

COVER Book Cover

IBM Store System

**Hardware Service Manual for
Point-of-Sale Input/Output Devices**

Document Number SY27-0339-02

NOTICES Notices

+--- **Note** -----+
|
| Before using this information and the products it supports, be |
| sure to read the general information under "Notices" in |
| topic FRONT_1. Translations of the safety notices can be found in |
| IBM 4693/4694 Point of Sale Terminals: Product Safety |
| Information, P/N 60G1330. |
|
+-----+

EDITION Edition Notice

Third Edition (October 1995)

This is the third edition of the *IBM Store Systems: Hardware Service Manual for Point of Sale Input/Output Devices*.

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FRONT_1.1 Trademarks

FRONT_1.2 Electronic Emission Notices

FRONT_1.3 General Safety Considerations

FRONT_1.1 Trademarks

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Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Subtopics

FRONT_1.2.1 Canada ICES - Class A

FRONT_1.2.2 United Kingdom Office of Telecommunications Statement of Compliance

FRONT_1.2.1 Canada ICES - Class A

This class A digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

The United Kingdom Telecommunications Act 1984. This apparatus is approved under number NS/G/1234/J/100003 for indirect connections to the public telecommunications systems in the United Kingdom.

FRONT_1.3.1 Nickel-Cadmium Batteries

Some Point-of-Sale products contain a nickel-cadmium battery. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area.

In the United States of America, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM nickel-cadmium batteries and battery packs. For information on proper disposal of the nickel-cadmium batteries in this product, please contact IBM at 1-800-426-4333. Please have the IBM part listed on the battery available prior to your call.

For information on disposal of nickel-cadmium batteries outside the United States, contact your local waste disposal facility.

FRONT_2 Electrostatic Discharge (ESD)

Attention ESD damage can occur when there is a difference in charge between the part, the product, and the service person. No damage will occur if the service person and the part being installed are at the same charge level.

ESD Damage Prevention

Anytime a service action involves physical contact with logic cards, modules, back-panel pins, or other ESD sensitive (ESDS) parts, the service person must be connected to an ESD common ground point on the product through the ESD wrist strap and cord.

The ESD ground clip can be attached to any frame ground, ground braid, green wire ground, or the round ground prong on the AC power plug. Coax or connector outside shells can also be used.

Handling Removed Cards

Logic cards removed from a product should be placed in ESD protective containers. No other object should be allowed inside the ESD container with the logic card. Attach tags or reports that must accompany the card to the outside of the container.

Subtopics

FRONT_2.1 European Union (EU) Electromagnetic Compatibility

FRONT_2.2 Laser Product Identification

FRONT_2.1 European Union (EU) Electromagnetic Compatibility

This product is in conformity with the protection requirements of EC Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22 / European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse A. Für diese Klasse von Geräten gilt folgende Bestimmung nach dem EMVG: Geräte dürfen an Orten, für die sie nicht ausreichend entstört sind, nur mit besonderer Genehmigung des Bundesministers für Post und Telekommunikation oder des Bundesamtes für Post und Telekommunikation betrieben werden. Die Genehmigung wird erteilt, wenn keine elektromagnetischen Störungen zu erwarten sind. (Auszug aus dem EMVG vom 9.Nov.92, Para.3, Abs.4)

Hinweis:

Dieses Genehmigungsverfahren ist von der Deutschen Bundespost noch nicht veröffentlicht worden.

FRONT_2.2 Laser Product Identification

IBM Point of Sale Scanners and the IBM 1520 Hand-Held Scanner are laser products. Where required, the scanner has a label that identifies its classification. The information on the label in the U.S.A. is shown below.

**Class II Laser Product -
Avoid Long-Term
Viewing of Direct Light**

This manual provides repair procedures for cash drawers, keyboards, printers, displays and OEM devices that are attached to point-of-sale terminals.

- Chapter 1, START
- Chapter 2, Point-Of-Sale Cash Drawers
- Chapter 3, Point-of-Sale Displays
- Chapter 4, Point-of-Sale Keyboards
- Chapter 5, Point-of-Sale Printer Model 1 or Model 2
- Chapter 6, Point-of-Sale Printer Models 3, 3R, 4, 4A, 4R
- Chapter 7, 4678 OEM Input/Output Devices

Use this manual only after using the *Hardware Service Manual* or the *Maintenance Manual* for problem determination on your point-of-sale terminal.

To begin, go to Chapter 1, "START" in topic 1.0 and select the starting point that best describes the action you want to perform.

```
+--- Error Messages and Function Keys -----+
|
| The operating system or application may display messages that do not
| appear in this manual. See the documentation for the appropriate
| operating system or application.
|
| When using a keyboard that has a Ctrl key, the S1 and S2 functions
| require a combination of two keys. First press and hold the Ctrl key
| then press the S1 or S2 key.
|
+-----+
```

Service personnel using this manual should be:

- Trained to service IBM Point of Sale Terminals
- Trained to service I/O devices attached to point-of-sale terminals
- Trained to service IBM Personal Computers and Personal Systems

IBM 4693, 4694, and 4695 Point of Sale Terminals

IBM 4693 Point of Sale Terminals: Installation and Operation Guide, SA27-3978
IBM 4694 Point of Sale Terminals: Installation and Operation Guide, SA27-4005
IBM 4695 Point of Sale Terminal and Touch Display: Installation and Operation Guide, GA27-4031
IBM 4693, 4694, and 4695 Point of Sale Terminals: Hardware Service Manual, SY27-0337
IBM 4693, 4694, and 4695 Point of Sale Terminals: Maintenance and Test Summary, SX27-3919
IBM Store Systems: Hardware Service Manual for Point-of-Sale Input/Output Devices, SY27-0339
IBM Store Systems: Hardware Technical reference, SY27-0336
IBM Store Systems: Parts Catalog, S131-0097
IBM 4693 Point of Sale Terminals: Reference Diskette, SX27-3918
IBM 4693 Point of Sale Terminals: Diagnostic Diskette, SX27-3928
IBM 4693 Point of Sale Terminals: Support Diskette for Medialess Terminals, SX27-3929

IBM 4683/4684 Point of Sale Terminals

IBM 4683 Point of Sale Terminal: Installation Guide, SA27-3783
IBM 4684 Point of Sale Terminal: Installation Guide, SA27-3837
IBM 4684 Point of Sale Terminal: Introduction and Planning Guide, SA27-3835
IBM 4684 Store Loop Adapter/A: Installation, Testing, Problem Determination, and Technical Reference, SD21-00
IBM 4683/4684 Point of Sale Terminal: Operations Guide, SA27-3704
IBM 4680 Store System and 4683/4684 Point of Sale Terminal: Problem Determination Guide, SY27-0330
IBM 4684 Point of Sale Terminal: Maintenance Summary Card, SX27-3885
IBM 4680 Store System: Terminal Test Procedures Reference Summary, GX27-3779
IBM 4683/4684 Point of Sale Terminal: Maintenance Manual, SY27-0295

Scanners

IBM 1520 Hand-Held Scanner User's Guide - GA27-3685

IBM 4686 Retail Point of Sale Scanner: Physical Planning, Installation, and Operation Guide - SA27-3854

IBM 4686 Retail Point of Sale Scanner: Maintenance Manual - SY27-0319

IBM 4687 Point of Sale Scanner Model 1: Physical Planning, Installation, and Operation Guide - SA27-3855

IBM 4687 Point of Sale Scanner Model 1: Maintenance Manual - SY27-0317

IBM 4687 Point of Sale Scanner Model 2: Physical Planning Guide - SA27-3882

IBM 4687 Point of Sale Scanner Model 2: Operator's Guide - SA27-3884

IBM 4687 Point of Sale Scanner Model 2: Maintenance Manual - SY27-0324

IBM 4696 Point of Sale Scanner Scale: Physical Planning, Installation, and Operation Guide - GA27-3965

IBM 4696 Point of Sale Scanner Scale: Maintenance Manual - SY27-0333

FRONT_6 Summary of Changes

SY27-0339-02 (October 1995)

This edition includes service information for the following point-of-sale input/output devices:

- Compact cash drawer
- Sure Point Monochrome Touch Screen
- Sure Point Color Touch Screen

SY27-0339-01 (September 1994)

This edition includes service information for the following point-of-sale input/output devices:

- Cash drawers
- 40-character alphanumeric display
- Vacuum fluorescent display II
- LCD flat panel display
- Keyboards
- Printers
- Signature capture device

SY27-0339-00 (June 1993)

This edition includes service information for the following point-of-sale input/output devices:

- Cash drawers
- Keyboards
- Printers

1.0 Chapter 1. START

This manual provides repair information for input/output (I/O) devices attached to point-of-sale terminals. For I/O devices that are not designed to be repaired, simply exchange the entire unit when required.

To determine if a terminal system unit or one of the I/O devices is failing, use the problem determination guide for the operating system and/or the hardware service manual for the terminal. Once it has been determined that one of the repairable I/O devices is failing, use this manual to help repair the device.

Task	Topic
Look up a message	1.2
Look up a symptom	1.3
Run a test	1.1
Repair a cash drawer (light gray)	2.2
Repair a cash drawer (dark gray)	2.3
Repair a compact cash drawer	2.4
Repair a display	3.0
Repair a keyboard	4.0
Repair a Model 1 or 2 point-of-sale printer	5.0
Repair a Model 3 or 4 point-of-sale printer	6.0
Repair a signature capture device	7.0
Exchange or install a keylock	C.0
Preventive maintenance	B.0
Special tools you may need	D.0

Subtopics

- 1.1 Tests
- 1.2 Messages
- 1.3 Symptoms

1.1 Tests

The procedure to run tests on the I/O devices supported by this manual varies depending upon the system or terminal to which they are attached.

The point-of-sale printer stand-alone tests are described in the printer chapters of this manual. Other tests provided by either the operating system, reference diskette, or service diskette are not described here. See the *Messages Guide*, *Hardware Service Manual*, or *Problem Determination Guide* for your terminal.

1.2 Messages

Messages directly associated with the I/O device failures are addressed in this section. For messages that are not listed here, use the *hardware service manual* for your terminal, the operating system *message guide*, or the documentation for the application program.

Table 1-1. Message Table	
Message (n = any number)	Go to
Keyboards	
3nn or 0003nnnn 631n T41nn T51nn T61nn W303 W306 W308 W318	"Keyboard and Card Reader Messages" in topic 4.2
Printers	
633n T71nn W304 W305 W354 W355	"Printer Messages" in topic 6.6
Cash Drawers	
635n T31nn	<ul style="list-style-type: none"> <input type="checkbox"/> "Cash Drawer Messages (light gray)" in topic 2.2.1 <input type="checkbox"/> "Cash Drawer Messages (dark gray)" in topic 2.3.1 <input type="checkbox"/> "Compact Cash Drawer Messages" in topic 2.4.1
Miscellaneous	
Application Program Status xxx* Annn through Snnn Unnn Wnnn Xnnn Ynnn Znnn	<p>Follow the <i>User Response</i> for the message in the documentation for your point-of-sale terminal, the operating system, or the application program.</p> <p>Note: In the xxx* (Application Program Status) message, the xxx can be any characters. The asterisk (*) appears at the end of all these messages.</p>

1.3 Symptoms

Symptoms directly associated with the I/O devices are addressed in this section. The following table determines where to look for symptom descriptions and required actions.

Table 1-2. Symptom Index	
Symptom	Go to
Cash drawer symptoms	<ul style="list-style-type: none"> □ "Point-of-Sale Cash Drawer (light gray)" in topic 2.2 □ "Point-of-Sale Cash Drawer (dark gray)" in topic 2.3 □ "Compact Cash Drawer Symptoms" in topic 2.4.2
Display	Chapter 3, "Point-of-Sale Displays" in topic 3.0
Keyboard	Chapter 4, "Point-of-Sale Keyboards" in topic 4.0
Printer	Chapter 5, "Point-of-Sale Printer Model 1 or Model 2" in topic 5.0 or Chapter 6, "Point-of-Sale Printer Models 3, 3R, 4, 4A, 4R" in topic 6.0
Signature capture device	Chapter 7, "4678 OEM Input/Output Devices" in topic 7.0
Miscellaneous	Follow the <i>User Response</i> for the symptom in the hardware service manual for your terminal or in the operating system problem determination guide.

2.0 Chapter 2. Point-Of-Sale Cash Drawers

This chapter contains repair information for servicing light gray, dark gray, and compact point-of-sale cash drawers.

Note: It is assumed that you were directed to this manual from the *hardware service manual* or *problem determination procedures* for your terminal and that the failure has been isolated to the cash drawer or cable.

DANGER

```
+-----+
| Never work on equipment or connect or disconnect signal cables during |
| periods of lightning activity.                                         |
+-----+
```

CAUTION:

For your safety, connect equipment requiring electrical power to a properly wired and grounded outlet.

Subtopics

- 2.1 Electrostatic Discharge (ESD)
- 2.2 Point-of-Sale Cash Drawer (light gray)
- 2.3 Point-of-Sale Cash Drawer (dark gray)
- 2.4 Compact Cash Drawer
- 2.5 Replacing the Compact Cash Drawer Integration Cover

2.1 *Electrostatic Discharge (ESD)*

Attention ESD damage can occur when there is a difference in charge between the part, the product, and the service person. No damage occurs if the service person and the part being installed are at the same charge level.

ESD Damage Prevention

Anytime a service action involves physical contact with logic cards, modules, back-panel pins, or other ESD sensitive (ESDS) parts, the service person must be connected to an ESD common ground point on the product through the ESD wrist strap and cord.

The ESD ground clip can be attached to any frame ground, ground braid, green wire ground, or the round ground prong on the AC power plug. Coax or connector outside shells can also be used.

Handling Removed Cards

Logic cards removed from a product should be placed in ESD protective containers. No other object should be allowed inside the ESD container with the logic card. Attach tags or reports that must accompany the card to the outside of the container.

2.2 Point-of-Sale Cash Drawer (light gray)

Subtopics

- 2.2.1 Cash Drawer Messages (light gray)
- 2.2.2 Cash Drawer Symptoms (light gray)
- 2.2.3 Removing and Replacing the Drawer
- 2.2.4 Removing and Replacing the Top Cover
- 2.2.5 Removing and Replacing the Slide Assembly
- 2.2.6 Removing and Replacing the Latch and Sensor Assembly
- 2.2.7 Removing and Replacing the Cam
- 2.2.8 Removing and Replacing the Keylock Assembly

2.2.1 Cash Drawer Messages (light gray)

Message	Repair Actions Listed in Most Likely Order of Failure
T3151 T3153 T3163	<ol style="list-style-type: none"><li>1. Exchange the cash drawer latch and sensor assembly. See topic 2.2.6.<li>2. See the <i>hardware service manual</i> for your terminal and exchange the terminal system board.

2.2.2 Cash Drawer Symptoms (light gray)

Table 2-2. Cash Drawer Symptoms	
Symptom	Repair Actions Listed in Most Likely Order of Failure
The cash drawer does not open when the cash drawer key is turned to the left (open) position.	<ol style="list-style-type: none"> 1. Exchange the latch and sensor assembly. See topic 2.2.6. 2. Exchange the slide assembly. See topic 2.2.5. 3. Exchange the cam. See topic 2.2.7. 4. Exchange the keylock. See topic 2.2.8.
The cash drawer does not open when doing store transactions or running cash drawer tests but it opens when the cash drawer key is turned to the left (open) position.	<ol style="list-style-type: none"> 1. Exchange the latch and sensor assembly. See topic 2.2.6. 2. Service the base unit or the system unit. See the <i>Hardware Service Manual</i> for your terminal.
The cash drawer does not stay closed.	<ol style="list-style-type: none"> 1. Exchange the latch and sensor assembly. See topic 2.2.6. 2. Service the base unit or the system unit. See the <i>Hardware Service Manual</i> for your terminal.
The status displayed by the cash drawer tests does not match the physical status of the cash drawer being tested.	Exchange the latch and sensor assembly. See topic 2.2.6.
<p>Example:</p> <p>Cash drawer tests say CD A IS CLOSED when actually cash drawer A is open.</p>	

2.2.3 Removing and Replacing the Drawer

1. Open the drawer and insert a screwdriver as shown.
2. To release the drawer from the slide, pry on the latch and lift up on the front of the drawer.
3. Repeat this action to release the other side.
4. Lift the drawer out.
5. To exchange the drawer, position the drawer in the slides and press down until both latches lock into place.

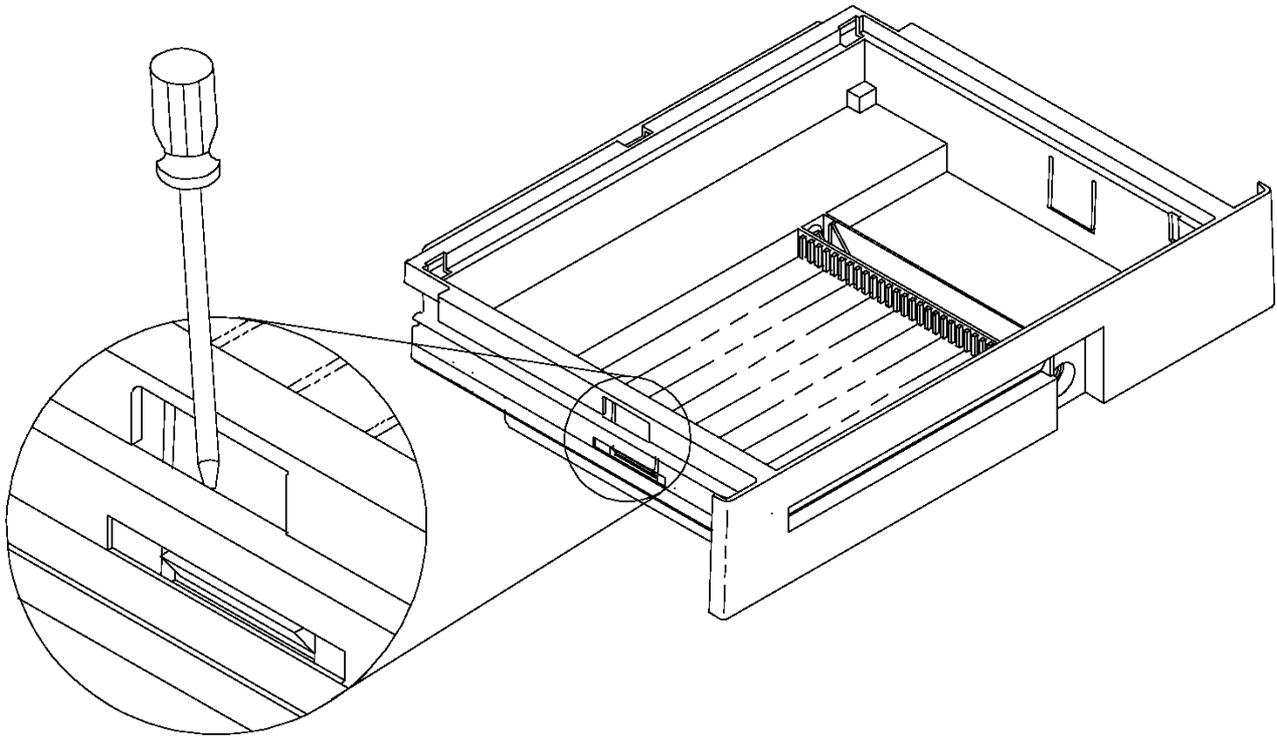


Figure 2-1. Removing and Replacing the Drawer

2.2.4 Removing and Replacing the Top Cover

1. Remove the drawer. See topic 2.2.3.
2. To separate the top cover from the base, pull the tabs (1) inward and push up on the cover.
3. To exchange the top cover, place the top cover over the base, interlocking the front of the top cover with the rear of the base.
4. Slide the top cover forward until the tabs (1) lock into place.
5. Reinstall the drawer.

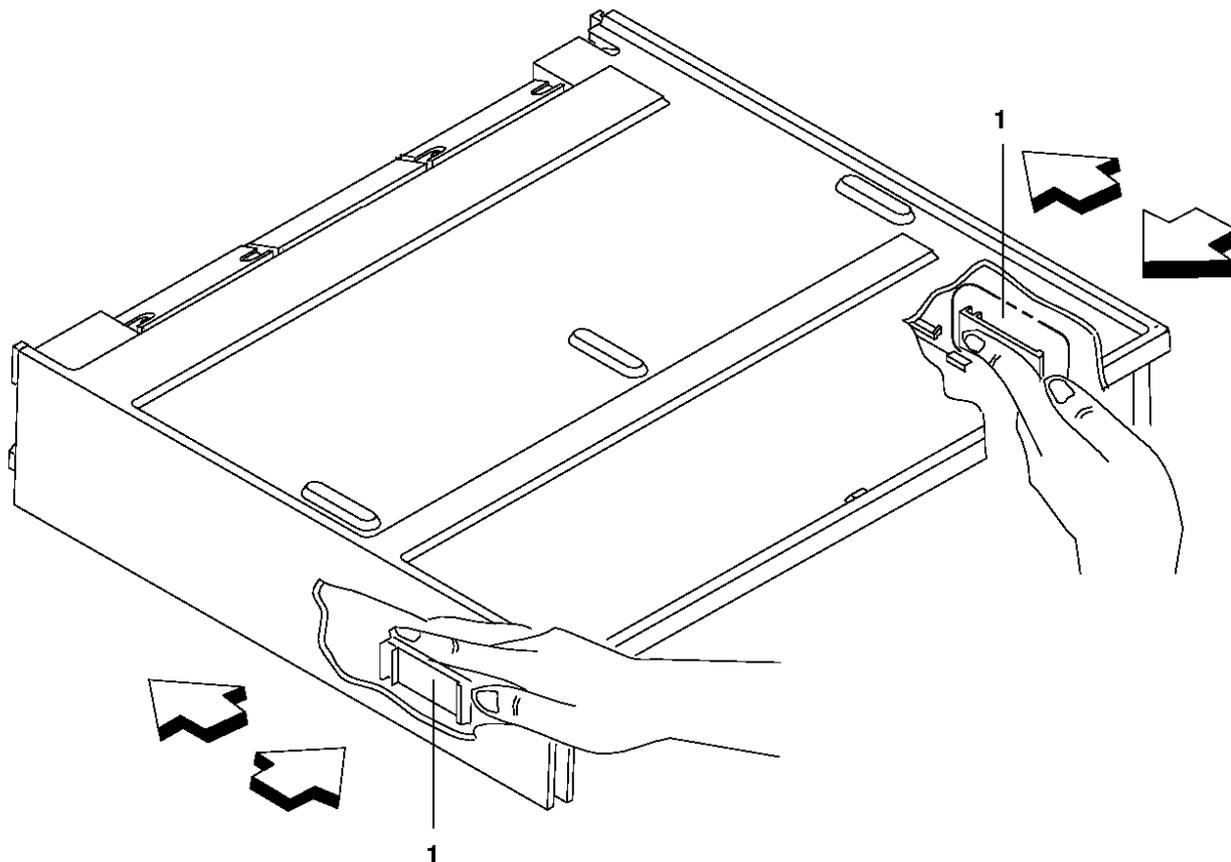


Figure 2-2. Removing and Replacing the Top Cover

2.2.5 Removing and Replacing the Slide Assembly

1. Remove the drawer. See topic 2.2.3.
2. Separate the top cover from the base. See topic 2.2.4.
3. Pry the wedges (7) up and remove them. The wedges are at the front and rear of the slide assembly. See Figure 2-3 in topic 2.2.6.
4. Lift the slide assembly (6) out of the frame.
5. To exchange the slide assembly, place it into the frame.
6. Put the wedges (7) in the slots and press them down to lock them in place. The wedge slots are at the front and rear of the slide assembly.
7. Reinstall the top cover.
8. Reinstall the drawer.

2.2.6 Removing and Replacing the Latch and Sensor Assembly

1. Remove the drawer. See topic 2.2.3.
2. Separate the top cover from the base. See topic 2.2.4.
3. Pry out on the latches (2) one at a time to free them. See Figure 2-3.
4. Lift the assembly (1) out of the base.
5. To exchange the latch and sensor assembly, position it in the base and press down until the latches (2) lock into place.
6. Reinstall the top cover.
7. Reinstall the drawer.

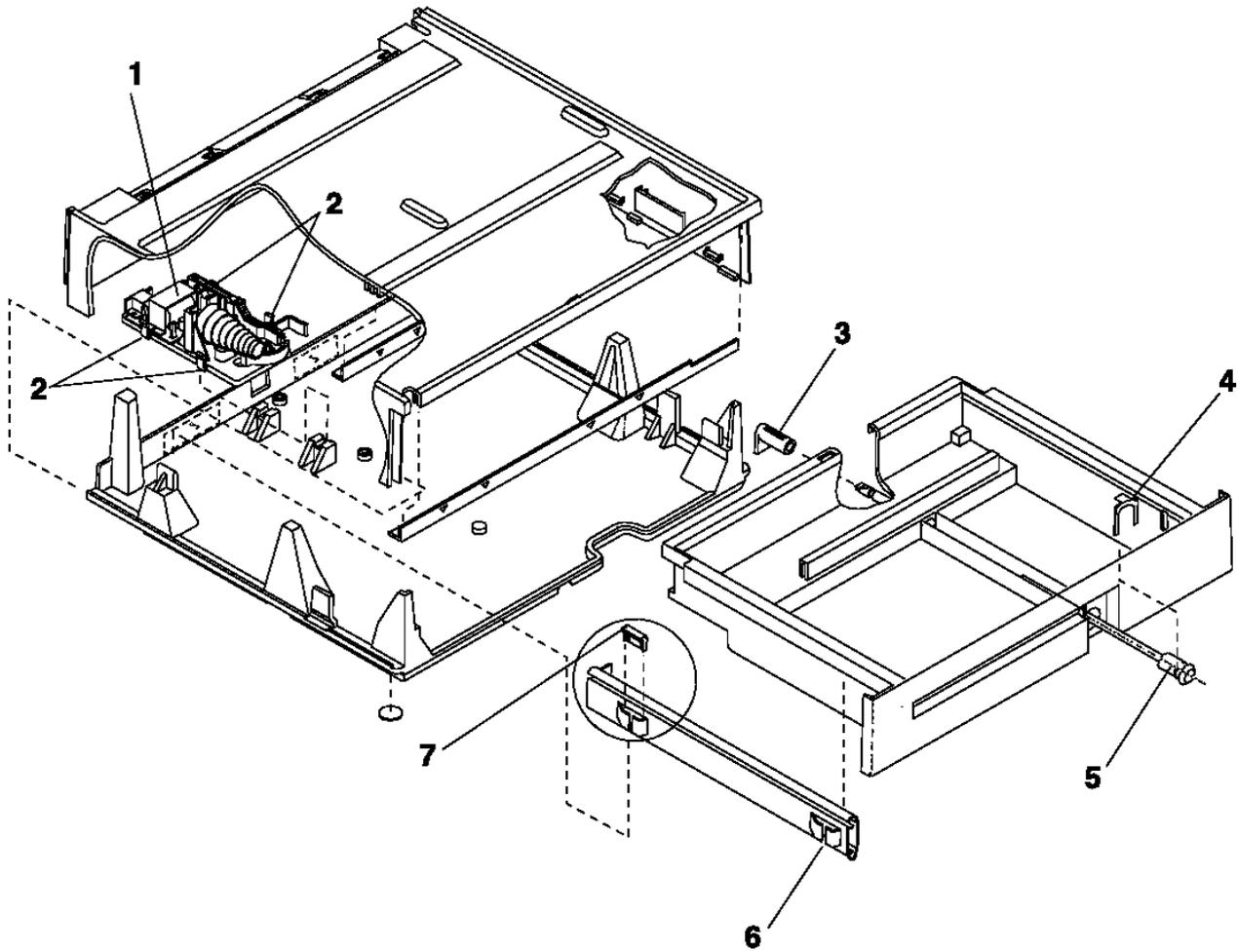


Figure 2-3. Cash Drawer Assembly

2.2.7 Removing and Replacing the Cam

1. Remove the drawer. See topic 2.2.3.
2. Separate the top cover from the base. See topic 2.2.4.
3. Remove the spring attached to the cam (1).
4. Pry out on the latches (2).
5. Lift the cam off the pivot post.
6. To exchange the cam, position the cam (1) over the pivot post.
7. Press down until the latches (2) lock into place.
8. Reinstall the spring on the cam.
9. Reinstall the top cover.
10. Reinstall the drawer.

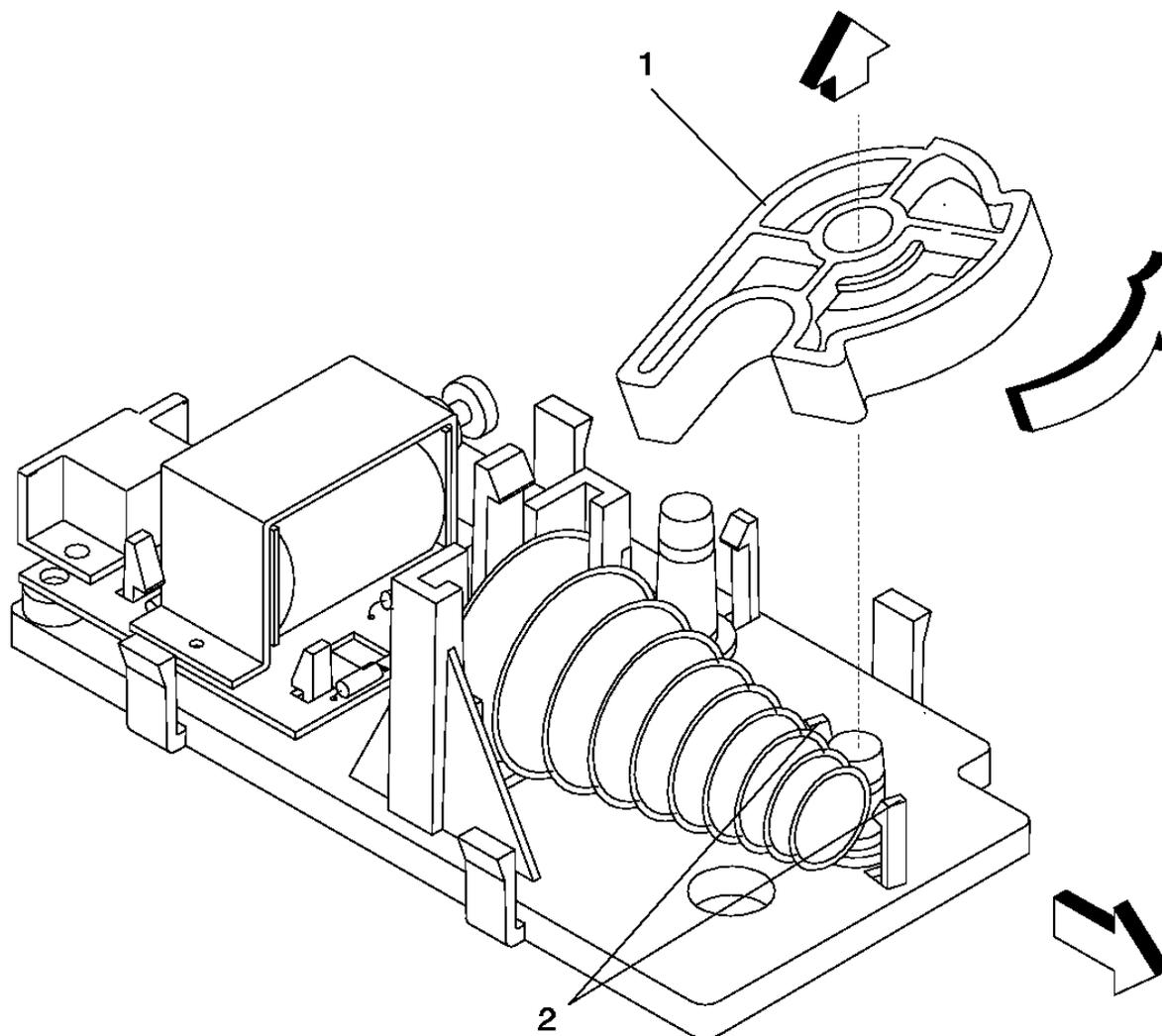


Figure 2-4. Removing and Replacing the Cam

2.2.8 Removing and Replacing the Keylock Assembly

1. Remove the drawer. See topic 2.2.3.
2. Release the latches (3) on both sides of the locking cam and remove the locking cam.
3. Remove the clip (4).
4. Slide the lock assembly out of the drawer.
5. To exchange the keylock assembly, slide the lock assembly into the drawer.
6. Reinstall the clip (4).
7. Push the locking cam onto the shaft until the latches (3) lock into place.
8. Reinstall the drawer.

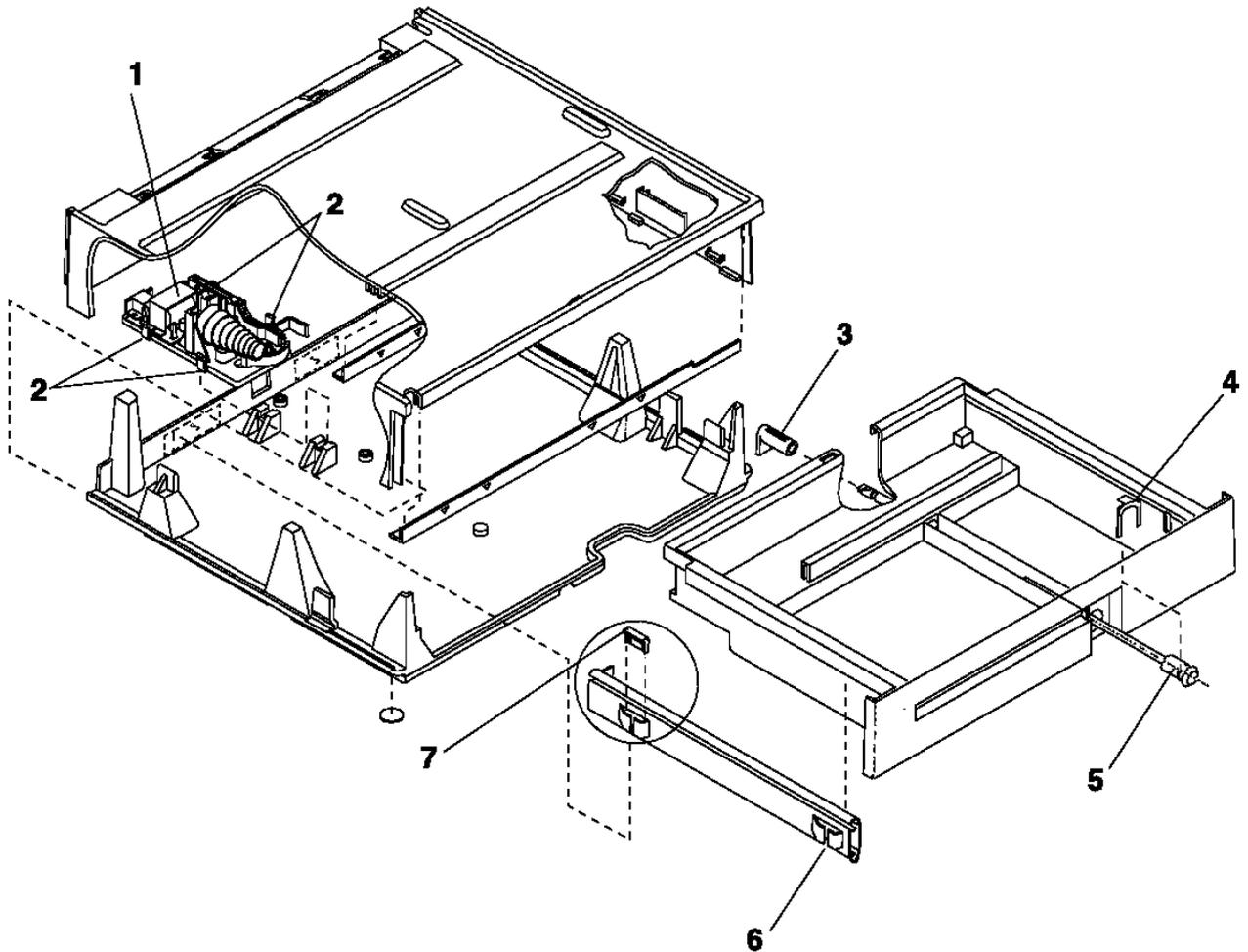


Figure 2-5. Cash Drawer Assembly

2.3 Point-of-Sale Cash Drawer (dark gray)

This section contains the repair information for dark gray cash drawers.

Subtopics

- 2.3.1 Cash Drawer Messages (dark gray)
- 2.3.2 Cash Drawer Symptoms (dark gray)
- 2.3.3 Removing and Replacing the Drawer
- 2.3.4 Removing and Replacing the Top Cover
- 2.3.5 Removing and Replacing the Slide Assembly
- 2.3.6 Removing and Replacing the Latch Assembly
- 2.3.7 Removing and Replacing the Card Assembly
- 2.3.8 Removing and Replacing the Cash Drawer Cam
- 2.3.9 Removing and Replacing the Cash Drawer Pawl
- 2.3.10 Removing and Replacing the Keylock Assembly

2.3.1 Cash Drawer Messages (dark gray)

Use the following table to determine the cause of a cash drawer message.

Message	Repair Actions Listed in Most Likely Order of Failure
T3151 T3153 T3163	<ol style="list-style-type: none">1. Exchange the latch and sensor assembly. See topic 2.3.6.2. See the <i>hardware service manual</i> for your terminal and exchange the terminal system board.

2.3.2 Cash Drawer Symptoms (dark gray)

Use the following table to determine the cause of a cash drawer symptom.

Table 2-4. Cash Drawer Symptoms	
Symptom	Repair Actions Listed in Most Likely Order of Failure
The cash drawer does not open when the cash drawer key is turned to the left (open) position.	<ol style="list-style-type: none"> 1. Exchange the latch and sensor assembly. See topic 2.3.6. 2. Exchange the slide assembly. See topic 2.3.5. 3. Exchange the cam. See topic 2.3.8. 4. Exchange the keylock. See topic 2.3.10.
The cash drawer does not open when doing store transactions or running cash drawer tests but it opens when the cash drawer key is turned to the left (open) position.	<ol style="list-style-type: none"> 1. Exchange the latch and sensor assembly. See topic 2.3.6. 2. If this is a 4693 terminal, see the <i>IBM 4693, 4694, and 4695 Point of Sale Terminals: Hardware Service Manual, SY27-0337</i> and exchange the Rear Connector Panel. 3. If this is a 4684 terminal, see the <i>IBM 4683/4684 Point of Sale Terminal: Maintenance Manual, SY27-0295</i> and exchange the Power Supply. 4. See the <i>hardware service manual</i> for your terminal and exchange the terminal system board.
The cash drawer does not stay closed.	<ol style="list-style-type: none"> 1. Exchange the latch and sensor assembly. See topic 2.3.6. 2. Exchange the drawer. See topic 2.3.3. 3. If this is a 4693 terminal, see the <i>IBM 4693, 4694, and 4695 Point of Sale Terminals: Hardware Service Manual, SY27-0337</i> and exchange the Rear Connector Panel. 4. If this is a 4684 terminal, see the <i>IBM 4683/4684 Point of Sale Terminal: Maintenance Manual, SY27-0295</i> and exchange the Power Supply. 5. See the <i>hardware service manual</i> for your terminal and exchange the terminal system board.
The status displayed by the cash drawer tests does not match the physical status of the cash drawer being tested. Example: Cash drawer tests say CD A IS CLOSED when actually cash drawer A is open.	Exchange the latch and sensor assembly. See topic 2.3.6.

2.3.3 Removing and Replacing the Drawer

1. Switch **POWER OFF**.
2. Open the cash drawer and pull it all the way out.
3. Remove the till.
4. Push in on the buttons in the rails and pull up on the front of the drawer until it becomes free from the slides. Then pull it forward out of the base.
5. To exchange the drawer, make sure that the latch assembly is unlatched, otherwise the drawer will not close correctly.
6. Pull both slides all the way out.
7. Position the rear of the drawer into slides such that the drawer guide on each side of the drawer aligns with the corresponding opening in each slide. See Figure 2-6.
8. Pivot the front of the drawer downward until it is positioned fully into the slides.
9. Close the drawer to make sure it closes correctly and stays closed.

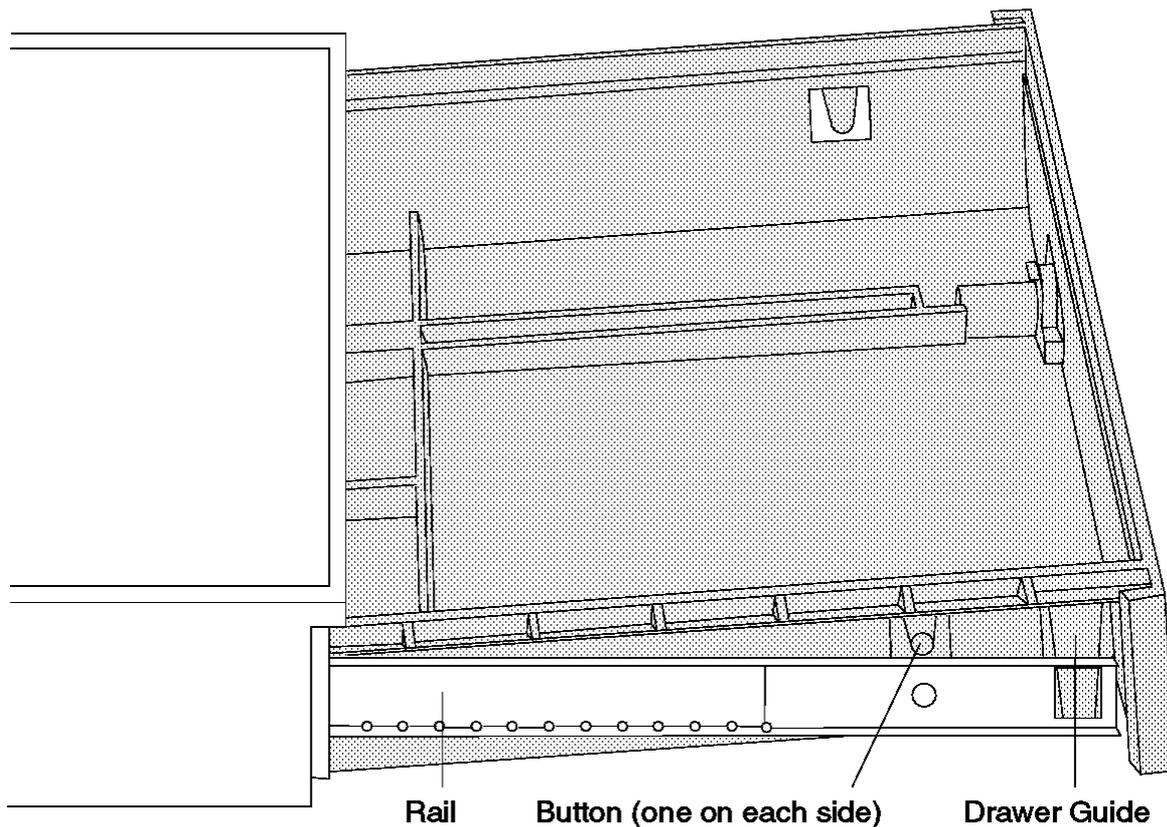


Figure 2-6. Removing and Replacing the Drawer

2.3.4 Removing and Replacing the Top Cover

1. Switch **POWER OFF**.
2. Open the rear panel by pushing the buttons at the upper rear corners of the cover.
3. Disconnect the cash drawer cable from the rear of the cash drawer.

Note: There may be other terminal cables routed through the rear of the top cover. Remove the rear panel by releasing it at the pivots. Separate the top cover and base without disturbing these cables. Only disconnect cables from the terminal unit when necessary.

4. Set the devices mounted on the top cover to the side.
5. Remove the drawer. See topic 2.3.3.
6. To separate the top cover from the base, reach in from the front and push the cover latches outward while pushing them to the rear. The cover slides off to the rear. See Figure 2-7.
7. To exchange the top cover, reverse this procedure.

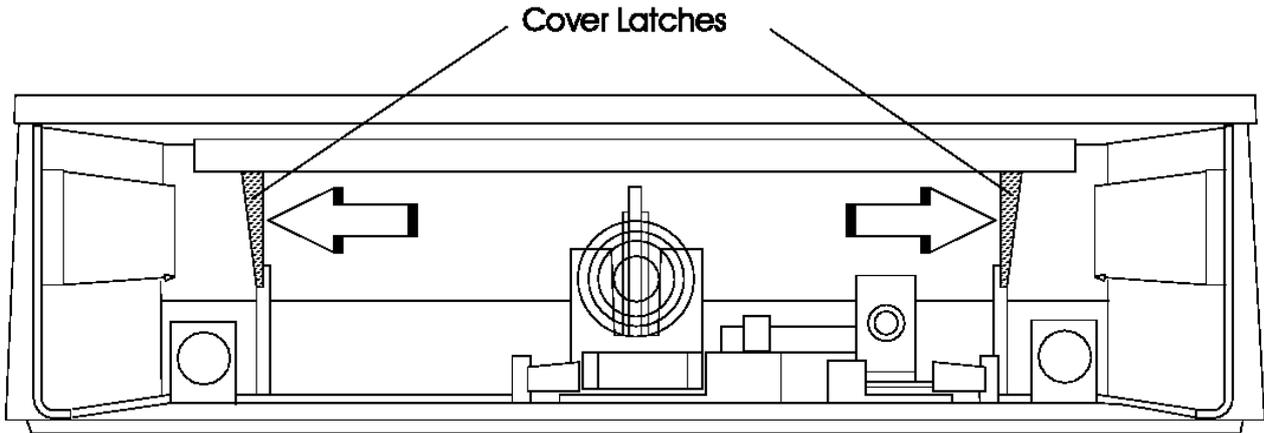


Figure 2-7. Removing and Replacing the Top Cover

2.3.5 *Removing and Replacing the Slide Assembly*

1. Switch **POWER OFF**.
2. Remove the drawer. See topic 2.3.3.
3. Remove the latch assembly. See topic 2.3.6.
4. Remove the 3 screws that secure the slide to the base and lift the slide assembly out. See Figure 2-8 in topic 2.3.6.

Note: To save time, try to remove the slides without removing the top cover. However, if necessary, remove the top cover.

5. To exchange the slide assembly, place the slide assembly into the base so that the screw holes are aligned.
6. Insert the screws that secure the slides to the base.
7. Reinstall the latch assembly.
8. Reinstall the top cover, if it was removed.
9. Reinstall the drawer.

2.3.6 Removing and Replacing the Latch Assembly

1. Switch **POWER OFF**.
2. Disconnect the cash drawer cable from the connector at the rear of the cash drawer.
3. Remove the drawer. See topic 2.3.3.
4. Reach in from the front and push the latch on each side of the latch assembly inward while pulling the assembly toward the front. See Figure 2-8.
5. Slide the assembly out of the base.
6. To exchange the latch assembly, slide the assembly into the base from the front and align it with the slots in the base. Push the assembly to the rear until it locks into place.
7. Make sure the latching mechanism is unlatched.
8. Reinstall the drawer.
9. Reconnect the cash drawer cable to the connector at the rear.

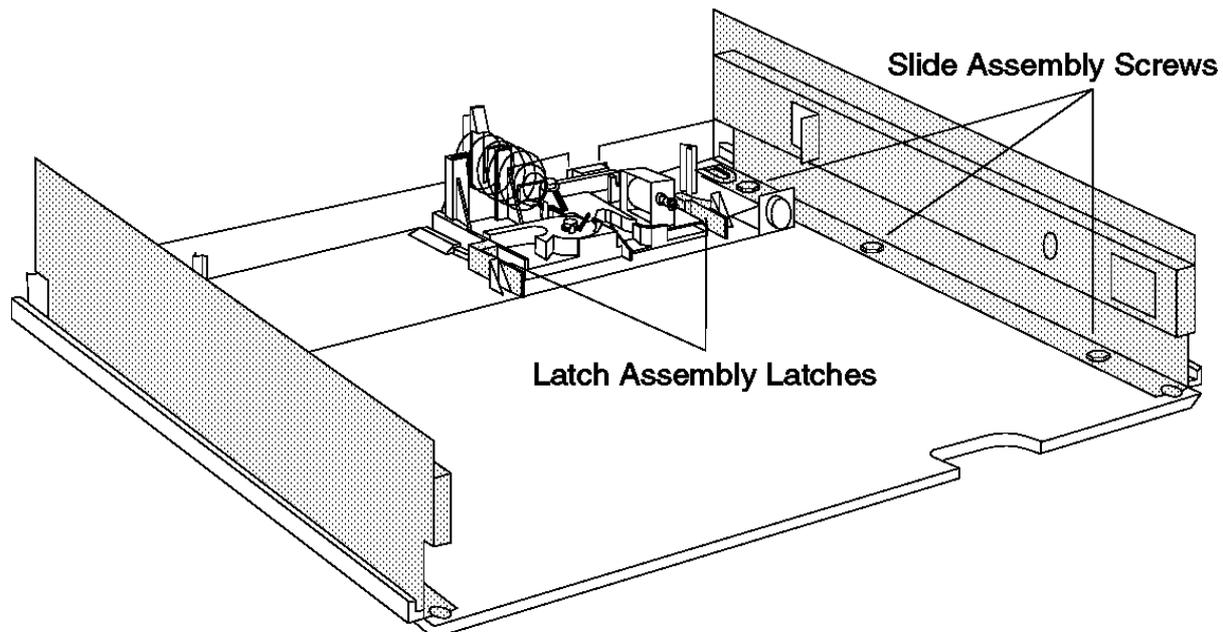


Figure 2-8. Removing and Replacing the Slide Assembly

2.3.7 *Removing and Replacing the Card Assembly*

1. Switch **POWER OFF**.
2. Remove the drawer. See topic 2.3.3.
3. Remove the latch assembly. See topic 2.3.6.
4. Remove the pawl. See topic 2.3.9 and 2.3.9.
5. Remove the 3 screws holding the card assembly to the latch assembly.
6. To exchange the card assembly, position the card assembly on the latch assembly and secure it with the 3 screws.
7. Reinstall the pawl. Make sure that the latch assembly is in the unlatched position.
8. Reinstall the latch assembly.
9. Reinstall the drawer.

2.3.8 *Removing and Replacing the Cash Drawer Cam*

1. Switch **POWER OFF**.
2. Remove the drawer. See topic 2.3.3.
3. Remove the latch assembly. See topic 2.3.6.
4. Remove the cash drawer propulsion spring by pushing the spring retainer and sliding the spring up out of its mounting slots. See Figure 2-9 in topic 2.3.9.
5. Remove the cam spring.
6. Spread apart the 2 cam latches holding the cam on the pivot post while lifting the cam off the post.
7. To exchange the cam assembly, position the cam over the pivot post and push down until the cam latches lock the cam into place.
8. Attach the cam spring to the cam and to the pawl. Make sure that the latch assembly is in the unlatched position.
9. Reinstall the cash drawer propulsion spring.
10. Reinstall the latch assembly.
11. Reinstall the drawer.

2.3.9 Removing and Replacing the Cash Drawer Pawl

1. Switch **POWER OFF**.
2. Remove the drawer. See topic 2.3.3.
3. Remove the latch assembly. See topic 2.3.6.
4. Remove the cam spring. See Figure 2-9.
5. Spread apart the 2 pawl latches holding the pawl on the pivot post while lifting the pawl off the post.
6. To exchange the pawl assembly, position the pawl over the pivot post and push down until the pawl latch locks the pawl into place.
7. Attach the cam spring to the cam and to the pawl. Make sure that the latch assembly is in the unlatched position.
8. Reinstall the latch assembly.
9. Reinstall the drawer.

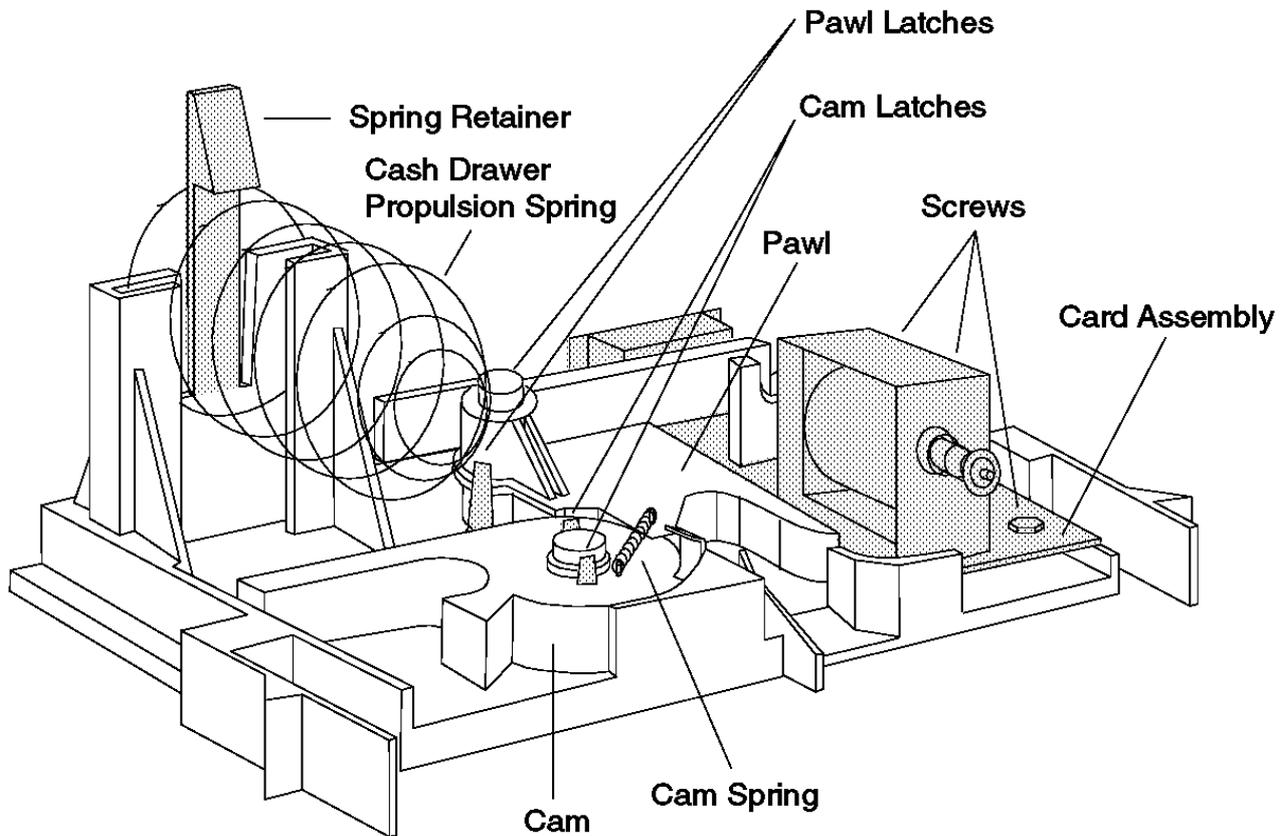


Figure 2-9. Removing and Replacing the Card Assembly and Cam

2.3.10 Removing and Replacing the Keylock Assembly

1. Remove the drawer. See topic 2.3.3.
2. Remove the lock retainer clip holding the keylock assembly on the inside of the drawer. See Figure 2-10.
3. Slide the lock assembly out of the front of the drawer.

Note: It may take some force to free the keylock assembly.

4. To exchange the keylock assembly, make sure the lock actuator rod is in the position shown.
5. Slide the lock assembly all the way into the opening in the front of the drawer, making sure that the end of the lock actuator rod is interlocked with the rear of the lock.
6. Reinstall the lock retainer clip.
7. Reinstall the drawer.

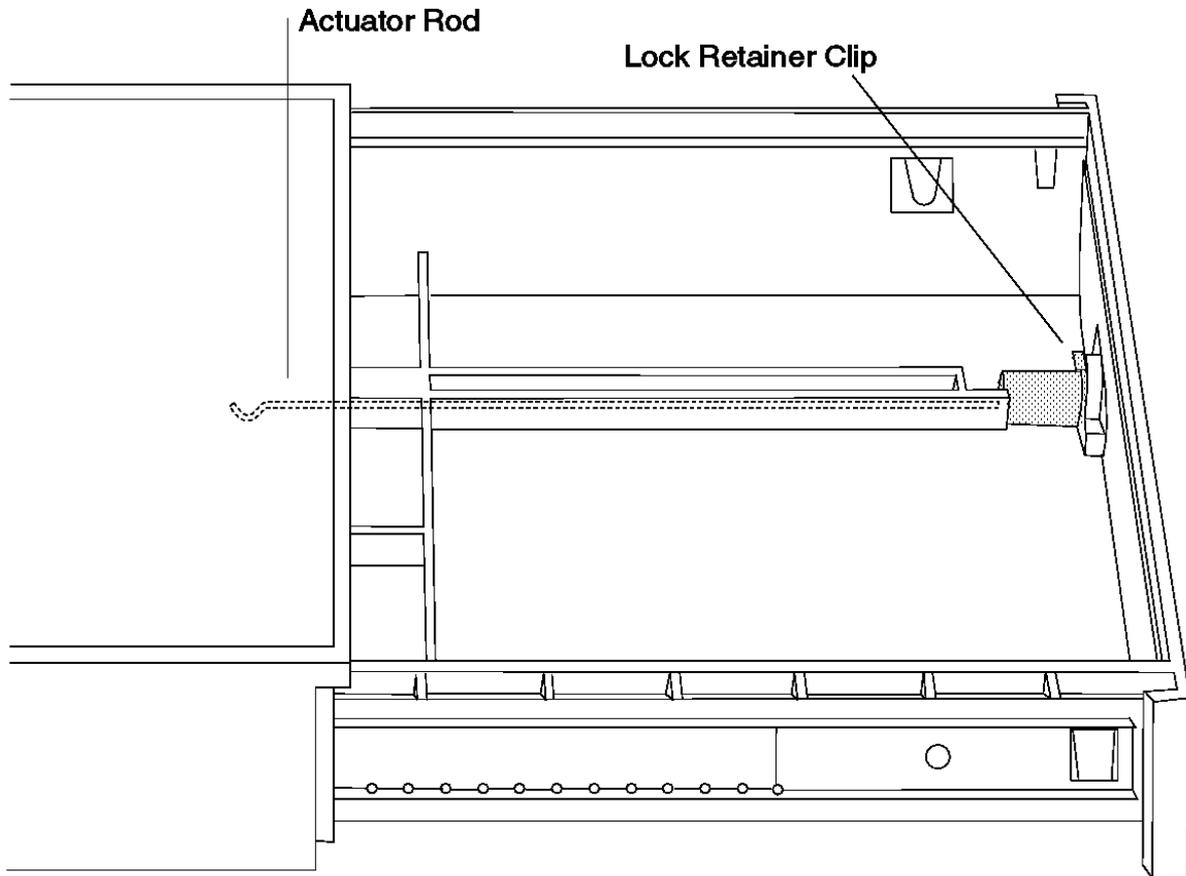


Figure 2-10. Removing and Replacing the Keylock Assembly

2.4 Compact Cash Drawer

This section contains the repair information for compact cash drawers.

Subtopics

- 2.4.1 Compact Cash Drawer Messages
- 2.4.2 Compact Cash Drawer Symptoms
- 2.4.3 Compact Cash Drawer Removals and Replacements
- 2.4.4 Removing and Replacing the Drawer
- 2.4.5 Removing and Replacing the Drawer Slide Latches
- 2.4.6 Removing and Replacing the Slide Assembly
- 2.4.7 Removing and Replacing the Rollers
- 2.4.8 Removing and Replacing the Keylock Assembly
- 2.4.9 Removing and Replacing the Top Cover
- 2.4.10 Removing and Replacing the Latch and Sensor Assembly
- 2.4.11 Removing and Replacing Latch and Sensor Assembly FRUs
- 2.4.12 Removing and Replacing the Coin Roll Cutter
- 2.4.13 Removing and Replacing the Compact Cash Drawer Security Clip

2.4.1 Compact Cash Drawer Messages

Use Table 2-5 to determine the action to take due to a cash drawer failure.

Table 2-5. Cash Drawer Messages	
Message	Repair Actions Listed in Most Likely Order of Failure
T3151 T3153 T3163	1. Exchange the latch and sensor assembly card. See topic 2.4.10.
	2. See the <i>Hardware Service Manual</i> for your terminal and exchange the terminal system board.

2.4.2 Compact Cash Drawer Symptoms

Use Table 2-6 to determine the action to take due to a cash drawer failure.

Table 2-6. Cash Drawer Symptoms	
Symptom	Repair Actions Listed in Most Likely Order of Failure
The cash drawer does not open or close smoothly or appears to be binding.	<ol style="list-style-type: none"> 1. Look for items that may cause binding, such as pens, paper clips, etc., trapped somewhere between the drawer and cover or the drawer and the base. 2. Remove the drawer and the rollers at the rear of the drawer and at the front of the base. Exchange the rollers if necessary. 3. Check to see if the slide assembly in the base is binding. Exchange the slide assembly, if necessary. See topic 2.4.6.
The cash drawer does not open when the cash drawer key is turned to the 9 o'clock (open) position.	<ol style="list-style-type: none"> 1. Exchange the keylock insert if the lock does not turn with the key. 2. Gently pull the drawer open while holding the key turned to the 9:00 o'clock position, to determine if the slide assembly is binding. Look for items that may cause binding, such as pens, paper clips, etc.. Exchange the slide assembly, if necessary. See topic 2.4.6. 3. Exchange the cam, pawl, and spring kit. See topic 2.4.11. 4. Check for a bent actuator rod. Exchange the actuator rod, if necessary.
The cash drawer does not open when doing store transactions or running cash drawer tests but it opens when the cash drawer key is turned to the 9'clock position.	<ol style="list-style-type: none"> 1. Exchange the latch and sensor assembly card. See topic 2.4.11. 2. See the <i>Hardware Service Manual</i> for your terminal and exchange the terminal system board.
The cash drawer does not stay closed.	<ol style="list-style-type: none"> 1. Make sure that the keylock is not stuck in the open position (rotated to the 9:00 o'clock position). Exchange the lock assembly if necessary. See topic 2.4.8. 2. Exchange the cam, pawl, and spring kit. See topic 2.4.11. 3. Exchange the latch and sensor assembly card. See topic 2.4.11. 4. Exchange the drawer. See topic 2.4.4. 5. See the <i>Hardware Service Manual</i> for your terminal and exchange the terminal system board.
The status displayed by the cash drawer tests does not match the physical status of the cash drawer being tested.	<ol style="list-style-type: none"> 1. Exchange the latch and sensor assembly card. See topic 2.4.11. 2. Exchange the cam, pawl, and spring kit. See topic 2.4.11. 3. See the <i>Hardware Service Manual</i> for your terminal and exchange the terminal system board.
<p>Example:</p> <p>Cash drawer tests say CD A IS CLOSED when actually cash drawer A is open.</p>	<ol style="list-style-type: none"> 3. See the <i>Hardware Service Manual</i> for your terminal and exchange the terminal system board.

2.4.3 Compact Cash Drawer Removals and Replacements

2.4.4 Removing and Replacing the Drawer

1. Switch **POWER OFF**.
2. Open the cash drawer and pull it all the way out.
3. Remove the till.
4. Using a coin or large screwdriver, move the drawer slide latches to the right (facing the front of the drawer, see Figure 2-11 and Figure 2-12) until the drawer is released from the slide assembly. Lift the drawer out.
5. If you are exchanging the drawer you must remove the lock assembly and install it into the new drawer. See "Removing and Replacing the Keylock Assembly" in topic 2.4.8.
6. Reassemble.

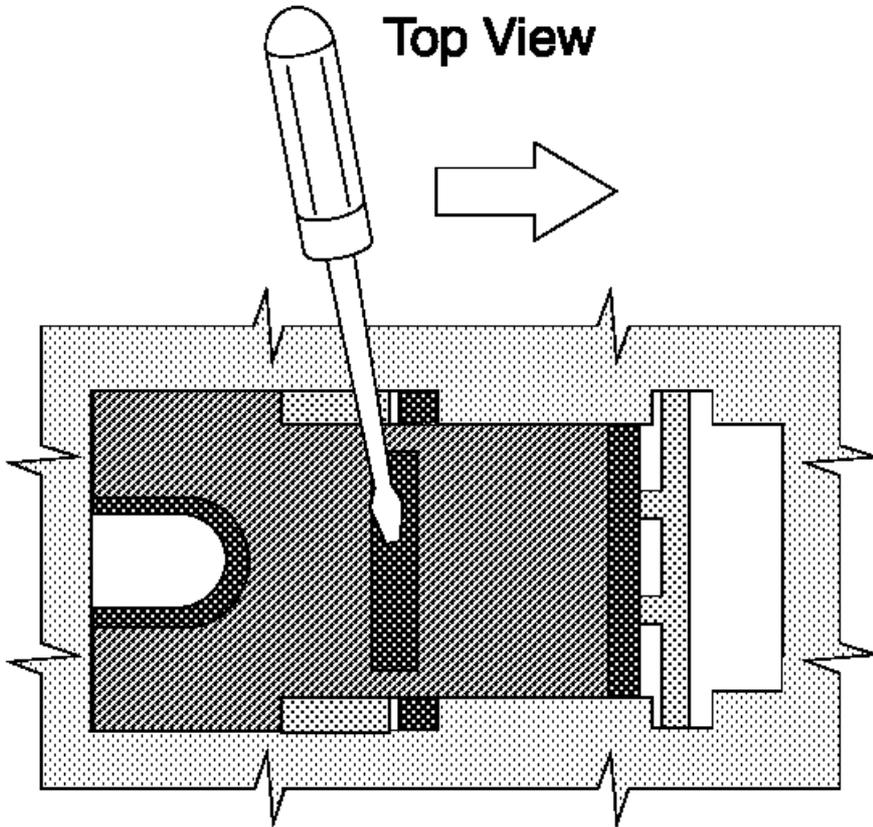


Figure 2-11. Releasing the Cash Drawer from the Slide Assembly

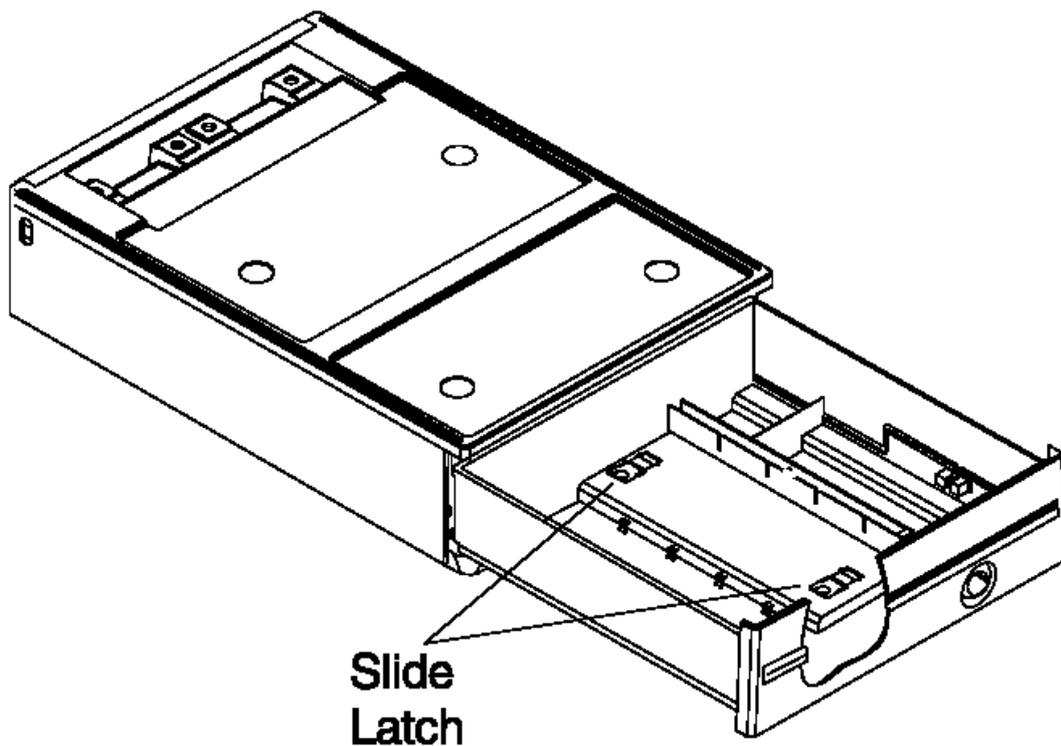


Figure 2-12. Removing and Replacing the Drawer

2.4.5 Removing and Replacing the Drawer Slide Latches

1. Switch **POWER OFF**.
2. Remove the cash drawer.
3. Remove the slide latch by sliding it all the way to the left (latched position).
4. Gently pry and press at the point shown in Figure 2-13.
5. To exchange the latch, insert it through the opening in the bottom of the drawer and rotate it into position. Then push up from the bottom until it latches.

Top View

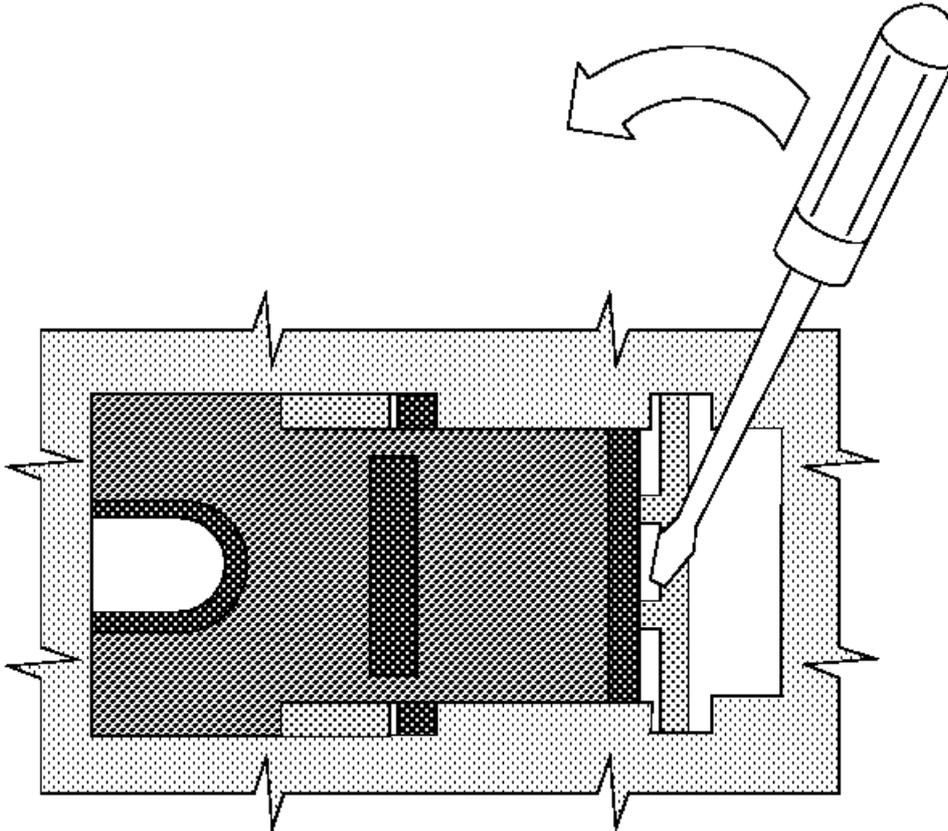


Figure 2-13. Removing and Replacing the Slide Latches

2.4.6 Removing and Replacing the Slide Assembly

1. Switch **POWER OFF**.
2. Remove the drawer. See topic 2.4.4.
3. Remove the three screws that secure the slide to the base and lift the slide assembly out. See Figure 2-14.
4. To exchange the slide assembly, place the slide assembly into the base so that the screw holes are aligned.
5. Insert and tighten the screws that secure the slide to the base.
6. Reassemble.

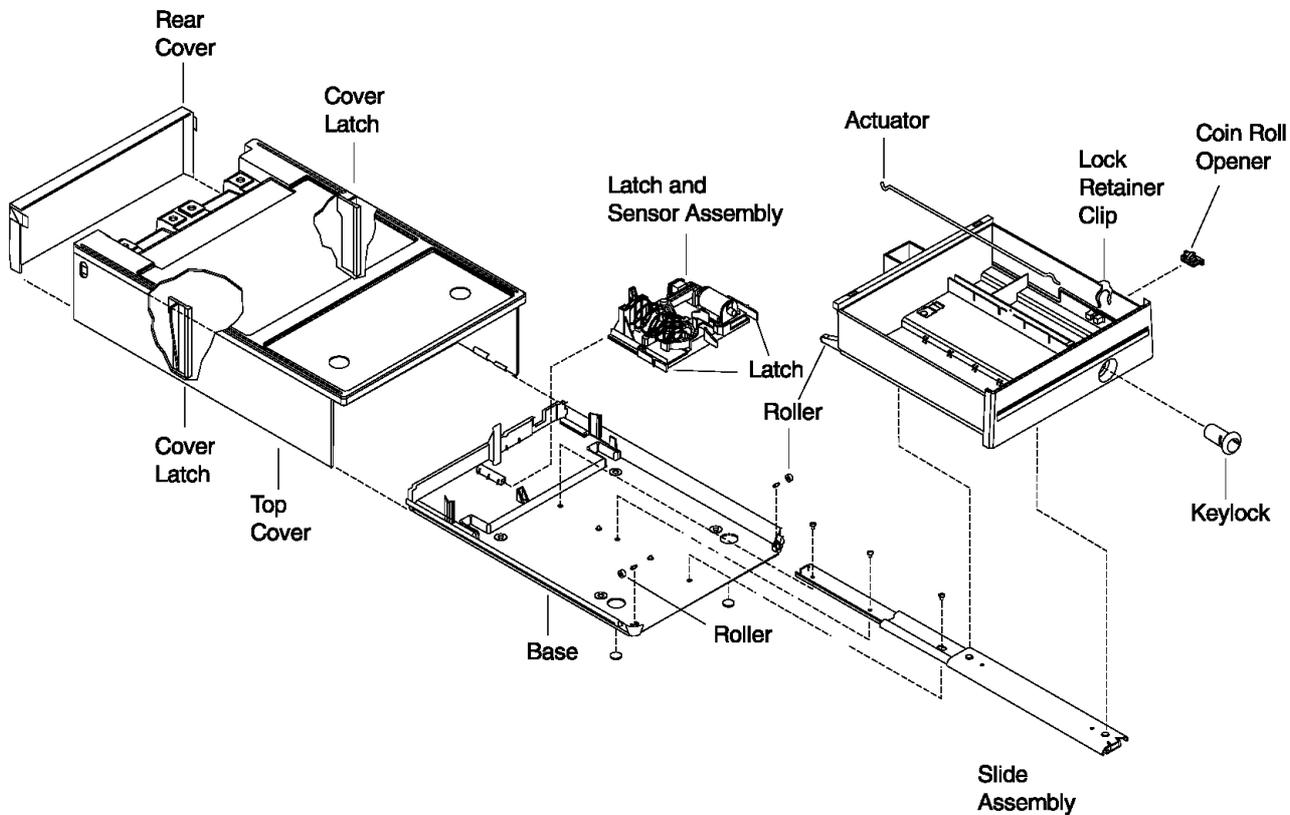


Figure 2-14. Compact Cash Drawer Assembly

2.4.7 *Removing and Replacing the Rollers*

1. Switch **POWER OFF**.
2. Remove the drawer. See topic 2.4.4.

Note: There are four rollers: two ball-bearing rollers at the front of the base and two plastic rollers at the rear of the drawer assembly. They should all be exchanged at the same time.

3. Each roller shaft is snapped into two plastic posts. To exchange the roller and shaft, gently pry the roller and shaft out and snap the new set into position. Be sure to use the ball bearing rollers on the base and the plastic rollers on the drawer.
4. Reassemble.

2.4.8 Removing and Replacing the Keylock Assembly

1. Remove the drawer. See topic 2.4.4.
2. Remove the lock retainer clip holding the keylock assembly on the inside of the drawer. See Figure 2-14 in topic 2.4.6.
3. Slide the lock assembly out of the front of the drawer.

Note: It may take some force to free the keylock assembly.

4. To exchange the keylock assembly, make sure the lock actuator rod is in the position shown in Figure 2-14 in topic 2.4.6.
5. Slide the lock assembly all the way into the opening in the front of the drawer, making sure that the end of the lock actuator rod is interlocked with the rear of the lock.
6. Reassemble.

2.4.9 Removing and Replacing the Top Cover

1. Switch **POWER OFF**.
2. Remove any equipment that is on the top of the cash drawer.
3. Remove the rear cover.
4. Unplug cable 3 from the rear of the cash drawer.
5. Remove the drawer. See topic 2.4.4.
6. Reach into the front with two hands and push the two cover latches to the outside while sliding the top cover to the rear. See Figure 2-14 in topic 2.4.6.
7. To exchange the top cover, align the top cover with the edges on the base at the rear and slide the cover forward until it latches into place.
8. Reassemble.

2.4.10 *Removing and Replacing the Latch and Sensor Assembly*

1. Switch **POWER OFF**.
2. Open the rear cover.
3. Disconnect the cash drawer cable from connector 3 at the rear of the cash drawer.
4. Remove the cash drawer. See topic 2.4.4.
5. Reach in from the front with two hands and push the latch on each side of the latch assembly inward while pulling the assembly toward the front. See Figure 2-14 in topic 2.4.6.
6. To exchange the latch and sensor assembly, make sure the latching mechanism is in the unlatched (drawer open) position.
7. Slide the assembly into the base from the front and align it with the slots in the base. Then push the assembly to the rear until it locks into place.
8. Reassemble.

2.4.11 Removing and Replacing Latch and Sensor Assembly FRUs

1. Switch **POWER OFF**.
2. Remove the drawer. See topic 2.4.4.
3. Remove the latch assembly. See topic 2.4.10.
4. Remove the cash drawer propulsion spring by pushing the spring retainer back and sliding the spring up and out of its mounting slots. See Figure 2-15.
5. Remove the latch plate bracket by removing the screw in cam pivot post and the screw in the pawl pivot post.
6. Remove the cam spring by lifting the ends of the small posts on the cam and pawl.
7. Spread apart the two pawl latches holding the pawl on the pivot post while lifting the pawl off the post.
8. Spread apart the two cam latches holding the cam on the pivot post while lifting the cam off the post.
9. Remove the three screws that retain the card assembly and remove it.
10. Reverse this procedure to exchange the latch and sensor assembly FRUs.

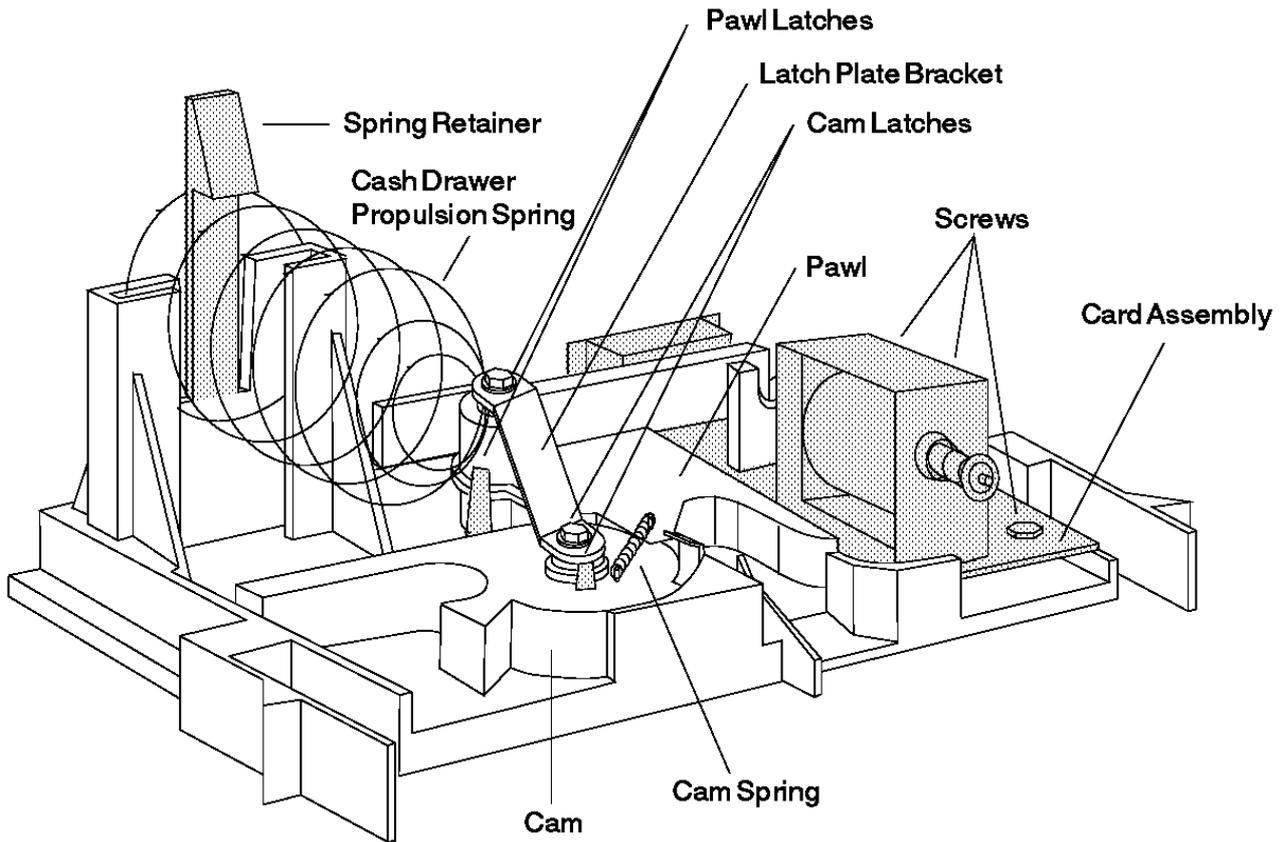
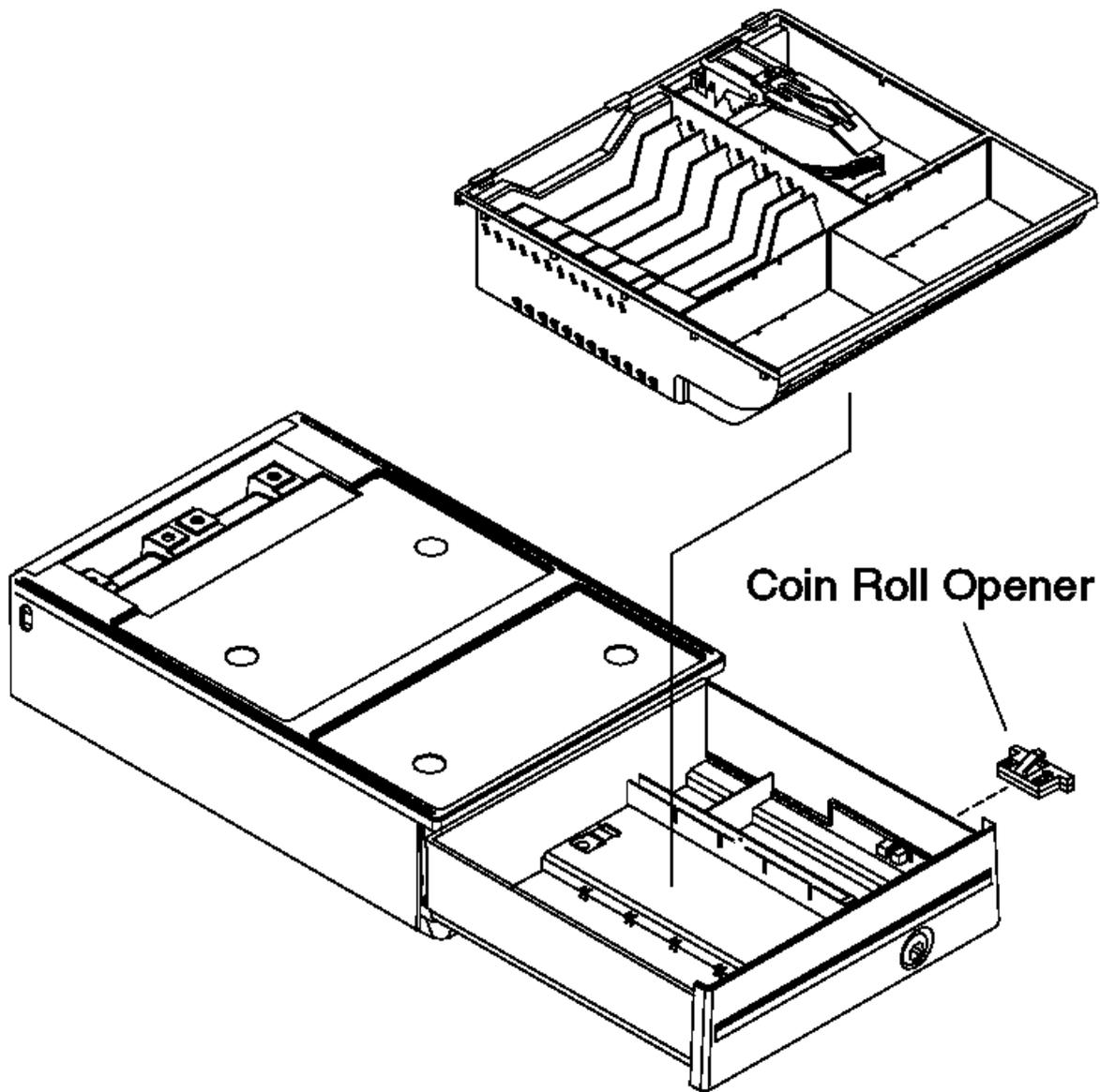


Figure 2-15. Removing and Replacing Latch and Sensor Assembly FRUs

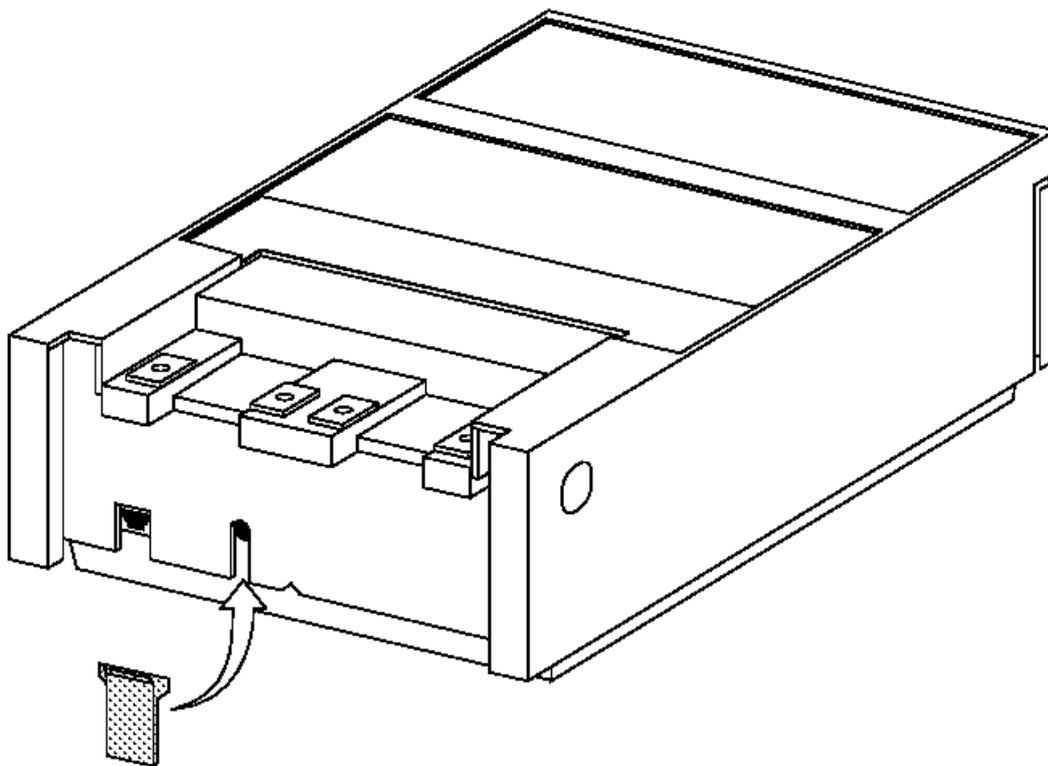
2.4.12 Removing and Replacing the Coin Roll Cutter

1. Open the cash drawer and pull it all the way out.
2. Remove the till.
3. From inside the drawer, squeeze the cutter latches together with your fingers and push the cutter outward until it can be removed from the outside.
4. To exchange the cutter, snap the new one into position from the outside.
5. Reassemble.



2.4.13 Removing and Replacing the Compact Cash Drawer Security Clip

1. Switch **POWER OFF**.
2. Open the rear cover of the cash drawer and remove it.
3. Remove the top cover. See "Removing and Replacing the Top Cover" in topic 2.4.9.
4. Remove the security clip.
5. Reassemble.



2.5 Replacing the Compact Cash Drawer Integration Cover

1. Open the rear cover on the 4695 by pressing the tabs on both sides of the 4695. See Figure 2-16.
2. Install the compact cash drawer integration panel. Fasten the integration panel to the cash drawer with two M4 screws.
3. Place the 4695 on top of the compact cash drawer and onto the threaded studs of the integration panel. Fasten the 4695 to the cash draw with two M6 screws.
4. Install the integration cover.

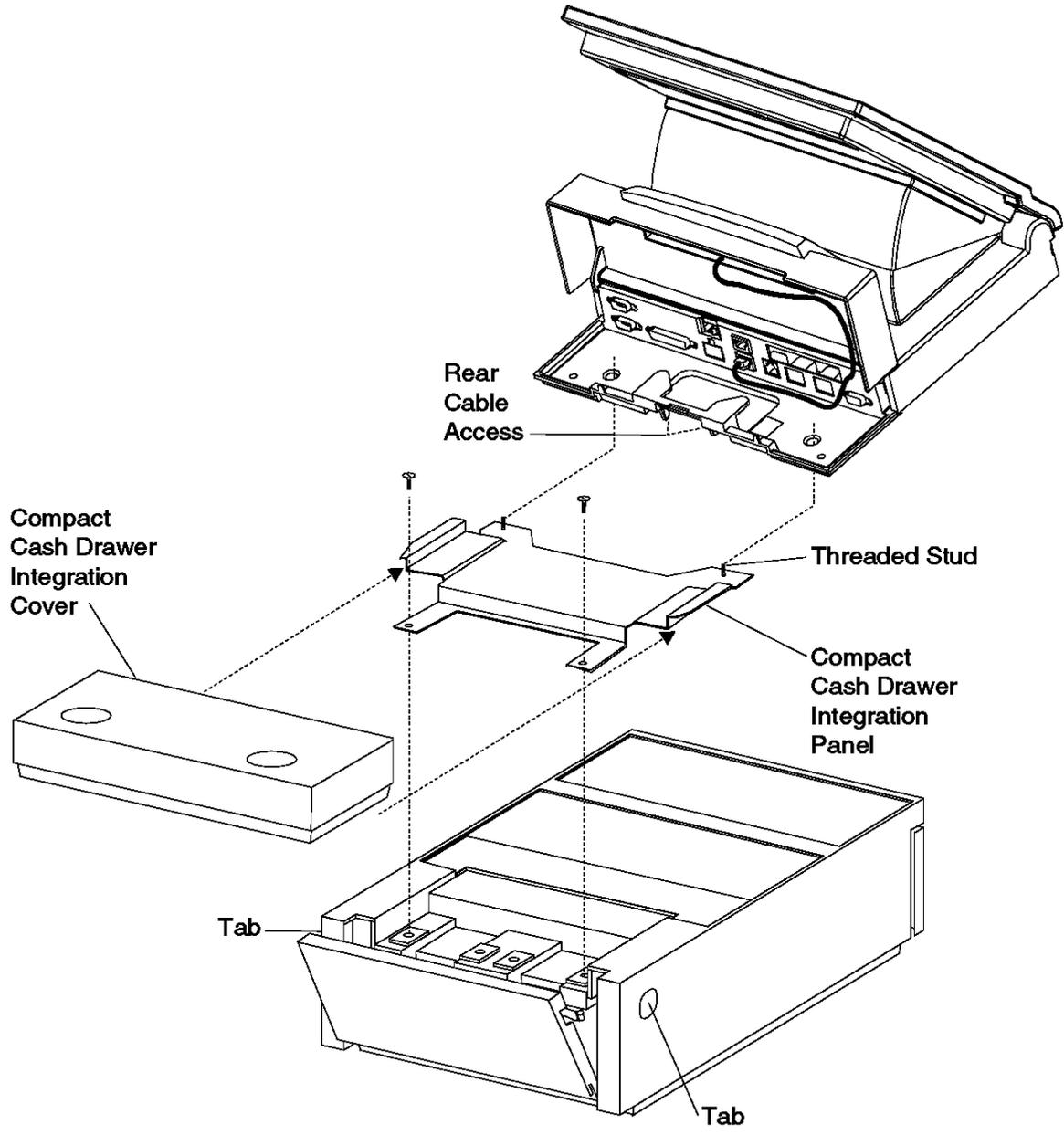


Figure 2-16. Integration Panel Installation

3.0 Chapter 3. Point-of-Sale Displays

Subtopics

- 3.1 Flat Panel Display
- 3.2 Flat Panel Display Symptoms
- 3.3 Flat Panel Display Component Removal and Replacement
- 3.4 Sure Point Touch Screens
- 3.5 Touch Display Symptoms
- 3.6 Monochrome Touch Display Component Removal and Replacement
- 3.7 Color Touch Display Component Removal and Replacement
- 3.8 Removing and Replacing the Accessory Kits
- 3.9 40-Character Vacuum Fluorescent Display II
- 3.10 40-Character Alphanumeric Display

3.1 Flat Panel Display

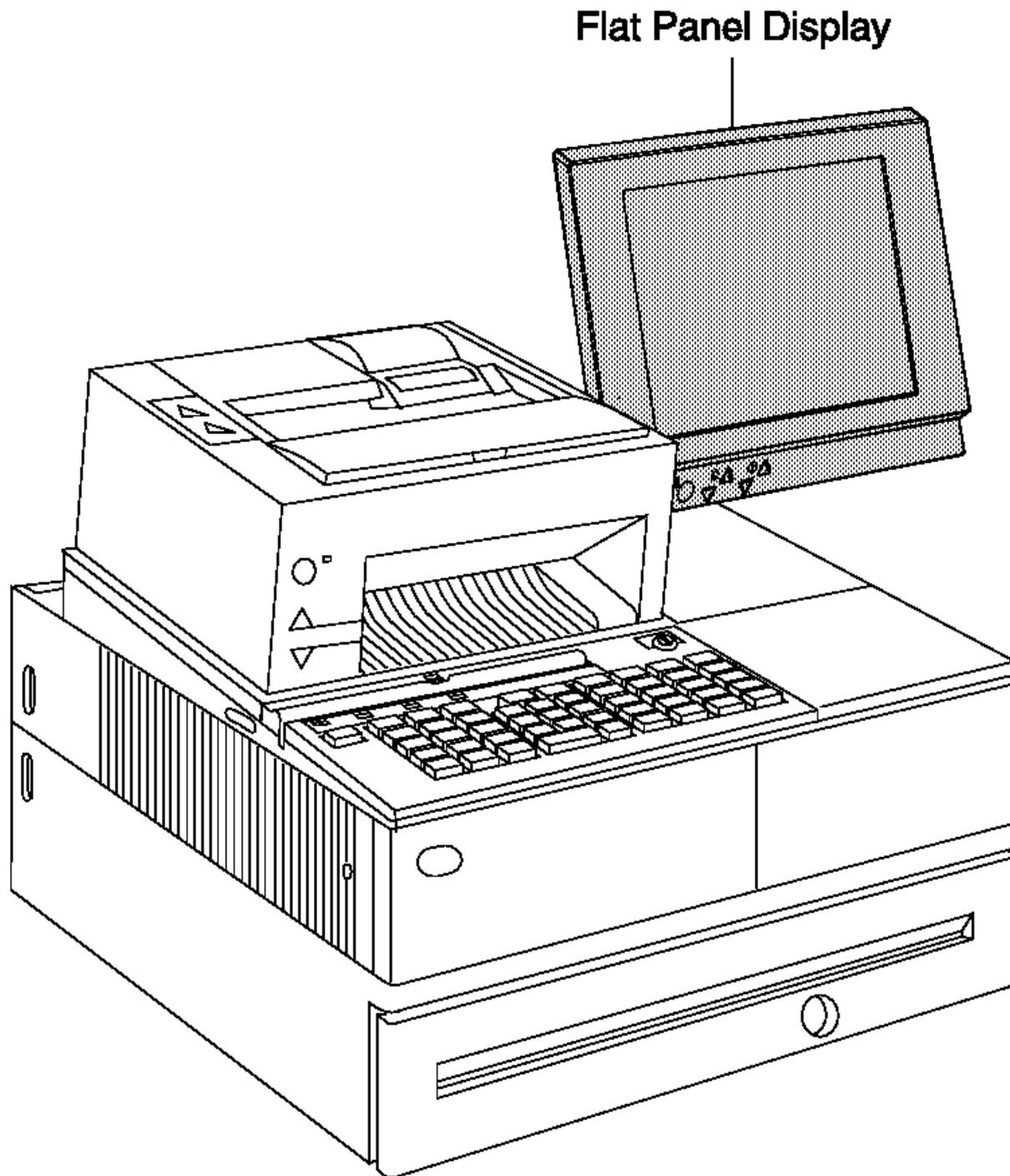


Figure 3-1. IBM 4693 with Integrated Flat Panel Display

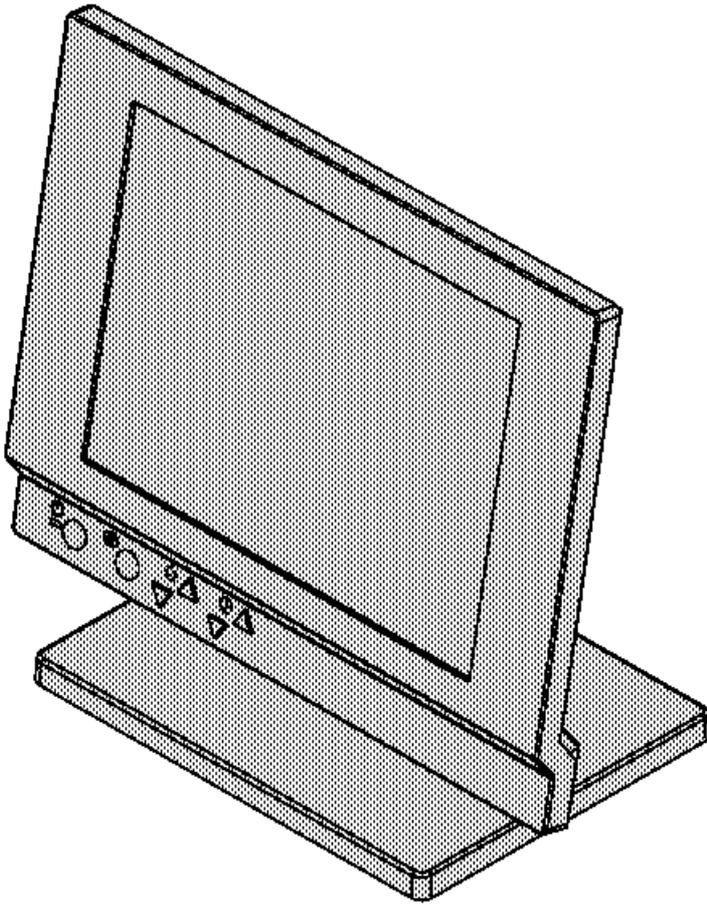


Figure 3-2. Distributed Display

+--- **Mercury Disposal** -----+

| The flat panel display contains a cold cathode fluorescent lamp (CCFL) |
| that contains mercury. |
| Dispose of it in accordance with local ordinances or regulations. |

Subtopics

- 3.1.1 Flat Panel Display Testing
- 3.1.2 Flat Panel Display Messages
- 3.1.3 Flat Panel Display Sleep Control

3.1.1 Flat Panel Display Testing

The flat panel display and adapter are tested each time that power is switched ON. If you get an error message or failure symptom, see "Flat Panel Display Messages" in topic 3.1.2 or "Flat Panel Display Symptoms" in topic 3.2.

To perform a more complete test of the flat panel display, the following diskettes are required:

IBM 4693 Point of Sale Terminals: Reference Diskette, SX27-3918

IBM 4695 Service Diskette Version 1.00 (or later), SX27-3965

IBM Flat Panel Display Adapter/A - Option Diskette Version 1.00 (or later), SX27-3966

For the 4693, see the *IBM 4693, 4694, and 4695 Point of Sale Terminals: Hardware Service Manual, SY27-0337*.

3.1.2 Flat Panel Display Messages

When the Mode Control Switch is pressed to switch Ready mode ON and storage retention is disabled, power-on self-test (POST) on the flat panel adapter is performed automatically. These messages indicate errors detected by POST.

0148nnxn

Explanation: An IBM 4695 Point of Sale Adapter/A or IBM Flat Panel Display Adapter/A error occurred.
(n = any number)
(x = slot number)

User Response: Exchange the adapter card.

3.1.3 Flat Panel Display Sleep Control

There is an indicator and a button on the front for sleep control. The following table describes how to control sleep modes.

Table 3-1. Sleep Control	
Sleep Indicator	Is ON when display is in sleep mode. This also indicates the mode while in setup state as described below.
Sleep/Resume Button	The left round button controls sleep/resume of display.
Auto Sleep Mode	<p>In this mode, the display sleeps when the sleep time selected using the Reference Disk Configuration Setup Menu has expired. If no screen change occurs during this time (1 to 15 minutes), the display automatically goes into sleep mode. The default time selected by Auto Configuration is 3 minutes.</p> <p>Note: Application programs that are constantly changing the screen, such as graphic clocks, never allow the display to automatically sleep.</p> <p>The display resumes when at least one of the following conditions is met:</p> <ol style="list-style-type: none"> 1. Display screen is changed by the program that is running. <p>Note: When the display is sleeping and a key is pressed, the screen resumes after processing the keystroke. This may cause a different screen than expected to appear.</p> <ol style="list-style-type: none"> 2. Sleep/Resume button is pushed.
Manual sleep mode	In this mode, the display toggles between sleep and resume by pressing the Sleep/Resume button. The sleep time selected when using the Reference Disk Setup Menu has no effect in manual mode.
Switching modes	<p>To switch between auto and manual sleep mode, use the following instructions:</p> <ol style="list-style-type: none"> 1. Push both Sleep/Resume button and Reverse button for more than 3 seconds to enter setup state. 2. In setup state, the indicator blinks. There are 2 different sequences of indicator blinks and by observing this sequence, the current sleep mode can be determined. <p>Auto mode Blink sequence is as follows:</p> <p style="text-align: center;">PICTURE 21</p> <p>Manual mode Blink sequence is as follows:</p> <p style="text-align: center;">PICTURE 22</p> <ol style="list-style-type: none"> 3. Push the Reverse button to change the sleep mode. Observe the blink sequence. 4. Push the Sleep/Resume button to exit setup state.
Sleep Type	<p>The sleep type is selectable. The 3 types are described below.</p> <p>Dim Backlight brightness is fixed to the lowest value.</p> <p>Off Backlight is turned off.</p> <p>Blank Backlight is turned off and video screen is blanked.</p> <p>The sleep type is cyclically changed by using the</p>

I/O Devices - Hardware Service Manual
Flat Panel Display Sleep Control

```
|          | contrast up/down buttons while in setup state.  See above |  
|          | "Mode" description for how to enter and exit setup state. |  
+-----+
```

3.2 Flat Panel Display Symptoms

The actions in the table are intended for trained service personnel only.

The upper half and lower half of the LCD are driven separately and a horizontal center line may be slightly visible.

Table 3-2. Flat Panel Display Symptoms	
SYMPTOMS	ACTIONS
Flat panel display does not display anything (blank display).	<ol style="list-style-type: none"> 1. Check the sleep mode indicator. If the sleep indicator is ON, push the Sleep/Resume button to resume. 2. Make sure the large cable is connected to the adapter card in the system unit and to the display. 3. Make sure the small cable is connected to socket 4A, 4B, 9A, or 9B at the rear of the system unit and to the display. 4. Make sure the LCD module cable is connected to the LCD module and LCD panel card. 5. Make sure the adapter card in the system unit is installed properly. 6. Exchange the LCD panel card. See topic 3.3.4. 7. Exchange the LCD module. See topic 3.3.2. 8. Exchange the adapter card in the system unit.
Backlight does not light.	<ol style="list-style-type: none"> 1. Check the sleep mode indicator. If the sleep indicator is ON, push the Sleep/Resume button to resume. The backlight should turn ON. 2. Check the sleep type that is selected to be sure types "Off" or "Blank" are not selected by mistake. See "Flat Panel Display Sleep Control" in topic 3.1.3. 3. Exchange the CCFL Assembly. See topic 3.3.3. 4. Exchange Panel Card. See topic 3.3.4.
Flat panel display is failing to display correctly.	<ol style="list-style-type: none"> 1. Exchange the LCD panel card. See topic 3.3.4. 2. Exchange the LCD module. See topic 3.3.2.
Display does not sleep.	<ol style="list-style-type: none"> 1. See the notes related to Auto Sleep Mode in Table 3-1 in topic 3.1.3. 2. Exchange the LCD panel card. See topic 3.3.4.
Brightness or contrast controls do not cause a change.	<ol style="list-style-type: none"> 1. Make sure that the brightness or contrast is not at it's maximum (high or low). 2. Exchange the LCD panel card. See topic 3.3.4.
Reverse Video Button does not work.	Exchange the LCD panel card. See topic 3.3.4.
1 long and x short BEEPs during POST (x = 2,3,5 or 6)	Exchange the adapter card in the system unit.
1 long and 4 short BEEPS during POST	<ol style="list-style-type: none"> 1. Make sure the cables are connected properly. 2. Exchange the LCD panel card. See topic 3.3.4. 3. Exchange the adapter card in the system unit.

3.3 Flat Panel Display Component Removal and Replacement

This section explains the removal and replacement of the flat panel display components. Establish personal grounding before touching this unit.

These procedures are intended for trained service personnel only.

Subtopics

3.3.1 Removing and Replacing the Front Cover

3.3.2 Removing and Replacing the LCD module Assembly

3.3.3 Removing and Replacing the CCFL (Cold Cathode Fluorescent Lamp) Assembly

3.3.4 Removing and Replacing the LCD panel card

3.3.5 Removing and Replacing the Flat Filler Panel

3.3.6 Removing and Replacing the Display Cable

3.3.1 Removing and Replacing the Front Cover

1. Remove the 2 screws (1). See Figure 3-3.
2. Open the front cover by gently prying and flexing the cover outward at the 6 latch locations shown in Figure 3-3. It is best to release at the bottom edge first. Then release the sides, leaving the top until last.
3. To replace the front cover, reverse this procedure.

Note: Do not touch the display face. Also, make sure that the inside of the cover is clean before it is reinstalled.

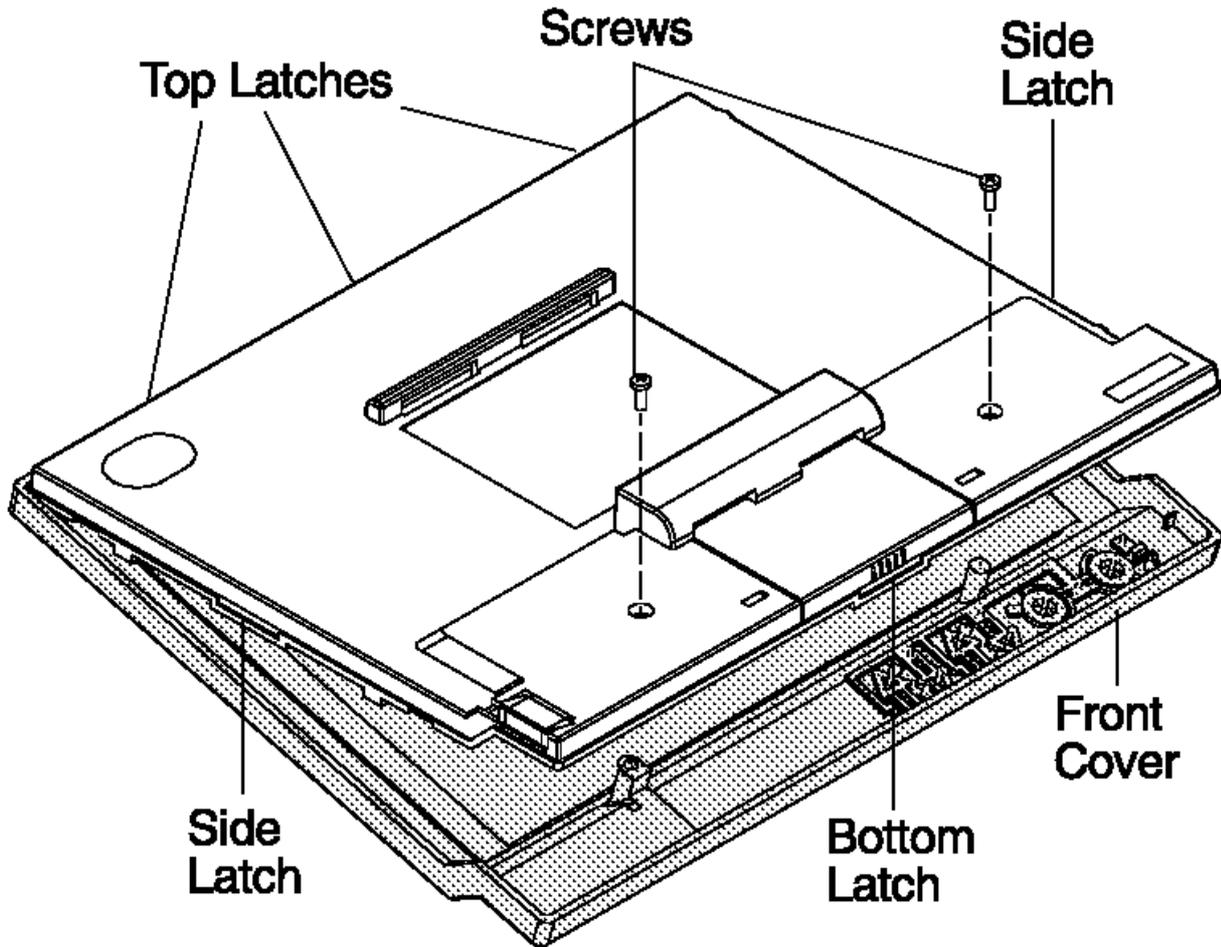


Figure 3-3. Removing the Front Cover

3.3.2 Removing and Replacing the LCD module Assembly

1. Remove the front cover assembly.
2. Remove the 4 screws (2). See Figure 3-4.
3. Disconnect the cables (3) and (4) attached to the LCD panel card and lift the LCD module assembly out.
4. To replace the LCD module assembly, reverse this procedure.

Note: Make sure that the LCD module is free of dust, debris, and fingerprints before being replaced.

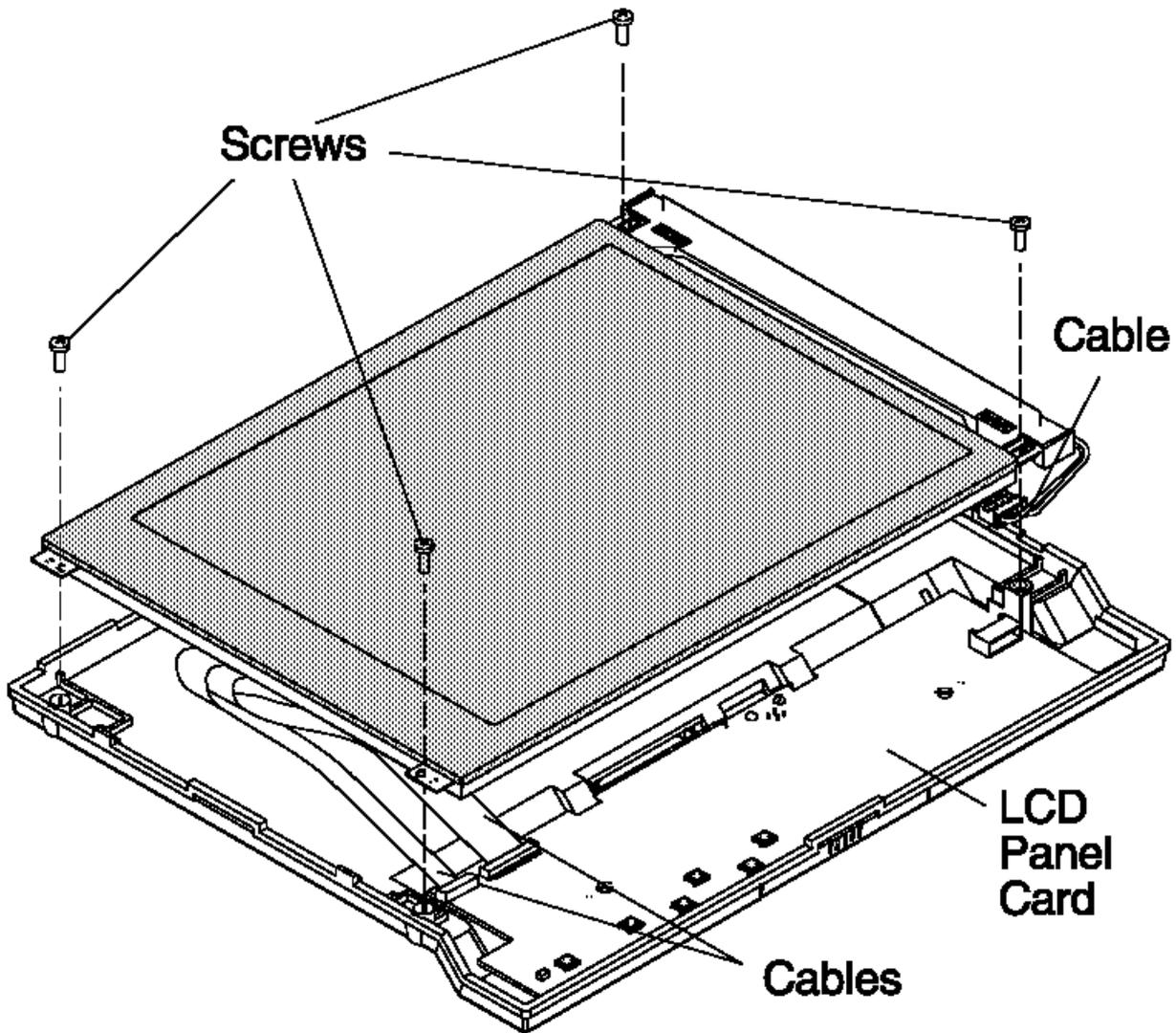


Figure 3-4. Removing the LCD module

3.3.3 Removing and Replacing the CCFL (Cold Cathode Fluorescent Lamp) Assembly

Note: For clarity, the rear cover is not shown in the illustrations. Do not remove the rear cover.

1. Remove the front cover assembly.
2. Disconnect the CCFL cable attached to the LCD panel card.
3. Remove the CCFL cover by lifting the latches and pushing the cover outward as shown in Figure 3-5.
4. Remove the CCFL cables from the groove.
5. Carefully lift the CCFL assembly out. See Figure 3-6.
6. To replace the CCFL assembly, reverse this procedure.

Notes:

- a. When replacing the CCFL assembly, take note of the length of the cables. There is a long cable and a short one. Place the short cable at the bottom edge. See Figure 3-7.
- b. Be sure that CCFL cables are seated completely into the groove and routed over the corner of the cover as shown in Figure 3-5.
- c. Be sure that the aluminum foil covers the CCFL assembly as the cover is reinstalled.

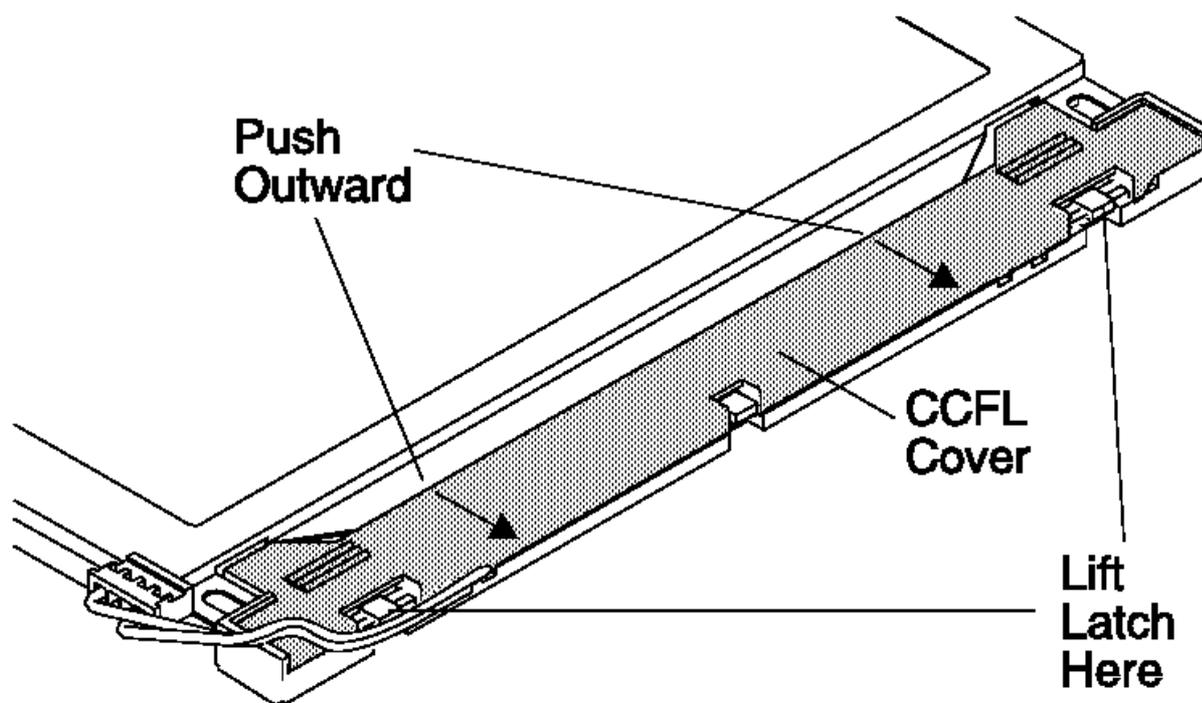


Figure 3-5. Opening the CCFL Front Cover

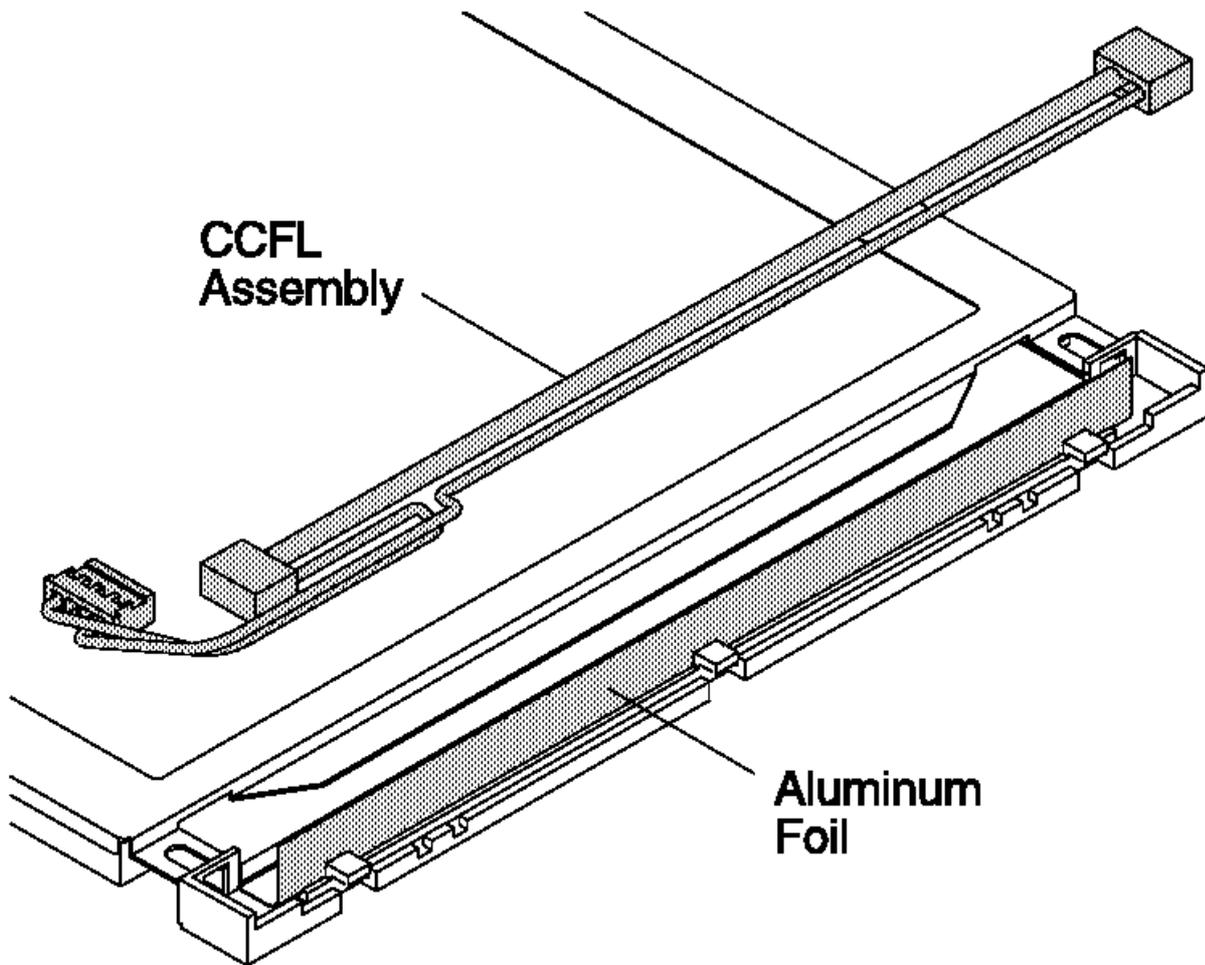


Figure 3-6. Removing the CCFL Assembly

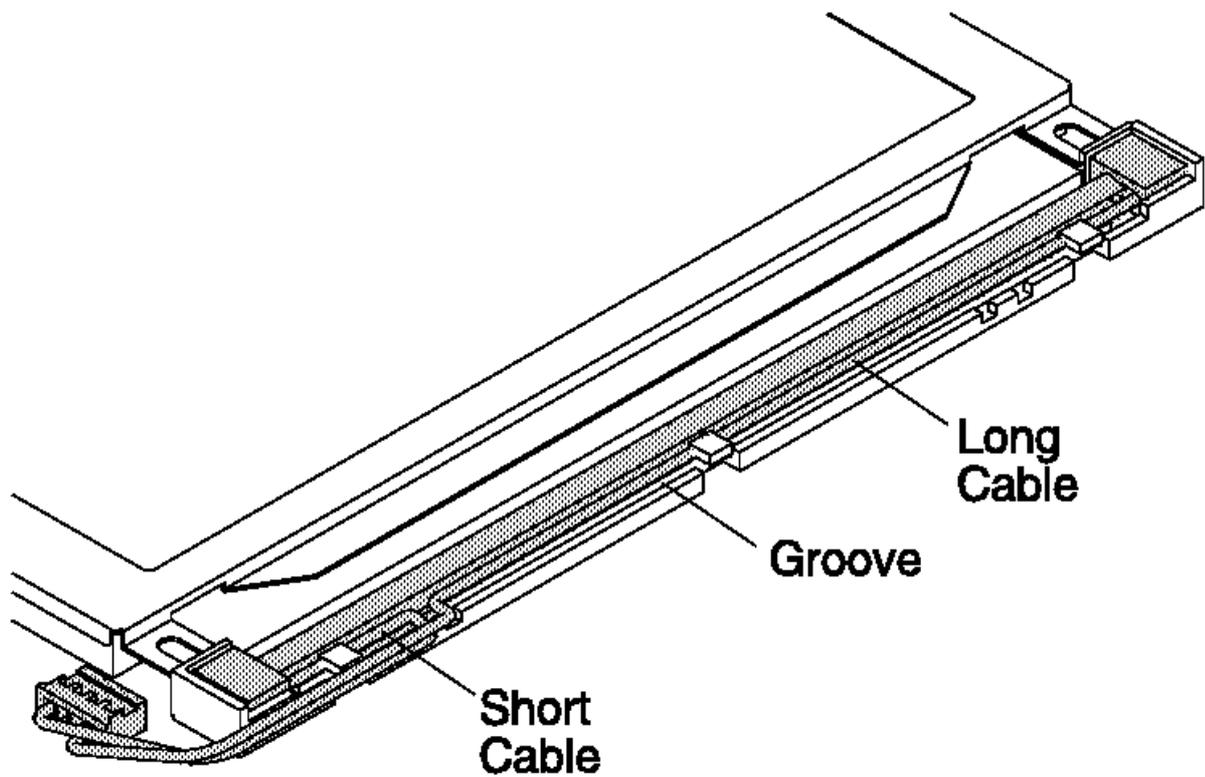


Figure 3-7. Reassembling the CCFL Assembly

3.3.4 Removing and Replacing the LCD panel card

1. Remove the LCD module assembly. See Figure 3-4 in topic 3.3.2.
2. Lift the panel card out.
3. To replace the LCD panel card, reverse this procedure.

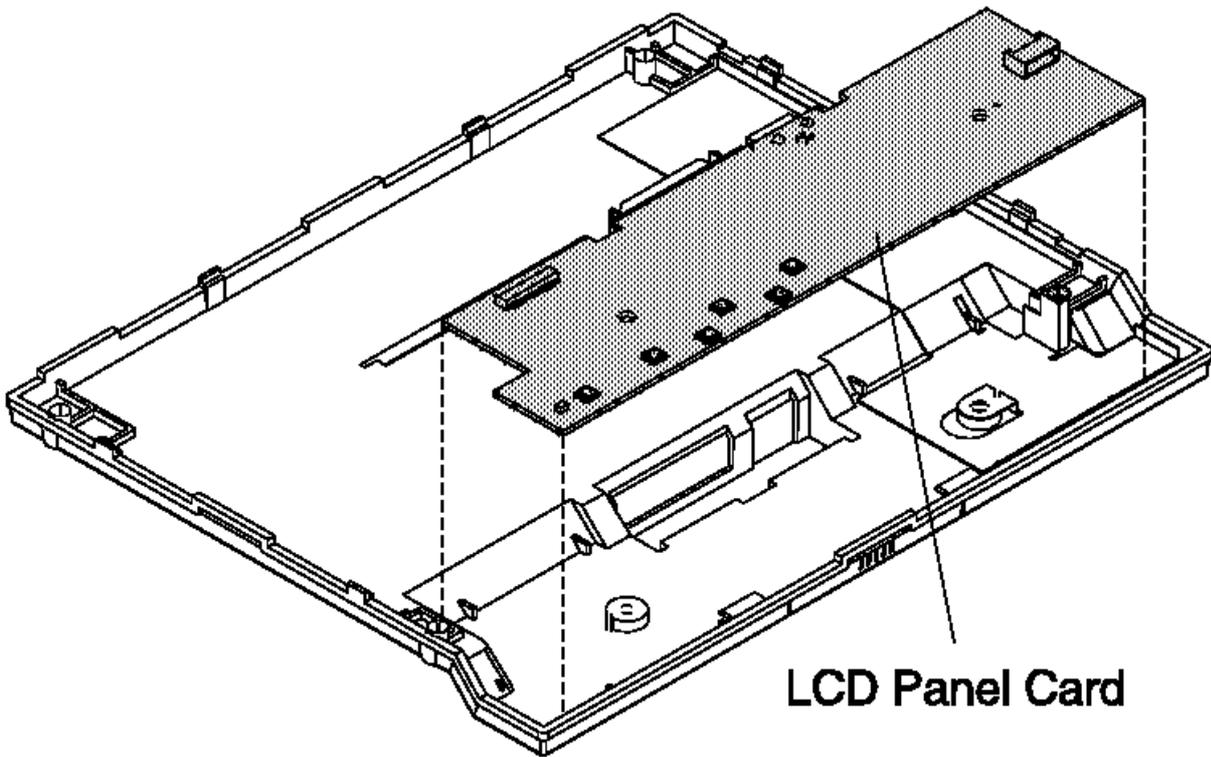


Figure 3-8. Removing LCD panel card

3.3.5 Removing and Replacing the Flat Filler Panel

See the *Installation and Operation Guide for Point-of-Sale Input/Output Devices*.

3.3.6 *Removing and Replacing the Display Cable*

Removing and replacing the display cable is the same as "Removing and Replacing the Integration Kit" in topic 3.8.2 or "Removing and Replacing the Distribution Kit" in topic 3.8.1. See these procedures.

3.4 Sure Point Touch Screens

The Sure Point Touch Display is a 9.5 inch liquid crystal display (LCD) with a backlight (cold cathode fluorescent lamp). The Sure Point Touch display attaches to all 4693 and 4694 Point-of-Sale Terminals except the 4693 Model 2x2. To attach the display to the 4693 or 4694 Point-of-Sale Terminal an adapter and one of following kits are required:

- Integration kit
- Distribution kit
- Cash Drawer Integration kit

The integration kit allows the display to be integrated on an IBM 4693 Point-of-Sale Terminal system unit (except 4693 Model 2x2) and on an IBM 4694 Model 041, 044, and 144 system unit. It offers independent tilt, swivel, and rotate action for flexibility and easy positioning.

The distribution kit allows the display to be installed on a countertop. It offers independent tilt and swivel rotate action for flexibility and easy positioning.

The Cash Drawer Integration Kit allows the display to be integrated on IBM 4693 Cash Drawer. It offers independent tilt, swivel, and rotate action for flexibility and easy positioning.

Subtopics

- 3.4.1 Touch Display Controls
- 3.4.2 Touch Display Beeper Controls
- 3.4.3 Touch Display Calibration
- 3.4.4 Touch Display Sleep Control

3.4.1 *Touch Display Controls*

Controls on the front of the touch display are used to change contrast, brightness, and reverse video.

Sleep/Resume The left-hand round button controls the sleep and resume functions.

Reverse Video The right-hand round button switches the display between normal and reverse video. This function is available on the monochrome model only.

Brightness The left-hand pair of up and down triangle buttons control the brightness. The brightness changes continuously with the allowable range while the buttons are pressed.

Contrast The right-hand pair of up and down triangle buttons control the contrast. The contrast changes continuously within the allowable range while the buttons are pressed.

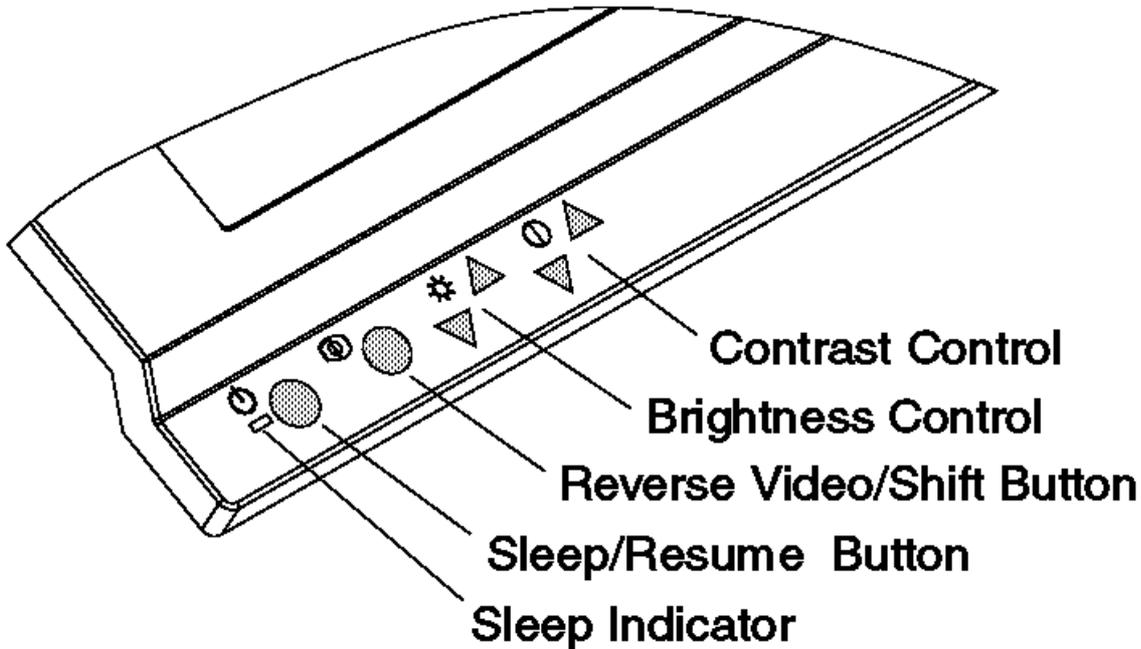
3.4.2 Touch Display Beeper Controls

The beeper controls on the front of the touch display change the frequency and loudness of the beeper.

Beeper Controls

Frequency The right-hand pair of up and down triangle buttons and the reverse video/shift button pressed at the same time control the frequency of the beeper. The frequency changes continuously within the allowable range (1500-3500 Hz) while the buttons are pressed.

Loudness The left-hand pair of up and down triangle buttons and the reverse video/shift button pressed at the same time control the loudness of beeper.



Mercury Disposal

The touch display contains a cold cathode fluorescent lamp (CCFL) that contains mercury. Dispose of it in accordance with local ordinances or regulations.

3.4.3 Touch Display Calibration

1. Press and hold down the Sleep/Resume button and at the same time switch Ready mode On.
2. Wait to hear three beeps, then touch the lower left corner of the screen. See Figure 3-9.
3. Wait to hear two beeps, then touch the upper right corner of the screen.
4. One more beep indicates calibration is complete.
5. Load the Reference diskette (Micro Channel) or the Service diskette (ISA bus).

The menu flow to run the Calibration test is the same for IBM ISA bus and Micro Channel Point-of-Sale Terminals. The menus are dynamic and change depending upon the configuration.

6. Select Test Menu, when the Main Menu is displayed.
7. Select Run POS Device Tests.
8. Select Run Terminal X (X=terminal being tested).

The touch display test and calibration test is displayed, when the touch display is attached.

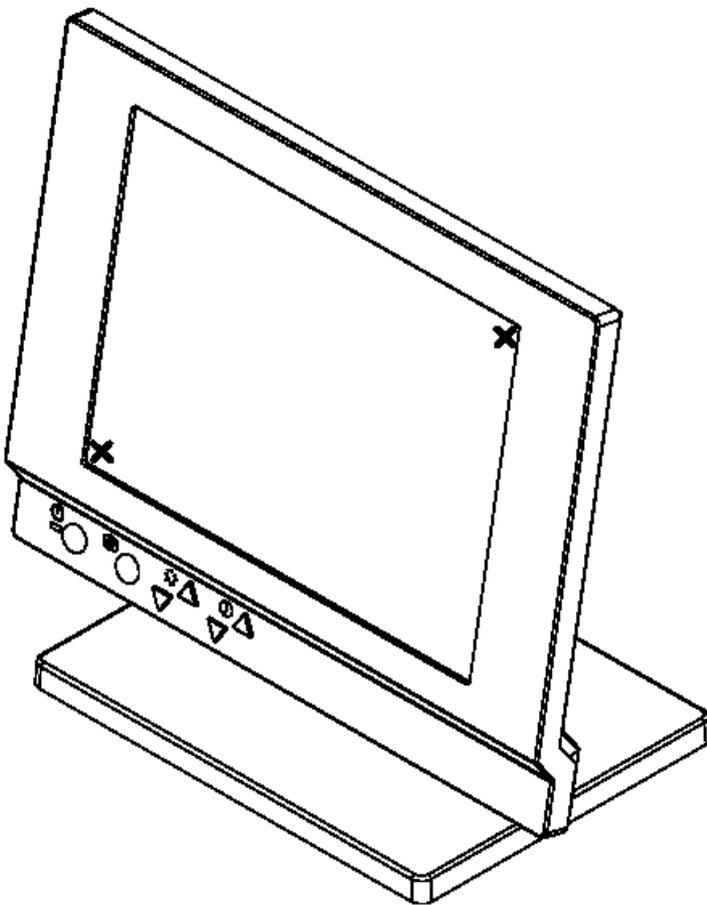


Figure 3-9. Low Resolution Calibration

3.4.4 Touch Display Sleep Control

There is an indicator and a button on the front of the display for sleep control. Table 3-3 describes how to control the sleep modes.

Table 3-3. Sleep Control	
Sleep Indicator	Is ON when the display is in sleep mode. This also indicates the mode while using setup.
Sleep/Resume Button	The left round button controls the sleep/resume function of the display.
Auto Sleep Mode	<p>In this mode, the display enters the sleep condition when the amount of time programmed by the backlight command has passed after the last touch. The time can be programmed in the range of 1 to 65535 seconds, using the SIO command.</p> <p>The display resumes when one or more of the following conditions are met:</p> <ol style="list-style-type: none"> 1. The screen is touched. 2. Sleep/Resume button is pushed. <p>In this mode, the Sleep/Resume does not cause the display to go to sleep.</p> <ol style="list-style-type: none"> 3. SIO Backlight command is issued.
Manual Sleep Mode	<p>In this mode, the display switches between sleep and resume by pressing the Sleep/Resume button.</p> <p>The Sleep/Resume button or SIO commands can be used to put the display to sleep.</p>
Switching between Auto and Manual Mode	<p>To switch between auto and manual sleep mode:</p> <ol style="list-style-type: none"> 1. Push both the Sleep/Resume button and the Reverse Video button for more than three seconds to enter setup state. 2. In setup state, the indicator blinks. You can determine the current sleep mode by observing the sequences of indicator blinks. <p>Auto mode blink sequence is as follows:</p> <p style="text-align: center;">PICTURE 31</p> <p>Manual mode blink sequence is as follows:</p> <p style="text-align: center;">PICTURE 32</p> 3. Push the Reverse Video button to change the sleep mode. Observe the blink sequence. 4. Push the Sleep/Resume button to exit setup state.
Changing Sleep Type	<p>Dim Backlight brightness is set to the lowest value</p> <p>Off Backlight is turned off. (Monochrome only)</p> <p>Blank Backlight is turned off and the screen is blanked</p> <p>The sleep type is cyclically changed by using the contrast up/down buttons while in setup state.</p>

3.5 Touch Display Symptoms

The actions listed below are for trained service personnel only.

The upper half and lower half of the LCD are controlled separately and a horizontal center line may be slightly visible.

Table 3-4. Touch Display Symptoms	
SYMPTOMS	ACTIONS
Touch display does not display anything (blank display).	<ol style="list-style-type: none"> 1. Check the sleep mode indicator. If the sleep indicator is ON, push the Sleep/Resume button to resume. 2. Make sure the large cable is connected to the adapter card in the system unit and to the display. 3. Make sure the small cable is connected to socket 4A, 4B, 9A, or 9B at the rear of the system unit and to the display. 4. Make sure the LCD module cable is connected to the LCD module and LCD panel card. 5. Make sure the adapter card in the system unit is installed properly. 6. Exchange the LCD panel card. For monochrome displays, see topic 3.6.4. For color displays, see topic 3.7.4. 7. Exchange the LCD module. For monochrome displays, see topic 3.6.2. For color displays, see topic 3.6.2. 8. Exchange the adapter card in the system unit.
Backlight does not light.	<ol style="list-style-type: none"> 1. Check the sleep mode indicator. If the sleep indicator is ON, push the Sleep/Resume button to resume. The backlight should turn ON. 2. Check the sleep type that is selected to be sure types "Off" or "Blank" are not selected by mistake. See Table 3-3 in topic 3.4.4. 3. For color displays, make sure the inverter card cable is connected to the LCD panel card and the inverter card. 4. For color displays, exchange the inverter card. See topic "Removing and Replacing the Inverter Card" in topic 3.7.5 form=pageonly.. 5. Exchange the CCFL Assembly. For monochrome displays, see topic 3.3.3. For color displays, see topic 3.7.3. 6. Exchange the Panel Card. For monochrome displays, see topic 3.6.4. For color displays, see topic 3.7.4.
Touch display does not work or is failing to display correctly.	<ol style="list-style-type: none"> 1. Exchange the LCD panel card. For monochrome displays, see topic 3.6.4. For color displays, see topic 3.7.4. 2. Exchange the LCD module. For monochrome displays, see topic 3.6.2. For color displays, see topic 3.6.2.
Display does not sleep.	<ol style="list-style-type: none"> 1. See the notes related to Auto Sleep Mode in Table 3-3 in topic 3.4.4. 2. Exchange the LCD panel card. For monochrome displays, see topic 3.6.4. For color displays, see topic 3.7.4.
Brightness or contrast controls do not cause a change.	<ol style="list-style-type: none"> 1. Make sure that the brightness or contrast is not at its maximum (high or low). 2. Exchange the LCD panel card. For monochrome displays, see topic 3.6.4. For color displays, see topic 3.7.4.

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Touch Display Symptoms

Reverse Video button does not work.	Exchange the LCD panel card. For monochrome displays, see topic 3.6.4. For color displays, see topic 3.7.4.
1 long and x short BEEPS during POST (x = 2, 3, 5 or 6)	Exchange the adapter card in the system unit.
1 long and 4 short BEEPS during POST	<ol style="list-style-type: none">1. Make sure the cables are connected properly.2. Exchange the LCD panel card. For monochrome displays, see topic 3.6.4. For color displays, see topic 3.7.4.3. Exchange the adapter card in the system unit.

Subtopics

3.5.1 Touch Display Testing

3.5.2 Touch Display Messages

3.5.1 Touch Display Testing

The touch display and adapter are tested each time that power is switched ON. If you get an error message or failure symptom, see "Touch Display Messages" in topic 3.5.2 or "Touch Display Symptoms" in topic 3.5.

To perform a more complete test of the touch display, the following diskettes are required:

IBM 4693 Point-of-Sale Terminals: Reference Diskette, SX27-3918

IBM 4695 Service Diskette Version 1.00 (or later), SX27-3965

IBM Touch Display Adapter/A - Option Diskette Version 1.00 (or later), SX27-3966

3.5.2 Touch Display Messages

When the Mode Control Switch is pressed to switch Ready mode ON and storage retention is disabled, power-on self-test (POST) on the touch display adapter is performed automatically. This message indicates an error detected by POST.

0148nnxn

Explanation: An IBM 4695 Point-of-Sale Adapter/A or IBM Touch Display Adapter/A error occurred.
(n = any number)
(x = slot number)

User Response: Exchange the adapter card.

3.6 Monochrome Touch Display Component Removal and Replacement

These procedures are intended for trained service personnel only. Make sure you establish personal grounding before touching this unit. See topic FRONT_2.

Subtopics

3.6.1 Removing and Replacing the Front Cover

3.6.2 Removing and Replacing the LCD Module Assembly and Touch Panel Assembly

3.6.3 Removing and Replacing the CCFL (Cold Cathode Fluorescent Lamp) Assembly

3.6.4 Removing and Replacing the LCD Panel Card

3.6.1 Removing and Replacing the Front Cover

1. Remove the two screws. See Figure 3-10.
2. Open the front cover by gently prying and flexing the cover outward at the six latch locations shown in Figure 3-10. It is best to release at the bottom latch edge first. Then release the sides, leaving the top until last.
3. To exchange the front cover, reverse this procedure.

Note: Do not touch the display face. Also, make sure that the inside of the cover is clean before it is reinstalled.

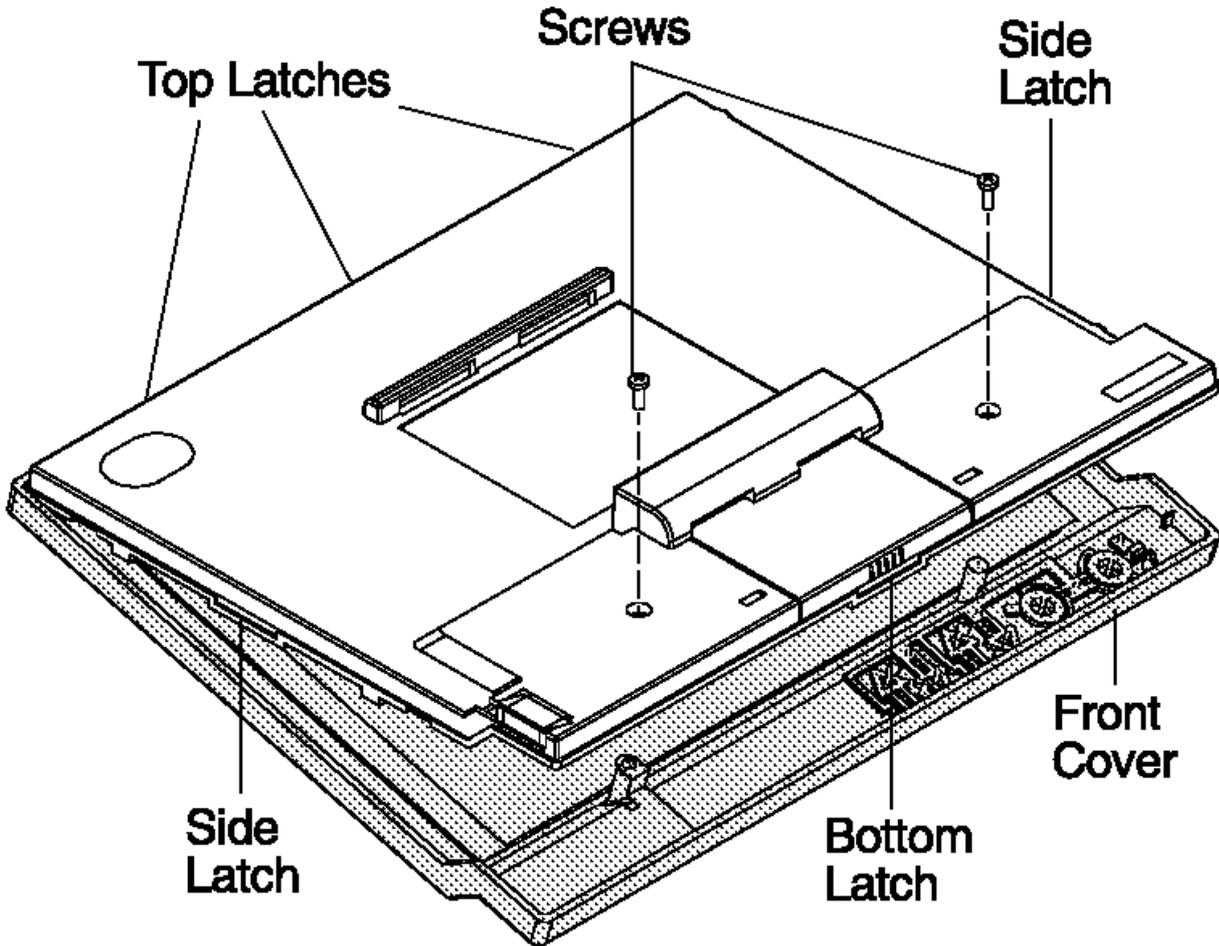


Figure 3-10. Removing the Front Cover

3.6.2 *Removing and Replacing the LCD Module Assembly and Touch Panel Assembly*

1. Remove the front cover assembly.
2. Remove the four screws. See Figure 3-11.
3. Disconnect the cables attached to the touch card and lift the LCD module and touch panel assembly out.
4. Remove the touch panel. The touch panel is adhered to the LCD module by dual-sided adhesive tape. Remove the LCD module now, if you are going to exchange it.
5. Reverse this procedure to exchange the touch panel and the LCD module.

Note:

- Make sure that the LCD module is free of dust, debris, and fingerprints before reinstalling.
- Make sure that the touch panel scan area is adjusted to the LCD active area. See Figure 3-11.
- Insert the aluminum sheet between the LCD module and the touch panel.

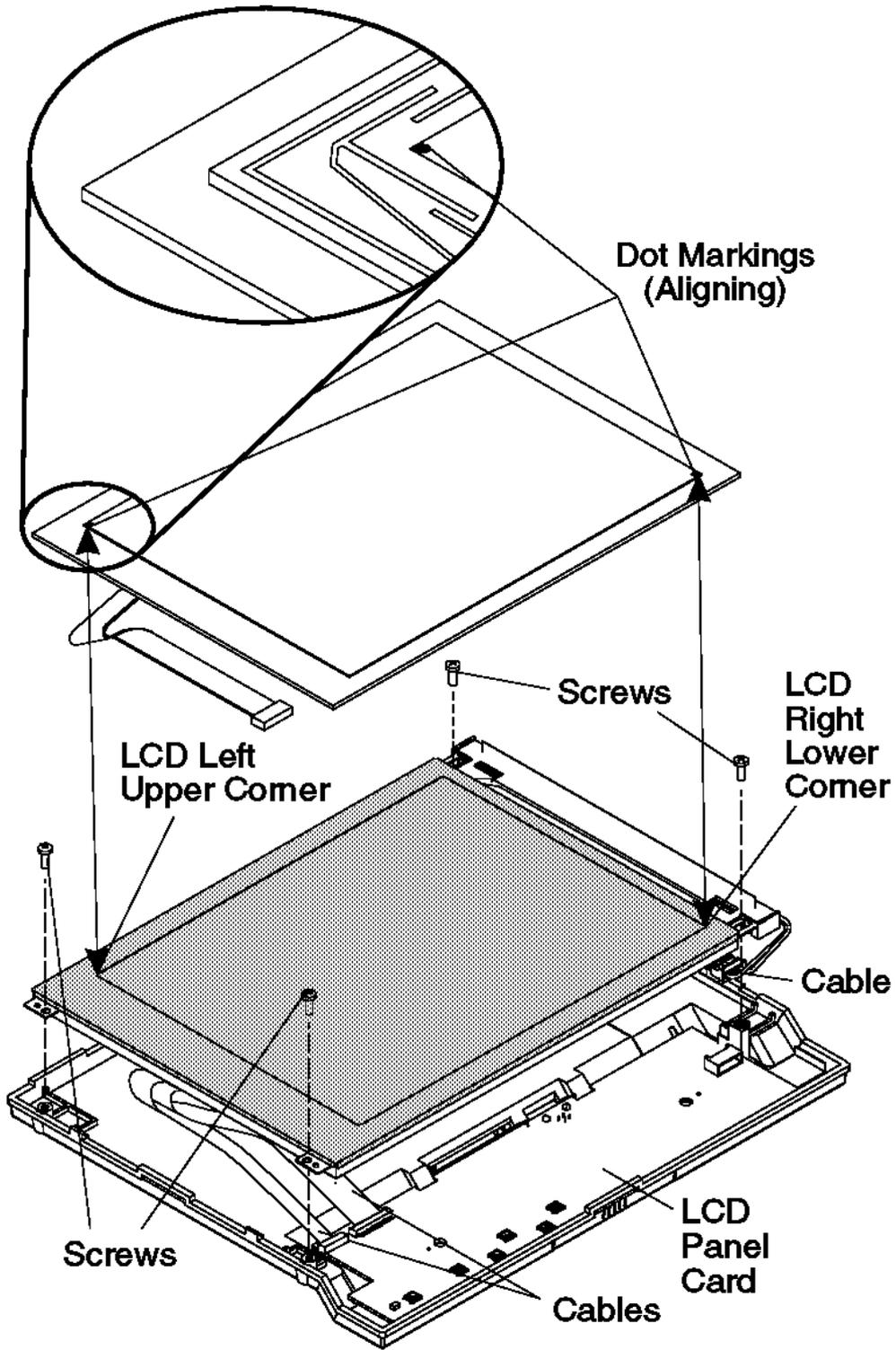


Figure 3-11. Removing the LCD module

3.6.3 Removing and Replacing the CCFL (Cold Cathode Fluorescent Lamp) Assembly

Note: For clarity, the rear cover is not shown in the illustrations. Do not remove the rear cover.

1. Remove the front cover assembly.
2. Disconnect the CCFL cable attached to the LCD panel card.
3. Remove the CCFL cover by lifting the latches and pushing the cover outward as shown in Figure 3-12.
4. Remove the CCFL cables from the groove.
5. Carefully lift the CCFL assembly out. See Figure 3-13.
6. To exchange the CCFL assembly, reverse this procedure.

Notes:

- a. When reinstalling the CCFL assembly, take note of the length of the cables. There is a long cable and a short one. Place the short cable at the bottom edge. See Figure 3-14.
- b. Make sure that CCFL cables are seated completely into the groove and routed over the corner of the cover as shown in Figure 3-12.
- c. Be sure that the aluminum foil covers the CCFL assembly as the cover is reinstalled.

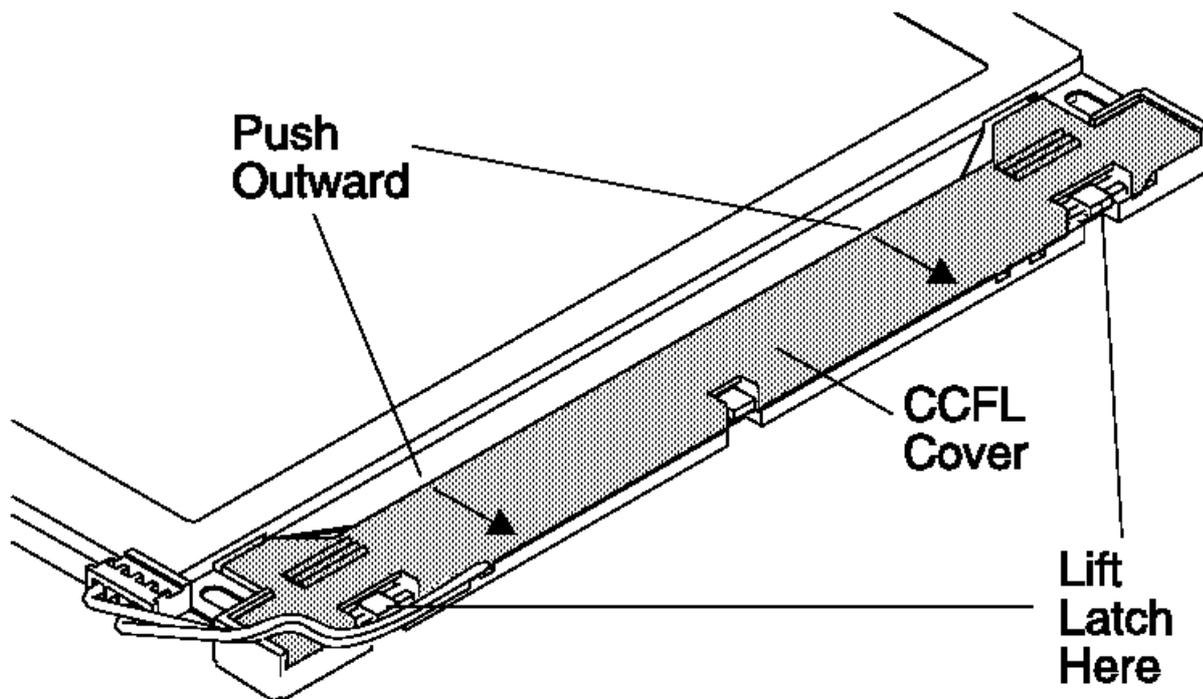


Figure 3-12. Opening the CCFL Front Cover

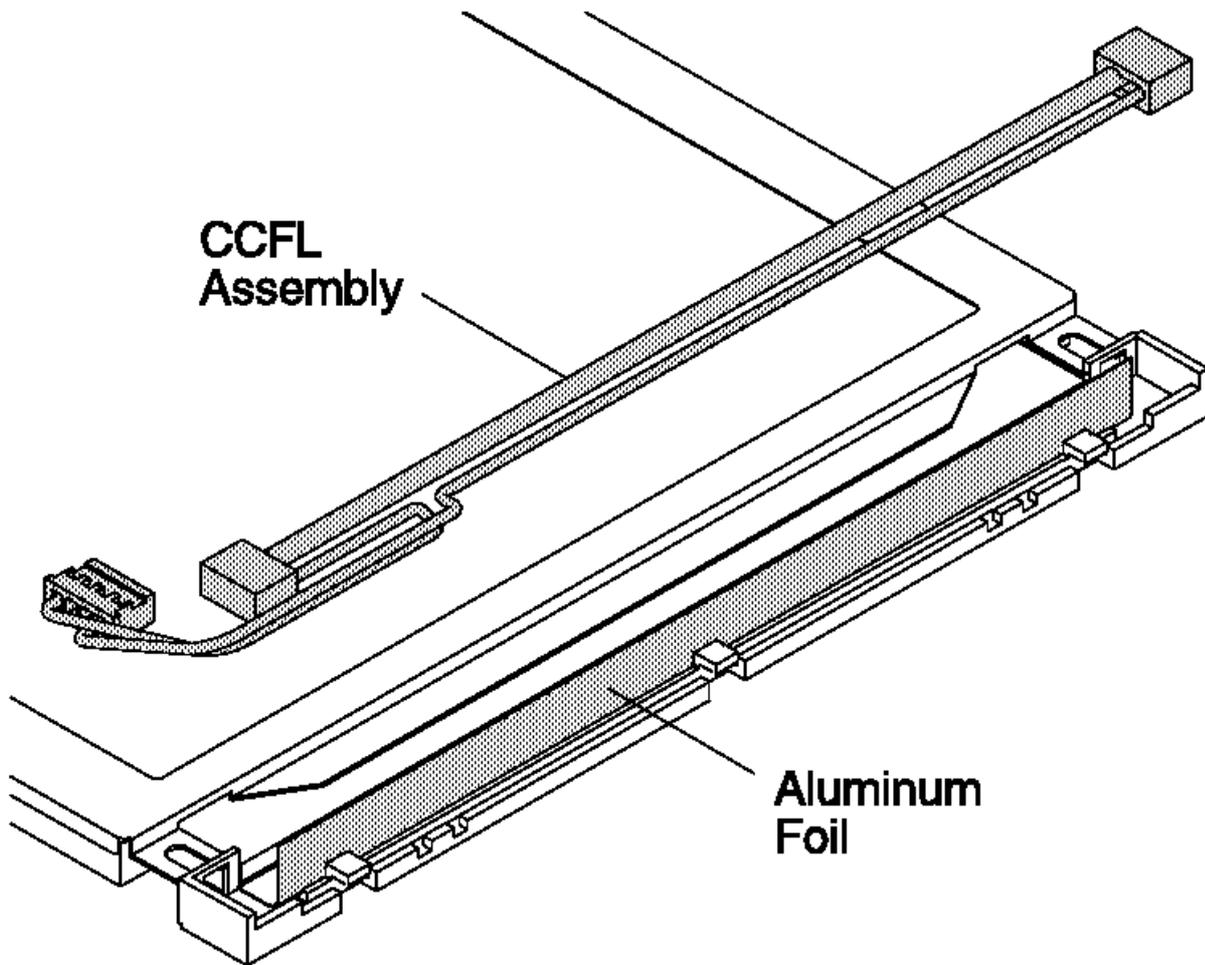


Figure 3-13. Removing the CCFL Assembly

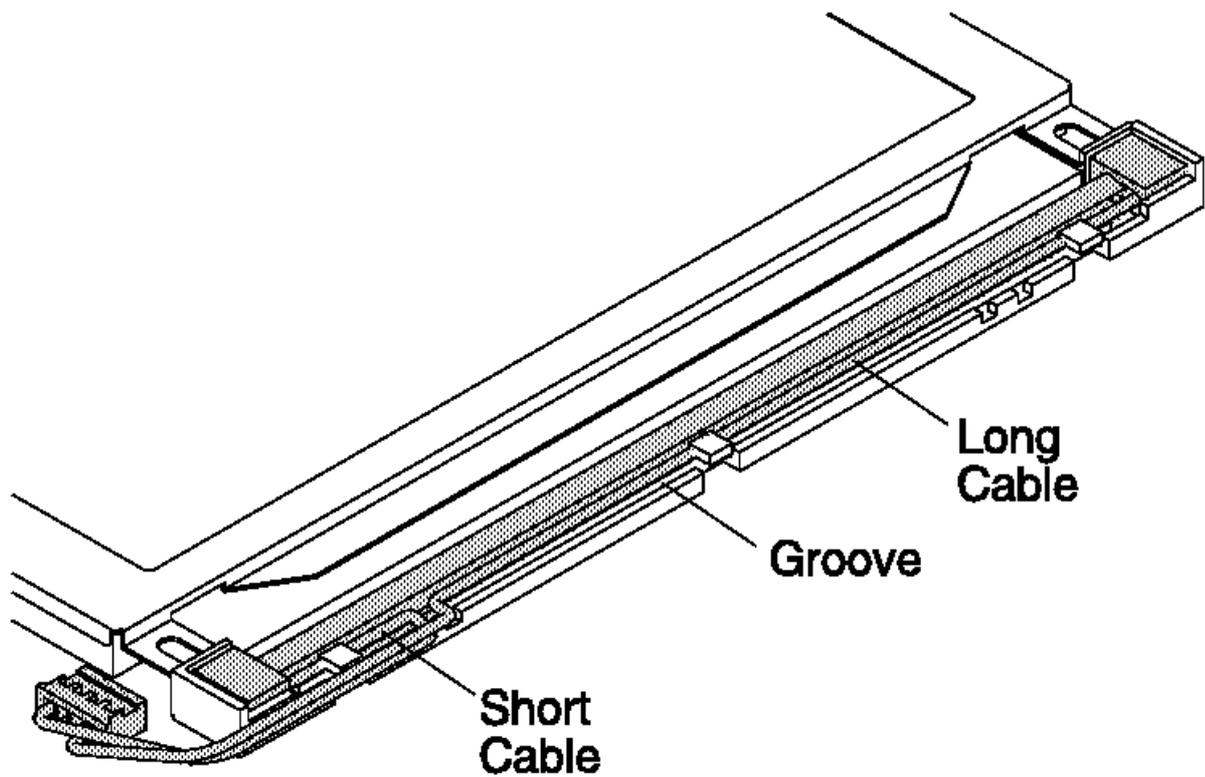


Figure 3-14. Reassembling the CCFL Assembly

3.6.4 Removing and Replacing the LCD Panel Card

1. Remove the LCD module assembly. See Figure 3-11 in topic 3.6.2.
2. Lift the panel card out.
3. To exchange the LCD panel card, reverse this procedure.

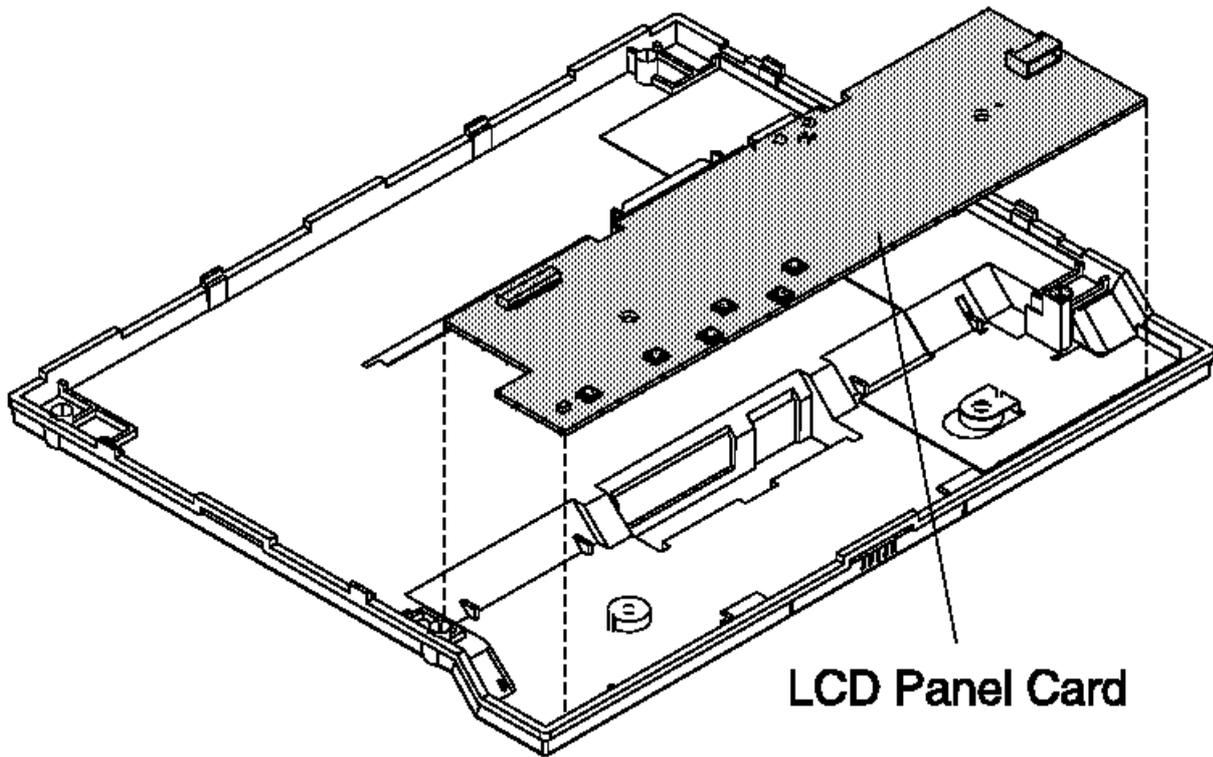


Figure 3-15. Removing LCD panel card

3.7 Color Touch Display Component Removal and Replacement

These procedures are intended for trained service personnel only. Make sure you establish personal grounding before touching this unit.

Subtopics

3.7.1 Removing and Replacing the Front Cover

3.7.2 Removing and Replacing the LCD Module Assembly and Touch Panel Assembly

3.7.3 Removing and Replacing the CCFL (Cold Cathode Fluorescent Lamp) Assembly

3.7.4 Removing and Replacing the LCD Panel Card

3.7.5 Removing and Replacing the Inverter Card

3.7.1 Removing and Replacing the Front Cover

1. Remove the two screws. See Figure 3-16.
2. Open the front cover by gently prying and flexing the cover outward at the six latch locations shown in Figure 3-16. It is best to release at the bottom latch edge first. Then release the sides, leaving the top until last.
3. To exchange the front cover, reverse this procedure.

Note: Do not touch the display face. Also, make sure that the inside of the cover is clean before it is reinstalled.

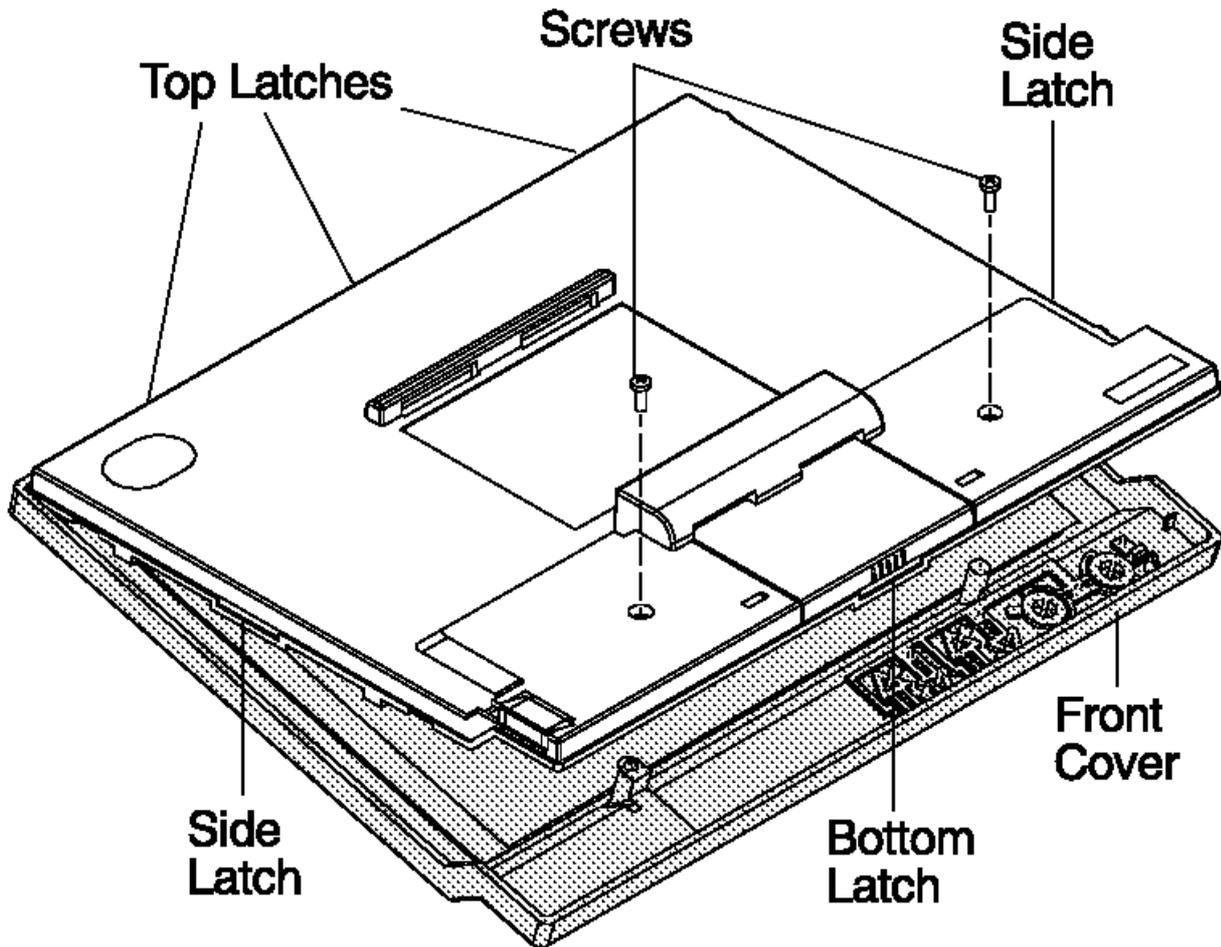


Figure 3-16. Removing the Front Cover

3.7.2 Removing and Replacing the LCD Module Assembly and Touch Panel Assembly

1. Remove the front cover assembly.
2. Detach the touch panel from the LCD module and turn it over to the left. The touch panel is adhered to the LCD module by dual-sided adhesive tape.
3. Remove the four screws connecting the LCD module to the back cover. See Figure 3-17.
4. Disconnect the CCFL cable of the LCD module attached to the inverter card.
5. Turn over the LCD module to the left.
6. Disconnect the touch panel cable. Remove the touch panel now, if you are going to exchange it.
7. Disconnect the LCD module cable card from the LCD module. Remove the LCD module now, if you are going to exchange it.
8. Reverse this procedure to exchange the touch panel or the LCD module.

Note:

- Make sure that the LCD module is free of dust, debris, and fingerprints before reinstalling.
- Make sure that the touch panel scan area is adjusted to the LCD active area. See Figure 3-17.
- Make sure that the shield sheet is fastened between the rear cover boss and the LCD module frame and by the screw at the upper right corner.
- Make sure that the ground wire terminal from the LCD module card is fastened between the rear cover boss and the LCD module frame and by the screw at the lower right corner.

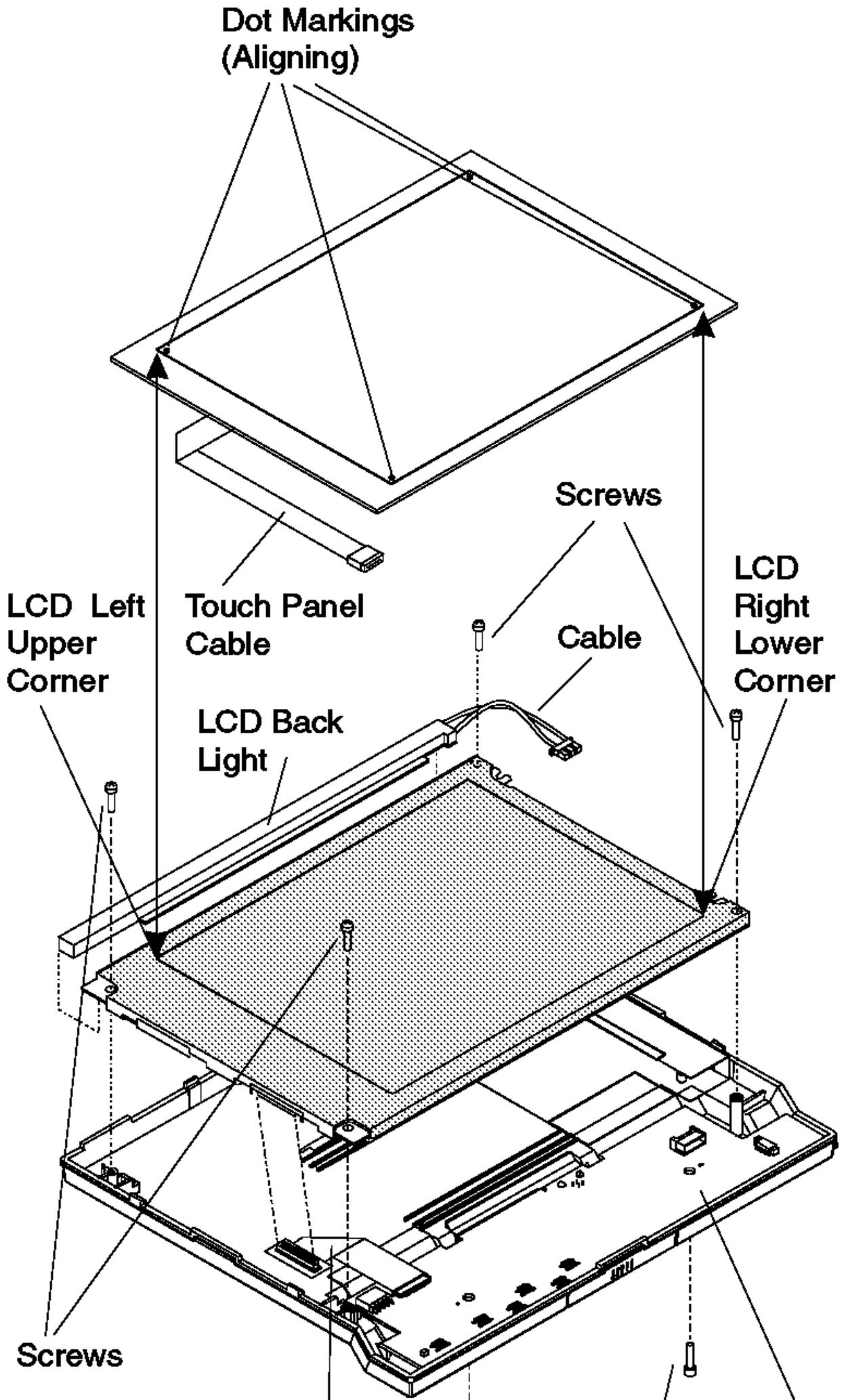


Figure 3-17. Removing the LCD module

3.7.3 *Removing and Replacing the CCFL (Cold Cathode Fluorescent Lamp) Assembly*

1. Remove the front cover assembly. See "Removing and Replacing the Front Cover" in topic 3.7.1.
2. Remove the LCD module assembly. See "Removing and Replacing the LCD module Assembly" in topic 3.3.2.
3. Remove the two screws from the backlight cover.
4. Lift the backlight and backlight cable out of the LCD.
5. To exchange the CCFL assembly, reverse this procedure.

Note:

- Make sure the cable is routed underneath the tabs, as shown in Figure 3-18 in topic 3.7.4.
- Make sure the backlight cover is first slide under the LCD rear cover shield, as shown in Figure 3-18 in topic 3.7.4, before installing the two screws.

3.7.4 Removing and Replacing the LCD Panel Card

1. Remove the LCD module assembly. See Figure 3-17 in topic 3.7.2. cover.
2. Disconnect the Inverter card cable.
3. Lift the panel card out.
4. To exchange the LCD panel card, reverse this procedure.

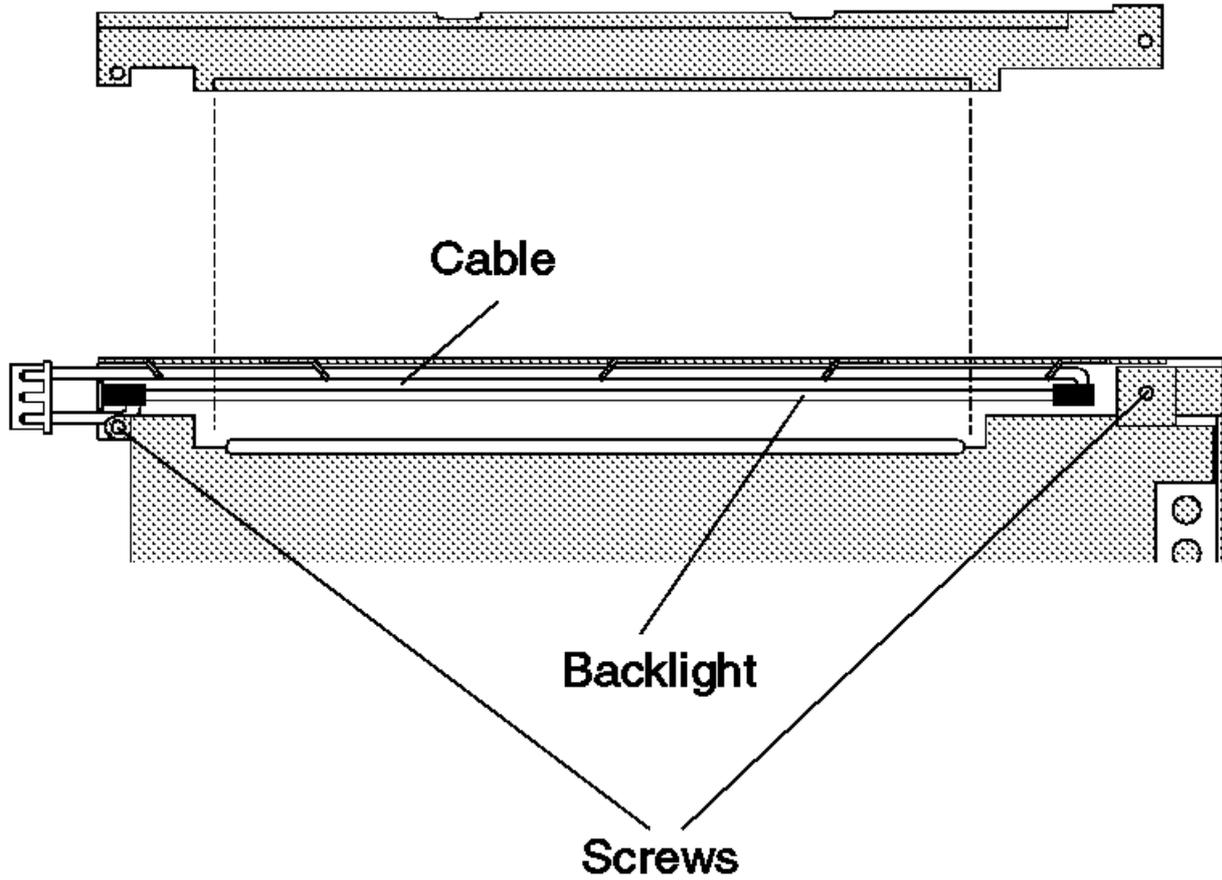


Figure 3-18. Reinstalling the Backlight Cover

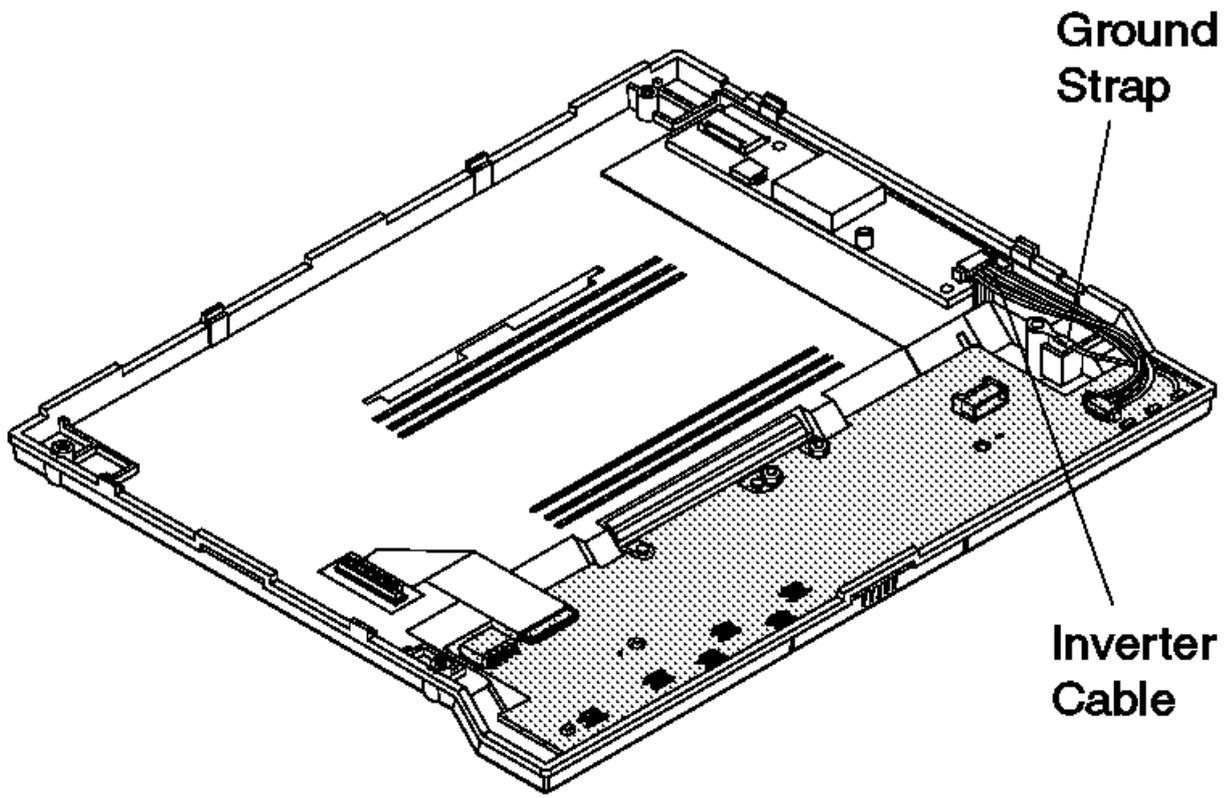


Figure 3-19. Removing the LCD Panel Card

3.7.5 Removing and Replacing the Inverter Card

1. Remove the front cover. See "Removing and Replacing the Front Cover" in topic 3.7.1.
2. Remove the LCD and touch module assembly. See "Removing and Replacing the LCD module Assembly" in topic 3.3.2.
3. Remove the inverter card. See Figure 3-20.
4. Reverse this procedure to exchange the inverter card.

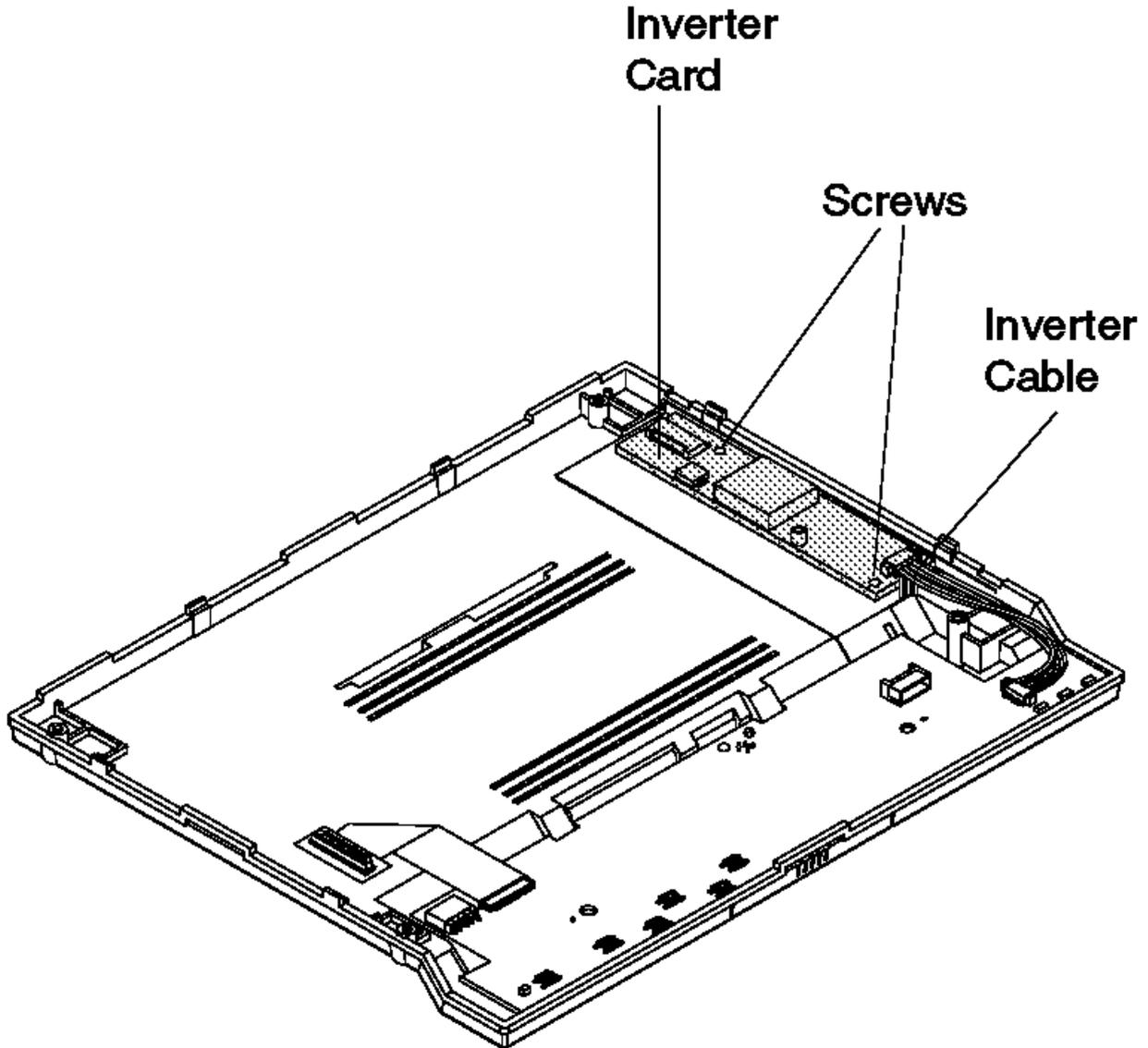


Figure 3-20. Removing the Inverter Card

3.8 Removing and Replacing the Accessory Kits

This section explains the removal and replacement of the touch display accessory kits.

Subtopics

3.8.1 Removing and Replacing the Distribution Kit

3.8.2 Removing and Replacing the Integration Kit

3.8.1 Removing and Replacing the Distribution Kit

1. Disconnect the cables from the adapter card or system unit.
2. Remove the distribution base from the checkstand by removing screw (1). See Figure 3-21.
3. Remove the touch display from the display holder. See Figure 3-21.
4. Detach the display holder from the distribution base.
5. Remove the four screws and remove the metal plate from the bottom of the distribution base.
6. Remove the cables from the distribution base.
7. Tilt the display holder down and remove the cables from between the ribs. See Figure 3-23.
8. Tilt the display holder up and remove the cables through the center opening. See Figure 3-22.
9. To exchange the distribution kit, reverse this procedure.

```
+--- Cable Routing -----+
|
| It is important that the cables are routed properly through the
| distribution base and the display holder.
|
| 1. Make sure that the small cable exits the display holder on top
|    of the large cable. See Figure 3-21.
|
| 2. Make sure that the cables are located inside the ribs in the
|    tube. See Figure 3-23.
|
+-----+
```

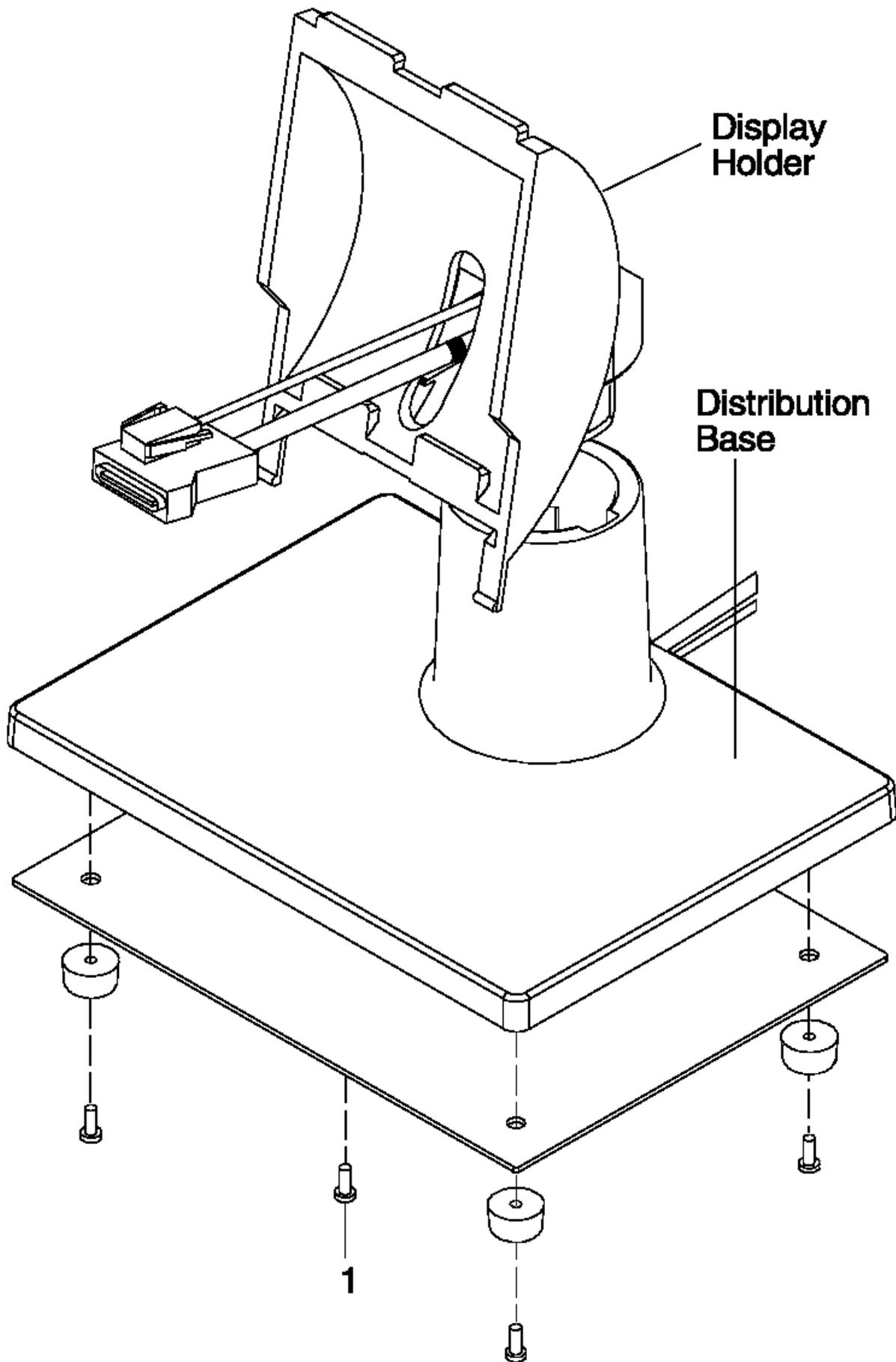


Figure 3-21. Distribution Base

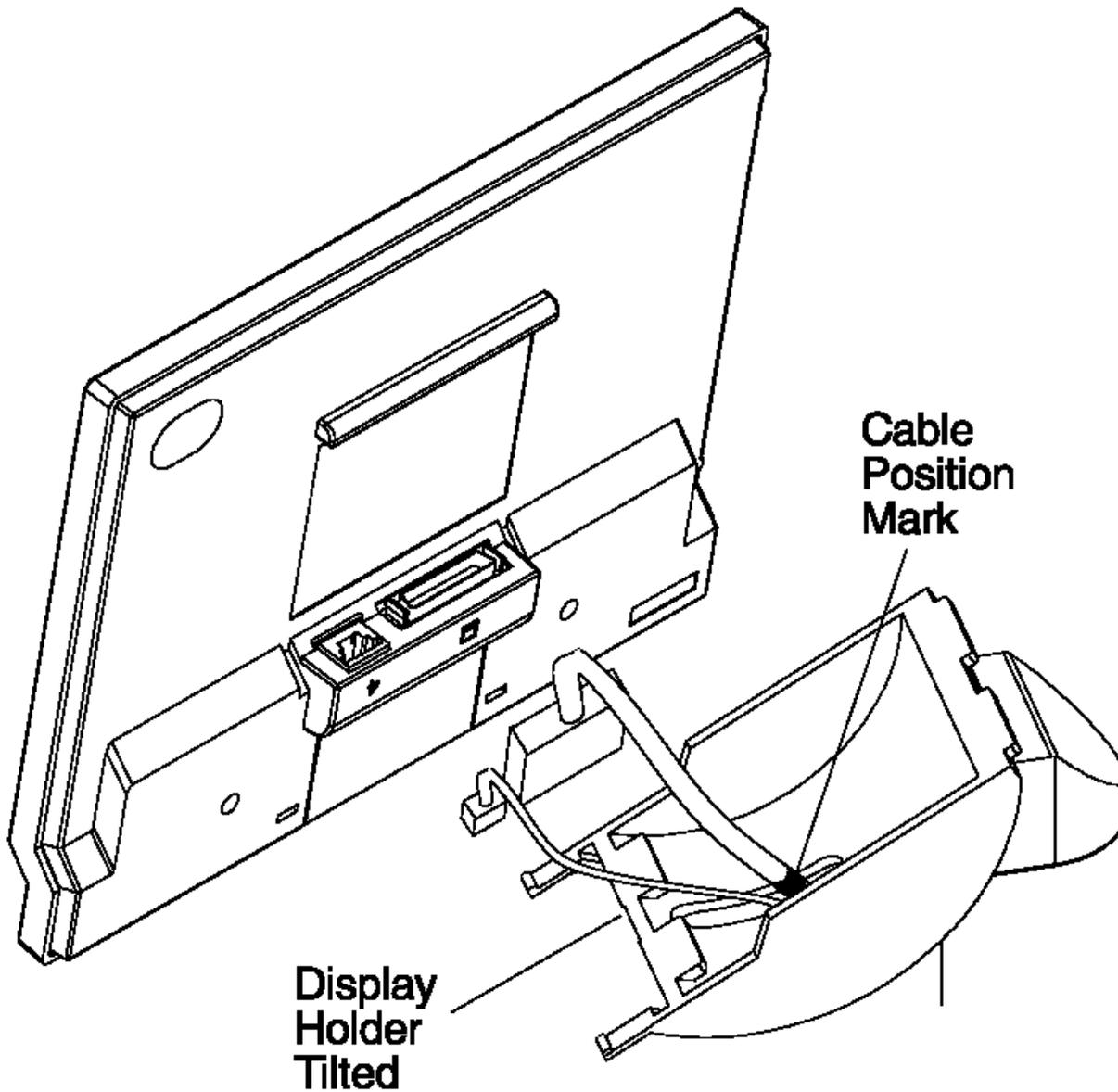


Figure 3-22. Display Holder Tilted Up

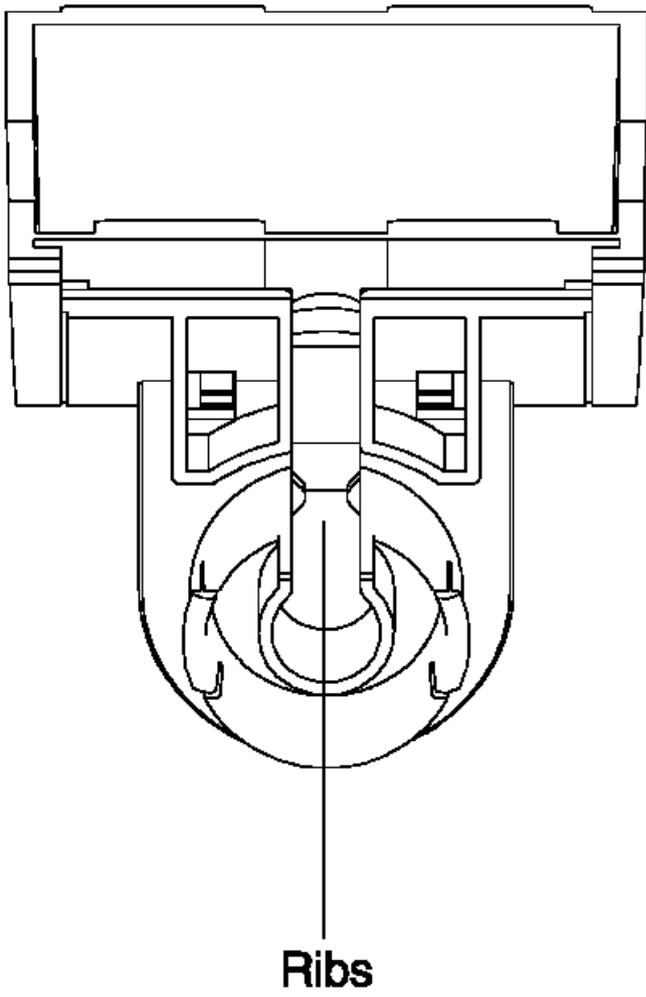


Figure 3-23. Display Holder Ribs

3.8.2 *Removing and Replacing the Integration Kit*

Subtopics

3.8.2.1 Removing the Integration Kit

3.8.2.2 Replacing the Integration Kit

3.8.2.1 *Removing the Integration Kit*

1. Disconnect the cables from the adapter card or system unit.
2. Remove the integration kit from the terminal. See Figure 3-25 in topic 3.8.2.2.
3. Remove the touch display from the display holder. See Figure 3-24 in topic 3.8.2.2.
4. Disconnect the arm from the integration base and remove the cables from the integration base. See Figure 3-26 in topic 3.8.2.2.
5. Remove the cables from the groove in the arm and disconnect the arm from the display holder.
6. Tilt the display holder to a position where you can remove the cables from between the two ribs. See Figure 3-23 in topic 3.8.1.
7. Tilt the display holder to a position where you can remove the cables through the opening at the center. See Figure 3-22 in topic 3.8.1.

3.8.2.2 Replacing the Integration Kit

1. Separate the display holder from the arm. See Figure 3-27.
2. Separate the arm from the integration base. Make sure that the alignment ring is on the base. See Figure 3-26.
3. Route both cables up through the integration base from the bottom.
4. Route both cables into the groove in the arm and up through the opening.
5. Tilt the display holder to the up position and route both cables through the opening at the center of the display holder. Make sure that the cables exit the display holder as shown in Figure 3-27.
6. Attach the display holder to the arm.
7. Attach the arm to the integration base.

```
+--- Cable Routing -----+
|
| It is important that the cables are routed properly through the
| integration base, the arm, and the display holder. Make sure that the
| cables are positioned in the groove of the arm. See Figure 3-26.
|
+-----+
```

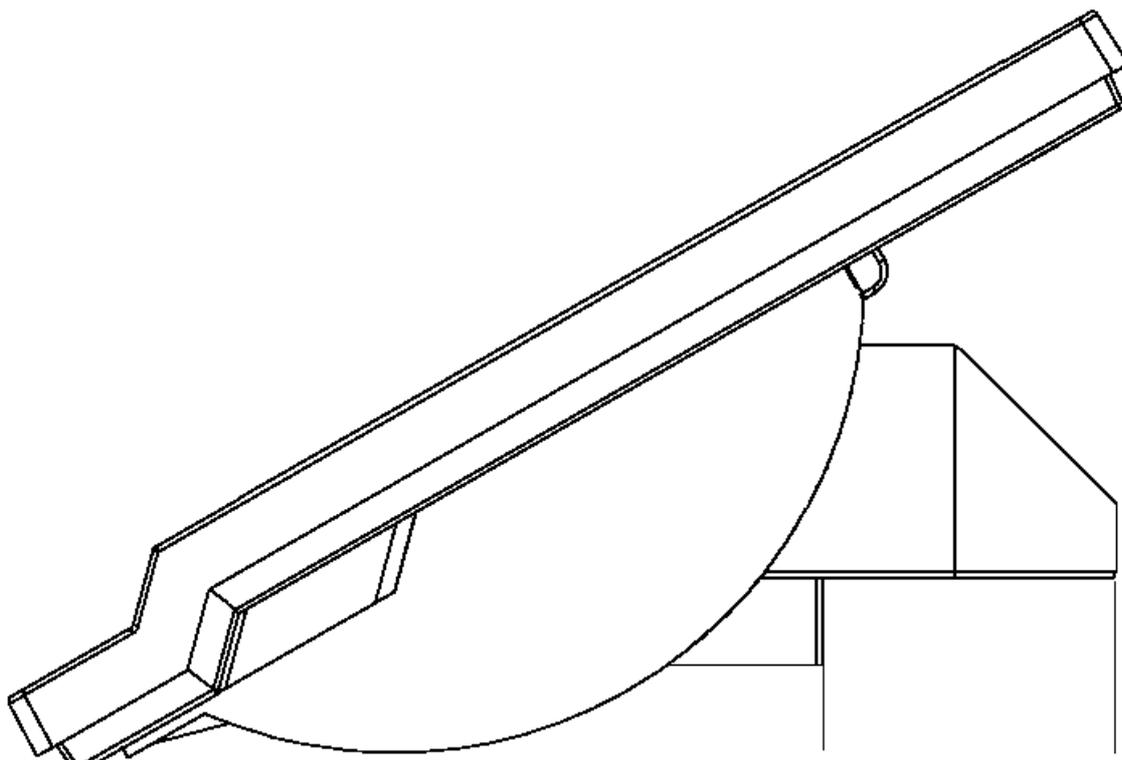
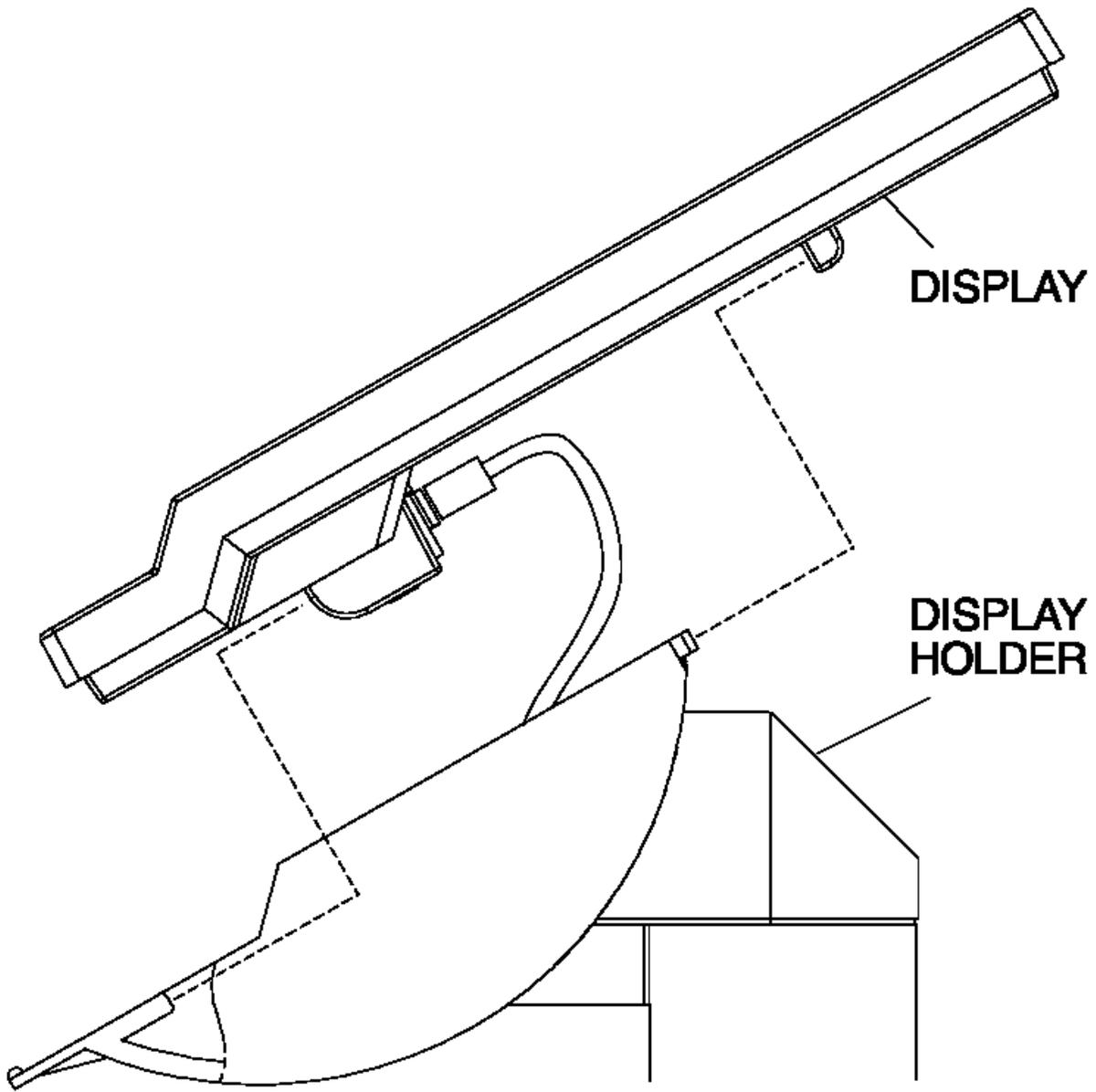


Figure 3-24. Touch Display Removal From Holder

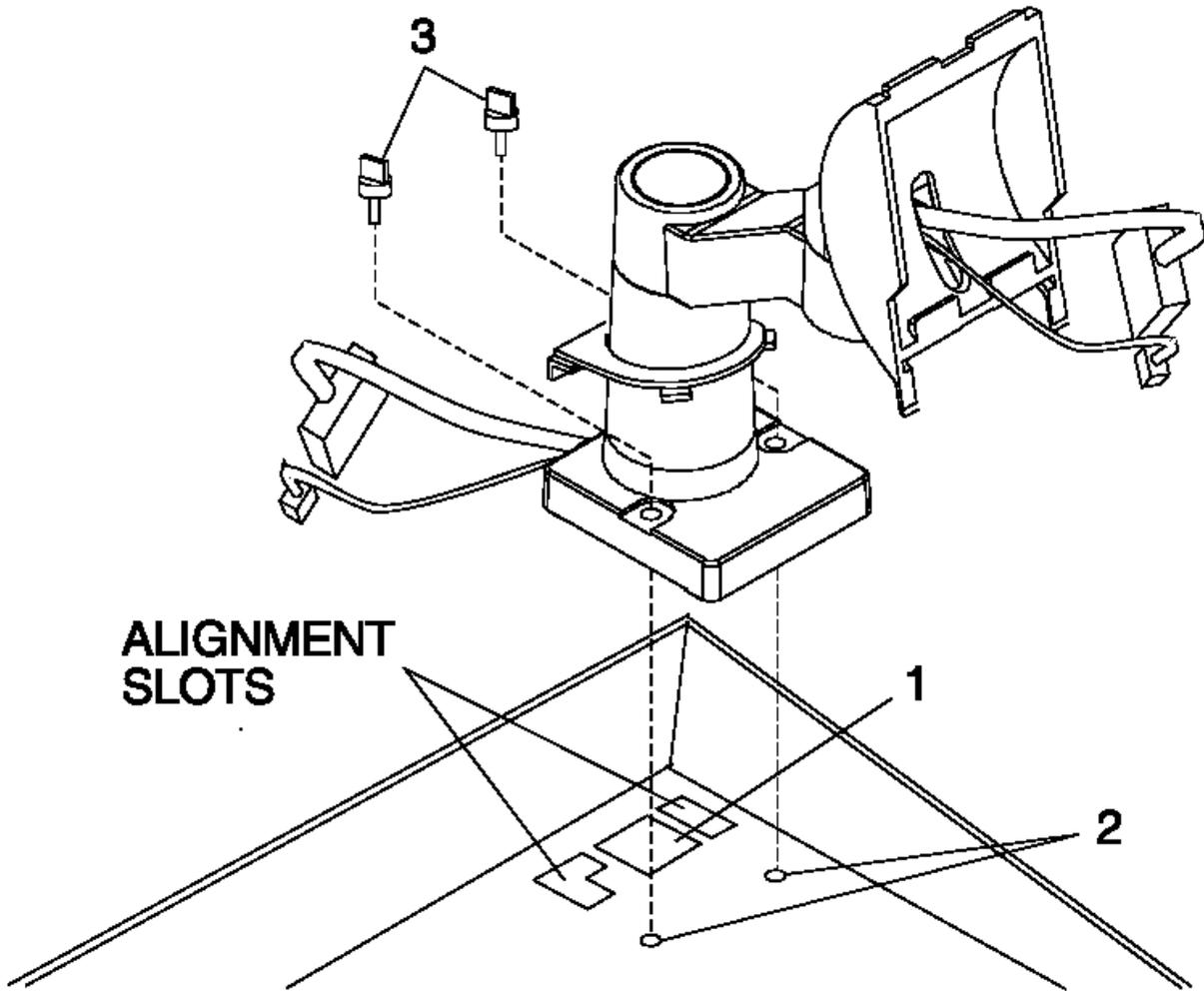


Figure 3-25. Integration Kit Removal From Terminal

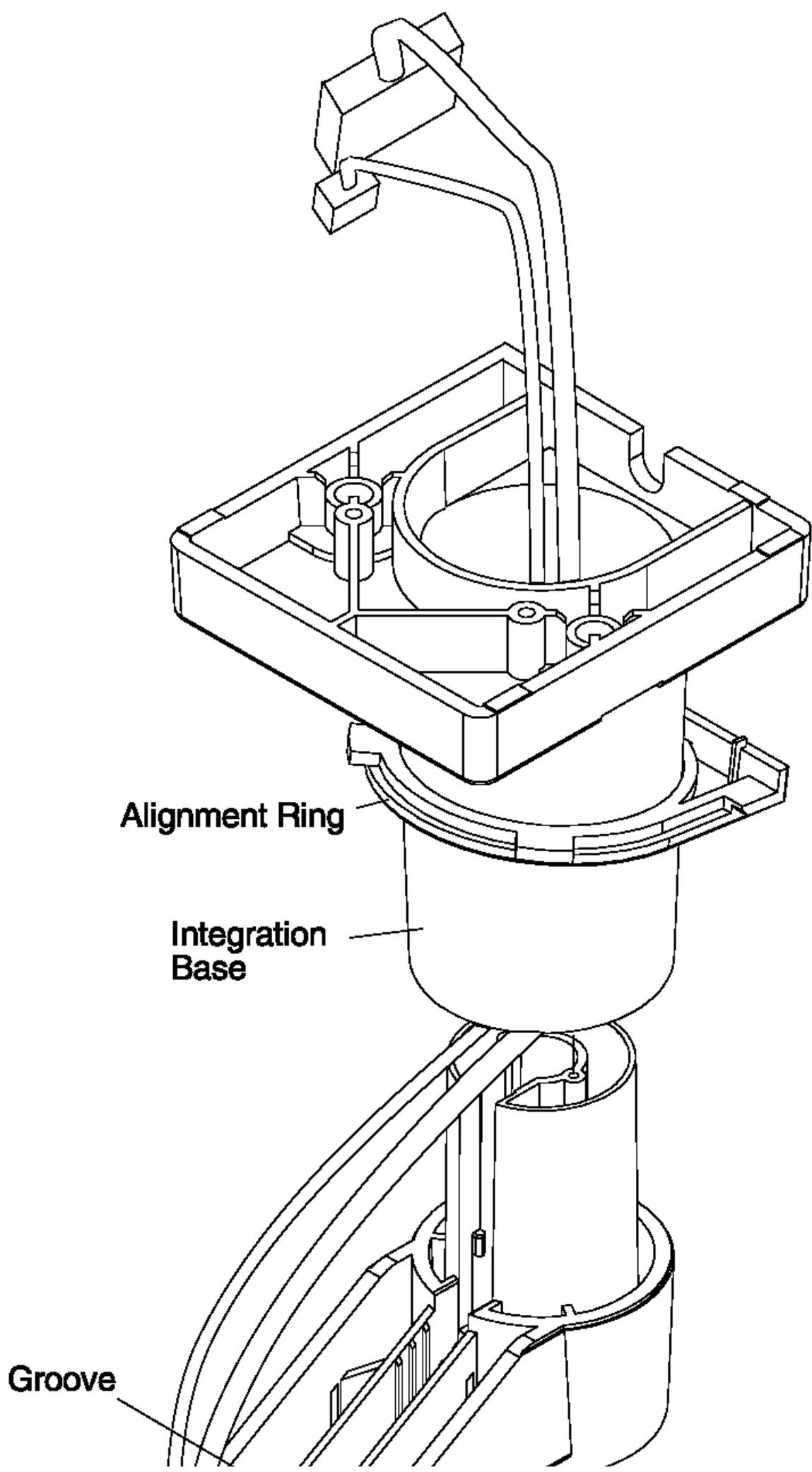


Figure 3-26. Integration Kit

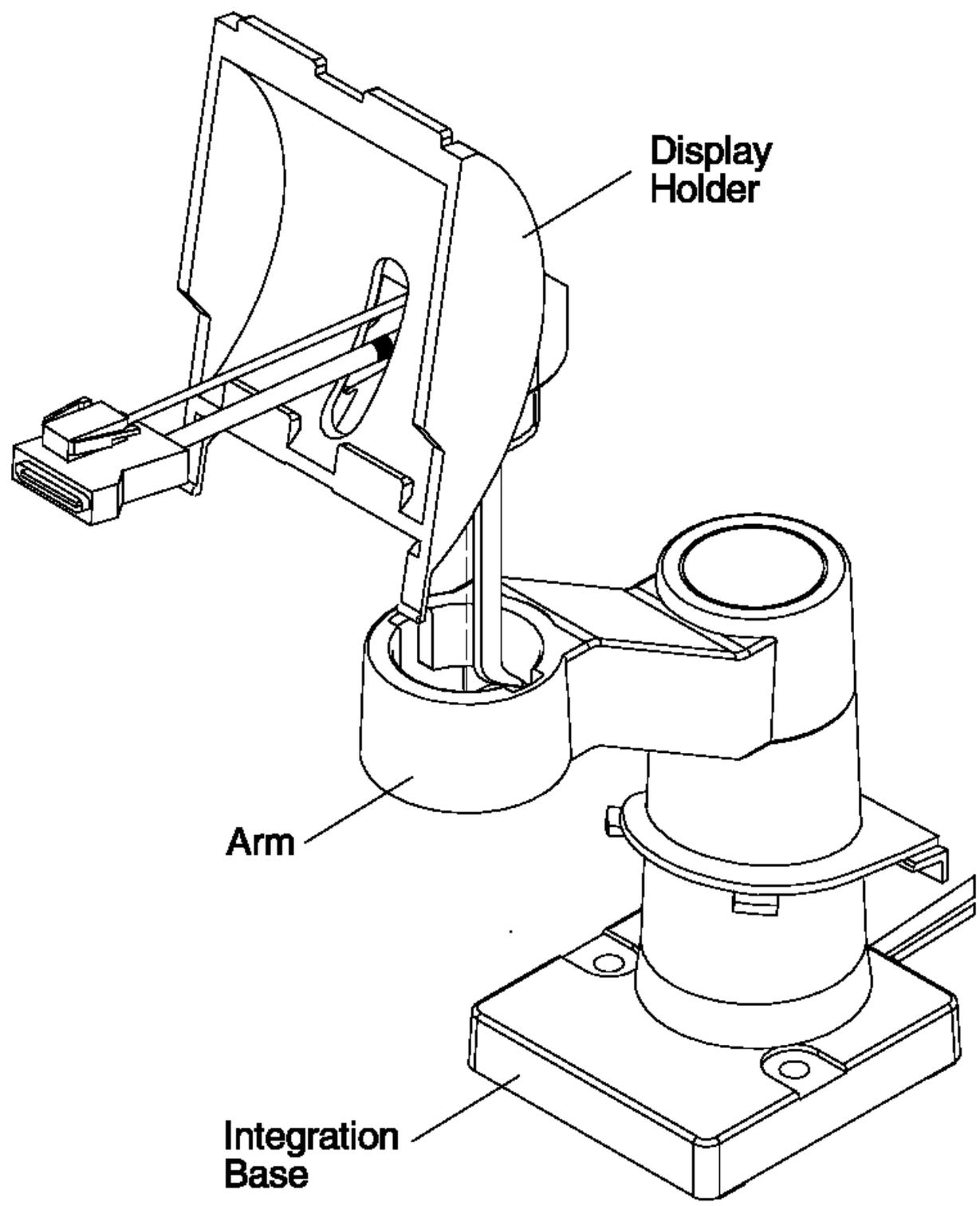


Figure 3-27. Integration Kit and Display Holder

3.9 40-Character Vacuum Fluorescent Display II

See the maintenance documentation with your terminal for problem determination and test procedures on displays. If necessary, replace the display.

Subtopics

3.9.1 Removing and Replacing the 40-Character VFD II

3.9.2 Removing, Replacing, and Cleaning the 40-Character Vacuum Fluorescent Display II Lens

3.9.1 *Removing and Replacing the 40-Character VFD II*

1. Switch **POWER OFF** at the system unit.

Note: For illustration, a single-sided display is shown. The yoke for a double-sided display is taller than the yoke for a single-sided display. However, the removal procedure is similar for both types.

2. Gently spread the arms of the yoke open slightly and slide the display out of the yoke. Use a tool to pry with, if necessary.
3. Unplug the display cable from the display.
4. To replace the display, reverse this procedure.

3.9.2 Removing, Replacing, and Cleaning the 40-Character Vacuum Fluorescent Display II Lens

1. Remove the 40-Character Vacuum Fluorescent Display II from the yoke.
2. At the bottom of the display, press in on the plastic grill at the locations illustrated by the arrows and snap the lens frame free from the display.

DO NOT SPRAY CLEANING SOLUTION INTO THE DISPLAY.

3. Use a soft cloth dampened with a mild cleaning solution to clean the display glass and the lens.
4. To remove the lens from the frame for replacement, flex the frame outward as shown by the arrows and snap the lens out.
5. Place the replacement lens into the frame from the outside and snap it into position in the frame.
6. Snap the frame onto the display and place the display into the yoke.

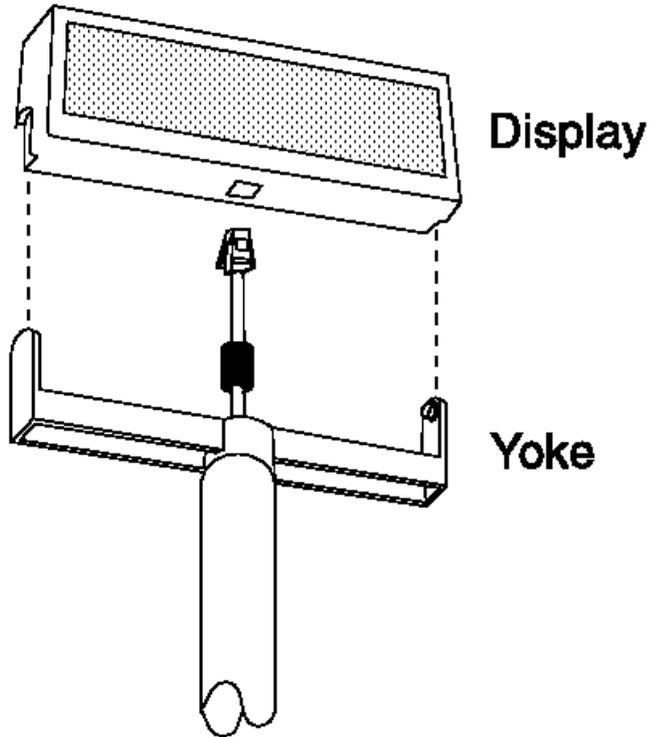


Figure 3-28. Removing and Replacing the 40-Character Vacuum Fluorescent Display II

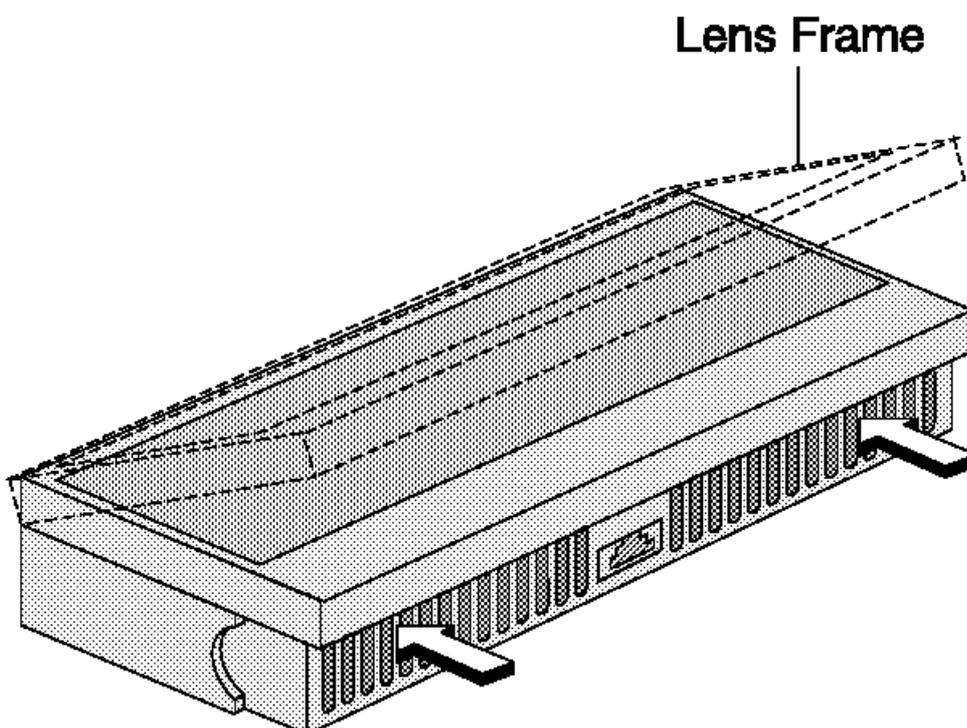


Figure 3-29. Removing the Frame

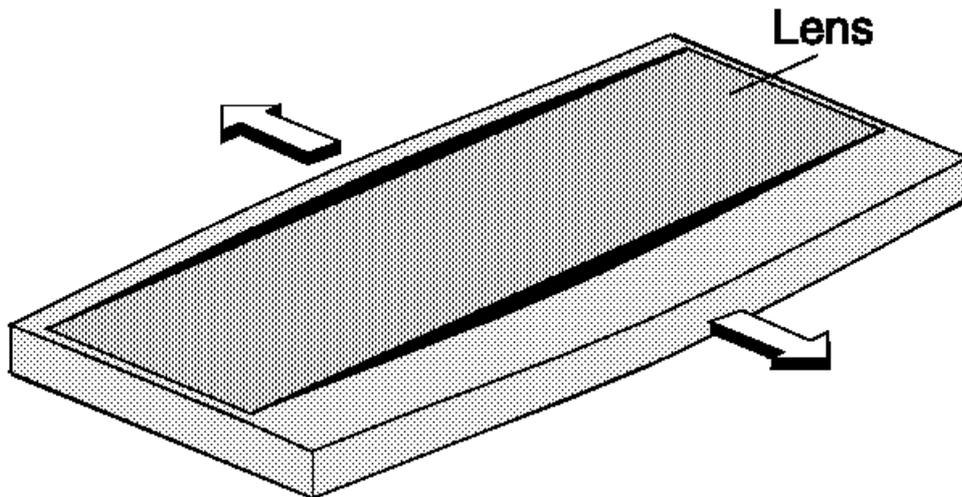


Figure 3-30. Removing the Lens

3.10 40-Character Alphanumeric Display

See the maintenance documentation with your terminal for problem determination and test procedures on displays. If necessary, replace the display.

Subtopics

3.10.1 Removing and Replacing the 40-Character VFD

3.10.2 Removing, Replacing, and Cleaning the 40-Character Vacuum Fluorescent Display Lens

3.10.1 *Removing and Replacing the 40-Character VFD*

1. Switch **POWER OFF** at the system unit.
2. Gently spread the arms of the yoke open slightly and slide the display out of the yoke. Use a tool to pry with if necessary.
3. Unplug the display cable from the display.
4. To replace the display, reverse this procedure.

3.10.2 Removing, Replacing, and Cleaning the 40-Character Vacuum Fluorescent Display Lens

1. Remove the 40-character vacuum fluorescent display from the yoke.

THIS DISPLAY CONTAINS HAZARDOUS VOLTAGES. MAKE SURE THAT POWER IS NOT APPLIED TO THE DISPLAY BY UNPLUGGING THE DISPLAY BEFORE REMOVING THE LENS.

2. Place the display top-down on a non-slippery flat surface.
3. Using a "stubby" flat-bladed screwdriver, insert the blade between the green lens and the plastic cover approximately 2 inches from the end of the display. Press down firmly to release the latch. Repeat this at the opposite end of the display.
DO NOT SPRAY CLEANING SOLUTION INTO THE DISPLAY.
4. Use a soft cloth dampened with a mild cleaning solution to clean the display glass and the lens.
5. To replace the lens, place the display on its back on a flat surface. Place the side of the lens with 3 latches into the display, aligning it at each end. Press down firmly with two hands until it snaps into place.

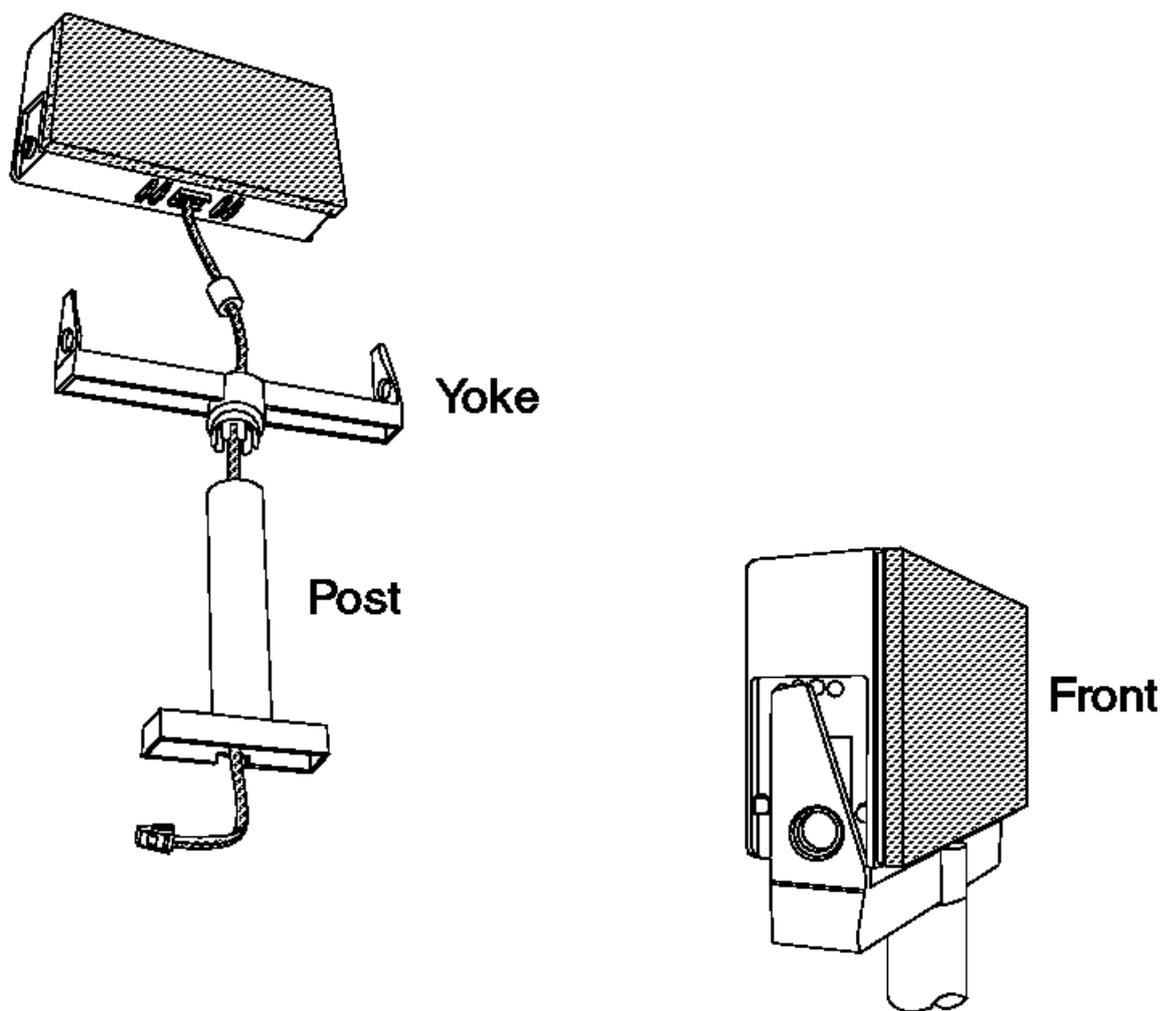


Figure 3-31. Removing the 40-Character Vacuum Fluorescent Display

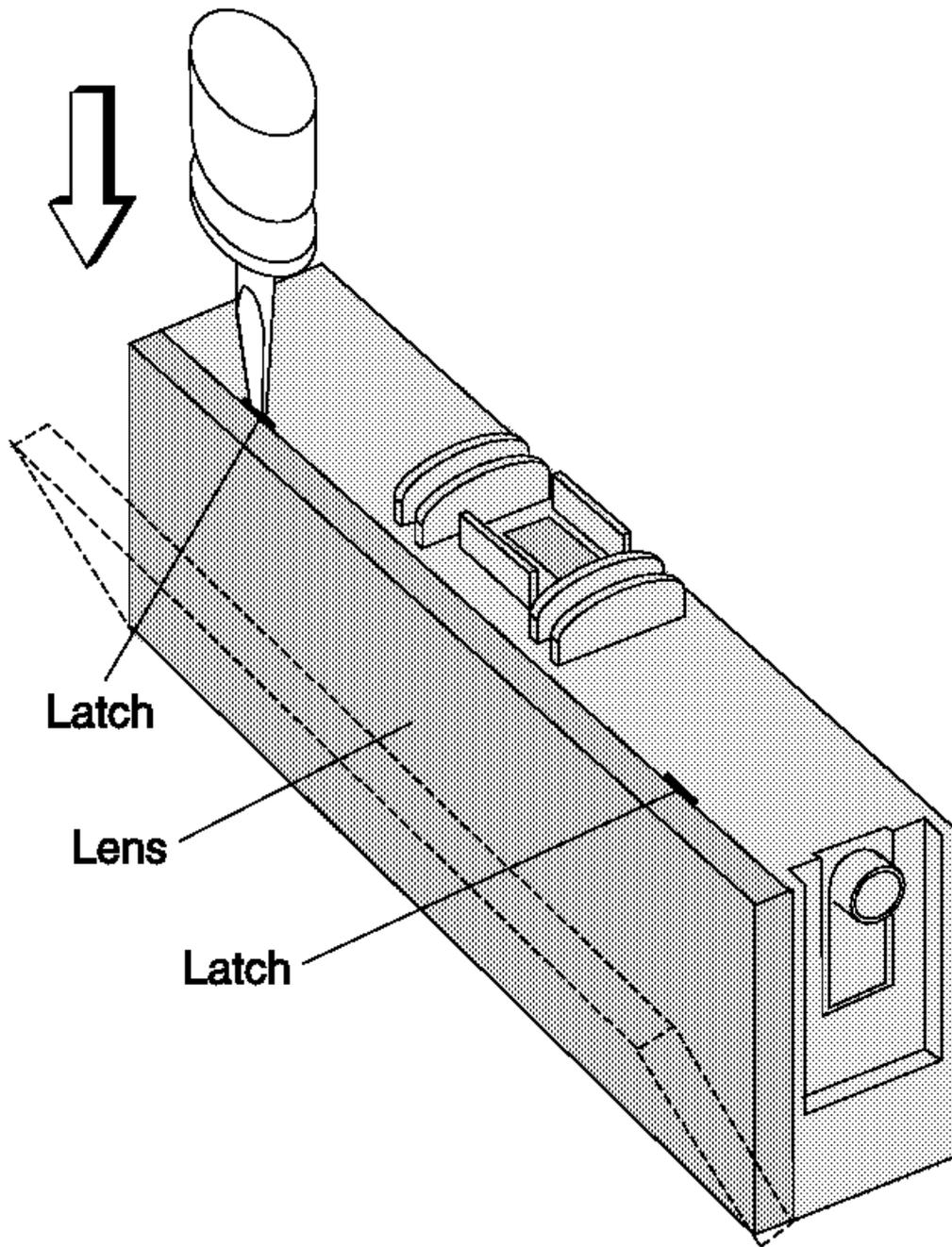


Figure 3-32. Removing and Replacing the Lens

4.0 Chapter 4. Point-of-Sale Keyboards

This chapter contains repair information for POS keyboards. Exchange the enhanced alphanumeric (PS/2* type) and the matrix keyboards and cables when they fail. Other keyboards should be repaired.

DANGER

```
+-----+  
| Never work on equipment or connect or disconnect signal cables during |  
| periods of lightning activity. |  
+-----+
```

CAUTION:

For your safety, connect equipment requiring electrical power to a properly wired and grounded outlet.

Subtopics

- 4.1 Electrostatic Discharge (ESD)
- 4.2 Keyboard and Card Reader Messages
- 4.3 Keyboard and Card Reader Symptoms

4.1 *Electrostatic Discharge (ESD)*

Attention ESD damage can occur when there is a difference in charge between the part, the product, and the service person. No damage will occur if the service person and the part being installed are at the same charge level.

ESD Damage Prevention

Anytime a service action involves physical contact with logic cards, modules, back-panel pins, or other ESD sensitive (ESDS) parts, the service person must be connected to an ESD common ground point on the product through the ESD wrist strap and cord.

The ESD ground clip can be attached to any frame ground, ground braid, green wire ground, or the round ground prong on the AC power plug. Coax or connector outside shells can also be used.

Handling Removed Cards

Logic cards removed from a product should be placed in ESD protective containers. No other object should be allowed inside the ESD container with the logic card. Attach tags or reports that must accompany the card to the outside of the container.

4.2 Keyboard and Card Reader Messages

Use the *Hardware Service Manual* for your terminal to determine that the keyboard is failing.

The keyboards listed can be repaired after determining the failing FRU. For other keyboards, exchange the entire keyboard and cable. See Figure A-2 in topic A.2 to help identify the keyboards.

Note: When using a keyboard that has a **Ctrl** key, the S1 and S2 functions require a combination of two keys. First press and hold the **Ctrl** key then press the **S1** or **S2** key.

This document uses abbreviated names for some keyboards:

Abbreviated Name	Full Name
50-key Keyboard	50-key Keyboard (4680 style)
Alphanumeric Keyboard	Alphanumeric Keyboard (4680 style)
Combined Keyboard/Display	Combined Keyboard/Display (4680 style)
ANPOS Keyboard	Alphanumeric Point of Sale Keyboard
RPOS Keyboard (no reader)	50-key Retail Point of Sale Keyboard
RPOS Keyboard/Reader	50-key Retail Point of Sale Keyboard with Card Reader
RPOS Keyboard/Reader/Display	50-key Retail Point of Sale Keyboard with Card Reader and Display
RANPOS Keyboard/Reader	Retail Alphanumeric Point of Sale Keyboard with Card Reader
ML Keyboard/Reader	133-key Modifiable Layout Keyboard with Reader

Use the following table to determine the failing FRU.

Table 4-1. Keyboard Messages	
Message	Repair Actions Listed in Most Likely Order of Failure
ANPOS and RANPOS keyboard POST error codes 00030n00	Exchange the logic board in the ANPOS or RANPOS keyboard connected to the Kybd port of the 4684 or 4693. See the logic board removal/replacement procedure for your keyboard.
Reference diskette codes M0001 M0300 M0320	Exchange the logic board in the keyboard you are using. See the logic board removal and replacement procedure for the failing keyboard.
Display test error codes for displays mounted in the combined keyboard/display or the RPOS keyboard/reader/display. T4157 T4158 T4167 T4168	Exchange the display in the keyboard. See the removal and replacement procedures for the failing keyboard.
Keyboard test error codes T5151 T5152 T5161 T5162 T5170	Exchange the logic board in the keyboard being tested. See the logic board removal and replacement procedure for the failing keyboard.
Card reader test error codes T6151 - Keyboard 5A T6161 - Keyboard 5B T6194 - Keyboard (Kybd port)	Exchange the keyboard logic board in the keyboard/card reader being tested. See the logic board removal and replacement procedure for the keyboard with the failing reader. Exchange the entire keyboard, if the keyboard is not repairable.
Card reader test error codes	If the card reader is attached to

<p>T6152 - Keyboard 5A</p> <p>T6162 - Keyboard 5B</p> <p>T6195 - Keyboard (Kybd port)</p>	<p>a repairable keyboard, exchange the card reader being tested. See card reader removal and replacement Procedure for the keyboard with the failing card reader.</p> <p>If exchanging the card reader fails to correct the problem, exchange the keyboard logic board. See the logic board removal and replacement procedure for the keyboard with the failing card reader.</p> <p>Exchange the entire keyboard if it is not repairable.</p>
<p>Keyboard error codes</p> <p>6310 - 50-key/Combined KB 5A</p> <p>6311 - 50-key/Combined KB 5B</p> <p>6312 - Alphanumeric 5A</p> <p>6313 - Alphanumeric 5B</p> <p>631A - ANPOS 5A</p> <p>631B - ANPOS 5B</p> <p>631C - RPOS Keyboard family 5A</p> <p>631D - RPOS Keyboard family 5B</p> <p>6322 - Combined KB/Display 5A</p> <p>6323 - Combined KB/Display 5B</p> <p>6340 - Card Reader 5A</p> <p>6341 - Card Reader 5B</p> <p>6346 - Card Reader 5A</p> <p>6347 - Card Reader 5B</p> <p>6348 - Card Reader 5A</p> <p>6349 - Card Reader 5B</p>	<p>Exchange the logic board for the keyboard indicated. See the logic board removal and replacement procedure for the failing keyboard.</p>
<p>Model xx2 (Satellite) Terminals</p> <p>6390 - 50-key/Combined KB 5A</p> <p>6391 - 50-key/Combined KB 5B</p> <p>6392 - Alphanumeric 5A</p> <p>6393 - Alphanumeric 5B</p> <p>639A - ANPOS 5A</p> <p>639B - ANPOS 5B</p> <p>639C - RPOS Keyboard family 5A</p> <p>639D - RPOS Keyboard family 5B</p> <p>63A2 - Combined KB/Display 5A</p> <p>63A3 - Combined KB/Display 5B</p> <p>63C0 - Card Reader 5A</p> <p>63C1 - Card Reader 5B</p> <p>63C6 - Card Reader 5A</p> <p>63C7 - Card Reader 5B</p>	

I/O Devices - Hardware Service Manual
Keyboard and Card Reader Messages

63C8 - Card Reader 5A	
63C9 - Card Reader 5B	
Operating system keyboard error codes	Exchange the logic board for the keyboard being used. See the logic board removal and replacement procedure for the failing keyboard.
W303	
W318	

4.3 Keyboard and Card Reader Symptoms

You must use the *Hardware Service Manual* for your terminal to determine that the keyboard is the cause of the failure.

See Figure A-2 in topic A.2 to help identify the keyboards.

The keyboards listed can be repaired. For other keyboards, exchange the entire keyboard and cable.

Abbreviated Name	Full Name
50-key Keyboard	50-key Keyboard (4680 style)
Alphanumeric Keyboard	Alphanumeric Keyboard (4680 style)
Combined Keyboard/Display	Combined Keyboard/Display (4680 style)
ANPOS Keyboard	Alphanumeric Point of Sale Keyboard
RPOS Keyboard (no reader)	Retail Point of Sale Keyboard
RPOS Keyboard/Reader	Retail Point of Sale Keyboard with Card Reader
RPOS Keyboard/Reader/Display	Retail Point of Sale Keyboard with Card Reader and Display
RANPOS Keyboard/Reader	Retail Alphanumeric Point of Sale Keyboard with Card Reader
ML Keyboard/Reader	Modifiable Layout Keyboard with Reader

Use the following table to determine the failing FRU.

Table 4-2. Keyboard Symptoms	
Symptom	Repair Actions Listed in Most Likely Order of Failure
One or several keyboard keys are failing (keyboard is operational).	<ul style="list-style-type: none"> <input type="checkbox"/> Exchange the keypad assembly. <input type="checkbox"/> Exchange the keyboard logic board. <p>See the logic board removal and replacement procedure for the failing keyboard.</p>
Keyboard tone, audible tone, or speaker is failing.	<ul style="list-style-type: none"> <input type="checkbox"/> On alphanumeric and ANPOS keyboards - Exchange the Speaker <p>Note: The speaker is not a FRU on some keyboards.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Exchange the keyboard logic board. See the logic board removal and replacement procedure for the ANPOS keyboard.
All keyboard lights are ON (keyboard not operational).	<ul style="list-style-type: none"> <input type="checkbox"/> Exchange the keyboard logic board. See the logic board removal and replacement procedure for your keyboard.
One or more keyboard lights are failing (keyboard is operational).	<ul style="list-style-type: none"> <input type="checkbox"/> For RPOS keyboards, exchange the Indicator Light Assembly. See topic 4.3.4.5. <input type="checkbox"/> For Alphanumeric Keyboards, exchange the Indicator Light Assembly. See topic 4.3.2.2. <input type="checkbox"/> Exchange the keyboard logic board. See the logic board removal and replacement procedure for your keyboard.
All keyboard keys are failing (keyboard not operational).	<ul style="list-style-type: none"> <input type="checkbox"/> Exchange the keyboard logic board. See the logic board removal and replacement procedure for your keyboard.
The manager keylock does not turn with the key.	<ul style="list-style-type: none"> <input type="checkbox"/> Exchange the manager keylock. See the keylock removal and replacement procedure for your keyboard.
The manager keylock turns with the key but is not detected by the test or application program.	<ul style="list-style-type: none"> <input type="checkbox"/> Exchange the keyboard logic board. See the logic board removal and replacement procedure for your keyboard.
The display in the combined keyboard/display is failing.	Exchange the display. See topic 4.3.5.2.
The card reader in the keyboard is failing.	<ul style="list-style-type: none"> <input type="checkbox"/> Exchange the card reader. See the card reader removal

and replacement procedure for
your keyboard.

- Exchange the keyboard logic
board. See the logic board
removal and replacement
procedure for your keyboard.

Subtopics

- 4.3.1 Removing and Replacing the 50-Key Keyboard Components
- 4.3.2 Removing and Replacing Alphanumeric Keyboard Components
- 4.3.3 Removing and Replacing ANPOS Keyboard Components
- 4.3.4 Removing and Replacing the RPOS Keyboard Family Components
- 4.3.5 Removing and Replacing Combined Keyboard/Display Components

4.3.1 *Removing and Replacing the 50-Key Keyboard Components*

See Figure 4-1 in topic 4.3.1.4 when removing and replacing 50-key keyboard components.

Subtopics

- 4.3.1.1 Removing and Replacing the Keyboard Cover
- 4.3.1.2 Removing and Replacing the Keypad Assembly
- 4.3.1.3 Removing and Replacing the Logic Board
- 4.3.1.4 Removing the Manager's Keylock

4.3.1.1 Removing and Replacing the Keyboard Cover

1. Set the manager keylock to the OFF (clockwise) position.
2. Press in on the back-center of the keyboard (1).
3. Lift up on the back of the keyboard cover (2), move it toward the front of the keyboard base, and lift it off.

To exchange the keyboard cover, reverse this procedure.

4.3.1.2 Removing and Replacing the Keypad Assembly

1. Remove the keyboard cover.
2. Remove the grounding screw (5).
3. Lift the keypad (6) off the mounting posts (10).
4. Disconnect the cables and lift the keypad out of the keyboard base.

To exchange the keypad assembly, reverse this procedure.

4.3.1.3 Removing and Replacing the Logic Board

1. Remove the keyboard cover.
2. Remove the keypad assembly.
3. Remove the screws (11).
4. Release the latches (7) at the front edge of the logic board (8).
5. Move the logic board from under the tabs (9) at the back of the keyboard base and lift it out of the base.

To exchange the logic board, reverse this procedure.

4.3.1.4 *Removing the Manager's Keylock*

1. Remove the keyboard cover.
2. Remove the keylock retainer (4).
3. Lift the keylock (3) out of the keyboard cover.

To exchange the keylock, reverse this procedure.

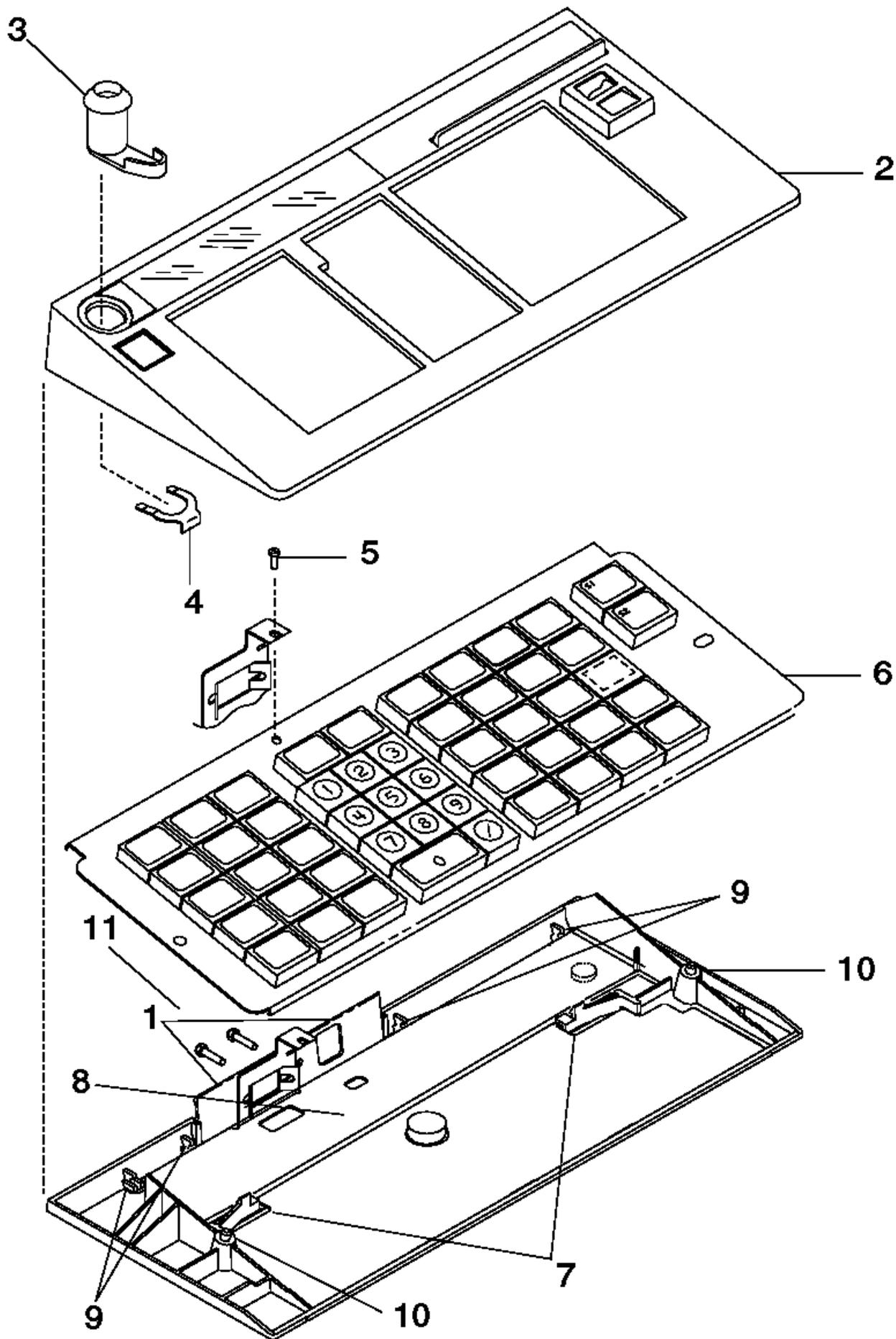


Figure 4-1. Removing and Replacing 50-Key Keyboard Components

4.3.2 *Removing and Replacing Alphanumeric Keyboard Components*

See pages 4.3.2.6 and 4.3.2.6 for removing and replacing Alphanumeric Keyboard components.

Subtopics

4.3.2.1 Removing and Replacing the Keyboard Cover

4.3.2.2 Removing and Replacing the Indicator Light Assembly

4.3.2.3 Removing and Replacing the Keypad Assembly

4.3.2.4 Removing and Replacing the Manager's Keylock

4.3.2.5 Removing and Replacing the Logic Board

4.3.2.6 Removing and Replacing the Speaker

4.3.2.1 *Removing and Replacing the Keyboard Cover*

1. Press in on the 2 tabs (3) on the back of the keyboard.
2. Lift up on the back of the keyboard cover, move it toward the front of the keyboard base, and lift it off.
3. Disconnect the cable from connector CN3 on the logic board.

To exchange the keyboard cover, reverse this procedure.

4.3.2.2 Removing and Replacing the Indicator Light Assembly

1. Remove the keyboard cover.
2. Release the tab holding the indicator light assembly and remove it from the keyboard cover.
3. Disconnect the cable from connector CN1 on the assembly.

To exchange the indicator light assembly, reverse this procedure.

4.3.2.3 *Removing and Replacing the Keypad Assembly*

1. Remove the keyboard cover.
2. Release the 2 latches (1) at the back of the keypad.
3. Lift up on the back of the keypad and slide it out of the 3 tabs (2) at the front of the keyboard base.
4. Disconnect the cables from connectors CN5 and CN6 on the logic board and lift the keypad out of the keyboard base.

To exchange the keypad assembly, reverse this procedure.

4.3.2.4 Removing and Replacing the Manager's Keylock

1. Remove the keyboard cover.
2. Remove the keylock retainer.
3. Lift the keylock out of the keyboard cover.

To exchange the keylock, reverse this procedure.

4.3.2.5 Removing and Replacing the Logic Board

1. Remove the keyboard cover.
2. Remove the keypad assembly.
3. Remove the screw (6).
4. Disconnect the cables from connectors CN4 and CN7 on the logic board.
5. Move the logic board from under the tabs (4) and lift it out of the keyboard base.

To exchange the logic board, reverse this procedure.

4.3.2.6 Removing and Replacing the Speaker

1. Remove the keyboard cover.
2. Remove the keypad assembly.
3. Disconnect the speaker cable from connector CN4 on the logic board.
4. Slide the speaker toward the front and lift it out of the keyboard base.

To exchange the speaker, reverse this procedure.

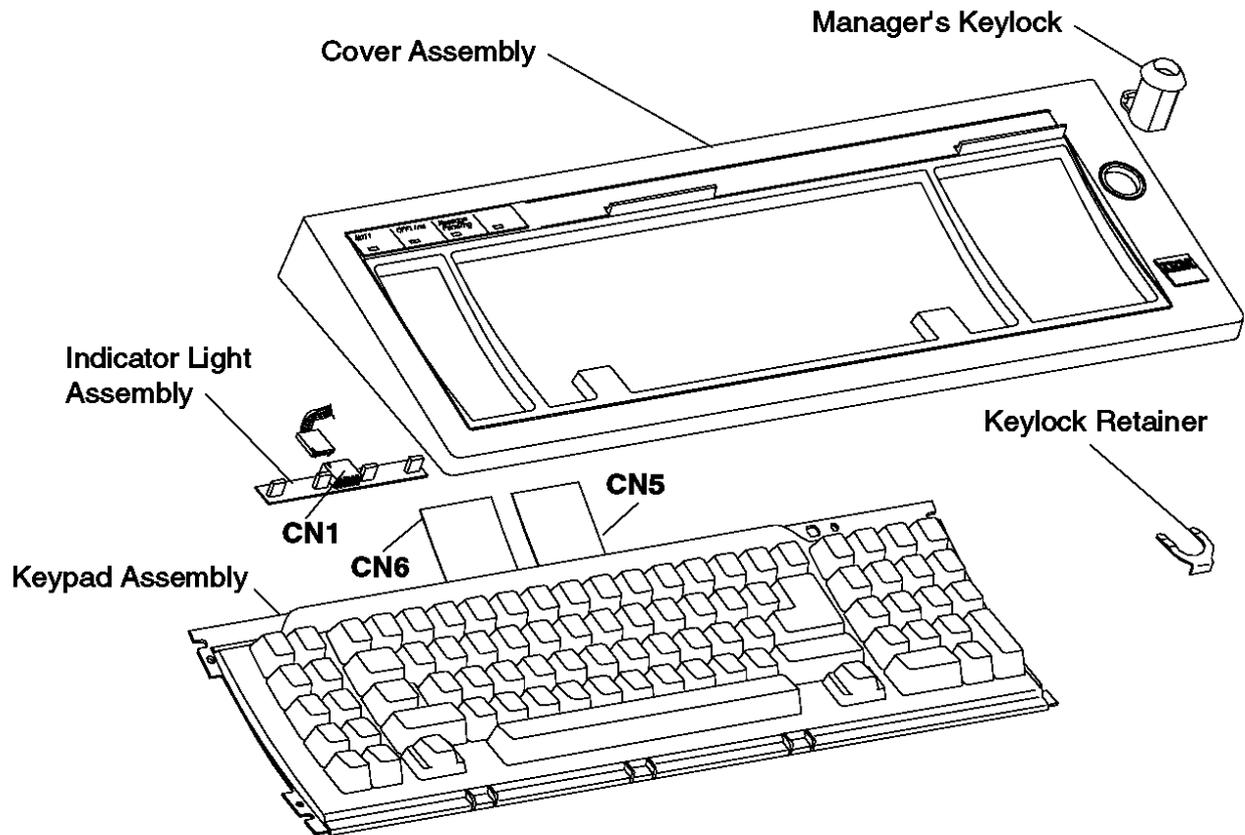


Figure 4-2. Removing and Replacing Alphanumeric Keyboard Components

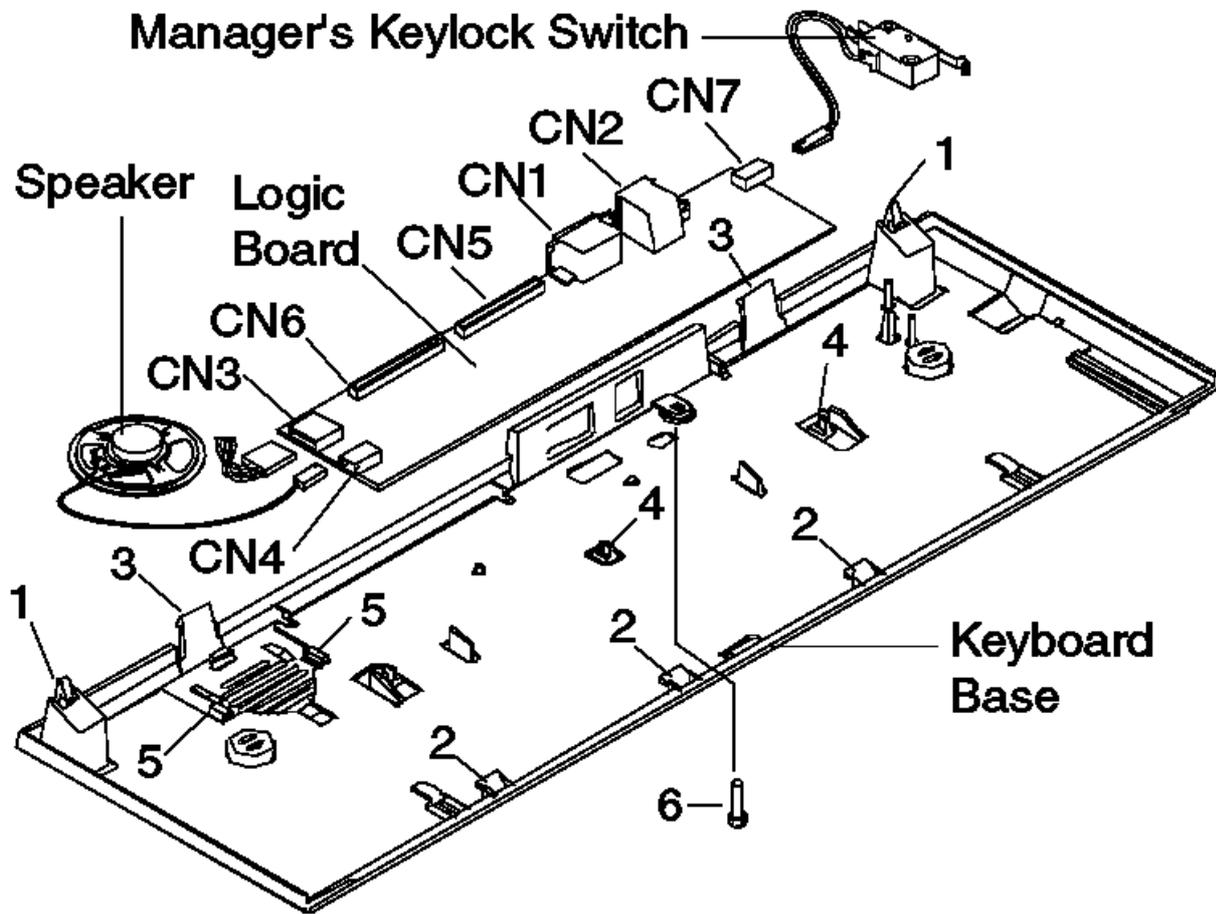


Figure 4-3. Removing and Replacing Alphanumeric Keyboard Components

4.3.3 *Removing and Replacing ANPOS Keyboard Components*

Subtopics

- 4.3.3.1 Removing and Replacing the Keyboard Cover
- 4.3.3.2 Removing and Replacing the Keypad Assembly
- 4.3.3.3 Removing and Replacing the Logic Board
- 4.3.3.4 Removing and Replacing the Manager's Keylock
- 4.3.3.5 Removing and Replacing the Manager's Keylock Switch
- 4.3.3.6 Removing and Replacing the Speaker
- 4.3.3.7 Removing and Replacing the ANPOS Card Reader or Filler Cover

4.3.3.1 Removing and Replacing the Keyboard Cover

1. Remove the card reader or filler cover.
2. Unlatch keyboard cover tabs 1, 2, and 3, in that order. See Figure 4-4 in topic 4.3.3.7.
3. Lift up on the back of the cover, move it toward the front of the base, and lift it off.

To exchange the keyboard cover, reverse this procedure.

4.3.3.2 *Removing and Replacing the Keypad Assembly*

1. Remove the card reader or filler cover. See topic 4.3.3.7.
2. Remove the keyboard cover.
3. Lift the keypad assembly and turn it over as shown in Figure 4-5 in topic 4.3.3.7.

Note: The cable connected to connector J1 is a *flexible cable*.

4. To disconnect the J1 cable, gently lift up on the top of the connector as shown in (2). This allows the connector to release the cable.
5. Pull the cable out of the connector as shown in (3).
6. Disconnect the cables from connectors J2 and J3 in the same manner as the J1 cable.

To exchange the keypad assembly, reverse this procedure.

4.3.3.3 *Removing and Replacing the Logic Board*

1. Remove the card reader or filler cover. See topic 4.3.3.7.
2. Remove the keyboard cover.
3. Remove the keypad assembly.
4. Remove the grounding screw (8) that goes through the keyboard base and attaches to the logic board. See Figure 4-6 in topic 4.3.3.7.
5. Disconnect the cables from connectors J6 and J7.
6. Release the 3 logic board latches (7).
7. Move the logic board from under the tabs (9) and lift it out of the keyboard base.

To exchange the logic board, reverse this procedure.

4.3.3.4 Removing and Replacing the Manager's Keylock

1. Remove the card reader or filler cover.
2. Remove the keyboard cover.
3. Remove the keylock retainer (11). See Figure 4-6 in topic 4.3.3.7.
4. Lift the keylock (12) out of the keyboard cover.

To exchange the manager's keylock, reverse this procedure.

4.3.3.5 Removing and Replacing the Manager's Keylock Switch

1. Remove the card reader or filler cover.
2. Remove the keyboard cover.
3. Lift the keypad assembly and turn it over as shown in Figure 4-5 in topic 4.3.3.7.
4. Disconnect the cable on the manager's keylock switch (10) from connector J6. See Figure 4-6 in topic 4.3.3.7.
5. Unlatch the manager's keylock switch assembly and remove it.

To exchange the manager's keylock switch, reverse this procedure.

4.3.3.6 *Removing and Replacing the Speaker*

1. Remove the card reader or filler cover. See topic 4.3.3.7.
2. Remove the keyboard cover.
3. Lift the keypad assembly and turn it over as shown in Figure 4-5 in topic 4.3.3.7.
4. Disconnect the cable on the speaker (3) from connector J7. See Figure 4-6 in topic 4.3.3.7.
5. Slide the speaker toward the front of the keyboard base and remove it.

To exchange the speaker, reverse this procedure.

4.3.3.7 Removing and Replacing the ANPOS Card Reader or Filler Cover

1. Stand the keyboard on its front edge. See Figure 4-7.
2. Press and hold the card reader latch (1) on the bottom of the keyboard.
3. While pressing the latch, grasp the end of the card reader or filler cover nearest the center of the keyboard (2) and lift it away from the keyboard.
4. Continue lifting the card reader or filler cover until it is removed from the keyboard.

To exchange the card reader or filler cover, reverse this procedure.

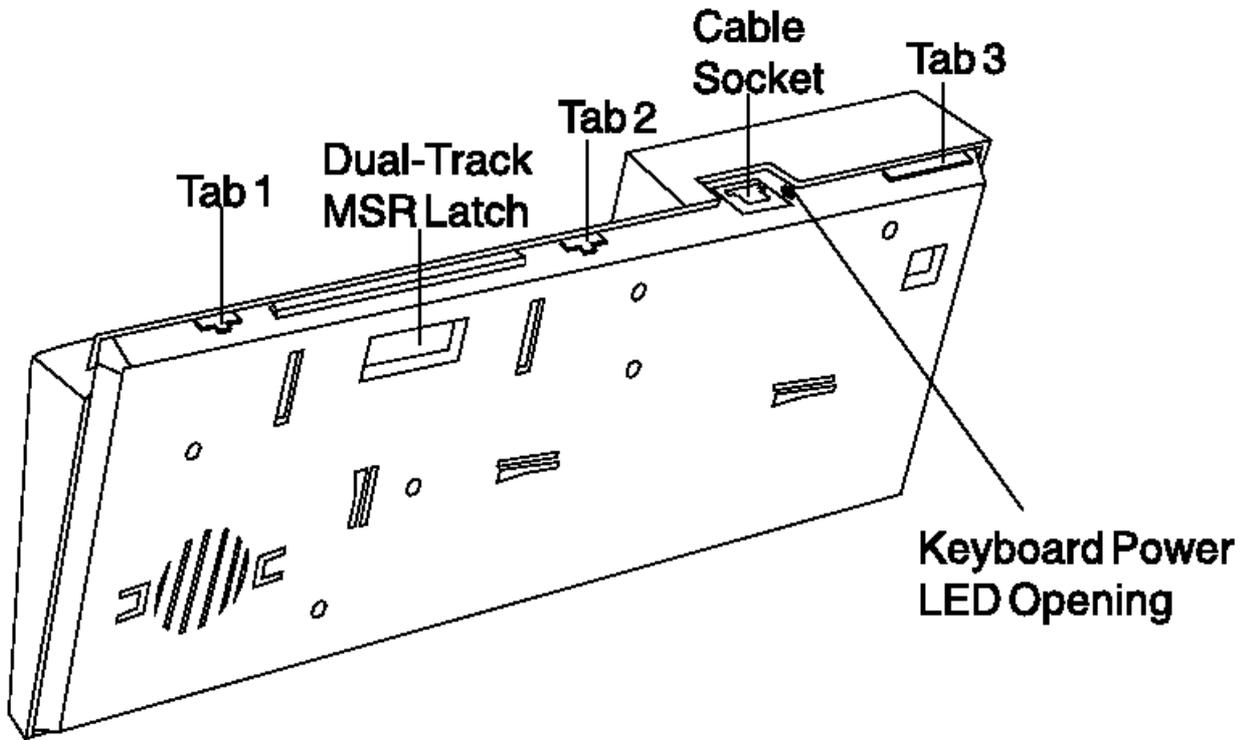


Figure 4-4. Removing the ANPOS Keyboard Cover

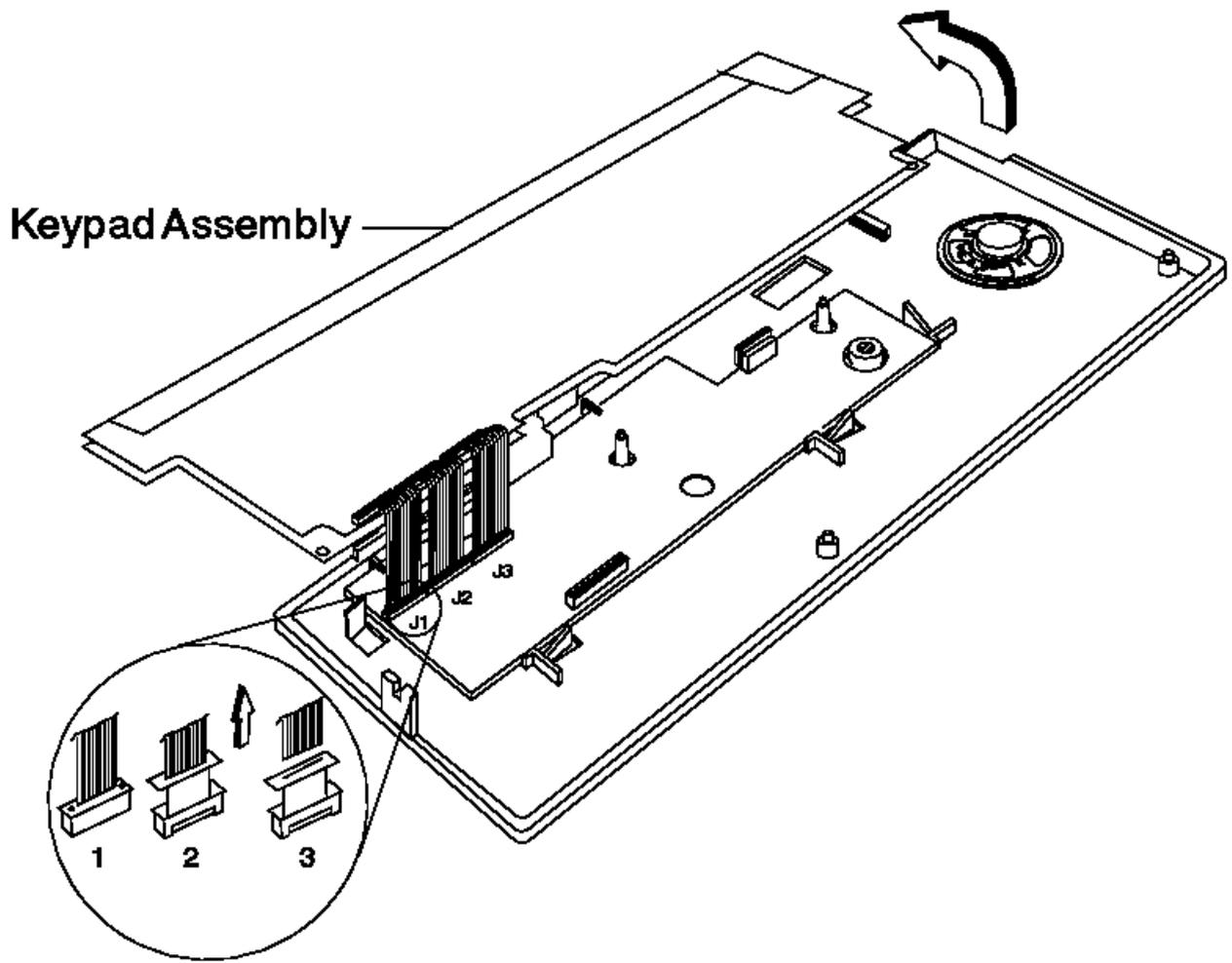


Figure 4-5. Removing the Keypad Assembly

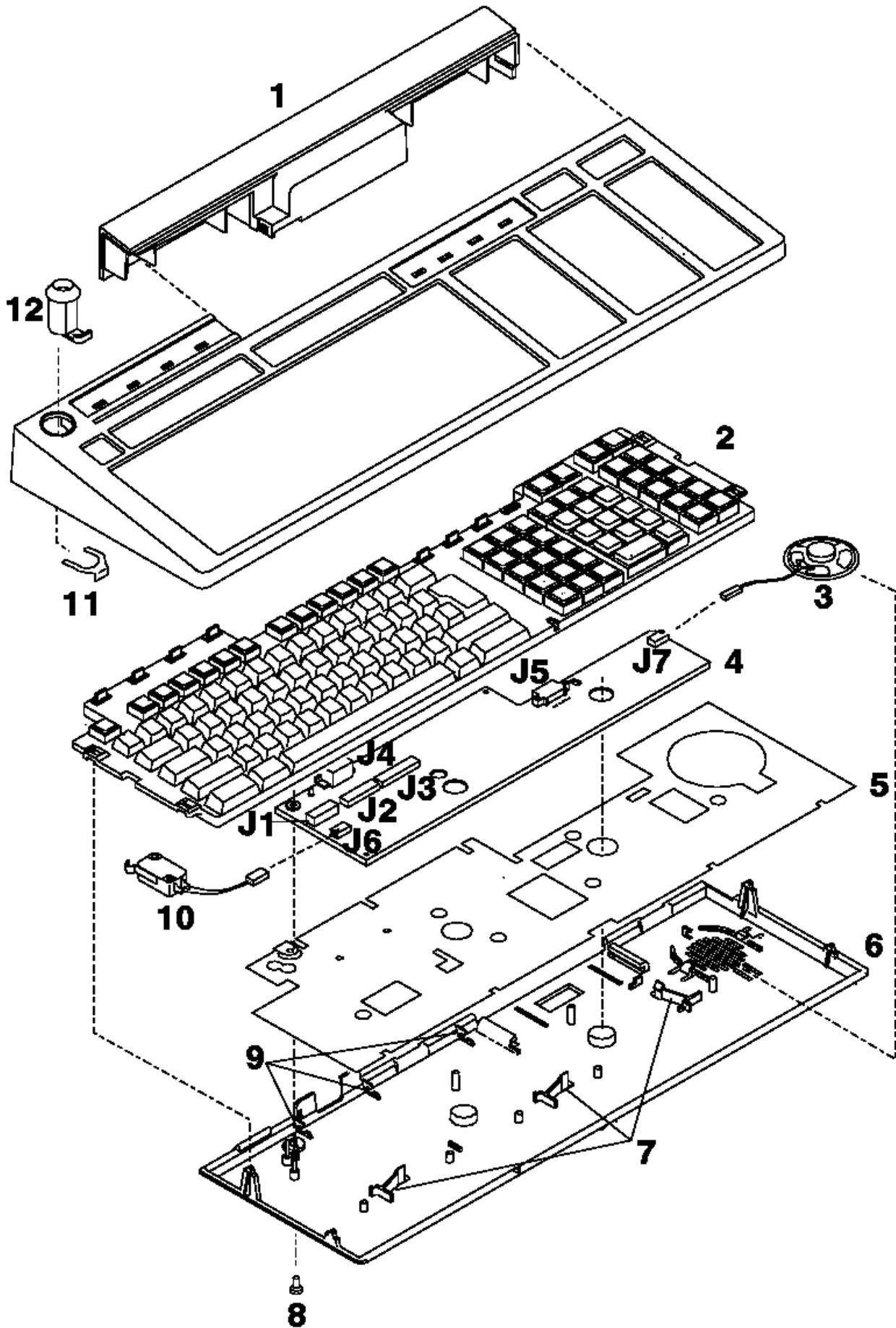


Figure 4-6. Removing ANPOS Keyboard Components

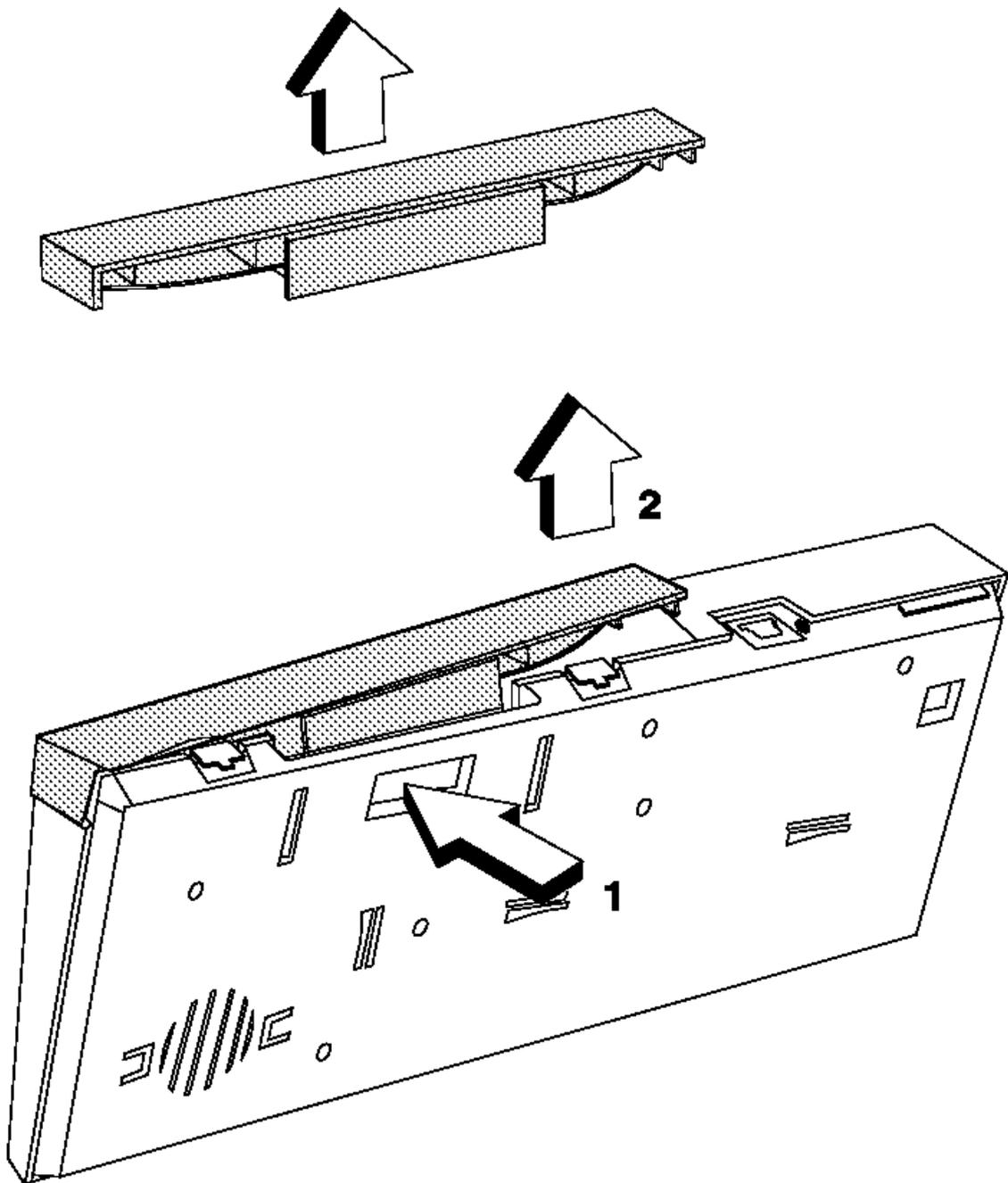


Figure 4-7. Removing the ANPOS card reader or Filler Cover

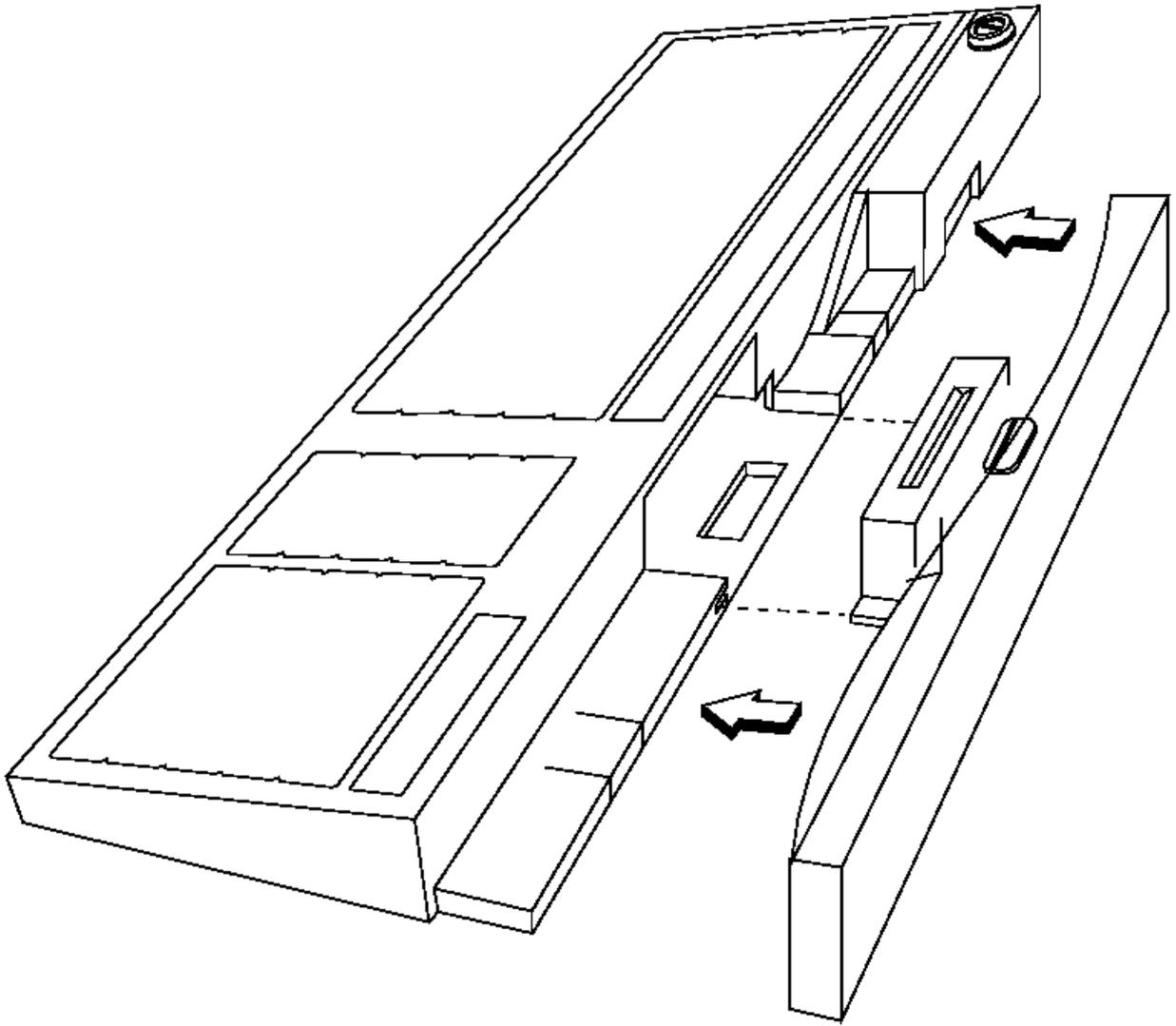


Figure 4-8. Replacing the ANPOS Card Reader or Filler Cover

4.3.4 *Removing and Replacing the RPOS Keyboard Family Components*

```
+--- Important Information -----+
|
| These procedures apply to the entire family of RPOS keyboards
| including the RPOS keyboard/reader, RPOS keyboard/reader/display,
| RANPOS/reader, and the modifiable layout keyboard/reader (ML
| keyboard/reader).
|
+-----+
```

Subtopics

- 4.3.4.1 Removing and Replacing the Keyboard Cover and Keypad Assembly
- 4.3.4.2 Removing and Replacing the Logic Board
- 4.3.4.3 Removing and Replacing the Manager's Keylock Actuator Arm
- 4.3.4.4 Removing and Replacing the Card Reader
- 4.3.4.5 Removing and Replacing the Indicator Light Assembly
- 4.3.4.6 Removing and Replacing the Display Assembly
- 4.3.4.7 Removing and Replacing the Keyboard Legs

4.3.4.1 *Removing and Replacing the Keyboard Cover and Keypad Assembly*

1. See Figure 4-9 in topic 4.3.4.7.
2. Remove the 3 (or 4) screws located at the bottom front of the keyboard.

Attention There are 2 ribbon cables inside the keyboard that you must handle carefully. When removing the cover, do it slowly and gently, to avoid damage to the cables.

3. Carefully lift up on the front edge of the cover and unlatch it from the keyboard base. Carefully tilt the cover toward the rear until you can slide the 2 ribbon cables up and out of cable sockets J3 and J4.
4. Disconnect the indicator light cables from socket J7 and J9 (if present).
5. Disconnect the card reader cable from socket J8.
6. Using a small screwdriver or spring hook in the small hole in the card reader logic card, pull the logic card out of its holding bracket. It is held in place by friction only.
7. Remove the 2 screws holding the card reader and slide it out of its locating slots, being careful to not stress or break the ribbon cable attached between the reader and the reader logic card.
8. Using a small screwdriver, unlatch the indicator light assemblies and remove them. Some keyboards have only one light assembly.
9. Remove the keylock insert (if present) or the blank lock insert. See topic C.1.
10. Remove the plastic keylock actuator by unsnapping it from the bottom of the metal housing.
11. Remove the retainer clip and remove the keylock housing.

To exchange the keyboard cover and keypad assembly, reverse this procedure.

Attention Make sure that the 2 ribbon cables are properly seated in cable sockets J3 and J4 when the Keyboard Cover and Keypad Assembly are attached to the keyboard base. It is easy to pull these cables loose during reassembly.

12. Test the keyboard to ensure that it works correctly.

4.3.4.2 *Removing and Replacing the Logic Board*

1. Remove the keyboard cover and keypad assembly. See topic 4.3.4.1.

Note: Only perform those steps necessary to disconnect all the cables to the logic board from the keyboard cover and keypad assembly.

2. Remove the display cable shield holding screw (if present).
3. Disconnect the operator display cable (if present) from socket J2.
4. Pull the 2 logic board latches at the front of the logic board toward the front of the keyboard while lifting the logic board. The logic board and its attached shield will now slide forward and out of the base.

To exchange the logic board, locate it underneath the tab at the rear and snap it into place, then reconnect all the cables. See topic 4.3.4.1 for details of keyboard cover and keypad assembly replacement.

Attention Make sure that the 2 ribbon cables are properly seated in cable sockets J3 and J4 when the keyboard cover and keypad assembly are attached to the keyboard base. It is easy to pull these cables loose during reassembly.

5. Test the keyboard to ensure that it works correctly.

4.3.4.3 *Removing and Replacing the Manager's Keylock Actuator Arm*

1. Remove the keyboard cover and keypad assembly. See topic 4.3.4.1.

Note: Only perform those steps necessary to allow you to gain access to the keylock assembly.

2. Remove the broken or defective actuator arm from the keylock assembly. If necessary, pry it free with a screwdriver.
3. Press the replacement actuator arm into the keylock assembly until it latches into place.
4. Reinstall the cover and keypad assembly making sure to connect all cables that were disconnected.

Attention Make sure that the 2 ribbon cables are properly seated in cable sockets J3 and J4 when the keyboard cover and keypad assembly are attached to the keyboard base. It is easy to pull these cables loose during reassembly.

5. Test the keyboard to ensure that it works correctly.

4.3.4.4 *Removing and Replacing the Card Reader*

1. Remove the 3 (or 4) screws located at the bottom front of the keyboard.

Attention There are 2 ribbon cables inside the keyboard that you must handle carefully. When removing the cover, do it slowly and gently, to avoid damage to the ribbon cables.

2. Carefully lift up on the front edge of the cover and unlatch it from the keyboard base. Carefully tilt the cover toward the rear until you can slide the 2 ribbon cables up and out of cable sockets J3 and J4.
3. Disconnect the card reader cable that connects to cable socket J8.
4. Using a small screwdriver or spring hook in the small hole in the card reader logic card, pull the logic card out of its holding bracket. It is held in place by friction only.
5. Remove the 2 screws holding the card reader and slide it out of its locating slots being careful to not stress or break the ribbon cable attached between the reader and the reader logic card.
6. To exchange the card reader assembly, reverse this procedure.

Attention Make sure that the 2 ribbon cables are properly seated in their sockets (J3 and J4) when the keyboard cover and keypad assembly is attached to the keyboard base. It is easy to pull these cables loose during reassembly.

7. Test the keyboard to ensure that it works correctly.

4.3.4.5 *Removing and Replacing the Indicator Light Assembly*

1. Remove the 3 (or 4) screws located at the bottom front of the keyboard.

Attention There are 2 ribbon cables inside the keyboard that you must handle carefully. When removing the cover, do it slowly and gently, to avoid damage to the ribbon cables.

2. Carefully lift up on the front edge of the cover and unlatch it from the keyboard base. Carefully tilt the cover toward the rear until you can slide the 2 ribbon cables up and out of cable sockets J3 and J4.
3. Disconnect the card reader cable at socket J8.
4. Disconnect the cables from the indicator light assemblies that connect to socket J7 and J9. Some keyboards have only one indicator assembly.
5. There are 2 latches on each assembly that you can get to without removing the card reader . Using a small screwdriver, unlatch the indicator light assembly and remove it.
6. To exchange the indicator light assembly, reverse this procedure.

Attention Make sure that the 2 ribbon cables are properly seated in cable sockets J3 and J4 when the keyboard cover and keypad assembly are attached to the keyboard base. It is easy to pull these cables loose during reassembly.

7. Test the keyboard to ensure that it works correctly.

4.3.4.6 *Removing and Replacing the Display Assembly*

1. Remove the 3 (or 4) screws located at the bottom front of the keyboard.

Attention There are 2 ribbon cables inside the keyboard that you must handle carefully. When removing the cover, do it slowly and gently, to avoid damage to the ribbon cables.

2. Carefully lift up on the front edge of the cover and it unlatch it from the keyboard base. Carefully tilt the cover toward the rear until you can slide the 2 ribbon cables up and out of cable sockets J3 and J4.
3. Disconnect the cables from sockets J7, J8, and J9.
4. Remove the display cable shield holding screw from the logic board.
5. Disconnect the operator display cable from socket J2.
6. Remove the logic board.
7. Lift the display out of the keyboard.
8. To exchange the display assembly, reverse this procedure.

Attention Make sure that the 2 ribbon cables are properly seated in cable sockets J3 and J4 when the keyboard cover and keypad assembly is attached to the keyboard base. It is easy to pull these cables loose during reassembly.

9. Test the keyboard to ensure that it works correctly.

4.3.4.7 *Removing and Replacing the Keyboard Legs*

1. Rotate the legs so that they hold the keyboard in the tilted position.
2. Each leg has a small slot visible from the side. Using a small screwdriver, pry the leg off its mounting post.
3. To exchange the leg, position the leg so that the keyboard tilts and push it to snap it into place on the mounting post.

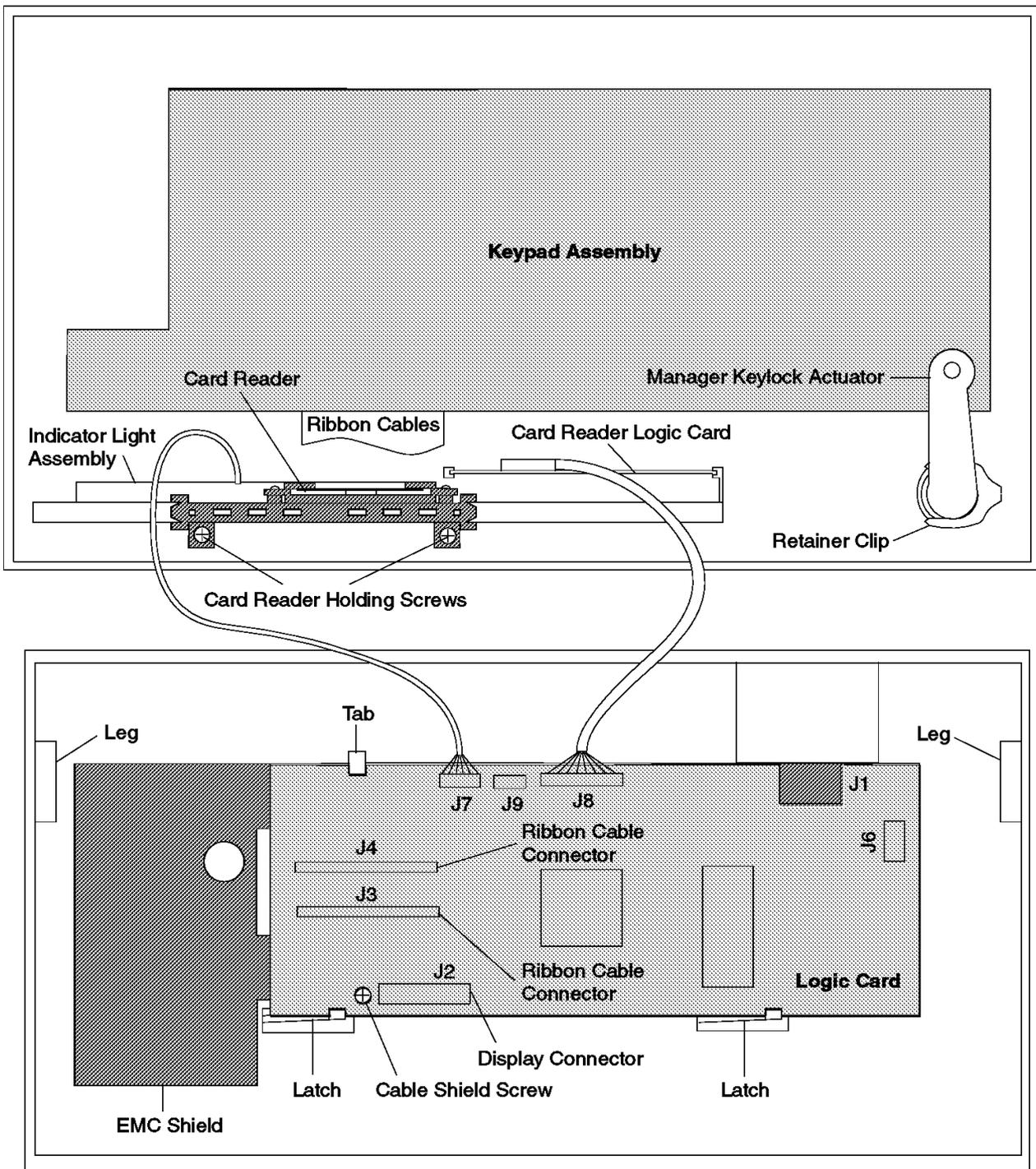


Figure 4-9. RPOS Keyboard Components. This is the bottom view of the top cover and keypad assembly and the top view of the logic card in a typical keyboard. Since some keyboards are larger or have a display, your keyboard may look slightly different.

4.3.5 *Removing and Replacing Combined Keyboard/Display Components*

Subtopics

- 4.3.5.1 Removing and Replacing the Keyboard Cover
- 4.3.5.2 Removing and Replacing the Display Assembly
- 4.3.5.3 Removing and Replacing the Keypad Assembly
- 4.3.5.4 Removing and Replacing the Logic Board
- 4.3.5.5 Removing and Replacing the Manager's Keylock
- 4.3.5.6 Removing and Replacing the Manager's Keylock Switch
- 4.3.5.7 Removing and Replacing the Speaker
- 4.3.5.8 Removing and Replacing the Combined Keyboard/Display Card Reader

4.3.5.1 Removing and Replacing the Keyboard Cover

1. Remove the card reader or filler cover. See topic 4.3.5.8.
2. Unlatch keyboard cover tabs 1, 2, and 3, in that order. See Figure 4-10 in topic 4.3.5.8.
3. Lift up on the back of the cover, move it toward the front of the keyboard, and lift it off.

To exchange the keyboard cover, reverse this procedure.

4.3.5.2 Removing and Replacing the Display Assembly

1. Remove the card reader or filler cover. See topic 4.3.5.8.
2. Remove the keyboard cover.
3. Disconnect the cable from the display. See Figure 4-11 in topic 4.3.5.8.
4. Lift the display from the display posts.

To exchange the display, reverse this procedure.

4.3.5.3 Removing and Replacing the Keypad Assembly

1. Remove the card reader or filler cover. See topic 4.3.5.8.
2. Remove the keyboard cover.
3. Remove the grounding screw (18). See Figure 4-13 in topic 4.3.5.8.
4. Lift the keypad assembly and turn it over as shown in Figure 4-12 in topic 4.3.5.8.
5. Disconnect the cables from cable sockets J4 and J7. See Figure 4-13 in topic 4.3.5.8.

To exchange the keypad assembly, reverse this procedure.

4.3.5.4 Removing and Replacing the Logic Board

1. Remove the card reader or filler cover. See topic 4.3.5.8.
2. Remove the keyboard cover. See topic 4.3.5.1.
3. Remove the keypad assembly. See topic 4.3.5.3.
4. Remove the display assembly. See topic 4.3.5.2.
5. Remove the grounding screw (17) that goes through the keyboard base and attaches to the logic board. See Figure 4-13 in topic 4.3.5.8.
6. Disconnect the cables from cable sockets J1 and J5.
7. Release the 3 logic board latches (15).
8. Move the logic board from under the tabs (10) and lift it out of the keyboard base.

To exchange the logic board, reverse this procedure.

4.3.5.5 Removing and Replacing the Manager's Keylock

1. Remove the card reader or filler cover. See topic 4.3.5.8.
2. Remove the keyboard cover. See topic 4.3.5.1.
3. Remove the keylock retainer (3). See Figure 4-13 in topic 4.3.5.8.
4. Lift the keylock (1) out of the keyboard cover.

To exchange the manager's keylock, reverse this procedure.

4.3.5.6 *Removing and Replacing the Manager's Keylock Switch*

1. Remove the card reader or filler cover. See topic 4.3.5.8.
2. Remove the keyboard cover. See topic 4.3.5.1.
3. Lift the keypad assembly and turn it over as shown in Figure 4-13 in topic 4.3.5.8.
4. Disconnect the cable on the manager's keylock switch (9) from cable socket J1. See Figure 4-13 in topic 4.3.5.8.
5. Unlatch the manager's keylock switch assembly and remove it.

To exchange the manager's keylock switch, reverse this procedure.

4.3.5.7 *Removing and Replacing the Speaker*

1. Remove the card reader or filler cover. See topic 4.3.5.8.
2. Remove the keyboard cover. See topic 4.3.5.1.
3. Remove the display assembly. See topic 4.3.5.2.
4. Remove the keypad assembly. See topic 4.3.5.3.
5. Remove the logic board.
6. Disconnect the cable on the speaker (7) from cable socket J5. See Figure 4-13 in topic 4.3.5.8.
7. Slide the speaker toward the back of the keyboard base and remove it.

To exchange the speaker, reverse this procedure.

4.3.5.8 Removing and Replacing the Combined Keyboard/Display Card Reader

1. Stand the keyboard on its front edge. See Figure 4-14.
2. Press and hold the MSR latch (1) on the bottom of the keyboard.
3. While pressing the latch, grasp the end of the card reader or filler cover nearest the center of the keyboard (2) and lift it away from the keyboard.
4. Continue lifting the card reader or filler cover until it is removed from the keyboard.

To exchange the card reader or filler cover, reverse this procedure.

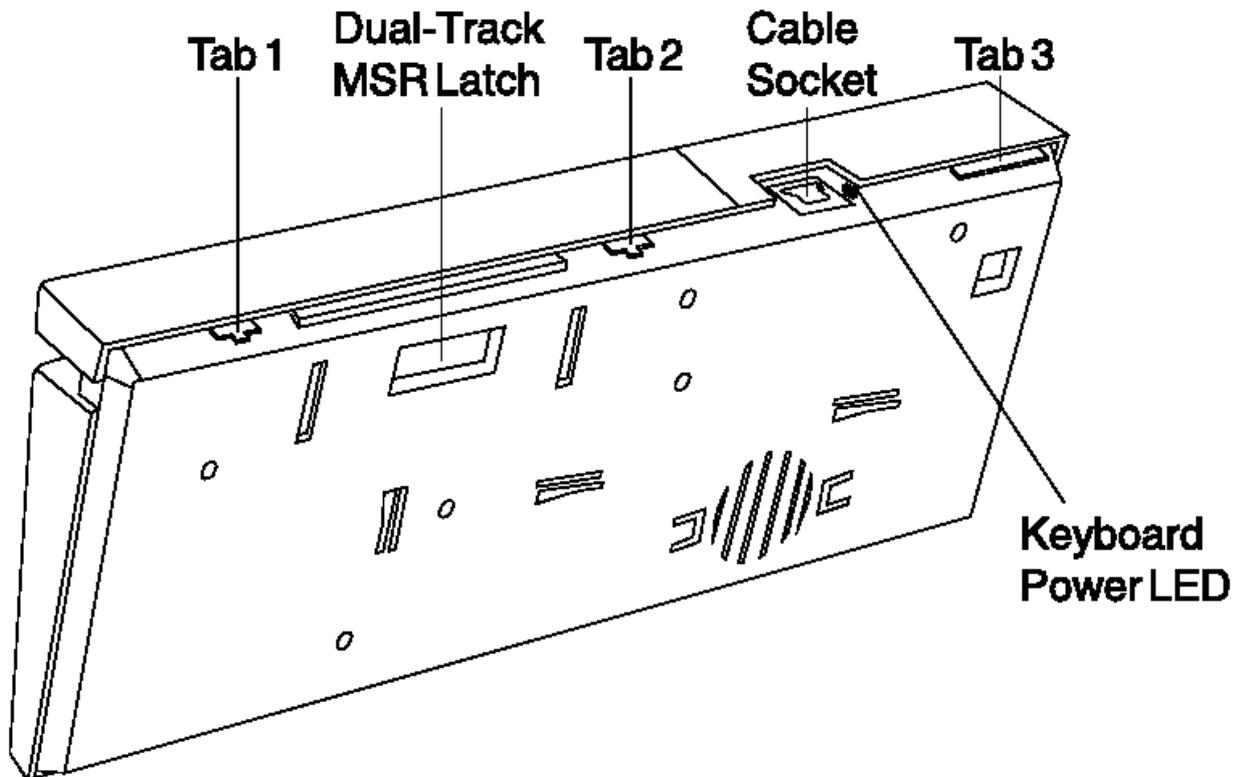


Figure 4-10. Removing the Keyboard Cover

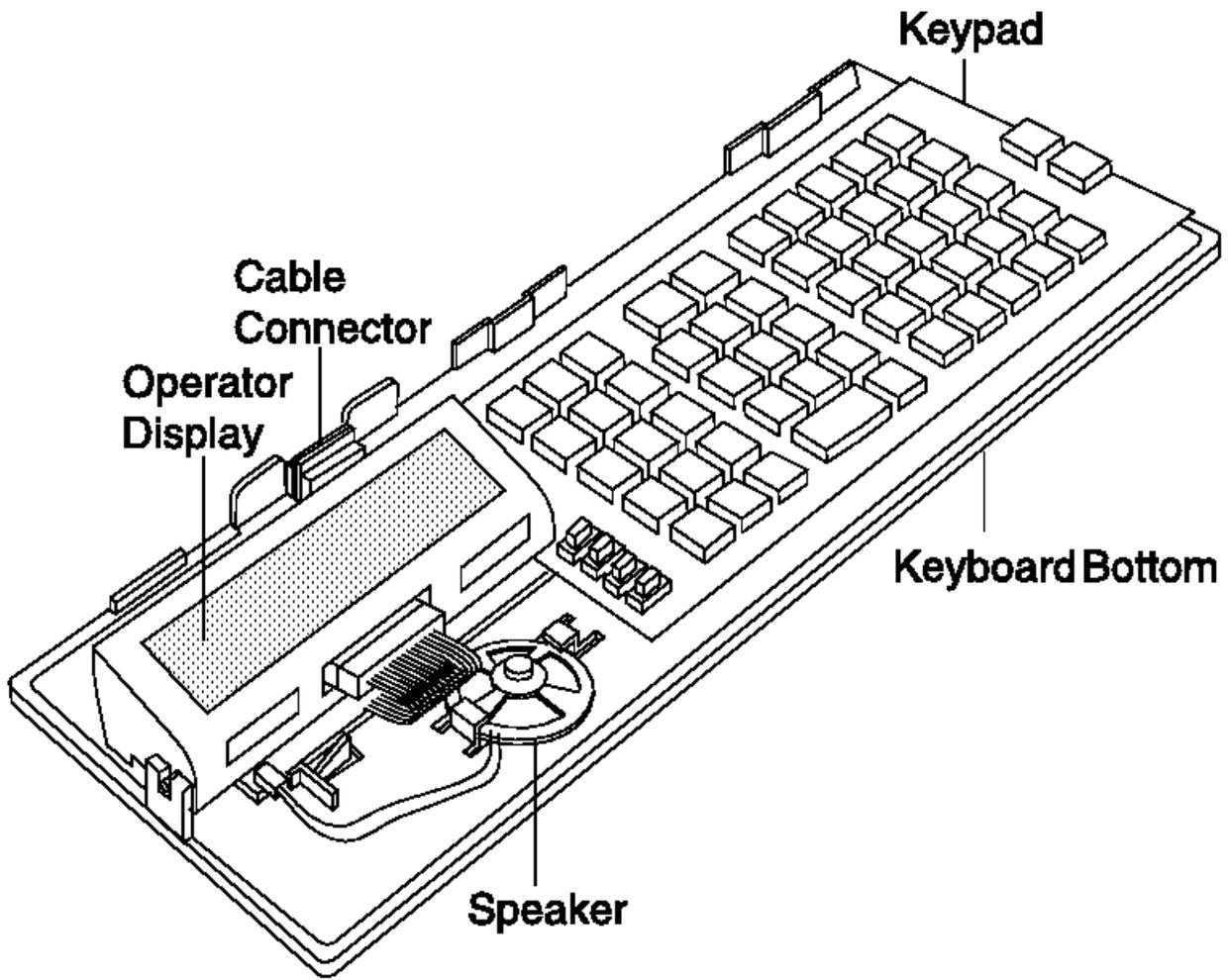


Figure 4-11. Removing the Display

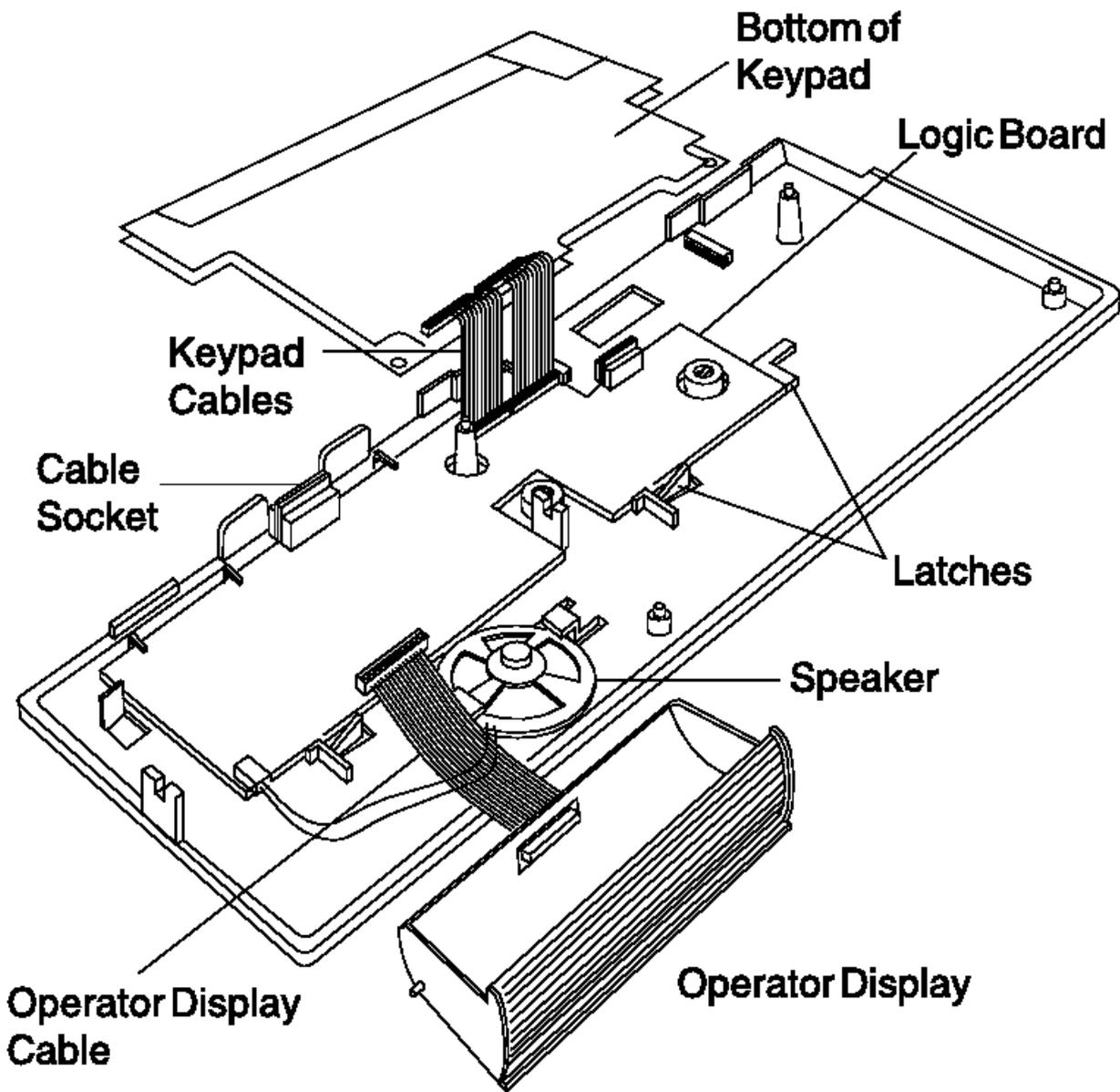


Figure 4-12. Removing the Keypad

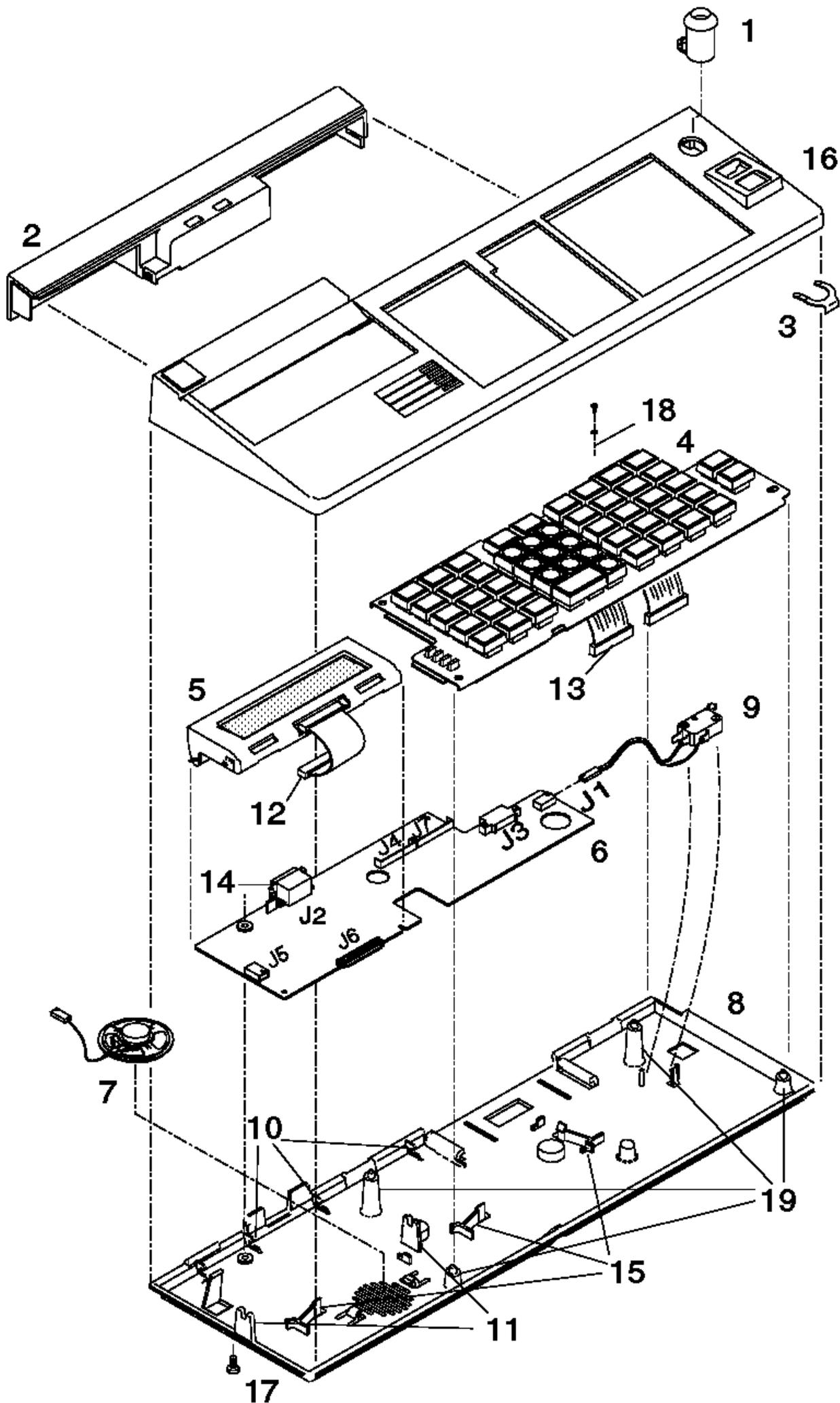


Figure 4-13. Removing a Combined Keyboard/Display Component

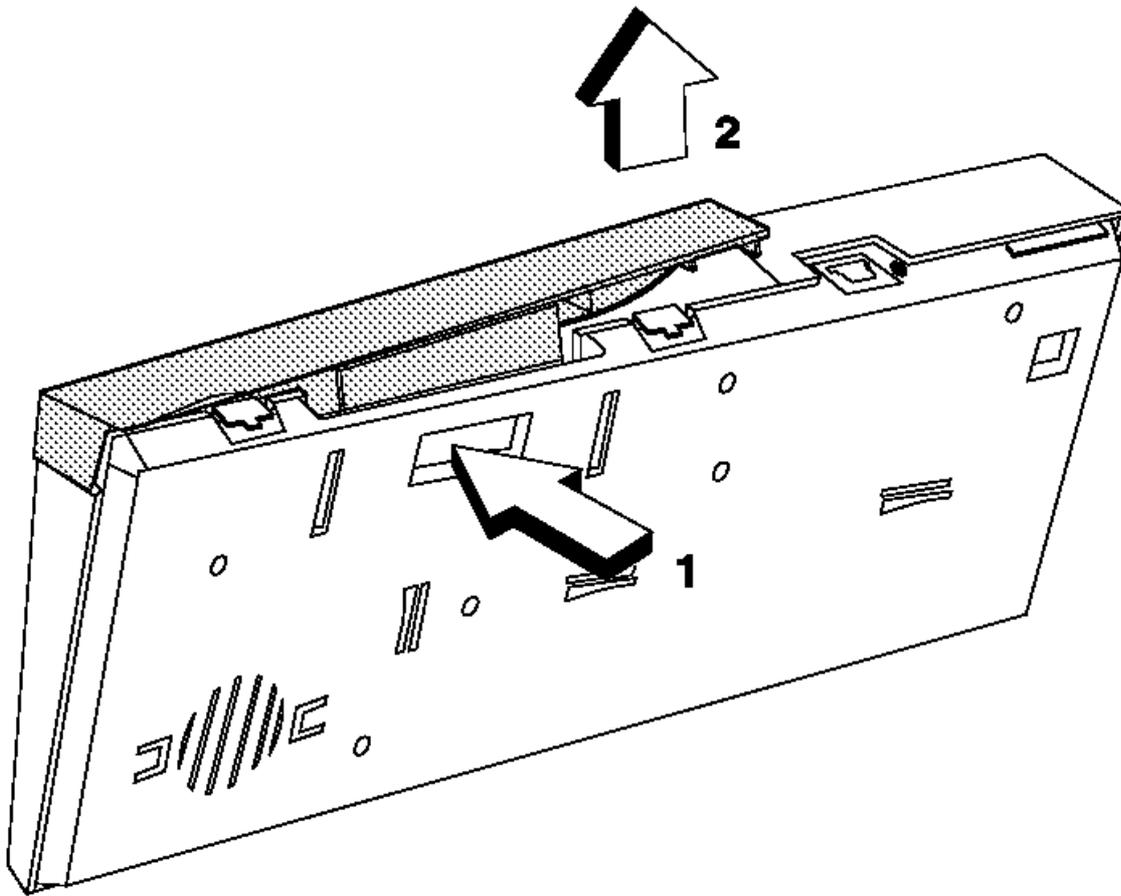
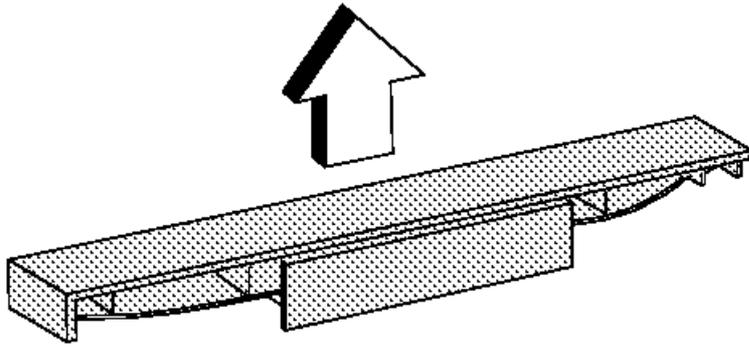


Figure 4-14. Removing the Combined Keyboard/Display Card Reader or Filler Cover

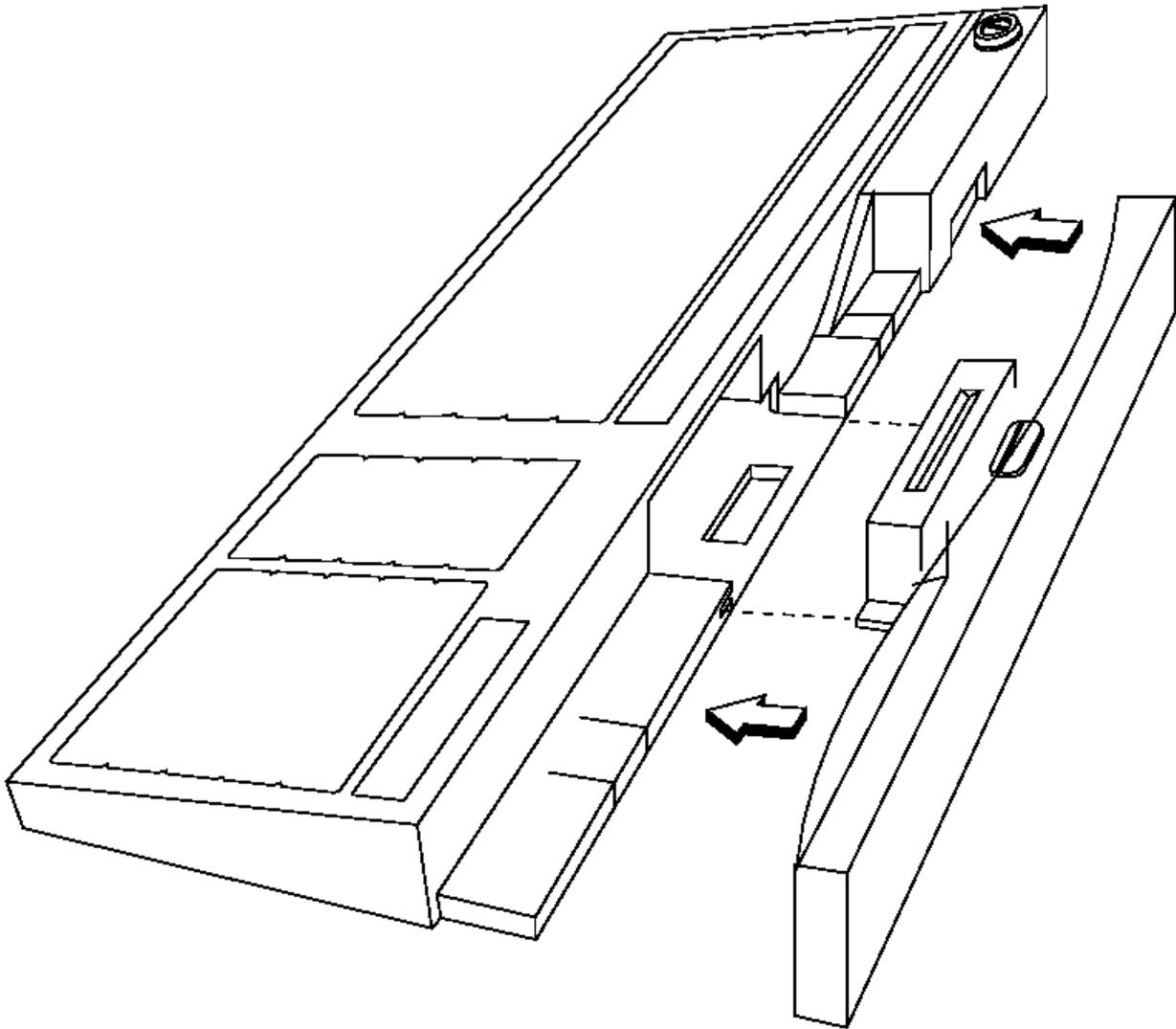


Figure 4-15. Replacing the Combined Keyboard/Display card reader or Filler Cover

5.0 Chapter 5. Point-of-Sale Printer Model 1 or Model 2

DANGER

+-----+
| Never work on equipment or connect or disconnect signal cables during |
| periods of lightning activity. |
+-----+

CAUTION:

For your safety, connect equipment requiring electrical power to a properly wired and grounded outlet.

Subtopics

- 5.1 Electrostatic Discharge (ESD)
- 5.2 Printer Stand-Alone Test Procedure
- 5.3 Printer Messages
- 5.4 Printer Symptoms
- 5.5 Printer Repair Procedures (Models 1 and 2)
- 5.6 Printer Sensor Checks

5.1 *Electrostatic Discharge (ESD)*

Attention ESD damage can occur when there is a difference in charge between the part, the product, and the service person. No damage will occur if the service person and the part being installed are at the same charge level.

ESD Damage Prevention

Anytime a service action involves physical contact with logic cards, modules, back-panel pins, or other ESD sensitive (ESDS) parts, the service person must be connected to an ESD common ground point on the product through the ESD wrist strap and cord.

The ESD ground clip can be attached to any frame ground, ground braid, green wire ground, or the round ground prong on the AC power plug. Coax or connector outside shells can also be used.

Handling Removed Cards

Logic cards removed from a product should be placed in ESD protective containers. No other object should be allowed inside the ESD container with the logic card. Attach tags or reports that must accompany the card to the outside of the container.

Note: Any time you are working on the printer it is a good idea to clean the sensors. This reduces the number of service calls due to dust and paper debris.

5.2 Printer Stand-Alone Test Procedure

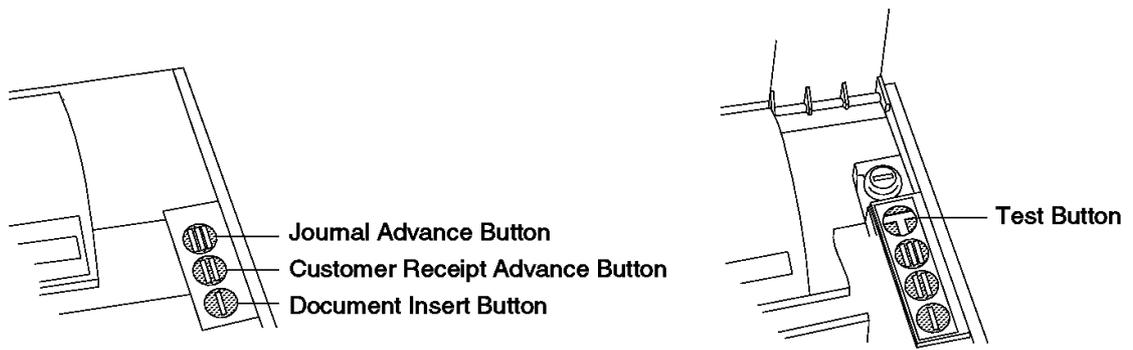


Figure 5-1. POS Printer Buttons - Models 1 and 2

1. Ensure the point-of-sale terminal is powered-ON and the printer is receiving power.
2. Open the printer cover and ensure that the print head preload spring is holding the print head against the platen. See Figure 5-2.

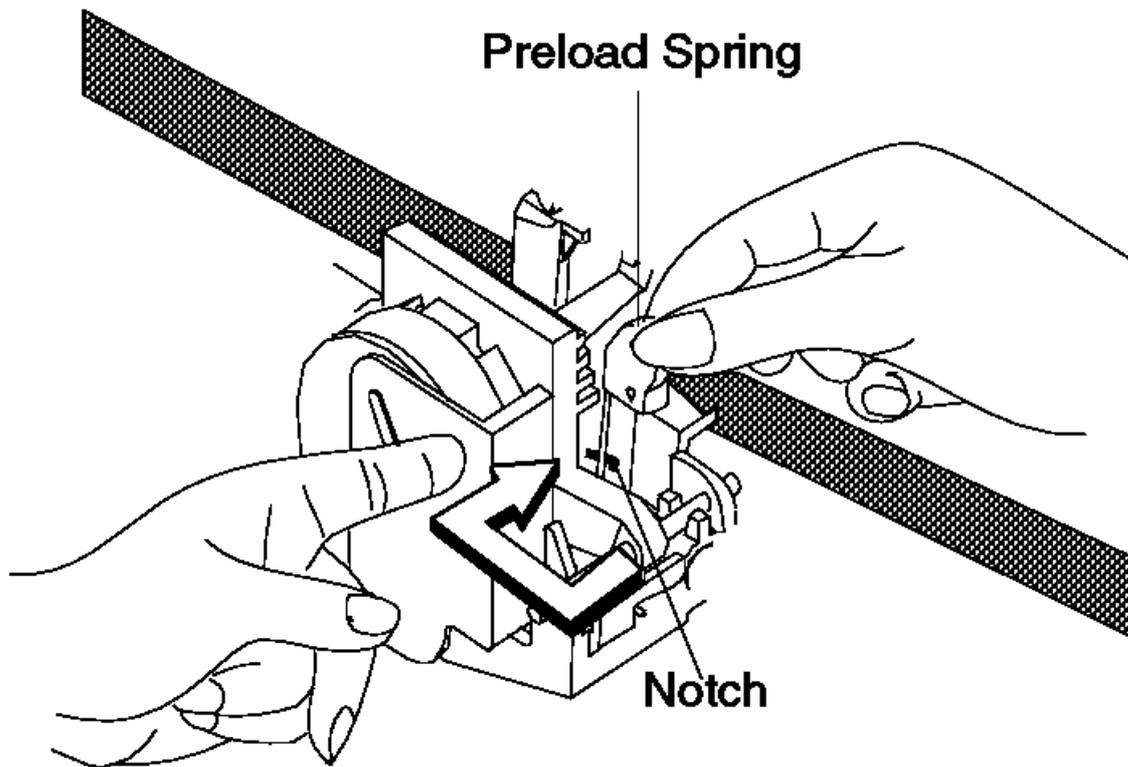


Figure 5-2. Print Head Preload Spring

3. Ensure the following:
 - The paper is installed correctly.
 - The ribbon is in good condition.
 - The ribbon cartridge is seated correctly.
4. Ensure that the print head cable is connected to the printer card. See Figure 5-3.

Print Head Cable Connector

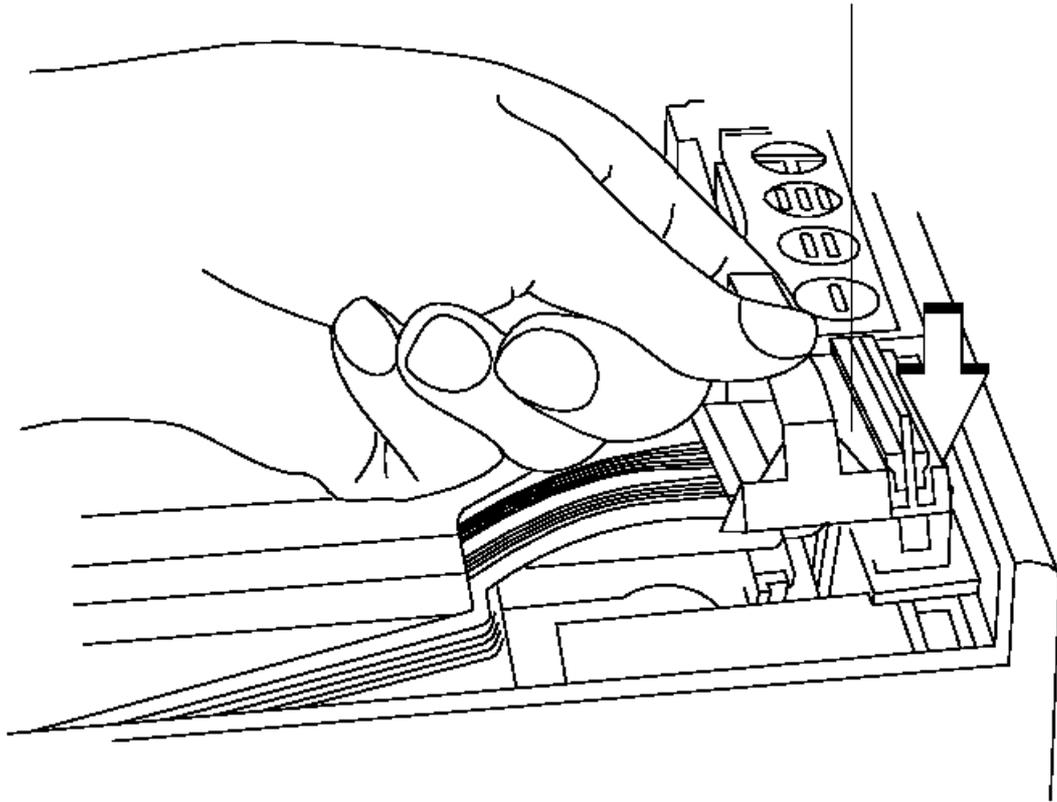


Figure 5-3. Print Head Cable

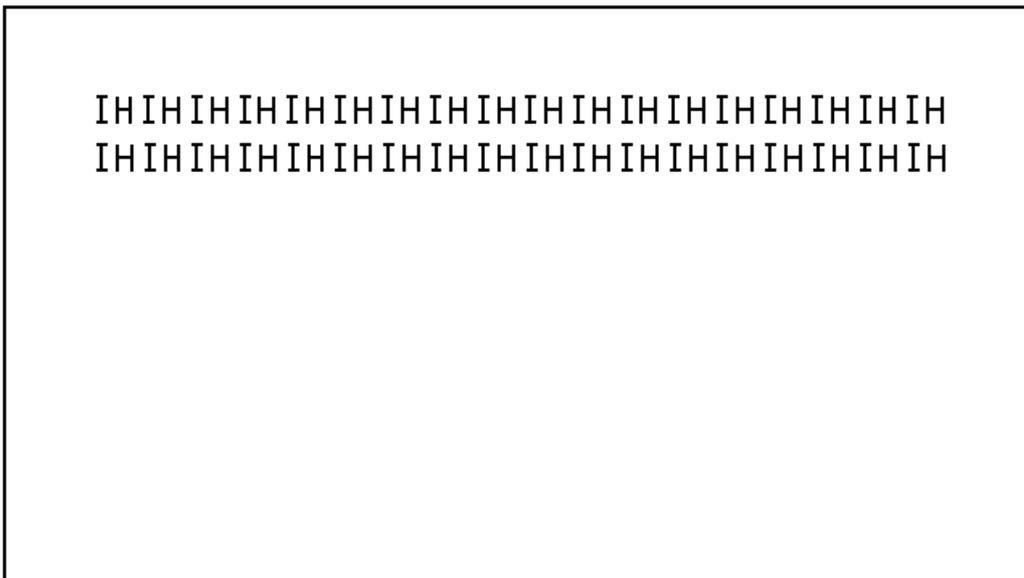


Figure 5-4. Printer Stand-Alone Test Pattern

5. Press the **II** button to advance the paper at the customer receipt station. See Figure 5-1.

If the paper does not advance correctly, see "Printer Symptoms" in topic 5.4.

6. Press the **III** button to advance the paper at the journal station.

If the paper does not advance correctly, see "Printer Symptoms" in topic 5.4.

7. Press the **T** button to print an **IH...** pattern of 36 characters at the customer receipt station and the journal station. See Figure 5-4.

If the printer does not operate as described or the printing does not compare, see "Printer Symptoms" in topic 5.4.

8. Insert a document into the document insert (DI) station. See Figure 5-5.

9. Press the **I** button to close the DI station on the inserted document. Test by pulling the document out from the bottom. You should feel some resistance.

If the DI station does not close on the document, see "Printer Symptoms" in topic 5.4.

10. Press the **T** button to print an **IH...** pattern on the inserted document.

If the printing is not correct, see "Printer Symptoms" in topic 5.4.

11. Press the **I** button and remove the document from the document insert station. The stand-alone test is complete.

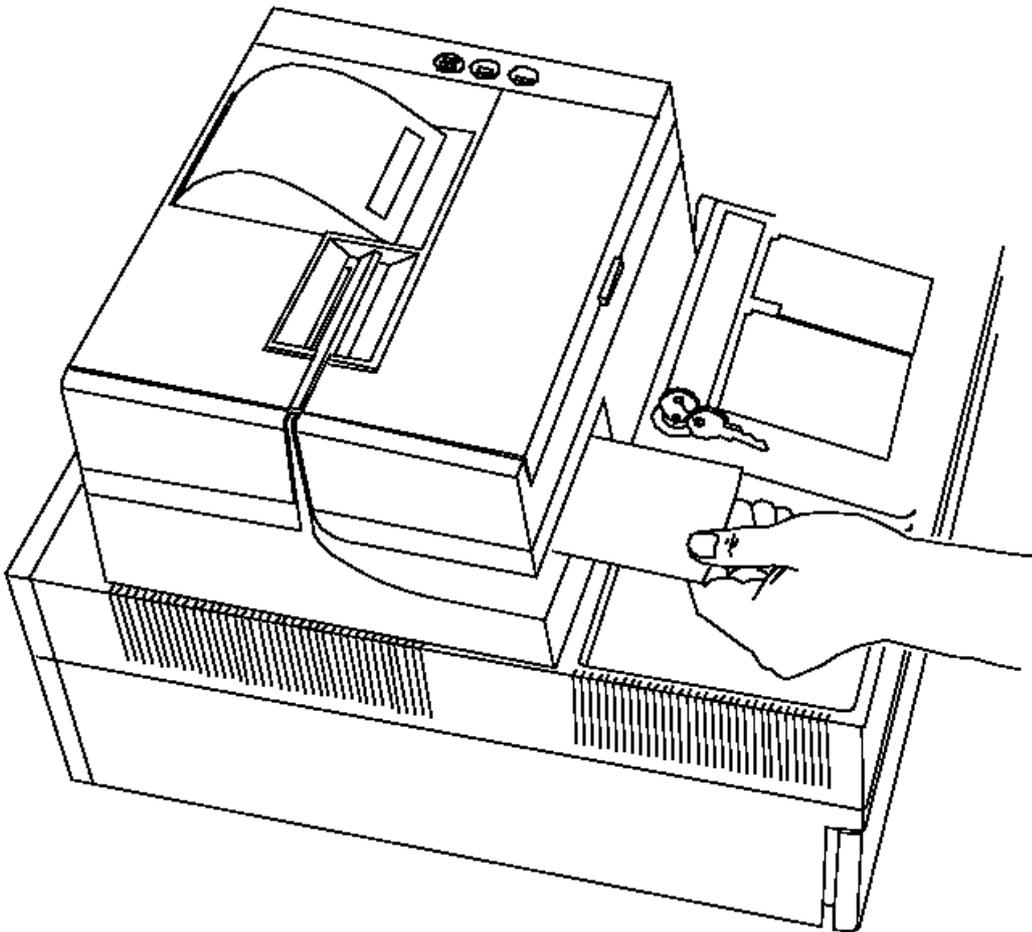


Figure 5-5. Inserting a Document into the Model 1 or 2 Printer

5.3 Printer Messages

After repairing the printer, run the printer tests to ensure that the printer is operating correctly.

Table 5-1. Printer Messages	
Printer Message	Repair Actions Listed in Most Likely Order of Failure
T7100	The printer test has started.
T7101	The printer test was stopped by pressing S2 while the "IH" test pattern was printing at the customer receipt station. Press S2 to continue the test.
T7110	The printer test is printing the "IH" test pattern at the customer receipt station. Observe the printing for correct operation.
T7120	The printer test is printing the "IH" test pattern at the journal station. Observe the printing for correct operation.
T7130	The printer test is printing the "IH" test pattern at the document insert station. Observe the printing for correct operation.
T7131	The printer test is ready to print the "IH" test pattern at the document insert station. Insert paper into the station and close the station by pressing the "I" button on the printer keypad.
T7132	The printer test has completed printing at the document insert station. Open the station by pressing the "I" button on the printer keypad and remove the document.
T7151	Exchange the printer card. See topic 5.5.22.
T7152	<ol style="list-style-type: none"> 1. Ensure that the print head preload spring is in position to hold the print head against the platen. See Figure 5-2 in topic 5.2. To exchange the print head preload spring, see topic 5.5.19. 2. Lubricate the carriage shaft, wear plate, and print head guide rods with #6 oil or equivalent. See "Lubricant Equivalents" in topic D.2. Saturate the carrier oil wick with #6 oil or equivalent. 3. Exchange the print head carriage motor and check the motor pulley for cracks. See topic 5.5.21. 4. Exchange the print head carriage drive belt. See topic 5.5.20. 5. Check the print head home sensor. See topic 5.6. <ul style="list-style-type: none"> <input type="checkbox"/> If the print head home sensor is failing, exchange it. See topic E.9. <input type="checkbox"/> If the print head home sensor is not failing, adjust it. See topic 5.5.2. 6. Exchange the printer card. See topic 5.5.22.
T7153	<ol style="list-style-type: none"> 1. Check the printer cover interlock sensor. See topic 5.6. If the printer cover interlock sensor is failing, exchange it. See topic 5.5.6. 2. Ensure that the access cover interlock tab is not broken. If the access cover interlock tab is broken, exchange the access cover. See topic 5.5.4. 3. Exchange the printer card. See topic 5.5.22.
T7154	<ol style="list-style-type: none"> 1. Check the journal paper ribbon drive motor and belt. Pressing III on the printer keypad, which rotates the journal paper take-up spool, indicates the journal paper is not jammed or loaded incorrectly. 2. Check the journal paper motion emitter sensor. See

	<p>topic 5.6.</p> <p>If the journal paper motion emitter sensor is failing, exchange it. See topic 5.5.11.</p> <ol style="list-style-type: none"> 3. Ensure that the journal paper motion emitter shaft rotates freely. 4. Exchange the printer card. See topic 5.5.22.
T7155	<ol style="list-style-type: none"> 1. Exchange the keypad. See topic 5.5.15. 2. Exchange the printer card. See topic 5.5.22.
T7156	<ol style="list-style-type: none"> 1. Check the document insert paper sensor. See topic 5.6. <p>If the document insert paper sensor is failing, exchange it. See topic E.6.</p> <ol style="list-style-type: none"> 2. Exchange the printer card. See topic 5.5.22.
T7157	<ol style="list-style-type: none"> 1. Remove paper or other obstructions from the document insert paper sensor. 2. Check the document insert paper sensor. See topic 5.6. <p>If the document insert paper sensor is failing, exchange it. See topic E.6.</p> <ol style="list-style-type: none"> 3. Exchange the document insert paper guide. See topic 5.5.7. 4. Exchange the platen. See topic 5.5.16. 5. Exchange the printer card. See topic 5.5.22.
T7158	<ol style="list-style-type: none"> 1. Exchange the keypad. See topic 5.5.15. 2. Exchange the printer card. See topic 5.5.22.
W304	Exchange the printer card. See topic 5.5.22.
W305	<ol style="list-style-type: none"> 1. Ensure that the print head preload spring is in position to hold the print head against the platen. See Figure 5-2 in topic 5.2. To exchange the print head preload spring, see topic 5.5.19. 2. Lubricate the carriage shaft, wear plate and print head guide rods with #6 oil or equivalent. See "Lubricant Equivalents" in topic D.2. Saturate the carrier oil wick with #6 oil. 3. Exchange the print head carriage motor and check the motor pulley for cracks. See topic 5.5.21. 4. Exchange the print head carriage drive belt. See topic 5.5.20. 5. Check the print head home sensor. See topic 5.6. <ul style="list-style-type: none"> <input type="checkbox"/> If the print head home sensor is failing, exchange it. See topic E.9. <input type="checkbox"/> If the print head home sensor is not failing, adjust it. See topic 5.5.2. 6. Exchange the printer card. See topic 5.5.22.

5.4 Printer Symptoms

After repairing the printer, run the printer tests to ensure that the printer is operating correctly.

Table 5-2. Printer Symptoms	
Printer Symptom	Repair Actions Listed in Most Likely Order of Failure
The document insert/customer receipt station advances receipt paper continuously.	<ol style="list-style-type: none"> 1. Exchange the keypad. See topic 5.5.15. 2. Exchange the printer card. See topic 5.5.22. 3. Exchange the document insert/customer receipt motor. See topic E.7.
The document insert/customer receipt station does not advance inserted documents.	<ol style="list-style-type: none"> 1. Exchange the printer card. See topic 5.5.22. 2. Exchange the toggle assembly. See topic E.11. 3. Exchange the document insert/customer receipt motor. See topic E.7. 4. Exchange the document insert backup roller. See topic E.4. 5. Check the document insert paper sensor. See topic 5.6. <p>If the document insert paper sensor is failing, exchange it. See topic E.6.</p>
The document insert/customer receipt station does not advance receipt paper.	<ol style="list-style-type: none"> 1. Ensure that the receipt paper path is free of obstructions. 2. Check the document insert paper sensor. See topic 5.6. Also check the document insert paper sensor for dust or paper scraps. <p>If the document insert paper sensor is failing, exchange it. See topic E.6.</p> <ol style="list-style-type: none"> 3. Exchange the document insert/customer receipt motor. See topic E.7. 4. Exchange the toggle assembly. See topic E.11. 5. Exchange the document insert backup roller. See topic E.4. 6. Exchange the printer card. See topic 5.5.22.
The document insert/customer receipt station does not sense an inserted document - or - does not close on an inserted document.	<ol style="list-style-type: none"> 1. Check the document insert paper sensor. See topic 5.6. Also check the document insert paper sensor for dust or paper scraps. <p>If the document insert paper sensor is failing, exchange it. See topic E.6.</p> <ol style="list-style-type: none"> 2. Exchange the printer card. See topic 5.5.22.
The document insert/customer receipt station does not stop documents at the document insert gate.	<ol style="list-style-type: none"> 1. Exchange the document insert gate spring. See topic E.5. 2. Exchange the document insert gate. See topic E.5.
The document insert/customer receipt station gets paper jams.	<ol style="list-style-type: none"> 1. Exchange the paper tear guide. See topic 5.5.16. 2. Exchange the document insert paper guide. See topic 5.5.7. 3. Ensure that paper of the correct size is used and that it is installed correctly. 4. Exchange the toggle assembly. See topic E.11. 5. Check for obstructions in the document insert/customer receipt station paper path. 6. Adjust the print head cam. See topic 5.5.1.
The document insert/customer receipt station is overprinting.	<ol style="list-style-type: none"> 1. Check for obstructions in the document insert/customer receipt station paper path. Also, check for damage to the paper tear guide and the document insert guide. 2. Exchange the toggle assembly. See topic E.11. 3. Exchange the document insert/customer receipt motor. See topic E.7. 4. Exchange the printer card. See topic 5.5.22.
The document insert/customer	<ol style="list-style-type: none"> 1. Exchange the printer ribbon cartridge. See topic 5.5.23.

receipt station printing is light.	<ol style="list-style-type: none"> Exchange the carriage wear shoe. See topic 5.5.19. Exchange the platen. See topic 5.5.16. Exchange the paper tear guide. See topic 5.5.16. Exchange the document insert paper guide. See topic 5.5.7.
The journal station advances paper continuously.	<ol style="list-style-type: none"> Exchange the keypad. See topic 5.5.15. Exchange the journal/ribbon motor. See topic 5.5.12. Exchange the printer card. See topic 5.5.22.
The journal station does not advance paper.	<ol style="list-style-type: none"> Exchange the journal/ribbon motor. See topic 5.5.12. Exchange the journal spool and clutch. See topic 5.5.13. Exchange the journal drive belt. See topic 5.5.9. Exchange the journal motor pulley. See topic 5.5.10. Exchange the printer card. See topic 5.5.22.
The journal station is overprinting.	<ol style="list-style-type: none"> Exchange the journal/ribbon motor. See topic 5.5.12. Exchange the journal spool and clutch. See topic 5.5.13. Exchange the journal drive belt. See topic 5.5.9. Exchange the journal motor pulley. See topic 5.5.10. Ensure that the O-ring is properly connected to the journal paper motion emitter shaft. Exchange the printer card. See topic 5.5.22.
The journal station printing is light.	<ol style="list-style-type: none"> Exchange the printer ribbon cartridge. See topic 5.5.23. Exchange the carriage wear shoe. See topic 5.5.19. Exchange the platen. See topic 5.5.16.
The keylock does not work.	<ol style="list-style-type: none"> Remove the tumbler and lubricate with #6 oil or equivalent. See "Lubricant Equivalents" in topic D.2. Exchange the keylock. See topic 5.5.14.
The keypad "T" (test) keybutton does not work.	<ol style="list-style-type: none"> Ensure that the keypad cable is properly connected to the printer card. Exchange the keypad. See topic 5.5.15. Exchange the printer card. See topic 5.5.22.
The keypad "I" keybutton does not work.	<ol style="list-style-type: none"> Ensure that the keypad cable is properly connected to the printer card. Exchange the keypad. See topic 5.5.15. Exchange the printer card. See topic 5.5.22.
The keypad "II" keybutton does not work.	<ol style="list-style-type: none"> Ensure that the keypad cable is properly connected to the printer card. Exchange the keypad. See topic 5.5.15. Exchange the printer card. See topic 5.5.22.
The keypad "III" keybutton does not work.	<ol style="list-style-type: none"> Ensure that the keypad cable is properly connected to the printer card. Exchange the keypad. See topic 5.5.15. Exchange the printer card. See topic 5.5.22.
All keypad keybuttons fail to work.	<ol style="list-style-type: none"> Ensure that the keypad cable is properly connected to the printer card. Exchange the keypad. See topic 5.5.15. Exchange the printer card. See topic 5.5.22.
The margins are not correct.	<ol style="list-style-type: none"> Check the print head home sensor. See topic 5.6. <ul style="list-style-type: none"> If the print head home sensor is failing, exchange it. See topic E.9. If the print head home sensor is not failing, adjust it. See topic 5.5.2. Ensure that the print head carriage motor pulley is functioning properly. See 5.5.21.2. Lubricate the carriage shaft and print head guide rods with #6 oil or equivalent. See "Lubricant Equivalents" in topic D.2. Saturate the carriage oil wick with #6 oil or equivalent.

	<ol style="list-style-type: none"> 3. Ensure that the carriage drive belt and belt spring assembly is functioning properly. 4. Adjust or exchange the print head cam. See topic 5.5.1.
Printed characters are light.	<ol style="list-style-type: none"> 1. Exchange the ribbon cartridge after checking the ribbon drive shaft to ensure that the ribbon is advancing properly. See topic 5.5.23. 2. Clean the print head. If this fails to correct the symptom, exchange the print head. See topic 5.5.17. 3. Ensure that the print head preload spring is in position to hold the print head against the platen. To exchange the print head preload spring, see topic 5.5.19. 4. Exchange the journal/ribbon motor. See topic 5.5.12. 5. Exchange the print head carriage assembly. See topic 5.5.18. 6. Exchange the platen. See topic 5.5.16. 7. Exchange the carriage wear shoe. See topic 5.5.19. 8. Exchange the ribbon drive shaft. See topic E.10.
Printed characters are missing.	<ol style="list-style-type: none"> 1. Ensure that the printer ribbon cartridge is properly seated. 2. Clean the print head. If this fails to correct the symptom, exchange the print head. See topic 5.5.17. 3. Exchange the printer card. See topic 5.5.22. 4. Exchange the print head carriage drive belt. See topic 5.5.20. 5. Exchange the print head carriage motor. See topic 5.5.21.
Printed characters are not spaced correctly.	<ol style="list-style-type: none"> 1. Exchange the print head carriage drive belt. See topic 5.5.20. 2. Exchange the printer card. See topic 5.5.22. 3. Exchange the print head carriage motor. See topic 5.5.21.
Printed characters are smudged.	<ol style="list-style-type: none"> 1. Exchange the document insert paper guide. See topic 5.5.7. 2. Adjust or exchange the platen. See topic 5.5.16. 3. Exchange the print head. See topic 5.5.17. 4. Adjust or exchange the print head wear shoe. See topic 5.5.17.
Printed characters have missing or extra dots.	<ol style="list-style-type: none"> 1. Clean the print head and ensure that it is connected properly to the printer card. If this fails to correct the symptom, exchange the print head. See topic 5.5.17. 2. Exchange the printer card. See topic 5.5.22.
The printer advances paper continuously.	<ol style="list-style-type: none"> 1. Exchange the keypad. See topic 5.5.15. 2. Exchange the printer card. See topic 5.5.22.
The printer causes the point-of-sale terminal display to go blank.	<ol style="list-style-type: none"> 1. Exchange the print head. See topic 5.5.17. 2. Exchange the printer card. See topic 5.5.22. 3. Exchange the printer capacitor. See topic E.3.
The printer causes the point-of-sale terminal power supply to shut down.	<ol style="list-style-type: none"> 1. Exchange the print head. See topic 5.5.17. 2. Exchange the printer card. See topic 5.5.22. 3. Exchange the platen grounding strap. See topic E.2. 4. Exchange the printer capacitor. See topic E.3.
The printer does not print.	<ol style="list-style-type: none"> 1. Ensure that the print head is properly connected to the printer card. 2. Exchange the print head. See topic 5.5.17. 3. Ensure that the print head preload spring is in position to hold the print head against the platen. See Figure 5-2 in topic 5.2. To exchange the print head preload spring, see topic 5.5.19. 4. Exchange the ribbon cartridge. See topic 5.5.23.

	5. Exchange the printer card. See topic 5.5.22.
The printer makes a continuous grinding noise.	<ol style="list-style-type: none"> 1. Exchange the print head carriage motor. See topic 5.5.21. 2. Check the print head home sensor. See topic 5.6. <ul style="list-style-type: none"> □ If the print head home sensor is failing, exchange it. See topic E.9. □ If the print head home sensor is not failing, adjust it. See topic 5.5.2. 3. Exchange the printer card. See topic 5.5.22.
The ribbon and the journal paper do not advance.	<ol style="list-style-type: none"> 1. Exchange the journal/ribbon motor. See topic 5.5.12. 2. Exchange the printer card. See topic 5.5.22.
The ribbon does not advance.	<ol style="list-style-type: none"> 1. Exchange the ribbon cartridge. See topic 5.5.23. 2. Exchange the ribbon drive shaft. See topic E.10. 3. Exchange the journal/ribbon motor. See topic 5.5.12. 4. Exchange the printer card. See topic 5.5.22.
The ribbon is damaged by the printer.	<ol style="list-style-type: none"> 1. Exchange the print head. See topic 5.5.17. 2. Exchange the ribbon drive shaft. See topic E.10. 3. Exchange the print head carriage assembly. See topic 5.5.18.

5.5 Printer Repair Procedures (Models 1 and 2)

After repairing the printer, run the printer tests to ensure that the failure is corrected.

Subtopics

- 5.5.1 Adjusting the Print Head Cam
- 5.5.2 Adjusting the Print Head Home Sensor
- 5.5.3 Cleaning the Print Head
- 5.5.4 Removing and Replacing the Access Cover
- 5.5.5 Removing and Replacing the Bottom Cover
- 5.5.6 Removing and Replacing the Cover Interlock Sensor
- 5.5.7 Removing and Replacing the Document Insert Paper Guide
- 5.5.8 Removing and Replacing the Journal Cover
- 5.5.9 Removing and Replacing the Journal Drive Belt
- 5.5.10 Removing and Replacing the Journal Motor Pulley
- 5.5.11 Removing and Replacing the Journal Paper Motion Emitter Sensor
- 5.5.12 Removing and Replacing the Journal/Ribbon Motor
- 5.5.13 Removing and Replacing the Journal Spool and Clutch
- 5.5.14 Removing and Replacing the Keylock
- 5.5.15 Removing and Replacing the Keypad
- 5.5.16 Removing and Replacing the Platen and Paper Tear Guide
- 5.5.17 Removing and Replacing the Print Head
- 5.5.18 Removing and Replacing the Print Head Carriage and Shaft
- 5.5.19 Removing and Replacing the Print Head Carriage Components
- 5.5.20 Removing and Replacing the Print Head Carriage Drive Belt
- 5.5.21 Removing and Replacing the Print Head Carriage Motor
- 5.5.22 Removing and Replacing the Printer Card
- 5.5.23 Removing and Replacing the Printer Ribbon Cartridge
- 5.5.24 Removing and Replacing the Receipt Paper Backup Roller
- 5.5.25 Removing and Replacing the Top Cover
- 5.5.26 Replacing Customer Receipt Paper
- 5.5.27 Replacing Journal Station Paper

5.5.1 Adjusting the Print Head Cam

1. Remove the document insert paper guide.
2. Loosen the screw (3).
3. Ensure that the end of the cam (4) is installed over the side frame rib.
4. Insert a 1.2 mm gauge (2) as shown in Figure 5-6.
5. Hold the gauge against the platen (1) and move the cam until it touches the gauge. Tighten the screw while applying a force down, back, and to the left. Remove the gauge. (After the screw is tightened, the gauge should fit tightly into the space between the platen and the cam. The cam should not move when the gauge is inserted or removed.)
6. Reinstall the document insert paper guide.

Reference	Topic
Removing and Replacing the Document Insert Paper Guide	5.5.7

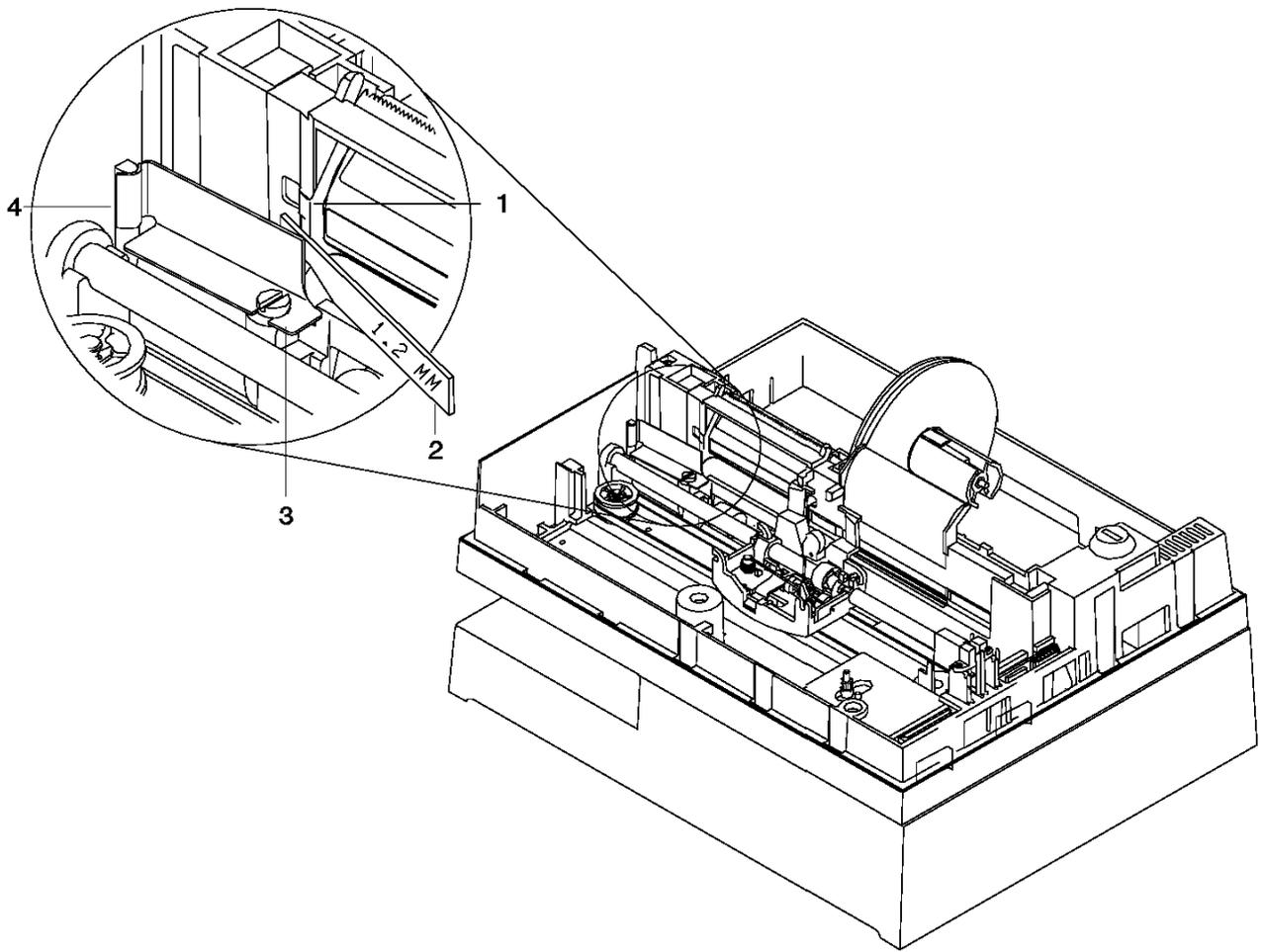


Figure 5-6. Adjusting the Print Head Cam. For illustration, the top cover has been removed. Removal of the cover is not necessary for this procedure.

5.5.2 *Adjusting the Print Head Home Sensor*

Note: The home sensor flag must be adjusted to set the document insert/customer receipt paper margin anytime the carriage or home sensor flag is exchanged.

1. Switch **POWER OFF**.
2. Remove the print head to gain access to the home sensor flag adjustment screw. Loosen the adjustment screw (1) and locate it in the center of the adjustment slot. Tighten the screw.
3. Reinstall the print head.
4. Switch the power ON.
5. Press the "I" button to open the document insert station.
6. Put a sheet of paper into the station. Ensure that the paper is all the way to the right and against the right-hand paper guide.
7. Press the "I" button to close the station.
8. Press the "T" test button to start printing.
9. Measure the distance from the right edge of the paper to the right edge of the nearest printed "H". This measurement should be $5.5 \pm .5$ mm from the edge of the paper. If the measurement is LESS than 5.0 mm, loosen the adjustment screw and move the flag to the right. If the measurement is MORE than 6.0 mm, loosen the adjustment screw and move the flag to the left.
10. Return to Step 5 and repeat the steps until the measurement is correct.

Reference	Page
Removing and Replacing the Print Head	5.5.17

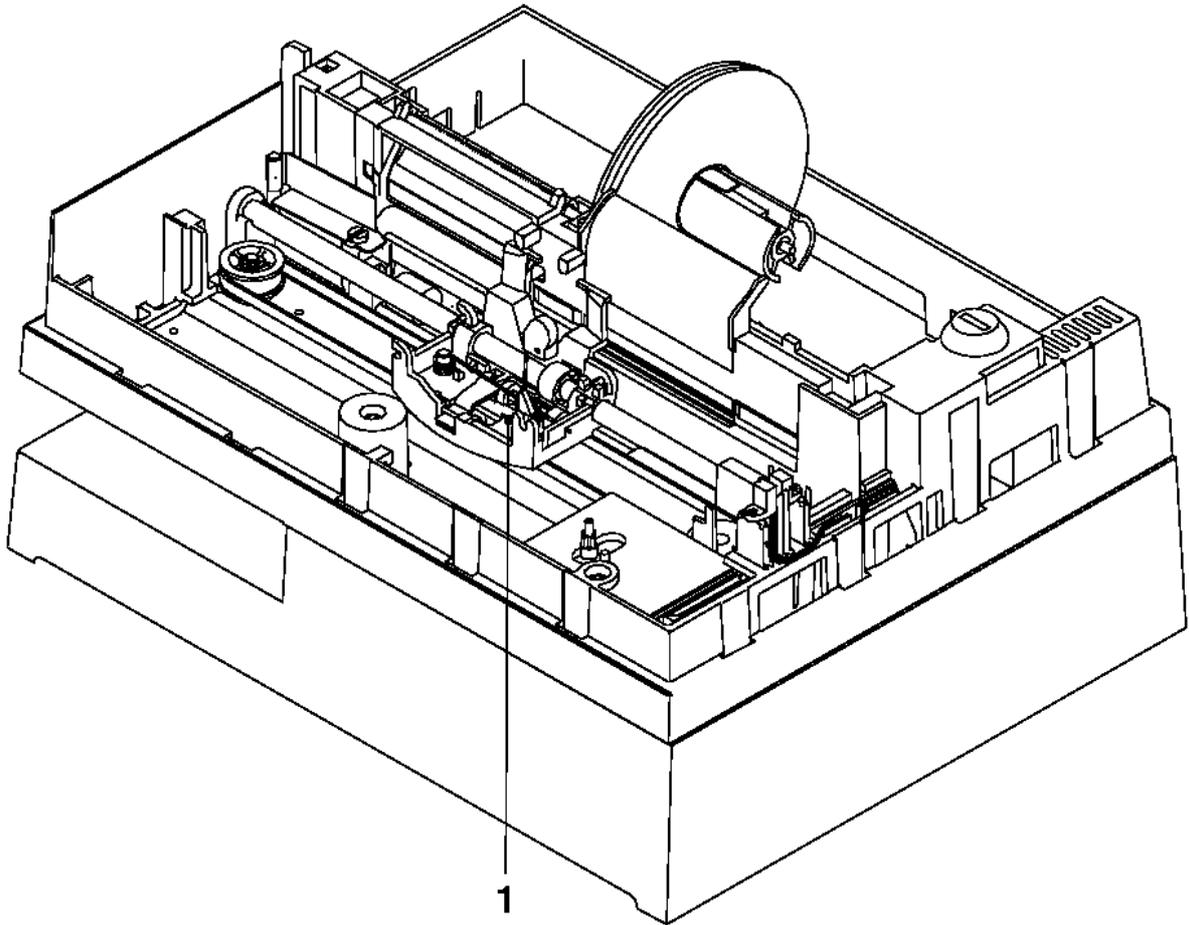


Figure 5-7. Adjusting the Print Head Home Sensor. For illustration, the top cover has been removed. Removal of the cover is not necessary for this procedure.

5.5.3 Cleaning the Print Head

This procedure removes dried ink from the wire guide and introduces a lubricant to the guide and wires. The process reduces wire drag in the guide and allows greater impact force against the ribbon and paper.

1. Switch **POWER OFF**.
2. Pull the print head preload spring toward the front of the printer and out of the notch on the side of the print head.
3. Move the preload spring to the right and release it. The large arrow shows the movement of the preload spring. See topic 5.5.3.

The print head moves toward the front of the printer.

4. Remove the ribbon cartridge.
5. Release the print head latch and lift the right side of the print head assembly. See topic 5.5.3.
6. Move the print head to the left and out of the printer.

Note: Do not drop the print head.

7. With the print head pointed vertically down, (toward the bottom of the printer), apply 2 or 3 drops of the silicone lubricant, P/N 96X4791 or equivalent, to the wire guide in the area shown. See "Lubricant Equivalents" in topic D.2. See topic 5.5.3.

The silicone lubricant is available with field bill B/M 83X8273, (ECA 001).

8. Switch power ON.
9. With the print head pointed down press the test button "T" 3 or 4 times.

Attention When the test button is pressed the print head carrier moves back and forth across the printer. Hold the print head above and out of the path of the carrier.

10. Use a clean tissue to wipe the excess ink and lubricant off the face of the wire guide.
11. Repeat the three previous steps until the liquid that appears on the face of the wire guide is light in color, (it should be almost clear). Do NOT try to remove ink stains from the wire guide.

12. Switch **POWER OFF**.

13. Put the slender shaft on the left side of the print head into the slots on the left side of the carriage. See topic 5.5.3

14. Hold the print head toward the front of the printer.

15. Lower the right side of the print head until the print head latch locks into place over the slender shaft on the right.

16. Exchange the ribbon cartridge.

17. Push the print head toward the rear of the printer and hold it there.

18. Pull the print head preload spring toward the front of the printer.

19. Move the spring to the left and release it into the notch on the right side of the print head. The large arrow shows the movement of the preload spring.

20. Switch power ON.

21. Run the printer tests to verify that the printer is operating correctly.

If the printing is still unacceptable, repeat the cleaning procedure.

If after repeating the cleaning procedure, the printing is still not acceptable, exchange the print head.

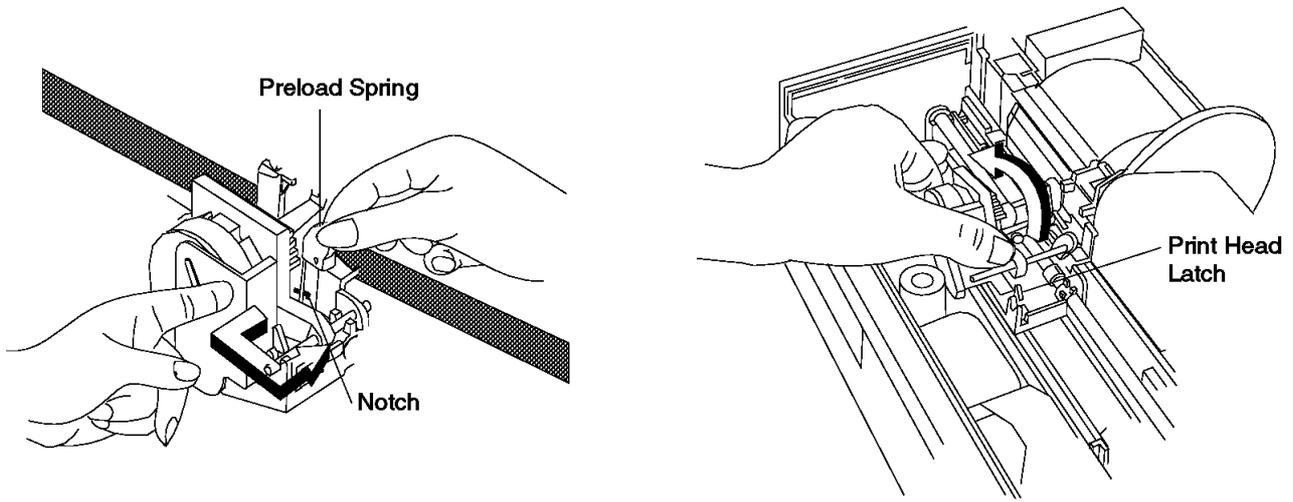


Figure 5-8. Releasing the Preload Spring

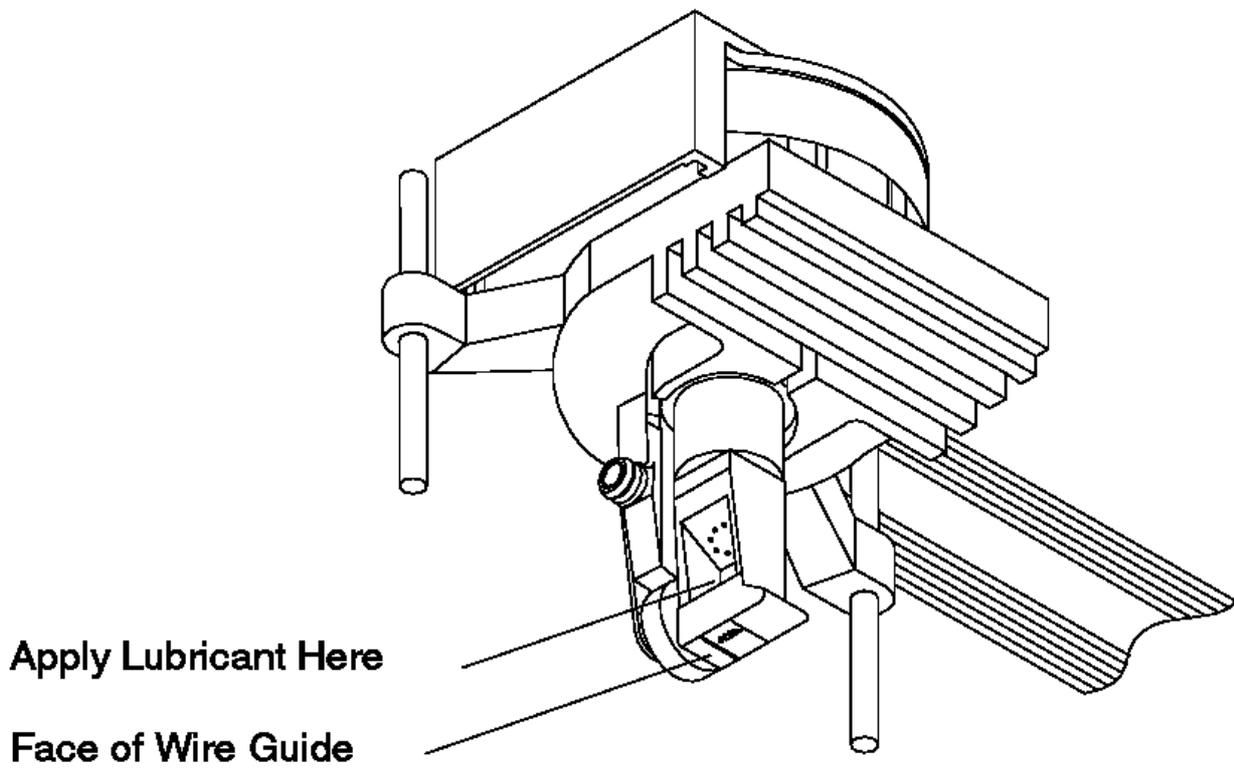


Figure 5-9. Print Head Cleaning

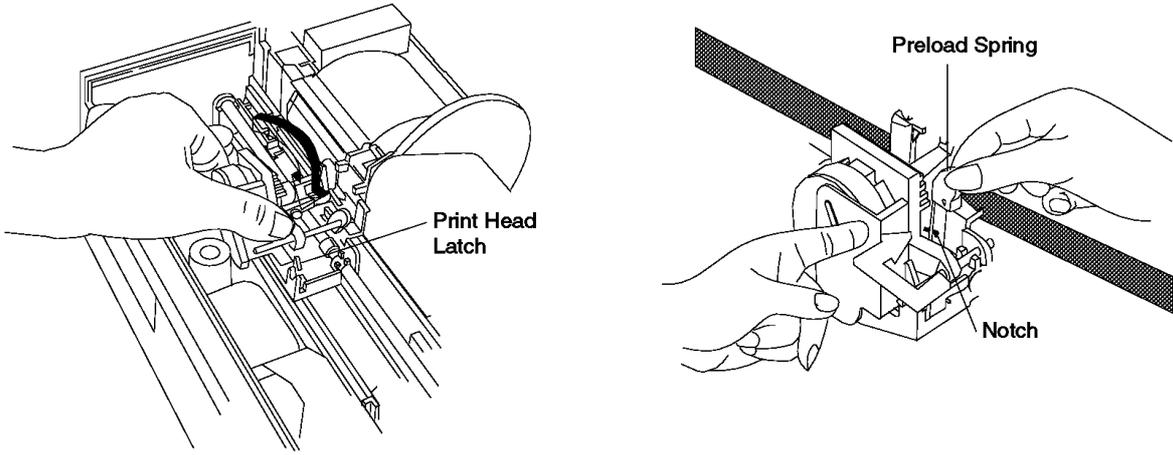


Figure 5-10. Latching the Print Head and Preload Spring

5.5.4 *Removing and Replacing the Access Cover*

Subtopics

5.5.4.1 Removing the Access Cover

5.5.4.2 Replacing the Access Cover

5.5.4.1 *Removing the Access Cover*

1. Raise the access cover.
2. Move the holding tab (3) at one end of the cover toward the center of the printer and hold it there.
3. Push the cover back enough to raise the holding tab above its detent (2).
4. Do step 2 at the other end of the cover.
5. Push the cover back and off its hinge.

5.5.4.2 Replacing the Access Cover

1. Put the access cover on the hinge (1).
2. Pull the cover forward until the hinge snaps into place.
3. Close the cover until the holding tab (3) touches its detent (2).
4. Move the holding tab at one end of the cover toward the center of the printer and release it onto its detent.
5. Do step 3 at the other end of the cover.

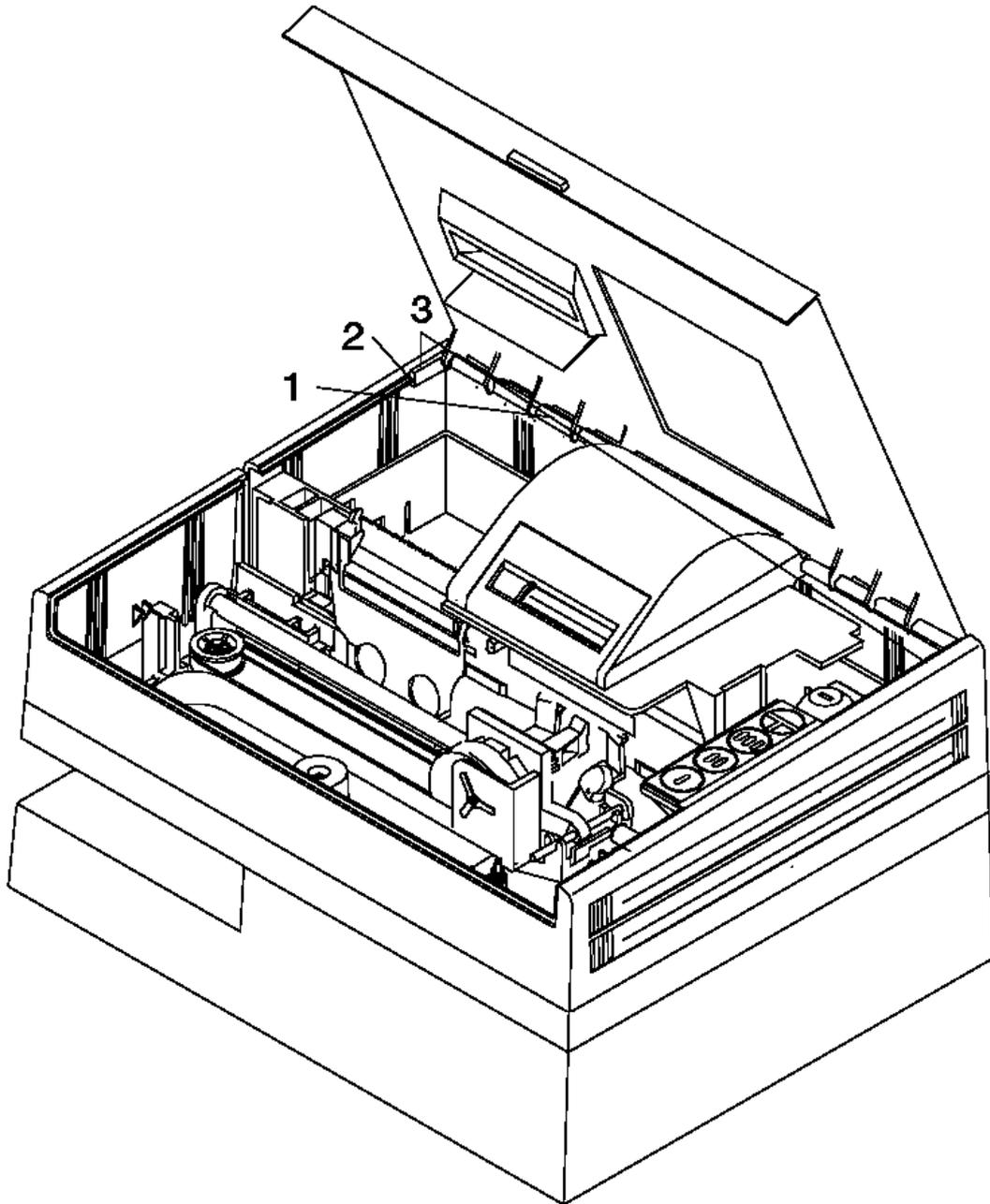


Figure 5-11. Access Cover

5.5.5 *Removing and Replacing the Bottom Cover*

Subtopics

5.5.5.1 Removing the Bottom Cover

5.5.5.2 Replacing the Bottom Cover

5.5.5.1 Removing the Bottom Cover

1. Disconnect the cable if present.
2. Loosen the thumbscrew (1).
3. Move the bottom cover holding tabs (2) toward the center of the printer to release them, and at the same time, pull the bottom cover off the printer.

5.5.5.2 Replacing the Bottom Cover

1. Align the holding tabs (2) over their slots.

The grounding straps should be centered in the hole for the thumbscrew.

2. Push in on the cover until the tabs lock into place.
3. Tighten the thumbscrew (1).

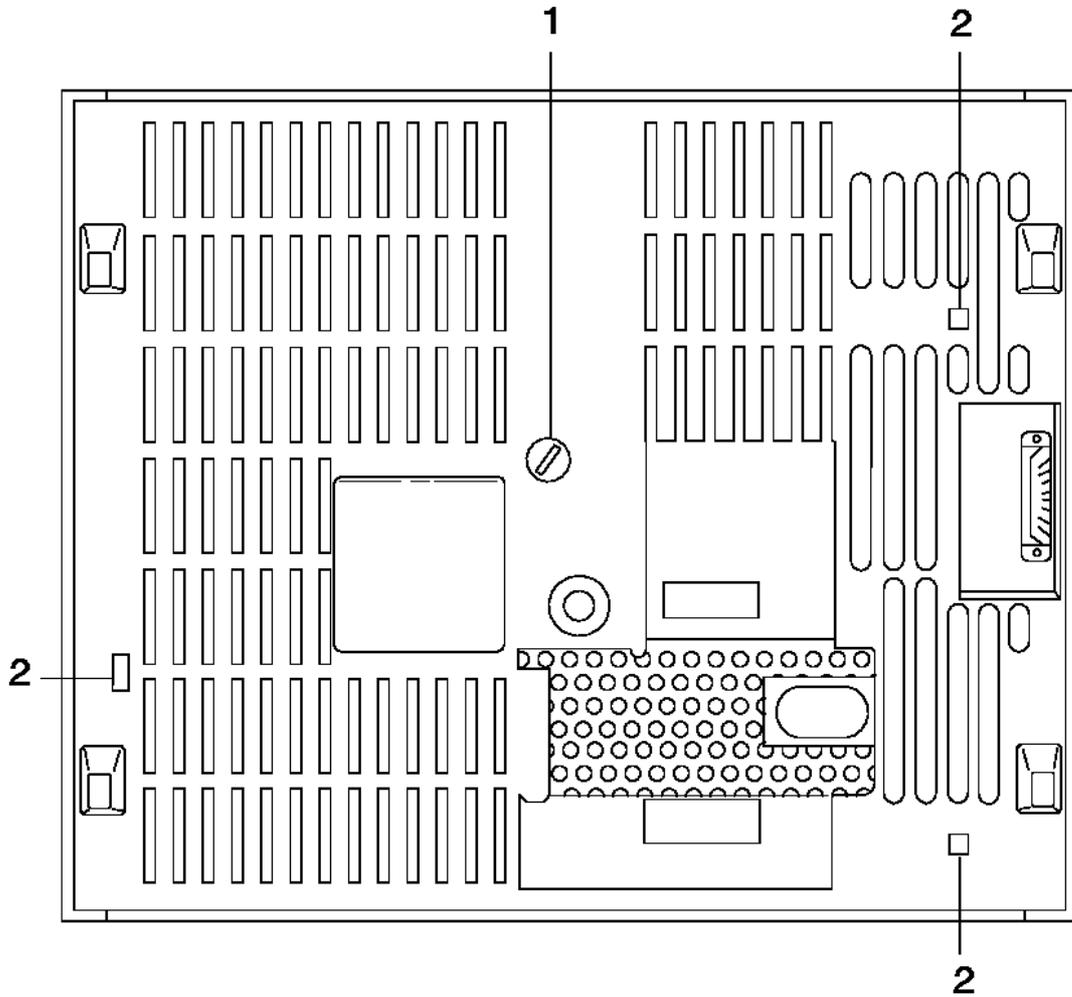


Figure 5-12. Bottom Cover

5.5.6 *Removing and Replacing the Cover Interlock Sensor*

Subtopics

5.5.6.1 Removing the Cover Interlock Sensor

5.5.6.2 Replacing the Cover Interlock Sensor

5.5.6.1 *Removing the Cover Interlock Sensor*

1. Remove the top cover assembly.
2. Disconnect the cover interlock sensor cable from printer card connector J3.
3. Release the sensor (1) from its holding tabs (2).
4. Lift the sensor out of the frame assembly.

5.5.6.2 Replacing the Cover Interlock Sensor

1. Put the sensor (1) into place.
2. Ensure that the holding tabs (2) lock into place.
3. Connect the cover interlock sensor cable to printer card connector J3.
4. Reinstall the top cover assembly.

Reference	Page
Removing and Replacing the Top Cover	5.5.25

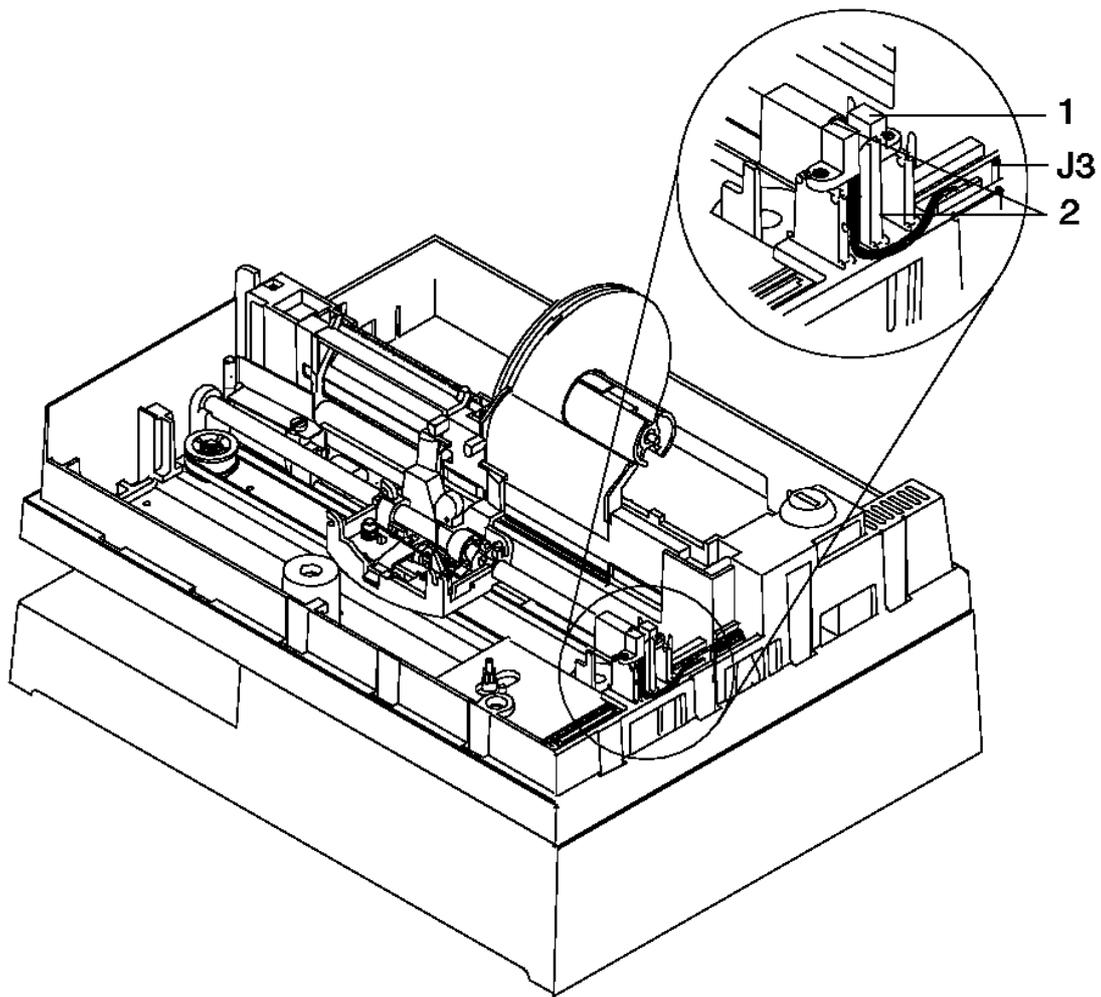


Figure 5-13. Cover Interlock Sensor

5.5.7 *Removing and Replacing the Document Insert Paper Guide*

CAUTION:

The edge of the printer's guide is sharp. Use care when removing and installing it.

Subtopics

5.5.7.1 Removing the Document Insert Paper Guide

5.5.7.2 Replacing the Document Insert Paper Guide

5.5.7.1 Removing the Document Insert Paper Guide

1. Put a piece of paper into the document insert station to hold the document insert gate toward the front of the printer.
2. Set the printer as shown in Figure 5-14 in topic 5.5.7.2.
3. Gain access to the paper guide (1) through the document insert opening.
4. Lift the guide off the locating pads (2).
5. Move the guide toward the back of the printer until the holding tabs on the guide can be pulled out of the openings (3) in the frame.
6. Pull the guide down and out of the printer.

5.5.7.2 Replacing the Document Insert Paper Guide

1. Put a piece of paper into the document insert station to hold the document insert gate toward the front of the printer.
2. Set the printer as shown in Figure 5-14
3. Put the paper guide (1) into place through the document insert opening.
4. Push the holding tabs through the openings (3) in the frame assembly.
5. Remove the piece of paper.
6. Move the guide toward the front of the printer to lock the holding tabs in place.
7. Ensure that the guide is installed over the locating pads (2) and all four holding tabs are in place (the guide is against the bottom of the frame).

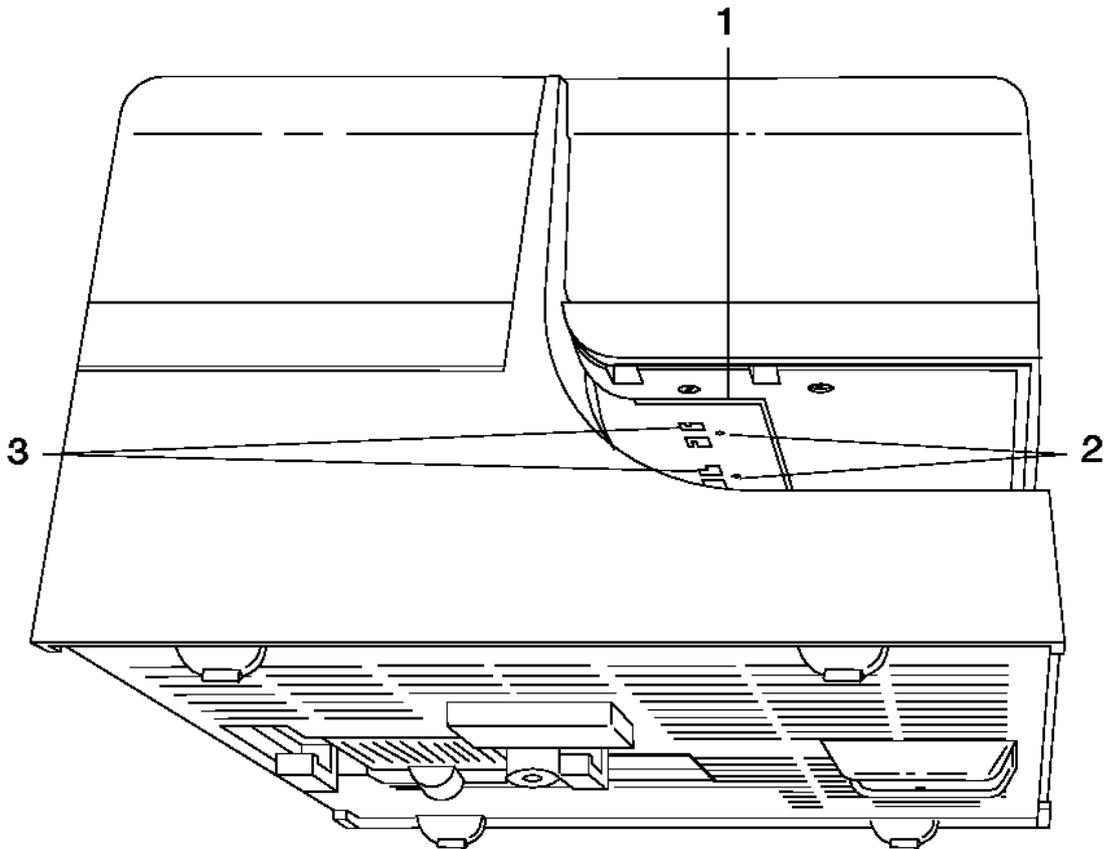


Figure 5-14. Document Insert Paper Guide

5.5.8 *Removing and Replacing the Journal Cover*

Subtopics

5.5.8.1 Removing the Journal Cover

5.5.8.2 Replacing the Journal Cover

5.5.8.1 *Removing the Journal Cover*

1. Remove the access cover.
2. Raise the journal cover. See Figure 5-15 in topic 5.5.8.2.
3. Push the cover back and off its hinge.

5.5.8.2 Replacing the Journal Cover

1. Put the journal cover on the hinge (1).
2. Pull the cover forward until the hinge snaps into place, and then close it.
3. Reinstall the access cover.

Reference	Page
Removing and Replacing the Access Cover	5.5.4

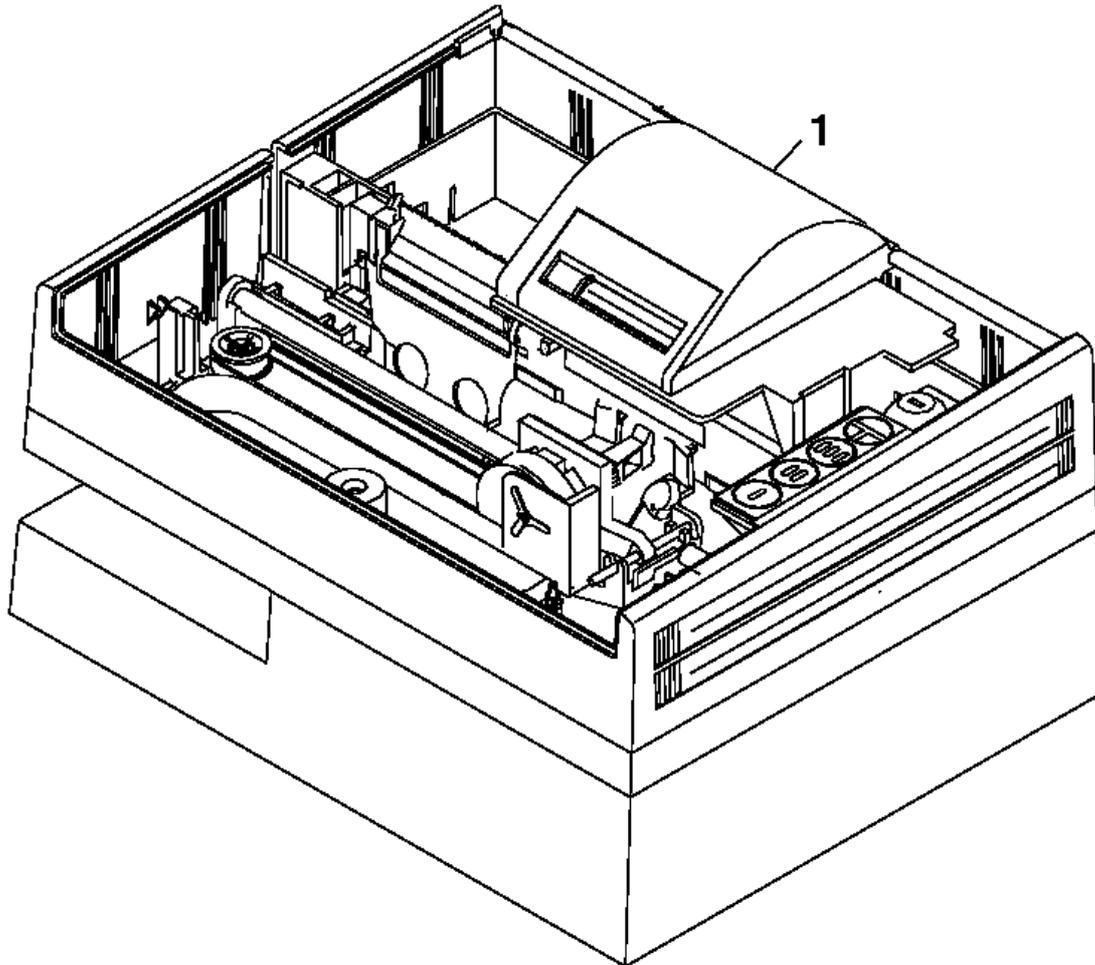


Figure 5-15. Journal Cover

5.5.9 Removing and Replacing the Journal Drive Belt

See topic 5.5.12. The printer journal drive belt is removed and replaced in this procedure.

5.5.10 Removing and Replacing the Journal Motor Pulley

See topic 5.5.12. The printer journal motor pulley is removed and replaced in this procedure.

5.5.11 Removing and Replacing the Journal Paper Motion Emitter Sensor

Subtopics

5.5.11.1 Removing the Journal Paper Motion Emitter Sensor

5.5.11.2 Replacing the Journal Paper Motion Emitter Sensor

5.5.11.1 *Removing the Journal Paper Motion Emitter Sensor*

1. Switch **POWER OFF**.
2. Remove the bottom cover.
3. Disconnect the emitter sensor cable from printer card connector J8.
4. Remove the cable from its retainer (1).
5. Release the holding tabs (3).
6. Pull the sensor (2) out of the printer.

5.5.11.2 Replacing the Journal Paper Motion Emitter Sensor

1. Put the emitter sensor (2) into place.
2. Push in on the emitter until the holding tabs (3) lock into place.
3. Connect the emitter sensor cable to printer card connector J8.
4. Put the cable in its retainer (1).
5. Reinstall the bottom cover.

Reference	Page
Removing and Replacing the Bottom Cover	5.5.5

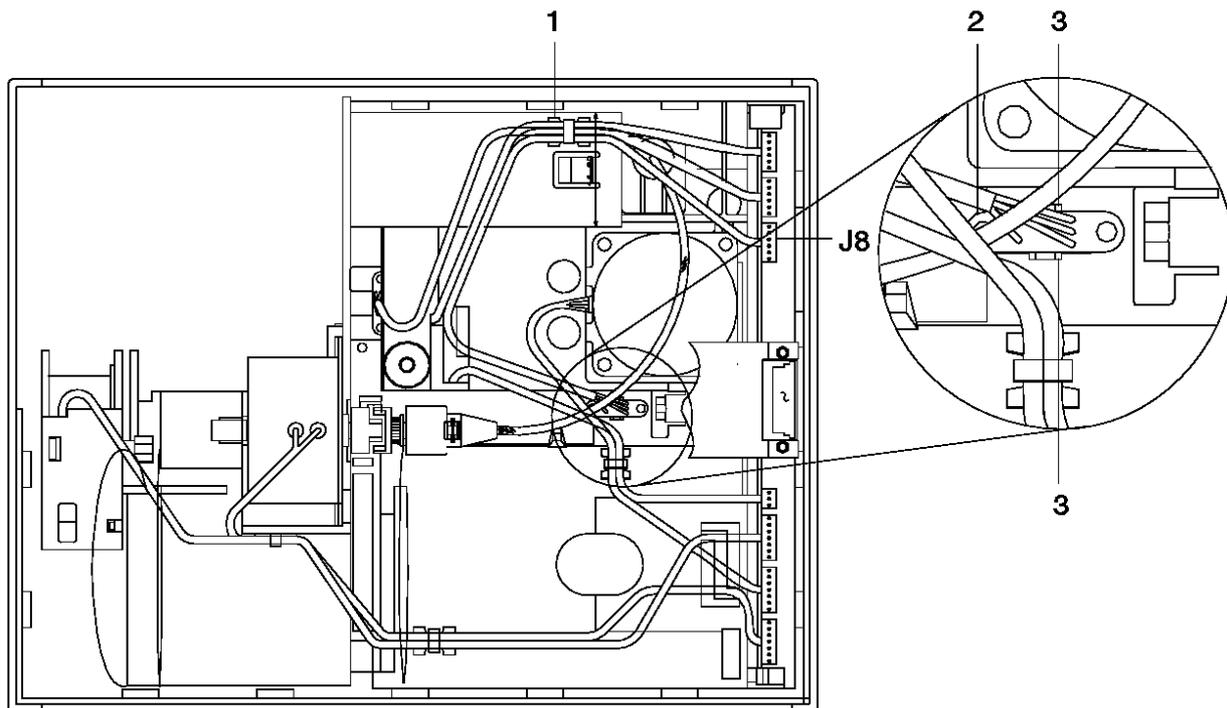


Figure 5-16. Journal Paper Motion Emitter Sensor

5.5.12 *Removing and Replacing the Journal/Ribbon Motor*

Subtopics

5.5.12.1 Removing the Journal/Ribbon Motor

5.5.12.2 Replacing the Journal/Ribbon Motor

5.5.12.1 *Removing the Journal/Ribbon Motor*

1. Take the belt off the journal paper spool.
2. Remove the bottom cover.
3. Release the ribbon drive shaft coupler (2) by removing the C-clip (3).
4. Pull the coupler off the motor shaft.
5. Remove the belt from the drive motor pulley (1).
6. Remove the pulley from the motor shaft.
7. Disconnect the drive motor cable from printer card connector J11.
8. Remove the cable from its retainer (4).
9. Move the motor toward the side of the printer and off its locating pad (5).
10. Pivot the motor toward the front of the printer and remove it from the printer.

5.5.12.2 *Replacing the Journal/Ribbon Motor*

1. Hold the drive motor toward the side of the printer as you put it into place.
2. Move the motor to the right into its locating pad (5).
3. Connect the motor cable to printer card connector J11.
4. Put the cable into its retainer (4).
5. Put the pulley (1) on the motor shaft.
6. Put the drive belt on the motor pulley and up toward the journal paper spool.
7. Connect the ribbon drive shaft coupler (2) to the motor shaft.
8. Attach the coupler to the shaft with the C-clip (3).
9. Put the drive belt on the journal paper spool.
10. Reinstall the bottom cover.

Reference	Page
Removing and Replacing the Bottom Cover	5.5.5

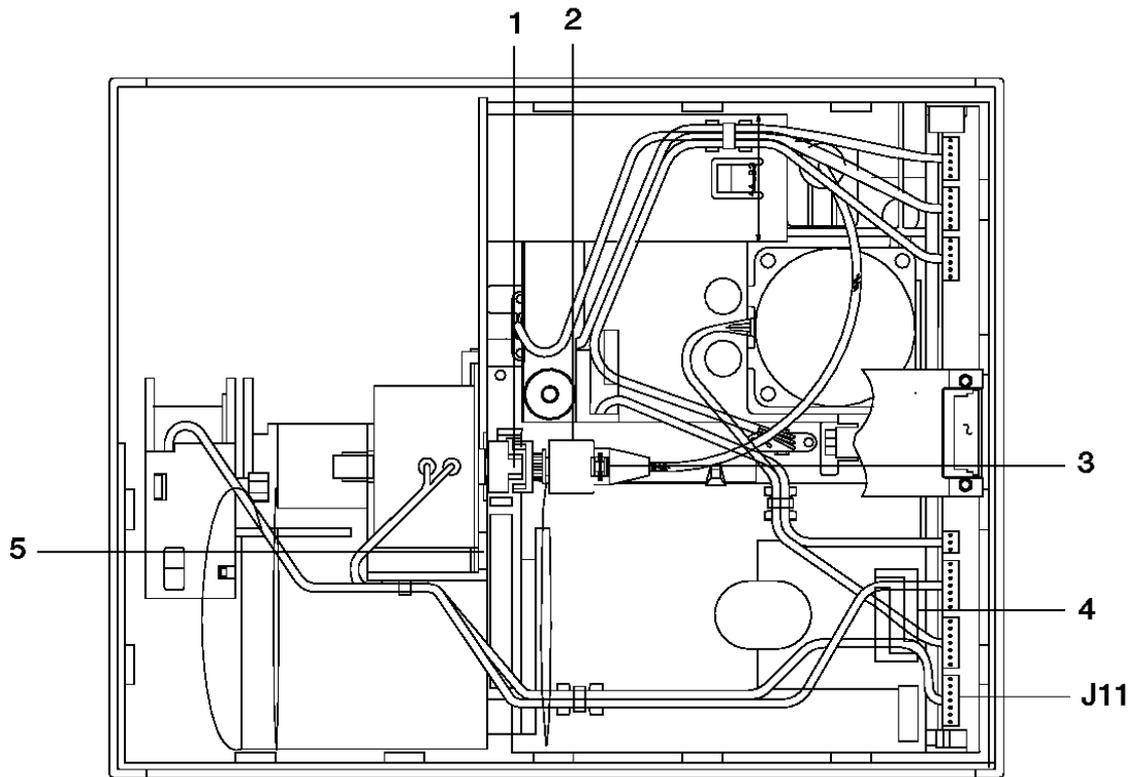


Figure 5-17. Journal Paper/Ribbon Motor. For illustration, the top cover has been removed. Removal of the cover is not necessary for this procedure.

5.5.13 *Removing and Replacing the Journal Spool and Clutch*

Subtopics

5.5.13.1 Removing the Journal Spool and Clutch

5.5.13.2 Replacing the Journal Spool and Clutch

5.5.13.1 *Removing the Journal Spool and Clutch*

1. Remove the journal station paper.
2. Remove the access cover.
3. Remove the journal cover.
4. Take the belt off the journal paper spool (1).
5. Remove the bottom cover.
6. Release the paper spool and clutch assembly holding tab (2).
7. Push the assembly away from the holding tab.
8. Pull the spool and clutch assembly (1) straight up and out of the printer.

5.5.13.2 Replacing the Journal Spool and Clutch

1. Put the paper spool and clutch assembly (1) into the slot shown in Figure 5-19.
2. Push the assembly down until the holding tab locks into place.
3. Put the belt on the journal paper spool.
4. Reinstall the bottom cover.
5. Reinstall the access cover.
6. Reinstall the journal cover.

Reference	Page
Removing and Replacing the Access Cover	5.5.4
Removing and Replacing the Bottom Cover	5.5.5
Removing and Replacing the Journal Cover	5.5.8

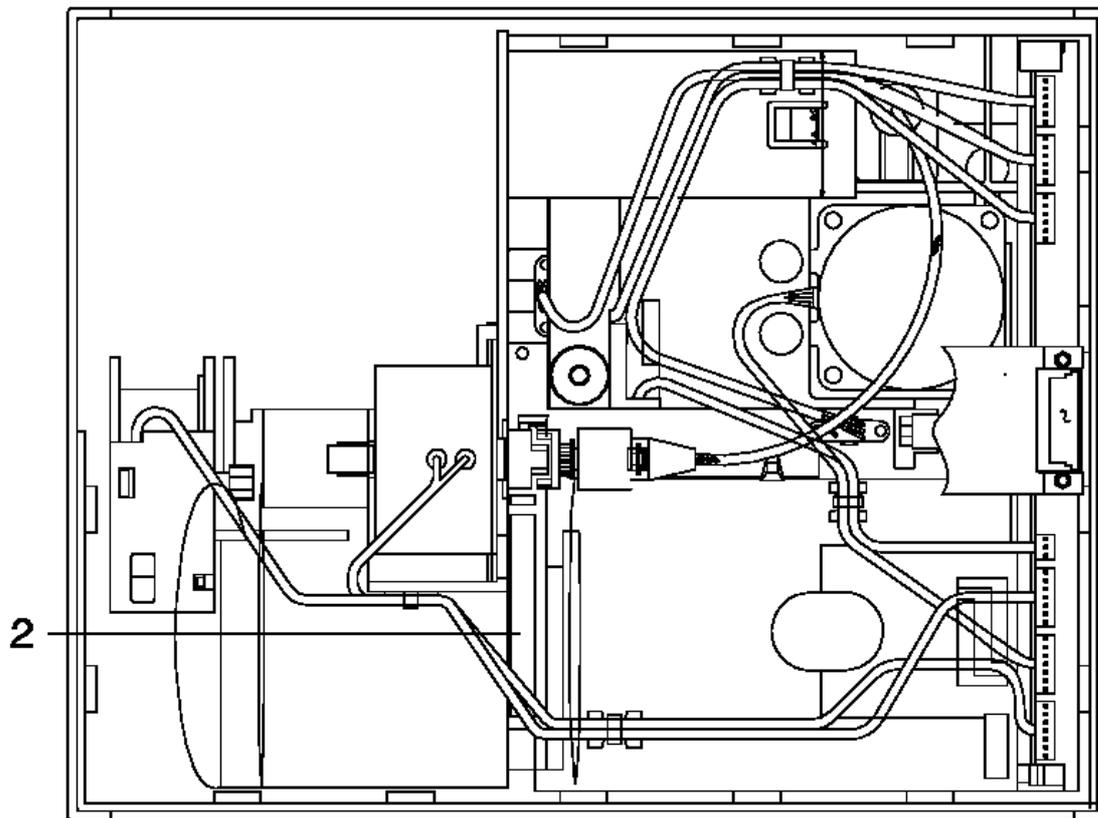


Figure 5-18. Journal Paper Spool and Clutch

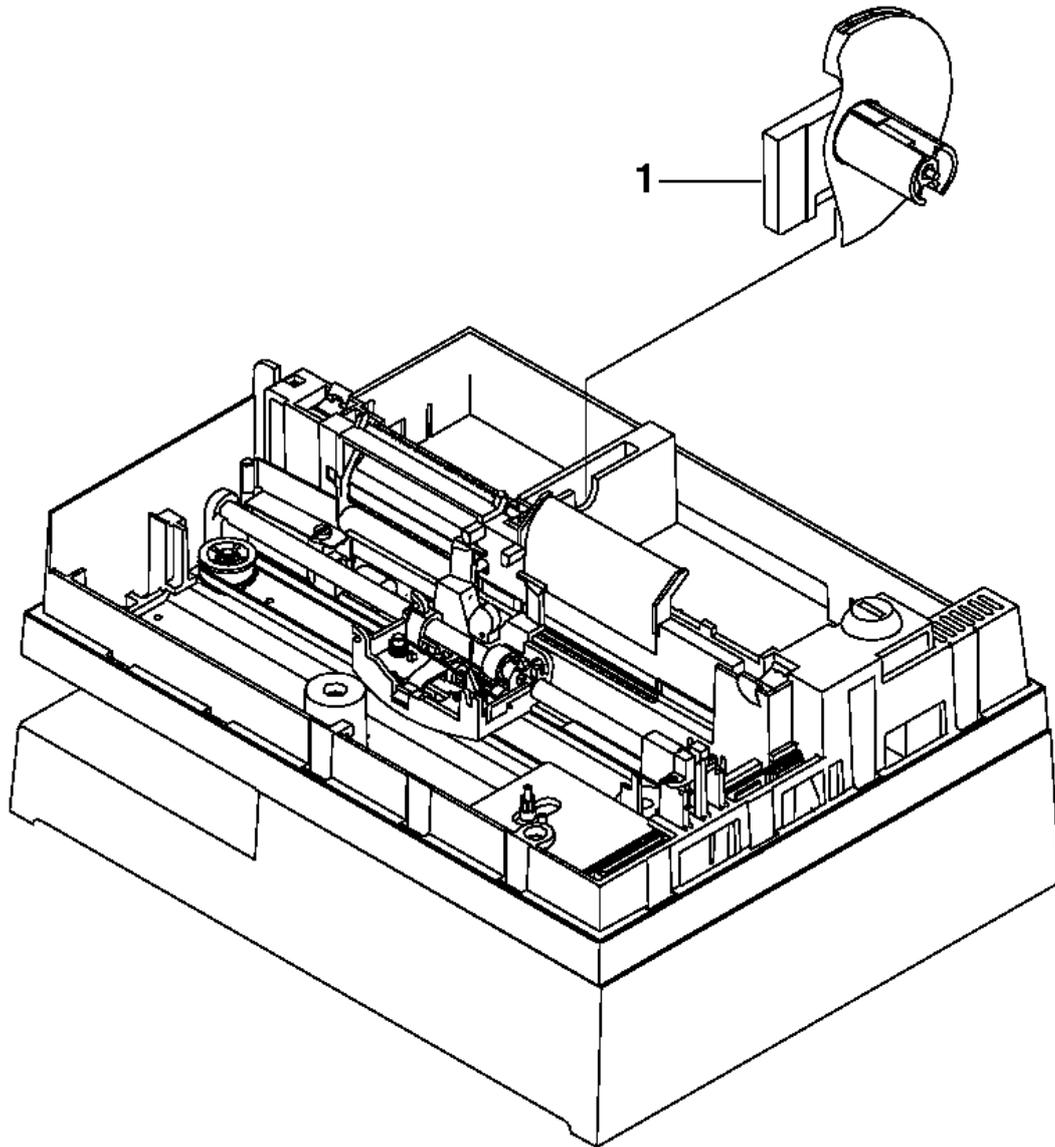


Figure 5-19. Journal Paper Spool and Clutch. For illustration, the top cover has been removed. Removal of the cover is not necessary for this procedure.

5.5.14 *Removing and Replacing the Keylock*

Subtopics

5.5.14.1 Removing the Keylock

5.5.14.2 Replacing the Keylock

5.5.14.1 *Removing the Keylock*

1. Remove the top cover assembly.
2. Ensure that the keylock is in the unlocked position.
3. Pull the retainer clip (2) down and toward the right side of the printer to release the keylock assembly (1) as shown in Figure 5-20.
4. Lift the assembly out of the printer.

Note: It may be necessary to tilt the assembly to get it past the locking arm.

5.5.14.2 Replacing the Keylock

1. Put the keylock assembly (1) into the printer.

Note: It may be necessary to tilt the assembly to get it past the locking arm.

2. Push the keylock retainer clip (2) onto the keylock assembly.
3. Reinstall the top cover.

Reference	Page
Removing and Replacing the Top Cover	5.5.25

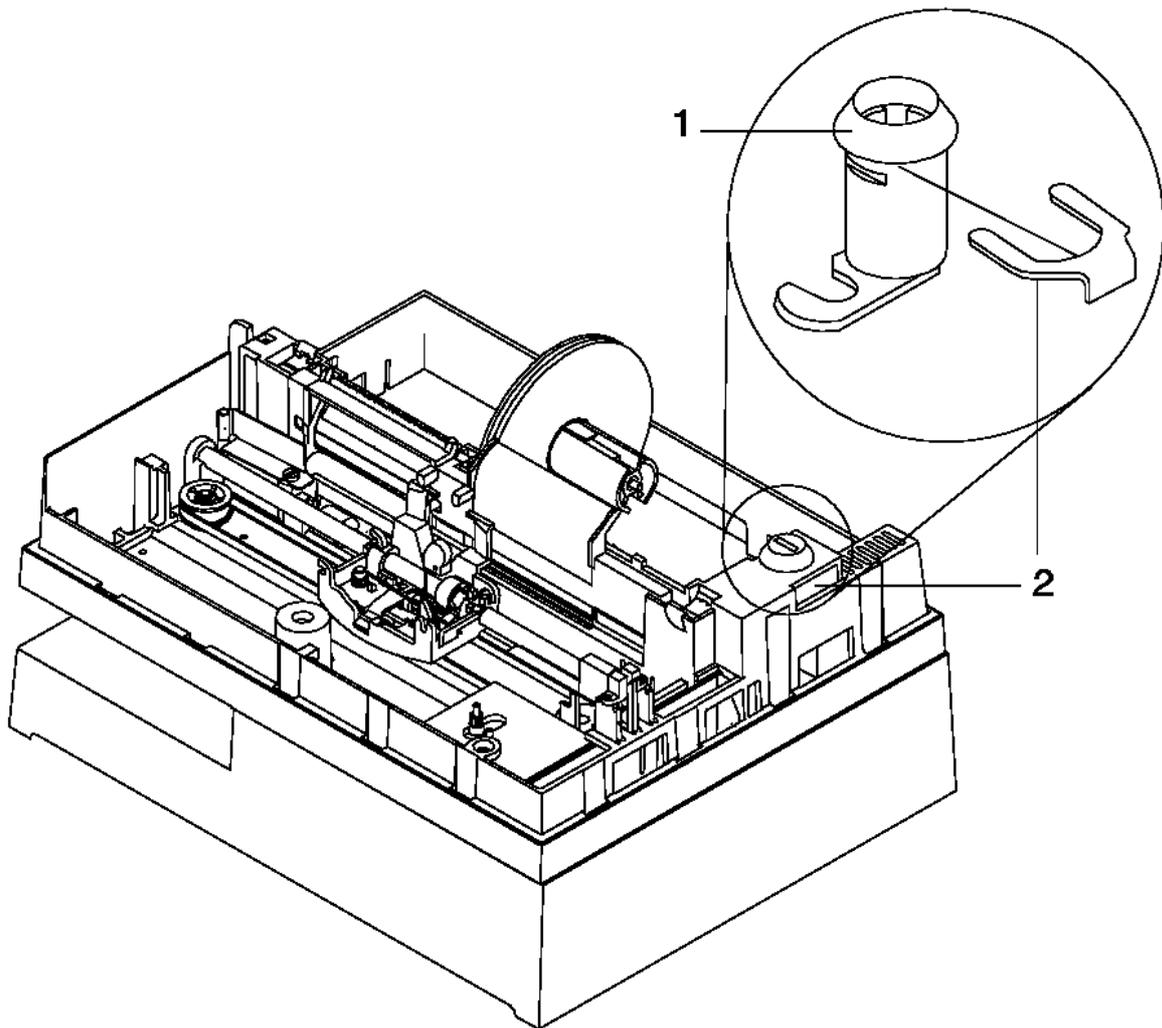


Figure 5-20. Keylock

5.5.15 *Removing and Replacing the Keypad*

Subtopics

5.5.15.1 Removing the Keypad

5.5.15.2 Replacing the Keypad

5.5.15.1 *Removing the Keypad*

1. Remove the top cover assembly.
2. Remove the ESD clip.
3. Peel the operator keypad off the cover assembly.

The pad is held to the cover with peel-and-stick adhesive.

5.5.15.2 Replacing the Keypad

1. Clean the old glue off the top cover assembly with alcohol.
2. Put the cable through the slot in the cover.
3. Peel off the protective cover to expose the adhesive.
4. Press the new operator keypad in place.
5. Peel the clear protective cover off the top of the keypad.
6. Install the ESD clip.
7. Connect the keypad cable.
8. Reinstall the top cover.

Reference	Page
Removing and Replacing the Top Cover	5.5.25

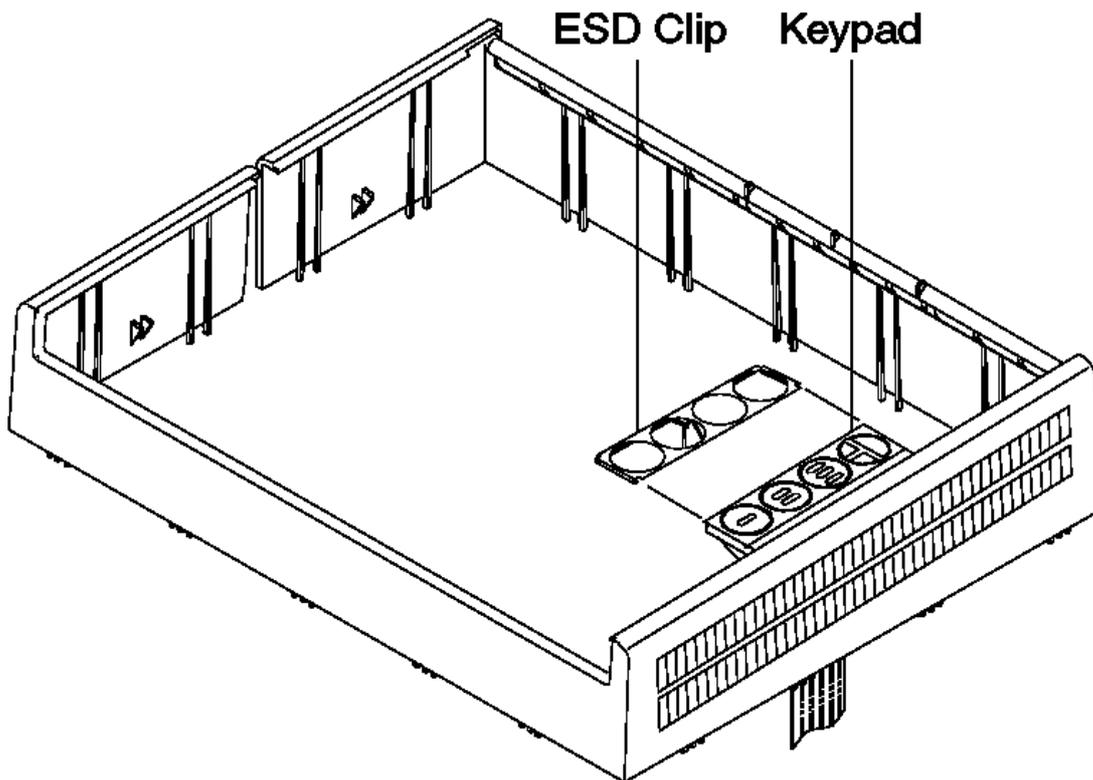


Figure 5-21. Keypad

5.5.16 Removing and Replacing the Platen and Paper Tear Guide

Subtopics

5.5.16.1 Removing the Platen and Paper Tear Guide

5.5.16.2 Replacing the Platen and Paper Tear Guide

5.5.16.1 *Removing the Platen and Paper Tear Guide*

1. Remove the top cover assembly.
2. Remove the document insert paper guide.
3. Remove the paper from both print stations.
4. Put a piece of paper into the document insert station to hold the document insert gate toward the front of the printer.
5. Remove the platen retainers (1). See Figure 5-22 in topic 5.5.16.2.
6. Hold the platen assembly at the journal station and lift up until the top roller (6) can be removed.
7. When the roller has been removed, lift the platen straight up and out of the printer.
8. Remove the piece of paper from the document insert station.
9. Move the holding tabs (3) (back of the platen) toward each other to release the paper tear guide.
10. Push the tabs through the platen and remove the guide.

5.5.16.2 Replacing the Platen and Paper Tear Guide

1. Put the paper tear guide on the platen with its holding tabs (3) as shown in Figure 5-22. Ensure that the sawtooth edge goes through the slot in the platen before the holding tabs lock into place.
2. Put a piece of paper into the document insert station.
3. Turn the large toggle gear down. This keeps the toggle assembly from interfering with the paper tear guide when the platen is installed.
4. Move the receipt paper backup roller and spacers to the center of their shaft to ensure that they do not interfere with the projections on the bottom of the platen.
5. Lubricate the rubber boots (2) with silicon grease, P/N 265390. Put the boots into their slots (4).
6. Push down on each end of the platen assembly until the boots are approximately halfway down.

Note: Be careful to avoid damaging the paper guides and journal bail.
7. Reinstall the top roller (6).
8. Continue to push down on each end of the platen assembly until the boots are at the bottom of their slots. Ensure that the platen is parallel with the frame assembly at the points designated by (5). Also, ensure that the platen boots are seated correctly by pushing them down in front of and behind the platen.
9. Reinstall the platen retainers (1). Hold the platen in the journal paper path area and rock the platen front to back several times. Push the platen back until the platen contacts the upper frame and then hold for one second.
10. Check to ensure that the platen grounding strap is properly seated under the platen. See Figure E-8 in topic E.2.2.
11. Remove the piece of paper.
12. Reinstall the top cover.
13. Reinstall the document insert paper guide.
14. Check the alignment between the platen and the print head. See topic 5.5.19.2.

Reference	Page
Removing and Replacing the Document Insert Paper Guide	5.5.7
Removing and Replacing the Top Cover	5.5.25

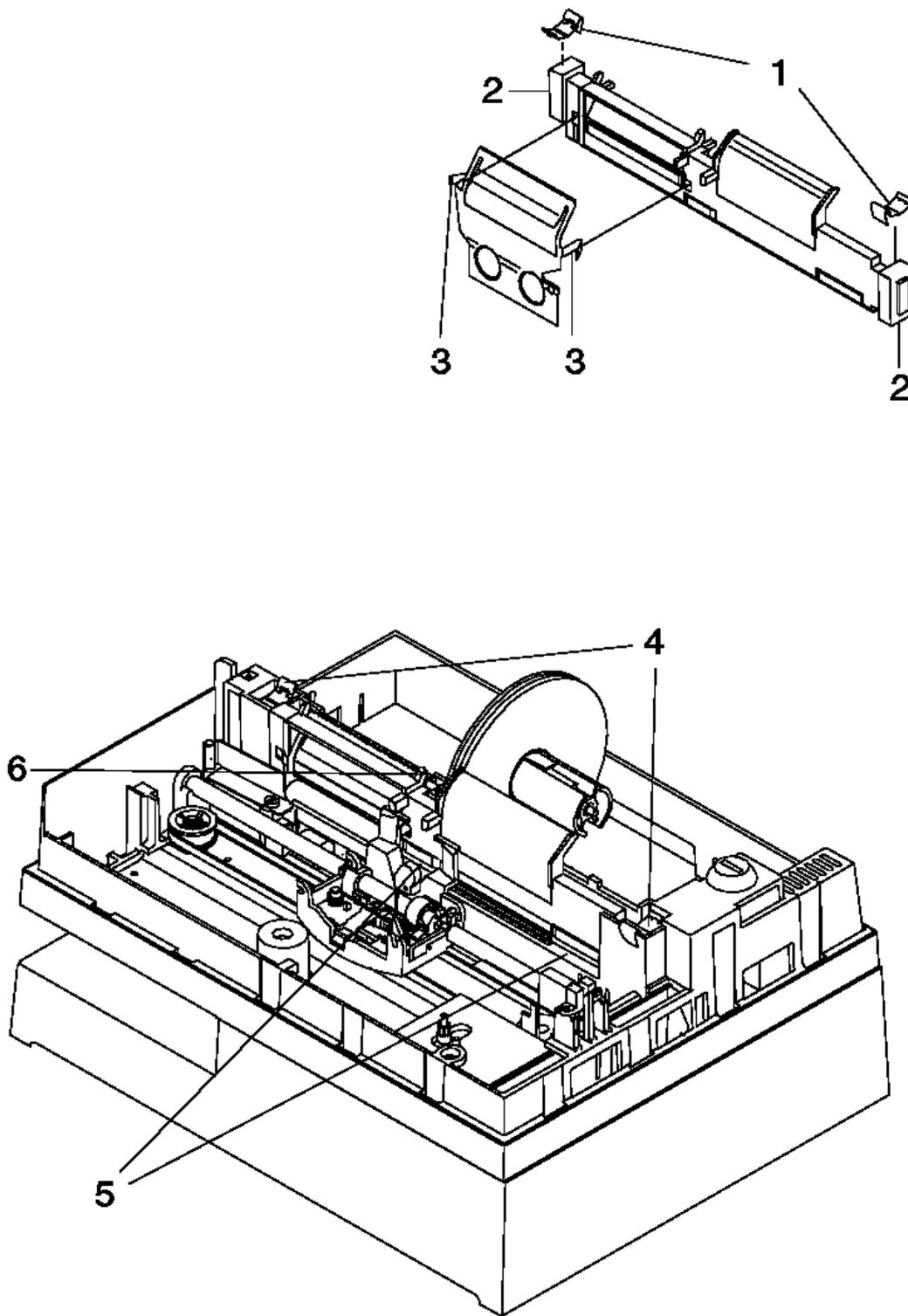


Figure 5-22. Platen and Paper Tear Guide

5.5.17 *Removing and Replacing the Print Head*

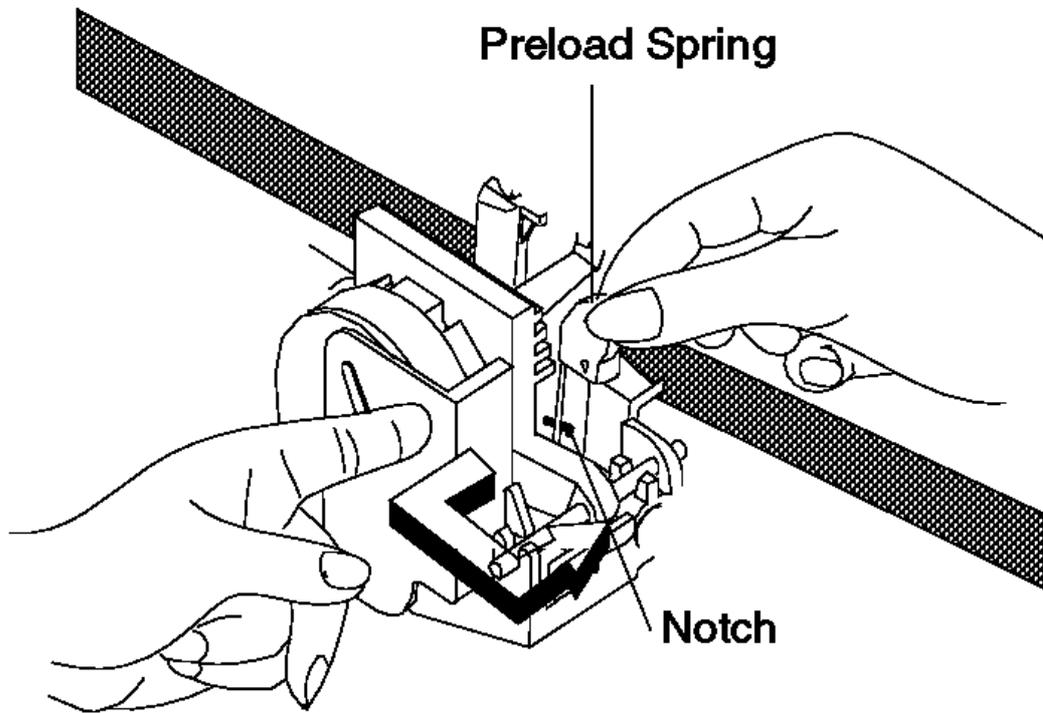
Subtopics

5.5.17.1 Removing the Print Head

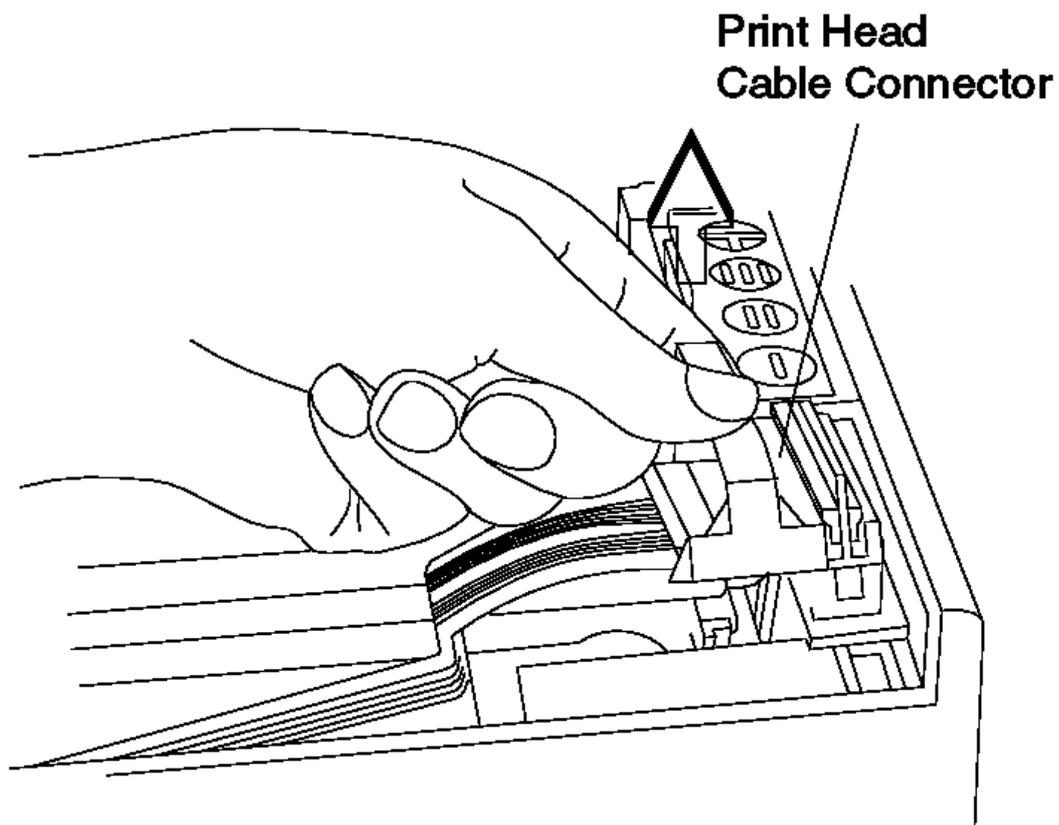
5.5.17.2 Replacing the Print Head

5.5.17.1 Removing the Print Head

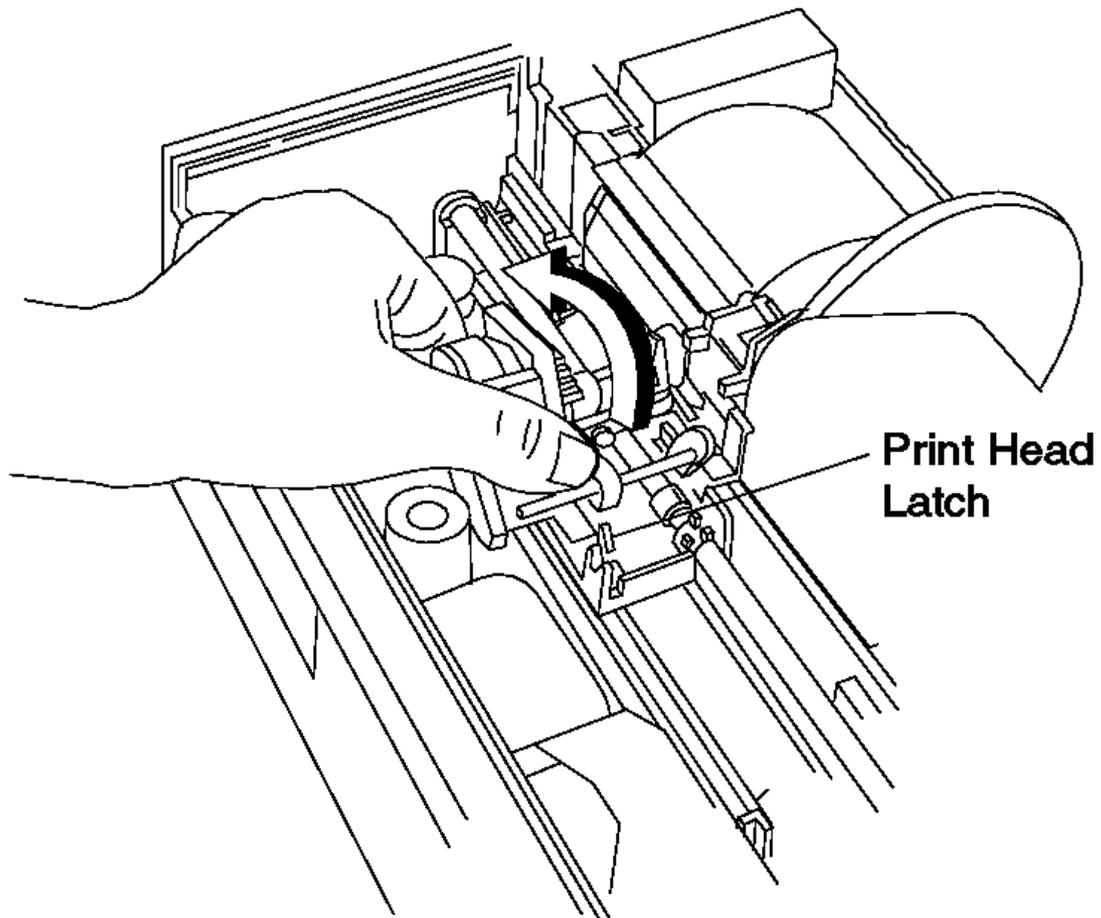
1. Switch **POWER OFF** at the terminal.
2. Pull the print head preload spring toward the front of the printer and out of the notch on the side of the print head.
3. Move the spring to the right and release it. The large arrow shows the movement of the preload spring.



4. The print head moves toward the front of the printer.
5. Remove the ribbon cartridge. See topic 5.5.23.1.
6. Unplug the print head cable connector from the printer card connector.



7. Release the print head latch and lift the right side of the print head assembly.



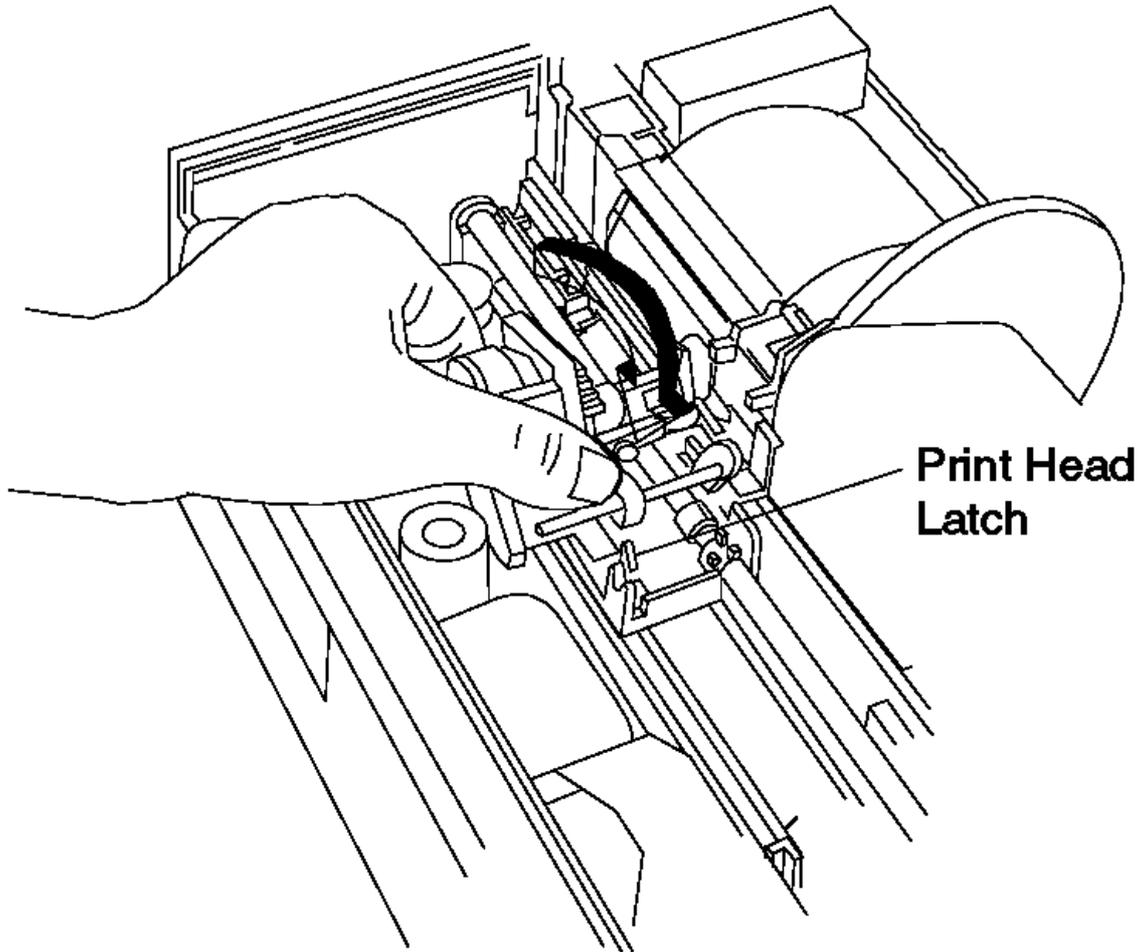
8. Move the print head to the left and out of the printer.

----- **Service Hint** -----

| If print heads are being replaced frequently, make sure that the
| recommended ribbons are being used. See "Expendable Supplies" in
| topic D.1.
|

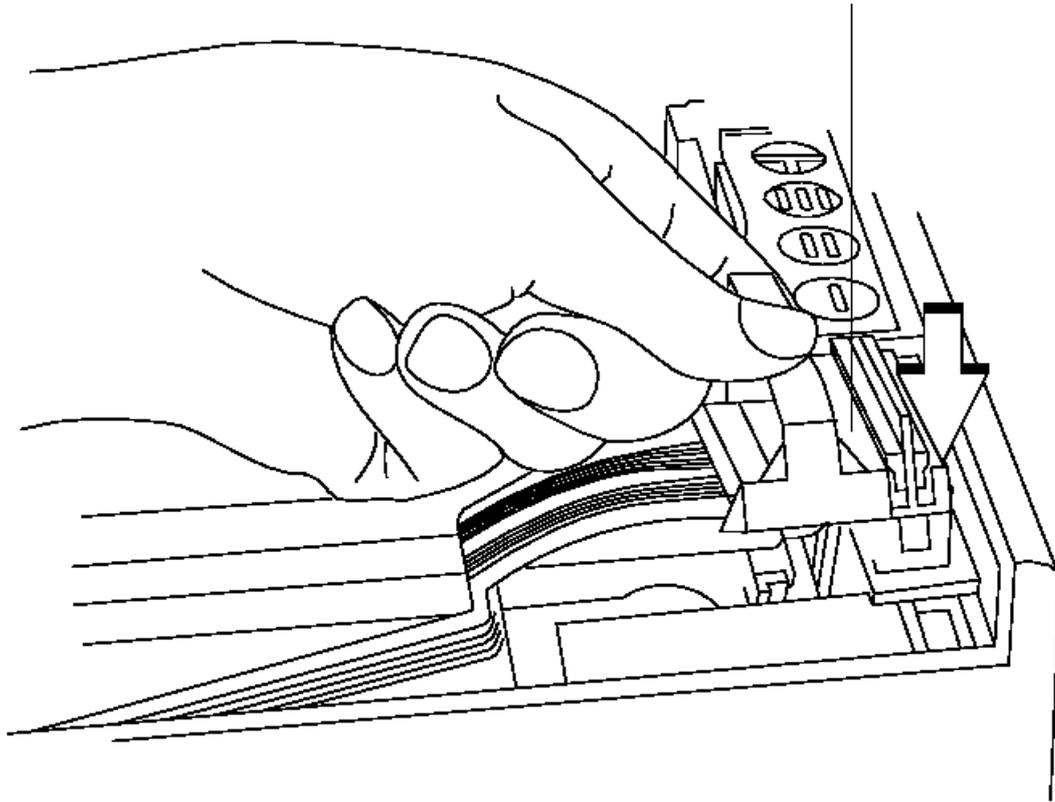
5.5.17.2 Replacing the Print Head

1. Switch **POWER OFF**.
2. Put the slender shaft on the left side of the print head into the slots on the left side of the carriage.
3. Hold the print head toward the front of the printer.
4. Lower the right side of the print head until the print head latch locks into place over the slender shaft on the right.

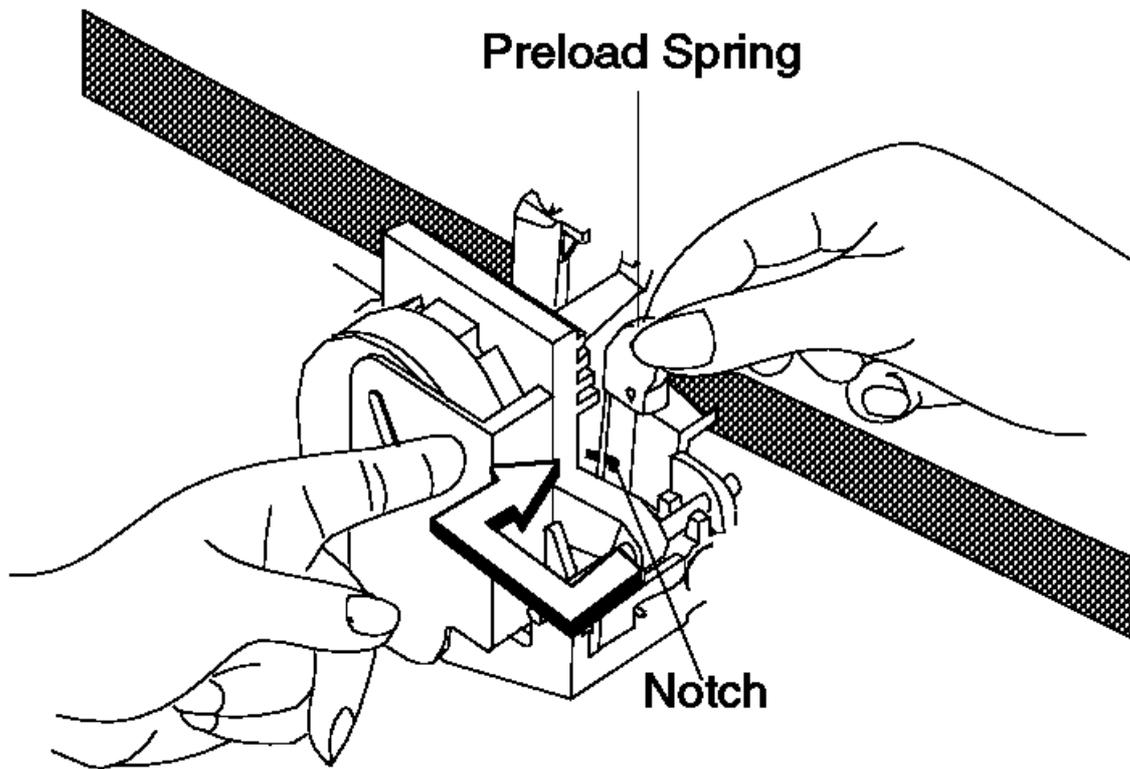


5. Plug the print head cable connector into the printer card connector.

Print Head Cable Connector



6. Exchange the ribbon cartridge. See topic 5.5.23.2.
7. Push the print head toward the rear of the printer and hold it there.
8. Pull the print head preload spring toward the front of the printer.
9. Move the spring to the left and release it into the notch on the right side of the print head. The large arrow shows the movement of the preload spring.



10. Switch power ON again.

11. Run the printer test to verify that the print head is working correctly.

5.5.18 *Removing and Replacing the Print Head Carriage and Shaft*

Subtopics

5.5.18.1 Removing the Print Head Carriage and Shaft

5.5.18.2 Replacing the Print Head Carriage and Shaft

5.5.18.1 *Removing the Print Head Carriage and Shaft*

1. Remove the top cover assembly.
2. Remove the bottom cover.
3. Remove the printer card.
4. Remove the belt from the drive motor pulleys (4) and move the carriage to the left. Make sure that the belt spring does not fall off and get lost. See Figure 5-23 in topic 5.5.18.2.
5. Release the holding tab (3).
6. Lift the right end of the print head carriage shaft up and move it to the right.
7. Lift the print head carriage and shaft assembly out of the printer.
8. To remove or replace the belt or any other component from the assembly, go to "Removing and Replacing the Print Head Carriage Components" in topic 5.5.19.

5.5.18.2 Replacing the Print Head Carriage and Shaft

1. Put the left end of the print head carriage shaft into the opening (1) in the frame.
2. Push the holding tab (3) out of the way.
3. Lower the right end of the shaft into place and release the holding tab over it.
4. Move the carriage to the center of the printer.
5. Put the belt on the drive motor pulleys (4).
6. Move the carriage to the extreme left and then to the extreme right. The spring that connects the belt together must not touch either pulley.
7. Lubricate the shaft and carriage wiper (2) with #6 oil or equivalent. See "Lubricant Equivalents" in topic D.2.
8. Reinstall the printer card.
9. Reinstall the bottom cover.
10. Reinstall the top cover.

Reference	Page
Removing and Replacing the Bottom Cover	5.5.5
Removing and Replacing the Printer Card	5.5.22
Removing and Replacing Print Head Carriage Components	5.5.19
Removing and Replacing the Top Cover	5.5.25

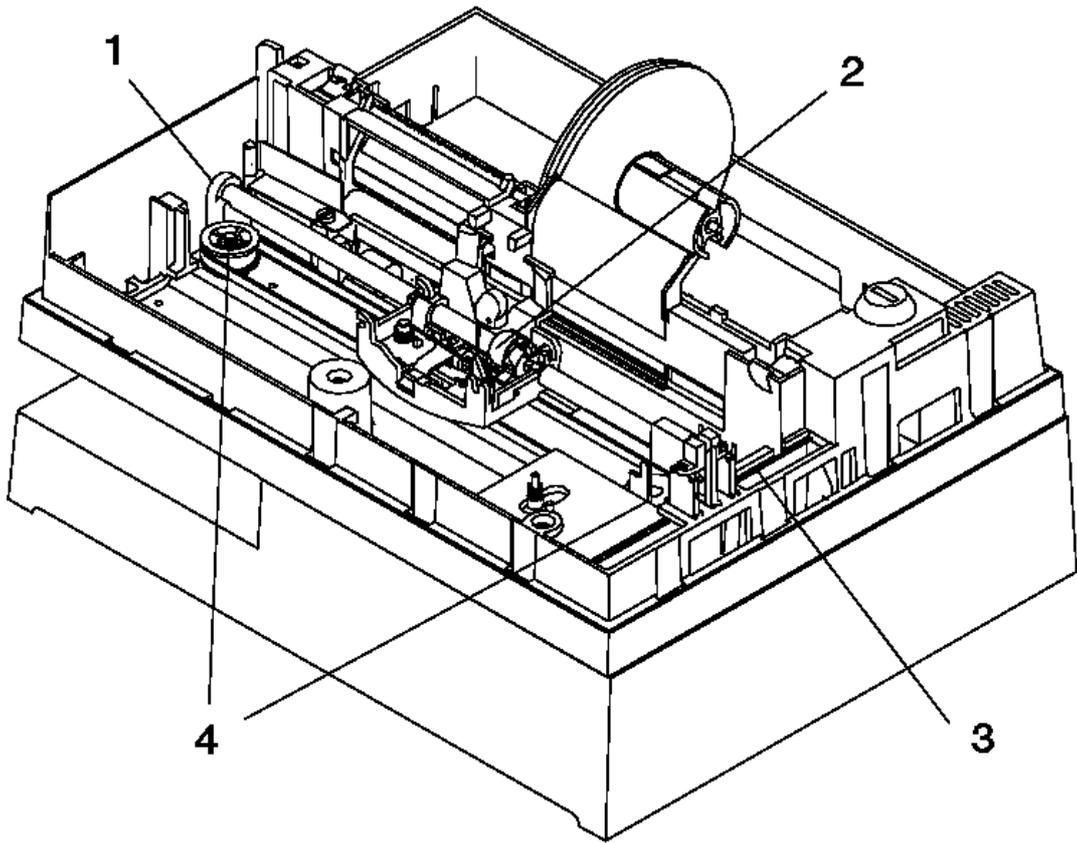


Figure 5-23. Print Head Carriage and Shaft

5.5.19 Removing and Replacing the Print Head Carriage Components

Subtopics

5.5.19.1 Removing Print Head Carriage Components

5.5.19.2 Replacing Print Head Carriage Components

5.5.19.1 *Removing Print Head Carriage Components*

1. To remove the print head carriage and shaft, go to topic 5.5.18.
2. Remove the wear shoe (4) that the carriage rides on. See Figure 5-24 in topic 5.5.19.2.
3. Remove the shaft from the assembly. The retainer (7) and wiper (6) will fall from the assembly.
4. Remove the spring (11).
5. Push down on the belt clamp (9) and hold it there.
6. Remove the clamp holding pin (10).
7. Remove the print head carriage drive belt.
8. Lift the clamp out of the assembly.
9. Remove the latch (8).
10. Pull the pin (12) out of the print head preload spring (2) and remove the preload spring.
11. Remove the screw (1) and the home sensor flag (3).

5.5.19.2 Replacing Print Head Carriage Components

1. Replace the home sensor flag (3) and the screw (1).
2. Replace the print head preload spring (2) and pin (12).
3. Replace the latch (8).
4. Put the belt clamp (9) into the assembly.
5. Locate the drive belt under the clamp so that the spring on the belt is the same distance from each side of the clamp.
6. Replace the clamp holding pin (10).
7. Replace the spring (11).
8. Replace the wear shoe (4) (see **Note** below).
9. Put the shaft into the assembly.
10. Replace the wiper (6) and retainer (7) on the shaft.
11. To replace the print head carriage and shaft, go to topic 5.5.18.
12. Adjust the home sensor flag.

Note: There may be two styles of wear shoes supplied with carriage assemblies.

1. One unmarked shoe for earlier printers.
2. Five sizes of shoes for later printers.

If your wear shoe has an identifying mark on it, choose the shoe that appears the same as the original that you are replacing. The selection of these shoes determines the spacing between the print head and the paper. If, after reassembly and testing, your printer fails to print dots, choose a thicker shoe to move the head closer to the paper. If ribbon smudges appear on the paper, choose a thinner shoe to move the head further away from the paper.

Reference	Page
Removing and Replacing the Print Head Carriage and Shaft	5.5.18
Adjusting the Print Head Home Sensor	5.5.2

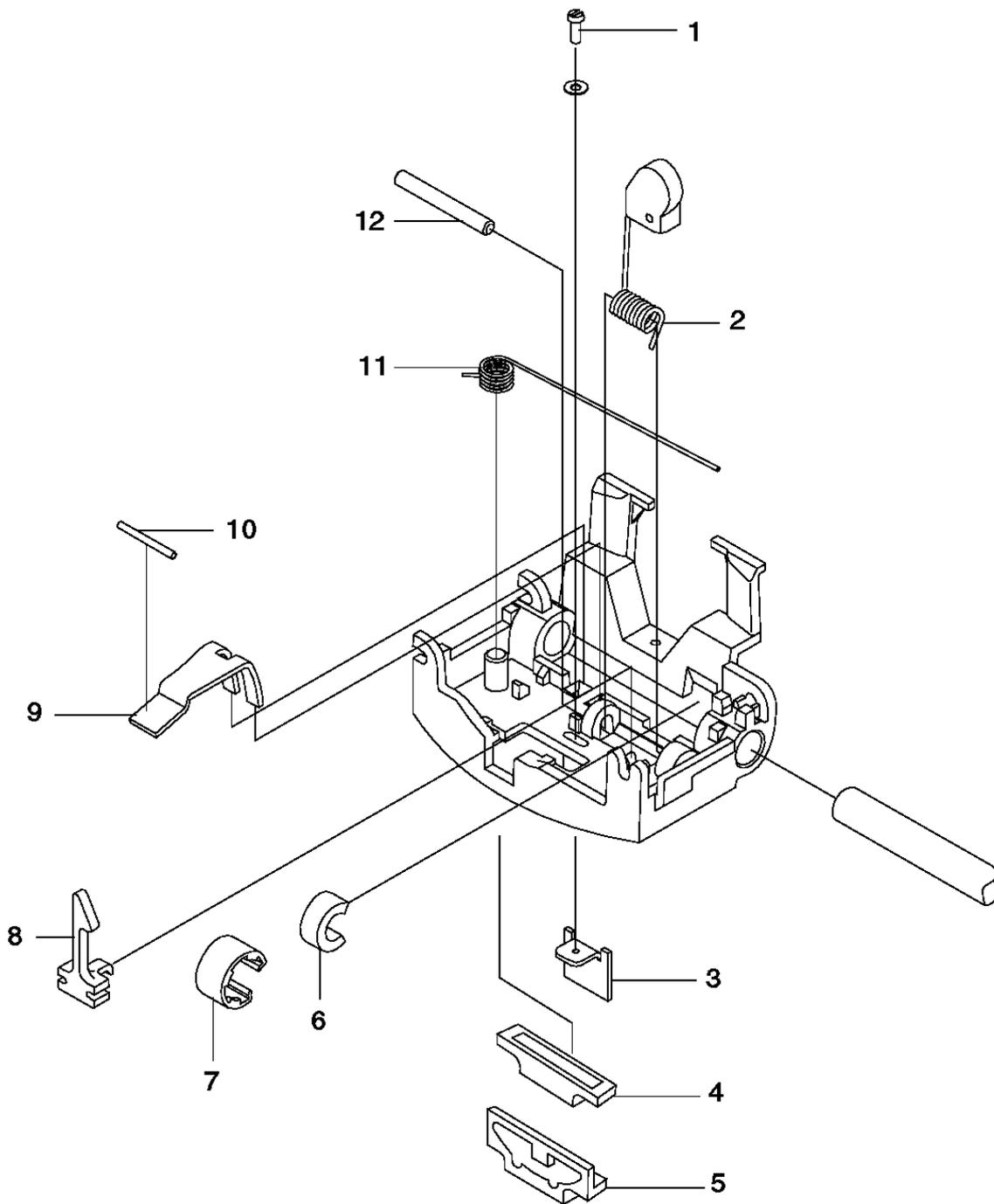


Figure 5-24. Print Head Carriage Components

5.5.20 Removing and Replacing the Print Head Carriage Drive Belt

See topic 5.5.19. The print head carriage drive belt is removed and replaced in this procedure.

5.5.21 *Removing and Replacing the Print Head Carriage Motor*

Subtopics

- 5.5.21.1 Removing the Print Head Carriage Motor
- 5.5.21.2 Replacing the Print Head Carriage Motor

5.5.21.1 Removing the Print Head Carriage Motor

1. Remove the carriage drive belt from the motor pulley (1). See Figure 5-25 in topic 5.5.21.2.
2. Remove the bottom cover.
3. Disconnect the motor cable from printer card connector J10.
4. Remove the motor cable from its retainers (3).
5. Remove the motor screws (2).
6. Pull the carriage drive motor out the bottom of the printer.

5.5.21.2 Replacing the Print Head Carriage Motor

1. Put the carriage drive motor into place as shown in Figure 5-25.
2. Reinstall the motor screws (2).
3. Put the motor cable into its retainers (3).
4. Connect the cable to printer card connector J10.
5. Move the carriage to the center of the printer.
6. Put the drive belt on the motor pulley (1).
7. Move the carriage to the extreme left and then to the extreme right. The spring that connects the belt must not touch either pulley.
8. Reinstall the bottom cover.

Reference	Page
Removing and Replacing the Bottom Cover	5.5.5

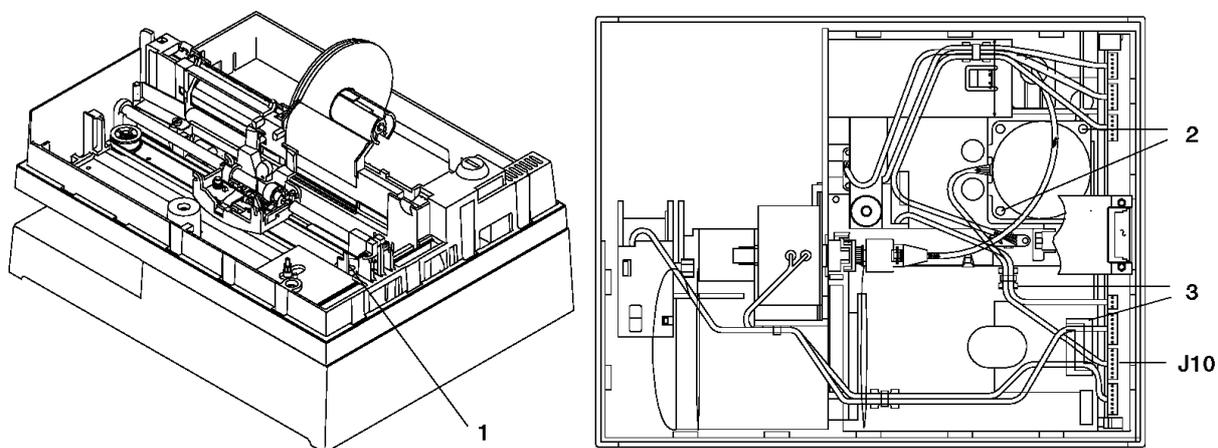


Figure 5-25. Print Head Carriage Motor. For illustration, the top cover has been removed. Removal of the cover is not necessary for this procedure.

5.5.22 *Removing and Replacing the Printer Card*

Attention Follow ESD procedures when handling static-sensitive components.

Subtopics

5.5.22.1 Removing the Printer Card

5.5.22.2 Replacing the Printer Card

5.5.22.1 *Removing the Printer Card*

1. Remove the top cover assembly.
2. Remove the bottom cover.
3. Disconnect the cables from the top and bottom of the printer card.

Note: The cable connectors are keyed so they only connect to their matching printer card connectors.

4. Remove the cables under the journal station from the holding clips, starting with the bottom cable.
5. Release the holding tabs (1).
6. Pull the printer card out through the bottom of the printer.
7. Remove the grounding strap from the card.

5.5.22.2 Replacing the Printer Card

1. Attach the grounding strap to the printer card.
2. Put the printer card in through the bottom of the printer.
3. Push in until the tabs (1) lock into place.
4. Place the cables under the journal station into the holding clips, starting with the top cable.
5. Connect the cables to the card.

Note: The cable connectors are keyed so they will only connect to their matching printer card connectors.

6. Reinstall the bottom cover.
7. Reinstall the top cover.

Reference	Page
Removing and Replacing the Bottom Cover	5.5.5
Removing and Replacing the Top Cover	5.5.25

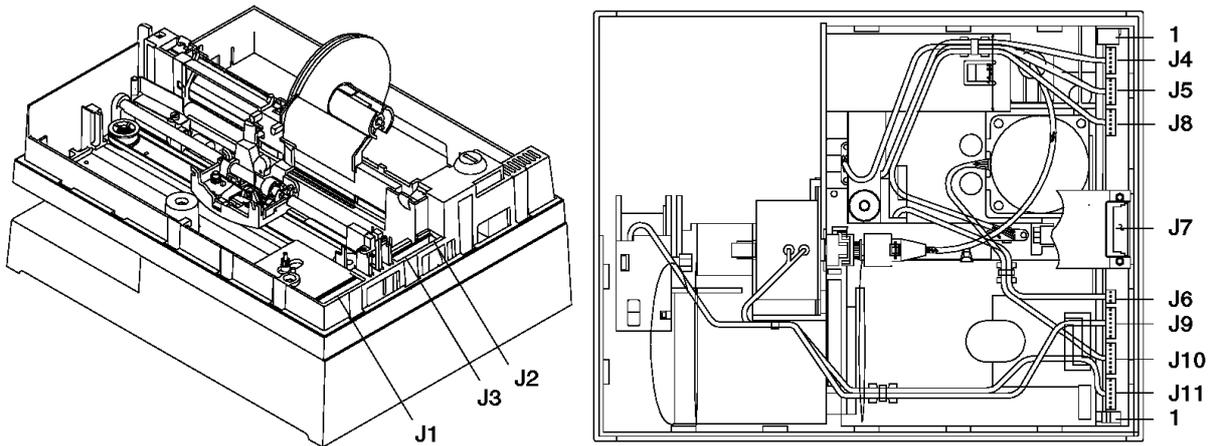


Figure 5-26. Printer Card Connectors

5.5.23 Removing and Replacing the Printer Ribbon Cartridge

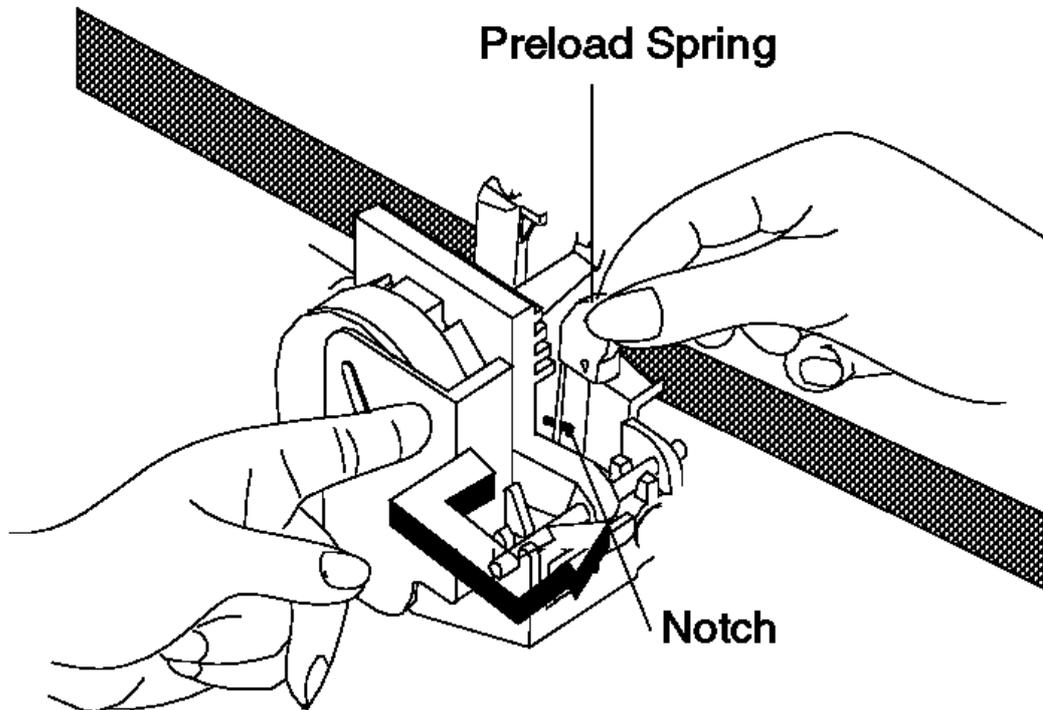
Subtopics

5.5.23.1 Removing the Ribbon Cartridge

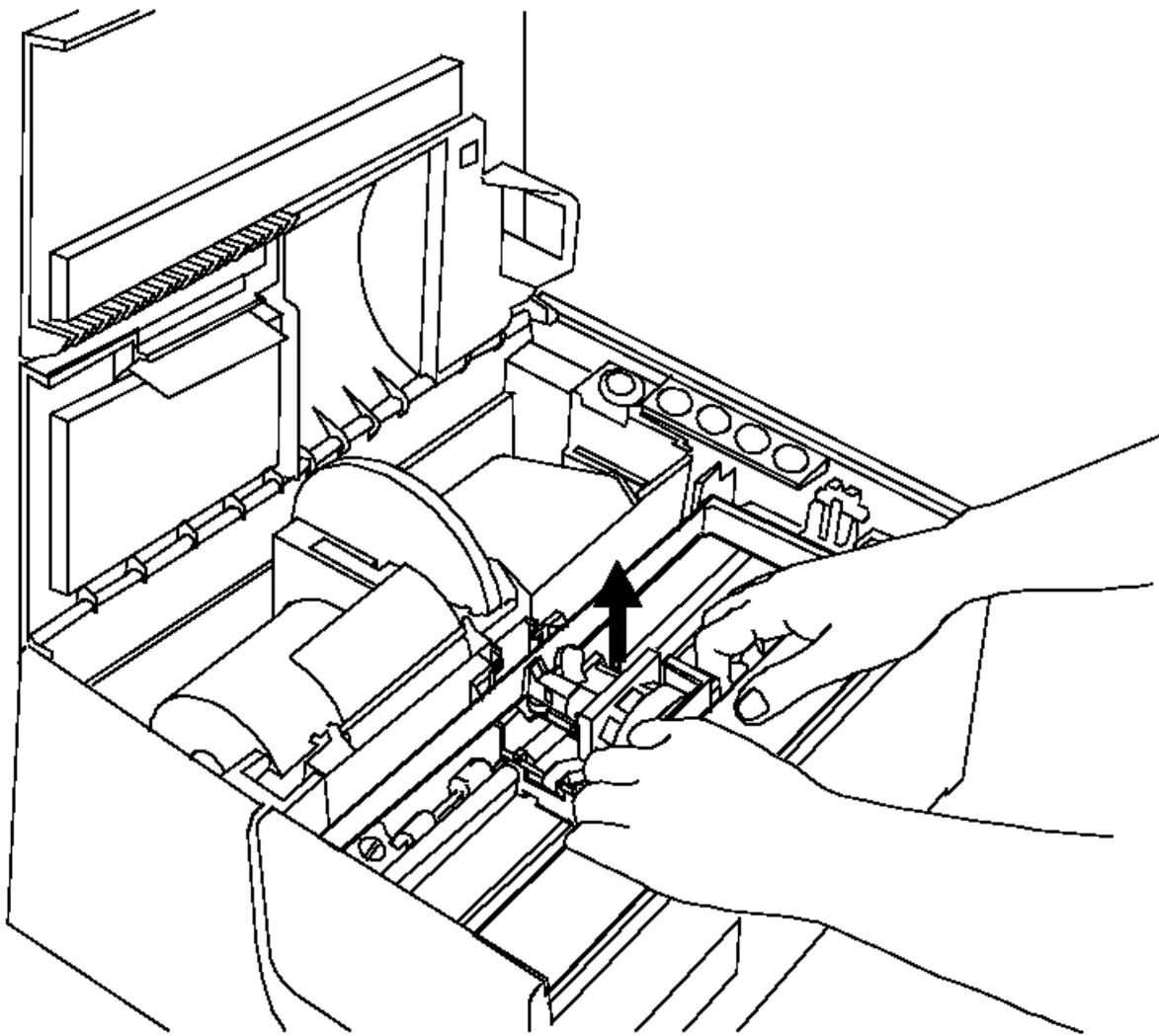
5.5.23.2 Replacing the Ribbon Cartridge

5.5.23.1 Removing the Ribbon Cartridge

1. Hold the print head against the ribbon with your left hand and pull the preload spring toward the front of the printer and out of the notch on the side of the print head.



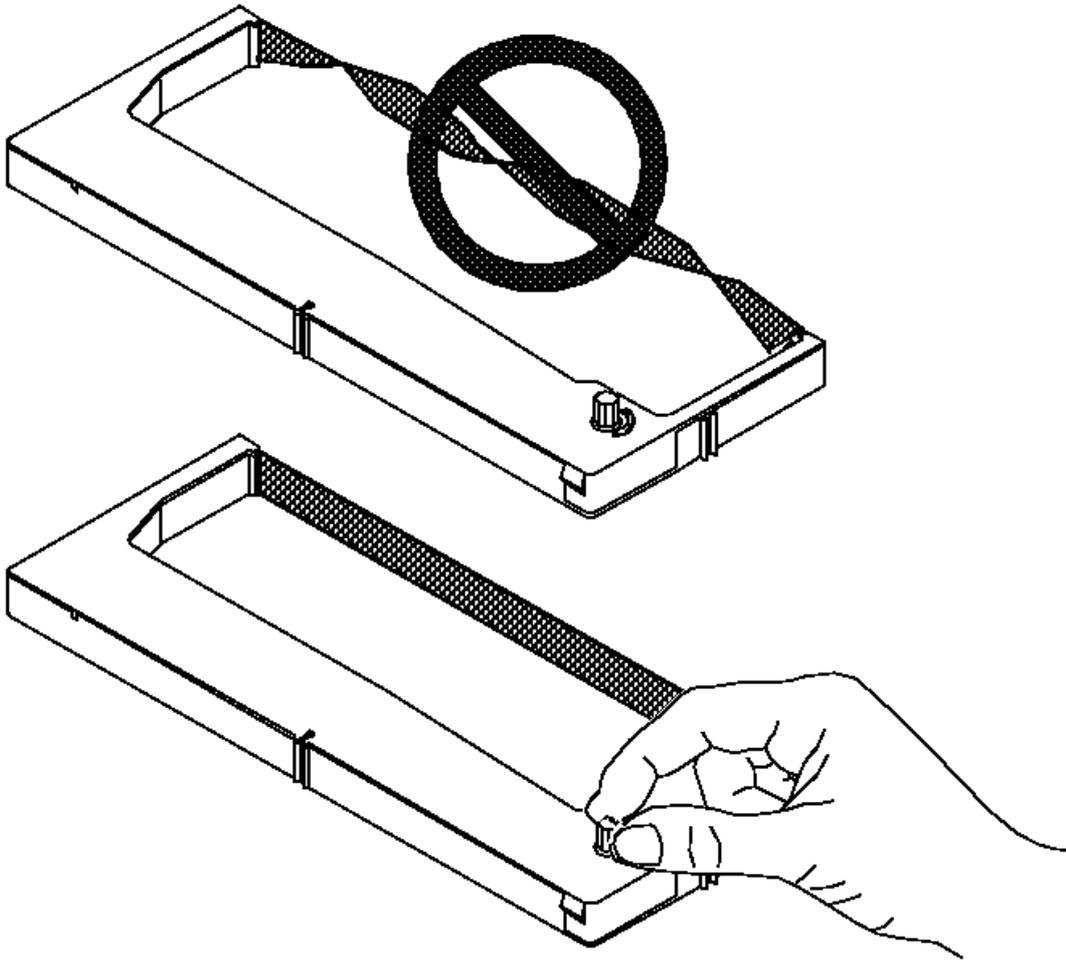
2. Move the spring to the right and release it. The large arrow shows the movement of the preload spring.
3. The print head moves toward the front of the printer.
4. Hold the print head away from the ribbon so it does not interfere with the ribbon cartridge removal.
5. Remove the old ribbon cartridge by grasping it on each side and pulling up firmly until it is free.



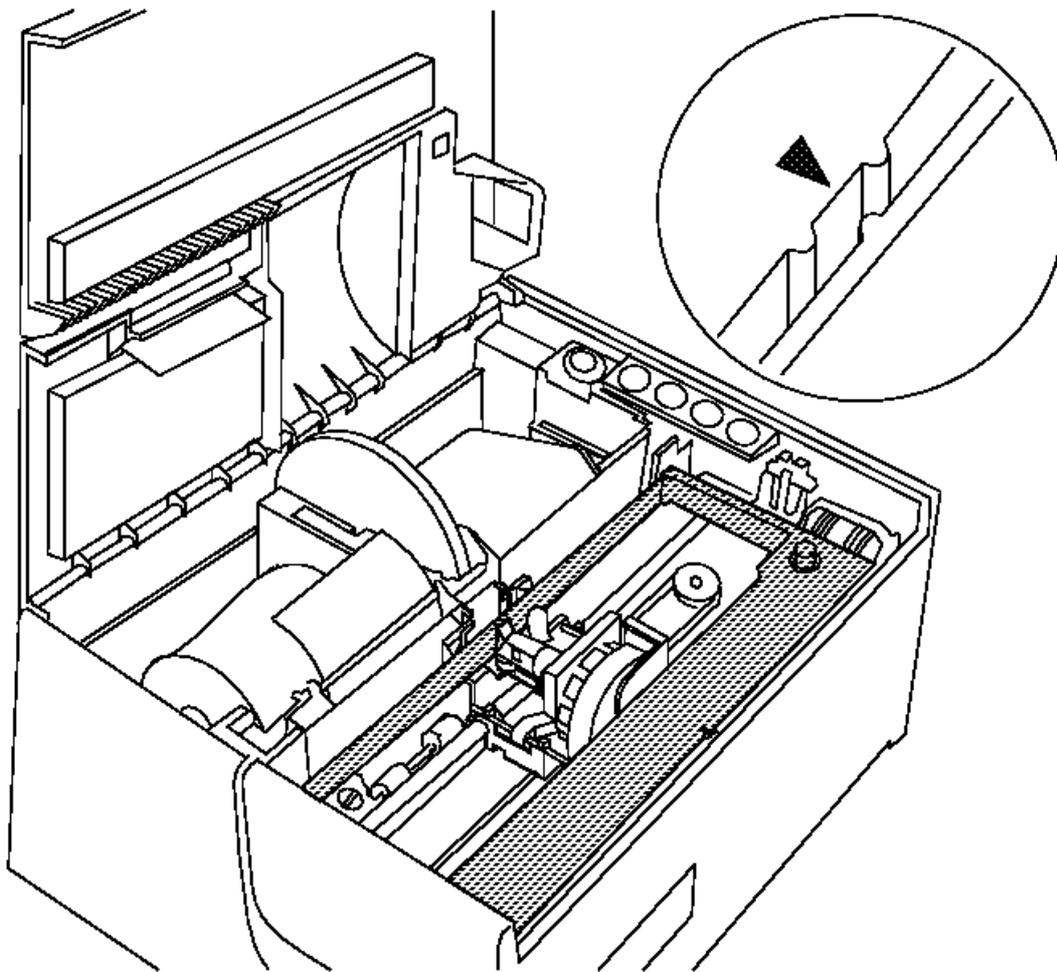
5.5.23.2 Replacing the Ribbon Cartridge

Note: Use ribbon cartridge P/N 4483015 or equivalent. Failure to do so may affect print head life and print quality. Replacing the ribbon cartridge is the user's responsibility.

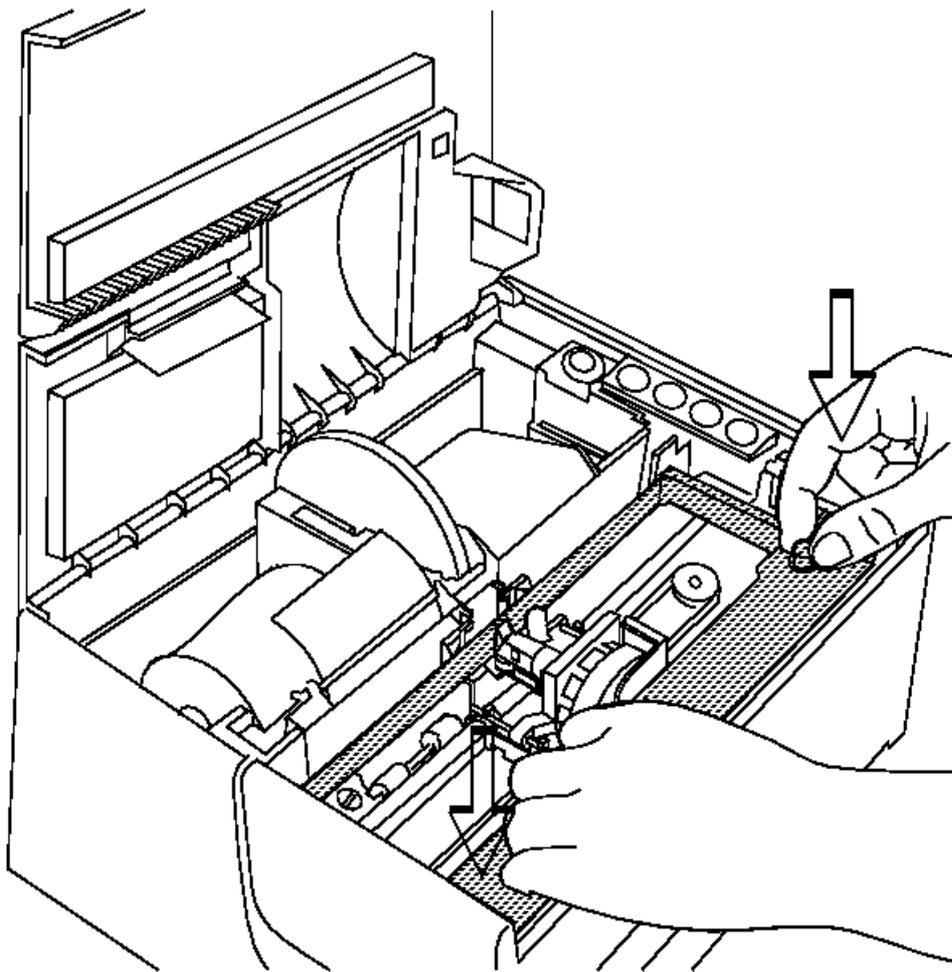
1. Rotate the ribbon feed knob clockwise to take up any slack in the ribbon. The knob is located on the top right side of the ribbon cartridge.



2. Line up the groove in the front center of the ribbon cartridge with the projection on the inside of the printer.

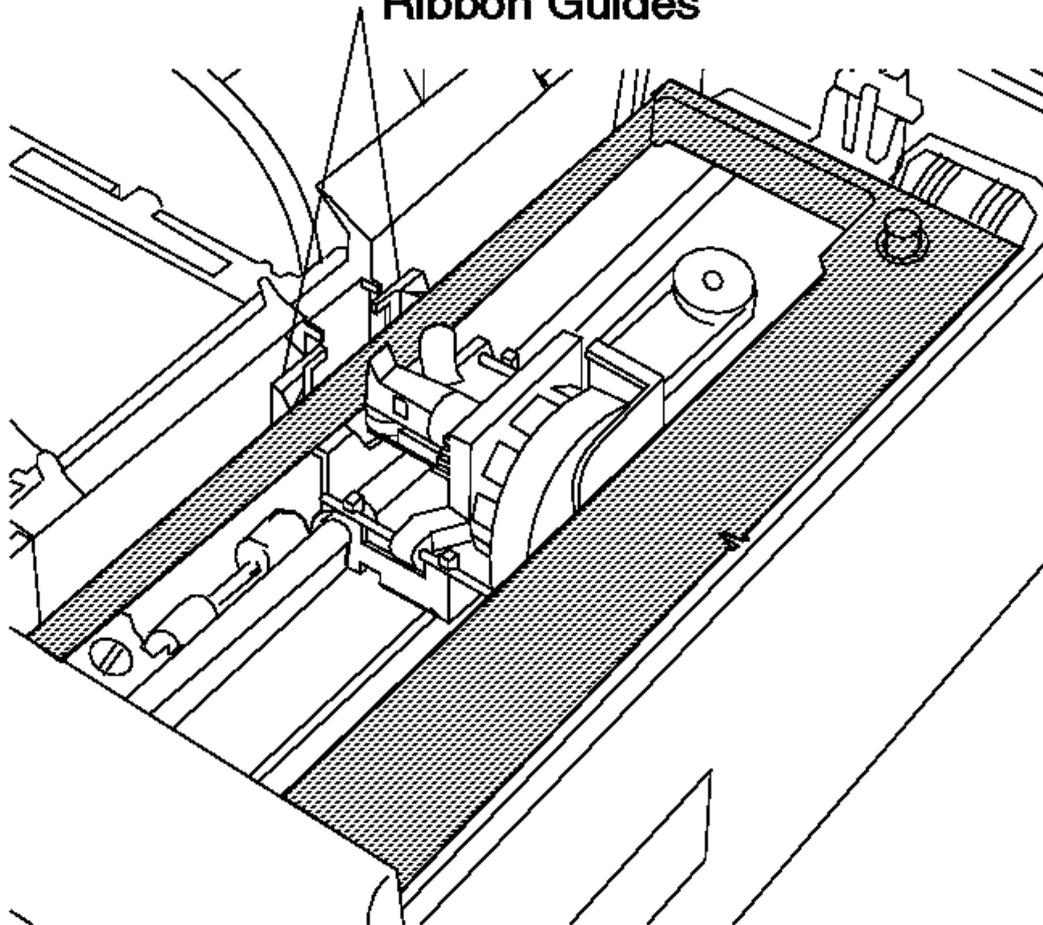


3. Press both ends of the ribbon cartridge straight down while rotating the ribbon feed knob clockwise until the cartridge snaps into place.

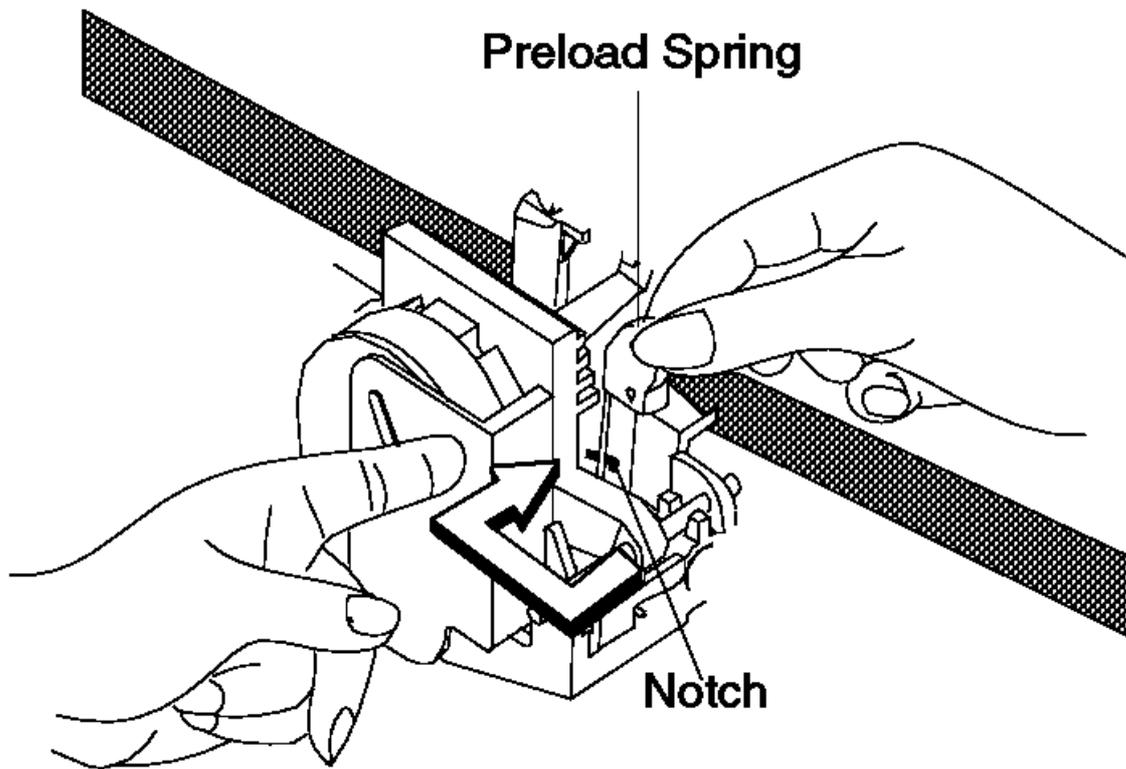


4. Ensure that the ribbon is between the print head and the two ribbon guides as shown in the following figure.

Ribbon Guides



5. Pull the print head preload spring toward the front of the printer.
6. Move the spring to the left and release it into the notch on the right side of the print head. The large arrow shows the movement of the preload spring.



7. Ensure that the print head is properly latched in place. The printer does not function if the print head is not properly seated.
8. Press the test button "T" to run the printer test to ensure that the ribbon is seated properly. (Put paper in both stations before running the test.)
9. Tear the customer receipt paper against the tear bar. If the paper is not torn off before you close the printer cover, it feeds down into the machine instead of through the slot in the printer cover.

5.5.24 Removing and Replacing the Receipt Paper Backup Roller

Subtopics

5.5.24.1 Removing the Receipt Paper Backup Roller

5.5.24.2 Replacing the Receipt Paper Backup Roller

5.5.24.1 *Removing the Receipt Paper Backup Roller*

1. Remove the top cover assembly.
2. Remove the platen assembly.
3. Slide the shaft to the left until the right side is free from the pivot.
4. Lift the receipt paper backup roller and shaft (1) with the spacers (2) out of the upper frame assembly.

5.5.24.2 Replacing the Receipt Paper Backup Roller

1. Put the receipt paper backup roller and shaft (1) with the spacers (2) into the upper frame assembly.
2. Reinstall the platen assembly.
3. Reinstall the top cover.

Reference	Page
Removing and Replacing the Platen and Paper Tear Guide	5.5.16
Removing and Replacing the Top Cover	5.5.25

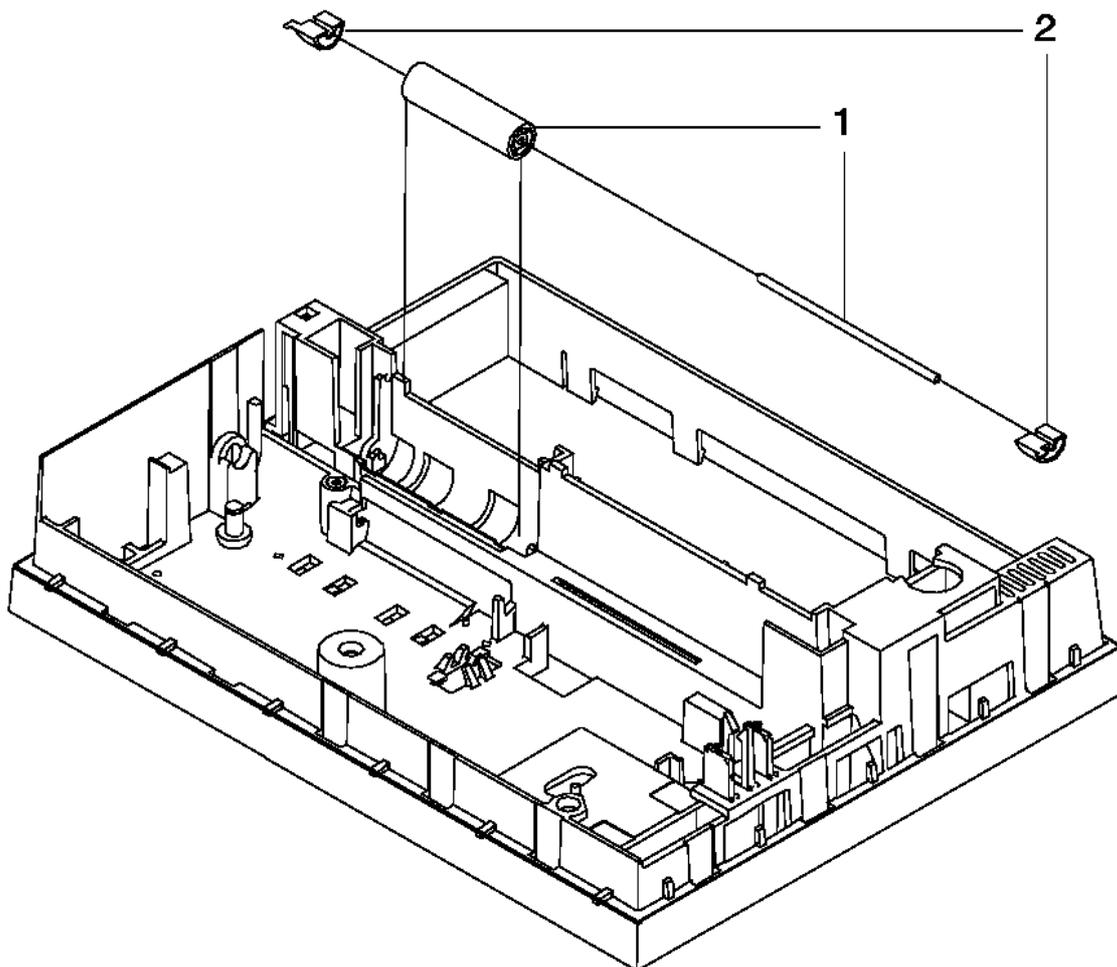


Figure 5-27. Receipt Paper Backup Roller. To illustrate the backup roller, the printer has been disassembled. Only the top cover and the platen need to be removed for this procedure.

5.5.25 *Removing and Replacing the Top Cover*

Subtopics

5.5.25.1 Removing the Top Cover

5.5.25.2 Replacing the Top Cover

5.5.25.1 *Removing the Top Cover*

1. Raise the access cover and the journal station cover (1).
2. Pull out and up on the top cover assembly at each side of the document insert slot (3).
3. Lift the left end and pivot the top cover assembly to the right side of the printer.
4. Disconnect the operator keypad cable from printer card connector J2. See Figure 5-26 in topic 5.5.22.2.
5. Lift the top cover assembly off the printer.

5.5.25.2 *Replacing the Top Cover*

1. Turn the printer so that the left side faces you.
2. Set the assembly on the printer with the left end raised as shown below.
3. Connect the operator keypad cable to printer card connector J2.
4. Lower the left side of the top cover while aligning the tabs (2) over the openings.
5. Push down and in on each side of the document insert slot (3) until the tabs lock into place.

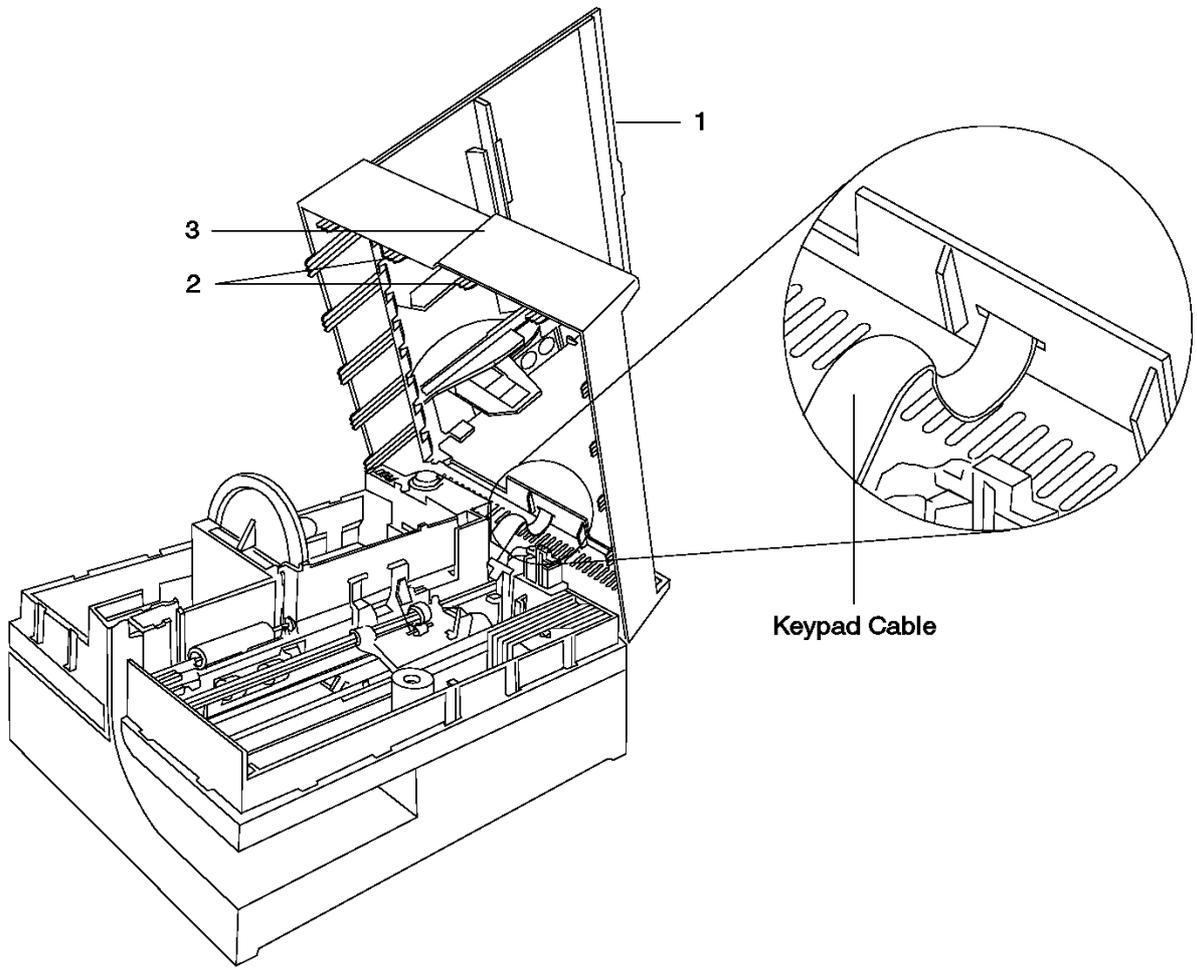


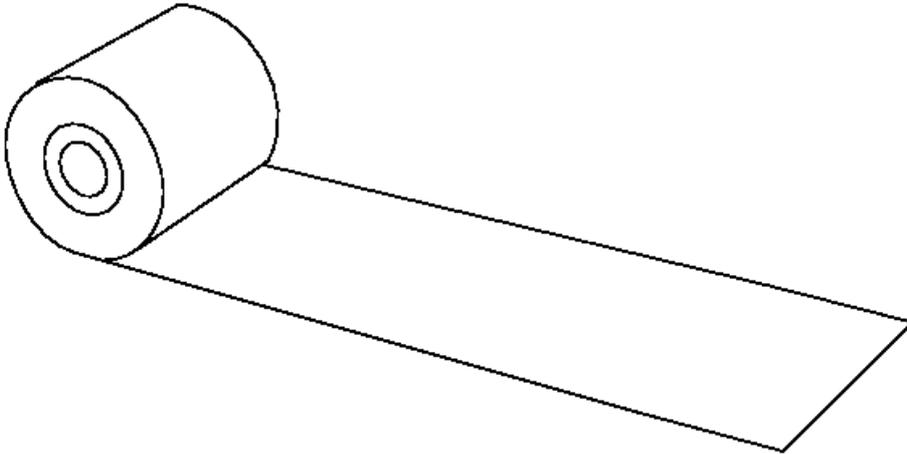
Figure 5-28. Top Cover

5.5.26 Replacing Customer Receipt Paper

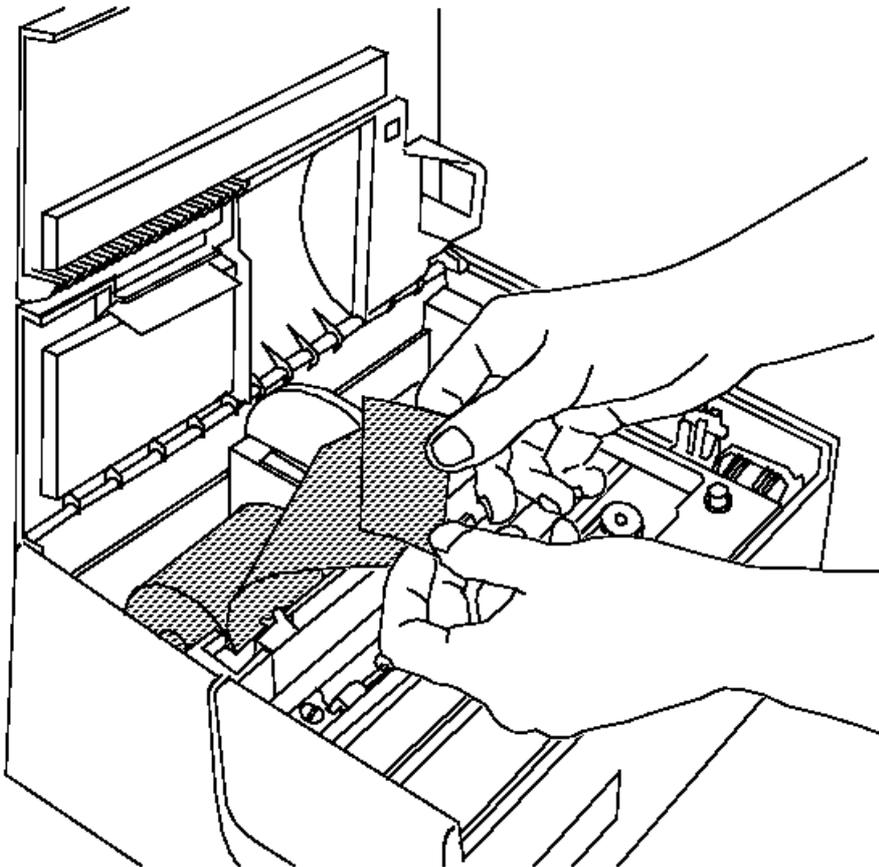
1. Remove the remaining parts of the old customer receipt paper roll and discard them.

Note: Do not pull the customer receipt paper backward through the customer receipt station.

2. Cut or tear the end of the new paper loose from the roll.
3. Turn the paper roll so that the loose end of the paper comes toward you from the bottom of the roll.
4. Pull out several inches of paper to work with as shown.

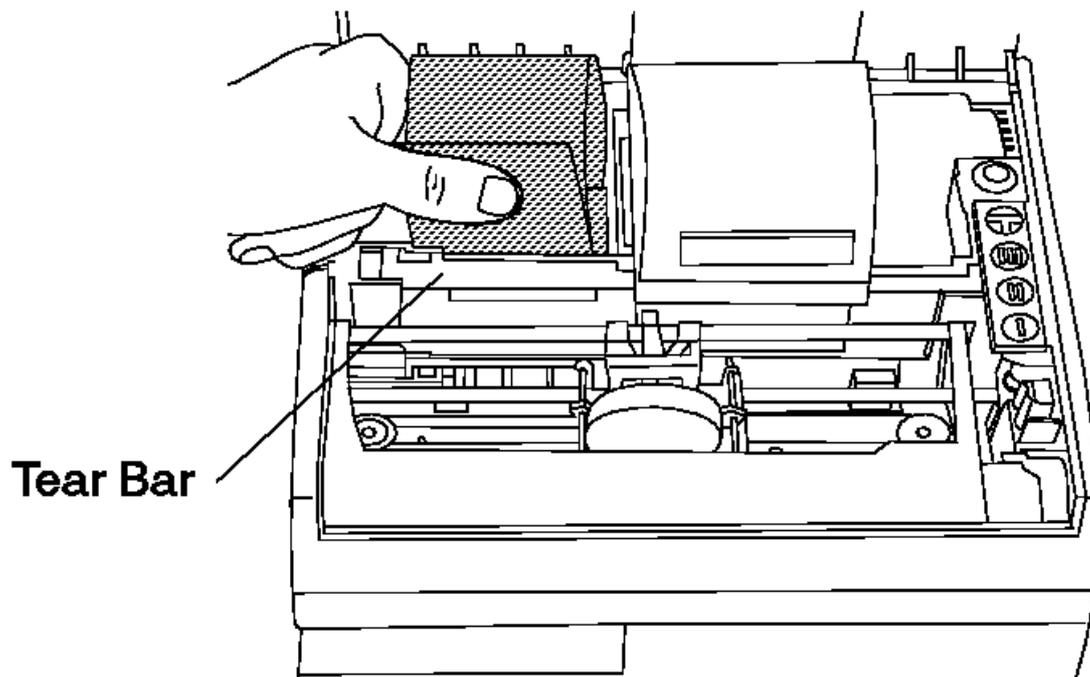


5. Place the paper roll in the customer receipt station.
6. Sharply fold back approximately 3 to 5 inches (7.5 to 13 cm) of the leading edge of the paper.

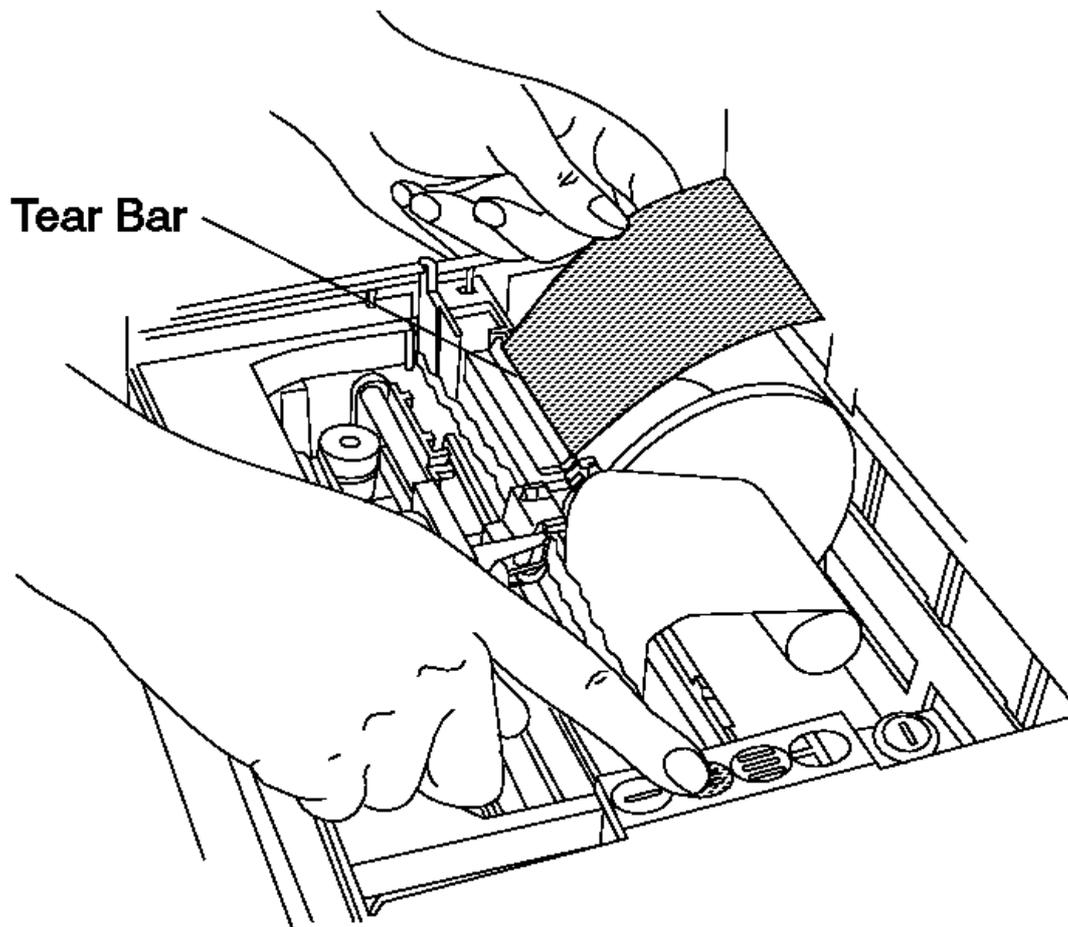


7. Insert the folded edge of the paper between the roller and the narrow space just behind the tear bar. Be sure the paper is centered in the opening and that the left and right sides of the folded end are square with the opening.

Push the paper downward until it stops. (Paper should not be seen coming out from below the tear bar.)



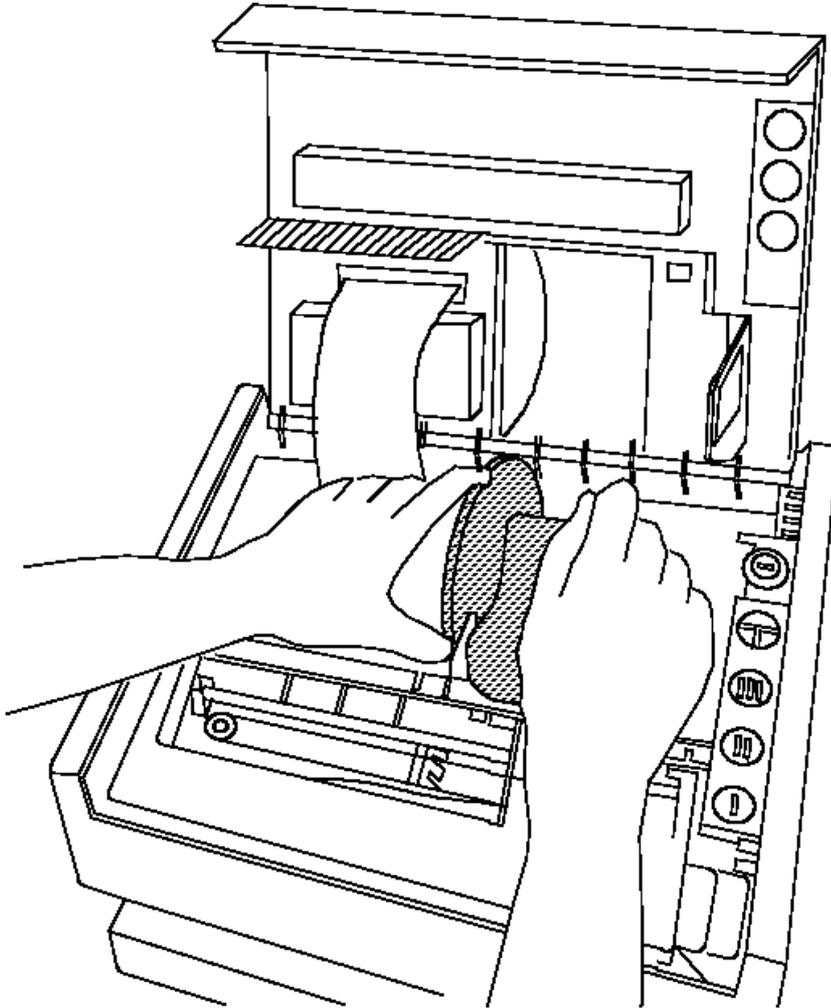
8. Press and hold the customer receipt advance button "II" until the paper feeds through the rollers and comes up behind the tear bar.



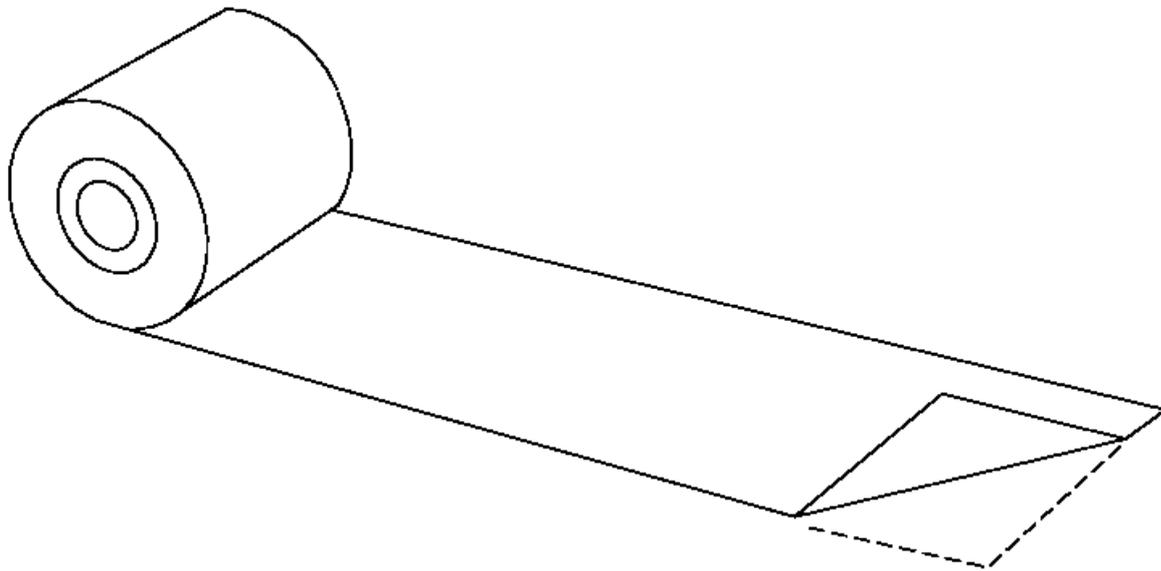
9. Press the test button "T" to run the printer test to ensure that the paper is loaded properly. (Put paper in both stations before running the test.)
10. Tear the customer receipt paper against the tear bar. If the paper is not torn off before you close the printer cover, it feeds down into the machine instead of through the slot in the printer cover.

5.5.27 Replacing Journal Station Paper

1. Gently push the print head to the left wall of the printer.
2. Tear the journal paper between the platen and the take-up spool.
3. Firmly grasp the take-up spool flange (black wheel) with your left hand to keep it from rotating.
4. Grasp the take-up roll of paper with your right hand and pull it off the spool. Rotate it toward the back of the printer as you do so.

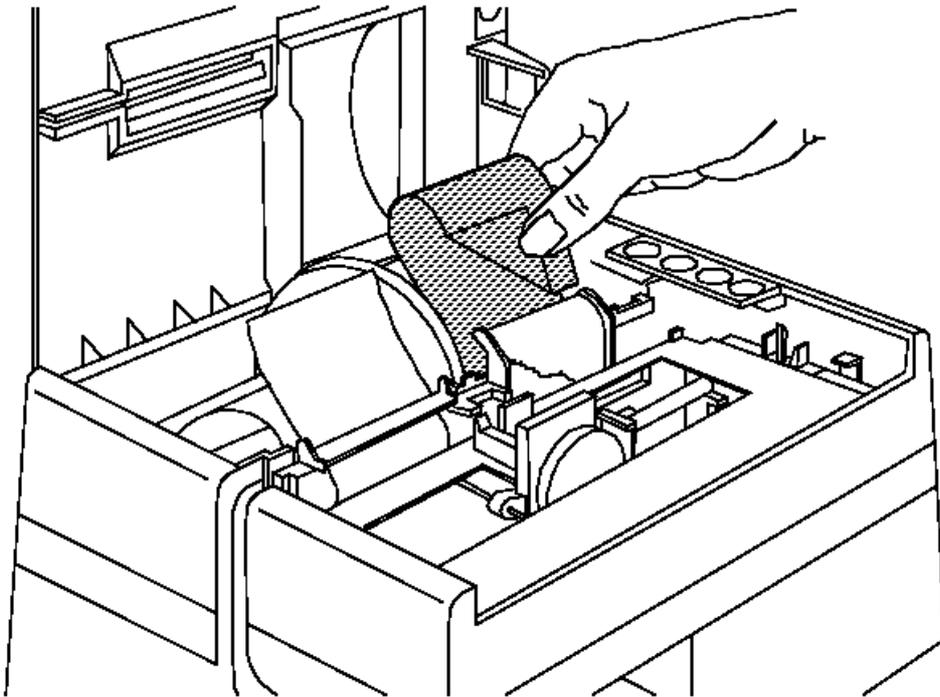


5. Remove the remaining parts of the old journal station paper roll and discard them.
6. Cut or tear the end of the new paper loose from the roll.
7. Turn the paper roll so that the loose end of the paper comes toward you from the bottom of the roll.
8. Pull out several inches of paper to work with and fold the end of the paper sharply as shown.

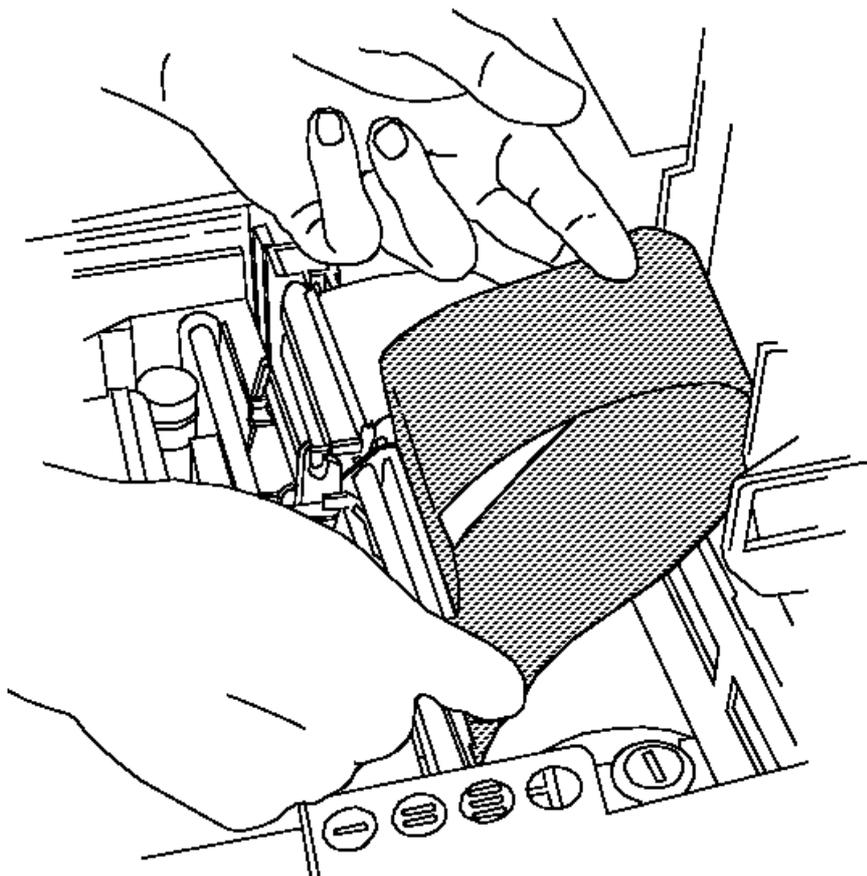


9. Place the paper roll in the journal station.

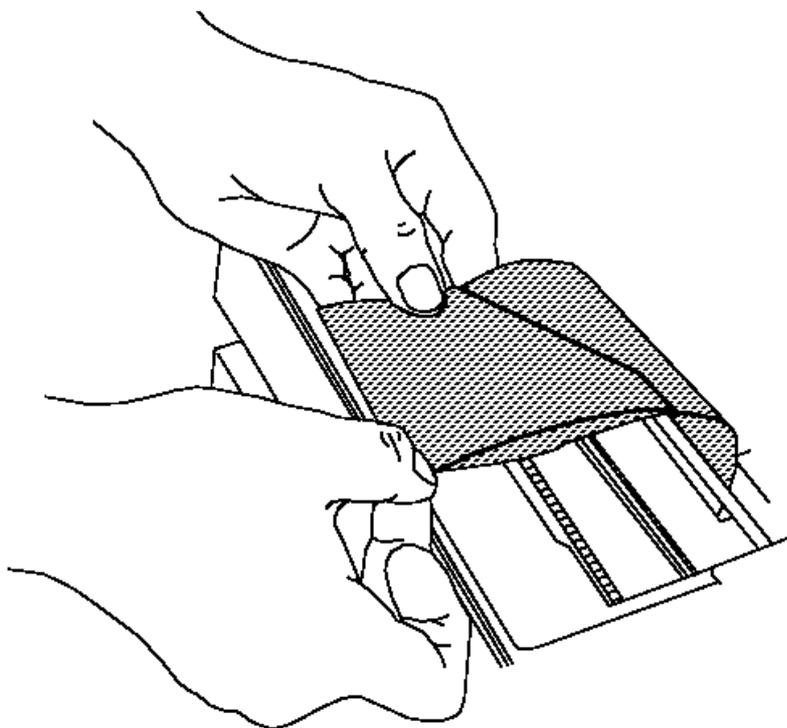
10. Point the leading edge of the paper down between the printer wall and the small roller just behind the wall. Be sure the paper is centered in the opening and that the left and right sides of the paper above the folded edge are square with the opening.



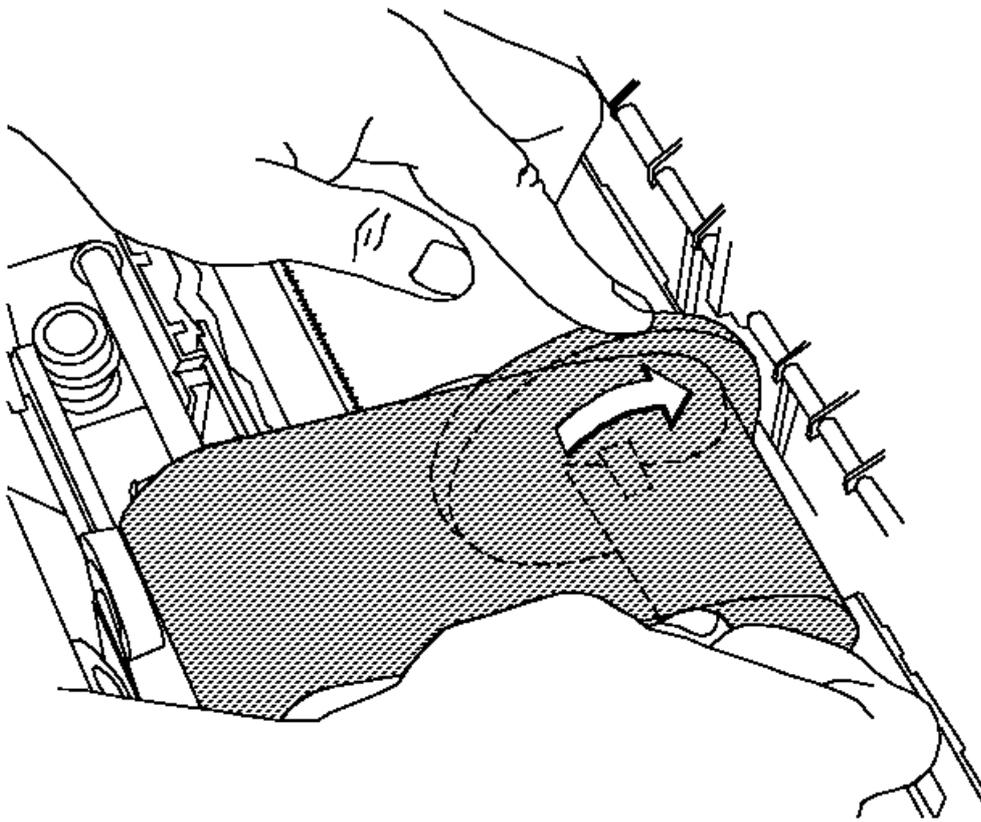
11. Put your fingers behind the paper and hold the paper against the back of the wall.



12. Use your fingers to repeatedly slide the paper down until it loops underneath and reappears in front.
13. Pull the paper straight up and toward you, about 8 inches.
14. Sharply fold back the leading edge of the paper approximately 1 to 2 inches as shown.



15. Pull the paper over the top of the take-up spool.
 16. Turn the paper fold down and slip the folded edge of the paper under the retainer (shown in the dotted lines) on the take-up spool.
- Turn the take-up spool toward the back of the printer to take the slack out of the paper. Gently push the paper toward the left side of the printer to keep the edge even as it loops around the take-up spool.



17. When the paper is wound snugly around the spool, press and hold the journal paper advance button "III" for a few seconds.
18. Press the test button "T" to run the printer test to ensure that the paper is loaded properly. (Put paper in both stations before running the test.)
19. Tear the customer receipt paper against the tear bar. If the paper is not torn off before you close the printer cover, it feeds down into the machine instead of through the slot in the printer cover.

5.6 Printer Sensor Checks

These tables provide the test points required to check the sensors in the point-of-sale printer.

Attention An 8060A (Fluke) digital CE meter must be used to perform the following printer sensor checks. Other meters may damage the sensors.

Readings other than the expected voltages indicate a failing sensor.

Subtopics

5.6.1 Cover Interlock Sensor

5.6.2 Document Insert Paper Sensor

5.6.3 Print Head Home Sensor

5.6.4 Journal Paper Motion Emitter Sensor

5.6.1 Cover Interlock Sensor

Meter Lead Connections to the Printer Card		
Positive Lead	Negative Lead	Expected Voltage (DC)
J3-3 (Green wire)	J3-1 (Black wire)	0.0 V to 0.4 V (sensor uncovered) 2.5 V to 5.5 V (sensor covered)
J3-4 (White wire)	J3-1 (Black wire)	1.0 V to 1.5 V (sensor uncovered and covered)

5.6.2 Document Insert Paper Sensor

Meter Lead Connections to the Printer Card		
Positive Lead	Negative Lead	Expected Voltage (DC)
J4-4 (Green wire)	J4-1 (Black wire)	0.0 V to 0.4 V (sensor uncovered)
		2.5 V to 5.5 V (sensor covered)
J4-5 (White wire)	J4-1 (Black wire)	1.0 V to 1.5 V (sensor uncovered and covered)

5.6.3 Print Head Home Sensor

Meter Lead Connections to the Printer Card		
Positive Lead	Negative Lead	Expected Voltage (DC)
J5-4 (Green wire)	J5-1 (Black wire)	0.0 V to 0.4 V (sensor uncovered) 2.5 V to 5.5 V (sensor covered)
J5-5 (White wire)	J5-1 (Black wire)	1.0 V to 1.5 V (sensor uncovered and covered)

5.6.4 Journal Paper Motion Emitter Sensor

Note: Rotate the journal paper take-up spool slowly to see the voltage change.

Meter Lead Connections to the Printer Card		
Positive Lead	Negative Lead	Expected Voltage (DC)
J8-3 (Green wire)	J8-1 (Black wire)	0.0 V to 0.4 V (sensor uncovered) 2.5 V to 5.5 V (sensor covered)
J8-5 (White wire)	J8-1 (Black wire)	1.0 V to 1.5 V (sensor uncovered and covered)

6.0 Chapter 6. Point-of-Sale Printer Models 3, 3R, 4, 4A, 4R

The MAPS are designed to address symptoms identified by running the STAND-ALONE PRINTER TESTS and the STAND-ALONE MICR TESTS (Models 3R and 4R only). Run these tests first, so that the MAPS call out the correct FRU to be exchanged.

The test procedures are written in MAP format and guide you through each test. The tests help create a *symptom* that directs you to another MAP or repair procedure. If you have a symptom that was not generated by one of these procedures, see topic 6.6 or 6.7.

Any time you are working on the printer it is a good idea to clean the sensors. This reduces the number of service calls caused by dust and paper debris.

Subtopics

- 6.1 Printer Abbreviations
- 6.2 Printer Models
- 6.3 Electrostatic Discharge (ESD)
- 6.4 TEST 4100: Stand-Alone Printer Test
- 6.5 Stand-Alone MICR Test
- 6.6 Printer Messages
- 6.7 Printer Symptoms
- 6.8 MAP 4110: CR or JNL Paper Advances Continuously
- 6.9 MAP 4120: Paper Cutter Does Not Cut Properly
- 6.10 MAP 4130: CR Paper Does Not Advance
- 6.11 MAP 4140: CR Paper Jams
- 6.12 MAP 4150: CR Station is Overprinting
- 6.13 MAP 4160: DI Paper Advances Continuously
- 6.14 MAP 4170: DI Station Does Not Feed Documents Correctly or Is Overprinting
- 6.15 MAP 4180: Home Errors
- 6.16 MAP 4190: JNL Paper Does Not Advance
- 6.17 MAP 4200: JNL Station Not Printing
- 6.18 MAP 4210: JNL Station is Overprinting
- 6.19 MAP 4220: MICR Does Not Read Correctly
- 6.20 MAP 4230: Power Problems
- 6.21 MAP 4240: Printed Characters are Light
- 6.22 MAP 4250: Printed Characters Missing One or More Dot Rows
- 6.23 MAP 4260: Printed Characters Are Smudged
- 6.24 MAP 4270: Printer Indicator Light Always On or Comes On Randomly
- 6.25 MAP 4280: Printer Indicator Light Not On
- 6.26 MAP 4290: Printer Indicator Light Not On When A Document Is Inserted
- 6.27 MAP 4300: Printer Not Printing Any Characters
- 6.28 MAP 4310: Ribbon Damaged by Printer
- 6.29 MAP 4320: Ribbon Does Not Advance
- 6.30 MAP 4330: CR Motor Resistance Checks
- 6.31 MAP 4340: Paper Cutter Motor Resistance Checks
- 6.32 MAP 4350: DI Motor Resistance Checks
- 6.33 MAP 4360: JNL Motor Resistance Checks
- 6.34 MAP 4370: Print Head Resistance Checks
- 6.35 MAP 4380: Transport Motor Resistance Checks
- 6.36 Printer Sensor Checks
- 6.37 Printer Adjustments
- 6.38 Removal and Replacement Procedures

6.1 Printer Abbreviations

The following abbreviations are used throughout this chapter:

CR customer receipt

DI document insert

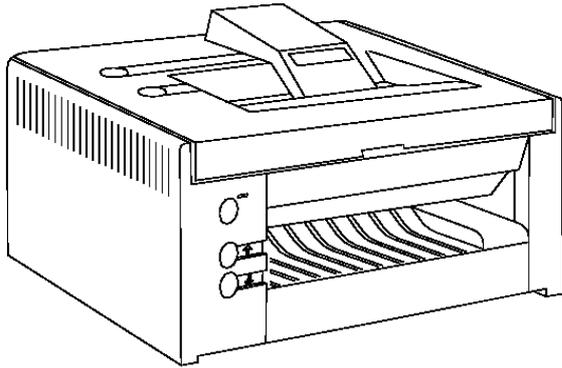
JNL journal station

MICR magnetic ink character recognition

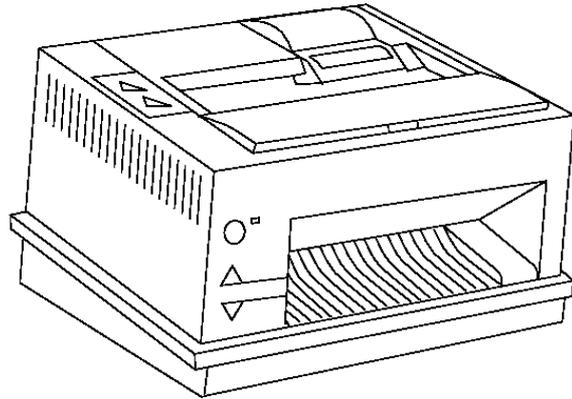
6.2 Printer Models

An "R" following the model number designates a printer with the capability to read MICR characters on checks.

Note: The Model 4 printer covers and buttons are slightly different than a Model 3. The illustrations in this chapter are mostly of the Model 3. Where the difference is important, both models are illustrated.



Model 3



Model 4

DANGER

+-----+
| Never work on equipment or connect or disconnect signal cables during |
| periods of lightning activity. |
+-----+

CAUTION:

For your safety, connect equipment requiring electrical power to a properly wired and grounded outlet.

6.3 *Electrostatic Discharge (ESD)*

Attention ESD damage can occur when there is a difference in charge between the part, the product, and the service person. No damage will occur if the service person and the part being installed are at the same charge level.

ESD Damage Prevention - Anytime a service action involves physical contact with logic cards, modules, back-panel pins, or other ESD sensitive (ESDS) parts, the service person must be connected to an ESD common ground point on the product through the ESD wrist strap and cord. The ESD ground clip can be attached to any frame ground, ground braid, green wire ground, or the round ground prong on the AC power plug. Coax or connector outside shells can also be used.

Handling Removed Cards - Logic cards removed from a product should be placed in ESD protective containers. No other object should be allowed inside the ESD container with the logic card. Attach tags or reports that must accompany the card to the outside of the container.

6.4 TEST 4100: Stand-Alone Printer Test

Note: When the printer access cover is open, the Ready button functions as a test button. The other four buttons, when pressed individually, function as paper advance buttons. See Figure 6-1 for the location of the printer buttons.

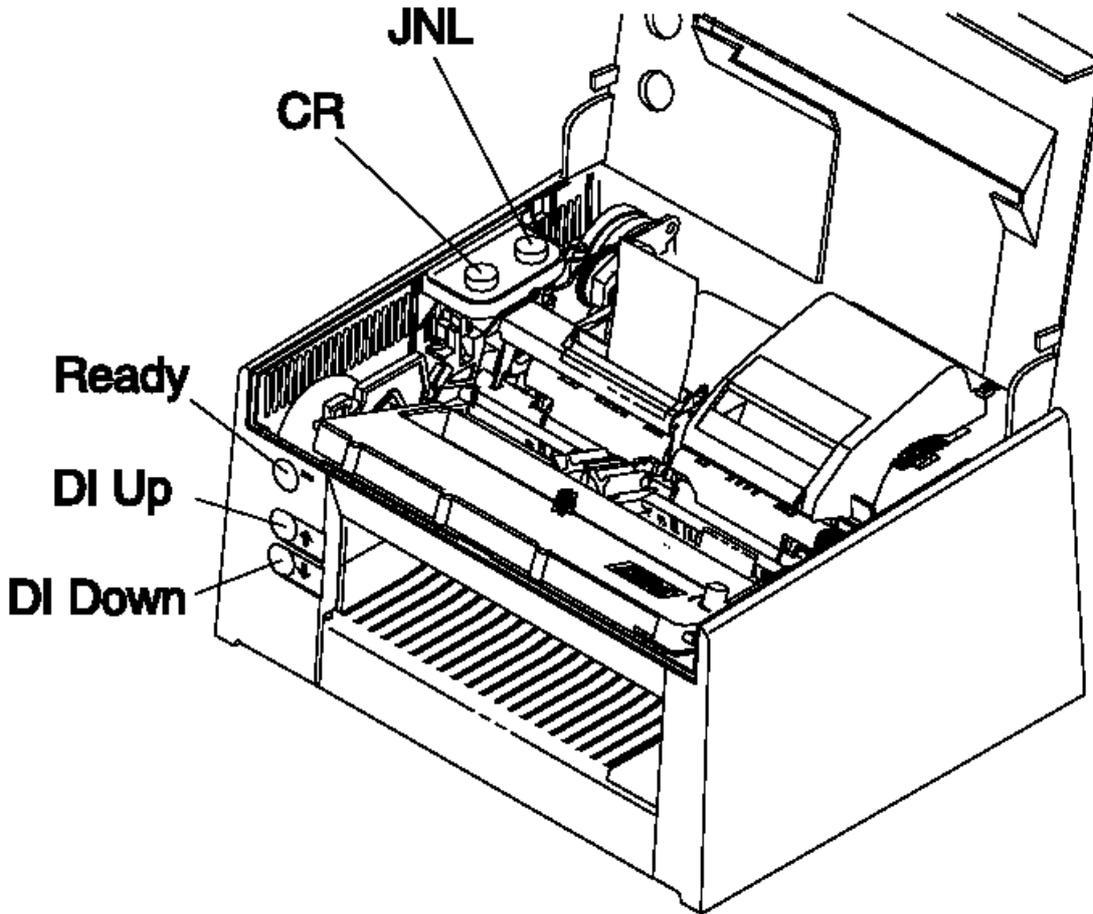


Figure 6-1. Printer Buttons

```
+----+
|001|
+----+
```

CAUTION:

For your safety when running the printer test, make sure personal articles such as ties, necklaces, or bracelets do not get caught in the moving print head.

- Open the cover on the printer.
- Ensure the following conditions are met before running the Stand-Alone Printer Test:
 - There is no document inserted in the printer.
 - The paper is installed correctly in both print stations.
 - The ribbon is in good working condition and it is seated correctly.

- Switch power ON at the point-of-sale terminal.

When the printer resets correctly, the printer indicator light next to Ready button comes on for a short time and the print head moves to the center position. See Figure 6-1 for the location of the buttons.

- While observing the printer indicator light, close the printer access cover.

Did the printer indicator light come ON?

```
Yes  No
|    |
|    |
|    +----+
|    |002|
```

+---+

Follow "MAP 4280: Printer Indicator Light Not On" in topic 6.25.

+---+
|003|
+---+

Did the printer indicator light go OFF after a short time?
Yes No

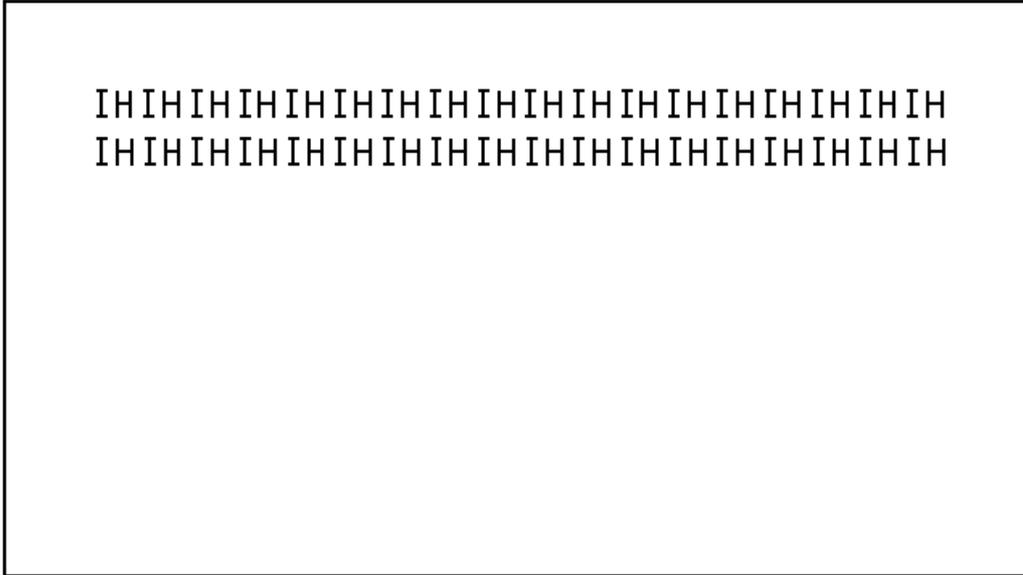


Figure 6-2. IH Test Pattern

|
+---+
|004|
+---+

Follow "MAP 4270: Printer Indicator Light Always On or Comes On Randomly" in topic 6.24.

+---+
|005|
+---+

- Open the printer access cover.

Is the printer indicator light flickering?
Yes No

+---+
|006|
+---+

- Continue at Step 008.

+---+
|007|
+---+

Follow "MAP 4180: Home Errors" in topic 6.15.

+---+

Yes No

```
|
| |
| +----+
| |015|
| +----+
```

Follow "MAP 4150: CR Station is Overprinting" in topic 6.12

```
+----+
|016|
+----+
```

The paper cutter should cut all but a small tab on the CR paper.

Did the paper cutter cut the CR paper correctly?

Yes No

```
|
| |
| +----+
| |017|
| +----+
```

Follow "MAP 4120: Paper Cutter Does Not Cut Properly" in topic 6.9.

```
+----+
|018|
+----+
```

The following steps test the **JNL station**.

- Press JNL button to advance paper at the JNL station. See Figure 6-1.

Did the JNL paper advance?

Yes No

```
|
| |
| +----+
| |019|
| +----+
```

Follow "MAP 4190: JNL Paper Does Not Advance" in topic 6.16.

```
+----+
|020|
+----+
```

- Close then open the cover to clear any outstanding JNL errors.

- Press and hold the Ready button and then press the JNL button to start the printer test.

The test begins and prints 50 lines of 38 characters.

Note: If the JNL paper movement sensor does not sense paper movement, the print head moves but print wires are not activated.

Allow at least 10 lines to print before stopping the test. You can stop the test at any time by pressing the Ready button.

Did the print head print on every line?

Yes No

```
|
| |
| +----+
| |021|
| +----+
```

Follow "MAP 4200: JNL Station Not Printing" in topic 6.17

```
+----+
|022|
+----+
```

- Compare the printing at the JNL station with Figure 6-2.

Did the IH pattern print correctly without overprinting?

Yes No

```
|
| |
| +----+
| |023|
| +----+
```

Follow "MAP 4210: JNL Station is Overprinting" in topic 6.18.

|
+----+
| 024 |
+----+

The following steps test the **DI station**.

- Close the printer access cover.
- Insert a document into the front of the printer while observing the printer indicator light.

Did the printer indicator light come ON?

Yes No

|
|
+----+
| 025 |
+----+

Follow "MAP 4290: Printer Indicator Light Not On When A Document Is Inserted" in topic 6.26.

+----+
| 026 |
+----+

- Remove the document from the front of the printer and insert it into the top of the printer.

Did the printer indicator light come ON?

Yes No

|
|
+----+
| 027 |
+----+

Follow "MAP 4290: Printer Indicator Light Not On When A Document Is Inserted" in topic 6.26.

+----+
| 028 |
+----+

- Press the Ready button.

Did the document advance into the printer?

Yes No

|
|
+----+
| 029 |
+----+

The document is not inserted correctly. Insert it again and return to Step 028.

- or -

Exchange the printer card. See topic 6.38.37.

+----+
| 030 |
+----+

- Press the DI up button, then press the DI down button (5).

Did the document move up and then down in the printer?

Yes No

|
|
+----+
| 031 |
+----+

Follow "MAP 4170: DI Station Does Not Feed Documents Correctly or Is Overprinting" in topic 6.14.

+----+
| 032 |
+----+

- Open the printer access cover.
- Press and hold the Ready button and then press the DI down button (5) to start the printer test.

The test begins and prints lines of 38 characters for 50 lines or until the end of the document is reached.

Allow a few lines to print before stopping the test. You can stop the test at any time by pressing the Ready button.

Did the printer print without overprinting?

Yes No

```
| |
| |
| +---+
| |033|
| +---+
| See topic 6.14.
```

```
+---+
|034|
+---+
```

The Stand-Alone Printer Test is complete. If you are working on a Model 3R or 4R printer, go to "Stand-Alone MICR Test" in topic 6.5 and perform the MICR test.

5. Compare the characters at the bottom of the check with those that are printed. The numeric characters should be the same. See "Special MICR Characters" in topic 6.5.1 for special characters.

If one of the following symptoms is observed, go to "MAP 4220: MICR Does Not Read Correctly" in topic 6.19.

- The test does not seem to detect the presence of a check (Green Ready indicator does not come ON).
- No characters are printed after the check is read.
- The printed characters are different than those printed on the check.
- Two (2) passes of the check are required to read the characters.
- The checks jam.

6. The Stand-Alone MICR Test is complete.

Subtopics

6.5.1 Special MICR Characters

6.5.2 MICR Head and Feed Rollers Cleaning Procedure

6.5.1 Special MICR Characters

Note: Test checks contain E13B characters only. They should be used for all MICR printers regardless of the characters printed on the customer checks.

Table 6-1. E13B Special Characters	
Special Character	Printed Character
PICTURE 127	\$
PICTURE 128	A
PICTURE 129	T
PICTURE 130	- (dash)

Table 6-2. CMC7 Special Characters	
Special Character	Printed Character
PICTURE 131	a
PICTURE 132	b
PICTURE 133	c
PICTURE 134	d
PICTURE 135	e

6.5.2 MICR Head and Feed Rollers Cleaning Procedure

1. Remove the head cleaner from its package. The head cleaners are available by ordering P/N 73G2600. See the package for cleaning illustration.
2. Insert the cleaner into the front of the printer, as if it were a check.
3. See Figure 6-5 and press button (4) until the cleaner appears at the top of the printer.
4. Press button (5) until the cleaner appears at the bottom of the printer.
5. Repeat this sequence 2 or 3 times.
6. To clean the feed rollers, simply hold the cleaner as it begins to feed into the printer. This causes the rollers to be cleaned as they slip on the cleaner.
7. Press button (5) to feed the cleaner out the bottom of the printer.
8. Repeat the feed roller cleaning until no smudge marks appear on the cleaner.
9. Discard the cleaner.

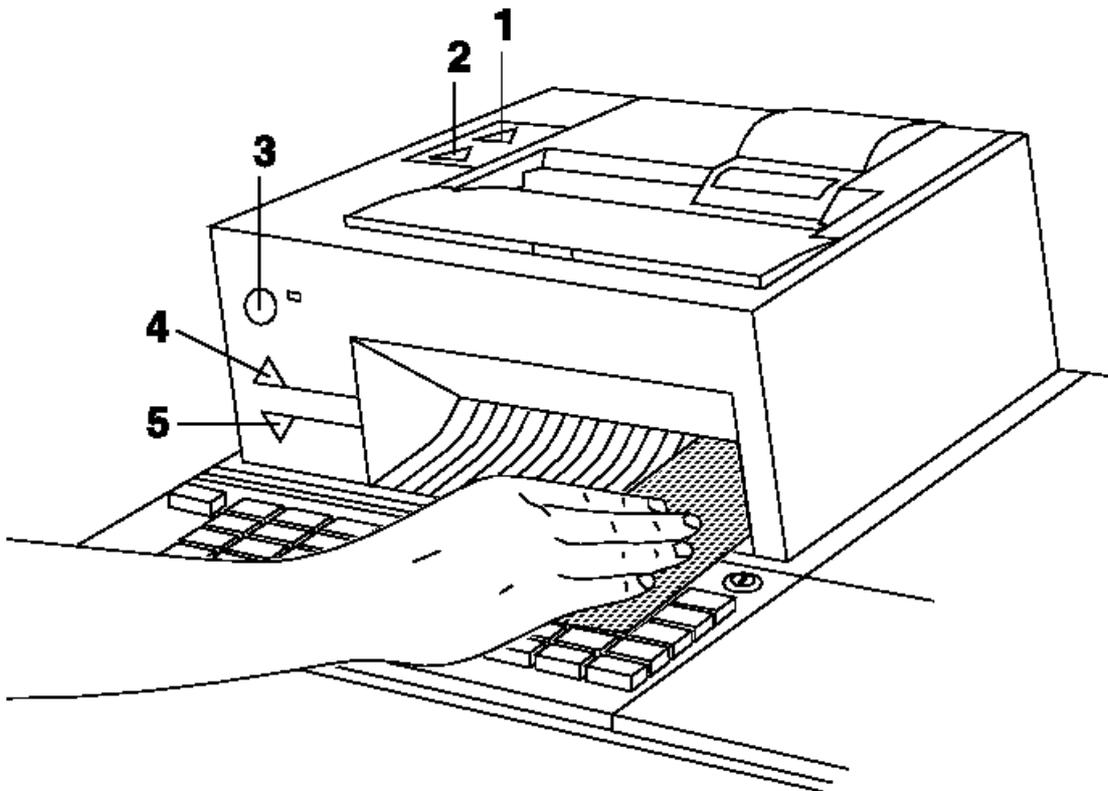


Figure 6-5. Inserting a Head Cleaner in Models 3R and 4R Printer

6.6 Printer Messages

Table 6-3. Printer Messages	
Printer Message	Repair Actions
6334 6338 63B4 63B8	Perform further testing using system online tests or reference diskette diagnostics.
T7151	<input type="checkbox"/> Exchange the printer card. See topic 6.38.37. <input type="checkbox"/> Exchange cable 7.
T7152	Follow "MAP 4180: Home Errors" in topic 6.15.
T7153 T7154 T7155 T7156 T7157	If the Stand-Alone Printer Tests run OK, exchange the printer card. See topic 6.38.37.
T7159	Exchange the printer card. See topic 6.38.37.
T7167 T7168	If Stand-Alone Printer Tests run OK, exchange the printer card. See topic 6.38.37.
W304 W305 W354 W355	Perform further testing using system online tests or reference diskette diagnostics.

6.7 Printer Symptoms

Table 6-4. Printer Symptoms	
Printer Symptom	Repair Actions
The paper cutter does not cut correctly.	Follow "MAP 4120: Paper Cutter Does Not Cut Properly" in topic 6.9.
The CR station does not advance paper.	Follow "MAP 4130: CR Paper Does Not Advance" in topic 6.10.
The CR station advances paper continuously.	Follow "MAP 4110: CR or JNL Paper Advances Continuously" in topic 6.8.
The CR station gets paper jams.	Follow "MAP 4140: CR Paper Jams" in topic 6.11.
The CR station is overprinting.	Follow "MAP 4150: CR Station is Overprinting" in topic 6.12.
The DI station does not position the forms correctly.	Follow the "Printer Adjustments" in topic 6.37.
The DI station does not advance inserted documents.	Follow "MAP 4170: DI Station Does Not Feed Documents Correctly or Is Overprinting" in topic 6.14.
The DI station advances documents continuously.	Follow "MAP 4160: DI Paper Advances Continuously" in topic 6.13.
The DI station is overprinting.	Follow "MAP 4170: DI Station Does Not Feed Documents Correctly or Is Overprinting" in topic 6.14.
The JNL spool does not wind paper tightly.	<ul style="list-style-type: none"> <input type="checkbox"/> Exchange the JNL pawl. See topic 6.38.23. <input type="checkbox"/> Exchange the JNL takeup clutch assembly. See topic 6.38.23.
The JNL station does not advance paper.	Follow "MAP 4190: JNL Paper Does Not Advance" in topic 6.16.
The JNL station advances paper continuously.	Follow "MAP 4110: CR or JNL Paper Advances Continuously" in topic 6.8.
The JNL station gets paper jams.	Load the paper or spool correctly or exchange the JNL roller assembly. See topic 6.38.26.
The JNL station does not print any characters or reports false errors.	Follow "MAP 4200: JNL Station Not Printing" in topic 6.17.
The JNL station is overprinting.	Follow "MAP 4210: JNL Station is Overprinting" in topic 6.18.
The lock does not work.	Exchange the lock. See topic 6.38.22.
The magnetic ink character reader (MICR) fails to read correctly.	Follow "MAP 4220: MICR Does Not Read Correctly" in topic 6.19.
The print head does not return to center home.	Follow "MAP 4180: Home Errors" in topic 6.15.
The printed characters are not centered on the paper.	Adjust the home sensor card. See topic 6.38.32.
The printed characters are not centered line to line.	Follow "Printer Adjustments" in topic 6.37.
The printed characters are light.	Follow "MAP 4240: Printed Characters are Light" in topic 6.21.
The printed characters	Follow "MAP 4250: Printed Characters

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Printer Symptoms

are missing one or more dot rows.	Missing One or More Dot Rows" in topic 6.22.
The printed characters are smudged.	Follow "MAP 4260: Printed Characters Are Smudged" in topic 6.23.
The printed characters have extra dots.	Exchange the printer card. See topic 6.38.37.
The printer does not print.	Follow "MAP 4300: Printer Not Printing Any Characters" in topic 6.27.
The printer does not power-ON.	Follow "MAP 4230: Power Problems" in topic 6.20.
The printer causes the point-of-sale terminal power supply to shut down.	Follow "MAP 4230: Power Problems" in topic 6.20.
The printer causes the point-of-sale terminal display to go blank.	Follow "MAP 4230: Power Problems" in topic 6.20.
The printer indicator light does not come ON when a document is inserted.	Follow "MAP 4290: Printer Indicator Light Not On When A Document Is Inserted" in topic 6.26.
The printer indicator light is flickering.	Follow "MAP 4180: Home Errors" in topic 6.15.
The printer indicator light is always ON.	Follow "MAP 4270: Printer Indicator Light Always On or Comes On Randomly" in topic 6.24.
The printer indicator light never comes ON.	Follow "MAP 4280: Printer Indicator Light Not On" in topic 6.25.
The ribbon does not advance.	Follow "MAP 4320: Ribbon Does Not Advance" in topic 6.29.
The ribbon is damaged by the printer.	Follow "MAP 4310: Ribbon Damaged by Printer" in topic 6.28.

6.8 MAP 4110: CR or JNL Paper Advances Continuously

Symptom Explanation	Conditions That Could Cause This Symptom
The JNL or CR station advances paper continuously.	<input type="checkbox"/> The top button assembly is failing.
	<input type="checkbox"/> The printer card is failing.

+---+
 |001|
 +---+

- Switch **POWER OFF** at the terminal.
- Remove the main cover, leaving the three cables connected. See topic 6.38.30.
- Disconnect cable J8 from the printer card. See Figure 6-6.
- Switch power ON at the terminal.

Did the paper stop advancing?

Yes No

|
 +---+
 |002|
 +---+

Exchange the printer card. See topic 6.38.37.

+---+
 |003|
 +---+

Exchange the button assembly.

- Model 3 - See topic 6.38.6
- Model 4 - See topic 6.38.7.

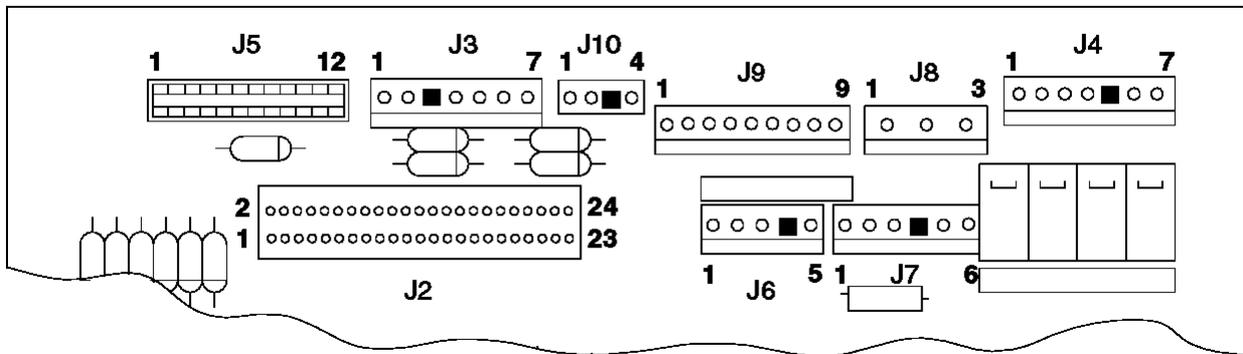


Figure 6-6. Printer Card Connections

6.9 MAP 4120: Paper Cutter Does Not Cut Properly

Symptom Explanation	Conditions That Could Cause This Symptom
The paper cutter does not cut correctly.	<input type="checkbox"/> The paper cutter is jammed. <input type="checkbox"/> The paper cutter is failing.

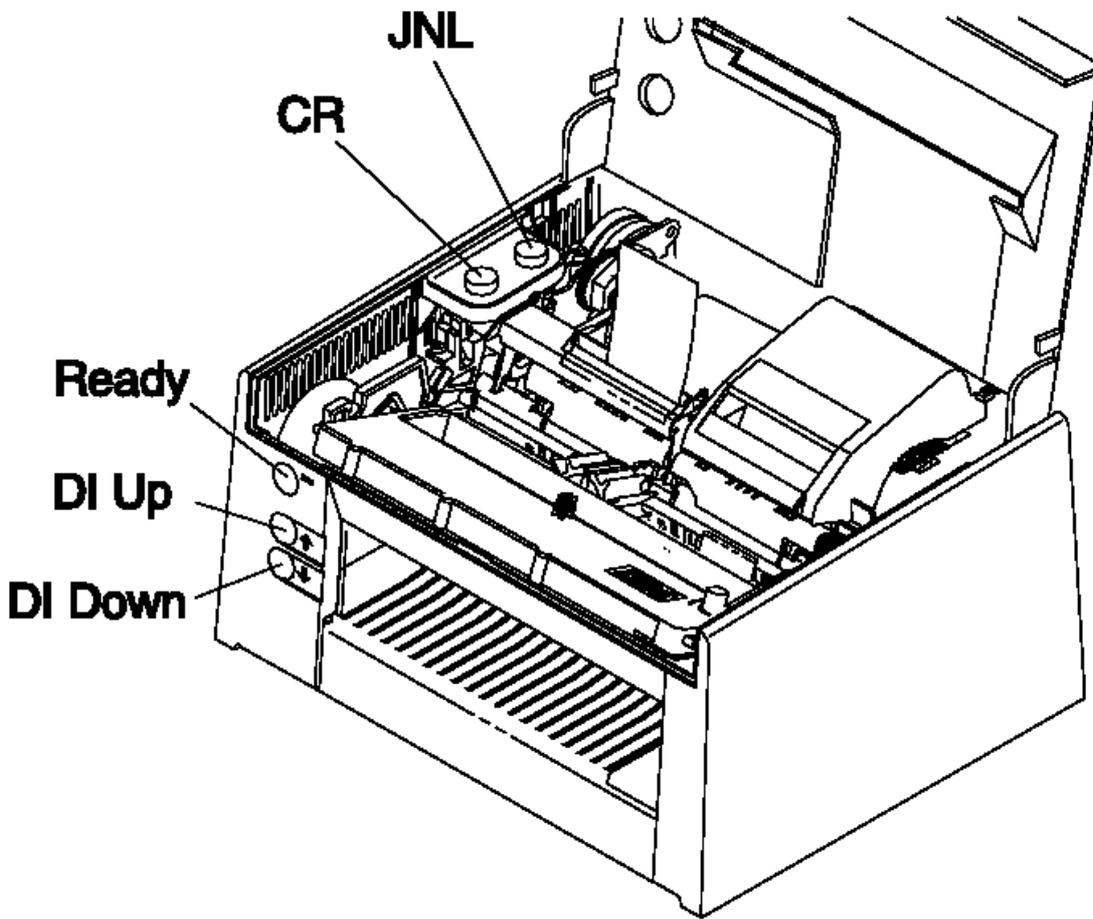


Figure 6-7. Printer Buttons

**Lift Here
To Raise
Cutter Cover**

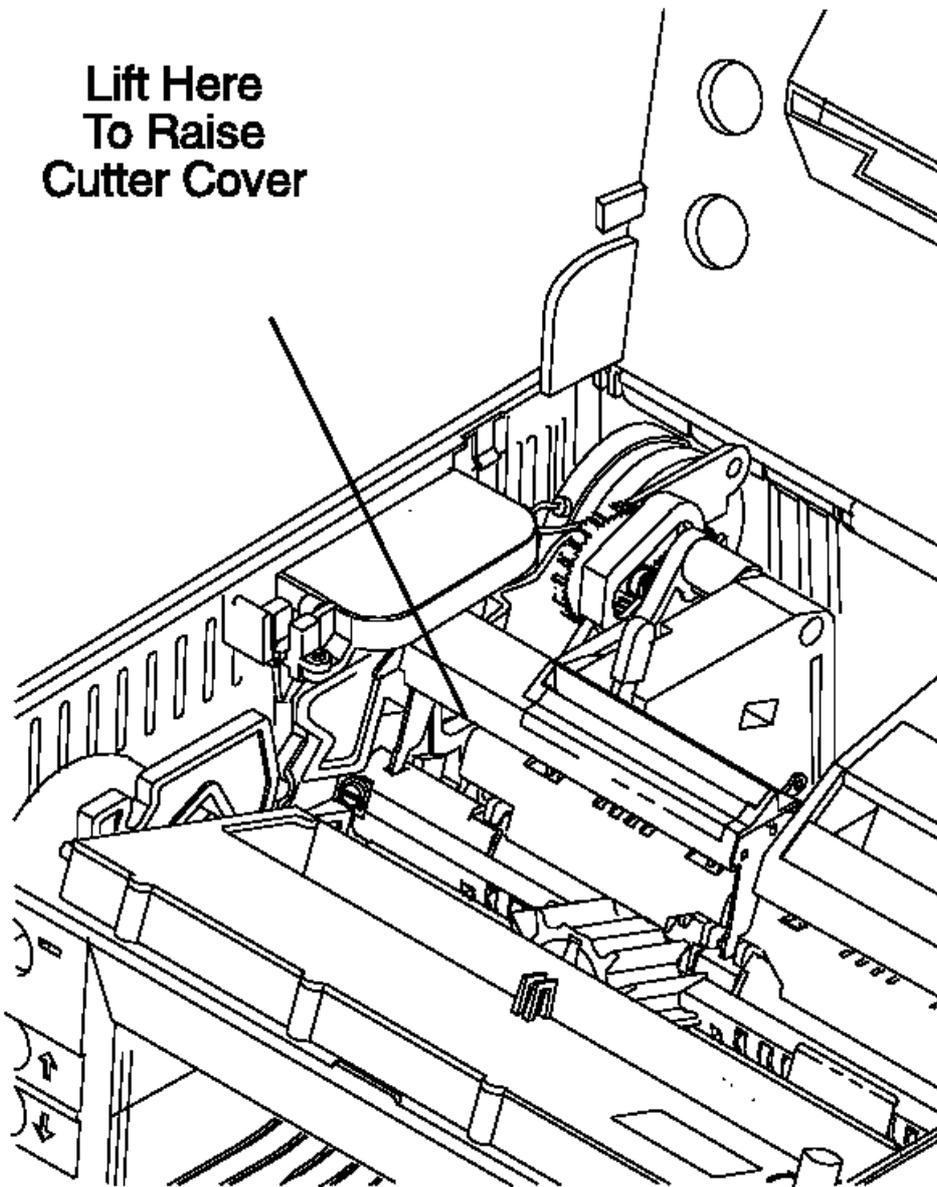


Figure 6-8. Paper Cutter

```
+---+  
|001|  
+---+
```

The Stand-Alone Printer Test must be run before continuing.

Have you run the Stand-Alone Printer Test?

Yes No

```
|  
|  
+---+  
|002|  
+---+
```

Run the Stand-Alone Printer Test. Go to topic 6.4.

```
+---+  
|003|  
+---+
```

- Switch **POWER OFF** at the terminal.

- Remove the main cover, leaving the three cables connected. See topic 6.38.30.

- Open the paper cutter cover by pulling up on the front of it. See Figure 6-8.
- Check for objects or paper jammed between the cutter blades or jammed in the cutter mechanism.

Is the cutter mechanism clear?

Yes No

```
|
| |
| +---+
| |004|
| +---+
```

To clear a paper jam:

- See Figure 6-8.
- Open the cutter cover.
- Move the toggle and look for any paper or debris.
- Remove the platen, if necessary.

Run the Stand-Alone Printer Test. Go to topic 6.4.

```
+---+
|005|
+---+
```

At the end of the following CR printer test, the paper cutter cuts the CR paper:

- Switch power ON at the terminal.
- Press and hold the Ready button. See Figure 6-7.
- Press the CR button.
- Release both buttons.
- While observing the paper cutter, press the Ready button.

The paper cutter gears, (1) in Figure 6-8, should move smoothly and the paper cutter blades should completely retract.

Did the paper cutter operate correctly?

Yes No

```
|
| |
| +---+
| |006|
| +---+
```

Exchange the paper cutter. See topic 6.38.11.

```
+---+
|007|
+---+
```

The paper cutter is working correctly.

Run the Stand-Alone Printer test. See topic 6.4.

6.10 MAP 4130: CR Paper Does Not Advance

Symptom Explanation	Conditions That Could Cause This Symptom
The paper in the CR station does not advance.	<input type="checkbox"/> There are obstructions in the CR paper path. <input type="checkbox"/> The CR motor gear assembly is failing. <input type="checkbox"/> The CR roller assembly is failing. <input type="checkbox"/> The top button assembly is failing. <input type="checkbox"/> The CR motor is failing. <input type="checkbox"/> The print head and printer card are both failing (exchange both at the same time).

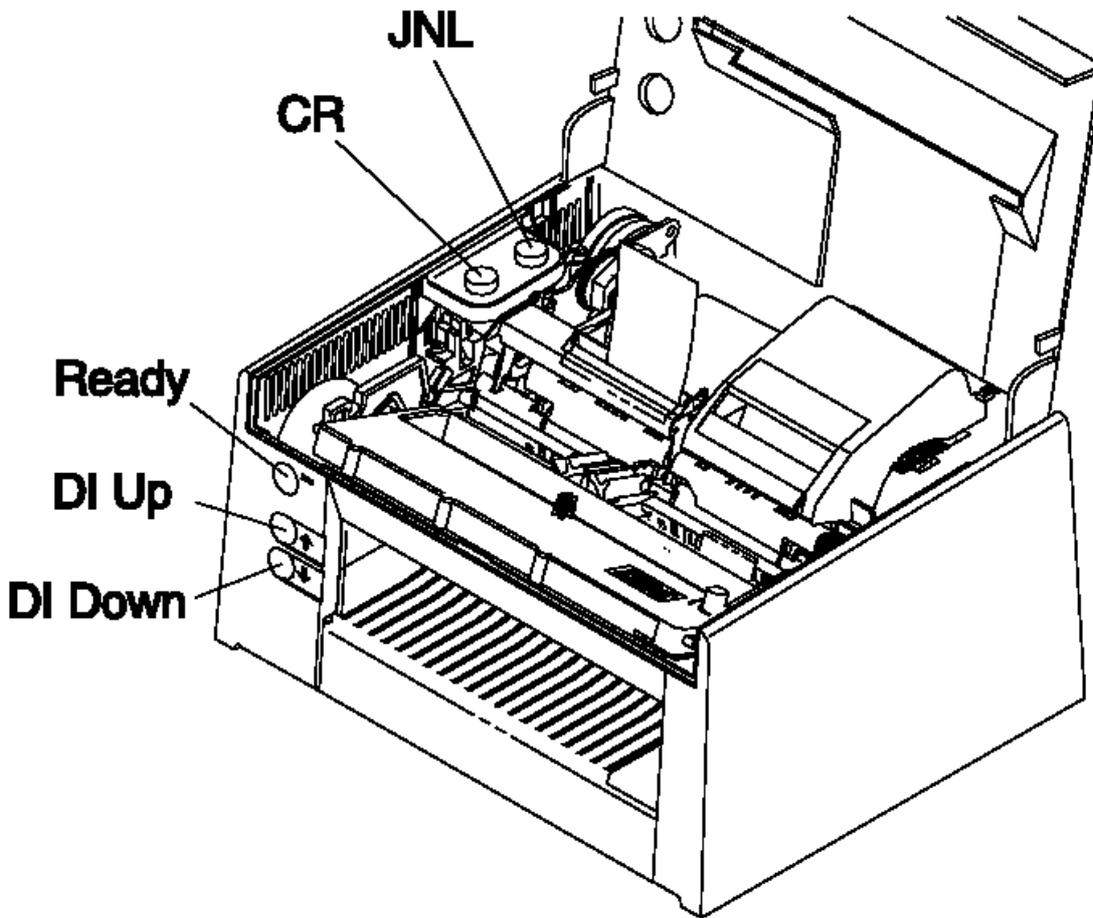


Figure 6-9. Printer Buttons

```
+----+
|001|
+----+
```

- Switch **POWER OFF** at the terminal.
- Remove the paper from the CR station and check for anything blocking the paper path.

Is the paper path clear of obstructions?

```
Yes No
|
+----+
|002|
+----+
```

Clear the paper path, load new paper and test the printer. See "TEST 4100: Stand-Alone Printer Test" in topic 6.4.

+----+
| 003 |
+----+

- Switch power ON at the terminal.
- Press the CR button.
- Observe the gear (1) on the side of the station. See Figure 6-10.

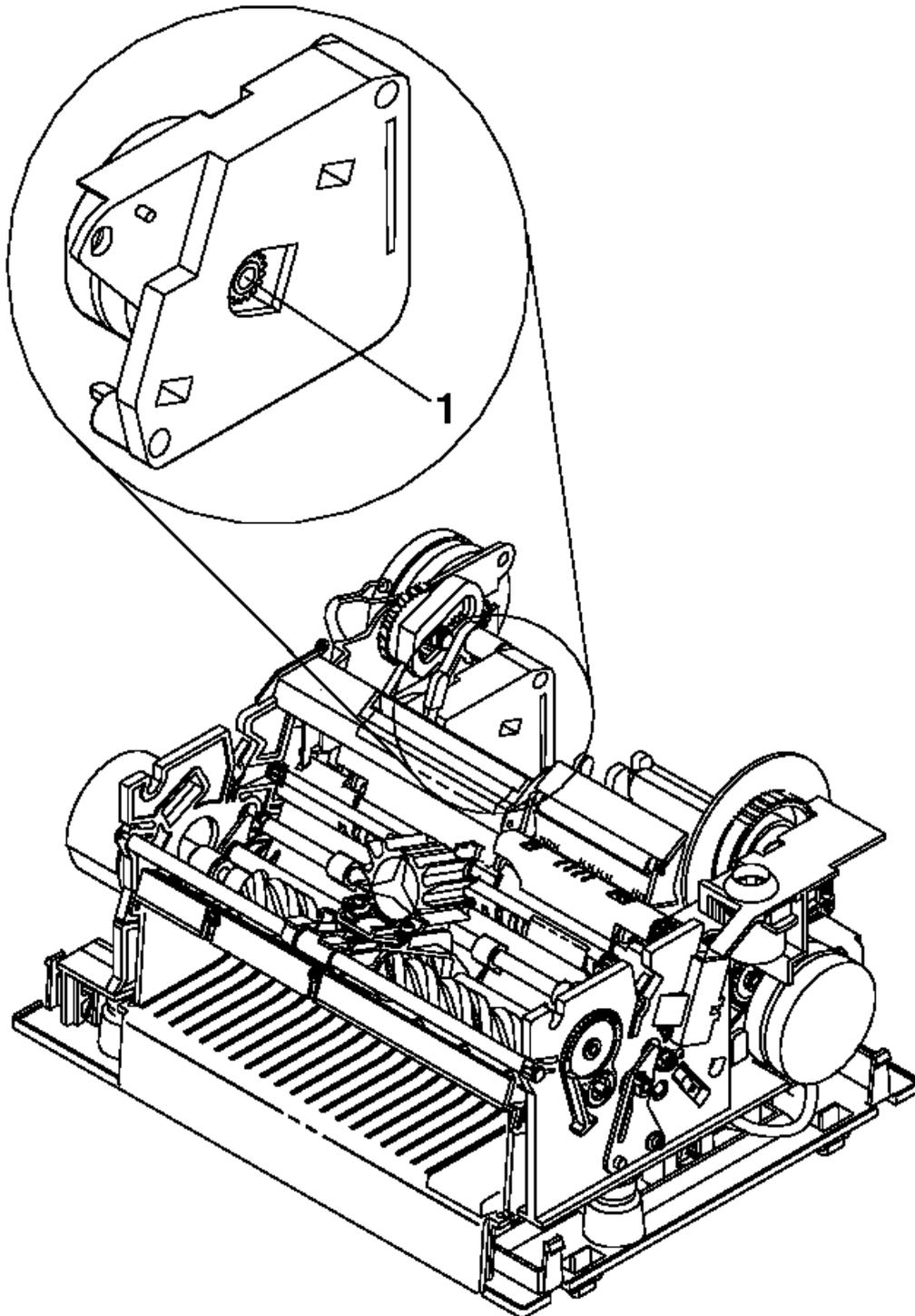


Figure 6-10. CR Motor Gear

Did the gear turn?

Yes No

| |

+---+
| 004 |
+---+

- Continue at Step 012.

+---+
| 005 |
+---+

Does the CR motor move without making abnormal noises?
Yes No

+---+
| 006 |
+---+

The print head and the printer card may both be failing. Check the print head for a short condition using "MAP 4370: Print Head Resistance Checks" in topic 6.34. Exchange both the print head and the printer card if a short exists. Otherwise, exchange only the printer card. See "Removal and Replacement Procedures" in topic 6.38.

+---+
| 007 |
+---+

- Observe the other gears in the drive train.

Did the other gears turn?

Yes No

+---+
| 008 |
+---+

Exchange the CR motor gear assembly. See topic 6.38.13.

+---+
| 009 |
+---+

- Load paper into the CR station.

Does the paper now advance?

Yes No

+---+
| 010 |
+---+

Exchange the CR roller assembly. See topic 6.38.14.

+---+
| 011 |
+---+

The CR assembly is now working correctly.

+---+
| 012 |
+---+

(From step 004)

- Measure for +5 V DC between J8-2 (negative) and J8-1 (positive) on the printer card. See Figure 6-11.

- Press the CR button. See Figure 6-9. The voltage should drop to less than +0.5 V DC.

Did the voltage drop?

Yes No

+---+
| 013 |
+---+

Exchange the top button assembly.

Model 3 - See topic 6.38.6.

Model 4 - See topic 6.38.7.

+---+
| 014 |
+---+

- Check the CR motor. See topic 6.30.

Is the CR motor OK?

Yes No

| |
| |
| +---+
| | 015 |
| +---+
| |

Exchange the CR motor. See topic 6.38.12.

+---+
| 016 |
+---+

- Check the print head for electrical shorts. See topic 6.34.

Is the print head OK?

Yes No

| |
| |
| +---+
| | 017 |
| +---+
| |

Exchange the print head and the printer card. See topic 6.38.9 and 6.38.37.

+---+
| 018 |
+---+

- Check the DI motor. See topic 6.32.

Is the DI motor OK?

Yes No

| |
| |
| +---+
| | 019 |
| +---+
| |

Exchange the DI motor. See topic 6.38.15.

+---+
| 020 |
+---+

Exchange the printer card. See topic 6.38.37.

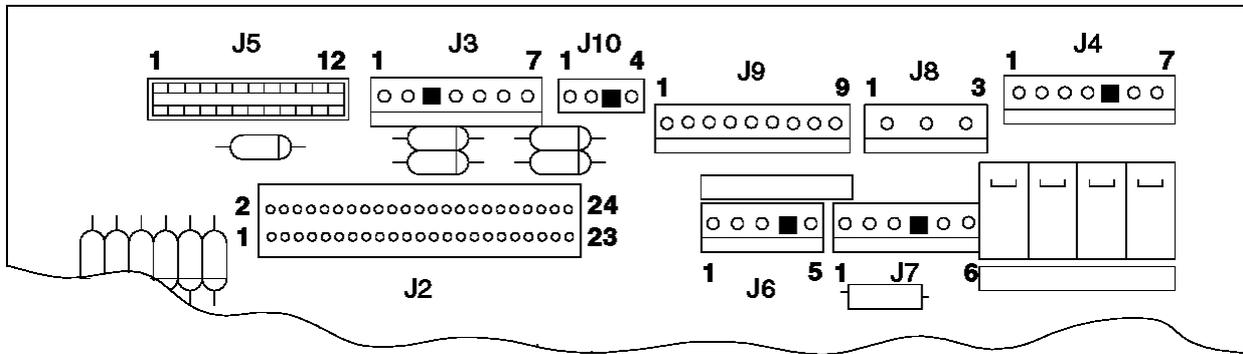


Figure 6-11. Printer Card Connections

6.11 MAP 4140: CR Paper Jams

Symptom Explanation	Conditions That Could Cause This Symptom
The CR paper jams.	<input type="checkbox"/> The paper cutter is jammed. <input type="checkbox"/> The paper cutter is failing. <input type="checkbox"/> The CR paper path is jammed. <input type="checkbox"/> The CR roller assembly is failing. <input type="checkbox"/> The printer card is failing.

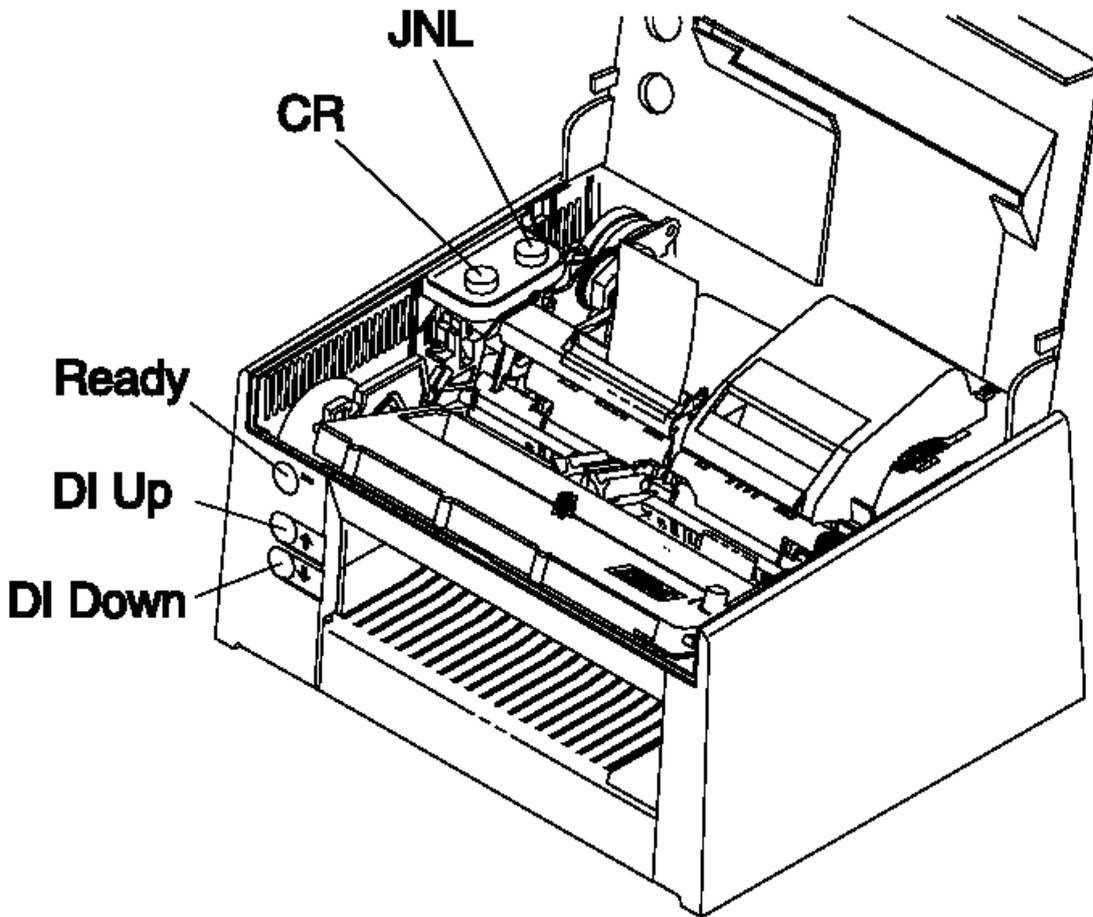


Figure 6-12. Printer Buttons

**Lift Here
To Raise
Cutter Cover**

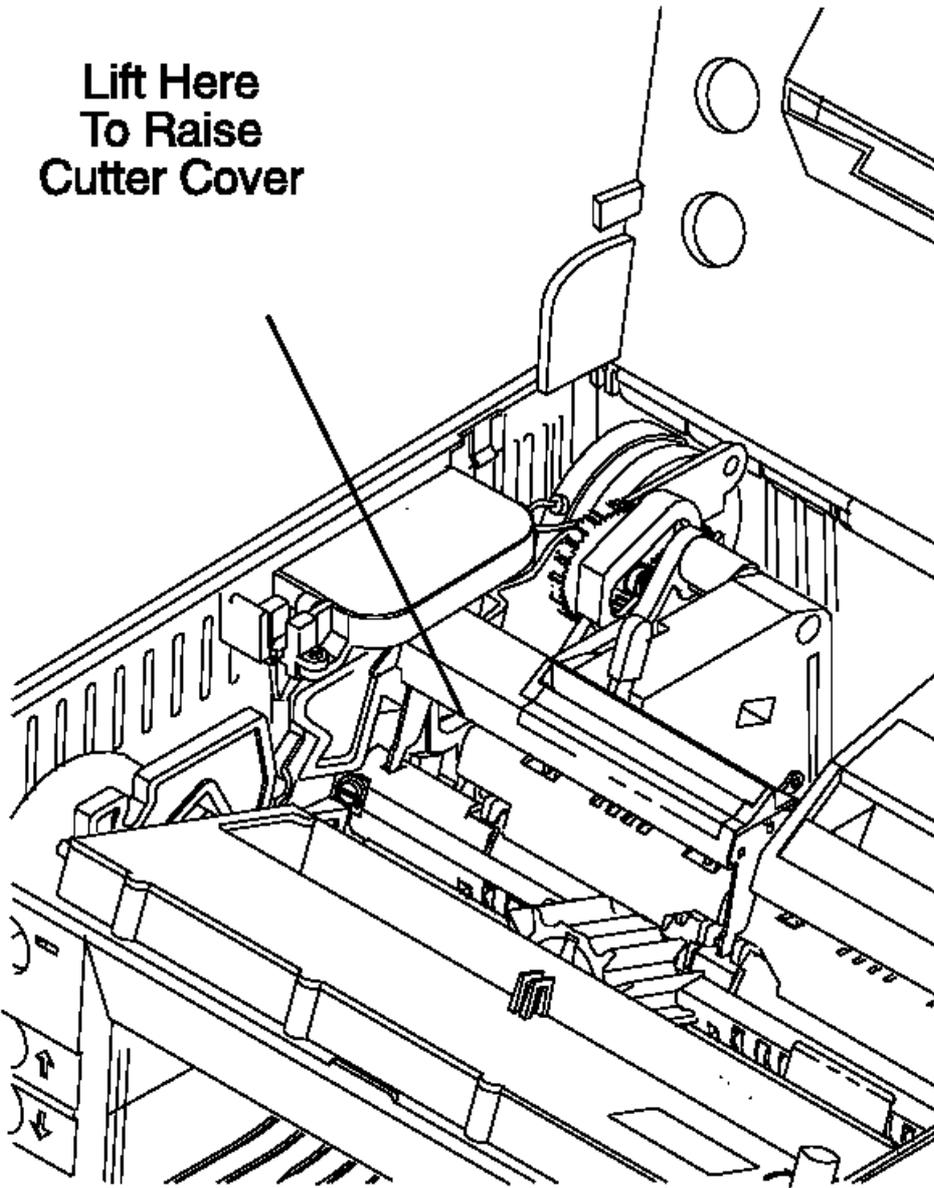


Figure 6-13. Paper Cutter

```
+----+  
|001|  
+----+
```

- Switch **POWER OFF** at the terminal.
- Remove the main cover, leaving the three cables connected. See topic 6.38.30.
- Open the paper cutter cover by pulling up on the cover at the far left side.
- Ensure that the paper is correctly installed.
- Ensure that the paper path is clear. Move the toggle lever and check the path. Also, check behind the bail.
- Check for objects or paper jammed between the paper cutter blades or in the paper cutter.

Is the paper cutter clear?

```
Yes No  
| |  
| |  
| +----+  
| |002|  
| +----+
```

| Clear the paper cutter and run the Stand-Alone Printer Test. See
| topic 6.4.

+----+
| 003 |
+----+

At the end of the following CR printer test, the paper cutter cuts the CR
paper:

- Switch power ON at the terminal.
- Press and hold the Ready button.
- Press the CR button.
- Release both buttons.
- While observing the paper cutter, press the Ready button.

The paper cutter gears, (1) in Figure 6-13, should move smoothly and the
paper cutter blades should completely retract.

Did the paper cutter operate correctly?

Yes No

| |
| |
| +----+
| | 004 |
| | +----+
| |

| Exchange the paper cutter. See topic 6.38.11.

| - or -

| Exchange the printer card. See topic 6.38.37.

+----+
| 005 |
+----+

Exchange the CR roller assembly. See topic 6.38.14.

6.12 MAP 4150: CR Station is Overprinting

Symptom Explanation	Conditions That Could Cause This Symptom
The CR station is overprinting.	<input type="checkbox"/> The CR paper rollers are failing.
	<input type="checkbox"/> The CR paper is jammed.
	<input type="checkbox"/> The CR motor is failing.
	<input type="checkbox"/> The CR motor gear assembly is failing.
	<input type="checkbox"/> The CR roller assembly is failing.
	<input type="checkbox"/> The printer card is failing.

+---+
|001|
+---+

The Stand-Alone Printer Test must be run before continuing.

Have you run the Stand-Alone Printer Test?

Yes No

|
|
| +---+
| |002|
| +---+
|

Run the Stand-Alone Printer Test. See topic 6.4.

+---+
|003|
+---+

- Lift the paper roll and check that the blue paper rollers in the bottom of the CR station turn freely.

Do the paper rollers turn freely?

Yes No

|
|
| +---+
| |004|
| +---+
|

Oil the paper rollers.

- or -

Exchange the paper rollers. See topic 6.38.29.

+---+
|005|
+---+

- Ensure that the paper is correctly installed and moves freely through the printer without jamming.

Is the CR paper moving freely through the printer?

Yes No

|
|
| +---+
| |006|
| +---+
|

See topic 6.11.

+---+
|007|
+---+

- Check the CR motor. See topic 6.30.

Is the CR motor OK?

Yes No

|
|
| +---+
| |008|
| +---+
|

Check the print head for a short condition. Use "MAP 4370: Print Head Resistance Checks" in topic 6.34. Exchange both the print head and the printer card if a short exists. Otherwise, exchange only printer card. See topic 6.38.37 and 6.38.9.

- or -

Exchange the CR motor. See topic 6.38.12.

+---+
|009|
+---+

Exchange the CR motor gear assembly. See topic 6.38.13.

- or -

Exchange the CR roller assembly. See topic 6.38.14.

6.13 MAP 4160: DI Paper Advances Continuously

Symptom Explanation	Conditions That Could Cause This Symptom
The paper in the DI station advances continuously.	<input type="checkbox"/> The front button assembly is failing. <input type="checkbox"/> The printer card is failing.

+---+
|001|
+---+

- Switch **POWER OFF** at the terminal.
- Remove the main cover, leaving the three cables connected. See topic 6.38.30.
- Disconnect cable J9 from the printer card.

Did the paper stop advancing?

Yes No

| |
| +---+
| |002|
| +---+
|

Exchange the printer card. See topic 6.38.37.

+---+
|003|
+---+

Exchange the front button assembly. See topic 6.38.2.

Symptom Explanation	Conditions That Could Cause This Symptom
The DI station does not advance paper in one or both directions.	<input type="checkbox"/> The document path is jammed. <input type="checkbox"/> The DI gears are failing. <input type="checkbox"/> The DI motor is failing. <input type="checkbox"/> The forms compensation hardware is failing. <input type="checkbox"/> The printer card is failing. <input type="checkbox"/> The front button assembly is failing.

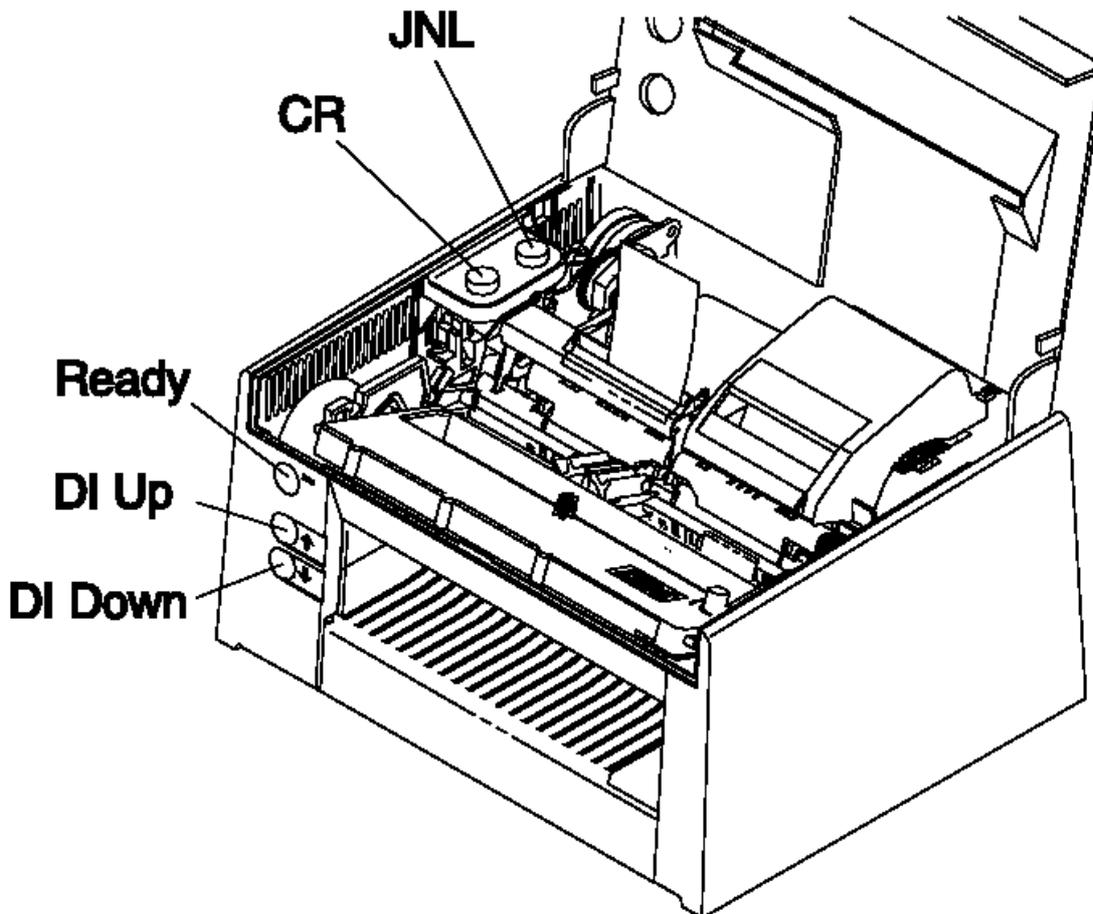


Figure 6-14. Printer Buttons

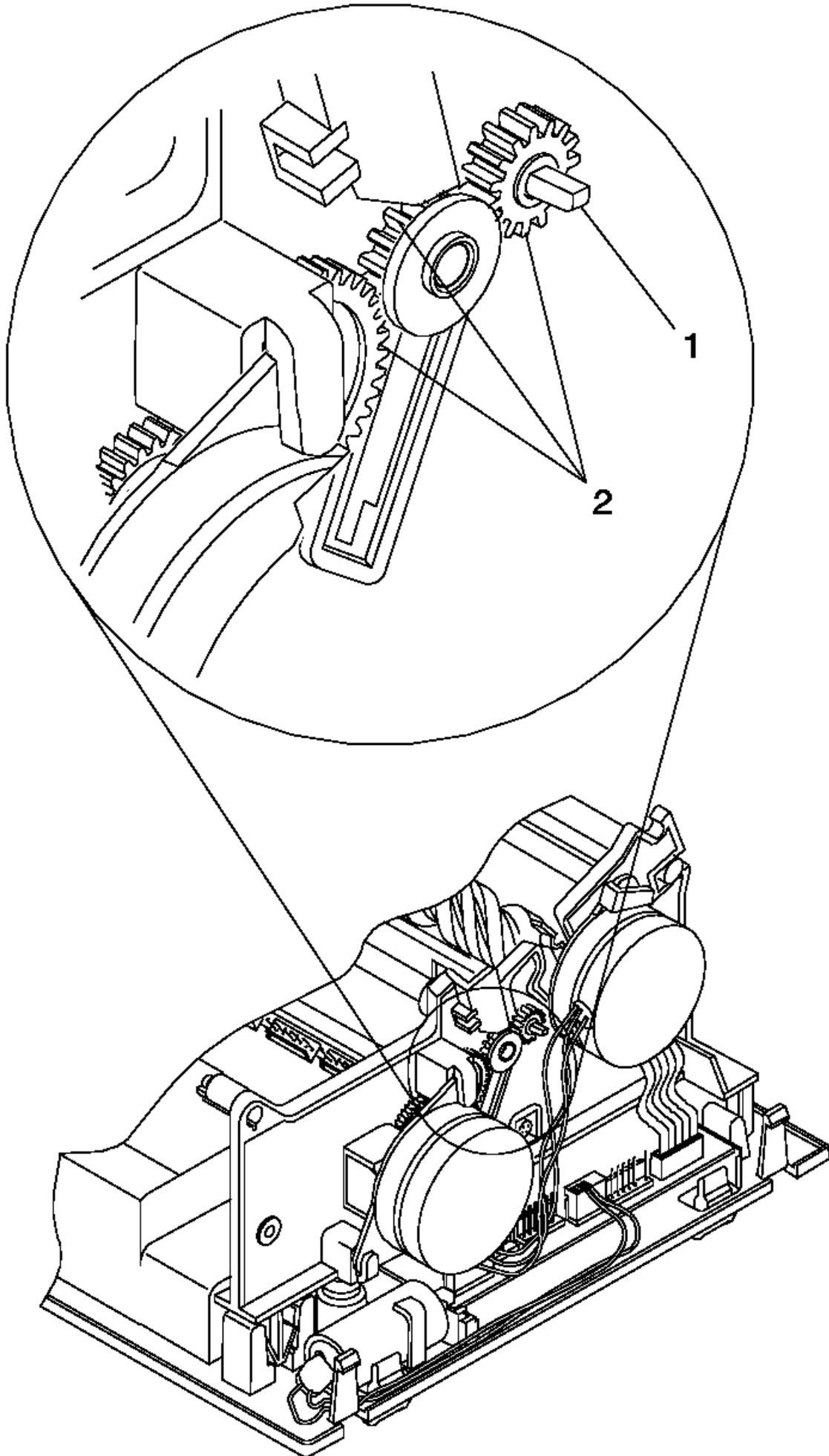


Figure 6-15. DI Gears

```
+----+
|001|
+----+
```

The Stand-Alone Printer Test must be run before continuing.

Have you run the Stand-Alone Printer Test?

Yes No

```
|
|
| +----+
| |002|
| +----+
```

Run the Stand-Alone Printer Test. See topic 6.4.

```
+----+
|003|
+----+
```

- Switch **POWER OFF** at the terminal.
- Remove the main cover, leaving the three cables connected. See topic 6.38.30.
- To see the DI gears on Models 3R and 4R, the cover over the gears must be removed. On other models, skip this step. Remove the DI motor, remove the cover, and reinstall the DI motor.
- Switch power ON.
- Press the DI up button. See Figure 6-14.
- Ensure that the gears, (2) in Figure 6-15, rotate and that there is no damage to their teeth.
- Ensure that the DI shaft, (1) in Figure 6-15, is not slipping and rotating inside the gear.
- Check the same conditions as above while pressing the DI down button (5).

Is the document path clear of obstructions?

Yes No

```
|
|
| +----+
| |004|
| +----+
```

- On Models 3R and 4R, reinstall the cover over the DI gears.
- Clear the document path. Check for debris inside the acoustic flap and around the rollers, DI guide, and sensors. Run the Stand-Alone Printer Test. See topic 6.4.

```
+----+
|005|
+----+
```

Did at least one of the DI gears turn?

Yes No

```
|
|
| +----+
| |006|
| +----+
```

- On Models 3R and 4R, reinstall the cover over the DI gears.
- Continue at Step 014.

```
+----+
|007|
+----+
```

Do all the DI gears rotate?

Yes No

```
|
|
| +----+
```

| 008 |

+----+

Exchange the DI gears. See topic 6.38.16.

+----+

| 009 |

+----+

- On Models 3R and 4R, reinstall the cover over the DI gears.

- Check the DI motor. See topic 6.32.

Is the motor OK?

Yes No

|

+----+

| 010 |

+----+

Exchange the DI motor. See topic 6.38.15.

+----+

| 011 |

+----+

- Pull the forms compensation shaft forward toward the front of the printer and then allow it to return to its original position. Move the forms compensation shaft using lever (1) in Figure 6-16.

- Slip a piece of paper under the four metal rollers on the shaft, (2) in Figure 6-16.

Does the paper slip under the paper rollers?

Yes No

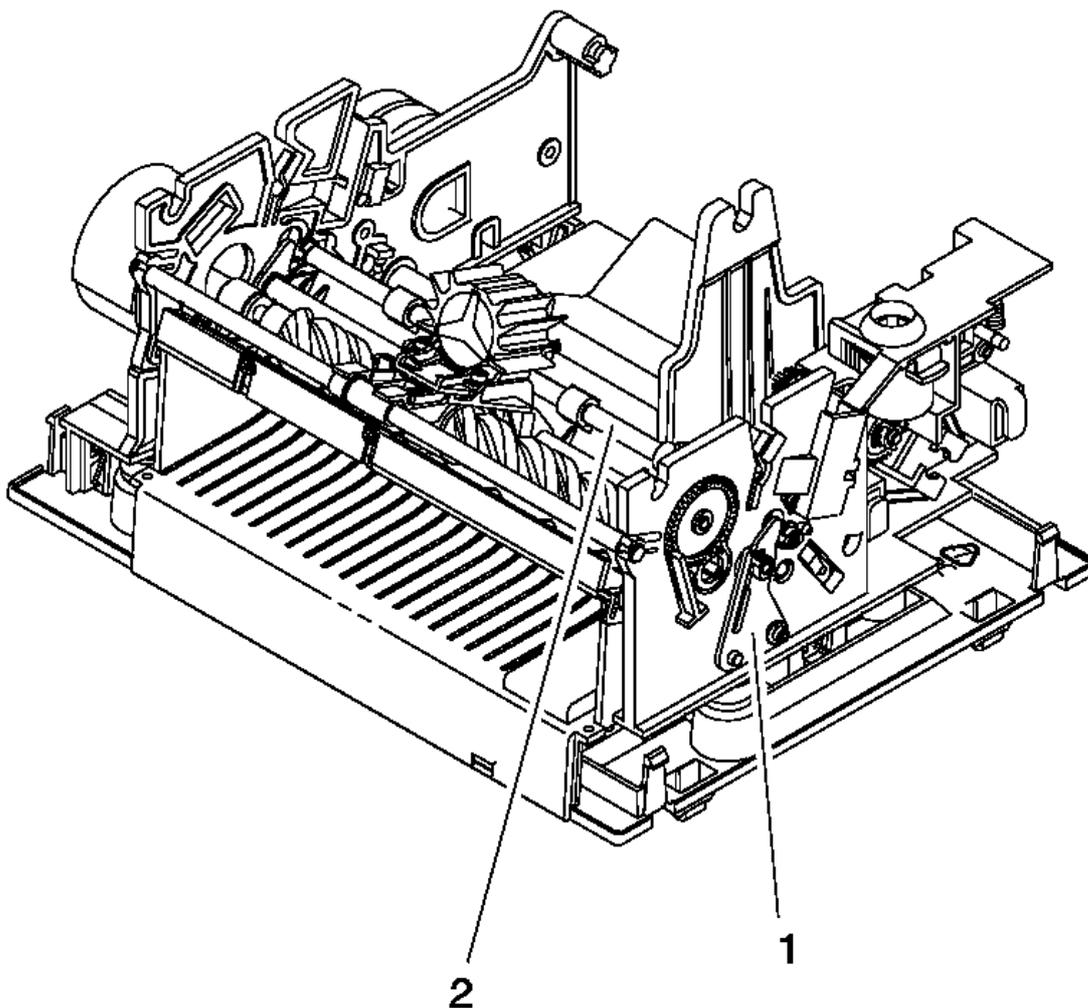


Figure 6-16. Forms Compensation Hardware

|
+---+
|012|
+---+

Check for objects that may be obstructing the paper rollers.

- or -

The forms compensation hardware is failing. Make sure that nothing is blocking the forms compensation hardware. Call your support organization for assistance.

+---+
|013|
+---+

Exchange the printer card. See topic 6.38.37.

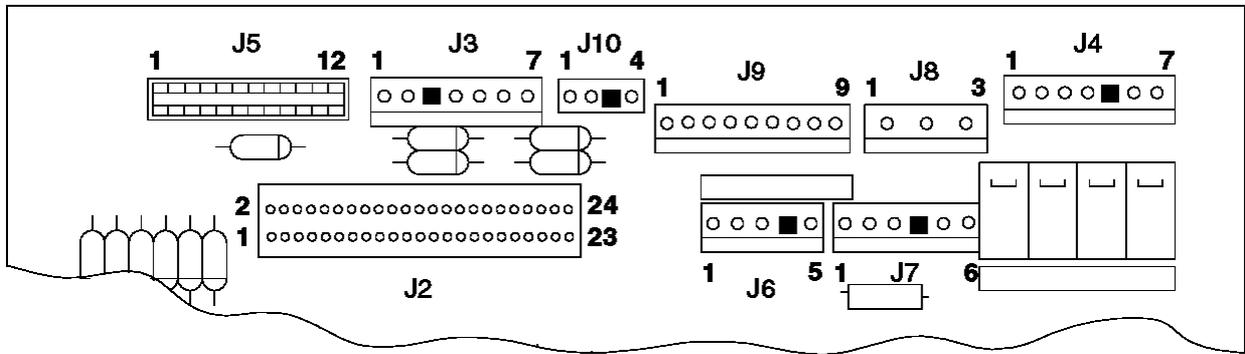


Figure 6-17. Printer Card Connections

```
+----+
|014|
+----+
(From step 006)
```

- Measure the voltage between J9-4 (negative) and J9-1 (positive). See Figure 6-17.
- Press the DI down button (5). The voltage should drop from +5 V DC to less than +0.5 V DC.

Did the voltage drop?

```
Yes No
|
|
| +----+
| |015|
| +----+
|
| Exchange the front button assembly. See topic 6.38.2.
```

```
+----+
|016|
+----+
```

- Measure the voltage between J9-4 (negative) and J9-2 (positive).
- Press the DI up button. The voltage should drop from +5 V DC to less than +0.5 V DC.

Did the voltage drop?

```
Yes No
|
|
| +----+
| |017|
| +----+
|
| Exchange the front button assembly. See topic 6.38.2.
```

```
+----+
|018|
+----+
```

- Check the DI motor. See topic 6.32.

Is the motor OK?

```
Yes No
|
|
| +----+
| |019|
| +----+
|
| Exchange the DI motor. See topic 6.38.15.
```

```
+----+
|020|
+----+
```

Exchange the printer card. See topic 6.38.37.

6.15 MAP 4180: Home Errors

Symptom Explanation	Conditions That Could Cause This Symptom
The print head is not reaching the center of the home sensor when expected or it reaches the home sensor too soon.	<input type="checkbox"/> The home sensor is blocked by debris or dust.
	<input type="checkbox"/> The print head path is blocked.
	<input type="checkbox"/> The home sensor card is failing.
	<input type="checkbox"/> The transport motor is failing.
	<input type="checkbox"/> The printer card is failing.
	<input type="checkbox"/> The helix and nut are worn.
	<input type="checkbox"/> The ribbon drive clutch is failing.

+---+
 |001|
 +---+

- Clean the sensors on the home sensor card. See topic 6.36.1.2.

Does the printer still fail?

Yes No

| |
 | +---+
 | |002|
 | +---+

The printer is now running correctly.

+---+
 |003|
 +---+

- Ensure that the toggle levers for the CR station and the JNL station are pushed toward the rear of the printer.
- Ensure that the printer ribbon cartridge is installed correctly and advances when the print head moves.
- Ensure that the print head cable is routed below the home sensors.
- Check that the CR or JNL paper is not jammed.
- Switch **POWER OFF** at the terminal.
- Remove the main cover, leaving the three cables connected. See topic 6.38.30.
- Ensure that the cable connecting the home sensor card to the printer card is plugged in correctly at both ends.
- Move the print head all the way to the left and to the right.

Does the print head move freely?

Yes No

| |
 | +---+
 | |004|
 | +---+

- Continue at Step 012.

+---+
 |005|
 +---+

- Switch power ON at the terminal.
- See topic 6.36 and perform the Home Sensor Check to verify that the home sensor card is operating correctly.

Is the home sensor card OK?

Yes No

| |
 | +---+

| 006 |

+----+

Exchange the home sensor card. See topic 6.38.32.

- or -

Exchange the home sensor card cable.

+----+

| 007 |

+----+

- Switch **POWER OFF** at the terminal.

- Remove the printer ribbon cartridge.

- Check the transport motor resistance. See topic 6.35.

Are all the measurements correct?

Yes No

|

+----+

| 008 |

+----+

Exchange the transport assembly. See topic 6.38.33.

+----+

| 009 |

+----+

- Check for wear between the helix and the nut by holding the helix fixed and moving the print head left and right with your hand and measuring the free movement of the head with a scale. It should be less than 1 mm.

Is the backlash (movement) less than 1 mm?

Yes No

|

+----+

| 010 |

+----+

Exchange the transport assembly. See topic 6.38.33.

+----+

| 011 |

+----+

Exchange the printer card. See topic 6.38.37.

+----+

| 012 |

+----+

(From step 004)

- Check if the print head carrier is hitting a sensor on the home sensor card (1), (2).

Is the print head carrier hitting a sensor on the home sensor card?

Yes No

|

+----+

| 013 |

+----+

- Continue at Step 015.

+----+

| 014 |

+----+

Adjust the home sensor card so the carrier clears the sensors, (1) and (2) in Figure 6-18.

+----+

| 015 |

+---+

- Check to see if the home errors occur after removing the ribbon cartridge.

Do home errors occur when the ribbon cartridge is removed?

Yes No

|
+---+
| 016 |
+---+

Exchange the ribbon cartridge.

- or -

Exchange the ribbon drive clutch spring if it appears rusty.

Note: Do not lubricate the carrier shaft and plastic helix.

+---+

| 017 |

+---+

Exchange the transport assembly. See topic 6.38.33.

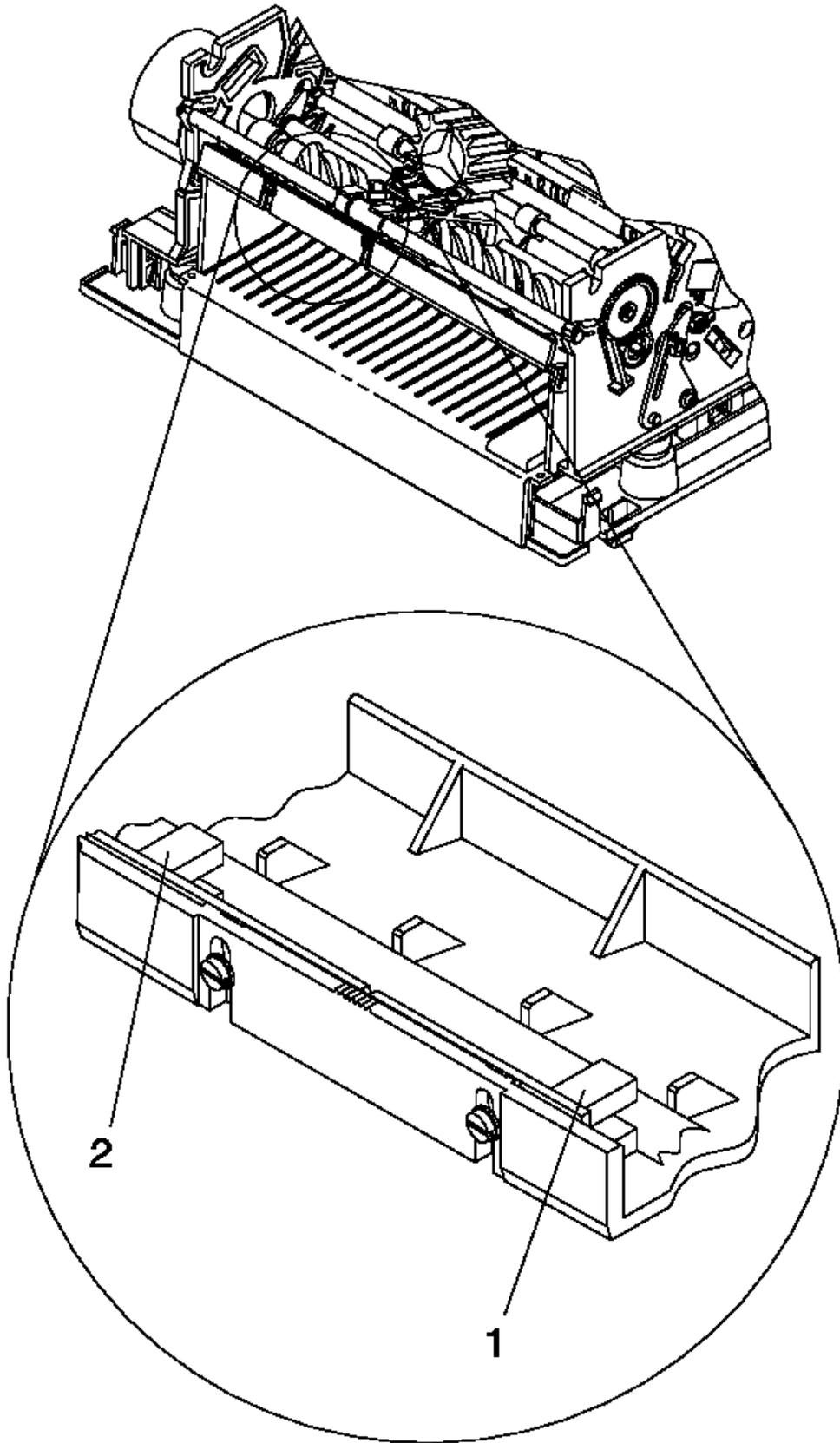


Figure 6-18. Home Sensor Card

6.16 MAP 4190: JNL Paper Does Not Advance

Symptom Explanation	Conditions That Could Cause This Symptom
The paper in the JNL station does not feed correctly	<input type="checkbox"/> The JNL takeup clutch assembly is failing.
	<input type="checkbox"/> The printer card is failing.
	<input type="checkbox"/> The extension card is failing.
	<input type="checkbox"/> The JNL drive gears are failing.
	<input type="checkbox"/> The JNL roller assembly is failing.
	<input type="checkbox"/> The top button assembly is failing
	<input type="checkbox"/> The JNL motor is failing.

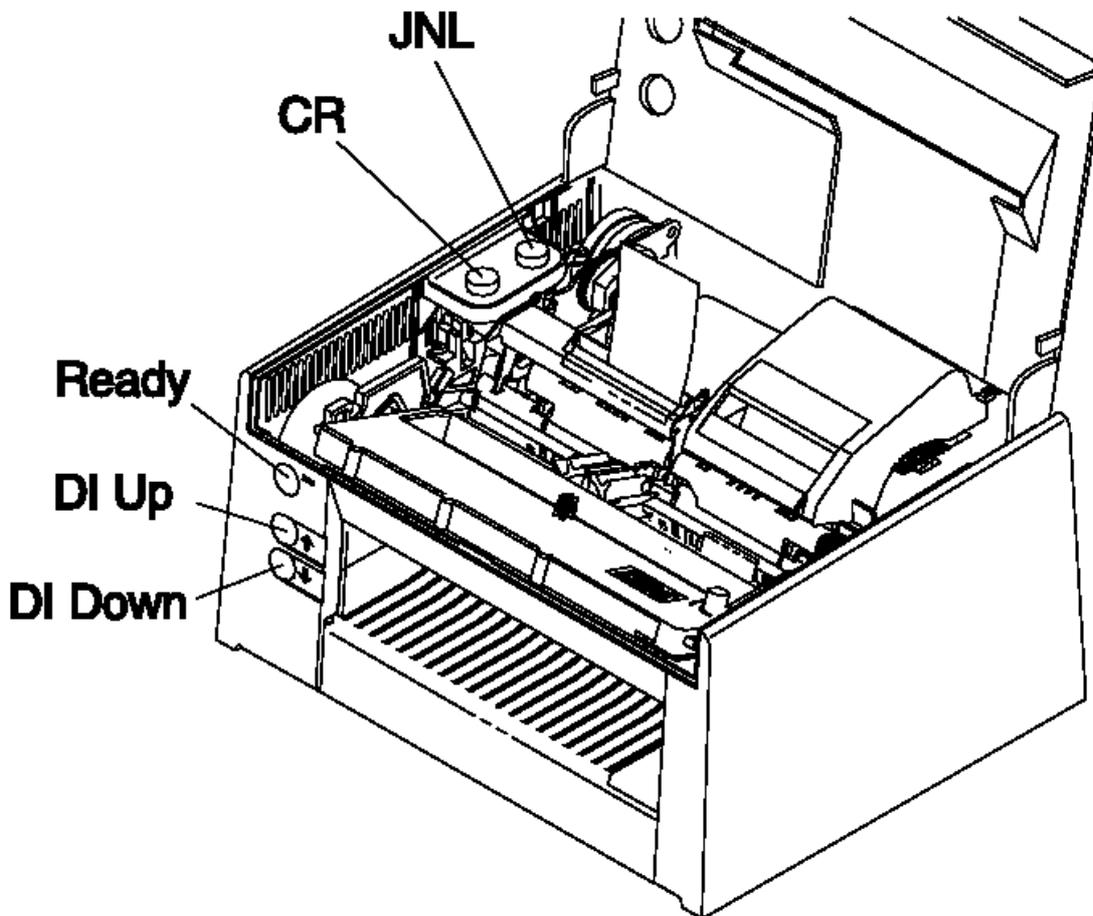


Figure 6-19. Printer Buttons

```
+----+
|001|
+----+
```

The Stand-Alone Printer Test must be run before continuing.

Have you run the Stand-Alone Printer Test?

Yes No

```
|
|+----+
||002|
|+----+
```

Run the Stand-Alone Printer Test. See topic 6.4.

```
+----+
|003|
```

+----+

- Switch **POWER OFF** at the terminal.
- Remove the main cover, leaving the three cables connected. See topic 6.38.30.
- Remove the paper from the JNL station and check for anything blocking the paper path.

Is the paper path clear?

Yes No

| |
| |
| +----+
| |004|
| +----+
| |

Clear the paper path, load new paper, and test the printer. See topic 6.4.

+----+

|005|

+----+

- Switch power ON at the terminal.
- Press the JNL button.
- Observe the gear attached to the JNL motor. See Figure 6-20.

Did the gear move?

Yes No

| |
| |
| +----+
| |006|
| +----+
| |

- Continue at Step 014.

+----+

|007|

+----+

Does the JNL motor and gears move without making an abnormal (chattering) noise?

Yes No

| |
| |
| +----+
| |008|
| +----+
| |

The print head and the printer card may both be failing. Check the print head for a short condition using "MAP 4370: Print Head Resistance Checks" in topic 6.34. Exchange both the print head and the printer card if a short exists. Otherwise, exchange only the printer card. See "Removal and Replacement Procedures" in topic 6.38.

+----+

|009|

+----+

- Observe the other gears in the drive train. See Figure 6-20.

Do the other gears turn freely as opposed to stumbling from insufficient motor torque?

Yes No

| |
| |
| +----+
| |010|
| +----+
| |

The JNL takeup clutch assembly or drive gears are failing. See topic 6.38.23 and exchange the assembly.

+----+

|011|

+----+

- Load paper into the JNL station.

Does the paper now feed correctly?

Yes No

| |
| +---+
| |012|
| +---+
|

Exchange the JNL roller assembly. See topic 6.38.26.

+---+
|013|
+---+

The JNL station is working correctly.

+---+
|014|
+---+

(From step 006)

- Measure for +5 V DC between J8-2 (negative) and J8-3 (positive). See Figure 6-21.
- Press the JNL button. See Figure 6-19. The voltage should drop to less than +0.5 V DC.

Did the voltage drop?

Yes No

| |
| +---+
| |015|
| +---+
|

Exchange the top button assembly.

Model 3 - See topic 6.38.6.

Model 4 - See topic 6.38.7.

+---+
|016|
+---+

- Check the JNL motor for electrical shorts. See topic 6.33.

Is the JNL motor OK?

Yes No

| |
| +---+
| |017|
| +---+
|

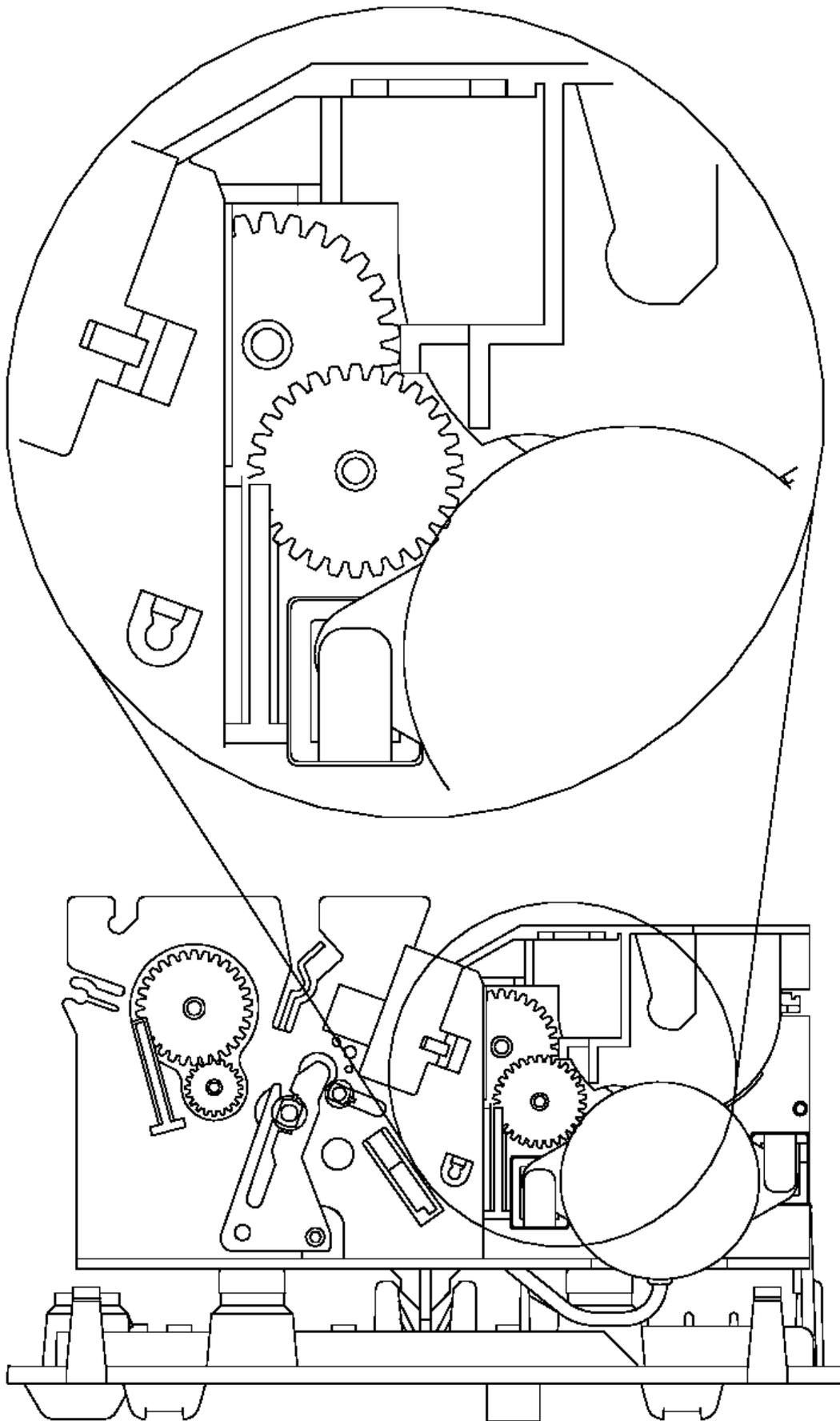
Exchange the JNL motor. See topic 6.38.24.

+---+
|018|
+---+

Exchange the printer card. See topic 6.38.37.

- or -

Exchange the extension card. See topic 6.38.38.



Right Side

Figure 6-20. JNL Drive Gears

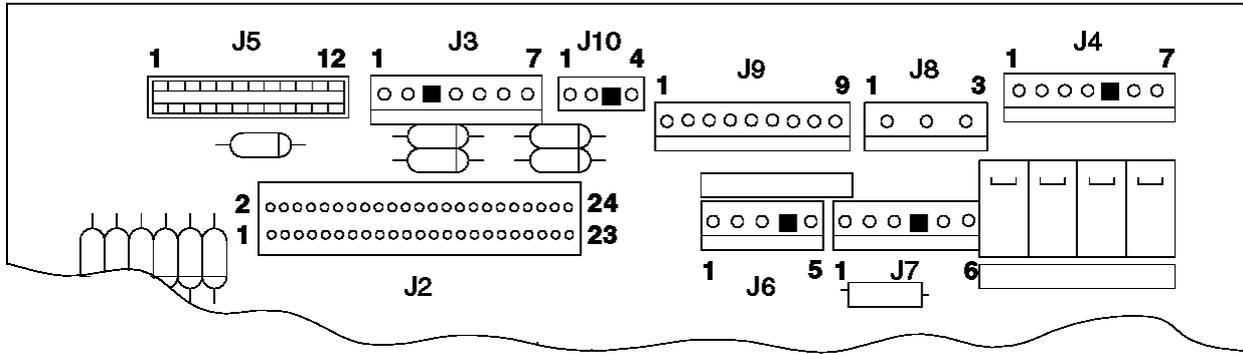


Figure 6-21. Printer Card Connections

6.17 MAP 4200: JNL Station Not Printing

Symptom Explanation	Conditions That Could Cause This Symptom
The JNL station does not print. This is a paper movement error.	<input type="checkbox"/> The emitter O-ring is worn.
	<input type="checkbox"/> The O-ring shaft is out of position.
	<input type="checkbox"/> The JNL paper motion sensor is failing.
	<input type="checkbox"/> The emitter O-ring has come off of the emitter wheel rim.
	<input type="checkbox"/> The printer card is failing.
	<input type="checkbox"/> The JNL roller assembly is failing.
	<input type="checkbox"/> The JNL paper is jammed.

+----+
|001|
+----+

The Stand-Alone Printer Test must be run before continuing.

Have you run the Stand-Alone Printer Test?

Yes No

| |
| +----+
| |002|
| +----+

Run the Stand-Alone Printer Test. See topic 6.4.

+----+
|003|
+----+

- Switch **POWER OFF** at the terminal and remove the main cover, leaving the three cables connected. See topic 6.38.30.
- Switch power ON at the terminal and press the JNL button. See Figure 6-19 in topic 6.16.

Did the JNL paper advance correctly?

Yes No

| |
| +----+
| |004|
| +----+

Follow "MAP 4190: JNL Paper Does Not Advance" in topic 6.16.

+----+
|005|
+----+

- Check the JNL paper motion sensor. See topic 6.36.

Is the sensor OK?

Yes No

| |
| +----+
| |006|
| +----+

Exchange the JNL paper motion sensor. See topic 6.38.25.

+----+
|007|
+----+

- See Figure 6-22.
- Ensure that the O-ring (1) that turns the emitter wheel is on the emitter wheel rim.

Is the O-ring on the emitter wheel rim OK?

Yes No

```
|
|
+----+
| 008 |
+----+
```

Put the O-ring back on the emitter wheel rim. See Figure 6-22.

```
+----+
| 009 |
+----+
```

- Ensure that the O-ring shaft is seated properly. The shaft should be held on both sides of the JNL roller. The O-ring shaft should move up and down in the slot near the O-ring as the JNL roller holder is toggled from the feed to the load position.

Is the O-ring shaft properly seated?

Yes No

```
|
|
+----+
| 010 |
+----+
```

Exchange the JNL roller assembly. See topic 6.38.26.

```
+----+
| 011 |
+----+
```

- Check the O-ring for wear. A worn O-ring often has a large flat area.

Is the O-ring OK?

Yes No

```
|
|
+----+
| 012 |
+----+
```

Exchange the JNL roller assembly. See topic 6.38.26.

```
+----+
| 013 |
+----+
```

Exchange the printer card. See topic 6.38.37.

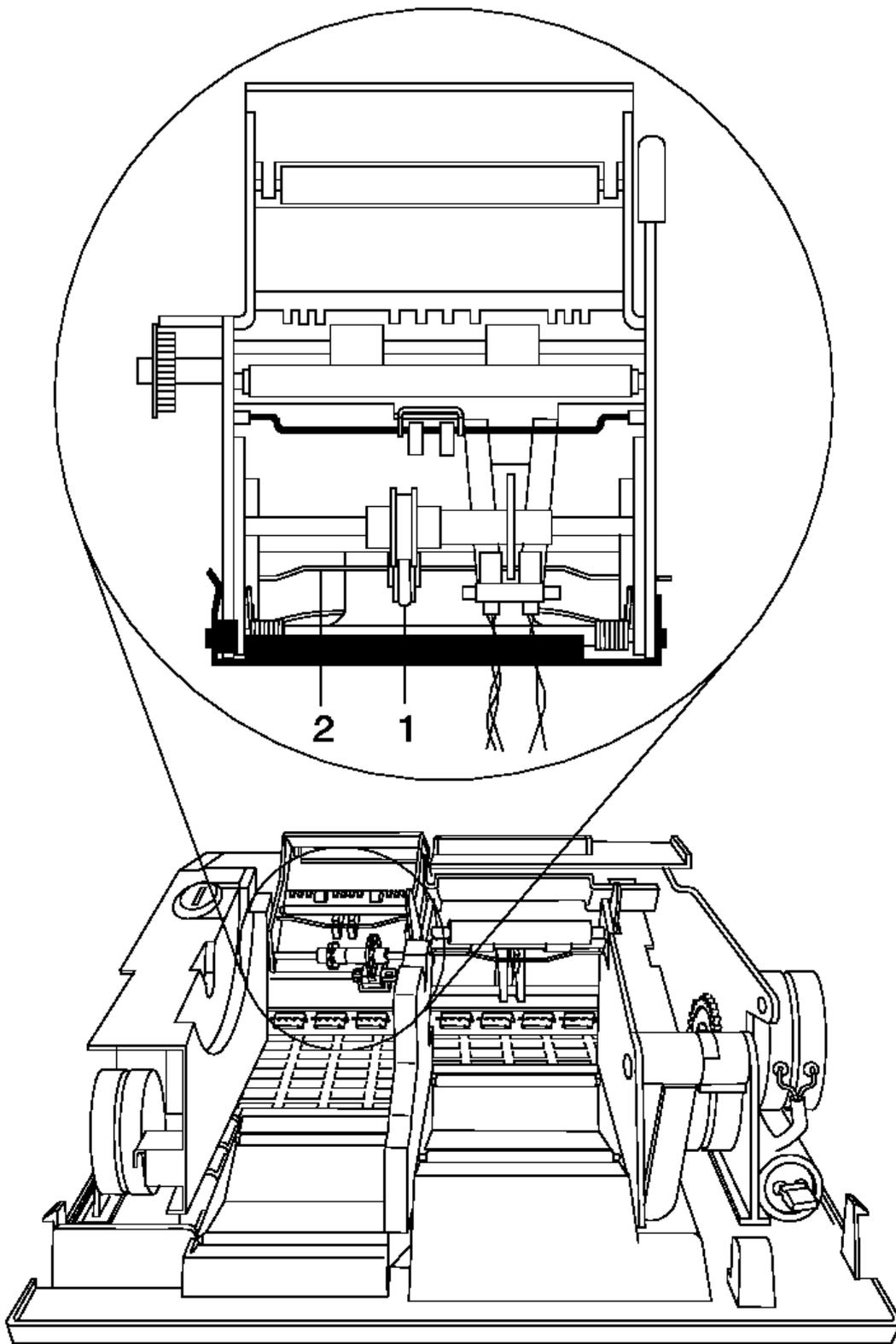


Figure 6-22. JNL Assembly

6.18 MAP 4210: JNL Station is Overprinting

Symptom Explanation	Conditions That Could Cause This Symptom
The JNL station is overprinting.	<input type="checkbox"/> The JNL takeup clutch assembly is worn out.
	<input type="checkbox"/> The JNL station rollers are failing.
	<input type="checkbox"/> The JNL motor is failing.
	<input type="checkbox"/> The JNL roller assembly is failing.
	<input type="checkbox"/> The feed roller mechanism is worn out.

+---+
 |001|
 +---+

The Stand-Alone Printer Test must be run before continuing.

Have you run the Stand-Alone Printer Test?

Yes No

|
 |
 | +---+
 | |002|
 | +---+

Run the Stand-Alone Printer Test. See topic 6.4.

+---+
 |003|
 +---+

- Lift the paper roll and check that the blue paper rollers in the bottom of the JNL station turn freely.

Did the blue paper rollers turn freely?

Yes No

|
 |
 | +---+
 | |004|
 | +---+

Exchange the paper rollers. See topic 6.38.29.

+---+
 |005|
 +---+

- Check the paper path for blockage.

Is the paper path OK?

Yes No

|
 |
 | +---+
 | |006|
 | +---+

Clear the paper path and retest the printer.

+---+
 |007|
 +---+

- Switch **POWER OFF** at the terminal and remove the main cover, leaving the three cables connected. See topic 6.38.30.

- Switch power ON at the terminal and press the JNL paper button while observing the JNL gears.

Do the JNL gears move freely as opposed to stumbling due to insufficient motor torque?

Yes No

|
 |
 | +---+
 | |008|
 | +---+

Exchange the JNL takeup clutch assembly. See topic "Removing and Replacing the JNL Takeup Clutch, Gears, and Pawl" in topic 6.38.23.

- or -

The paper feed shafts may have excessive friction. Exchange the JNL roller assembly. See topic 6.38.26.

+----+
|009|
+----+

- Check the JNL motor. See topic 6.33.

Is the JNL motor OK?

Yes No

|
+----+
|010|
+----+

Exchange the JNL motor. See topic 6.38.24.

+----+
|011|
+----+

Exchange the JNL roller assembly. See topic 6.38.26.

6.19 MAP 4220: MICR Does Not Read Correctly

Symptom Explanation	Conditions That Could Cause This Symptom
The Magnetic Ink Character Recognition (MICR) reader does not read correctly.	<input type="checkbox"/> There is an obstruction in the check path.
	<input type="checkbox"/> The MICR pressure pad is failing.
	<input type="checkbox"/> The MICR read head is failing.
	<input type="checkbox"/> The extension card is failing.
	<input type="checkbox"/> The printer card is failing.
	<input type="checkbox"/> The MICR read head magnet is failing.

The **Stand-Alone Printer Test** must be run before continuing. See "TEST 4100: Stand-Alone Printer Test" in topic 6.4.

+---+
 |001|
 +---+

Have you run the Stand-Alone Printer Test?

Yes No

| |
 | |
 | +---+
 | |002|
 | +---+

- Run the Stand-Alone Printer Test to test the basic functions of the printer before testing the MICR reader. See "TEST 4100: Stand-Alone Printer Test" in topic 6.4.

+---+
 |003|
 +---+

This procedure assumes that the basic functions of the printer have been tested and that the test was successful.

- Perform the read head cleaning procedure and then return to this procedure. See "MICR Head and Feed Rollers Cleaning Procedure" in topic 6.5.2.
- Run the Stand-Alone MICR Test and make the following observations before continuing. See topic 6.5.
 1. The green indicator comes on when the check is inserted.
 2. The check feeds into the printer when the Ready (green) button is pressed for 3 seconds.
 3. The check reverses direction, is read, and the correct characters are printed at the CR station.
 4. The check moves smoothly through the read operation.

Did the green indicator come on when the check was inserted?

Yes No

| |
 | |
 | +---+
 | |004|
 | +---+

Go to "MAP 4290: Printer Indicator Light Not On When A Document Is Inserted" in topic 6.26 to continue isolation of this failure.

+---+
 |005|
 +---+

Did the check begin feeding into the printer when the Ready button was pressed for 3 seconds?

Yes No

| |
 | |
 | +---+
 | |006|

+---+

Exchange the extension card first and then if the test still fails, exchange the printer card. See "Removal and Replacement Procedures" in topic 6.38.

+---+
|007|
+---+

Did the check feed into the printer without jamming, skewing, or damaging the check?

Yes No

|
+---+
|008|
+---+

Make sure that there is no paper or debris blocking the check path.

- or -

Exchange the MICR pressure pad. See topic 6.38.20.

+---+
|009|
+---+

Did the check reverse direction and feed out the front of the printer?

Yes No

|
+---+
|010|
+---+

Exchange the Upper DI Forms Sensor. See topic 6.38.18.

+---+
|011|
+---+

Did any characters print at the CR station?

Yes No

|
+---+
|012|
+---+

Make sure that the check being read does not have an amount field in the last 1 1/2 inches of the check. This causes reading failures. Try using a test check.

- or -

Make sure that the check was inserted correctly.

- or -

Exchange the MICR read head. See topic 6.38.19.

- or -

Exchange the extension card. See topic 6.38.38.

- or -

Exchange the printer card. See topic 6.38.37.

+---+
|013|
+---+

Did all the correct characters print at the CR station?

Yes No

|
+---+
|014|
+---+

Make sure that the check was inserted correctly.

- or -

Make sure that the check being read does not have an amount field in the last 1 1/2 inches of the check. This causes reading failures. Try using a test check.

- or -

Magnetic interference from a nearby video display, transformer, power supply, or other electrical device can cause MICR check reading failures. If you experience this problem, try moving any suspected devices away from the printer as far as practical.

- or -

Exchange the MICR pressure pad. See topic 6.38.20.

- or -

Exchange the DI gears. See topic 6.38.16.

- or -

Exchange the MICR read head. See topic 6.38.19.

- or -

Exchange the MICR magnet. See topic 6.38.17.

- or -

Exchange the DI motor. See topic 6.38.15.

- or -

Exchange the extension card. See page 6.38.38.

- or -

Exchange the printer card. See topic 6.38.37.

+---+
| 015 |
+---+

The problem may be intermittent. Run the Stand-Alone MICR Test several times to ensure that checks can now be read correctly. See "Stand-Alone MICR Test" in topic 6.5.

- or -

Magnetic interference from a nearby video display, transformer, power supply, or other electrical device can cause MICR check reading failures. If you experience this problem, try moving any suspected devices away from the printer as far as practical.

- or -

Make sure the customer checks that are failing to read are good quality checks.

- or -

Call your support organization for assistance.

6.20 MAP 4230: Power Problems

Symptom Explanation	Conditions That Could Cause This Symptom
The printer does not power-ON or loses power when trying to print.	<input type="checkbox"/> The terminal is powered-OFF. <input type="checkbox"/> The terminal power supply is failing. <input type="checkbox"/> Cable 7 is not connected. <input type="checkbox"/> The print head or a motor is failing due to an electrical short. <input type="checkbox"/> The printer card is failing.

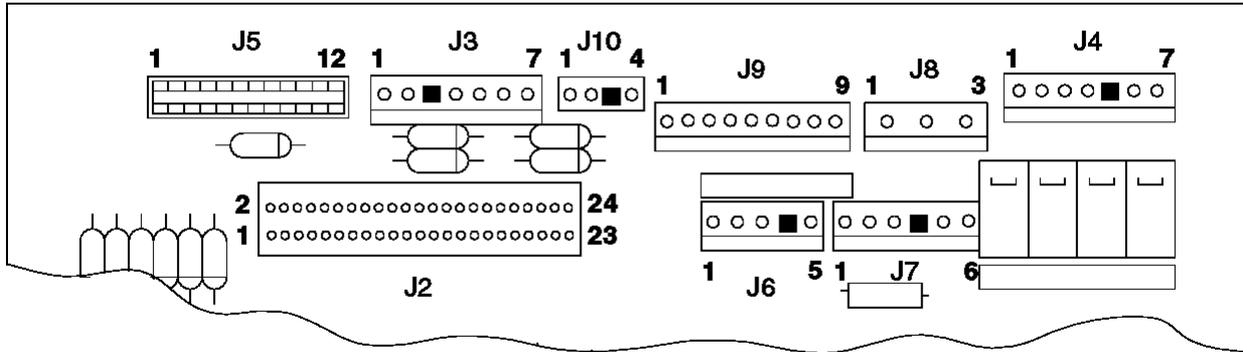


Figure 6-23. Printer Card Connections

+---+
 |001|
 +---+

- Switch **POWER OFF** at the terminal.
- Remove the main cover, leaving the three cables connected. See topic 6.38.30.
- Switch power ON at the terminal.

Did the terminal power-ON?

Yes No

|
 +---+
 |002|
 +---+

- Continue at Step 018.

+---+
 |003|
 +---+

- Check for +34.5 to +41 V DC between printer card connector J10 pin 2 (positive) and pin 1 (negative). See Figure 6-23.
- Check for +4.75 to +5.25 V DC between printer card connector J9 pin 6 (positive) and pin 4 (negative). See Figure 6-23.

Are the voltages within range?

Yes No

|
 +---+
 |004|
 +---+

Exchange the power supply in the terminal. See the *Hardware Service Manual* for your terminal.

- or -

Exchange cable 7.

+----+
| 005 |
+----+

A shorted coil on the print head or shorted field on a motor can draw too much current and cause the power supply on the terminal to switch off.

- Check the print head for electrical shorts. See topic 6.34.

Is the print head OK?

Yes No

| |
| |
| +----+
| | 006 |
| +----+

Exchange both the print head and the printer card at the same time.
See topic 6.38.9 and 6.38.37.

+----+
| 007 |
+----+

- Check the CR motor for electrical shorts. See topic 6.30.

Is the CR motor OK?

Yes No

| |
| |
| +----+
| | 008 |
| +----+

Exchange the CR motor. See topic 6.38.12.

+----+
| 009 |
+----+

- Check the paper cutter motor for electrical shorts. See topic 6.31.

Is the paper cutter motor OK?

Yes No

| |
| |
| +----+
| | 010 |
| +----+

Exchange the paper cutter motor. See topic 6.38.11.

+----+
| 011 |
+----+

- Check the JNL motor for electrical shorts. See topic 6.33.

Is the JNL motor OK?

Yes No

| |
| |
| +----+
| | 012 |
| +----+

Exchange the JNL motor. See topic 6.38.24.

+----+
| 013 |
+----+

- Check the DI motor for electrical shorts. See topic 6.32.

Is the DI motor OK?

Yes No

| |
| |
| +----+
| | 014 |
| +----+

Exchange the DI motor. See topic 6.38.15.

+---+
 | 015 |
 +---+

- Check the transport motor for electrical shorts. See topic 6.35.

Is the transport motor OK?

Yes No

|
 +---+
 | 016 |
 +---+

Exchange the transport assembly. See topic 6.38.33.

+---+
 | 017 |
 +---+

Exchange the printer card. See topic 6.38.37.

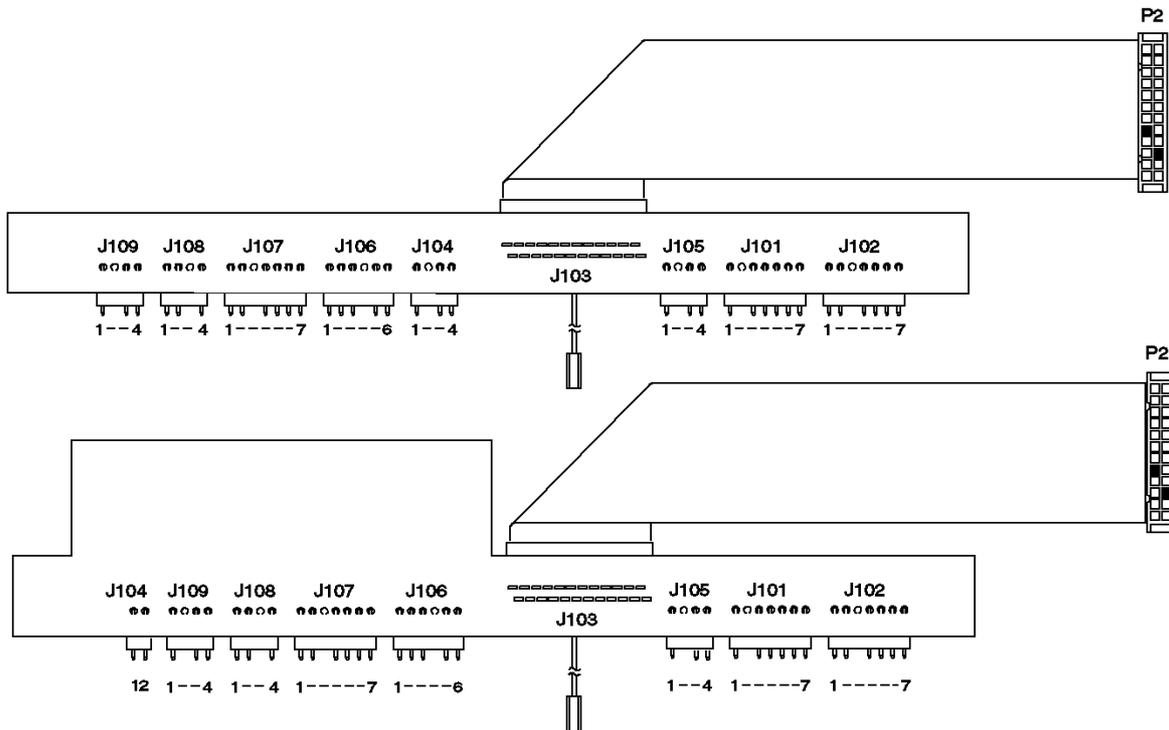


Figure 6-24. Extension Card Connections

+---+
 | 018 |
 +---+

(From step 002)

- Switch **POWER OFF** at the terminal.
- Unplug cable 7 from the printer.
- Switch power ON at the terminal.

Does the terminal power-ON?

Yes No

|
 +---+
 | 019 |
 +---+

Go to the *Hardware Service Manual* for your terminal to isolate the power problem.

+---+
 | 020 |
 +---+

- Switch **POWER OFF** at the terminal.
- Unplug printer card connectors J2, J3, J4, J5, J6, J7, J8, J9, and J10.
- Reconnect cable 7 to the printer.
- Switch power ON at the terminal.

Does the terminal power-ON?

Yes No

```
| |
| +---+
| |021|
| +---+
```

Exchange the printer card. See topic 6.38.37.

```
+---+
|022|
+---+
```

- Switch **POWER OFF** at the terminal.
- Reconnect J2.
- Switch power ON at the terminal.

Does the terminal power-ON?

Yes No

```
| |
| +---+
| |023|
| +---+
```

- Continue at Step 027.

```
+---+
|024|
+---+
```

One of the cables you disconnected is the cause of the problem.

- Switch **POWER OFF** at the terminal.
- Reconnect one of the following connectors : J3, J4, J5, J6, J7, J8, J9, or J10.
- Switch power ON at the terminal.

Does the terminal power-ON?

Yes No

```
| |
| +---+
| |025|
| +---+
```

- Reconnect the remaining cables.
Exchange the failing FRU connected to that cable.

```
+---+
|026|
+---+
```

- Return to Step 024 and reconnect another cable.
-

```
+---+
|027|
+---+
```

(From step 023)

- Switch **POWER OFF** at the terminal.
- Unplug the following printer card connectors from the extension card: J101, J102, J106, J107, J108, and J109. See Figure 6-24.
Note: The cable in J103 is part of the card.
- Switch power ON at the terminal.

Does the terminal power-ON?

Yes No

```
|
| |
| +---+
| |028|
| +---+
```

Exchange the extension card. See topic 6.38.38.

```
+---+
|029|
+---+
```

One of the cables you disconnected is the cause of the problem.

- Switch **POWER OFF** at the terminal.
- Reconnect one of the following connectors : J101, J102, J106, J107, J108, and J109.
- Switch power ON at the terminal.

Does the terminal power-ON?

Yes No

```
|
| |
| +---+
| |030|
| +---+
```

- Reconnect the remaining cables.

Exchange the failing FRU connected to that cable. See Table 6-6 in topic 6.37.2.1.

```
+---+
|031|
+---+
```

- Return to Step 029 and reconnect another cable.
-

6.21 MAP 4240: Printed Characters are Light

Symptom Explanation	Conditions That Could Cause This Symptom
The printed characters are light.	<input type="checkbox"/> The ribbon is not in good condition. <input type="checkbox"/> The ribbon is not turning. <input type="checkbox"/> The print head gap needs adjustment. <input type="checkbox"/> The forms compensation hardware is failing. <input type="checkbox"/> The print head wires are worn. <input type="checkbox"/> The multipart forms may be of poor quality.

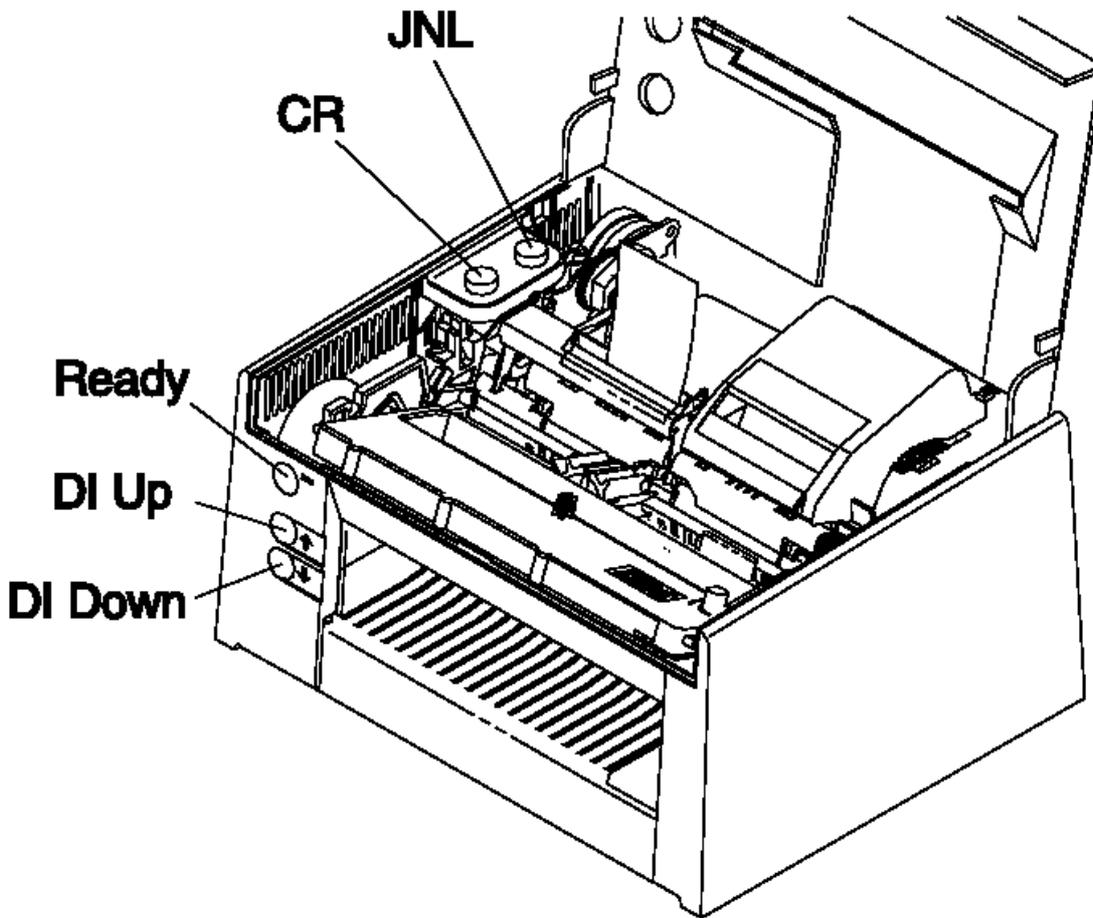


Figure 6-25. Printer Buttons

```
+----+
| 001 |
+----+
```

Note: Ensure that the ribbon is in good condition.

- Switch **POWER OFF** at the terminal.
- Manually move the print head left to right and then right to left.

The ribbon should move only when the print head is moving from left to right.

Does the ribbon turn when the print head is moved?

```
Yes No
|
|
+----+
| 002 |
+----+
```

See topic 6.29 and continue problem isolation procedures.

```
|  
+----+  
| 003 |  
+----+
```

- Take an 8 1/2 x 11 sheet of paper and run it back and forth through the DI station using the DI up button and the DI down button. See Figure 6-25.

- Run the Stand-Alone Printer Test. See topic 6.4.

Did the Stand-Alone Printer Test run successfully?

Yes No

```
|  
+----+  
| 004 |  
+----+
```

- Continue at Step 006.

```
+----+  
| 005 |  
+----+
```

The printer is now operating correctly.

```
+----+  
| 006 |  
+----+
```

- Pull back on the black carrier shaft and then let go of the shaft. The shaft should spring back on both ends. The rollers should not touch but there should be a clearance of less than one piece of paper.

- Move the forms compensation shaft using (2) in Figure 6-26.

Does the clearance between the rollers appear to be correct?

Yes No

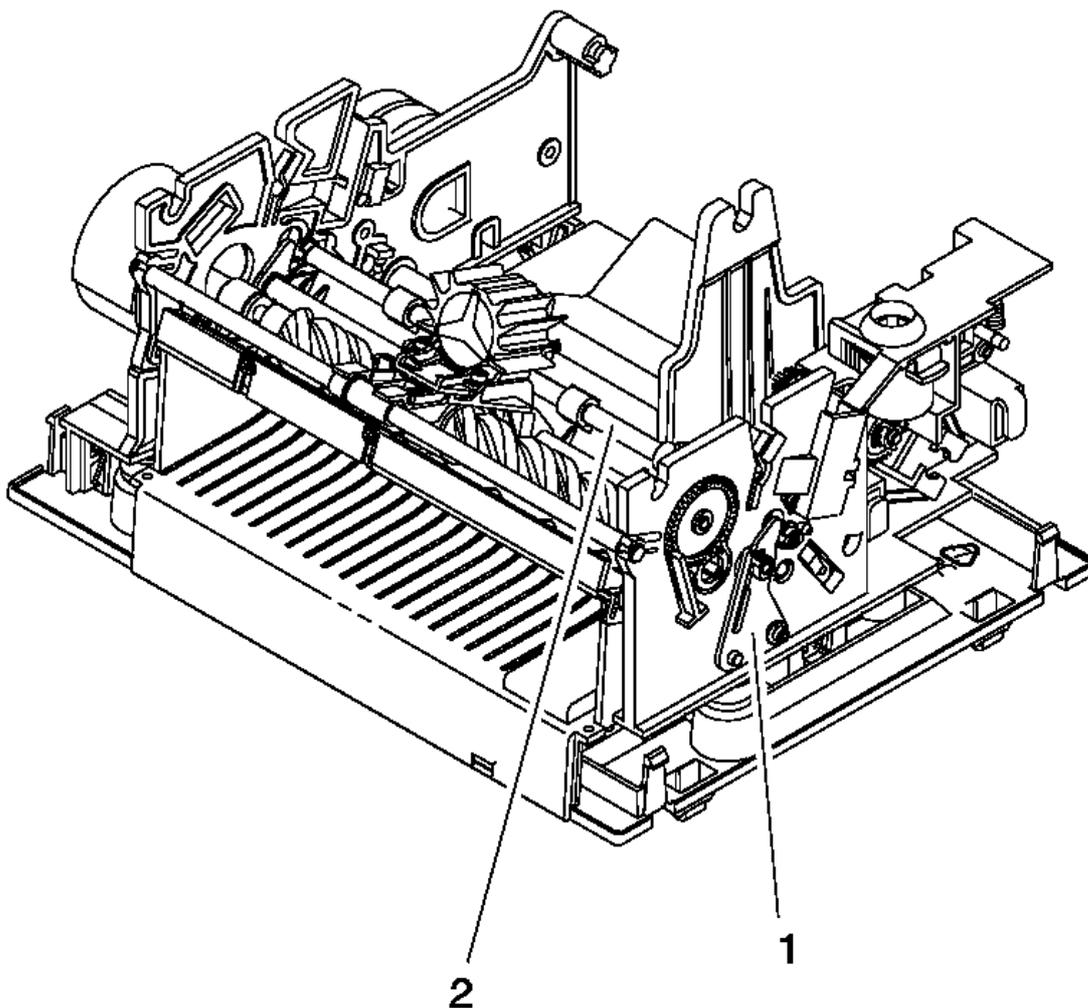


Figure 6-26. Forms Compensation Hardware

```
|  
+---+  
|007|  
+---+
```

Make sure that the forms compensation springs are attached properly on both the left and right sides.

- or -

The forms compensation hardware is failing. Call your support organization for assistance.

```
+---+  
|008|  
+---+
```

Readjust the print head gap and perform only the adjustment steps. See topic 6.38.9.

- or -

Exchange the print head. See topic 6.38.9.

6.22 MAP 4250: Printed Characters Missing One or More Dot Rows

Symptom Explanation	Conditions That Could Cause This Symptom
One or more wires are not firing on the print head.	<input type="checkbox"/> The print head is failing. <input type="checkbox"/> The printer card is failing. <input type="checkbox"/> The CR motor is failing. <input type="checkbox"/> The paper cutter motor is failing. <input type="checkbox"/> The JNL motor is failing. <input type="checkbox"/> The DI motor is failing.

+----+
 |001|
 +----+

- Check the print head resistance. See topic 6.34.

Is the print head OK?

Yes No

+----+
 |002|
 +----+

Was the resistance low?

Yes No

+----+
 |003|
 +----+

Exchange the print head. See topic 6.38.9.

+----+
 |004|
 +----+

Exchange the print head. See topic 6.38.9.

- and -

Exchange the printer card. See topic 6.38.37.

+----+
 |005|
 +----+

- Check the CR motor for electrical shorts. See topic 6.30.

Is the CR motor OK?

Yes No

+----+
 |006|
 +----+

Exchange the CR motor. See topic 6.38.12.

+----+
 |007|
 +----+

- Check the paper cutter motor for electrical shorts. See topic 6.31.

Is the paper cutter motor OK?

Yes No

+----+
 |008|
 +----+

Exchange the paper cutter motor. See topic 6.38.11.

+----+
| 009 |
+----+

- Check the JNL motor for electrical shorts. See topic 6.33.

Is the JNL motor OK?

Yes No

| |
| +----+ |
| | 010 | |
| +----+ |

Exchange the JNL motor. See topic 6.38.24.

+----+
| 011 |
+----+

- Check the DI motor for electrical shorts. See topic 6.32.

Is the DI motor OK?

Yes No

| |
| +----+ |
| | 012 | |
| +----+ |

Exchange the DI motor. See topic 6.38.15.

+----+
| 013 |
+----+

Exchange the print head. See topic 6.38.9.

- or -

Exchange the printer card. See topic 6.38.37.

6.23 MAP 4260: Printed Characters Are Smudged

Symptom Explanation	Conditions That Could Cause This Symptom
The printed characters are smudged.	<input type="checkbox"/> The print head gap needs adjustment.
	<input type="checkbox"/> The print head is failing.
	<input type="checkbox"/> The ribbon cartridge is failing.
	<input type="checkbox"/> The forms compensation hardware is failing.

+---+
|001|
+---+

- Check the ribbon cartridge.

Is the ribbon cartridge OK?

Yes No

|
|
+---+
|002|
+---+

- Exchange the ribbon cartridge.

+---+
|003|
+---+

- Check the print head gap and perform the print head gap adjustment procedures. See topic 6.38.9.

Is the print head gap OK?

Yes No

|
|
+---+
|004|
+---+

Adjust the print head gap. See topic 6.38.9.

+---+
|005|
+---+

Call your support organization for assistance.

Symptom Explanation	Conditions That Could Cause This Symptom
The printer indicator light is always on or comes on randomly.	<input type="checkbox"/> A DI sensor is blocked or failing. <input type="checkbox"/> The extension card is failing. <input type="checkbox"/> The printer card is failing.

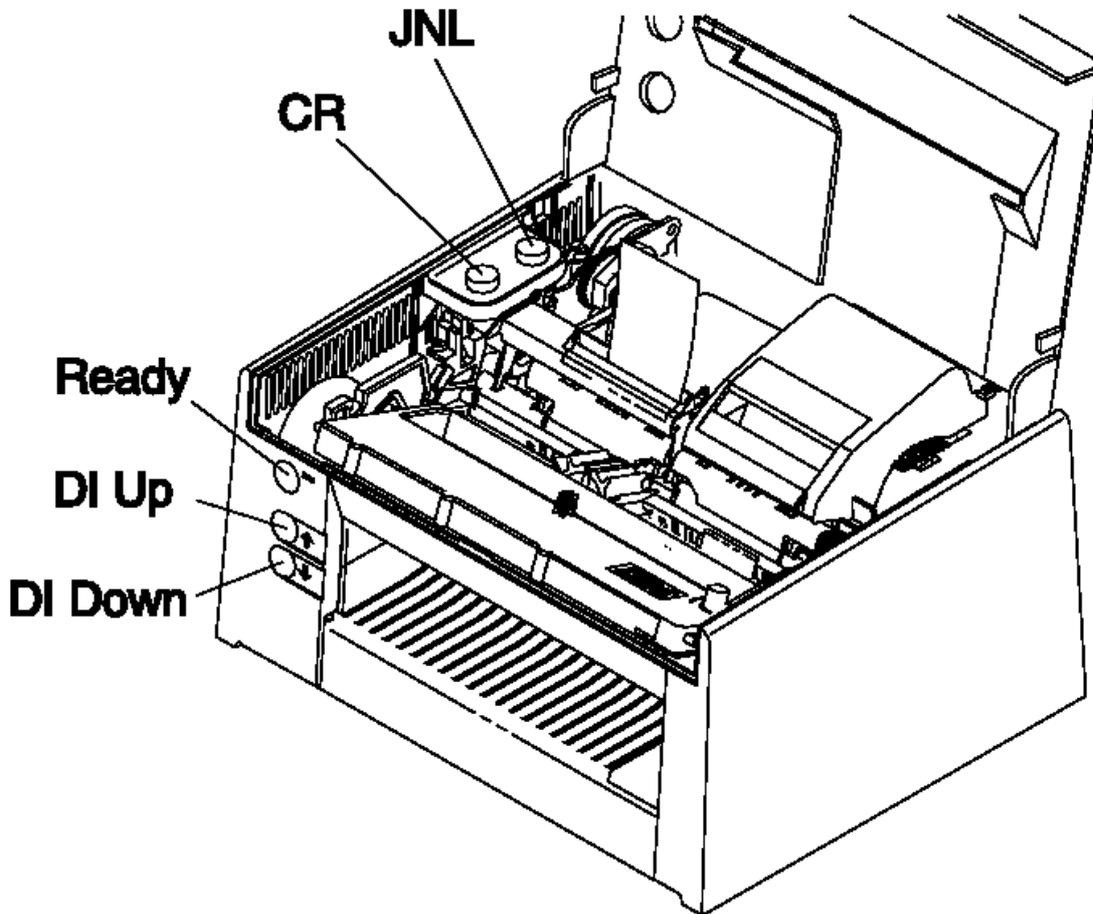


Figure 6-27. Printer Buttons

```
+---+
|001|
+---+
```

- Switch power ON at the terminal.
- Open the printer access cover.
- Check to see if paper or debris is blocking a DI sensor. See topic 6.36.1.
- Press and hold the Ready button and the DI up and down buttons, and wait for few seconds.

Note: Make sure the DI rollers and the print head have stopped moving.

- Close the printer access cover.
- Release all of the buttons.

Did the printer indicator light stay ON or continue to come on randomly?

```
Yes No
|
|
|+---+
| |002|
|+---+
```

The printer is now operating correctly.

|
+---+
|003|
+---+

- Check the lower DI forms sensor. See topic 6.36.

Is the lower sensor OK?

Yes No

|
+---+
|004|
+---+

If the extension card is not receiving +5 V DC from the printer card, exchange the extension card. See topic 6.38.38.

- or -

Exchange the lower DI forms sensor. See topic 6.38.17.

+---+
|005|
+---+

- Check the upper DI sensor. See "Upper DI Forms Sensor" in topic 6.36.

Is the upper sensor OK?

Yes No

|
+---+
|006|
+---+

If the extension card is not receiving +5 V DC from the printer card, exchange the extension card. See topic 6.38.38.

- or -

Exchange the upper DI sensor. See topic 6.38.18.

+---+
|007|
+---+

Exchange the printer card. See topic 6.38.37.

- or -

Exchange the extension card. See topic 6.38.38.

6.25 MAP 4280: Printer Indicator Light Not On

Symptom Explanation	Conditions That Could Cause This Symptom
The printer indicator light does not come on.	<input type="checkbox"/> The front button assembly is failing. <input type="checkbox"/> The cover sensor is failing. <input type="checkbox"/> The printer card is failing.

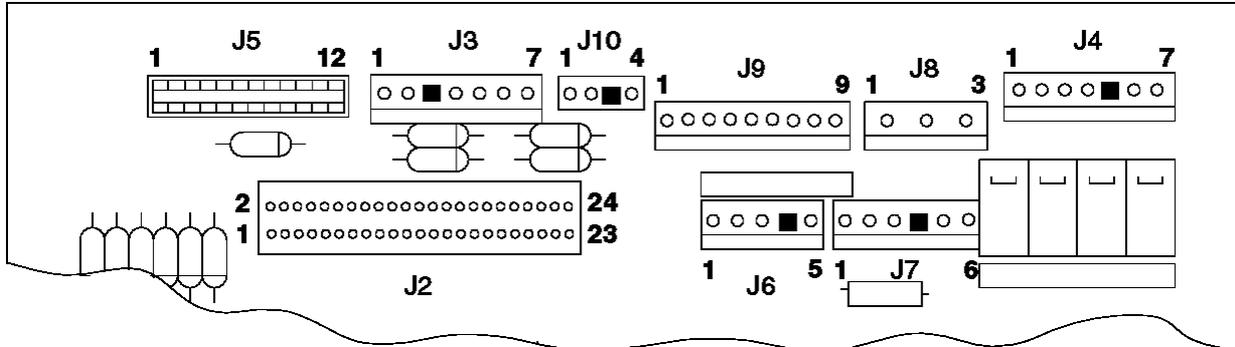


Figure 6-28. Printer Card Connections

```
+---+
|001|
+---+
```

The printer indicator light should go on for a short time and the print head should move to the center when the printer resets.

- While observing the printer indicator light, open the printer access cover and then close it.

Did the printer indicator light come ON for a short time?

Yes No

```
+---+
|002|
+---+
```

Did the print head move?

Yes No

```
+---+
|003|
+---+
```

Continue at Step 009.

```
+---+
|004|
+---+
```

Continue at Step 006.

```
+---+
|005|
+---+
```

Go to "TEST 4100: Stand-Alone Printer Test" in topic 6.4.

```
+---+
|006|
+---+
```

- Switch **POWER OFF** at the terminal.

- Remove the main cover, leaving the three cables connected. See topic 6.38.30.

- Disconnect cable J9 from the printer card.
- Measure the resistance of the printer indicator light between cable connector pins J9-5 and J9-6. The printer indicator light should give a reading of "OL" with the meter leads in one direction and a few million ohms with the leads reversed.

Is the printer indicator light OK?

Yes No

```
| |
| |
| +---+
| |007|
| +---+
```

Exchange the front button assembly. See topic 6.38.2.

```
+---+
|008|
+---+
```

Exchange the printer card. See topic 6.38.37.

```
+---+
|009|
+---+
```

- Switch **POWER OFF** at the terminal.
- Remove the main cover, leaving the three cables connected. See topic 6.38.30.
- Model 3 - Insert a piece of paper in the middle of the cover sensor to simulate the cover being closed.
Model 4 - Make sure the sensor magnet in the cover is not missing then close the top cover.
- Measure for +5 V DC between J7-3 (positive) and J7-1 (negative).
- Remove the paper from the cover sensor.
- Measure for 0 V DC between J7-3 (positive) and J7-1 (negative).

Did the voltage drop with the paper removed?

Yes No

```
| |
| |
| +---+
| |010|
| +---+
```

Exchange the cover sensor.

Model 3 - See topic 6.38.8.

Model 4 - See topic 6.38.7.

```
+---+
|011|
+---+
```

Exchange the printer card. See topic 6.38.37.

Symptom Explanation	Conditions That Could Cause This Symptom
One of the document sensors does not sense a document.	<input type="checkbox"/> The lower DI forms sensor is failing. <input type="checkbox"/> The upper DI sensor is failing. <input type="checkbox"/> The printer card is failing. <input type="checkbox"/> The extension card is failing.

+----+
| 001 |
+----+

- Switch power ON at the terminal.
- Open the printer access cover.
- Insert a piece of paper into the front of the printer until the paper stops.

Did the printer indicator light go on?

Yes No

| |
| |
| +----+
| | 002 |
| +----+

- Continue at Step 006.

+----+
| 003 |
+----+

- Insert a piece of paper into the top of the printer until the paper stops.

Did the printer indicator light go ON?

Yes No

| |
| |
| +----+
| | 004 |
| +----+

- Continue at Step 009.

+----+
| 005 |
+----+

Go to "TEST 4100: Stand-Alone Printer Test" in topic 6.4.

+----+
| 006 |
+----+

(From step 002)

- Switch **POWER OFF** at the terminal.
- Remove the main cover, leaving the three cables connected. See topic 6.38.30.
- Switch power ON at the terminal.
- See topic 6.36 and check that the lower DI forms sensor is operating correctly.

Is the sensor working correctly?

Yes No

| |
| |
| +----+
| | 007 |
| +----+

- Exchange the lower DI forms sensor. See topic 6.38.17.

```
|  
+----+  
|008|  
+----+
```

Exchange the printer card. See topic 6.38.37.

- or -

Exchange the extension card. See topic 6.38.38.

```
+----+  
|009|  
+----+  
(From step 004)
```

- Switch **POWER OFF** at the terminal.
- Remove the main cover. See topic 6.38.30.
- See topic 6.36 and check that the upper DI sensor is operating correctly.

Is the sensor working correctly?

Yes No

```
| |  
| |  
| +----+  
| |010|  
| +----+  
| |
```

Exchange the upper DI sensor. See topic 6.38.18.

```
+----+  
|011|  
+----+
```

Exchange the printer card. See topic 6.38.37.

- or -

Exchange the extension card. See topic 6.38.38.

6.27 MAP 4300: Printer Not Printing Any Characters

Symptom Explanation	Conditions That Could Cause This Symptom
The printer does not print any characters.	<input type="checkbox"/> The print head cable is not connected.
	<input type="checkbox"/> The print head cable is blocking the home sensor.
	<input type="checkbox"/> The print head gap is too large.
	<input type="checkbox"/> The ribbon is failing or not turning.
	<input type="checkbox"/> The printer card is failing.

+---+
|001|
+---+

- Switch **POWER OFF** at the terminal.
- Remove the main cover, leaving the three cables connected. See topic 6.38.30.
- Check the print head cable to ensure it is correctly installed in cable connector J5. See Figure 6-29.
- Check the print head cable to ensure that it is routed below the home sensors.
- Adjust the print head gap. See topic 6.38.9 and do only the adjustments.

The ribbon should move left to right only when the print head is moving from left to right.

- Manually move the print head left to right and right to left.

Does the ribbon move left to right when the print head moves from left to right?

Yes No

|
| +---+
| |002|
| +---+
|

See topic 6.29 and continue problem isolation procedures.

+---+
|003|
+---+

Exchange the printer card. See topic 6.38.37.

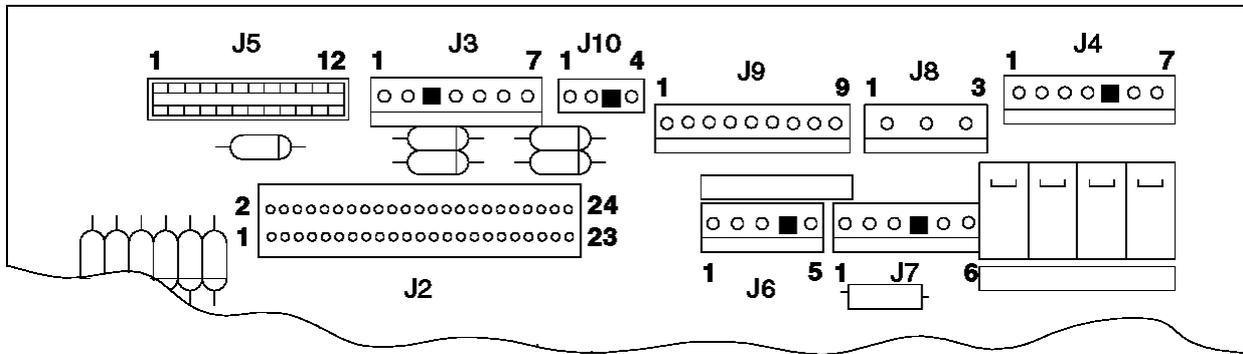


Figure 6-29. Printer Card Connections

6.28 MAP 4310: Ribbon Damaged by Printer

Symptom Explanation	Conditions That Could Cause This Symptom
The ribbon is being damaged by the printer.	<input type="checkbox"/> The printer ribbon cartridge is not turning.
	<input type="checkbox"/> The print head gap is not set correctly.
	<input type="checkbox"/> The print head is failing.

+----+
|001|
+----+

- Switch **POWER OFF** at the terminal.

The ribbon should move left to right only when the print head is moving from left to right.

- Manually move the print head left to right and right to left.

Does the ribbon move left to right when the print head moves from left to right?

Yes No

|
+----+
|002|
+----+

See topic 6.29 and continue problem isolation procedures.

+----+
|003|
+----+

- Check the print head gap. See topic 6.38.9.

Is the print head gap set correctly?

Yes No

|
+----+
|004|
+----+

- Adjust the print head gap. See topic 6.38.9.

+----+
|005|
+----+

Exchange the print head. See topic 6.38.9.

6.29 MAP 4320: Ribbon Does Not Advance

Symptom Explanation	Conditions That Could Cause This Symptom
The ribbon does not advance.	<input type="checkbox"/> The printer ribbon cartridge is failing.
	<input type="checkbox"/> The ribbon drive gears are failing.
	<input type="checkbox"/> The ribbon drive clutch is failing.

+---+
|001|
+---+

- Switch **POWER OFF** at the terminal.
- Remove the main cover, leaving the three cables connected. See topic 6.38.30.
- Remove the printer ribbon cartridge.
- Turn the knob on the printer ribbon cartridge in the direction of the arrow on the cartridge.

Did the ribbon move when the knob was turned?

Yes No

|
|
| +---+
| |002|
| +---+

Exchange the printer ribbon cartridge.

+---+
|003|
+---+

- Inspect the printer drive gears (1) for missing teeth. See Figure 6-30.

Are the gears OK?

Yes No

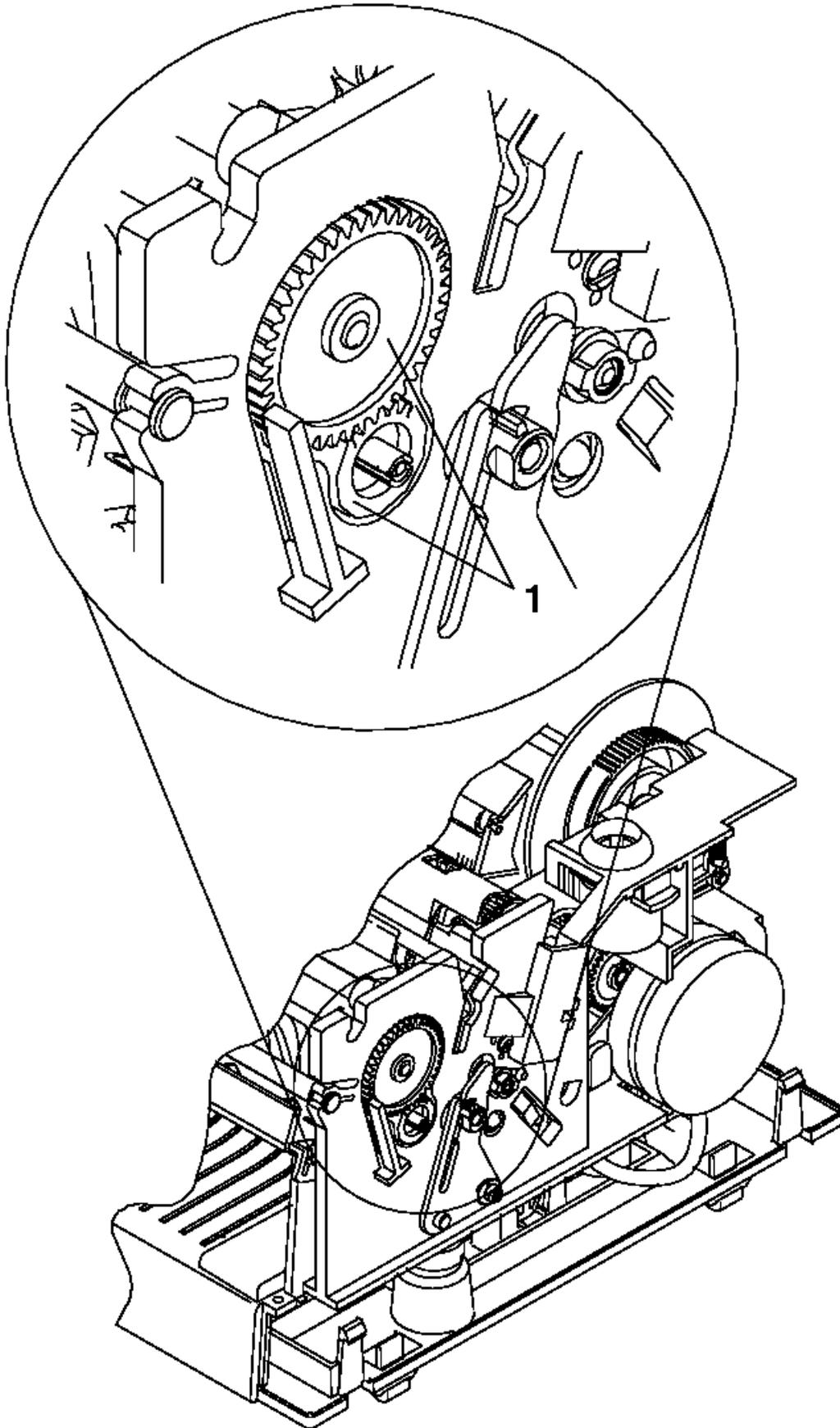


Figure 6-30. Printer Ribbon Drive Gears

|
+---+
|004|
+---+

| Exchange the ribbon drive gear, the large gear in Figure 6-30.

+----+
| 005 |
+----+

- Check that the large gear turns counterclockwise but resists being turned clockwise.

Did the gears resist being turned clockwise?

Yes No

| |
| +----+
| | 006 |
| +----+

| Exchange the ribbon drive clutch, the small gear in Figure 6-30.

+----+
| 007 |
+----+

Exchange the printer ribbon cartridge.

+---+
|003|
+---+

Was the resistance above the given range?

Yes No

|
|
+---+
|004|
+---+

The resistance was below the given range.

Exchange the CR motor and the printer card. See topic 6.38.13 and
6.38.37.

+---+
|005|
+---+

The resistance was above the given range.

Exchange the CR motor. See topic 6.38.13.

6.31 MAP 4340: Paper Cutter Motor Resistance Checks

Symptom Explanation	Conditions That Could Cause This Symptom
The paper cutter motor may be defective.	<input type="checkbox"/> The paper cutter motor is failing. <input type="checkbox"/> The printer card is failing.

Note: A short circuit in the motor winding can draw too much current and damage components on the printer card.

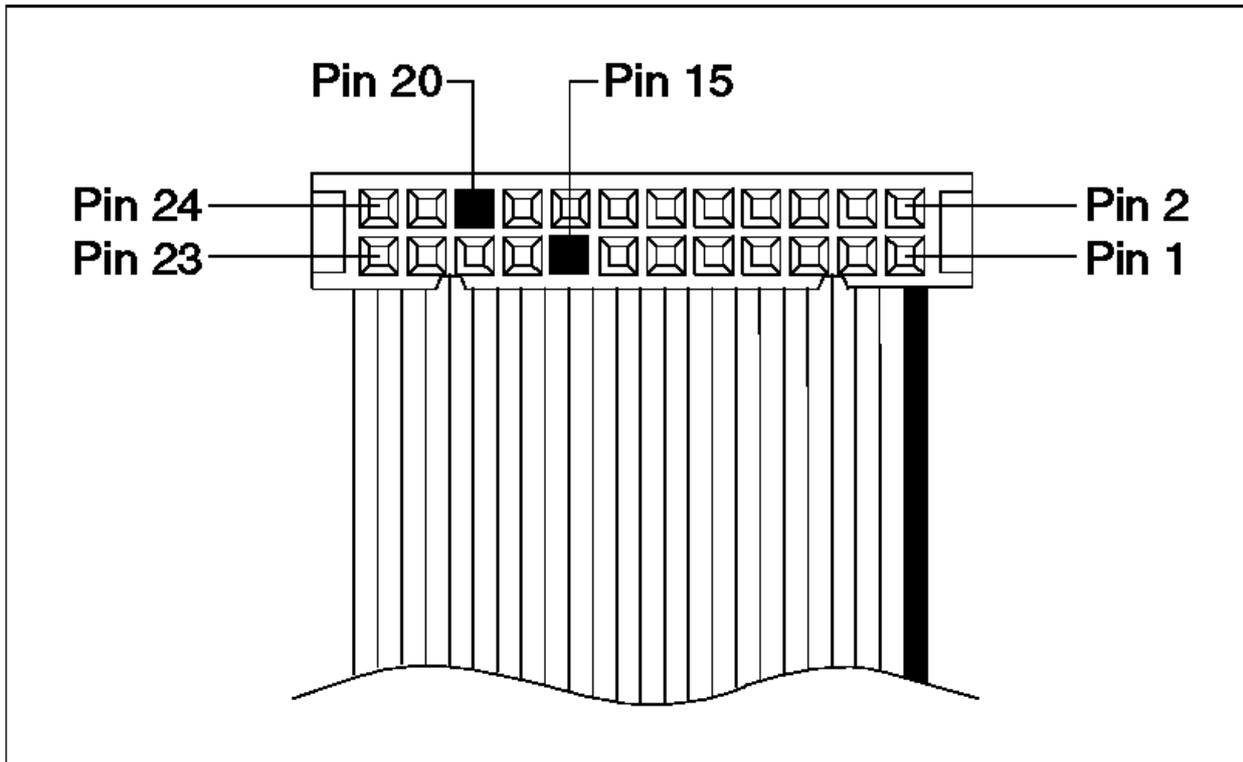


Figure 6-32. Extension Card Cable Connector

```
+----+
|001|
+----+
```

- Switch **POWER OFF** at the terminal.

Verify that the resistances in the paper cutter motor at the CR station are correct.

- Disconnect the extension card cable from J2 on the printer card. See Figure 6-38 in topic 6.36 for the locations of the printer card connections. See Figure 6-32 for the locations of the cable connector pins.

- At the cable connector, check for 111 to 129 ohms between pin 2 and:

- Pin 3
- Pin 4
- Pin 5
- Pin 6

Was the resistance out of the given range?

Yes No

```
|
| |
| +----+
| |002|
| +----+
```

The resistance values are within range.

Return to the MAP step that directed you to this MAP and continue with problem isolation.

+---+
|003|
+---+

Was the resistance above the given range?

Yes No

|
|
+---+
|004|
+---+

The resistance was below the given range.

Exchange the paper cutter motor and the printer card. See topic
6.38.11 and 6.38.37.

+---+
|005|
+---+

The resistance was above the given range.

Exchange the paper cutter motor. See topic 6.38.11.

6.32 MAP 4350: DI Motor Resistance Checks

Symptom Explanation	Conditions That Could Cause This Symptom
The DI motor may be defective.	<input type="checkbox"/> The DI motor is failing.
	<input type="checkbox"/> The printer card is failing.

Note: A short circuit in a motor winding can draw too much current and damage components on the printer card.

+---+
|001|
+---+

- Switch **POWER OFF** at the terminal.

Verify that the resistances in the DI motor are correct.

- Disconnect the DI motor cable from J3 on the printer card. See Figure 6-38 in topic 6.36 for the locations of the printer card connections. See Figure 6-33 for the locations of the cable connector pins.

- At the cable connector, check for 111 to 129 ohms between pin 1 and:

- Pin 5
- Pin 7

- Next, check for 111 to 129 ohms between pin 2 and:

- Pin 4
- Pin 6

Was the resistance out of the given range?

Yes No

|
+---+
|002|
+---+

The resistance values are within range.

Return to the MAP step that directed you to this MAP and continue with problem isolation.

+---+
|003|
+---+

Was the resistance above the given range?

Yes No

|
+---+
|004|
+---+

The resistance was below the given range.

Exchange the DI motor and the printer card. See topic 6.38.15 and 6.38.37.

+---+
|005|
+---+

The resistance was above the given range.

Exchange the DI motor. See topic 6.38.15.

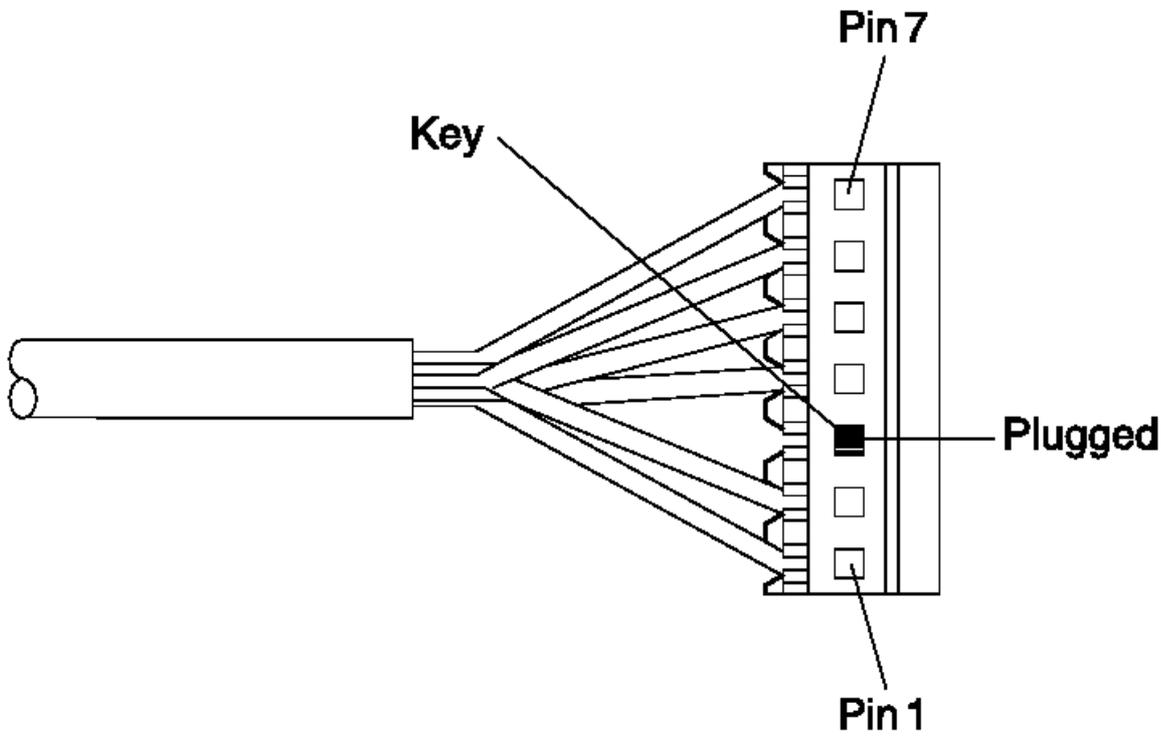


Figure 6-33. DI Motor Cable Connector

6.33 MAP 4360: JNL Motor Resistance Checks

Symptom Explanation	Conditions That Could Cause This Symptom
The JNL motor may be defective.	<input type="checkbox"/> The JNL motor is failing.
	<input type="checkbox"/> The printer card is failing.

Note: A short circuit in a motor winding can draw too much current and damage components on the printer card.

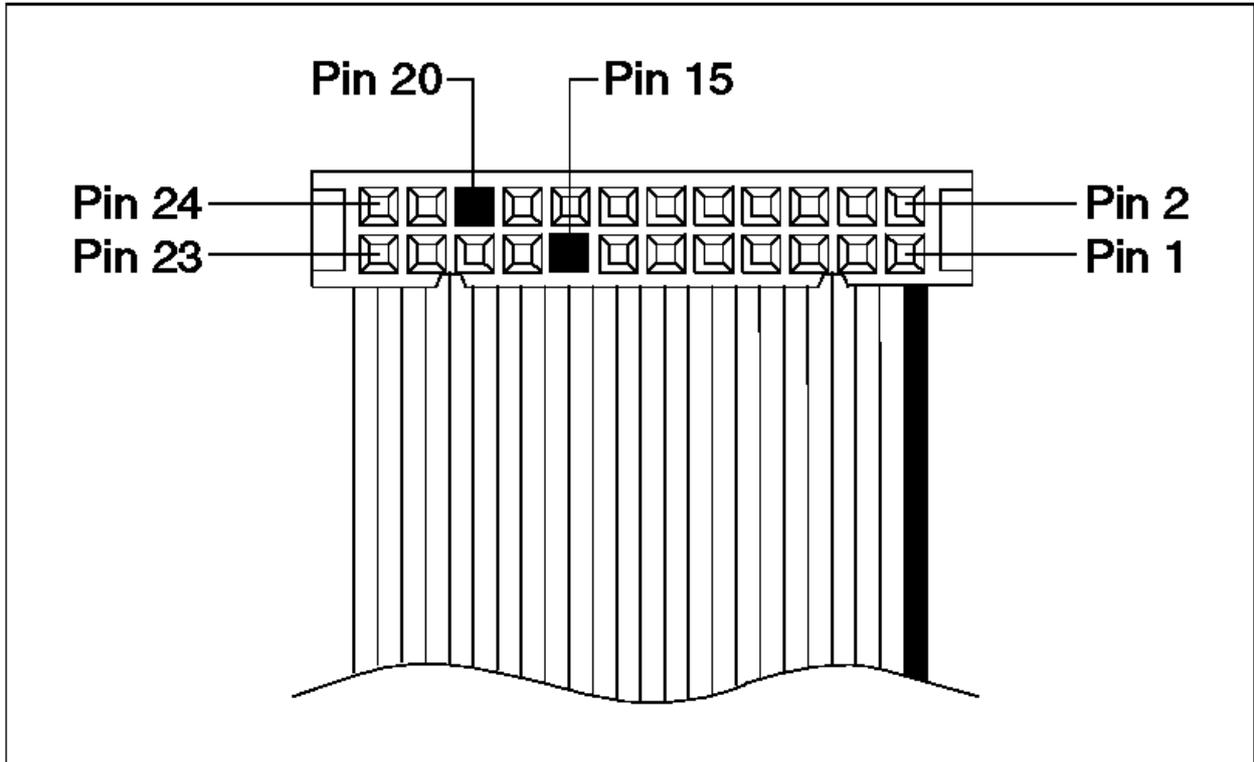


Figure 6-34. Extension Card Cable Connector

```
+---+
|001|
+---+
```

- Switch **POWER OFF** at the terminal.

Verify that the resistances in the JNL motor are correct.

- Disconnect the extension card cable from J2 on the printer card. See Figure 6-38 in topic 6.36 for the locations of the printer card connections. See Figure 6-34 for the locations of the cable connector pins.

- At the cable connector, check for 111 to 129 ohms between pin 1 and:

- Pin 11
- Pin 12
- Pin 13
- Pin 14

Was the resistance out of the given range?

Yes **No**

```
|
|
+---+
|002|
+---+
```

The resistance values are within range.

Return to the MAP step that directed you to this MAP and continue with problem isolation.

```
+---+
```

| 003 |
+---+

Was the resistance above the given range?

Yes No

|
+---+
| 004 |
+---+

The resistance was below the given range.

Exchange the JNL motor and the printer card. See topic 6.38.24 and 6.38.37.

+---+
| 005 |
+---+

The resistance was above the given range.

Exchange the JNL motor. See topic 6.38.24.

6.34 MAP 4370: Print Head Resistance Checks

Symptom Explanation	Conditions That Could Cause This Symptom
The print head may have an open or short circuit condition.	<input type="checkbox"/> The print head is failing. <input type="checkbox"/> The printer card is failing.

Note: A short circuit in a print head coil can draw too much current and damage components on the printer card. Exchange both the print head and the printer card at the same time if a short circuit is detected.

+----+
 |001|
 +----+

- Switch **POWER OFF** at the terminal.

Verify that the resistances in the print head are correct.

- Disconnect the print head cable from J5 on the printer card. See Figure 6-38 in topic 6.36 for the locations of the printer card connections. See Figure 6-35 for the locations of the print head cable connector strips.

- At the end of the print head cable, check for 17.2 to 21.2 ohms between connector strip 6 and:

- Connector Strip 1
- Connector Strip 2
- Connector Strip 3
- Connector Strip 4
- Connector Strip 8
- Connector Strip 9
- Connector Strip 10
- Connector Strip 11
- Connector Strip 12

Was the resistance above or below the given range?

Yes No

|
 |
 | +----+
 | |002|
 | +----+

The resistance values are within range.

Return to the MAP step that directed you to this MAP and continue with problem isolation.

+----+
 |003|
 +----+

Was the resistance above the given range?

Yes No

|
 |
 | +----+
 | |004|
 | +----+

The resistance was below the given range.

Exchange both the print head and the printer card. See topic 6.38.9 and 6.38.37.

+----+
 |005|
 +----+

The resistance was above the given range.

Exchange the print head. See topic 6.38.9.

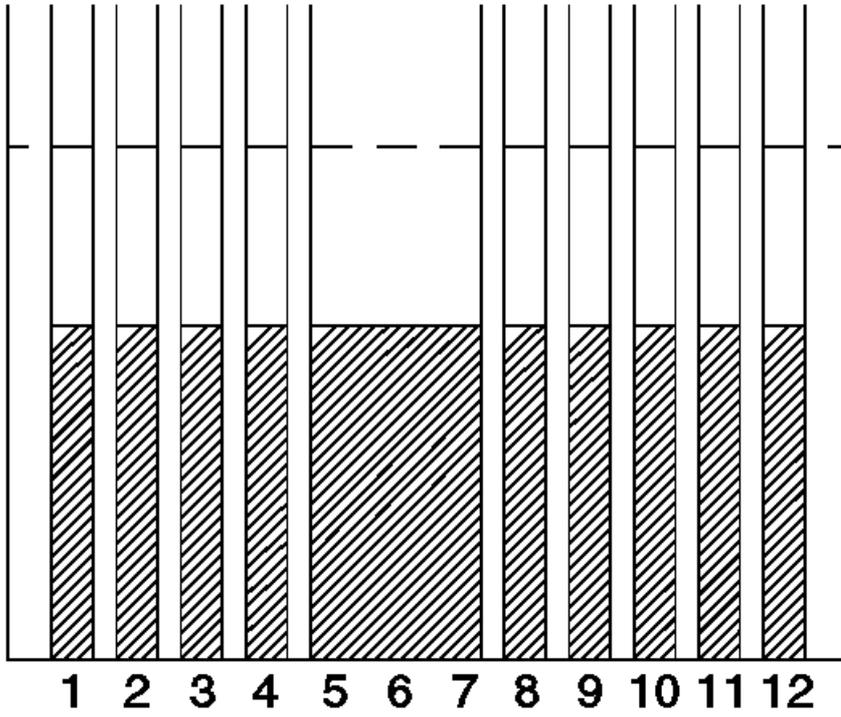


Figure 6-35. Print Head Cable Connector

6.35 MAP 4380: Transport Motor Resistance Checks

Symptom Explanation	Conditions That Could Cause This Symptom
The transport motor may be defective.	<input type="checkbox"/> The transport motor is failing.
	<input type="checkbox"/> The printer card is failing.

Note: A short circuit in a motor winding can draw too much current and damage components on the printer card.

+---+
|001|
+---+

- Switch **POWER OFF** at the terminal.

Verify that the resistances in the transport motor are correct.

- Disconnect the transport motor cable from J4 on the printer card. See Figure 6-38 in topic 6.36 for the locations of the printer card connections.

- Determine if your printer has a belt drive transport or a helix drive transport. See Figure 6-36 for the locations of the cable connector pins.

- At the cable connector, check for 4.5 to 5.5 ohms (helix drive) or 15 to 25 ohms (belt drive) between pin 1 and:

- Pin 3
- Pin 6

- Next, check for 4.5 to 5.5 ohms (helix drive) or 15 to 25 ohms (belt drive) between pin 2 and: between pin 2 and:

- Pin 4
- Pin 7

Was the resistance out of the given range?

Yes No

|
+---+
|002|
+---+

The resistance values are within range.

Return to the MAP step that directed you to this MAP and continue with problem isolation.

+---+
|003|
+---+

Was the resistance above the given range?

Yes No

|
+---+
|004|
+---+

The resistance was below the given range.

Exchange the transport assembly and the printer card. See topic 6.38.37 and 6.38.33.

+---+
|005|
+---+

The resistance was above the given range.

Exchange the transport assembly. See topic 6.38.33.

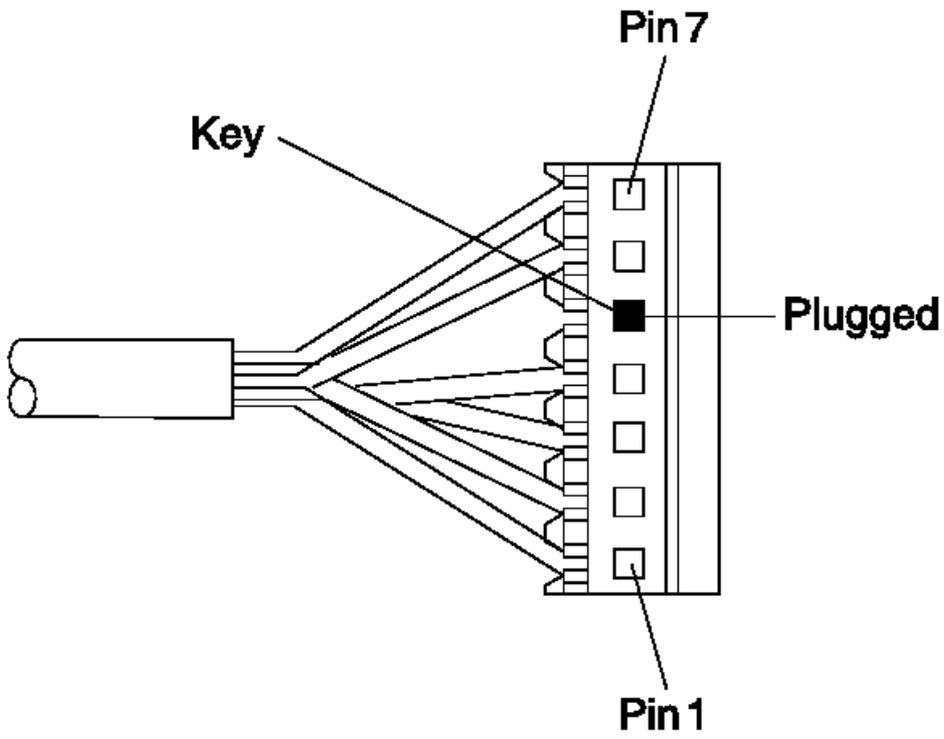


Figure 6-36. Transport Motor Cable Connector

6.36 Printer Sensor Checks

These tables provide the test points required to check the sensors in the Model 3 Printer. See Figure 6-37 and Figure 6-38 to locate the sensor card and the test points.

Switch power ON at the terminal before performing the printer sensor checks.

Attention Use an IBM 8060A (Fluke**) Digital Multimeter to perform the following printer sensor checks. Other meters may damage the sensors.

Readings other than the expected voltages indicate a failing sensor.

Upper DI Forms Sensor

Meter Lead Connections to the Extension Card		
Positive Lead	Negative Lead	Expected Voltage (DC)
J109-1	J109-4	+5 V DC source from printer card
J109-3	J109-4	Sensor Uncovered = 0.0 V to +2.5 V Sensor Covered = At least 25% greater than the uncovered sensor but less than +5 V.

Lower DI Forms Sensor

Meter Lead Connections to the Extension Card		
Positive Lead	Negative Lead	Expected Voltage (DC)
J108-4	J108-1	+5 V DC source from printer card
J108-2	J108-1	Sensor Uncovered = 0.0 V to +2.5 V Sensor Covered = At least 25% greater than the uncovered sensor but less than +5 V.

JNL Paper Motion Emitter Sensor

Note: Rotate the JNL paper emitter wheel very slowly to see the voltage change.

Meter Lead Connections to the Extension Card		
Positive Lead	Negative Lead	Expected Voltage (DC)
J106-2	J106-6	+5 V DC source from printer card
J106-3	J106-1	Sensor Uncovered = 0.0 V to +0.4 V Sensor Covered = +2.5 V to +5.5 V

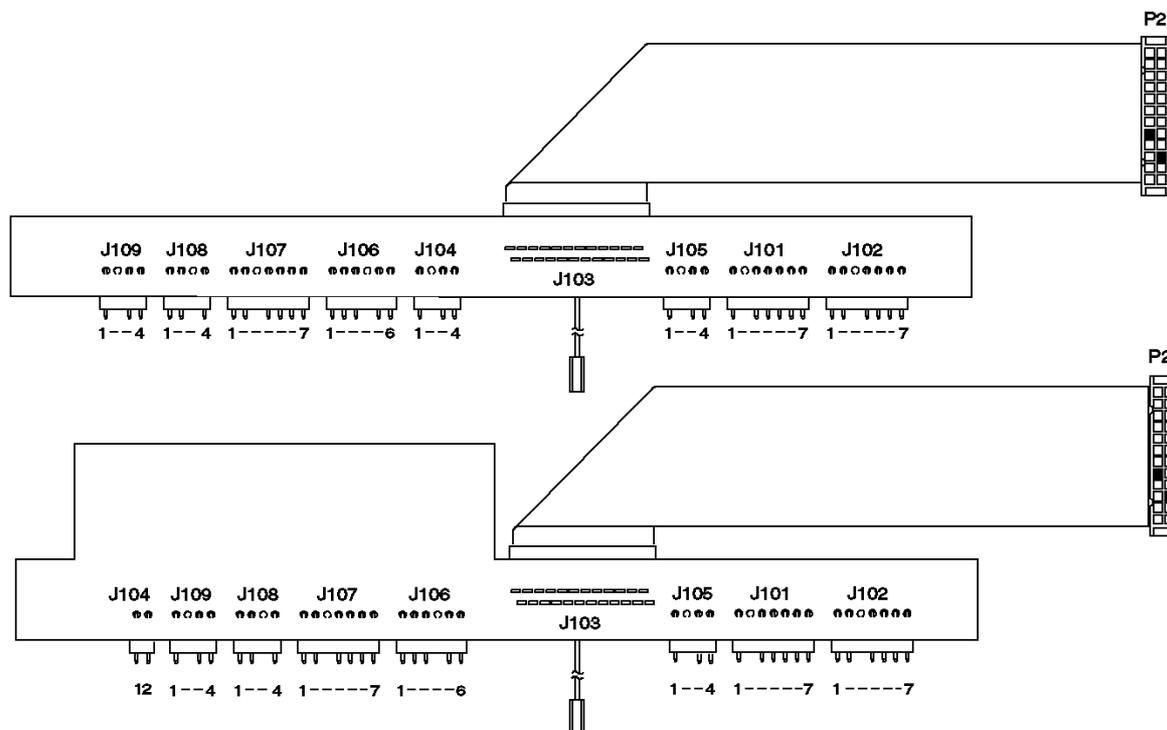


Figure 6-37. Extension Card Connections

Cover Sensor Check

Meter Lead Connections to the Printer Card		
Positive Lead	Negative Lead	Expected Voltage (DC)
J7-3	J7-1	Cover Open = 0.0 V to +0.8 V
		Cover Closed = +2.5 V to +5.5 V

Home Sensor Check

Meter Lead Connections to the Printer Card		
Positive Lead	Negative Lead	Expected Voltage (DC)
J6-1	J6-2	Left Sensor (1) Uncovered = 0.0 V to +0.4 V
		Left Sensor (1) Covered = +2.5 V to +5.5 V
J6-5	J6-2	Center Sensor (2) Uncovered = 0.0 V to +0.4 V
		Center Sensor (2) Covered = +2.5 V to +5.5 V

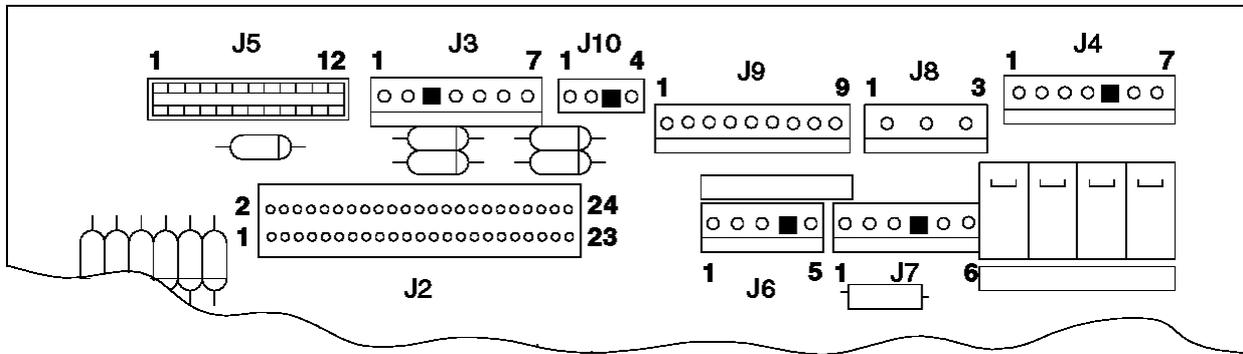


Figure 6-38. Printer Card Connections

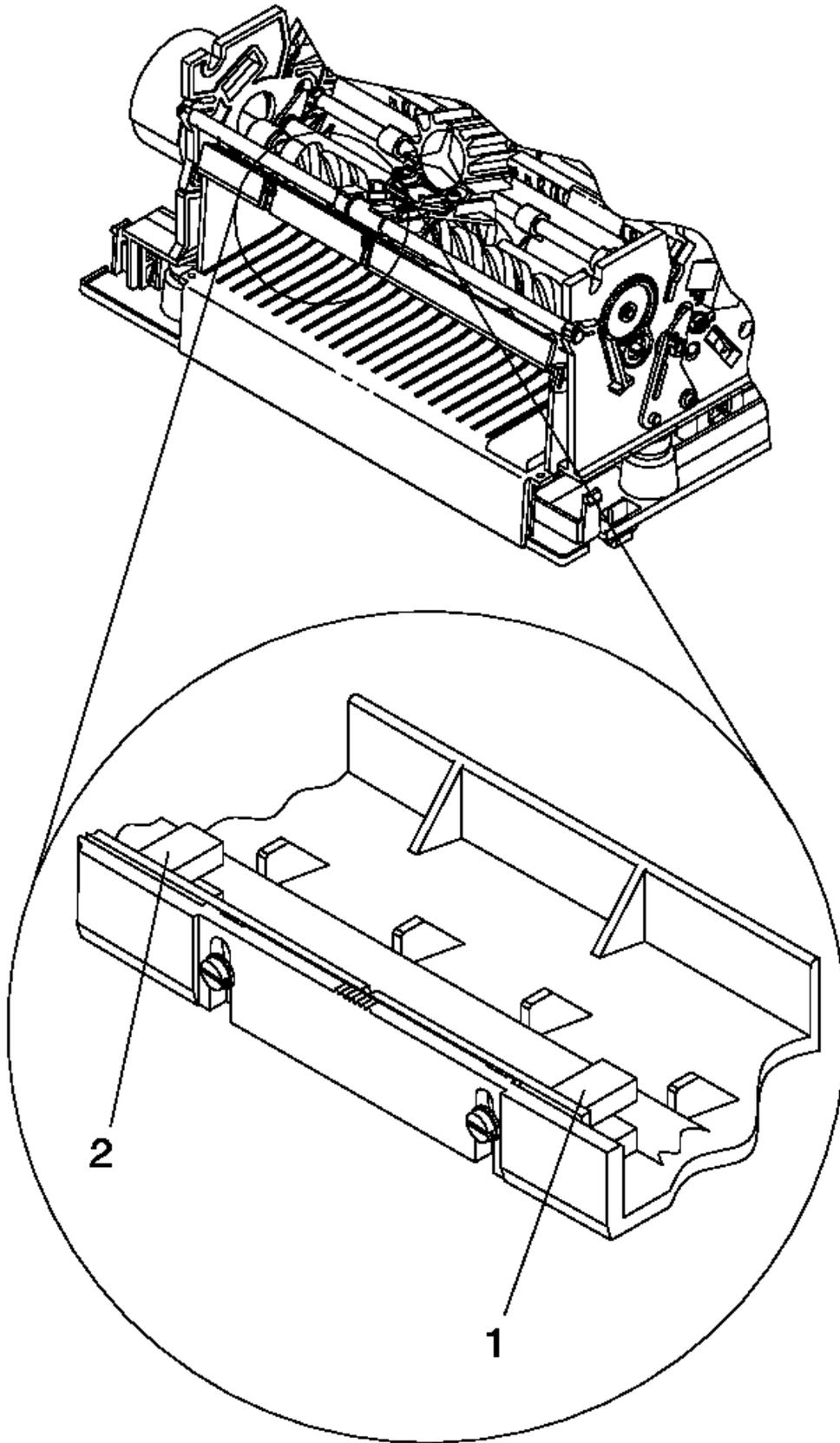


Figure 6-39. Home Sensor Card

Subtopics

6.36.1 Sensor Cleaning Procedures

6.36.1 *Sensor Cleaning Procedures*

Clean the sensors any time that the printer is being serviced.

Subtopics

6.36.1.1 DI Sensors

6.36.1.2 Home Sensor Card

6.36.1.3 JNL Paper Sensor

6.36.1.1 *DI Sensors*

1. Open the printer access cover.
2. Remove the printer ribbon cartridge.
3. Remove the debris from around both of the sensors.
4. Clean both the lower and upper DI sensors. See Figure 6-67 in topic 6.38.17.2 or Figure 6-69 in topic 6.38.18.2 for an illustration of the DI sensors.

6.36.1.2 *Home Sensor Card*

1. Open the printer access cover.
2. Remove the printer ribbon cartridge.
3. Push the print head all the way to the right.
4. Use a cotton swab dipped in isopropyl alcohol to clean the two home sensors. See Figure 6-39 in topic 6.36 for an illustration of the home sensors.

6.36.1.3 JNL Paper Sensor

1. Open the printer access cover.
2. Open the JNL cover.
3. Remove the JNL spool and the JNL paper.
4. Toggle the JNL roller forward by pulling the JNL lever toward you.
5. Clean both the sensor and the emitter wheel. See Figure 6-76 in topic 6.38.25.2 for an illustration of the sensor and of the emitter wheel.

6.37 *Printer Adjustments*

Subtopics

6.37.1 Using the 4680/4690 Operating System

6.37.2 Using the Reference Diskette

6.37.1 Using the 4680/4690 Operating System

1. Start UTILITY MODE by pressing **S1**, typing **9 5**, and then pressing **S2**.
2. When "enter request" is displayed, enter the keying sequence from the table for the procedure you want to do.
3. Press **S2** to advance through the various parts of the printer adjustment steps.
4. Type **9 9** and then press **S2** to exit.

Table 6-5. Adjustment Procedures	
Procedure	Keying Sequence
Print Current Adjustment Values - see Figure 6-40 in topic 6.37.2	7, 2, 1, S2
Character Alignment Procedure - see Figure 6-41 in topic 6.37.2	7, 2, 2, S2
DI Front Load Print Line Adjustment - see Figure 6-42 in topic 6.37.2	7, 2, 3, S2
DI Top Load Print Line Adjustment - see Figure 6-43 in topic 6.37.2	7, 2, 4, S2
Document Backlash Adjustment	7, 2, 5, S2
Document Reinsertion Adjustment	7, 2, 6, S2
Engineering Use Only	7, 2, 7, S2

6.37.2 Using the Reference Diskette

1. Load the reference diskette. See the hardware service manual for your terminal for reference diskette procedures.
2. Select START TESTS.
3. Select RUN POS DEVICE TESTS.
4. If a another terminal is attached, select the terminal whose printer you want to adjust. This is unnecessary when there is no other terminal attached.
5. Select PRINTER ADJUSTMENTS.
6. Select the adjustment you wish to make from the menu.
 - Print current adjustment values - see Figure 6-40
 - Character alignment procedure - see Figure 6-41
 - DI front load print line adjustment - see Figure 6-42
 - DI top load print line adjustment - see Figure 6-43
 - Document backlash adjustment
 - Document re-insertion adjustment
 - Engineering use only
7. Follow the instructions printed on the printer.
8. Press **S1** (**Esc** on the Enhanced A/N Keyboard) to return to the previous menu.

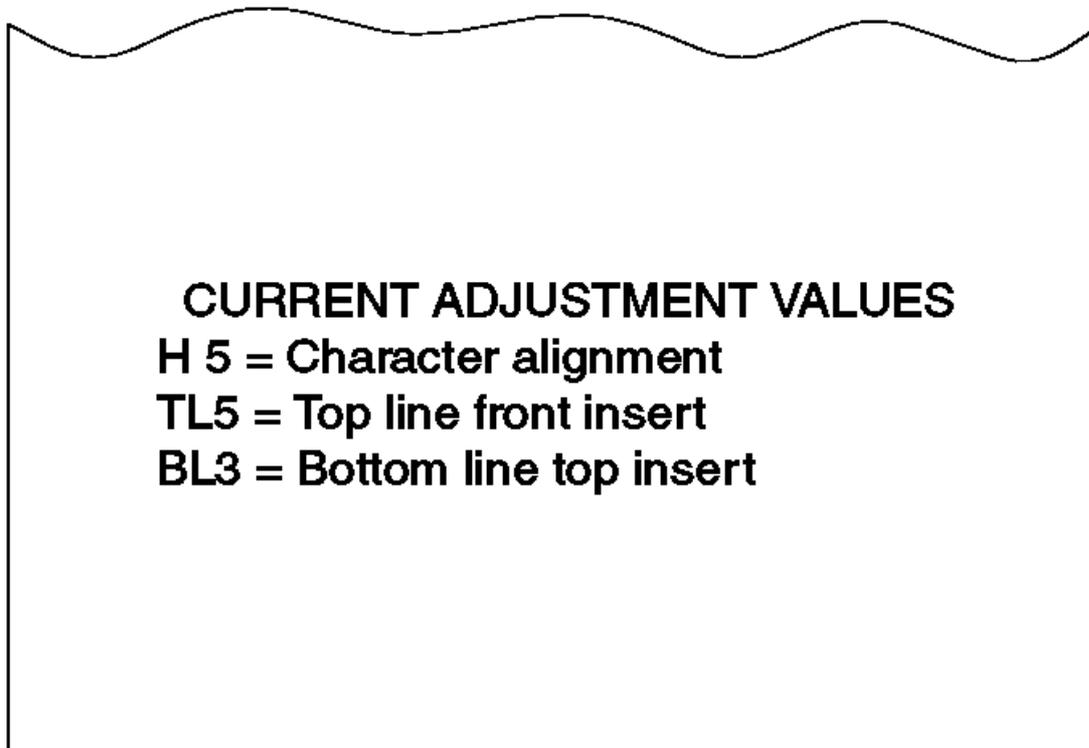


Figure 6-40. Current Adjustment Values

CHARACTER ALIGNMENT PROCEDURE

H	1
H	1
H	2
H	2
H	3
H	3
H	4
H	4
H	5
H	5
H	6
H	6
H	7
H	7
H	8
H	8
H	9
H	9

**Press the key (1-9) that corresponds
to the pair of H's that appear to be
most aligned**

5 = selected line

Figure 6-41. Character Alignment Procedure

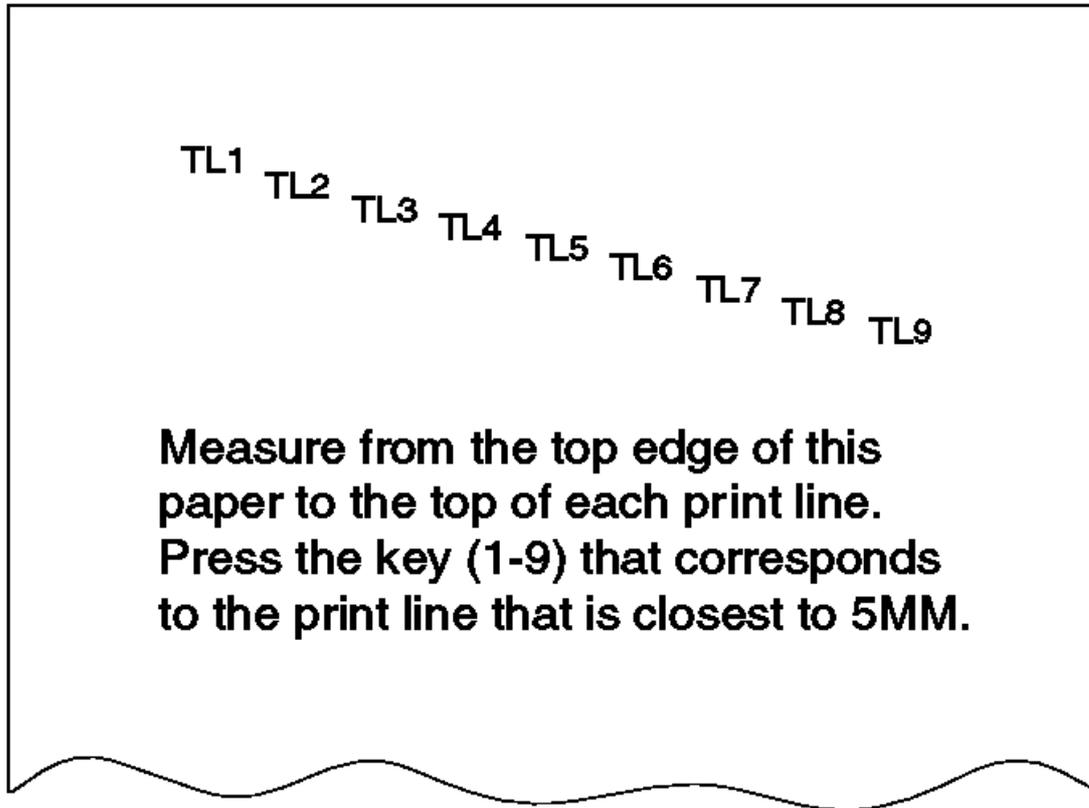


Figure 6-42. DI Front Load Print Line Adjustment

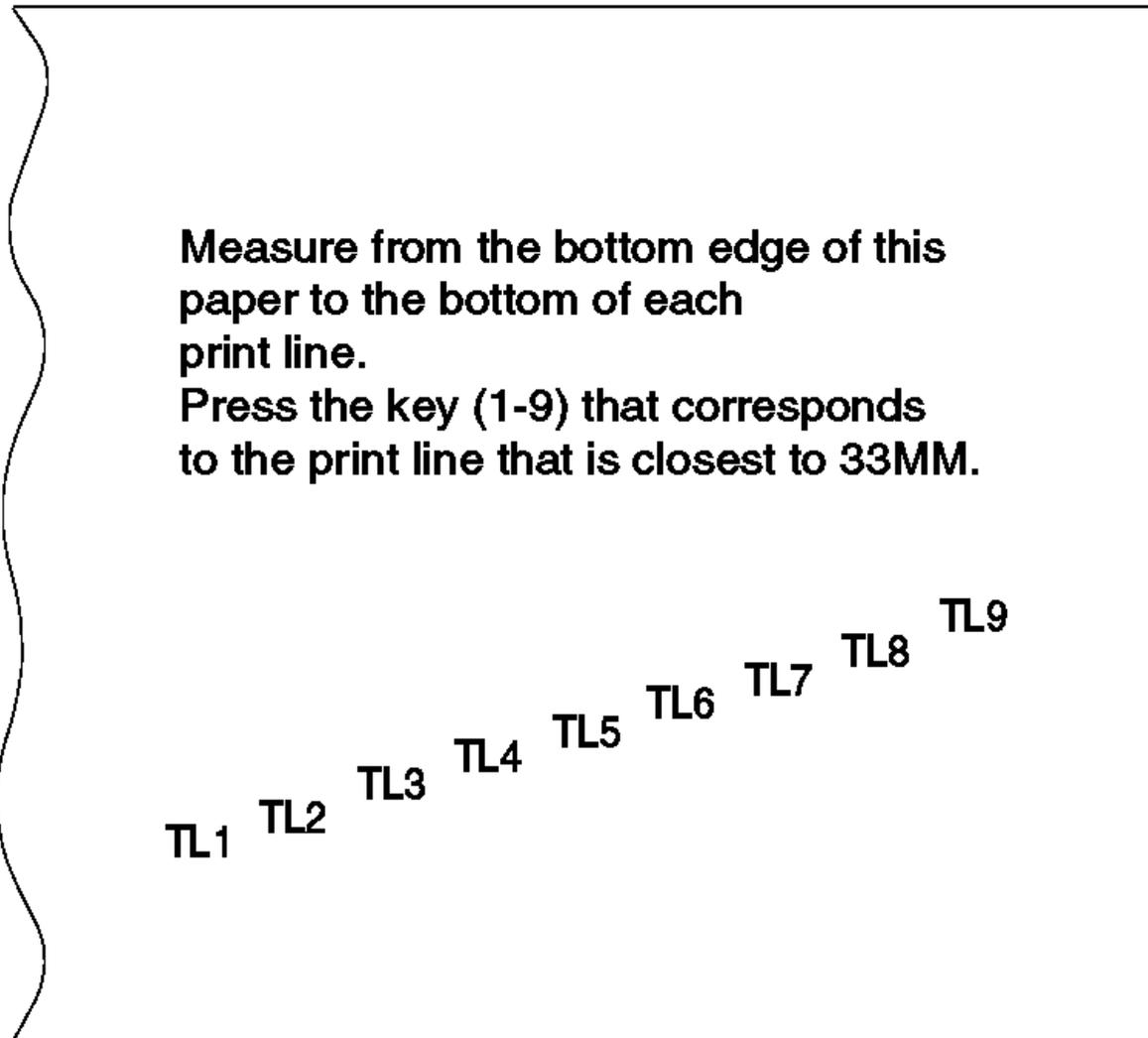


Figure 6-43. DI Top Load Print Line Adjustment

Subtopics
6.37.2.1 Printer Cards

6.37.2.1 Printer Cards

Use Figure 6-44 and Figure 6-45 as a guide when disconnecting and connecting cables. See Table 6-6 to determine where a printer component connects to the printer cards.

Table 6-6. Printer Connectors and Components			
Connector	Component	Connector	Component
J1	I/O Interface Cable	J10	Capacitor
J2	Signal to Extension Card	J101	Paper Cutter Motor
J3	DI Motor	J102	CR Motor
J4	Transport Motor	J103	Signals to Printer Card
J5	Print Head	J104	Magnetic Ink Character Reader
J6	Home Sensor	J106	JNL Paper Motion Sensor
J7	Cover Sensor	J107	JNL Motor
J8	Top Button Assembly	J108	Lower DI Forms Sensor
J9	Front Button Assembly	J109	Upper DI Sensor

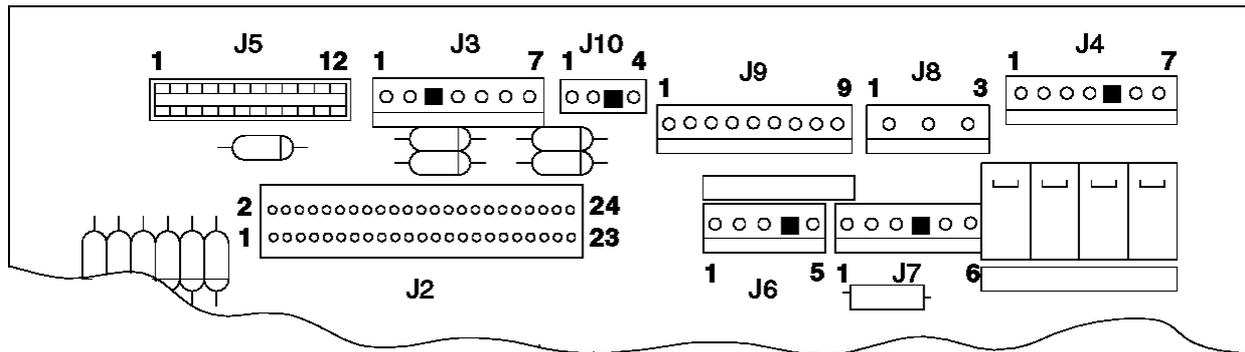


Figure 6-44. Printer Card

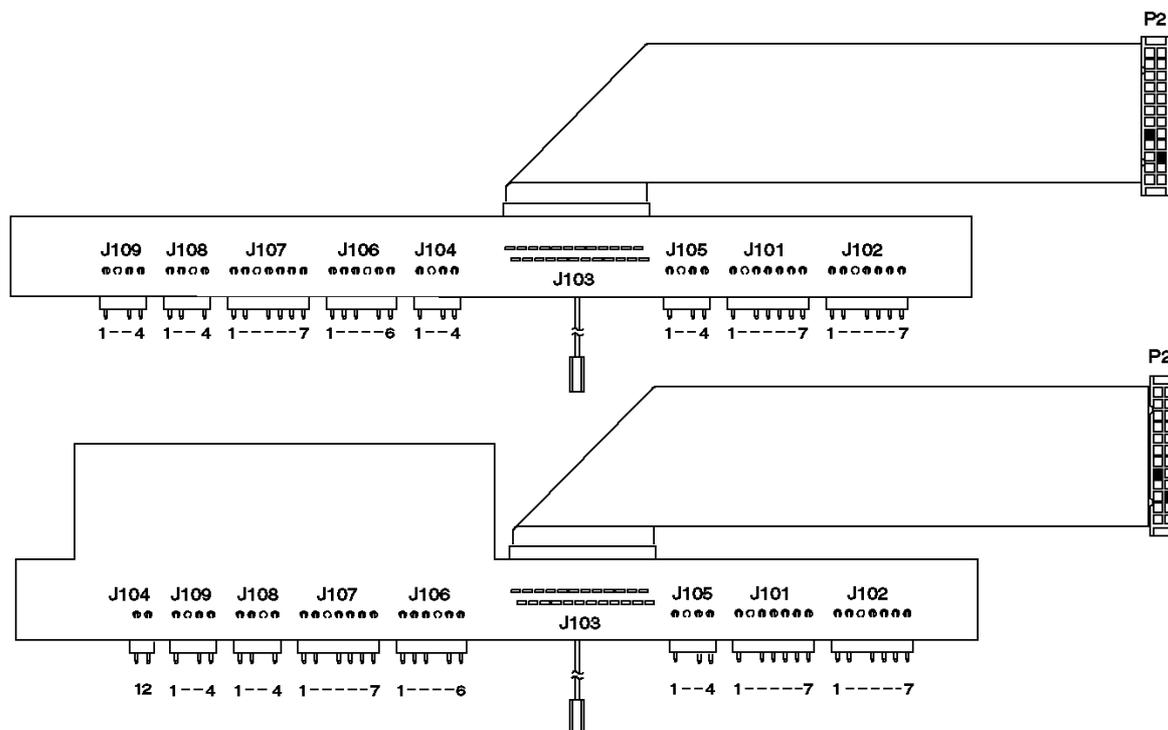


Figure 6-45. Extension Card

6.38 Removal and Replacement Procedures

Before Beginning
1. After exchanging any printer FRU, run the Stand-Alone Printer Test to ensure that the failure is corrected. See topic 6.4.
2. See Table 6-7 for information about FRUs not listed here.

There are no removal and replacement procedures for the following FRUs. Use the following table to find information when it is necessary to exchange the items listed.

Table 6-7. Where To Go For Information	
FRU	See Page
Paper Cutter Cover	6.38.11.2
Ribbon Drive Gear	6.38.34.2
Anti-Chatter Clip	6.38.34.2
Ribbon Clutch	6.38.34.2
Front Carrier Shaft	6.38.34.2
CR Feed Roll Gear and Bearing	6.38.13
Carrier Bushing	6.38.34.2
JNL Ledge	6.38.26.2
MICR Magnet	6.38.17.2
Home Sensor Cable	6.38.32
Print Head shield	6.38.9.2

You need to use special tools to perform some removal and replacement procedures. See Table 6-8 to determine the tool part numbers.

Table 6-8. Special Tools	
Tool	Part Number
Number 2 Phillips Bit	16F1664
Print Head Gap Setter	93F0419
Torque Screwdriver	16F1661
T10 Torx bit	16F1617 or 39F8407 from kit P/N 39F8407

Subtopics

- 6.38.1 Removing and Replacing the Access Cover
- 6.38.2 Removing and Replacing the Front Button Assembly
- 6.38.3 Removing and Replacing the Acoustic Flap
- 6.38.4 Removing and Replacing the Upper DI Guide
- 6.38.5 Removing and Replacing the Base
- 6.38.6 Removing and Replacing the Top Button Assembly (Model 3)
- 6.38.7 Removing and Replacing the Button and Cover Sensor Assembly (Model 4)
- 6.38.8 Removing and Replacing the Cover Sensor (Model 3 only)
- 6.38.9 Removing and Replacing the Print Head
- 6.38.10 Removing and Replacing the Capacitor
- 6.38.11 Removing and Replacing the Paper Cutter
- 6.38.12 Removing and Replacing the CR Motor
- 6.38.13 Removing and Replacing the CR Motor Gear Assembly
- 6.38.14 Removing and Replacing the CR Roller Assembly

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- 6.38.15 Removing and Replacing the DI Motor
- 6.38.16 Removing and Replacing the DI Gears
- 6.38.17 Removing and Replacing the Lower DI Sensor
- 6.38.18 Removing and Replacing the Upper DI Sensor
- 6.38.19 Removing and Replacing the Magnetic Ink Character Reader (MICR)
- 6.38.20 Removing and Replacing the Magnetic Ink Character Reader Pressure Pad
- 6.38.21 Removing and Replacing the JNL Cover
- 6.38.22 Removing and Replacing the JNL Lock
- 6.38.23 Removing and Replacing the JNL Takeup Clutch, Gears, and Pawl
- 6.38.24 Removing and Replacing the JNL Motor
- 6.38.25 Removing and Replacing the JNL Paper Motion Sensor
- 6.38.26 Removing and Replacing the JNL Roller Assembly and Frame
- 6.38.27 Removing and Replacing the JNL Support Post
- 6.38.28 Removing and Replacing the JNL Spool
- 6.38.29 Removing and Replacing the Paper Rollers
- 6.38.30 Removing and Replacing the Main Cover
- 6.38.31 Removing and Replacing the Platen Assembly
- 6.38.32 Removing and Replacing the Home Sensor Card
- 6.38.33 Removing and Replacing the Transport Assembly
- 6.38.34 Removing and Replacing the Helix Drive Transport Assembly
- 6.38.35 Converting From Helix to Belt Drive Transport Assembly
- 6.38.36 Removing and Replacing the Belt Drive Transport Assembly
- 6.38.37 Removing and Replacing the Printer Card
- 6.38.38 Removing and Replacing the Extension Card

6.38.1 *Removing and Replacing the Access Cover*

Subtopics

6.38.1.1 Removing the Access Cover

6.38.1.2 Replacing the Access Cover

6.38.1.1 *Removing the Access Cover*

1. Raise the access cover.
2. Push the tabs on both sides of the access cover inward as shown.
3. Rotate the cover back and off its hinge.

6.38.1.2 Replacing the Access Cover

1. Put the access cover on its hinge in a vertical position and snap it into place on the hinge.
2. While pushing the tabs on both sides of the access cover inward as shown, close the cover. Ensure that the access cover is correctly seated on its hinge and that it opens and closes correctly.

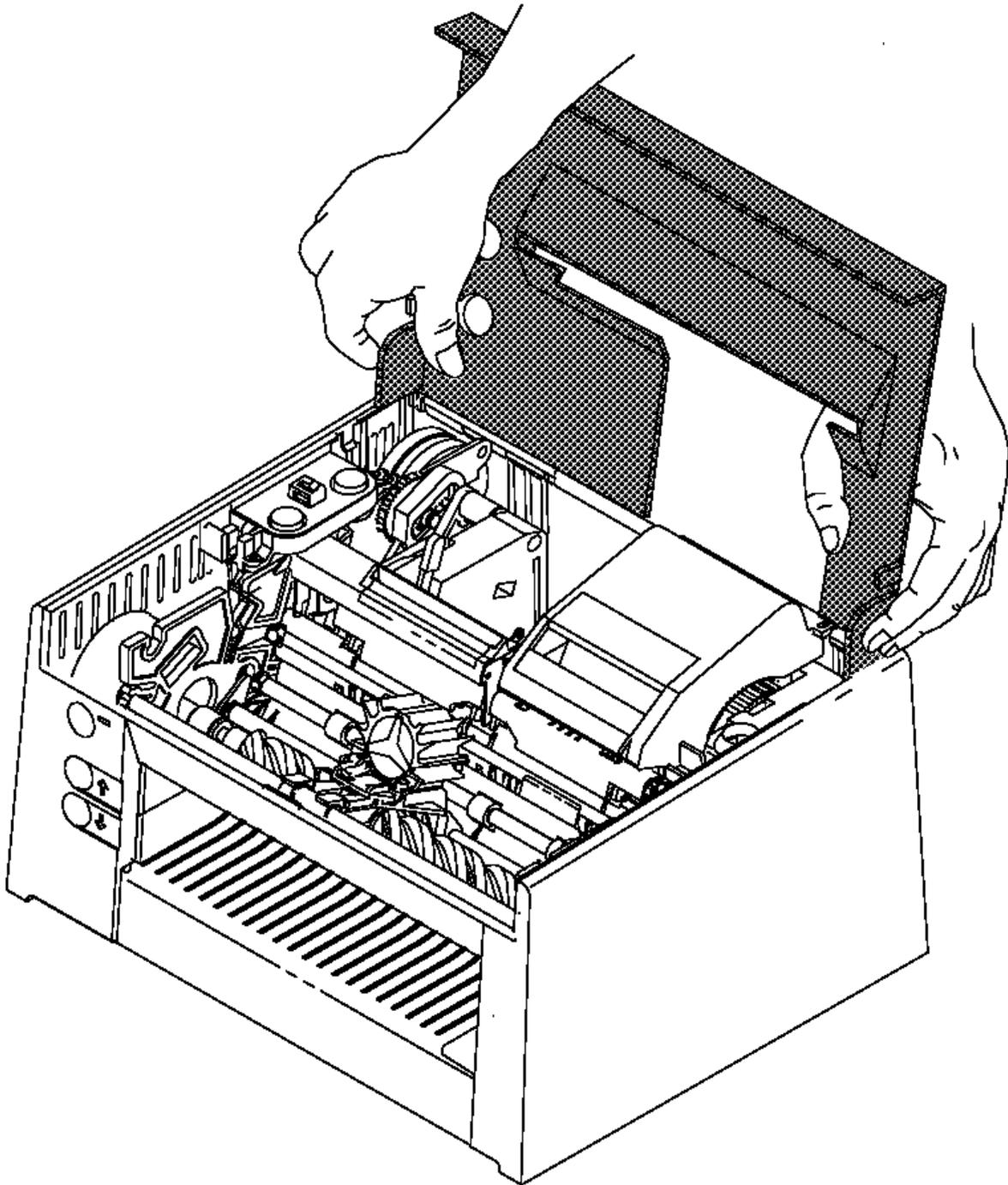


Figure 6-46. Access Cover

6.38.2 *Removing and Replacing the Front Button Assembly*

Subtopics

6.38.2.1 Removing the Front Buttons

6.38.2.2 Replacing the Front Buttons

6.38.2.1 *Removing the Front Buttons*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Disconnect the front button assembly cable from printer card connector J9. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
5. Remove the two front button assembly screws (1).
6. Remove the front button assembly.

6.38.2.2 Replacing the Front Buttons

1. Attach the front button assembly to the main cover using the two screws (1). Do not overtighten the screws.
2. Connect the front button assembly cable to printer card connector J9. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
3. Reinstall the main cover.
4. Connect the printer to the base or system unit.
5. Switch power ON at the base or system unit.
6. After replacing the button assembly, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone Printer Test	6.4

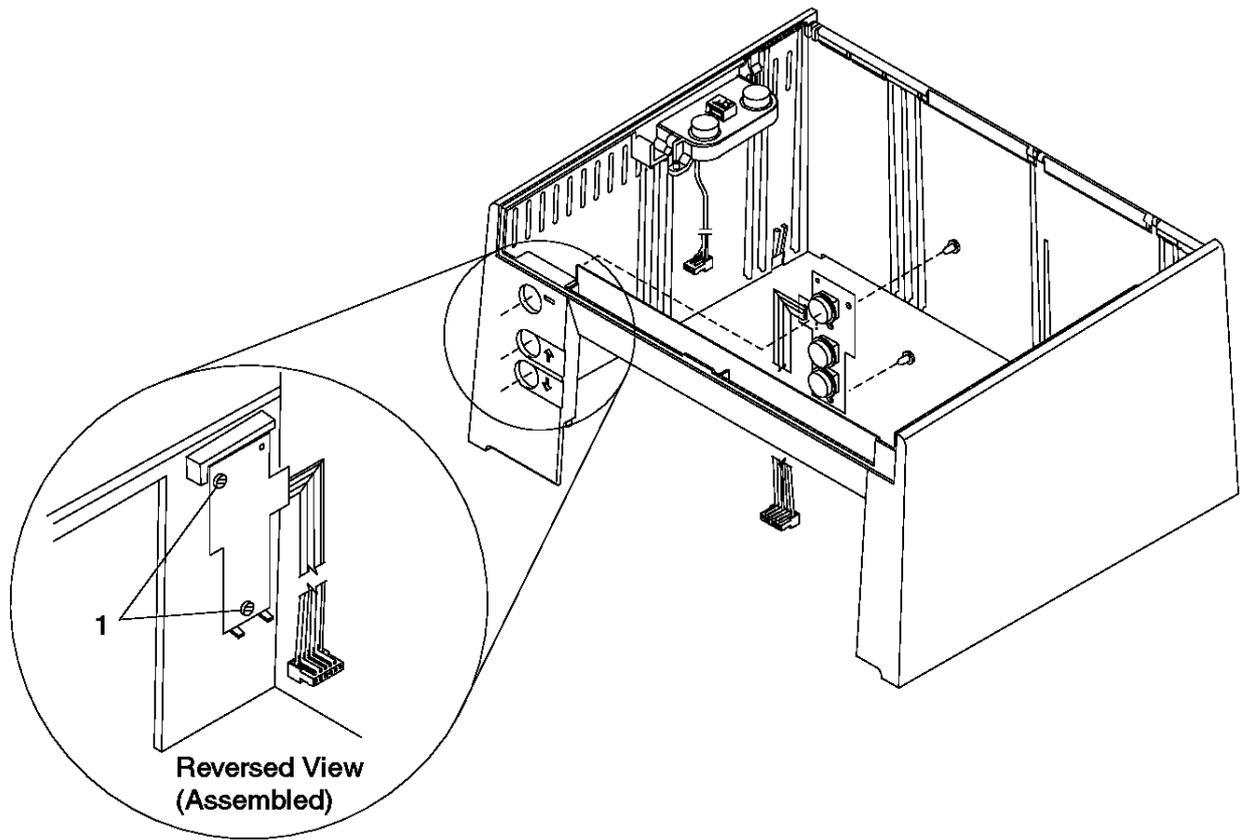


Figure 6-47. Button Assembly (Front)

6.38.3 *Removing and Replacing the Acoustic Flap*

Subtopics

6.38.3.1 Removing the Acoustic Flap

6.38.3.2 Replacing the Acoustic Flap

6.38.3.1 *Removing the Acoustic Flap*

NOTE: The Acoustic Flap reduces printer noise and holds the front-ejected forms in the printer. The new flap has a polyester film that makes it more damage-resistant, as well as making it easier to insert a form. The alignment of the flap's adhesive edges to the cover is very important for forms handling. A correctly installed flap does not allow the forms to catch or crumple.

1. Remove the main cover.
2. Place the printer on its back so the front of the printer is facing upward.
3. Remove the damaged flap and all the remaining foam material. Also remove any dirt, debris, and old adhesive from the area.

Tips:

- See Figure 6-48 in topic 6.38.3.2.
- The vinyl foam material tears easily.
- Use a screwdriver to pry the old flap loose then pull up to remove.
- Use a screwdriver to scrape off any remaining foam material.
- Use needlenose pliers to remove any debris. **Do not use alcohol.**

6.38.3.2 Replacing the Acoustic Flap

1. Lift up 25.4mm (1 inch) of both adhesive strips on one end of the flap. Fold both adhesive strips outward. Later, you will use needlenose pliers to remove the remainder of the strip, after the flap is correctly positioned. See Figure 6-48.
2. Fold the flap in a U-shape with the shiny side out so that both adhesive edges come in contact with the cover. See Figure 6-48.
3. Align the flap flush with the left side of the cover.
4. Place the flap against the square corner (1) of the inner locating rib on the cover. Align the edge of the flap along the rib.
5. Holding the flap in position with your fingers, slowly remove the adhesive strip using the needlenose pliers. Press hard on the adhesive after the strip is removed because the adhesive is pressure activated.
6. Place the shiny edge of the flap on the square corner (2) of the outer locating rib. Align the edge of the flap along the rib.
7. Holding the flap in position with your fingers, slowly remove the adhesive strip. Press hard on the other adhesive to activate it.
8. Check the installation by pulling the print head toward the front and inserting a document from both directions, front and top. The document should move freely through the printer without catching or jamming. If the document does not move freely, return to step 3 in topic 6.38.3.1. The flap may be deflecting the paper into a catch point.
9. Reinstall the main cover.
10. Test the printer using the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone Printer Test	6.4

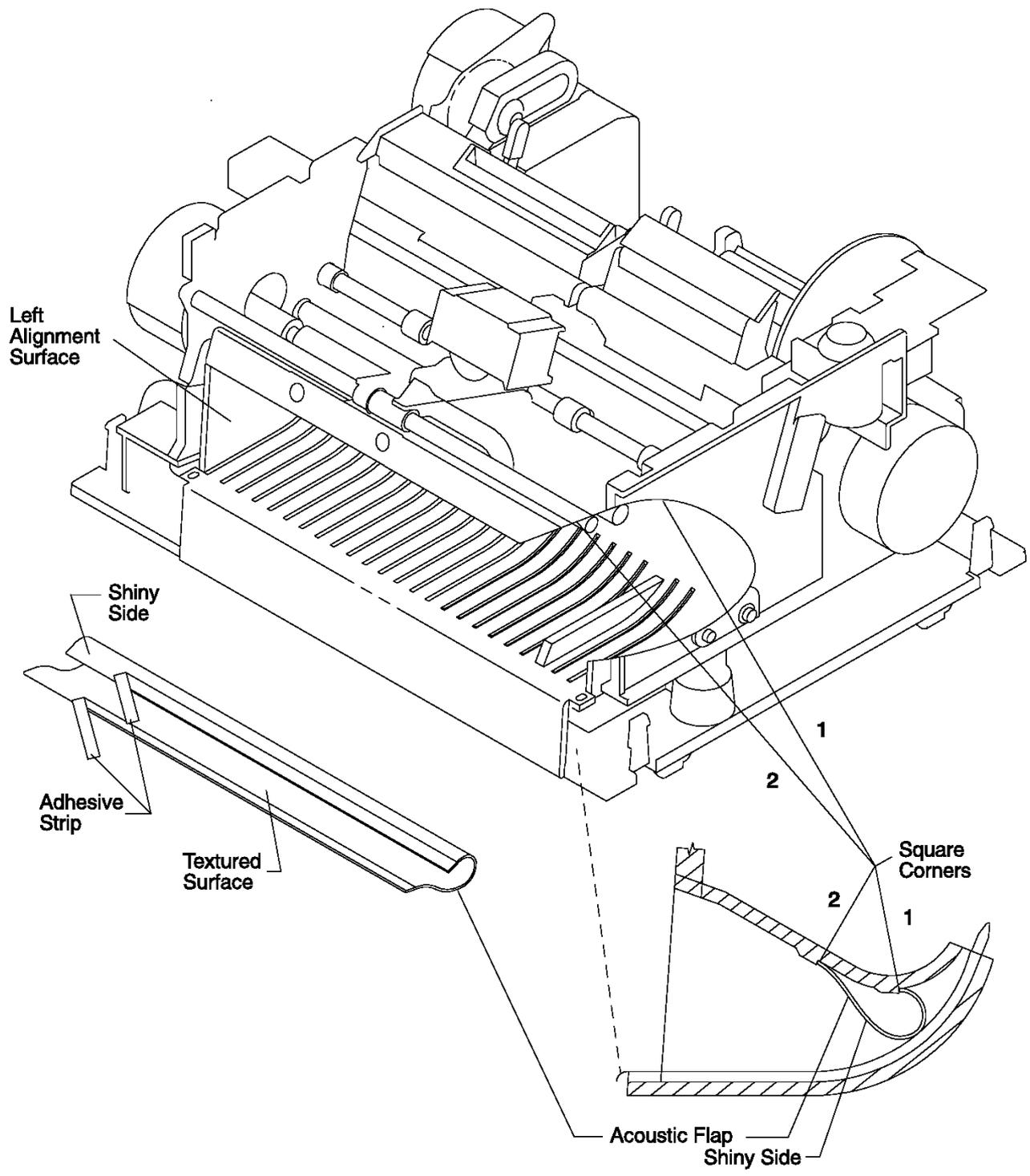


Figure 6-48. Acoustic Flap

6.38.4 *Removing and Replacing the Upper DI Guide*

Subtopics

6.38.4.1 Removing the Upper DI Guide

6.38.4.2 Replacing the Upper DI Guide

6.38.4.1 *Removing the Upper DI Guide*

1. Switch **POWER OFF** at the base or system unit.
2. Remove the ribbon cartridge.
3. Remove the print head from the carrier. It is not necessary to disconnect the print head cable.

Note: There are two types of guides. The older style is a thin film, plastic material. The later style is molded plastic. The removal procedure is different depending upon which style you have. Always install the later style molded plastic shield when replacing a damaged or defective guide.

4. **OLDER STYLE** - Using pliers, pull the guide up and out of the printer. Ensure that all loose pieces are removed. Use caution to not damage the upper DI sensor.
5. **LATER STYLE** - Using a screwdriver blade, starting at the left side, pry the guide away from the white tab holding it in place. Repeat this to release the guide from all tabs, left to right. See Figure 6-49 in topic 6.38.4.2.
6. Pull the black carrier shaft to the front to relieve pressure on the DI rollers, then lift the guide out.

6.38.4.2 Replacing the Upper DI Guide

1. Align the rectangular holes in the guide with the DI rollers.
2. Pull the black carrier shaft to the front to release the pressure on the DI rollers.
3. Push the guide down between the DI rollers and release the black carrier shaft.
4. Starting at the right side, push the guide into all the tabs.
5. Reinstall the print head on the carrier using the gap setting tool to set the correct print head to platen gap.
6. Reinstall the ribbon cartridge.
7. After replacing the print head, run the Stand-Alone Printer Test. Make sure to test printing in the DI station after inserting forms from both the top and the front.

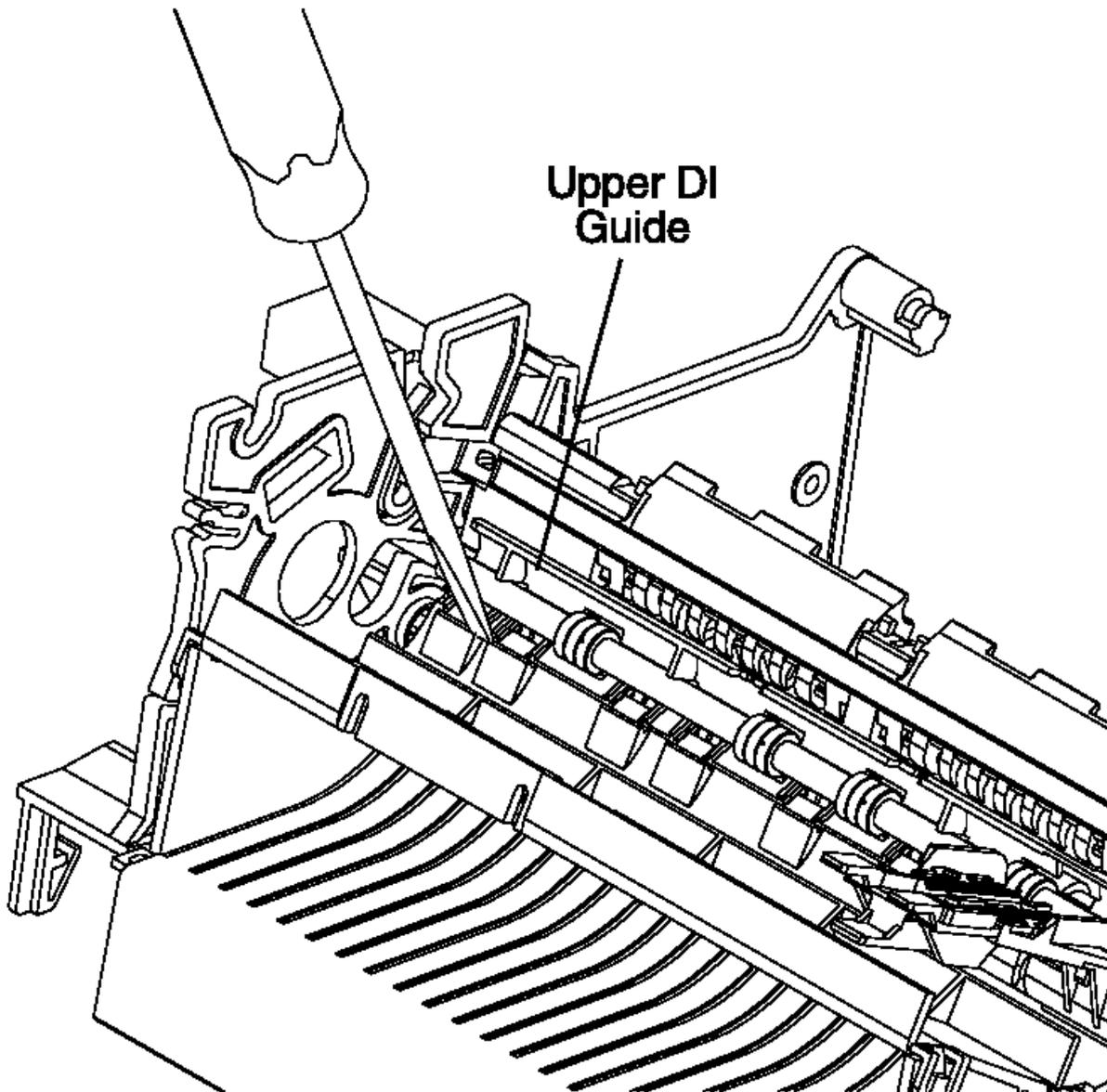


Figure 6-49. Upper DI Guide Removal and replacement

Reference	Topic
Removing and Replacing the Print Head	6.38.9
Stand-Alone Printer Test	6.4

6.38.5 *Removing and Replacing the Base*

Subtopics

6.38.5.1 Removing the Base

6.38.5.2 Replacing the Base

6.38.5.1 *Removing the Base*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the JNL spool.
5. Disconnect all of the cables from the printer card. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card. Make note of how the cables are routed for reinstallation.
6. Remove the printer card.
7. Rotate the printer onto its back with the base facing you as shown.
8. Carefully release the two lower forms entry tabs (1) and (2), sequentially.
9. Release the base holding tabs (3), (4), (7) in sequence according to the adjacent numerals on the panel.
10. Disconnect the extension card ground lead from the ground clip.
11. Sequentially release the base holding tabs (5) and (6).
12. Pull the base off the printer.

6.38.5.2 Replacing the Base

1. Place the base on a flat surface.
2. Align the holding tabs on the printer assembly over the corresponding receptacles in the base as shown in Figure 6-51.
3. Reconnect the extension card ground lead to the ground clip.
4. Carefully push on the printer until the base tabs lock into place.
Note: Ensure that the front tabs (1) and (2) are latched in place.
5. Reinstall the printer card.
6. Connect all of the cables to the printer card. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card. Route the cables as they were before.
7. Reinstall the JNL spool.
8. Reinstall the main cover.
9. Connect the printer to the base or system unit.
10. Switch power ON at the base or system unit.
11. After replacing the base, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the JNL Spool	6.38.2
Removing and Replacing the Printer Card	6.38.3
Stand-Alone Printer Test	6.4

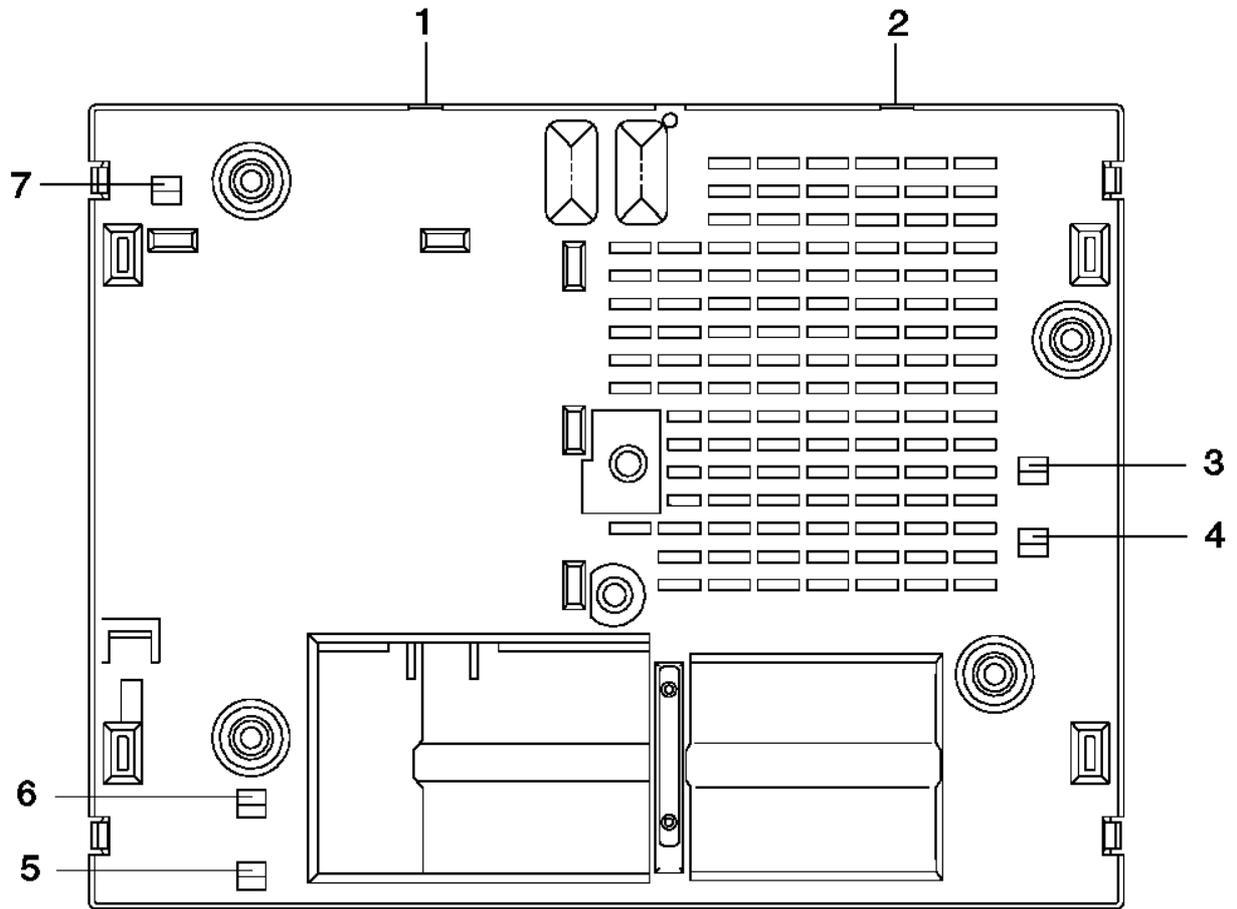


Figure 6-50. Base Tabs

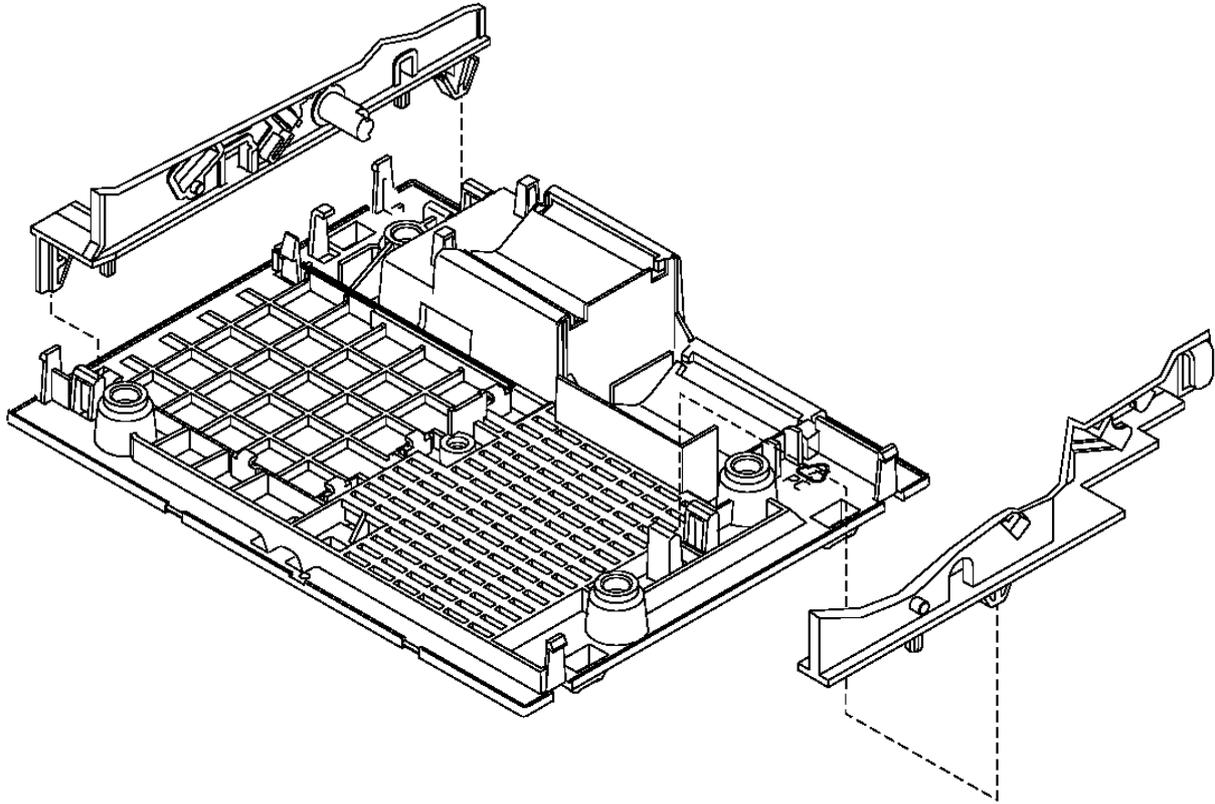


Figure 6-51. Base. The base has been disassembled beyond what is necessary for this procedure in order to illustrate how it attaches to the printer frame.

6.38.6 *Removing and Replacing the Top Button Assembly (Model 3)*

Subtopics

6.38.6.1 Removing the Top Buttons

6.38.6.2 Replacing the Top Button Assembly

6.38.6.1 *Removing the Top Buttons*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Disconnect the top button assembly cable from printer card connector J8. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
5. Release the three tabs (1) of the top button assembly cover.
6. Remove the top button assembly.

6.38.6.2 Replacing the Top Button Assembly

1. Put the top button assembly cable through the slot in the top button assembly holder.
2. Lower the button assembly into place.
3. Place the top button assembly cover over the button assembly and press it until all three tabs click into place.
4. Connect the top button assembly cable to printer card connector J8. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
5. Reinstall the main cover.
6. Connect the printer to the base or system unit.
7. Switch power ON at the base or system unit.
8. After replacing the top button assembly, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone Printer Test	6.4

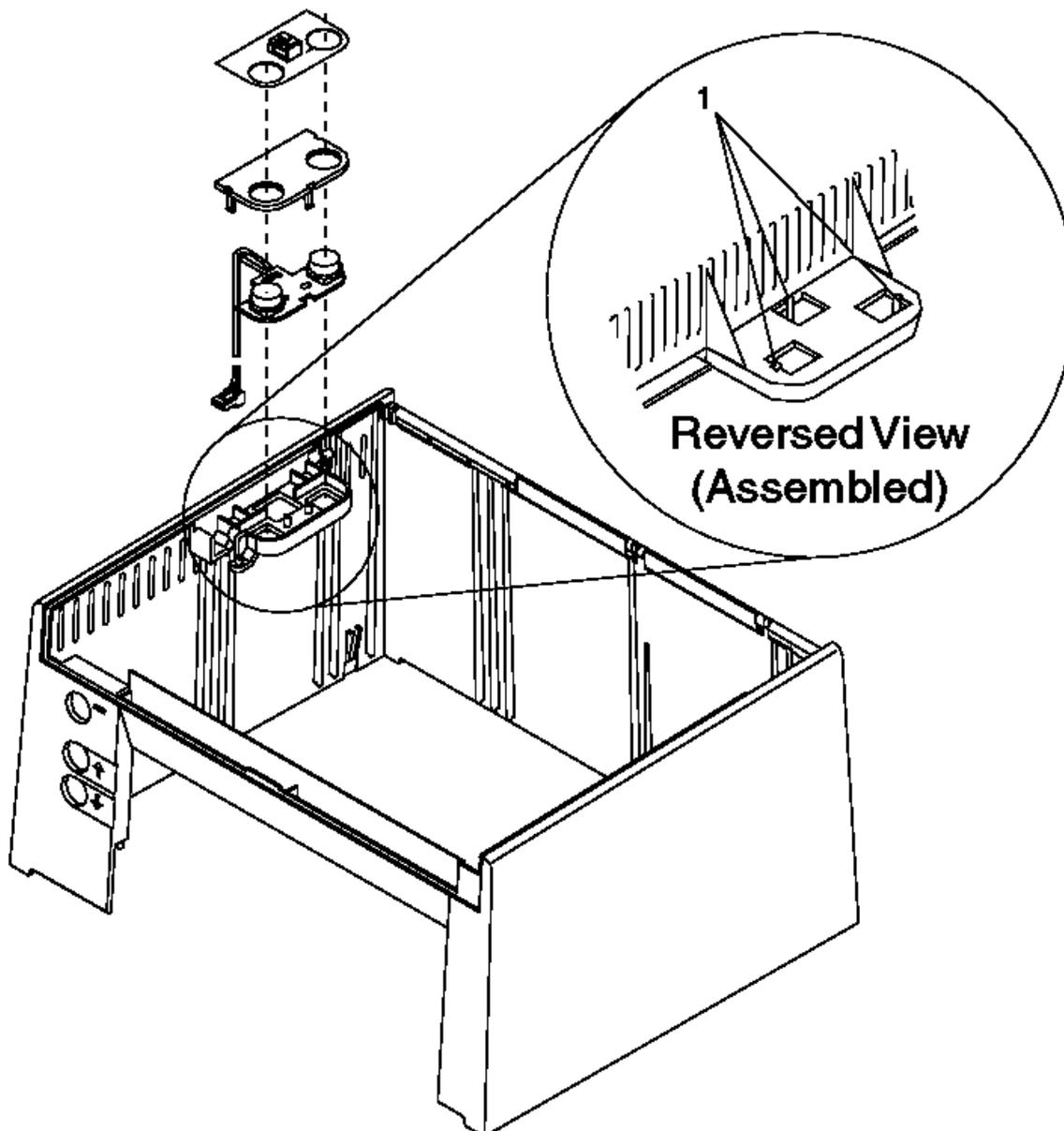


Figure 6-52. Top Button Assembly (Model 3)

Removing and Replacing the Button and Cover Sensor Assembly (Model 4)

6.38.7 *Removing and Replacing the Button and Cover Sensor Assembly (Model 4)*

Subtopics

6.38.7.1 Removing the Top Buttons and Cover Sensor

6.38.7.2 Replacing the Top Button Assembly

6.38.7.1 *Removing the Top Buttons and Cover Sensor*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Disconnect the top button assembly cables from printer card connectors J7 and J8. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
5. Remove the three screws from the top button assembly.
6. Remove the top button assembly.

6.38.7.2 Replacing the Top Button Assembly

1. Put the top button assembly in place and secure with three screws.
2. Connect the top button assembly cables to printer card connectors J7 and J8. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
3. Reinstall the main cover.
4. Connect the printer to the base or system unit.
5. Switch power ON at the base or system unit.
6. After replacing the top button assembly, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone Printer Test	6.4

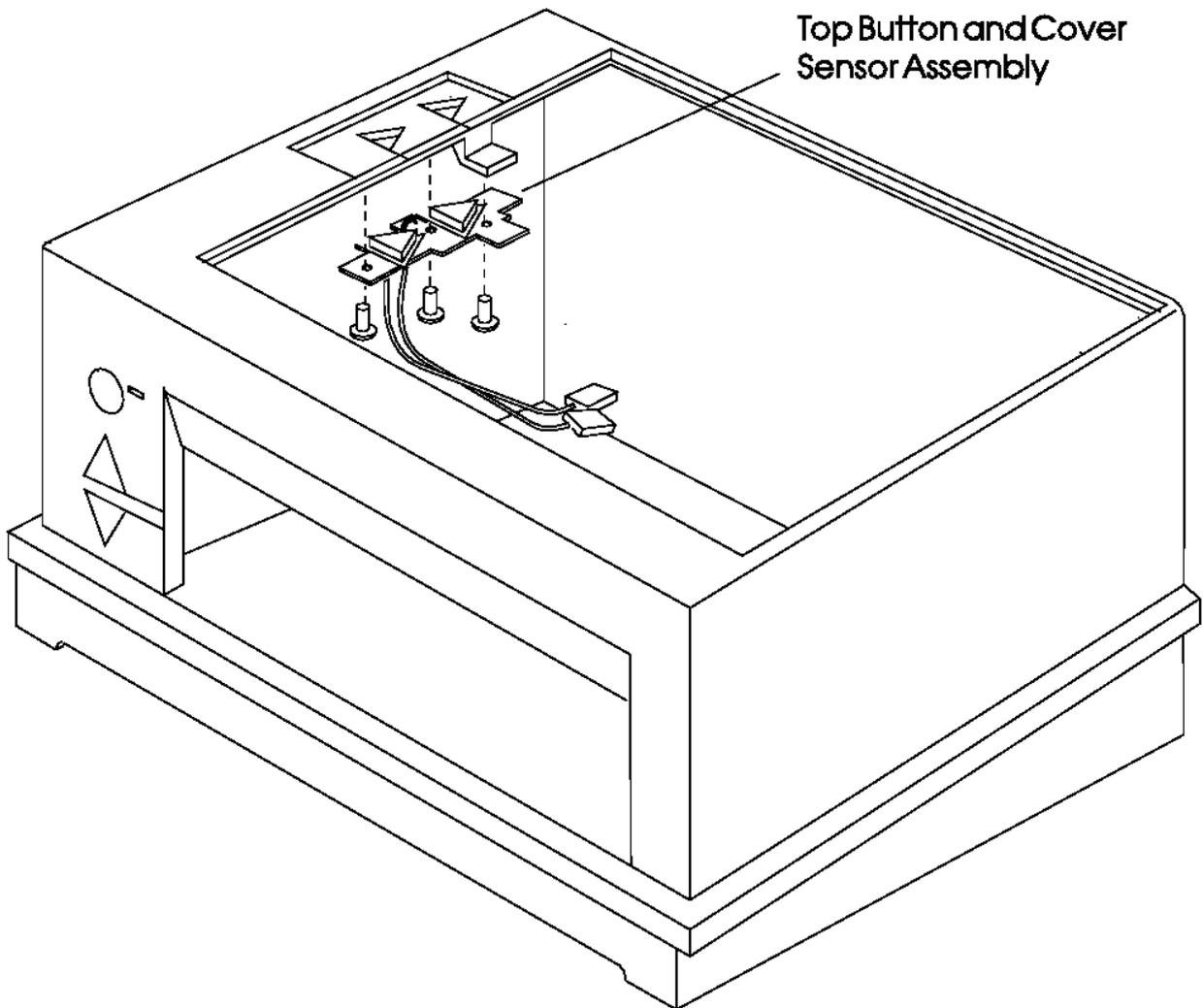


Figure 6-53. Button and Cover Sensor Assembly (Model 4)

6.38.8 *Removing and Replacing the Cover Sensor (Model 3 only)*

Subtopics

6.38.8.1 Removing the Cover Sensor

6.38.8.2 Replacing the Cover Sensor

6.38.8.1 *Removing the Cover Sensor*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Disconnect the cover sensor cable from printer card connector J7. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
5. Release the sensor from its holding tab and lift it out of the main cover.

6.38.8.2 Replacing the Cover Sensor

1. Put the sensor into place, ensuring that the holding tabs lock into place.
2. Connect the cover sensor cable to printer card connector J7. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
3. Reinstall the main cover.
4. Connect the printer to the base or system unit.
5. Switch power ON at the base or system unit.
6. After replacing the cover sensor, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone Printer Test	6.4

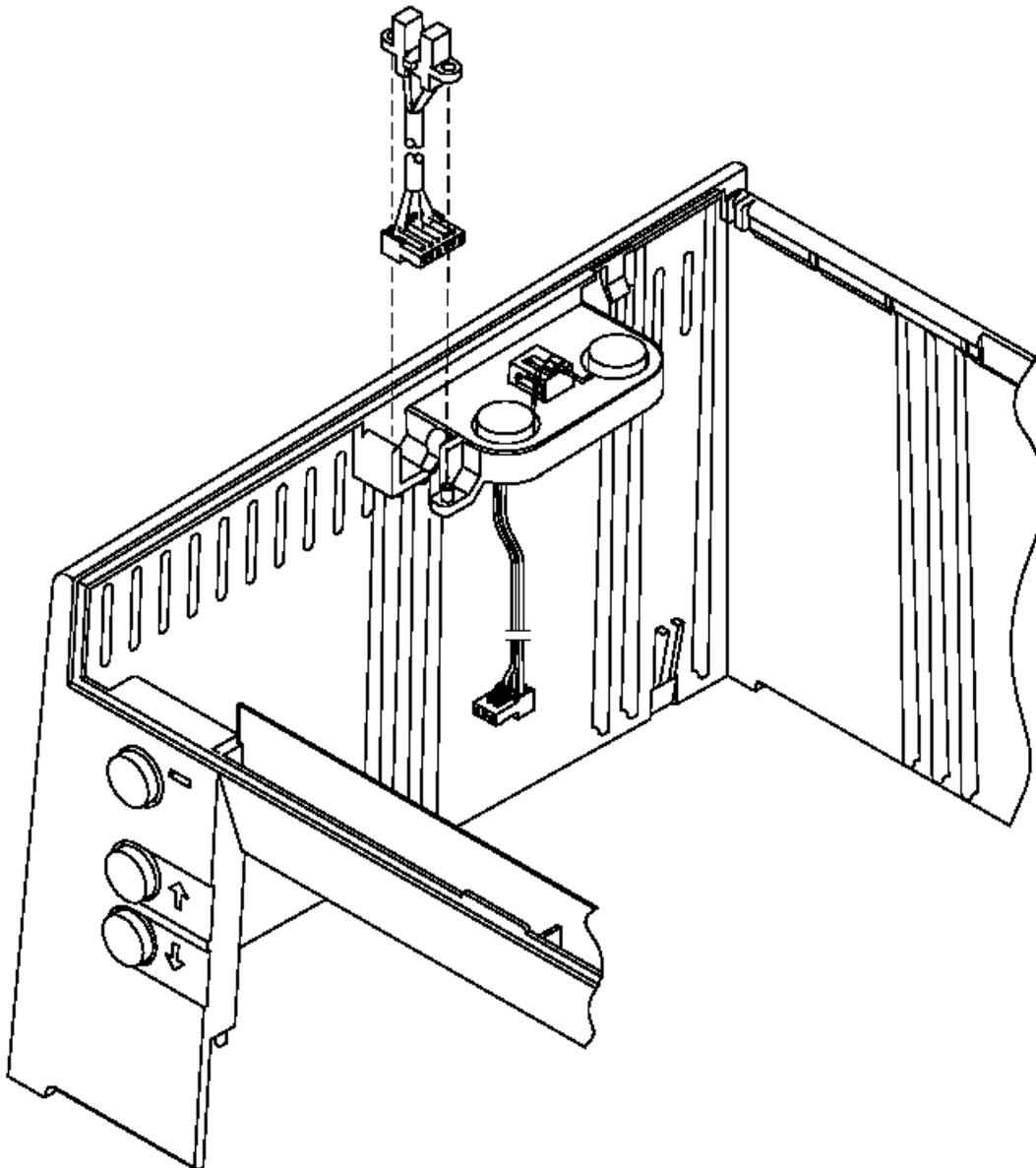


Figure 6-54. Cover Sensor

6.38.9 *Removing and Replacing the Print Head*

Subtopics

6.38.9.1 Removing the Print Head

6.38.9.2 Replacing the Print Head

6.38.9.1 *Removing the Print Head*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the printer ribbon cartridge.
5. Remove the print head shield by gently spreading it at the bottom and lifting up.
6. Disconnect the print head cable from printer card connector J5. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.

Note: The print head cable is permanently attached to the print head.

7. Remove the two screws (1), lock washers, and special flat washers that attach the print head to the carrier assembly.
8. Pull the carrier away from the platen so the print head can slide forward off of its key.
9. Remove the print head and print head cable from the printer.

```
+--- Service Hint -----+
|
| If print heads are being exchanged frequently, make sure that the
| recommended ribbons are being used. See "Expendable Supplies" in
| topic D.1.
|
+-----+
```

6.38.9.2 Replacing the Print Head

1. Center the carrier in the printer. Pull the carrier away from the platen to allow the print head to engage the key on the carrier.
2. Loosely screw the print head to the carrier using the screws, lock washers, and special flat washers as shown.
3. Use the gap setting tool as shown in Figure 6-56 to set the correct gap between the print head and platen. Latch the tool in front of the print head as shown and move the print head forward on the carrier until the tool is flush with the platen.
4. Screw the print head onto the carrier as shown. Torque both screws using a torque screwdriver with a T10 Torx bit set at 6 inch-pounds (0.69Nm). **Do not overtighten the screws.** Remove the adjustment tool and reinstall the print head shield.
5. Tuck the print head cable under the rib on the carrier and move the carrier to the right side of the printer. See Figure 6-57. Slide the cable under the home sensor card assembly and then route it through the left side frame. The 90 degree bend in the cable should be flush with the slot in the left side frame.
6. Connect the print head cable to printer card connector J5. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
7. Reinstall the printer ribbon cartridge.
8. Reinstall the main cover.
9. Connect the printer to the base or system unit.
10. Switch power ON at the base or system unit.
11. Press the Ready button, the DI up button, and the DI down button simultaneously.
12. After replacing the print head, run the Stand-Alone Printer Test. Also, perform the printer adjustments.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Printer Adjustments	6.37
Stand-Alone Printer Test	6.4

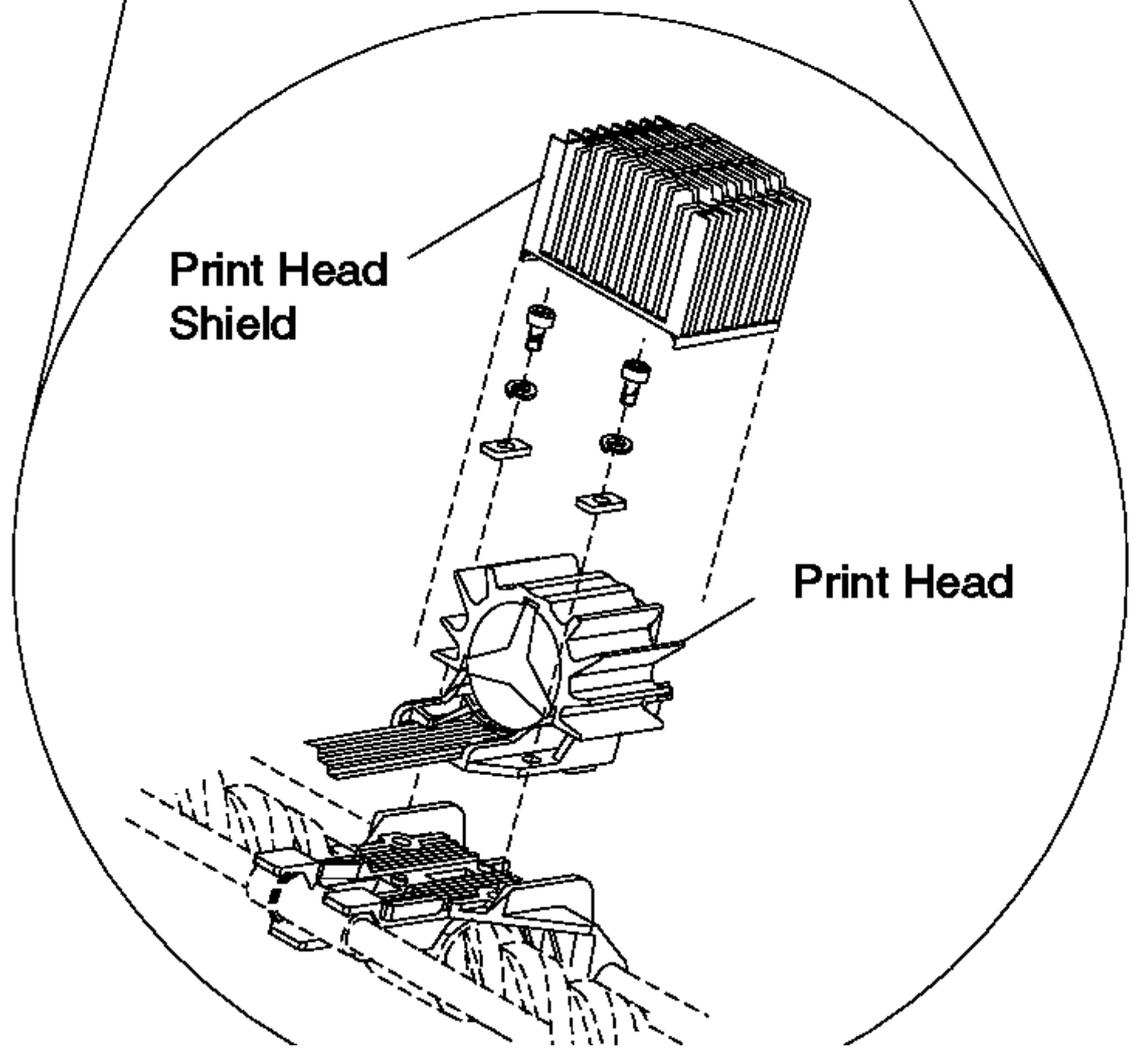
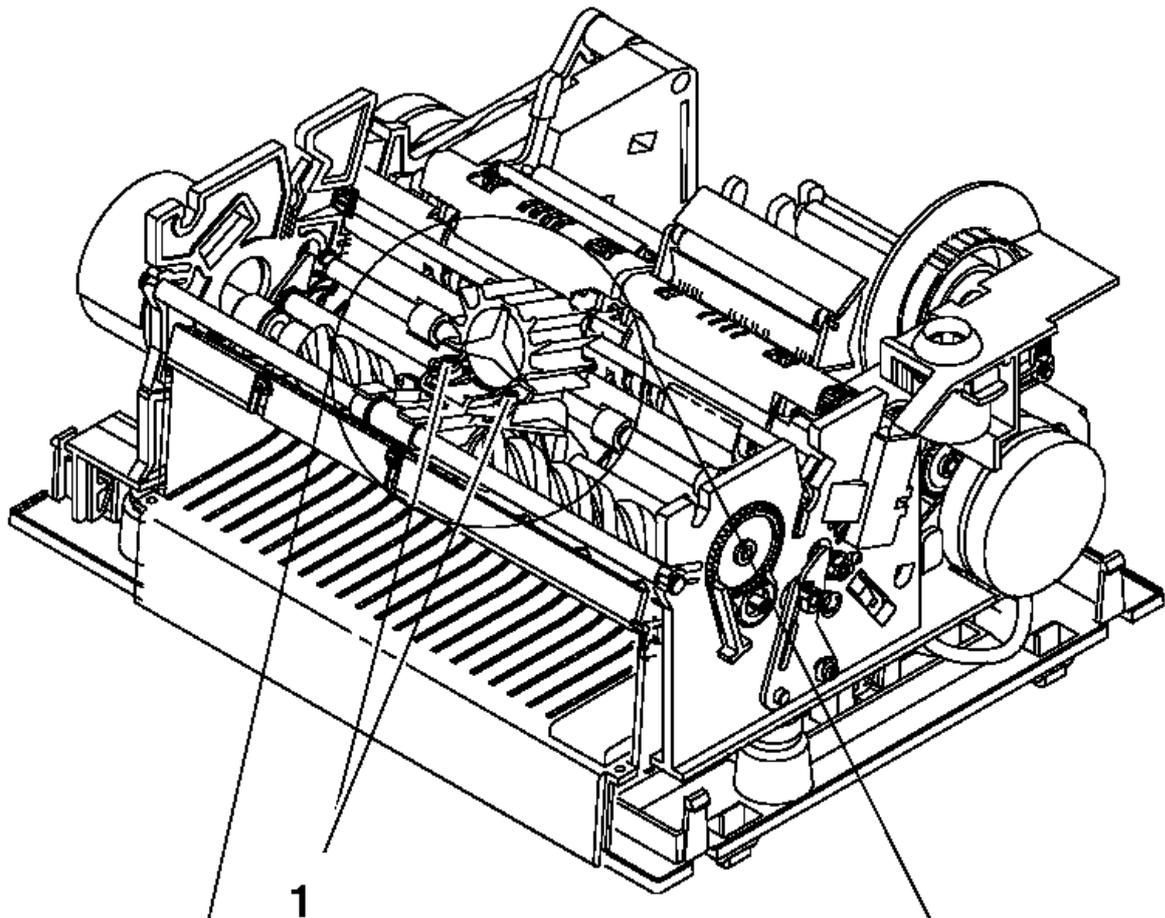


Figure 6-55. Print Head

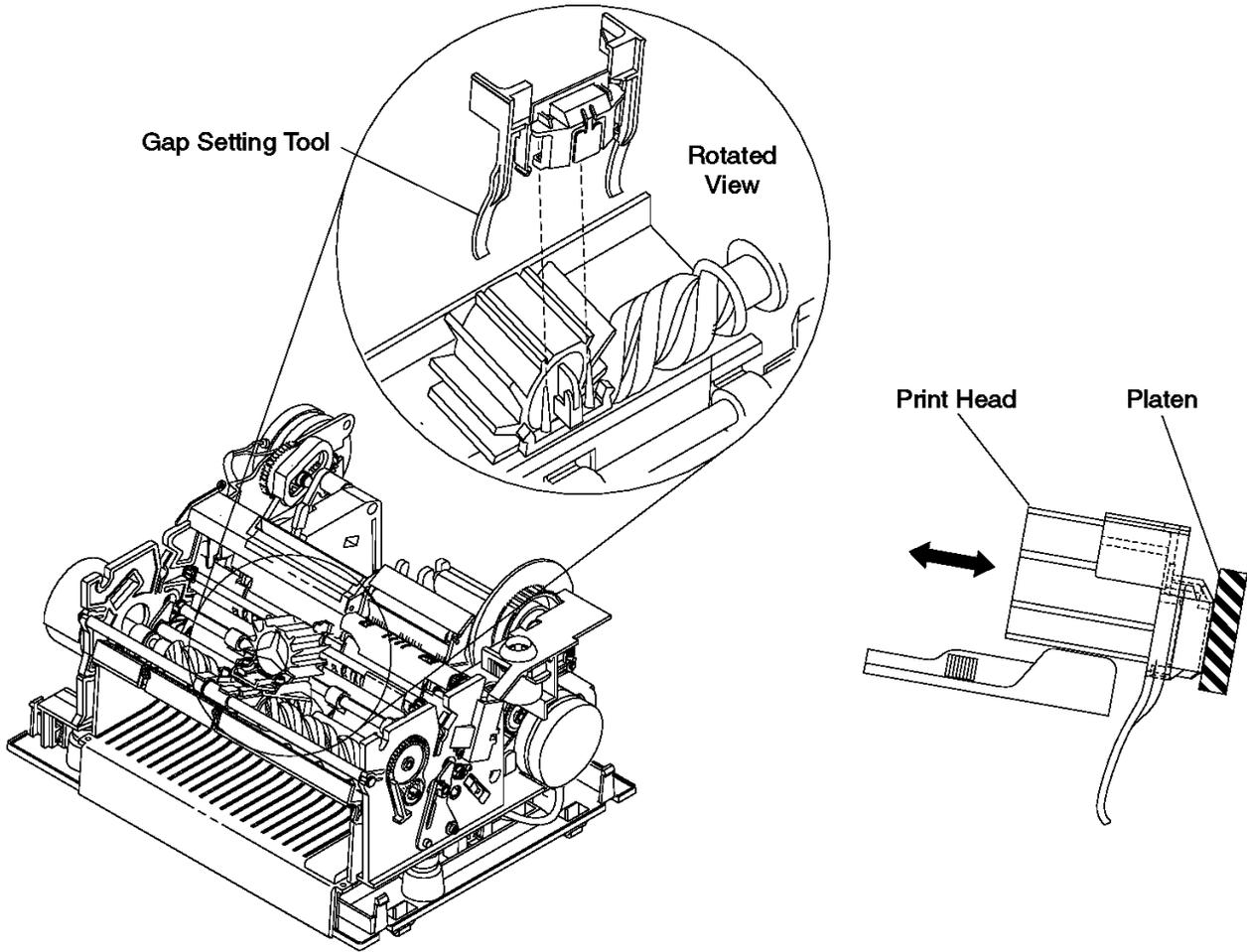


Figure 6-56. Print Head Adjustment. The print head and its gap setting tool are shown on the right.

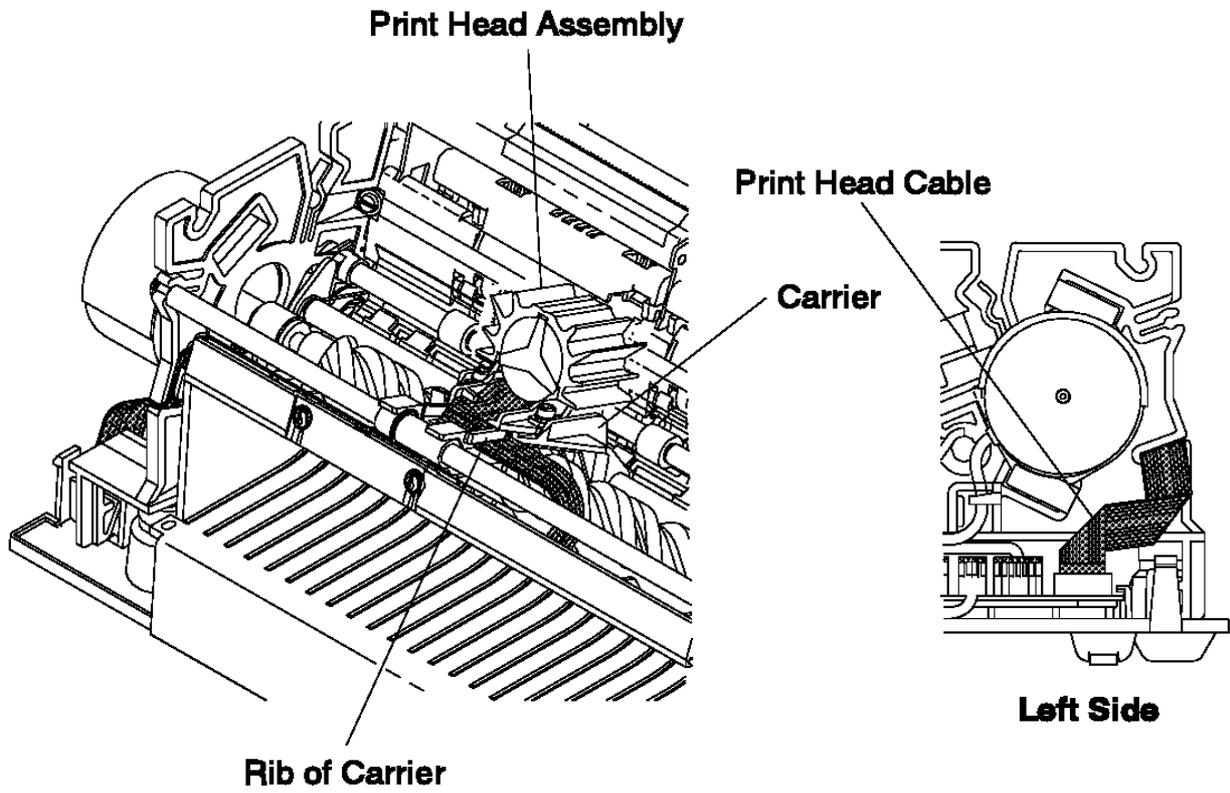


Figure 6-57. Print Head Cable Routing

6.38.10 *Removing and Replacing the Capacitor*

Subtopics

6.38.10.1 Removing the Capacitor

6.38.10.2 Replacing the Capacitor

6.38.10.1 *Removing the Capacitor*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Disconnect the capacitor cable from printer card connector J10. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
5. Remove the capacitor as shown.

6.38.10.2 Replacing the Capacitor

1. Install the new capacitor as shown.
2. Connect the capacitor cable to printer card connector J10. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
3. Reinstall the main cover.
4. Connect the printer to the base or system unit.
5. Switch power ON at the base or system unit.
6. After replacing the capacitor, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone Printer Test	6.4

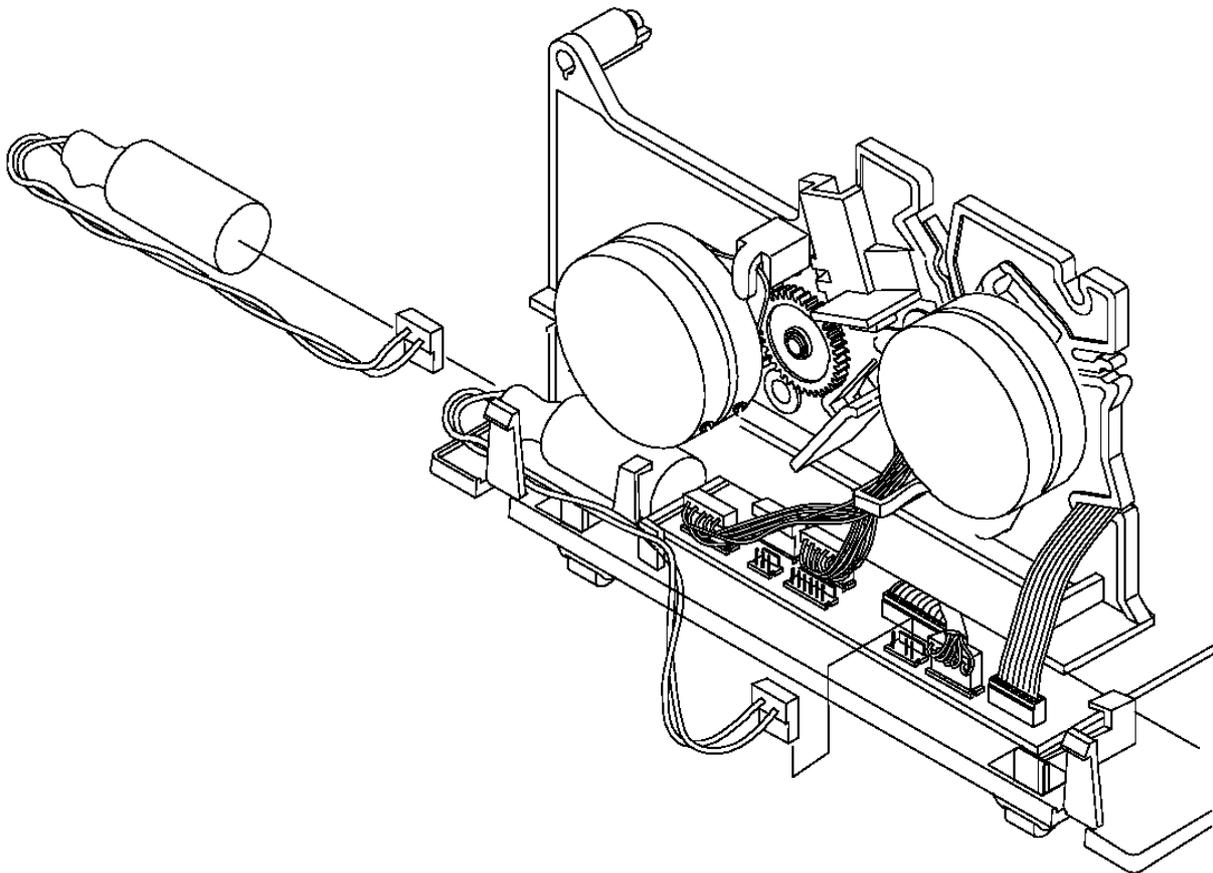


Figure 6-58. Capacitor

6.38.11 *Removing and Replacing the Paper Cutter*

Subtopics

6.38.11.1 Removing the Paper Cutter

6.38.11.2 Replacing the Paper Cutter

6.38.11.1 *Removing the Paper Cutter*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Disconnect the paper cutter motor cable from extension card connector J101. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card. Make note of how the cable is routed for reinstallation.
5. Remove the screw, washers, and locknut attaching the paper cutter to the side frame.
6. Gently rotate and lift the paper cutter frame as shown and remove it from the printer.

6.38.11.2 Replacing the Paper Cutter

1. Lower the paper cutter into the platen and rotate as shown in Figure 6-59.
2. Reinstall the screw, washers, and locknut attaching the paper cutter to the side frame.
3. Connect the paper cutter motor cable to extension card connector J101. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card. Route the cable as it was before.
4. Reinstall the main cover.
5. Connect the printer to the base or system unit.
6. Switch power ON at the base or system unit.
7. After replacing the paper cutter, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone Printer Test	6.4

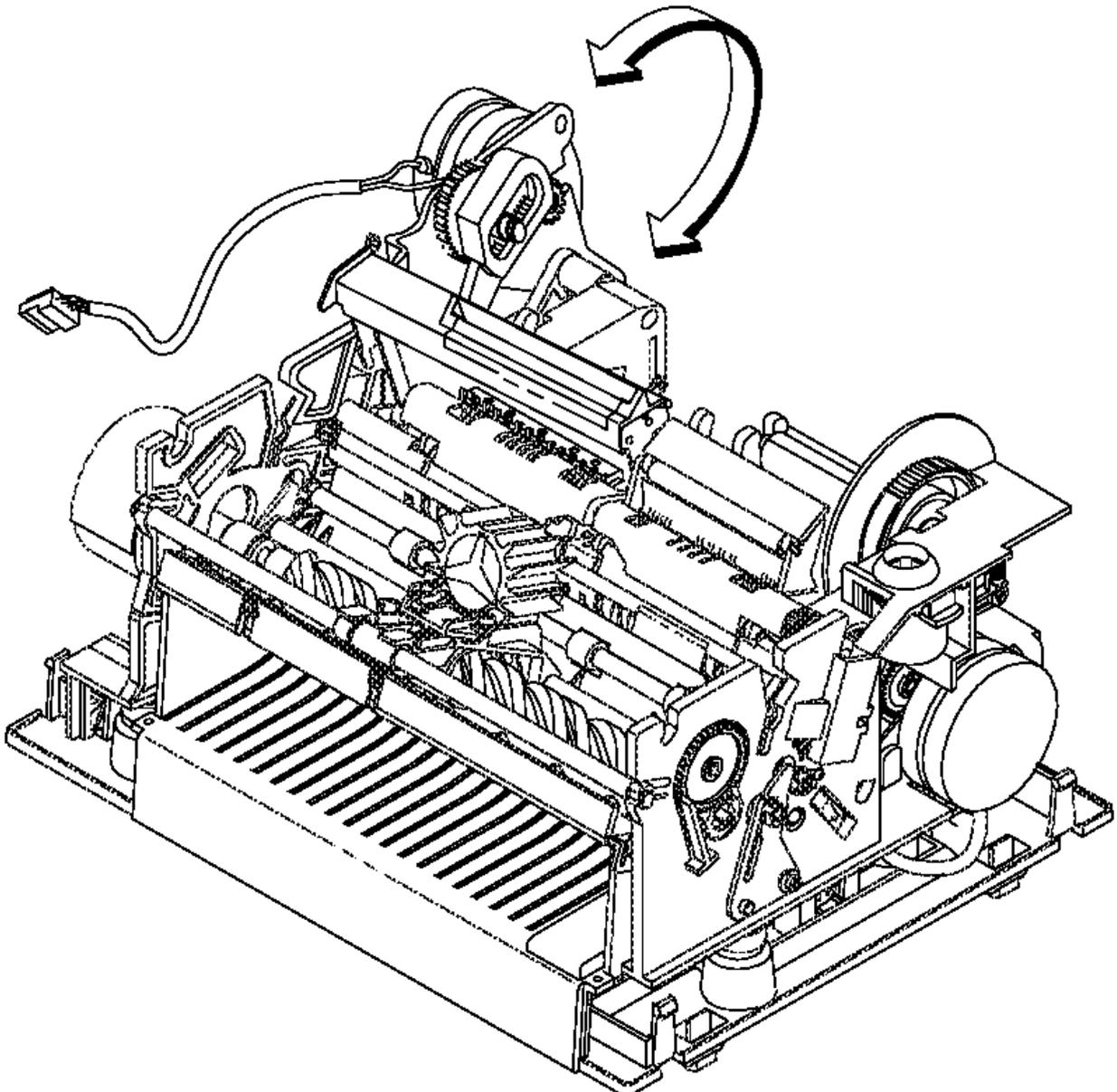


Figure 6-59. Paper Cutter

6.38.12 *Removing and Replacing the CR Motor*

Subtopics

6.38.12.1 Removing the CR Motor

6.38.12.2 Replacing the CR Motor

6.38.12.1 *Removing the CR Motor*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the paper cutter.
5. Unlatch the CR motor mount and tilt it up, but do not remove the motor gear assembly. See step 5 in topic 6.38.13.1 under Removing the CR Motor Gear Assembly.
6. Disconnect the motor cable from extension card connector J102. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card. Make note of how the cable is routed for reinstallation.
7. Insert 2 screwdrivers into the CR motor gear assembly as shown. See Figure 6-60 in topic 6.38.12.2. Turn the screwdrivers in opposite directions and gently pry the metal flange on the motor in the direction shown until the motor is released from the tabs.
8. Slide the motor out of the assembly.

Note: Ensure that the two gears in the assembly do not fall off of their posts.

6.38.12.2 Replacing the CR Motor

1. Slide the CR motor into the motor gear assembly and turn the motor counterclockwise until it clicks into place. Verify that the gears are correctly engaged.
2. Connect the motor cable to extension card connector J102. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card. Route the cable as it was before.
3. Press the CR motor gear assembly down until it clicks into place.

Note: Ensure that the bearing is still in its slot in the motor gear assembly.

4. Reinstall the paper cutter.
5. Reinstall the main cover.
6. Connect the printer to the base or system unit.
7. Switch power ON at the base or system unit.
8. After replacing the CR motor, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the Paper Cutter	6.38.1
Stand-Alone Printer Test	6.4

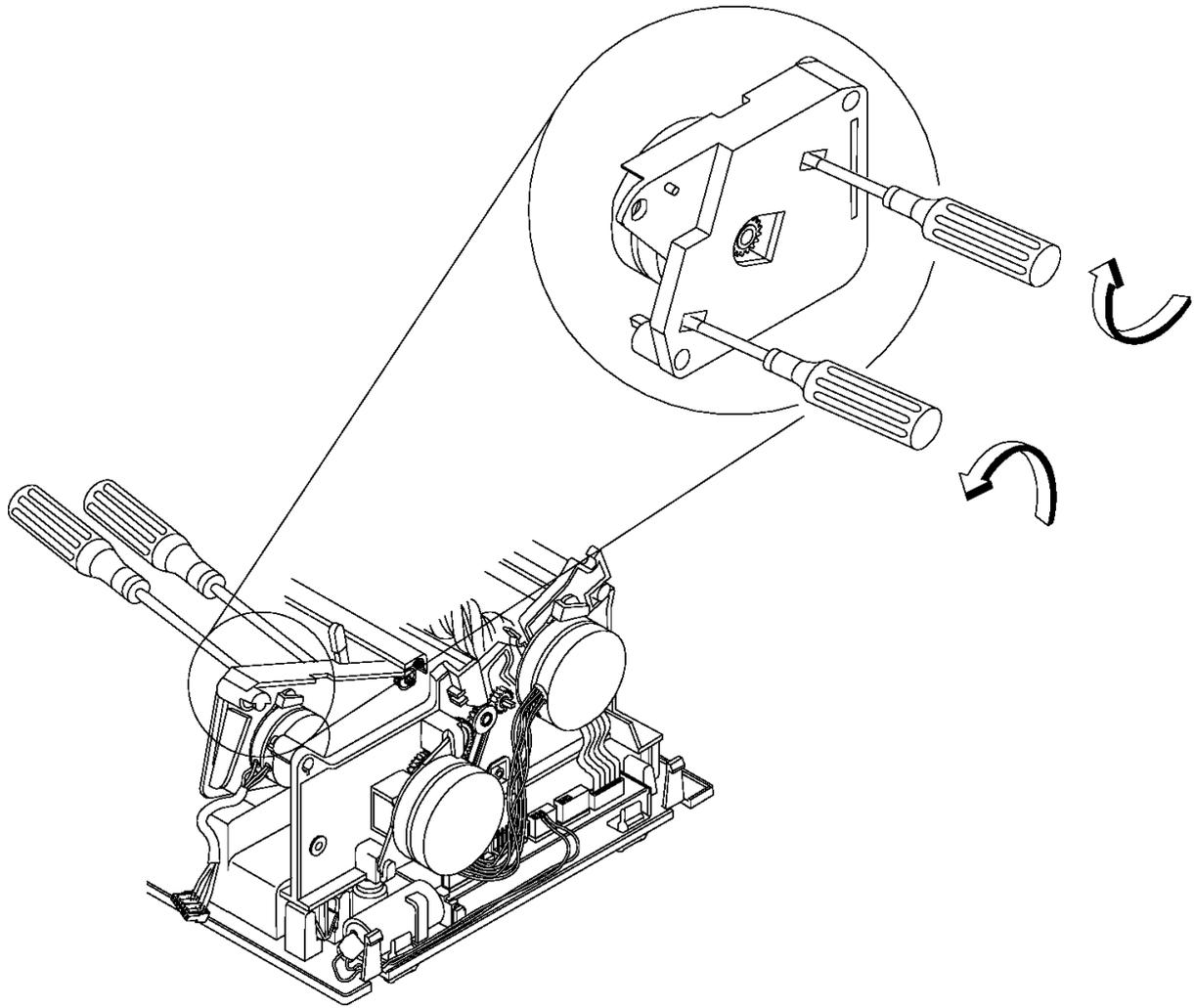


Figure 6-60. CR Motor. The enlarged view has been turned to illustrate where to insert the screwdrivers.

6.38.13 Removing and Replacing the CR Motor Gear Assembly

Subtopics

6.38.13.1 Removing the CR Motor Gear Assembly

6.38.13.2 Replacing the CR Motor Gear Assembly

6.38.13.1 *Removing the CR Motor Gear Assembly*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the paper cutter.
5. Pull out the tab on the CR motor gear assembly and raise it up until it is free from the tab.
6. Disconnect the CR motor cable from extension card connector J102. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card. Make note of how the cable is routed for reinstallation.
7. Remove the CR feed roll gear from the end of the CR shaft by lifting the locking tab on the gear and using a screwdriver to push the gear off the shaft.
8. Remove the feed roll gear bearing.
9. Remove the CR motor gear assembly.

6.38.13.2 Replacing the CR Motor Gear Assembly

1. Put the CR motor gear assembly on the platen assembly and reinstall the D-shaped bearing and gear on the end of the CR shaft as shown. Ensure that the gear snaps into place.
2. Connect the CR motor cable to printer extension card connector J102. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card. Route the cable as it was before.
3. Press the motor gear assembly down until the tab clicks into place.

Note: Ensure that the bearing is still in its slot in the motor gear assembly.

4. Reinstall the paper cutter.
5. Reinstall the main cover.
6. Connect the printer to the base or system unit.
7. Switch power ON at the base or system unit.
8. After replacing the CR motor gear assembly, run the Stand-Alone Printer Test. See topic 6.4.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the Paper Cutter	6.38.1
Stand-Alone Printer Test	6.4

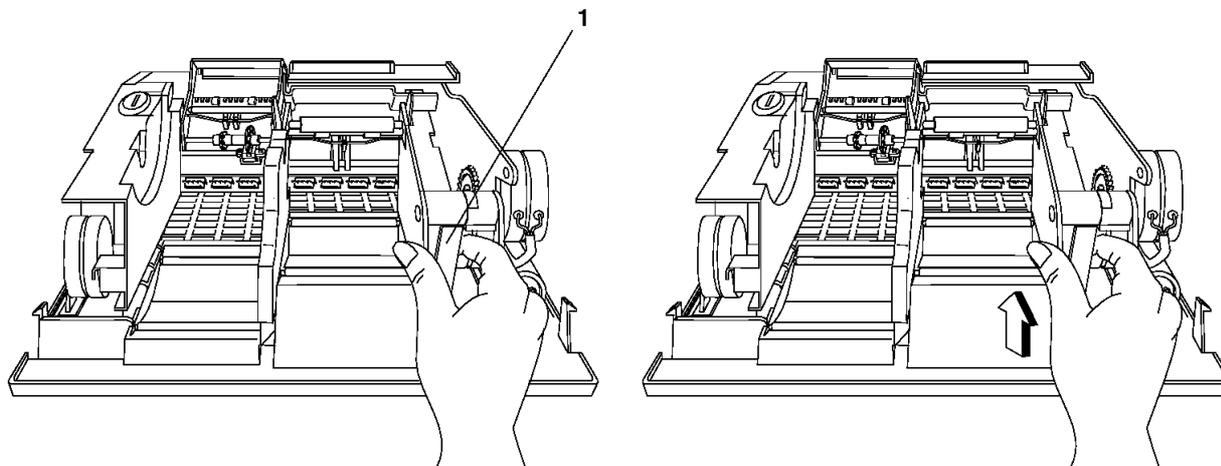


Figure 6-61. Unlatching the CR Motor Gear Assembly

**CR Feed Roll
Gear and Bearing**

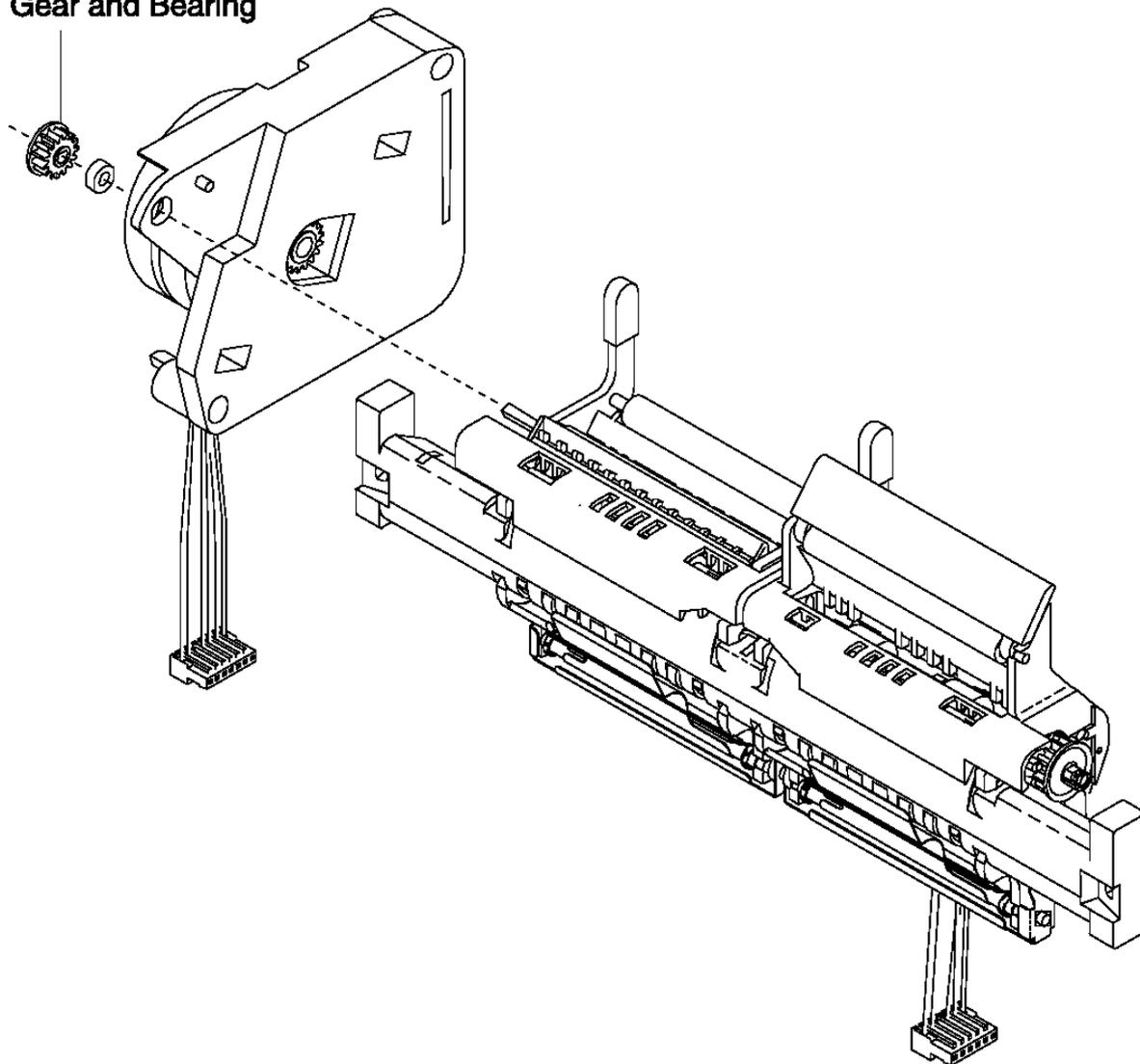


Figure 6-62. CR Motor Gear Assembly. The platen assembly is shown removed from the printer to illustrate how the motor gear assembly attaches to it.

6.38.14 Removing and Replacing the CR Roller Assembly

Subtopics

- 6.38.14.1 Removing the CR Roller Assembly
- 6.38.14.2 Replacing the CR Roller Assembly

6.38.14.1 *Removing the CR Roller Assembly*

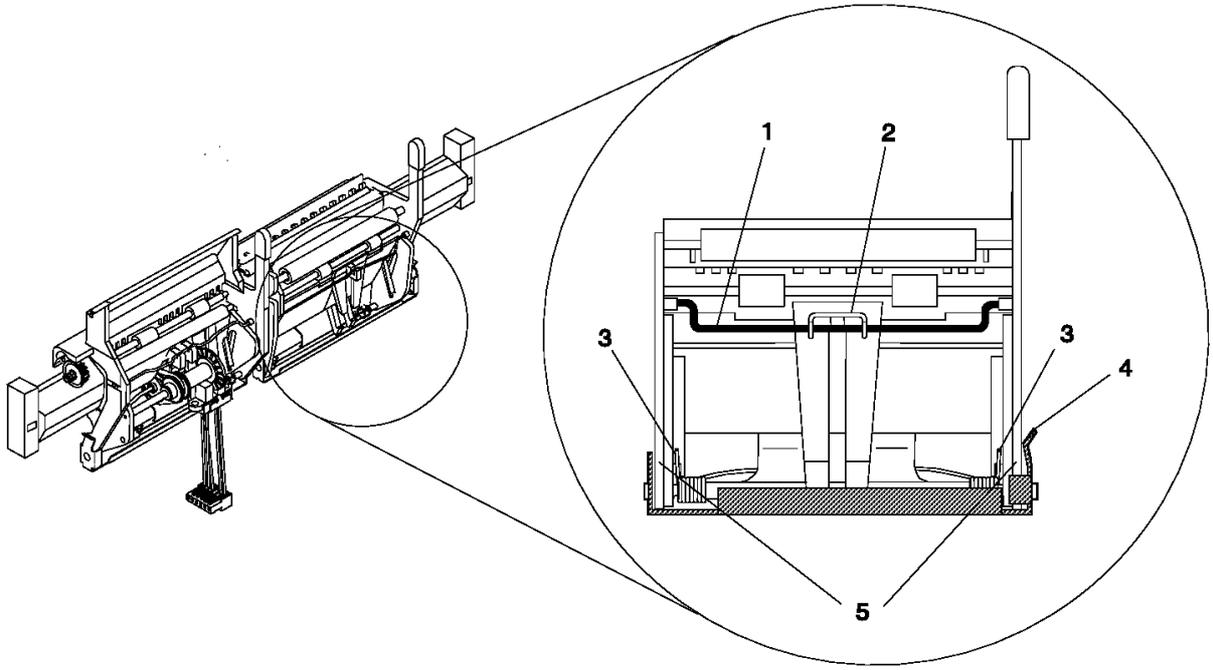
1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the paper cutter.
5. Remove the platen assembly.
6. Remove the toggle spring retainer clip (2), then disengage the toggle spring (1) at its center attachment point.
7. Remove the roller leg retainer (4) then gently pry outward on the ends of the CR roller assembly (5) until they are free of the posts on the CR frame.
8. Remove the CR roller assembly and note how it attaches to the frame.
9. Gently spread the top sides of the CR frame one side at a time until they are loose from the platen and rotate the frame off of the platen as shown.

Note: The rubber pads on the platen may come off.

6.38.14.2 Replacing the CR Roller Assembly

1. Attach the bottom of the CR frame to the platen and rotate it forward as shown until the top sides of the frame touch the platen. Gently spread the top sides one at a time and continue rotating the frame until it clicks into place.
2. Check that the rubber pads keep the frame tight with the platen.
3. Gently spread the arms of the roller to allow its holes to fit over the posts on the frame. Reinstall the roller leg retainer (4).
4. Attach the toggle spring (1) at its center attachment point then install the toggle spring retainer clip (2). Ensure that the spring is correctly seated and that the roller moves back-and-forth correctly.
5. Check that the ends of the bail springs (3) are positioned correctly.
6. Reinstall the platen assembly.
7. Reinstall the paper cutter.
8. Reinstall the main cover.
9. Connect the printer to the base or system unit.
10. Switch power ON at the base or system unit.
11. After replacing the CR components, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the Paper Cutter	6.38.1
Removing and Replacing the Platen Assembly	6.38.3
Stand-Alone Printer Test	6.4



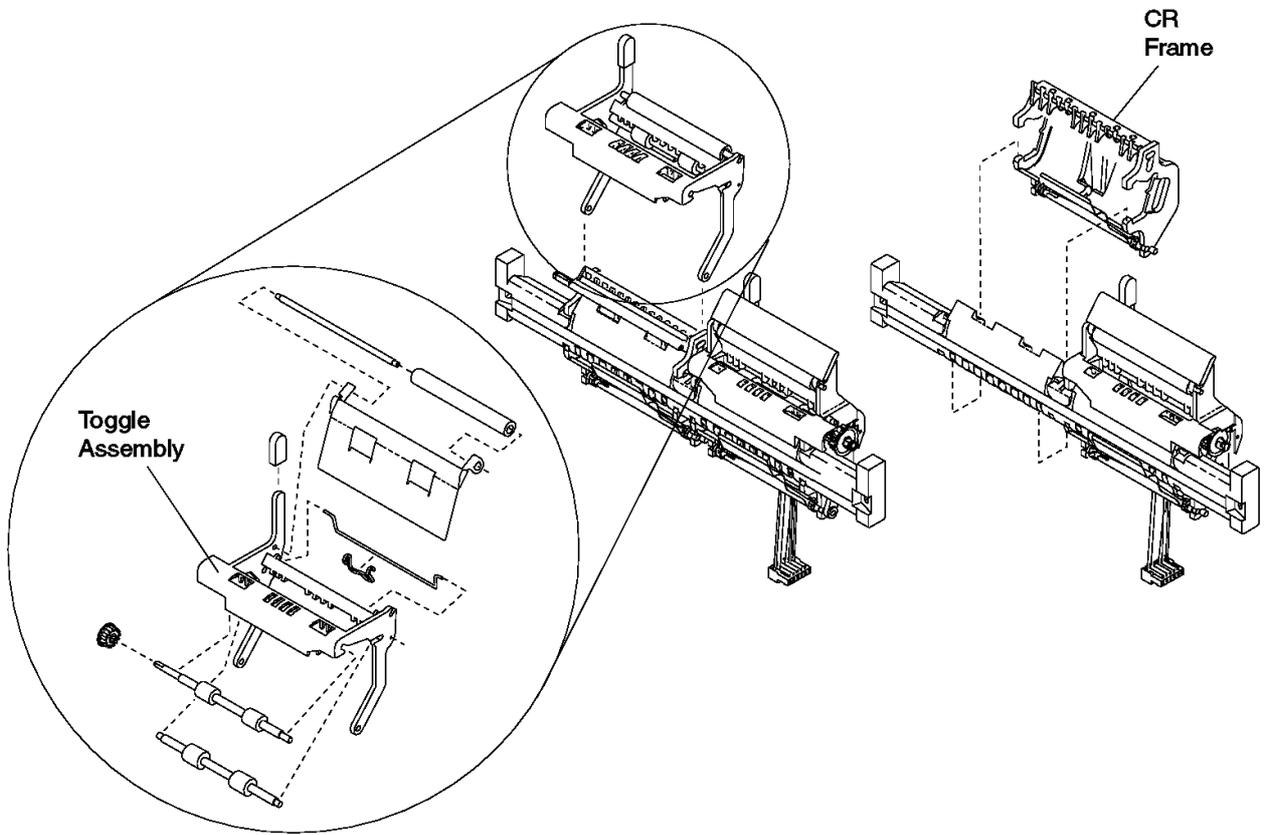


Figure 6-63. CR Assembly

6.38.15 *Removing and Replacing the DI Motor*

Subtopics

6.38.15.1 Removing the DI Motor

6.38.15.2 Replacing the DI Motor

6.38.15.1 *Removing the DI Motor*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Disconnect the motor cable from printer card connector J3. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card. Make note of how the cable is routed for reinstallation.
5. Insert a screwdriver under the DI tab as shown. Try to keep the screwdriver blade flush to the tab.
Attention Do not pry outward on the plastic tabs. They may break off and require a replacement printer.
6. Insert another screwdriver under the other motor flange as shown.
7. With the screwdrivers, gently pry the metal flanges on the motor in the direction shown until the motor rotates clockwise and is released from the tabs.

6.38.15.2 Replacing the DI Motor

1. Slide the DI motor into the printer as shown and turn the motor counterclockwise until it clicks into place.
2. Connect the motor cable to printer card connector J3. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card. Route the cable as it was before.
3. Reinstall the main cover.
4. Connect the printer to the base or system unit.
5. Switch power ON at the base or system unit.
6. After replacing the DI motor, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone Printer Test	6.4

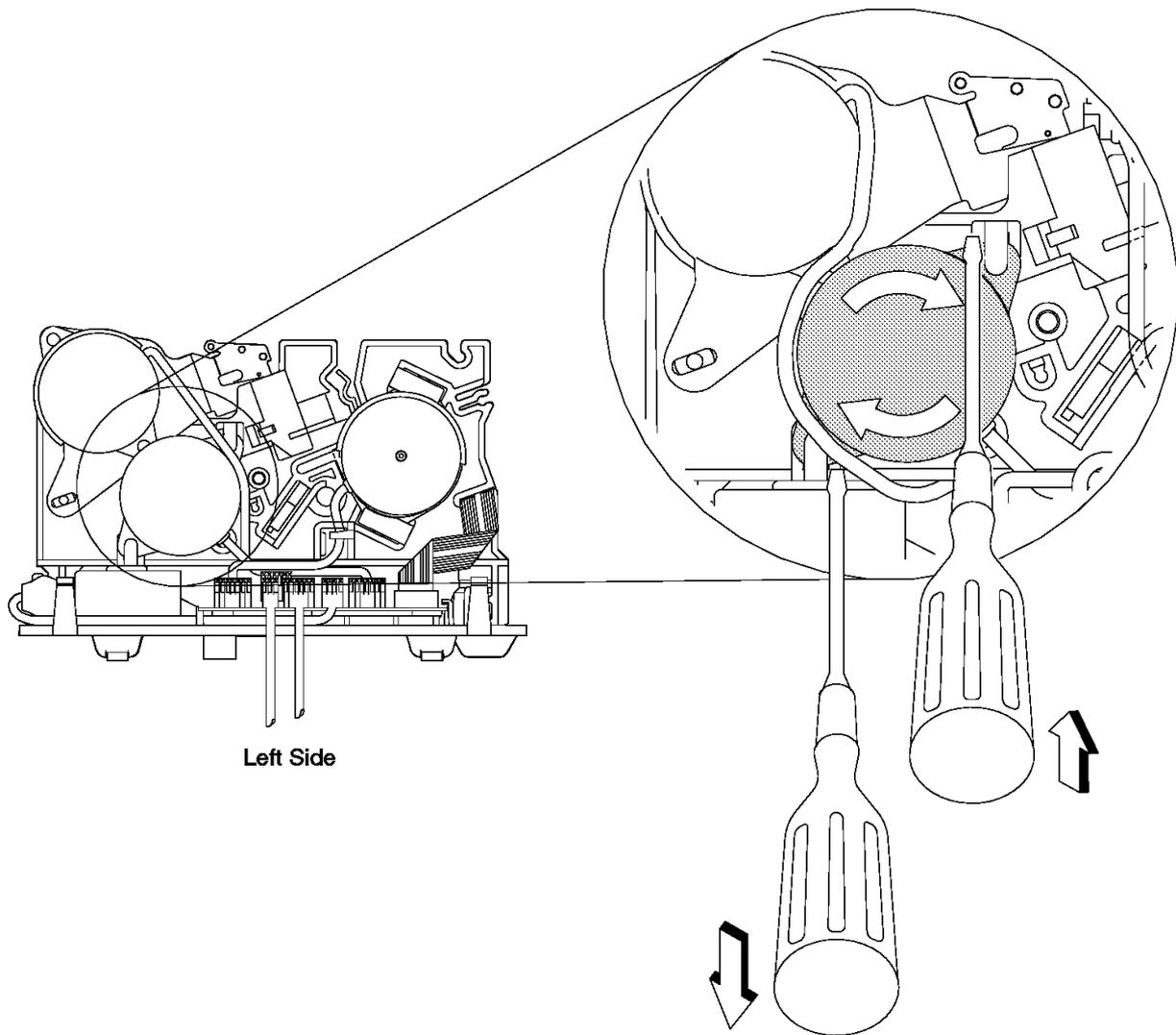


Figure 6-64. DI Motor

6.38.16 *Removing and Replacing the DI Gears*

Note: There are 4 DI gears supplied as a kit (P/N 73G2598). Once removed, all 4 gears must be exchanged with new gears.

Subtopics

6.38.16.1 Removing the DI gears

6.38.16.2 Replacing the DI Gears

6.38.16.1 *Removing the DI gears*

1. Remove the DI motor. See 6.38.15
2. Remove the DI gear cover (Models 3R and 4R only).
3. Remove gear (1) by using a small screwdriver to gently pry outward on the plastic retainer holding the gear to the shaft. Use a second screwdriver to pry the gear off the shaft. See Figure 6-66 in topic 6.38.16.2.
4. Remove gears (2),(3), and (4), in that order, by simply sliding them off their shaft.

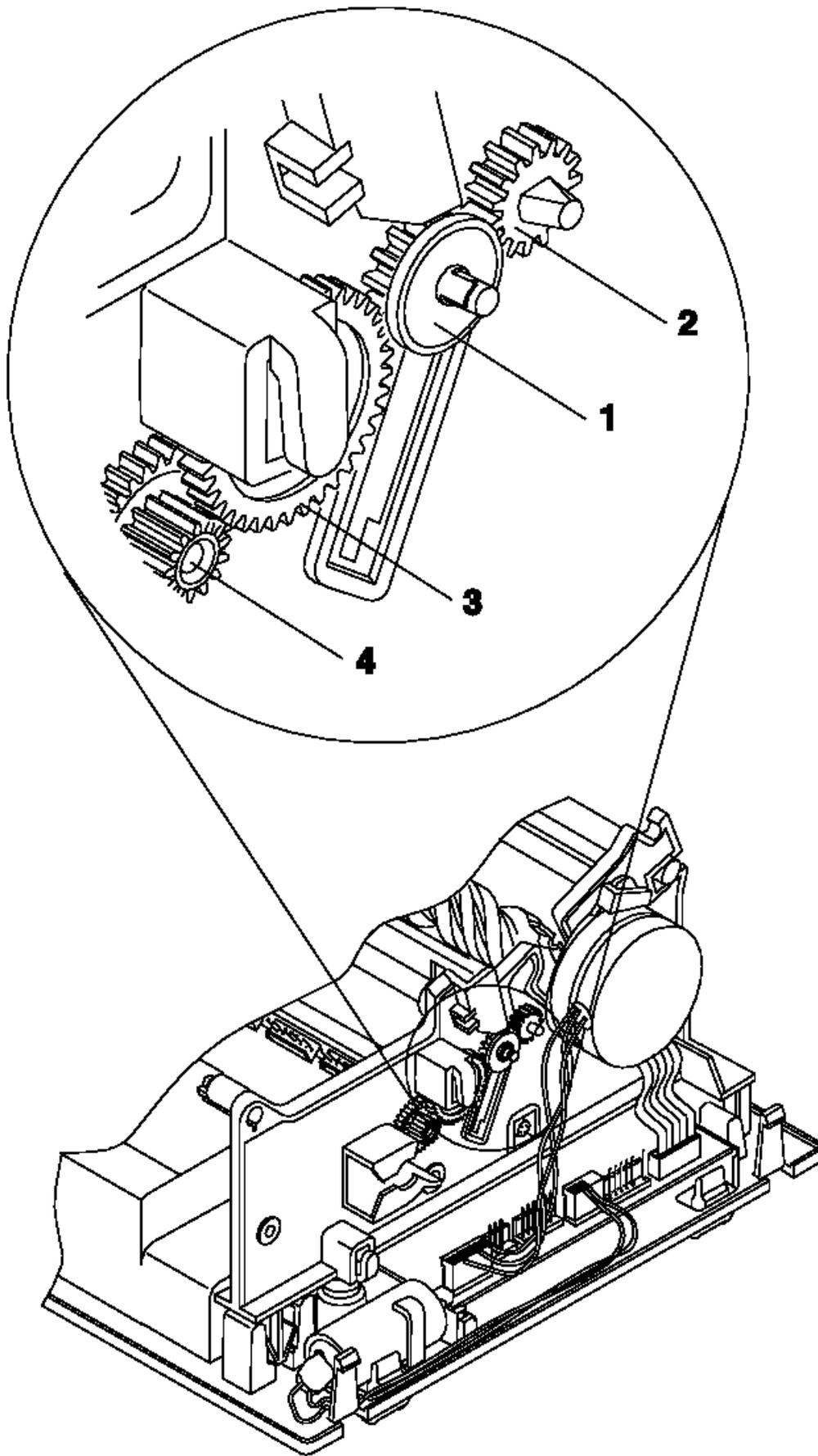


Figure 6-65. DI Gears Shown With Motors Removed

6.38.16.2 Replacing the DI Gears

1. Replace the 4 gears in reverse order (4), (3), (2), and (1).
2. Reinstall the DI gear cover (Models 3R and 4R only).
3. Reinstall the DI motor.
4. After replacing the gears, run the Stand-Alone Printer Test. Also run the Stand-Alone MICR Test (models 3R and 4R only). See 6.4 and 6.5.

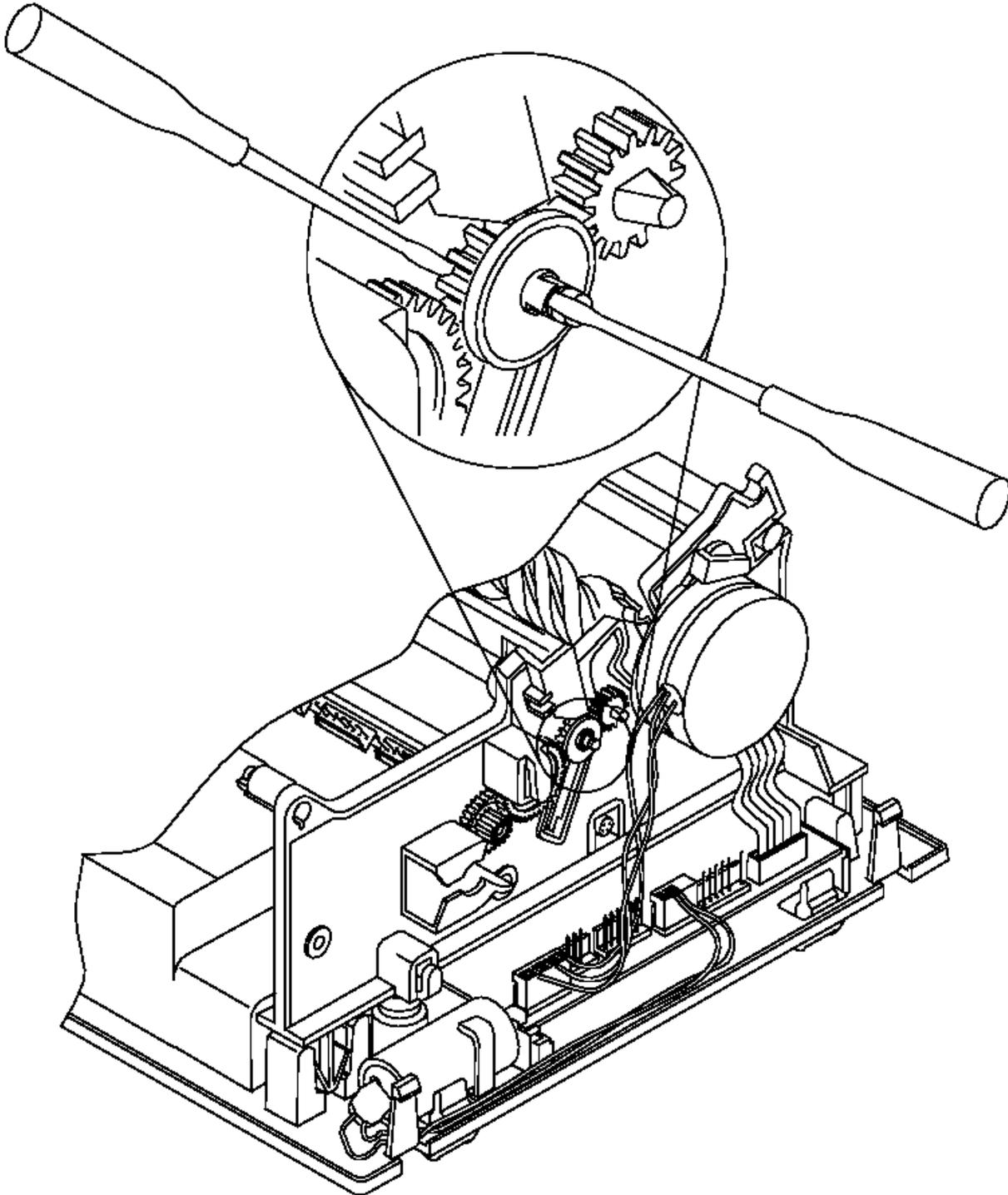


Figure 6-66. Removing DI gears

6.38.17 Removing and Replacing the Lower DI Sensor

This procedure is also used when replacing the magnetic ink character reader (MICR) magnet on printers that have the MICR feature installed.

Subtopics

6.38.17.1 Removing the Lower DI Forms Sensor

6.38.17.2 Replacing the Lower DI Forms Sensor

6.38.17.1 *Removing the Lower DI Forms Sensor*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the JNL spool.
5. Disconnect the cables from the printer card. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
6. Remove the base from the printer.
7. Remove the extension card.
8. Using a spring hook as shown, release the sensor from the tab by gently lifting up. See Figure 6-67 in topic 6.38.17.2.
9. On printers that have the MICR feature installed, the MICR magnet assembly is held in place by the paper sensor. Make sure you remove the magnet at the same time. See Figure 6-68 in topic 6.38.17.2.

6.38.17.2 Replacing the Lower DI Forms Sensor

1. On printers that have the MICR feature installed, the MICR magnet assembly must be installed at the same time as the sensor.
2. Attach the lower DI forms sensor to the printer by gently pushing it until it snaps into place.
3. Reinstall the extension card.
4. Reinstall the base of the printer.
5. Connect the cables to the printer card.
6. Reinstall the JNL spool.
7. Reinstall the main cover.
8. Connect the printer to the base or system unit.
9. Switch power ON at the base or system unit.
10. Press the Ready button, the DI up button, and the DI down button simultaneously.
11. Perform the DI Top Load Print Line Adjustment.
12. Run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Base	6.38.5
Removing and Replacing the Extension Card	6.38.3
Removing and Replacing the Platen Assembly	6.38.3
Printer Adjustments	6.37
Stand-Alone Printer Test	6.4

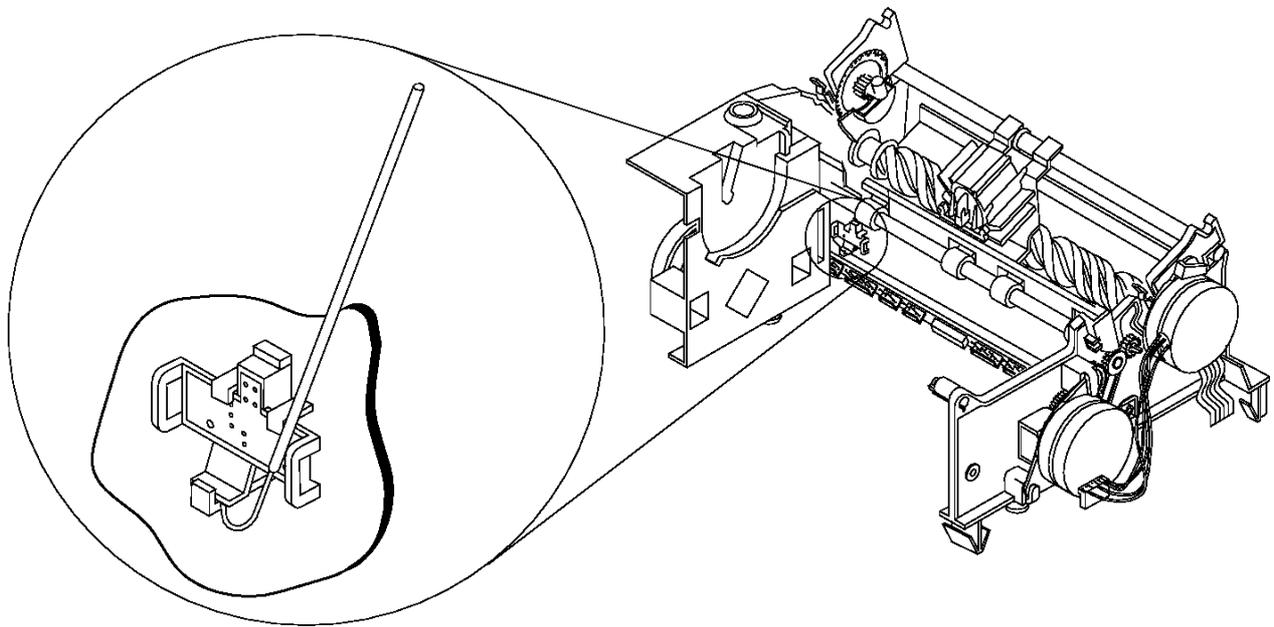


Figure 6-67. Lower DI Sensor

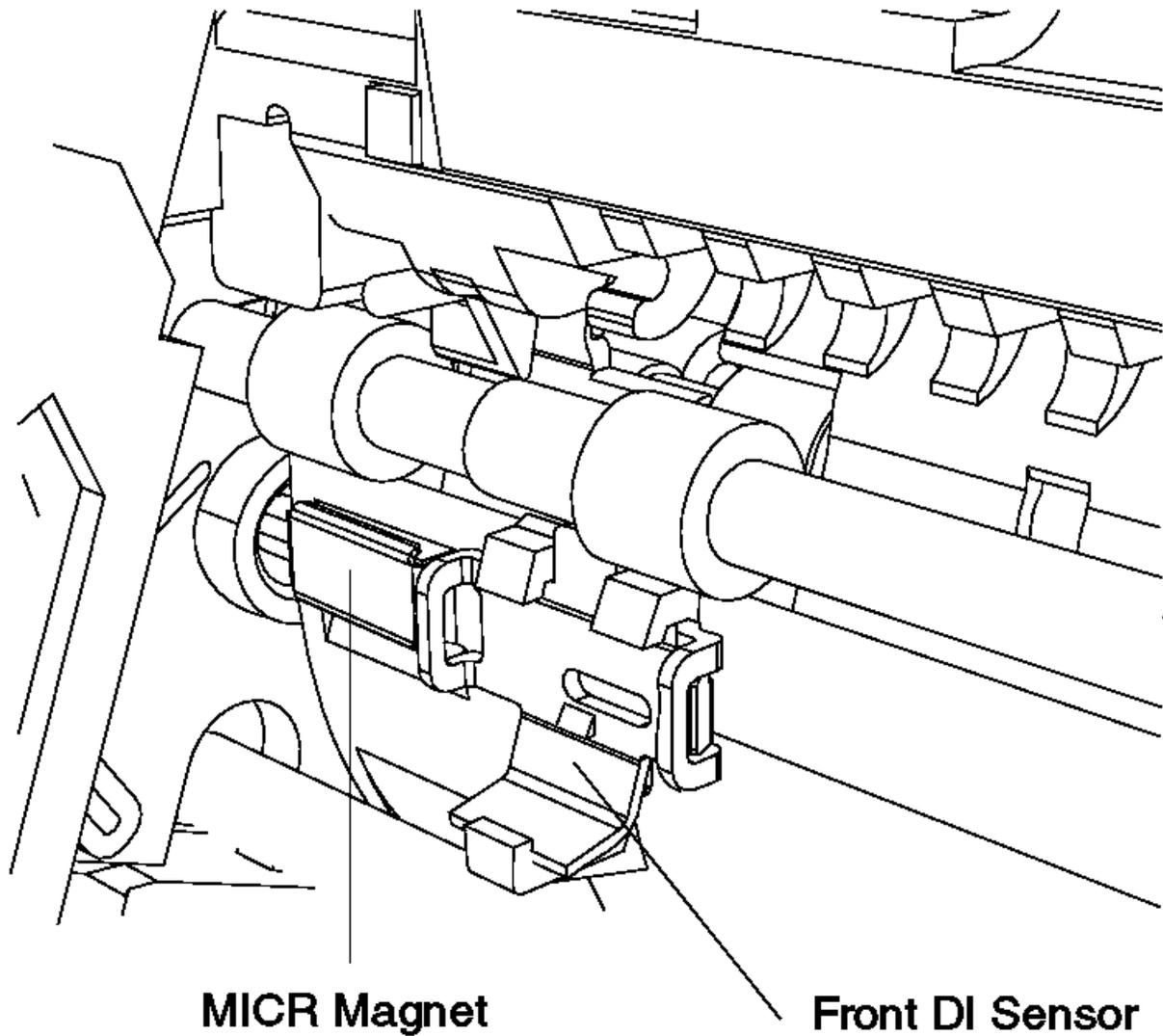


Figure 6-68. Lower DI Sensor with MICR Magnet

6.38.18 *Removing and Replacing the Upper DI Sensor*

Subtopics

6.38.18.1 Removing the Upper DI Sensor

6.38.18.2 Replacing the Upper DI Sensor

6.38.18.1 *Removing the Upper DI Sensor*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Disconnect the sensor cable from the extension card connector J109. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card. Make note of how the cable is routed for reinstallation.
5. Remove the screw (1).
6. On printers that have the MICR feature or a platen filler where the MICR is normally installed, there is not enough room to allow the sensor cable and connector to be removed. If this is the case, the platen assembly must be loosened and raised enough to allow the sensor cable and connector to be removed.
7. Remove the upper DI sensor from the right side frame, carefully threading the cable and connector out of the printer.

6.38.18.2 Replacing the Upper DI Sensor

1. Align the pins in the sensor with the holes in the right side frame.
2. Attach the upper DI forms sensor to the right side frame using the screw (1).
3. Connect the sensor cable to the extension card connector J109. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card. Route the cable as it was before.
4. Retighten the platen if was it loosened during the removal.
5. Reinstall the main cover.
6. Connect the printer to the base or system unit.
7. Switch power ON at the base or system unit.
8. Press the Ready button, the DI up button, and the DI down button simultaneously.
9. Perform the DI Front Load Print Line Adjustment.
10. After replacing the upper DI forms sensor, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the Platen Assembly	6.38.3
DI Front Load Print Line Adjustment	6.37
Stand-Alone Printer Test	6.4

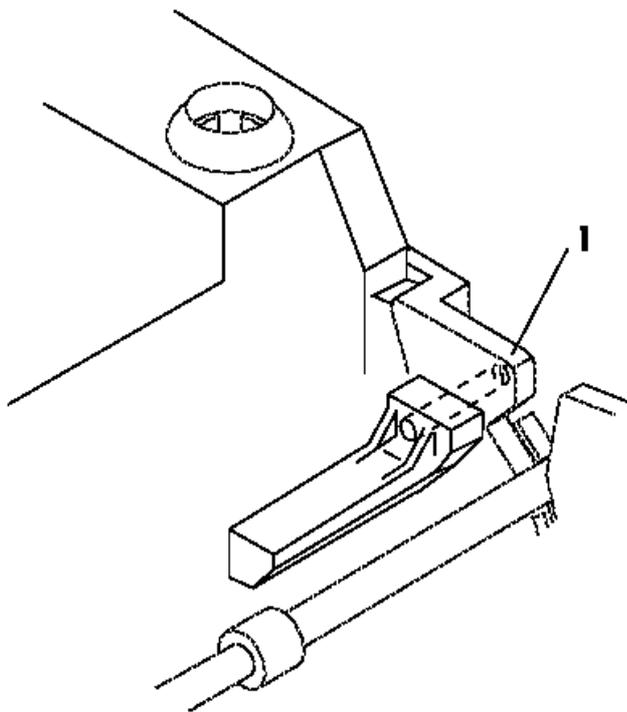


Figure 6-69. Upper DI Forms Sensor

6.38.19 *Removing and Replacing the Magnetic Ink Character Reader (MICR)*

Subtopics

6.38.19.1 Removing the Magnetic Ink Character Reader

6.38.19.2 Replacing the Magnetic Ink Character Reader

6.38.19.1 *Removing the Magnetic Ink Character Reader*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the platen assembly.
5. Observe the position of the MICR then remove the screw holding the read head in place.

6.38.19.2 Replacing the Magnetic Ink Character Reader

1. Position the MICR into the platen such that the 3-digit date code is visible. Make sure the MICR is against the back wall of the platen.
2. Reinstall the screw and bracket holding the MICR in position.
3. Reinstall the platen assembly.
4. Reinstall the main cover.
5. After replacing the MICR, run the Stand-Alone Printer Test and the Stand-Alone MICR test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the Platen Assembly	6.38.3
Stand-Alone Printer Test	6.4
Stand-Alone MICR Test	6.5

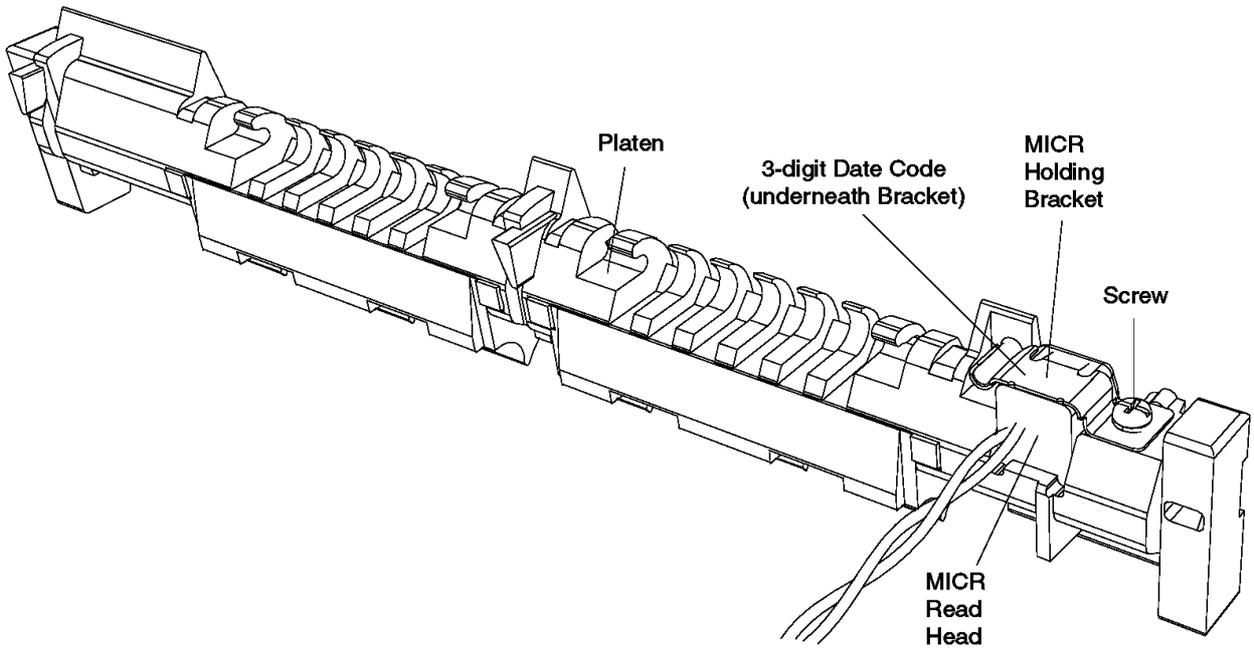


Figure 6-70. Magnetic Ink Character Reader

6.38.20 *Removing and Replacing the Magnetic Ink Character Reader Pressure Pad*

Subtopics

6.38.20.1 Removing the Magnetic Ink Character Reader Pressure Pad

6.38.20.2 Replacing the Magnetic Ink Character Reader Pressure Pad

6.38.20.1 Removing the Magnetic Ink Character Reader Pressure Pad

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the screw holding the pressure pad.

6.38.20.2 Replacing the Magnetic Ink Character Reader Pressure Pad

1. Attach the magnetic ink character reader pressure pad to the platen frame.
2. Reinstall the main cover.
3. Connect the printer to the base or system unit.
4. Switch power ON at the base or system unit.
5. After replacing the magnetic ink character reader pressure pad, run the Stand-Alone Printer Test and the Stand-Alone MICR Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone Printer Test	6.4
Stand-Alone MICR Test	6.5

MICR Pressure Pad Assembly

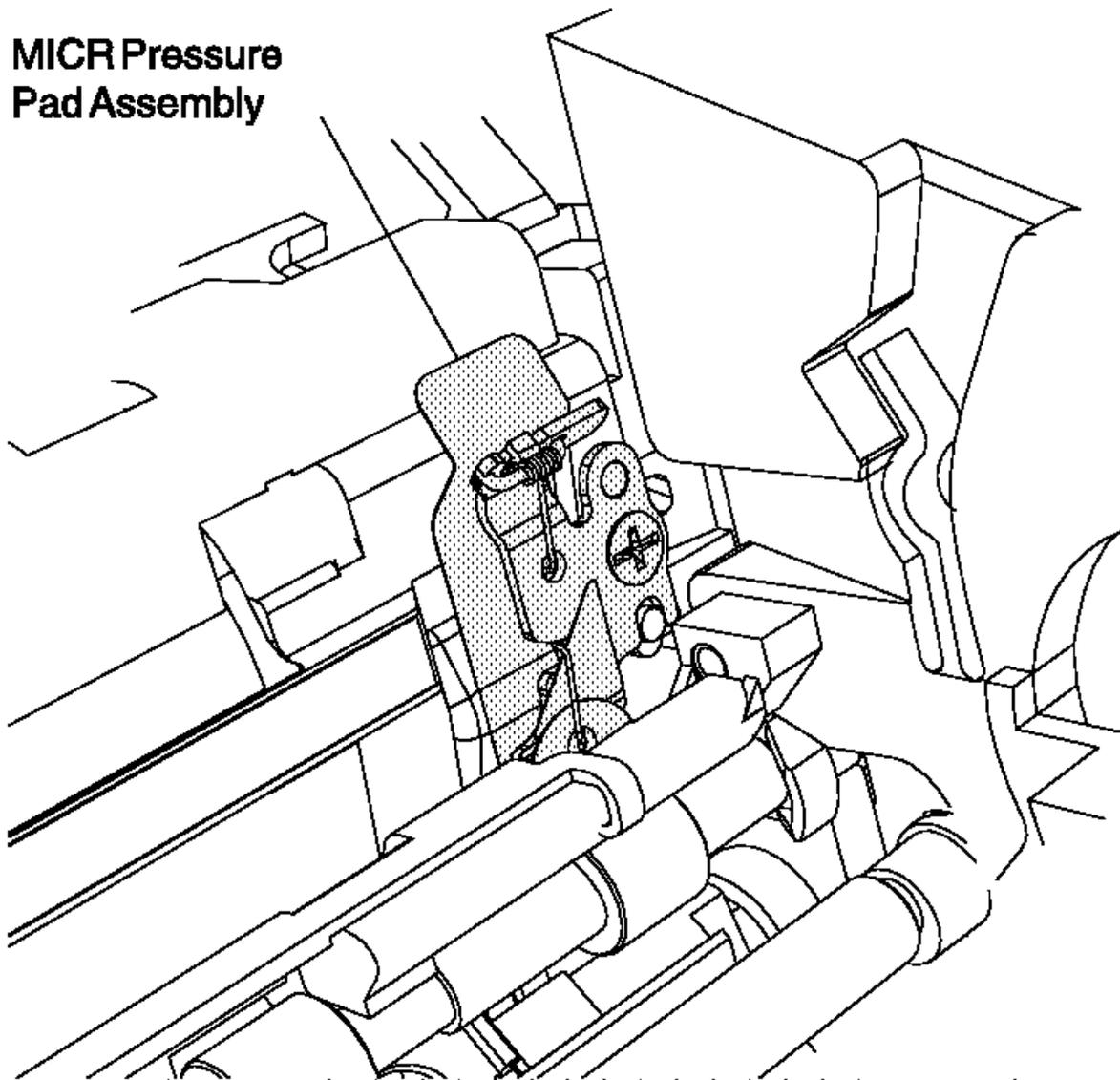


Figure 6-71. Magnetic Ink Character Reader Pressure Pad

6.38.21 Removing and Replacing the JNL Cover

Subtopics

6.38.21.1 Removing the JNL Cover

6.38.21.2 Replacing the JNL Cover

6.38.21.1 *Removing the JNL Cover*

1. Remove the access cover.
2. Unlock and raise the JNL cover.
3. Rotate and pull the cover back and off its hinge.

6.38.21.2 Replacing the JNL Cover

1. Put the JNL cover on the hinge as shown. See Figure 6-72.
2. Pull the cover forward until the hinge snaps into place, and then close it. Ensure that the cover opens and closes correctly.
3. Reinstall the access cover.

Reference	Topic
Removing and Replacing the Access Cover	6.38.1

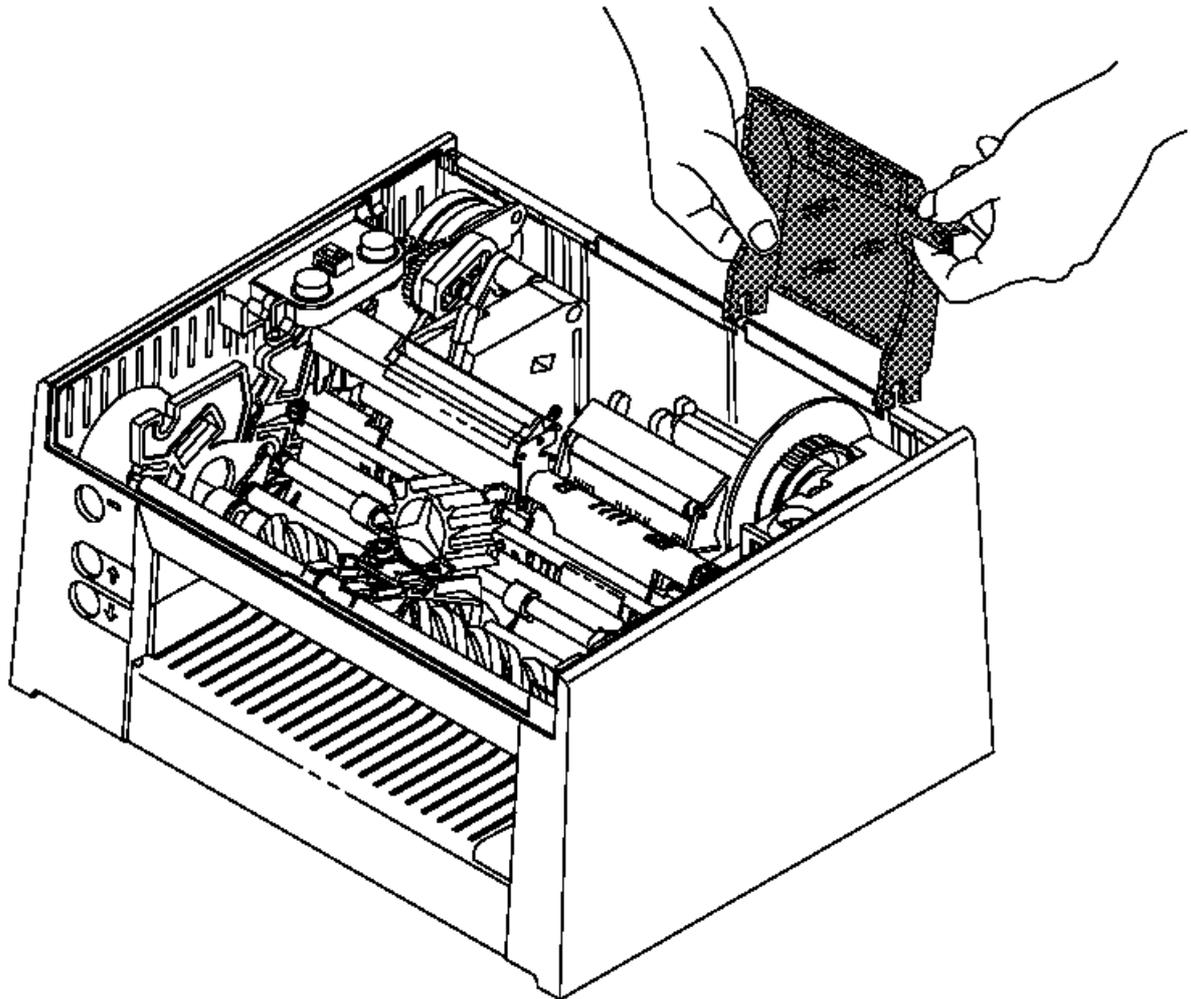


Figure 6-72. JNL Cover

6.38.22 *Removing and Replacing the JNL Lock*

Subtopics

6.38.22.1 Removing the JNL Lock

6.38.22.2 Replacing the JNL lock

6.38.22.1 *Removing the JNL Lock*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Ensure that the lock is in the unlocked position.
5. Pull the retainer clip (1) out of the printer to release the lock assembly.
6. Lift the lock assembly out of the printer.

6.38.22.2 Replacing the JNL lock

1. Put the lock assembly into the printer as shown.
2. Push the retainer clip (1) onto the lock assembly.
3. Ensure that the lock is operating correctly.
4. Reinstall the main cover.
5. Connect the printer to the base or system unit.
6. Switch power ON at the base or system unit.
7. After replacing the lock, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone Printer Test	6.4

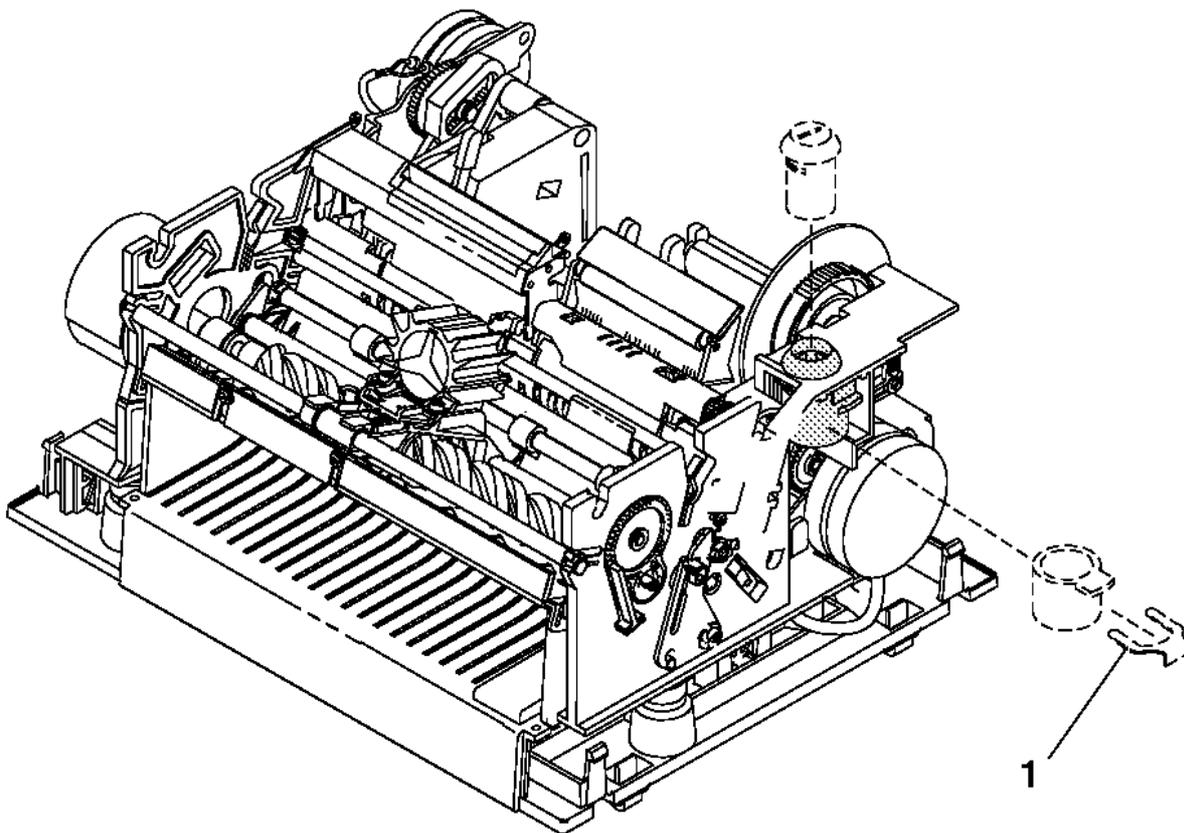


Figure 6-73. JNL Cover Lock

6.38.23 *Removing and Replacing the JNL Takeup Clutch, Gears, and Pawl*

Subtopics

6.38.23.1 Removing the Takeup Clutch, Gears, and Pawl

6.38.23.2 Replacing the Takeup clutch, Gears, and Pawl

6.38.23.1 *Removing the Takeup Clutch, Gears, and Pawl*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the JNL motor.
5. Remove the JNL drive gears (3) by gently pulling them from their shaft. Note their orientation and the sequence when you remove them.
6. Disengage the pawl spring (1) and remove it and the pawl (2), if required.

6.38.23.2 Replacing the Takeup clutch, Gears, and Pawl

1. Connect the pawl spring (1) to the pawl (2) and attach them to the side frame. Connect and attach the pawl spring and pawl as shown in Figure 6-74.
2. Reassemble the JNL drive gears as shown and ensure that they operate correctly.
3. Reinstall the JNL motor.
4. Reinstall the main cover.
5. Connect the printer to the base or system unit.
6. Switch power ON at the base or system unit.
7. After replacing the pawl and drive gears, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the JNL Motor	6.38.2
Stand-Alone Printer Test	6.4

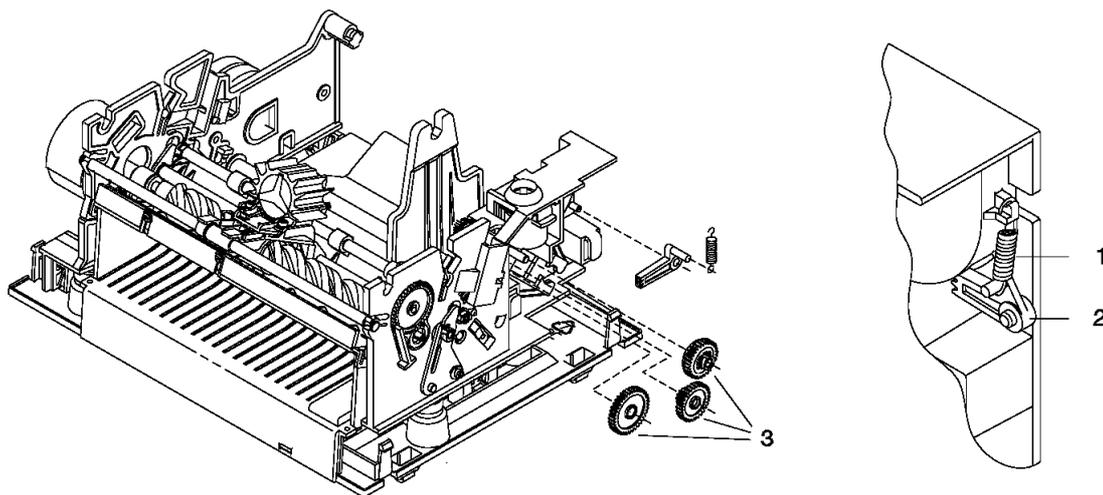


Figure 6-74. JNL Pawl and Drive Gears

6.38.24 *Removing and Replacing the JNL Motor*

Subtopics

6.38.24.1 Removing the JNL Motor

6.38.24.2 Replacing the JNL Motor

6.38.24.1 *Removing the JNL Motor*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Disconnect the motor cable from extension card connector J107. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card. Make note of how the cable is routed for reinstallation.
5. Insert a screwdriver under the JNL motor retaining tab as shown.

Attention Do not pry outward on the plastic tabs. They may break off and require a replacement printer.

6. Insert another screwdriver under the JNL flange as shown.
7. With the screwdrivers, gently pry the metal flanges on the motor in the direction shown until the motor is released from the tabs.
8. Remove the motor from the printer.

6.38.24.2 Replacing the JNL Motor

1. Slide the JNL motor into the printer and turn the motor counterclockwise until it clicks into place.
2. Connect the motor cable to extension card connector J107. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card. Route the cable as it was before.
3. Reinstall the main cover.
4. Connect the printer to the base or system unit.
5. Switch power ON at the base or system unit.
6. After replacing the JNL motor, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone Printer Test	6.4

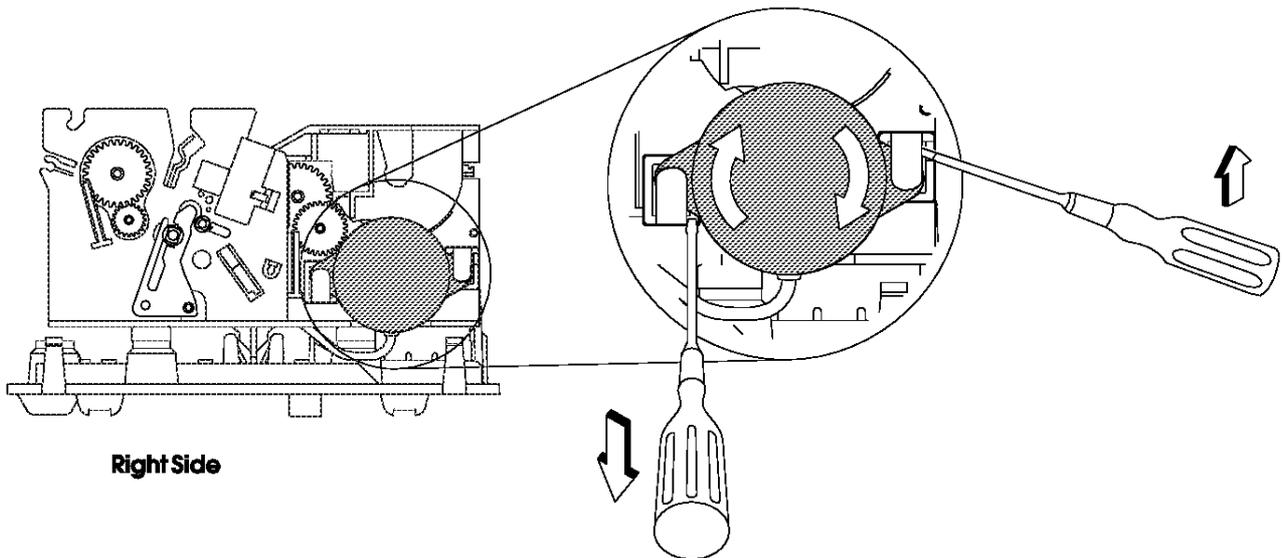


Figure 6-75. JNL Motor

6.38.25 Removing and Replacing the JNL Paper Motion Sensor

Subtopics

- 6.38.25.1 Removing the JNL Paper Motion Sensor
- 6.38.25.2 Replacing the JNL Paper Motion Sensor

6.38.25.1 *Removing the JNL Paper Motion Sensor*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Disconnect all cables from the printer card. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
5. Remove the base.
6. Disconnect the JNL paper motion sensor cable from printer extension card connector J106. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card. Make note of how the cable is routed for reinstallation.
7. Remove the JNL emitter wheel shaft (1) by gently prying the shaft out of the JNL frame at each end.
8. Using a springhook, remove the sensor clip by gently lifting the small end until the clip rotates out and allows the removal of the JNL paper motion sensor.

6.38.25.2 Replacing the JNL Paper Motion Sensor

1. Exchange the JNL paper motion sensor and install the sensor clip by placing the large side of the clip against the sensor mount and rotating the small end through the sensor until it snaps into place. Ensure that the sensor is seated firmly.
2. Reinstall the JNL emitter wheel (2) and shaft (1).
3. Connect the JNL paper motion sensor cable to extension card connector J106. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card. Route the cable as it was before.
4. Reinstall the base.
5. Connect all cables to the printer card. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
6. Reinstall the main cover.
7. Connect the printer to the base or system unit.
8. Switch power ON at the base or system unit.
9. After replacing the JNL paper motion sensor, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the Base	6.38.5
Stand-Alone Printer Test	6.4

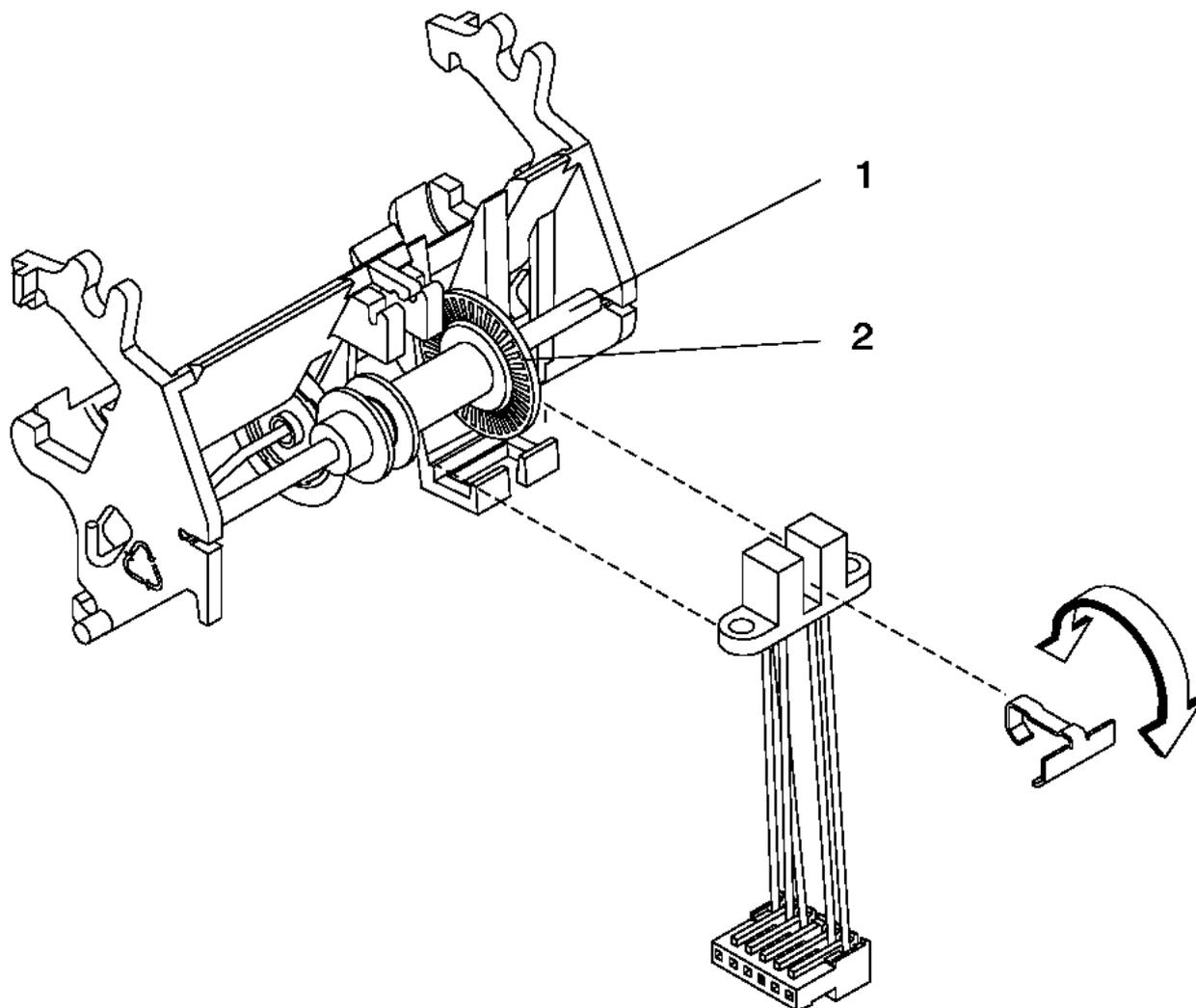


Figure 6-76. The JNL frame assembly has been isolated to illustrate how the JNL paper motion sensor attaches to it. Do not remove the JNL frame assembly when removing and replacing the JNL paper motion sensor.

6.38.26 Removing and Replacing the JNL Roller Assembly and Frame

Subtopics

6.38.26.1 Removing the JNL Assembly

6.38.26.2 Replacing the JNL Assembly

6.38.26.1 *Removing the JNL Assembly*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the platen assembly.
5. Remove the toggle spring retainer clip (2) then disengage the spring toggle (1) at its center attachment point.
6. Disengage the O-ring shaft (3) from the inside leg of the roller and slide the shaft out the hole in the outside leg of the roller.
7. Remove the roller leg retainer (6) then gently pry outward on the ends of the JNL roller assembly (5) until they are free of the posts on the JNL frame. Remove the JNL roller assembly and make note of how it attaches to the frame.
8. Gently spread the top sides of the JNL frame one at a time until they are loose from the platen and rotate the frame off of the platen as shown.

Note: The rubber pads on the platen may come off.

6.38.26.2 Replacing the JNL Assembly

1. Attach the bottom of the JNL frame to the platen and rotate it forward as shown until the top sides of the frame touch the platen. Gently spread the top sides one at a time and continue rotating the frame forward until both sides click into place. Check that the rubber pads keep the frame tight against the platen.
2. Gently spread the arms of the roller to allow the holes to fit over the posts on the frame. Reinstall the roller leg retainer (6).
3. Attach the toggle spring (1) at its center attachment point then install the toggle spring retainer clip (2). Ensure that the spring is correctly seated and that the roller moves back-and-forth correctly.
4. Ensure that the O-ring shaft is seated properly. The shaft should be held on both sides of the JNL roller. The O-ring shaft should move up and down in the slot near the O-ring as the JNL roller holder is toggled from the feed to the load position.
5. Reinstall the O-ring shaft (3) by inserting it through the hole in the outside leg of the roller, then snapping the shaft into the inside leg of the roller. Check that the bail springs (4) are correctly positioned. See Figure 6-77.
6. Reinstall the platen assembly.
7. Reinstall the main cover.
8. Connect the printer to the base or system unit.
9. Switch power ON at the base or system unit.
10. After replacing the JNL components, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the Platen assembly	6.38.3
Stand-Alone Printer Test	6.4

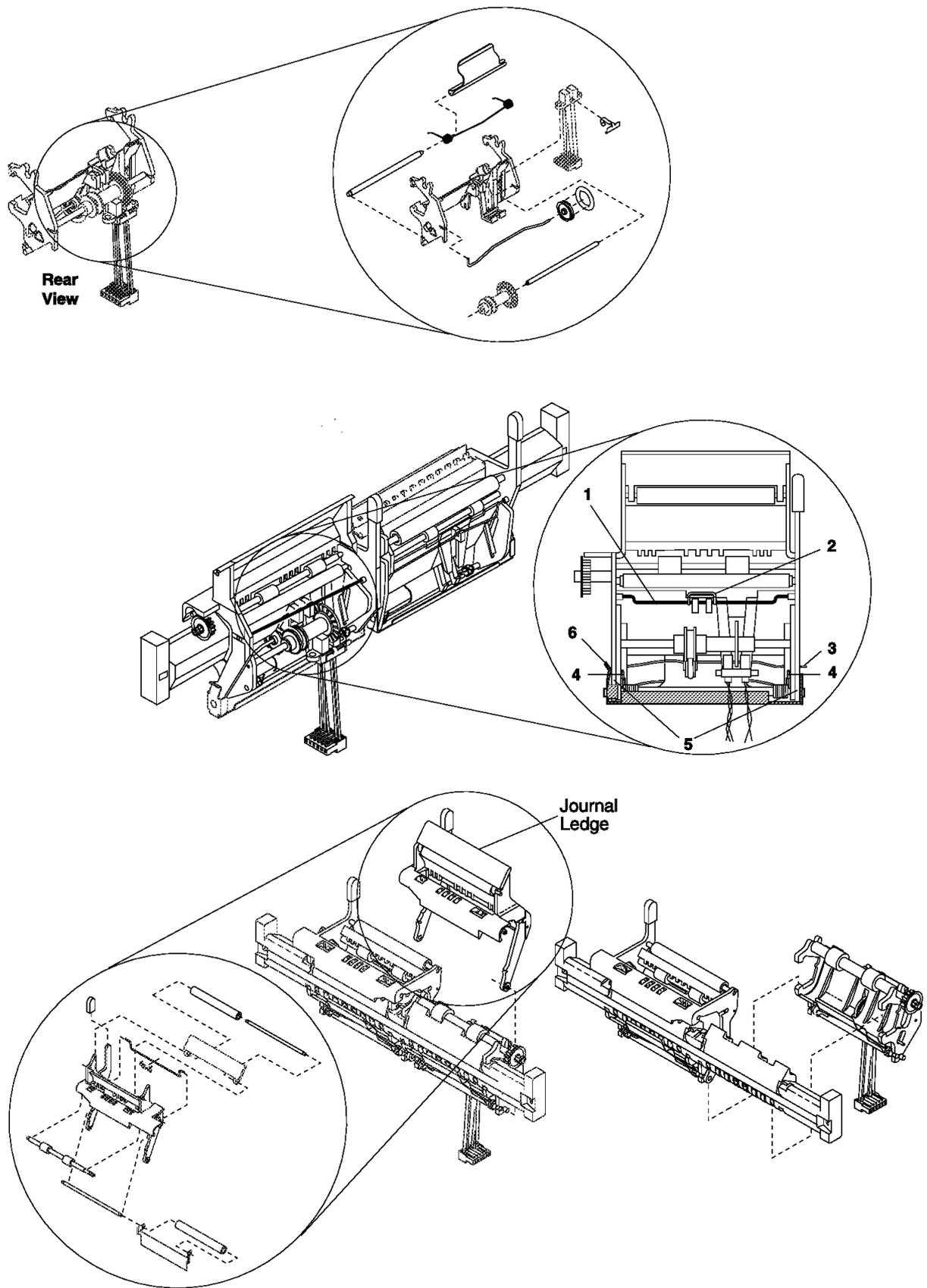


Figure 6-77. JNL Assembly

6.38.27 Removing and Replacing the JNL Support Post

Subtopics

6.38.27.1 Removing the JNL Support Post

6.38.27.2 Replacing the JNL Support Post

6.38.27.1 *Removing the JNL Support Post*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the JNL spool.
5. Mark the location of the JNL support post (1) ridges on the printer. These three ridges are located on the CR side of the post.
6. Rotate the printer onto its back with the base facing you as shown.

Note: Do not rotate the printer so that it rests on its top.

7. Remove the screws (2) and JNL support plate from the base. Do not tilt the post sideways; this causes the two hex nuts to fall out of the post.
8. Rotate the printer so that it rests on the base.
9. Lift the JNL support post from the printer.

6.38.27.2 Replacing the JNL Support Post

1. Lower the JNL support post (1) into the printer. Ensure that the two hex nuts are in the post.
2. While holding the JNL support post in place, rotate the printer onto its back with the base facing you as shown.
Note: Do not rotate the printer so that it rests on its top.
3. Reinstall the screws (2) and JNL support plate, but do not completely tighten the screws. Tighten the screws so that the post does not move freely but can be adjusted.
4. Rotate the printer so that it rests on the base.
5. Adjust the post by aligning its ridges with the marks on the printer. These three ridges are located on the CR side of the post.
6. Rotate the printer onto its back with the base facing you as shown.
7. Completely tighten the screws.
8. Rotate the printer so that it rests on the base.
9. Reinstall the JNL spool.
10. Reinstall the main cover.
11. Connect the printer to the base or system unit.
12. Switch power ON at the base or system unit.
13. After replacing the JNL support post, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the JNL Spool	6.38.2
Stand-Alone Printer Test	6.4

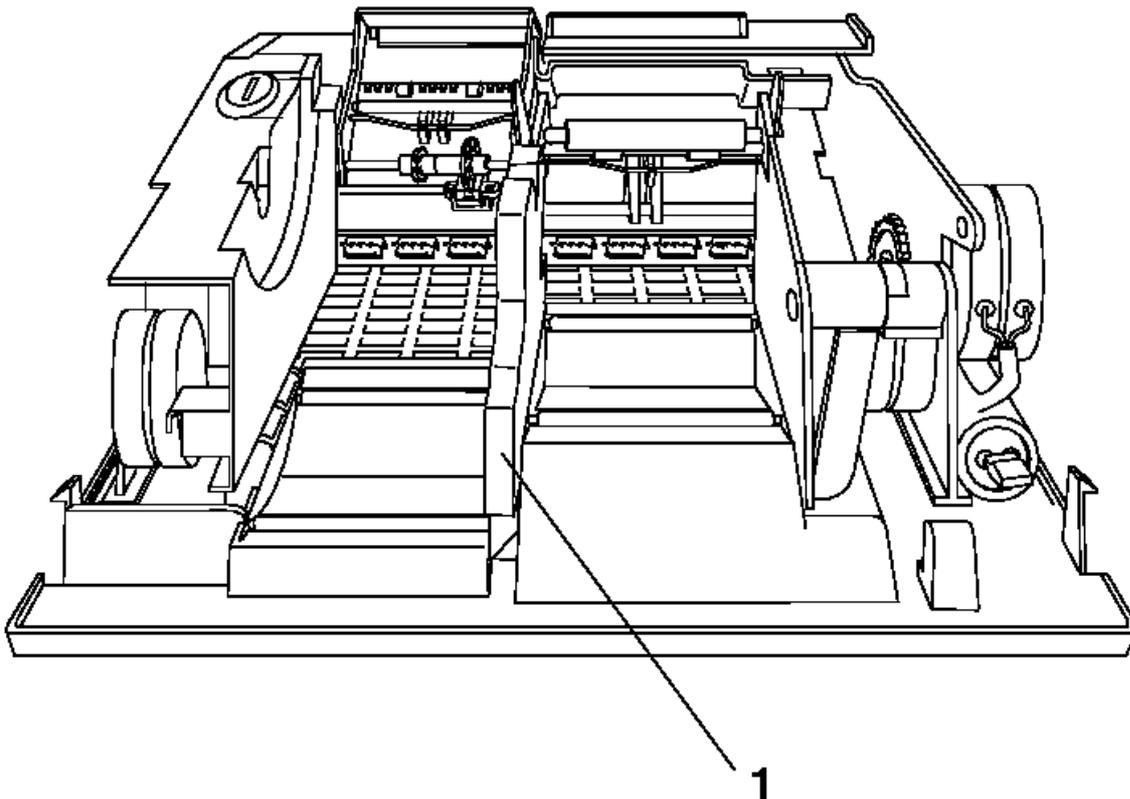


Figure 6-78. JNL Support Post

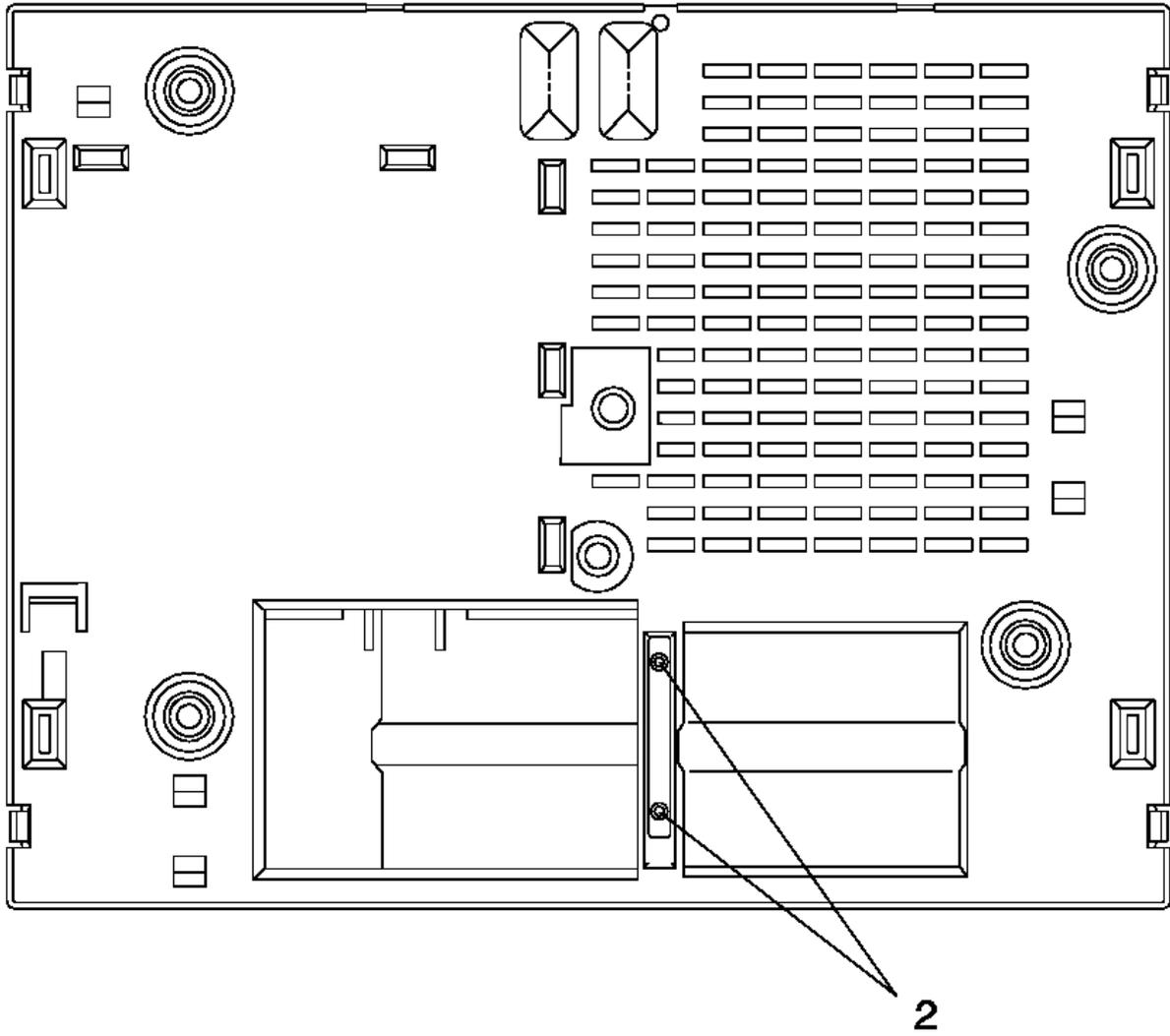


Figure 6-79. JNL Support Post Screws and Plate

6.38.28 *Removing and Replacing the JNL Spool*

Subtopics

6.38.28.1 Removing the JNL Spool

6.38.28.2 Replacing the JNL Spool

6.38.28.1 *Removing the JNL Spool*

1. Switch **POWER OFF** at the base or system unit.
2. Raise the access cover.
3. Unlock and raise the JNL cover.
4. Slide the JNL spool slightly to the left, then lift the JNL spool out of the printer as shown.

6.38.28.2 Replacing the JNL Spool

1. Lower the JNL spool into the printer as shown.
2. Lower the JNL cover and lock it, if required
3. Lower the access cover.
4. Switch power ON at the base or system unit.
5. After replacing the JNL spool, run the Stand-Alone Printer Test.

Reference	Topic
Stand-Alone Printer Test	6.4

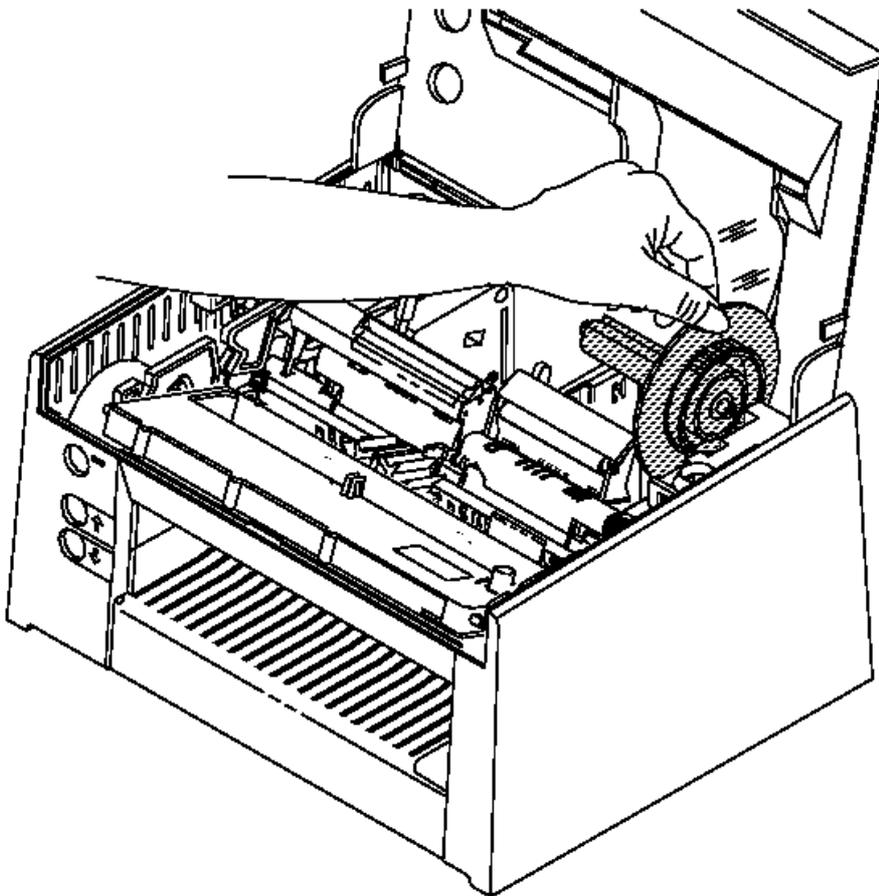


Figure 6-80. JNL Spool

6.38.29 *Removing and Replacing the Paper Rollers*

Subtopics

6.38.29.1 Removing the Paper Rollers

6.38.29.2 Replacing the Paper Rollers

6.38.29.1 *Removing the Paper Rollers*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the JNL spool.
5. Remove the JNL support post.
6. Remove the JNL paper rollers (2) and the customer receipt rollers (1) by lifting at the ends where the JNL support post was installed.

6.38.29.2 Replacing the Paper Rollers

1. Exchange the JNL paper rollers (2) and the CR rollers (1). Ensure that they roll freely and do not bind.
2. Reinstall the JNL support post.
3. Reinstall the JNL spool.
4. Reinstall the main cover.
5. Connect the printer to the base or system unit.
6. Switch power ON at the base or system unit.
7. After replacing the paper rollers, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the JNL Spool	6.38.2
Removing and Replacing the JNL Support Post	6.38.2
Stand-Alone Printer Test	6.4

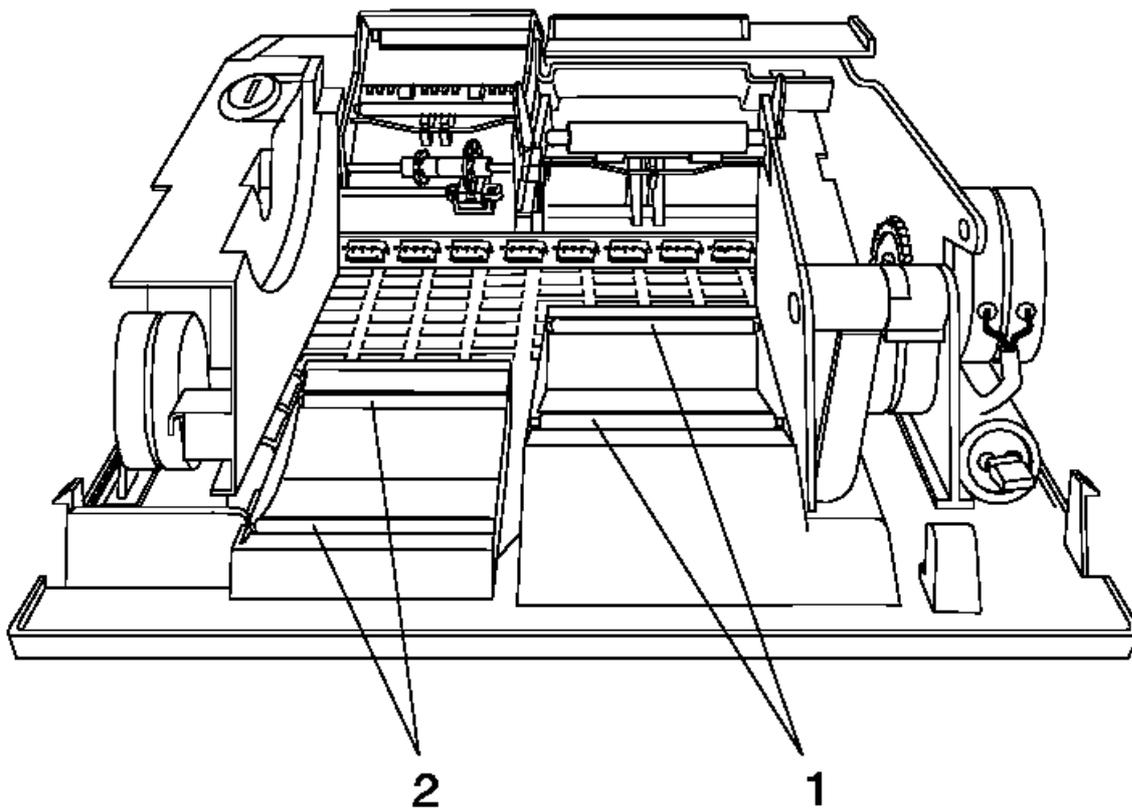


Figure 6-81. Paper Rollers

6.38.30 Removing and Replacing the Main Cover

Subtopics

6.38.30.1 Removing the Main Cover

6.38.30.2 Replacing the Main Cover

6.38.30.1 *Removing the Main Cover*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Rotate the printer onto its back as shown.

Note: Do not rotate the printer so that it rests on its top.

4. Move the four main cover holding tabs, (1) toward the center of the printer with a screwdriver to release them as shown. Rotate the printer so that it rests on its base.
5. Remove the main cover from the printer by pivoting the cover onto its left side to prevent damage to the attached cables.
6. Disconnect the top and front keypad cables and the cover sensor cable from printer card connectors J8, J9, and J7, respectively. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.

6.38.30.2 Replacing the Main Cover

1. Place the main cover, resting on its left side, to the left of the printer.
2. Connect the top and front keypad cables and the cover sensor cable to printer card connectors J8, J9, and J7, respectively. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
3. Align the holding tabs (1) over their slots. Ensure that all of the printer cables are within the main cover.
4. Push down on the main cover until the tabs lock into place. Ensure that all four tabs engage.
5. Connect the printer to the base or system unit.
6. Switch power ON at the base or system unit.
7. After replacing the main cover, run the Stand-Alone Printer Test.

Reference	Topic
Stand-Alone Printer Test	6.4

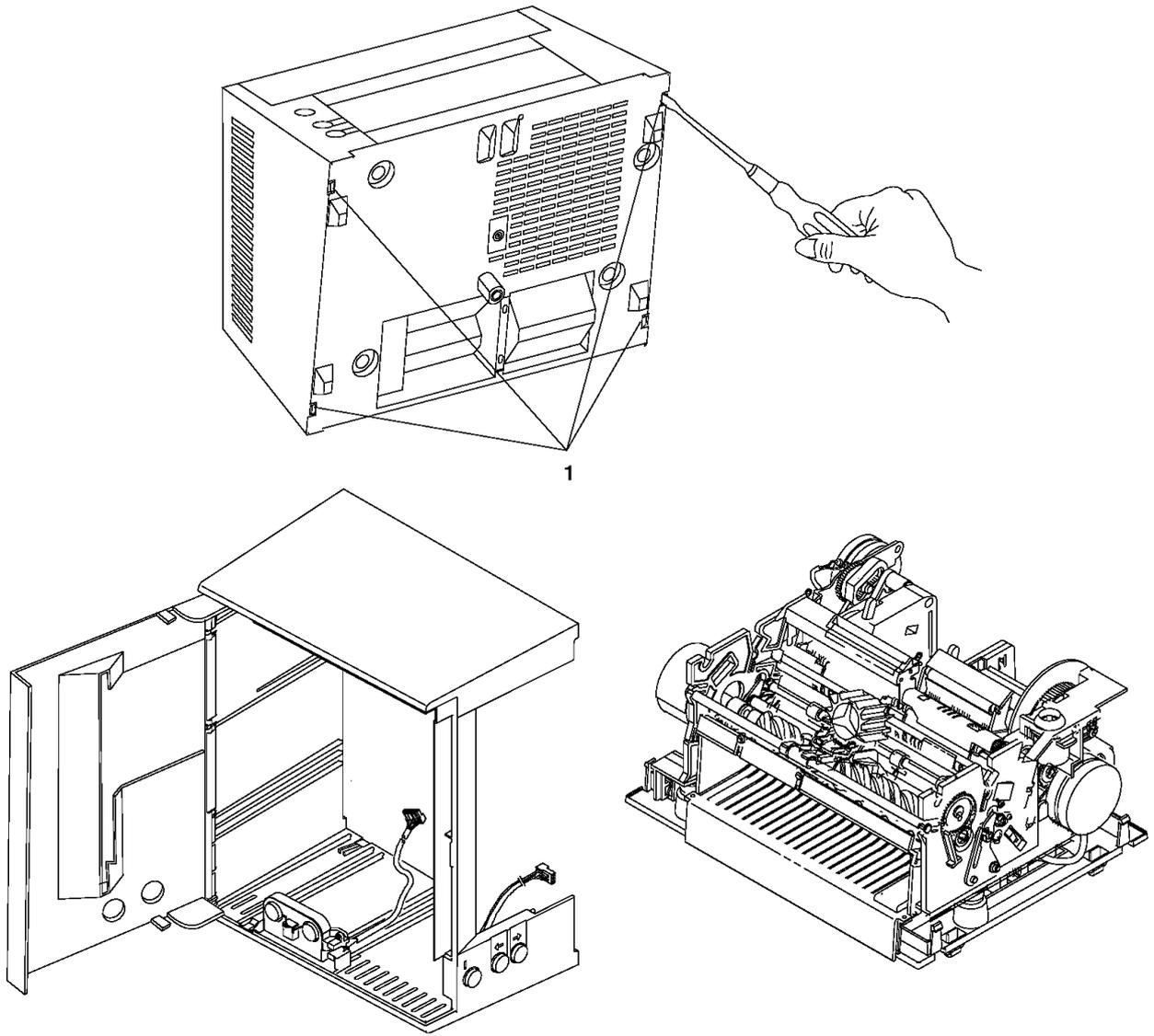


Figure 6-82. Main Cover

6.38.31 *Removing and Replacing the Platen Assembly*

Subtopics

6.38.31.1 Removing the Platen Assembly

6.38.31.2 Replacing the Platen Assembly

6.38.31.1 *Removing the Platen Assembly*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the JNL spool.
5. Remove the paper cutter.
6. Remove the CR motor gear assembly from the printer. Begin at step 5 in topic 6.38.13.1 under Removing the CR Motor Gear Assembly.
7. Remove the two platen screws (1), flat washers, lock washers, and special nuts using a magnetic tool to prevent the hardware from dropping into the printer.
8. Lift the platen assembly straight up from the printer.
9. Disconnect the JNL emitter sensor cable (J106) and the MICR cable (J104, if present) from the extension card. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card.

6.38.31.2 Replacing the Platen Assembly

1. Lower the platen assembly into the printer as shown.

Note: Ensure that the rubber O-ring is on its wheel and that the emitter shaft is seated correctly.

2. Connect the JNL emitter sensor cable (J106) and the MICR cable (J104, if present) to the printer card connector. See Figure 6-45 in topic 6.37.2.1 for an illustration of the extension card.

3. Push the platen down and push the frame to the center to maintain the factory adjustment.

4. Reinstall the two platen screws (1), flat washers, lock washers, and special nuts. The platen should be seated to the bottom and inside of the side frame compartments. Torque both screws using a torque screwdriver set at 8.4 inch pounds (0.95Nm).

Note: Ensure that the nut is seated correctly in the side frame. A magnetic tool or needle nose pliers may be required to hold the nut in place while starting the platen screws.

5. Connect the CR motor gear assembly to the printer. See steps 2 in topic 6.38.13.2 and 3 in topic 6.38.13.2 under Replacing the CR Motor Gear Assembly.

6. Reinstall the paper cutter.

7. Reinstall the JNL spool.

8. Reinstall the main cover.

9. Connect the printer to the base or system unit.

10. Switch power ON at the base or system unit.

11. After replacing the platen assembly, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the JNL Spool	6.38.2
Removing and Replacing the Paper Cutter	6.38.1
Stand-Alone Printer Test	6.4

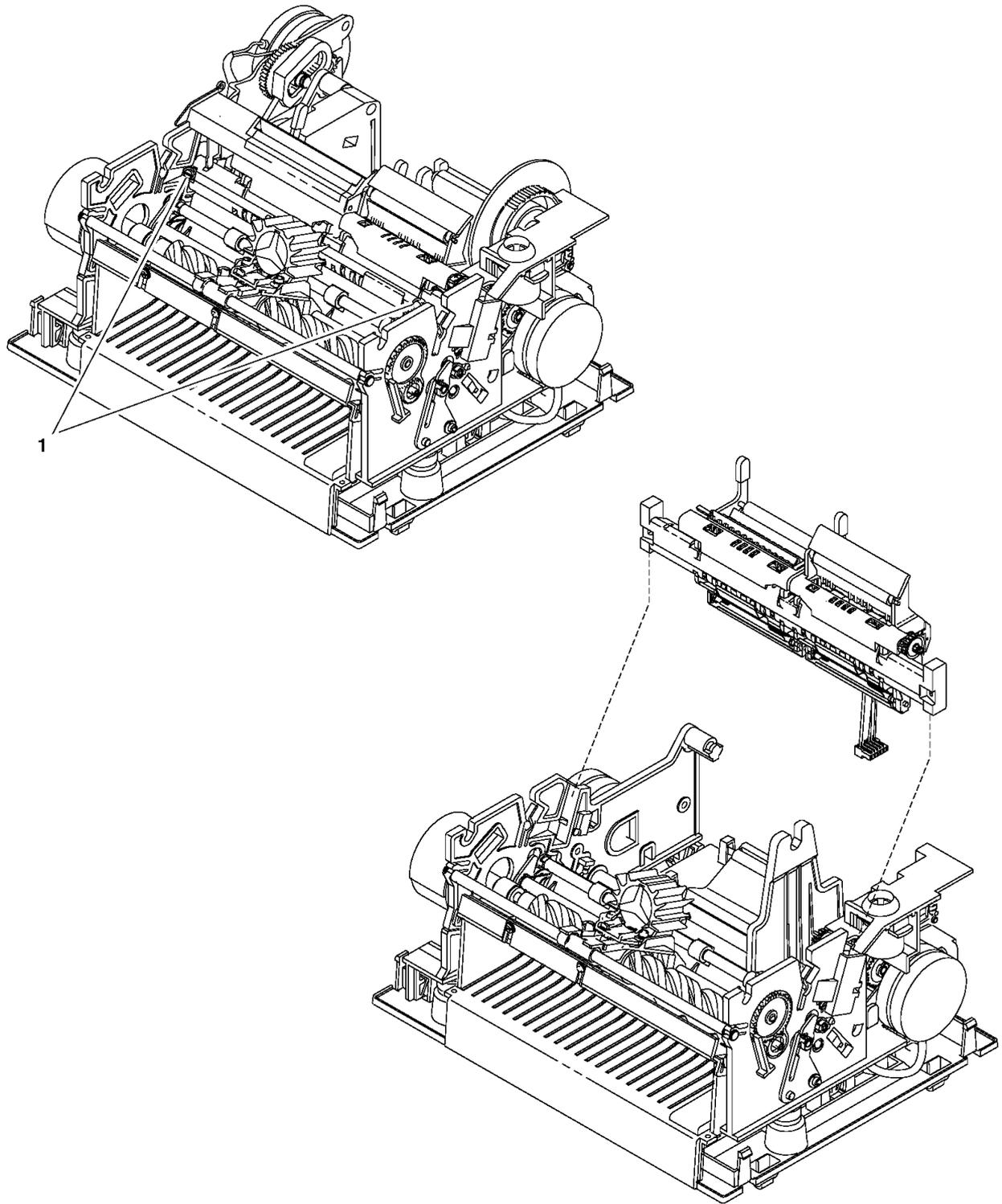


Figure 6-83. Platen Assembly

6.38.32 *Removing and Replacing the Home Sensor Card*

Subtopics

6.38.32.1 Removing the Home Sensor Card

6.38.32.2 Replacing the Home Sensor Card

6.38.32.1 *Removing the Home Sensor Card*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Disconnect the sensor cable from the home sensor card. See Figure 6-84 in topic 6.38.32.2. The cable is located on the far left side of the card. Make note of how the cable is routed for reinstallation.
5. Mark the location of the two screws (1) on the upper forms guide to establish the location of the home sensor card.
6. Mark the notch in the edge of the upper forms guide (4) that is closest to the groove in the top edge of the home sensor card.
7. Remove the two screws (1), flat washers, and back-up nut plate.
8. Lift the home sensor card (3) out of the printer.

6.38.32.2 Replacing the Home Sensor Card

1. Put the home sensor card (3) into place.
2. Adjust the home sensor card left to right using the groove in the card and the marked notch in the upper forms guide (4). Adjust the home sensor card vertically by locating the mounting screws in the same location that was marked on the upper forms guide.

Note: To adjust the printing, move the home sensor card in the direction you want the print to move.

3. Reinstall the two screws (1), flat washers, and back-up nut plate. Tighten both screws, making sure the left to right and vertical adjustments are maintained. Torque both screws using a torque screwdriver set at 6 inch pounds (0.69Nm).
4. Connect the sensor cable (2) to the home sensor card. Route the cable as it was before.
5. Move the print head left and right to ensure that it does not hit either home sensor.
6. Reinstall the main cover.
7. Connect the printer to the base or system unit.
8. Switch power ON at the base or system unit.
9. After replacing the home sensor card, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone Printer Test	6.4

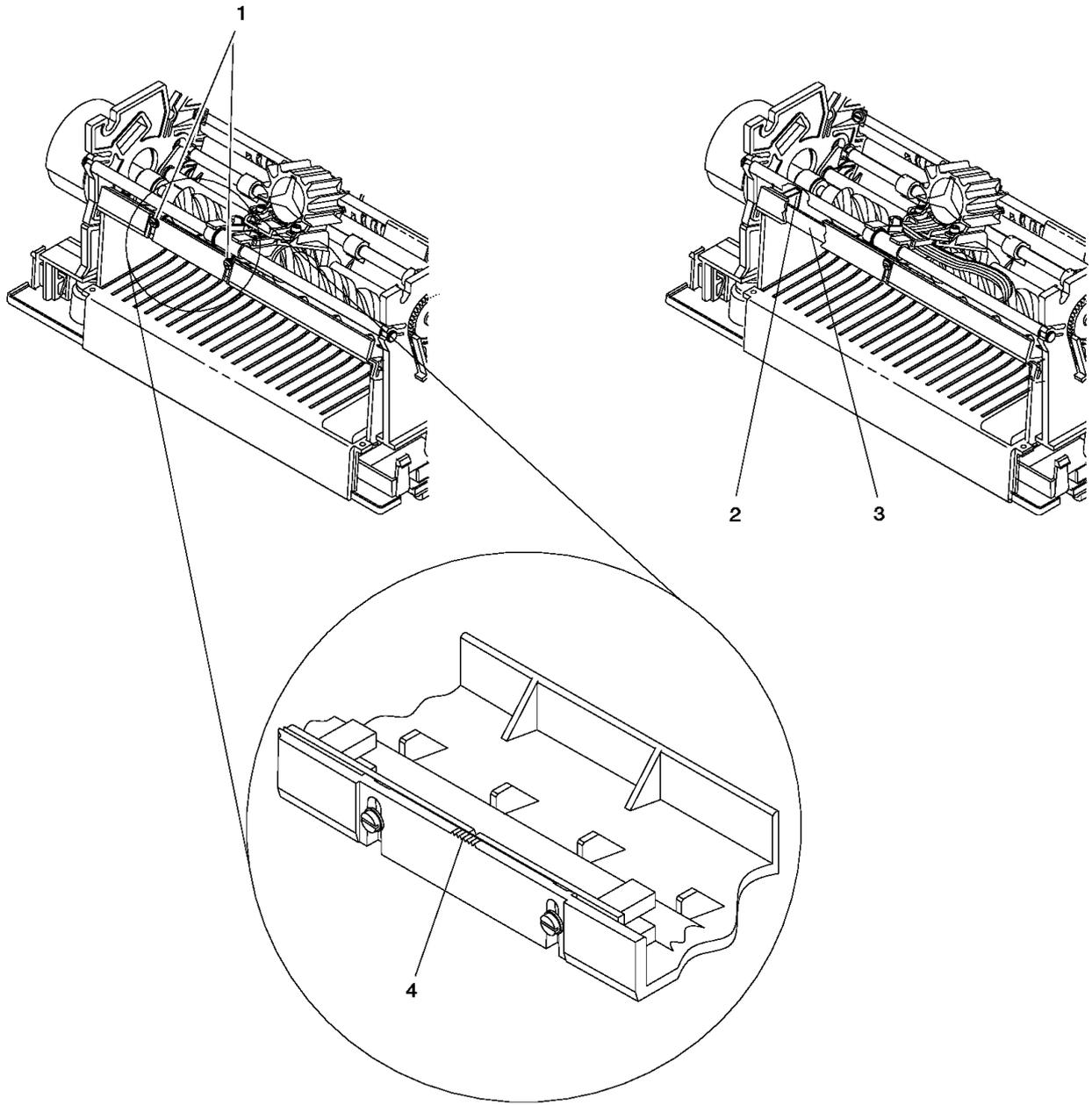


Figure 6-84. Home Sensor Card

6.38.33 *Removing and Replacing the Transport Assembly*

There are two types of transport assemblies. The older style is a helix drive and the newer style is a belt drive. Printers can be converted from a helix drive to a belt drive but not from a belt drive to a helix drive.

- If you are exchanging a failing helix drive transport assembly with a new helix drive assembly, go to "Removing and Replacing the Helix Drive Transport Assembly" in topic 6.38.34.
- If you are exchanging a failing helix drive transport assembly with a new belt drive assembly, go to "Converting From Helix to Belt Drive Transport Assembly" in topic 6.38.35.
- If you are exchanging a failing belt drive transport assembly with a new belt drive assembly, go to "Removing and Replacing the Belt Drive Transport Assembly" in topic 6.38.36.
- You cannot exchange a failing belt drive transport assembly with a helix drive transport assembly.

6.38.34 *Removing and Replacing the Helix Drive Transport Assembly*

Subtopics

6.38.34.1 Removing the Transport Assembly

6.38.34.2 Replacing the Transport Assembly

6.38.34.1 *Removing the Transport Assembly*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the ribbon cartridge.
5. Remove the ribbon drive clutch at the end of the transport shaft by prying the gear tabs open with a screwdriver while pushing the gear out with another screwdriver as shown. See Figure 6-85 in topic 6.38.34.2.

Note: Ensure that the clutch spring is removed.

6. Disconnect the transport motor cable from printer card connector J4. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
7. On Models 3R and 4R, remove the DI motor and the cover over the DI gears on the left side of the printer.
8. Rotate the transport motor clockwise and remove the assembly from the printer.
9. Remove the anti-chatter clip (if present) from the helix bearing sleeve on the right side frame. See Figure 6-85 in topic 6.38.34.2.
10. Pull the transport assembly through the hole in the left side frame, disengaging the helix nut.
11. Move the print head to the center of the printer, between the CR and JNL stations and remove the print head.
12. Remove the front carrier shaft by gently releasing one end at a time from the side frames. See Figure 6-85 in topic 6.38.34.2.
13. Raise the print head carrier and note the position of the helix nut in the carrier, then remove the helix nut.

6.38.34.2 Replacing the Transport Assembly

1. Move the print head to the center of the printer, between the CR and JNL stations. Raise the print head carrier and reinstall the helix nut.
2. Reinstall the front carrier shaft by gently pressing one end at a time into the side frames. Ensure that the carrier bushing is installed correctly. See Figure 6-85.
3. Reinstall the print head and perform the print head gap adjustment. See "Replacing the Print Head" in topic 6.38.9.2.
4. Apply a film of lubricant supplied with the new assembly to the metal end of the transport shaft.
5. Place the transport assembly, except for the ribbon drive clutch, into the printer and thread the helix through the helix nut.
6. Rotate the transport motor counterclockwise to attach it to the left side frame.

Note: Be careful not to fold or damage the rubber boot on the face of the motor.
7. On Models 3R and 4R, reinstall the DI gear cover and the DI motor.
8. On Models 3R and 4R, reinstall the cover over the DI gears on the left side of the printer.
9. Apply a film of lubricant supplied with the new assembly to the outside of the ribbon drive clutch spring, and to both hubs of the ribbon drive gear.
10. Push the ribbon drive clutch (spring and gear) onto the transport shaft until it snaps into place.
11. Snap the anti-chatter clip (if present) back over the helix shaft and bearing sleeve.
12. Move the print head left and right to ensure that it is functioning correctly.
13. Connect the transport motor cable to printer card connector J4. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
14. Reinstall the ribbon cartridge.
15. Reinstall the main cover.
16. Connect the printer to the base or system unit.
17. Switch power ON at the base or system unit.
18. After replacing the transport assembly, run the Stand-Alone Printer Test and perform the printer adjustments if necessary for proper character alignment.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Stand-Alone printer Test	6.4

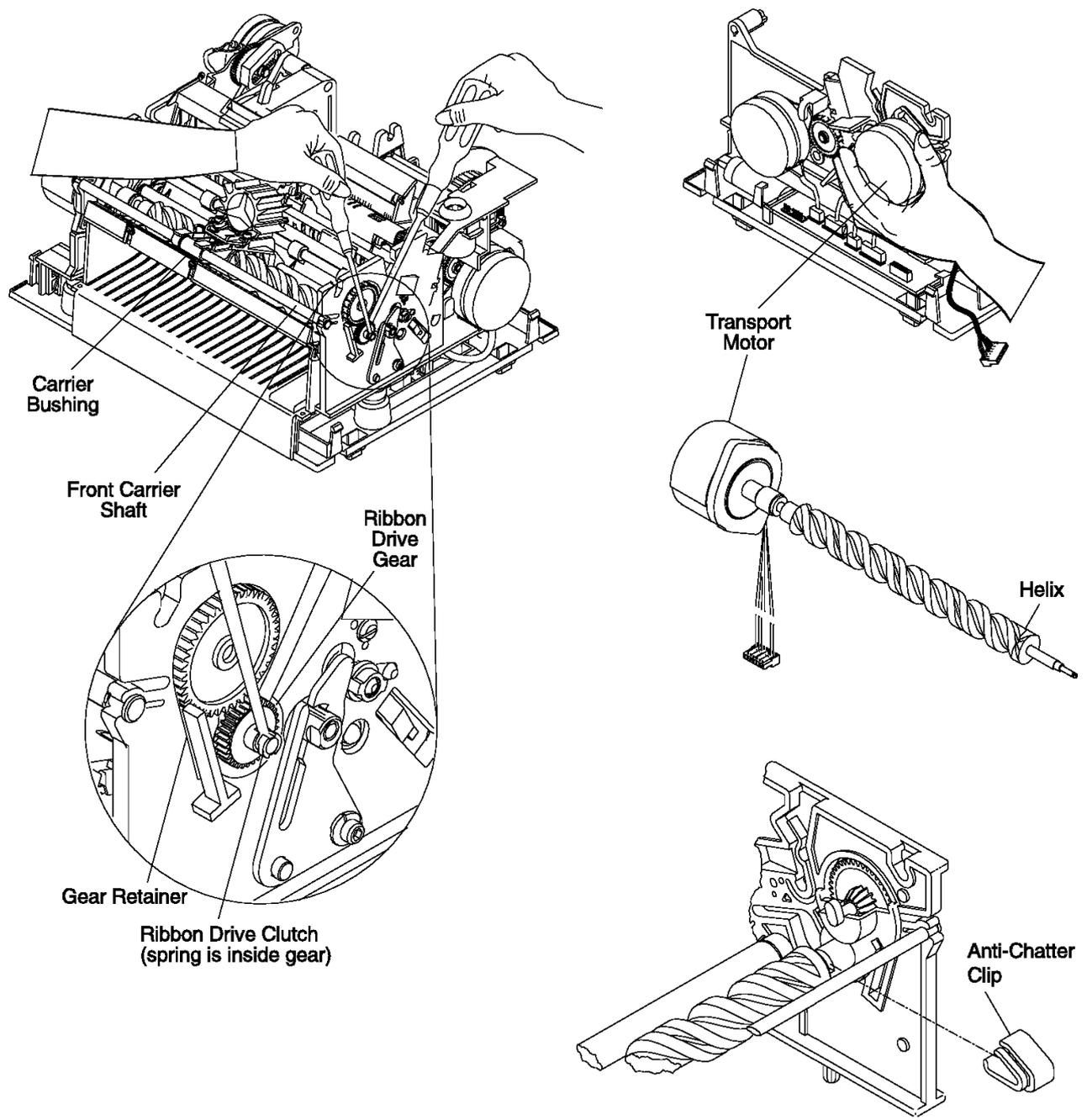


Figure 6-85. Transport Assembly

6.38.35 *Converting From Helix to Belt Drive Transport Assembly*

1. Remove the helix transport assembly. See "Removing and Replacing the Transport Assembly" in topic 6.38.33.
2. Move the carrier to the center of the printer, between the CR and JNL print stations.
3. Reinstall the front carrier shaft by gently pressing one end a time into the side frames. Ensure that the carrier bushing is installed correctly.
4. Place the print head into position but do not install the screws or other hardware used to retain the print head.
5. Using pliers, remove the motor tabs for the transport motor on the left side frame. Make sure any excess material does not extend beyond 0.75mm from the side frame.
6. On Models 3R and 4R, reinstall the cover over the DI gears on the left side of the printer.
7. The printer is now prepared for the belt drive transport assembly to be installed. See "Removing and Replacing the Belt Drive Transport Assembly" in topic 6.38.36.

6.38.36 *Removing and Replacing the Belt Drive Transport Assembly*

Subtopics

6.38.36.1 Removing the Transport Assembly

6.38.36.2 Replacing the Transport Assembly

6.38.36.1 *Removing the Transport Assembly*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the ribbon cartridge.
5. Disconnect the transport motor cable from printer card connector J4. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
6. Remove the ribbon drive clutch by prying the gear tabs open with a screwdriver while pushing the gear out with another screwdriver as shown. See Figure 6-85 in topic 6.38.34.2.

Note: Ensure that the clutch spring is removed.

7. Move the print head to the center of the printer, between the CR and JNL print stations. Remove the 2 screws and other hardware retaining holding the print head to the carrier.
8. Push down on the belt near the left side of the carrier assembly and move the carrier to the extreme right side, exposing the transport assembly mounting hardware on the left side.
9. Remove the transport assembly clamp, lock washer, and screw. See Figure 6-86 in topic 6.38.36.2.
10. Pull the transport assembly through the hole in the left side frame.
11. Move the carrier to the center of the printer, between the CR and JNL print stations.
12. Remove the bushing in the right side frame where the ribbon drive shaft assembly was removed. This can be done by inserting a small screwdriver into the right side frame to push it out.

6.38.36.2 Replacing the Transport Assembly

1. Insert the bushing in the right side frame where the ribbon drive shaft assembly fits.
2. Assemble the transport bevel gear and ribbon drive shaft assembly onto the transport assembly. See Figure 6-86.
3. Install the transport assembly into the printer through the hole in the left side frame. Be sure that the transport assembly is properly located at the motor end and that it fits snugly against the left side frame.
4. Install the clamp, screw, and lockwasher.
5. Apply a thin film of lubricant supplied with the new assembly to the inside of the ribbon drive clutch spring and to the inside of both hubs of the drive gear.
6. Push the ribbon drive clutch (spring and gear) onto the ribbon drive shaft until it snaps into place.
7. Align the carrier mount underneath the carrier and install the screws holding the print head. See Figure 6-86. Perform the print head gap adjustment. See "Replacing the Print Head" in topic 6.38.9.2.
8. Move the print head to the full left and right positions to ensure that the transport assembly functions correctly.
9. Connect the transport motor cable to printer card connector J4. See Figure 6-44 in topic 6.37.2.1 for an illustration of the printer card.
10. Reinstall the ribbon cartridge.
11. Reinstall the main cover.
12. Switch power ON at the base or system unit.
13. After replacing the transport assembly, run the Stand-Alone Printer Test and perform the printer adjustments if necessary for proper character alignment. Also ensure that the ribbon drives correctly.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the Print Head	6.38.9
Stand-Alone Printer Test	6.4
Printer Adjustments	6.37

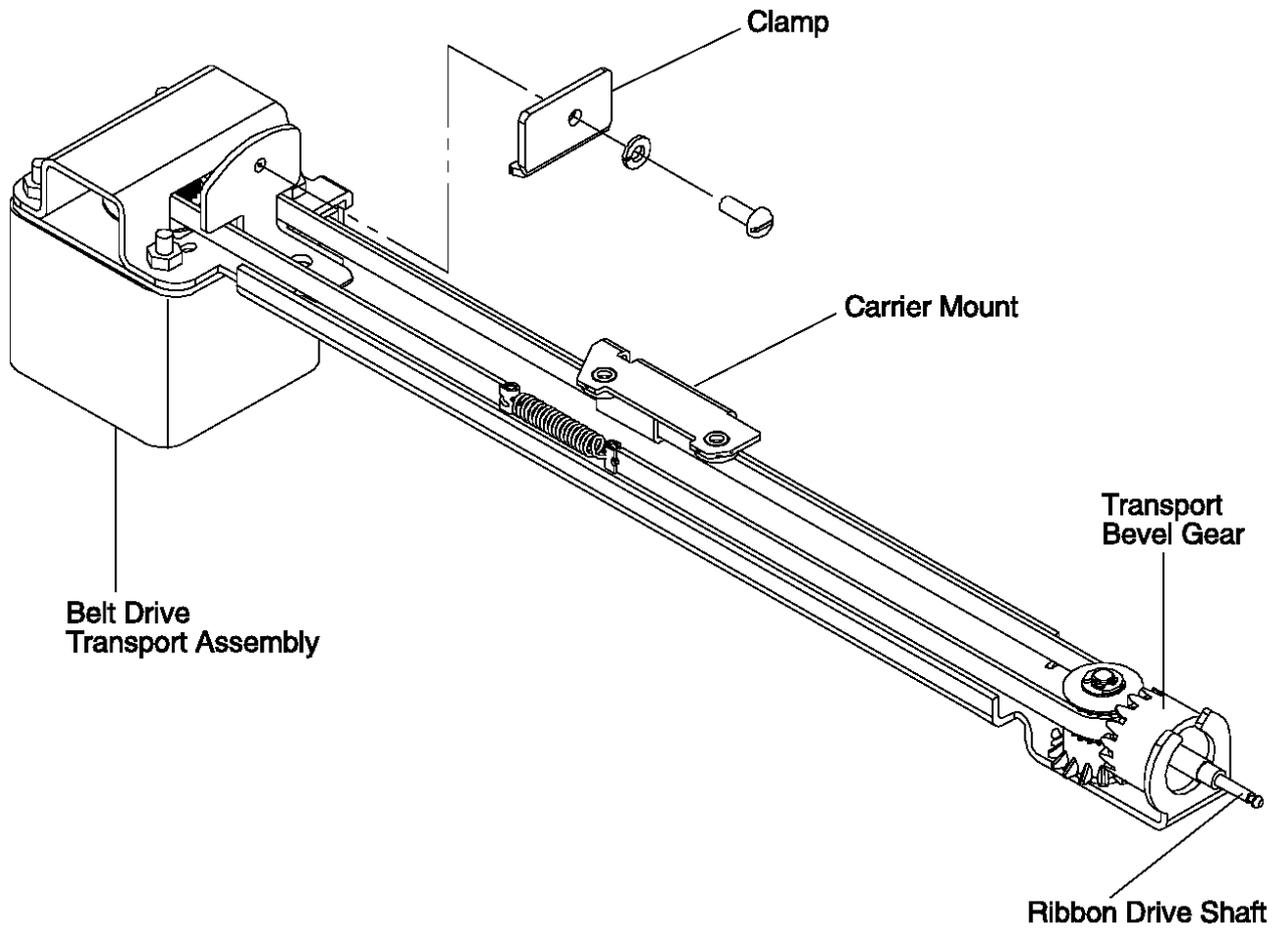


Figure 6-86. Belt Drive Transport Assembly

6.38.37 *Removing and Replacing the Printer Card*

Note: A short circuit in a print head coil or a motor winding can draw too much current and damage components on the printer card. To test the resistance of a print head coil or motor winding, see the resistance checks beginning on topic 6.30.

Attention Follow ESD procedures when handling static-sensitive components.

Subtopics

6.38.37.1 Removing the Printer Card

6.38.37.2 Replacing the Printer Card

6.38.37.1 *Removing the Printer Card*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Disconnect all of the cables from the printer card. Make note of how the cable is routed for reinstallation. See Figure 6-44 in topic 6.37.2.1 for a detailed illustration of the printer card.
5. Release the tab (1) holding the printer card in place. Carefully slide the printer card out of the printer.

6.38.37.2 Replacing the Printer Card

1. Push the tab (1) back and carefully slide the printer card into the printer until the tab locks into place.

Notes:

- a. Ensure that the printer card slides under the hooks (1) and that the ground clip (2) is correctly positioned on the left side frame.
- b. Ground clip (2) is not present on later printers that have a laminated aluminum shield on the under side.

2. Connect the cables to the card. See Figure 6-44 in topic 6.37.2.1 for a detailed illustration of the printer card.

Note: Connect J2, J6, and J7 first and be careful not to reverse J3 and J4. Route the cables as they were before.

3. Reinstall the main cover.
4. Connect the printer to the base or system unit.
5. Switch power ON at the base or system unit.
6. After replacing the printer card, run the Stand-Alone Printer Test.
7. Perform the printer adjustments.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Printer Adjustments	6.37
Stand-Alone printer Test	6.4

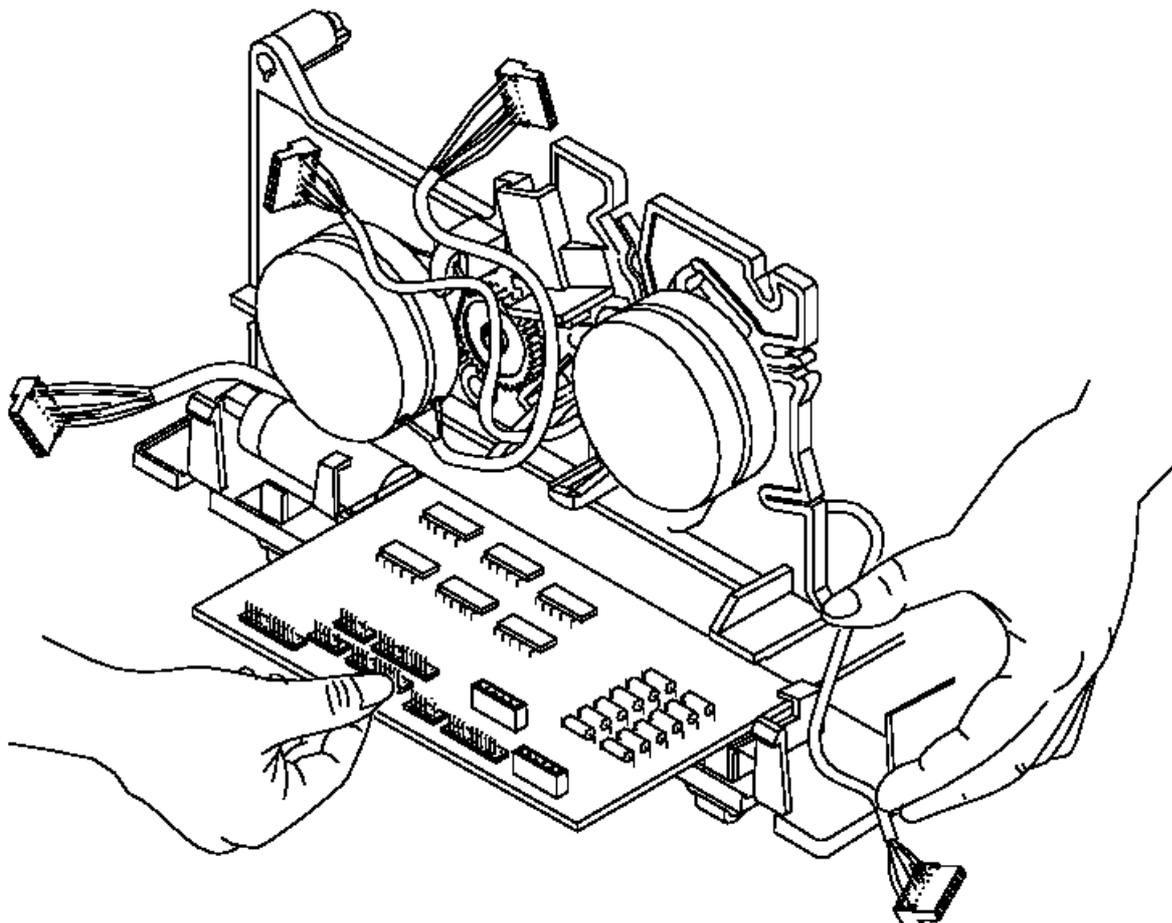
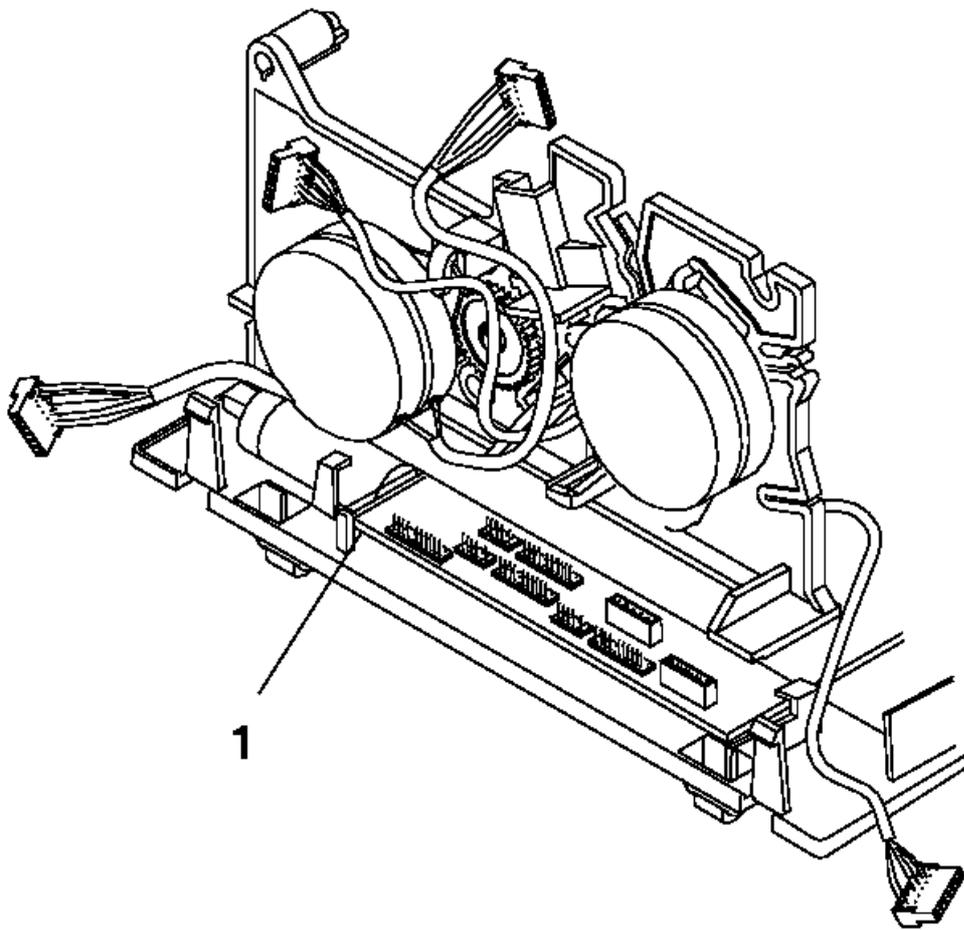


Figure 6-87. Printer Card

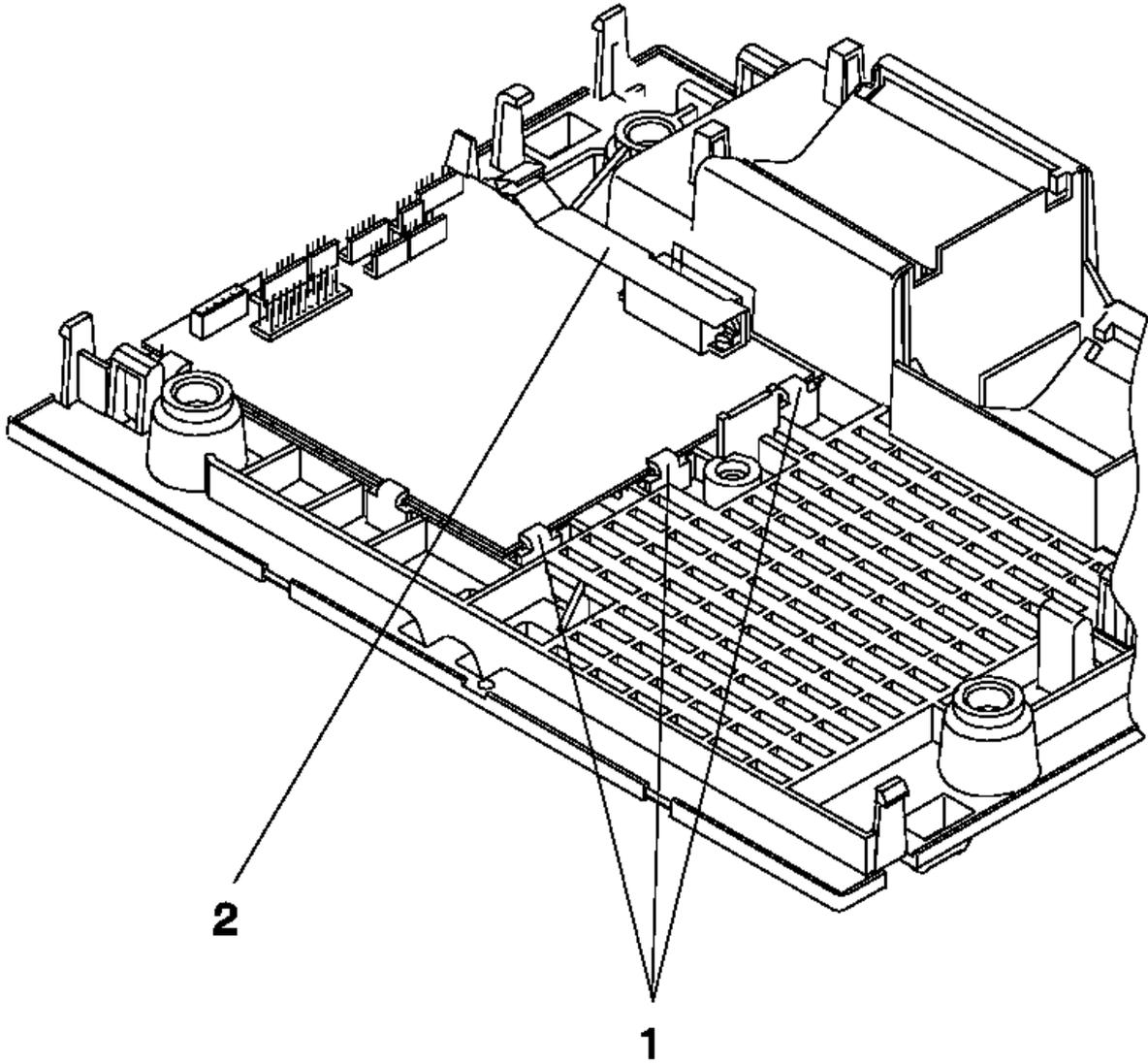


Figure 6-88. Printer Card Hooks. The base is shown without the printer attached to illustrate the printer card hooks.

6.38.38 *Removing and Replacing the Extension Card*

Attention Follow ESD procedures when handling static-sensitive components.

Subtopics

6.38.38.1 Removing the Extension Card

6.38.38.2 Replacing the Extension Card

6.38.38.1 *Removing the Extension Card*

1. Switch **POWER OFF** at the base or system unit.
2. Disconnect the printer from the base or system unit.
3. Remove the main cover.
4. Remove the JNL spool.
5. Remove the base.
6. Disconnect all of the cables from the extension card (1). See Figure 6-45 in topic 6.37.2.1 for a detailed illustration of the extension card. Make note of how the cable is routed for reinstallation.
7. Release the extension card tabs on either side of the printer using a spring hook as shown.
8. Carefully lift the extension card and its cable out of the printer.

6.38.38.2 Replacing the Extension Card

1. Put the extension card back into place as shown, making sure the tabs on both sides lock into place.

Attention Do not orient the card differently than shown to prevent damaging the printer.

2. Connect the cables to the extension card. See Figure 6-45 in topic 6.37.2.1 for a detailed illustration of the extension card. Route the cables as they were before.

3. Reinstall the base.

4. Reinstall the JNL spool.

5. Reinstall the main cover.

6. Connect the printer to the base or system unit.

7. Switch power ON at the base or system unit.

8. After replacing the extension card, run the Stand-Alone Printer Test.

Reference	Topic
Removing and Replacing the Main Cover	6.38.3
Removing and Replacing the JNL Spool	6.38.2
Removing and Replacing the Base	6.38.5
Stand-Alone Printer Test	6.4

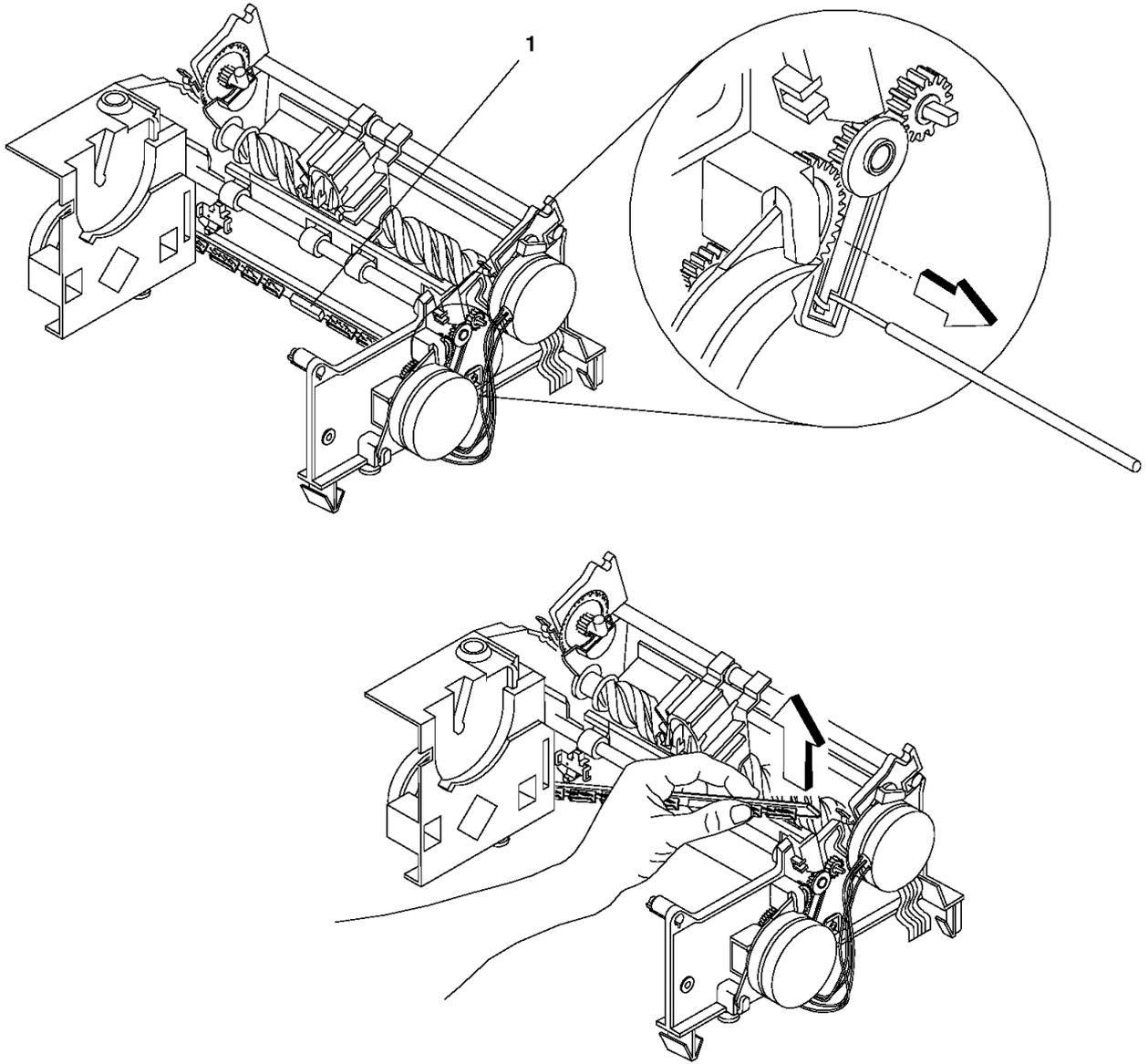


Figure 6-89. Extension Card

7.0 Chapter 7. 4678 OEM Input/Output Devices

Subtopics

7.1 Signature Capture Device (Models A01 and A02)

7.2 Signature Capture Device Symptoms

7.1 Signature Capture Device (Models A01 and A02)

4678 Models A01 and A02 are signature capture devices consisting of an electromagnetic tablet, interface cable and pen manufactured by Checkmate Electronics Inc.**. Checkmate 2020 Model A01 uses an RS485 interface cable to attach to device channel ports 4B, 9A, 9B, 9C, or 9/E of an IBM point-of-sale terminal. Checkmate 2020 Model A02 uses an RS232 interface cable to attach to a serial port on a personal computer or point-of-sale terminal and includes a separate AC adapter that provides +15 V DC to the tablet.

The pen and ballpoint refill are supply items that are replaced by the user when necessary. The tablet is replaced when it fails and is returned to the manufacturer for repair.

In this document, Model A01 is referred to as the RS485 interface model. Model A02 is referred to as the RS232 interface model.

Subtopics

7.1.1 Signature Capture Device Preliminary Checks

7.1.1 Signature Capture Device Preliminary Checks

When the signature capture device fails, perform these preliminary checks:

1. Make sure that the pen cable is securely plugged into the tablet.
2. Make sure that the signature capture device is correctly attached to the POS terminal or personal computer.

RS485 model - Attached to socket 4B, 9A, 9B, 9C, or 9/E on the POS terminal

RS232 model - Attached to serial port (RS232) of the POS terminal or personal computer.

3. For the RS232 interface model, make sure that the AC adapter is plugged into a known good electrical outlet and that its cable is plugged into the RS232 interface cable connector.
4. If the signature capture device is still failing, go to "Signature Capture Device Symptoms" in topic 7.2.

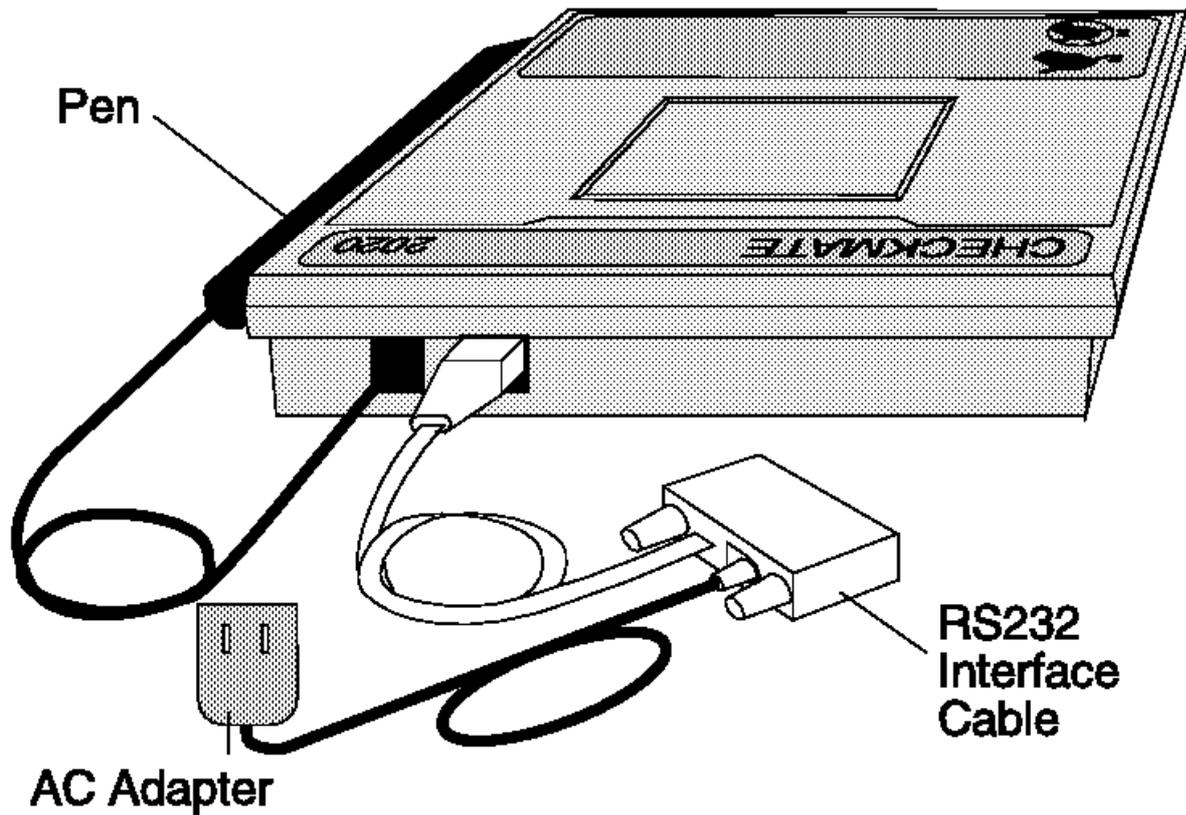


Figure 7-1. RS232 Model

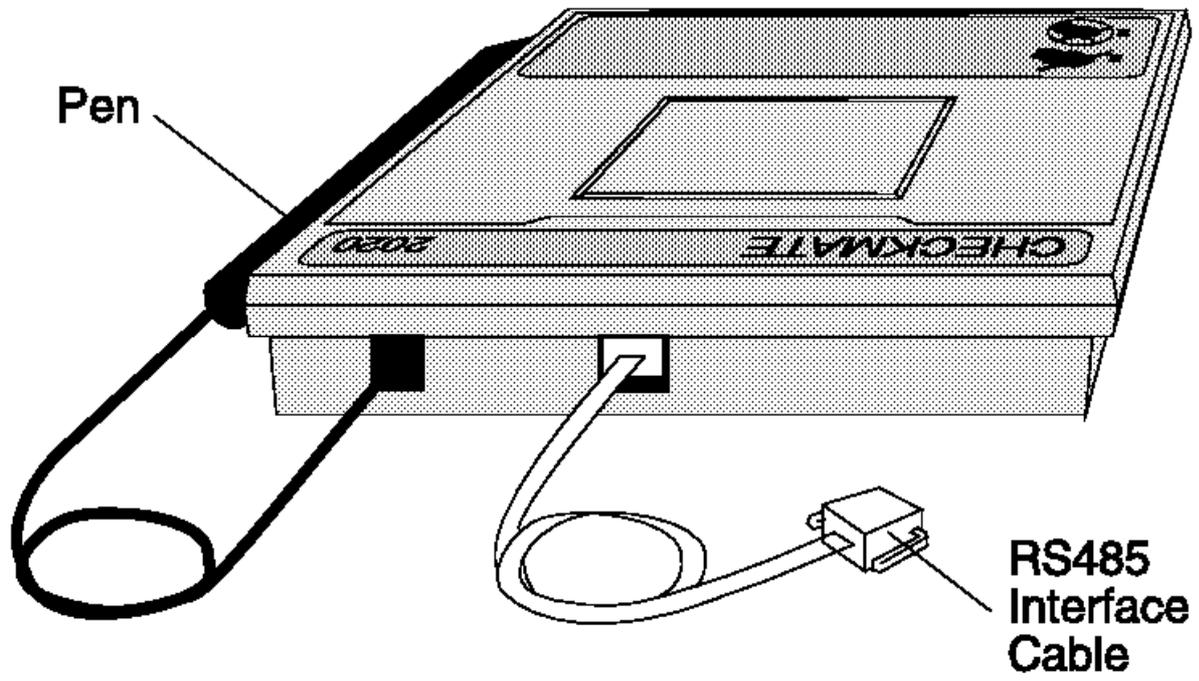


Figure 7-2. RS485 Model

7.2 Signature Capture Device Symptoms

Before Beginning

1. When spare signature capture devices are available, the quickest way to isolate the failing component is to swap each component, one at a time, with a known good one until the failing one is identified.
2. User application programs should display messages relating to the signature capture device. See the user's application program documentation, when necessary, to determine the meaning of an application message.

Table 7-1. Signature Capture Device Symptoms

Symptom	Actions
There are no LEDs ON at the RS232 model	<input type="checkbox"/> Make sure that the RS232 interface cable is securely attached to the tablet. <input type="checkbox"/> Make sure that the RS232 interface cable is securely attached to the terminal or personal computer. <input type="checkbox"/> Make sure that the AC adapter power cord is plugged into a known good electrical outlet. <input type="checkbox"/> Make sure that the AC adapter cable is securely plugged into the RS232 cable connector. <input type="checkbox"/> Exchange the RS232 interface cable. <input type="checkbox"/> Exchange the AC adapter. <input type="checkbox"/> Exchange the tablet.
There are no LEDs ON at the RS485 model	<input type="checkbox"/> Make sure that the RS485 interface cable is attached to the tablet. <input type="checkbox"/> Make sure that the RS485 interface cable is attached to the point-of-sale terminal at socket 4B, 9A, 9B, 9C, or 9/E. <input type="checkbox"/> Exchange the RS485 interface cable. <input type="checkbox"/> Exchange the tablet.
The green (sign) LED never turns ON	<input type="checkbox"/> Exchange the interface cable. <input type="checkbox"/> Exchange the tablet.
An application error message indicates that bad signature data was generated	<input type="checkbox"/> Ask the user to exchange the tethered pen. <input type="checkbox"/> Exchange the tablet.
An application error message indicates that the signature was not submitted in time.	<input type="checkbox"/> Verify that the signature was submitted within the timeout period. The default timeout period is 20 seconds (may be changed by the application program). <input type="checkbox"/> Ask the user to exchange the tethered pen. <input type="checkbox"/> Exchange the tablet.
An application error message indicates that the signature capture device is not connected.	<input type="checkbox"/> Make sure that the interface cable is attached to the tablet. <input type="checkbox"/> Make sure that the interface cable is attached to the terminal or personal computer. <input type="checkbox"/> Make sure that the AC adapter power cord (RS232 only) is plugged into a known good electrical outlet. <input type="checkbox"/> Make sure that the AC adapter cable (RS232 only) is plugged into the RS232 interface cable connector. <input type="checkbox"/> Exchange the interface cable. <input type="checkbox"/> Exchange the AC adapter (RS232 only). <input type="checkbox"/> Exchange the tablet.

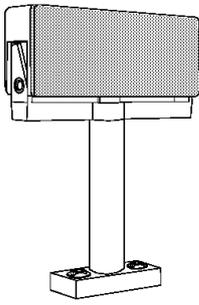
A.0 Appendix A. *Display and Keyboard Options*

Subtopics

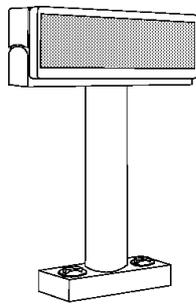
A.1 Display Options

A.2 Keyboard Options

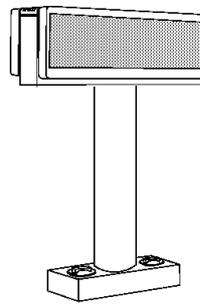
A.1 Display Options



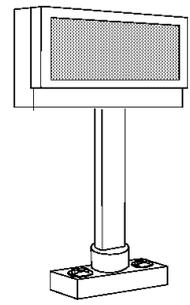
40 Character Vacuum Fluorescent Display



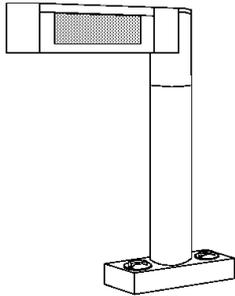
40 Character Vacuum Fluorescent Display II (single sided)



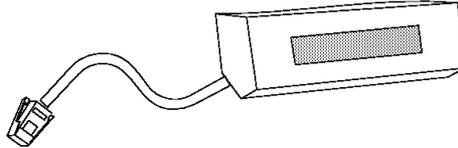
40 Character Vacuum Fluorescent Display II (Two sided)



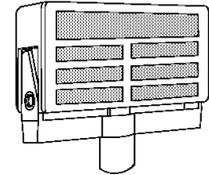
Character / Graphics Display



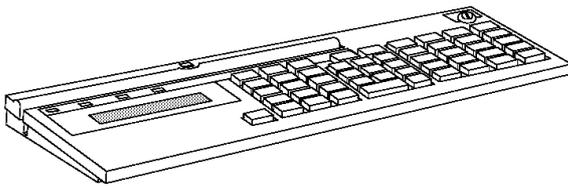
40-Character Liquid Crystal Display (LCD)



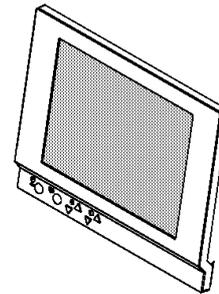
Operator Display



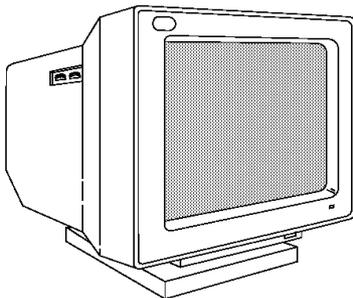
Shopper Display



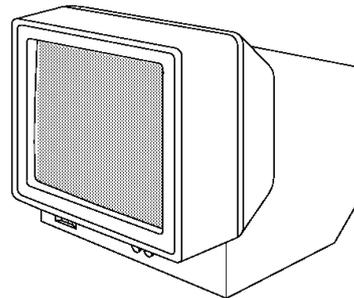
Combined Keyboard / Display or POS Keyboard/Display/MSR



LCD Flat Panel Display



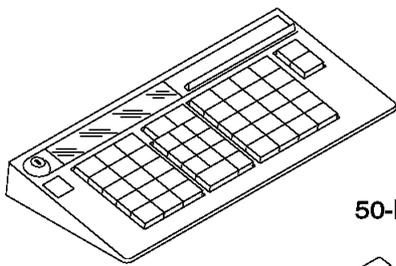
Video Display



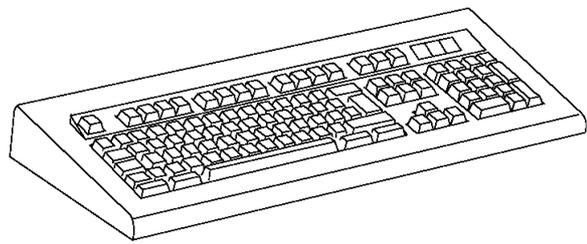
9-Inch Monochrome or Color Display

Figure A-1. Display Options

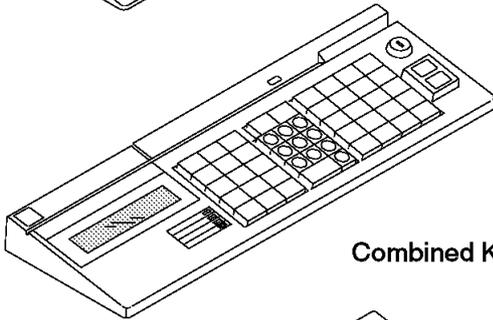
A.2 Keyboard Options



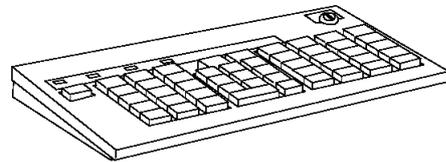
50-Key Keyboard



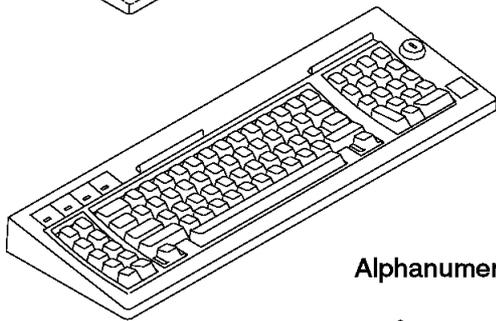
Enhanced Alphanumeric Keyboard



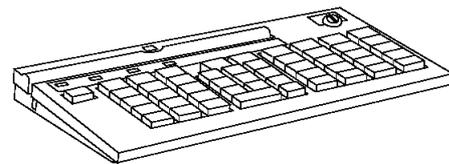
Combined Keyboard/Display



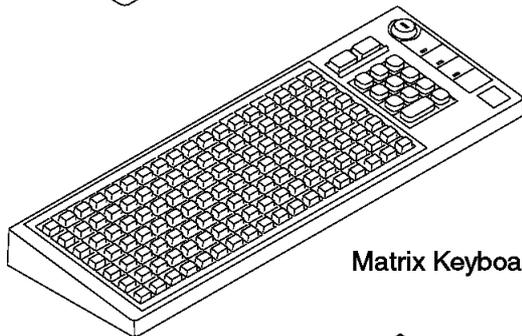
RPOS Keyboard



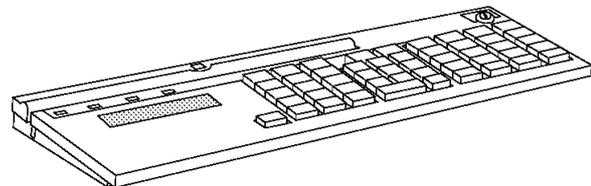
Alphanumeric Keyboard



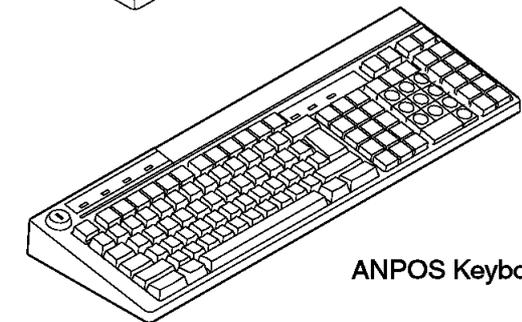
RPOS Keyboard/Reader



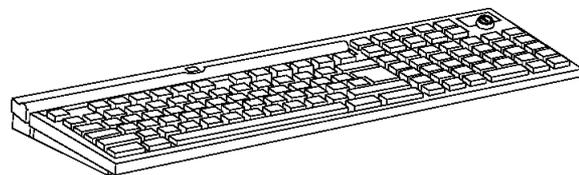
Matrix Keyboard



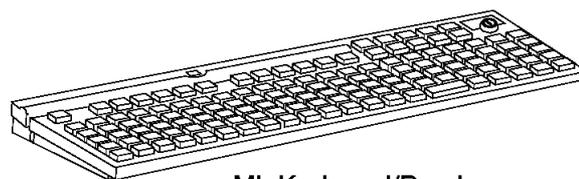
RPOS Keyboard/Reader/Display



ANPOS Keyboard



RANPOS Keyboard/Reader



ML Keyboard/Reader

Figure A-2. Keyboard Options. Note: The Enhanced A/N Keyboard may only be used with the IBM 4684, 4693, and 4694 terminals.

B.0 Appendix B. Preventive Maintenance for I/O Devices

```

+--- Preventive Maintenance Scheduling -----+
|
| Perform these preventive maintenance procedures once every twelve
| months.
|
+-----+

```

Cash Drawer

- Check the cash drawer rails. Use the rail repair kit if the rails are damaged (P/N 25F6269).

Display

- Clean the display covers.
- Check for broken covers and missing mounting hardware and exchange if necessary.

Keyboard and Card Reader

- Vacuum the keyboard.
- Pass the cleaning card P/N 6019483 through the reader a few times.
- Run the keyboard test.
- Clean the keyboard cover and the keytops.

Keylocks

- Apply 3 drops of silicon lubricant P/N 96X4791 into the key opening of the keylocks in the cash drawer, keyboard, and printer.

System/Base Unit

- Vacuum the ventilation grills.
- Check the cables and the power cord for chafing, frayed insulation, cracks, or breaks.

Model 1 or Model 2 Printer

- Remove the bottom cover and vacuum the printer from the top and bottom.
- Check the tear bar.
- Vacuum the home, document insert, journal, and cover sensors.
- Clean the print head. See "Cleaning the Print Head" in topic 5.5.3.

Note: Do not use the silicon oil to lubricate anywhere else in the printer.

- Lubricate the carriage shaft, wear shoe skid-plate, and the print head guide rod shaft bearings with #6 oil or equivalent. See "Lubricant Equivalents" in topic D.2.
- Clean the teeth of the toggle gear.
- Exchange the carriage shaft wiper and saturate it with #6 oil or equivalent.
- Run the "Printer Stand-Alone Test Procedure" in topic 5.2.

Models 3, 3R, 4, 4A and 4R Printers

- Clean the dust, fuzz balls, debris, and chad from the printer. This significantly increases the life of the printer.
- Vacuum dust and debris from the following sensors:
 - Home sensor
 - Cover sensor (Model 3 only)
 - Document insert (DI) upper & lower sensors (journal side)
 - Journal sensor

Note: After you clean the DI sensors, the **sensor sensitivity** needs to be reset. To reset the sensor sensitivity, press the feed up, feed down, and green buttons at the same time. Open the cover and wait for the line feeding to stop. Close the cover.

- Clean the lead screw and black carrier shafts with a clean dry cloth. DO NOT lubricate lead screw or black carrier shafts.
- Check to see if the print wires are snagging the ribbon. This situation can cause home errors and require that the print head be exchanged.
- Check the ribbon drive clutch for proper (one way) operation.
- Remove the ribbon and wipe off the ink from the tip of the print head. Ink can collect on the print head and smudge the forms.
- Check and clean the DI rollers using alcohol. Press up or down feed buttons to move the rollers. On models 3R and 4R you can use the MICR cleaner.
- Check the upper forms entry shield for even clearance across the platen face. Make sure the shield is not trapped between the platen and the print head assembly.
- Check that the forms compensation system moves freely by feeding a thick form. The print head should move back as the feed rollers open up.

Note: Replacing or adjusting the following parts is a factory only repair.

- Check blue idler rollers (2) and paper bucket rollers (4) for free movement/rotation. Lubricate with #6 oil.
- Clear the debris around the platen rollers.
- Oil cutter blade pivots with #6 oil. Wipe off excess oil.
- Check that the metal bails, in both the receipt and journal stations that hold the paper are against the platen, set flush against the platen and paper loads correctly.
- On Models 3R and 4R, clean the MICR read head and feed rollers. See "MICR Head and Feed Rollers Cleaning Procedure" in topic 6.5.2.
- On Models 3R and 4R, inspect the MICR pressure pad for wear and damage.
- On Models 3R and 4R, exchange the DI gears. Use DI gear kit P/N 73G2598. See "Removing and Replacing the DI Gears" in topic 6.38.16.
- Run the Stand-Alone Printer Test when the PM procedure is complete. See "TEST 4100: Stand-Alone Printer Test" in topic 6.4.

Subtopics

B.1 Helpful Hints

B.1 Helpful Hints

- The microcode in the printer allows a change in horizontal and vertical character alignment. This compensates for wear in the printer so if the print line appears to be misaligned, use the appropriate **Printer Adjustment** procedure for your terminal. See "Printer Adjustments" in topic 6.37.
- If the printer is reporting false home errors, the problem may be the transport motor, helix assembly, and nut.
- False journal out-of-paper conditions, which require the cover to be opened even though paper is present, can be caused by the journal slip clutch or the O-ring failure.

C.0 Appendix C. Removing and Replacing the Keylock

Subtopics

C.1 Removing and Replacing the Lock Insert

C.2 Removing and Replacing the Blank Lock Insert

C.1 Removing and Replacing the Lock Insert

1. See Figure C-1 in topic C.2 for identification of the lock pieces.
2. Unlock the keylock before proceeding.
3. Insert the lock installation-removal key fully into the lock insert. See Figure C-4 in topic C.2.

Note: There are two installation-removal keys. Use the one that you can insert into the lock insert. The installation-removal keys are shipped with the store controller.

4. Pivot the key slightly downward while pulling the lock insert out of the cylinder until the insert is disengaged from the cylinder.
5. When replacing the lock insert, it fits all the way into the lock cylinder only when the slot in the bottom of the cylinder and the lug on the end of the insert are both in alignment. If necessary, insert the aligner tool into the lock cylinder and rotate it until you feel it engage the slot at the bottom of the cylinder. Then turn the aligner tool until the arrow points up. See Figure C-3 in topic C.2.
6. Remove the key that came with the new lock insert.
7. Push the brass installation/removal key into the lock insert. Be sure the key is FULLY INSERTED.
8. With the brass installation/removal key still in the lock insert, push the lock insert fully into the lock cylinder.
9. Hold the insert in place with your finger and remove the installation/removal key.
10. Test the lock using the keys that came with the insert to be sure that the lock operates correctly.

C.2 Removing and Replacing the Blank Lock Insert

Note: The blank lock insert handle is shipped with the store controller.

1. Insert the blank lock insert handle into the blank keylock cylinder. See Figure C-5.
2. Using the blank insert handle, turn the locking screw counter clockwise until the insert can be removed from the cylinder.
3. When replacing the blank lock insert, the insert has a lug on one end that must be aligned with the slot in the bottom of the lock cylinder. Hold the blank lock insert so that the lug is aligned with the slot.
4. Push the blank lock insert into the empty lock cylinder until it is flush with the top of the lock cylinder.
5. Use the blank lock insert handle to turn the locking screw clockwise until it reaches the bottom of the hole. Do not overtighten.

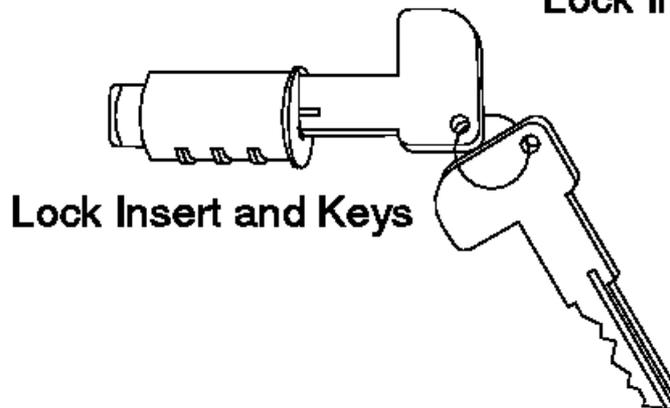
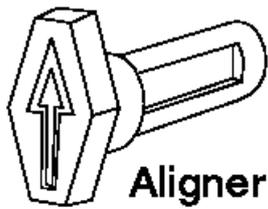
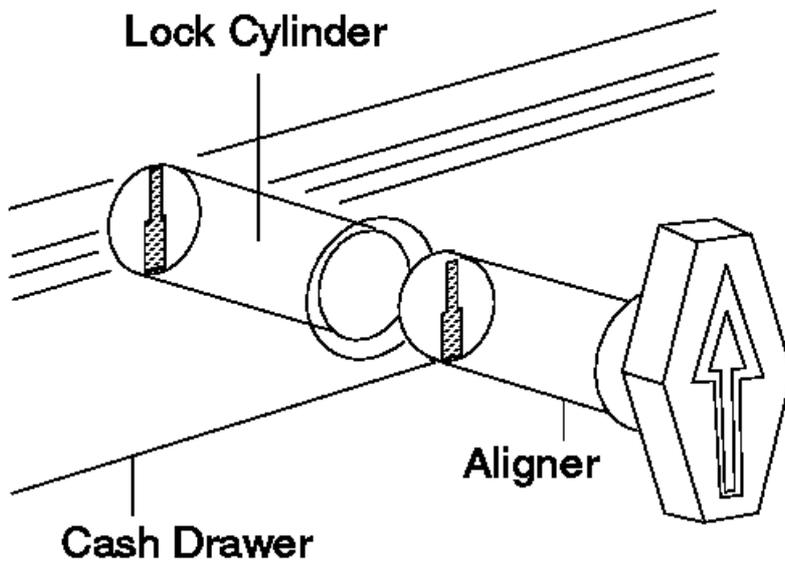
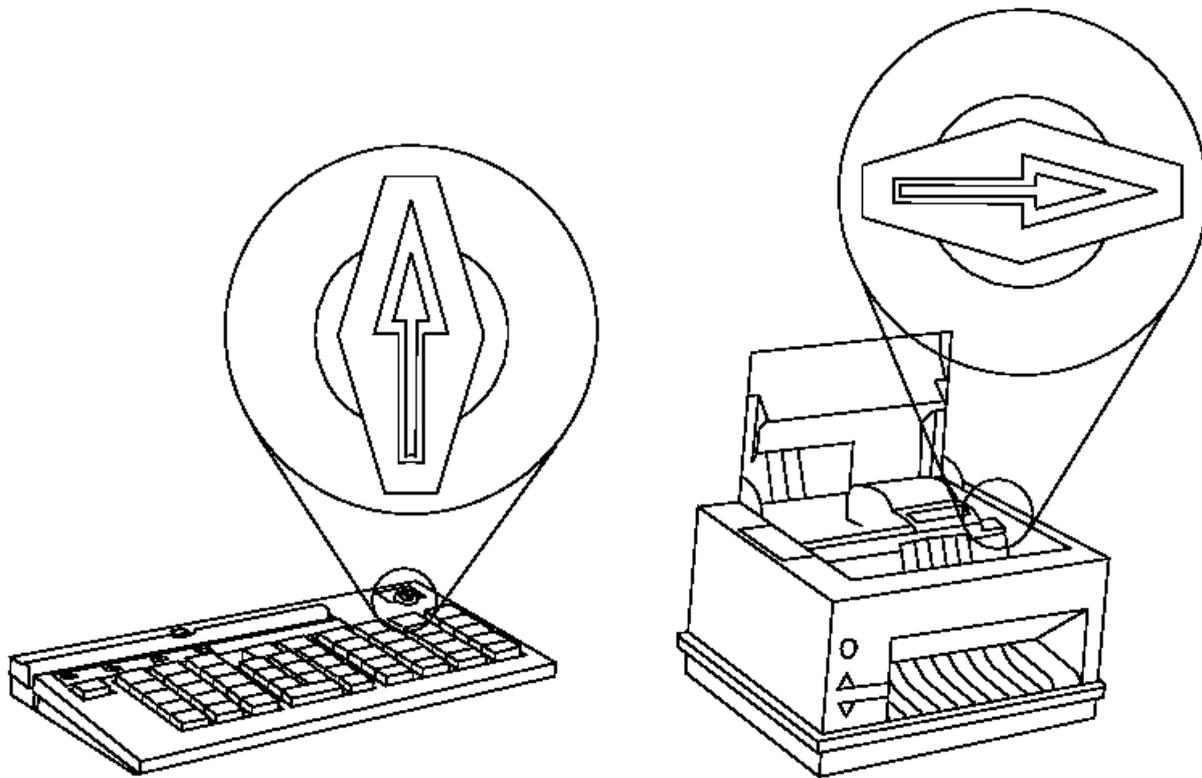


Figure C-1. Lock Pieces



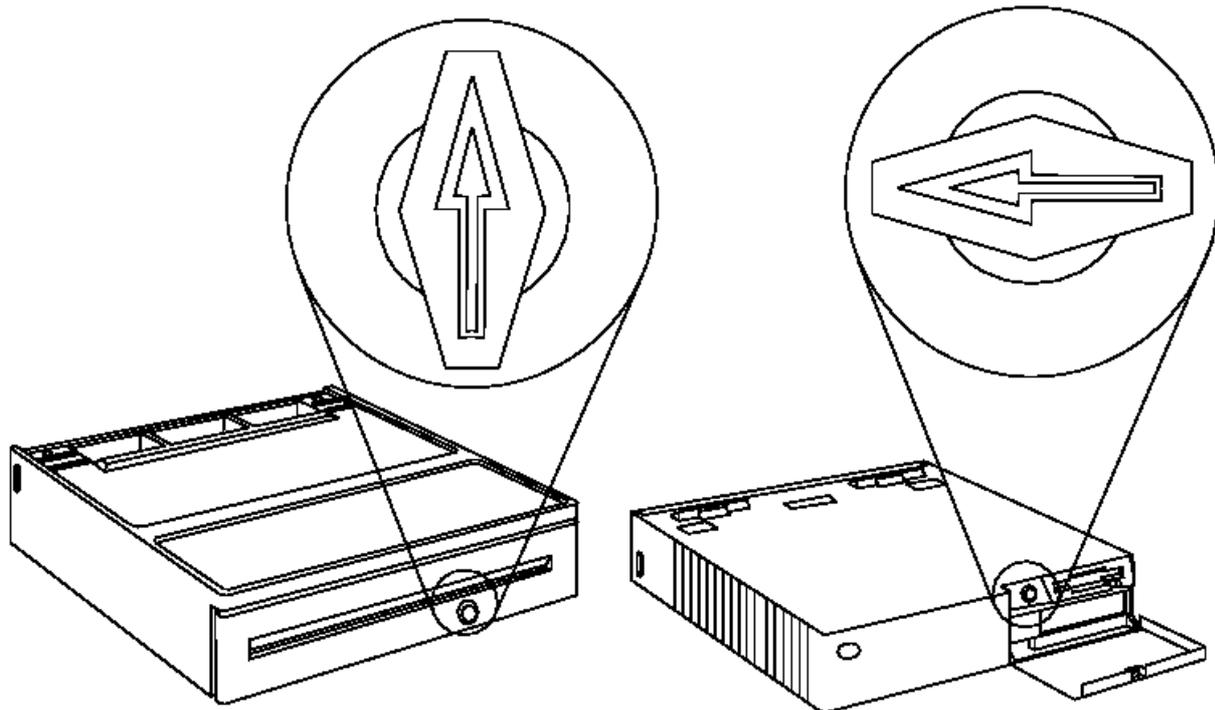
Example

Figure C-2. Lock Alignment



Keyboard

Printer



Cash Drawer

System Unit

Arrow Positions

Figure C-3. Aligner Positions

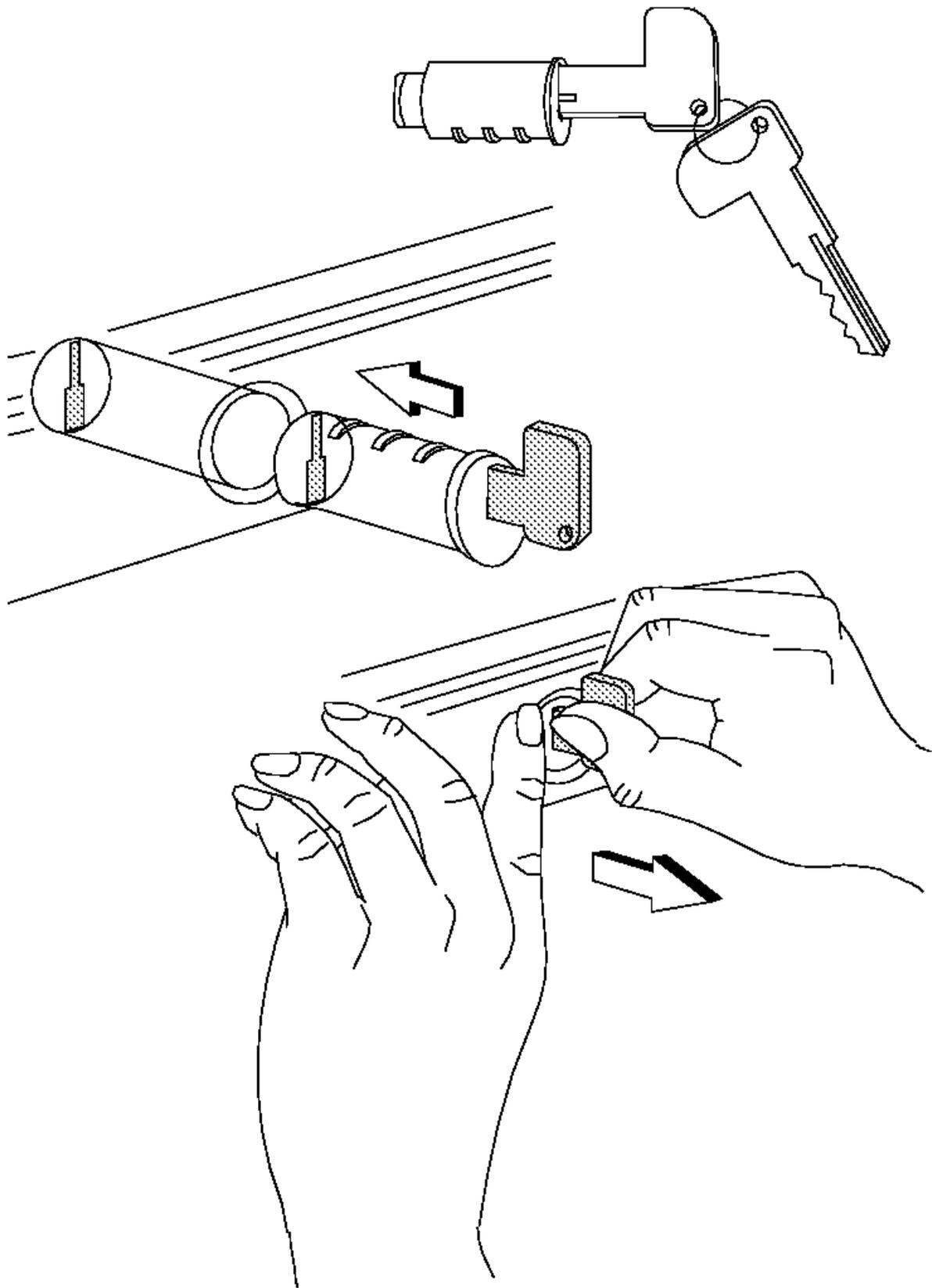


Figure C-4. Lock Insert Installation

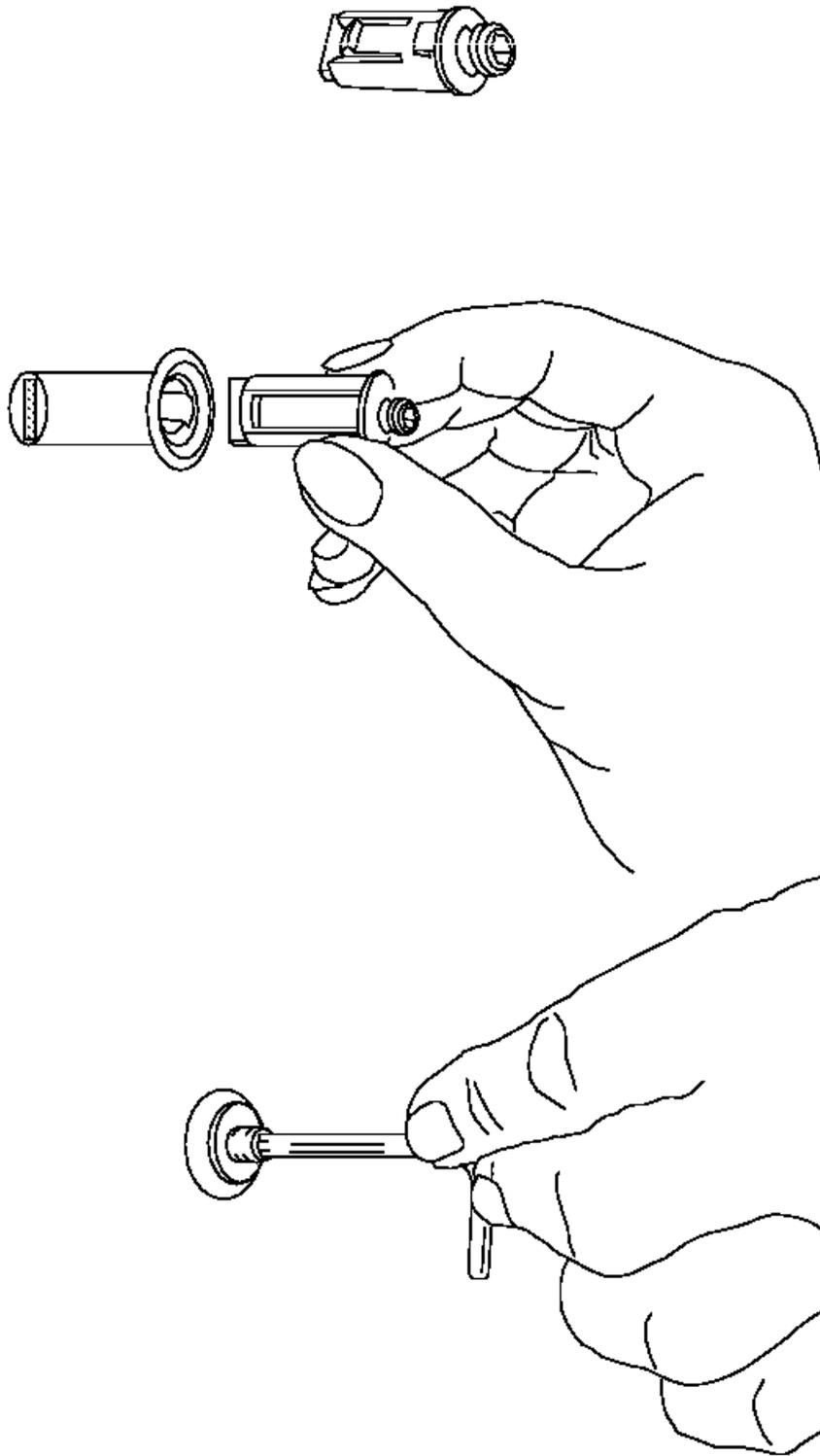


Figure C-5. Lock Blank Lock Insert Installation

D.0 Appendix D. Special Tools

To maintain point-of-sale terminals, the service representative may need the following items that are not supplied in the tool kit:

- Keytop puller, P/N 1647720 (shipped with 4680 style keyboards)
- Lock cylinder alignment key, lock installation-removal key, and dummy lock insert key, P/N 4783922 (shipped with the store controller)
- Miniprobos (two), P/N 453718
- Module extractor, P/N 9900764
- Card reader cleaning card, P/N 6019483
- Single-track card reader test card, P/N 4055210
- Dual-track card reader test card, P/N 90X9640
- Model 1 and Model 2 printer frame separating tools (two), P/N 63X4985
- Scanner test label, P/N 6317966 (a scanner test label, P/N 6317962 is shipped with the scanner)
- Special tools for Model 3 and 4 printer - See Table 6-8 in topic 6.38.
- Test checks for MICR, P/N 73G2601 (package of 10)

Subtopics

D.1 Expendable Supplies

D.2 Lubricant Equivalents

D.1 Expendable Supplies

- Paper for the point-of-sale printer, P/N 432768 (or equivalent)
- Print ribbon for the Model 1 and 2 point-of-sale printer, P/N 4483015 (or equivalent)
- Print ribbon for the Model 3 and 4 point-of-sale printer, P/N 1040888 (black) or P/N 1040875 (purple) or P/N 1040900 (black auto-inking) (or equivalent)
- MICR head cleaner for Model 3R and 4R point-of-sale printer, P/N 73G2600 (package of 10)

Note: Failure to use the recommended ribbon may affect print head life and print quality.

D.2 Lubricant Equivalents

Lubricant	Equivalent	Manufacturer
#6 oil	ISO VG32 - Renolin MR10 ISO VG32 - DTE 797 (light) ISO VG32 - Turbo T32	Fuchs** Mobil** Shell**
P/N 93F0415	Supermil M-125 L55/2	Amoco** Kluber Barrierta
P/N 96X4791	Electronic Fluid 200 - 20 Centistokes Viscosity	Dow Corning**

E.0 Appendix E. Procedures For Model 1 and 2 Printer Not Recommended for Field Personnel

Subtopics

- E.1 Separating the Upper and Lower Printer Frame Assemblies
- E.2 Removing and Replacing the Platen Grounding Strap
- E.3 Removing and Replacing the Capacitor
- E.4 Removing and Replacing the Document Insert Backup Roller
- E.5 Removing and Replacing the Document Insert Gate
- E.6 Removing and Replacing the Document Insert Paper Sensor
- E.7 Removing and Replacing the Document Insert/Customer Receipt Motor
- E.8 Removing and Replacing the Journal Paper Motion Emitter Shaft
- E.9 Removing and Replacing the Print Head Home Sensor
- E.10 Removing and Replacing the Ribbon Drive Shaft
- E.11 Removing and Replacing the Toggle Assembly
- E.12 Joining the Upper and Lower Printer Frame Assemblies

E.1 Separating the Upper and Lower Printer Frame Assemblies

+--- **Special Frame-Separating Tool** -----+
|
| It is not recommended that field service personnel separate the
| printer frame assemblies. However, in some countries where on-site
| service is available, this procedure may be done by qualified service
| personnel. A special frame-separating tool, P/N 63X4985, is used to
| separate the upper and lower assemblies.
|
+-----+

CAUTION:

The edge of the printer's paper guide is sharp. Use care when removing and installing it.

1. Set the printer as shown in Figure E-1
2. Insert a piece of paper in the document insert station.
3. Gaining access through the document insert opening, remove the document insert paper guide (1).
4. Lift the guide off the locating pads (2).
5. Move the guide toward the back of the printer until the holding tabs on the guide can be pulled out of the openings (3) in the frame.
6. Pull the guide out of the printer.

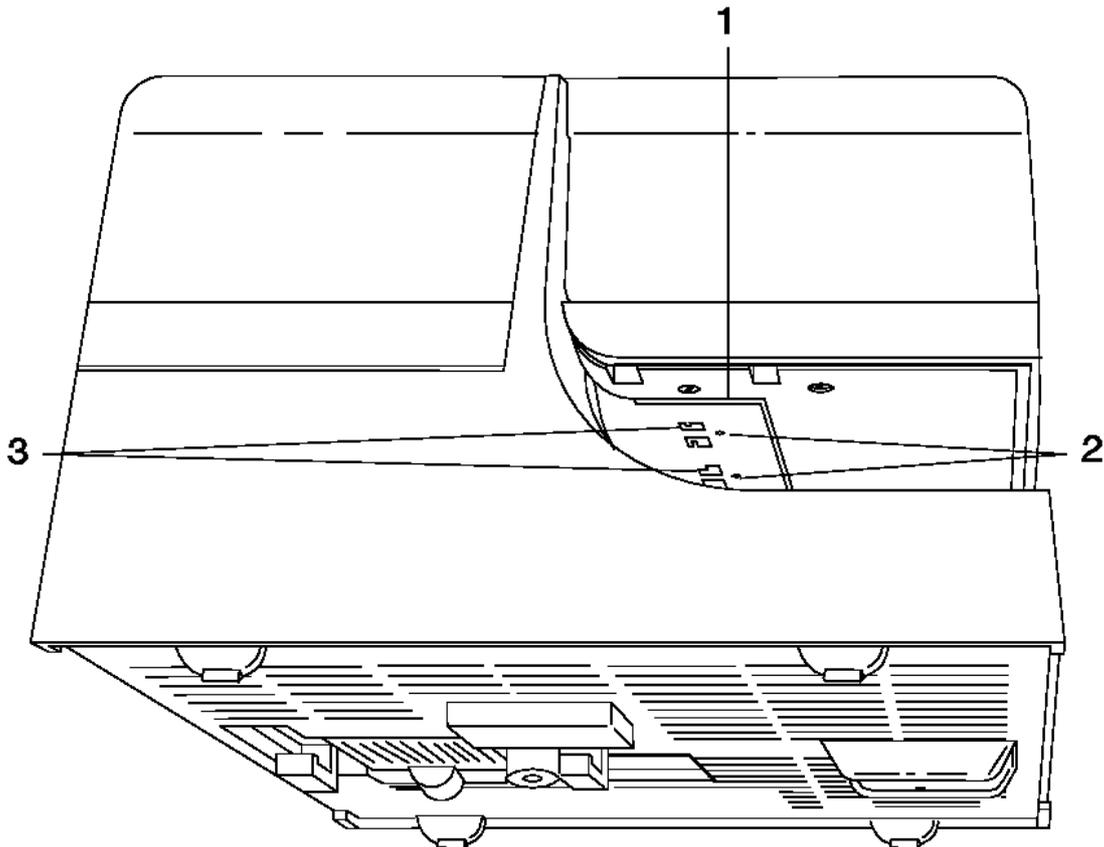


Figure E-1. Part 1. Removing the Document Insert Paper Guide

7. Raise the access cover and the journal station cover (4).
8. Remove the top cover assembly by pulling out and up on the assembly at each side of the document insert slot (5).
9. Lift the left end and pivot the top cover assembly to the right side of the printer.
10. Disconnect the operator keypad cable from printer card connector J2.

11. Lift the top cover assembly off the printer.
12. Remove the paper from both print stations.
13. Remove the ribbon cartridge.
14. Remove the print head.

Reference	Topic
Removing and Replacing the Print Head	5.5.17
Removing and Replacing the Ribbon Cartridge	5.5.23

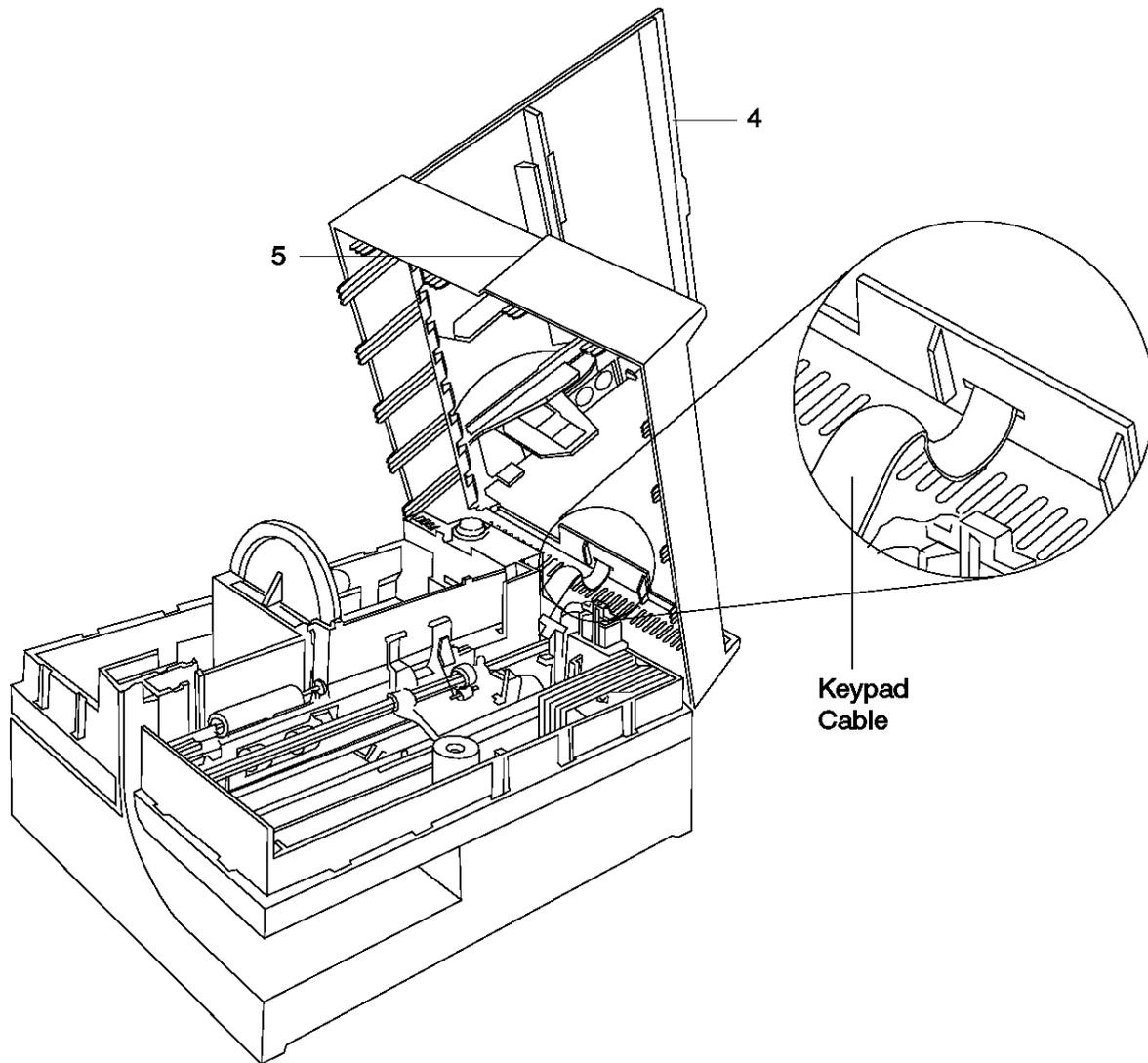


Figure E-2. Part 2. Removing the Top Cover

15. Remove the belt from the carriage drive motor pulley (6). Make sure the belt spring is not lost.
16. Disconnect the remaining cables from the top of the printer card.
17. Loosen the thumbscrew from the bottom cover (7).
18. Remove the bottom cover by moving the holding tabs (8) toward the center of the printer to release them, while at the same time pulling the bottom cover off the printer.

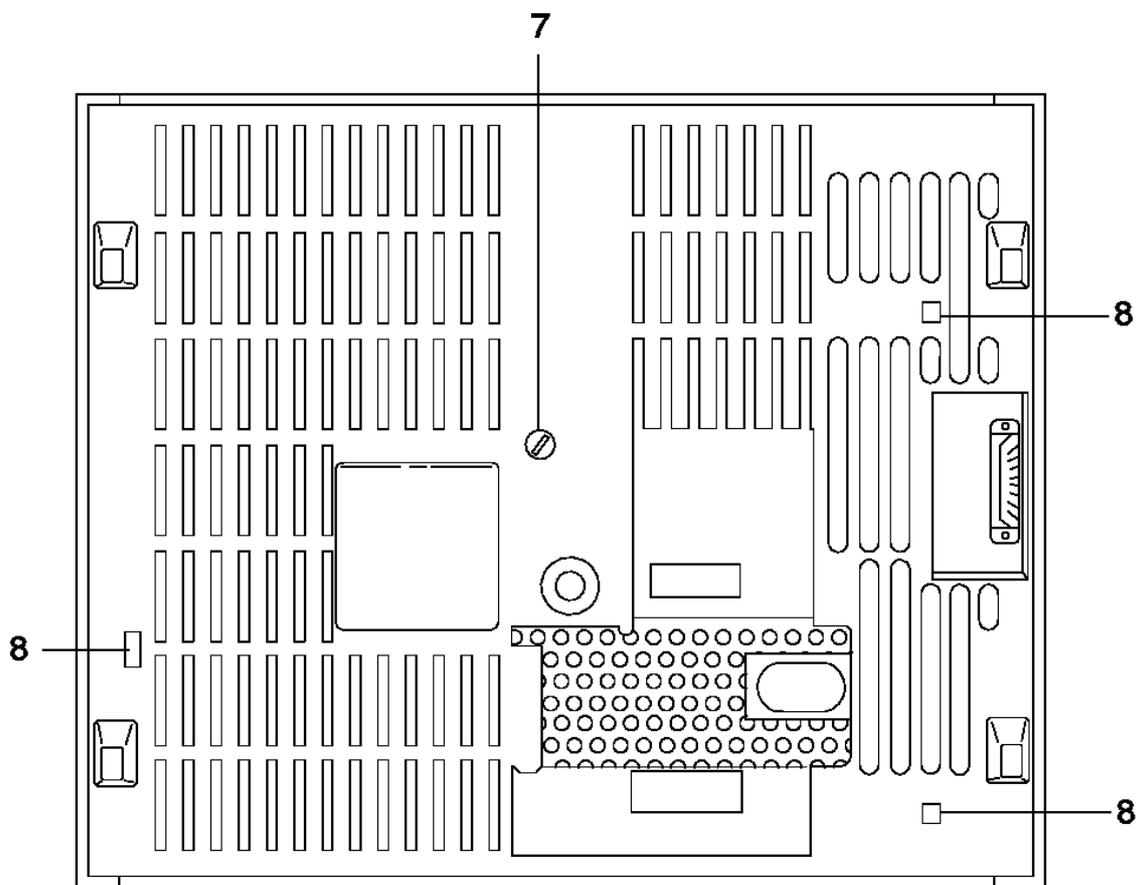
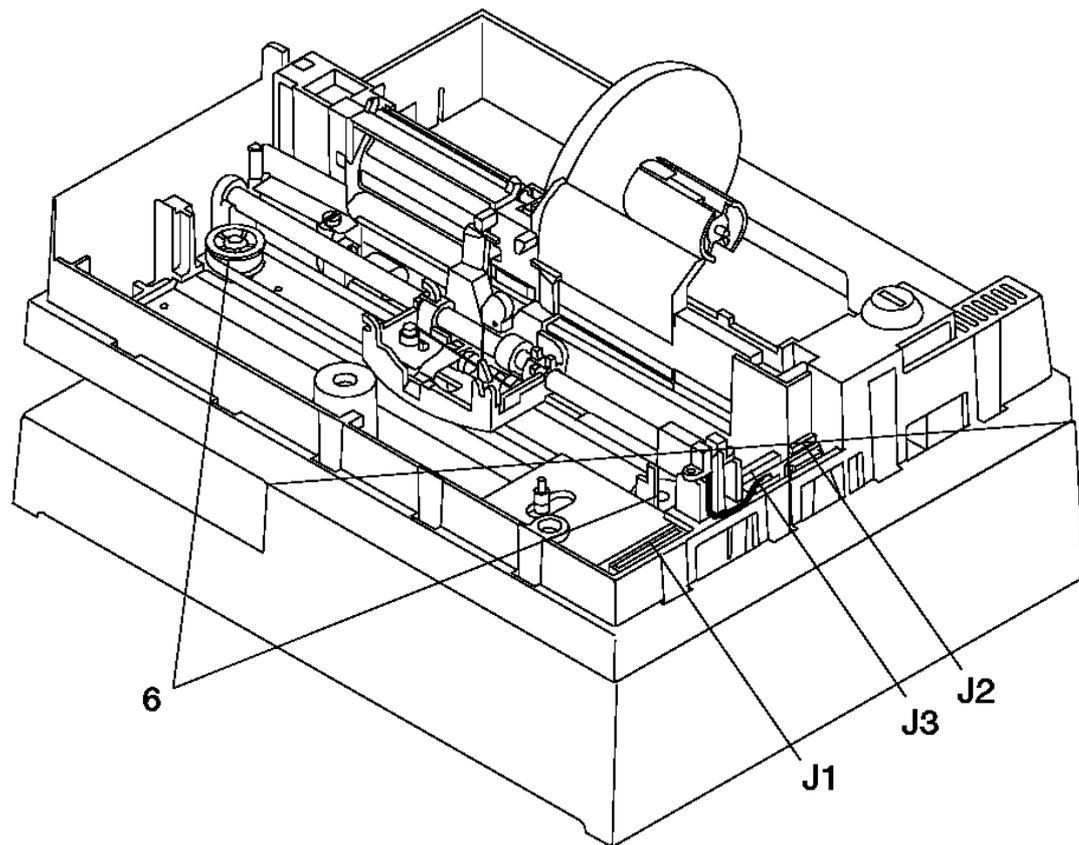


Figure E-3. Part 3. Removing the Bottom Cover

19. Remove the bottom frame screw (1).
20. Remove the ground strap and its attaching screw (2).
21. Disconnect the cables from the bottom of the printer card.
Note: The cable connectors are keyed so they only connect to their matching printer card connectors.
22. Remove the cables under the journal station from the holding clips, starting with the bottom cable.
23. Remove the document insert sensor cable from the retainer. If you are removing a component that has a cable attached, remove that component's cable from its retainers (3).
24. Release the holding tabs (4).
25. Pull the printer card out through the bottom of the printer.

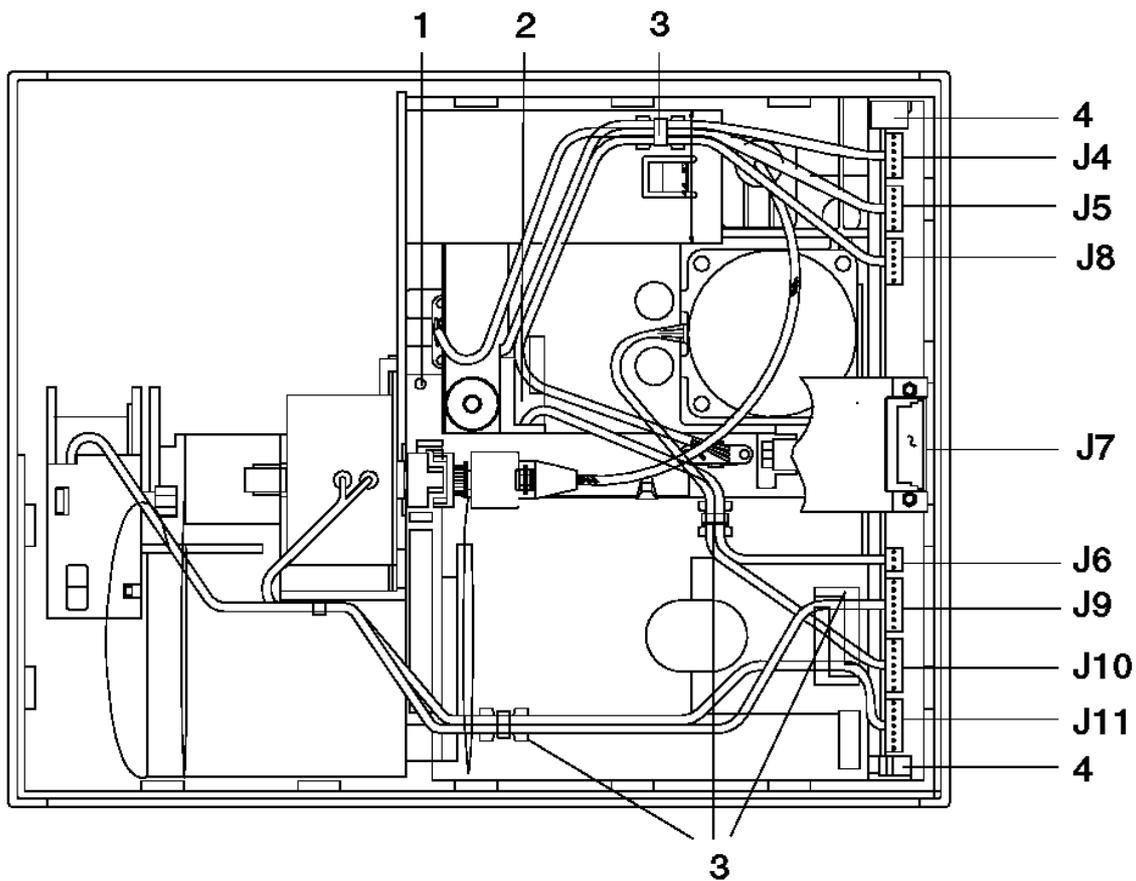


Figure E-4. Part 4. Removing the Printer Card

26. Prepare to remove the platen by inserting a piece of paper into the document insert station.
27. Remove the platen retainers (12).
28. Check to ensure that the platen grounding strap is properly seated. See Figure E-8 in topic E.2.2.
29. Hold the platen assembly (13) at the journal station and lift up until the top roller (14) can be removed.
30. Continue lifting the platen up and out of the printer.
31. Remove the piece of paper from the document insert station.

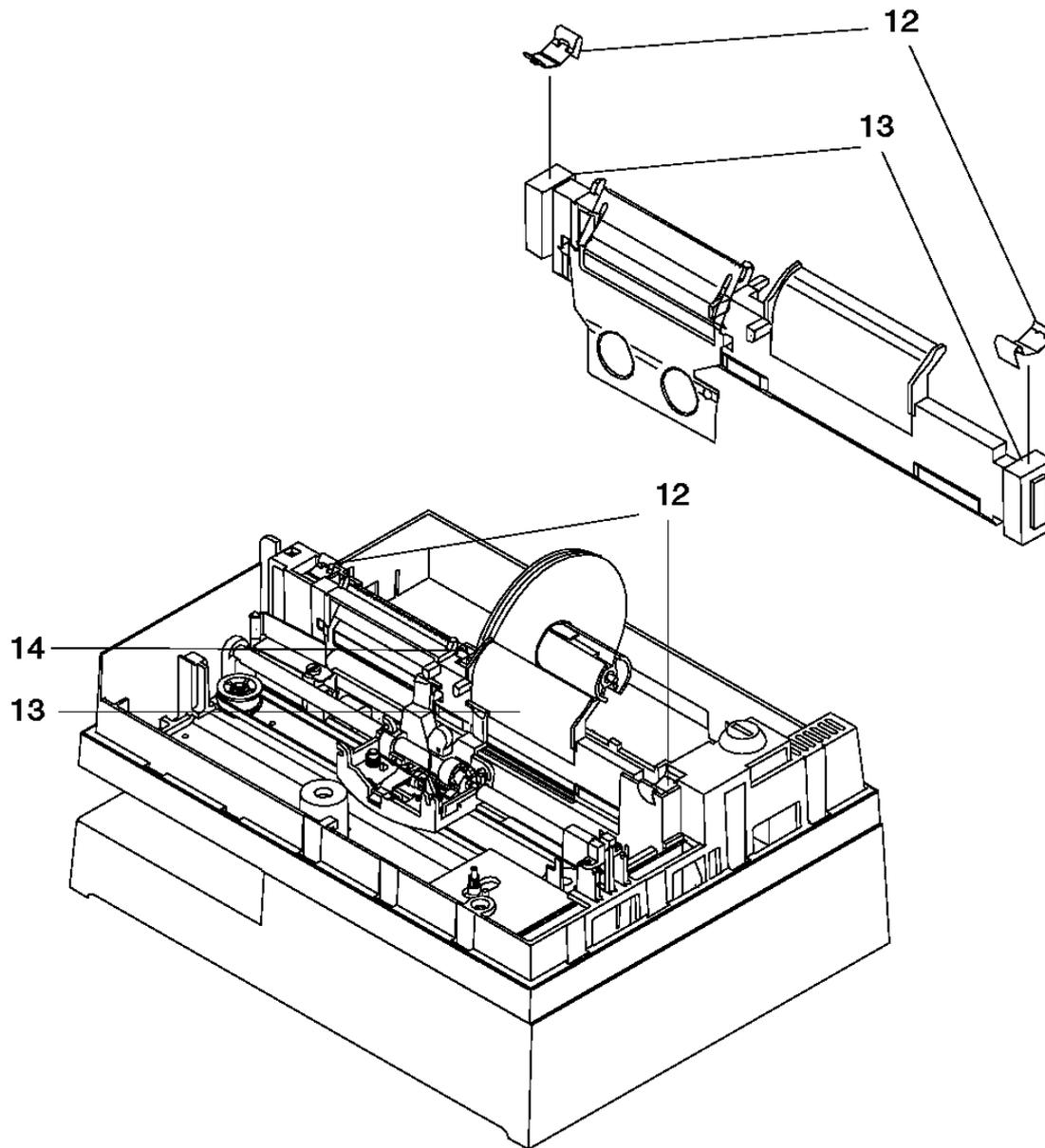


Figure E-5. Part 5. Removing the Platen

32. To release the tabs that lock the frame assemblies together, insert the frame separating tool, P/N 63X4985, into the tab that is just above the front opening of the document insert slot. With your other hand, pull up on the top half of the printer.

33. Push in on the frame separating tool just far enough to release the holding tab.

34. Lift and hold the upper frame to prevent the tabs from relocking.

35. Continue inserting the tool counterclockwise around the base unit until the upper and lower frames are separated.

Note: Pull the toggle shaft, see (18) in Figure E-7 away from the document insert/customer receipt motor before you lift the upper frame assembly.

36. Lift the upper frame assembly far enough to prevent the locking tabs from relocking.

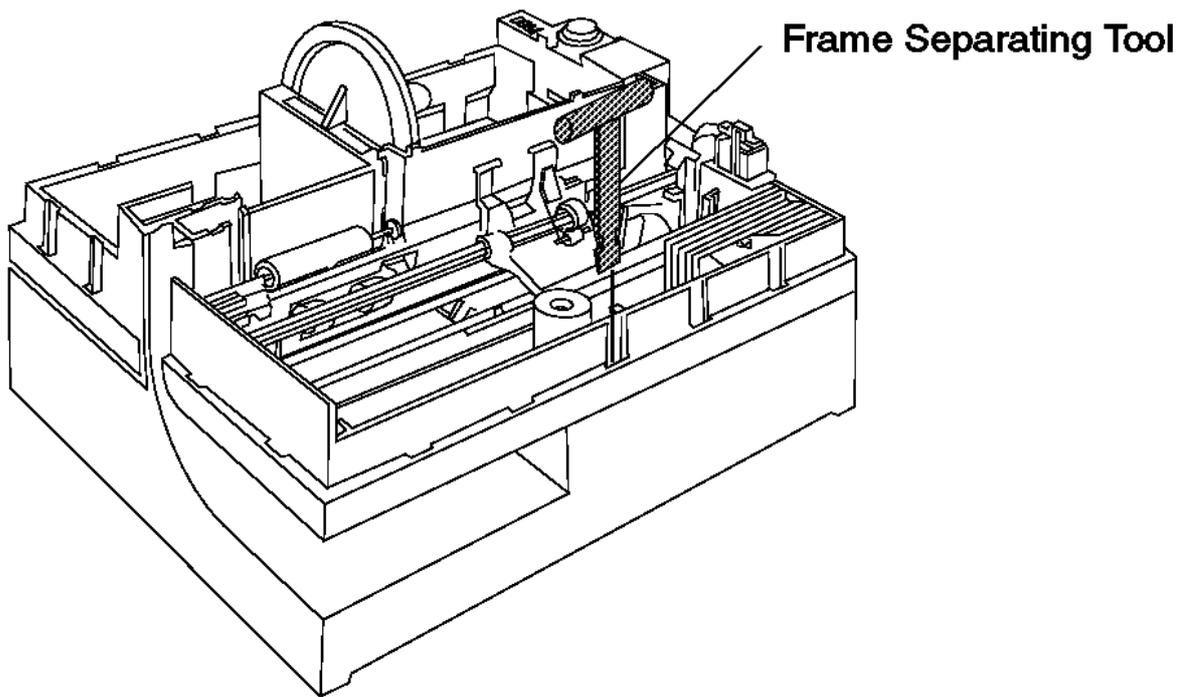


Figure E-6. Part 6. Using the Frame Separating Tool

37. Separate the upper frame assembly from the lower frame assembly.
38. If you are here to remove the toggle assembly or the document insert sensor, continue.
39. Remove the toggle assembly (18) by sliding its shaft out of one of the pivot points.
40. Lift the end of the assembly and slide the shaft out of the other pivot point.
41. If you are here to remove the document insert sensor, continue.
42. Remove the sensor (16) by removing the retainer (17) and lifting the sensor out.

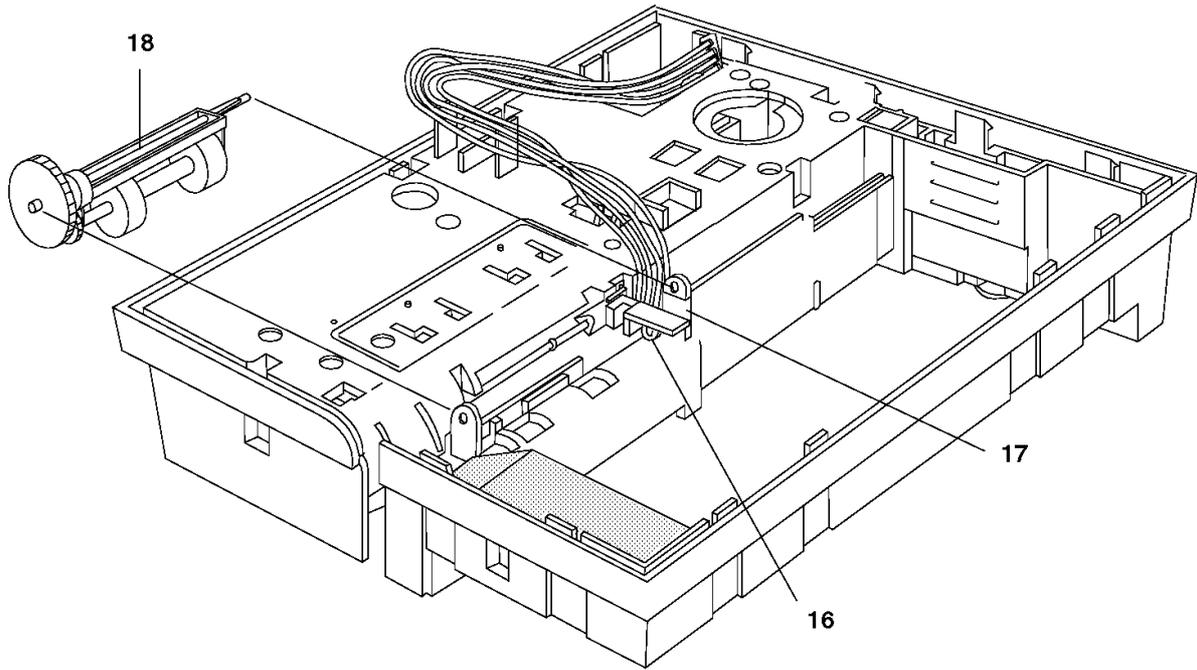


Figure E-7. Part 7. Removing the Toggle Assembly and Document Sensor

E.2 Removing and Replacing the Platen Grounding Strap

Subtopics

E.2.1 Removing the Platen Grounding Strap

E.2.2 Replacing the Platen Grounding Strap

E.2.1 Removing the Platen Grounding Strap

1. Pull the strap out from under the platen.

Note: The platen may need to be lifted very slightly to accomplish this step.

2. Lift the strap out from the printer.

Note: Some factory-installed straps are held in place by a tab that is located under the metal grounding plate in the printer. To remove this version, separate the printer frames and loosen the two screws (1) nearest to the strap. The strap can now be removed.

E.2.2 Replacing the Platen Grounding Strap

1. Position the strap so that it fits between the plastic wall and the grounding plate.
2. Lock the strap in place under the platen.

Note: The platen may need to be lifted very slightly to allow this. Be sure that the platen has been seated correctly.

3. Reassemble the printer frames, if necessary.

Reference	Topic
Separating the Upper and Lower Frame Assemblies	E.1
Joining the Upper and Lower Frame Assemblies	E.12

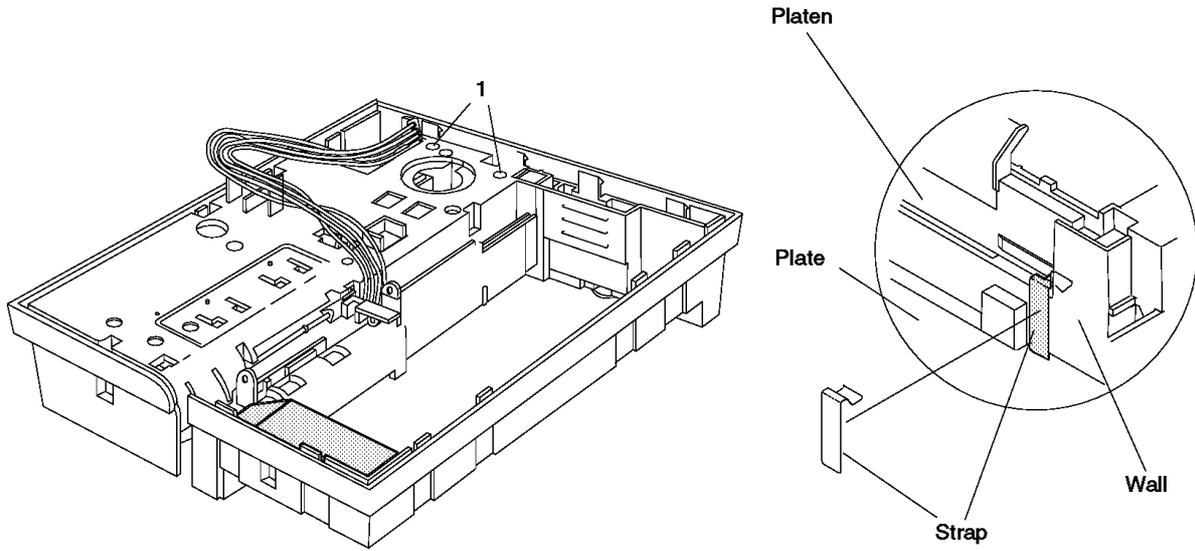


Figure E-8. Platen Grounding Strap

E.3 Removing and Replacing the Capacitor

Subtopics

E.3.1 Removing the Capacitor

E.3.2 Replacing the Capacitor

E.3.1 Removing the Capacitor

1. Separate the upper and lower frame assemblies.
2. To release the capacitor (1), push down on the end that has the wires attached.
3. Disconnect the capacitor from the card.
4. Lift the capacitor out of the frame assembly.

E.3.2 Replacing the Capacitor

1. Put the wired end of the capacitor (1) into the frame and lower the capacitor into place.
2. Push the capacitor cable connector through the opening in the frame.
3. Connect the capacitor cable to the printer card connector J6 and reroute the cable through the cable tie.
4. Join the upper and lower frame assemblies.

Reference	Topic
Separating the Upper and Lower Frame Assemblies	E.1
Joining the Upper and Lower Frame Assemblies	E.12

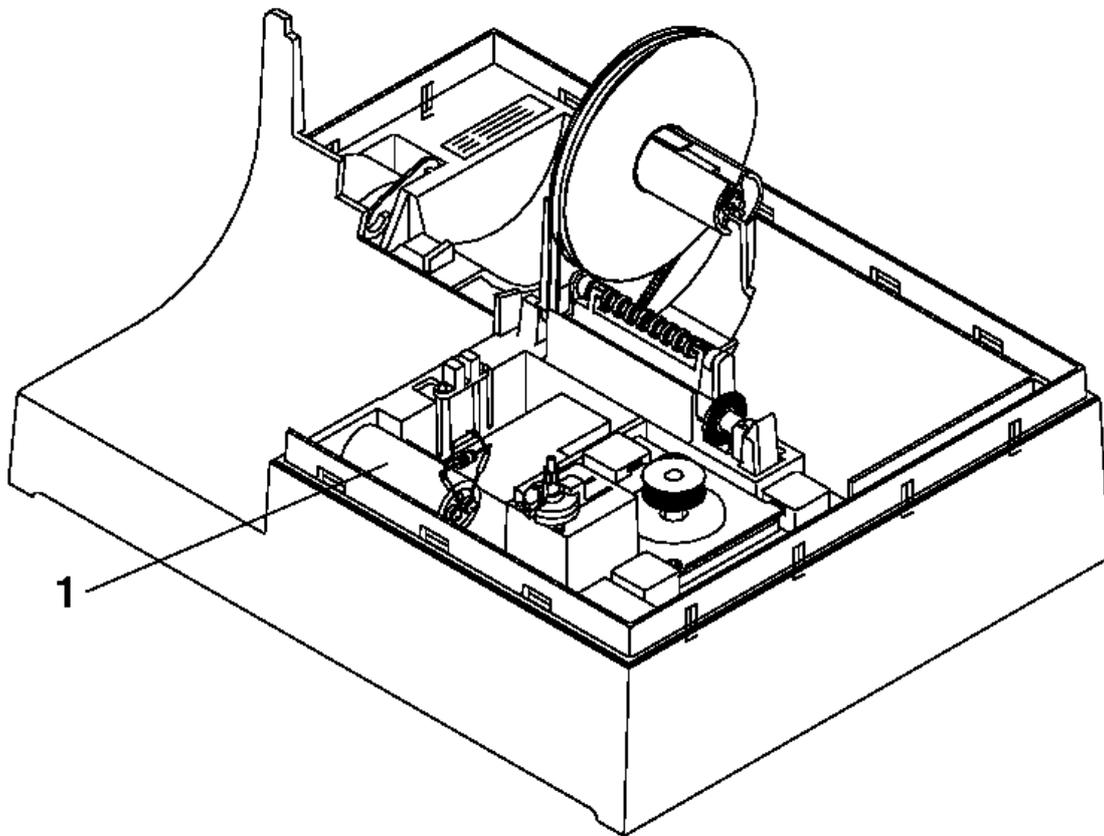


Figure E-9. Model 2 Capacitor

E.4 Removing and Replacing the Document Insert Backup Roller

See "Removing and Replacing the Document Insert Gate" in topic E.5. The document insert backup roller is removed and replaced in this procedure.

E.5 Removing and Replacing the Document Insert Gate

Subtopics

E.5.1 Removing the Document Insert Gate

E.5.2 Replacing the Document Insert Gate

E.5.1 Removing the Document Insert Gate

1. Separate the upper and lower frame assemblies.
2. Move the print head carriage to the right end of the frame assembly.
3. Remove the spring (3) from the insert gate (2). See Figure E-10 in topic E.5.2.
4. Push the left end of the backup roller (1) toward the back of the frame. This moves the end of the backup roller shaft (4) out of its pivot point.
5. Pull the shaft out of the insert gate.
6. Remove the insert gate from the frame assembly.
7. Remove the backup roller and shaft.

E.5.2 Replacing the Document Insert Gate

1. Insert the backup roller shaft (4) through the backup roller.
2. Move the print head carriage to the right end of the frame assembly.
3. Put the document insert gate (2) into the frame assembly and locate it as shown in Figure E-10.
4. Locate the backup roller (1) and push the end of the shaft with the flat side into the document insert gate.
5. Push the opposite end of the shaft into its pivot point.
6. Replace the spring (3).
7. Join the upper and lower frame assemblies.

Reference	Topic
Separating the Upper and Lower Frame Assemblies	E.1
Joining the Upper and Lower Frame Assemblies	E.12

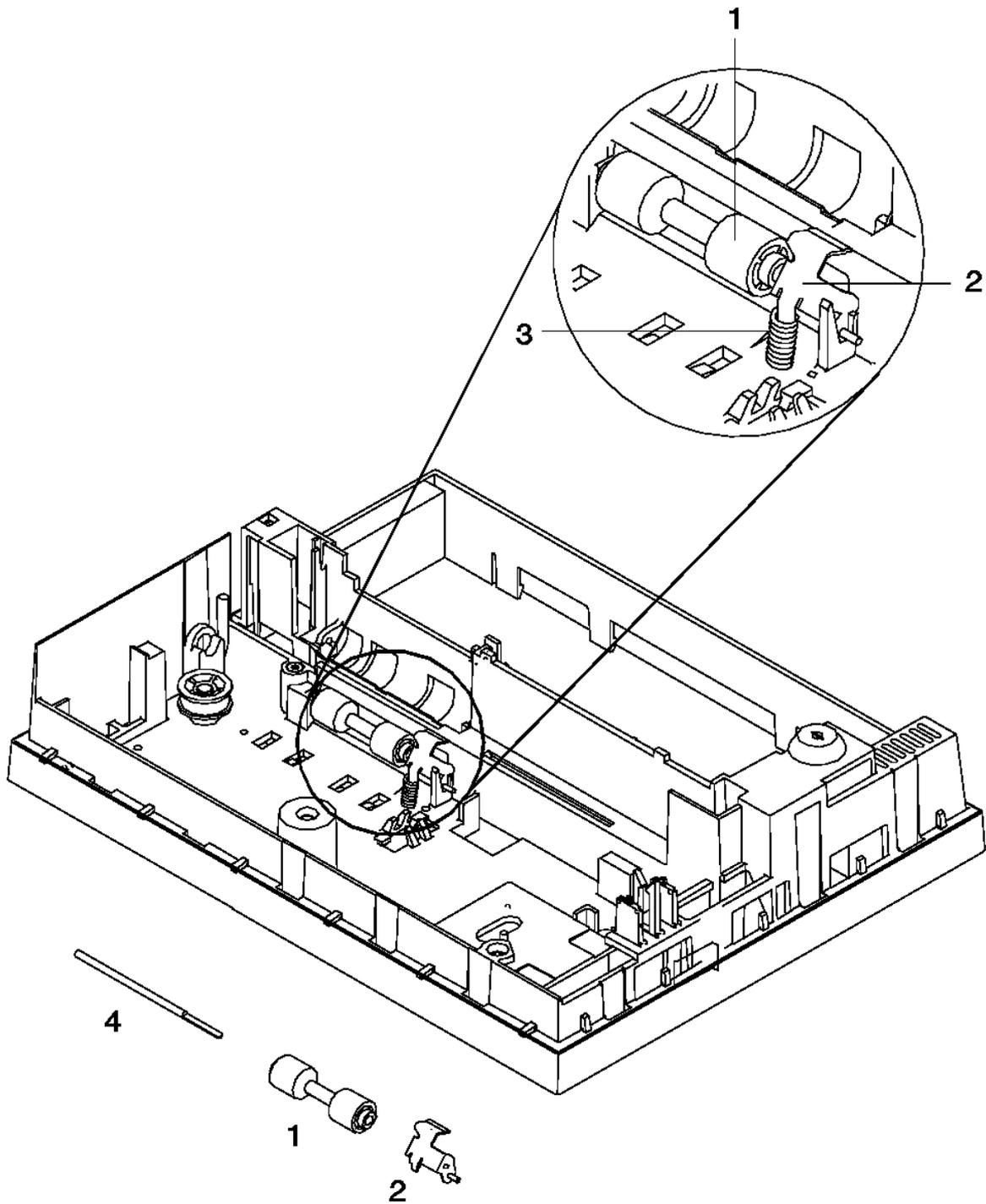


Figure E-10. Document Insert Gate and Backup Roller. To illustrate the backup roller, the print head carriage assembly has been removed. Removal of this assembly is not necessary for this procedure.

E.6 Removing and Replacing the Document Insert Paper Sensor

Subtopics

E.6.1 Removing the Document Insert Paper Sensor

E.6.2 Replacing the Document Insert Paper Sensor

E.6.1 Removing the Document Insert Paper Sensor

See "Separating the Upper and Lower Printer Frame Assemblies" in topic E.1. The document insert paper sensor is removed in this procedure.

E.6.2 Replacing the Document Insert Paper Sensor

See "Joining the Upper and Lower Printer Frame Assemblies" in topic E.12. The document insert paper sensor is replaced in this procedure.

E.7 Removing and Replacing the Document Insert/Customer Receipt Motor

Subtopics

E.7.1 Removing the Document Insert/Customer Receipt Motor

E.7.2 Replacing the Document Insert/Customer Receipt Motor

E.7.1 Removing the Document Insert/Customer Receipt Motor

1. Separate the upper and lower frame assemblies. See "Separating the Upper and Lower Printer Frame Assemblies" in topic E.1.
2. Move the motor (1) away from the center of the frame to release it from its locating pad.
3. Pivot the motor toward you and lift it out of the frame.

E.7.2 Replacing the Document Insert/Customer Receipt Motor

1. Hold the motor holding clip toward the frame as you put the motor in place.
2. Move the motor toward the center of the frame and into its locating pad.
3. Join the upper and lower frame assemblies. See "Joining the Upper and Lower Printer Frame Assemblies" in topic E.12.

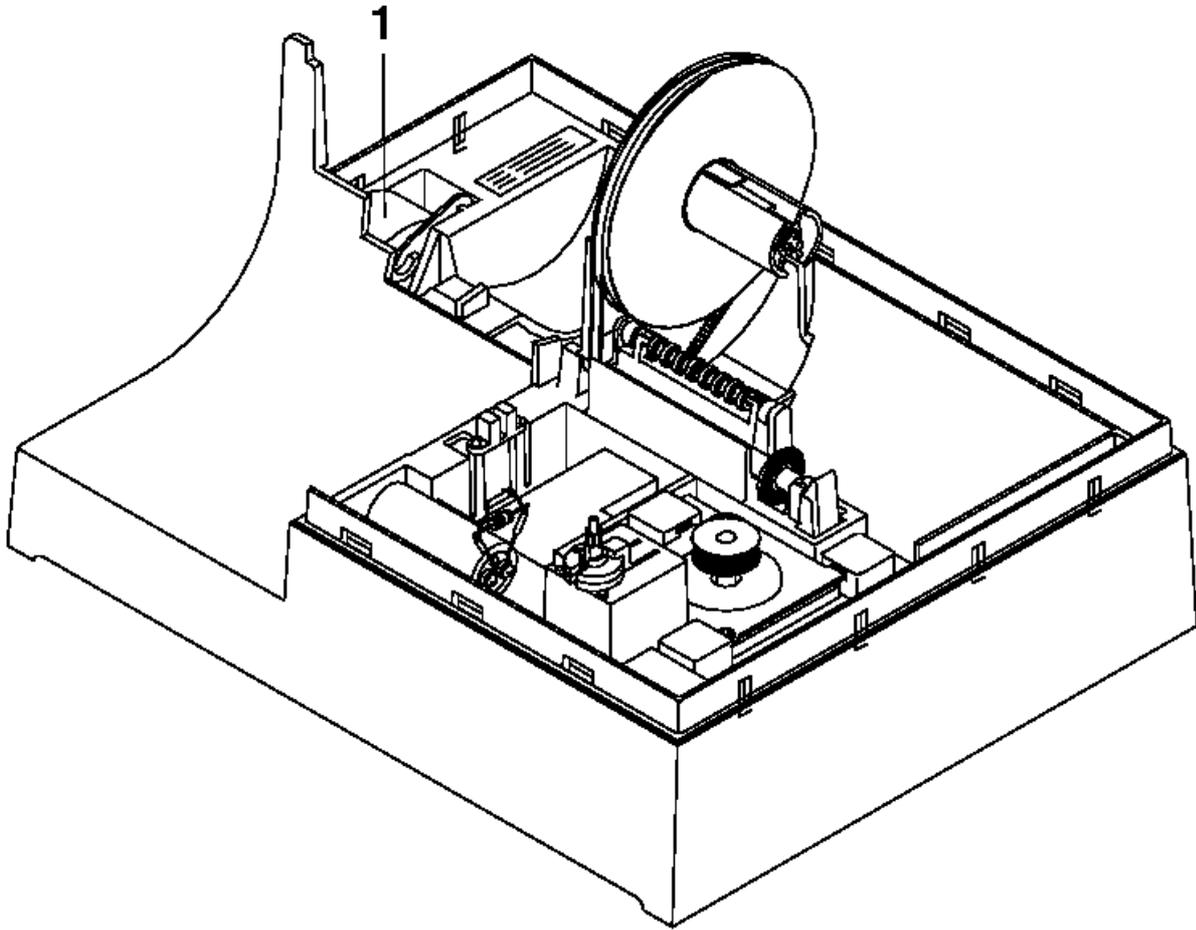


Figure E-11. Document Insert/Customer Receipt Motor

E.8 Removing and Replacing the Journal Paper Motion Emitter Shaft

Subtopics

E.8.1 Removing the Journal Paper Motion Emitter Shaft

E.8.2 Replacing the Journal Paper Motion Emitter Shaft

E.8.1 Removing the Journal Paper Motion Emitter Shaft

1. Separate the upper and lower frame assemblies.
2. Release the holding tab (2).
3. Lift the right end of the emitter shaft (1).
4. Move the shaft to the right and lift it out of the frame.

E.8.2 Replacing the Journal Paper Motion Emitter Shaft

1. Ensure that the O-ring is in the center of the emitter shaft before putting the shaft in the printer.
2. Put the left end of the emitter shaft into place.
3. Move the holding tab (2) out of the way and lower the right end of the emitter shaft into place.
4. Join the upper and lower frame assemblies.

Reference	Topic
Separating the Upper and Lower Frame Assemblies	E.1
Joining the Upper and Lower Frame Assemblies	E.12

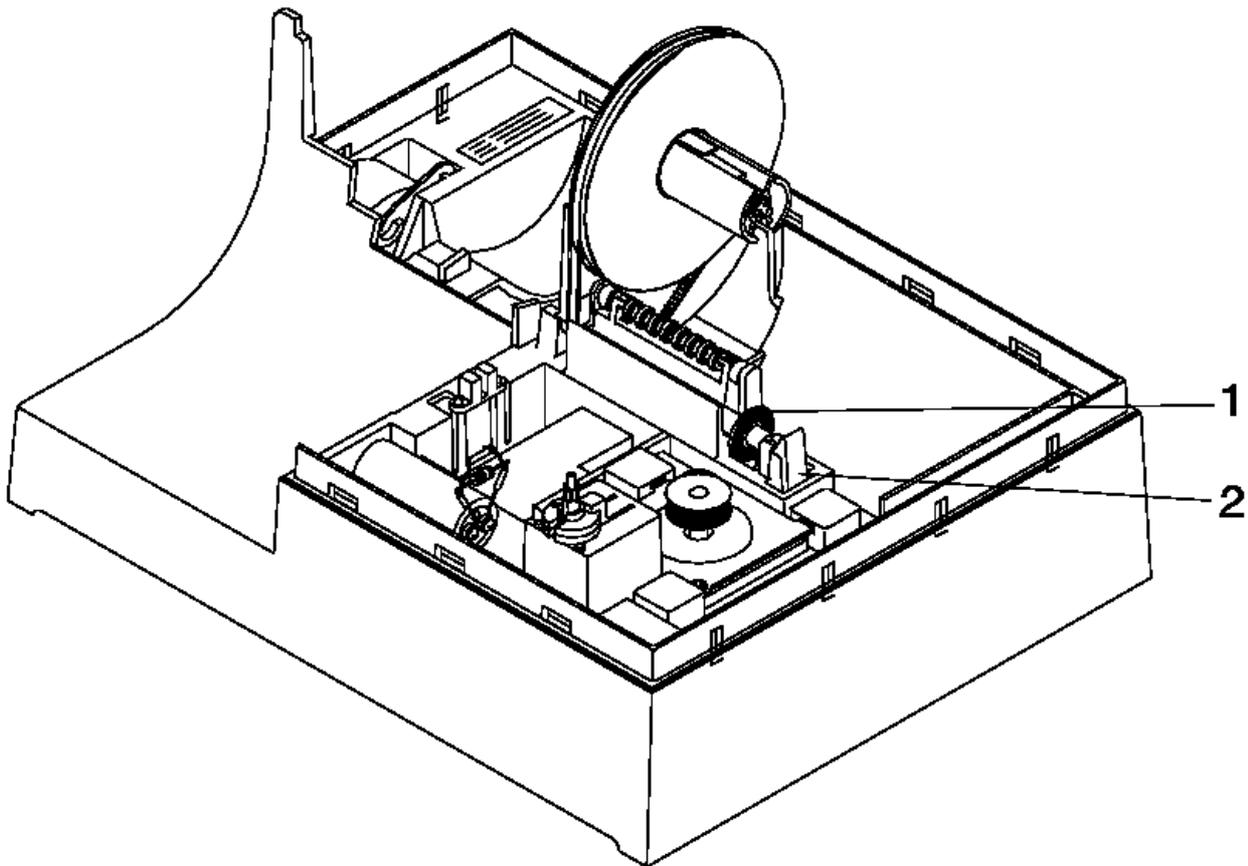


Figure E-12. Journal Paper Motion Emitter Shaft

E.9 Removing and Replacing the Print Head Home Sensor

Subtopics

E.9.1 Removing the Print Head Home Sensor

E.9.2 Replacing the Print Head Home Sensor

E.9.1 Removing the Print Head Home Sensor

1. Separate the upper and lower frame assemblies.
2. Disconnect the sensor cable from printer card connector J5.
3. Lift the home sensor (1) out of the frame assembly.

E.9.2 Replacing the Print Head Home Sensor

1. Put the home sensor (1) into place.
2. Push the sensor cable connector through the opening below the sensor.
3. Connect the cable to the printer card connector J5 and place the cable in its retainers.
4. Join the upper and lower frame assemblies.
5. Continue at "Adjusting the Print Head Home Sensor" in topic 5.5.2.

Reference	Topic
Separating the Upper and Lower Frame Assemblies	E.1
Joining the Upper and Lower Frame Assemblies	E.12

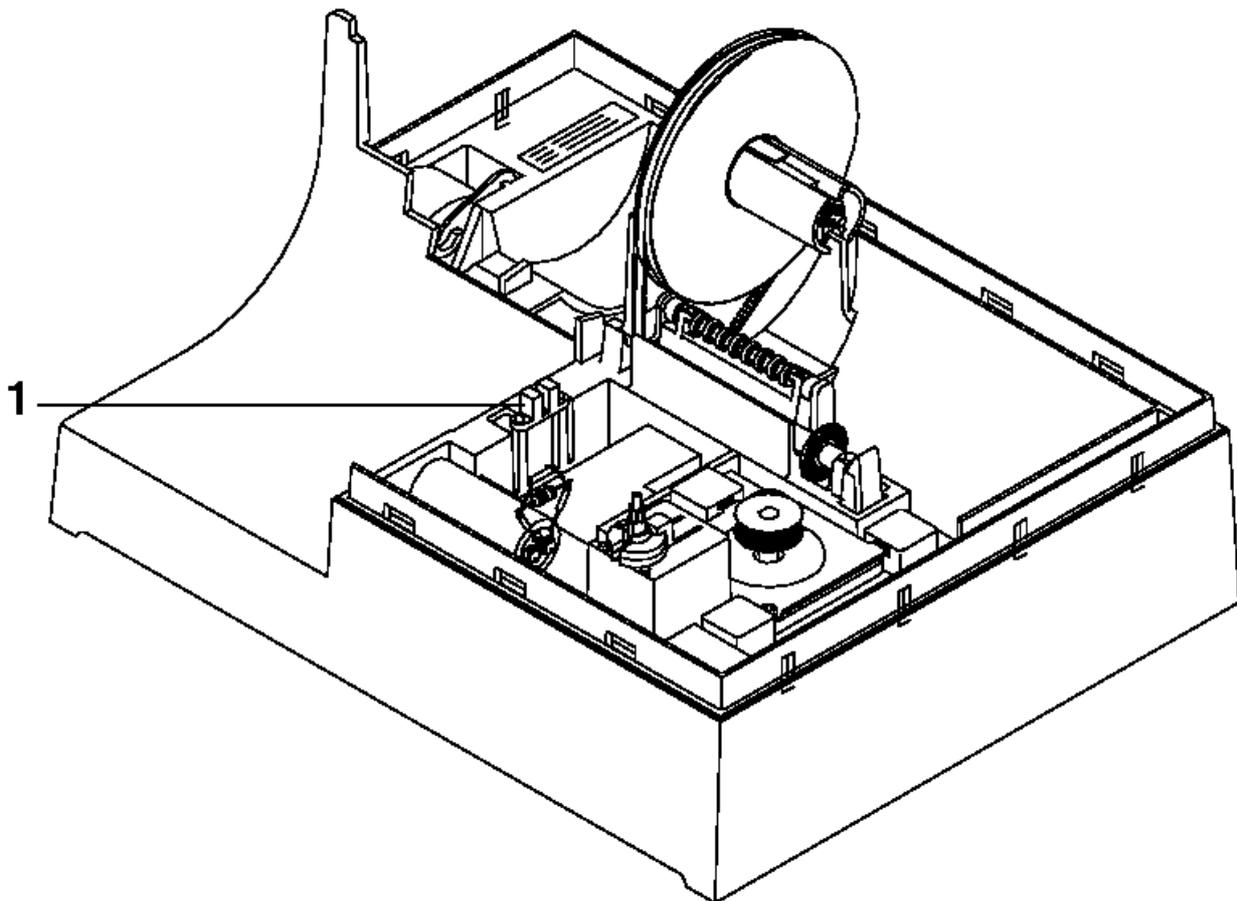


Figure E-13. Print Head Home Sensor

E.10 Removing and Replacing the Ribbon Drive Shaft

Subtopics

E.10.1 Removing the Ribbon Drive Shaft

E.10.2 Replacing the Ribbon Drive Shaft

E.10.1 Removing the Ribbon Drive Shaft

1. Separate the upper and lower frame assemblies.
2. Turn the shaft bearing (1) until the slot in the bearing aligns with the retainer (2). See Figure E-14 in topic E.10.2.
3. Move the bearing to the left over the retainer and out of its mount.
4. Remove the bearing from the shaft by separating the parts (3) as shown in Figure E-14 in topic E.10.2.

The bearing parts snap apart.

5. Release the drive shaft coupler (4) by removing the C-clip (5).
6. Pull the coupler off the motor shaft.
7. Remove the shaft from the printer.

E.10.2 Replacing the Ribbon Drive Shaft

1. Push the bearing end of the shaft up through the opening below the bearing mount.
2. Put the bearing on the drive shaft by snapping the bearing parts together, as shown in Figure E-14.
3. Align the slot (1) in the bearing over the retainer (2).
4. Move the bearing into its mount.
5. Turn the slot toward the rear of the printer and away from the retainer.
6. Connect the ribbon drive shaft coupler (3) to the motor shaft.
7. Attach the coupler to the shaft with the C-clip (3).
8. Join the upper and lower frame assemblies.

Reference	Topic
Separating the Upper and Lower Frame Assemblies	E.1
Joining the Upper and Lower Frame Assemblies	E.12

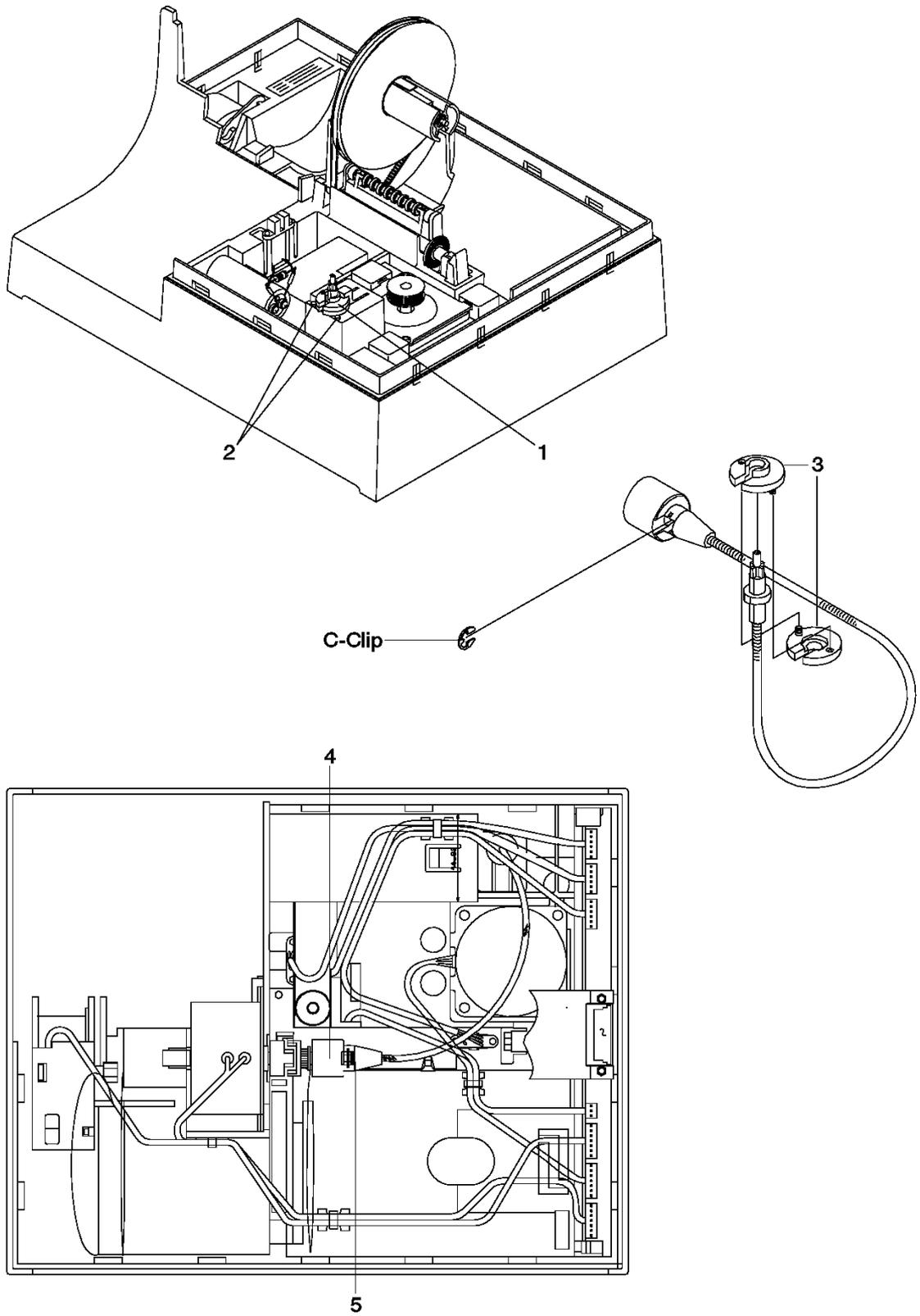


Figure E-14. Ribbon Drive Shaft and Bearing

E.11 Removing and Replacing the Toggle Assembly

Removing the Toggle Assembly: To remove the toggle assembly continue at "Separating the Upper and Lower Printer Frame Assemblies" in topic E.1.

Replacing the Toggle Assembly: The toggle assembly is replaced in "Joining the Upper and Lower Printer Frame Assemblies" in topic E.12.

E.12 Joining the Upper and Lower Printer Frame Assemblies

Note: It is not recommended that field service personnel reassemble the printer frame assemblies. However, in some countries where on-site service is available, this procedure may be done by qualified service personnel.

Note: If the document insert sensor or the toggle assembly were removed after separating the frame, start at Step 1. Otherwise start at Step 6.

1. Put the document insert paper sensor (3) into the frame assembly as shown in Figure E-15 and lock the sensor in place with the retainer (2).
2. Put the toggle assembly (1) into place with the large gear up and toward the side frame, and the rubber rolls toward the frame as shown.
3. Slide the shaft into one of the pivot points.
4. Align the toggle assembly and slide the shaft into the other pivot point.

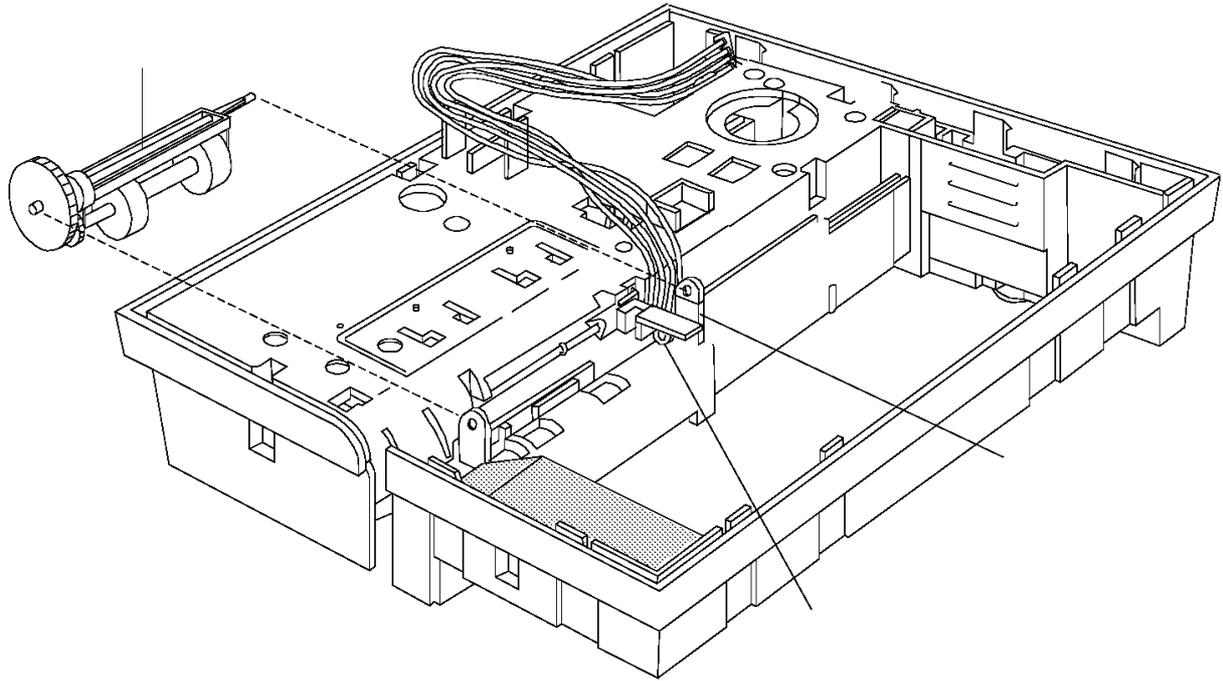


Figure E-15. Part 1. Installing the Toggle Shaft and Document Sensor

5. Align the document insert paper sensor cable and grounding strap so that they go through the opening in the frame.
6. Align the upper frame assembly over the lower frame assembly so the two assemblies install together as shown in Figure E-16.
7. Use a spring-hook to pull the cable wires through the opening so they are not pinched when the assemblies are connected.
8. Lower the upper frame assembly and push down until the locking tabs lock into place.

Note: The document insert/customer receipt motor should be moved slightly to allow the toggle shaft to lock into its alignment hole.

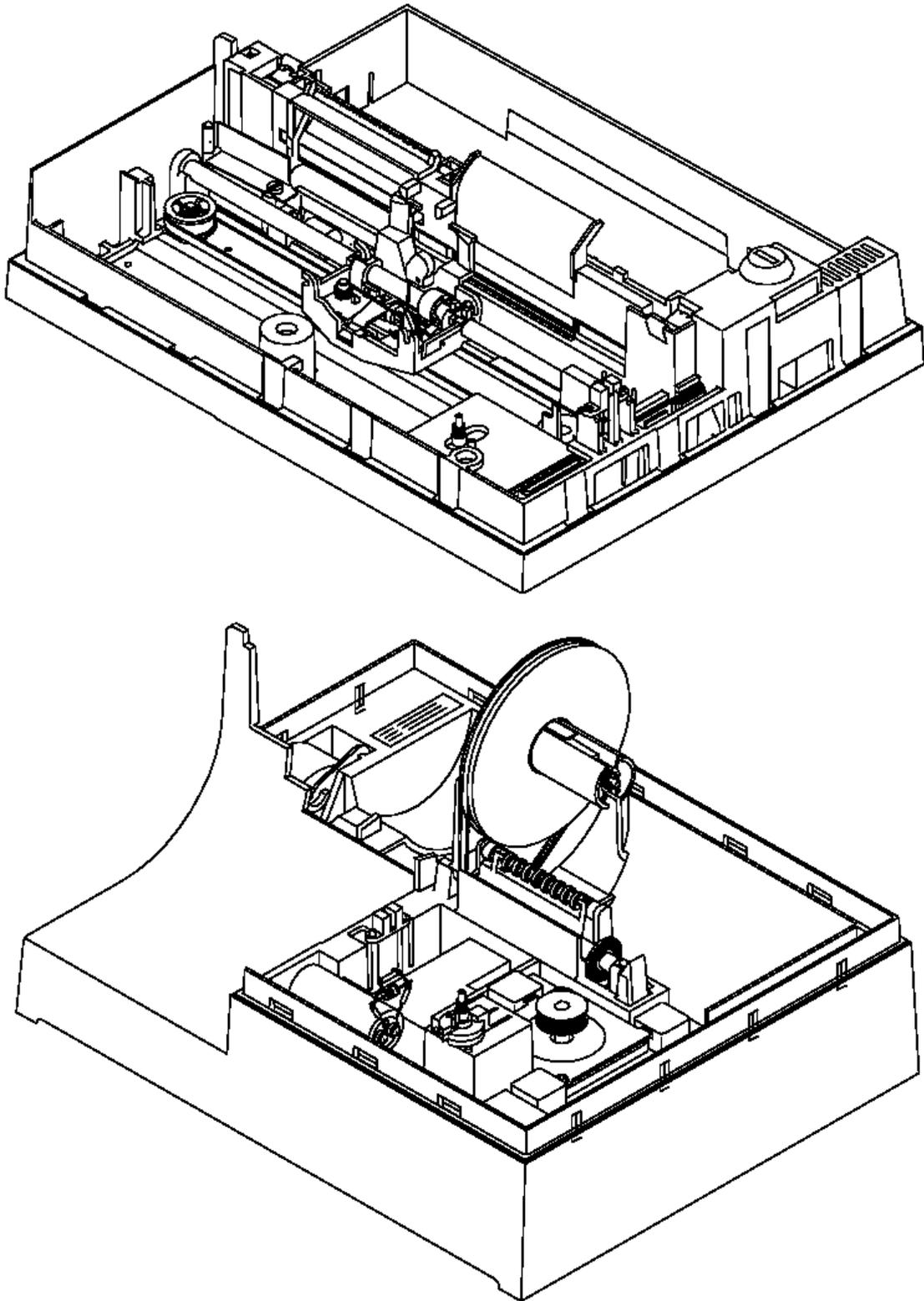


Figure E-16. Part 2. Connecting Upper and Lower Frame Assemblies

9. Ensure that the sensor cable is not pinched.
10. Reinstall the bottom frame screw (1).
11. Reinstall the grounding strap and its attaching screw (2).
12. Reinstall the printer card in through the bottom of the printer.
13. Push the card in until the holding tabs (4) lock into place.

14. Place the cables under the journal station holding clips (3), starting with the top cable.
15. Connect the cables to the bottom of the card.

Note: The cable connectors are keyed so they only connect to their matching printer card connectors.

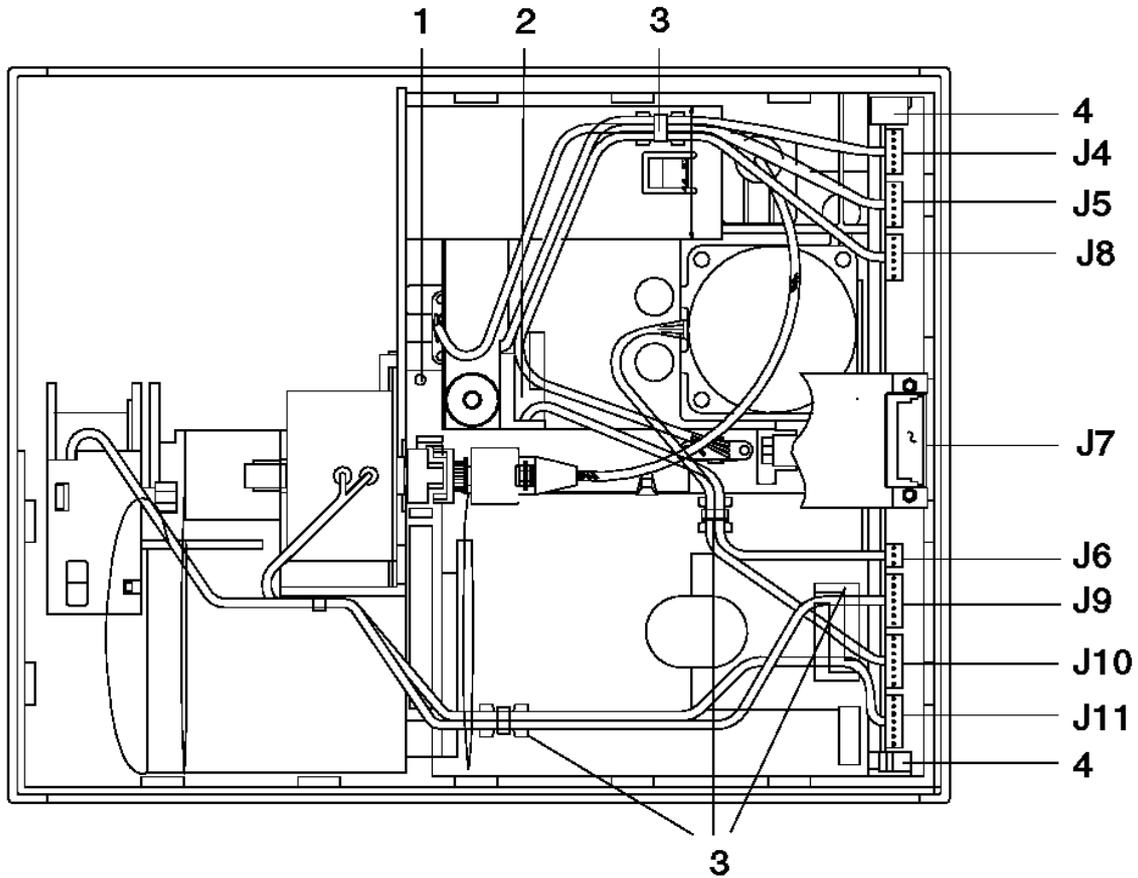


Figure E-17. Part 3. Installing the Printer Card

16. Move the carriage to the center of the printer.
17. Put the belt on the carriage drive pulleys (8).
18. Move the carriage to the extreme left and then to the extreme right. The spring that connects the belt together must not touch either pulley.
19. Connect the cover interlock sensor cable J3 to the top of the card.
20. Put a piece of paper into the document insert station.
21. Turn the large toggle gear down. This keeps the toggle assembly from interfering with the paper tear guide when the platen is installed.

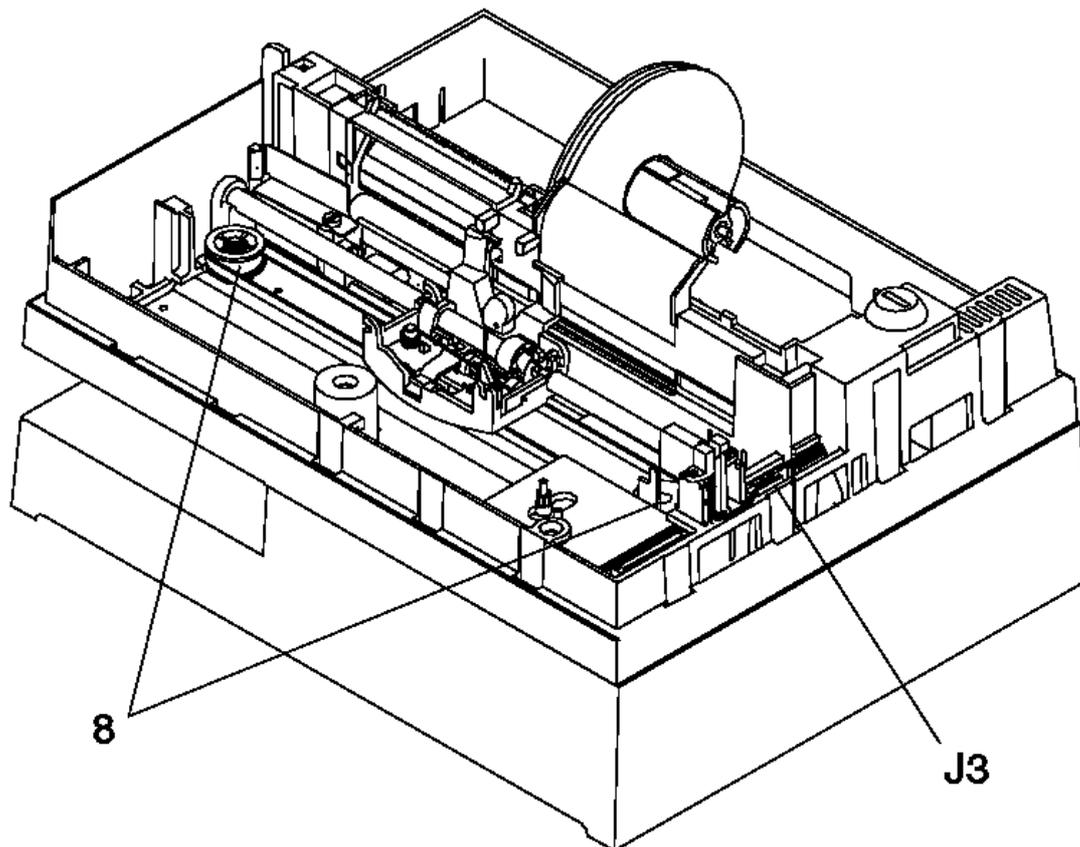


Figure E-18. Part 4. Installing the Carriage Belt and Sensor Cable

22. To replace the platen, lubricate the rubber boots (11) with silicon grease (P/N 265390).
23. Put the boots into their slots (12).
24. Move the receipt paper backup roller and spacers to the center of their shaft.
25. Push down on each end of the platen assembly until the boots are approximately halfway down.
26. Reinstall the top roller (14).
27. Continue to push down on each end of the platen assembly until the boots are at the bottom of their slots.
28. Check to ensure that the platen is parallel with the frame assembly at the points designated by (13) and reinstall the platen retainers (12a).
29. Check to ensure that the platen grounding strap is properly seated underneath the platen. See Figure E-8 in topic E.2.2.
30. Remove the piece of paper.

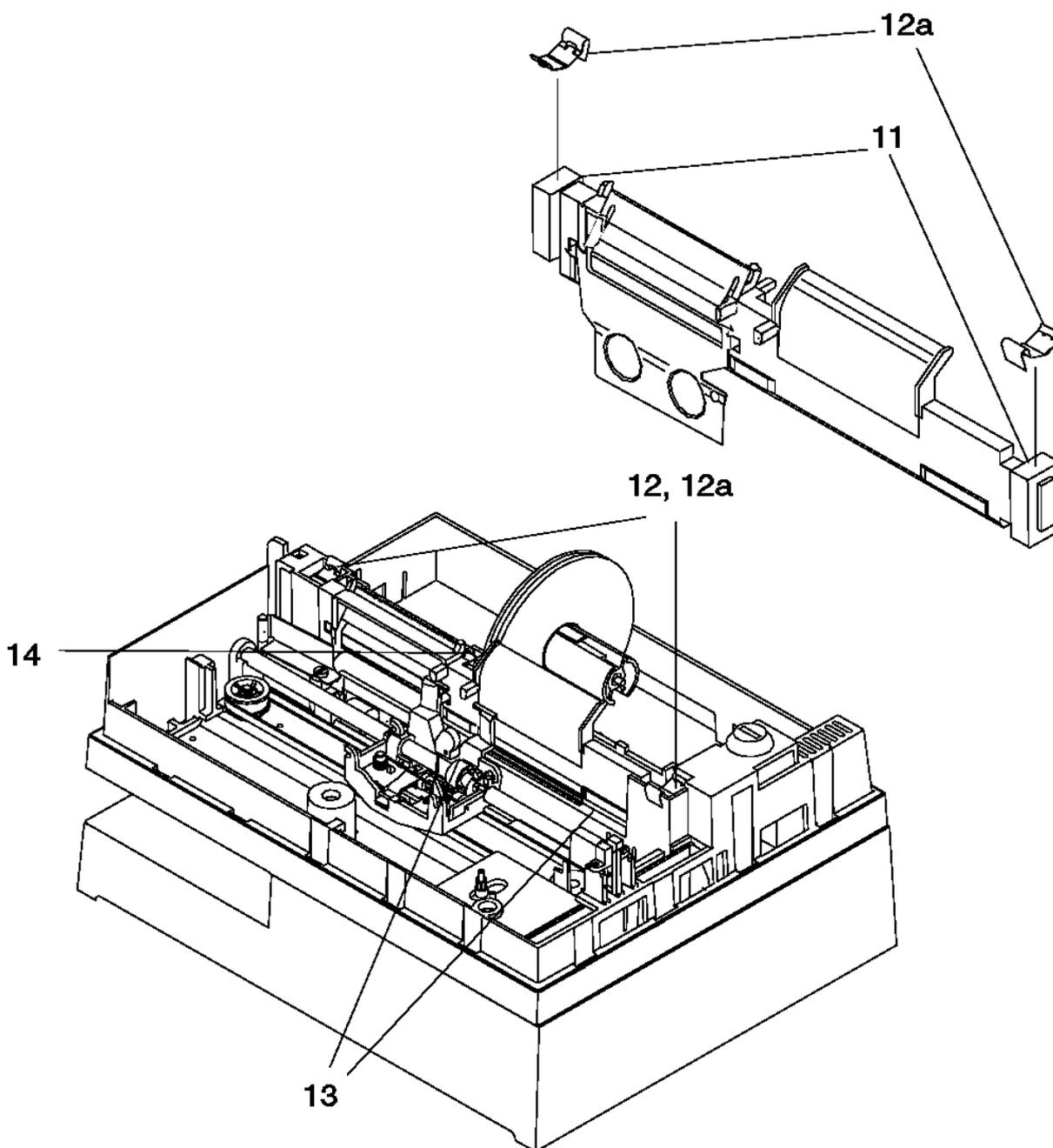


Figure E-19. Part 5. Installing the Platen

31. To reinstall the top cover assembly, set the assembly on the printer with the left end raised as shown in Figure E-20.
32. Connect the operator keypad cable to printer card connector J2.
33. Lower the left side of the top cover while aligning the holding tabs (15) over the openings (16) on each side of the document insert slot.
34. Push down and in on each side of the document insert slot until the tabs lock into place.

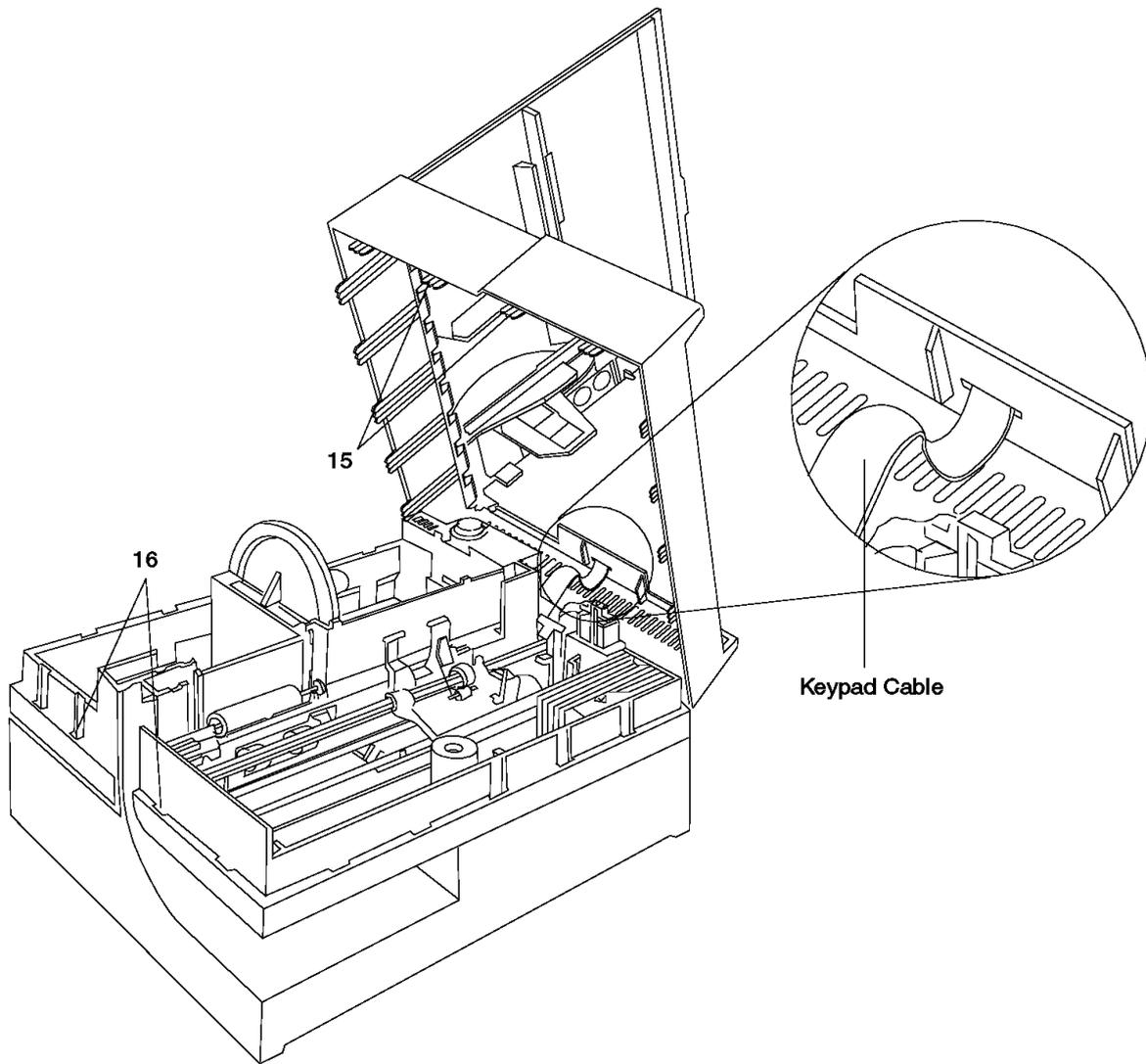


Figure E-20. Part 6. Installing the Top Cover

35. To reinstall the bottom cover, align the bottom cover locking tabs (17) over their slots.

The grounding straps should be centered in the hole for the thumbscrew.

36. Push in on the bottom cover until the tabs lock into place.

37. Tighten the thumbscrew (18).

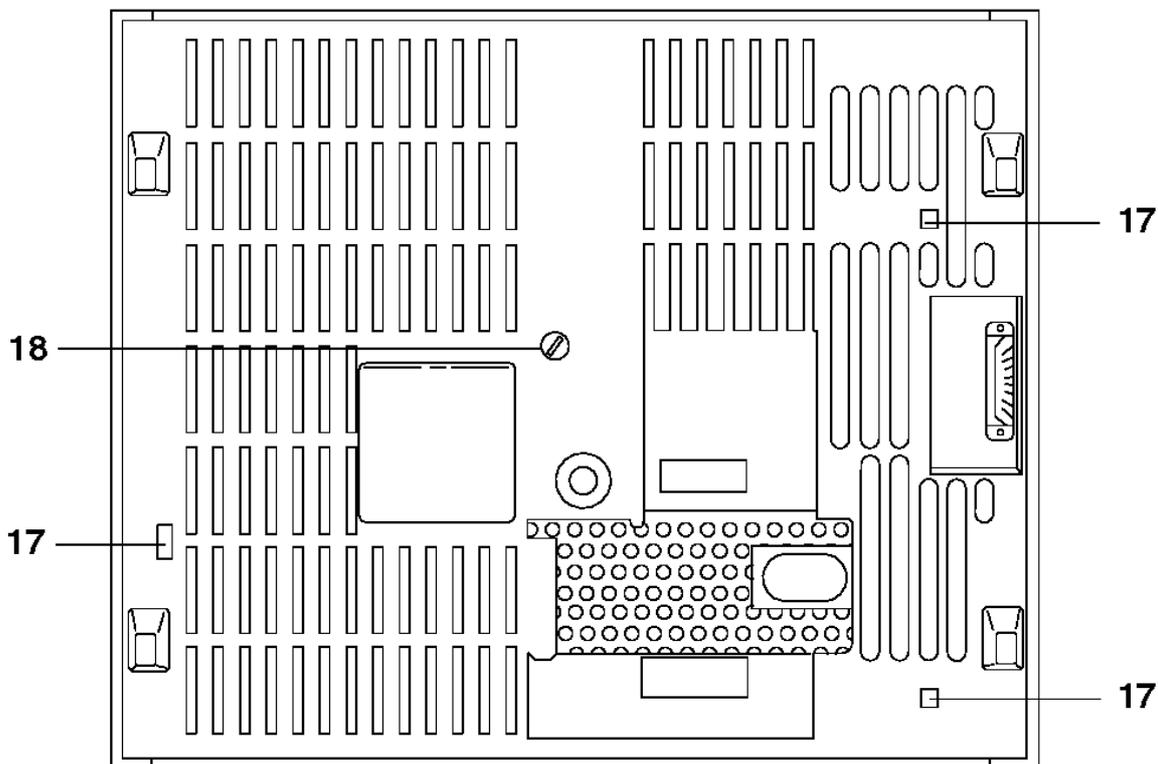


Figure E-21. Part 7. Installing the Bottom Cover

38. Set the printer as shown in Figure E-22.

39. To reinstall the document insert paper guide (19), insert a piece of paper into the document insert station.

CAUTION:

The edge of the printer's paper guide is sharp. Use care when removing and installing it.

40. Put the paper guide in through the document insert opening.

41. Push the holding tabs through the openings (21) in the frame assembly.

42. Remove the piece of paper.

43. Move the guide toward the front of the printer to lock the holding tabs in place.

44. Ensure that the guide is installed over the locating pads (20).

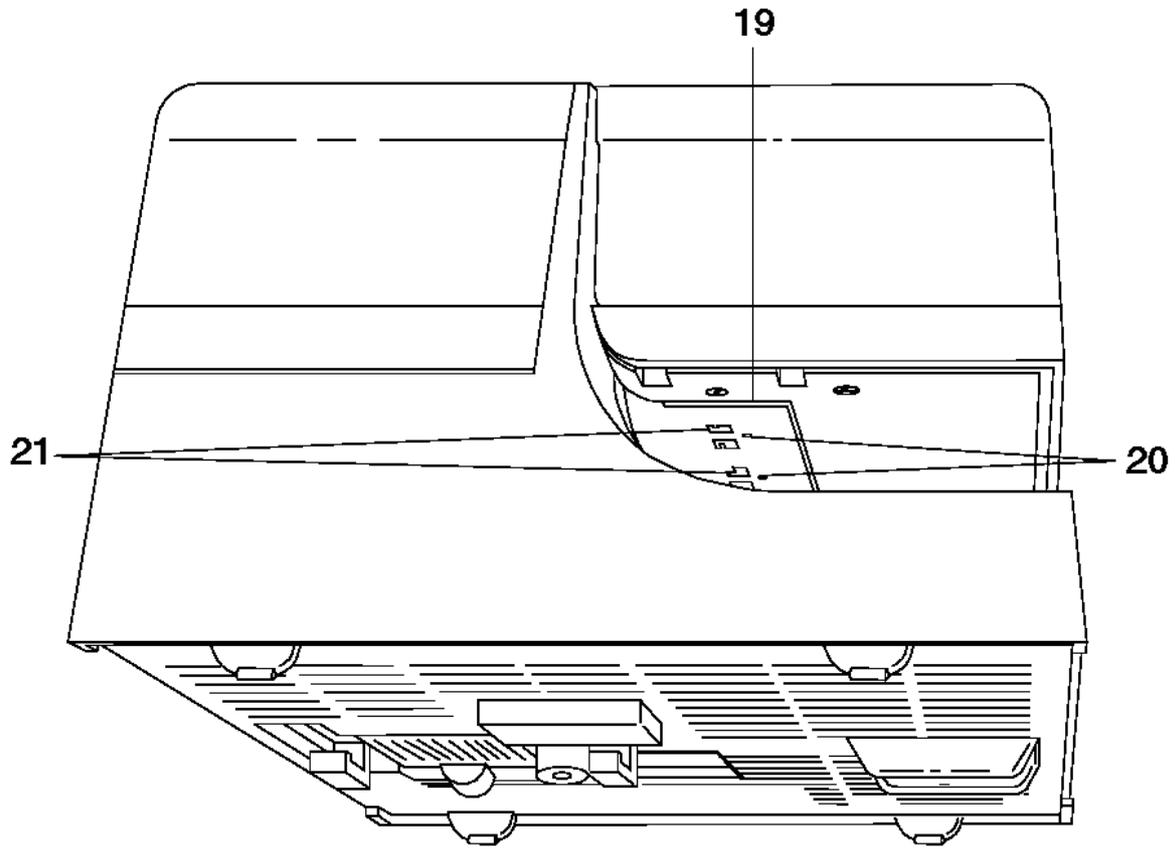


Figure E-22. Part 8. Installing the Document Insert Guide

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 Phone No. _____