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Service Manual

Lexmark Optra™ T
4069-XXX

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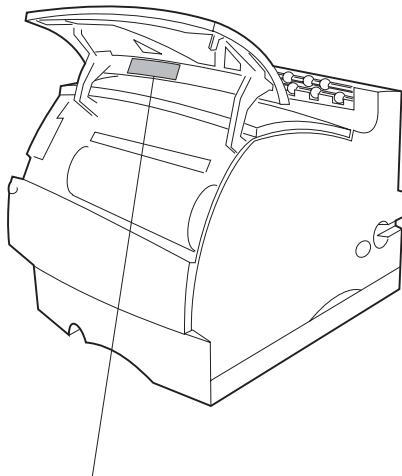
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Notices and Safety Information

Laser Notices

The following laser notice labels may be affixed to this printer as shown:

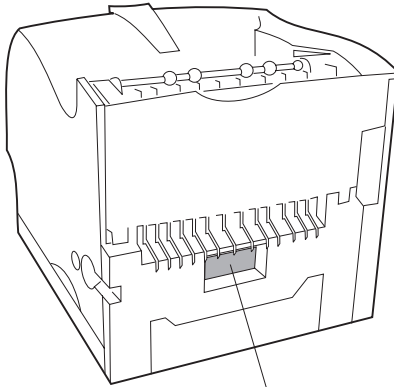
Laser Advisory Label



CAUTION -	Invisible laser radiation when open and interlock defeated. Avoid exposure to beam.
ATTENTION -	Radiation laser invisible si le dispositif est ouvert et si non bloqué. Évitez l'exposition au rayon.
VORSICHT -	Unsichtbare Laserstrahlung wenn drucker offen und sperre gelöst. Nicht dem strahl aussetzen.
VOORZICHTIG -	Onzichtbare laserstraling wanneer de printer open is en niet vergrendeld. Vermijd blootstelling aan straal.
ATTENZIONE -	Radiatori laser invisibile se il dispositivo è aperto e non bloccato. Evitare l'esposizione diretta.
AVISO -	Radiación laser invisible si la puerta está abierta y el dispositivo no está bloqueado. Evite exponerse a la radiación.
CUIDADO -	Radição laser invisível quando a tampa é aberta. Evite exposição aos raios.
VARO!	Aviittäessä ja suojalukitus ohitettaessa olet alttina näkymättömälle laser säteilylle. Älä katso säteeseen.
WARNING -	Ongelrig laserstraling når deksel åpnes og sikkerhetslåsen er uforberedt. Bli uten å se på strålen.
ADVARSEL -	Uoprigtig laserstråling når deksel åpnes og sikkerhetsbryteren er ude av funksjon. Unngå undersøkelse for stråling.
ADVARSEL -	Radiación laser invisible si s'obren i el tancament intern no es correcte. Eviteu exposar-vos-hi.
ATENCIÓN -	
注意：	同梱の警告有 看不到的雷射輻射部分外殼・構造を露出する光線下。
注意：	トップカバーを開き、互锁システムが作動しない状態で開閉可能なレーザー光線が照射されるので、ご注意ください。
주의：	개방과 인터락이 해제 시 눈에 보이지 않는 레이저가 방사됩니다. 레이저 빛에 노출되지 않도록 주의하십시오.

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Class 1 Laser Statement Label



CLASS 1 LASER PRODUCT
LASER KLASSE 1
LOUKAN 1 LASERLAITE
APPAREIL A LASER DE CLASSE 1
TO IEC 60825

Laser Notice

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

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

Laser

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

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

Avis relatif à l'utilisation de laser

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

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

Avvertenze sui prodotti laser

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

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

Avisos sobre el láser

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

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la Clase I durante su uso normal, el mantenimiento realizado por el usuario o cualquier otra situación de servicio técnico.

Declaração sobre Laser

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

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

Laserinformatie

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

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

Lasermeddelelse

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

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 bølgelængdeområdet 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 -määrittelyksen mukainen ja muualla luokan I laserlaitteiden IEC 60825 -määrittelyksen 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 määrittelyksiä 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 laserstråling när denna del är öppnad och spårren är urkopplad. Betrakta ej strålen.

Laser-notis

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

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Laserprodukter i Klasse I anses ej hälsovådliga. Skrivaren har en inbyggd laser av Klasse 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 Klasse I-nivå vid normal användning, underhåll som utförs av användaren eller annan föreskriven serviceåtgärd.

Laser-melding

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

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

Avís sobre el Làser

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

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

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

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

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

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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。
- 本产品的维护资讯仅供专业服务人员使用，而非针对一般使用者。
- 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

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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.

Ozone Information

This product does not produce measurable amounts of ozone gas.

Preface

This manual is divided into the following chapters:

- “General Information” contains a general description of the printer, options, and the maintenance approach used to repair it. General environmental and safety instructions as well as special tools and test equipment are listed in this chapter.
- “Diagnostic Information” contains a service error code table, user status message table, user error message table, symptom table, and service checks used to isolate failing field replaceable units (FRUs).
- “Diagnostic Aids” contains tests and checks used to locate or repeat symptoms of printer problems. Printer operation information is provided to enhance the tests and checks.
- “Repair Information” provides instructions for making printer adjustments and removing and installing FRUs.
- “Connector Locations” uses illustrations to identify the major components and test points on the printer.
- “Preventive Maintenance” contains safety inspection guidelines, lubrication specifications, and maintenance information to prevent problems and maintain performance.
- “Parts Catalog” contains illustrations and part numbers for individual FRUs.

1. General Information

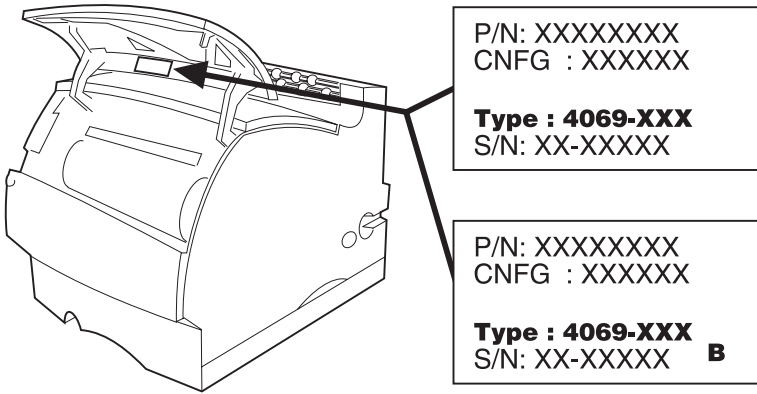
The Optra™ T laser printers are letter quality page printers designed to attach to IBM-compatible PC's and to most computer networks.

The Optra T laser printer is available in the following models.

Model Name	Type
Optra T 610	4069-010
Optra T 610n	4069-01n
Optra T 612	4069-212
Optra T 612n	4069-21n
Optra T612v	4069-31v
Optra T612vn	4069-31e
Optra T 614	4069-414
Optra T 614	4069-41b
Optra T 614n	4069-41e
Optra T 614nl	4069-41l
Optra T 614n	4069-41n
Optra T 616	4069-616
Optra T 616n	4069-61n

4069-XXX

Look at the printer serial label to identify the printer you are working on. There are two service levels of Optra T printers. Some printers are at a service level B as indicated by the B on the label.



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 4MB, 8MB, 16MB, 32MB, 64MB and 128MB SDRAM DIMM

Flash memory options of 2MB, 4MB, 8MB and 16MB DIMM

Integrated network options

Token-Ring

Ethernet

Tri-Port Adapter

IR Adapter

IPDS SIMM

Prescribe SIMM

TIFF SIMM

Barcode SIMM

Parallel Interface Card

SCS

USB/Parallel Port

Marknet Print Servers

250 and 500-sheet paper trays of A5, letter, and legal size.

250 Sheet Special Media Tray Assembly

500 Sheet Special Media Tray

2000 Sheet High Capacity Feeder

Envelope feeder

Duplex option - 250 Sheet

Duplex option - 500 Sheet

Hard Disk - 2.1 GB

Forms Hard Disk - 2.1 GB

Vertical Kiosk Presenter

Horizontal Kiosk Presenter

Output Expander

5-Bin Mailbox

High Capacity Output Stacker

Maintenance Approach

The diagnostic information in this manual leads you to the correct field replaceable unit (FRU) or part. Use the service error codes, user status messages, user error messages, service checks, and diagnostic aids to determine the printer problem and repair the failure. After you complete the repair, perform tests as needed to verify the repair.

Tools Required For Service

- Flat-blade screwdriver
- #1 Phillips screwdriver
- #2 Phillips screwdriver
- T10 Torx Screwdriver
- 7.0 mm nut driver
- 5.5 mm wrench
- Needlenose pliers
- Diagonal pliers
- Spring hook
- Feeler gauges
- Analog or digital multimeter
- Parallel wrap plug 1319128
- Serial wrap plug 1329048
- Twinax/serial debug cable 1381963
- Coax/serial debug cable 1381964

Acronyms

CSU	Customer Setup
DIMM	Dual In-Line Memory Module
DRAM	Dynamic Random Access Memory
EDO	Enhanced Data Out
EP	Electrophotographic Process
EPROM	Erasable, Programmable Read-Only Memory
ESD	Electrostatic Discharge
FRU	Field Replaceable Unit
GB	Gigabyte
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
POR	Power-On Reset
POST	Power-On Self Test
RIP	Raster Imaging Processor
ROM	Read Only Memory
SIMM	Single In-Line Memory Module
SDRAM	Synchronous Dual Random Access Memory
SRAM	Static Random Access Memory
UPR	Used Parts Return
V ac	Volts alternating current
V dc	Volts direct current

4069-XXX

2. Diagnostic Information

Start

CAUTION: Remove the power cord from the printer or wall outlet before you connect or disconnect any cable or electronic board or assembly for personal safety and to prevent damage to the printer. Use the handholds on the side of the printer. Make sure your fingers are not under the printer when you lift or set the printer down.

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

Service error codes are indicated by a three-digit error code. If a service error code is displayed, go to the [“Service Error Codes” on page 2-2](#).

User status messages provide the user with information on the current status of the printer. Ready is displayed on the first line of the display unless Power Saver is invoked, and then Power Saver is displayed. If a user status message is displayed, go to the [“User Status Messages” on page 2-12](#).

User error messages are indicated by a two or three-digit error code that provides the user with information that explains a problem with a print cartridge, paper jam, option, port, and so on. If a user error message is displayed, go to the [“User Error Messages” on page 2-16](#).

If your machine completes the [“Power-On Self Test \(POST\)” on page 2-24](#) without an error, and you have a symptom, go to the [“Symptom Tables” on page 2-25](#). Locate your symptom and take the appropriate action.

If a service error code appears while you are working on the machine, go to the [“Service Error Codes” on page 2-2](#) and take the indicated action for that error.

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Service Error Codes

Service Error Codes are generally non-recoverable except in an intermittent condition when you can POR the printer to temporarily recover from the error condition.

Error Code	Action
900 RIP Software	Contact the next support level or call Lexmark.
901 Engine Flash	Indicates that the flash which the engine board code is programmed into is bad. Replace the engine board.
902 General Engine Software	These errors indicate an unrecoverable engine software error. Replace the engine board.
903 Paperport Link Driver Error	Check for correct location of the jumpers on the interconnect board for the model/type printer you are servicing. Incorrect jumper settings can cause a 902 service error. If jumpers are set correctly, replace the engine board.
904 Interface Violation by the controller software	
905 Interface Violation by Paperport Device	
906 Controller-Engine Link Driver Error	
910 DC Pick Motor DC Pick Motor Stall	Error Codes 910,911,912,913 and 914 are indications that a Tray 1 paper feed problem has been detected. Go to the "Input Tray(s) Option Service Check" on page 2-53.
911 DC Pick Motor Excessive PWM	
912 DC pick motor below speed	
913 DC pick motor over speed	

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Error Code	Action
914 DC pick motor: No encoder feedback	Check the integrated paper tray (tray 1) for correct paper loading. Reload the paper and POR the printer. If the error continues, go to the “Input Tray(s) Option Service Check” on page 2-53.
917 Transfer Roll	Indicates a problem in the transfer roll area. Go to the “Transfer Roll Service Check” on page 2-108. Note: This error also displays if an incorrect level HVPS assembly is installed in a printer that has the erase lamp assembly installed. Check to make sure the correct HVPS assembly is installed.
920 Fuser Error	Indicates that the fuser is below temperature when printing. Go to the “Fuser Service Check” on page 2-47. For models 31v and 31e go to “Belt Fuser” on page 2-50.
921 Fuser Error	Indicates that the fuser is below standby temperature when the printer is idle. Go to the “Fuser Service Check” on page 2-47.
922 Fuser Error	Fuser failed to reach standby temperature. Go to the “Fuser Service Check” on page 2-47. For models 31v and 31e go to “Belt Fuser” on page 2-50.
923 Fuser Error	Fuser is too hot during printing or when printer is idle. Go to the “Fuser Service Check” on page 2-47. For models 31v and 31e go to “Belt Fuser” on page 2-50.
924 Fuser Error	An open circuit has been detected in the Fuser Thermistor Circuit. Go to the “Fuser Service Check” on page 2-47. For models 31v and 31e go to “Belt Fuser” on page 2-50.
925 Fuser Error 010/212/414/616/ 01n/21n/41b/41/ 41n/61n	Wrong fuser lamp installed. Check the fuser lamp for the correct type of lamp that should be installed.
927 Fan Stalled	Indicates a printer fan stalled. Go to the “Fan Service Check” on page 2-46.

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Error Code	Action
928 Erase Lamps	<p>Models 010/212/414/616/31v/01n/21n/31e/41n/61n Indicates that the engine has detected that either the erase lamp assembly is missing or disconnected. Go to the “Erase Lamp Service Check (010/212/414/616/31v/01n/21n/31e/41n/61n)” on page 2-45.</p> <p>Models 41b/41e/41l and models 010/212/414/616/31v/01n/21n/31e/41n/61n at service level B do not have erase lamps installed. Go to “Printer Serial Label” on page 7-2 to identify the printer service level. Check to make sure the correct HVPS is installed if this error displays on these models.</p>
929 Toner Sensor	The toner sensor is not operating properly, the developer drive assembly is not operating properly or the print cartridge is defective. Go to the “Toner Sensor Service Check” on page 2-107.
930 Printhead Error	The wrong printhead is installed. Replace with the correct printhead.
931-935 Printhead Error	These errors represent a problem with the printhead. Go to the “Printhead Service Check” on page 2-92.
932 - Printhead: Lost Hsync	
933 - Mirror Motor Locks/Lost Hsync	
934 - Mirror Motor Lost Lock	
935 - Mirror Motor unable to reach operating speed.	
936-937 Transport Motor	Indicates a problem with the main drive motor. Go to the “Main Drive Service Check” on page 2-69.
936 - Main Drive Motor initial lock failure	
937 - Main Drive Motor lost lock	

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Error Code	Action
939 Controller - Engine Communications Error	<p>The controller board and the engine board cannot communicate with one another. The controller board, engine board or interconnect board is defective. Check each board for correct installation and secure ground. If no problem is found, replace the FRUs in the following order:</p> <p>controller board</p> <p>engine board</p> <p>interconnect board</p> <p>Note: The controller software also can cause a 939 error code. Contact your next level for software support.</p>
941 Controller Code CRC	A 941 error can be created by a defective code overlay SIMM, a code upgrade, a defective IPDS or a prescribe SIMM. These should be checked before replacing the controller board.
941 Controller Font CRC	Replace the controller board.
943 Controller Font Version	Indicates that the controller code and FONT ROM are incompatible.
944 Controller Board Failure	Replace the controller board.
945 Controller Board Failure - ASIC Failure	Replace the controller board.
946 Controller Board Failure - SRAM Failure	Replace the controller board.
947 Engine Board	Replace the engine board.
953 NVRAM Failure	Indicates the NVRAM chip on the engine board has failed. Replace the engine board.
954 NVRAM Failure	Indicates the NVRAM experienced a CRC failure. Replace the engine board.

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Error Code	Action
956 Configuration ID	<p>Indicates a problem with the Configuration ID. This error occurs because the engine received a configuration ID from the controller software which is not valid for the level of engine code existing in the printer. Setting the configuration ID correctly should fix this error. The ID can be set via the NPA data stream or operator panel.</p> <p>Note: This error is not generated at POR to allow the servicer a method of resetting the configuration ID. However, setting the configuration ID is the only operation that the servicer can perform. See “Setting Configuration ID” on page 3-21.</p>
960 RAM Memory Error	Indicates a DRAM Memory Error on the controller board. Replace the controller board.
961 RAM in Slot 1 is Bad.	Replace the DIMM in Slot 1. If this does not fix the problem, replace the controller board.
962 RAM in Slot 2 is Bad.	Replace the DIMM in Slot 2. If this does not fix the problem, replace the controller board.
963 RAM in slot 3 is Bad.	Replace the DIMM in slot 3. If this does not fix the problem, replace the controller board.
964 Emulation Error	<p>Indicates a failure within the Download Emulation which is programmed into the code overlay SIMM. The specific error is as follows:</p> <p>964 - Download Emulation CRC Failure. Checksum Failure.</p> <p>965 - Download Emulation Outdated, The Download Emulation and the controller code are incompatible. Go to “Disabling Download Emulations” on page 3-3.</p>
965 Emulation Error	
975 - 979 Network Card X	<p>The following errors indicate a failure with the network card in the specified slot. X=any card installed in slots 1,2 or 3. 975 - Unrecognizable Network Card x. Replace Network Card x.</p> <p>976 - Unrecoverable software error in Network Card x.</p> <p>977 - Controller software detects that a Network Card is installed in slot x but cannot establish communications with it.</p> <p>978 - Bad checksum while programming Network Card x. Replace Network Card x.</p> <p>979 - Flash parts failed while programming Network Card x.</p> <p>If the printer is a network model, replace the controller board.</p>

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Error Code	Action
980 <device> Comm	The engine is experiencing unreliable communications to the specified device.
981 <device>	The engine protocol violation detected by the specified device.
982 <device> Comm	Communications error detected by the specified device.
983 <device>	Invalid command received by the specified device.
984 <device>	Invalid command parameter received by the specified device. Note: Service Errors 980 thru 984 <device> can be one of the following: engine board, duplex, tray x (1,2,3,4 or 5), envelope feeder or output bin x (1,2 or 3).
990 <device>	Indicates an equipment check condition has occurred in the specified device, but the device is unable to identify the exact component failure. Note: <device> can be one of the following: duplex, tray x (1,2,3,4 or 5), envelope feeder or output bin x(1,2 or 3).
991 <device> Card	The specified device has detected an equipment check in its system card. Note: <device> can be one of the following: duplex, tray x(1,2,3,4 or 5), envelope feeder or output bin x (1,2 or 3).

Sub Error Codes For 9XX and 2XX Error Codes

The sub error codes are helpful troubleshooting a paper path problem, especially paper jams in the base printer, envelope feeder and duplex unit.

When a 9XX or 2XX error displays:

Press and hold return and press select to enter for sub error codes.

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The following is an example of how the printer displays a duplex unit sub error code.

	Byte 1	Byte 2	Byte 3	Byte 4
DU	XX	XX	XX	XX
DU	XX	XX	XX	XX
	Byte 5	Byte 6	Byte 7	Byte 8

Base Printer Sub Error Codes

Each status byte has a different level of troubleshooting value for each area of the printer. The following table displays status bytes 1, 2 and 3. This set of status bytes is designed to help isolate paper jams and paper feed problems in the base printer.

Status Bytes 1, 2,3	Explanation
84 xx 00	The input sensor is still covered by the first sheet of paper through the printer and the second sheet is ready to arrive at the sensor.
84 xx 01	Video information has not started on the page at the input sensor within two inches after activating the input sensor flag.
84 xx 02	The media takes too long to complete a pass through the input sensor.
84 xx 04	This can occur when a sheet of paper is in the machine during POST and the input sensor flag has tripped the input sensor.
84 xx 05	This error is generated whenever media is seen at the input sensor before the sensor flag activates the input sensor.
84 xx 06	A paper jam is detected by the tray you are trying to feed from.
84 xx 07	A paper jam is detected by a smart option and an error message displays.
84 xx 08	Paper Tray 5 pass thru sensor is not activated by a sheet of paper.

4069-XXX

Status Bytes 1, 2,3	Explanation
84 xx 09	Paper Tray 4 pass thru sensor is not activated by a sheet of paper.
84 xx 0A	Paper Tray 3 pass thru sensor is not activated by a sheet of paper.
84 xx 0B	Paper Tray 2 pass thru sensor is not activated by a sheet of paper.
84 xx 0C	Paper Tray 5 pass thru sensor is not activated and never deactivated. A sheet of paper may still be over the sensor or the flag is still activated.
84 xx 0D	Paper Tray 4 pass thru sensor is not activated and never deactivated. A sheet of paper may still be over the sensor or the flag is still activated.
84 xx 0E	Paper Tray 3 pass thru sensor is not activated and never deactivated. A sheet of paper may still be over the sensor or the flag is still activated.
84 xx 0F	Paper Tray 2 pass thru sensor is not activated and never deactivated. A sheet of paper may still be over the sensor.
84 xx 10	The main motor is stalled or the incorrect main motor is installed in the printer.
84 xx 11	The paper activated the input sensor too soon.
84 xx 13	The paper activated the input sensor too soon.
84 xx 1D	The envelope feeder pass thru sensor is activated and never deactivated.
84 xx 1E	The envelope feeder pass thru sensor is not activated.
84 xx 1F	The paper fed too early from Tray 1.
84 xx 21	The smart option did not pick the paper.
84 xx 22	The smart option did not pick the paper.
8E xx 02	The input sensor is not activated even though the paper is picked from the source.

4069-XXX

Status Bytes 1, 2,3	Explanation
8E xx 0B	The autocompensator DC motor stalls when attempting to pick a sheet of paper.
8E xx 11	The autocompensator DC motor takes too long to ramp up.

Envelope Feeder Sub Error Codes

Status byte 1 contains the most valuable information to help isolate a feed problem with the envelope feeder and is the only byte contained in the following table.

Status Byte 1	Explanation
00	There was no envelope feeder error reported.
10	Printer failed POST - Homing of Envelope feeder
11	Printer failed POST - Halted Envelope Feeder
21	The envelope feeder failed to feed, envelope jam.
30	The D.C. motor failed to reach operating speed.
32	The motor stalled.
36	The motor failed to stop.

Duplex Unit Sub Error Codes

Status byte 4 contains the most valuable information to help isolate a failing part or assembly in the duplex option and is the only byte contained in the following table.

Status Byte 4	Explanation
00	No duplex error. No problem was reported to the engine by the duplex system card.
01	The leading edge of the sheet of paper never arrived at the input sensor.

4069-XXX

Status Byte 4	Explanation
02	The duplex option system board never received media notification from the printer.
03	The trailing edge of the sheet of paper never cleared the input sensor.
04	The leading edge of the sheet of paper never arrived at the exit sensor. Note: This error is the most common due to the long length of the paper path between the input sensor and the exit sensor.
05	The duplex logic thinks a sheet of paper is feeding to the duplex unit due to a sensor malfunction in the paper path when in fact the printer has not sent a command to send a sheet of paper to the duplex unit.
06	The exit sensor detected a sheet of paper too early.
07	The sheet of paper's trailing edge did not clear the exit sensor in the desired length of time.
08	The feed motor experienced a complete motor stall.
0E	The D.C. motor is under speed. The motor never reached the correct operating speed.
13	There is paper left in the duplex option. Paper was sensed during the homing operation during POST.
15	There is paper left in the duplex option. Paper was sensed during the DC motor diagnostic test during POST.
18	The D.C. motor experienced an acceleration error.
3D	There is paper left in the duplex option. Paper was sensed during IR clear during POST.

User Status Messages

User Status Message	Status	Action
Ready	The printer is ready to receive and process data.	Press Menu> or <Menu to take the printer out of Ready and enter all the Menus except the TESTS MENU (Busy State).
Ready/Hex	The printer is ready and HEX Trace is active, which is known as HEX Trace Ready.	Press Menu> or <Menu to take the printer out of Ready and enter the TESTS MENU (Busy State). Press Select for the values. Press Menu> until Reset Printer is on the second line of the display. Press Select to Reset the printer.
Busy	The printer is busy receiving or processing data, or printing data. Note: The printer indicator light blinks while the printer is processing data.	Press Stop to take the printer out of Busy. The Not Ready message is displayed. No more data is processed, but the printer processes all paper currently in the printer paper path. Press Go to return to Ready.
Flushing Buffer	The printer is flushing corrupted print data and the current print job is being discarded.	No button actions are possible while this message is displayed.

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User Status Message	Status	Action
Printing Menu Settings	The printer is processing or printing a list of current settings menus because Print Menu Settings is selected from the menu.	Press Stop to take the printer out of Ready. The Not Ready message is displayed. No more data is processed, but the printer processes all paper currently in the printer paper path. Press Go to return to Ready after the page prints. Press Menu> or <Menu to take the printer out of Ready and enter the TESTS MENU (Busy State). Press Select for the values. Press Menu> until Reset Printer is on the second line of the display. Press Select to reset the printer.
Printing Directory List	A directory of the flash and disk contents is processing or printing because Print Directory is selected from the menu.	Press Stop to take the printer out of Ready. The Not Ready message is displayed. No more data is processed, but the printer processes all paper currently in the paper path. Press Go to return to Ready after the page prints. Press Menu> or <Menu to take the printer out of Ready and enter the TESTS MENU (Busy Stat). Press Select for the values. Press Menu> until Reset Printer is on the second line of the display. Press Select to reset the printer.

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User Status Message	Status	Action
Restoring Factory Defaults	The printer is restoring factory defaults.	No button actions are possible while this message is displayed.
Performing Self Tests	The printer is running the normal series of start-up tests after it is powered On. When the tests are complete, the printer returns to Ready.	No button actions are possible while this message is displayed.
Not Ready (Press Go)	The printer is in the Not Ready state, which means it is not ready to receive or process data. This message displays when Menu> or <Menu is pressed during a print job.	Press Go to take the printer out of the Not Ready state. Press Menu> or <Menu to take the printer out of Ready and enter the TESTS MENU (Busy state). Press Menu> until Reset Printer is on the second line of the display. Press Select to reset the printer.
Resetting Printer	The printer is deleting any print jobs in process and restoring all settings to user defaults.	No button actions are possible while this message is displayed.
Formatting Flash (Do Not Power Off)	The flash memory is being formatted.	No button actions are possible while this message is displayed.
Program Flash (Do Not Power Off)	The flash memory is being programmed, which means fonts or macros are being written to flash memory.	Do not perform any button actions while this message is displayed.
Formatting Disk	The disk is being formatted.	No button actions are possible while this message is displayed.

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User Status Message	Status	Action
Programming Disk (Do Not Power Off)	The disk is being programmed, which means fonts or macros are being written to disk.	No button actions are possible while this message is displayed. Note: If information is written to flash memory and to disk at the same time, the Program Flash message is displayed.
Menus Disabled	The printer menus have been disabled. This occurs when Menu> or <Menu is pressed while the printer is Ready and Menu Lockout is active. The printer display shows this message for one second and then returns to the Ready message.	No button actions are possible while this message is displayed.
Activating Menu Changes	The printer is reset to activate a printer setting changed in the menus.	No button actions are possible while this message is displayed.

User Error Messages

User Error Message	Explanation
200 Paper Jam Remove Cartridge	Paper is jammed at the printer Input Sensor. Open the printer's upper front door and remove the print cartridge to access the paper jam area.
201 Paper Jam Remove Cartridge	Paper is jammed between the printer's input and exit sensors. Open the printer's upper front door and remove the print cartridge to access the jam area.
202 Paper Jam Open Rear Door	Paper is jammed at the printer exit sensor. Open the printer rear door to access the jam area.
230 Paper Jam Check Duplex	The paper is most likely jammed in the Duplex Unit. Remove the duplex front cover to access the jam area. If the paper is jammed in the rear of the duplex, then replace the duplex front cover and open the duplex rear door. If the paper is not jammed in the duplex unit, then it may be jammed in the rear of the printer. Open the printer rear door to access the jam.
24X Paper Jam Check Tray X	Paper is jammed around Tray X (X=tray 1 thru 5). Try opening Tray X. If the tray is difficult to remove, then you may have to remove the tray above or below tray X to remove the jammed pages.
250 Paper Jam Check MP Feeder	Paper is jammed in the multipurpose feeder.
260 Paper Jam Check Envelope Feeder	Paper is jammed in the envelope feeder.
27X Paper Jam Check Output Bin X	Paper is jammed in output bin X (X=1 thru 3). Open the rear door of Output Bin X to access the jammed pages.
Insert Cartridge or Close Door	This message displays when the printer's front door is open or the print cartridge is missing. If this message cannot be cleared go to "Cover Open Switch/Cable Service Check" on page 2-31.

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User Error Message	Explanation
31 Defective Print Cartridge	<p>Error code 31 is displayed when the top front cover is closed and a defective print cartridge is detected. It may take the printer 10-20 seconds to determine if the print cartridge is defective. Depending on the setting of the Machine Class ID the printer may be allowed to print pages during this 10-20 second interval. If pages are allowed to print, they are not reprinted once a good print cartridge is inserted.</p> <p>Note: This error indicates the printer was able to read the cartridge ID, but the ID did not pass the verification test. To pass the verification test, the ID read from the print cartridge must match the ID from the last “good” print cartridge or the same ID must be read from the print cartridge twice. The last “good” print cartridge ID is stored in NVRAM.</p>
32 Unsupported Print Cartridge	<p>Error 32 is displayed when the top cover is closed and an unsupported print cartridge is detected. It may take the printer 10-20 seconds to determine if the print cartridge is supported. Depending on the setting of the Machine Class ID the printer may be allowed to print pages during this 10-20 second interval. If pages are allowed to print, then they are not reprinted once a good print cartridge is inserted. If this does not fix the problem, go to “Smart Cartridge Service Check” on page 2-106.</p>
34 Short Paper	<p>The printer determines the paper length is too short to print the formatted data. This occurs when the printer does not know the actual paper size loaded in the tray. For auto-size sensing trays, this error occurs if the paper stop is in the incorrect position. Make sure the Paper Size setting is correct for the size paper that is being used.</p>
36 Resolution Reduced	<p>The resolution of the page has been reduced from 600 dpi to 300 dpi in order to prevent a Memory Full error. This message can only occur if the Resolution Reduction setting is turned on.</p> <p>Note: 1200 dpi pages are not resolution reduced. If a 1200 dpi job runs out of memory, a Memory Full error is displayed.</p>

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User Error Message	Explanation
37 Insufficient Collation Memory	This message is displayed when the printer memory used to store pages is too full to collate the print job.
38 Memory Full	This message is displayed when the printer memory used to store pages is full.
39 Complex Page	This message is displayed when the page is too complex to print.
51 Defective Flash	This message is displayed when the printer detects a defective flash. This error may occur at power on, or during flash format and write operations. Press Go to clear the message. The flash is marked as bad and normal operation continues. Flash operations are not allowed until the problem is resolved.
52 Flash Full	This message is displayed when there is not enough free space in the flash memory to hold the resources that have been requested to be written to flash.
53 Unformatted Flash	This message is displayed when the printer detects an unformatted flash at power on. Press Go to clear the message. The flash is marked as bad and normal operation continues. Flash operations are not allowed until the flash is formatted.
54 Standard Serial Error	This error is displayed when a serial error (framing or parity) is detected on the standard serial port. This usually indicates the serial port is not set up correctly.
54 Serial Option X Error	This error is displayed when a serial error (framing or parity) is detected on the optional serial port. This usually indicates the optional serial port is not set up correctly.
56 Standard Serial Disabled	This error is displayed when data is sent to the printer across the standard serial port, but the port has been disabled.

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User Error Message	Explanation
56 Parallel Port Disabled	This error is displayed when data is sent to the printer across the parallel port, but the parallel port has been disabled. Once this message is displayed, reporting of further errors is suppressed until the menus are entered, or the printer is reset.
58 Too Many Trays Attached	This error code is displayed when too many input trays are attached to the printer.
58 Too Many Bins Attached	This error code is displayed when too many optional output bins are attached to the printer.
58 Too Many Disks Installed	This error is displayed when too many disks are attached to the printer.
61 Defective Disk	This error code is displayed when the printer detects a defective disk. This error may occur at power on or during disk format and write operations. The following actions may be taken while this message is displayed: Press Go to clear the message. The disk is marked defective and normal printer operations continue. Disk operations are not allowed with a defective disk. The Format Disk menu is not shown.
62 Disk Full	This error code is displayed when there is not enough free space on the disk to hold the resources that have been requested to be written to the disk. This message displays for both resource and PostScript Disk operators when the disk is full.
63 Unformatted Disk	This error code displays when the printer detects an unformatted disk at power on. Press Go to clear the message. The disk is marked as bad and normal operation continues. Disk operations are not allowed until the disk is formatted.
80 Scheduled Maintenance	The operator panel displays this message at each 300K page count interval. It is necessary to replace the fuser assembly, transfer roller, and charge roll at this interval to maintain the print quality and reliability of the printer. The parts are available as a maintenance kit. For more information, go to "Scheduled Maintenance" on page 6-2.

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User Error Message	Explanation
81 Engine Code CRC Failure	This error displays when the microcode to be programmed in the engine flash code module has failed a CRC check. Press Go to clear the message. The microcode data is discarded and must be re-transmitted from the host computer.
88 Toner Low	This message displays when toner low occurs and the toner low alarm is activated. Press Go to clear this message.

User Line 2 Messages

If none of the conditions exist that are listed in the following table, line 2 is blank. If any of the messages in the table are displayed the following actions can be taken:

Press Menu> or <Menu to take the printer offline and access the Ready Menu group.

Note: The Menu buttons are not active if Menu Lockout is turned on.

Press Stop to take the printer offline. The Not Ready message is displayed. No more data is processed from the host computer. Press the Go button to return the printer to the Ready state.

User Message	Explanation
Toner Low	If the toner cartridge is low, then "Toner Low" displays. The Toner Low condition clears whenever the upper front door is opened, and Toner Low displays again if the condition exists after the upper front door is closed.
Tray X Missing	If any of the input trays are missing, then "Tray X Missing" displays (where X designates which Tray (1 through 5) is missing. If multiple trays are missing, they are prioritized in this order: Tray 1, 2..., then tray 5. Tray X Missing status clears whenever Tray X is reinserted.

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User Message	Explanation
Tray X Empty	<p>If any of the input trays are empty, then “Tray X Empty” displays where X designates which tray (Tray 1 through 5) is empty. If multiple trays are empty, then they are prioritized in this order: Tray 5, Tray 4,...Tray 1.</p> <p>Note: Tray X Empty status clears whenever Tray X is removed. When Tray X is reinserted, it is examined and the appropriate status, if any, displays. Also note that Empty status is not displayed for the Envelope Feeder or Multipurpose Feeder.</p>
Tray X Low	<p>If any of the input trays are low, then “Tray X Low” displays where X designates which tray (1 through 5) displays. If multiple trays are low, they are prioritized in the following order: Tray 5,4,3,2,1.</p> <p>Note: Tray X Low clears whenever Tray X goes empty, or Tray X is removed. When Tray X is reinserted, it is examined and the appropriate status, if any, displays.</p> <p>Note: The printer cannot detect when the envelope feeder or multipurpose feeder are low.</p>

User Line 2 Link Messages

If the printer is locked on a particular link, the link indication displays. If the printer is ready to process any link, no messages display. The link messages are listed in the following table.

User Message	Explanation
Parallel	Standard Parallel Port, if available.
Serial	Standard Serial Port, if available.
Serial X	Serial Port, where X=1,2,3, is attached to PCI connector X.
Network X	Network card X, X=1,2,3, is attached to PCI connector X.

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User Message	Explanation
LocalTalk X	LocalTalk Card X, X=1,2,3, is attached to PCI connector X.
Infrared	Standard Infrared port, if available.
Infrared X	Infrared Port X, X=1,2,3, is attached to PCI connector X.

Check Device Connection Messages

The messages in the following table display when the printer loses communications with one of the following devices.

User Status Message	Explanation
Check Output Bin X Connection	Check Output Bin X (X=1,2,or 3).
Check Env Feeder Connection	Check Envelope Feeder Option Connection.
Check Tray X Connection	Check Tray X (X=1,2,3,4 or 5).
Check Duplex Connection	Check Duplex Option Connection.

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The messages in the following table can occur in two ways. The specified device could have been removed from the printer, for instance to clear a paper jam. Otherwise, the device can still be attached to the printer, but is experiencing a communications problem, not fully connected, or having a hardware failure.

- If the device is temporarily removed or not connected properly, then reattach it. When the option is recognized, the printer automatically clears the error and continues.
- If the option is experiencing a hardware problem, turn the printer off and back on. If the error occurs again, turn the printer off, remove the option and call for service.

User Status Message	Explanation
Turn Printer OFF to Enable Option	This message displays when a printer option, Input Tray, Output Bin or Envelope Feeder, has been attached while the printer is powered On. In order to use the option, the printer must first be powered off and back on again. Data loss results if print jobs are active when the printer is power cycled. If a print job is active, then remove the option and finish the job. The printer automatically clears the message once the option is removed. Once the job is complete, turn off the printer and attach the option again.
Insert Duplex Front Cover	This message displays when the duplex front access cover is not installed.
Close Duplex Rear Door	This message displays when the duplex rear door is open.

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. The LED comes on.
2. The operator panel displays one and a half row of pels, and then clears.
3. Diamonds scroll across the display, and then clear.
4. The operator panel displays one and a half row of pels, and then clears.
5. The top line of the operator panel displays one square block of pels that turn on one at a time until all sixteen blocks display and then they all turn off.
6. "Performing Self Test" appears on the display.
 - The 2000 sheet high capacity option elevator tray moves to the uppermost position if installed.
 - The duplex option is checked if installed.
 - The output expander option exit rollers turn if installed.
7. "Busy" appears on the display.
8. The fuser lamp turns on. The fuser takes longer to warm up from a cold start than a warm start. (All models except the 31v)
9. The main fan turns on.
10. The main drive motor turns on.
11. The developer drive assembly drives the developer shaft in the toner cartridge.
12. The exit rollers turn.
13. The operator panel LED starts blinking.
14. Models 414 and 616 only - The auxiliary fan turns on and continues to run until the printer is powered off.
15. "Ready" appears on the display.

Symptom Tables

Symptom Table - Base Printer

Symptom	Action
Auxiliary Fan (414/616) fails to run or is noisy.	Go to the "Auxiliary Fan Service Check" on page 2-46.
Dead Machine	Go to the "Dead Machine Service Check" on page 2-32.
Operator Panel - One or more buttons do not work.	Go to the "Operator Panel Buttons Service Check" on page 2-70.
Operator Panel - Display is blank. Printer sounds 5 beeps.	Go to the "Operator Panel Service Check" on page 2-70.
Operator Panel - Display is blank. Printer does not sound 5 beeps.	Replace the operator panel assembly.
Operator Panel continuously displays all diamonds, sounds 5 beeps and does not complete POST.	Go to the "Operator Panel Service Check" on page 2-70.
Paperfeed problems - Base printer or Integrated 250 Paper Tray	Go to the "Paper Feed Service Check" on page 2-89.
Paper jams at exit of Redrive Assembly - No Duplex Option installed.	Go to the "Paper Feed Service Check" on page 2-89.
Paper jams at exit of Redrive Assembly - Duplex Option installed	Go to the "Duplex Option Service Check" on page 2-35.
Fuser Solenoid fails to operate. (All models except the 31v)	Go to the "Fuser Solenoid Service Check" on page 2-51.
Print quality - Black page	Go to "Print Quality - All Black Page" on page 2-94.
Print quality - Blank page	Go to "Print Quality - Blank Page" on page 2-94.
Print quality - Light print	Go to "Print Quality - Light Print" on page 2-104.

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Symptom	Action
Print quality - Background	Go to "Print Quality - Background" on page 2-98.
Print quality - Residual image	Go to "Print Quality - Residual Image" on page 2-103.
Print quality - Skew	Go to the "Paper Feed Service Check" on page 2-89.
Print quality - Banding	Go to "Print Quality - Banding" on page 2-101.
Print quality - Random marks	Go to "Print Quality - Random Marks" on page 2-96.
Print quality - Toner on backside of printed page	Go to "Print Quality - Toner on backside of printed page" on page 2-105.
Print quality - Vertical black bands on edge of copy	Go to "Print Quality - Black bands on outer edges of the page" on page 2-101.
Unable to clear a "32-Unsupported Print Cartridge" User Error Message	Go to "Smart Cartridge Service Check" on page 2-106

Symptom Table - High Capacity Feeder Option (2000 Sheet)

Symptom	Action
The printer does not recognize the high capacity feeder option installed.	Go to the "High Capacity Feeder Input Tray Service Check" on page 2-56.
Paper feed problem with the high capacity feeder option.	Go to the "High Capacity Feeder Input Tray Service Check" on page 2-56.

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Symptom Table: Paper Tray Options

Symptom	Action
Paper feed problem with 250 Sheet Paper Tray Option.	Go to the "Input Tray(s) Option Service Check" on page 2-53.
Paper feed problem with 500 Sheet Paper Tray Option.	Go to the "Input Tray(s) Option Service Check" on page 2-53.
Media fails to pass thru from the lower attached Paper Tray option to the next higher mounted option.	Go to the "Input Tray(s) Option Service Check" on page 2-53.

Symptom Table - Duplex

Symptom	Action
Paper feed problem with Duplex	Go to the "Duplex Option Service Check" on page 2-35.
Paper jams at Paper Removal Tray	Go to the "Duplex Option Service Check" on page 2-35.
Paper skews in the Duplex Option	Go to the "Duplex Option Service Check" on page 2-35.
Paper fails to pass from lower option thru the Duplex Option.	Go to the "Duplex Option Service Check" on page 2-35.

Symptom Table - Envelope Feeder Option

Symptom	Action
Envelopes do not feed from the envelope feeder.	Go to the "Envelope Feeder Option Service Check" on page 2-38.
Envelopes do not feed properly into base printer.	Go to the "Envelope Feeder Option Service Check" on page 2-38.

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Symptom Table - Output Expander

Symptom	Action
Printer does not display Output Bin Full	Go to the "Output Bin Sensor Standard Tray Service Check" on page 2-74.
Paper does not feed all the way into the output tray.	Go to the "Output Expander Service Check" on page 2-75

Service Checks

Note: Anytime the engine board is replaced, the Configuration ID must be reset in NVRAM on the new engine board. Go to ["Setting Configuration ID"](#) on page 3-21.

Review the following information before performing any service checks.

- Paperfeed Problems (especially paper jams): Go to ["Viewing the Error Log"](#) on page 3-8 and check the printer error log for indications of repetitive entries that help to isolate a problem to a particular area of the printer or option.
- Paperfeed Problems with error message: Use the ["Sub Error Codes For 9XX and 2XX Error Codes"](#) on page 2-7 to help diagnose the problem.
- Print Quality Problems: Go to ["Print Quality Test Pages"](#) on page 3-24 and print a test page to help diagnose problems before changing any settings or working on the printer.
- Use the resident diagnostics test provided to help isolate a problem before taking the machine apart or removing any options.

Charge Roll Service Check

Service Tip: Close and evenly spaced repetitive marks 47.19 mm (1.86 inch) apart or spots on the page can be caused by a damaged or contaminated charge roll.

Service Tip: Check to make sure the right charge roll arm bushing is correctly installed and operates correctly.

To remove the charge roll:

1. Wrap a piece of plain white paper around the charge roll to prevent contamination or damage.
2. Carefully remove the roll by pressing outward and to the right on the charge roll link arm and remove the charge roll from the right side charge roll bearing.
3. Remove the charge roll from the left side charge roll bearing and remove the roll from the printer. Leave the paper wrapped around the charge roll until it is reinstalled.

	FRU	Action
1	Charge Roll Assembly	Check the charge roll for correct installation, toner buildup, marks, cuts or other signs of contamination or damage. Replace as necessary.
2	Left Side Charge Roll Link	Check the left side charge roll link assembly for correct assembly operation. Check for damage to the arm or bearing assembly.

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	FRU	Action
3	Right Side Charge Roll Link Right Charge Roll Bushing	<p>Check the right side charge roll link assembly for correct assembly operation. If incorrect, replace the charge roll link assembly with the charge roll link assembly kit. If correct, check the right charge roll link assembly bearing for signs of wear or contamination. Excessive contamination could cause intermittent charging of the charge roll. If incorrect, replace the link assembly. Check for continuity of the right link assembly from the bearing to the charge roll high voltage contact on the right side frame. If incorrect, replace the link assembly.</p> <p>Make sure the charge roll bushing is installed and operating correctly.</p> <p>Note: The screw that attaches the charge roll lead to the contact must be secure.</p>

Cover Open Switch/Cable Service Check

	FRU	Action
1	Toner Cartridge	Check the toner cartridge to make sure it is correctly installed and that the right and left cartridge tracks are not loose or broken. Check to make sure the cover open switch activation tab on the toner cartridge is not broken and that the tab correctly activates the cover open switch spring.
2	Cover Open Switch/Cable Assembly	<p>Check the cover open switch for proper mechanical operation. If incorrect, repair as necessary. Disconnect the cover open switch cable from J4 at the engine board and measure the voltage at J4-3. It measures approximately +5 V dc. If the voltage is incorrect, replace the engine board. If the voltage is correct, check the voltage at J4-1. If the voltage measures greater than +1.0 V dc, replace the engine board. If the voltage is correct, check the continuity between J4-1 and J4-3 on the cable. If no change in continuity occurs as the switch is activated, replace the cover open switch/cable assembly. If the continuity changes as the switch is activated, replace the engine board.</p> <p>Note: It is easier to check the voltages on J4 with the controller board removed.</p>

Dead Machine Service Check

Note: If a high capacity input tray is installed, remove the option and check the base printer for correct operation. If the base printer operates correctly, go to [“High Capacity Feeder Input Tray Service Check” on page 2-56](#). If the base printer continues to not operate correctly, remove any other attached paper handling options. Observe all necessary ESD precautions when removing and handling the controller board, engine board or any of the installed option cards or assemblies.

Service Tip: When removing the LVPS from the printer observe the following:

1. The LVPS uses a self docking connector that mates with another connector mounted on the left side frame assembly. Some force may be required to pull the LVPS loose from the connector.
2. Gently remove the LVPS supply using caution not to damage the printed circuit board. Pull the LVPS out far enough to reach the fuser lamp cable.
3. The fuser lamp cable uses a locking type of connector system. Unlock the fuser lamp cable connector, disconnect the cable and remove the LVPS from the printer.

Note: If the LVPS is blowing fuses, remove the LVPS from the printer. Check the metal LVPS shield for signs of damage that causes the shield to touch components on the LVPS board assembly.

	FRU	Action
1	Line Voltage	Check the AC line voltage. If the line voltage is incorrect, inform the customer.
2	AC Line Cord	Check the line cord for any signs of damage. If correct, check the continuity of the line cord and replace if necessary.

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	FRU	Action
3	+5 V dc at any Option Connector	Check for +5 V dc on any of the option connectors. The easiest to access is the envelope feeder connector located behind the lower front door. If +5 V dc is present at any of the connectors, go to step 9. If +5 V dc is not present, go to step 4.
4	+5 V dc at the controller board test point	Check for +5 V dc at the +5 V dc test pad located on the controller board. If correct, go to step 9.
5	+5 V dc at the engine board Test Point	Check for +5 V dc at the +5 V dc test point on the engine board. If correct, replace the engine board. If incorrect, go to step 6.
6	LVPS Fuse F1	Remove the LVPS from the printer and check fuse F1. Replace the fuse if the fuse is blown.
7	LVPS Fuse F1 - Continues to blow after LVPS installed in the printer.	<p>Replace fuse F1 if necessary. Turn the LVPS on/off switch Off and connect the AC line cord and turn the LVPS On.</p> <p>CAUTION: Before checking fuse F1 turn the LVPS Off and disconnect the AC line cord. Check fuse F1. If the fuse is blown, replace the LVPS.</p>
8	LVPS	<p>Remove the LVPS from the machine.</p> <p>CAUTION: Before making any measurements on the LVPS output connector, observe all necessary safety precautions before applying AC power. Measure the voltage on LVPS output connector CN3. The voltage measures +5 V dc. If incorrect, replace the LVPS.</p>

	FRU	Action
9	Engine Board	<p>Turn the printer off and disconnect all the cables from the engine board. Check for +5 V dc at the engine board test point. If incorrect, replace the FRUs in the following order:</p> <p>engine board</p> <p>interconnect board</p> <p>If correct, turn the printer off and reconnect one cable at a time until you find the defective assembly.</p> <p>Service Tip: A short or low resistance load that is attached to the engine board can cause the LVPS to overcurrent and shut the +5 V dc supply down to 0 V dc.</p> <p>Service Tip: Check the engine board for burn marks or other damage, especially R20,R21, R22 and R23 located next to the upper left engine board mounting screw. If this screw is overtightened it might deform the engine board shield and cause it to short out these resistors.</p>

Duplex Option Service Check

The printer does not recognize the Duplex Option is attached. The printer does not recognize tray options below the duplex option are installed.

	FRU	Action
1	Fuse F1 on Duplex Option System Board	If fuse F1 is blown, replace the fuse. If fuse F1 continues to blow, check the stepper motor for a short between the motor case and pins J3-1 through J3-4. If no problem is found, check the D.C. servo motor pins J1-1 and J1-2 to the motor housing for a short. If a short is found, replace the motor assembly. If no short is found, replace the system board.
2	Autoconnect Cables/ Connectors	Check the autoconnect cables for damage to the cables or the pins in the connectors. If damaged, replace the cable(s). If no damage is found, check to make sure the cables are connected to J9, J10, J11 and J12 on the duplex system board. If no problem is found, replace the duplex system board.

4069-XXX**POST fails, 230 Paper Jam, Check Duplex message displays.**

	FRU	Action
1	Duplex D.C. Servo Drive Motor	<p>Check the D.C. servo motor cables for signs of cuts or other damage. Check the D.C. servo motor sensor cable connector for pin damage. If no problem is found, replace the FRUs in the following order:</p> <p>D.C. motor assembly</p> <p>duplex option system board</p>
2	Input Sensor, Input Sensor Flag	<p>Run the Duplex Sensor Test from the diagnostics menu. If the test fails, check the input sensor cable at J5 on the system board for correct installation. If no problem is found, replace the FRUs in the following order:</p> <p>input sensor assembly</p> <p>duplex option system board</p>
3	Paper Exit Sensor and Flag	<p>Check the duplex exit sensor for correct installation and free movement of the sensor flag. Check to make sure the sensor cable is connected to J8 on the system board. If no problem is found, replace the FRUs in the following order:</p> <p>exit sensor assembly</p> <p>duplex option system board</p>

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230 Paper Jam - Check Duplex message displays. The page is not duplexed and only exits half way out of the redrive.

	FRU	Action
1	Duplex Stepper Motor	Check the stepper motor cable for cuts or pinched wiring. Check the routing of the motor leads along the left side of the bottom tray. Check for correct installation of the motor cable connector at J3 on the system board. Check for any shorts between each pin of the motor cable and the motor housing. If shorts are found, replace the motor. Check the resistance of the stepper motor between J3-1 (Stpmtr A-) to J3-2 (Stpmtr A+). The resistance measures approximately 10 ohms. The resistance between J3-3 (Stpmtr B-) to J3-4 (Stpmtr B+) measures approximately 10 ohms. If the resistance is incorrect, replace the stepper motor. Check for shorts between windings on pins J3-1 to J3-2 and pins J3-3 to J3-4. If a short is found, replace the stepper motor assembly. If no short is found, replace the duplex system board.

Envelope Feeder Option Service Check

Service Tip: Check the envelope feeder paper path for any debris, pieces of envelope and so on. If any other options are installed make sure they are operating normally. If only the envelope feeder is failing to operate correctly, continue with this service check, otherwise go to the Interconnect Card Service Check.

Service Tip: The envelope feeder option receives its +5 V dc operating voltage from the +24 V dc bulk at J1-7. If +24 V dc is not present at J1-7, tray 1 is the only tray option that is recognized.

Note: If a 260 Paper Jam Check Envelope message displays, check the [“Sub Error Codes For 9XX and 2XX Error Codes”](#) on page 2-7.

Printer does not recognize the envelope feeder as an attached input option.

	FRU	Action
1	Envelope Feeder	Check to make sure the envelope feeder is correctly installed and mated to the autoconnect at the front of the printer.
2	Front Autoconnect on Printer	Check the connector for signs of damage to the connector or contacts. If you find damage, replace the damaged cable/connector assembly. Remove the envelope feeder option and check the voltages at the autoconnect on the front of the printer. If incorrect, check the interconnect board. If correct, reinstall the envelope option and continue with step 3.

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	FRU	Action
3	Autoconnect on the Envelope Option	<p>Check the connector for any signs of damage to the connector or contacts. If you find damage, replace the damaged cable/connector assembly. Disconnect the autoconnect cable at J1 on the envelope system board and measure the following voltages:</p> <p>J1-3 measures +5 V dc J1-5 measures +5 V dc J1-7 measures +24 V dc</p> <p>If any of the voltages are incorrect, replace the autoconnect cable/connector. If the voltages are correct, replace the envelope system board.</p>

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Operator panel displays 260 Paper Jam immediately when envelope feed is requested - POST incomplete.

	FRU	Action
1	Pass through Sensor	<p>Check for any debris, pieces of envelope and so on over the pass thru sensor. Check for correct installation of the pass thru sensor flag. Make sure the sensor cable is attached to the envelope system board. Perform an envelope feeder sensor test to check both the sensor and sensor flag.</p> <p>Note: It may be necessary to use a small tool to actuate the sensor flag because it is located under the front cover. Be careful not to damage the flag.</p> <p>If the test fails, check the flag for any signs of damage or binds. If incorrect, replace the flag. If the flag is operating correctly, check the voltage at J3-3. The voltage measures approximately +5 V dc. If incorrect, replace the envelope system board. If correct, check the voltage at J3-2. The voltage changes from 0 to +5 V dc when the flag is moved in and out of the sensor. If incorrect, replace the sensor assembly. If this does not fix the problem, replace the envelope system board.</p>

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Operator panel displays 260 Paper Jam after attempted feed but before envelopes are put in the hopper OR the operator panel continues to display "Load Envelopes" after envelopes are placed in the hopper.

Service Tip: The kick rolls rotate during the attempted feed cycles.

	FRU	Action
1	Envelope Out Hopper Sensor Flag	Check the envelope out sensor flag for damage, correct installation and operation. If incorrect, repair or replace the flag.
2	Envelope Out Hopper Input Sensor	Check the sensor to make sure it is installed correctly and the sensor cable is properly connected to the envelope system board. If correct, perform the Envelope Feed Sensor Test to check both the sensor and flag. If the test fails, remove any envelopes in the hopper, turn the printer off and disconnect J3 from the system board. Turn the printer on and check the voltage at J3-3 on the system board. The voltage measures approximately +5 V dc. If incorrect, replace the envelope system board. If correct, replace the input sensor assembly.

4069-XXX**990 Service Error, Envelopes fail to feed from the hopper.**

	FRU	Action
1	D.C. Feed Motor Assembly	Check the motor and motor cable for any signs of loose wires or poor connections. Check to make sure the motor cable is connected to the envelope system board.
2	Envelope Feeder System Board	Check the voltage on J4-1. The voltage measures approximately +24 V dc. If incorrect, replace the envelope system board, if correct, measure the voltage at J4-6. The voltage measures approximately +5 V dc. If incorrect, disconnect J4 and measure the voltage again. If incorrect, replace the envelope feeder system board. If correct, replace the D.C. motor assembly.

260 Paper Jam displays, unable to clear and envelopes fail to feed from the hopper. Kick rolls ARE NOT rotating.

	FRU	Action
1	Main Drive Belt	Check the belt for correct installation and for signs of damage. Replace as necessary.
2	Gears	Check all the gears for correct installation and for signs of damage. Repair or replace parts as necessary.
3	Clutch Latch Assembly	Check the clutch latch assembly to make sure it moves freely.
4	Master Cam Gear Master/ Kick Gear	Check the master cam gear and master/kick gear to make sure they rotate together. If not, then the tenons on the master kick gear may be sheared off. If incorrect, replace the master kick gear.

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260 Paper Jam displays, unable to clear and envelopes fail to feed from the hopper. Kick rolls ARE rotating.

Check the deflector gap adjustment before continuing this service check.

	FRU	Action
1	Deflector Gap Adjustment	Check the deflector gap adjustment. The adjustment may be too narrow.
2	Weight Assembly	Check the weight assembly to make sure it moves up and down freely without any binds. Also check to make sure the weight assembly rests on all the rear kick rollers when the hopper is empty. Replace the weight assembly if it is damaged or does not operate properly.
3	Envelope Edge Guide	Check the envelope edge guide to make sure it is not warped or set too close to the envelopes in the hopper. Replace the edge guide if it is damaged or does not operate properly.

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260 Paper Jam displays, envelope stops in feeder paper path.

	FRU	Action
1	Kick Rolls/Feed Rolls/Drive Rolls	Check all the rolls for any signs of oil, grease or other contamination. If you find a problem, clean the rolls. If this does not correct the problem, replace the envelope feeder option.
2	Deflector Gap Adjustment	Check the deflector gap adjustment. The adjustment may be too narrow.

Envelope Feeder multifeeds or may not display a 260 Paper Jam message.

	FRU	Action
1	Envelopes	Check the envelopes being used in the feeder. Check for signs of the envelopes being stuck together or signs of glue. Check to make sure the flaps are not interleaved.
2	Deflector	Check the deflector gap adjustment. The adjustment may be too wide.
3	Restraint Roll Bias Spring	Check for a missing, broken or incorrectly installed restraint roll bias spring. If incorrect, reinstall or replace the spring.

260 Paper Jam displays. An envelope stopped in the paper path of the feeder and an envelope also stopped in the base printer paper path.

	FRU	Action
1	Latch Lever	Check to make sure the tip of the latch lever is centered in the opening in the floor of the paper path. The latch lever may not be detented on the latch.

Erase Lamp Service Check (010/212/414/616/31v/01n/21n/31e/41n/61n)

Error code 928 may be displayed when the printer detects that the erase lamp assembly, cable or engine board is defective.

Note: If the erase lamp assembly is defective, both the erase lamp and lens are replaced as a kit. Models 41b/41e/41l and any model at service level B do not have erase lamps installed. Go to **“Printer Serial Label”** on page 7-2 to identify the printer service level.

Make the following checks when a 928 service error displays.

	FRU	Action
1	Cable, Front Harness	Check the connection of the front harness to connector J10 on the engine board for correct installation. If incorrect, repair as necessary. Check the front harness to erase lamp assembly for correct installation. If incorrect, repair as necessary.
2	Engine Board	Remove the controller board and toner cartridge from the machine. Ground pin J10-15. The erase lamps turn on. The lamps can be observed through the front of the machine with the cover open and print cartridge removed. If the lamps do not turn on, measure the voltage on J10-14. The voltage reads approximately +24 V dc. If incorrect, replace the engine board. If correct, check the voltage at J10-15. The voltage reads between +15 V dc to +20 V dc. If incorrect, check the continuity of the erase lamp lines in the main harness. If incorrect, replace the cable harness. If correct, replace the erase lamp assembly.

Fan Service Check

Auxiliary Fan Service Check

The auxiliary fan is in models 414/616/411/61n.

Fan does not run or is noisy.

	FRU	Action
1	Fan Assembly	Check the fan for proper installation and for excessive noise. If incorrect, replace the fan and cable assembly.
2	Engine Board	<p>Check to make sure the auxiliary fan cable is seated on connector J7 on the engine board. If correct, check for +24 V dc on J7-1 on the engine board. If incorrect, replace the engine board. If correct, replace the fan assembly.</p> <p>Note: When the printer is in warm-up the voltage at J7-1 measures approximately +12 V dc. When the printer is running, the voltage measures approximately +24 V dc.</p>

Main Fan Service Check

Check the cable connections at J1 on the engine board and at the main fan assembly. The main fan runs continuously when the printer is powered on unless the printer is in the Power Saver mode.

	FRU	Action
1	Main Fan	Manually spin the fan and check that it rotates freely. Check the cable connection to the engine board, J1 for correct installation.
2	Main Fan to Engine Board Cable	Check the continuity of the cable. If incorrect, replace the cable.

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	FRU	Action
3	Error Code 927 (Fan runs)	Check the voltage at J1-1 on the engine board. The voltage measures +5 V dc (static) 0 V dc (fan running). If incorrect, replace the main fan. If this does not fix the problem, replace the engine board.
4	Error Code 927 (Fan not running)	Check the voltage at J1-3 on the engine board. The voltages are as follows: +22 V dc to +24 V dc (printer and fan running) +12 V dc to +15 V dc (printer not running - fan running about half speed). If incorrect, replace the engine board. If this does not fix the problem, replace the main fan.

Fuser Service Check

Hot Roll Fuser

Cold Fuser Service Check

Error codes 920, 921, and 922 may display for a cold fuser failure. A 920 error caused by low line voltage can sometimes be cleared by turning the machine off and then on again. A 925 service error indicates the wrong fuser lamp is installed in the printer and does not match the one stored in the printer code.

Note: Make sure the fuser is correctly installed before proceeding with this service check. The fuser must be firmly seated in the two rear connectors. Both the right and left lock down screws must be tight.

Service Tip: Set the Fuser Temperature to NORMAL before starting this service check.

	FRU	Action
1	Fuser Lamp (Incorrect Lamp/925 Service Error)	Install the correct voltage and wattage lamp or fuser assembly.
2	Fuser Lamp	Remove the controller board. Run the Diagnostic Print Test and observe the lamp through the left side frame. If the lamp doesn't come on, unplug the printer and check the continuity between the two pins on the fuser lamp cable going to the fuser assembly. If you do not measure continuity, remove the fuser assembly and check the continuity of the lamp. If incorrect, replace the lamp. If correct, replace the fuser cover assembly.
3	LVPS LVPS to Fuser Auto Docking Connector Fuser AC Cable	Turn the printer off. Remove the fuser assembly. Turn the printer power on. Measure across the AC fuser cable pins for line voltage with the cable connected. If incorrect, turn the printer off and disconnect the power cord. Check the continuity of the LVPS to fuser AC cable. If incorrect, replace the cable. If correct, replace the LVPS.
4	Fuser Top Cover Assembly (Thermal Fuse/Thermistor Assembly)	Disconnect the thermistor cable from the fuser board at J2. The resistance is as follows: HOT - J2-1 - J2-2 = 2.5K ohms COLD = 150K ohms to 260K ohms

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Hot Fuser Service Check

Error codes 923 and 924 may display for a hot fuser failure.

CAUTION: The fuser may be hot, use caution before removing or servicing.

	FRU	Action
1	Fuser Cover Assembly (Assembly includes Thermistor and Thermal Fuses.)	Check for damage to the thermistor assembly. Check the resistance of the thermistor: HOT - J2-1 to J2-2 = 2.5K ohms COLD =150K ohms to 260K ohms Check the continuity from each pin of J2 to ground. If there is continuity, replace the fuser cover assembly
2	Engine Board	Error code 924 indicates the engine board detects an open circuit in the thermistor circuit for the fuser assembly. The voltage on J2-6 on the engine board measures approximately +5 V dc. If incorrect, replace the engine board. If correct, check the continuity of the DC fuser cable (fuser board to auto docking connector) in the fuser assembly and the DC fuser cable (engine board to auto docking connector) in the printer. If there is no continuity, replace the cable. If there is continuity, check the voltage on J2-2 on the fuser control board. It measures approximately +5 V dc. If incorrect, replace the fuser control board.
3	Fuser Hot Roll Backup Roll Bearings	Examine the fuser assembly for signs of overheating or damage. Check the hot roll and backup roll for signs of excessive toner, label glue, labels or other contaminants. If any are found, repair as necessary or replace the fuser assembly.

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Belt Fuser

Hot Fuser Service Check

Error codes 923 and 924 may display for a hot fuser failure.

Note: The belt fuser assembly is a FRU. Do not attempt to disassemble and repair the belt fuser.

CAUTION: The fuser may be hot, use caution before removing or servicing.

	FRU	Action
1	Engine Board EP Autoconnect Cable (Engine Board to Fuser)	Error code 924 indicates the engine board detects an open circuit in the thermistor circuit for the fuser assembly. The voltage on J2-6 on the engine board measures approximately +5 V dc. If incorrect, replace the engine board. If correct, check the continuity of the DC fuser cable (engine board to auto docking connector) in the printer. If there is no continuity, replace the cable. If there is continuity, replace the belt fuser assembly.

Fuser Solenoid Service Check

The fuser solenoid is in all models except the 31v and 31e.

Service Tip: Try changing the envelope enhance level setting. A different setting may correct the problem.

Note: Check the fuser envelope conditioner solenoid adjustment as described in the adjustment section **“Fuser Solenoid Adjustment”** on page 4-3.

	FRU	Action
1	Fuser Envelope Conditioner Solenoid	The operation of the fuser solenoid can be observed by removing the redrive assembly. Check for proper mechanical operation of the solenoid and associated hardware, link and so on. If correct, check the resistance of the solenoid between J4-1 and J4-2. The resistance measures between 5 ohms and 10 ohms. If incorrect, replace the solenoid assembly.
2	Fuser Control Board	The solenoid receives power from the engine board. The fuser control board receives +42Vdc from the LVPS via the interconnect board. Check for approximately +42 V dc at the +42 V dc test point on the fuser control board. If the voltage is correct, replace the fuser control board.

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	FRU	Action
3	LVPS Interconnect Board	If the +42 V dc test point does not measure approximately +42 V dc, check the voltage at CN3-18 on the LVPS. The voltage measures approximately +42 V dc. If the voltage is correct, replace the interconnect board assembly. If the voltage is incorrect, replace the LVPS.
4	Fuser DC Cable (Engine Board to Fuser Board Cable) Engine Board	Check for continuity of the DC fuser cable that is attached between J2 on the engine board and J1 on the fuser control board. If the cable does not measure continuity, replace the cable. If the cable measures continuity, replace the engine board.

Input Sensor Service Check

Service Tip: Run the Base Sensor Test. Check the input sensor for proper operation. The display changes from open to closed as the sensor flag is manually moved in and out of the sensor.

Service Tip: Run a Diagnostic Print Test in the continuous mode with the controller board removed. A defective input sensor or circuit causes the first copy to exit only partially through the fuser assembly.

	FRU	Action
1	Input Sensor Flag	Check the input sensor flag for damage and proper operation. If a problem is found, repair as necessary.
2	Engine Board	Check for approximately +5 V dc at J10-10 on the engine board. If incorrect, replace the engine board.

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	FRU	Action
3	Input Sensor Cable	Check the continuity of the input sensor cable section of the front wiring harness. If incorrect, replace the harness. If correct, replace the input sensor assembly.

Input Tray(s) Option Service Check

250 Sheet and 500 Sheet Trays

Service Tip: Try all the other input paper sources to make sure they are properly feeding paper.

For 990 Error Code- Service Tray X, X= displays the number of the tray that has a problem or needs service.

	FRU	Action
1	Tray X option System Board or Compensator Assembly or Autoconnect Cable	Check the autoconnect cables and connectors for any signs of damage. Replace if necessary. Check the cables for continuity. If incorrect, replace the compensator assembly cable. If the cables, connectors and connections are good, replace the FRUs in the following order: autocompensator assembly option system board

4069-XXX

24X Paper Jam message displays, Paper jammed over the Pass Thru Sensor. (The printer displays the value of X for the paper tray where the error occurs. Example: 241 is a Paper Jam Tray 1)

	FRU	Action
1	Pass Thru Sensor and Flag Assembly	The tray x option system board did not detect a piece of paper actuating the pass thru sensor. Remove any jammed sheets of paper from the printer and check the pass thru sensor and flag for proper operation by running the appropriate Tray Sensor Test from the diagnostics menu. If the test fails, check the sensor for correct installation and the flag for proper operation. Also check the sensor cable to make sure it is correctly connected to the option system board. If incorrect, replace the tray x option pass thru sensor assembly.
2	Power Takeoff Shaft and Spring, Bevel Gear, Feedroll Gear, Drive Roll Assembly, Wear Plate, Drive Shaft Bearings and Skewed Backup Roller	Check these parts for signs of broken or damaged parts, contamination on the drive rollers or wear plate and wear or damage to the drive shaft bearings. Check the drive roll assembly and skewed backup roller for signs of wear, slick spots, material buildup, and oil or grease on the rollers. Also check for proper operation of the paper aligning assembly. Repair or replace parts as necessary.

4069-XXX

Tray X Low message displays when Tray X is full or has adequate paper in the tray.

	FRU	Action
1	Paper Low Sensor Assembly Paper Low Sensor Flag Tray X Option System Board	Run the Tray X Sensor Test and check the sensor for proper operation. If incorrect, check the following: Paper low sensor flag for smooth and correct operation. Paper low sensor for correct installation on the autocompensator housing. Paper low sensor cable for signs of cuts, pinched wiring or other damage especially at connector J5 on the system board. If no problem is found, replace the paper low sensor assembly. If this does not correct the problem, replace the option system board.

Tray X Empty message displays when Tray X has paper in the tray.

	FRU	Action
1	Paper Out Sensor Flag	Check the paper out sensor flag for correct operation and installation. If correct, replace the option system board. (The paper out sensor is mounted on the system board).
2	Paper Out Sensor (On Option System Board)	

4069-XXX

Printer does not recognize Tray X is installed.

	FRU	Action
1	Autoconnect Cables Tray X System Board	Check the autoconnect from the printer or option above tray x. Check for signs of cuts, pinched wiring or damage to the contacts in the connector. Check the autoconnect cable(s) for correct installation at the tray x system board. If correct, check the continuity of the autoconnect cable(s). If correct, replace the tray x system board. If incorrect, replace the cable.

Paper from Tray X does not reach the Pass Thru Sensor.

Service Tip: Check the media in tray x to make sure it is within specifications. Some types of labels, foil material and slick papers can cause misfeeds and slippage of the rollers.

	FRU	Action
1	Autocompensator Assembly	Check the autocompensator pick arm rollers for any sign of glazing, toner or other buildup. Clean or replace as necessary.

High Capacity Feeder Input Tray Service Check

Note: Voltage measurements in the high capacity feeder input tray service checks must be made with the high capacity feeder attached to the base printer to obtain accurate results.

Service Tip: Be sure the paper size switch is set to the correct paper size setting and the rear paper guides are in the correct locations for the size of paper installed in the high capacity feeder tray.

Service Tip: Check the other paper sources to be sure they are operating correctly.

4069-XXX

The base printer indicates a dead machine condition when the high capacity input tray is installed.

	FRU	Action
1	AC Line Cord AC Jumper (HCIT to Printer) AC input and Output Receptacles AC Wiring Harness	<p>If the base printer works normally using the AC line cord from the AC wall outlet and does not work when using the AC jumper from the HCIT, check the AC jumper cord. If defective, replace the cord. If not defective, check the AC input and output receptacles and wiring harness in the HCIT. Repair or replace the receptacles or AC wiring harness as required.</p> <p>NOTE: Make sure the ground wire is installed correctly from the AC wiring harness to the frame of the HCIT and the nut and lockwasher are tightened down.</p>

4069-XXX

The base printer does not recognize that the high capacity input tray is installed.

	FRU	Action
1	High Capacity Feeder Autoconnect Mechanical Check	Check the high capacity feeder input tray to make sure it is mounted correctly and is not pushed down into the frame assembly or damaged. Be sure the high capacity feeder input tray autoconnect is properly connected to the high capacity feeder tray option board assembly.
2	Base Printer or option mounted above	Check the option or base printer autoconnect for signs of damage. Repair the high capacity option autoconnect as necessary.
3	LVPS (2000 Sheet Option) Option System Board	Check the voltages at J11-2 and J11-4. The voltage measures +24 V dc. If the voltage is correct, replace the high capacity system board assembly. If the voltage is incorrect, check the continuity of the AC input cable to the LVPS. If correct, replace the LVPS assembly. If incorrect, replace the AC cable to the input of the LVPS.

	FRU	Action
4	High Capacity Feeder Option Control Board	<p>Check the voltage on J8-1 (green). The voltage measures +24 V dc. If incorrect, check the autoconnect system for any problems. +24 V dc must come from the base printer through the autoconnect system to the high capacity input for the high capacity feeder to be recognized. If the voltage is correct, check the voltages at J11-3(red) and J11-4(red). The voltages measure +24 V dc. If correct, replace the high capacity feeder option system board. If incorrect, disconnect J8 from the system board and measure the voltages again. If incorrect, check the LVPS cable and the A.C. internal wiring from the input appliance receptacle. If incorrect, replace as necessary. If correct, replace the LVPS. If the voltages are correct, check the stepper motor for shorts from the motor housing to each pin on the motor connector. If you find a short between any pin and the motor housing, replace the motor assembly. If no shorts are found, replace the high capacity feeder option control board.</p> <p>Check the voltage at J9-1 (light blue). The voltage measures approximately +24 V dc. If incorrect, disconnect the cable at J9 and check the voltage again. If the voltage continues to be incorrect, replace the high capacity feeder option system board. If the voltage measures correctly, check the cable. If the cable is damaged, replace as necessary. If no problem is found with the cable, replace the high capacity feeder option control board.</p>

4069-XXX

24X Paper Jam message displays, Paper jammed over the Pass Thru Sensor. (X=The printer displays the value of X for the paper tray where the error occurs. Example: 242 is a Paper Jam Tray 2)

	FRU	Action
1	Pass Thru Sensor and Flag Assembly	The tray x option system board did not detect a piece of paper actuating the pass thru sensor. Remove any jammed sheets of paper from the printer and check the pass thru sensor and flag for proper operation by running the appropriate Tray Sensor Test from the diagnostics menu. If the test fails, check the sensor for correct installation and the flag for proper operation. Also check the sensor cable to make sure it is correctly connected to the option system board. If incorrect, replace the tray x option pass thru sensor assembly.
2	Power Takeoff Shaft and Spring, Bevel Gear, Feedroll Gear, Drive Roll Assembly, Wear Plate, Drive Shaft Bearings and Skewed Backup Roller	Check these parts for signs of broken or damaged parts, contamination on the drive rollers or wear plate and wear or damage to the drive shaft bearings. Check the drive roll assembly and skewed backup roller for signs of wear, slick spots, material buildup, and oil or grease on the rollers. Also check for proper operation of the paper aligning assembly. Repair or replace parts as necessary.

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Tray X Paper Low Message displays when Tray X is full or has adequate Paper in the tray.

	FRU	Action
1	Paper Low Switch Paper Low Switch Cable High Capacity Feeder Input System Board	Run the sensor diagnostics for tray X (X=the number that represents the high capacity input tray). If the test fails, disconnect the paper low switch cable from J3 on the high capacity system board. Short pins 1 and 2 together while observing the sensor test on the display. If the display does not change, replace the high capacity feeder system board. If the display changes check the continuity of the switch. If incorrect, replace the switch. If correct, replace the switch cable.

Tray X empty message displays when there is paper in the high capacity feeder input tray.

	FRU	Action
1	Paper Out Sensor Flag	Check the paper out sensor flag for correct operation and installation. If correct, replace the high capacity feeder system board. (The paper out sensor is mounted on the high capacity feeder system board).
2	Paper Out Sensor (On Option System Board)	

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The elevator tray fails to stop at the correct position and continues to drive into the bottom frame.

	FRU	Action
1	Lower Limit Switch Lower Limit Switch Cable	Check continuity of the lower limit switch. If incorrect, replace the switch. If correct, check the switch cable. If incorrect, replace the cable. If correct, replace the high capacity feeder option control board.
2	High Capacity Feeder Control Board	Disconnect the lower limit switch cable and check the voltage at J2-1 (orange). The voltage measures approximately +5 V dc. If incorrect, replace the high capacity feeder option control board.

The elevator tray down button does not operate. The tray moves to the upper position.

Service Tip: Open the high capacity feeder option front door and check the black rubber bumper attached to the door switch spring. Be sure the rubber button is centered and not touching the sides of the hole or the switch will not function properly.

	FRU	Action
1	Lower Limit Switch Lower Limit Switch Cable High Capacity Feeder Control Board	Check the lower limit switch to make sure it is not closed (normally open). If incorrect, replace the switch. Check the lower limit switch cable for a short between pins 1 and 2. If incorrect, replace the cable. If correct, replace the high capacity feeder option control board.

4069-XXX

Paper from the high capacity feeder input tray does not reach the pass thru sensor.

Service Tip: Check to be sure the paper in tray is within specifications.

	FRU	Action
1	Autocompensator Assembly	Check the autocompensator pick arm rollers for sign of glazing, toner or other buildup. Replace as necessary.
2	Wear Strips	Check the wear strips for glazing or contamination. Replace as required. It is advisable to replace all four wear strips at the same time.

4069-XXX

The elevator tray does not move up or down. The printer recognizes that the option is installed.

	FRU	Action
1	DC Drive Motor High Capacity Feeder Option System Board	<p>Be sure the motor cable is correctly installed at J1 on the board. Check the cables, damaged or loose wires. Disconnect the motor. Check for a short between each pin and the motor housing. If a problem is found, replace the motor assembly. If no problem is found, measure the resistance between the following pins on the motor cable connector:</p> <p>Pins 1 (brown) and pin 2 (Yellow)</p> <p>The resistance measures between approximately 7.5 and 10.5 ohms. If incorrect, replace the motor assembly. If correct, replace the high capacity feeder option system board.</p>

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The elevator moves in one direction only.

	FRU	Action
1	DC Drive Motor Assembly High Capacity Feeder System Board	<p>Check the voltages at J1 on the high capacity system board. The voltages measure as follows:</p> <p>Static (Motor Not Running) J1-1 (Brown): approximately 0 V dc J1-2 (yellow): approximately 0V dc</p> <p>Motor Running Forward J1-1 (Brown): Approximately 0 V dc J1-2 (Yellow): Approximately +24V dc</p> <p>Motor Running Reverse J1-1 (Brown): Approximately +24 V dc J1-2 (Yellow): Approximately 0 V dc</p> <p>If any of the voltages are incorrect, disconnect the motor and measure the resistance between J-1 and J-2. The resistance measures between 7.5 and 10.5 ohms. If incorrect replace the motor. If correct, replace the system board.</p>

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Paper size switch not selecting paper size that is selected.

	FRU	Action
1	Paper Size Switch High Capacity Feeder Option Control Board	<p>Check for continuity between the common pin (J5-1) and the pin of the paper size selected.</p> <p>J5-1 (Black): Common Lead J5-2 (Blue) B5 J5-3 (Green) Executive J5-4 (Yellow) A4 J5-5 (Orange) Letter J5-6 (Red) Legal J5-7 (Brown) A5</p> <p>If any position does not measure continuity when selected, replace the paper size switch assembly. If the switch assembly is operating correctly, replace the high capacity feeder option control board.</p>

24X Paper Jam Check Tray X Message displays when Tray X is empty. No Tray X Message displays.

	FRU	Action
1	High Capacity Feeder Option Control Board	<p>Check the voltages on the board at J4-1 (red) and J4-3 (blue). The voltages measure approximately +5 V dc. If incorrect, disconnect J4 from the board and measure the voltages again. If incorrect, replace the high capacity feeder option control board.</p>
2	Elevator Top Optical Sensor Cable Elevator Top Optical Sensor	<p>Check the continuity of the sensor cable. If incorrect, replace the cable. If correct, replace the top optical sensor assembly.</p>

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Tray X Empty message displays. Tray does not respond to loading paper. No response from the front door switch.

	FRU	Action
1	High Capacity Feeder Option Control Board	Check the voltage on the board at J4-2 (green). The voltage measures approximately +5 V dc. If incorrect, disconnect the cable at J4 and check the voltage again. If incorrect, replace the high capacity feeder option control board.
2	Elevator Top Optical Sensor Cable Elevator Top Optical Sensor	Check the continuity of the sensor cable. If incorrect, replace the cable. If correct, replace the top optical sensor assembly.

Tray X Paper Low Message displays when the high capacity feeder input tray is full or has adequate paper in the tray.

	FRU	Action
1	Paper Low Switch Paper Low Switch Cable High Capacity Feeder Option Control Board	Run the sensor diagnostics for tray X (X=the number that represents the high capacity input tray). If the test fails, check the voltage at J3-1 (grey). The voltage measures approximately +24 V dc. If incorrect, disconnect the paper low switch cable from J3 and measure the voltage again on J3-1. If incorrect, replace the high capacity feeder option control board. If correct, check the cable for a short between pins 1 and 2 on the cable. If incorrect, replace the cable. If correct, check the switch for a bent or deformed actuator lever or defective switch. If incorrect, replace the switch.

4069-XXX**Excessive Noise or Vibration**

	FRU	Action
1	DC Motor Assembly	Check to make sure all the motor plate mounting screws are tight.
2	Idler Pulley DC Motor Assembly	Check to make sure the idler pulley is not binding on the pulley shaft. Check the pulley for any signs of wear. Check the idler pulley shaft on the motor mounting plate for any signs of damage or contamination.
3	Drive Pulley	Check the drive pulley for any signs of wear, binds or damage to the pulley or pulley shaft. Make sure the pulley turns freely on the pulley shaft.
4	Motor Drive Belt Tray Drive Belt	Check the DC motor drive belt for any signs of damage. Check to make sure the belt is tracking correctly on the drive pulley, idler pulley and motor pulley. Check the tray drive belt for any signs of damage. Check to make sure the belt is tracking correctly on the lower section of the drive pulley and lead screw pulleys.

Main Drive Service Check

Service Tip: Excessive gear or main drive assembly noise is usually caused by a defective motor assembly or engine board.

Service Tip: If there are equally spaced horizontal lines across the page, go to **“Print Quality - Evenly spaced horizontal lines or marks” on page 2-97.**

WARNING: Whenever the gearbox assembly is removed from the machine it must be handled very carefully. Do not allow any of the gears to come in contact with any metal or other hard surface to avoid gear damage. It is also very important not to let any dirt, paper, staples or other material come intact with the grease in the gearbox assembly.

	FRU	Action
1	Main Drive Assembly (Excessive noise or vibration)	Remove the controller board and run a Diagnostic Print Test in the continuous mode. Check the main drive assembly for any excessive noise or vibration. Determine if the noise is in the main drive, toner cartridge, fuser or main drive gearbox. Look for any loose or worn parts in the developer drive assembly, main drive gearbox or fuser. Repair as necessary.
2	Main Drive Motor Assembly (Excessive noise, gears ratcheting and so on)	A service error code 936 - Transport Motor may be displayed. Check the voltage at J12-6 on the engine board. It measures approximately +5 V dc when the motor is not running and goes to 0 V dc when the motor is running. If incorrect, replace the engine board. If this does not fix the problem, replace the main drive motor.
3	Main Drive Motor Cable	Check the continuity of the main drive motor cable. If incorrect, replace the cable.

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	FRU	Action
4	Motor does not turn, no gear error code 936 or User message 201 Paper Jam displays.	<p>Check the voltages at J12 on the engine board.</p> <p>Pin number and voltage:</p> <p>J12-1 = +24 V dc</p> <p>J12-4 = +5 V dc (static) 0 V dc (when main drive motor running)</p> <p>J12-5 = + 5 V dc (static) 0 V dc (when main drive motor running)</p> <p>J12-6 = +5 V dc (static) +2.5 V dc (when main drive motor running)</p> <p>J12-7 = +5 V dc (static) 0 V dc (when main drive motor running)</p> <p>J12-8 = +5 V dc (static) +5 V dc (when main drive motor running)</p> <p>J12-11 = + 5 V dc (static) 0 V dc (when main drive motor running)</p> <p>If the voltage is incorrect, replace the FRUs in the following order:</p> <p>main drive motor assembly</p> <p>engine board</p>

Operator Panel Service Check

Operator Panel Buttons Service Check

Note: Before continuing with this service check do the “**Button Test**” on [page 3-9](#) in the diagnostic aids chapter.

	FRU	Action
1	Operator Panel Assembly	If any button fails the Button Test, replace the operator panel assembly.

	FRU	Action
2	Engine Board (No buttons work)	Check the voltage at J11-5. The voltage measures approximately +5 V dc with the controller board removed. If incorrect, replace the engine board. If correct, check the continuity of the operator panel cable. If incorrect, replace the cable. If correct, replace the operator panel assembly.

Operator Panel Display Service Check

SERVICE TIP: The printer has detected a problem with the engine board, operator panel cable or operator panel assembly if POST does not complete and the printer emits 5 beeps and stops in a continuous pattern until the printer is turned off. The operator panel cable is an individual cable on some printers and a combination cable assembly with the cover switch cable on later models.

Note: If the operator panel is operating properly except for a PEL or a few PELS missing or broken, run the **"LCD Test"** on page 3-9 from the hardware tests before continuing with this diagnostic service check.

	FRU	Action
1	Operator Panel Cable	Check for proper installation of the cable at the engine board (J11) and at the operator panel. Check the continuity of the operator panel cable. If incorrect, replace the cable.
2	Operator Panel Display blank, 5 beeps, LED Off	Check the voltage at J11-2 on the engine board. It measures approximately +5 V dc. If incorrect, replace the engine board. If correct, replace the operator panel assembly.
3	Operator Panel Display blank, 5 beeps, LED On	Check for ground between J13-4 and ground. If correct, replace the operator panel assembly. If incorrect, replace the engine board.

	FRU	Action
4	Operator Panel all diamonds, No Beeps	Check to make sure a SIMM is not plugged in backward. This condition causes the printer to fail POST displaying all diamonds on the operator panel with no beeps.
5	Operator Panel all diamonds, 5 Beeps	Check the voltage at Pin J11-1 and J11-3. The voltage measures approximately +5 V dc. If incorrect, replace the FRUs in the following order: operator panel assembly engine board

Options Service Check

Service Tip: When you have a problem with any of the options installed in the options slots on the interconnect board on a 212/414/616/01n/21n/41n/61n (the 010/31v/31e and 010 at service level B have only one slot), switch the non operating option to one of the other option slots to isolate the failure.

Flash Memory Option(s)

Run a copy of the test page and check to see if the option you are checking is listed. The printer does not recognize the option being installed if the option is not listed. Check to make sure that the Memory DIMM is installed correctly and is not broken or damaged. If the Memory DIMM is correctly installed not broken or damaged then run the **“Flash Test” on page 3-3**. If the test fails, replace the FLASH DIMM. If the problem continues, replace the controller board.

DRAM Memory Option(s)

This service check is the same as the flash memory option service check with the following exception:

Run the **“SDRAM Memory Test” on page 3-10** from the menu if the SDRAM Memory DIMM is correctly installed and not broken or damaged. If the test fails, replace the SDRAM DIMM. If the problem continues, replace the controller board.

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Hard Disk Option

Service Tip: The Optra T printers support one hard disk option. Check to make sure only one hard disk option is installed.

- 2.1 GB or larger

Check to make sure the fixed disk and the fixed disk board are correctly installed. Run the “Quick Disk Test” on page 3-2 from the Device Test on the Diagnostic Menu when a problem is suspected either with the hard disk system board or with the hard disk.

Note: The Quick Disk Test is a non-destructive test and indicates Pass or Fail. If the test fails, replace the hard disk. If a problem still exists, replace the hard disk board.

The “Disk Test/Clean” on page 3-2 is used to help restore the disk if the disk contains bad data and is unusable. This test is divided into a cleaning and a verifying or testing section.

WARNING: This can be a very lengthy test depending on the disk size. This test leaves the hard disk unformatted. The servicer or user must reformat the disk using the Format Disk Menu operation. This is a destructive type of test. All the data on the disk is destroyed and should not be performed on a known good disk.

Network Card Option

Note: The network is installed on the controller board on network model printers.

Error Code 976 - Network Card X (X=Network card 1, 2, or 3)

A 976 error code indicates an unrecoverable software error in network card x. Verify that network card x is correctly installed in the socket on the interconnect board and is properly grounded. If you find no problem, contact your next level of support before replacing the network card.

Error Code 977 - Network Card X

A 977 error displays when the RIP software detects that a network card is installed in slot x on the interconnect board but cannot establish communications with the network card.

Output Bin Sensor Standard Tray Service Check

Service Tip: If the output bin standard tray fills up and the bin full sensor fails to post the message "Remove Paper Standard Bin", enter the Diagnostic Mode, select Output Bin Tests, select Sensor Tests and select Standard Bin. Check the sensor and flag for proper operation. If you find no problem with the sensor and flag, continue with the service check.

Service Tip: Check to make sure the correct flag is installed. The Output Bin Sensor is a normally closed sensor with the sensor flag down. Therefore, unless the flag is in the up position or out of the sensor slot, a Remove Paper Standard Bin message is not displayed.

	FRU	Action
1	Engine Board Printer fails to display Remove Paper Standard Bin message. Output Bin Sensor Test fails	Check the voltage at J6-3. It measures +5 V dc when the flag is in the sensor and 0 V dc when the flag is out of the sensor. If the voltage does not change, replace the sensor cable assembly. If this does not fix the problem, replace the engine board.
2	Output Bin Sensor Flag	Check to make sure the correct flag is installed. Check the flag for damage or improper operation. If incorrect, replace the flag. Note: A broken or improper operating sensor flag causes a Remove Paper Standard Bin message to display before POST completes and cannot be cleared.

Output Expander Service Check

Service Tip: The majority of the mechanical components can be observed during operation by removing the left, right and system board covers. The output expander functions without the covers installed.

Note: Make sure the option is correctly installed before attempting to service the unit. No jumpers should be installed at connector J6 on the output expander board.

Problems with excessive static electricity buildup.

	FRU	Action
1	Output Expander Control Board Cover	Check the output expander control board cover to make sure the ESD brush ground lead is firmly attached to the output expander frame. Also check to make sure the ESD brush is not loose.

Printer does not recognize one or more output expander options as being installed.

Service Tip: If more than a single output expander option is installed, check each one to see if the printer recognizes any single option as being installed. If the printer recognizes any of the output expander options then the base printer autoconnect system is operating correctly and the problem is in the unrecognized expander option.

	FRU	Action
1	Output Expander Option	<p>Make sure the output expander option is the only option that is not recognized by the base printer. If the output expander is the only option not recognized by the printer, continue with step 2. If not, check the autoconnects of the options not recognized and the interconnect board and cable connections.</p>
2	Output Expander Assembly Mechanical Linkage	<p>Check the autoconnects for damage, especially the connector pins. Remove the left and right side covers. Remove the front control board cover. Check the cables at J1A, J1B, J2A and J2B on the control board to make sure they are attached securely and correctly. Remove the output expander and check the voltages on the output bin autoconnect located on the top left rear of the printer. Go to "Autoconnect - Top" on page 5-19. If the voltages are correct, reinstall the output expander unit and check the voltages at J1A and J1B on the connector. If correct, replace the output expander control board. If incorrect, replace the output expander assembly mechanical linkage.</p>

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202 Paper Jam Open Rear Door Message displays. A sheet of paper is jammed prior to the pass through sensor flag.

202 Paper Jam Open Rear Door Message displays. A sheet of paper feeds out to the standard bin even though bin x is selected. Paper exits half way out of the redrive.

Service Tip: For this type of problem check the sub error codes. They can help isolate the problem. 202 Paper Jam messages can also occur prior to the output expander pass thru sensor.

	FRU	Action
1	Output Expander Drive Belt Drive Pulley Drive Belt Idler Pulley Belt Tension Spring	Check to ensure the output expander drive belt is correctly installed on the drive pulley and belt idler pulley. Check the belt tension spring to make sure it is not loose or broken. Repair as necessary.
2	Mechanical Linkage DC Motor Assembly	If the DC motor is functioning properly check the gears, clutch and other linkage parts for correct operation and any signs of wear, broken gear teeth or damaged parts. If incorrect, replace the mechanical linkage/DC motor assembly.

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Remove Paper - Output Bin X is displayed, POST Incomplete, Unable to clear the message.

	FRU	Action
1	Dual Output Bin Sensor Flag	Check the flag for correct operation, binding, broken parts or interference from the sensor cable, If incorrect, repair as necessary.

271 Paper Jam - Check Bin X. POST Incomplete

	FRU	Action
1	Pass Thru Sensor and Flag Assembly Control Board	Check the sensor flag for proper operation. If correct, check to make sure the pass thru sensor cable is correctly connected to J3 on the control board. Disconnect the pass thru sensor cable from J3 on the control board and check the voltage at J3-3. The voltage measures approximately +5 V dc. If incorrect, replace the control board. If correct, check the voltage at J3-2. The voltage measures approximately 0 V dc. If incorrect, replace the sensor assembly. If this does not fix the problem, replace the control board.

271 Paper Jam - Check Bin X, POST Complete, First Sheet of paper feeds into Output Bin X.

Note: Before performing the following checks run the Output Bin X Sensor Test and check for the failing sensor.

Sensor Test: NF = Near Full (Upper part of sensor assembly)

F = Full (Lower Part of sensor assembly)

P = Pass Thru Sensor

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990 Service - BIN X

	FRU	Action
1	D.C. Motor Mechanical Linkage Assembly	<p>Check the DC motor cable connector to be sure it is correctly installed at J4 on the output expander option board. If correct, disconnect J4 from the option board and check the resistance of the motor on the cable connector: J4-1 to J4-2: measures between 115 and 135 ohms. Also check J4-1 and J4-2 to the motor case for shorts. If either the resistance is incorrect or a short is found, replace the motor/mechanical linkage assembly.</p> <p>Note: If the DC motor is shorted, it may also be necessary to replace the control board.</p>
2	Output Expander Control Board	<p>Disconnect the motor cable J4 and check the voltages at J4 on the board.</p> <p>Note: Use caution not to short to adjacent pins on the connector.</p> <p>J4-1 (Motor Idle) +24 V dc J4-2 (Motor Idle) +24 V dc J4-5 (Motor Idle) +5 V dc J4-6 (Motor Idle) +5 V dc</p> <p>If any of the voltages are incorrect, replace the control board. If the voltages are correct, replace the DC motor/mechanical linkage assembly.</p>

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No indication that Bin X is Full OR No indication that Bin X is Near Full

	FRU	Action
1	Dual Output Bin X Sensor Assembly Control Board	Check for correct installation of the sensor cable at J5 on the control board. If either the Bin Full (F) or Bin Near Full (NF) fail the sensor test then check the voltage at J5-3 and J5-4. The voltage measures approximately +5 V dc. If the voltage is incorrect, replace the control board. If correct, replace the sensor assembly.

High-Capacity Output Stacker Service Check

Service Tip: The majority of the mechanical components can be observed during operation by removing the left, right and front covers. The high capacity output stacker option functions without the covers installed.

Models 010 and 010n do not support this output option.

Determine which paper path stacker assembly is not functioning properly.

Make sure the option(s) are installed correctly and the machine is configured correctly before attempting to service the high-capacity output stacker option.

Go to "[High-Capacity Output Stacker Board](#)" on page 5-22 to identify the correct jumper location at J6 for the upper and lower units.

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Problems with excessive static electricity buildup

	FRU	Action
1	Front Cover Assembly	Check the front cover assembly to make sure the ESD brush ground lead is firmly attached to the high capacity option. Also check to make sure the ESD brush is not loose or damaged.

The printer does not recognize one or more output options as installed

Service Tip: If more than a single output option is installed, check each one to see if the printer recognizes any single option as installed. If the printer recognizes any of the output options, the base printer autoconnect system is operating correctly. The problem is in the unrecognized option. Continue with this service check or go to the service check for the failing output option.

	FRU	Action
1	High Capacity Stacker Option	Check the autoconnects, cables and connectors of the option for any signs of loose or damaged parts.
2	High-Capacity Output Stacker/Mechanical Linkage Assembly	Remove the left and right side covers and check all four autoconnects for damage, especially the connector pins. Remove the output option and check the voltages on the standard output bin autoconnect located on the top left rear of the printer. Go to “Autoconnect - Top” on page 5-19 . If the voltages are correct, reinstall the output option and note the positions of the torroids on the autoconnect cables on the upper and lower assemblies, and check the voltages on the autoconnects. If all voltages are correct and the lower assembly is failing, replace the lower control board. If the upper assembly is failing, replace the upper control board. If the voltages are incorrect, replace the upper or lower failing mechanical linkage assembly.

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202 Paper Jam Open Rear Door Message displays and a sheet of paper is jammed prior to the pass through sensor flag or 202 Paper Jam Open Rear Door Message displays, a sheet of paper feeds out to the standard bin even though bin X is selected and paper exits half way out of the redrive assembly.

Service Tip: For this type of problem check the **“Base Printer Sub Error Codes” on page 2-8**. They can help isolate the problem. A 202 paper jam message can also occur prior to the high-capacity output stacker pass through sensors.

	FRU	Action
1	Lower Pass Thru Sensor/ Flag Assembly	Check the flag for correct operation, binding, broken parts or interference from the sensor cable. If incorrect, repair as necessary. If correct, check to make sure the lower pass thru sensor is correctly connected to J3 on the lower control board. Disconnect the pass thru sensor cable and check the voltage at J3-3. The voltage measures approximately +5V dc. If incorrect, check the voltage at J3-2. The voltage measures approximately 0V dc. If incorrect, replace the sensor assembly. If this does not fix the problem, replace the lower control board.
2	High-Capacity Output Stacker Drive belt(s), Drive Pulleys, Belt Idlers, and Belt Tension Springs	Check to ensure the output stacker drive belt or the failing assembly is correctly installed on the drive pulley and belt idler pulley. Check the belt tension spring to make sure it is not loose or broken. Repair as necessary.
3	Mechanical Linkage/Motor Assembly (Upper or Lower)	If the DC motor is functioning properly check the gears, clutch and other linkage parts for correct operation and any signs of wear, broken gear teeth or damaged parts. If incorrect, replace the mechanical linkage assembly/DC Motor Assembly.

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Remove Paper - Output Bin X Full displays. You may not be able to clear the message.

	FRU	Action
1	Dual Output Bin Sensor Flag (Upper Assembly)	Check the flag for correct operation, binding, broken parts or interference from the sensor cable. If incorrect, repair as necessary.

271 Paper Jam - Check Bin X. POST Incomplete

	FRU	Action
1	Upper Pass Thru Sensor Flag Assembly Upper Control Board	Check the flag for correct operation, binding, broken parts or interference from the sensor cable. If incorrect, repair as necessary. If correct, check to make sure the lower pass thru sensor is correctly connected to J3 on the lower control board. Disconnect the pass thru sensor cable and check the voltage at J3-3. The voltage measures approximately +5V dc. If incorrect, check the voltage at J3-2. The voltage measures approximately 0V dc. If incorrect, replace the sensor assembly. If this does not fix the problem, replace the lower control board.

5-Bin Mailbox Service Check

Service Tip: The majority of the mechanical components can be observed during operation by removing the left, right side covers.

Models 010/010n and 010/01n at service level B do not support this output option.

Make sure the option(s) are correctly installed before attempting to service the unit. Be sure the option is correctly installed and the machine is configured correctly before attempting to service the unit.

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Problems with excessive static electricity buildup

	FRU	Action
1	Front Cover Assembly	Check the front cover assembly to make sure the ESD brush ground lead is firmly attached to the 5-Bin Mailbox frame. Also check to make sure the ESD brush is not loose or damaged.

The printer does not recognize one or more output options as installed.

Service Tip: If more than a single output option is installed, check each one to see if the printer recognizes any single option as being installed. If the printer recognizes any of the output options then the base printer autoconnect system is operating correctly and the problem is in the unrecognized option. Continue with this service check or go to the service check for the failing output option.

	FRU	Action
1	5-Bin Mailbox Option	Check the autoconnects, cables and connectors of the option parts for any signs of loose or damaged parts.
2	Mechanical Linkage Assembly	Remove the left and right side covers and check the two autoconnects for damage especially the connector pins. Remove the output option and check the voltages on the standard output bin autoconnect located on the top left rear of the printer. Go to "Autoconnect - Top" on page 5-19 . If the voltages are correct, reinstall the output option noting the position of the torroid on the autoconnect cable of the lower autoconnect. Check the voltages on each of the autoconnects. If the torroid was moved make sure to move it back to its original position on the cable. If the voltages are correct, replace the control board. If the voltages are incorrect, replace the failing autoconnect assembly.

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271 Paper Jam - Check Bin 1 displays

	FRU	Action
1	Bottom Pass Thru Sensor Flag Assembly Control Board	Check the flag for correct operation, binding, broken parts or interference from the sensor cable. If incorrect, repair as necessary. If correct, check to make sure the bottom pass thru sensor is correctly connected to J5 on the control board. Disconnect the pass thru sensor cable and check the voltage at J5-3. The voltage measures approximately +5V dc. If incorrect, check the voltage at J5-2. The voltage measures approximately 0V dc. If incorrect, replace the sensor assembly. If this does not fix the problem, replace the control board.

274 Paper Jam - Check Bin 4 Displays

Service Tip: When a 274 Paper Jam Check Bin 4 message displays, a problem exists with the top pass thru sensor assembly or the control board.

	FRU	Action
1	Top Pass Thru Sensor Flag Assembly Control Board	Check the flag for correct operation, binding, broken parts or interference from the sensor cable. If incorrect, repair as necessary. If correct check to make sure the top pass thru sensor is correctly connected to J11 on the control board. Disconnect the pass thru sensor cable and check the voltage at J11-3 The voltage measures approximately +5V dc. If incorrect, check the voltage at J11-2. The voltage measures approximately 0V dc. If incorrect, replace the sensor assembly. If this does not fix the problem, replace the lower control board.

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Ready Bin X Full message displays - May be able to clear message and will feed paper into Bin selected.

	FRU	Action
1	Bin X Sensor Bin X Sensor Cable Bin X Sensor Flag Control Board	<p>Check the sensor and sensor cable for the bin that is displaying the message to make sure the sensor is seated correctly in the side of the tray and the cable is connected to the sensor and the control board. Check the flag for binding and proper operation. If correct, replace the Bin X sensor. If this does not fix the problem, replace the control board.</p> <p>Note: This sensor is in a normally open position with the flag out of the sensor slot.</p>

Bin X is full - No message that Bin X is full displays

	FRU	Action
1	Bin X Sensor Bin X Sensor Cable Bin X Sensor Flag Bin X Sensor Flag Control Board	<p>Check the sensor flag for binds, broken or missing parts. If correct, check the bin sensor for correct installation in the side of the tray. If the bin sensor is installed correctly, check the sensor cable for correct installation to the sensor and control board. If correct, replace the Bin X sensor. If this does not fix the problem, replace the control board.</p>

Ready - Bin X Full displays and paper feeds into Bin X

	FRU	Action
1	Bin X Sensor Bin X Sensor Control Board	<p>Check the sensor flag for binds. Make sure the sensor flag is not in an up position. If the sensor flag is operating correctly, replace the bin X sensor. If this does not fix the problem, replace the control board.</p>

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Paper does not feed into the bin selected. 271 Paper Jam - Check Bin 1 displays

	FRU	Action
1	Deflector Deflector Spring Deflector Cover Deflector Cover Spring Shaft assemblies	Check all the bin parts for signs of missing or loose springs, binds in the deflector or deflector cover, broken or binding shaft assemblies or broken gear teeth. If incorrect, repair as necessary.
2	Bin X Solenoid Assembly Control Board	Check the solenoid for any binds. Make sure the solenoid is contacting the latch correctly. If incorrect, repair as necessary. If the solenoid appears to be operating mechanically, check the resistance of the solenoid. It measures between 30 and 50 ohms. If incorrect, replace the failing solenoid assembly. If correct, replace the control board.
3	Mechanical Linkage Motor Assembly	If the DC motor is functioning properly, check the gears, clutch and other linkage parts for correct operation and any signs of wear, broken gear teeth or damaged parts. If incorrect, replace the mechanical linkage assembly/DC motor assembly.

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990 Service Error displays

	FRU	Action
1	Mechanical Linkage DC Motor Assembly	<p>Check the DC motor cable connector to be sure it is correctly installed at J2 on the control board. If correct, disconnect J2 from the control board and check the resistance of the motor on the cable connector. J2-1 to J2-2 measures between 115 and 135 ohms. Also check J2-1 and J2-4 to the motor case for shorts. If either the resistance is incorrect or a short is found, replace the mechanical linkage/ DC motor assembly.</p> <p>Note: If the DC motor is shorted, it may also be necessary to replace the control board.</p>
2	Control Board	<p>Disconnect the motor cable J2 from the control board and check the voltages at J2 on the board.</p> <p>Note: Use caution not to short adjacent pins on the connector as damage to the board could result.</p> <p>J2-1 (motor idle) +24V dc J2-2 (Motor Idle) +24V dc J2-5 (motor idle) +5V dc J2-6 (motor idle) +5V dc</p> <p>If any of the voltages are incorrect, replace the control board. If correct, replace the mechanical linkage/ DC motor assembly.</p>

Paper Feed Service Check

If you have a 936 Transport Motor Error go to the **“Main Drive Service Check”** on page 2-69.

	FRU	Action
1	Alignment Assembly	Check to ensure the alignment assembly is correctly attached to the left side frame and the mounting screws are tight. Check the alignment assembly for any signs of worn rollers, contaminated rollers or binds. Replace the alignment assembly if any problem is found.
2	Inner Deflector	Check the inner paper deflector for correct installation. If the deflector is bowed or not fitting correctly, replace the deflector.

Autocompensator fails to feed paper. Failures occur randomly throughout the stack of paper.

	FRU	Action
1	Pass Through Sensor	Check the pass through sensor for correct installation and operation.
2	Autocompensator Assembly	The autocompensator pick roll shaft assembly is not providing enough torque if the pick rollers are not picking the paper correctly. Replace the autocompensator assembly.
3	Wear Strips in Tray X problem is found.	Check the wear strips for excessive wear, scratches or rough spots. Replace the wear strips if a problem is found.

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Paper feed failures occur only near the top of the stack of paper.

The most common cause of this problem is paper curl. Remove the paper from tray x and check for the natural curvature in the paper. Reinstall the paper in the correct manner. If the problem persists, it may be necessary to reduce the stack height. Replace both pick rolls if the paper appears to be flat in the tray but there is still a problem.

Failures occur mainly near the bottom of the stack of paper.

The autocompensator pick arm may not be coming down far enough to allow the pick rolls to properly contact the paper. Also the autocompensator motor may be failing. If this problems continues, replace the autocompensator assembly.

Double Feeding Paper

Note: If double feeding paper occurs mostly from the bottom of the stack, check for missing or damaged restraint pads in the tray.

	FRU	Action
1	Paper	Paper is usually the primary cause of a double feeding paper problem. Flex the paper before placing the paper in the tray. Edge-welded paper is the most common cause of double feeding. Loading the paper in the tray in different locations and directions and using rough paper and short grain paper also causes double feeding.
2	Autocompensator	Make sure the counterbalance spring is not missing, loose or broken at the top of the autocompensator arm assembly. If you find a problem, replace the autocompensator assembly.

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Multipurpose Tray

Paper fails to feed from the multipurpose tray.

The pick roll should make one complete revolution and stop with the flat side down. If the pick roll turns but does not pick paper, check the roll for signs of wear, oil or grease on the surface of the pick roll or slick spots. If you find a problem, replace the pick roll assembly. Check to ensure the media that is being fed through the multipurpose tray assembly meets recommended paper specifications.

Parallel Port Service Check

Run the **"Parallel Wrap Test"** on page 3-11.

Note: The Parallel Wrap Test is designed to check the parallel port hardware by using a wrap plug (P/N 1319128) and invoking the Parallel Diagnostic Test. This test helps isolate the printer from the parallel cable and host. The test provides failure information on the display for approximately three seconds. If the test indicates that a problem is detected, replace the controller board.

Printhead Service Check

The printhead assembly does not contain any service replaceable parts or components. If service error code 930 displays, the wrong printhead is installed in the printer.

Note: A 201 paper jam may also indicate a failing printhead. The paper may have jammed prior to or at the input sensor. Print the error log and see if 201 or 931 errors are logged.

	Service Error Code	Explanation
1	Error Code 931 No first HYSNC Signal Error Code 932 Lost HYSNC	These errors usually indicate a failure in the HYSNC signal to the printhead. Check the continuity of the cables connected to J3 and J8 on the engine board. If incorrect, replace the defective cable. The voltage at J8-4 measures approximately +5 V dc. If incorrect, replace the engine board. The voltage at J3-7 measures approximately +24 V dc. If incorrect, replace the engine board. If correct, replace the printhead assembly.
2	Error Code 934 Mirror Motor Lost Lock Error Code 935 Mirror Motor unable to reach operating speed	These error codes indicate a problem with the mirror motor circuit in the printhead assembly or the mirror motor cable to the engine board cable or engine board assembly. Check the continuity of the mirror motor cable connected to J3 on the engine board. If incorrect, replace the cable. The voltage at J3-7 measures approximately +24 V dc. If incorrect, replace the engine board. If correct, replace the FRUs in the following order: engine board printhead assembly

Print Quality Service Check

Service Tip: Before troubleshooting any print quality problems do the following:

- Install another print cartridge if available before proceeding with the service checks.
- Use Tray 1 to test for print quality of the base printer.
- Replace the charge roll if it is damaged or contaminated.
- Replace the transfer roll if it is damaged or contaminated.
- Make sure the fuser assembly is installed correctly.
- Verify proper paper type, texture and weight settings for the media being used.
- Test the printer using plain paper (20lb).

Select the following menu settings as indicated. Be sure and note the original settings so you can return the printer to the original customer printer setup.

- Print Resolution: Set to 300 dpi (print quality problems should be checked at different resolution settings).
- Print Darkness: Set to NORMAL.
- Toner Saver: Set to OFF.
- PQET: Set to OFF.
- Fuser Temperature: Set to NORMAL.
- Test the printer using plain paper (20 lb)

An incorrect printer driver for the installed software can cause problems. Incorrect characters could print and the copy may not fit the page correctly.

Measure all voltages from the connector to printer ground. All voltages measured during the print cycle are measured with the controller board removed while running the print test.

Note: Belt Fuser (31v/31e) - If treeing is a problem on the printer, replace the belt fuser assembly.

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Print Quality - All Black Page

Service Tip: An all black page is generally caused by a problem in the high voltage system or an incorrect high voltage in the printing process resulting in toner development on the entire photoconductor drum.

	FRU	Action
1	High Voltage Contacts	Check the high voltage contacts on the right side frame to ensure they fit securely and are not pitted, contaminated or damaged. If incorrect, replace the contact with one from the HV contact kit. Screws are included to attach the contacts to the right side frame in the HV contact kit.
3	Charge Roll Conductive Bushing	Check to make sure the charge roll bushing is correctly installed in the right charge roll arm.
2	HVPS	Check the voltages on J10-1 thru J10-8. If incorrect, replace the engine board.
3	HVPS Cable (Part of Front Harness Cable) Engine Board	Check the continuity of the HVPS cable. If incorrect, replace the cable assembly. If correct, replace the engine board.

Print Quality - Blank Page

	FRU	Action
1	Print Cartridge	Check the print cartridge for any signs of damage, especially the PC drum contact on the cartridge.

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	FRU	Action
2	High Voltage Contact	<p>Check the PC drum contact on the right side frame for damage, PC drum contact wear or contamination. If the contact is bent or damaged, replace the contact.</p> <p>Note: Inspect the HVPS PC drum contact on the board for any signs of damage or contamination.</p>
3	HVPS	<p>Check the fuse on the HVPS. If open, replace the HVPS. Check the voltages at J10 on the engine board. Measure the following voltages from connector J10 to printer ground:</p> <p>Printer Idle J10-5 measures +24 V dc</p> <p>Printer Printing J10-5 measures +24 V dc</p> <p>In the voltages at J10-5 are incorrect, replace the engine board.</p>
4	Front Cable Harness HVPS Section	<p>Check the front cable harness at J10 on the engine board and at CN1 on the HVPS to make sure the harness is connected properly. If connected properly, check the continuity of the cable harness. If there is no continuity, replace the front cable harness.</p>
5	Printhead Assembly	<p>Generally a 93x service error is posted if the printhead assembly fails and the printer does not give a blank copy symptom.</p> <p>The printhead used in the printer does not have a mechanical shutter as previous laser printers. The printer is interlocked through the front top cover interlock switch.</p>

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Print Quality - Random Marks

Service Tip: The primary cause of random marks is due to loose material moving around inside the printer and attaching to the photoconductor, charge roll or transfer roll.

	Symptom	Action
1	Random Marks	Check the print cartridge for any signs of loose or foreign material that might be on the photoconductor. Check the transfer roll and charge roll for any pieces of material that are stuck to the rolls.

Print Quality - Blurred or Fuzzy Print

Blurred or fuzzy print is usually caused by a problem in the main drive gearbox assembly, alignment assembly, any feed roller or in the transfer roll bearings or transfer roll. Check the gearbox assembly for correct operation. Check the transfer roll for binds or a contaminated shaft or bearings.

Blurred print can also be caused by incorrect feeding from one of the input paper sources, paper trays, duplex or envelope feeder.

Check the high voltage contacts to ensure they are not bent, corroded or damaged. Replace as necessary.

4069-XXX**Print Quality - Evenly spaced horizontal lines or marks**

	FRU	Action
1	Lines spaced 3.19 mm (.126 inch) apart	This can be caused by the motor pinion gear on the main drive motor. Replace the main drive motor.
2	Lines spaced 22.32 mm (.882 inch) apart Lines spaced 28.7 mm (1.130 inch) apart Lines spaced 47.83 mm (1.883 inch) apart Lines spaced 63.77 mm (2.511 inch) apart	This can be caused by a defective gear in the main drive gearbox assembly. Replace the main drive gearbox assembly.
3	Lines spaced 38.26 mm (1.506 inch) apart	This can be caused by defective gear(s) in the main drive gearbox. Replace the FRUs in the following order: main drive gearbox reference edge
4	Lines spaced 44.64 mm (1.757 inch) apart	Replace the FRUs in the following order: developer drive assembly main drive gearbox assembly
5	Lines spaced 47.19 mm (1.858 inch) apart	Replace the FRUs in the following order: toner cartridge charge roll developer drive assembly
6	Lines spaced 49.16 mm (1.935 inch) apart	Replace the toner cartridge.

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	FRU	Action
7	Lines spaced 49.74 mm (1.958 inch) apart	Replace the FRUs in the following order: redrive assembly fuser assembly
8	Lines spaced 51.02 mm (2.009 inch) apart	Replace the transfer roll.
9	Lines spaced 52.23 mm (2.056 inch) apart	Replace the redrive assembly.
10	Lines spaced 76.53 mm (3.013 inch) apart	Replace the FRUs in the following order: alignment assembly main drive gearbox assembly
11	Lines spaced 95.66 mm (3.766 inch) apart	Replace the FRUs in the following order: toner cartridge main drive gearbox assembly
12	Lines spaced 99.49 mm (3.917 inch) apart	Replace the redrive assembly.
13	Lines spaced 114.79 mm (4.519 inch) apart	Replace the alignment assembly.

Print Quality - Background

Service Tip: Some background problems can be caused by rough papers, non-Lexmark toner cartridges or if the media texture is set to the rough setting.

Some slick or coated papers may also cause background. Some problems occur with printers that run a large amount of graphics in a humid environment. The customer may try to improve the print quality by increasing the transfer setting.

Check the charge roll to make sure it is not at the end of life.

	FRU	Action
1	Erase Lamp/Lens Assembly (models 010/212/414/616/31v/01n/21n/31e/41n/61n)	Check the erase lamp lens for any signs of toner, paper dust or other types of contamination. Clean the lens with a soft dry cloth if necessary. If unable to clean the contamination off the lens, replace the lens and lamp assembly. Check the erase lamp assembly. Use the same procedure as outlined in the "Erase Lamp Service Check (010/212/414/616/31v/01n/21n/31e/41n/61n)" on page 2-45.
2	Printhead	The printhead on the Optra T printers cannot be cleaned. Try another printhead if all other attempts fail to correct a background problem.
3	Transfer Roll Assembly	Check the high voltage contact from the HVPS to the transfer roll. Check the transfer arm assembly right side bearing for any signs of contamination, pitting or a loose cable to the bearing. If any problems are found, replace the defective part. Check the transfer roll shaft for any signs of contamination, wear or pitting on the ends of the shaft that go into the bearings. If a problem is found, clean the ends of the shaft or replace the transfer roll assembly.
4	High Voltage Contacts	Check the high voltage contacts on the right side frame to ensure they are clean and not bent, deformed, or pitted. If incorrect, replace the contact.

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	FRU	Action
5	Engine Board HVPS Connector	<p>Check the following voltages at J10 on the engine board. Measure the voltages from J10 to printer ground.</p> <p>Printer Idle J10-1 approximately 0 V dc J10-2 approximately 4 V dc J10-4 approximately 0 V dc</p> <p>Printer Printing J10-1 varies 0 V dc to +5 V dc J10-2 varies 0 V dc to +4 V dc J10-4 varies 0 V dc to +1.9 V dc</p> <p>If J10-1 voltage is incorrect, check the continuity of the front harness cable (J10-1 line). If there is no continuity, replace the harness cable. If there is continuity, replace the HVPS. If this does not correct the problem, replace the engine board.</p> <p>If J10-2 voltage is incorrect or if the voltage remains at 0 V dc, check the continuity of the front harness cable (J10-2 line). If there is no continuity, replace the harness cable. If there is continuity, replace the HVPS. If this does not correct the problem, replace the engine board.</p> <p>If J10-4 voltage is incorrect, check the front harness cable (J10-3 line). If there is not continuity, replace the harness cable. If correct, replace the engine board. If this does not correct the problem, replace the HVPS.</p>

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Print Quality - Banding

Service Tip: Banding is difficult to detect except on a page with a uniform gray or a large amount of graphics printed on the page. Banding is primarily due to a variation in the speed of the paper as it feeds thru the printer, especially in the development and transfer process. Inspect the alignment assembly, main drive assembly and all other paper feed components for signs of wear, dirt, binds, or damage, especially the drive gears. Banding appears as light or dark horizontal lines on a uniformly gray page.

Banding can also be caused by a defective charge roll brush contact or HVPS. Check the charge roll contact for any signs of damage and for proper connection to the HVPS and print cartridge.

Print Quality - Black bands on outer edges of the page

This print quality problem appears as vertical black bands on one or both sides of the copy and can be wide, narrow, light or dark.

	FRU	Action
1	Charge Roll Counterbalance Springs	If the problem is just on one side of the page, check the charge roll counterbalance spring on that side. You can check to see if enough force is being applied to the charge roll by applying a slight downward pressure with your finger to the charge roll link arm that the spring is attached to while you run a print test sample. See if the problem changes or goes away. If this fixes or changes the problem, then check the springs and charge roll link arm assemblies for binds or defective parts. Replace as necessary.

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	FRU	Action
2	Charge Roll Assembly Charge Roll Link Arm	Check the charge roll for any signs of toner buildup or other contamination on the outer edges that correspond to the bands on the page. Check the charge links and arms for proper operation, binds or incorrectly mounted counterbalance springs. Repair or replace as necessary.
3	HVPS	<p>Check the following voltages at J10-8 on the engine board:</p> <p>Printer Idle J10-8 measures 0 V dc</p> <p>Printer Printing Test Page J10-8 voltage changes from 0 V dc to +4 V dc</p> <p>If the voltage does not vary, check the continuity of line J10-8 in the front cable harness. If there is no continuity, replace the cable harness. If there is continuity, replace the HVPS. If this does not correct the problem, replace the engine board.</p> <p>Turn the printer Off and check the resistance between J10-7 and printer ground. The resistance measures approximately 0 ohms. If incorrect, make sure the engine board is mounted correctly and securely grounded. If correct, replace the engine board.</p>

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Print Quality - Residual Image

Service Tip: Install a new print cartridge if available before doing this service check. Residual image can be caused by the photoconductor, cleaning blade and other parts inside the print cartridge.

	FRU	Action
1	Erase Lamp Assembly (models 010/212/414/616/31v//01n/21n/31e/41n/61n)	Check the erase lamp lens assembly for any signs of paper dust, toner buildup or any other contamination. Clean with a soft cloth or replace the lens and lamp assembly which are provided together in a kit. If the lens is clean then check the erase lamp assembly for failed erase lamps. If defective, replace the erase lamp assembly.
2	Hot Roll Fuser Assembly	Check the fuser assembly for signs of toner contamination. The hot roll especially might cause toner to be retained and deposited on the page.
3	Belt Fuser (31v/31e)	Toner buildup on the belt can cause toner to be carried out on the backside of the media. If any toner buildup is present on the belt, replace the belt fuser assembly.

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Print Quality - Light Print

Service Tip: Check the toner saver and print darkness settings first if the print is light.

	FRU	Action
1	Transfer Roll	Check the right end of the transfer roll shaft for signs of wear or contamination. If incorrect, replace the transfer roll.
2	Right Side Transfer Roll Arm Assembly	Check the right side transfer roll arm assembly bearing for any signs of wear or contamination. Also check to ensure the transfer cable is firmly attached to the bearing. If incorrect, replace the right side transfer arm assembly. Check the connection of the transfer roll assembly cable to the transformer on the HVPS board. Check the continuity of the cable from the bearing to the spade terminal on the cable. If incorrect, replace the right side transfer arm assembly. If correct, replace the HVPS.

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Print Quality - Toner on backside of printed page

Service Tip: This is generally caused by loose toner in the machine in the paper path being carried through the printer on the backside of the paper.

	FRU	Action
1	Hot Roll Fuser Assembly	Toner is being carried out on the backside of the media. This problem is generally caused by a toner buildup on the fuser hotroll or backup roll. Check the fuser hotroll and backup roll for any noticeable buildup of toner. Repair as necessary.
2	Belt Fuser (31v/31e)	Toner buildup on the belt can cause toner to be carried out on the backside of the media. If any toner buildup is present on the belt, replace the belt fuser assembly.
3	Transfer Roll Transfer Plate Assembly	Check the transfer roll for any signs of toner buildup or loose toner around the area of the transfer plate assembly. Clean the area and run another copy. If the problem continues, replace the FRUs in the following order: HVPS engine board

Smart Cartridge Service Check

Note: If you are unable to clear a “32-Unsupported Cartridge” User Error Message, make sure an Optra T print cartridge is correctly installed in the printer. The cartridge is easily identified by the smart chip located on the top right side of the cartridge. Install another print cartridge before attempting to troubleshoot the printer. Check to make sure the smart cable is properly connected to J21 on the engine board. Check the print cartridge for any signs of damage or improper installation of the smart chip. Also check to make sure there is proper contact between the smart chip and the smart cartridge contacts.

Service Tip: An intermittent “32-Unsupported Cartridge” User Error Message can be caused by poor contact between the smart cartridge contacts in the upper front cover and the smart chip. Also check for proper seating of the smart cartridge cable to the engine board.

	FRU	Action
1	Smart Cartridge Contact Smart Cartridge Ground Contact	Check both contacts to make sure they are properly installed and the two contacts are not touching each other. Check both contacts for any signs of being bent, worn or broken. If incorrect replace both contacts.
2	Smart Cartridge Cover	Check to make sure that the smart cartridge cover is properly snapped into place and is not damaged or broken. Replace as necessary.
3	Smart Cartridge Plunger	Check the plunger for correct installation and any signs of being damaged or broken. Correct any problem found or replace the plunger as necessary.

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	FRU	Action
4	Smart Cartridge Cable Engine Board	Check the voltage on the smart cartridge contact. The voltage measures approximately +5 V dc when not writing data to the engine board. If data is being written, the voltage measures approximately +12 V dc. If incorrect, disconnect the cable from J21 on the engine board and check the voltage on J21-1. The voltage measures approximately +5 V dc. If incorrect, replace the engine board. If correct, replace the smart cartridge cable.

Serial Port Service Check

Run the **“Serial Wrap Test”** on page 3-12.

Note: The Serial Wrap Test is designed to check the serial port hardware by using a wrap plug (P/N 1329048) and invoking the Serial Post Diagnostic Test. The test helps isolate the printer from the serial cable and host. The test provides failure information on the display for approximately three seconds. If the test indicates a problem, replace the controller board.

Toner Sensor Service Check

Service Tip: Check the print darkness MENU setting before checking the toner sensor.

This service check is intended to be used when a 929 Service Error displays.

	FRU	Action
1	Developer Drive Assembly	Incorrect operation of the developer drive assembly can cause the printer to display a 929 error code (Toner Sensor). Check the developer drive assembly for correct installation, any sign of worn, loose or broken parts.

	FRU	Action
2	Front Harness Cable	Check the toner sensor portion of the front harness cable to make sure it is properly seated into the toner sensor. If correct at both the sensor and engine board (J10), check the continuity of the cable. If incorrect, replace the cable.
3	Toner Sensor	The toner sensor cable is part of the front harness and part of connector J10 on the engine board. Check the voltage at J1-011. It reads approximately +5 V dc. If incorrect, replace the engine board. If correct, check the voltage at J10-12. It reads approximately +5 V dc with the controller board removed from the printer. If incorrect, replace the engine board. If correct, replace the toner sensor assembly. A bad ground connection between J10-13 on the engine board and pin 3 on the toner sensor results in a 929 service error.

Transfer Roll Service Check

Service Tip: The transfer roll is 51.02 mm (2.009 inch) diameter. Any print quality problems such as lines that are spaced 15.2 mm apart indicate you should check the transfer roll for damage, toner or foreign material buildup.

Service Tip: The transfer roll assembly is part of the Maintenance Kit and is replaced when a '80 Scheduled Maintenance" message displays. Ask the customer if they have replaced the transfer roll recently.

CAUTION: Make sure the printer is powered Off before making any checks on the transfer roll or associated parts for personal safety and to prevent damage to the printer.

Note: Error Code 917

A 917 transfer roll error code on all models at service level B may display if an incorrect level HVPS is installed in a printer that has the

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is installed in a printer that has the erase lamp assembly installed. Check to make sure the correct level HVPS is installed. Go to **“Printer Serial Label”** on page 7-2 to identify the printer service level.

	FRU	Action
1	Transfer Roll Assembly	Check the transfer roll for any signs of toner buildup, surface damage to the roll, oil or other contaminants on the surface of the roll. Replace the transfer roll as necessary.
2	Left Transfer Arm Assembly	Check the left transfer roll arm assembly to make sure it is fastened and locked in the down position. If the arm is not locked down, check to ensure the arm is not broken and will lock into the EP frame correctly. Check the left transfer arm assembly spring for proper operation.
3	Right Transfer Arm Assembly	Check the right transfer arm assembly to make sure it is fastened and locked in the down position. If the arm is not locked down, check to make sure the arm is not broken and will lock into the EP frame correctly. Check the right transfer arm assembly spring for proper operation. For any background problems, check to ensure the contact to the HVPS board is correct and that there is approximately 0 ohms resistance between the transfer roll shaft and the HVPS contact. If correct, go to “Print Quality - Background” on page 2-98.

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	FRU	Action
4	HVPS - 917 Error Code	<p>Check the voltage at J10-3. The voltage changes from +24 V dc with the printer idle to 0 V dc when the printer runs the print test. If the voltage is incorrect, check the continuity of line J10-3 in the front cable harness to the HVPS. If there is no continuity, replace the cable harness. If there is continuity, replace the HVPS. If the problem continues, replace the engine board.</p> <p>Note: This error displays if the incorrect level HVPS is installed.</p>

3. Diagnostic Aids

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

To run the printer diagnostic tests described in this chapter, you must put the printer in Diagnostic Mode.

Diagnostic Mode

To enter the Diagnostic Mode:

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

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

- Print Registration
- Print Tests
- Hardware Tests
- Duplex Tests (If installed)
- Input Tray Tests
- Output Bin Tests
- Five Bin Mailbox Test
- Base Sensor Test
- Printer Setup
- Error Log
- EP Factory Defaults

Exiting the Diagnostics Mode

Select Exit Diagnostics to exit the Diagnostics Mode and return to normal mode.

Device Tests

Quick Disk Test

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

To run the Quick Disk Test:

1. Select the Quick Disk Test from the Device Tests menu.
 - The power indicator blinks while the test is in progress.
 - “Quick Disk Test/Test Passed” message displays if the test passes and the power indicator turns on solid.
 - “Quick Disk Test/Test Failed” message displays if the test failed and the power indicator turns on solid.
2. Press Go, Return, or Stop to return to the Device Tests menu.

Disk Test/Clean

WARNING: This test destroys all data on the disk and should not be attempted on a good disk. Also note that this test may run approximately 1 1/2 hours depending on the disk size.

To run the Disk Test/Clean Test:

1. Select Disk Test/Clean from the Device Tests menu.
 - "Files will be lost/Go or Stop?" message displays to warn the user that all contents on the disk will be lost.
2. To exit the test immediately and return to the Device Tests menu, press Return/Stop. To continue with the test, press Go.
 - If go is selected, "Disk Test/Clean/BAD:000000 00%" message displays. The screen updates periodically indicating the percentage of test completed and the number of bad blocks found.
3. The power indicator blinks during the test. The test can be canceled anytime during the test by pressing Return/Stop.
 - Once the test is complete, the power indicator turns on solid and a message displays.

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- “xxxx Bad Blocks/yyyyy Usable” message displays if fewer than 2000 bad blocks are detected. xxxx indicates the number of bad blocks and yyyyyy indicates the number of usable blocks.
 - “xxxx Bad Blocks/Replace Disk” message displays if more than 2000 bad blocks are detected. The disk cannot be recovered because too many bad blocks exist on the disk.
4. Press Go or Return/Stop to return to the Device Tests menu.

Flash Test

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

WARNING: This test destroys all data on the flash because the flash is reformatted at the end of the test.

To run the Flash Test:

1. Select Flash Test from the Device Tests menu.
 - The power indicator blinks while the test is running.
 - “Flash Test/Test Passed” message displays if the test passes and the power indicator turns on solid.
 - “Flash Test/Test Failed” message displays if the test fails and the power indicator turns on solid.
2. Press Go or Return/Stop to return to the Device Tests menu.

Disabling Download Emulations

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

Error Code 965: Download Emulation Outdated. Time stamps indicate the download emulation and RIP code are incompatible.

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

To Disable the Download Emulation:

1. Turn the printer off.
2. Press and hold the Go and Menu buttons.

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3. Turn the printer On and release the buttons once “Performing Self Test” displays.
 - Once the printer is idle, the emulation can be downloaded again.
4. Program the download emulation into the code overlay SIMM again.
5. If these steps do not resolve the problem, replace the code overlay SIMM and download the emulation again.

Duplex Tests

Duplex Quick Test

This test is used to verify that the Duplex Option Top Margin is set correctly. This test prints a duplexed version of the Quick Test Page that can be used to adjust the Top Margin for the backside of the duplexed page. You can run one duplexed page (Single) or continue printing duplexed pages (Continues) until Return/Stop is pressed.

The paper you choose to print the page on should be either Letter or A4.

To run the Duplex Quick Test:

1. Select Duplex Quick Test from the menu.
2. Select Single or Continuous.
 - The single Duplex Quick test cannot be canceled.

The printer attempts to print the Quick Test Page from the default paper source. If the default paper source only supports envelopes, then the page is printed from Tray 1.

Check the Quick Test Page for the correct offset between the placement of the first scan line on the front and back side of a duplexed sheet.

If adjustment is necessary the Top Margin Offset must be adjusted first. The range of the adjustment is -25 to +25. The Duplex Top Margin Offset range is -20 to +20.

Adjustment of this setting lets you shift up or down the position of the Top Margin. Changing this parameter by 1 unit moves the margin

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1/100 inch. A positive offset moves the text down the page and widens the top margin while a negative offset moves the text up the page and narrows the top margin.

3. Press Return/Stop to exit the test.

Check the Top Margin Offset of the base printer.

Duplex Sensor Test

This test is used to determine whether or not the Duplex sensors and switches are working correctly.

Select Sensor Test from the Duplex Tests menu.

Manually actuate each of the duplex sensors. When the sensor/switch is closed, CL (closed) displays, when the sensor/switch is open, OP (Open) displays.

Duplex input sensor

Duplex exit sensor

Press Return/Stop to exit the test.

Duplex Motor Test

This test lets you test the duplex unit's paper feed drive system, and verify that the power and velocity values are acceptable.

To run the Duplex Motor Test:

1. Select Motor Test from the Duplex Tests menu. The duplex motor test continues to run until the printer is powered off.
 - The power indicator blinks while the test is running.
 - The duplexer runs the motor at a high speed and then a low speed and takes an average of the power required for each speed.
 - After all the information is computed, the motor turns off.

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The following appears on the printer display:

DUPLEX MOTOR AA
BB CC DD EE FF

To pass the test the following results must display:

AA = 00
BB = in the range of 20 through 3F inclusively (hex)
CC = in the range of 3A through 5D inclusively (hex)
DD = in the range of 11 through 1F inclusively (hex)
Ignore bytes EE and FF.

If the test fails, remove the drive belt from the duplex D.C. motor and run the motor test again. For the duplex D.C. motor to pass the test the following results must display:

AA = 00
BB = in the range of 29 through 3E inclusively (hex)
CC = in the range of 35 through 51 inclusively (hex)
DD = in the range of 0C through 13 inclusively (hex)

For the duplex drive system to pass the test the following results must display:

AA = 00
BB = in the range of 29 through 3F inclusively (hex)
CC = in the range of 3A through 5D inclusively (hex)
DD = in the range of 11 through 1F inclusively (hex)

2. Press Return/Stop to exit the test.

Duplex Feed 1 Test

This test feeds a blank sheet of paper to the duplex paper stop position 1.

To run the Duplex Feed 1 Test:

1. Select Duplex Feed 1 from the Duplex Test menu.
 - The power indicator blinks while the paper is feeding.
 - "Duplex Feed 1/Feeding" message displays while the paper is feeding through the printer.
 - "Duplex Feed 1/Clear Paper" message displays when the paper reaches paper stop position 1 and the power indicator turns on solid.

Duplex Feed 2 Test

This test feeds a blank sheet of paper to the duplex paper stop position 2.

To run the Duplex Feed 2 Test:

1. Select Duplex Feed 2 from the Duplex Test menu.
 - The power indicator blinks while the paper is feeding.
 - "Duplex Feed 2/Feeding" message displays while the paper is feeding through the printer.
 - "Duplex Feed 2/Clear Paper" message displays when the paper reaches the duplex paper stop position 2 and the power indicator turns on solid.

Error Log

Viewing the Error Log

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

To view the Error Log:

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

Clearing the Error Log

To clear the Error Log:

1. Select Clear Log from the Error Log menu.
2. Select "YES" to clear the Error Log or "NO" to exit the Clear Log menu.
 - If "YES" is selected, the Empty Error Log displays on the screen.
3. Press Return/Stop to exit the Clear Log menu.

Hardware Tests

The following Hardware Tests can be selected from this menu:

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

LCD Test

To run the LCD Test:

1. Select LCD Test from the Diagnostic menu.
 - The LCD test continually executes the LCD display test.
2. Press Return/Stop to cancel the test.

Button Test

To run the Button Test:

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

SDRAM Memory Test

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

To run the SDRAM Memory Test:

1. Select SDRAM Memory Test from the menu.
 - The power indicator blinks indicating the test is in progress.
2. Press Return/Stop to exit the test.

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

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

Once the maximum pass count or fail count is reached, the test is stopped, the power indicator is turned on solid, and the final results display. If the test fails, the message SDRAM Error, displays for approximately three seconds and the failure count increases by 1.

ROM Memory Test

The ROM Memory Test is used to check the validity of the controller board code and fonts.

To run the ROM Memory Test:

1. Select ROM Memory Test from the menu. P and F represent the same numbers for DRAM.
 - The power indicator blinks indicating the test is in process.
The test runs continuously.
2. Press Return/Stop to exit the test.

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

ROM Checksum Error
ROM Burst Read Error

Once the maximum pass count or fail count is reached, the test stops with the power indicator on solid. The final results display on the screen.

Parallel Wrap Test

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

To run the Parallel Wrap Test:

1. Disconnect the parallel interface cable and install the wrap plug (P/N 1319128).
2. Select the Parallel Wrap Test from the menu.
 - The power indicator blinks indicating the test is in progress. The test runs continuously until canceled.

Each time the test finishes, the screen updates. If the test passes, the Pass Count increases by 1, however if the test fails, one of the following messages displays for approximately three seconds:

Sync Busy Error
Byte Interrupt Request Error
Strobe Interrupt Request Error
Init Fail Error
Init Busy Error
Init Rise Error
Host Busy Error
RAM Data FF Error
RAM Data AA Error
RAM Data 00 Error
RAM Data 55 Error
DMA Count Error

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DMA Address Error
DMA Interrupt Error
DMA Memory Error
DMA Background Error
Clear Init Rise Error
False Init Rise Error
Autofeed Rising Interrupt Error
Clear Autofeed Rise Error
False Autofeed Rise Error
Autofeed Falling Interrupt Error
Clear Autofeed Fall Error

Once the maximum count is reached the test stops. The power indicator goes on solid and the final results display.

Press Return/Stop to exit the test.

Serial Wrap Test

This test is used to check the operation of the Serial Port Hardware using a wrap plug. Each signal is tested.

To run the Serial Wrap Test:

1. Disconnect the serial interface cable and install the wrap plug.
2. Select the appropriate Serial Wrap Test from the menu: Serial Wrap, Serial 1 Wrap, Serial 2 Wrap or Serial 3 Wrap. P and F represent the same numbers for DRAM.
 - The power indicator blinks indicating the test is running.
3. This test runs continuously unless canceled by pressing Return/Stop.

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Each time the test finishes, the screen updates with the result. If the test passes, the Pass Count increases by 1, however if the test fails, one of the following failure messages displays for approximately three seconds and the Fail Count increases by 1:

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

Once the maximum count is reached the test stops. The power indicator goes on solid and the final results display.

Press Return/Stop to exit the test.

Input Tray Tests

Input Tray Feed Test

This test lets the servicer observe the paper path as media is feeding through the printer. A blank sheet of paper feeds through the printer as the laser turns off during this test. The only way to observe the paper path is to open the lower front door that is used to access the envelope or multipurpose feeder. The paper is placed in the output bin.

To run the Input Tray Feed Test:

1. Select Input Tray Feed Test from the menu.
2. Select the input source from the sources displayed on the Feed Test menu. All installed sources are listed.
3. Select either Single (feeds one sheet of media from the selected source) or Continuous (continues feeding media from the selected source until Return/Stop is pressed).
4. Press Return/Stop to exit test.

Input Tray Sensor Test

This test is used to determine if the input tray sensors are working correctly.

To run the Input Tray Sensor Test:

1. Select the Sensor Test from the Input Tray Test menu.
 - "Input Tray/Empty=OP/Pass=OP" message displays.
 - EM = Input Tray Empty Sensor
 - LO = Input Tray Paper Low Sensor
 - P = Input Tray Pass Thru Sensor
2. Once this message displays, the servicer can manually actuate each sensor. The tray empty sensor can be actuated by hand, however a sheet of paper can be used to cover the pass through sensor. When the sensor is closed, CL displays, when the sensor is open, OP displays.
3. Press Return/Stop to exit the test.

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The multipurpose tray and the envelope feeder do not have a paper low sensor. The multipurpose tray does not have a pass through sensor.

Output Bin Test - Standard Bin

This test is used to verify if the standard bin sensor is working correctly.

To run the Standard Bin Sensor Test:

1. Select Output Bin Tests from the Diagnostic Menu.
2. Select Output Bin Tests - Sensor Tests.
3. Select Sensor Tests - Standard Bin.
 - “Standard Bin/Full=CL” message displays.

Manually actuate the bin sensor by moving the flag in and out of the sensor. The display indicates OP (open) when the flag is out of the sensor and CL (closed) when the flag is in the sensor.

4. Press Return/Stop to exit the test.

Output Bin Feed Test

Note: If the “Configure Bins” printer setting is link rather than mailbox, the printer selects its own internal bin linking regardless of which output bin is selected for the feed test

This test is to verify that media can be fed to a specific output bin. No information is printed on the media because the printhead is not turned on during this test.

To run the Output Bin Feed Test:

1. Select Feed Test from the Output Bin Test menu.
2. Select the output bin you want the paper to exit into. All output bins installed on the printer are shown on the feed test menu.
3. Select either Single (one sheet of media feeds to the selected output bin) or Continuous (media continues feeding to the selected output bin) until Return/Stop is pressed.
4. Press Return/Stop to exit the test.

Output Bin Sensor Test

This test is used to verify if the output bin sensors are working correctly.

To run the Output Bin Sensor Test:

1. Select Sensor Test from the Output Bin Test menu.
 - "Output Bin/Full=OP/Input=OP" message displays.
 - Full = Output Bins Full Sensor
 - Pass = Output Bins Pass Thru Sensor
2. Once the message displays, the servicer can manually actuate each of the output bin sensors. The bin full sensor can be actuated by hand, however a sheet of paper can be used to cover the bin's pass thru sensor. When the sensor is closed CL displays, and when the sensor is open OP displays.
3. Press Return/Stop to exit the test.

Output Bin X Sensor Test

Output Expander or High Capacity Output Stacker

To run the Output Bin X Sensor tests:

1. Select Output Bin tests from the menu.
2. Select Output Bin tests - Sensor Tests.
3. Select Sensor Tests - Output Bin X.
4. Press Return/Stop to exit the test.

The following is displayed:

Output Bin X

P=OP F=OP NF=CL

P = Pass Thru Sensor

F = BIN FULL Sensor (lower part of dual sensor)

NF = Near Full Sensor (upper part of dual sensor)

Once the message displays, you can manually actuate each of the output bin sensors. For all the sensors except the output level sensor, when the sensor is closed CL displays and when the sensor is open OP displays.

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If the high capacity output stacker is selected then the following is displayed:

HC BIN 1

TP=OP, P=OP, F=OP, NF=OP

IP = high capacity output stacker top position sensor

P = high capacity output stacker passthru sensor

F = high capacity output stacker full sensor

NF = high capacity output stacker near full sensor

If the 5-bin mailbox is selected the following is displayed:

<output bin> (output bin displayed on line 1 = output bin 1, output bin2, output bin3, output bin4 or output bin 5 for the bin selector)

P1 = 5-bin mailbox first passthru sensor

P2 = 5-bin mailbox second passthru sensor

L = EM, indicates 5-bin x empty

L = NL, bin contains media but the bin is not near full on full

L = NF, indicates bin is near full

L = FL, indicates bin is full

Base Sensor Test

This test is used to determine if the sensors located inside the printer are working correctly.

The following sensors can be checked:

Toner Optical Sensor

Input Sensor

Output Sensor (Fuser Exit)

Narrow Media Sensor

Front Door Sensor (Upper Front Cover)

To run the Base Sensor Test:

1. Select the Base Sensor Test.
 - The operator panel displays OP for open and CL for closed.
2. Manually toggle the sensors by hand to verify that each sensor switches from open to closed.

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5-Bin Mailbox Diverter Test

Note: This test checks the operation of each mailbox output diverter. Also if more than one 5-bin mailbox option is installed, the test checks all of the diverters installed on the printer.

When the test is selected from the diagnostic menu the following is displayed:

Diverter Test Running

This is a single test. The test terminates upon completion.

Print Registration

The print registration range is as follows:

Bottom Margin: -20 to +20 Each increment causes approximately .55 mm shift in the bottom margin.

Top Margin: -25 to +25

Left Margin: -25 to +25

Right Margin: -10 to +10

To set Print Registration:

1. Select Registration from the Diagnostic menu.
2. The Top margin sign/value pair blinks. This indicates it is the margin value being changed.
3. To select the margin value to be changed press Select until the margin value pair you want to change is blinking.
4. To change the margin value press either Menu> or <Menu. When the value you want is displayed, press Select to save the value.
5. To exit the Registration menu, press Return.

To verify the margin values are correct you must print the "Quick Test Page" from the registration screen. Press Go to print the test page. While printing the Quick Test Page the "Quick Test Printing" message displays. Once the Quick Test Page completes printing, the Registration screen displays again.

The "Quick Test Page" should be printed on letter or A4 paper.

Printer Setup

Setting the Page Count

This lets the servicer change the page count from the diagnostic menu. This is used whenever the engine board is replaced because this board contains the printer's NVRAM Memory where the page count is stored.

To set the Page Count:

1. Select Page Count from the Diagnostic menu.
 - The current page count displays.
 - The leftmost digit blinks, indicating it is the first digit to be changed.
2. Press either Menu> or <Menu until the value you want displays.
3. Press Select to move to the next digit, press Menu> or <Menu until the value you want displays. Continue with each digit until you set the page count. You can skip any digit by pressing Select.
4. Press Select to save the new page count in NVRAM.
5. Press Return/Stop to exit the Diagnostic menu.

Viewing the Permanent Page Count

The Permanent Page Count can only be viewed and cannot be changed.

To view the Permanent Page Count:

1. Select Permanent Page Count from the menu.
2. Press Return/Stop to exit the Diagnostic menu.

Maintenance Page Count

This counter is reset by the servicer after a “80 Scheduled Maintenance” message displays (250K copies) and a maintenance kit is installed.

To view the Maintenance Page Count:

1. Select Maintenance Count Value from the diagnostic menu.
2. Press Return to go to the previous menu.

To reset the Maintenance Page Count to zero:

1. Select Reset Maintenance Count. Pressing Select causes the maintenance page counter to reset to zero.
 - Reset Maintenance Count Saved displays momentarily. When the reset operation is complete, the menu returns to the Printer Setup Reset Maintenance Count screen.

Setting Configuration ID

The configuration ID is used to communicate information about certain areas of the printer that cannot be determined using hardware sensors. The Configuration ID is originally set at the factory when the printer is manufactured, however it requires resetting whenever you replace the engine board and can be set on the operator panel. However the Configuration ID is the only diagnostic function displayed until a valid ID is entered.

To set the Configuration ID:

1. Enter the Diagnostic Mode.
2. Select Configuration ID from the Printer Setup menu.
 - The current ID displays on the screen. The Configuration ID is on a label located inside the printer. The label is attached to the top front cover hinge assembly and is visible when the top front cover is open.
 - The leftmost digit blinks indicating that it is the first digit to be changed.
3. To change the value, press either Menu> or <Menu until the value you want is reached. Press Select to move to the next digit, or press Select again to skip a digit. Change each digit as required. When the last digit is changed, press Select to

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validate the Configuration ID. If the ID is invalid then "INVALID ID" message displays on Line 2 before the ID redisplay. You have to reenter the Configuration ID until a valid ID is verified. If the ID is valid then the ID is saved in NVRAM and the printer automatically PORs to activate the new setting.

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

Restore EP Factory Defaults

To restore each of the printer settings contained in the EP Setup menu to their factory default value select Restore from the menu. To exit the menu without restoring the settings to the factory default values, select Do Not Restore. Sometimes this is used to help correct print quality problems.

Fuser Temperature

This adjustment can be used to help solve some customer problems with paper curl on low grade papers and or problems with letter heads on some types of media.

The fuser temperature can be adjusted as follows:

- NORMAL
- LOWER
- LOWEST

Warm Up Time

You can change the amount of time the printer warms up before allowing pages to print by changing this setting from 0 to 5. The factory sets the warm up at 0 or no warm up time. This time period allows the backup roll to heat up and helps reduce curl in some environments.

Transfer

The transfer can be adjusted as follows:

- LOW
- MEDIUM
- HIGH

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Print Contrast

The print contrast setting controls the developer voltage offset.

The print contrast can be adjusted as follows:

- LOW
- MEDIUM
- HIGH

Charge Roll

The charge roll can be adjusted as follows:

- LOW
- MEDIUM
- HIGH

Print Tests

The purpose of the diagnostic Print Tests is to verify that the printer can print on media from each of the installed input options. Each of the installed options is listed in the following order in the menu:

Tray 1
Tray 2 (if installed)
Tray 3 (if installed)
Tray 4 (if installed)
Tray 5 (if installed)
Multipurpose Feeder (if installed)
Envelope Feeder (if installed)

For each input source selected you have the following choice:

- Single (prints the Print Test Page once)
- Continuous (continue printing the Print Test Page until Return or Stop is pressed).

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The contents of the Print Test Page varies depending on the media installed in the selected input source.

Note: The Print Test Page always prints on one side of the paper, regardless of the duplex setting or the presence of a duplex option.

If a source is selected that contains envelopes, an envelope test pattern is printed. If continuous is selected, the test pattern is printed only on the first envelope.

To run the Print Test Page:

1. Select Print Tests from the Diagnostic menu.
2. Select the media source.
3. Select Single or Continuous.
 - If single is selected no buttons are active during printing.
 - If continuous is selected, Return or Stop can be selected to cancel the test.

Check each Test Page from each source to assist in Print Quality and Paper Feed problems.

Print Quality Test Pages

The purpose of this diagnostic function is to allow printing of the print quality test pages with the toner cartridge lockout function disabled. The print quality test consists of three pages. Page one contains a mixture of graphics and text. Pages two and three only contain graphics. If duplex is turned On, the pages are duplexed, otherwise the pages are printed on one side. The Print Quality Test pages are printed in English and must always be printed on letter, legal or A4 paper.

Note: The print quality test pages can also be printed from the configuration menu, however a cartridge must be installed with a machine class ID matching the machine class ID stored in NVRAM. Some diagnostic information may be printed on the pages when printing from this menu.

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To run the Print Quality Test Pages:

1. Turn the printer off.
2. Press and hold Select and Return.
3. Turn on the printer.
4. Release the buttons once Performing the Self Test displays.
5. The printer performs its normal POR cycle then print one copy of the Print Quality Test pages. If you want more than one copy, perform these steps again.

The following is printed on page 1.

- Diagnostic EP Setup:
 - fuser temperature, warm up time, transfer, print contrast and charge roll settings.
- Contents of the Diagnostic Error Log.
- Printer configuration information:
 - printer serial number, controller code level, engine code level, operator panel code level, smart option code levels, font versions, and so on.
- Values for the Quality Menu settings used to print the pages.

Printing Menu Settings Page

Note: This test page must be printed on letter, legal or A4 paper.

To print the Menu Settings Page:

1. Select the TESTS MENU.
2. Select Print Menus from the TESTS MENU.

The page contains the following information:

- A list of all the printer settings contained in the control panel menus and their values.
- A list of the installed options and features such as RAM memory SIMMs, optional input paper trays, envelope feeder, duplexer, output bins, flash or disk.
- Printer information such as serial number, page count, installed RAM, engine code level, RIP code level, envelope feeder code level, tray 1-5 code levels, output bin 1-3 code levels, control panel code levels, font ROM version and SRAM availability.

Autocompensator Operation

The autocompensator is a paper pick device that generates its own normal force. This force generation is inherent in the fundamental design of the pick arm. If light media is used, it picks very gently. If a heavy media is used, it picks very aggressively. No customer adjustments are necessary, therefore no special trays are needed for card stock or labels.

The gearing in the arm is designed so the input torque from the motor produces a movement about the pivot of the arm. This movement produces a downward force at the pick rolls. The friction between the pick roll and the paper produces a frictional locking condition. If the paper is physically held and not allowed to feed, then the motor stalls. Slippage between the roll and the paper is theoretically impossible. When the motor is energized the pick rolls are driven down into the stack increasing the normal force and drive force until the bending strength of the paper is overcome and the paper bends and moves up the dam. Once this critical threshold is achieved the normal force remains at a level just high enough to reliably feed the paper. Rather than having a fixed spring force for feeding all weights of paper like the D-roll, this device has its own mechanical logic for producing only enough pick energy to feed a single sheet of paper regardless of its stiffness.

High normal force is one of the most significant contributors to double feeding paper. The pick arm is counter balanced by an extension spring located on the pick arm to reduce weight in the rest state. This spring is factory set to exert no more than ten to fifteen grams on the stack. This is as light as can be realistically set and always guarantee there is some force to start the autocompensating phenomena. This spring is not to be considered an adjustment for feeding problems unless it is obvious that the pick arm cannot fall all the way down to the bottom of the tray or has come loose.

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Poor gear efficiency can cause the arm to generate higher normal forces. If the pick assembly is noisy, replacement may be required.

The arm must pivot freely through its full range of motion. On 500 sheet trays there are wrap springs located on the pivot arbors of the arm. These springs aid to prevent the arm from bouncing. If the arm appears to be binding or sticky near the bottom of the tray these springs may be the problem. Reducing the tension on the counterbalance spring may be used as a temporary fix to get additional weight at bottom, until the pick assembly can be replaced. However, the counterbalance spring is not to be considered an adjustment for feeding problems.

Autoconnect System, Paper Tray Options, Envelope Feeder and Output Expander Operations

Electrical

Autoconnect Cabling and Connectors

The printer options make electrical connection automatically or autoconnects requiring no external cables when the option is mechanically installed under the printer. Communication between the option and the base printer stops when you remove an option located above or below the printer. The printer no longer recognizes the option and deletes associated messages. Each installed option below the base printer provides an electrical autoconnect to the option attached below it. The output expander option attached above the base printer provides power to the option above it. We do not recommend to attach or "Hot Plug" any options with the base printer power turned On.

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Duplex Option

The duplex option interface is a six pin autoconnector that provides a +24 V dc, +24 V dc return, serial interface transmit signal, serial interface receive signal and two ground pins. The duplex option receives the +24 V dc from the base printer for the duplex motors and also converts the voltage to +5 V dc for duplex electronics.

Duplex chassis grounding is provided from the printer to the duplex option through a ground spring attached to the frame and base of the printer. The ground connection is automatically made when the option is installed below the printer.

The paper input sensor is located in the rear of the duplex unit under the input paper guide. The rear cover open switch is located on the rear cover assembly. The paper exit sensor is located on the left frame assembly. The jam removal tray open switch is located at the end of the left frame assembly. There are no switches in the level 2 duplex option.

Option Microcode

The options are “Smart Options” or options that have a system board. The option system board has a microprocessor that controls the option mechanism. A software architecture is provided that controls the option and communicates information such as paper path status, sensor or switch status, motor status and so on to the base printer.

Fuser Operation

Hot Roll Fuser

The hot roll fuser in the Optra T printer is made up of two primary assemblies. The first assembly is the top fuser cover which contains the thermistor/cable, thermal fuse, cable assembly, left and right lamp brackets and cover. This is a complete assembly and the parts cannot be individually replaced as in previous Lexmark laser printers.

The thermal fuse (two fuses in series) protects the fuser assembly and surrounding parts from ignition in the event of a failure in the fuser control circuitry by opening the AC circuit to the lamp. The thermistor assembly is designed to keep the temperature of the fuser hot roll within a predetermined temperature by being in contact with the fuser hot roll and changes resistance as the temperature of the hot roll increases. The thermistor resistance changes from approximately 150K ohms to approximately 260K ohms as the temperature of the fuser hot roll increases. The thermistor is connected to the fuser control board connector J2-1 and J2-2 and from J2 to J1-2 and J1-3 on the fuser control board to J2-6 and J2-7 on the engine board. J2-6 (TEMPIN+) and J2-7 (TEMPIN-) are connected to module PLCC U9. U9 monitors the change in thermistor resistance and sends a signal (HEATON) from J20-A25 through the interconnect board to CN3-9 on the LVPS to signal the triac to turn the fuser lamp On or Off to maintain the correct fuser temperature.

The voltage drop across the thermistor is proportional to the fuser temperature and varies from approximately 2.0 V dc (cold) to 2.3 V dc (warm during idle) to approximately 2.7 V dc during continuous printing. These voltages are assuming the fuser temperature is set to normal. The HEATON signal from CN3-9 varies from 0 V dc (lamp On) to +5 V dc (lamp Off) and is connected to the cathode of an Opto triac to control the fuser lamp. The second part of the assembly is the fuser frame which contains the hot roll, backup roll, and associated parts as well as the paper exit guide assembly, narrow media sensor, fuser control board (which has the exit sensor mounted on the board) and the envelope conditioner solenoid.

Belt Fuser

The belt fuser utilizes a ceramic heating element inside a cylindrically formed belt as the heating element of the fusing process. The contact area of the belt is heated to fusing temperature. The media passes between the belt and a back-up roller, fusing the image to the media. The media then passes on through the decurl rollers to the paper exit.

Unlike the hot roll fuser, the belt fuser does not require detack fingers to remove the paper from the heated surface (belt). This is because the contact portion of the belt, which is cylindrically shaped, gives as the fusing process occurs. This flattens the belt contact surface. The result is a sharp detack angle between the belt and the exiting media. This eliminates the need for detack fingers.

The flattening of the belt in combination with the reduced pressure between the belt and the back-up roller allows the belt fuser to print on many different types of media without requiring a solenoid (thumper) to keep the media from wrinkling. A specific type of media that is affected is an envelope.

The time for the first copy to print is constant for the belt fuser no matter what state the machine is in, warm or cold. This is a result of the belt being able to reach fusing temperature very rapidly. This happens due to the small area that must be heated. The ceramic slab heats a small portion of the belt that is directly involved in the fusing process. This is in sharp contrast to the hot roll, which heats the entire roll to fusing temperature.

Paper Feed Jams

Paper Jams - Base Printer

Error Message 200 - Paper Jam - Remove Cartridge

This message indicates that paper is jammed at the printer input sensor. This condition can be caused by the paper jamming prior to activating the input sensor flag, the sensor not detecting paper over the sensor or paper arriving at the sensor too late.

Note: A defective engine board or printhead can also cause a 200-Paper Jam message to occur prior to the paper reaching the input sensor flag. This error can display due to a problem with the HSYSC signal to or in the printhead. Use the sub error code table to assist in isolating a 200 paper jam message.

Error Message 201 - Paper Jam - Remove Cartridge

This message indicates the paper is jammed between the printer's input and exit sensors. This condition can be caused by the paper exiting the input sensor too late or jamming in the fuser assembly prior to activating the exit sensor flag in time or not at all.

Error Message 202 - Paper Jam - Open Rear Door

This message indicates the paper is jammed at the printer exit sensor. This can be caused by the paper arriving at the sensor too late, the paper is jammed in the fuser assembly or is jammed exiting the fuser assembly in the redrive assembly or the exit sensor flag is not operating correctly.

Paper Jams - Options

Error Message 230 Paper Jam - Check Duplex

The paper is most likely jammed in the duplex unit, however the paper can also be jammed in the redrive at the input to the duplex option. The redrive assembly may not be correctly installed or locked in position or the duplex link is bent and not aligned properly to allow paper to feed correctly into the duplex option.

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Error Message 24x (x=Tray 1 through 5) Paper Jam Check Tray x.

The paper has not cleared the pass through sensor or reached the pass through sensor of the option above tray x.

Error Message 250 - Paper Jam - Check MP Feeder

The paper is jammed in the multipurpose feeder and has not reached the base machine input sensor or has not reached the input sensor in time.

Error Message 260 Paper Jam - Check Envelope Feeder

An envelope is jammed in the envelope feeder or has not reached the base machine input sensor.

Error Message 27x Paper Jam - Check Bin x.

Paper is jammed in output bin x (X=bin 1 thru 3). Generally this message appears when the paper has not cleared the exit sensor in time, has jammed in the redrive assembly or has not fed into the output bin selected.

4. Repair Information

WARNING: 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.

Adjustment Procedures

Duplex Motor Drive Belts

Do the duplex motor belt and drive belt adjustment whenever you remove or replace the duplex motor or loosen the motor or drive belt idler pulley.

Service Tip: Excessive belt tension can result in stalling the duplex motor. Too little belt tension can result in belt slippage.

To do the duplex drive belt adjustment:

1. Do the removal procedure “**Duplex Front Cover Door**” on **page 4-19** to access the drive belt idler pulley.
2. Loosen the idler pulley mounting screw and position the idler to provide 3 mm (± 5 mm) drive belt deflection.
3. Tighten the idler pulley mounting screw being careful to maintain the adjustment.
4. Reassemble the duplex unit.

To do the duplex motor belt adjustment:

1. Do the removal procedure “**Duplex Motor**” on **page 4-20** to access the motor mounting screws but do not remove the motor.
2. Loosen the screw in the elongated adjustment slot and position the motor to provide 3 mm (± 5 mm) motor belt deflection.
3. Tighten both mounting screws being careful to maintain the adjustment.
4. Reassemble the duplex unit.

Fuser Solenoid Adjustment

Perform the fuser solenoid adjustment whenever you replace the fuser solenoid. Adjust the fuser solenoid while installed in the printer. Adjust the screw on the eccentric mounted on the solenoid housing to provide an air gap between the rear of the solenoid stator and the solenoid armature.

Printer Models	Solenoid Air Gap
010/212/01n/21n	4.0 mm
414/616/41n/61n	4.5 mm

Gap Adjustment

The gap adjustment allows you to increase the minimum gap between sheets of paper as they are fed through the printer. This adjustment does not reduce the printer's overall performance such as pages per minute but can help in reducing the amount of curl of some printed media thus improving media stacking in the output bin.

1. Enter the Diagnostic Mode
2. Select EP SETUP from the Diagnostic Menu.
3. Select GAP ADJUST
4. The range of the GAP adjustment is 0 to 255. Adjust the gap setting by using the Menu < > button to select the value. If GAP=0 displays, it indicates a factory setting to minimum gap. Select a value and run several copies of the media that displays a curl problem. It may take several tries before improvement is noticed.

Note: This setting has no effect when printing in duplex mode.

Printhead Assembly Adjustment

Do the printhead assembly adjustment whenever you remove or replace the printhead assembly or loosen the mounting screws.

Install the new printhead with the three mounting screws centered in the slots in the printhead frame assembly. Leave the screws loose enough to allow the printhead assembly to move from side to side within the slots. It is necessary to perform a registration adjustment before locking down the three printhead mounting screws.

To perform the registration adjustment:

1. Turn the printer off.
2. Press and hold: Return and Go.
3. Turn the printer On and release the buttons when "Performing Self Test" displays.
4. Select Registration from the menu.
5. Select Quick Test Page. The test page should only be printed on letter or A4 paper from Tray 1. The Quick Test Page consists of alignment diamonds, horizontal lines that can be used for skew adjustment, page count setting, printer serial number code levels and print registration settings.
6. Check the Quick Test Page for any sign of skew by checking the diamonds at the top left and top right of the test page for equal distance from the top of the page. If any adjustment is necessary, adjust the left or right printhead mounting screws and check the skew again by running another Quick Test Page. This procedure may take two or three attempts before you get satisfactory results.
7. When you have the correct adjustment, gently tighten the printhead mounting screws being careful not to move the printhead assembly.

Paper Alignment Assembly Adjustment

Do the alignment assembly adjustment whenever you replace the alignment assembly. Always print a copy of the Quick Test Page before making any adjustments to the alignment assembly reference adjustment screw. When replacing the alignment assembly, it is necessary to back the reference adjustment screw out far enough to remove the old assembly and install the new one.

If you are replacing the alignment assembly go to step a. If you are only adjusting the reference adjustment screw go to step b.

- a. Print a copy of the Quick Test Page and check the margin adjustments printed on the test page. These settings should be within the range specified in **“Print Registration” on page 3-19.**

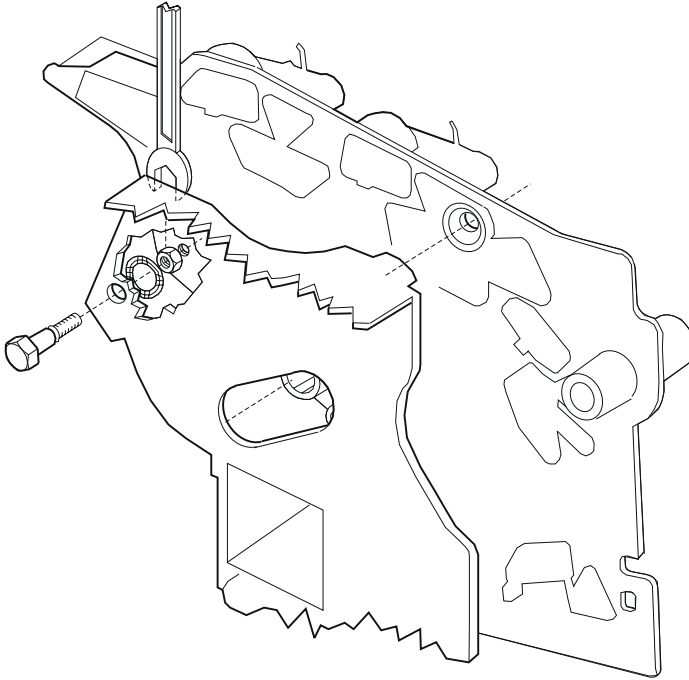
Do the reference adjustment if you are sure the margins are set correctly.

1. Loosen the locknut on the inside rear of the alignment assembly.
2. Remove the two screws holding the alignment assembly to the left side frame.
3. Back the reference adjustment screw out far enough to allow the alignment assembly to be removed from the printer. It is not necessary to completely remove the screw.
4. Install the new alignment assembly. Turn the reference screw clockwise with a 7 mm nut driver until it touches the back of the reference plate and tighten the nut with a 5.5 mm wrench.

The reference adjustment screw can be adjusted without loosening the nut. Turn the screw clockwise a few turns and print a copy of the Quick Test Page as you check the diamonds on the left margin. Continue adjusting the screw as you check the results of each adjustment on a new test page until you obtain the results you want.


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- b. Print a copy of the Quick Test Page and check the margin adjustments printed on the test page. These settings should be within the range specified in **“Print Registration” on page 3-19**. The reference screw can be adjusted without loosening the locknut. Turn the screw a few turns and print a copy of the Quick Test Page as you check the diamonds on the left margin. Continue adjusting the screw as you check the results of each adjustment on a new test page until you obtain the results you want.



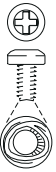


Screw Identification Table

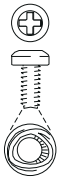
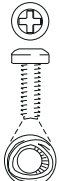
The following table contains screw types, locations, and quantities necessary to service the printer. Each screw callout in the removal procedure graphic displays the screw reference number listed in the table. Pay careful attention to each screw type location when doing removals. You must install the correct screw type in each location during reassembly.

Reference Number	Screw Type	Location	Purpose	Qty
102 	M3.5x8 mm Thread Cutting	right side frame to center pan	attach	1
		toner level sensor	mounting	1
		charge roll	mounting	1
		main drive gearbox	mounting	3
		EP module to left and right side frame	attach	9
		developer drive assembly	mounting	2
		stacker duct to frame	mounting	2
		cartridge hold down assembly	mounting	2
		MPT deflector	mounting	2
		interconnect board shield ground	attach	2
		engine board shield to frame	attach	1
		laser cover	mounting	4
		deflector	mounting	2

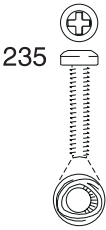
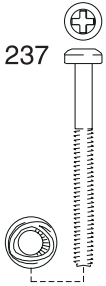
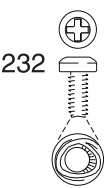
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Reference Number	Screw Type	Location	Purpose	Qty
102 	M3.5x8 mm Thread Cutting	spring	mounting	1
		controller board	mounting (front)	2
		integrated tray ITC board	mounting	2
		stacker support to right side frame	attach	2
104 	M3.5x12 mm Thread Cutting	engine board shield to left frame	attach	1
		paper alignment assembly	mounting	2
		toner cartridge guide track	mounting	2
		left side frame to center pan	attach	3
		right side frame to center pan	attach	2
		deflector	mounting	2
201 	M3x5 mm Taptite	INA cover (2 screws per cover)	attach	6
		interconnect board	mounting	5

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Reference Number	Screw Type	Location	Purpose	Qty
202 	M3x6 mm Taprite	outer shield	mounting	6
		inner redrive deflector	mounting	2
		interconnect board to center pan	mounting	2
		engine board (bottom holes)	mounting	2
		controller board to interconnect board ground	attach	2
		controller board to inner shield	mounting	2
		controller board (back)	mounting	2
		engine board to interconnect shield ground	attach	1
		lower stacker duct	mounting	1
		ground cables to ground (center pan - front)	attach	1
		cable clip (main drive gearbox, BTM)	mounting	2
		fuser screw	mounting	7
203 	M3x8 mm Taprite	LVPS	mounting	2
		auto compensator hanger bracket	mounting	1

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Reference Number	Screw Type	Location	Purpose	Qty
235 	M3x12 mm Taptite Panhead	HVPS board	mounting	1
237 	M3x28 mm Taptite Panhead	developer drive ground (bottom hole)	attach	1
232 	M3x6 mm Taptite Panhead	stacker duct	mounting	1
		engine board	mounting	2
		controller to shield	mounting	2
		controller board	mounting	2
		in pan	mounting	2
		shield ground	attach	1
		LVPS	mounting	2
		fuser cover	mounting	2
		cable clip	mounting	2
		outer shield	mounting	6
		ina cover	mounting	4

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Reference Number	Screw Type	Location	Purpose	Qty
323	M3.5x8 mm Plastite Thread Forming	autocompensator	mounting	3
324	M3.5x10 mm Plastite Thread Forming	right side cover	mounting	1
		right side frame to pan	attach	3
		left side frame to pan	attach	1
397	M3x6 mm SEMS Machine Screw with washer	fuser board	mounting	1
425	M3.5x12 mm Plastite Thread Forming with washer	printhead to EP frame	mounting	3

Removal Procedures

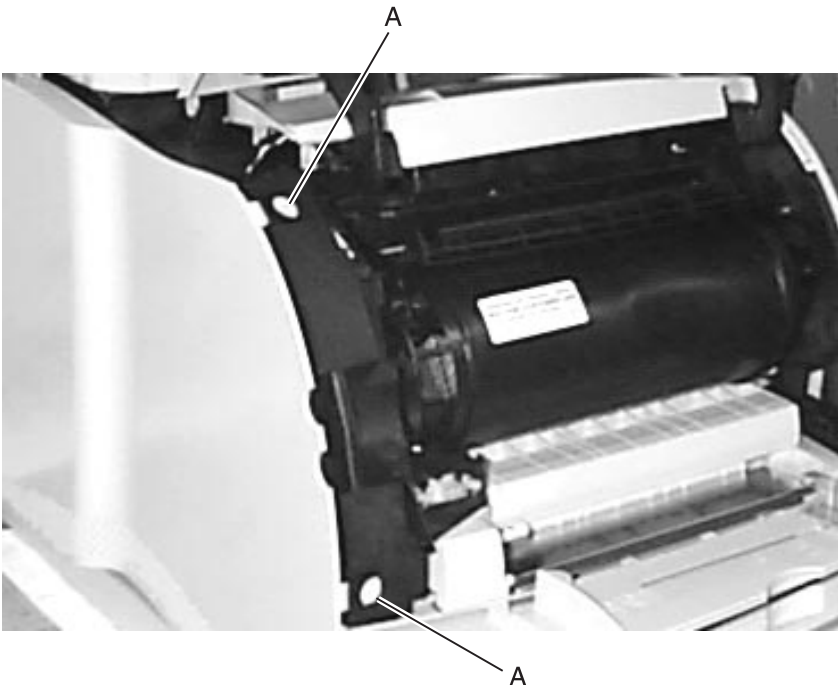
CAUTION: Remove the power cord from the printer or wall outlet before you connect or disconnect any cable or electronic board or assembly for personal safety and to prevent damage to the printer. Use the hand grips on the side of the printer. Make sure your fingers are not under the printer when you lift or set the printer down.

Note: Some removal procedures require removing cable ties. You must replace cable ties during reassembly to avoid pinching wires, obstructing the paper path, or restricting mechanical movement.

Covers

Left Door

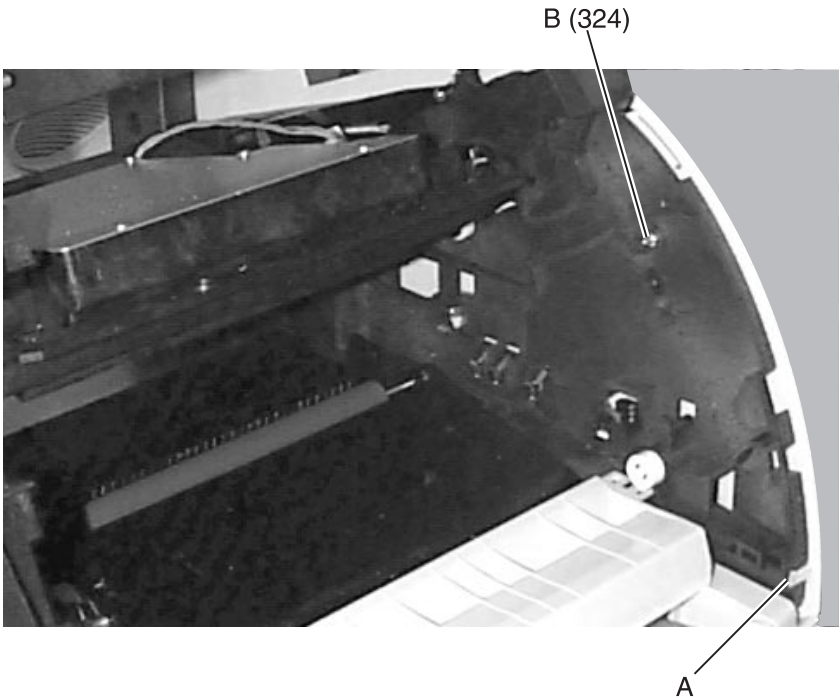
1. Open the upper and bottom front covers.
1. Press the two left door latch buttons (A) and open the left door.
2. Release the left door from the rear hinges and remove the door.



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Right Cover

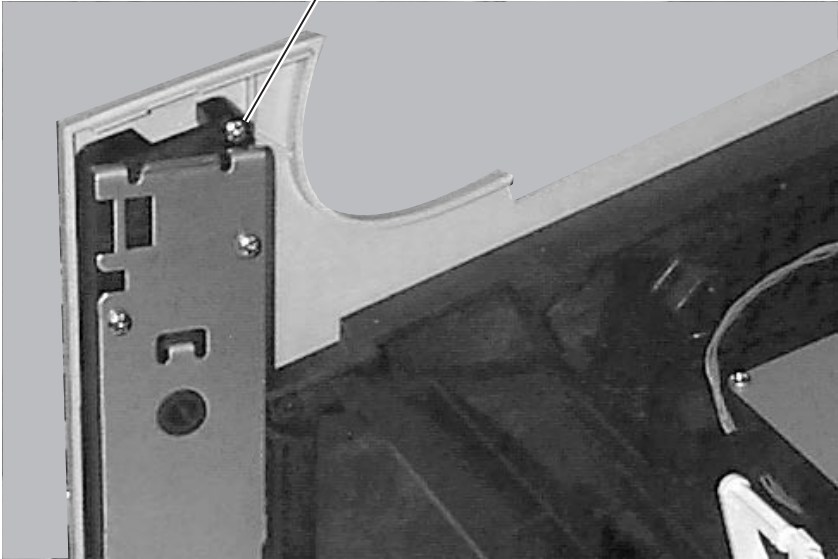
1. Open the upper and bottom front covers.
2. Release the cover latch (A) and remove the right cover mounting screw (B).



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3. Remove the redrive assembly.
4. Remove the right side cover mounting screw (B).
5. Remove the right side cover.

B (324)

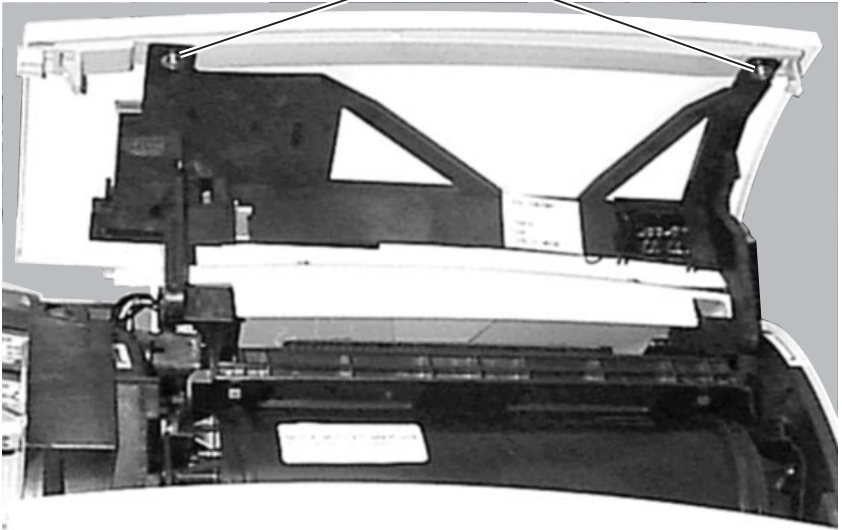


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Upper Front Cover

1. Raise the upper front cover.
2. Remove the upper front cover mounting screws (A).
3. Rotate the cover upward to allow the rear cover hinges to clear the mounting slots and remove the cover.

A (323)

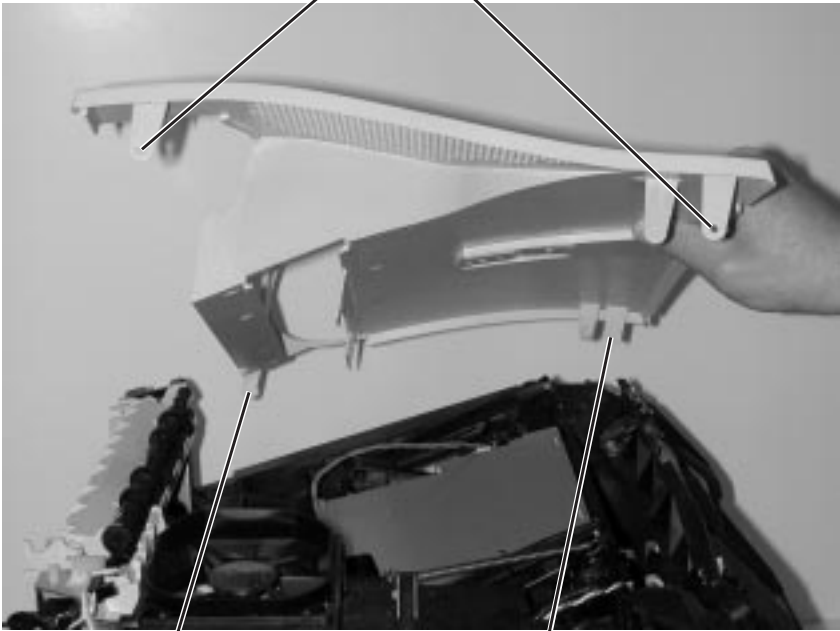


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Laser Assembly Cover

1. Remove the left door.
2. Remove the right cover.
3. Remove the rear paper deflector.
4. Press the fuser wiper cover latch and remove the cover.
5. Remove the paper full sensor flag assembly from the mounting bracket.
6. Remove the mounting screws (A) and remove the cover.

A (102)



A (102)

A (102)

Center Pan Assembly

1. Remove the left and right side frames.
2. Remove the pan assembly.

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Controller Board

1. Remove the inner EMC shield.
2. Remove the controller board mounting screw (A).
3. Remove the controller board mounting screws (C).
4. Remove the controller board parallel port mounting screws (B).
5. Remove the serial port mounting screws if present.
6. Remove the controller board.

