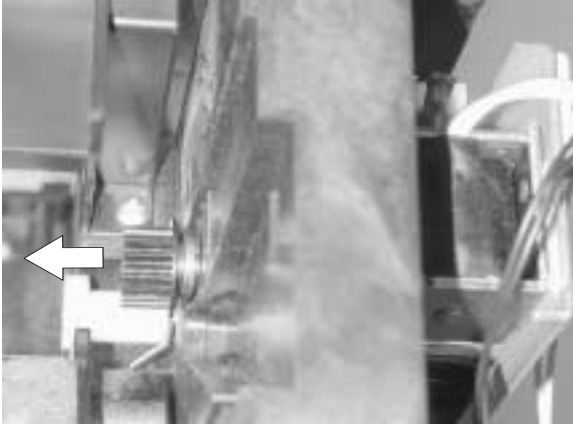
**Note:** Bottom screw is longer than top screw.



3. Pull toner sensor away from printer, disconnect cable, and remove sensor.

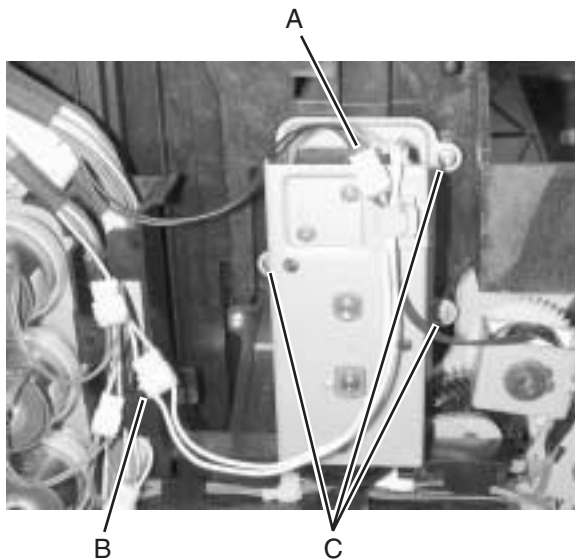
## Cleaning roller clutch removal

1. Remove transfer belt cleaning roller. See **“Transfer belt cleaning roller removal”** on page 4-6.
2. Remove right cover. See **“Right cover removal”** on page 4-22.
3. Using a flat tip tool, pry and remove cleaning roller clutch gear from inside of printer.



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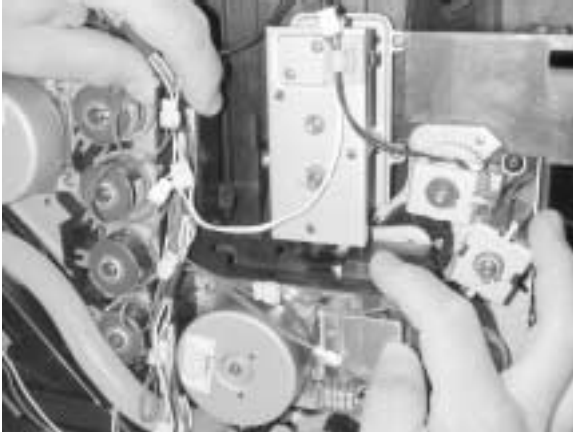
4. Remove wires from cable guide on front of cleaning roller clutch (A).
5. Disconnect cleaning roller clutch cable (B).
6. Remove three screws (C) from cleaning roller clutch.



7. Remove cleaning roller clutch from printer.

## Main motor assembly removal

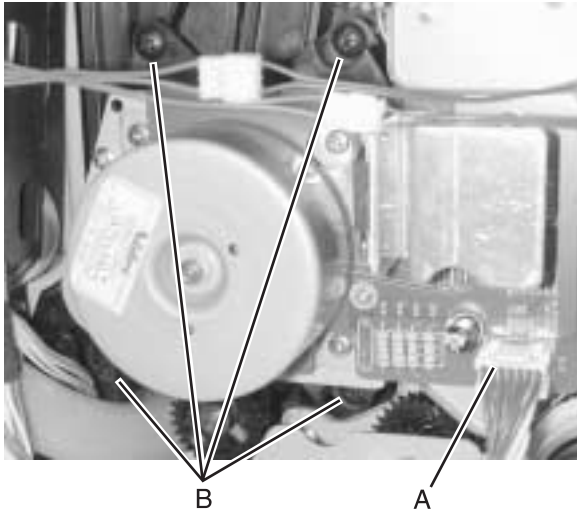
1. Remove right cover. See **“Right cover removal”** on **page 4-22.**
2. Remove clutch wires from wire guide and swing wire guide away from printer.



3. Disconnect main motor assembly cable (A) from main motor.

**5021-0XX**

4. Remove 4 screws (B) from the main motor assembly.

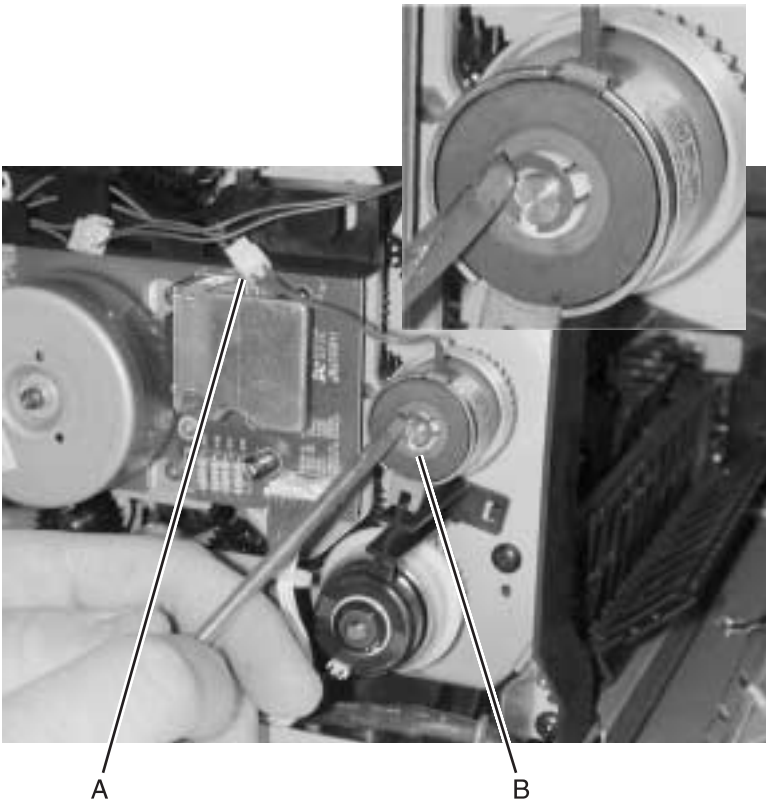


5. Remove main motor assembly from printer.

## Clutch removal

**Note:** This procedure applies to the fuser clutch, transfer roller clutch, registration clutch, and the paper feed clutch.

1. Remove right cover. See **“Right cover removal”** on **page 4-22**.
2. Disconnect clutch cable (A).
3. Remove clip from clutch (B).



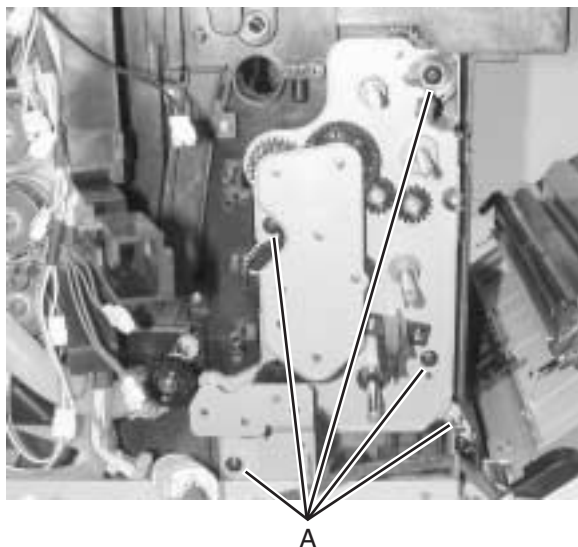
4. Slide clutch away from printer to remove.

## Main drive gear assembly removal

1. Remove cleaning roller clutch. See **“Toner sensor (sender) removal” on page 4-35.**
2. Remove main motor assembly. See **“Main motor assembly removal” on page 4-38.**

**Note:** If you are removing the main drive gear assembly to get to the waste toner feeder you do not have to remove the fuser, transfer roller, registration, or paper feed clutch. The clutches are removed at the first of this procedure because the main drive gear assembly FRU does not include the clutches.

3. Remove fuser clutch. See **“Clutch removal” on page 4-40.**
4. Remove transfer roller clutch. See **“Clutch removal” on page 4-40.**
5. Remove registration clutch. See **“Clutch removal” on page 4-40.**
6. Remove paper feed clutch. See **“Clutch removal” on page 4-40.**
7. Remove five screws (A) that secure main drive gear assembly to printer.



8. Remove main drive gear assembly from printer.



**Note:** When reinserting the main drive gear assembly, ensure that you start with the bottom right corner. This allows proper installation of the assembly. The photo depicts proper removal and the first part of reinstalling.

### Waste toner feeder removal

1. Remove main drive gear assembly. See **“Main drive gear assembly removal” on page 4-41.**
2. Loosen two screws (A) of sensor base to allow free movement of waste toner feeder.

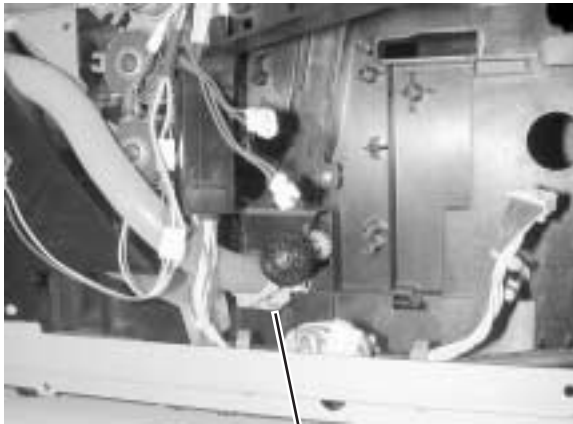


A



## 5021-0XX

3. Remove screw (B) from waste toner feeder pipe.

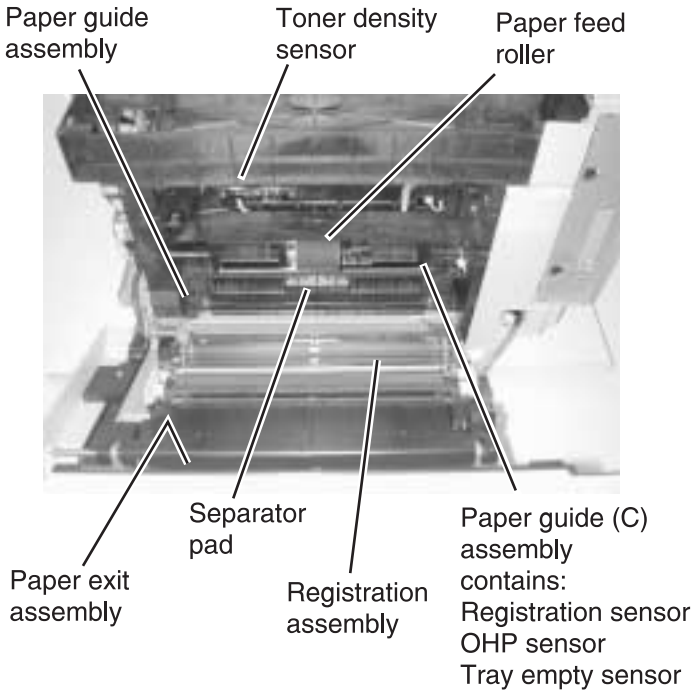


B

4. Remove waste toner feeder pipe from waste toner bottle holder.
5. Pull and remove waste toner feeder from printer.

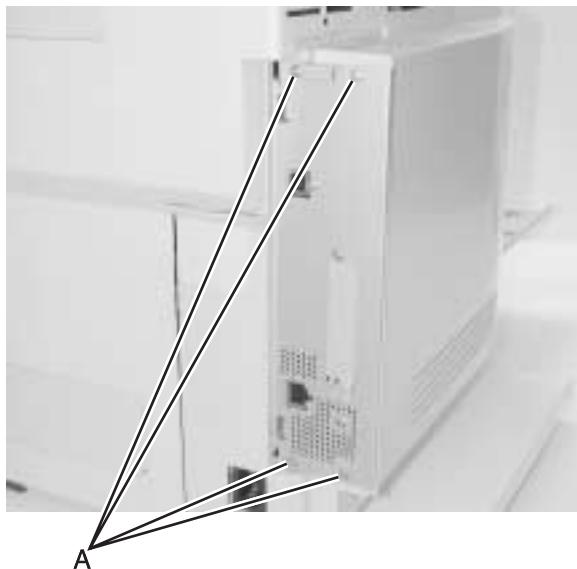


## Rear removals



## RIP board removal

1. Disconnect any attached cables.
2. Remove four screws (A).

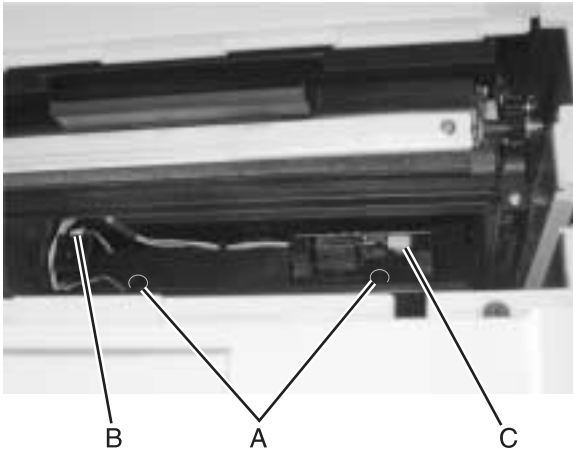


3. Slide RIP board out of printer.

## Bracket assembly removal

1. Remove erase lamp. See **“Erase lamp removal” on page 4-27**.
2. Remove two screws (A).
3. Disconnect connector (B) from transfer belt marker sensor.

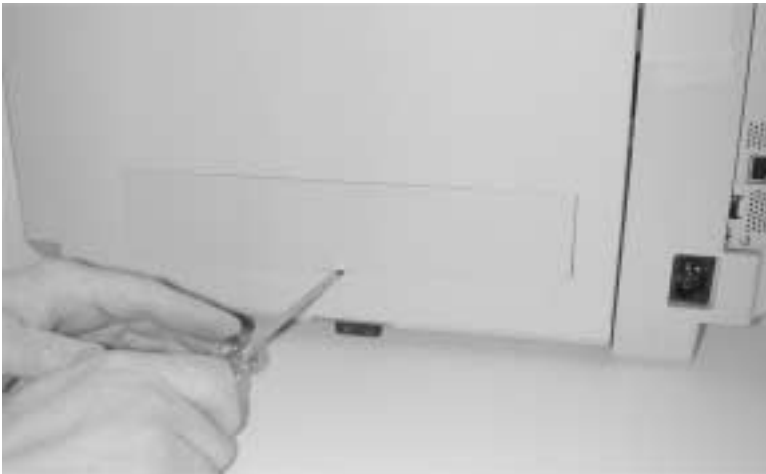
4. Disconnect connector (C) from toner density sensor.



5. Lift and remove bracket assembly.

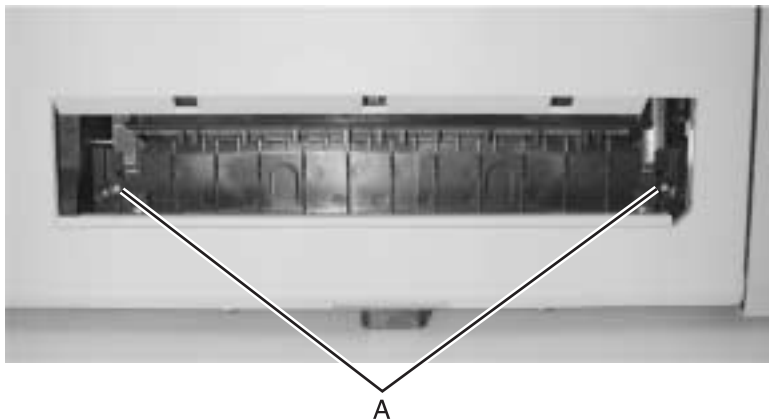
### Paper guide assembly removal

1. Remove duplex unit if attached. See **“Duplex unit assembly removal” on page 4-13.**
2. Remove lower duplex cover from rear cover assembly.

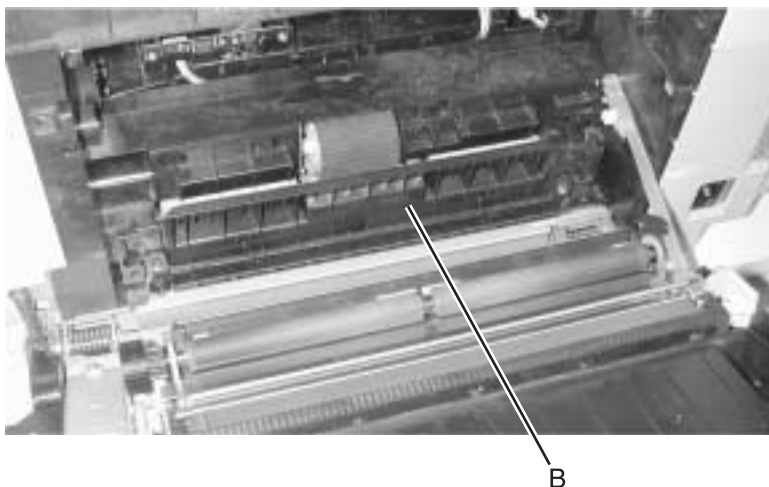


## 5021-0XX

3. Remove two screws (A) that attach paper guide assembly to printer. Screws are located in holes.



4. Open rear cover assembly.
5. Lift and remove paper guide assembly (B) from printer.

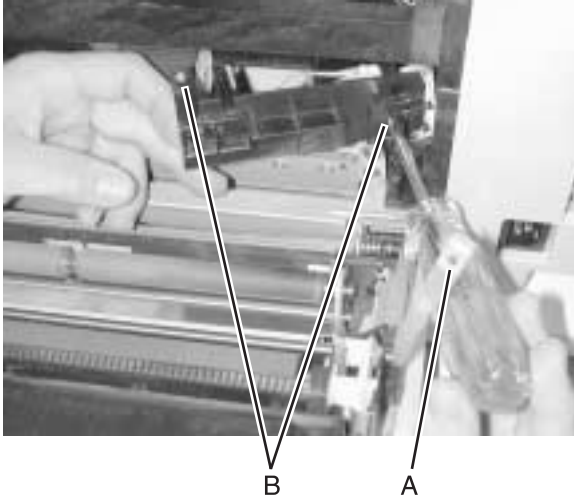


### Paper guide (C) assembly removal

1. Remove paper guide assembly. See **“Paper guide assembly removal” on page 4-46.**
2. Remove transfer belt unit. See **“Transfer belt unit removal” on page 4-7.**

## 5021-0XX

3. Remove support pin, disconnecting support cable (A) from printer.
4. Remove two screws (B) that attach paper guide (C) assembly to printer.



5. Disconnect three sensor cables from sensors located on paper guide (C) assembly and remove paper guide (C) assembly.

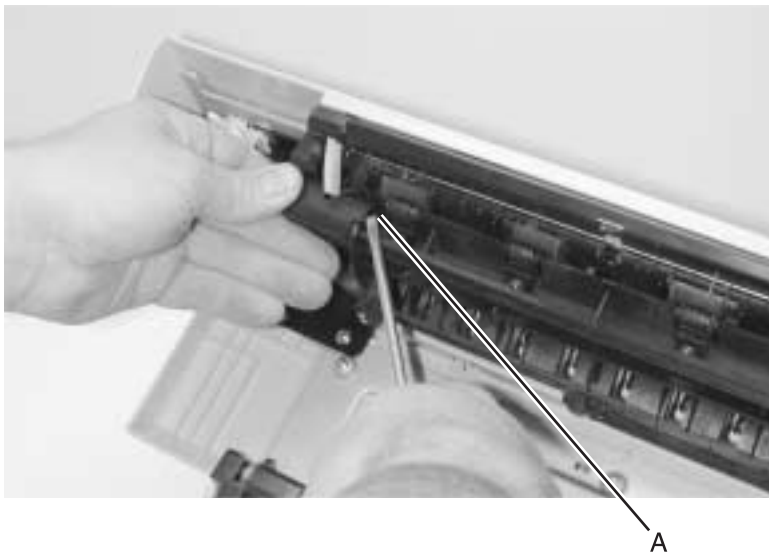
### Paper feed roller removal

1. Remove paper guide (C) assembly. See **“Paper guide (C) assembly removal” on page 4-47.**
2. Slide paper feed roller off shaft to remove.



## Paper exit assembly removal

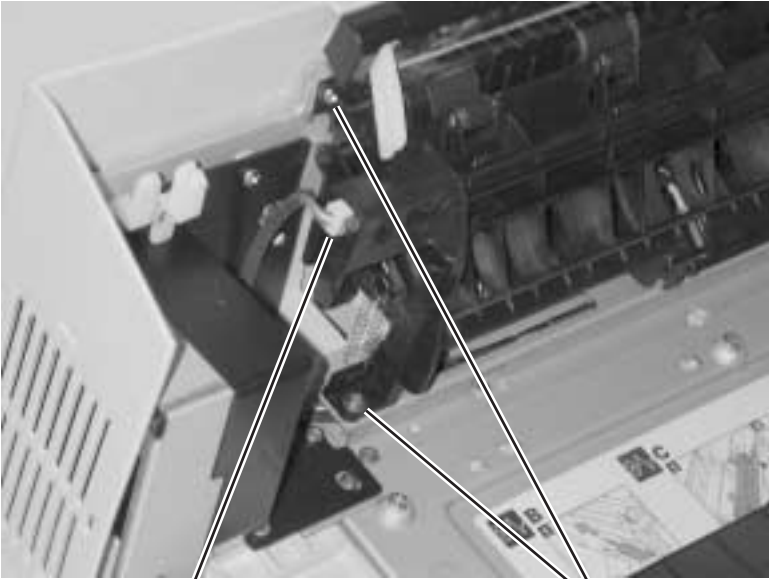
1. Open rear cover assembly.
2. Remove plastic bracket (A).



3. Disconnect cable (B).

**5021-0XX**

4. Remove two screws (C).



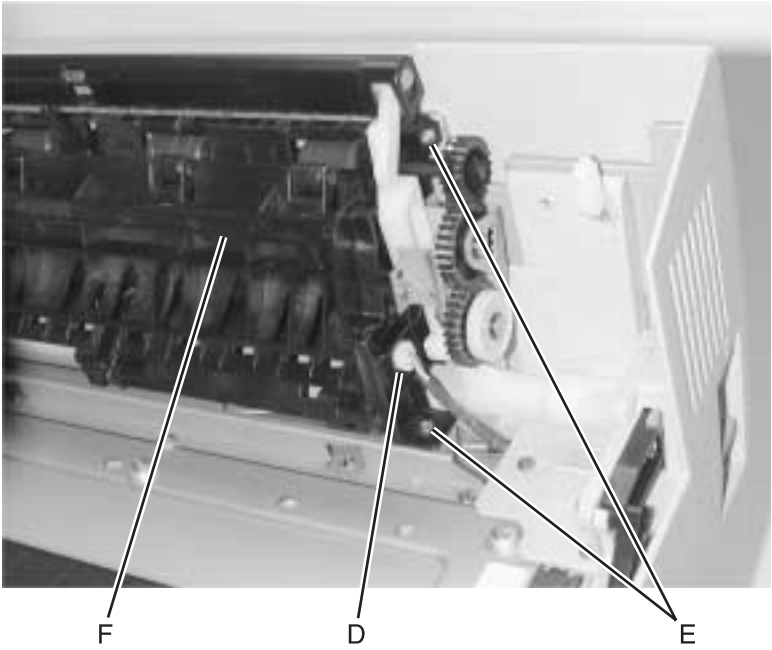
B

C



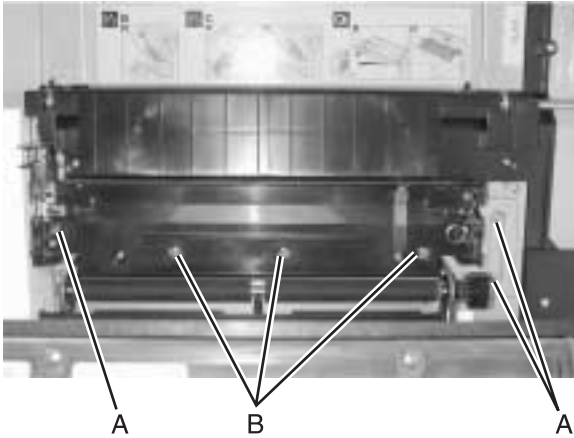
## 5021-0XX

5. Disconnect cable (D).
6. Remove two screws (E).
7. Remove paper exit (F).



## Registration assembly removal

1. Remove transfer roller. See **“Transfer roller removal”** on page 4-8.
2. Remove three metal screws (A) and three plastic screws (B).



3. Lift and remove registration assembly.

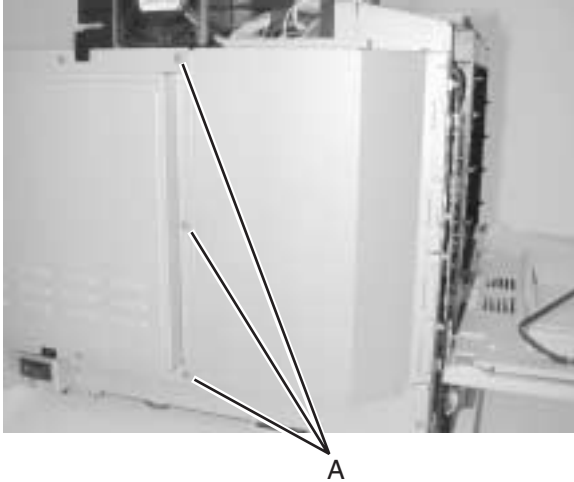
## Left side removals



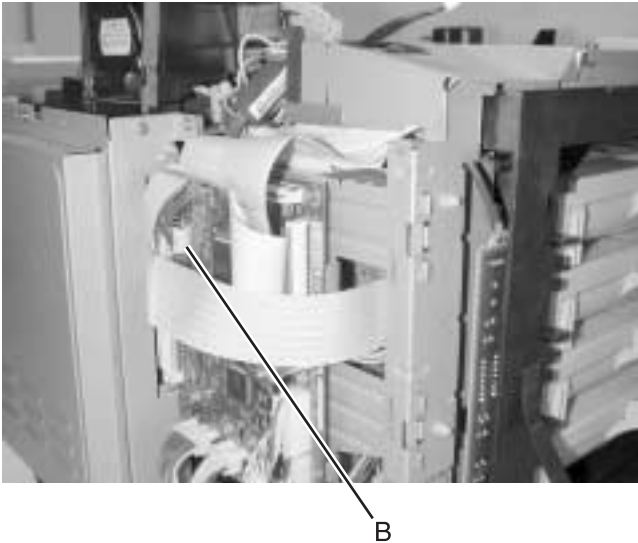
Engine controller board shield			NVRAM cable Engine controller board
RIP board engine cage			HVPS LVPS
HVPS cage			Toner sensor Toner present sensor
LVPS cage		Toner retract solenoid and cam	

## Operator panel cable removal

1. Remove left cover. See **“Left cover removal”** on page 4-24.
2. Remove three screws (A) from engine controller board shield; remove shield.

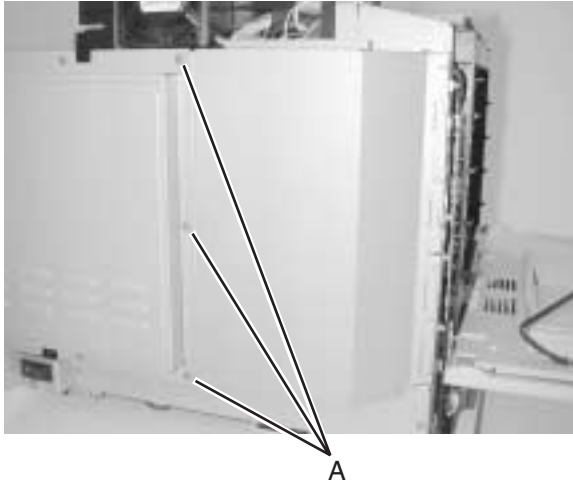


3. Disconnect operator panel cable (B) from engine controller board and remove.



## Engine controller board removal

1. Remove left cover. See **“Left cover removal”** on page 4-24.
2. Remove RIP board. See **“RIP board removal”** on page 4-45.
3. Remove three screws (A) from engine controller board shield; remove shield.

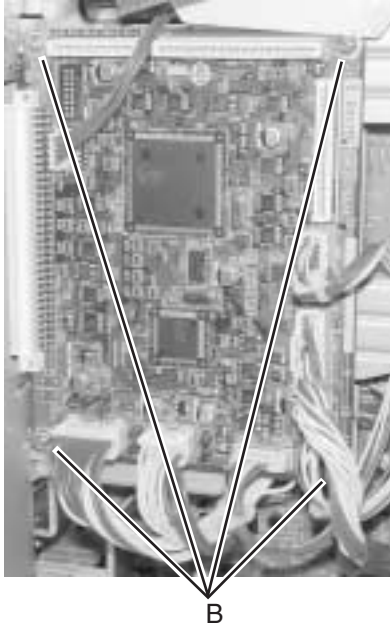


4. Disconnect all connectors from engine controller board.



## 5021-0XX

5. Remove four screws (B) from engine controller board; remove engine controller board.



**Note:** When reinstalling flat cables, ensure blue side of cable is opposite pins on connectors HVCN, I1CN, and I2CN. Flat cable pins are exposed on only one side (opposite blue side) and must make contact with metal pins on connectors.

## RIP board cage removal

1. Remove engine controller board. See **“Operator panel cable removal” on page 4-54.**
2. Remove screw (A) from power supply fan.



A

3. Lay power supply fan to side.

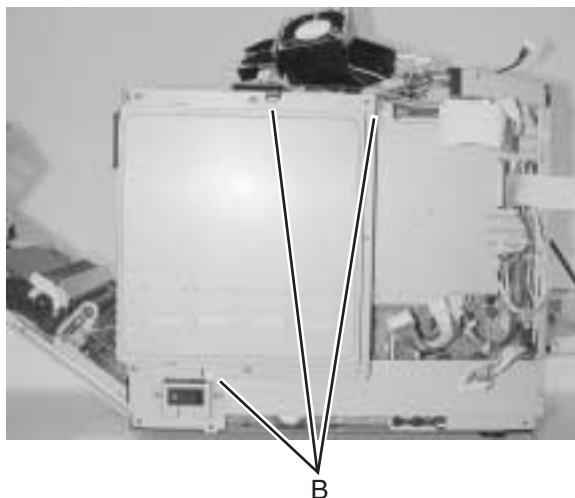
4. Remove ducting.





## 5021-0XX

5. Remove three screws (B) from RIP board cage.



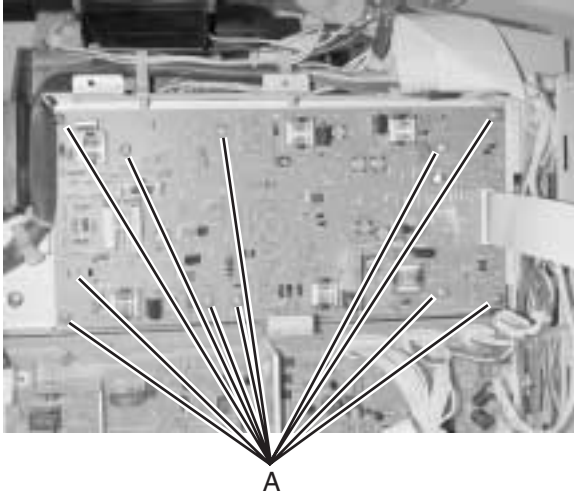
6. Remove RIP board cage.

### High voltage power supply (HVPS) removal

1. Remove RIP board cage. See **“RIP board cage removal”** on **page 4-57**.
2. Disconnect all connectors from HVPS.

**Note:** When reinstalling flat cable, ensure blue side of cable is opposite pins on connector CN1. Flat cable pins are exposed on only one side (opposite blue side) and must make contact with metal pins on connector.

3. Remove 11 screws (A) (4 corner screws are gold in color (metal), inner screws are silver (plastic)); remove HVPS.



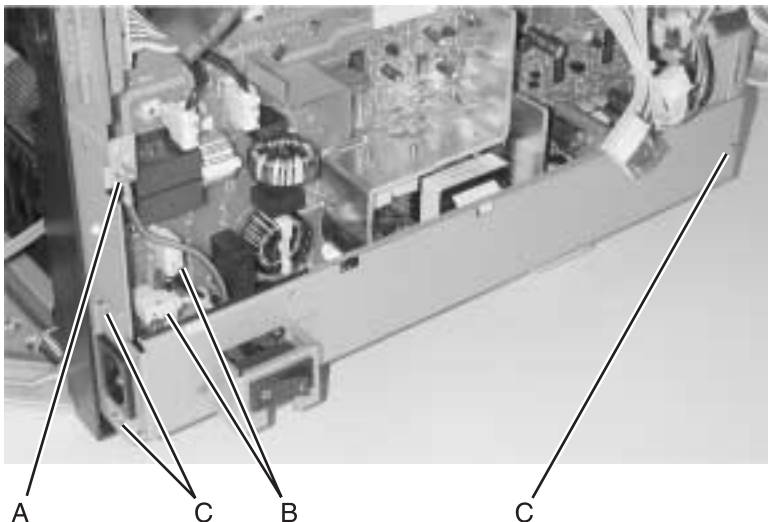
### Low voltage power supply (LVPS) with cage removal



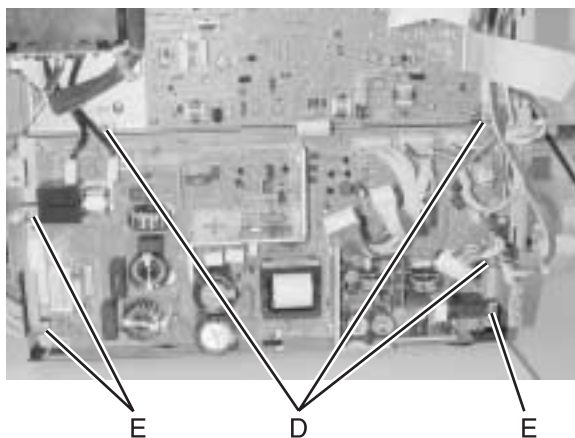
1. Remove transfer belt unit. See **“Transfer belt unit removal” on page 4-7.**
2. Remove RIP board cage. See **“RIP board cage removal” on page 4-57.**

## 5021-0XX

3. Remove grounding terminal screw (A).
4. Disconnect power supply bracket connector (B).
5. Remove three screws (C) that attach power supply bracket; remove power supply bracket.

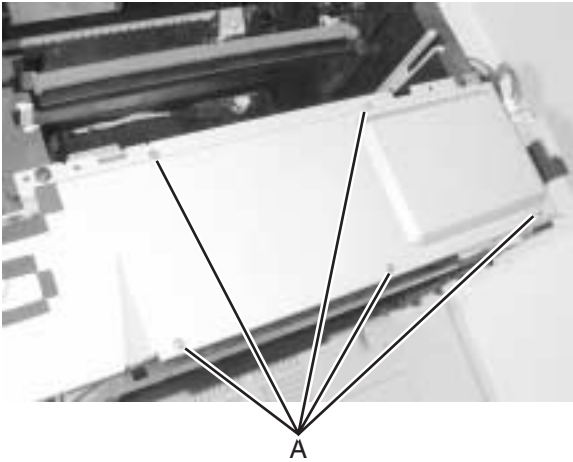


6. Disconnect all connectors from LVPS.
7. Remove three metal screws (D) and 3 plastic screws (E) that attach LVPS with cage; remove LVPS with cage.

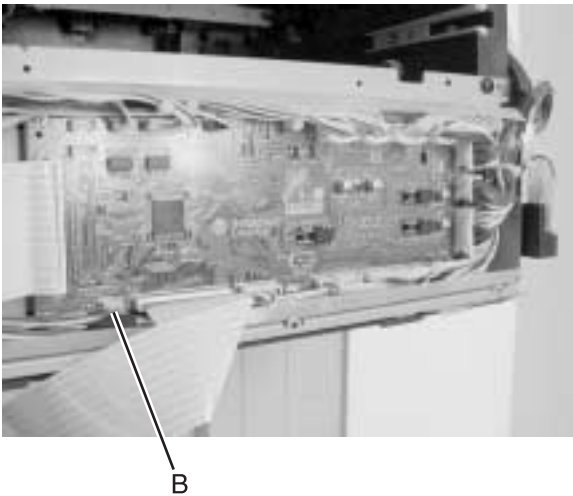


## HVPS cage removal

1. Remove HVPS. See **“High voltage power supply (HVPS) removal”** on page 4-59.
2. Remove LVPS with cage. See **“Low voltage power supply (LVPS) with cage removal”** on page 4-60.
3. Remove five screws (A) from shield cover.

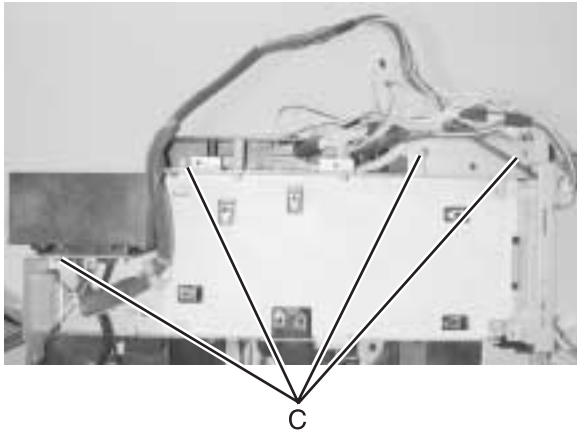


4. Disconnect toner present sensor cable (B) from connector (DCN2) on I/O board.



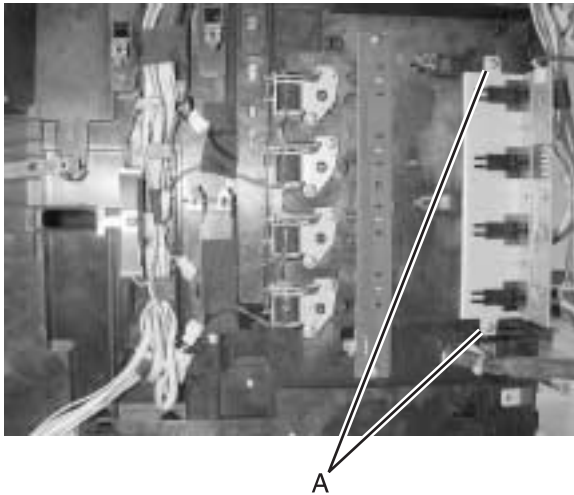
## 5021-0XX

5. Remove four screws (C); remove HVPS cage.



### Toner present sensor removal

1. Remove HVPS cage. See **“HVPS cage removal”** on **page 4-62**.
2. Remove two screws (A); remove toner present sensor.

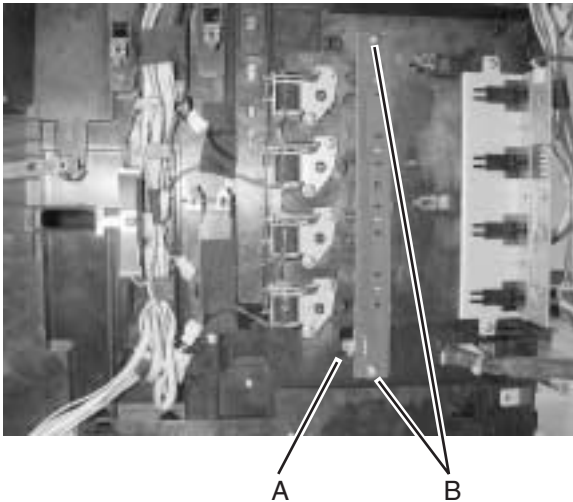


## Toner sensor (receiver) removal

**Note:** The toner sensor is comprised of two separate parts: the sender and receiver. The sender portion of the toner sensor is located on the right side of the printer. See **“Toner sensor (sender) removal” on page 4-35** for removal.

1. Remove HVPS cage. See **“HVPS cage removal” on page 4-62**.
2. Disconnect toner sensor cable from connector (A) on toner sensor (receiver).
3. Remove 2 screws (B); remove toner sensor (receiver).

**Note:** Bottom screw is longer than top screw.

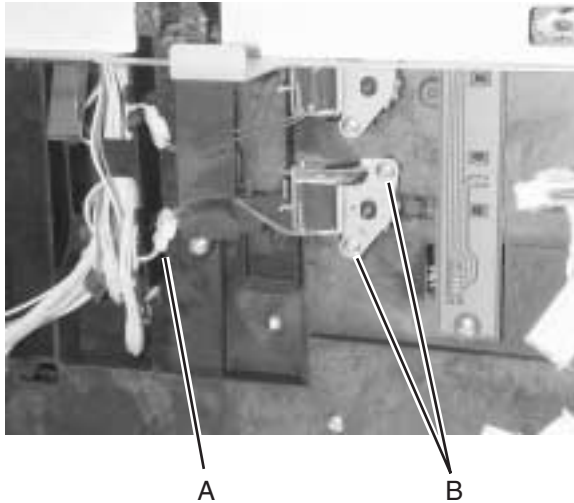


## Toner retract solenoid and cam removal

1. For cyan retract solenoid, remove LVPS with cage. See **“Low voltage power supply (LVPS) with cage removal” on page 4-60**.
2. For rest of retract solenoids, remove HVPS cage. See **“HVPS cage removal” on page 4-62**.
3. Disconnect cable from toner retract solenoid connector (A).

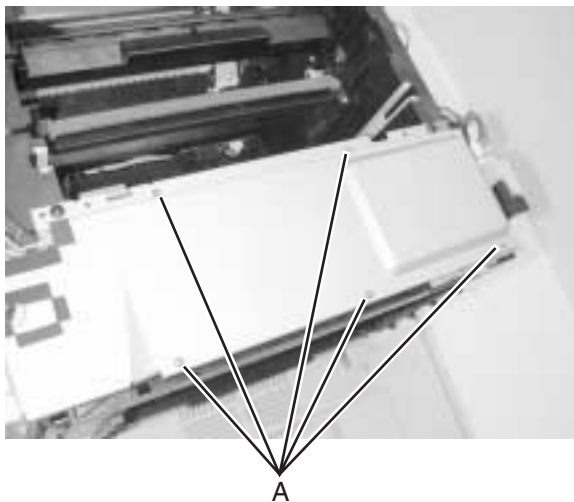
## 5021-0XX

4. Remove two screws (B); remove toner retract solenoid and toner retract cam.



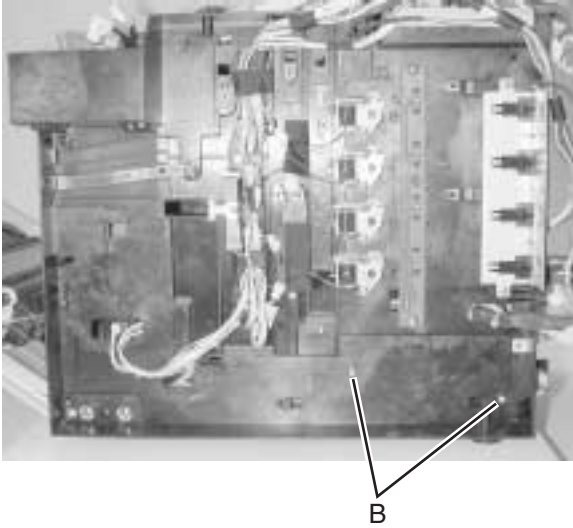
### Left tray guide assembly removal

1. Remove HVPS cage. See **“HVPS cage removal”** on [page 4-62](#).
2. Remove five screws (A) from shield cover (top); remove shield cover.

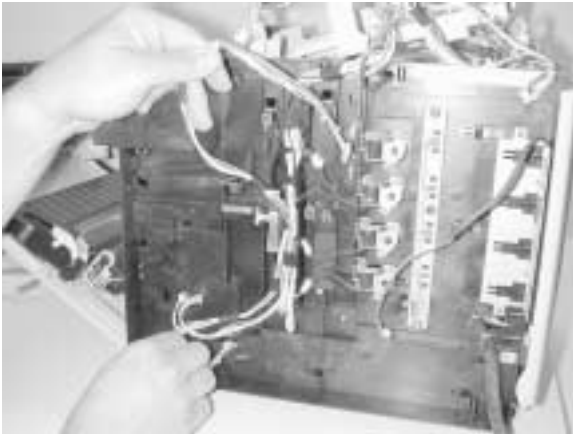


## 5021-0XX

3. Disconnect cable from DCN19 on I/O board.
4. Remove two (B) screws that secure left tray guide assembly to printer frame.



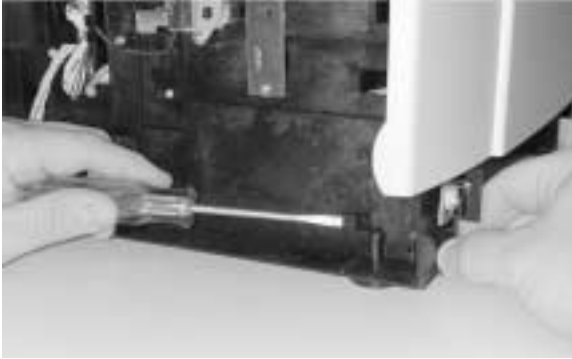
5. Reroute cable from I/O board to allow sufficient cable length for removing left tray guide assembly from frame.





## 5021-0XX

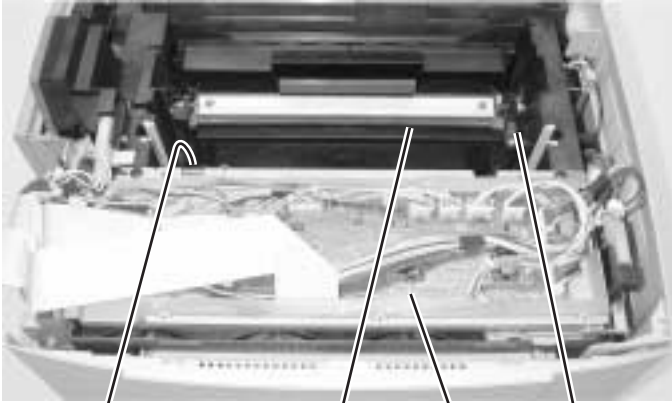
6. Using a flat blade tool, disengage tabs on left tray guide assembly from printer frame.



7. Slide left tray guide assembly out front of printer.

## Top removals

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Marker—  
sensor assembly

Waste toner—  
auger

I/O  
board

Waste toner  
agitator

## Marker sensor assembly removal

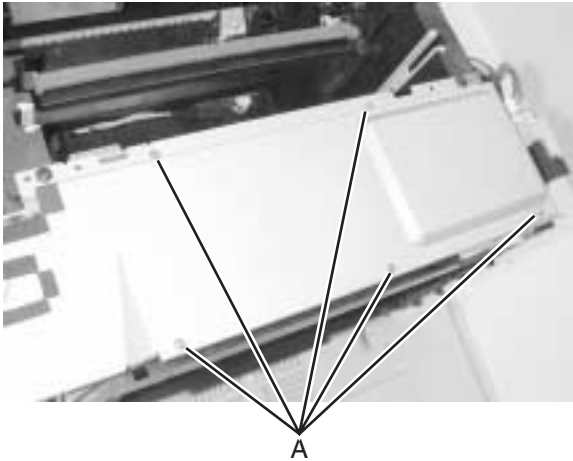
1. Remove all toner cartridges.
2. Remove photodeveloper cartridge. See **“Photodeveloper cartridge removal” on page 4-11.**
3. Remove transfer belt unit. See **“Transfer belt unit removal” on page 4-7.**
4. Remove screw (A) from bracket.



5. Disconnect cable from sensor and remove marker sensor assembly.

## I/O board removal

1. Remove top cover assembly. See **“Top cover assembly removal” on page 4-18.**
2. Remove five (A) screws from shield cover.



3. Disconnect all cables attached to I/O board.

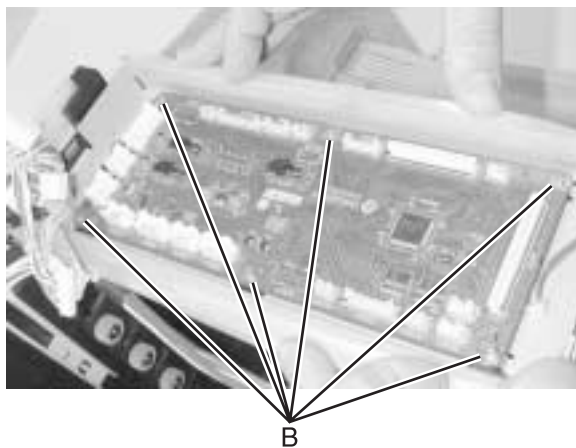
**Warning:** There are several cables connected to the I/O board that can be interchanged. When removing the cables, especially if the tie wraps are to be cut, use an identification method for the cables. Write the distinguishing cable wire colors in the table provided. If a connector is not used, write N/A in the column.

Connector	Number of pins	Cable wire colors
DCN1	39	
DCN2	3	
DCN3	31	
DCN4	8	
DCN5	3	
DCN6	6	
DCN7	12	
DCN8	3	
DCN9	N/A	
DCN10	24	
DCN11	12	
DCN12	14	

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Connector	Number of pins	Cable wire colors
DCN13	12	
DCN14	16	
DCN15	12	
DCN16	14	
DCN17	N/A	
DCN18	3	
DCN19	10	
DCN20	3	
DCN21	4	
DCN22	4	Do not remove the jumper.

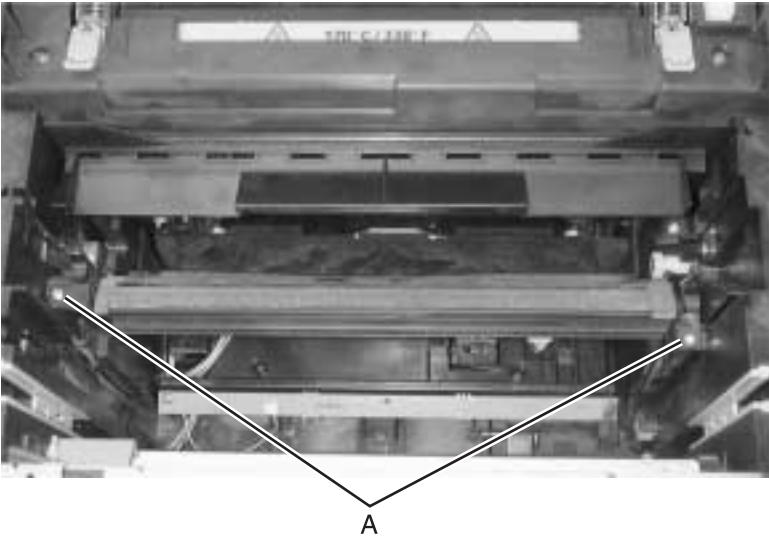
4. Remove six screws (B) from I/O board; remove I/O board.



**Note:** When reinstalling flat cables, ensure blue side of cable is opposite pins on connectors DCN1 and DCN3. Flat cable pins are exposed on only one side (opposite blue side) and must make contact with metal pins on connectors.

## Waste toner auger removal

1. Remove photodeveloper cartridge. See **“Photodeveloper cartridge removal” on page 4-11.**
2. Remove transfer belt unit. See **“Transfer belt unit removal” on page 4-7.**
3. Remove top cover assembly. See **“Top cover assembly removal” on page 4-18.**
4. Remove transfer belt cleaning roller. See **“Transfer belt cleaning roller removal” on page 4-6.**
5. Remove two screws (A) from waste toner auger; remove waste toner auger.



## Waste toner agitator removal

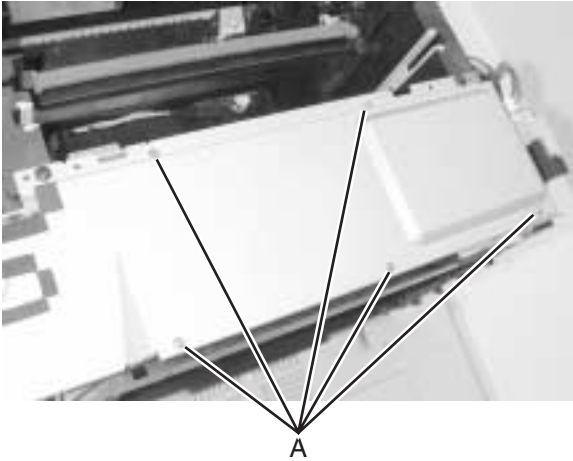
1. Remove waste toner auger. See **“Waste toner auger removal” on page 4-72.**
2. Remove gear (A) from cleaning roller clutch.



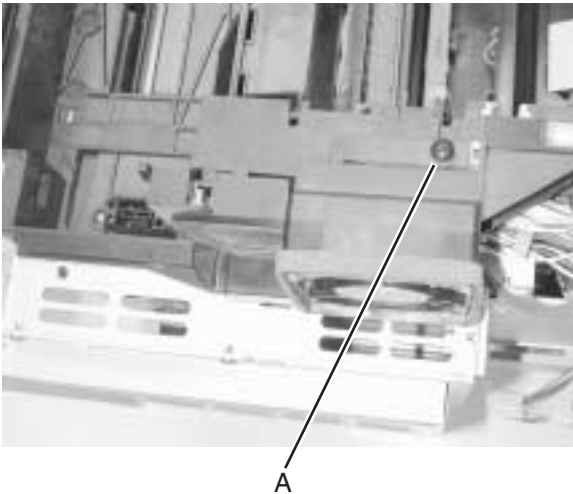
3. Pull agitator off shaft; lift and remove.

## Power supply fan removal

1. Remove top cover assembly. See **“Top cover assembly removal”** on page 4-18.
2. Remove 5 (A) screws from I/O shield cover.



3. Disconnect cable from DCN20 on I/O board.
4. Remove screw (A) from power supply fan.

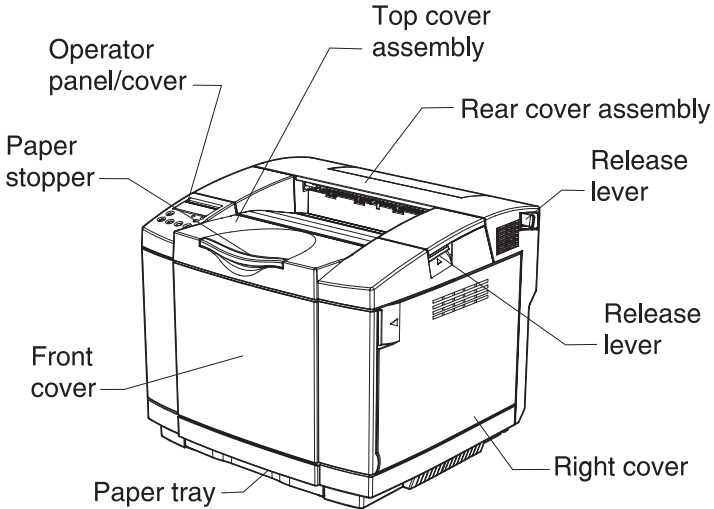


5. Disconnect cables from interlock switches and remove power supply fan.

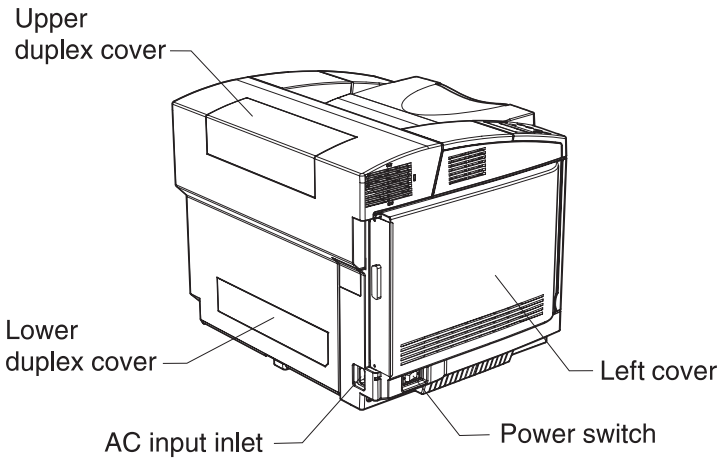


## 5. Locations and connectors

### Printer



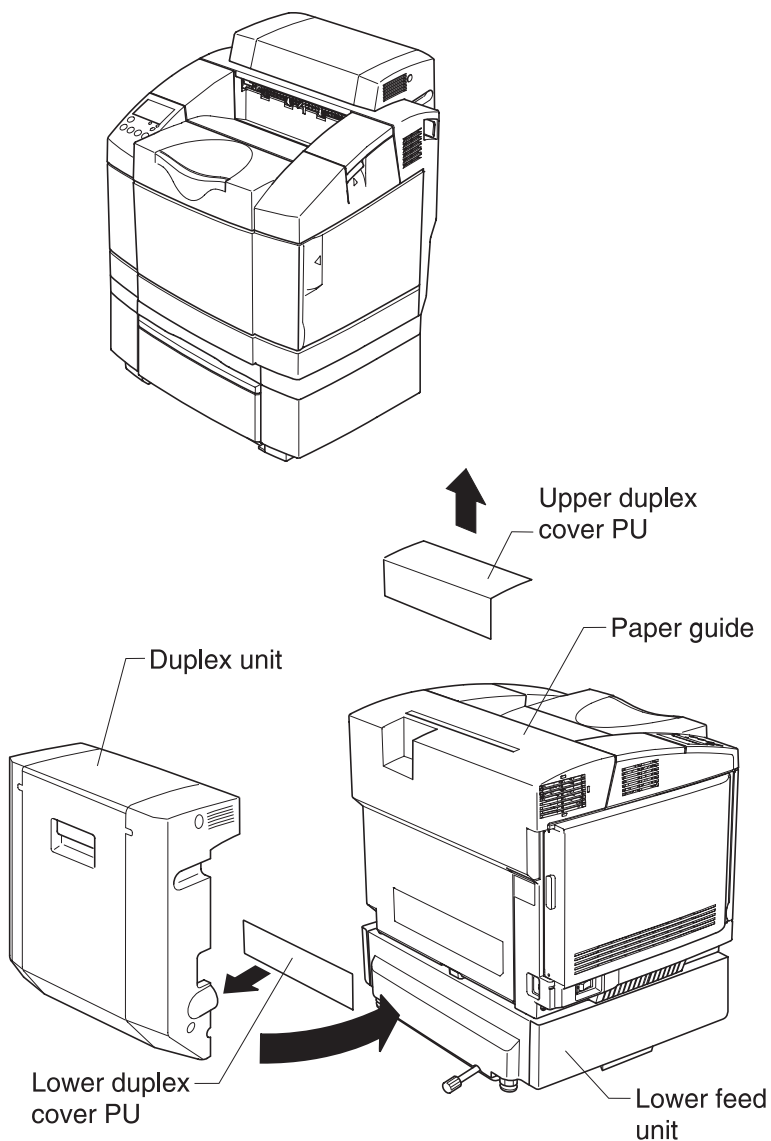
Front view



Back view

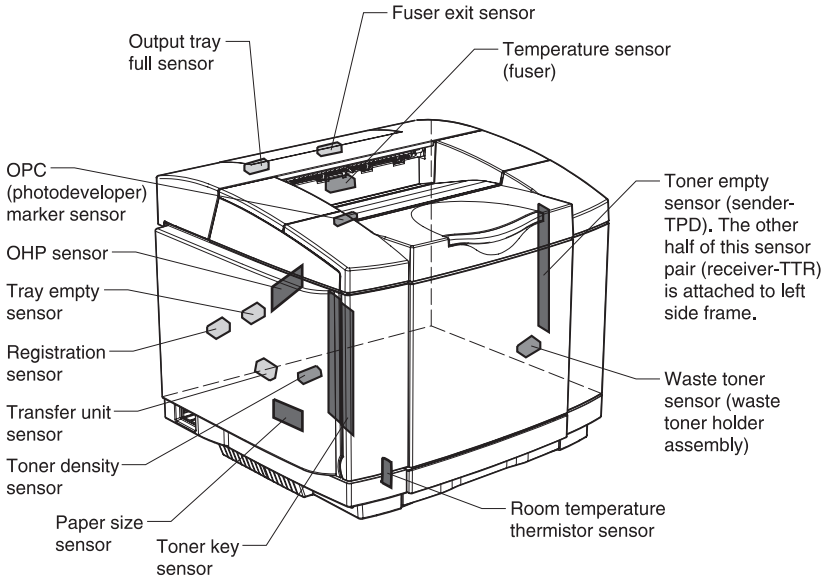
Part name	Description
Paper stopper	Stopper for exited papers.
Operator panel/cover	Displays status of printer operation.
Top cover assembly	Upper enclosure and also the paper exit tray.
Rear cover assembly	Printer rear enclosure that opens allowing clearing of internal paper jams or maintenance work.
Release lever (rear cover assembly)	Releases rear cover assembly.
Release lever (top cover assembly)	Releases the opening portion of the top cover assembly. Opening the top cover assembly allows access to the photodeveloper unit.
Right cover	Covers the right side of the printer where the motors and drives are located.
Front cover	Printer front enclosure that opens allowing toner cartridge or waste toner bottle replacement.
Paper tray	Standard paper tray that holds printer paper.
Upper duplex cover	Covers a portion of the paper exit and is removed prior to installing duplex unit.
Left cover	Covers the left side of the printer where a majority of the electronic boards are located.
Power switch	Turns the printer on and off.
AC input inlet	Connects the power cord that supplies AC power to the printer.
Lower duplex cover	Covers a portion of the paper feed path and is removed prior to installation of the duplex unit. Removal of the lower duplex unit also gives access to paper guide (A) and (B) assemblies.

# Options



## Electronic components

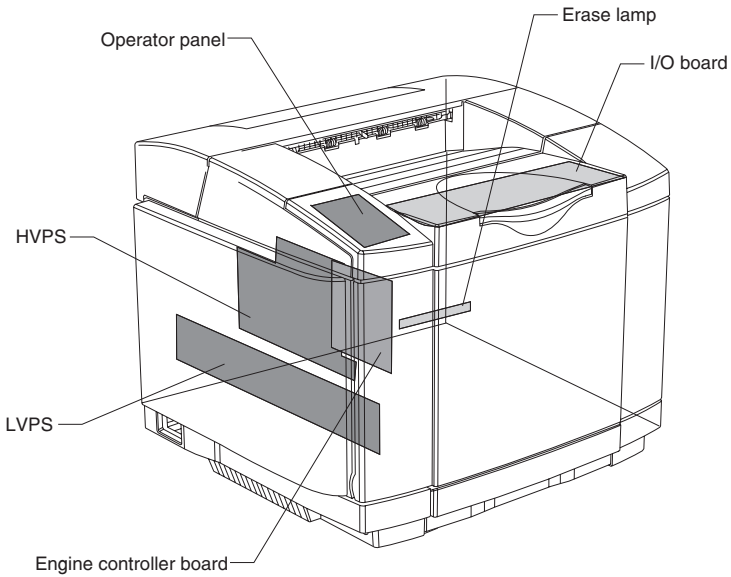
### Sensor locations



Name	Code	Function
Paper size sensor	PSU	Detects paper size.
Registration sensor	PT1	Detects whether paper is fed from paper drawer.
Fuser exit sensor	PT2	Detects when paper exits from rear cover assembly.
Tray empty sensor	PEU	Detects if paper is loaded in paper drawer.
OHP sensor	OHP	Detects if transparencies are loaded in paper drawer.
OPC marker sensor	PBS	Detects connecting position of OPC belt.
Toner empty sensor	TPD/TTR	Detects if any toner cartridge is empty.

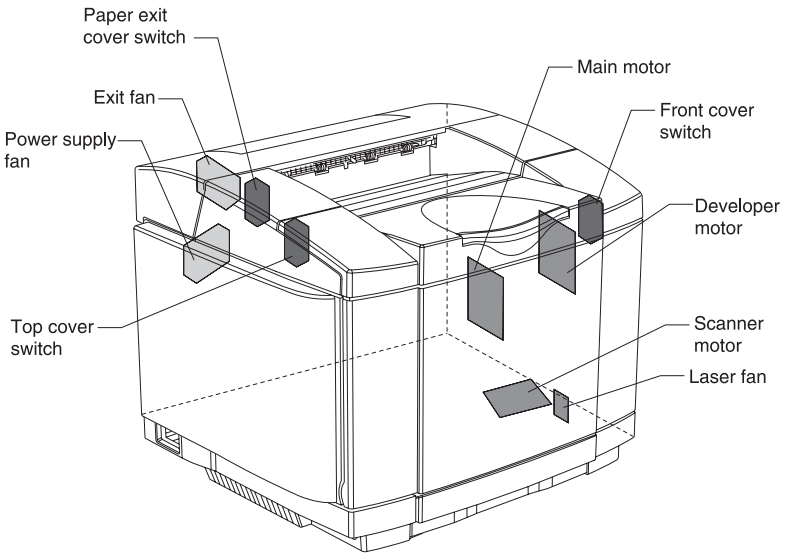
Name	Code	Function
Waste toner sensor	WTS (LED/TR)	Detects when waste toner bottle is full.
Temperature sensor for fuser unit	TH	Thermistor that detects fuser temperature.
Output tray full sensor	PFUL	Detects when paper exit tray is full.
Toner key sensor	TNK	Detects presence of toner cartridge.
Toner density sensor	TDS	Detects toner density of images formed on the transfer belt surface.
Room temperature thermistor sensor	RTS	Detects ambient room temperature.
Transfer unit sensor	TBS	Detects irregular rotation of transfer belt.

## Printer circuit board locations



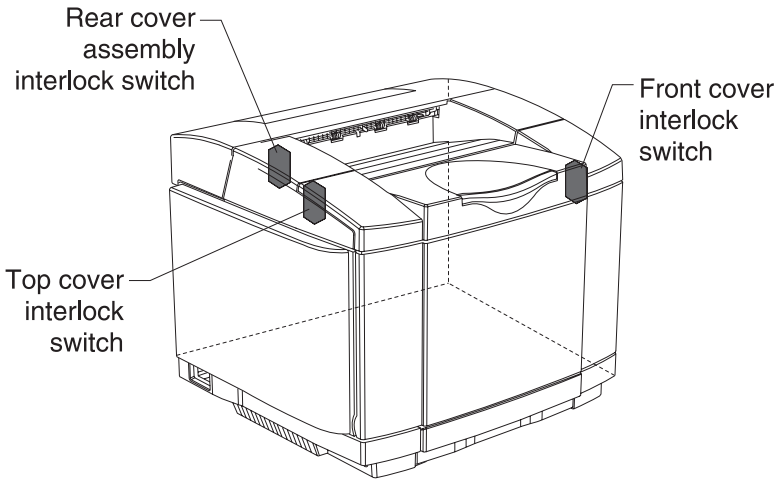
Name	Function
Engine controller board	Controls the following printer processes Fuser temperature control Laser output control Operator panel indication Toner empty sensing control Error processing control Interface control
Operator panel	Displays the printer operation status and supports the manual input switch.
Erase lamp	Discharges OPC belt located in the photodeveloper cartridge.
I/O board	Relays signals between the controlled parts and engine controller board and drives the controlled parts.
Low voltage power supply (LVPS)	Provides power to control the printer.
High voltage power supply (HVPS)	Provides power necessary for the printing process.

## Fan/motor locations



Name	Code	Function
Main motor	M M	Drives OPC belt and paper transport system.
Developer motor	D M	Drives toner cartridge and developing system.
Scanner motor	S C M	Drives laser beam scanning in optical unit
Power supply fan	PSFAN	Exhausts heat from power supply unit and interface controller.
Exit fan	EXFAN	Exhausts heat from fusing unit.
Laser fan	LDFAN	Exhausts heat from laser assembly (printhead).

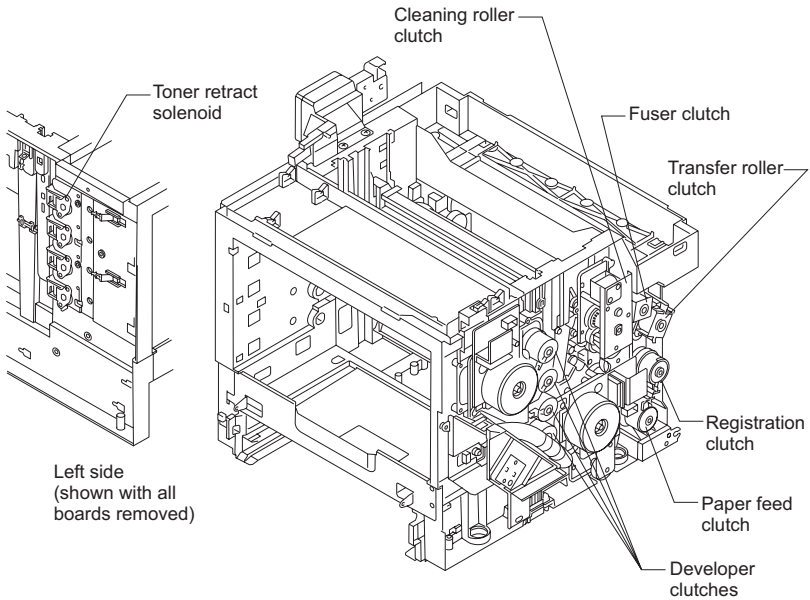
### Interlock switch locations



Name	Code	Function
Front cover interlock switch	DSW1	Safety interlock switches that break power when covers are opened.
Rear cover assembly interlock switch	DSW2	
Top cover interlock switch	DSW3	



## Solenoid/clutch locations



Name	Code	Function
Paper feed clutch	PCLU	Feeds paper by coupling feed roller to the main gear unit at the time of a paper feed.
Registration clutch	RECL	Transports paper by coupling registration roller to main gear unit as synchronized with rotation of transfer belt.
Fuser clutch	FUCL	Drives the fusing roller by coupling the fuser unit to the main gear unit.
Cleaning roller clutch	FBCL	Drives the transfer belt cleaner brush by coupling cleaning clutch to main gear unit at the time of transfer belt cleaning.
Developer clutches	DCL (Y,M,C,K)	Drives selected toner cartridge by coupling toner cartridge with developer gear. This is done for each color during development.

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<b>Name</b>	<b>Code</b>	<b>Function</b>
Toner retract solenoid	DSL (Y,M,C,K)	Places selected toner cartridge in development position during development phase.
Transfer roller clutch	TRCL	Cam action clutch that rotates, allowing transfer roller to press against the back of paper during second transfer. The transfer roller touching the back of paper causes toner to release from transfer belt onto paper during second transfer process.

## Symbol and part name table

Symbol	Part name
BR	Back-up roller
CTFAN	Control fan motor (cooling fan PS)
DCLK DCLY DCLM DCLC	Developer clutch (K.Y.M.C.)
DM	Developer motor
DPJ	Drum jam sensor
DSW1	Interlock switch (front)
DSW2	Interlock switch (top)
DSW3	Interlock switch (rear)
DUP	Duplex unit
Erase lamp	Erase lamp
FBCL	Cleaning roller solenoid
FBSOL	Cleaning cam clutch
FCS	Cleaning roller sensor
FUCL	Fuser clutch
FUSER unit	Fuser unit
HPSEN	Drum encoder sensor
HR	Heater roller
HTFAN	Heater fan motor (cooling fan EX)
HVU	High voltage unit
IOD1	IOD1 P.W.B.
IOD2	IOD2 P.W.B.
LCD	LCD P.W.B.

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<b>Symbol</b>	<b>Part name</b>
LDU	Laser drive unit P.W.B.
LFU	Lower paper feeding unit
LVPS	Power supply unit
MCTL	Main engine (MCTL P.W.B.) board
MM	Main motor
OHP	OHP sensor
OIL	Oil sensor
Optical unit	Optical unit
OZFAN	Ozone fan motor (cooling fan OZ)
PANEL	Operator panel P.W.B.
PBS	Belt sensor
PCLU	Upper paper feeding clutch
PDU	PDU P.W.B.
PEU	Upper paper empty sensor
PFUL	Exit paper full sensor
PSL (MC) PSL (KY)	Developer cam clutch
PSU	Upper paper size sensor
PT1	Paper feed sensor
PT2	Paper exit sensor
RECL	Registration clutch
SCM	Scanner motor
TBLE TBFL	Waste toner sensor (WT holder assembly)
TFU1 TFU2	Thermal fuse

<b>Symbol</b>	<b>Part name</b>
TH	Themistor
TNK	Toner key sensor
TPD TTR	Toner empty sensor
TRCM	Transfer cam clutch

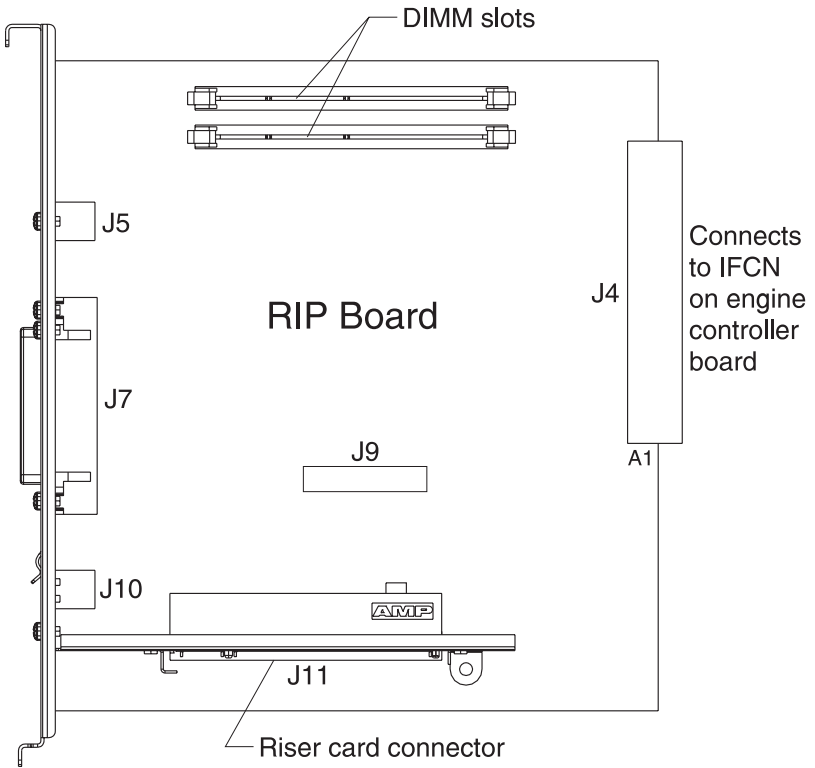
**5021-0XX**

## **Wiring diagram / cable harness reference**

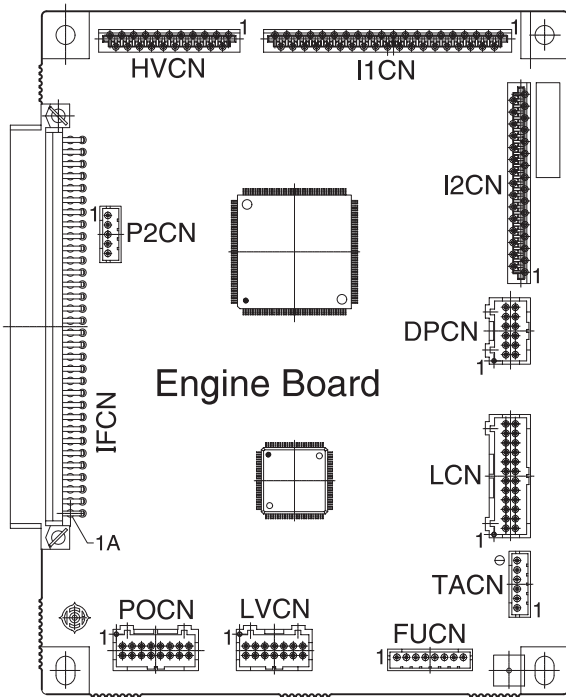
### **Notes:**

- See cable diagram foldout in the back of this manual.
- Cables are marked, in large circles, with the # sign.

# RIP board

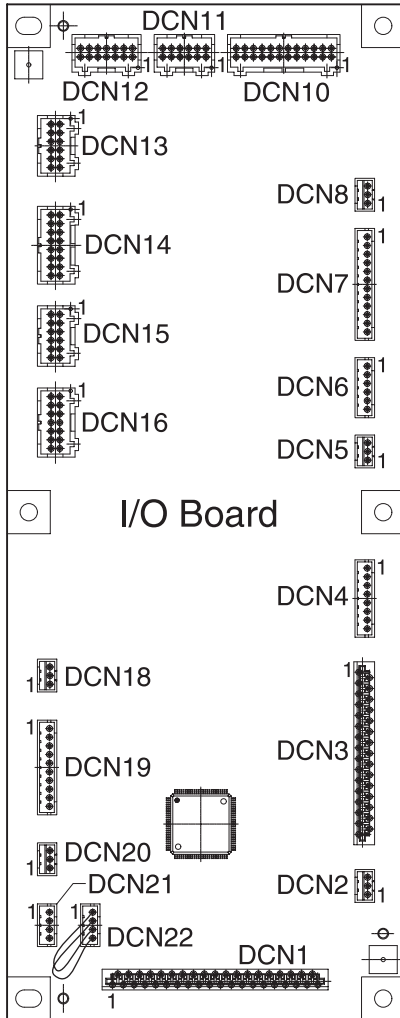


# Engine controller board

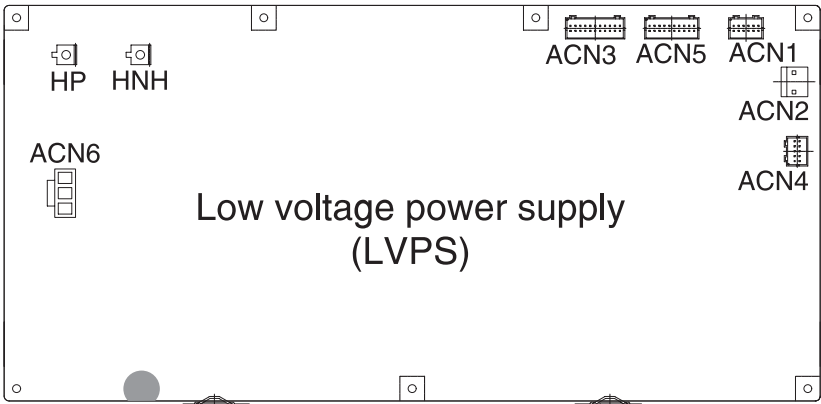




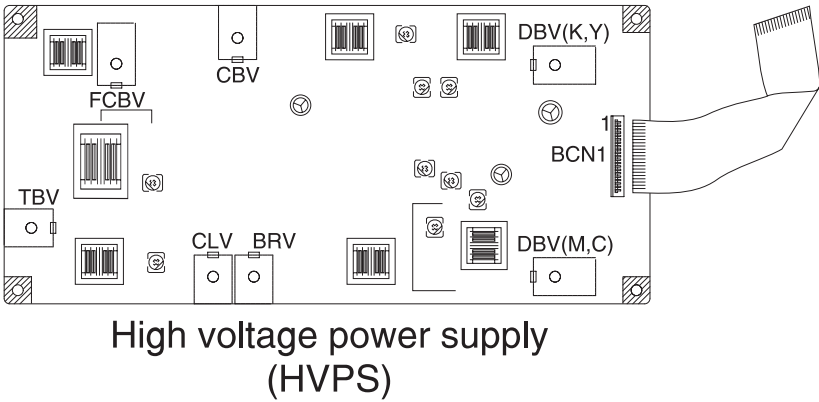
## Input/output (I/O) board



### Low voltage power supply (LVPS) board

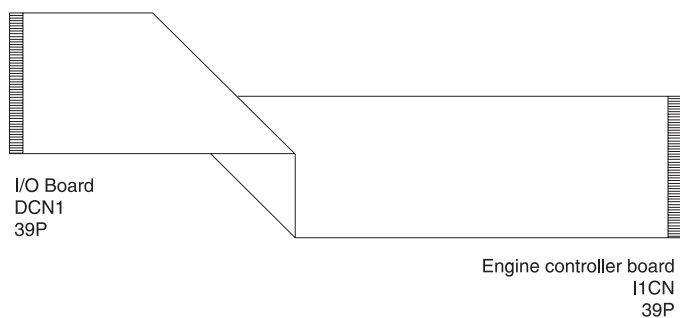


### High voltage power supply (HVPS) board



## Printer cables

### Cable 1 connector assignments



### Cable 1 connector pin assignments

#### Engine controller board I1CN—I/O board DCN1

I1CN Pin No.	Signal name	DCN1 Pin No.
39	SGND	1
38	+5V-S	2
37	I1RDWR	3
36	I1DATA	4
35	I1CK	5
34	I1LOAD	6
33	I1SCDO	7
32	NC	8
31	NC	9
30	DSL(K)ON-P	10
29	DSL(C)ON-P	11

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<b>I1CN Pin No.</b>	<b>Signal name</b>	<b>DCN1 Pin No.</b>
28	DSL(M)ON-P	12
27	DSL(Y)ON-P	13
26	TH3	14
25	IDATA	15
24	ILOAD	16
23	ISCK	17
22	SGND	18
21	LEDON-N	19
20	HTFANON-P	20
19	CTFANON-P	21
18	TBEN-N	22
17	PBSEN-N	23
16	ELON-P	24
15	PKCLL1ON-P	25
14	IOD1VOFF-P (+5V-SOFF-P)	26
13	OILLES-P	27
12	PWMSEND	28
11	BANKSEL	29
10	I/ODATA0	30
9	I/ODATA1	31
8	I/ODATA2	32
7	I/ODATA3	33
6	I/ODATA4	34
5	I/ODATA5	35
4	I/OAD0	36

<b>I1CN Pin No.</b>	<b>Signal name</b>	<b>DCN1 Pin No.</b>
3	I/OAD1	37
2	I/OAD2	38
1	SGND	39

## Cable 2 connector assignments



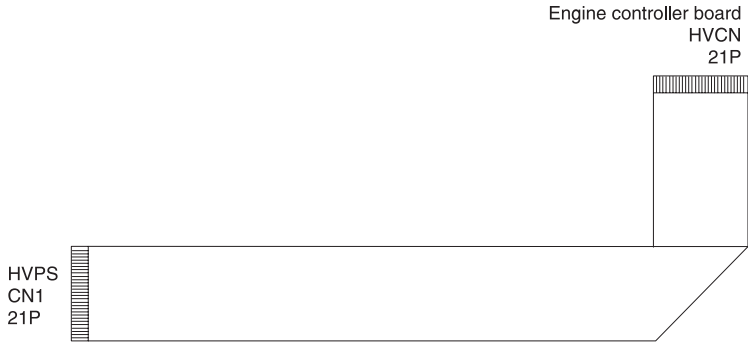
## Cable 2 connector pin assignments

### Engine controller board I2CN—I/O board DCN3

I2CN Pin No.	Signal name	DCN3 Pin No.
31	SGND	1
30	COLSEL1	2
29	COLSEL2	3
28	DCL(C)ON-P	4
27	DCL(M)ON-P	5
26	DCL(Y)ON-P	6
25	DCL(K)ON-P	7
24	PSL(KY)ON-P	8
23	PSL(MC)ON-P	9
22	SGND	10
21	MMCLK	11
20	MMON-N	12
19	MMREV-N	13

I2CN Pin No.	Signal name	DCN3 Pin No.
18	MMENC	14
17	MMGAIN	15
16	GARESET-N	16
15	RECLON-P	17
14	FBCLON-P	18
13	FBSLON-P	19
12	TRSLON-P	20
11	HTFANON-P/* OZFANON-P	21
10	FUCLON-P	22
9	PKCLU1ON-P	23
8	SGND	24
7	DMCLK	25
6	DMRDY-N	26
5	DMON-N	27
4	DMGAIN	28
3	TALWDDA	29
2	SEPASLON-P	30
1	SGND	31

**Cable 3 connector assignments**



**Cable 3 connector pin assignments**

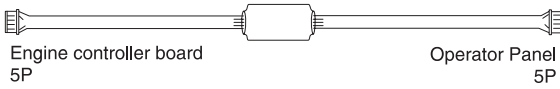
**Engine controller board HVCN—HVPS CN1**

HVCN Pin No.	Signal name	CN1 Pin No.
21	PGND	1
20	PGND	2
19	PGND	3
18	+24V-1D	4
17	+24V-1D	5
16	+24V-1D	6
15	BRVON-N	7
14	CLVP-N	8
13	PWMON-N	9
12	BRVPWM-N	10
11	BRVERR	11
10	CBVPWM-N	12



<b>HVCN Pin No.</b>	<b>Signal name</b>	<b>CN1 Pin No.</b>
9	THVRON-N	13
8	DBV(MC)PWM-N	14
7	THVPWM-N	15
6	DBV(KY)PWM-N	16
5	THV-I	17
4	FCBVPWM-N	18
3	ID (PGND)	19
2	PGND	20
1	HVUCNCHK-N	21

### Cable 4 connector assignments

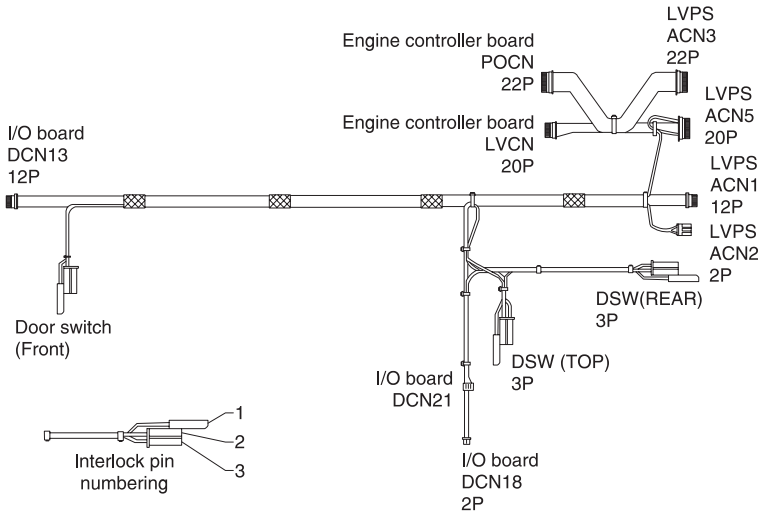


### Cable 4 connector pin assignments

#### Engine controller board P2CN—Operator panel

P2CN Pin No.	Signal name	Operator panel Pin No.
1	N/A	1
2	N/A	2
3	N/A	3
4	N/A	4
5	N/A	5

## Cable 5 connector assignments



## Cable 5 connector pin assignments

### I/O board DCN13—LVPS ACN1

DCN13 Pin No.	Signal name	ACN1 Pin No.
1	+24-1D	2
2	PGND	1
3	+24-1D	4
4	PGND	3
5	+24-1D	6
6	PGND	5
7	+24-1D	8
8	PGND	7
9	+5V-1	10
10	SGND	9

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<b>DCN13 Pin No.</b>	<b>Signal name</b>	<b>ACN1 Pin No.</b>
11	+5V-1	12
12	SGND	11

**LVPS ACN2—Interlock switches**

<b>ACN2 Pin No.</b>	<b>Signal name</b>	<b>Interlock switch Pin No.</b>
1	DSW-O:F	Front-1
2	DSW-I:R	Rear-2

**I/O board DCN18—Interlock switches**

<b>DCN18 Pin No.</b>	<b>Signal name</b>	<b>Interlock switch Pin No.</b>
1	REARDOPEN-P	Rear-3
2	NC	N/A
3	TOPDOPEN-P	Top-3

**Interlock switches—Interlock switches**

<b>Interlock switch Pin No.</b>	<b>Signal name</b>	<b>Interlock switch Pin No.</b>
Top-1	none	Front-2
Top-2	none	Rear-1

**LVPS ACN5—Engine controller board DCN21**

<b>ACN5 Pin No.</b>	<b>Signal name</b>	<b>DCN21 Pin No.</b>
1	TESTO1	1
2	TESTO2	2
3	TESTI1	3
4	TESTI2	4

**LVPS ACN5—Engine controller board LVCN**

<b>ACN5 Pin No.</b>	<b>Signal name</b>	<b>LVCN Pin No.</b>
5	+5VDO-N	1
6	+5V-1R	2
7	BRON-N	3
8	DCOFF1-P	4
9	ACOFF-P	5
10	HRON-N	6
11	ACSYNC-N	7
12	SWRUS-P	8
13	PGND	9
14	+24	10
15	PGND	11
16	+24	12
17	SGND	13
18	CN-CHK	14
19	SGND	15
20	SGND	16

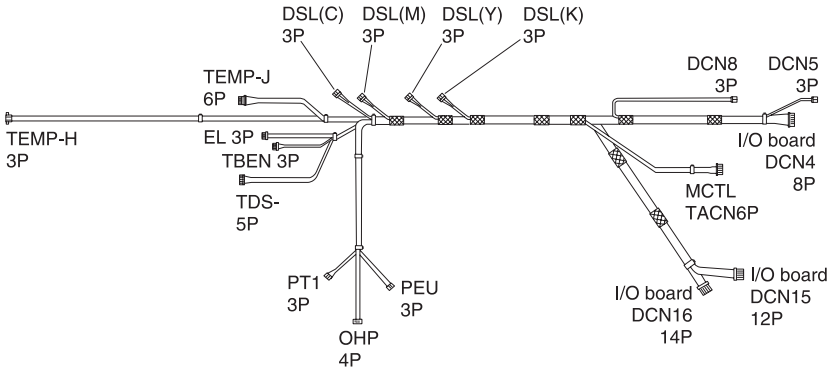
**5021-0XX**

<b>ACN5 Pin No.</b>	<b>Signal name</b>	<b>LVCN Pin No.</b>
21	no connection	N/A
22	no connection	N/A

## Engine controller board POCN—LVPS ACN3

POCN Pin No.	Signal name	ACN3 Pin No.
1	+5V-2(CNT)	2
2	SGND(CNT)	1
3	+5V-2(CNT)	4
4	SGND(CNT)	3
5	+5V-2(CNT)	6
6	SGND(CNT)	5
7	+3.3V-2	8
8	SGND(CNT)	7
9	+3.3V-2	10
10	SGND(CNT)	9
11	+3.3V-2	12
12	SGND(CNT)	11
13	+5V-1(MCTL)	14
14	SGND(MCTL)	13
15	+5V-1(MCTL)	16
16	SGND(MCTL)	15
17	+24V-1D	18
18	PGND	17
19	+24V-1D	20
20	PGND	19
N/A	no connection	21
N/A	no connection	22

### Cable 6 connector assignments



### Cable 6 connector pin assignments

#### I/O board DCN4—Toner retract solenoids

DCN4 Pin No.	Signal name	Developer solenoid Pin No.
Black toner retract solenoid		
1	DSL(K)ON-N	no number
2	+24V-F2	no number
Yellow toner retract solenoid		
3	DSL(Y)ON-N	no number
4	+24V-F2	no number
Magenta toner retract solenoid		
5	DSL(M)ON-N	no number
6	+24V-F2	no number
Cyan toner retract solenoid		
7	DSL(C)ON-N	no number
8	+24V-F2	no number



**I/O board DCN5—Photodeveloper (OPC) marker sensor**

<b>DCN5 Pin No.</b>	<b>Signal name</b>	<b>Marker sensor Pin No.</b>
1	PBSEN-N	1
2	+5V-S	2
3	SGND	2

**I/O board DCN8—Laser fan**

<b>DCN8 Pin No.</b>	<b>Signal name</b>	<b>Laser fan Pin No.</b>
1	LDFANON-P	no number
2	PGND	no number
3	LDFAN ERR	no number

**I/O board DCN15—Toner present sensor, erase lamp**

<b>DCN15 Pin No.</b>	<b>Signal name</b>	<b>Sensor Pin No.</b>
Toner present sensor (receiver-left side)		
1	TLES(K)-P	1
2	TLES(Y)-P	2
3	TLES(M)-P	3
4	TLES(C)-P	4
5	TLESCN-N	5
6	SGND	6
Toner present sensor (sender-right side)		
7	LEDON-P	1
8	NC	N/A

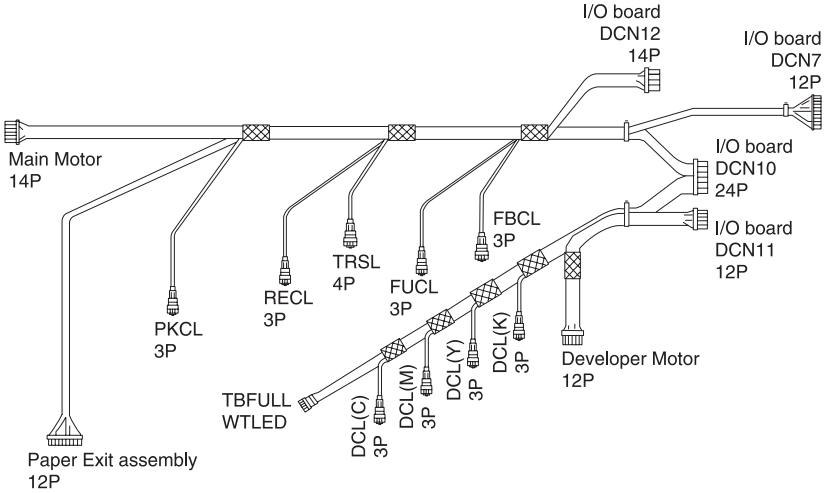
**5021-0XX**

<b>DCN15 Pin No.</b>	<b>Signal name</b>	<b>Sensor Pin No.</b>
9	TLESCHK	2
10	SGND	3
Erase lamp		
11	+24V-1DF3	1
12	ELON-N	3

## I/O board DCN16—Sensors

DCN16 Pin No.	Signal name	Sensor Pin No.
Transfer belt unit marker sensor		
1	+5V-S	no number
2	TBEN-N	no number
3	SGND	no number
Registration sensor		
4	+5V-S	no number
5	PT1-N	no number
6	SGND	no number
Paper empty sensor		
7	+5V-S	no number
8	PEU-P	no number
9	SGND	no number
OHP sensor		
10	+5V-S	1
11	OHPSENU	2
12	SGND	3
13	NC	
14	NC	

### Cable 7 connector assignments



### Cable 7 connector pin assignments

#### I/O board DCN7—Rear cover assembly

DCN7 Pin No.	Signal name	Pin No.
Fuser exit sensor		
1	+5V-S	no number
2	PT2-N	no number
3	SGND	no number
4	NC	
5	NC	
6	NC	
Output tray full sensor		
7	+5V-1	no number
8	PEFULL-N	no number

<b>DCN7 Pin No.</b>	<b>Signal name</b>	<b>Pin No.</b>
9	SGND	no number
Exit fan		
10	HTFANON-P	no number
11	PGND	no number
12	HTFANERR	no number

**I/O board DCN10—Developer drive assembly, clutches, and waste toner sensor**

<b>DCN10 Pin No.</b>	<b>Signal name</b>	<b>Sensor/ solenoid/ clutch Pin No.</b>
1	NC	N/A
2	NC	N/A
Cleaning roller solenoid		
3	+24V-1DF3	no number
4	FBCLON-N	no number
Fuser clutch		
5	+24V-1DF3	no number
6	FUCLON-N	no number
Transfer roller clutch		
7	+24V-1DF3	no number
8	TRSLON-N	no number
Registration clutch		
9	+24V-1DF3	no number
10	RECLON-N	no number
Paper feed clutch		
11	+24V-1DF3	no number
12	PKCLU1ON-N	no number
Waste toner sensor-TBFL (on outside of waste toner holder)		
13	TBFULL-N	no number
14	SGND	no number
Waste toner sensor-TBLE (on inside of waste toner holder)		
15	WTLEDON	no number

<b>DCN10 Pin No.</b>	<b>Signal name</b>	<b>Sensor/ solenoid/ clutch Pin No.</b>
16	SGND	no number
Cyan developer clutch		
17	+24V-1DF3	no number
18	DCL(C)ON-N	no number
Magenta developer clutch		
19	+24V-1DF3	no number
20	DCL(M)ON-N	no number
Yellow developer clutch		
21	+24V-1DF3	no number
22	DCL(Y)ON-N	no number
Black developer clutch		
23	+24V-1DF3	no number
24	DCL(K)ON-N	no number

**5021-0XX****I/O board DCN11—Developer motor**

<b>DCN11 Pin No.</b>	<b>Signal name</b>	<b>Developer motor Pin No.</b>
1	DMRDY-N	1
2	DMON-N	2
3	DMCLK	3
4	+24V-1D	4
5	PGND	5
6	+24V-1D	6
7	PGND	7
8	PGND	8
9	SGND	9
10	+5V-1	10
11	DMGAIN	11
12	DMOVLD	12

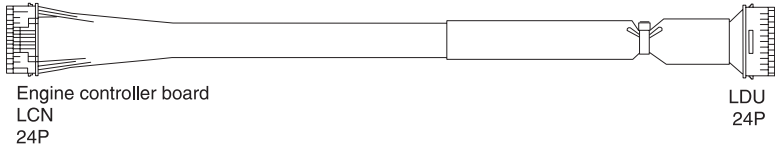
**I/O board DCN12—Main motor**

<b>DCN12 Pin No.</b>	<b>Signal name</b>	<b>Main motor Pin No.</b>
1	MMRDY-N	1
2	MMON-N	2
3	MMCLK	3
4	+24-1D	4
5	PGND	5
6	+24-1D	6
7	PGND	7



<b>DCN12 Pin No.</b>	<b>Signal name</b>	<b>Main motor Pin No.</b>
8	PGND	8
9	SGND	9
10	+5V-1	10
11	MMENC	11
12	MMREV-N	12
13	MMGAIN	13
14	MMOVL	14

## Cable 9 connector assignments



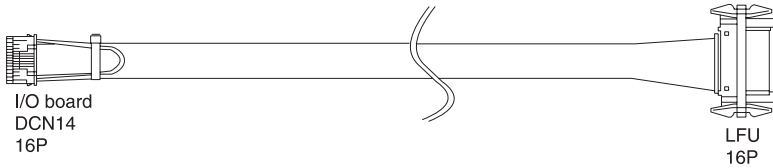
## Cable 9 connector pin assignments

### Engine board LCN—Printhead LDU

LCN Pin No.	Signal name	LDU Pin No.
1	+5V-1R	1
2	LCONT1	2
3	LREADY	3
4	LCONT2	4
5	SGND	5
6	LDREF4	6
7	VIDEO-N	7
8	LDREF3	8
9	VIDEO-P	9
10	LDREF2	10
11	SGND	11
12	LDREF1	12
13	BDT-P	13
14	LDREF0	14
15	BDT-N	15
16	+5V-1	16

<b>LCN Pin No.</b>	<b>Signal name</b>	<b>LDU Pin No.</b>
17	SGND	17
18	SGND	18
19	SCMRDY-N	19
20	SCMCLK	20
21	PGND	21
22	SCMON-N	22
23	+24V-1	23
24	+3.3V	24

## Cable 10 connector assignments



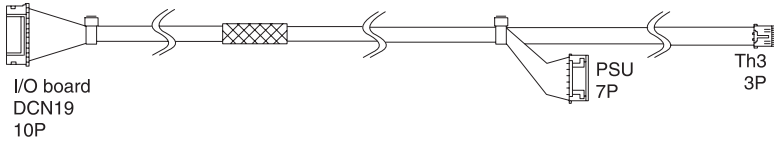
## Cable 10 connector pin assignments

### I/O board DCN14—Lower feeder unit

DCN14 Pin No.	Signal name	Lower feeder unit Pin No. (pin 1 is pin closest to front of printer)
1 connects to DCN14 pin 16	LFCN-RET	N/A
2	+24V-F2	1
3	PKCLL1ON-N	2
4	NC/FDCLL1ON-N	N/A
5	PSL1	3
6	PSL2	4
7	PSL3	5
8	PSCST1	6
9	PEL1-P	7
10	OCST1-N	8
11	SGND	12
12	NC	10

<b>DCN14 Pin No.</b>	<b>Signal name</b>	<b>Lower feeder unit Pin No. (pin 1 is pin closest to front of printer)</b>
13	+5V-S	13
14	NC	9
15	+5V-1	11
16 connects to DCN14 pin 1	LFCN-CHK-N	N/A

## Cable 11 connector assignments

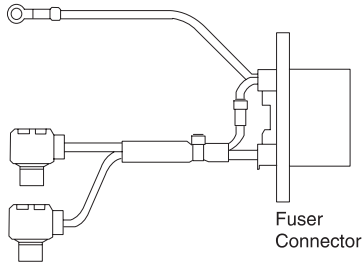


## Cable 11 connector pin assignments

### I/O board DCN19—Paper size sensor and temperature thermistor

DCN19 Pin No.	Signal name	Pin No.
Paper size sensor (PSU)		
1	+5V-1	1
2	PSU1	2
3	PSU2	3
4	PSU3	4
5	PSU4	5
6	NOT USED	N/A
7	SGND	6
8	NOT USED	
Temperature thermistor (RT)		
9	SGND	1
10	TH3	3

## Cable 12 connector assignments



## Cable 12 connector pin assignments

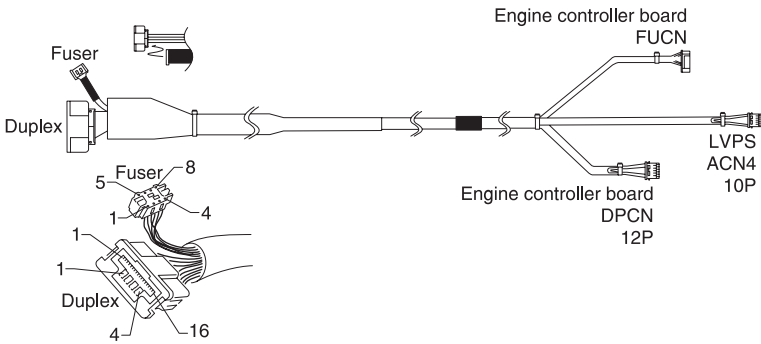
### Fuser connector—LVPS (120V Printer)

Fuser connector Pin No.	Signal name	LVPS Pin No.
1	FG	Ground screw
2	P	P
3	NC	N/A
4	P2	P2

### Fuser connector—LVPS (240V Printer)

Fuser connector Pin No.	Signal name	LVPS Pin No.
1	FG	Ground screw
2	P	P
3	P2	P2
4	NC	N/A

### Cable 13 connector assignments



### Cable 13 connector pin assignments

#### Engine controller board FUCN—fuser

FUCN Pin No.	Signal name	Fuser connector
1	TH1	1
2	TH1	2
3	TH2	3
4	TH2	4
5	FUTEMP	5
6	SGND	6
7	NC	7
8	NC	8



**Engine controller board DPCN—Duplex unit DUPL**

<b>DPCN Pin No.</b>	<b>Signal name</b>	<b>DUPL Pin No.</b>
1	D-COMMAND	1
2 connects to DPCN pin 11	DPCN-RET	N/A
3	DUMBUSY2-N	2
4	SGND	3
5	D-STATUS	4
6	SGND	5
7	DUPMON-P	6
8	SGND	7
9	DUREON-P	8
10	DUPCHK-N	9
11 connects to DPCN pin 2	DPCN-CHK	N/A
12	SLEEP-P'	10

**LVPS ACN4—Duplex unit (DUPL) and duplex power**

<b>ACN4 Pin No.</b>	<b>Signal name</b>	<b>DUPL Pin No.</b>
1	+5V-1	11
2 connects to ACN4 pin 9	CNCHK-RET	N/A
3	+5V-1	12
4	SGND	13
6	SGND	14

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<b>ACN4 Pin No.</b>	<b>Signal name</b>	<b>DUPL Pin No.</b>
9 connects to ACN4 pin 2	CN-CHK	N/A
		<b>Duplex power</b>
5	+24V-2	1
7	+24V-2	3
8	PGND	2
10	PGND	4

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## **6. Preventive maintenance**

There is no preventive maintenance for the Lexmark C510.

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## 7. Parts catalog

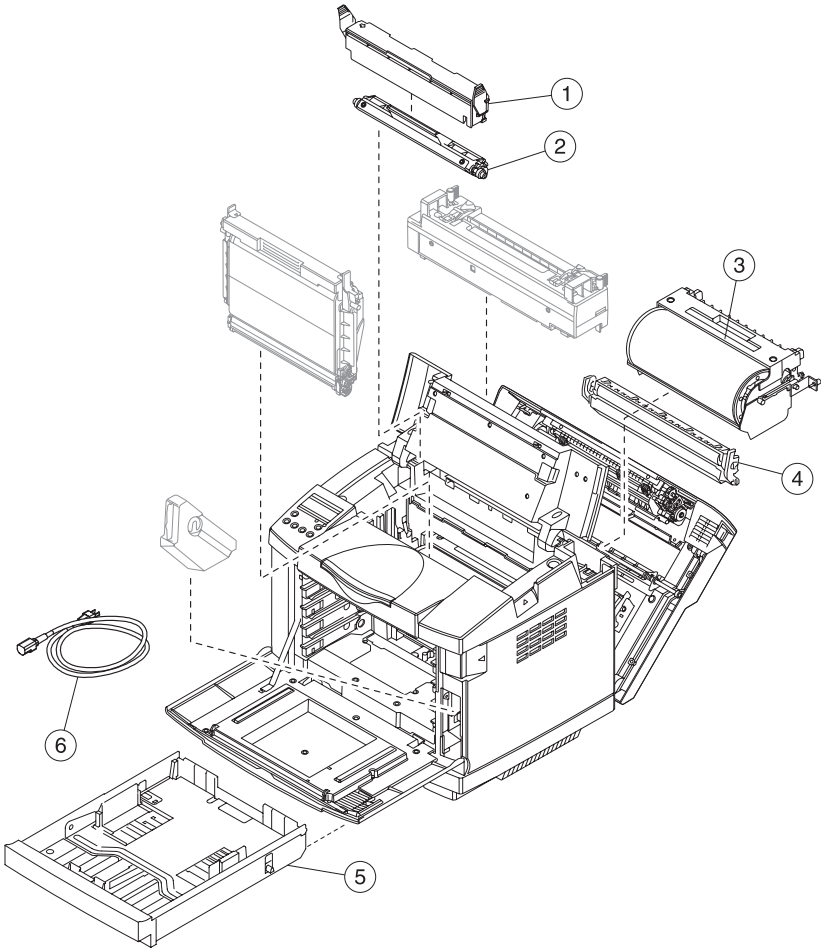
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### How to use this parts catalog

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- **SIMILAR ASSEMBLIES:** If two assemblies contain a majority of identical parts, they are shown on the same list. Common parts are shown by one index number. Parts peculiar to one or the other of the assemblies are listed separately and identified by description.
- **NS: (Not Shown)** in the Asm-Index column indicates that the part is procurable but is not pictured in the illustration.

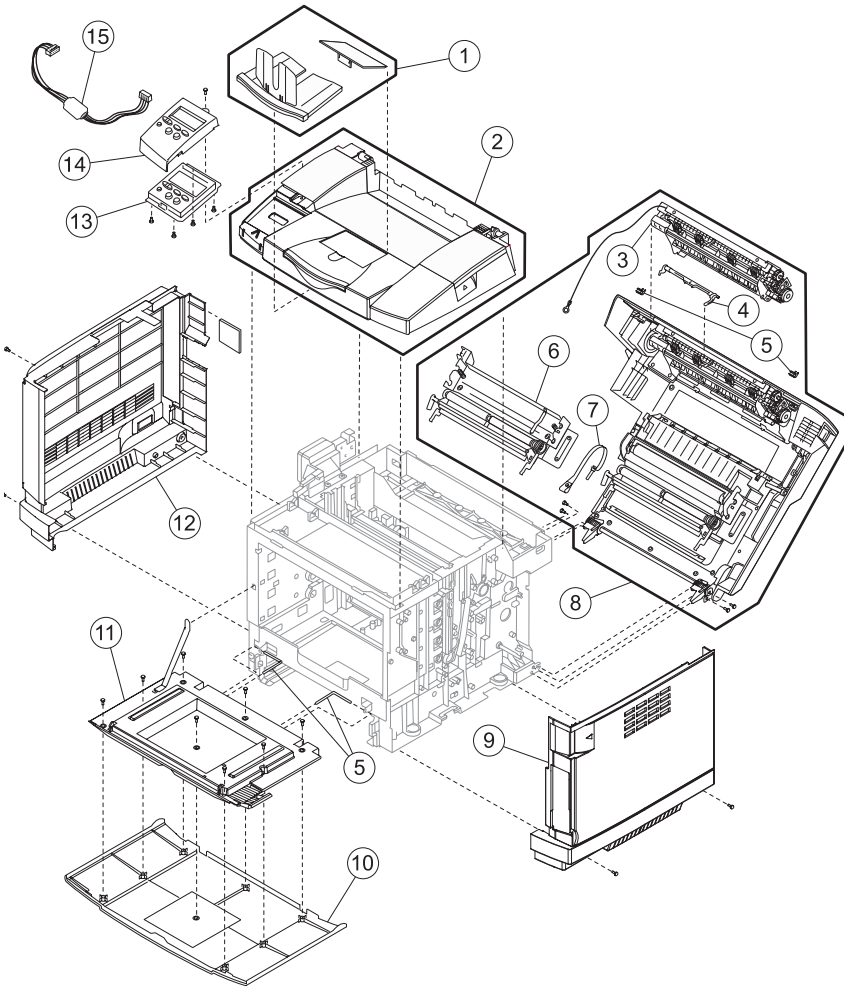
# Assembly 1: Base printer



## Assembly 1: Base printer

Index	P/N	Units	Description
1-1	56P1611	1	Cover, cleaning roller
2	56P1607	1	Roller, cleaning
3	56P1651	1	Transfer unit
4	56P1660	1	Transfer roller assembly
5	56P1669	1	Paper tray, standard
6	12G7008	1	Power cord, USA
6	1339517	1	Power cord, LV, USA, APG, Bolivia, Canada, Columbia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Venezuela
6	1339518	1	Power cord, HV, Argentina
6	1339520	1	Power cord, HV, Brazil
6	1339524	1	Power cord, HV, Chile
6	1339528	1	Power cord, HV, UK, Ireland
6	1339529	1	Power cord, HV, Austria, Belgium, Euro English, Finland, France, Germany, Greece, Netherlands, Norway, Poland, Portugal, Russia, Slovakia/Czech/Hungary, Spain, Sweden, Turkey
6	1339530	1	Power cord, HV, Israel
6	1339531	1	Power cord, HV, Switzerland French, Switzerland German, Switzerland Italian
6	1339532	1	Power cord, HV, South Africa
6	1339533	1	Power cord, HV, Italy
6	1339534	1	Power cord, HV, Denmark

# Assembly 2: Covers

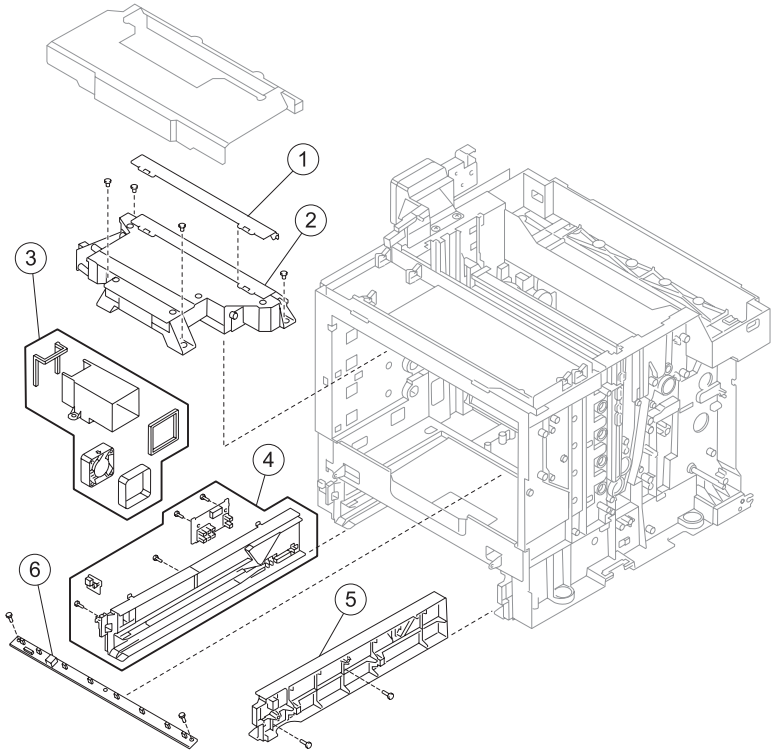




## Assembly 2: Covers

Index	P/N	Units	Description
2-1	56P1676	1	Assembly, paper ramp and stop
2	56P1612	1	Cover assembly, top
3	56P1677	1	Assembly, paper exit (contains output tray full sensor and flag, fuser exit sensor and flag)
4	56P1672	1	Actuator, paper exit
5		1	Packet, parts P/N 56P1662
6	56P1679	1	Assembly, registration
7	56P1685	1	Strap, rear cover support
8	56P1659	1	Rear cover assembly
9	56P1613	1	Cover, right
10	56P1616	1	Cover, front
11	56P1615	1	Cover, inner front
12	56P1614	1	Cover, left
13	56P1668	1	Operator panel
14	56P1666	1	Cover, operator panel
15	56P1604	1	Cable, operator panel

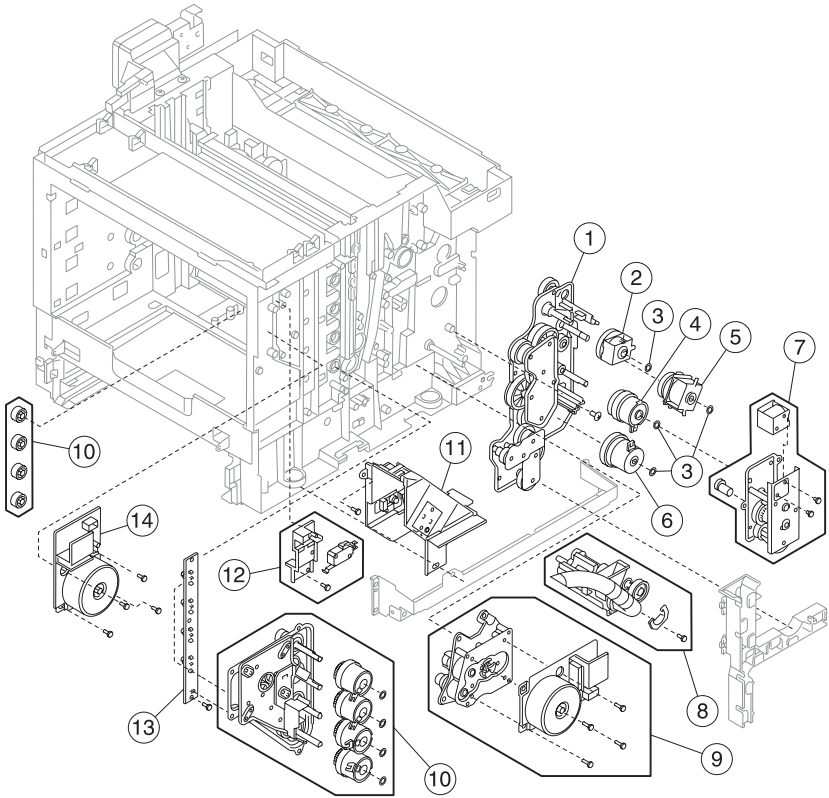
# Assembly 3: Front



**Assembly 3: Front**

<b>Index</b>	<b>P/N</b>	<b>Units</b>	<b>Description</b>
3-1	56P1688	1	Cover, laser unit assembly lens
2	56P1632	1	Laser unit assembly (printhead)
3	56P1671	1	Fan assembly, laser unit
4	56P1680	1	Left tray guide assembly (includes paper size sensor and temperature thermistor)
5	56P1633	1	Right tray guide
6	56P1657	1	Lamp, erase

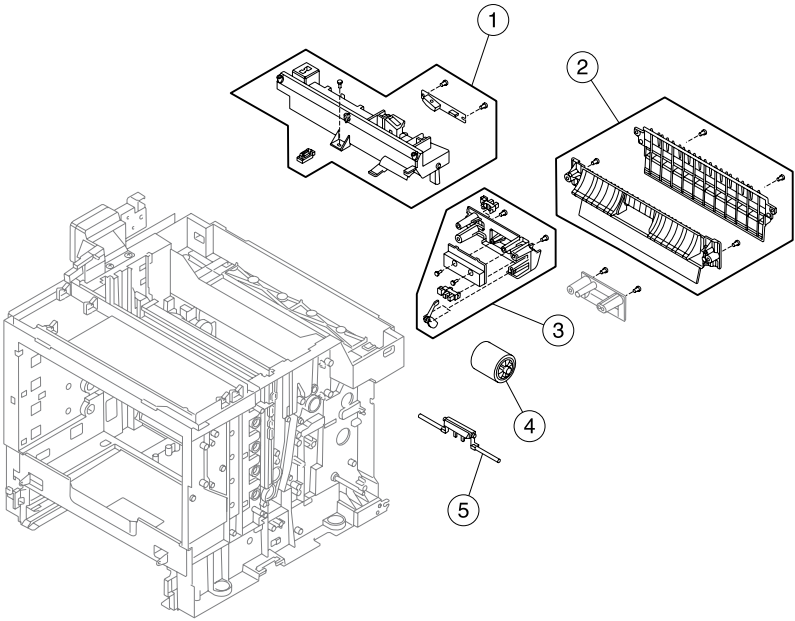
# Assembly 4: Right



**Assembly 4: Right**

<b>Index</b>	<b>P/N</b>	<b>Units</b>	<b>Description</b>
4-1	56P1625	1	Gear assembly, main drive
2	56P1622	1	Clutch, fuser
3		1	Packet, parts P/N 56P1662
4	56P1621	1	Clutch, registration
5	56P1623	1	Clutch, transfer roller
6	56P1620	1	Clutch, paper feed
7	56P1624	1	Clutch, cleaning roller
8	56P1626	1	Waste toner feeder
9	56P1619	1	Motor assembly, main
10	56P1628	1	Drive assembly, developer
11	56P1629	1	Assembly, waste toner holder
12	56P1681	1	Assembly, interlock switch
13	56P1631	1	Sensor, toner, sender TPD (This is a two-piece sensor system. Ordering of this part number includes both the right and left side.)
14	56P1627	1	Motor, developer

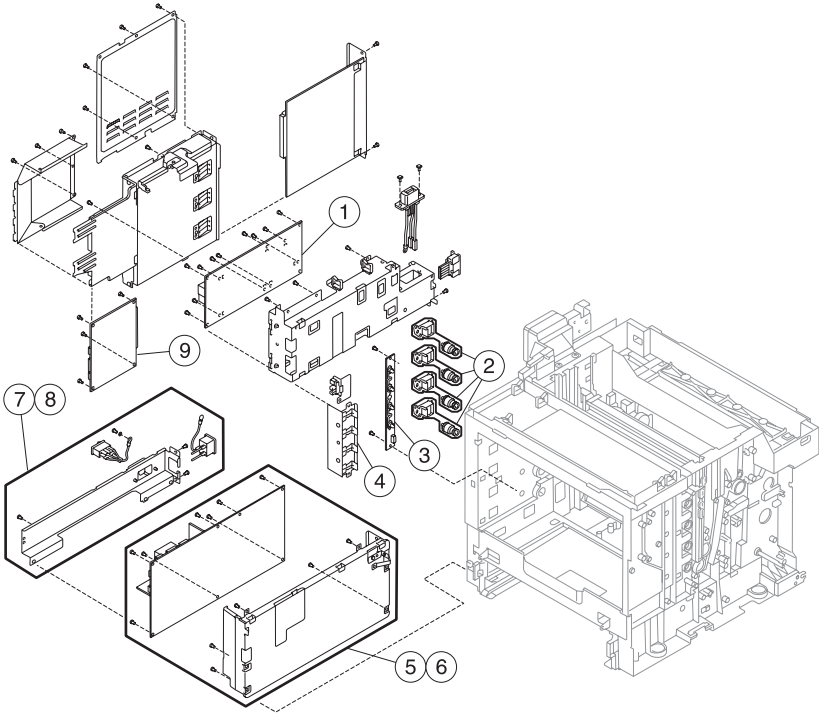
# Assembly 5: Rear



**Assembly 5: Rear**

<b>Index</b>	<b>P/N</b>	<b>Units</b>	<b>Description</b>
5-1	56P1678	1	Assembly, bracket (includes marker sensor (transfer belt unit), toner density sensor)
2	56P1682	1	Paper guide assembly
3	56P1654	1	Paper guide (C) assembly (includes registration sensor, OHP sensor, tray empty sensor)
4	56P1655	1	Roller, paper feed
5	56P1656	1	Pad, separator

# Assembly 6: Left

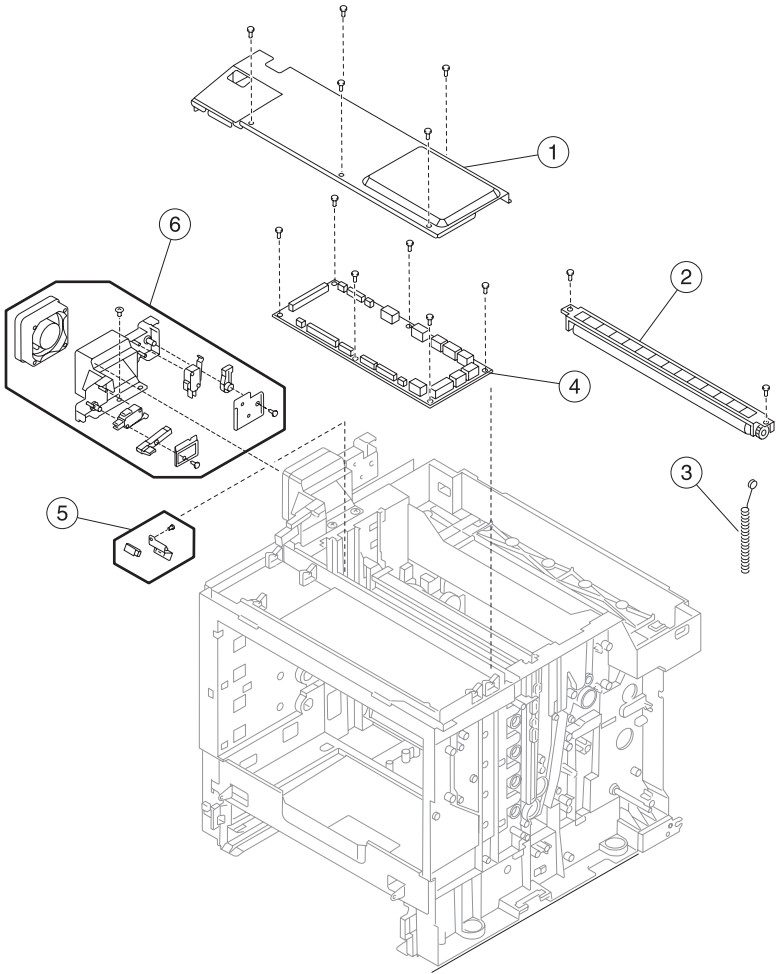




**Assembly 6: Left**

<b>Index</b>	<b>P/N</b>	<b>Units</b>	<b>Description</b>
6-1	56P1640	1	Power supply, high voltage
2	56P1683	1	Assembly, toner retract
3	56P1631	1	Sensor, toner, receiver TTR (This is a two-piece sensor system. Ordering of this part number includes both the right and left side.)
4	56P1648	1	Sensor, toner present
5	56P1641	1	Power supply, 110 V low voltage
6	56P1642	1	Power supply, 220 V low voltage
7	56P1643	1	Bracket, 110 V power supply
8	56P1650	1	Bracket, 220 V power supply
9	56P1639	1	Board, engine controller

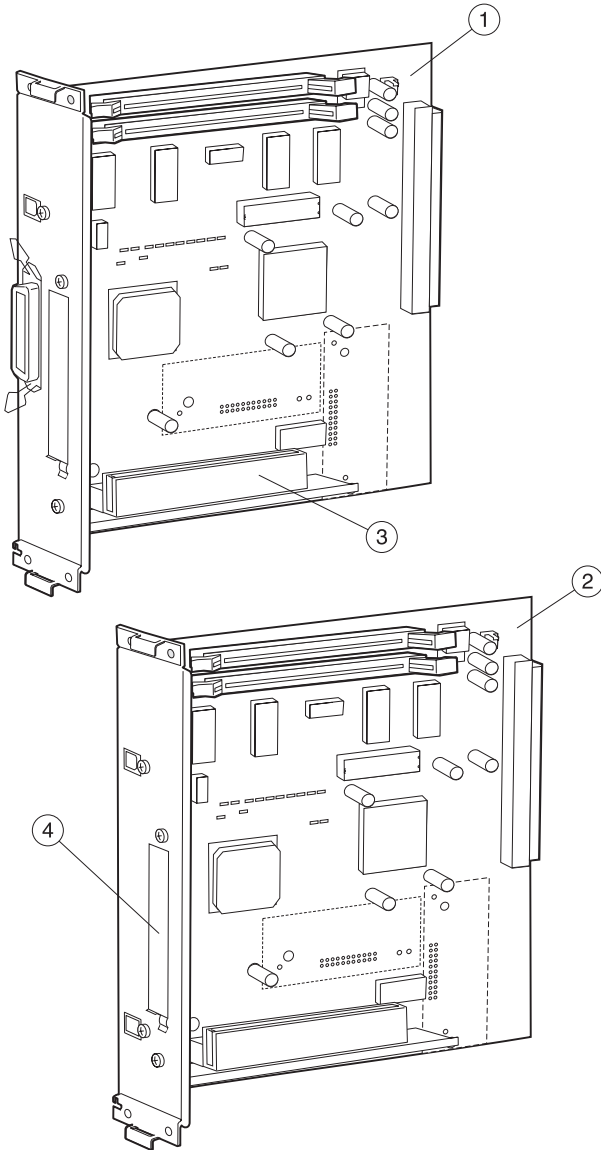
# Assembly 7: Top



**Assembly 7: Top**

<b>Index</b>	<b>P/N</b>	<b>Units</b>	<b>Description</b>
7-1	56P1618	1	Cover, I/O board
2	56P1637	1	Auger, waste toner
3	56P1638	1	Agitator, waste toner
4	56P1617	1	Board, I/O
5	56P1684	1	Assembly, marker sensor (OPC) (includes bracket)
6	56P1644	1	Fan, power supply (includes top cover and rear cover assembly interlock switches)

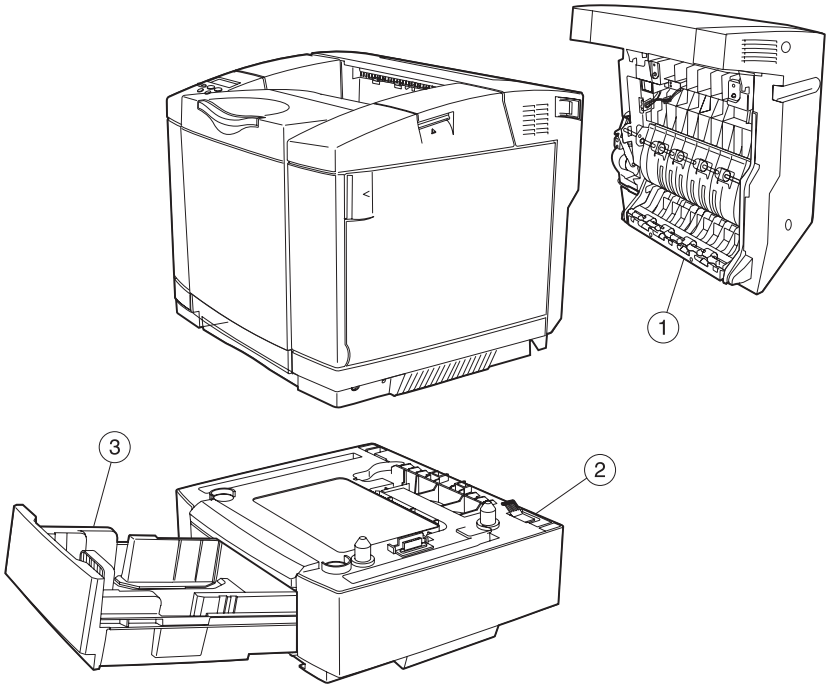
# Assembly 8: RIP board



**Assembly 8: RIP board**

<b>Index</b>	<b>P/N</b>	<b>Units</b>	<b>Description</b>
8-1	56P2714	1	Board, Base RIP
2	56P2715	1	Board, Network RIP
3	12G7229	1	Card assembly, riser
4	56P1667	1	Shield, INA
NS	99A1611	1	Shield, Ethernet
NS	99A2432	1	Shield, parallel

## Assembly 9: Miscellaneous/Options



## Assembly 9: Miscellaneous/Options

Index	P/N	Units	Description
9-1	56P1663	1	Assembly, duplex unit
2	56P1664	1	Assembly, secondary paper feed
3	56P1665	1	Tray, secondary paper feed
NS	56P1670	1	Paper tray, legal
NS	56P1419	1	Drive assembly, 20+GB hard disk with adapter
NS	56P1661	1	Parts packet, harness
NS	56P1662	1	Parts packet, screw
NS	7372640	1	Field relocation kit
NS	56P0698	1	DIMM, 64MB SDRAM
NS	56P0699	1	DIMM, 128MB SDRAM
NS	56P1417	1	DIMM, 16MB Flash
NS	56P1418	1	DIMM, 32MB Flash
NS	56P1428	1	DIMM, Optra Forms™ 16MB
NS	56P1427	1	DIMM, Optra Forms 32MB
NS	56P1424	1	Drive assembly, Optra Forms 20+GB
NS	56P1429	1	DIMM, Simplified Chinese font
NS	56P1430	1	DIMM, Traditional Chinese font
NS	56P1438	1	DIMM, Japanese font
NS	56P1673	1	Card, ImageQuick™
NS	56P1674	1	Card, Bar Code
NS	56P1675	1	Card, PrintCrytion™
NS	56P1431	1	Card, 10/100BaseTX
NS	56P1432	1	Card, 10/100BaseTX/10Base2
NS	56P1433	1	Card, 10/100BaseTX
NS	56P1434	1	Card, Token Ring 3 port
NS	56P1435	1	Adapter, external serial
NS	12G9832	1	Cable, parallel, 10-foot bidirectional
NS	1427498	1	Cable, parallel, 20-foot bidirectional
NS	14D0403	1	Cable, USB, 2-meter
NS	11A6199	1	Cable, 50-foot serial
NS	13A0298	1	Adapter, coax/twinax
NS	56P1437	1	Card, parallel 1284B

### Assembly 9: Miscellaneous/Options

Index	P/N	Units	Description
NS	56P1436	1	Card, RS-232C serial
NS	56P1741	1	Card, N2100t Token Ring
NS	56P1742	1	Card, N2101e 10/100TX



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