



Service Manual

Optra™ E310/E312

4044-00X

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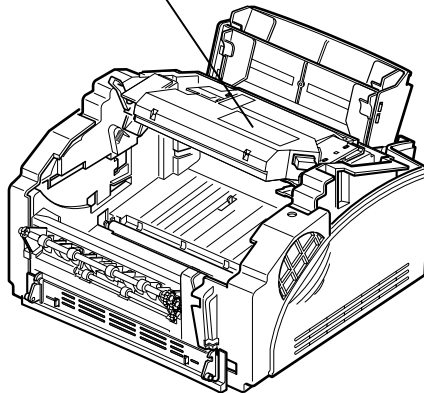
Notices and Safety Information

Laser Notice

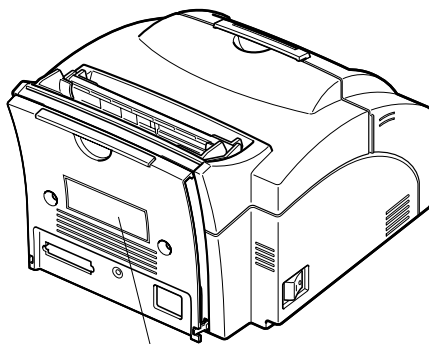
The printer is certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for Class I (1) laser products, and elsewhere is certified as a Class I laser product conforming to the requirements of IEC 825.

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 Advisory Label



Class 1 Laser Statement Label



CLASS 1 LASER PRODUCT
LASER KLASSE 1
LUOKAN 1 LASERLAITE
APPAREIL A LASER DE CLASSE 1
TO IEC 825

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) 825 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 825 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 825.

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 825 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 825.

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 825.

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 825.

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 825 -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 määräytyksiä 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 825.

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 825.

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 825.

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.

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。

Korean Laser Notice

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Safety Information

- This product is designed, tested and approved to meet strict global safety standards with the use of specific Lexmark components. The safety features of some parts may not always be obvious. Lexmark is not responsible for the use of other 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.

Consignes de Sécurité

- Ce produit a été conçu, testé et approuvé pour respecter les normes strictes de sécurité globale lors de l'utilisation de composants Lexmark spécifiques. Les caractéristiques de sécurité de certains éléments ne sont pas toujours évidentes. Lexmark ne peut être tenu responsable de l'utilisation d'autres pièces de rechange.
- 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.

Norme di sicurezza

- Il prodotto è stato progettato, testato e approvato in conformità a severi standard di sicurezza e per l'utilizzo con componenti Lexmark specifici. Le caratteristiche di sicurezza di alcune parti non sempre sono di immediata comprensione. Lexmark non è responsabile per l'utilizzo di parti di ricambio di altri produttori.
- 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.

Sicherheitshinweise

- Dieses Produkt und die zugehörigen Komponenten wurden entworfen und getestet, um beim Einsatz die weltweit gültigen Sicherheitsanforderungen zu erfüllen. Die sicherheitsrelevanten Funktionen der Bauteile und Optionen sind nicht immer offensichtlich. Sofern Teile eingesetzt werden, die nicht von Lexmark sind, wird von Lexmark keinerlei Verantwortung oder Haftung für dieses Produkt 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.

Pautas de Seguridad

- Este producto se ha diseñado, verificado y aprobado para cumplir los más estrictos estándares de seguridad global usando los componentes específicos de Lexmark. Puede que las características de seguridad de algunas piezas no sean siempre evidentes. Lexmark no se hace responsable del uso de otras piezas de recambio.
- 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.

Informações de Segurança

- Este produto foi concebido, testado e aprovado para satisfazer os padrões globais de segurança na utilização de componentes específicos da Lexmark. As funções de segurança de alguns dos componentes podem não ser sempre óbvias. A Lexmark não é responsável pela utilização de outros componentes de substituição.
- 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.

Informació de Seguretat

- Aquest producte està dissenyat, comprovat i aprovat per tal d'acomplir les estrictes normes de seguretat globals amb la utilització de components específics de Lexmark. Les característiques de seguretat d'algunes peces pot ser que no sempre siguin òbvies. Lexmark no es responsabilitza de l'ús d'altres peces de recanvi.
- 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.

Chinese Safety Information

安全资讯

- 本产品使用特有的 Lexmark 元件，并依照严格的世界安全标准来设计、测试及验证。有些零件的安全功能可能不明显。对于其他厂牌更换零件的使用，Lexmark 概不负责。
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- 本产品在拆卸、维修的时候，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。

Korean Safety Information

안전 사항

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- 본 제품을 해체하거나 정비할 경우 전기적인 충격을 받거나 상처를 입을 위험이 커집니다. 전문 서비스 기술자는 이 사실을 숙지하고 필요한 예방 조치를 취하도록 하십시오.

4044-XXX

1. General Information

This printer is a letter-quality laser page printer designed to attach to an IBM Personal Computer or other computers compatible with the IBM Personal Computer (with 386 processor or higher) and Macintosh Computers via the USB connection.

Product Name	Optra E310	Optra E312	Optra E312L	Optra E312L
MT/Model	4044-001	4044-201	4044-2L1	4044-2L2
Speed	8 pages per minute	10 pages per minute	10 pages per minute	10 pages per minute
Base Memory	2MB	4MB	4MB	2MB
Emulations	PSLII, PCL6, PPDS	PSLII, PCL6, PPDS	PSLII, PCL6, PPDS	PSLII, PCL6, PPDS
Connectivity	Parallel/ USB	Parallel/ USB	Parallel/ USB	Parallel/ USB
Resolution	True 600dpi/Image Quality 1200dpi			
Starter Toner Cartridge	6k pages	6k pages	1.5k pages	1.5k pages

Options

The following options are available. Some options are not available in every country. Contact your point of purchase for options available in your country.

Memory options of 8MB, 16MB, 32MB and 64MB

Flash memory options of 1MB, 2MB and 4MB

Acronyms

CSU	Customer Setup
DRAM	Dynamic Random Access Memory
EP	Electrophotographic Process
EPROM	Erasable, Programmable Read-Only Memory
ESD	Electrostatic Discharge
FRU	Field Replaceable Unit
HVPS	High Voltage Power Supply
LASER	Light Amplification by Stimulated Emission of Radiation
LCD	Liquid Crystal Display
LED	Light-Emitting Diode
LVPS	Low Voltage Power Supply
MROM	Masked Read Only Memory
NVRAM	Nonvolatile Random Access Memory
OEM	Original Equipment Manufacturer
PC	Photoconductor
POST	Power-On Self Test
ROM	Read Only Memory
SIMM	Single In-Line Memory Module
SRAM	Static Random Access Memory
UPR	Used Parts Return
USB	Universal Serial Bus
V ac	Volts alternating current
V dc	Volts direct current

2. Diagnostic Information

Start

CAUTION: ***NEVER*** manually actuate or disable the top cover interlock switch and the printhead shutter actuator at the same time. To perform some of the service checks and tests, such as troubleshooting paper feed problems, you need to actuate the top cover interlock switch with the covers opened or removed and power applied to the machine. It is important for personal safety that you *DO NOT, FOR ANY REASON*, disable the printhead shutter actuator when power is on.

Remove power from the printer before you connect or disconnect any cable or electronic board or assembly for personal safety and to prevent damage to the printer.

Use the service error code, user error message, symptom table, service checks, and diagnostic aids in this chapter to determine the corrective action necessary to repair a malfunctioning printer.

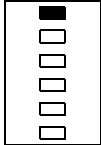
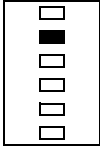
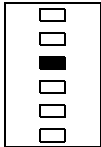
The lights on the operator panel can indicate either a user error message or service error message. When a service error occurs, the printer stops printing and all operator panel LEDs blink in a

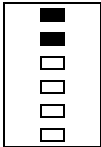
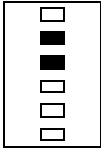
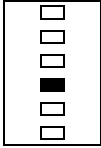
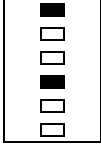
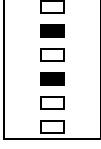
Service Error Codes

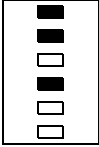
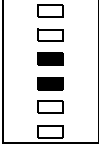
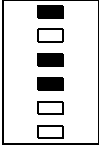
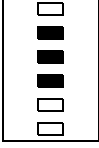
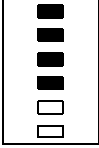
Primary Service Error Codes

When a service error occurs the printer stops printing and all operator panel LEDs blink in a continuous pattern, indicating a service error, until the printer is powered off.

Press and release the operator panel button to display the service error code. Locate the blinking LEDs in the following table and take the indicated action.

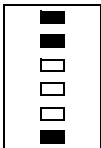
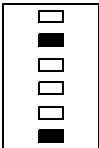
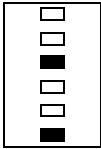
Blinking Operator Panel LED	Action
<p>Software Service Error Code</p> 	<p>Run the Printer Diagnostic Test to diagnose between the ROM SIMM and the controller board. If no other error code displays after the test completes, replace the controller board.</p>
<p>Fuser Failure Error</p> 	<p>Press and release the operator panel button to view the secondary service error code. Go to “Secondary Service Error Codes” on page 2-5.</p>
<p>Laser Diode Failure</p> 	<p>Inspect the printhead cable and replace as necessary. Replace the printhead assembly. If this does not correct the problem, replace the engine/LVPS board.</p>

Blinking Operator Panel LED	Action
<p data-bbox="139 212 352 237">Mirror Motor Failure</p> 	<p data-bbox="547 212 928 342">Inspect the printhead cable and replace as necessary. Replace the printhead assembly. If this does not correct the problem, replace the engine/LVPS board.</p>
<p data-bbox="139 453 389 477">Optional Memory Error</p> 	<p data-bbox="547 453 937 529">Replace the optional memory SIMM. If this does not correct the problem, replace the controller board.</p>
<p data-bbox="139 693 378 717">ROM Checksum Error</p> 	<p data-bbox="547 693 937 769">Replace the ROM SIMM. If this does not correct the problem, replace the controller board.</p>
<p data-bbox="139 933 352 958">Base Memory Error</p> 	<p data-bbox="547 933 852 958">Replace the controller board</p>
<p data-bbox="139 1174 368 1198">NVRAM Failure Error</p> 	<p data-bbox="547 1174 852 1198">Replace the controller board</p>

Blinking Operator Panel LED	Action
<p>ASIC Register Failure Error</p> 	<p>Replace the controller board</p>
<p>ASIC SRAM Failure Error</p> 	<p>Replace the controller board</p>
<p>Flash Memory Failure Error</p> 	<p>Replace the ROM SIMM w/Flash. If this does not correct the problem, replace the controller board.</p>
<p>Font Checksum Failure Error</p> 	<p>Replace the ROM SIMM. If this does not correct the problem, replace the controller board.</p>
<p>Engine/LVPS Board Communications Failure Error</p> 	<p>Replace the engine/LVPS board</p>

Secondary Service Error Codes

For some service error codes, a second service error code is used to further describe the error. When a service error occurs, pressing the operator panel button after viewing the primary service error code displays the secondary service error code. The following table contains the secondary service error codes.

Blinking Operator Panel LED	Action
<p>Fuser Failure - Over Temperature</p> 	<p>Go to the “Hot Fuser Service Check” on page 2-21.</p>
<p>Fuser Failure - Under Temperature</p> 	<p>Go to the “Cold Fuser Service Check” on page 2-17.</p>
<p>Fuser Failure - Thermistor Open</p> 	<p>Go to the “Fuser Service Check” on page 2-17.</p>

User Error Message Table

Primary User Error Message Table

When a user error message occurs the printer stops printing and one or two operator panel LEDs are on solid or blinking until the printer is powered off. Locate the printer's LED Status in the following table and take the indicated action.

User Error Message	LED Status	Action
Paper Jam	Paper Jam on solid	Open cover and clear any paper jams. Close the top cover. If the error message is still present, go to the "Paper Feed Service Check" on page 2-24.
Load Manual Paper/ Envelope	Load Paper blinks and Press Button on solid	Load media into the manual slot and push the operator panel button to resume printing one sheet or do an operator panel reset by pressing and holding the operator panel button for more than three seconds.
Load Paper/Load Envelope	Load Paper on solid and Press Button on solid	Load media in the appropriate paper tray and push the operator panel button to resume printing or do an operator panel reset by pressing and holding the operator panel button for more than three seconds.
Top Cover Open	Error on solid	Close the top cover. If the error LED remains on solid and POST does not continue, go to the "Cover Open Switch Service Check" on page 2-13.

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User Error Message	LED Status	Action
Memory Full/Complex Page/Resolution Reduction Warning/Font Error/ Resource Save Off Deficient Memory	Error on solid and Press Button on solid	The printer memory is full or the page is too complex to print. The printer is forced to reduce the resolution of a formatted page to 300 dpi before printing, or the printer is unable to maintain the required data transfer rate. Go to the "Secondary User Error Message Table" on page 2-8.
Flash Memory Full	Error blinks and Press Button on solid	This condition only occurs when the Flash memory is full.

Secondary User Error Message Table

Press and release the operator panel button two times to display the user secondary error LED status. Each press and release action must be performed within a half second. Locate the printer's LED status in the following table and take the indicated action.

User Error Message	LED Status	Action
Complex Page	Ready, Error, and Press Button on solid	Switch the printing mode to a different printing mode using the Lexmark driver for Windows, or push the operator panel button to resume printing, or do an operator panel reset by pressing and holding the operator panel button for more than three seconds.
Memory Full	Ready, Data, Error, and Press Button on solid	Change the printing mode to Quick Print Plus or reduce the complexity of the job or the resolution, or push the operator panel button to resume printing, or do an operator panel reset by pressing and holding the operator panel button for more than three seconds.
Resolution Reduction	Ready, Data blinking and the Error, Press Button on solid	Switch from the GL/2 or raster mode to Quick Print Plus mode using the Lexmark driver for Windows, or press the operator panel button to resume printing, or do an operator panel reset by pressing and holding the operator button for more than three seconds.

User Error Message	LED Status	Action
Font Error	Data blinking and Error, Press Button on solid	The print command is requesting a font that is not present or installed. The user must select a different font or try turning the Best Fit setting on and retry the print command.
Resource Save Off Deficient Memory	Ready blinking and Error, Press Button on solid	The printer lacks sufficient memory to enable Resource Save. It is recommended that the user install additional memory or set each link buffer to the Auto value.

Power-On Self Test (POST)

When you turn the printer On, it performs a Power-On Self Test. Check for correct POST functioning of the base printer by observing the following:

1. All LEDs turn on solid.
2. All LEDs turn off.
3. The cooling fan and fuser lamp turn on.

Note: The fuser lamp turns off once the thermistor reaches operating temperature. As the temperature drops, the lamp turns back on automatically.
4. The LEDs begin to turn on then off sequentially.
5. Once the fuser has reached operating temperature, the main motor turns on and the pick roller shaft assembly rotates to home position.
6. The Ready LED turns on solid while the Data LED blinks.
7. The engine/LVPS board checks the status of the input and exit paper feed sensors.
8. The main motor turns off.
9. The Data LED turns off.

Symptom Tables

POST Symptom Table

Symptom	Action
The main motor, cooling fan and fuser do not come on.	Go to "Cover Open Switch Service Check" on page 2-13.
POST completes except one or more LEDs do not come on.	Go to the "Operator Panel Service Check" on page 2-23.
None of the LEDs come on.	Go to the "Operator Panel Service Check" on page 2-23.
Main motor does not come on.	Go to the "Main Motor Service Check" on page 2-21.
Fan does not come on.	Go to the "Cooling Fan Service Check" on page 2-12.
Fuser lamp does not come on.	Go to the "Cold Fuser Service Check" on page 2-17.
Fuser lamp never turns off.	Go to the "Hot Fuser Service Check" on page 2-21.
The paper feed picks and tries to feed paper.	Go to the "Paper Feed Service Check" on page 2-24.

Base Printer Symptom Table

Symptom	Action
Dead Machine (no power)	Go to the "Dead Machine Service Check" on page 2-14.
Fan noisy or not working	Go to the "Cooling Fan Service Check" on page 2-12.
Fuser parts melted	Go to the "Hot Fuser Service Check" on page 2-21.
Fuser lamp doesn't light	Go to "Cold Fuser Service Check" on page 2-17.
Toner not fused to the paper	Go to "Cold Fuser Service Check" on page 2-17.

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Symptom	Action
Blank page	Go to "Blank page" on page 2-28.
Black page	Go to "Black page" on page 2-29.
Heavy background	Go to "Heavy background" on page 2-30.
Light print	Go to "Light print" on page 2-33.
White or black lines or bands	Go to "White or black lines or bands" on page 2-34.
Toner on back of page	Go to "Toner on back of page" on page 2-34.
Incorrect characters print	Go to "Incorrect characters print" on page 2-34.
Paper jams	Go to "Paper Feed Service Check" on page 2-24.
Main Motor noisy or does not move	Go to "Main Motor Service Check" on page 2-21.
Paper never picks	Go to "Paper never picks" on page 2-27.
Paper feeds continuously	Go to "Paper picks during POST and/or continuously" on page 2-25.
Paper skew	Go to "Paper Feed Service Check" on page 2-24.
Printer not communicating with host	Go to "Parallel Port Service Check" on page 2-35.
Paper wrinkled or bent	Go to "Paper "trees", wrinkles, stacks poorly or curls" on page 2-28.
Top cover will not close	Go to "Cover Open Switch Service Check" on page 2-13.
Operator panel button does not respond	Go to "Operator Panel Button Service Check" on page 2-24.
Operator panel LEDs do not light or very dim	Go to "Operator Panel Service Check" on page 2-23.

Service Checks

Note: All service checks which involve measuring voltages of the circuit boards (except the controller board) must be performed with the engine/LVPS to controller board cable disconnected and the printer positioned on its left side. This provides the servicer access to the various circuit boards underneath the printer while supplying necessary power to the rest of the printer.

Cooling Fan Service Check

FRU	Action
Model E310 Interconnect Board Cooling Fan	Make sure motor cable is properly seated in location CN408 on the interconnect board. Disconnect the cable and check connector-pin CN408-3 for +24 V dc. If the voltage is not present, replace the interconnect board. If the voltage is present, replace the cooling fan.

FRU	Action
Model E312 Engine Board Cooling Fan	Make sure motor cable is properly seated in location CN3 on the engine board. Disconnect the cable and check connector-pin CN3-1 for +24 V dc. If the voltage is not present, replace the engine board. If the voltage is present, replace the cooling fan.

Cover Open Switch Service Check

Note: Make sure a toner cartridge is installed and the cover closes all the way, engaging the cover open switch lever. The lever can easily be positioned incorrectly if the top cover has been removed and replaced.

FRU	Action
Models E310 & E312 Cover Open Switch	Make sure the cover open switch cable is properly seated in CN2 of the HVPS. Disconnect the cable and check the switch for continuity. Push the cover open switch lever down to engage the switch and close the circuit. If the circuit does not close, replace the switch.
Model E310 HVPS Engine/LVPS Board	Measure the voltage at CN2-3 of the HVPS. It measures +24 V dc. If voltage is present at CN2-3, check for continuity between CN2-1 and CN1-2. If continuity does not exist, replace the HVPS. If continuity does exist, check the HVPS to engine/LVPS board cable for continuity. Replace if defective. If voltage is not present at CN2-3, check the voltage at CN1-1. It measures +24 V dc. If it does, replace the HVPS. If it does not, check the voltage at CN2-2 of the engine/LVPS board. It measures +24 V dc. If it does, replace the HVPS to engine/LVPS board cable.

FRU	Action
Model E312 HVPS	Measure the voltages at CN2 of the HVPS. CN2-3 measures +5 V dc and CN2-4 measures +24 V dc. If the correct voltage is present, check the continuity between the following connector locations: CN2-3 - CN1-17 CN2-3 - CN1-19 CN2-4 - CN1-2 CN2-4 - CN1-4 If any location does not measure continuity, replace the HVPS.
Model E312 HVPS to Engine Board Cable	Replace the cable if it does not measure continuity.
E312 Engine Board	Go to the "Engine Board (model E312)" on page -9. Measure the voltages on CN11. If any voltages are incorrect, replace the engine board.

Dead Machine Service Check

Note: Check the AC line voltage. The voltage should be within the following limits:

100 V ac - 127 V ac for the low voltage model printer

200 V ac - 240 V ac for the high voltage model printer

FRU	Action
Model E310 & E312 LVPS Fuse	Check the fuse on the LVPS for continuity. Replace with the appropriate fuse if blown. If a fuse blows again after being replaced, install a new fuse and go to "Engine/LVPS Board (model E310)" on page 5-4 and check the engine/LVPS board output.

FRU	Action
Model E310 Engine/LVPS Board Power Switch	Disconnect the cables from CN2 and CN5 and leave the cables connected to the power switch attached. With the printer positioned on its left side and the engine/LVPS board positioned on a flat surface, turn the power switch on and check the AC line voltage at connector CN201. If no voltage is present, replace the power switch. If line voltage is present, measure the voltages at connectors CN2 and CN5. Go to the “Engine/LVPS Board (model E310)” on page 5-4 and check for correct voltage measurements. Replace the engine/LVPS board if any of the voltage measurements are incorrect.
Model E310 LVPS to Interconnect Board Cable	Check the continuity of the LVPS to interconnect board cable. Replace the cable if it does not measure continuity.
Model E310 Interconnect Board	Reconnect the LVPS to the interconnect board cable. Go to “Interconnect Board (model E310)” on page 5-21 and measure voltages on the following connectors on the interconnect board: CN401/CN402/CN403/CN404/ CN405/CN407/CN408 If any of the measured voltages are incorrect, replace the interconnect board.
Model E312 Power Switch	Place the printer on its rear side. Position the LVPS board on a flat surface with all the cables connected. Turn the printer power switch to the on position. Check the AC line voltage at power switch connector CN501. If no voltage is present, replace the power switch

FRU	Action
<p>Model E312 LVPS Board</p>	<p>Disconnect the LVPS cable from connector CN7 on the engine board. Go to the "LVPS (model E312)" on page -14. Check the voltage measurements at connector CN503. If any voltage measurements are incorrect, replace the LVPS.</p>
<p>Model E312 Engine Board</p>	<p>Reconnect the LVPS cable to connector CN7 on the engine board. Disconnect all other cables from the engine board. Go to the "Engine Board (model E312)" on page -9. Check the voltage measurements at each connector. If any voltages are incorrect, replace the engine board. If all voltages are correct, reconnect all the cables to the engine board one at a time. Check the voltage measurements on the engine board each time you connect a cable. If a voltage measurement is incorrect after connecting one of the cables, replace the FRU that you connected.</p>

Fuser Service Check

Cold Fuser Service Check

When toner is partially fused to the paper, it is usually caused by low fuser temperature.

Avoid handling the lamp as much as possible as it is easily broken. Be careful not to touch the glass housing with bare hands as skin contains acids that can weaken the glass.

The line voltage to the printer must be within the following limits:

100 V ac - 127 V ac for the low voltage model printer

200 V ac - 240 V ac for the high voltage model printer

Turn the printer off and wait a few minutes for the fuser lamp to cool. Turn the machine on and observe the lamp turning on during POST. You can see the lamp with the left side cover and fuser wire cover removed.

The fuser lamp does light

FRU	Action
Model 310 Thermistor	If the fuser lamp comes on and a fuser failure LED error code displays, be sure the thermistor is contacting the hot roll and the thermistor cable is firmly seated in connector CN1 on the LVPS board. Check for excessive toner buildup on the surface of the thermistor. Clean or replace as necessary. Turn the printer off and disconnect the thermistor cable from CN1 on the LVPS board. Measure the resistance of the thermistor between CN1-1 and CN1-2. The resistance measures approximately 225K ohms when cool. Replace the thermistor as necessary.
Model 312 Thermistor	If the fuser lamp comes on and a fuser failure LED error code displays, be sure the thermistor is contacting the hot roll and the thermistor cable is firmly seated in connector CN10 on the engine board. Check for excessive toner buildup on the surface of the thermistor. Clean or replace as necessary. Turn the printer off and disconnect the thermistor cable from CN10 on the engine board. Measure the resistance of the thermistor between CN10-1 and CN10-3. The resistance measures approximately 225K ohms when cool. Replace the thermistor as necessary.
Models E310 & E312 Fuser Lamp	Make sure the correct voltage lamp is installed. The voltage rating is stamped on one of the lamp contacts.

The fuser lamp does not light

FRU	Action
<p>Model E310 Fuser Lamp Lamp Cable Thermistor LVPS</p>	<p>Turn the printer off and disconnect the fuser lamp wires from the fuser. Check for continuity across the fuser lamp wire contacts. If there is continuity, go to step 1: Continuity. If there is no continuity, go to step 2: No Continuity.</p> <p>Step 1: Continuity</p> <p>Measure the voltage at connector CN202 on the LVPS. It should match the line voltage. If it does not, replace the LVPS. If line voltage is present, check the fuser lamp cable for continuity. Replace if defective. Make sure the fuser thermistor is correctly connected to CN1 on the LVPS. If the problem persists, disconnect the thermistor cable from CN1 on the LVPS board and measure the voltage between CN1-1 and ground. The voltage measures approximately 3.9 V dc. If the voltage is incorrect, replace the LVPS. If correct, replace the thermistor.</p> <p>Step 2: No Continuity</p> <p>Check the thermal fuse for continuity. If incorrect, replace the thermal fuse. If correct, replace the lamp.</p>

FRU	Action
<p>Model E312 Fuser Lamp Lamp Cable Thermistor LVPS</p>	<p>Turn the printer off and disconnect the fuser lamp wires from the fuser. Check for continuity across the fuser lamp wire contacts. If there is continuity, go to step 1: Continuity. If there is no continuity, go to step 2: No Continuity.</p> <p>Step 1: Continuity</p> <p>Measure the voltage at connector CN502 on the LVPS. It should match the line voltage. If it does not, replace the LVPS. If line voltage is present, check the fuser lamp cable for continuity. Replace if defective. Make sure the fuser thermistor is correctly connected to CN10 on the engine board. If the problem persists, disconnect the thermistor cable from CN10 on the engine board and measure the voltage between CN10-1 and ground. The voltage measures approximately 3.9 V dc. If the voltage is incorrect, replace the engine board. If correct, replace the thermistor.</p> <p>Step 2: No Continuity</p> <p>Check the thermal fuse for continuity. If incorrect, replace the thermal fuse. If correct, replace the lamp.</p>

Hot Fuser Service Check

FRU	Action
Model E310 Fuser Thermistor	Disconnect the thermistor cable from the LVPS. Measure the resistance across CN1-1 and CN1-2 of the thermistor cable. Replace the thermistor if the resistance is lower than 1k ohm or shorted.
Model E312 Fuser Thermistor	Disconnect the thermistor cable from the engine board. Measure the resistance across CN10-1 and CN10-3 of the thermistor cable. Replace the thermistor if the resistance is lower than 1k ohm or shorted.
Models E310 & E312 Fuser Lamp	Make sure the correct voltage fuser lamp is installed. Replace if necessary.

Main Motor Service Check

FRU	Action
Model E310 Interconnect Board Main Motor Main Motor Cable	<p>Check the interconnect board for the following voltages:</p> <p>CN405-3 +24 V dc CN405-4 +24 V dc</p> <p>If these voltages are not correct, replace the interconnect board. If these voltages are correct, check the main motor cable for continuity. If continuity exists on each wire, replace the main motor. If continuity does not exist on one or more of the wires, replace the cable.</p>

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FRU	Action
Model E312 Engine Board Main Motor Main Motor Cable	Check the engine board for the following voltages: CN2-3 +24 V dc CN2-4 +24 V dc If these voltages are not correct, replace the engine board. If these voltages are correct, check the main motor cable for continuity. If continuity exists on each wire, replace the main motor. If continuity does not exist on one or more of the wires, replace the cable.

Operator Panel Service Check

Inspect the operator panel cable for damage. Make sure the cable is plugged in securely.

Run POST and check each LED for proper operation.

FRU	Action
<p>Models E310 & E312 Operator Panel Operator Panel Cable</p>	<p>If more than one LED does not turn on or an individual LED stays on solid during POST, check the operator panel cable for continuity. Replace if defective. If the cable measures continuity, replace the operator panel.</p>
<p>Models E310 & E312 Operator Panel Operator Panel Cable Controller Board</p>	<p>If all LEDs are dim and operate erratically during POST or all LEDs come on and stay on solid during POST, replace the following FRUs one at a time in the order shown:</p> <p>Controller Board Operator Panel Operator Panel Cable</p> <p>If none of the LEDs come on, make sure the cable is properly connected to the operator panel and the controller board. Disconnect the cable and check it for continuity. Replace if necessary. If the cable measures continuity, measure the following voltages with the printer on at idle:</p> <p>U5-1: Ground U5-2: +5 V dc U5-3: +5 V dc U5-5: +5 V dc U5-6: Ground</p> <p>If these voltages are not correct, replace the controller board. If these voltages are correct, replace the operator panel.</p>

Operator Panel Button Service Check

FRU	Action
Models E310 & E312 Operator Panel Operator Panel Cable	Disconnect the operator panel from the operator panel cable. Check the continuity between U5-1 and U5-2 on the operator panel as you press the operator panel button. As the button is pressed, continuity is present. Replace the operator panel if continuity is not present. If continuity is present, replace the operator panel cable.

Paper Feed Service Check**Paper Jam error indication during POST**

FRU	Action
Models E310 & E312 Exit Sensor Flag	If the exit sensor flag is not resting within the paper exit sensor during POST, the printer displays a paper jam message. Make sure the flag is operating freely and correctly installed.
Models E310 & E312 Input Paper Feed Sensor	Make sure the input paperfeed sensor is working properly. A stuck or incorrectly installed sensor causes this error.

Paper picks during POST and/or continuously

FRU	Action
Models E310 & E312 Pick Roller Clutch Solenoid	Check the pick roller clutch for wear. The solenoid interacts with the clutch controlling motion of the pick roller. If the cam surface of the pick roller clutch assembly is worn, the solenoid may not stop the pick roller from rotating. Replace the pick roller clutch assembly if necessary. Make sure the spring on the solenoid is properly installed. If the spring is improperly installed or missing, the pick roller will continuously pick paper.

Paper picks but stops about an inch down the page

FRU	Action
Models E310 & E312 Roller Guides	Check for correct position of roller guides on pick roller assembly.

Paper picks but stops half way through the printer

FRU	Action
Model E310 Input Paper Feed Sensor Interconnect Board	Make sure the input paper feed sensor is working properly. Check for a broken or stuck flag on the input paper feed sensor. Check to make sure the cable is seated on the CN401 connector on the interconnect board. Disconnect the cable and check for the following voltages: CN401-3 +5 V dc CN401-4 Ground If these voltages are not correct, replace the interconnect board. If correct, replace the input paper feed sensor.

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FRU	Action
Model E312 Input Paper Feed Sensor Engine Board	<p>Make sure the input paper feed sensor is working properly. Check for a broken or stuck flag on the input paper feed sensor. Check to make sure the cable is seated on the CN6 connector on the engine board. Disconnect the cable and check for the following voltages:</p> <p>CN6-3 +5 V dc CN6-4 Ground</p> <p>If these voltages are not correct, replace the engine board. If correct, replace the input paper feed sensor.</p>

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Paper never picks

FRU	Action
Models E310 & E312 Paper Tray	Make sure the paper tray is correctly installed. The black mylar guide sheet in the front of the tray must be positioned in the paper path just behind the pick roller assembly. This guide sheet can easily block the paper path if installed incorrectly.
Model E310 Pick Roller Solenoid	Make sure solenoid is installed correctly and its cable is plugged into CN402 on the interconnect board. If installation is correct, disconnect the solenoid and check CN402-1 for +24 V dc. If the voltage is present, replace the solenoid. If the voltage is not present, replace the interconnect board.
Model E312 Pick Roller Solenoid	Make sure solenoid is installed correctly and its cable is plugged into CN4 on the engine board. If installation is correct, disconnect the solenoid and check CN4-1 for +24 V dc. If the voltage is present, replace the solenoid. If the voltage is not present, replace the engine board.

Paper occasionally picks or picks multiple sheets at once

FRU	Action
Models E310 & E312 Pick Roller Assembly	Check pick roller assembly for wear. Replace as necessary.
Models E310 & E312 Paper Separator Assembly	Check the friction pad on the paper separator for signs of wear. Replace as necessary.
Models E310 & E312 Pick Roller Pad Assembly	Check the friction pad on the pick roller pad assembly for signs of wear. Replace as necessary.

Paper "trees", wrinkles, stacks poorly or curls

FRU	Action
Models E310 & E312 Transfer Roller	This problem is most likely due to a worn transfer roller. A worn transfer roller causes the printer to run hotter than required for the media being printed. Excessive heat can cause paper treeing problems, poor stacking or curl.

Print Quality Service Check

Blank page

FRU	Action
Models E310 & E312 Toner Cartridge	Remove the toner cartridge and gently shake the assembly to evenly distribute the toner.
Printhead Printhead Cable HVPS Engine/LVPS Board (Model E310) Engine Board (Model E312)	Blank pages can be caused by a defective printhead assembly, high voltage power supply or engine/LVPS board. Disconnect the printhead cable from the HVPS and measure the signals on connectors CN3 and CN4. Go to the “High Voltage Power Supply (model E310)” on page 5-16 in the connector locations chapter and check the voltage measurements. If the voltages are correct, check the printhead cable for continuity. If the cable measures continuity, replace the printhead. If the cable does not measure continuity, replace the cable. If the voltage measurements are not correct, replace the HVPS. If the problem still exists, replace the engine/LVPS board on the model E310 or the engine board on the model E312.

Black page

Note: Incorrect laser exposure or incorrect charging of the photoconductor causes an all black page.

FRU	Action
Models E310 & E312 HVPS Contacts	Check the contacts for contamination and correct installation. Replace as necessary.
Model E310 Engine/LVPS Board HVPS Cable HVPS	Make sure the HVPS to engine/LVPS cable is correctly installed. Disconnect the cable and measure the signals on CN2 of the engine/LVPS board. Go to “Engine/LVPS Board (model E310)” on page 5-4 and check the voltage measurements. If the voltages are not correct, replace the engine/LVPS board. If the voltages are correct, check the HVPS to engine/LVPS cable for continuity. If the cable does not measure continuity, replace the cable. If the cable measures continuity, replace the HVPS.
Model E312 Engine Board HVPS Cable HVPS	Make sure the HVPS to engine board cable is correctly installed. Disconnect the cable and measure the signals on CN11 of the engine board. Go to the “Engine Board (model E312)” on page -9 . Check the voltage measurements. If the voltages are not correct, replace the engine board. If the voltages are correct, check the HVPS to engine board cable for continuity. If the cable does not measure continuity, replace the cable. If the cable measures continuity, replace the HVPS.

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Heavy background

Poor development or poorly charged toner particles cause excessive background. This is more noticeable as the toner cartridge nears end of life.

FRU	Action
Models E310 & E12 Toner Cartridge	Make sure toner cartridge is correctly installed and the high voltage contacts are clean. If the cartridge is installed correctly, try a new cartridge.
Model E310 HVPS Contacts HVPS Board Engine/LVPS Board	Check the contacts for correct installation and contamination where contact is made with the toner cartridge and HVPS Board. Clean as necessary. If this does not correct the problem, replace the following FRUs one at a time in the order shown: HVPS Board Engine/LVPS Board
Model E312 HVPS Contacts HVPS Board Engine Board	Check the contacts for correct installation and contamination where contact is made with the toner cartridge and HVPS Board. Clean as necessary. If this does not correct the problem, replace the following FRUs one at a time in the order shown: HVPS Board Engine Board

Partial blank image/white spots (no periodic pattern)

FRU	Action
Toner Cartridge	Remove the toner cartridge and gently shake the assembly to evenly distribute the toner. If toner cartridge is low, try a new one.
Fuser Backup Roller Springs	Check left and right backup roller springs and backup roller to ensure adequate even pressure is applied to the fuser hotroll.
Paper	Make sure recommended paper is being used.

Variation in image density horizontally across page

FRU	Action
Toner Cartridge	The charge roll in the toner cartridge may have an unbalanced pressure against the PC drum. Try a new toner cartridge.
Transfer Roller Bearing Assembly Transfer Roller	Check the springs in the left and right transfer roller bearings. The bearing assemblies should support the transfer roller, applying even pressure to the PC drum. Replace either or both transfer roller bearing assemblies if the springs show signs of damage or fatigue. Inspect the transfer roller for signs of wear or damage and replace as necessary.

Periodic irregularity down page

FRU	Action
PC Drum (Toner Cartridge) Distance Between Irregularity 94.5 mm	The PC drum or gear driving the PC drum may be contaminated or damaged. Inform the customer to replace the toner cartridge.
Charge Roller (Toner Cartridge) Distance Between Irregularity 37.8 mm	The charge roller or gear driving the charge roller may be contaminated or damaged. Inform the customer to replace the toner cartridge.
Supply Roller (Toner Cartridge) Distance Between Irregularity 40.1 mm	The supply roller or gear driving the supply roller may be contaminated or damaged. Inform the customer to replace the toner cartridge.
Developer Roller (Toner Cartridge) Distance Between Irregularity 46.1 mm	The supply roller or gear driving the developer roller may be contaminated or damaged. Inform the customer to replace the toner cartridge.
Transfer Roller Distance Between Irregularity 46.0 mm	The transfer roller or gear driving the transfer roller may be contaminated or damaged. Inspect the roller and gear. Replace as necessary.
Hot Roll Distance Between Irregularity 56.7 mm	The hot roll of the fuser or gear driving the hot roll may be contaminated or damaged. Inspect the hot roll and gear. Replace or clean as necessary.
Backup Roller Distance Between Irregularity 69.1 mm	The backup roller of the fuser may be contaminated or damaged. Inspect and replace as necessary.

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Poor fusing of image

FRU	Action
Fuser Lamp	The fuser may not be operating at the proper temperature to fuse the toner to the paper. Go to the “Cold Fuser Service Check” on page 2-17.
Paper	Make sure recommended paper is being used.

Light print

FRU	Action
Toner Cartridge	Make sure the toner cartridge is installed correctly and is not low on toner. If the problem continues, install a new toner cartridge.
Transfer Roller HVPS Contact (Transfer Roller) HVPS Board	Check the transfer roller for signs of toner buildup and contamination. Inspect the HVPS contact (transfer roller) for contamination. Inspect the HVPS board for contamination where it meets the HVPS contacts. If all components appear free of contamination, replace the following FRUs one at a time in the order shown: Transfer Roller HVPS Contact (Transfer Roller) HVPS Board

White or black lines or bands

FRU	Action
Toner Cartridge Paper Feed Drive Gears	Banding appears as light or dark horizontal lines on a uniformly gray page or on a page with a large area of graphics. Banding is primarily due to a variation in the speed of the paper as it feeds through the printer especially in the developer and transfer process. Inspect the toner cartridge and paper feed components, especially the drive gears, for signs of wear, debris, binds or damage.

Toner on back of page

FRU	Action
Print Cartridge	Inspect the overall paper path for signs of spilled toner. Gently clean the contaminated areas with a soft cloth or compressed air.
Fuser Hot Roll Backup Roller	The fuser hot roll can cause toner on the back of the paper if toner is building up on the hot roll. This buildup may transfer to the backup roller, later transferring to the backside of the paper. Inspect the hot roll and backup roller for signs of contamination and replace as necessary.
Transfer Roller	A transfer roller contaminated with toner can cause toner to transfer to backside of printed pages. Inspect the transfer roller for contamination and replace as necessary.

Incorrect characters print

Make sure the correct printer driver software is installed. Incorrect software can cause incorrect characters to print and the image may not fit the page.

Parallel Port Service Check

1. Perform a print test to make sure the printer prints correctly.
2. Be sure the printer cable is designed for bidirectional printing.
3. Be sure the user application is set up correctly. Improper set up can prevent establishing a communication link with the printer.
4. Try enabling the parallel port pull-up resistors. Go to **"Parallel Mode 1"** on page 3-8. Try printing a test page after enabling resistors. If the printer still does not print, disable the resistors.
5. If the internal print test page prints correctly, the user application/printer driver is set up correctly and the correct bi-directional parallel cable is installed, yet the printer still fails to print on command from the host, replace the controller board.

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3. Diagnostic Aids

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

Memory Test

The following tests run sequentially when performing this test:

- Standard Memory Test
- Optional Memory Test

The memory test runs automatically during POST if a different size optional memory SIMM is installed since the last printer power on.

Perform the following steps to run the Memory Test:

1. Turn the printer off.
2. Open the top cover.
3. Press and hold the operator panel button as you turn on the printer. Release the button once the Error LED comes on solid.
4. Close the top cover.
5. If all the diagnostic tests run correctly, the Data LED blinks. If a test fails, the Error LED pattern for the service error code displays on the operator panel. Go to the **“Service Error Codes”** on [page 2-2](#) and take the indicated action for that error.

Diagnostic Test

Once the memory test is complete, the diagnostic test pages can be printed by briefly pressing the operator panel button. Two pages are printed. The first page is a listing of various printer settings and code level. The second page is used to inspect registration. If the printer requires a registration adjustment, you must contact your next level of support to obtain the software utility that enables you to adjust registration.

Print Quality Test

There are three print quality test pages. The first page displays the installed printer base code level and user default settings for the following:

- Top Margin Offset
- Left Margin Offset
- Printer Page Count
- Installed Memory
- PQET Setting (on/off)
- Toner Saver (on/off)
- Print Resolution
- Print Darkness

The next two test pages are used to evaluate print quality. One test page is gray and the other is black. Perform the following steps to print the second test page:

1. Turn the printer off.
2. Open the top cover.
3. Turn the printer power on.
4. When the Error LED comes on solid, double-click the operator panel button.
5. Once the Error and Press Button LEDs start blinking, close the top cover.
6. The Ready LED comes on solid and the Error and Press Button LED continue blinking.
7. Double-click the operator button four times. The Ready and Data LEDs come on solid while the Error and Press Button LEDs continue blinking.
8. Perform a long button press until all LEDs come on solid.
9. The test pages are printing.
10. When the test pages have finished printing, the Ready LED comes on solid and the Data LED goes off.

Note: After the print quality test pages print, the printer automatically returns to the Ready mode.

User Mode Print Test

The User Mode Print Test Page displays the user default values, installed options, printer features, various typefaces, and the installed printer base code level.

1. Turn the printer power on. The Ready LED comes on solid (printer is in the ready state).
2. Press and release the operator panel button.
3. The Ready LED comes on solid and the Data LED blinks indicating the printer is busy.
4. The test page prints and the operator panel Ready LED comes on solid and the Data LED turns off.
5. The printer returns to the Ready mode.

Configuration Mode

The configuration mode gives the ability to set the following printer functions through the operator panel:

Parallel Port Settings

- Enable Port
- NPA Mode
- Protocol
- Mode 1
- Mode 2
- Strobe Adjust

USB Settings

- Enable Port
- NPA Mode

PPDS Activated

- Auto CRLF/LFCR

Operator Panel Configuration Mode Button Definition

Term	Description	Result
Brief Button Press	Press the operator panel button no longer than three seconds.	This action moves through the configuration mode settings.
Long Button Press	Press and hold the operator panel button for more than three seconds.	This action selects and saves the setting for the menu item displayed. To indicate that the setting is saved, all LEDs blink once.
Double-Click Button Press	Press and release the operator panel button two times. Each press and release action must be performed within a half second.	This action moves through the configuration mode menu.

Perform the following steps to enter the configuration mode:

1. Turn the printer power off.
2. Open the top cover.
3. Turn the printer power on.
4. When the Error LED comes on solid, double-click the operator panel button.
5. When the Error and Press Button LEDs start blinking, close the top cover. The Ready LED comes on solid and the Error and Press Button LEDs continue blinking.
6. Double-click the operator panel button two times. The Load Paper LED comes on solid while the Error and Press Button LEDs continue blinking.
7. Perform a long button press. All LEDs blink once. The Ready LED stays on solid. The printer is in the configuration mode.
8. To exit the configuration mode, turn the printer power off.

Configuration Mode Operator Panel Overlays

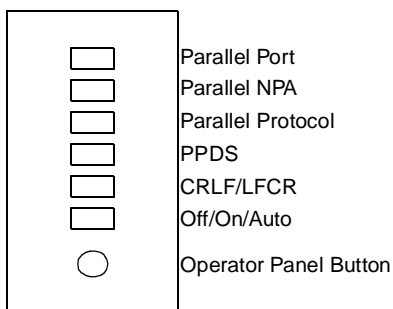
When in configuration mode, the first menu item and its setting are displayed. The first menu item is the Parallel Port and is indicated by

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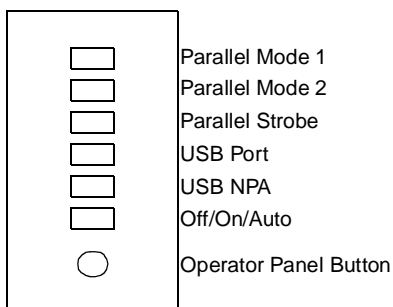
the solid Ready LED. The setting of the menu item is indicated by the status of the Press Button LED. To change the menu item setting, briefly press the operator panel button. Once the setting you want is indicated by the status of the Press Button LED, perform a long button press to save the setting. All LEDs come on while the setting is saved. To select other menu items, double-click the operator panel button until the menu item LED you want is selected.

There are ten menu items that can be selected by using the five LEDs as indicated by the following overlays on two passes through the configuration menu. The first time through the menu the LED selected is on solid. The second time through the menu the LED selected is blinking.

First pass - LED on solid overlay.



Second pass - LED blinking overlay



Configuration Mode Settings

The following is a description of the available configuration mode menu items and settings. The asterisk (*) indicates the factory default setting.

Parallel Port

Parallel Port allows the user to enable or disable the parallel port. If the port is not being used, disabling it frees allocated memory to be used to process print jobs.

Perform the following steps to change the Parallel Port setting:

1. Enter the configuration mode.
Note: The Parallel Port (Ready) LED comes on solid. The current Parallel Port setting is indicated by the Off/On/Auto (Press Button) LED. When the LED is off, the parallel port is disabled. When the LED is *blinking, the parallel port is enabled.
2. Perform a brief button press to select the Parallel Port setting.
3. Perform a long button press. All LEDs blink once, indicating the setting is saved.
4. Exit the configuration mode by turning the printer power off.

Parallel NPA

Parallel NPA mode allows two way communication between the host and the printer.

Perform the following steps to change the Parallel NPA setting:

1. Enter the configuration mode.
2. Perform a double click button press. This moves to the Parallel NPA item on the configuration menu. The Parallel NPA (Data) LED comes on solid.
3. The current Parallel NPA setting is indicated by the Off/On/Auto (Press Button) LED.
 - When the LED is on solid, all data received by the printer must be in NPA packets. Any non-packet data is rejected as bad packets.
 - When the LED is off, the printer is not performing any NPA processing.

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- When the LED is *blinking, the printer examines incoming data and decides whether it is receiving NPA packets.
4. Perform a brief button press to select the Parallel NPA setting.
 5. Perform a long button press. All LEDs blink once, indicating the setting is saved.
 6. Exit the configuration mode by turning the printer power off.

Parallel Protocol

The printer supports two parallel protocol settings: standard and fastbytes. When the protocol is set to standard, information is received at a normal transmission rate. When the protocol is set to fastbytes, information can be received at a much faster transmission rate provided the host computer supports the fastbytes mode.

Perform the following steps to change the Parallel Protocol setting:

1. Enter the configuration mode.
2. Perform a double click button press twice. This moves to the Parallel Protocol item on the configuration menu. The Parallel Protocol (Load Paper) LED comes on solid.
3. The current Parallel Protocol setting is indicated by the Off/On/ Auto (Press Button) LED. When the LED is off, the Parallel Protocol is set to standard. When the LED is *on, the Parallel Protocol is set to fastbytes. Perform a brief button press to select the Parallel Protocol setting.
4. Perform a long button press. All LEDs blink once, indicating the setting is saved.
5. Exit the configuration mode by turning the printer power off.

PPDS

To access the PPDS data stream, the PPDS setting must be set to active. When PPDS is activated, the default Printer Language is changed to PPDS and the default PCL and PostScript Smartswitch settings are changed to Off.

Perform the following steps to change the PPDS setting:

1. Enter the configuration mode.
2. Perform a double click button press three times. This moves to the PPDS item on the configuration menu. The PPDS (Paper Jam) LED comes on solid.

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3. The current PPDS setting is indicated by the Off/On/Auto (Press Button) LED. When the LED is *off, the PPDS is set to inactive. When the LED is on, the PPDS is set to active. Perform a brief button press to select the PPDS setting.
4. Perform a long button press. All LEDs blink once, indicating the setting is saved.
5. Exit the configuration mode by turning the printer power off.

CRLF/LFCR

This function controls whether or not the printer automatically performs a carriage return after a line feed control command and whether or not the printer automatically performs a line feed after a carriage return control command.

Perform the following steps to change the CRLF/LFCR setting:

1. Enter the configuration mode.
2. Perform a double click button press four times. This moves to the CRLF/LFCR item on the configuration menu. The CRLF/LFCR (Error) LED comes on solid.
3. The current CRLF/LFCR setting is indicated by the Off/On/Auto (Press Button) LED.
 - When the LED is *off, Auto CR after LF is off and Auto LF after CR is off.
 - When the LED is on, Auto CR after LF is on and Auto LF after CR is off.
 - When the LED is blinking, Auto CR after LF is off and Auto LF after CR is on.
4. Perform a brief button press to select the CRLF/LFCR setting.
5. Perform a long button press. All LEDs blink once, indicating the setting is saved.
6. Exit the configuration mode by turning the printer power off.

Parallel Mode 1

Parallel Mode 1 controls whether or not resistors are enabled on the parallel post signals. The default is to not have the resistors enabled, however, this function is useful because some IBM clone PC's have open collector outputs on their parallel port signals.

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Perform the following steps to change the Parallel Mode 1 setting:

1. Enter the configuration mode.
2. Perform a double click button press five times. This moves to the Parallel Mode 1 item on the configuration menu. The Parallel Mode 1 (Ready) LED is blinking.
3. The current Parallel Mode 1 setting is indicated by the Off/On/ Auto (Press Button) LED. When the LED is off, the Parallel Mode 1 is set to off. When the LED is *on, the Parallel Mode 1 is set to on. Perform a brief button press to select the Parallel Mode 1 setting.
4. Perform a long button press. All LEDs blink once, indicating the setting is saved.
5. Exit the configuration mode by turning the printer power off.

Parallel Mode 2

Parallel Mode 2 controls whether or not the parallel port data is sampled on the leading or trailing edge of strobe. The default is to sample on the leading edge of strobe, however, some IBM clone PC's assumes that a printer will sample on the trailing edge.

Perform the following steps to change the Parallel Mode 2 setting:

1. Enter the configuration mode.
2. Perform a double click button press six times. This moves to the Parallel Mode 2 item on the configuration menu. The Parallel Mode 2 (Data) LED is blinking.
3. The current Parallel Mode 2 setting is indicated by the Off/On/ Auto (Press Button) LED. When the LED is off, the Parallel Mode 2 is set to sample on trailing edge. When the LED is *on, the Parallel Mode 2 is set to sample on leading edge. Perform a brief button press to select the Parallel Mode 2 setting.
4. Perform a long button press. All LEDs blink once, indicating the setting is saved.
5. Exit the configuration mode by turning the printer power off.

Parallel Strobe

This setting allows the user to adjust the factory setting for the amount of time strobe is sampled to determine that valid data is

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available on the parallel port. Each increment of the strobe adjust value means the strobe is sampled 50ns longer.

Perform the following steps to change the Parallel Strobe Adjust:

1. Enter the configuration mode.
2. Perform a double click button press seven times. This moves to the Parallel Strobe item on the configuration menu. The Parallel Strobe (Load Paper) LED is blinking.
3. The current Parallel Strobe setting is indicated by the Off/On/Auto (Press Button) LED. When the LED is *off, the Parallel Strobe is set to normal. When the LED is on, the Parallel Strobe is set to +1. When the LED is blinking, the Parallel Strobe is set to +2. Perform a brief button press to select the Parallel Strobe setting.
4. Perform a long button press. All LEDs blink once, indicating the setting is saved.
5. Exit the configuration mode by turning the printer power off.

USB Port

This menu item allows the user to enable or disable the USB port. If the port is not being used, disabling it frees allocated memory to be used to process print jobs.

Perform the following steps to change the USB Port setting:

1. Enter the configuration mode.
2. Perform a double click button press eight times. This moves to the USB Port item on the configuration menu. The USB Port (Paper Jam) LED is blinking.
3. The current USB Port setting is indicated by the Off/On/Auto (Press Button) LED. When the LED is off, the USB Port is disabled. When the LED is *blinking, the USB Port is enabled. Perform a brief button press to select a different USB Port setting.
4. Perform a long button press. All LEDs blink once, indicating the setting is saved.
5. Exit the configuration mode by turning the printer power off.

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USB NPA

USB NPA mode allows for two way communication between the host and the printer.

Perform the following steps to change the USB NPA setting:

1. Enter the configuration mode.
2. Perform a double click button press nine times. This moves to the USB NPA mode item on the configuration menu. The USB NPA (Error) LED is blinking.
3. The current USB NPA setting is indicated by the Off/On/Auto (Press Button) LED.
 - When the LED is off, the USB port does not search for NPA data within the received data.
 - When the LED is *blinking, the USB port searches for optional NPA data within the received data.
 - When the LED is on solid, the USB port requires that data sent to the printer be in NPA format.
4. Perform a brief button press to select a different USB NPA setting.
5. Perform a long button press. All LEDs blink once, indicating the setting is saved.
6. Exit the configuration mode by turning the printer power off.

Hex Trace

When the printer is in Hex Trace, it prints a hexadecimal and a character representation of a print job. The printer does not recognize any print controls or commands in this mode. A Hex Trace printout is used to help isolate the cause of print problems.

When a job is printed, the printer operator panel displays the Hex Trace indication, (Ready LED blinking), showing that the printer remains in the Hex Trace mode. Turn the printer power off or do an operator panel reset (long button press) to exit the Hex Trace mode.

Perform the following steps to enter the Hex Trace mode:

1. Turn the printer power off.
2. Open the top cover.
3. Turn the printer power on.

4. When the Error LED comes on solid, double-click the operator panel button.
5. Once the Error and Press Button LEDs start to blink, close the top cover.
6. The Ready LED comes on solid and the Error and Press Button LEDs continue blinking.
7. Double-click the operator button three times. The Paper Jam LED comes on solid while the Error and Press Button LEDs continue blinking.
8. Perform a long button press until all LEDs come on solid. The printer is in Hex Trace mode
9. To exit the Hex Trace mode, turn the printer power off.

Restoring Factory Defaults

Restoring factory defaults returns the printer settings to the original factory settings.

Perform the following steps to invoke factory defaults:

1. Turn the printer power off.
2. Open the top cover.
3. Turn the printer power on.
4. When the Error LED comes on solid, double-click the operator panel button.
5. Once the Error and Press Button LEDs start blinking, close the top cover.
6. The Ready LED comes on solid and the Error and Press Button LEDs continue blinking.
7. Double-click the operator button one time. The Data LED comes on solid while the Error and Press Button LEDs continue blinking.
8. Perform a long button press until all LEDs come on solid.
9. The printer is reset to factory defaults.

Engine Clean Cycle

The Engine Clean Cycle function prints one blank page in a special cleaning mode. The cleaning mode helps eliminate small specs of toner present in the background when printing.

Perform the following steps to perform the Engine Clean Cycle:

1. Turn the printer power off.
2. Open the top cover.
3. Turn the printer power on.
4. When the Error LED comes on solid, double-click the operator panel button.
5. Once the Error and Press Button LEDs start blinking, close the top cover.
6. The Ready LED comes on solid and the Error and Press Button LEDs continue blinking.
7. Perform a long button press until all LEDs come on solid.
8. The printer feeds one page from the automatic paper feed slot and then returns to normal printing mode.

Toggle Demo/Normal Mode

The Toggle Demo/Normal Mode function enables or disables the printer's retail demo mode. When the printer is in Demo mode, demo pages can be printed by briefly pressing the operator panel button.

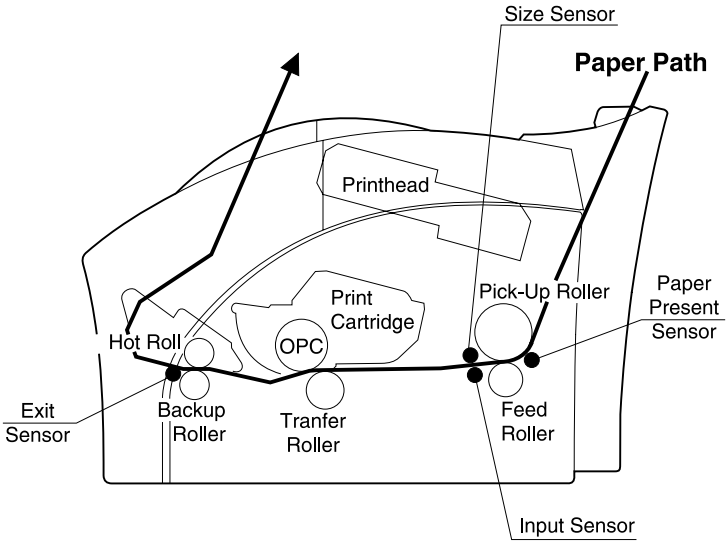
Perform the following steps to enter Toggle Demo/Normal Mode:

1. Turn the printer power off.
2. Open the top cover.
3. Turn the printer power on.
4. When the Error LED comes on solid, double-click the operator panel button.
5. Once the Error and Press Button LEDs start blinking, close the top cover.
6. The Ready LED comes on solid and the Error and Press Button LEDs continue blinking.
7. Double-click the operator button five times. The Ready and Load Paper LEDs come on solid while the Error and Press Button LEDs continue blinking.
8. Perform a long button press until all LEDs come on solid. The printer is in Demo mode.
9. To return the printer to Normal mode, repeat steps 1 through 8.

Printer Operation

Paper is held in a 150 page tray where it is picked by a center-fed "D" shape pick roller. The paper follows an "L" shape path as it moves through the printer. Images are created with toner on an OPC drum within the toner cartridge. A transfer roller then draws the toner off the OPC drum onto the paper. Once the toner is affixed to the paper by the fuser, the paper exits either the top or front of the printer.

Paper Path



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4. Repair Information

CAUTION: Read the following before handling electronic parts.

Handling ESD-Sensitive Parts

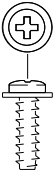
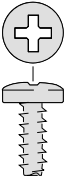

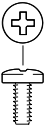
Many electronic products use parts that are known to be sensitive to electrostatic discharge (ESD). To prevent damage to ESD-sensitive parts, follow the instructions below in addition to all the usual precautions, such as turning off power before removing logic boards:

- Keep the ESD-sensitive part in its original shipping container (a special “ESD bag”) until you are ready to install the part into the machine.
- Make the least-possible movements with your body to prevent an increase of static electricity from clothing fibers, carpets, and furniture.
- Put the ESD wrist strap on your wrist. Connect the wrist band to the system ground point. This discharges any static electricity in your body to the machine.
- Hold the ESD-sensitive part by its edge connector shroud (cover); do not touch its pins. If you are removing a pluggable module, use the correct tool.
- Do not place the ESD-sensitive part on the machine cover or on a metal table; if you need to put down the ESD-sensitive part for any reason, first put it into its special bag.
- Machine covers and metal tables are electrical grounds. They increase the risk of damage because they make a discharge path from your body through the ESD-sensitive part. (Large metal objects can be discharge paths without being grounded.)
- Prevent ESD-sensitive parts from being accidentally touched by other personnel. Install machine covers when you are not working on the machine, and do not put unprotected ESD-sensitive parts on a table.
- If possible, keep all ESD-sensitive parts in a grounded metal cabinet (case).
- Be extra careful in working with ESD-sensitive parts when cold-weather heating is used because low humidity increases static electricity.

Removal Procedures

CAUTION: Be sure to unplug the power cord whenever you are working on the printer with one of the covers removed. Be sure to remove the print cartridge before you perform removal procedures.

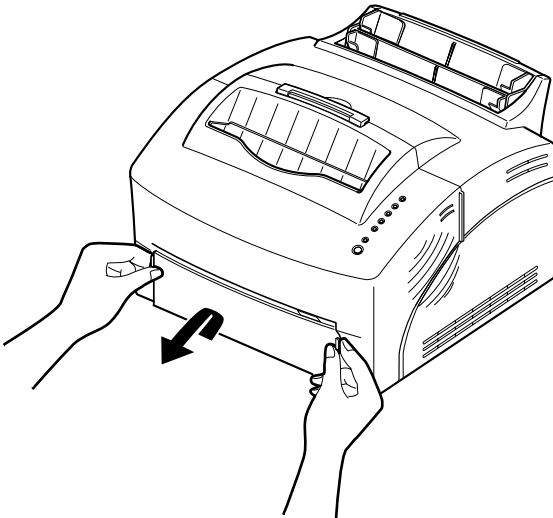
Screw Identification Table

Type 1 Screw	Type 2 Screw	Type 3 Screw	Type 4 Screw
			

Covers

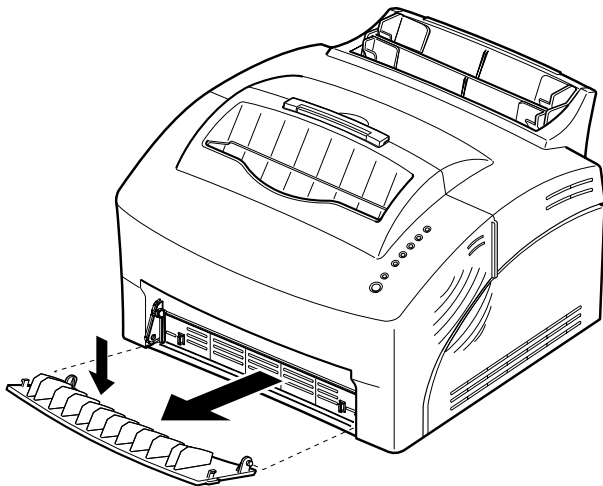
Front Cover and Face Up Cover

1. Press the cover inward to release it and pull it forward.

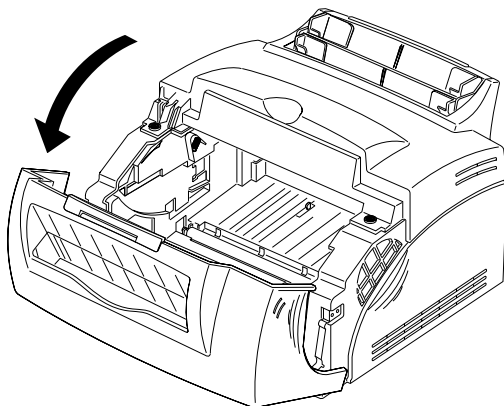


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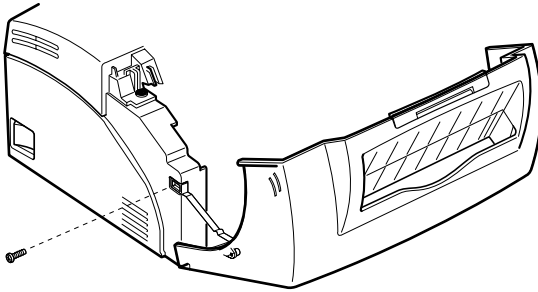
2. Remove the face up cover.



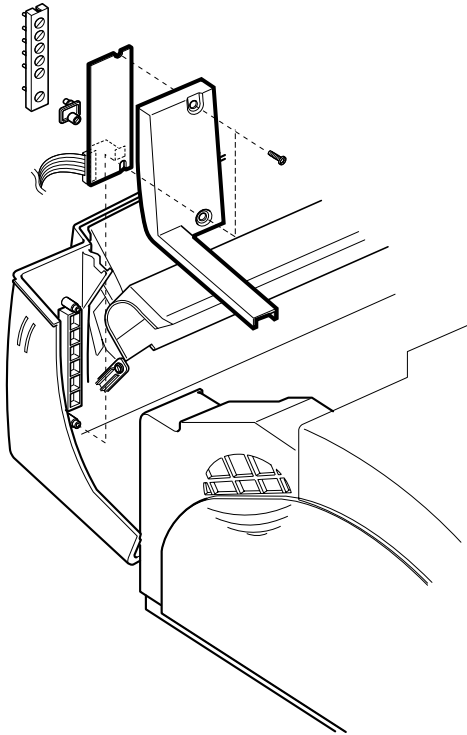
3. Open the front cover.



4. Remove the screw from the support on each side of the printer.

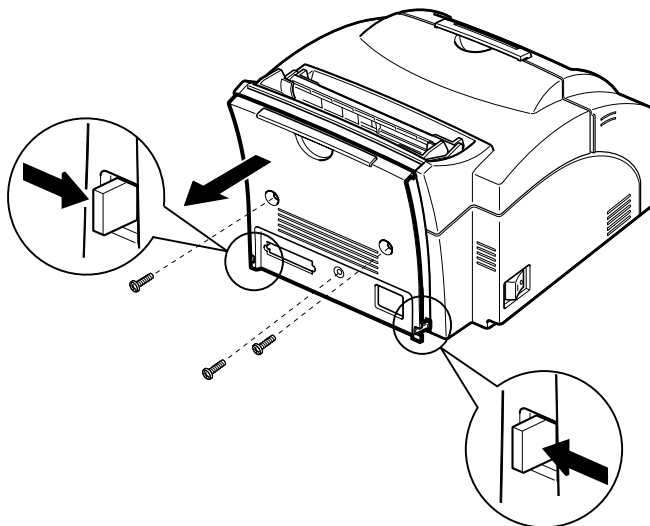


Note: If you want to remove the front cover only, remove the two screws and then remove the panel board and board cover.

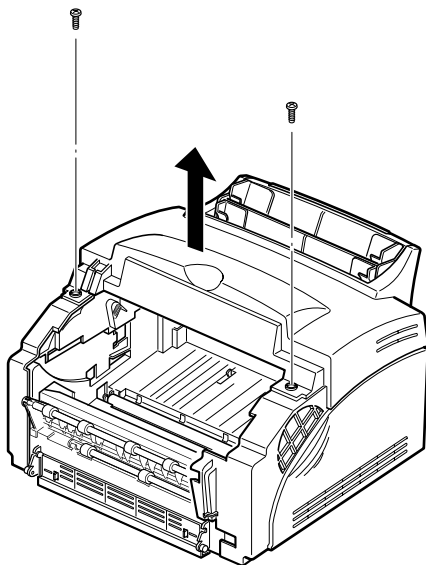


Rear and Top Cover

1. Remove the three screws, press the retaining tabs and remove the rear cover.

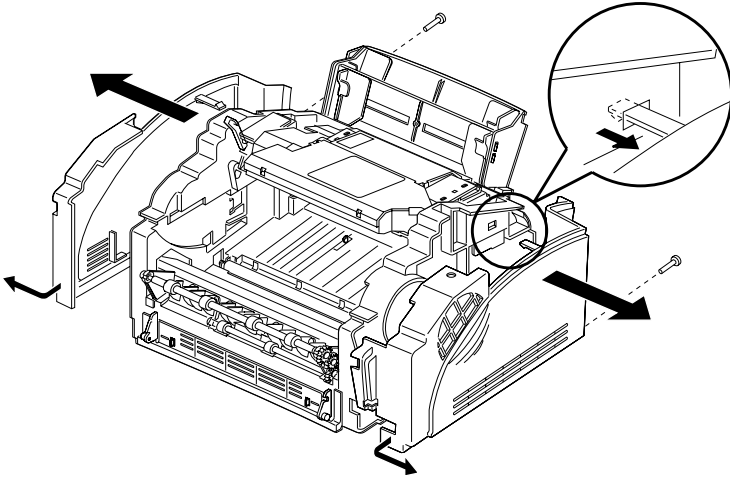


2. Remove the front cover and face up cover.
3. Remove the two screws and remove the top cover.



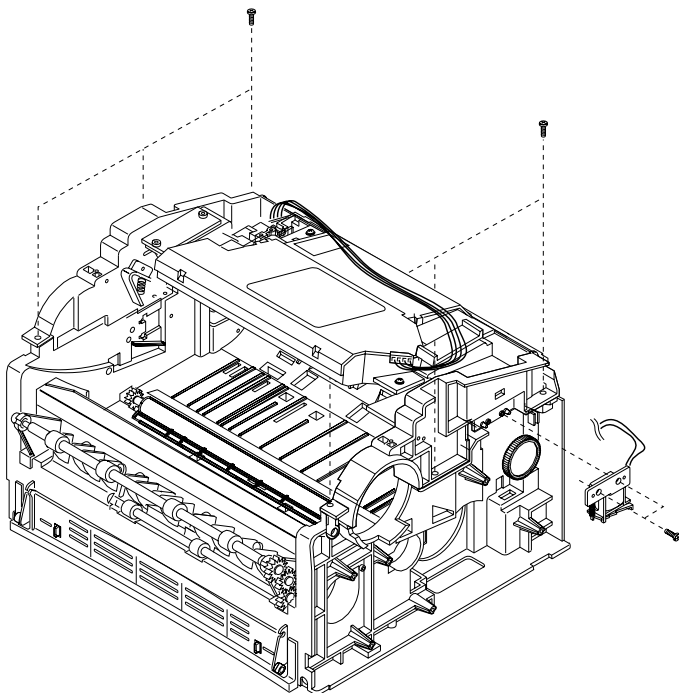
Side Covers

1. Remove the front cover, face up cover, top cover and rear cover.
2. Remove the two screws securing the rear of each side cover.
3. Release the side cover tabs as shown and remove the left and right side covers.



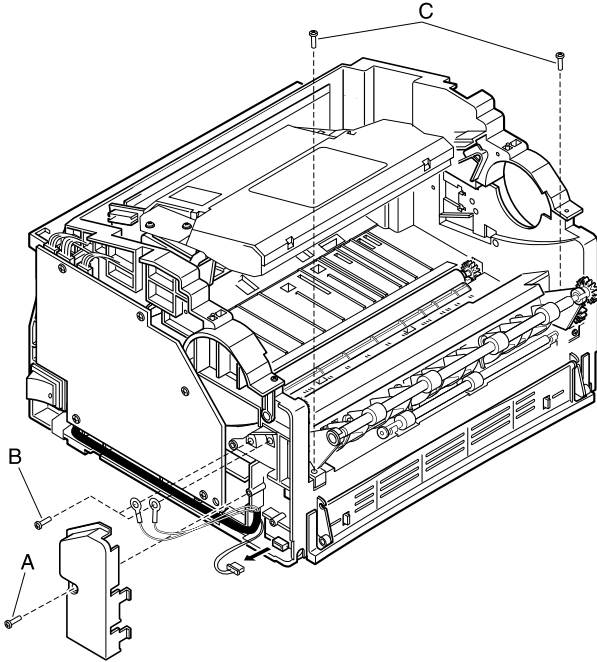
Frame Assembly

1. Remove all covers.
2. Remove the HVPS.
3. Remove the two screws and remove the solenoid.
4. Remove the six screws and remove the frame assembly.



Fuser Assembly

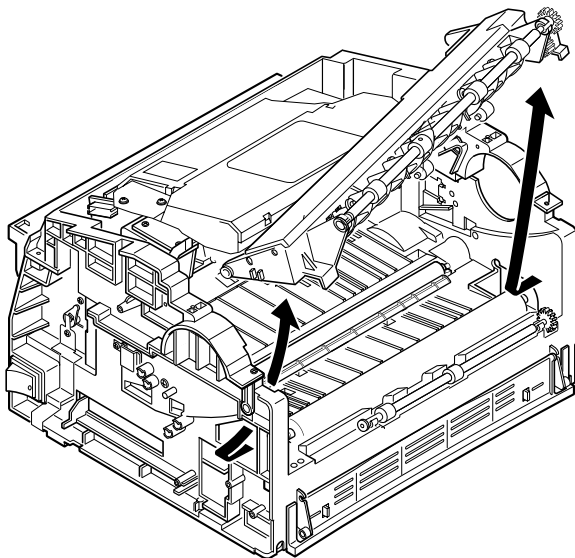
1. Remove all covers.
2. Remove the wire cover mounting screw (A).
3. Remove the two fuser lamp wire mounting screws (B).
4. Unplug the connector from the engine/LVPS board.
5. Remove the two fuser mounting screws (C).
6. Release the two snaps holding the fuser down.



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7. Slide the fuser in the direction of the arrows and remove the fuser.

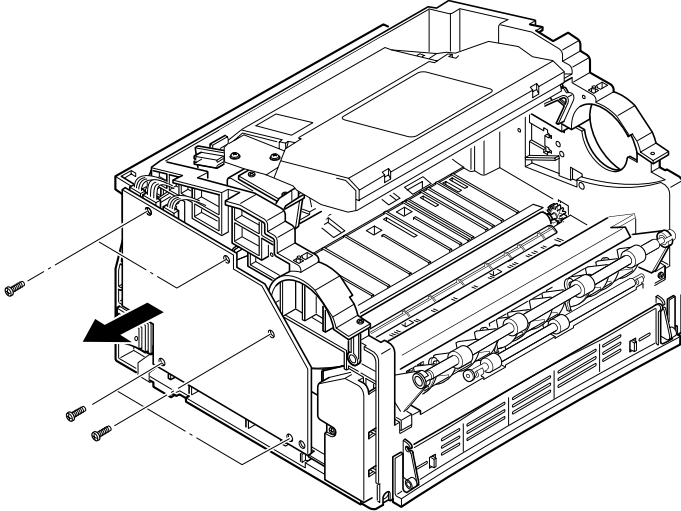
Note: The backup roller can fall from the printer if the printer is turned on its side with the fuser removed.



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HVPS

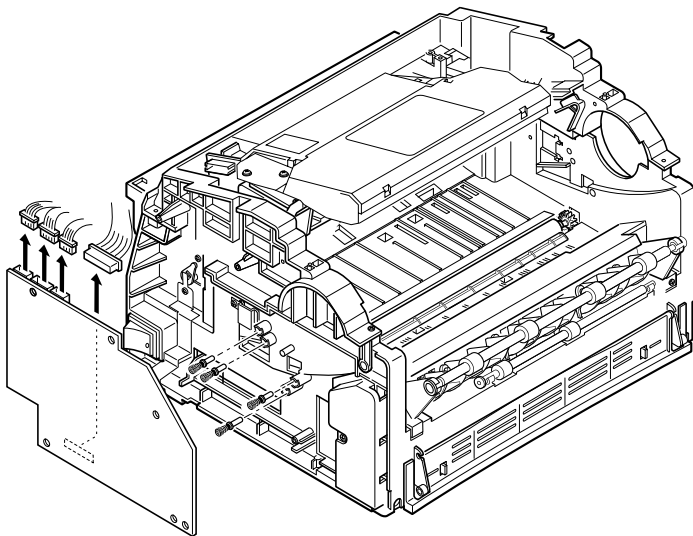
1. Remove all covers.
2. Remove the HVPS board mounting screws.



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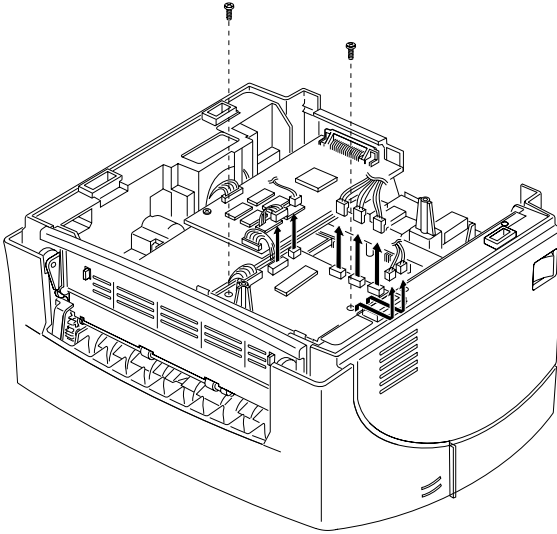
3. Unplug the three cables from the connectors on top of the HVPS.
4. Unplug the cable from the lower connector inside the HVPS and remove the HVPS.

Note: The high voltage contacts can fall from the printer with the HVPS removed. Three contacts with the shorter springs are installed in the hole marked L+S. The contact with the longer spring is installed in the hole marked L+L.



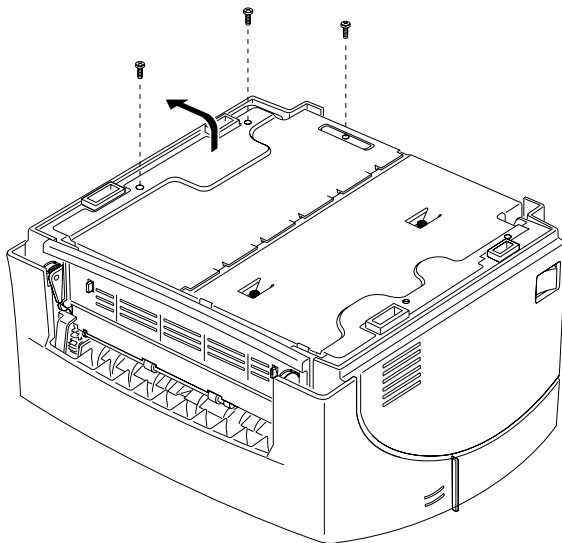
Interconnect Board (model E310)

1. Remove the LVPS.
2. Unplug all connectors from the interconnect board.
3. Remove the screws and remove the interconnect board.



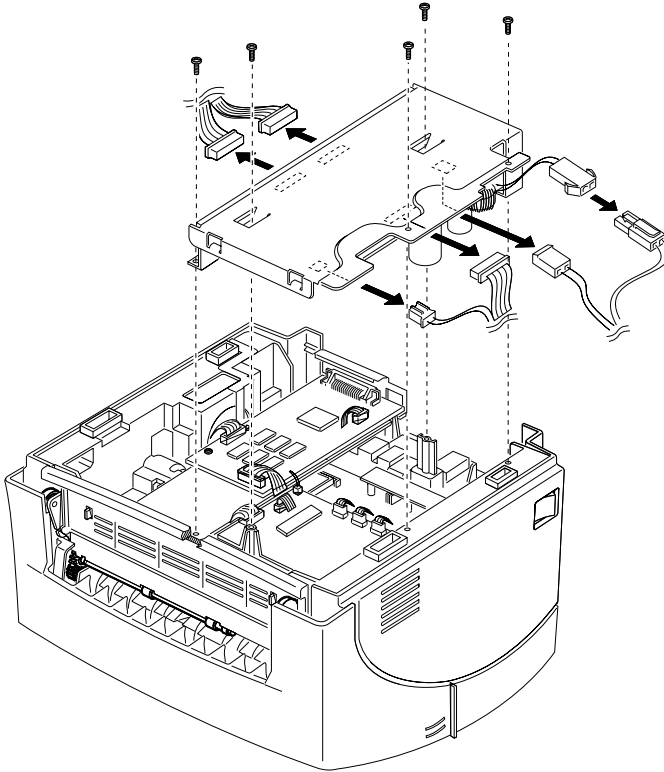
Engine/LVPS Board (model E310)

1. Turn the printer upside down.
2. Remove all screws securing the SIMM access panel.
3. Remove the SIMM access panel.



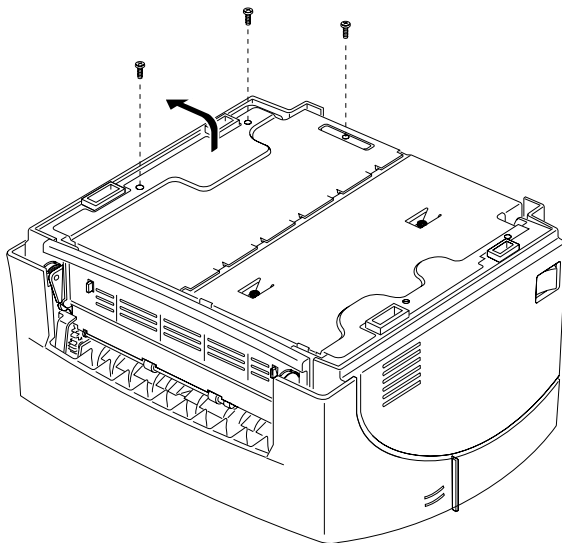
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4. Unplug all the connectors from the engine/LVPS board.
5. Remove the five screws and remove the engine/LVPS board.



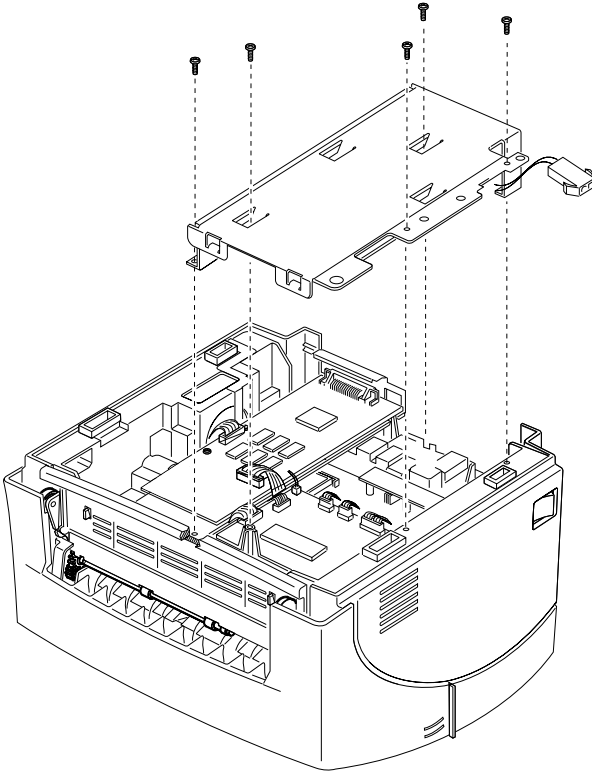
Engine/LVPS Board (model E312)

1. Turn the printer upside down.
2. Remove all screws securing the SIMM access panel.
3. Remove the SIMM access panel.



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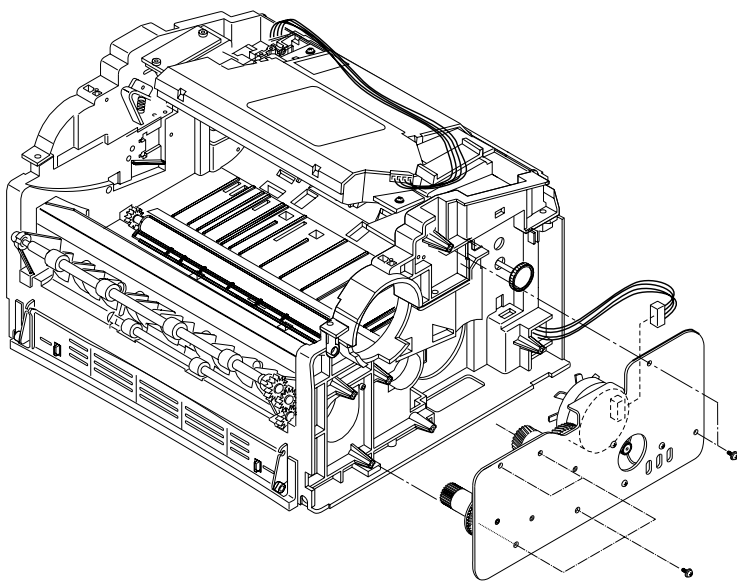
4. Remove the five screws securing the LVPS shield.
5. Lift the shield from the printer and disconnect all the cables from the LVPS.



6. Remove the screws mounting the LVPS to the shield and remove the LVPS.
7. Disconnect all the cables from the engine board.
8. Remove the screws mounting the engine board to the lower frame and remove the engine board.

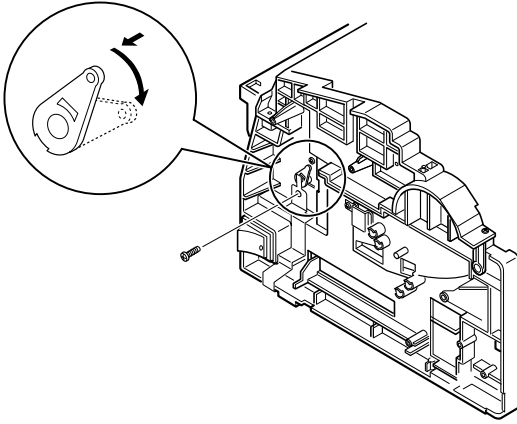
Main Drive Assembly

1. Remove all covers.
2. Remove the six main drive assembly mounting screws.
3. Unplug the connector and remove the main drive assembly.



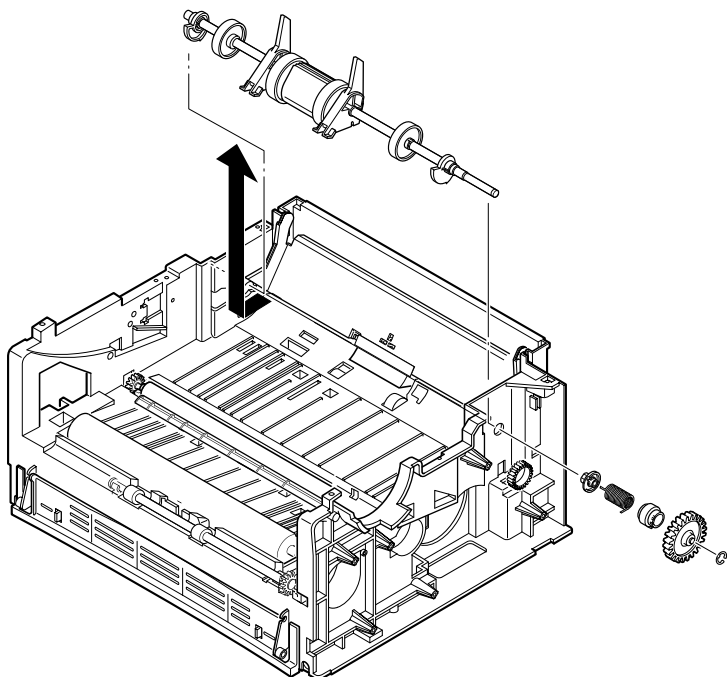
Pick Roll Assembly

1. Remove all the covers.
2. Remove the high voltage power supply.
3. Remove the roller bearing.



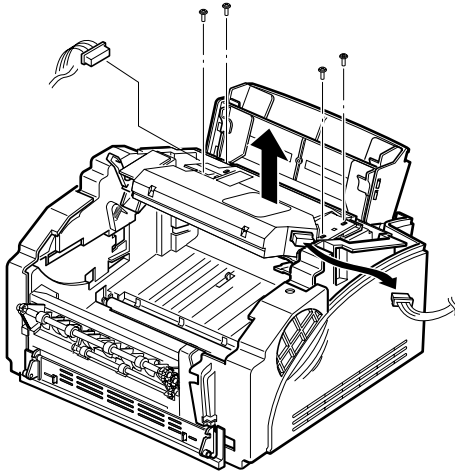
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4. Remove the roller access cover on the left side of the pick roller assembly.
5. Remove the upper frame.
6. Remove the pick up roller gear and clutch.
7. Lift the pick roll assembly from the printer.



Printhead Assembly

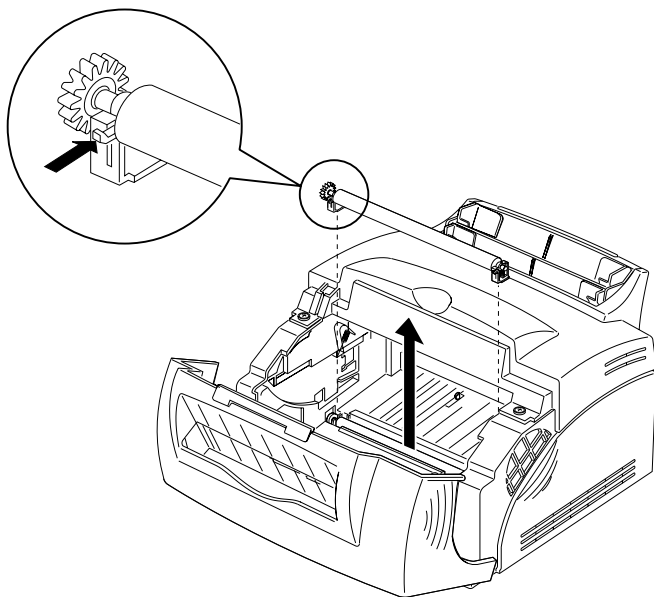
1. Remove the top cover.
2. Unplug all the connectors from the printhead.
3. Remove the four mounting screws and remove the printhead.



Note: Be sure to transfer the snap-on torroids when replacing the printhead cable.

Transfer Roll

1. Remove the front cover and face up cover.
2. Remove the black cover on the left end of the transfer roll.
3. Press the latches on the bearings to release them from the lower frame.
4. Lift the transfer roll from the printer.



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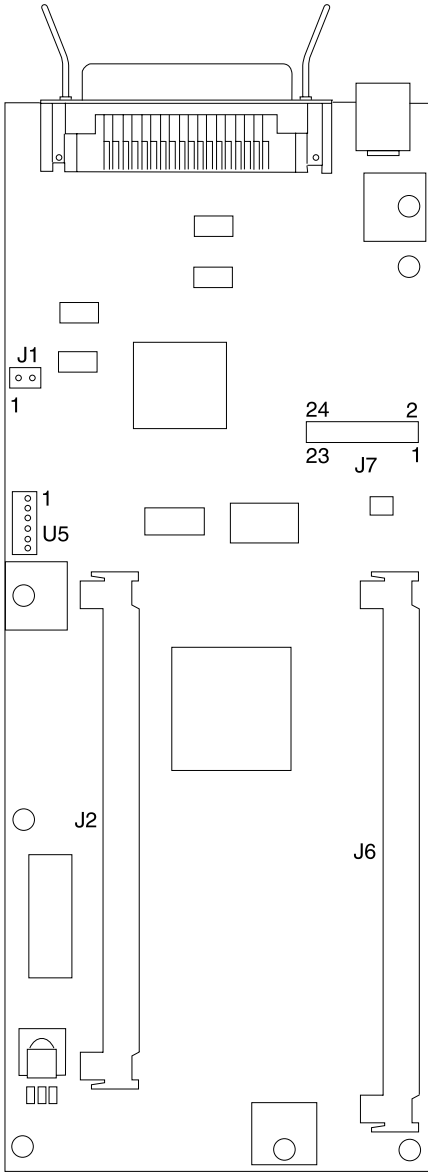
5. Connector Locations

Controller Board (model E310/E312)

Connector	Pin No.	Signal
J1 Printhead	1	N/A
	2	Ground
U5 Operator Panel (signals at idle)	1	Ground
	2	+5 V dc
	3	+5 V dc
	4	N/A
	5	+5 V dc
	6	Ground
J7 Engine/LVPS Board	1	+5 V dc
	2	+5 V dc
	3	+5 V dc
	4	+5 V dc
	5	+5 V dc
	6	+5 V dc
	7	Ground
	8	+5 V dc
	9	+5 V dc
	10	+5 V dc
	11	Ground
	12	+5 V dc
	13	+5 V dc
	14	+5 V dc

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Connector	Pin No.	Signal
J7 (continued)	15	+5 V dc
	16	+5 V dc
	17	+5 V dc
	18	Ground
	19	Ground
	20	Ground
	21	Ground
	22	Ground
	23	+5 V dc
	24	+5 V dc



Engine/LVPS Board (model E310)

Connector	Pin No.	Signal
CN201 Power Switch	1	AC In
	2	AC In
CN202 Fuser Lamp	1	AC In
	2	AC In
CN1 Thermistor	1	THERM
	2	+3.9 V dc
CN2 HVPS/Printhead	1	+24 V dc SWITCH
	2	+24 V dc
	3	Ground
	4	+24 V dc
	5	VDO
	6	MHV
	7	LDON
	8	SUPPLY
	9	Ground
	10	DEV350

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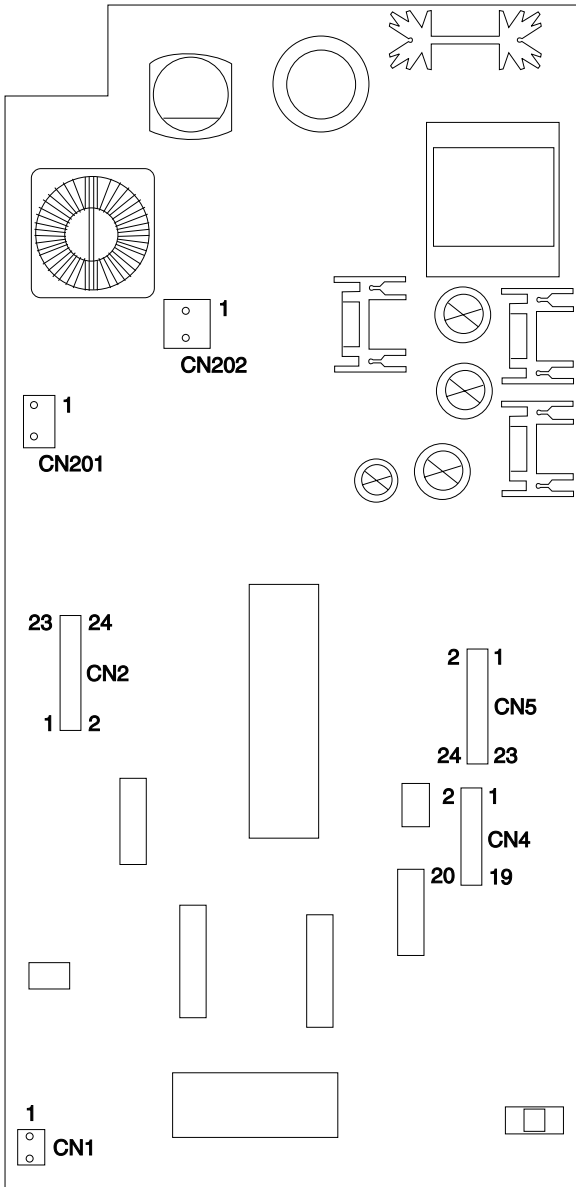
Connector	Pin No.	Signal
CN2 (continued)	11	HSYNC
	12	THVPWM
	13	EXT CLK
	14	Ground
	15	Ground
	16	THVEA
	17	LREADY
	18	DEV300
	19	P MOTOR
	20	+5 V dc
	21	AGND
	22	AGND
	23	THVREAD
	24	AGND

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Connector	Pin No.	Signal
CN4 Interconnect Board	1	DEV FUSE FAN J
	2	MOTOR EA J
	3	MOTOR PB J
	4	MOTOR PA J
	5	AGND
	6	NEW DEV J
	7	PFEED J
	8	AGND
	9	Ground
	10	Ground
	11	CLUTCH J
	12	PEMPTY J
	13	+24 V dc
	14	PNARROW J
	15	+5 V dc
	16	+24 V dc
	17	PTL J
	18	+5 V dc
	19	PMOTOR EXT J
	20	EXT CLK J

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Connector	Pin No.	Signal
CN5 Controller Board	1	EBUSY
	2	Not Used
	3	EMSG
	4	EXITPAP
	5	CCLK
	6	PRINT
	7	VDI
	8	Not Used
	9	PSYNC
	10	READY
	11	HSYNC
	12	Not Used
	13	+5 V dc
	14	CMSG
	15	+5 V dc
	16	+5 V dc
	17	Ground
	18	+5 V dc
	19	Ground
	20	Ground
	21	Ground
	22	Ground
	23	VDO
	24	Not Used



Engine Board (model E312)

Connector	Pin No.	Signal
CN1 Controller Board	1	EBUSY
	2	Not Used
	3	EMSG
	4	EXITPAP
	5	CCLK
	6	PRINT
	7	VDI
	8	Not Used
	9	PSYNC
	10	READY
	11	HSYNC
	12	Not Used
	13	+5 V dc
	14	CMSG
	15	+5 V dc
	16	+5 V dc
	17	Ground, Floating
	18	+5 V dc
	19	Ground, Floating
	20	Ground, Floating
	21	Ground, Floating
	22	Ground, Floating
	23	VDO
	24	Not Used

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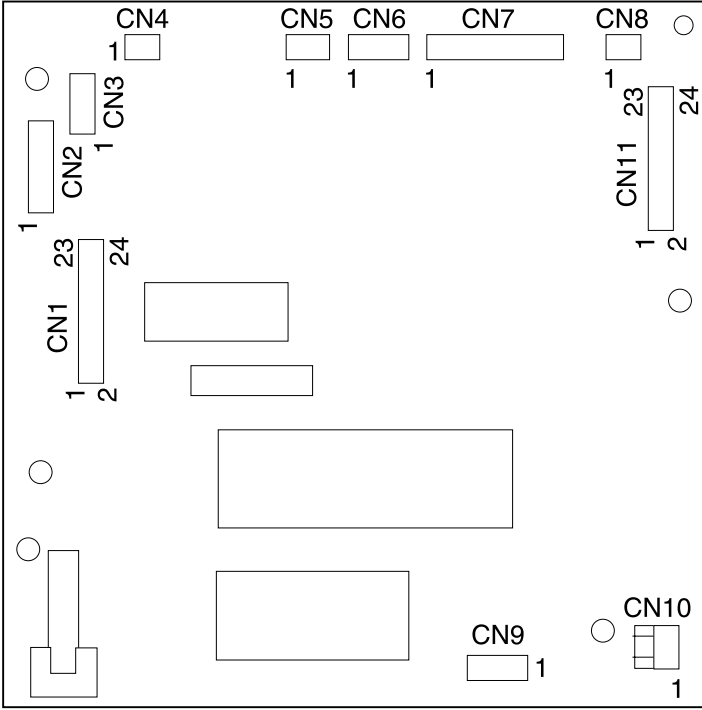
Connector	Pin No.	Signal
CN2 Motor	1	OUTA
	2	OUTB
	3	+24 V dc
	4	+24 V dc
	5	OUTA*
	6	OUTB*
CN3 Fan	1	+24 V dc Switch
	2	Not Used
	3	Fan
CN4 Clutch	1	+24 V dc Switch
	2	Clutch
CN5 Paper Present Sensor	1	PEMPTY
	2	+5 V dc
	3	Ground, Floating
CN6 Paper Feed/Paper Narrow Sensor	1	P Feed
	2	P Width
	3	+5 V dc
	4	Ground, Floating

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Connector	Pin No.	Signal
CN7 LVPS	1	+5 V dc
	2	+5 V dc
	3	Ground, Floating
	4	Ground, Floating
	5	Fuser On
	6	+24 V dc Switch
	7	Ground
	8	Ground
	9	+24 V dc
	10	+24 V dc
CN8 Pre-Transfer LED (PTL)	1	PTL
	2	Ground, Floating
CN9 DCV	1	Not Used
	2	Not Used
	3	Not Used
	4	Not Used
CN10 Thermistor	1	THERM
	2	Not Used
	3	Ground, Floating

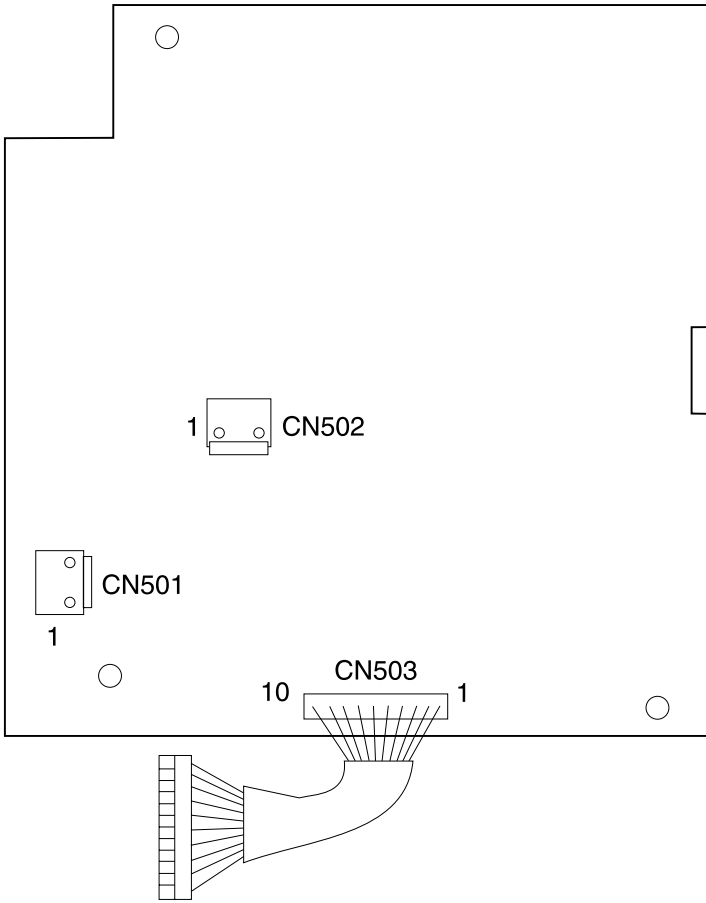
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Connector	Pin No.	Signal
CN11 HVPS	1	+24 V dc
	2	+24 V dc Switch
	3	+24 V dc
	4	+24 V dc Switch
	5	LREADY
	6	THVEA
	7	VDO
	8	THV PWM
	9	HSYNC
	10	MHV PWM
	11	DEVEA-A
	12	Supply EA
	13	LDON
	14	DEVEA-B
	15	Ground, Floating
	16	Ground, Floating
	17	Ground, Floating
	18	+5 V dc
	19	Ground
	20	+5 V dc
	21	Ground
	22	Ground
	23	THVREAD
	24	PMOTOR



LVPS (model E312)

Connector	Pin No.	Signal
CN501 Power Switch	1	AC In
	2	AC In
CN502 Fuser Lamp	1	AC In
	2	AC In
CN503 Engine Board	1	+5 V dc
	2	+5 V dc
	3	Ground, Floating
	4	Ground, Floating
	5	Fuser On
	6	+24 V dc Switch
	7	Ground
	8	Ground
	9	+24 V dc
	10	+24 V dc



High Voltage Power Supply (model E310)

Connector	Pin No.	Signal
CN1 Engine/LVPS Board	1	+24 V dc
	2	+24 V dc SWITCH
	3	+24 V dc
	4	Ground
	5	MHV
	6	VDO
	7	SUPPLY
	8	LDON
	9	DEV350
	10	Ground
	11	THVPWM
	12	HSYNC
	13	Ground
	14	EXT CLK
	15	THVEA
	16	Ground
	17	DEV300
	18	LREADY
	19	+5 V dc
	20	P MOTOR
	21	AGND
	22	AGND
	23	AGND
	24	THVREAD

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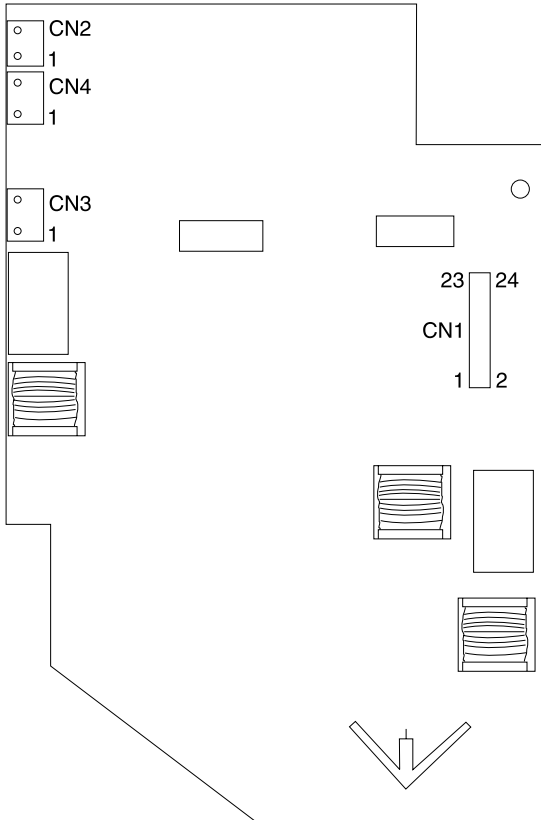
Connector	Pin No.	Signal
CN2 Cover Open Switch	1	+24 V dc SWITCH
	2	Not Used
	3	+24 V dc
CN3 Printhead	1	+24 V dc SWITCH
	2	AGND
	3	P MOTOR
	4	LREADY
	5	EXT CLK
CN4 Printhead	1	HSYNC
	2	+5 V dc SWITCH
	3	Ground
	4	LDON
	5	VDO
	6	Ground

High Voltage Power Supply (model E312)

Connector	Pin No.	Signal
CN1 Engine Board	1	+24 V dc SWITCH
	2	+24 V dc
	3	+24 V dc SWITCH
	4	+ 24 V dc
	5	THVEA
	6	LREADY
	7	THV PWM
	8	VDO
	9	MHV PWM
	10	HSYNC
	11	SUPPLYEA
	12	DEVEA-A
	13	DEVEA-B
	14	LDON
	15	Ground, Floating
	16	Ground, Floating
	17	+5 Vdc
	18	Ground, Floating
	19	+5 V dc
	20	Ground
	21	Ground
	22	Ground
	23	PMOTOR
	24	THVREAD

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Connector	Pin No.	Signal
CN2 Cover Open Switch	1	+24 V dc SWITCH
	2	+5 V dc SWITCH
	3	+5 V dc
	4	+24 V dc
CN3 Printhead	1	+24 V dc SWITCH
	2	AGND
	3	P MOTOR
	4	LREADY
	5	EXT CLK
CN4 Printhead	1	HSYNC
	2	+5 V dc SWITCH
	3	Ground, Floating
	4	LDON
	5	VDO
	6	Not Used

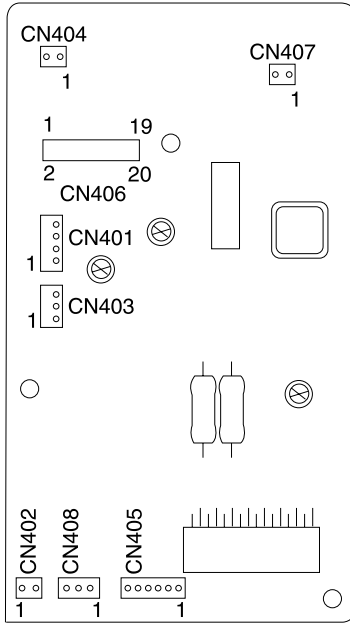


Interconnect Board (model E310)

Connector	Pin No.	Signal
CN401 Paper Feed/Paper Narrow Sensor	1	PFEED J
	2	PNARROW J
	3	+5 V dc
	4	Ground
CN402 Clutch	1	+24 V dc
	2	CLUTCH J
CN403 Paper Empty Sensor	1	PEMPTY J
	2	+5 V dc
	3	Ground
CN404 Developer Fuse	1	Not Used
	2	Not Used
CN405 Main Motor	1	OUT A
	2	OUT B
	3	+24 V dc
	4	+24 V dc
	5	OUT A*
	6	OUT B*

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Connector	Pin No.	Signal
CN406 Engine/LVPS Board	1	MOTOR EA J
	2	DEV FUSE FAN J
	3	MOTOR PA J
	4	MOTOR PB J
	5	NEW DEV J
	6	AGND
	7	AGND
	8	PFEED J
	9	Ground
	10	Ground
	11	EMPTY J
	12	CLUTCH J
	13	PNARROW J
	14	+24 V dc
	15	+24 V dc
	16	+5 V dc
	17	+5 V dc
	18	PTL J
	19	EXT CLK J
	20	PMOTOR EXT J
CN407 Pre-Transfer LED (PTL)	1	PTL J
	2	+5 V dc
CN408 Cooling Fan	1	DEV FAN J
	2	N/A
	3	+24 V dc



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6. Parts Catalog

How To Use This Parts Catalog

- **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.
- **AR:** (As Required) in the Units column indicates that the quantity is not the same for all machines.
- **NS:** (Not Shown) in the Asm-Index column indicates that the part is procurable but is not pictured in the illustration.
- **PP:** (Parts Packet) in the parts description column indicates the part is contained in a parts packet.
- **INDENTURE:** The indenture is marked by a series of dots located before the parts description. The indenture indicates the relationship of a part to the next higher assembly. For example:

INDENTURE RELATIONSHIP OF PARTS

(No dot) MAIN ASSEMBLY

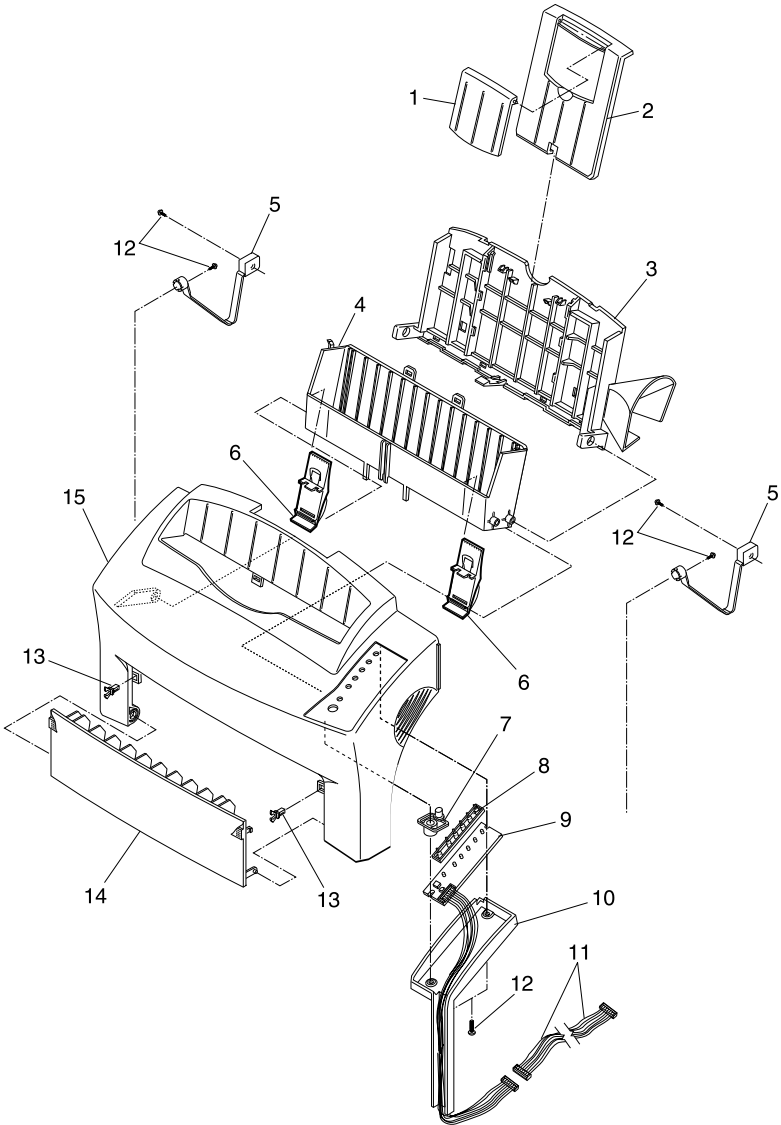
(One dot) o Detail parts of a main assembly

(One dot) o Subassembly of the main assembly

(Two dot) o o Detail part of a one-dot subassembly

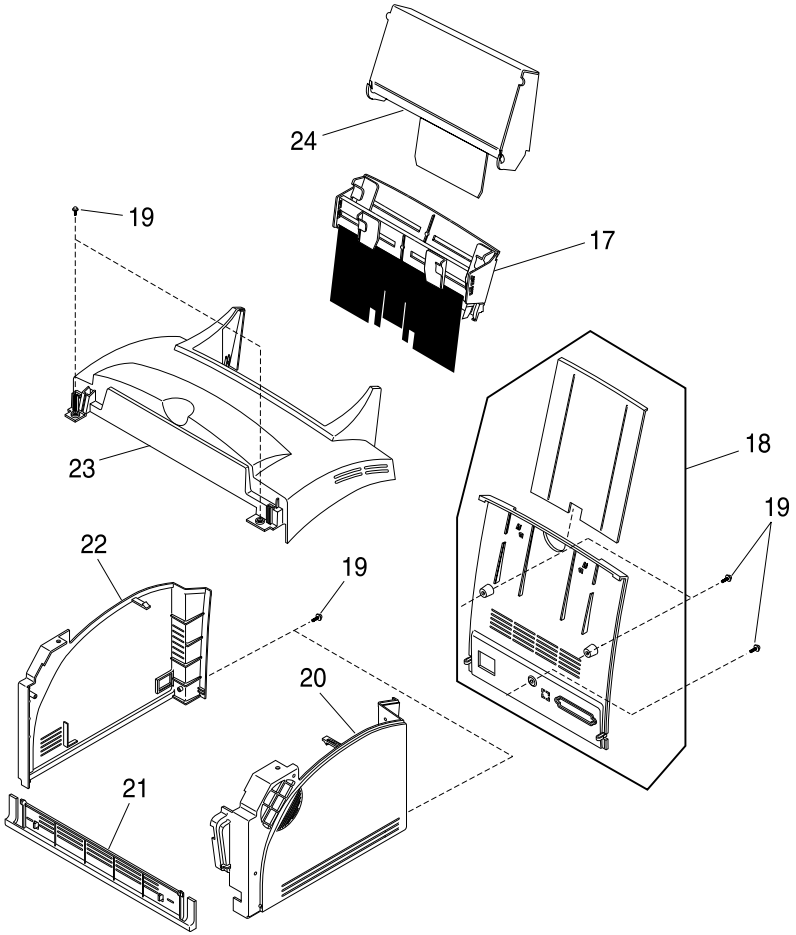
(Two dot) o o Subassembly of a one-dot subassembly

Assembly 1: Covers



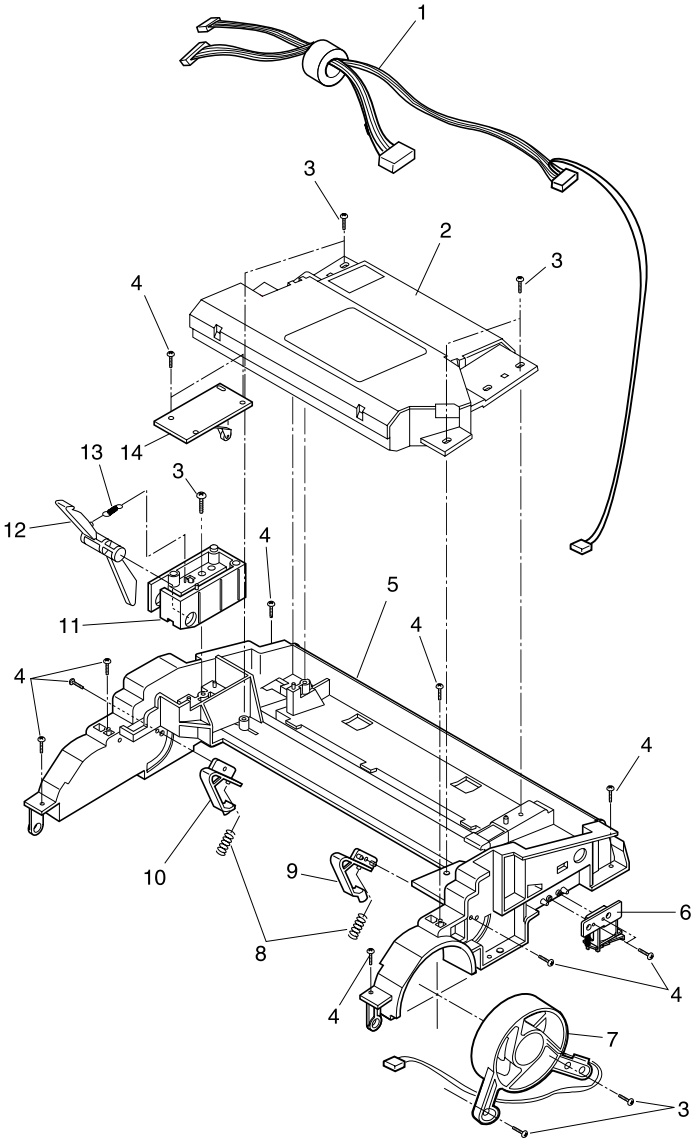
Asm-Index	Part Number	Units	Description
1-1	12G0021	1	Extender, Paper Support
1-2	12G0022	1	Support, Paper E310
1-2	12G1939	1	Support, Paper E312
1-3	12G0175	1	Cover Asm, Cooling Air/Stacker
1-4	12G0024	1	Stacker Assembly, Paper
1-5	12G0025	1	Support, Open Cover
1-6	12G0126	2	Guide, Paper Stacker
1-7	12G0030	1	Button, Operator Panel
1-8	12G0031	1	Lens, Operator Panel
1-9	12G0032	1	Panel, Operator
1-10	12G1850	1	Cover, Op Panel Cable
1-11	12G0027	1	Cable Asm, Operator Panel
1-12		6	Screw, Type 1 PP 12G0101
1-13	12G0181	2	Latch, Front Exit
1-14	12G0029	1	Tray, Front Exit
1-15	12G1846	1	Cover, Front w/English Overlay E310
1-15	12G1874	1	Cover, Front w/English Overlay E312
1-15	12G3668	1	Cover, Front w/English Overlay E312L
NS	12G3972	1	Op Panel Overlay, English
NS	12G0112	1	Packet, WT Op Panel Overlay

Assembly 1: Covers (continued)



Asm-Index	Part Number	Units	Description
1-17	12G0035	1	Tray Asm, Paper E310
1-17	12G1938	1	Tray Asm, Paper E312
1-18	12G0098	1	Cover Asm, Rear
1-19		7	Screw, Type 1 PP 12G0101
1-20	12G1847	1	Cover, Right Side
1-21	12G0037	1	Cover, Lower Front
1-22	12G0040	1	Cover, Left Side
1-23	12G0041	1	Cover, Top
1-24	12G0176	1	Cover, Optional Paper

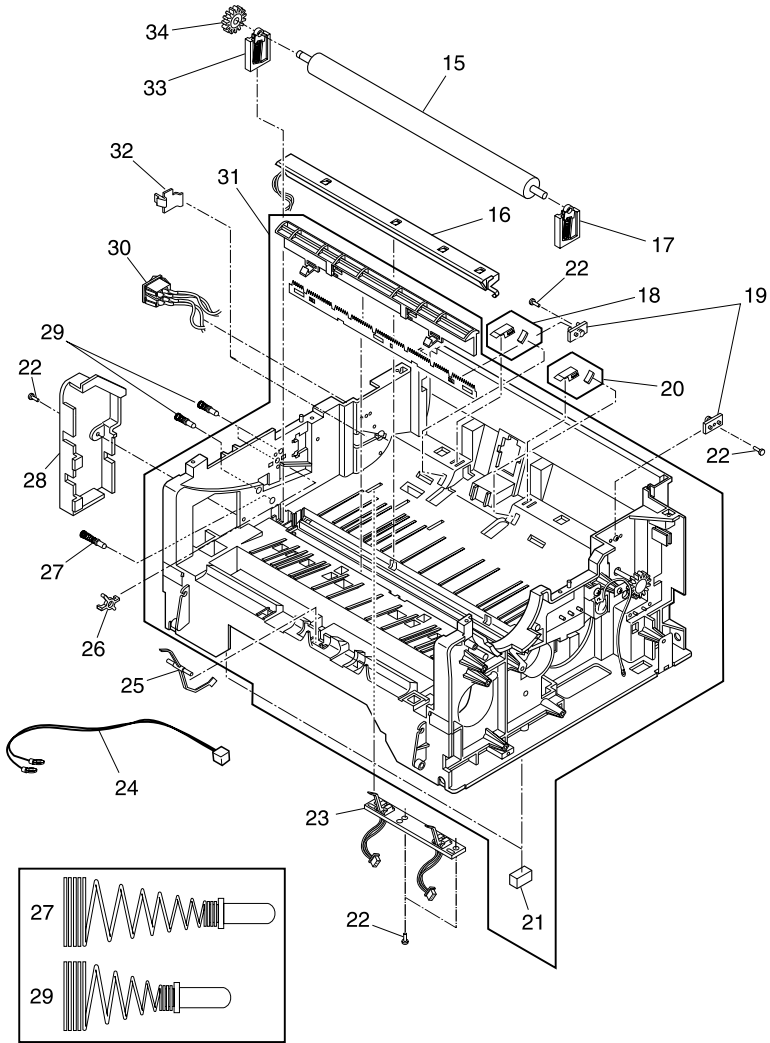
Assembly 2: Frame



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Asm-Index	Part Number	Units	Description
2-1	12G0099	1	Cable Asm, Printhead to HVPS
2-2	12G0046	1	Printhead Assembly E310
2-2	12G1879	1	Printhead Assembly E312
2-3		6	Screw, Type 2 PP 12G0101
2-4		13	Screw, Type 3 PP 12G0101
2-5	12G0125	1	Frame, Upper E310
2-5	12G1882	1	Frame, Upper E312
2-6	12G0047	1	Solenoid, Pick Roller Clutch E310
2-6	12G1929	1	Solenoid, Pick Roller Clutch E312
2-7	12G0128	1	Fan, Cooling
2-8	12G0059	2	Spring, Print Cartridge Lock
2-9	12G0155	1	Lock, Print Cartridge, Right
2-10	12G0154	1	Lock, Print Cartridge, Left
2-11	12G0152	1	Housing, Cover Open Sensor E310
2-11	12G1883	1	Housing, Cover Open Sensor E312
2-12	12G0060	1	Lever, Cover Open Sensor E310
2-12	12G1881	1	Lever, Cover Open Sensor E312
2-13	12G0153	1	Spring, Cover Open Sensor
2-14	12G0045	1	Board Asm, Cover Open Sensor E310
2-14	12G1878	1	Board Asm, Cover Open Sensor E312

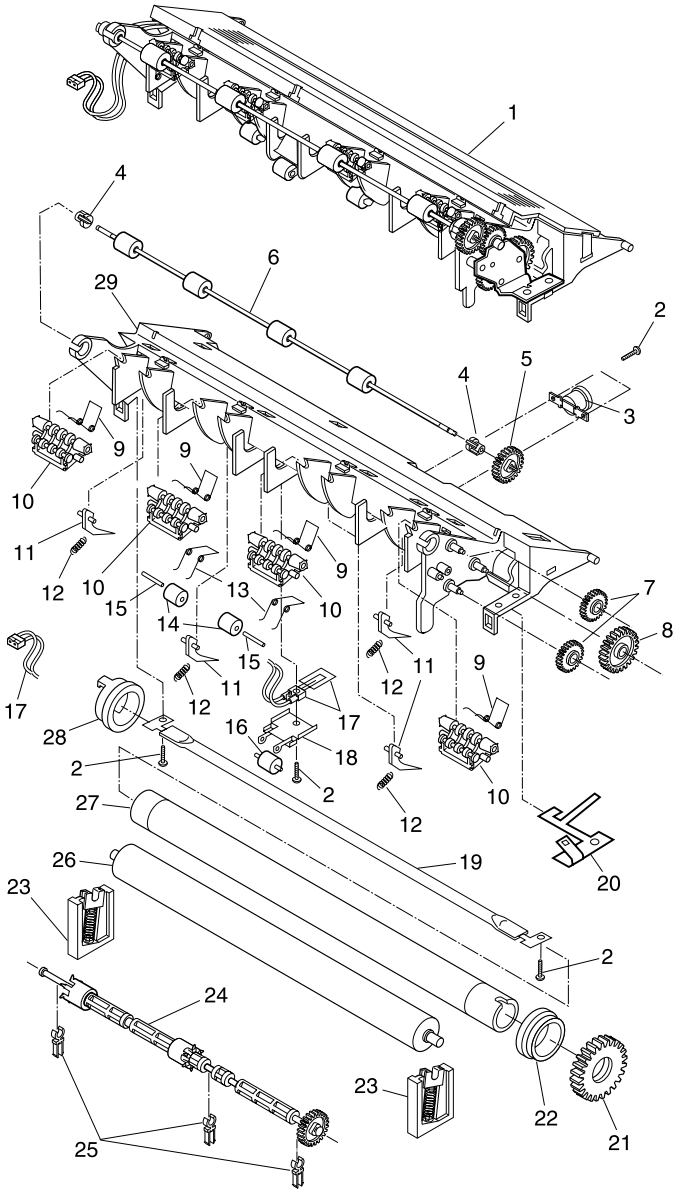
Assembly 2: Frame (continued)



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Asm-Index	Part Number	Units	Description
2-15	12G0048	1	Roller, Transfer
2-16	12G0057	1	LED Asm, Pre-Transfer E310
2-16	12G1887	1	LED Asm, Pre-Transfer E312
2-17	12G0049	1	Bearing Asm, Transfer Roller Right
2-18	12G0119	1	Pad Asm, Friction Left E310
2-18	12G1931	1	Pad Asm, Friction Left E312
2-19	12G0127	2	Post, Separator Asm Spring
2-20	12G0120	1	Pad Asm, Friction Right E310
2-20	12G1932	1	Pad Asm, Friction Right E312
2-21	12G0106	2	Foot, Rubber
2-22		5	Screw, Type 3 PP 12G0101
2-23	12G0050	1	Sensor Asm, Input Paper Feed/Size E310
2-23	12G1884	1	Sensor Asm, Input Paper Feed/Size E312
2-24	12G0113	1	Cable Asm, Fuser Lamp
2-25	12G0051	1	Flag, Paper Exit Sensor E310
2-25	12G1885	1	Flag, Paper Exit Sensor E312
2-26	12G0109	1	Guide, HV Contact
2-27	12G0052	1	Contact Asm, HV-Transfer Roller
2-28	12G0061	1	Cover, Fuser Lamp Wiring
2-29	12G0053	3	Contact Asm, HV-Main
2-30	12G0107	1	Cable Asm, Power Switch E310
2-30	12G1888	1	Cable Asm, Power Switch E312
2-31	12G0056	1	Frame Asm, Lower E310
2-31	12G1930	1	Frame Asm, Lower E312
2-32	12G0130	1	Cover, Pick Roller Access
2-33	12G0069	1	Bearing Asm, Transfer Roller Left
2-34	12G0058	1	Gear, Transfer Roller

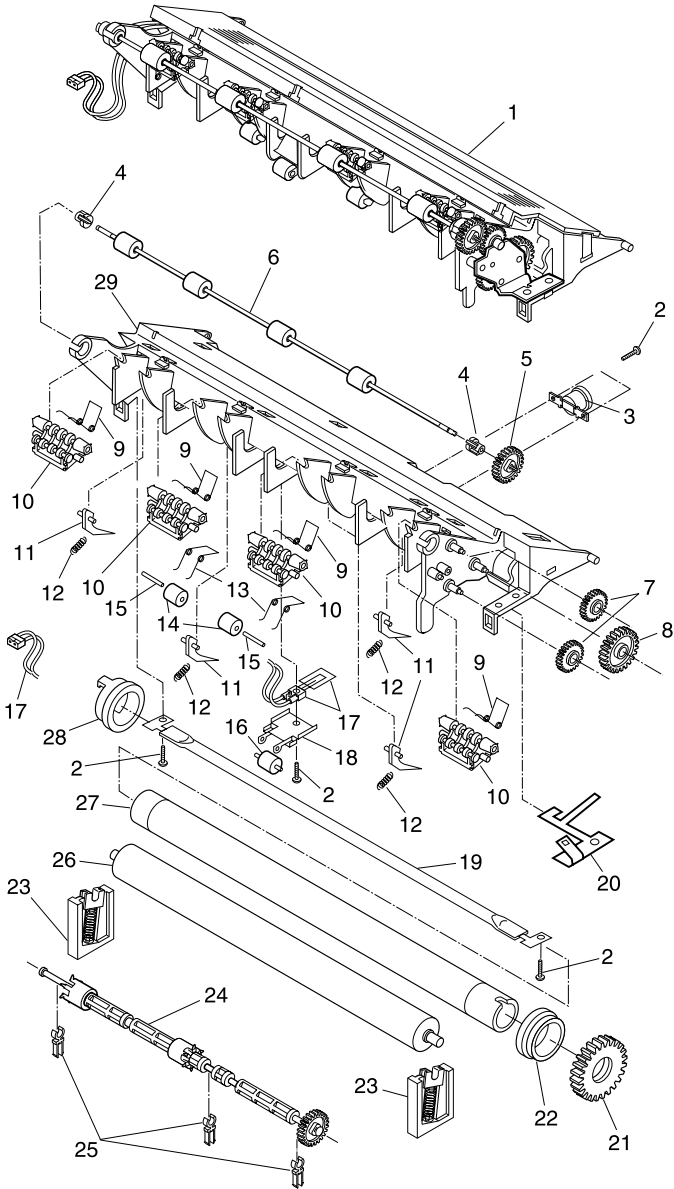
Assembly 3: Fuser



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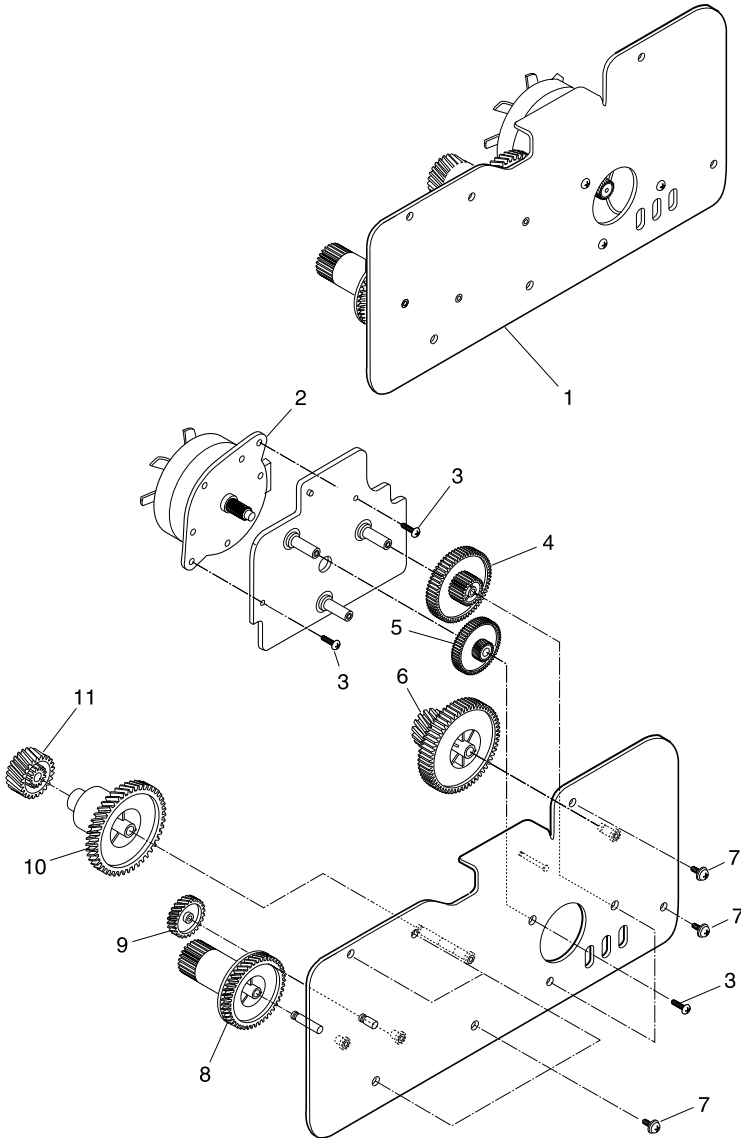
Asm-Index	Part Number	Units	Description
3-1	12G0074	1	Fuser Assembly 110 V dc E310
3-1	12G1935	1	Fuser Assembly 110 V dc E312
3-1	12G0122	1	Fuser Assembly 220 V dc E310
3-1	12G1936	1	Fuser Assembly 220 V dc E312
3-2		7	Screw, Type 3 PP 12G0101
3-3	12G0075	1	Fuse, Thermal
3-4	12G0166	2	Bearing, Fuser Exit Roller
3-5	12G0167	1	Gear, Fuser Exit Roller
3-6	12G0165	1	Roller Asm, Fuser Exit/Redrive
3-7	12G0160	2	Gear, Redrive, Idler #2
3-8	12G0161	1	Gear, Redrive, Idler #1
3-9	12G0159	4	Spring, Redrive Roller
3-10	12G0123	4	Roller Asm, Redrive
3-11	12G0103	4	Finger, Detack E310
3-11	12G1891	4	Finger, Detack E312
3-12	12G0157	4	Spring, Detack Finger
3-13	12G0158	2	Spring, Fuser Exit Roller
3-14	12G0171	2	Roller, Fuser Exit

Assembly 3: Fuser (continued)



Asm-Index	Part Number	Units	Description
3-15	12G0172	2	Shaft, Fuser Exit Roller
3-16	12G0156	1	Roller, Fuser Exit Center
3-17	12G0076	1	Thermistor, Hot Roll E310
3-17	12G1892	1	Thermistor, Hot Roll E312
3-18	12G1942	1	Holder, Fuser Exit Center Roller
3-19	12G0078	1	Lamp, Fuser, 110 V ac E310
3-19	12G1893	1	Lamp, Fuser, 110 V ac E312
3-19	12G0124	1	Lamp, Fuser, 220 V ac E310
3-19	12G1894	1	Lamp, Fuser, 220 V ac E312
3-20	12G0082	1	Plate, Hot Roll Ground
3-21	12G0081	1	Gear, Fuser Hot Roll
3-22	12G0080	1	Bearing, Right Hot Roll
3-23	12G0083	2	Bearing Asm, Backup Roll
3-24	12G0084	1	Roller Asm, Exit Paper Feed
3-25	12G0174	3	Bushing, Exit Paper Feed Roller
3-26	12G0086	1	Roller, Backup
3-27	12G0079	1	Hot Roll, Fuser
3-28	12G0077	1	Bearing, Left Hot Roll
3-29	12G3776	1	Frame, Fuser E310
3-29	12G3777	1	Frame, Fuser E312

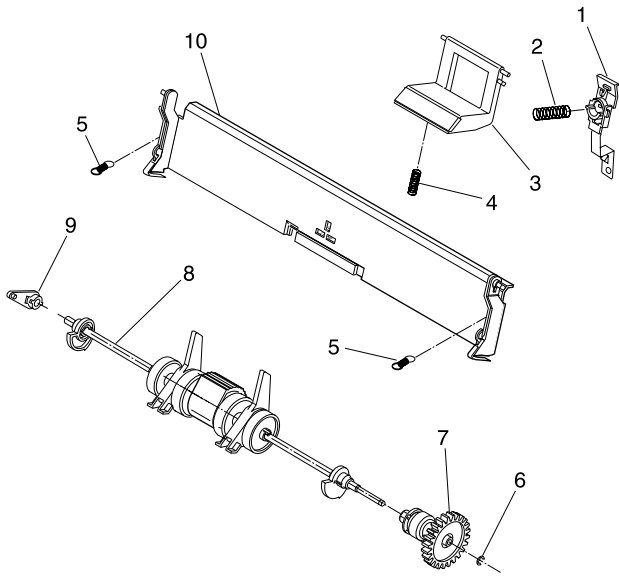
Assembly 4: Main Drive



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Asm-Index	Part Number	Units	Description
4-1	12G0042	1	Main Drive Assembly E310
4-1	12G1877	1	Main Drive Assembly E312
4-2	12G0044	1	Motor Asm, Main
4-3		5	Screw, Type 4 PP 12G0101
4-4		1	Gear, Drive Feed 1 PP 12G0102
4-5		1	Gear, Drive Feed 2 PP 12G0102
4-6		1	Gear, Input Paper Feed PP 12G0102
4-7		6	Screw, Type 3 PP 12G0101
4-8		1	Gear, Fuser Drive PP 12G0102
4-9		1	Gear, Idler PP 12G0102
4-10		1	Gear, OPC Drive 1 PP 12G0102
4-11		1	Gear, OPC Drive 2 PP 12G0102

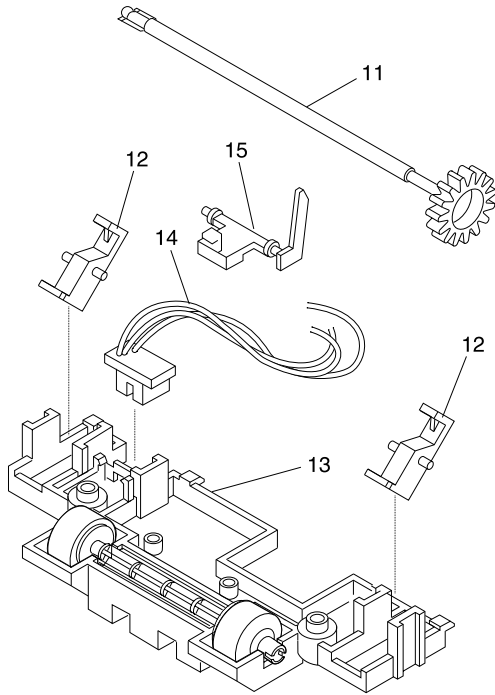
Assembly 5: Paper Feed



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Asm-Index	Part Number	Units	Description
5-1	12G0063	1	Holder Asm, Spring
5-2	12G0068	1	Spring, Pad Asm, Rear
5-3	12G0062	1	Pad Asm, Pick Roller
5-4	12G0121	1	Spring, Pad Asm, Lower
5-5	12G0104	2	Spring, Separator Asm
5-6		1	Clip, E PP 12G0101
5-7	12G0065	1	Clutch Asm, Pick Roller
5-8	12G0067	1	Roller Asm, Pick E310
5-8	12G1933	1	Roller Asm, Pick E312
5-9	12G0066	1	Bearing, Left Pick Roller Shaft
5-10	12G0064	1	Separator Asm, Paper

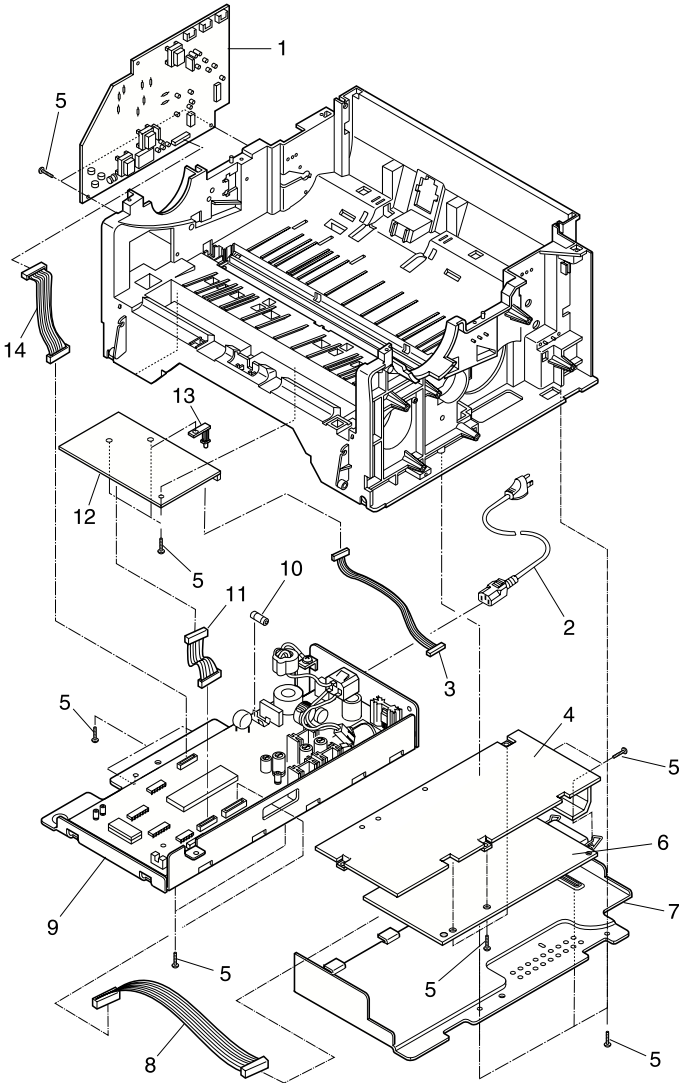
Assembly 5: Paper Feed (continued)



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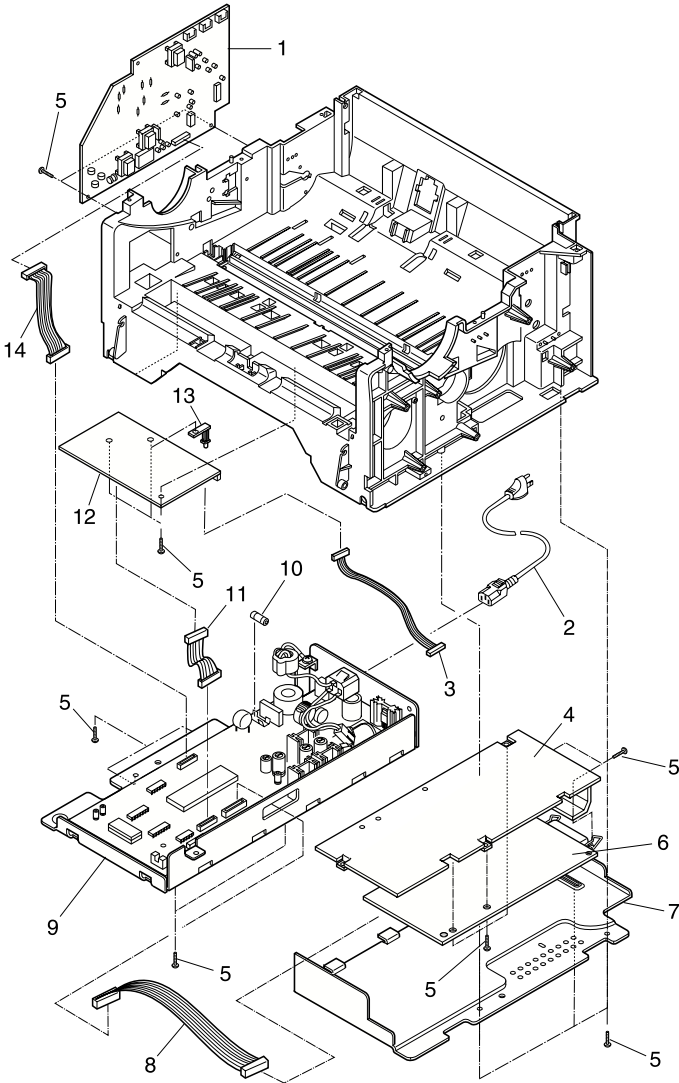
Asm-Index	Part Number	Units	Description
5-11	12G0105	1	Shaft Asm, Input Paper Feed E310
5-11	12G1934	1	Shaft Asm, Input Paper Feed E312
5-12	12G0072	2	Separator, Secondary Paper E310
5-13	12G0070	1	Roller Asm, Input Paper Feed E310
5-13	12G1889	1	Roller Asm, Input Paper Feed E312
5-14	12G0073	1	Sensor, Paper Present
5-15	12G0071	1	Flag, Paper Sensor Present

Assembly 6: Electronics (model E310)



Asm-Index	Part Number	Units	Description
6-1	12G0087	1	Board Asm, HVPS E310
6-2	1339526	1	Power Cord, U.S., Canada, Brazil (HV)
6-2	1339517	1	Power Cord, Saudi Arabia
6-2	1339519	1	Power Cord, U.K., Ireland, Bahrain, Qatar, Oman, Jordan, Iraq, Kuwait, Yemen, Egypt, Sudan
6-2	1339520	1	Power Cord, Austria, Germany, Belgium, France, Netherlands, Norway, Spain, Spain-Catalan, Sweden, Finland, Turkey, Hungary, Greece, Czechoslovakia, Slovakia, Eastern Countries, Russia, Poland, Portugal
6-2	1339521	1	Power Cord, Israel
6-2	1339522	1	Power Cord, Switzerland
6-2	1339523	1	Power Cord, South Africa
6-2	1339525	1	Power Cord, Denmark
6-2	1342534	1	Power Cord, Chile
6-2	1342536	1	Power Cord, Argentina, Paraguay, Uruguay
6-3	12G0097	1	Cable Asm, Motor to Interconnect Board E310
6-4	12G0108	1	Bracket, Controller Board Mounting
6-5		14	Screw, Type 3 PP 12G0101
6-6	12G3786	1	Board Asm, Controller E310
6-6	12G3783	1	Board Asm, Controller E312/312L(model 2L1)
6-6	12G3784	1	Board Asm, Controller E312L (Model 2L2)
6-7	12G0114	1	Panel, SIMM Access

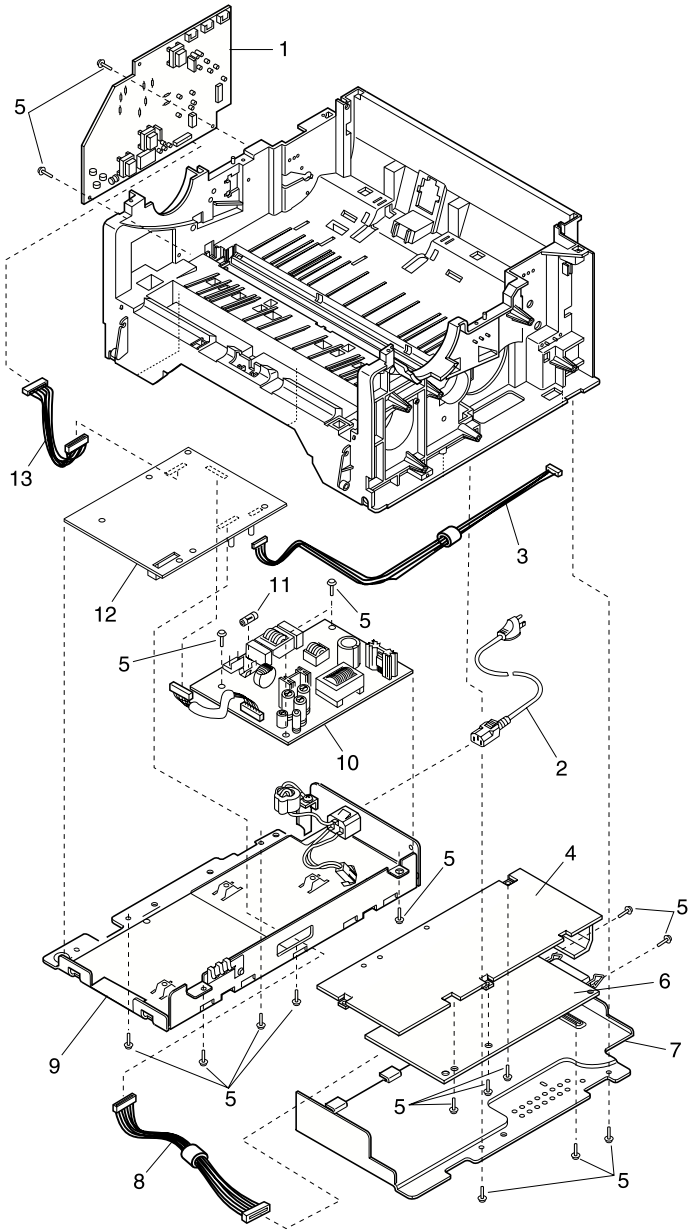
Assembly 6: Electronics (model E310 continued)



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Asm-Index	Part Number	Units	Description
6-8	12G0095	1	Cable Asm, Engine/LVPS Board to Controller Board E310
6-9	12G0089	1	Board Asm, Engine/LVPS-110 V ac E310
6-9	12G0091	1	Board Asm, Engine/LVPS-220 V ac E310
6-10	12G0090	1	Fuse, Power Supply-110 V ac
6-10	12G0092	1	Fuse, Power Supply-220 V ac
6-11	12G0100	1	Cable Asm, Engine/LVPS Board to Interconnect Board E310
6-12	12G0088	1	Board Asm, Interconnect E310
6-13	12G1828	1	Guide, Cable E310
6-14	12G0096	1	Cable Asm, Engine/LVPS to HVPS E310

Assembly 6: Electronics (model E312)



Asm-Index	Part Number	Units	Description
6-1	12G1896	1	Board Asm, HVPS E312
6-2			Power Cord Reference Assembly 6: Electronics (model 310) Asm/Index 6-2.
6-3	12G1940	1	Cable Asm, Motor to Engine Board E312
6-4	12G0108	1	Bracket, Controller Board Mounting
6-5		14	Screw, Type 3 PP 12G0101
6-6	12G1872	1	Board Asm, Controller E312
6-7	12G0114	1	Panel, SIMM Access
6-8	12G1926	1	Cable Asm, Engine Board to Controller Board E312
6-9	12G1941	1	Shield Asm, LVPS E312
6-10	12G1898	1	Board Asm, LVPS-110 V ac E312
6-10	12G1899	1	Board Asm, LVPS-220 V ac E312
6-11	12G0090	1	Fuse, Power Supply-110 V ac
6-11	12G0092	1	Fuse, Power Supply-220 V ac
6-12	12G1937	1	Board Asm, Engine E312
6-13	12G1927	1	Cable Asm, Engine to HVPS E312

Assembly 7: Options

Asm-Index	Part Number	Units	Description
7	99A0517	1	SIMM, 4MB DRAM Memory
7	99A0518	1	SIMM, 8MB DRAM Memory
7	99A0519	1	SIMM, 16MB DRAM Memory
7	99A0520	1	SIMM, 32MB DRAM Memory
7	99A0724	1	SIMM, 64MB DRAM Memory
7	99A0521	1	SIMM, 1 Meg Flash Memory
7	99A0522	1	SIMM, 2 Meg Flash Memory
7	99A0523	1	SIMM, 4 Meg Flash Memory
7	99A0545	1	Adapter, External Serial

Assembly 8: Miscellaneous

Asm-Index	Part Number	Units	Description
8		1	Parts Packet, Fasteners PP 12G0101
		3	o Screw, Type 1 (m3x10)
		2	o Screw, Type 2 (m4x10)
		6	o Screw, Type 3 (m3x10)
		2	o Screw, Type 4 (m3x6)
		1	o Clip, E
		8	
1	o Gear, Drive Feed 1		
1	o Gear, Drive Feed 2		
1	o Gear, Input Paper Feed		
1	o Gear, OPC Drive 2		
1	o Gear, OPC Drive 1		
1	o Gear, Idler		
1	o Gear, Fuser Drive		

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