Service Manual

Lexmark Z51 Color Jetprinter™

4098-001

- Table of Contents
- Start Diagnostics
- Safety and Notices
- Trademarks
- Index

LEXMARK™

Lexmark and Lexmark with diamond design are trademarks of Lexmark International, Inc., registered in the United States and/or other countries.

First Edition (March 1999)

Carrier Transport Motor Removal 4-4
Encoder Sensor / Temperature Sensor Removal 4-4
Encoder Strip Removal 4-4
Front Cover Removal 4-5
Gear Plate Assembly Removal 4-5
Gutter Pad / Maintenance Station Removal 4-5
Maintenance Wipers and Caps Removal 4-5
Mid Frame / Large Feed Roller / Exit Roller Removal 4-6
Operator Panel Removal 4-6
Paper Feed Motor Removal 4-7
Power / Parallel / USB Board Removal 4-7
Printhead Cable and Cradle Removal 4-8
Rear Cover Removal 4-8
Sheet Feeder Removal 4-9
Small Feed Rollers 4-9
Small Feed Roller Holder / EOF Removal 4-9
Star Wheel Roller Assembly Removal 4-9
System Board Removal 4-10

Connector Locations 5-1

Connector Locations (cont.) 5-2

Preventive Maintenance 6-1

Lubrication Specifications 6-1

Parts Catalog 7-1

How to Use This Parts Catalog 7-1
Assembly 1: Covers 7-2
Assembly 2: Frames 7-4
Assembly 3: Paper Feed 7-6
Assembly 4: Electronics 7-10
Assembly 5: Carrier 7-12
Assembly 6: Carrier Transport 7-14
Assembly 7: Maintenance Station 7-16

Index X-1

Preface

This manual describes the Lexmark Z51 Color Jetprinter (4098-001) and contains maintenance procedures for service personnel. It is divided into the following chapters:

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

Safety Information

- This product is designed, tested and approved to meet strict global safety standards with the use of specific Lexmark components. The safety features of some parts may not always be obvious. Lexmark is not responsible for the use of other replacement parts.
- The maintenance information for this product has been prepared for use by a professional service person and is not intended to be used by others.
- There may be an increased risk of electric shock and personal injury during disassembly and servicing of this product. Professional service personnel should understand this and take necessary precautions.

Consignes de Sécurité

- Ce produit a été conçu, testé et approuvé pour respecter les normes strictes de sécurité globale lors de l'utilisation de composants Lexmark spécifiques. Les caractéristiques de sécurité de certains éléments ne sont pas toujours évidentes. Lexmark ne peut être tenu responsable de l'utilisation d'autres pièces de rechange.
- Les consignes d'entretien et de réparation de ce produit s'adressent uniquement à un personnel de maintenance qualifié.
- Le démontage et l'entretien de ce produit pouvant présenter certains risques électriques, le personnel d'entretien qualifié devra prendre toutes les précautions nécessaires.

Norme di sicurezza

- Il prodotto è stato progettato, testato e approvato in conformità a severi standard di sicurezza e per l'utilizzo con componenti Lexmark specifici. Le caratteristiche di sicurezza di alcune parti non sempre sono di immediata comprensione. Lexmark non è responsabile per l'utilizzo di parti di ricambio di altri produttori.
- Le informazioni riguardanti la manutenzione di questo prodotto sono indirizzate soltanto al personale di assistenza autorizzato.
- Durante lo smontaggio e la manutenzione di questo prodotto, il rischio di subire scosse elettriche e danni alla persona è più elevato. Il personale di assistenza autorizzato, deve, quindi, adottare le precauzioni necessarie.

Sicherheitshinweise

- Dieses Produkt und die zugehörigen Komponenten wurden entworfen und getestet, um beim Einsatz die weltweit gültigen Sicherheitsanforderungen zu erfüllen. Die sicherheitsrelevanten Funktionen der Bauteile und Optionen sind nicht immer offensichtlich. Sofern Teile eingesetzt werden, die nicht von Lexmark sind, wird von Lexmark keinerlei Verantwortung oder Haftung für dieses Produkt übernommen.
- Die Wartungsinformationen für dieses Produkt sind ausschließlich für die Verwendung durch einen Wartungsfachmann bestimmt.
- Während des Auseinandernehmens und der Wartung des Geräts besteht ein zusätzliches Risiko eines elektrischen Schlags und körperlicher Verletzung. Das zuständige Fachpersonal sollte entsprechende Vorsichtsmaßnahmen treffen.

Pautas de Seguridad

- Este producto se ha diseñado, verificado y aprobado para cumplir los más estrictos estándares de seguridad global usando los componentes específicos de Lexmark. Puede que las características de seguridad de algunas piezas no sean siempre evidentes. Lexmark no se hace responsable del uso de otras piezas de recambio.
- La información sobre el mantenimiento de este producto está dirigida exclusivamente al personal cualificado de mantenimiento.
- Existe mayor riesgo de descarga eléctrica y de daños personales durante el desmontaje y la reparación de la máquina. El personal cualificado debe ser consciente de este peligro y tomar las precauciones necesarias.

Informações de Segurança

- Este produto foi concebido, testado e aprovado para satisfazer os padrões globais de segurança na utilização de componentes específicos da Lexmark. As funções de segurança de alguns dos componentes podem não ser sempre óbvias. A Lexmark não é responsável pela utilização de outros componentes de substituição.
- As informações de segurança relativas a este produto destinam-se a profissionais destes serviços e não devem ser utilizadas por outras pessoas.
- Risco de choques eléctricos e ferimentos graves durante a desmontagem e manutenção deste produto. Os profissionais destes serviços devem estar avisados deste facto e tomar os cuidados necessários.

Informació de Seguretat

- Aquest producte està dissenyat, comprovat i aprovat per tal d'acomplir les estrictes normes de seguretat globals amb la utililització 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'us 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.

안전 사항

- 본 제품에 관한 유지 보수 설명서는 전문 서비스 기술자 용으로 작성된 것이므로 비 전문가는 사용할 수 없습니다.
- 본제품을 해체하거나 정비할 경우 전기적인 충격을 받거나 상처를 입을 위험이 커집니다. 전문 서비스 기술자는 이 사실을 숙지하고 필요한 예방 조치를 취하도록 하십시오.
- 일부 부품의 안전성은 항상 보장되지 않습니다. 따라서, 교체 부품은 원래 부품과 같거나 동등한 특성을 가진 제품을 사용하여야합니다.

安全资讯

- 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。
- 有些零件的安全功能可能不明显。因此，所替换零件的性能一定要与原有的零件一致。

1. General Information

The Lexmark Z51 Color Jetprinter™ is an electro-mechanical printer that creates characters and graphics by composing programmed patterns of ink dots using a printhead and liquid ink. The printhead uses small heater plates and nozzles to control ink flow and the formation of characters on the print media. The printhead assembly and ink supply are combined into a single-unit, print cartridge, available as a customer replaceable supply item. Dual printheads provide color and true black printing without changing printheads. The number and size of inkjets or nozzles, in the printhead, determines the overall quality and capability of the printer. The black cartridge has a total of 208 nozzles and installs on the right. The color cartridge has a total of 192 nozzles and installs on the left. The printer is capable of printing in two directions from either cartridge.

Operator Panel

Buttons	**Lights**
• Left Button - Power Power On/Off	Left Light • On - Power On • Flashing - Printer Error
Right Button - Paper Feed • Clears a paper jam • Loads paper when paper is out	Right Light - Busy • On - Busy • Flashing - Paper Out/Jam

Maintenance Approach

The diagnostic information in this manual leads you to the correct field replaceable unit (FRU) or part. Use the symptom index, service checks, and diagnostic aids to determine the symptom and repair the failure. Begin with **“Indicator Light Table” on page 2-1**.

After you complete the repair, perform tests as needed to verify the repair.

Abbreviations

EOF	End of Forms
ESD	Electrostatic Discharge
FRU	Field Replaceable Unit
HVPS	High Voltage Power Supply
LVPS	Low Voltage Power Supply
OEM	Original Equipment Manufacturer
V ac	Volts alternating current
V dc	Volts direct current
LIF	Low Insertion Force
USB	Universal Serial Bus
FPC	Flat Printer Cable

2. Diagnostic Information

Start

Service error indications are a series of Power light flashes. There is a pause between each series of flashes. If your printer has an error indicator, locate the series of flashes in the **“Error Indicator Table” on page 2-2**. and take the indicated action. Unplug the printer to clear the error indicator.

The printer also logs the last occurring error. If you think it may have an intermittent error, or the error indicator lights have been cleared, you can retrieve the error:

1. Run the**“Print NVRAM Contents” on page 3-6** The last error appears at the bottom of the page.
2. To capture the next error in the error log, run **“Clear NVRAM” on page 3-5** to clear the error.
3. Run the **“Print Test Page” on page 3-2**.” If no error appears, go to **“Power-On Self Test (POST) Sequence” on page 2-4**.”

Indicator Light Table

Indicator Light	Indicates
Power light on	Machine is on.
Power light on and busy light flashes	Paper jam or paper out.
Power light and busy light flashes	Go to the **“Carrier Transport Service Check,”on page 2-8**.
Both lights on at the same time	Printer is busy or printing.
Power light flashes	See **“Error Indicator Table” on page 2-2**

Error Indicator Table

Number of Power Light Flashes	Service Error (Logged)	Error Name	Error Description	Action
2	**81**	Carrier stall	No carrier emitter signals received, carrier not moving	Go to **"Carrier Transport Service Check" on page 2-8**. Ensure the driver is installed correctly.
3	**93**	Data error	Incorrect data has been sent from the host PC to the printer	Check the system board and cable. If OK, check printhead cables. Replace as needed.
4	**89**	Print incomplete	Carrier stopped before print data all used	Check system board and cable. If OK, check printhead cables. Replace as needed.
6	**64,66 thru 78**	Exception Error	Illegal instruction from microprocessor	Replace system board
7	**65**	Address Error	16/32 bit item on odd address boundary	Replace system board. See**"System Board Removal" on page 4-10**.

Number of Power Light Flashes	Service Error (Logged)	Error Name	Error Description	Action
8	**None**	NVRAM error	Error detected in reading or writing NVRAM	Replace system board. See **"System Board Removal,"on page 4-10**.
9	**79**	Error	xxxxx	Replace system board. See **"System Board Removal" on page 4-10**."
11	**91**	Error	xxxxx	Replace system board
12	**92**	Short error	Short test detected short circuit in printhead	Check and replace printhead and cable as needed. If OK, replace the system board.
13	**94**	Head Select	Install head ID and print command head ID do not match	Replace printheads.
15	**96**	USB error	Error in USB hardware detected or invalid result occurred in USB code	Check system board cable. If OK, check system board and power/ parallel/USB board. Replace as needed.
None	**31,32,33**	Watchdog		No action

Note: There are seven reserved error code power light flashes (**5, 10, 14, and 16**) that have no code names. If any reserved codes are received, unplug and re-plug the printer.

Power-On Self Test (POST) Sequence

Turn the printer on and check for a correct POST operation by observing the following:

1. The power light come on.
2. The carrier moves to the left to wipe the printheads.
3. The carrier moves to the right over the maintenance station and seals the printheads.
4. The paper feed gears turn.
5. All motors stop and the power light stays on.

If your printer completes POST with no errors, go to the **“Symptom Tables” on page 2-6**, locate the symptom and take the indicated action.

If your printer does not complete POST, locate the symptom in the **“POST Symptom Table” on page 2-5** and take the indicated action.

POST Symptom Table

Symptom	Action
No power light and no motors run	Go to the **“Power Service Check” on page 2-13**.
Paper feed gears do not turn	Go to the **“Paper Feed Service Check” on page 2-11**.
Carrier does not move	Go to the **“Carrier Transport Service Check” on page 2-8**.
Carrier slams side frame	Go to the **“Carrier Transport Service Check” on page 2-8**.
No busy light	Replace the operator panel, or the system board.

Symptom Tables

Locate the symptom in the following tables and take the indicated action.

Carrier Transport Problems

Symptom	Action
• No carrier movement • Slow carrier movement • Carrier stops • Carrier slams side frame • Carrier does not move to cartridge load position when opening access door	Go to the **"Carrier Transport Service Check" on page 2-8**.

Maintenance Station Problems

Symptom	Action
• Fails to cap the printheads • Fails to clean the printheads	Go to the **"Maintenance Station Service Check" on page 2-10**.

Operator Panel Problems

Symptom	Action
• Power or Paper Feed buttons do not operate • Power or Busy lights do not come on	Replace the operator panel, or the system board.

Printer Communication Table

Symptom	Action
• Not able to print Test Page	Check the USB cable and system board cable connections. If OK, replace Power/Parallel/USB board

Paper Feed Problems

Symptom	Action
• Fails to pick paper • Picks more than one sheet of paper • Picks paper but fails to feed • Paper jams • Paper fails to exit • Noisy paper feed	Go to the **"Paper Feed Service Check" on page 2-11**.
Paper skews	Go to the **"Paper Path Service Check,"on page 2-13**.

Power Problems

Symptom	Action
No power in machine, motors do not operate and lights do not come on	Go to the **"Power Service Check,"on page 2-13**.

Print Quality Problems

Symptom	Action
• Voids in characters • Light print • Prints off the page • Blurred print • Carrier moves, but no print • Printhead dries prematurely • Colors print incorrectly • Vertical alignment off	Go to the **"Print Quality Service Check,"on page 2-14**.
• Ink smearing • Vertical streaks on paper • Print lines crowded	Go to the **"Paper Feed Service Check" on page 2-11**.

Service Checks

Carrier Transport Service Check

	FRU	Action
1	System Board	Unplug the printer and disconnect the carrier transport motor connector (J5) from the system board. Plug in the printer and check for approximately +30 V dc between (J5-1) and ground at the system board. If the voltage is incorrect, replace the system board. If the voltage is correct, check for carrier transport motor pins shorted to the housing. If a short is detected, replace the carrier transport motor.
2	Carrier Transport Motor	Check the motor for binds, or loose motor pulley. A noisy or chattering motor or a motor that fails to turn can be caused by: • An open or short in the motor. • An open or short in the motor driver on the system board. • A bind in the carrier transport mechanism. With the carrier transport motor cable disconnected from the system board, check for zero to ten (0 - 10) ohms between pins J5-1 and J5-2 on the motor. If the readings are incorrect, replace the motor.
3	Carrier Guide Shaft	Clean the carrier shaft. Lubricate the shaft and the carrier shaft bearing surfaces with grease (P/N 99A0394)
4	Carrier Transport Belt Idler Pulley Parts Carrier Frame	Check for worn, loose or broken parts. Check for obstructions blocking carrier movement. Lubricate the carrier to carrier frame engagement with grease (P/N 99A0394)

	FRU	Action
5	Encoder Strip Encoder Card Printhead Cable System Board	Check the encoder strip for proper installation. Check the strip for wear, dirt and grease. Be sure the carrier cable is fully seated in connector J10 and the cable is seated in the encoder card. Check the cable for damage. Perform the **"Encoder Sensor Test" on page 3-4**. If you cannot enter the test, replace the system board.
6	Maintenance Station	A problem with the maintenance station can cause carrier movement problems at the right margin. Go to the **"Maintenance Station Service Check,"on page 2-10**.
7	Operator Panel Operator Panel Cable System Board	If the carrier does not move when the access cover is opened, check the actuator arm for binds. If the arm is working correctly, check the operator panel cable is fully seated in J16 at the system board and in the operator panel. Check the continuity of the cable at pins 3 and 4. If the cable is good, replace the system board or operator panel.

Maintenance Station Service Check

The maintenance station has three functions:

1. Wipes the printhead nozzles to clear them of dirt.
2. Provides a place for the printheads to spit all nozzles keeping them clear prior to printing.
3. Seals the printheads when not in use to prevent the nozzles from drying.

	FRU	Action
1	Maintenance Station Assembly	As the carrier moves to the right over the maintenance station, a tab on the bottom of the carrier engages a tab on the sled of the maintenance station causing the caps to rise and seal the printhead. Carrier movement to the left uncaps the printheads. The wipers clean the printhead nozzles as the carrier leaves the maintenance station. The wipers clean the printheads only when the carrier is moving to the left. There should be no wiping action of the printhead nozzles when the carrier is moving to the right. After the printheads are wiped, a tab on the carrier engages a tab on the maintenance station and wipers are lowered. The carrier will then move to the right over the felt pad where they will spit all nozzles. Check the maintenance station for worn or broken parts.
2	Wipers	Worn wipers cause degraded print quality just after a printhead maintenance cleaning. Check for loose or worn wipers.
3	Caps	Worn caps cause the printhead nozzles to dry and clog. Check for loose or worn caps.

Paper Feed Service Check

If your printer does not have paper jam problems, continue with the service check. If your printer does have a paper jam problems, examine it for the following before you begin the service check:

- Check the entire paper path for obstructions.
- Be sure there is not too much paper in the sheet feeder.
- Be sure the correct type of paper is being used.
- Check for static in the paper.

	FRU	Action
1	System Board	With (J12) disconnected and power on, check for +30 V dc between (J12-2) and ground at the system board. If the voltage is not present, check for motor pins shorted to the motor housing. If you find a shorted pin, replace the motor. If you still have a failure, replace the system board.

	FRU	Action
2	Paper Feed Motor	A noisy or chattering motor or a motor that fails to turn, can be caused by: • An open or short in the motor • An open or short in the motor driver on the system board • A bind in the paper feed mechanism With the paper feed motor cable disconnected from the system board, check for 3 to 5 ohms between pin 1 and 4 on the motor cable. If the reading is incorrect, replace the motor. Check for motor pins shorted to the motor housing. If you find a shorted pin, replace the motor. If the failure remains, replace the system board. Although the paper feeds in a forward direction only, the paper feed motor turns in two directions. If the paper feed motor turns in one direction only, replace the system board. Binds in the paper feed motor or gear train can cause intermittent false paper jams. Remove the paper feed motor and check the shaft for binds.
3	Drive Train Assembly	Check for binds in the gear train and paper feed mechanism by removing the paper feed motor and rotating the large gear by hand. If you notice a bind, replace the drive train assembly. Also, check the feed clutch inside the large feed gear.
4	Sheet Feeder	Check all parts inside the sheet feeder for wear or damage. Check the auto compensator pick roller and pick pad for wear. Run the **“Print Test Page” on page 3-2**. A Paper Test Result of greater than 5000 indicates there is a drag on the pick mechanism. Check the pick mechanism for binds. A Paper Test Result = 65535 indicates it failed to pick paper on the first try but was successful on the second try. Check for a dirty pick roller causing it to slip on the print media.
5	Mid Frame Asm	Check the exit and star rollers for wear. Check the exit drive belt for wear.

	FRU	Action
6	Large and Small Feed Rollers	Check the rollers for wear and binds
7	End-of-Forms Flag / Spring System board	Check the end-of-forms flag for binds. Perform the **“End of Forms (EOF) Test” on page 3-3**. If the test fails, replace the system board.

Paper Path Service Check

Examine the printer for the following before you begin this service check:

- Check the entire paper path for obstructions.
- Be sure the paper guide is not worn/ broken and positioned against the paper without binding.
- Be sure the correct type of paper is being used.
- Be sure the printer is installed on a flat surface.

Go to the**“Paper Feed Service Check” on page 2-11**

Power Service Check

	FRU	Action
1	External Power Supply	Plug the external power supply into an outlet. Check for +30 V dc at the connector. If voltage is incorrect, replace the external power supply.
2	Connector Board All Cables Operator Panel Encoder Card System Board	Isolate for a shorted component by disconnecting the component from the printer and plugging in the power supply to see if there is a symptom change. Check the Test Pad readings on the system board. If the +30 V dc is missing, check to make sure the system board cable is fully seated in the connector board and system board. Check the system board cable for continuity. If the +5 V or +3.8 V and +30 V is present, replace the system.

Print Quality Service Check

	FRU	Action
1	Print Cartridge	Be sure the machine contains good print cartridges.
2	Color Print Cartridge Cross Contamination Wiper Print Cartridge	Cross contamination of color inks results in incorrect colors printed, as when green prints for yellow. This problem resolves quickly as the print cartridge is used. If cross contamination occurs, check the maintenance station wiper for damage. Also, check that the printhead nozzle plate is not resealed with tape.
3	Printhead Carrier Assembly	Reseat the printhead cables in the system board. Also, check the print cartridge latches and springs. Latch Spring
4	System Board Printhead Cable Rubber Backer Print Cartridge	Run the **"Print Clean Page" on page 3-6**. Look at the nozzle test pattern (the diagonal line) at the bottom of the page. There should be no breaks in the diagonal lines. Random breaks in the line indicate a problem with the print cartridge. Run the **"Print Test Page,"on page 3-2**. The test patterns at the bottom of the page are checking for opens in any of the lines to the printheads. There should be black and color lines below each of the "A" and "P" columns. If all the black or all the color lines are missing from one or more of the columns, check the following:. • Check the gold-plated dimple contacts at carrier for wear or damage. Remove the cable to check the dimples for wear. • A worn rubber backer results in poor contact with the printhead cable and the print cartridge. • Reset the printhead cable in the system board connectors. • Run the**"Print Test Page,"on page 3-2** again. If the problem is not resolved, replace the system board.

	FRU	Action
5	Encoder Card	Refer to the “Test Page” again. The current Temperature is the ambient temperature at the encoder card in degrees celcius. Printing slows to prevent overheating. Overheating can cause excessive ink flow from the print cartridges. The normal operating range is from 16 to 32 degrees celcius. If the Current Temperature indicates “Thermal Sensor Not Installed”, check the printhead cable connector J10 at the system board. Also, check the connector at the encoder card. If the problem continues, replace the system board.
6	Maintenance Station	Intermittent nozzle failures can be caused by worn parts in the maintenance station. Perform the **“Maintenance Station Service Check,”on page 2-10**, then return to this check.
7	Paper Feed	Ink smudging and smearing can be caused by paper problems or problems in the paper feed area. Check the following: • Correct type of paper is being used. • Paper for curl or wrinkles. • Feed rollers for wear, dirt, or looseness. • Gears for wear or binds. • Paper path for obstructions.
8	Transport	Blurred print and voids can be caused by problems in the transport area. Check the following: • Carrier belt for wear. • Carrier shaft for wear or dirt. • Carrier to carrier frame engagement is not binding. • Idler pulley for wear, damage, looseness. • Encoder strip for wear or dirt.
9	Alignment	Uneven vertical lines can be adjusted by performing the printhead alignment adjustment. The user performs the head to head and printhead alignment adjustment when replacing a print cartridge.

3. Diagnostic Aids

Auto Compensator Assembly Operation

The auto compensator assembly is a paper pick device that generates its own normal force which is inherent in the fundamental design of the pick arm. If light media is used, the auto compensator assembly picks very gently; if a heavy media is used, it picks very aggressively.

The spring pressure of the device is designed so the input torque from the motor causes downward force at the pick roll. The friction between the pick roll and the paper produces a frictional locking condition. The arm must pivot freely through its full range of motion. If the pick assembly is noisy, replace the auto compensator assembly.

Print Test Page

To Run:

- Install known good Color and Black Print Cartridges
- Hold down the Paper Feed button and Power On.
- Continue to hold the Paper Feed button down until POST completes.

What Prints:

- Code Level and Code Level Date.
- Current Ambient Temperature in Degrees Celsius.
- Manufacturer Information.
- Paper Test Result.
- Head Detect and Type Information.
- Color and Black.
  - Nozzle Test Pattern
  - 3 Printhead Purge Lines
  - Nozzle Test Pattern
- Data Lines Test Pattern.

End of Forms (EOF) Test

To Start the Test:

- Unplug power to the printer.
- Remove the rear cover.
- Place a 2 pin jumper on J13.
- Hold down the Power and Paper Feed buttons.
- Plug power to the printer.
- Release the buttons when the Power Light flashes (approximately 5 seconds).

To Test:

- Place a piece of paper in the manual feeder to activate the end-of-forms sensor.
- The Busy Light will come on when the flag is removed from the sensor and will be off when the flag is in the sensor.
- Unplug the printer power or press the Power button to end the test.
- Remove the jumper from J13.

Encoder Sensor Test

To start the Test:

- Unplug power to the printer.
- Remove the rear cover.
- Place a 2 pin jumper on J13
- Hold down the Paper Feed button.
- Plug power to the printer.
- Release the button when both Lights turn off (approximately 5 seconds).

To Test:

- Move the carrier by hand from right to left and left to right.
- The Power Light will flash when the carrier is moved and will be off when the carrier is stationary.
- The Busy Light will be off when the carrier is moved from right to left and on when the carrier is moved from left to right.
- Unplug the printer to exit the test.
- Remove the jumper from J13.

Clear NVRAM

To Run:

- Unplug power to the printer.
- Remove the rear cover.
- Place a 2 pin jumper on J14
- Place a sheet of paper in the manual sheet feeder far enough to activate the paper sensor.
- Open the access cover.
- Hold down the Power and Paper Feed buttons.
- Plug power to the printer.
- Release the buttons when both the Power and Busy Lights turn on.
- After approximately 20 seconds, the Power Light will flash.
- Power off the printer to exit the test.
- Remove the jumper from J14.

What Happens:

- The following will be reset to zero:
  - Last Error
  - Page Count
  - Carrier Metric
  - Drop Count (Color and Black)

Print NVRAM Contents

To Run:

- Load paper in the auto sheet feeder.
- Place a sheet of paper in the manual sheet feeder.
- Hold down the Paper Feed button and Power On.
- Continue to hold the Paper Feed button down until POST completes.

What Prints:

- NVRAM contents in hexadecimal format.
- Code Level and Code Level Date.
- Last Service Error.
- Page Count.
- Carrier Metric (Total distance carrier traveled in 32/600th of an inch).
- Dot Counts (Cyan, Magenta, Yellow, Primary and Secondary Black).
- Thermal Sensor (Y/N).
- Current Ambient Temperature in Degrees Celsius.
- Left and Right Head ID.

Print Clean Page

To Run:

- Install known good Color and Black Print Cartridges.
- Open the Access Cover.
- Hold down the Paper Feed button and Power On.
- Continue to hold the Paper Feed button down until POST completes.

What prints:

- Black and color nozzle test pattern.
- 6 lines of black and color printhead purges.
- Black and color nozzle test pattern.

4. Repair Information

This chapter explains how to make adjustments to the printer and how to remove defective parts.

Note: 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; 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.

Adjustments

The user is directed, in the Printer Control program, to perform the bidirectional alignment adjustments after replacing a print cartridge.

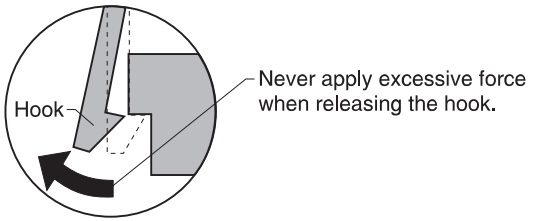
Removal Procedures

The following procedures are arranged according to the name of the printer part discussed.

CAUTION: Unplug the power cord before removing any parts.

Releasing Plastic Latches

Many of the parts are held in place with plastic latches. The latches break easily; release them carefully. To remove such parts, press the hook end of the latch away from the part to which it is latched.



Auto Compensator Assembly Removal

1. Remove all covers.
2. Remove the E-clip from right side of the auto compensator shaft.

   Note: For reinstalling purposes, note the position of the spring before removing.

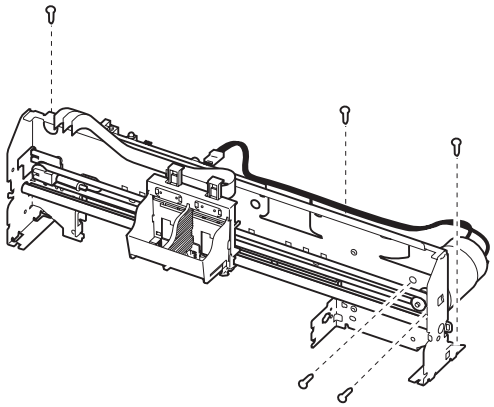
3. Pull shaft out the left side and remove auto compensator.

Buttons / Lenses Removal

1. Remove all covers.
2. Remove operator panel.
3. Depress the button clips and remove the buttons.
4. Lift and remove the lenses.

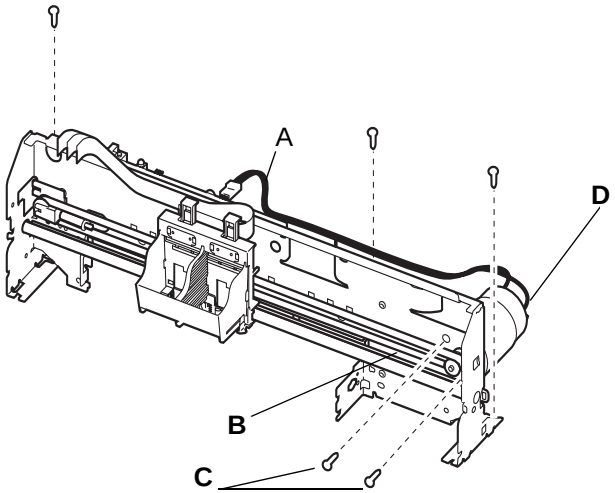
Carrier Frame Assembly / Base Removal

1. Remove all covers.
2. Remove the three screws that secure the carrier frame to the base assembly.
3. Remove system board cable.
4. Pull frame to the rear and remove. Note routing of ground cables.



Carrier Transport Motor Removal

1. Remove all covers.
2. Remove the sheet feeder.
3. Disconnect (J5) the carrier transport motor connector **{A}**from the system board.
4. Remove the belt **{B}**from the carrier transport motor pulley.
5. Remove the two screws **{C}**securing the carrier transport motor to the carrier frame and remove the motor**{D}**. Note the routing of the motor cable.



Encoder Sensor / Temperature Sensor Removal

1. Remove all covers.
2. Remove printhead carrier.
3. Remove screw from the encoder sensor.
4. Unplug cable and remove sensor.

Encoder Strip Removal

1. Remove all covers.
2. Depress retainer clip on left side of encoder strip.
3. Remove encoder strip.

   Note: The encoder strip must be inserted into the encoder sensor before reinstalling.

Front Cover Removal

1. Remove rear cover.
2. Disconnect operator panel cable.
3. Insert screwdriver and release two latches located on the bottom of front cover.
4. Pull the front cover forward and remove.

Gear Plate Assembly Removal

1. Remove all covers.
2. Remove the sheet feeder.
3. Remove the carrier frame.
4. Remove mid frame and star roller assembly.
5. Remove the two gear plate assembly screws from the carrier frame and remove the gear plate.

Gutter Pad / Maintenance Station Removal

1. Remove all covers.
2. Remove the carrier frame.
3. Depress two plastic latches and remove the maintenance station.
4. Remove the felt gutter pads.

Maintenance Wipers and Caps Removal

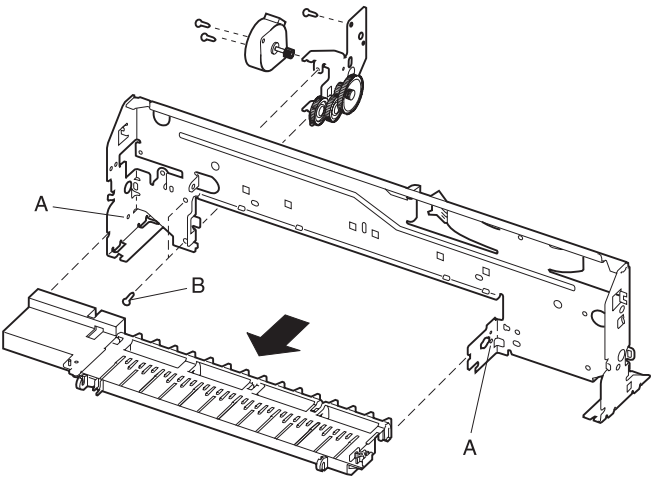
1. Remove all covers.
2. Push the carrier to the left away from the maintenance station.
3. Gently pull the caps and wipers off their mounts.

Mid Frame / Large Feed Roller / Exit Roller Removal

1. Remove all covers.
2. Remove the sheet feeder.
3. Remove the printhead carrier and the maintenance station.

Note: The carrier is attached to the belt at a raised tab. When reinstalling, be sure the belt tab and carrier are aligned.

4. Remove the two star wheel roller mounting screws. Remove star wheel roller assembly.
5. Remove the bushing from the right side of the large feed roller.
6. Depress tabs **{A}** on each end of mid frame and remove large feed roller and mid frame.
7. Apply pressure and remove the exit roller and belt.
8. Remove mounting screws **{B}** and remove gear plate and paper feed motor assembly.



Operator Panel Removal

1. Remove all covers.
2. Disconnect the operator panel cable. Note the routing of the cable.
3. Remove the operator panel screw.
4. Depress two latches and remove operator panel.

Paper Feed Motor Removal

1. Remove all covers.
2. Remove the sheet feeder.
3. Disconnect (J12) the paper feed motor from the system board.
4. Remove the two screws mounting the paper feed motor and remove the motor. Note the routing of all cables.

Power / Parallel / USB Board Removal

1. Remove all covers.
2. Disconnect the system board cable.
3. Remove two screws and disconnect two ground wires.
4. Depress latches and slide the card out.

Printhead Carrier Assembly / Shaft Removal

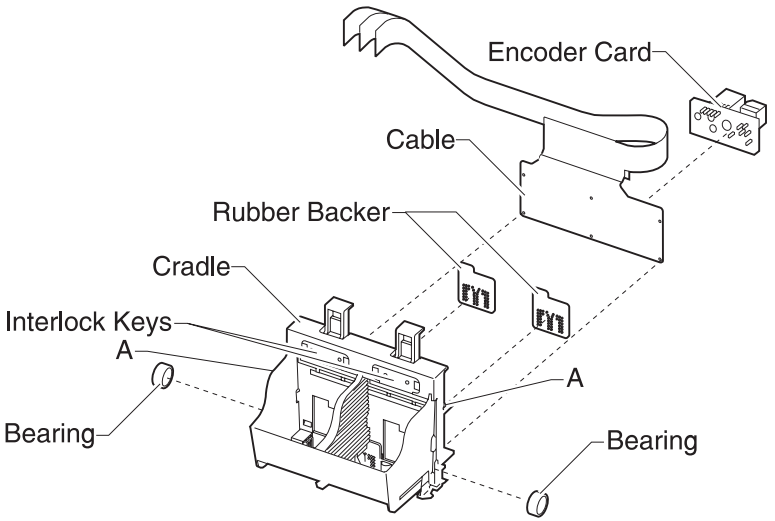
1. Remove all covers.
2. Apply pressure to the idler pulley and remove the belt from the transport carrier motor.
3. Remove the retainers from the ends of the carrier shaft.
4. Slide the shaft left and remove from the printer.
5. Disconnect printhead cables from the system board.

   Note: The carrier is attached to the belt at a raised tab. When reinstalling, be sure the belt tab and carrier are aligned.

6. Remove the carrier belt from the rear of the carrier.
7. Remove the carrier.

Printhead Cable and Cradle Removal

1. Remove all covers.
2. Remove the printhead carrier assembly.
3. Disconnect the printhead cable from the encoder card. Note the routing of the cable under the retaining clip on the carrier.
4. Separate the cradle from the printhead carrier assembly by pushing out the cradle latches **{A}**.



Rear Cover Removal

1. Remove the two screws from rear cover.
2. Insert screwdriver and depress two plastic latches and remove rear cover.

Sheet Feeder Removal

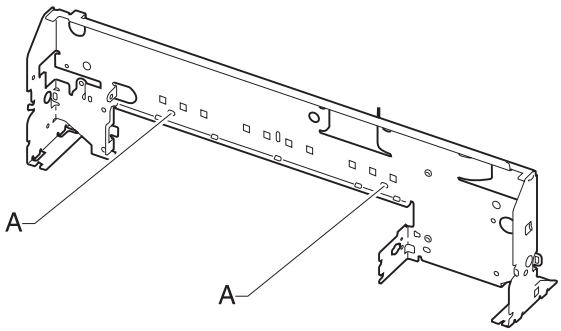
1. Remove all covers.
2. Remove the three mounting screws that hold the sheet feeder.
3. Remove the sheet feeder. Note the routing of the cables.

Small Feed Rollers

1. Remove all covers.
2. Remove the sheet feeder.
3. Disconnect springs from the small feed roller.
4. Press down on the friction roller assembly and remove.

Small Feed Roller Holder / EOF Removal

1. Remove all covers.
2. Remove sheet feeder assembly.
3. Remove mid frame.
4. Remove system board.
5. Depress two tabs **{A}** on small feed roller holder.
6. Slide holder down and remove holder and EOF flag.



Star Wheel Roller Assembly Removal

1. Remove all covers.
2. Move printhead carrier to the center of the printer.
3. Remove two screws on each end of star wheel roller assembly.
4. Remove star wheel roller assembly.

System Board Removal

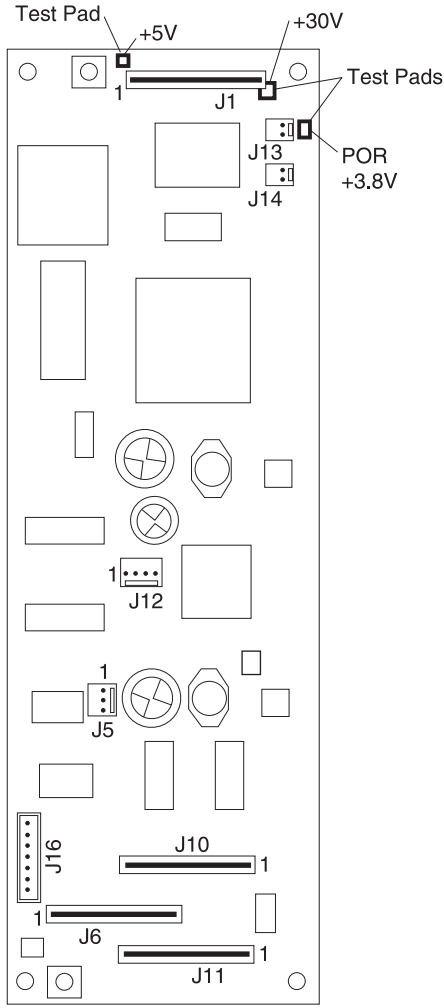
1. Remove all covers.
2. Remove the sheet feeder.
3. Disconnect all connectors from the system board.
4. Remove the two screws securing the system board to the carrier frame.

   Note: when removing the system board, be careful not to damage the EOF flag.

5. Remove the system board.

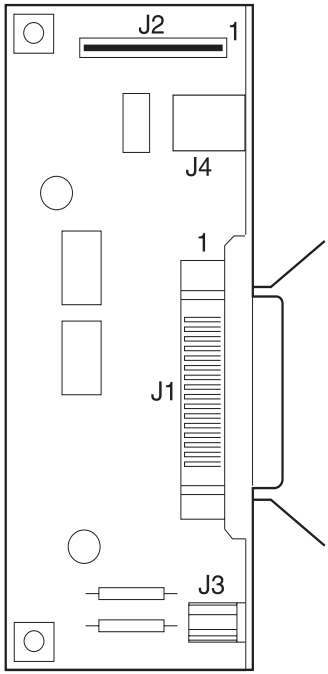
5. Connector Locations

J1	System Board
J5	Transport Motor
J6	Printhead
J10	Printhead
J11	Printhead
J12	Paper Feed Motor
J13	Test Jumper
J14	Test Jumper
J16	Operator Panel



Connector Locations (cont.)

J1	Parallel
J2	System Board
J3	Power Supply
J4	*USB



*Under USB, the printer will be hot-plug-able into USB compliant versions of Windows 95 and NT operating systems. Anytime the printer is disconnected or reconnected, the change will be quickly detected and reflected in the operating system view of available ports. The printer firmware will provide USB standard device ID information including a manufacturing name, Lexmark International, Inc., and product name. The communication path under USB will be bi-directional and asynchronous.

6. Preventive Maintenance

This chapter contains the lubrication specifications. Follow these recommendations to prevent problems and maintain optimum performance.

Lubrication Specifications

Lubricate only when parts are replaced or as needed, not on a scheduled basis. Use grease P/N 99A0394 to lubricate the following:

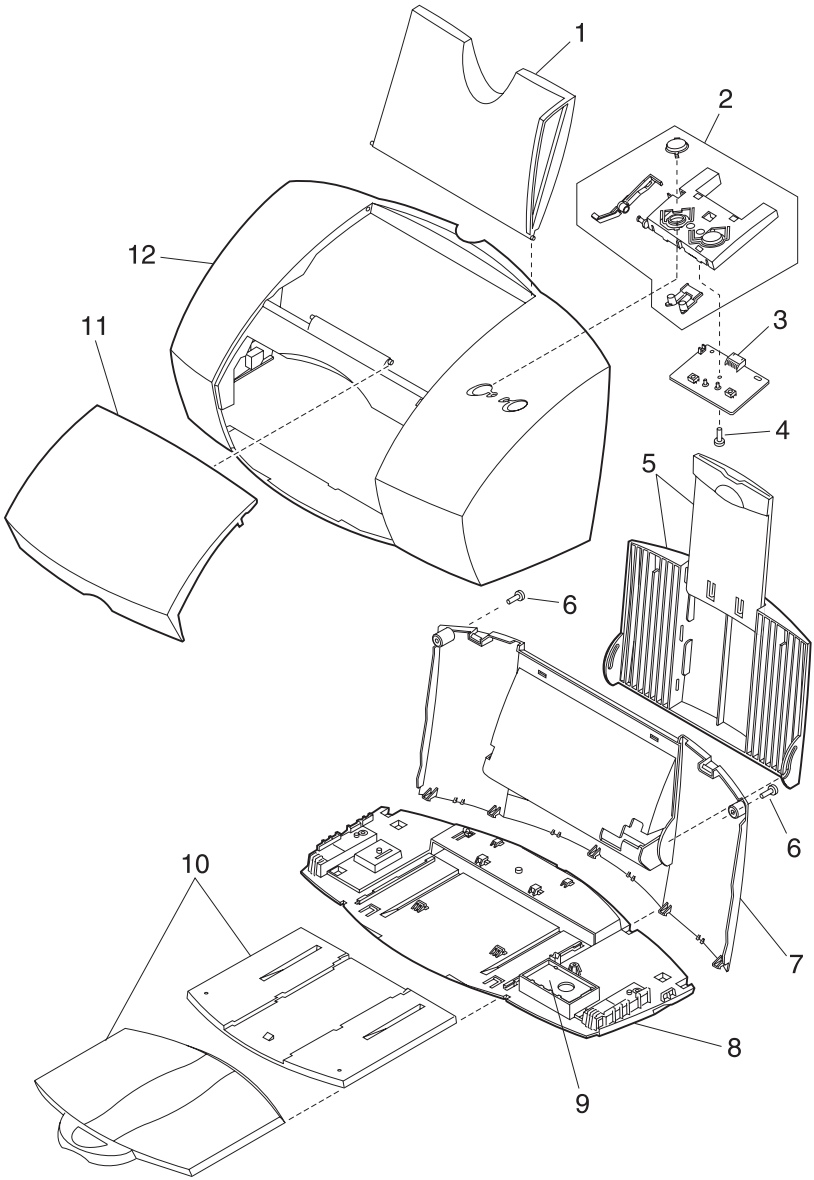
- All gear mounting studs.
- The left and right ends of the exit roller assembly at the mid-frame.
- The carrier to carrier frame engagement.
- The carrier guide shaft, and carrier guide shaft bearings.

7. Parts Catalog

How to Use This Parts Catalog

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

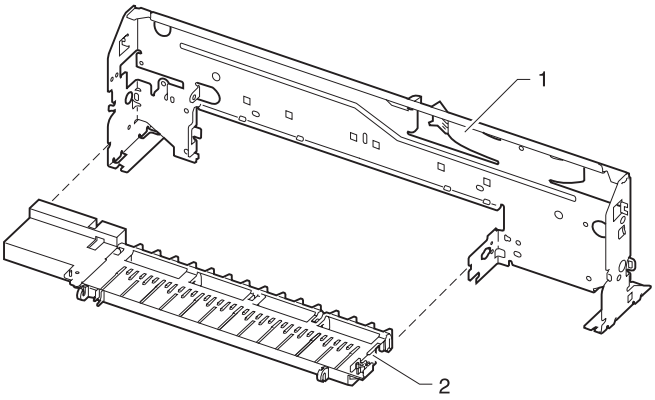
Assembly 1: Covers



Assembly 1: Covers

Asm-Index	Part Number	Units	Description
1-1	14R0187	1	Support, Paper
2	14R0156	1	Buttons and Lens Asm
3	14R0171	1	Card, Operator Panel
4	14R0192	1	Screw, Operator Panel Card Mount (PP)
5	14R0157	1	Tray, Banner Paper
6	14R0192	2	Screws, Rear Cover Mount (PP)
7	14R0151	1	Cover, Rear
8	14R0145	1	Base, Cover with four feet and Gutter Pad
9	14R0153	1	Pads, Gutter
10	14R0154	1	Tray, Exit Asm
11	14R0147	1	Door, Access and Need More Ink Label
12	14R0149	1	Cover, Front with Label
NS	7350234	1	Plain Package B/M includes: (Carton Cushion Set, Sealing Tape)
NS	14R0193	1	Label, Need More Ink
NS	14R0194	1	Label, Cartridge Install

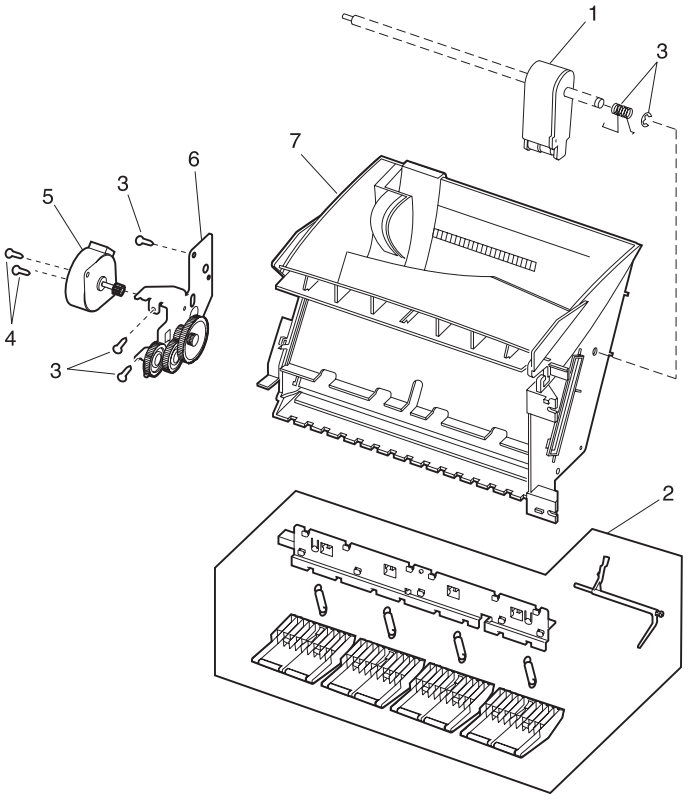
Assembly 2: Frames



Assembly 2: Frames

Asm-Index	Part Number	Units	Description
2-1	14R0160	1	Frame, Main
2	14R0159	1	Frame, Mid

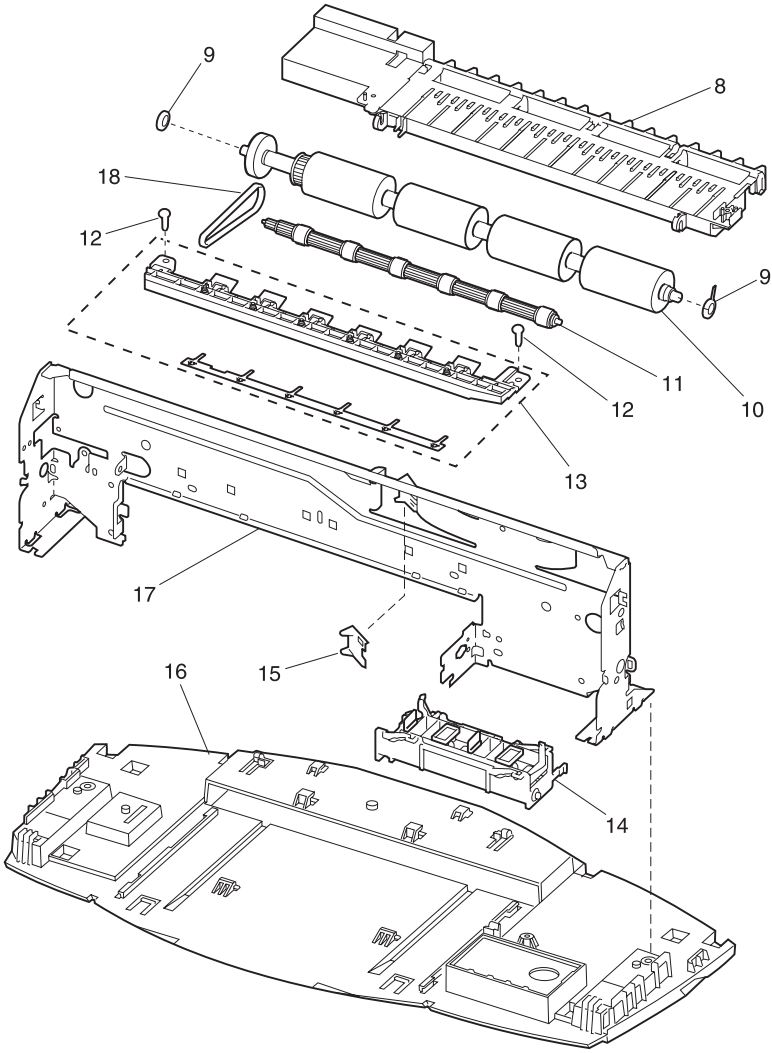
Assembly 3: Paper Feed



Assembly 3: Paper Feed

Asm-Index	Part Number	Units	Description
3-1	14R0189	1	Auto Compensator Assembly
2	14R0161	1	Small Feed Roller Asm w/Holder & Flag
3	14R0192	1	Screws, Gear Plate Asm Mount (PP)
3	14R0192	1	Spring and C-Clip, Auto Compensator Shaft (PP)
4	14R0192	1	Screws, Paper Feed Motor Mount (PP)
5	14R0164	1	Paper Feed Motor Asm with Gear
6	14R0165	1	Gear Plate Asm without Motor
7	14R0185	1	ASF Asm without Auto Compensator

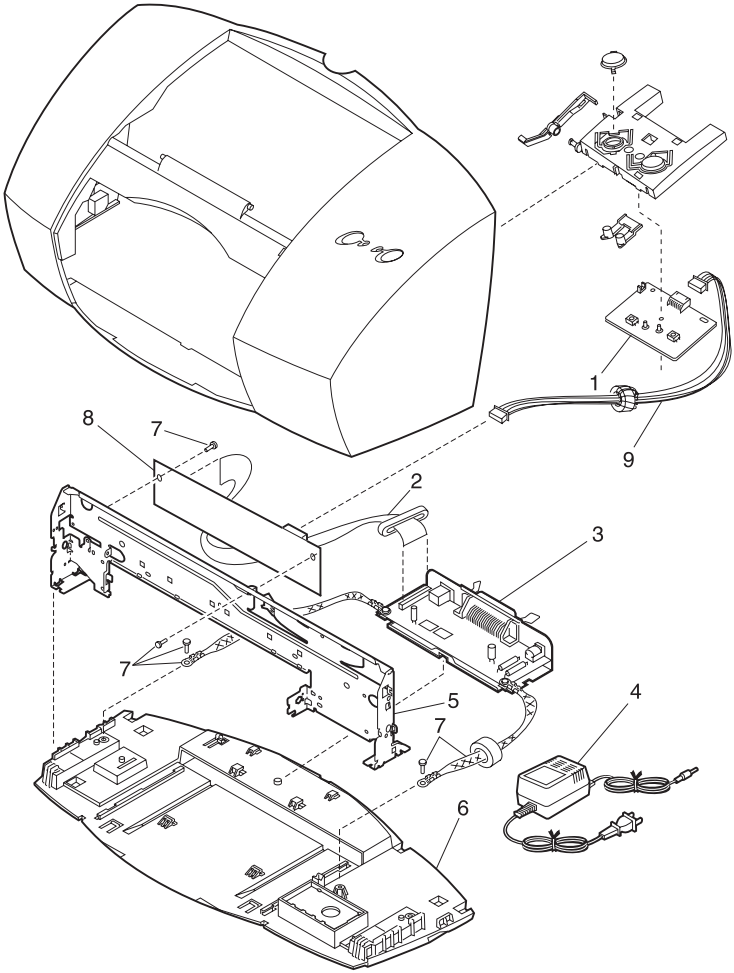
Assembly 3 (cont.): Paper Feed



Assembly 3 (cont.): Paper Feed

Asm-Index	Part Number	Units	Description
3-8	14R0159	1	Frame, Mid
9	14R0192	2	Bushing, Large Feed Roll (PP)
10	14R0163	1	Large Feed Roller Asm w/Gear & Pulley
11	14R0166	1	Exit Roller Asm
12	14R0192	2	Screws, Star Roller Mount (PP)
13	14R0162	1	Star Roller Crossbar Asm
14	14R0190	1	Maintenance Station Asm
15	14R0192	1	Holder, Printhead Cable Guide Clip (PP)
16	14R0145	1	Base, Cover with four feet and Gutter Pad
17	14R0160	1	Frame, Main
18	14R0167	1	Exit Drive Belt

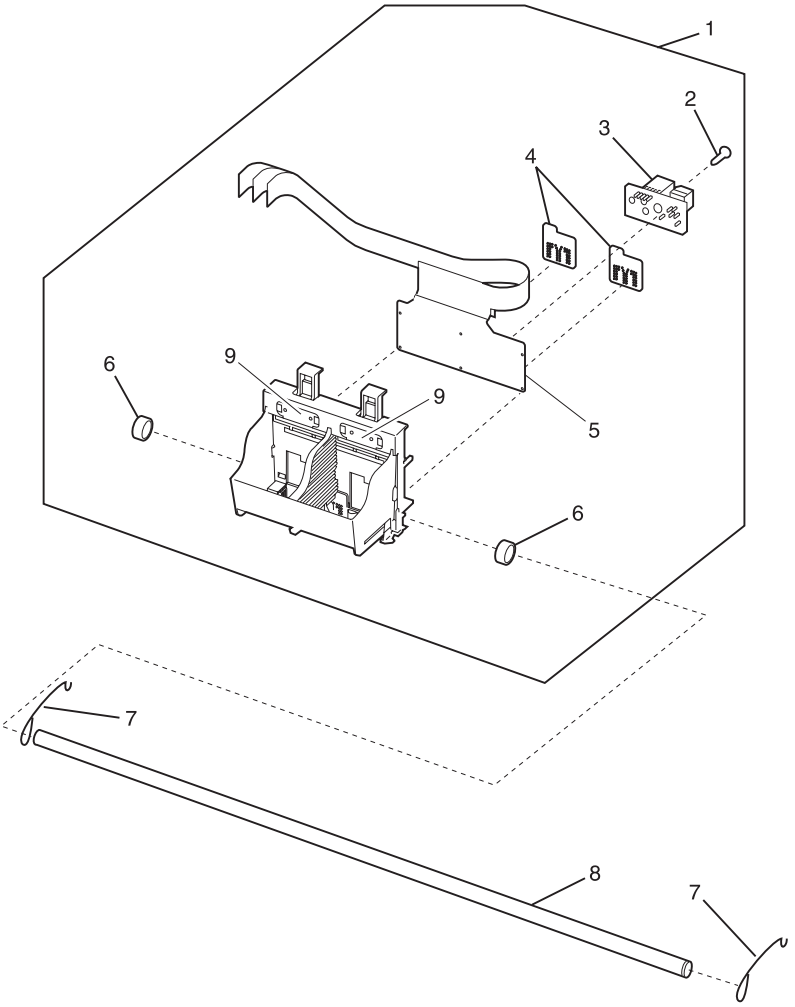
Assembly 4: Electronics



Assembly 4: Electronics

Asm-Index	Part Number	Units	Description
4-1	14R0171	1	Card, Operator Panel
2	14R0170	1	Cable, System Board
3	14R0169	1	Board, Power / Parallel / USB
4	12G1812	1	Power Supply, External (LV) 100 V (Japan)
4	12G1813	1	Power Supply, External (LV) 120 V (U.S.A.)
4	12G1814	1	Power Supply, External (HV) 220 V
5	14R0160	1	Frame, Main
6	14R0145	1	Base, Cover with four feet & gutter pad
7	14R0192	1	Screws, System Board Mount (PP)
7	14R0192	1	Ground Cables, Power/Parallel/ USB Board (PP)
8	14R0168	1	System Board
9	14R0195	1	Cable with/Torroid, Operator Panel
NS	11B6073	1	Power Cable (United Kingdom)
NS	11B6074	1	Power Cable (Europe)
NS	11B6075	1	Power Cable (Israel)
NS	11B6076	1	Power Cable (Australia /New Zealand)
NS	11B6077	1	Power Cable (South Africa)

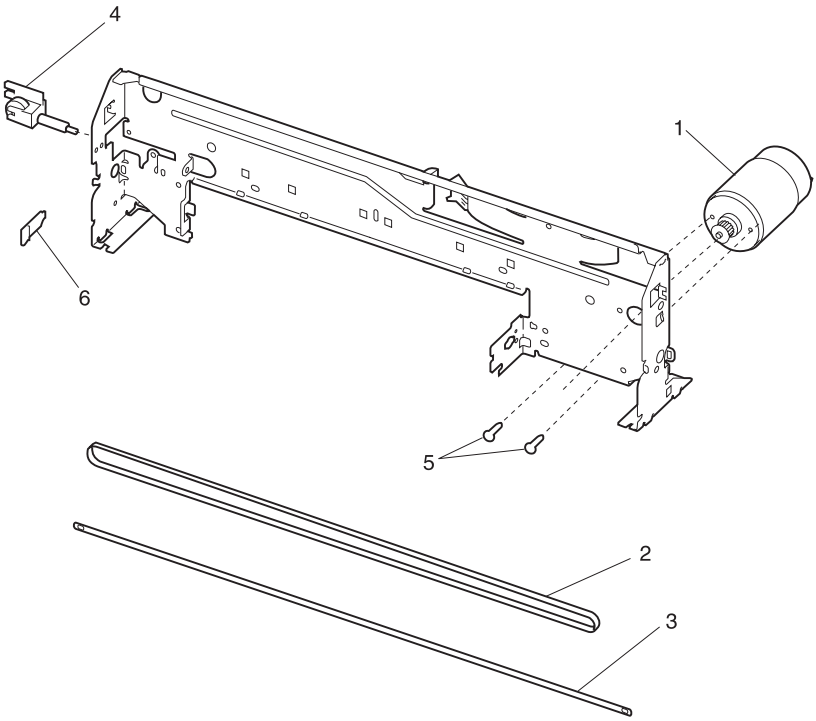
Assembly 5: Carrier



Assembly 5: Carrier

Asm-Index	Part Number	Units	Description
5-1	14R0175	1	Printhead Carrier Asm (complete)
2	14R0192	1	Screw, Encoder Card Mount (PP)
3	14R0179	1	Encoder Card Asm with Temperature Sensor
4	17A0124	2	Backer, Printhead Rubber
5	14R0176	1	Cable, Printhead
6	14R0192	2	Bearing, Carrier (PP)
7	14R0192	2	Retainers, Shaft (PP)
8	17A0125	1	Shaft, Carrier
9	14R0180	2	Cartridge Interlock Keys B/M

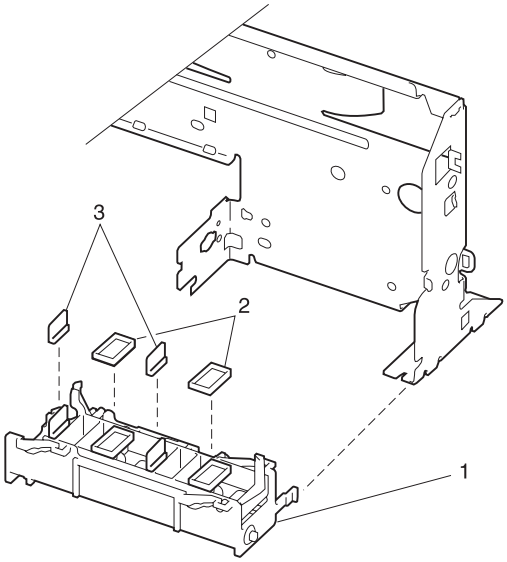
Assembly 6: Carrier Transport



Assembly 6: Carrier Transport

Asm-Index	Part Number	Units	Description
6-1	14R0181	1	Carrier Transport Motor Asm and Pulley
2	14R0182	1	Belt, Carrier
3	14R0183	1	Encoder Strip
4	14R0184	1	Pulley, Idler Tension
5	14R0192	2	Screws, Carrier Transport Motor (PP)
6	14R0192	1	Retainer, Encoder Strip (PP)

Assembly 7: Maintenance Station



Assembly 7: Maintenance Station

Asm-Index	Part Number	Units	Description
7-1	14R0190	1	Maintenance Station Asm
2	14R0191	1	Caps, Maintenance (PP)
3	14R0191	1	Wipers, Maintenance (PP)

Index

A

Abbreviations 1-2
Adjustments 4-2
Assemblies
- 1 Covers 7-2
- 2 Frames 7-4
- 3 Paper Feed 7-6
- 3 Paper Feed (cont.) 7-8
- 4 Electronics 7-10
- 5 Carrier 7-12
- 6 Carrier Transport 7-14
- 7 Maintenance Station 7-16

C

Connector Locations 5-1

D

Diagnostic Aids
- Auto Compensator Operation 3-1
- Encoder Test 3-4
- End of Forms Test 3-3
- NVRAM Dump 3-5
- Test Page 3-2

E

ESD-Sensitive Parts 4-1

G

General Information 1-1

I

Indicator Light Table 2-1

L

Lubrication Specifications 6-1

M

Maintenance Approach 1-2

O

Operator Panel
- Lights 1-1

P

Parts
- Carrier 7-12
- Carrier Transport 7-14
- Covers 7-2
- Electronics 7-10
- Frames 7-4
- Maintenance Station 7-16
- Paper Feed 7-6
- Paper Feed (cont.) 7-8

Plastic Latches 4-2
POST
- Sequence 2-4
- Symptom Table 2-5

Power Consumption 1-1
Preventive Maintenance 6-1
Problems
- Carrier Transport 2-6
- Maintenance Station 2-6
- Operator Panel 2-6
- Paper Feed 2-7
- Power 2-7
- Print Quality 2-7

R

Removals
- Auto Compensator Assembly 4-3
- Base Assembly 4-3
- Board (Power/Parallel/USB) 4-7
- Buttons / Lenses 4-3
- Carrier 4-7
- Carrier Frame 4-3
- Carrier Shaft 4-7
- Carrier Transport Motor 4-4
- Encoder Sensor 4-4
- Encoder Strip 4-4

EOF 4-9
Exit Roller 4-6
Front Cover 4-5
Gear Plate 4-5
Gutter Pad 4-5
Large Feed Roller 4-6
Maintenance Station 4-5
Mid Frame 4-6
Operator Panel 4-6
Paper Feed Motor 4-7
Printhead Cable & Cradle 4-8
Rear Cover 4-8
Sheet Feeder 4-9
Small Feed Roller Holder 4-9
Small Feed Rollers 4-9
Star Wheel Roller Assembly 4-9
System Board 4-10
Temperature Sensor 4-4
Wipers & Caps 4-5
Repair Information 4-1

S

Safety Information vi
Service Checks
Carrier Transport 2-8
Envelope Feed 2-10
Maintenance Station 2-10
Paper Feed 2-11
Paper Path 2-13
Power 2-13
Print Quality 2-14
Start 2-1
Symptom Table (POST) 2-5
Symptom Tables 2-6

T

Tests
Encoder 3-4
End of Forms (EOF) 3-3
NVRAM Dump 3-5
Test Page 3-2

Part Numbers

11B6073 7-11
11B6074 7-11
11B6075 7-11
11B6076 7-11
11B6077 7-11
14R0145 7-3, 7-9, 7-11
14R0147 7-3
14R0149 7-3
14R0151 7-3
14R0153 7-3
14R0154 7-3
14R0156 7-3
14R0157 7-3
14R0159 7-5, 7-9
14R0160 7-5, 7-9, 7-11
14R0161 7-7
14R0163 7-9
14R0164 7-7
14R0165 7-7
14R0166 7-9
14R0167 7-9
14R0168 7-11
14R0169 7-11
14R0170 7-11
14R0171 7-3, 7-11
14R0175 7-13
14R0176 7-13
14R0179 7-13
14R0180 7-13
14R0181 7-15
14R0182 7-15
14R0183 7-15
14R0184 7-15
14R0185 7-7
14R0187 7-3
14R0189 7-7
14R0190 7-9, 7-17
14R0191 7-17
14R0192 7-3, 7-7, 7-9, 7-11, 7-13, 7-15
14R0193 7-3
14R0194 7-3
17A0124 7-13
17A0125 7-13
7350234 7-3

Reader Comment Form

Lexmark Z51 Color Jetprinter
(4098-00X) Service Manual
U.S. P/N 12G0147 - Japan P/N 12G0148
March 1999

You may use this form to communicate your comments about this publication, with the understanding that Lexmark may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you.

1. Did you find the book well organized?
   Yes ❒ No ❒

2. Was the content of the book accurate and complete?
   Yes ❒ No ❒

3. Was the book easy to use?
   Yes ❒ No ❒

4. What can we do to improve the book?

   _____

   _____

5. What is your job title?

   _____

Questions or comments about supplies, service, applications, and so on slow response time considerably. Please refer those questions or comments to your authorized dealer or point of purchase.

Note: *Please direct all requests for copies of publications to your point of purchase. Publications are not stocked at the location to which this form is addressed.*

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 2659 LEXINGTON, KY

POSTAGE WILL BE PAID BY ADDRESSEE

LEXMARK INTERNATIONAL INC
DEPARTMENT D22A BUILDING 032-2
740 NEW CIRCLE ROAD NW
LEXINGTON KY 40511 9954

Fold Here

Cut Along Line

Tape Please Do Not Staple Tape