7011 POWERstation and POWERserver

Service Guide

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Sixth Edition (August 1994)

This edition notice applies to the *7011 POWERstation and POWERserver Service Guide*. This edition obsoletes all previous editions.

Table of Contents

Communications Statements

The following statements apply to this product when *not* using the system Ethernet function (local area network). The system standard I/O Ethernet port is FCC Class A. The statement for other products intended for use with this product appears in their accompanying manuals.

Federal Communications Commission (FCC) Statement

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult an authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from authorized dealers. Neither the provider nor the manufacturer are 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.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

EC Council Directive

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.

Neither the provider nor the manufacturer can accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards not supplied by the manufacturer.

Avis de conformité aux normes du ministère des Communications du Canada

Cet équipement ne dépasse pas les limites de Classe B d'émission de bruits radioélectriques pour les appareils numériques, telles que prescrites par le Réglement sur le brouillage radioélectrique établi par le ministère des Communications du Canada.

Canadian Department of Communications Compliance Statement

This equipment does not exceed Class B limits for radio noise emissions for digital apparatus, set out in Radio Interference Regulation of the Canadian Department of Communications.

VCCI Statement

この装置は，第二種情報装置（住宅地域又はその隣接した地域において使用されるべき情報装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）基準に適合しております。

しかし，本装置をラジオ，テレビジョン受信機に近接してご使用になると，受信障害の原因となることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

The following is a summary of the VCCI Japanese statement in the box above.

This equipment is in the Class 2 category (information equipment to be used in a residential area or an adjacent area thereto) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in such residential area.

When used near a radio or TV receiver, it may become the cause of radio interference.

Read the instructions for correct handling. VCCI-2.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG-Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse B.

The following statements apply to this product when using the system Ethernet function (local area network). The statement for other products intended for use with this product appears in their accompanying manuals.

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. Neither the provider nor the manufacturer are 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.

United Kingdom Telecommunications Safety Requirements

This equipment is manufactured to the International Safety Standard EN60950 and as such is approved in the UK under the General Approval Number NS/G/1234/J/100003 for indirect connection to the public telecommunication network.

The network adapter interfaces housed within this equipment are approved separately, each one having its own independent approval number. These interface adapters, supplied by the manufacturer, do not use or contain excessive voltages. An excessive voltage is one which exceeds 70.7 V peak ac or 120 V dc. They interface with this equipment using Safe Extra Low Voltages only. In order to maintain the separate (independent) approval of the manufacturer's adapters, it is essential that other optional cards, not supplied by the manufacturer, do not use main voltages or any other excessive voltages. Seek advice from a competent engineer before installing other adapters not supplied by the manufacturer.

EC Council Directive

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.

Neither the provider nor the manufacturer can accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of option cards not supplied by the manufacturer.

International Electrotechnical Commission (IEC) Statement

This product has been designed and built to comply with IEC Standard 950.

Avis de conformité aux normes du ministère des Communications du Canada

Cet équipement ne dépasse pas les limites de Classe A d'émission de bruits radioélectriques pour les appareils numériques, telles que prescrites par le Réglement sur le brouillage radioélectrique établi par le ministère des Communications du Canada. L'exploitation faite en milieu résidentiel peut entraîner le brouillage des réceptions radio et télé, ce qui obligerait le propriétaire ou l'opérateur à prendre les dispositions nécessaires pour en éliminer les causes.

Canadian Department of Communications Compliance Statement

This equipment does not exceed Class A limits for radio noise emissions for digital apparatus, set out in Radio Interference Regulation of the Canadian Department of Communications. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps necessary to correct the interference.

VCCI Statement

電波障害自主規制　届出装置の記述

> この装置は，第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCCI）基準に適合しております。
>
> 従って，住宅地域またはその隣接した地域で使用すると，ラジオ，テレビジョン受信機等に受信障害を与えることがあります。
>
> 取扱説明書に従って正しい取り扱いをしてください。

The following is a summary of the VCCI Japanese statement in the box above.

> This equipment is in the Class 1 category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Control Council For Interference by Data Processing Equipment and Electronic Office Machines aimed at preventing radio interference in commercial and/or industrial areas.
>
> Consequently, when used in a residential area or in an adjacent area thereto, radio interference may be caused to radios and TV receivers, etc.
>
> Read the instructions for correct handling. VCCI–1.

Radio Protection for Germany

Dieses Gerät ist berechtigt in Übereinstimmung mit dem deutschen EMVG vom 9.Nov.92 das EG-Konformitätszeichen zu führen.

Der Aussteller der Konformitätserklärung ist die IBM Germany.

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.

Safety Notices

Note: For a translation of the safety notices, refer to the *System Unit Safety Information*, Order Number SA23-2652.

A *danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury. *Danger* notices appear under the following topics on the following pages:

xi
2-1520-1
3-2
3-10.

A *caution* notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury. *Caution* notices appear under the following topics on the following pages:

xi
2-1520-1
3-66.

Electrical Safety

Observe the following safety instructions any time you are connecting or disconnecting devices attached to the workstation.

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.

DANGER

To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

CAUTION:
This product is equipped with a three-wire power cable and plug for the user's safety. Use this power cable in conjunction with a properly grounded electrical outlet to avoid electrical shock.

About This Book

This book refers to three different models of the 7011 system unit: the Model 220, Model 230, and Model 250. Statements about the Model 220 apply to all 220 systems, such as 22S, 22W, and 22T. Similarly, all statements about the Model 230 apply to the 23S, 23W, and 23T; all statements about the Model 250 apply to the 25S, 25W, 25T, 25E, and 25F. The Model 250 may use a 60Mhz 601 PowerPC™ processor or an 80Mhz PowerPC processor (which can be ordered as Feature Code 8000).

Purpose of This Guide

This book provides maintenance information that is specific to the 7011 system unit, adapters, and attached devices that do not have their own service information. It also contains Maintenance Analysis Procedures (MAPs) that are not common to other systems.

MAPs that are common to all systems are contained in the *POWERstation and POWERserver Common Diagnostics and Service Guide*.

This book is used by the service technician to repair system failures. This book assumes that the service technician has had training on the 7011 system unit.

Related Information

The *POWERstation and POWERserver Common Diagnostics and Service Guide*, Order Number SA23-2687, Section I, contains the maintenance information and procedures that are common to all systems. The information and procedures in this book apply to any system unit that uses the diagnostic programs.

Section II of the *POWERstation and POWERserver Common Diagnostics and Service Guide*, contains reference information about adapters, devices, and cabling for the system units. This manual also contains the removal and replacement procedures for the logic boards on the disk drives. This manual provides the service representative pin-out lists and cabling information to use in isolating problems with customer cabling.

The *7011 POWERstation and POWERserver Operator Guide,* Order Number SA23-2664, provides information about the controls and features of the system unit.

Chapter 1. Reference Information

System Unit Locations

Front View with Cover
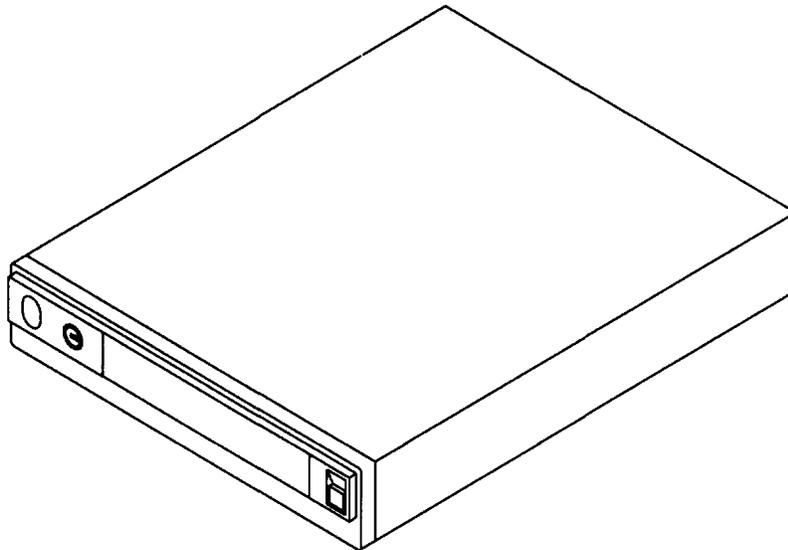
Front View with Operator Panel Door Open

Three-Digit Display

Key Mode Switch

Reset Button

Diskette Drive (Optional)

Power Switch

Power Indicator

Normal

Secure

Service

Reset

2.88

Diskette Status Light

Diskette Eject Button

Rear View

Video Connector

Serial Connectors

Parallel Connector

Optional Adapter Slots

V

S1

S2

P

1

2

K M T

ET

SCSI

Keyboard Connector

Power Cord Receptacle

Mouse Connector

Tablet Connector

Ethernet Connector

SCSI Connector

Front View without Covers

Optional Adapter

Graphics Adapter (Optional)

Disk Drive (Optional)

Diskette Drive (Optional)

Power Supply
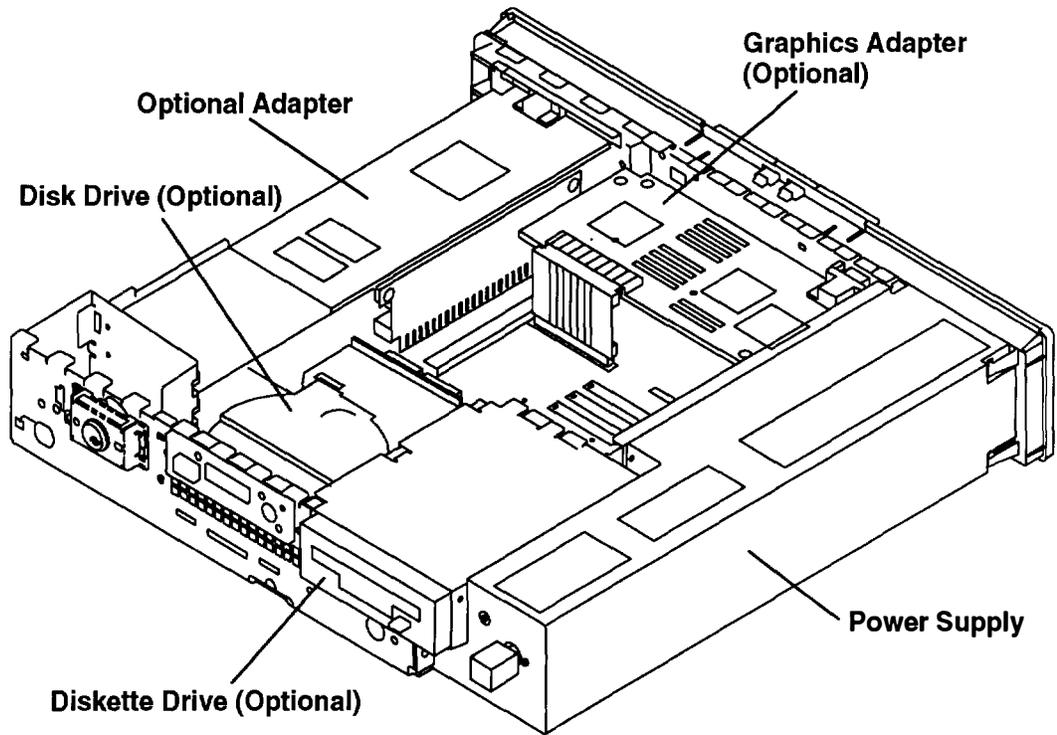
Model 220 System Board Locations

Connector	Function
J1	SCSI Connector
J2	Ethernet Connector
J3	Tablet Connector
J4	Mouse Connector
J5	Keyboard Connector
J6	Serial/Parallel Connector
J8	Riser Card Connector
J9	POWER Graphics Adapter Connector
J11	Power Supply Connector
J12 through J19	Memory (SIMMs) Connectors
J20	LED Connector
J21	Keylock Connector
J22	Disk Drive Signal Connector
J23	Diskette Connector
J24	Disk Drive Power Connector
JP1	Disable/Enable SCSI Jumpers
F1	Fuse, Ethernet
F2	Fuse for SCSI, Keyboard, Mouse, and Tablet
U16	ROM Module

Model 230 System Board Locations

Connector	Function
J1	SCSI Connector
J2	Ethernet Connector
J3	Tablet Connector
J4	Mouse Connector
J5	Keyboard Connector
J6	Serial/Parallel Connector
J8	Riser Card Connector
J9	POWER Graphics Adapter Connector
J11	Power Supply Connector
J12 through J19	Memory (SIMMs) Connectors
J20	LED Connector
J21	Keylock Connector
J22	Disk Drive Signal Connector
J23	Diskette Connector
J24	Disk Drive Power Connector
JP1	Disable/Enable SCSI Jumpers
F1	Fuse, Ethernet
F2	Fuse for SCSI, Keyboard, Mouse, and Tablet
U16	ROM Module

Model 250 System Board Locations
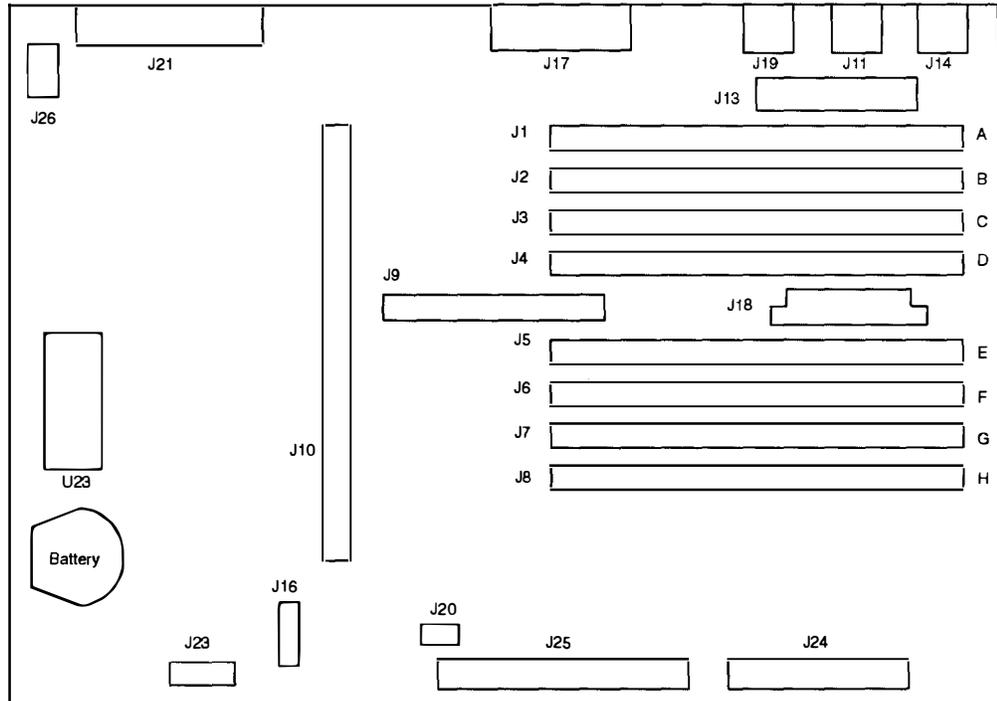
Connector	Function
J1 through J8 (A through H)	Memory (SIMMs) Connectors
J9	POWER Graphics Adapter Connector
J10	Riser Card Connector
J11	Mouse Connector
J13	Serial/Parallel Connector
J14	Keyboard Connector
J16	Keylock Connector
J17	Ethernet Connector
J18	Power Supply Connector
J19	Tablet Connector
J20	Disk Drive Power Connector
J21	SCSI Connector
J23	LED Connector
J24	Diskette Connector
J25	Disk Drive Signal Connector
J26	Disable/Enable SCSI Jumpers
U23	ROM Module

Specifications

The mechanical packaging, cooling, power supply, and environmental requirements for the 7011 workstation is shown in the following:

Dimensions (Horizontal Position)

Height – 84 mm (3.3 inches) including feet

Depth – 419 mm (16.5 inches)

Width – 406 mm (16 inches)

Dimensions (Vertical Position)

Height – 432 mm (17 inches) including stand

Depth – 419 mm (16.5 inches)

Width – 84 mm (3.3 inches); 203 mm (8 inches) at base of stand

Weight

9 –11.5 kg (20 – 25 pounds)

Operating Environment – Class A

Temperature – 16° to 32° C (60° to 90° F)

Humidity – 8% to 80 % noncondensing

Maximum Altitude – 2135 m (7000 feet)

Power Source Loading

Model 220 and 230 – 0.25 k VA maximum

Model 250 – 0.32k VA maximum

Power Supply

140 watts

Operating Voltage (Autoranging)

100 to 125 V ac; 50 to 60 Hz

200 to 240 V ac; 50 to 60 Hz

Heat Output (Maximum)

Models 220 and 230 – 570 BTU per hour

Model 250 – 511 BTU per hour

Acoustics

5.2 Bels operating

5.0 Bels idle

Disable or Enable the SCSI Connector

Optional security for SCSI is provided by five jumpers (JP1) on the system board. These jumpers (when set to the disabled position) prevent communication through the external SCSI connector. The default setting of the jumpers from the manufacturer is SCSI connector *enabled*.

Model 220

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Do the removal procedure in "Adapters" on page 3-20.

4. Remove disk drive connector J24 from the system board.

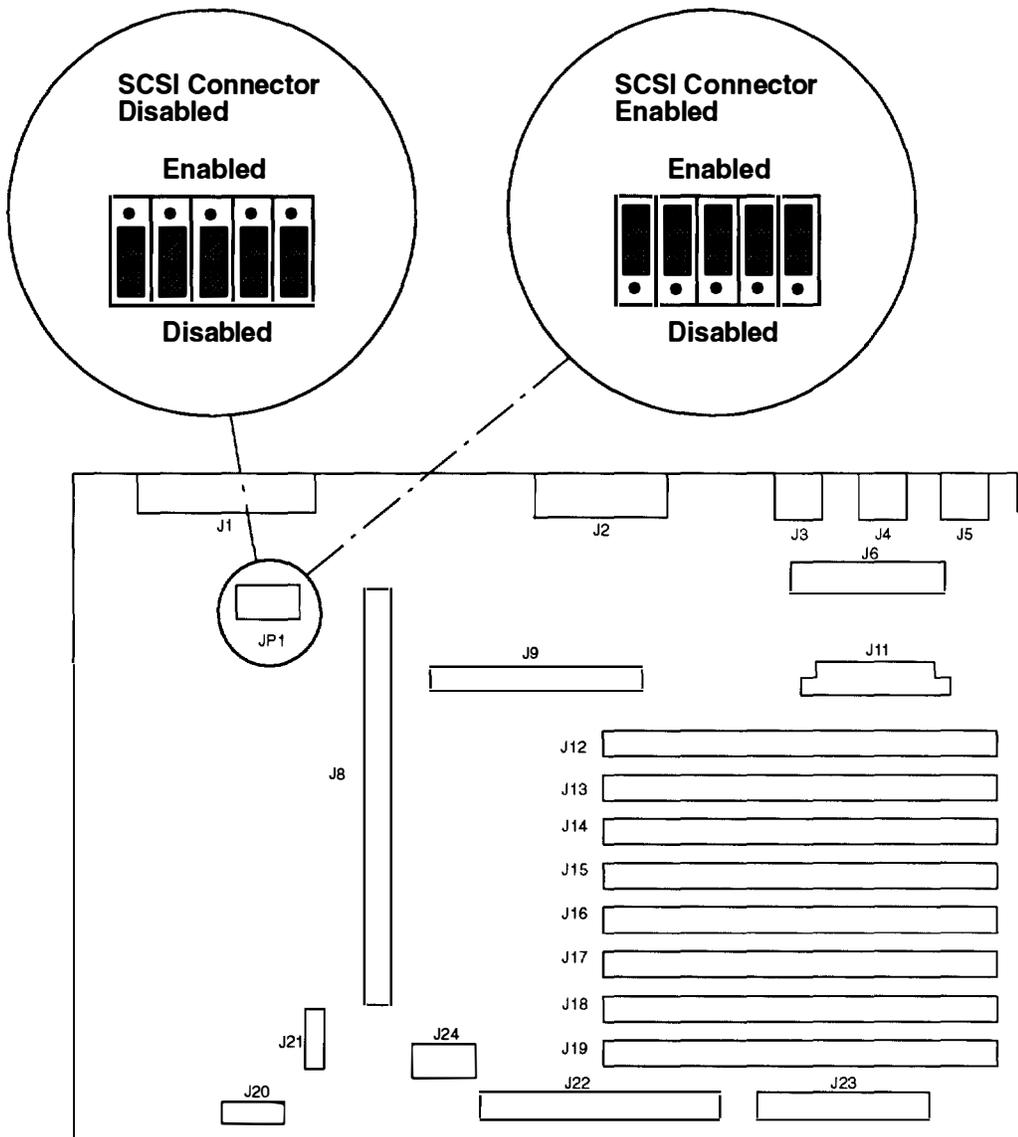5. Set the jumpers to the desired position.
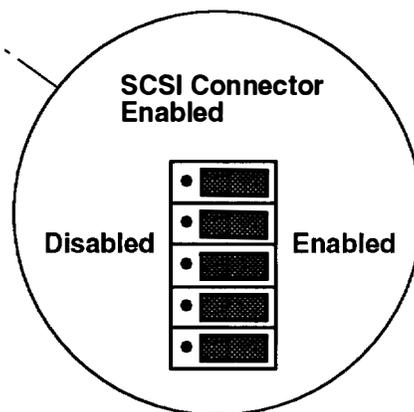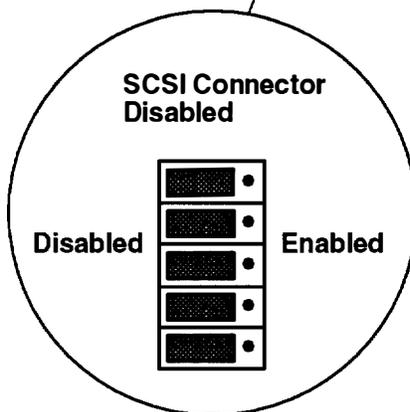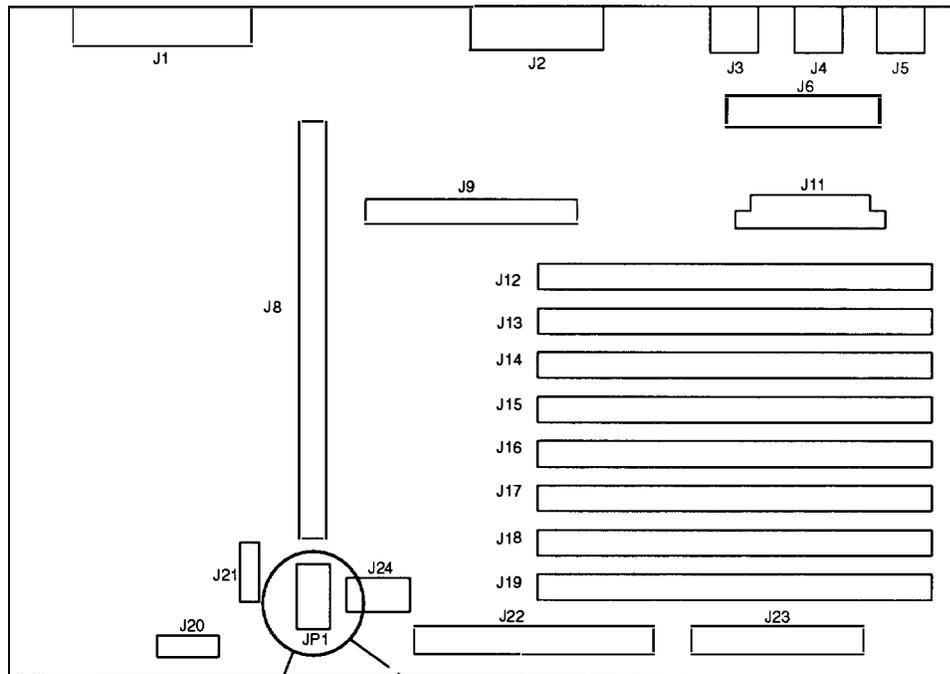
6. If you have removed any adapters, do the replacement procedure in "Adapters" on page 3-20.

7. Do the replacement procedure in "Chassis Cover" on page 3-6.

8. Do the replacement procedure in "Chassis Assembly" on page 3-3.

Model 230

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Do the removal procedure in "Adapters" on page 3-20.

4. Set the jumpers to the desired position.

5. Do the replacement procedure in "Adapters" on page 3-20.

6. Do the replacement procedure in "Chassis Cover" on page 3-6.

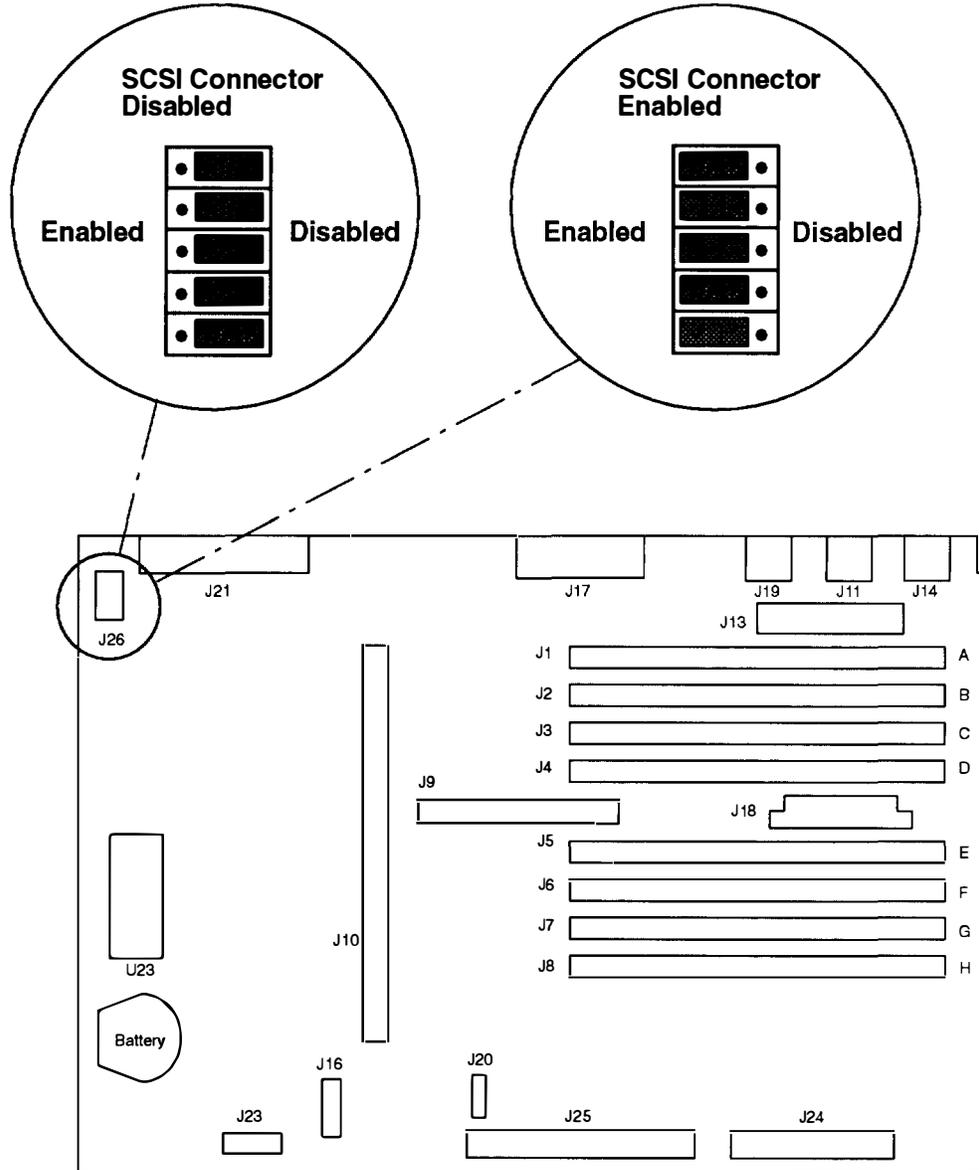7. Do the replacement procedure in "Chassis Assembly" on page 3-3.

Model 250

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Do the removal procedure in "Adapters" on page 3-20.

4. Set the jumpers to the desired position.

5. If you have removed any adapters, do the replacement procedure in "Adapters" on page 3-20.

6. Do the replacement procedure in "Chassis Cover" on page 3-6.

7. Do the replacement procedure in "Chassis Assembly" on page 3-3.

Setting the Display Jumpers

The following tables describe how to set the jumpers on the POWER Gt1, POWER Gt1B, POWER Gt1x, POWER GXT100, and POWER GXT150 graphics adapters for use with the various displays.
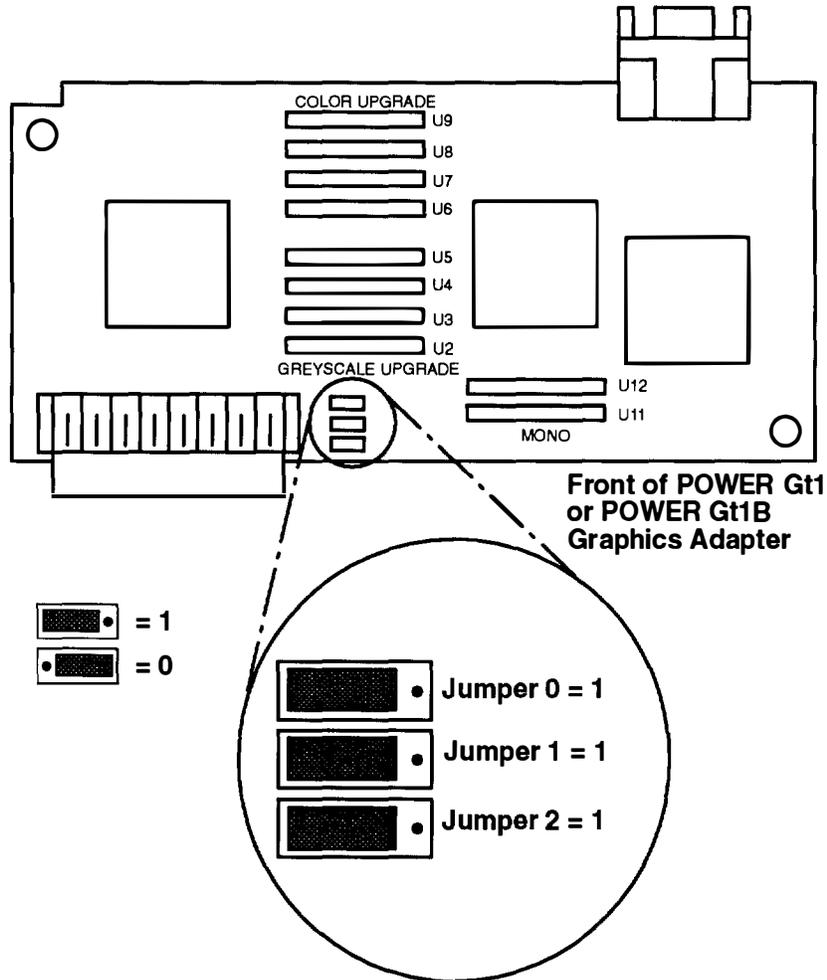
POWER Gt1 and POWER Gt1B Graphics Adapters

Refer to the illustration on page 1-11 for the location of the jumpers on the POWER Gt1 and POWER Gt1B graphics adapters.

The default setting from the manufacturer is `111`.

Display Type	Screen Resolution	Refresh Freq (Hz)	Pixel Freq (MHz)	Display Jumper 0 1 2
8507 Mono	1024 x 768	43.5	44.9	1 1 1
8508 Mono	1280 x 1024	67	128	1 1 1
8514 Color 6314 Color 6317 Color 6319 Color 6324 Color 6325 Color 6327 Color 9521 Color 9524 Color 9525 Color 9527 Color	1024 x 768 (See Notes)	43.5	44.9	1 1 1
8515 Color	1024 x 768	43.5	44.9	1 1 1
8517 Color	1024 x 768	69.96	78	1 1 1
	1280 x 1024	51.48	103	0 1 1
1091–051 Color	1280 x 1024	72	128	1 1 1
5081–16 Color	1280 x 1024	60	111	1 1 1
6091–16 Color	1280 x 1024	60	111	1 1 1
	1024 x 768	75.8	86	0 1 1
6091–19 Color	1280 x 1024	60	111	1 1 1
		67	120	1 1 0
6091–19i Color	1280 x 1024	60	111	1 1 1
POWERdisplay 20	1280 x 1024	60	111	1 1 1
6091–23 Color	1280 x 1024	60	111	1 1 1
Other Displays	1280 x 1024	60	108	1 0 1
	1024 x 768	60	64	0 0 1
		70.4	75	0 0 0

Notes:

1. The POWER Gt1B graphics adapter (FCC Class B) has only two display jumpers (0 and 1). Display jumper 2 is permanently set to 1. This limits the upper pixel frequency to 111 MHz.

2. All of the displays in the table listed with the 8514 display require device drivers included in AIX Version 4.1 or higher to operate in noninterlaced mode.

3. The POWERdisplay 20 is not supported by the POWER Gt1B adapter.

Front of POWER Gt1 or POWER Gt1B Graphics Adapter

= 1

= 0

Jumper 0 = 1

Jumper 1 = 1

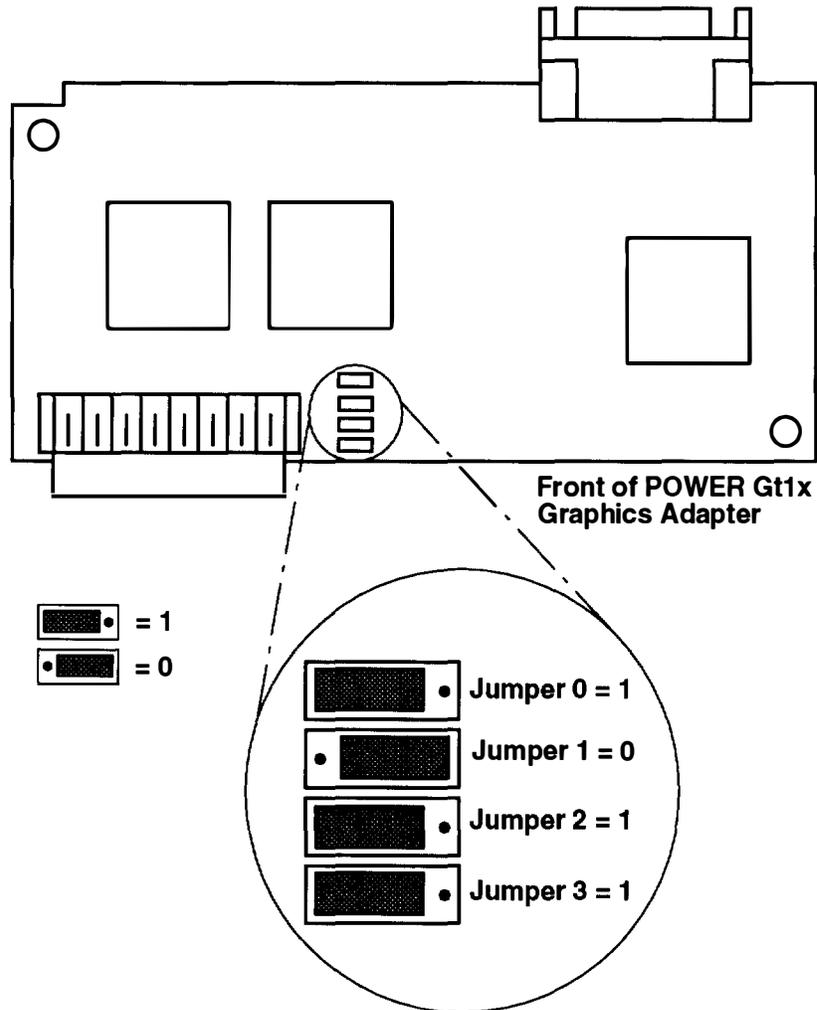Jumper 2 = 1

POWER Gt1x Graphics Adapter

Refer to the illustration on page 1-13 for the location of the jumpers on the POWER Gt1x Graphics Adapter.

The default setting from the manufacturer is `1111`.

Display Type	Screen Resolution (Noninterlaced)	Refresh Freq (Hz)	Display Jumper 0 1 2 3	Display Cable	Display Mode Switch
8508 Mono	1280 x 1024	67	1 1 1 1	51G7826	–
8517 Color	1024 x 768	70	1 1 1 1	51G7826	–
6314 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
6317 Color 6324 Color 6325 Color 6327 Color 9524 Color 9525 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
		75.8	1 0 1 1	51G7826	
	1280 x 1024	60	1 0 1 0	51G7826	–
6319 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
9521 Color 9527 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
		75.8	1 0 1 1	51G7826	
	1280 x 1024	60	1 0 1 0	51G7826	–
		77	1 1 0 1	51G7826	
1091–051 Color POWERdisplay 16S	1280 x 1024	72	1 1 1 1	09G3589	–
5081–16 Color	1280 x 1024	60	1 1 1 1	09G3539	–
6091–16 Color POWERdisplay 16	1280 x 1024	60	1 1 1 1	09G3539	out (1)
		77	1 1 0 1	09G3539	in (2)
6091–19 Color	1280 x 1024	60	1 1 1 1	09G3539	2
		67	1 1 1 0	09G3539	3
6091–19i Color POWERdisplay 19	1280 x 1024	60	1 1 1 1	09G3539	2
		77	1 1 0 1	09G3539	–
6091–23 Color	1280 x 1024	60	1 1 1 1	09G3539	–
POWERdisplay 17 POWERdisplay 20 Color	1280 x 1024	60	1 1 1 1	09G3539	
		77	1 1 0 1	09G3539	
		74	0 1 1 0	09G3539	
	1024 x 768	70	0 0 1 0	09G3539	

Display Type	Screen Resolution (Noninterlaced)	Refresh Freq (Hz)	Display Jumper 0 1 2 3	Display Cable	Display Mode Switch
Other Displays	1280 x 1024	60	0 1 1 1	09G3539	–
		74	0 1 1 0	09G3539	–
	1024 x 768	60	0 0 1 1	09G3539	–
		60	1 1 0 1	51G7827	–
		70	0 0 1 0	09G3539	–
		75.8	0 0 0 1	09G3539	–
	1152 x 900	66	0 1 0 0	51G8563	–
		76	0 1 0 1	51G8563	–

Note: The 8508, 8517, 6314, 6317, and 6319 displays require the listed adapter cable (Part Number 51G7826) for use with the display's attached cable.

Front of POWER Gt1x Graphics Adapter

= 1
= 0

Jumper 0 = 1
Jumper 1 = 0
Jumper 2 = 1
Jumper 3 = 1

POWER GXT100 and POWER GXT150 Graphics Adapters

Refer to the illustration on page 1-15 for the location of the display switches on the POWER GXT100 and POWER GXT150 graphics adapters.

The default setting from the manufacturer is `1111`.

**Note:** In the following table, Display Switch position `1` is Off; Display Switch position `0` is On.

Display Type	Screen Resolution (Noninterlaced)	Refresh Freq (Hz)	Display Switch 0 1 2 3	Display Cable— See Note	Display Mode Switch
8508 Mono	1280 x 1024	67	1 1 1 1	51G7826	–
8517 Color	1024 x 768	70	1 1 1 1	51G7826	–
6314 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
6317 Color 6324 Color 6325 Color 6327 Color 9524 Color 9525 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
		75.8	1 0 1 1	51G7826	
	1280 x 1024	60	1 0 1 0	51G7826	–
6319 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
9521 Color 9527 Color	1024 x 768	60	1 1 1 1	51G7826	–
		70	0 0 1 0	51G7826	–
		75.8	1 0 1 1	51G7826	
	1280 x 1024	60	1 0 1 0	51G7826	–
		77	1 1 0 1	51G7826	
1091–051 Color POWERdisplay 16S	1280 x 1024	72	1 1 1 1	09G3589	–
5081–16 Color	1280 x 1024	60	1 1 1 1	09G3539	–
6091–16 Color POWERdisplay 16	1280 x 1024	60	1 1 1 1	09G3539	out (1)
		77	1 1 0 1	09G3539	in (2)
6091–19 Color	1280 x 1024	60	1 1 1 1	09G3539	2
		67	1 1 1 0	09G3539	3
6091–19i Color POWERdisplay 19	1280 x 1024	60	1 1 1 1	09G3539	2
		77	1 1 0 1	09G3539	–
6091–23 Color	1280 x 1024	60	1 1 1 1	09G3539	–
POWERdisplay 17 POWERdisplay 20 Color	1280 x 1024	60	1 1 1 1	09G3539	
		77	1 1 0 1	09G3539	
		74	0 1 1 0	09G3539	
	1024 x 768	70	0 0 1 0	09G3539	

Display Type	Screen Resolution (Noninterlaced)	Refresh Freq (Hz)	Display Jumper 0 1 2 3	Display Cable– See Note	Display Mode Switch
Other Displays	1280 x 1024	60	0 1 1 1	09G3539	–
		74	0 1 1 0	09G3539	–
	1024 x 768	60	0 0 1 1	09G3539	–
		60	1 1 0 1	51G7827	–
		70	0 0 1 0	09G3539	–
		75.8	0 0 0 1	09G3539	–
	1152 x 900	66	0 1 0 0	51G8563	–
		76	0 1 0 1	51G8563	–

Notes:

- The POWER GXT100 graphics adapter supports a 1024 by 768 image resolution. The POWER GXT150 supports all resolutions listed.

- Some displays require the listed adapter cable (Part Number 51G7826) for use with the display's attached cable.

To set the switches, use a pen or paper clip to slide the switch toward or away from the numbers printed on the switch case. The switches are On (0) when slid away from the numbers and Off (1) when slid toward the numbers.

Switch Setting Shown: 1101

Front of POWER GXT100 or POWER GXT150 Graphics Adapter

Video Connector
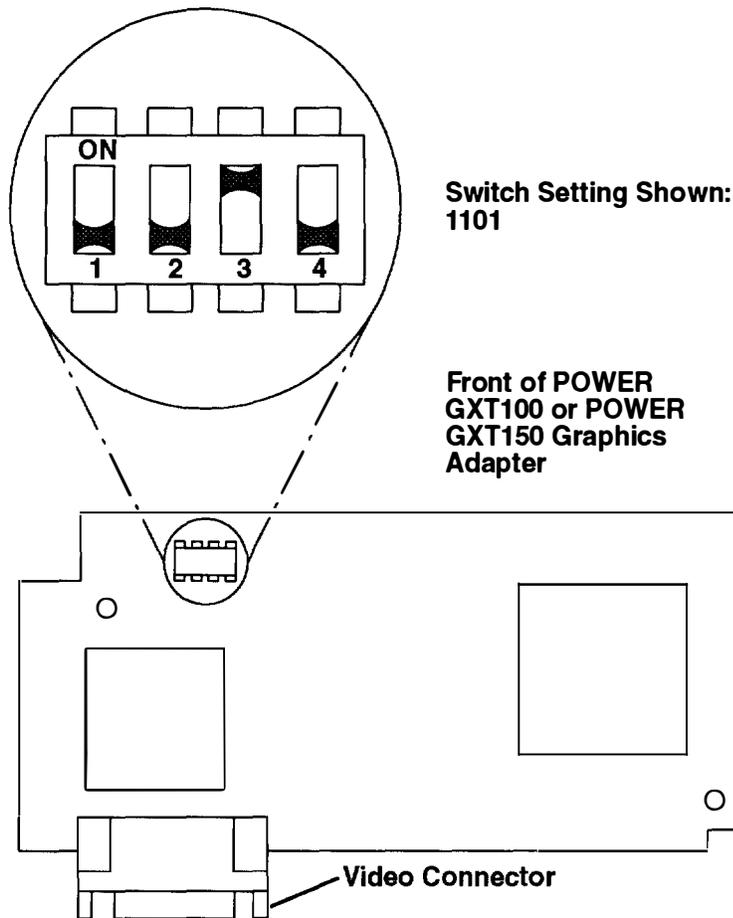
Power Cables

To avoid electrical shock, a power cable with a grounded attachment plug is provided. Use only properly grounded outlets.

Power cables used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA). These power cords consist of:

- Electrical cables, Type SVT or SJT.

- Attachment plugs complying with National Electrical Manufacturers Association (NEMA) 5-15P. That is:

   "For 115 V operation, use a UL listed cable set consisting of a minimum 18 AWG, Type SVT or SJT three-conductor cord a maximum of 15 feet in length and a parallel blade, grounding type attachment plug rated at 15 A, 125 V."

   "For 230 V operation in the United States use a UL listed cable set consisting of a minimum 18 AWG, Type SVT or SJT three-conductor cable a maximum of 15 feet in length, and a tandem blade, grounding type attachment plug rated at 15 A, 250 V."

- Appliance couplers complying with International Electrotechnical Commission (IEC) Standard 320, Sheet C13.

Power cables used in other countries consist of the following:

- Electrical cables, Type HD21.

- Attachment plugs approved by the appropriate testing organization for the specific countries where they are used.

   "For units set at 230 V (outside of U.S.): use a cable set consisting of a minimum 18 AWG cable and grounding type attachment plug rated 15 A, 250 V. The cable set should have the appropriate safety approvals for the country in which the equipment will be installed and should be marked 'HAR'."

Refer to "Power Cables and Plugs" on page 5-1 to find the power cables that are available.

Service Inspection Guide

Perform a service inspection on the system when:

- The system is inspected for a maintenance agreement.
- Service is requested and service has not recently been performed.
- An alterations and attachments review is performed.
- Changes have been made to the equipment that may affect the safe operation of the equipment.
- External devices with their own power cables have those cables attached.

If the inspection indicates an unacceptable safety condition, the condition must be corrected before anyone can service the machine.

Note: The correction of any unsafe condition is the responsibility of the owner of the system.

Perform the following checks:

1. Check the covers for sharp edges and for damage or alterations that expose the internal parts of the system unit.
2. Check the covers for proper fit to the system unit. They should be in place and secure.
3. Gently rock the system unit from side to side to determine if it is steady.
4. Set the power switch of the system unit to Off.
5. Remove the covers.
6. Check for alterations or attachments. If there are any, check for obvious safety hazards such as broken wires, sharp edges, or broken insulation.
7. Check the internal cables for damage.
8. Check for dirt, water, and any other contamination within the system unit.
9. Check the voltage label on the back of the system unit to ensure that it matches the voltage at the outlet.
10. Check the external power cable for damage.
11. With the external power cable connected to the system unit, check for 0.1 ohm or less resistance between the ground lug on the external power cable plug and the metal frame.
12. Perform the following checks on each device that has its own power cables:
    a. Check for damage to the power cord.
    b. Check for the correct grounded power cable.
    c. With the external power cable connected to the device, check for 0.1 ohm or less resistance between the ground lug on the external power cable plug and the metal frame of the device.
13. Install the covers.

Chapter 2. Maintenance Analysis Procedures (MAPs)

MAP 1520: Power Map

Note: This is not the "Start of Call" MAP. For the "Start of Call" MAP, refer to the *POWERstation and POWERserver Common Diagnostics and Service Guide.*

Purpose of This MAP

The Power MAP assists the trained service person in analyzing power problems in the system unit.

DANGER

> **An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.**
>
> **Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.**
>
> **When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.**
>
> **Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.**
>
> **During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.**

CAUTION:
This product is equipped with a three-wire power cable and plug for the user's safety. Use this power cable in conjunction with a properly grounded electrical outlet to avoid electrical shock.

Step 1.

Check that the external power cable to the system unit has continuity, is plugged into both the system unit and the outlet, and the outlet has the correct voltage.

Did you find a problem?

NO   Go to Step 2.

YES   Correct the problem and go to Step 15.

Step 2.

(from Step 1)

1. Set the power switch on the system unit to Off.

2. Remove the cover. (Refer to "Chassis Cover" on page 3-6.)

3. Disconnect the power supply connector from the system board.

4. Set the power switch on the system unit to On.

Did the power-on light come on and stay on, and are both power supply fans running continuously?

NO   Exchange the power supply and go to Step 15.

YES   Go to Step 3.

Step 3.

(from Step 2)

1. Set the power switch on the system unit to Off.

2. Connect the power supply connector to the system board.

Is a diskette drive installed?

NO   Go to Step 5.

YES   Go to Step 4.

Step 4.

(from Step 3)

1. Disconnect the diskette drive signal cable connector from the system board.

2. Set the power switch on the system unit to On.

Did the power light come on and stay on?

NO   Go to Step 5.

YES   Exchange the diskette drive and go to Step 15.

Step 5.

(from Steps 3 and 4)

Is a disk drive installed?

NO   Go to Step 7.

YES   Go to Step 6.

Step 6.

(from Step 5)

1. Set the power switch on the system unit to Off.

2. Disconnect the disk drive power cable connector.

3. Set the power switch on the system unit to On.

Did the power light come on and stay on?

NO   Go to Step 7.

YES   Exchange in this order; then go to Step 15.

              1. Disk drive

              2. Signal connector.

Step 7.

(from Steps 5 and 6)

1. Set the power switch on the system unit to Off.

2. Record the location of each adapter and memory card.

3. Remove one card.

4. Set the power switch on the system unit to On.

Did the power light come on and stay on?

NO   If all adapter and memory cards have not been removed, repeat this step. If all cards have been removed, go to Step 8.

YES   Go to Step 9.

Step 8.

(from Step 7)

1. Set the power switch on the system unit to Off.

2. Unplug one cable from the back of the system unit, such as the keyboard, tablet, mouse, serial or parallel port.

3. Set the power switch on the system unit to On.

Did the power-on light come on and stay on?

NO   Repeat this step until all cables have been removed; then go to Step 14.

YES   Repair or exchange the cable or its device that was just removed; then go to Step 15.

Step 9.

Look at the card that was removed.

Were any cables connected to the card?

NO   Go to Step 10.

YES   Go to Step 12.

Step 10.

Refer to the *POWERstation and POWERserver Common Diagnostics and Service Guide* to see if the card has more than one field-replaceable unit (FRU).

Does the failing card have additional FRUs?

NO   Exchange the failing card; then go to Step 15.

YES   Go to Step 11.

Step 11.

1. Set the power switch on the system unit to Off.

2. Remove all FRUs from the failing card.

3. Replace the failing card on the system board.

4. Set the power switch on the system unit to On; wait 10 seconds before answering the following question.

Is the power-on light on?

NO   Exchange the failing card; then go to Step 15.

YES   One of the additional FRUs that was removed is failing. If only one FRU was removed, exchange it. Otherwise, replace the removed FRUs, one at a time until you identify the failing FRU. Exchange the failing FRU and go to Step 15.

Step 12.

(from Step 9)

1. Set the power switch on the system unit to Off.

2. Replace the adapter without its cables.

3. Set the power switch on the system unit to On.

Did the power-on light come on and stay on?

NO   Exchange the adapter; then go to Step 15.

YES   Go to Step 13.

Step 13.

(from Step 12)

Either the cable or its device is defective.

1. Set the power switch on the system unit to Off.

2. Disconnect anything from the device end of the cable.

3. Connect the cable to the adapter.

4. Set the power switch on the system unit to On.

Did the power-on light come on and stay on?

NO   Exchange the cable; then go to Step 15.

YES   Repair or exchange the defective device; then go to Step 15.

Step 14.

(from Step 8)

1. Set the power switch on the system unit to Off.

2. Disconnect one of the following: operator panel, key mode switch, or any other cable (except power) attached to the system board.

3. Set the power switch on the system unit to On.

Did the power-on light come on and stay on?

NO   Repeat this step until the defective part is located or all connectors have been disconnected; exchange the system board and go to Step 15.

YES   Repair or exchange the FRU that was removed and go to Step 15.

Step 15.

(from Steps 1, 2, 4, 6, 8, 10, 11, 12, 13, and 14)

This completes the repair. Go to "MAP 0410: Repair Checkout" in the *POWERstation and POWERserver Common Diagnostics and Service Guide*.

MAP 1540: Minimum Machine Configuration

Purpose of This MAP

The Minimum Machine Configuration Map assists the trained service representative in analyzing configuration problems in the system unit.

Step 1.

(from Steps 3, 9, 12, 14, 17, and 22)

1. Set the power switch on the system unit to Off.

2. Set the key mode switch to the Service position.

3. Remove any adapters in slots 1 and 2. Record the slot numbers of the adapters and any cables attached to the adapter. Remove the riser card that connects the adapters to the system board.

4. Remove any memory SIMMs and record their socket numbers.

5. Unplug the disk drive signal cable if present.

6. Disconnect the signal cable from the diskette drive if present.

7. Disconnect all external device cables.

8. Remove the graphics adapter if present. Remove the graphics adapter connector that connects the graphics adapter to the system board.

9. Set the power switch on the system unit to On.

10. Wait for one of the following conditions:

   – The system stops for at least one minute with a constant number, character, or symbol in the three-digit display.

   – A flashing 888 is displayed in the three-digit display.

Is 213 displayed in the three-digit display?

NO   Go to Step 2.

YES   Go to Step 4.

Step 2.

(from Step 1)

Is 211 displayed in the three-digit display?

NO   Go to Step 3.

YES   Exchange the system board and retry Step 1. If this does not fix the problem, continue to Step 3.

Step 3.

(from Step 2)

One of the FRUs in the system is defective.

- Exchange the FRUs that have not been exchanged in the following order:

1. System board

2. Power supply.

- Test each FRU by setting the power switch on the system unit to On. No failure has been detected when the system stops with 213 in the three-digit display. The last FRU exchanged is defective.

Were you able to identify the defective FRU?

NO   Set the power switch on the system unit to Off.

                      If the symptom changed, go to Step 1.

                      If the symptom did not change, call your next level of support for assistance.

YES   Go to Step 19.

Step 4.

(from Step 1)

No failure was detected. One of the FRUs you removed is probably defective.

1. Set the power switch on the system unit to Off.

2. For Models 220 and 230, install one pair of memory SIMMs in positions A and B. For the Model 250, install a set of four matching SIMMs in positions A, B, C, and D.

   Refer to page 3-28 for an illustration of the SIMM locations on the system board.

3. Set the power switch on the system unit to On.

4. Wait for one of the following conditions:

   - The system stops for at least one minute with a constant number, character, or symbol in the three-digit display.

   - A flashing 888 is displayed in the three-digit display.

Is 261 or 262 displayed in the three-digit display?

NO   Go to Step 8.

YES   Go to Step 5.

Step 5.

(from Step 4)

Are all of the memory SIMMs that were removed previously installed back into the system unit?

NO   Go to Step 6.

YES   Go to Step 13.

Step 6.

(from Step 5)

No failure was detected. One of the FRUs you removed is probably defective.

1. Set the power switch on the system unit to Off.

2. Reinstall the next set of the SIMMs in their original slots:

   a. For the Models 220 and 230, reinstall the next pair of SIMMS in their original slots.

   b. For the Model 250, reinstall the next quad SIMMs (set of four) in their original slots.

3. Set the power switch on the system unit to On.

4. Wait for one of the following conditions:

   – The system stops for at least one minute with a constant number, character, or symbol in the three-digit display.

   – A flashing 888 is displayed in the three-digit display.

Is 261 or 262 displayed in the three-digit display?

NO   Go to Step 7.

YES   Go to Step 13.

Step 7.

(from Step 6)

One of the FRUs in the system is defective.

Exchange the FRUs that have not been exchanged in the following order:

- Memory SIMMs.

- System board.

1. Test each FRU by setting the power switch on the system unit to On. No failure has been detected when the system stops with 261 or 262 in the three-digit display. Any other condition means the FRU is defective.

2. Go to Step 19.

Step 8.

(from Step 4)

One of the FRUs in the system unit is defective.

Do you have another pair of SIMMs? (For the Model 250, do you have another quad of SIMMS?)

NO   Go to Step 9.

YES   Go to Step 10.

Step 9.

(from Step 8)

Exchange the FRUs that have not been exchanged in the following order:

1. Memory SIMMs
2. System board
3. Power supply.

Test each FRU by setting the power switch on the system unit to On. No failure has been detected when the system stops with 261 or 262 in the three-digit display. The last FRU exchanged is defective.

Were you able to identify the defective FRU?

NO   Set the power switch on the system unit to Off.

                   If the symptom changed, go to Step 1.

                   If the symptom did not change, call your next level of support for assistance.

YES   Go to Step 19.

Step 10.

(from Step 8)

1. Set the power switch on the system unit to Off.
2. For Models 220 and 230, remove the pair of memory SIMMs in positions A and B.

   For the Model 250, remove the quad of SIMMs in positions A, B, C, and D.

   Refer to page 3-28 for an illustration of the SIMM locations on the system board.
3. For Models 220 and 230, install a different pair of memory SIMMs in positions A and B.

   For the Model 250, install a different quad of SIMMs in positions A, B, C, and D.
4. Set the power switch on the system unit to On.
5. Wait for one of the following conditions:

   – The system stops for at least one minute with a constant number, character, or symbol in the three-digit display.

   – A flashing 888 is displayed in the three-digit display.

Is 261 or 262 displayed in the three-digit display?

NO   Go to Step 12.

YES   Go to Step 11.

Step 11.

One of the SIMMs you just removed is defective.

1. Test each FRU by setting the power switch on the system unit to On. No failure has been detected when the system stops with `261` or `262` in the three-digit display. Any other condition means the memory SIMM is defective.

2. Exchange the defective SIMM.

3. Go to Step 19.

Step 12.

Exchange the FRUs that have not been exchanged in the following order:

1. System board

2. Power supply.

Test each FRU by setting the power switch on the system unit to On. No failure has been detected when the system stops with `261` or `262` in the three-digit display. The last FRU exchanged is defective.

Were you able to identify the defective FRU?

NO   Set the power switch on the system unit to Off.

If the symptom changed, go to Step 1.

If the symptom did not change, call your next level of support for assistance.

YES   Go to Step 19.

Step 13.

(from Steps 5 and 6)

No failures have been detected. One of the FRUs you removed is probably defective.

1. Set the power switch on the system unit to Off.

2. Connect either:
   - A terminal (to serial port 1)
   - A keyboard and display.

3. Set the power switch on the system unit to On.

4. Wait for one of the following conditions:
   - The system stops for at least one minute with a constant number, character, or symbol in the three-digit display.
   - A flashing 888 is displayed in the three-digit display.
   - The system stops for at least one minute with a number in the three-digit display.

Is 260, 261, or 262 displayed in the three-digit display?

NO   Go to Step 14.

YES   Go to Step 15.

Step 14.

(from Step 13)

Exchange the FRUs that have not been exchanged in the following order:

1. Display/adapter

2. Keyboard

3. System board

4. Power supply.

Test each FRU by setting the power switch on the system unit to On. No failure has been detected when the system stops with either 260, 261, or 262 in the three-digit display. The last FRU exchanged is defective.

Were you able to identify the defective FRU?

NO   Set the power switch on the system unit to Off.

             If the symptom changed, go to Step 1.

             If the symptom did not change, call your next level of support for assistance.

YES   Go to Step 19.

Step 15.

The system is working correctly with this configuration. One of the FRUs you removed is probably defective.

If you are using a terminal attached to serial port 1, press any key.

Did the Main Menu display?

NO   Go to Step 16.

YES   Go to Step 20.

Step 16.

Was an SRN reported?

NO   Go to Step 17.

YES   Go to Step 18.

Step 17.

Exchange the FRUs that have not been exchanged in the following order:

1. Display, adapter, or terminal

2. System board

3. Power supply.

Test each FRU by rerunning the diagnostics.

Were you able to identify the defective FRU?

NO   Set the power switch on the system unit to Off.

                            If the symptom changed, go to Step 1.

                            If the symptom did not change, call your next level of support for assistance.

YES   Go to Step 18.

Step 18.

(from Steps 16, 17, and 20)

Exchange the FRUs indicated by the SRN.

Test each FRU by rerunning the diagnostics.

Were you able to identify the defective FRU?

NO   Go to Step 22.

YES   Go to Step 19.

Step 19.

(from Steps 3, 7, 9, 11, 12, 14, 18, 21, and 22)

Replace all remaining FRUs one at a time starting with your initial program load (IPL) device.

Run diagnostics each time a FRU is added.

A failure indicates the last FRU replaced was defective. When all FRUs have been tested and replaced if necessary:

- Go to "Map 0410: Repair Checkout" in the *POWERstation and POWERserver Common Diagnostics and Service Guide*.

Step 20.

(from Step 15)

Run the diagnostics.

Was an SRN reported?

NO   Go to Step 21.

YES   Go to Step 18.

Step 21.

(from Step 20)

Replace all remaining FRUs one at a time.

Run diagnostics each time a FRU is added.

Were you able to identify the defective FRU?

NO   Go to Step 22.

YES   Exchange the defective FRU. Go to Step 19.

Step 22.

(from Step 18 and 21)

Exchange the FRUs that have not been exchanged in the following order:

1. IPL device

2. System board

3. Power supply.

Test each FRU by rerunning the diagnostics.

Were you able to identify the defective FRU?

NO   Set the power switch on the system unit to Off.

                If the symptom changed, go to Step 1.

                If the symptom did not change, call your next level of support for assistance.

YES   Exchange the defective FRU. Go to Step 19.

MAP 1560: Diagnostics

Purpose of This MAP

The Diagnostics MAP assists the trained service representative in using the system unit's built-in diagnostic programs. This MAP should be used when the system diagnostics cannot be loaded because of a hardware problem. Entry into this MAP should be from "MAP 0020" in the *POWERstation and POWERserver Common Diagnostics and Service Guide.*

Step 1.

1. Set the power switch on the system unit to Off.

2. Wait 10 seconds.

3. Set the mode switch to the Secure position.

4. Turn on system power.

5. Wait until one of the following occurs:

   - The same number is displayed in the LEDs for more than one minute.

   - The number 888 flashes in the LEDs.

   - The system stops with nothing in the LEDs.

   - The system stops with a menu displayed.

Is 200 displayed in the three-digit display?

NO   Go to Step 2.

YES   Go to Step 3.

Step 2.

(from Step 1)

Is the Configuration and Diagnostics Main Menu displayed?

NO   Go to "MAP 0020: Problem Determination Procedure," Step 1, in the *POWERstation and POWERserver Common Diagnostics and Service Guide.*

YES   Perform the following:

                  1. Record SRN 111-102.

                  2. Go to Step 9.

Step 3.

(from Step 1)

1. Set the mode switch to the Service position.

2. Press the system Reset button.

3. Wait until one of the following occurs:

    - The same number is displayed in the LEDs for more than one minute.

    - The number `888` flashes in the LEDs.

    - The system stops with nothing in the LEDs.

    - The system stops with a menu displayed.

Is the Configuration and Diagnostics Main Menu displayed?

NO   Go to "MAP 0020: Problem Determination Procedure," Step 1 in the *POWERstation and POWERserver Common Diagnostics and Service Guide*.

YES   Go to Step 4.

Step 4.

(from Step 3)

Select option 5, `Perform Diagnostics`.

Is the Diagnostics Screen displayed?

NO   Perform the following:

        1. Record SRN 111-921.

        2. Go to Step 9.

YES   Go to Step 5.

Step 5.

(from Step 4)

Select option 2, `Perform Built-In Service Diagnostics.`

Is the Test Selection Menu displayed?

NO   Perform the following:

                         1. Record SRN 111-921.

                         2. Go to Step 9.

YES   Go to Step 6.

Step 6.

(from Step 5)

1. Select option 1, `Run All Built-In Service Diagnostics.`

2. When the Test Mode screen appears, select option 1, `Run One Time.`

3. Follow the displayed instructions for each test.

Did you arrive at the Test Completed, No Trouble Found menu?

NO   Go to Step 7.

YES   Go to Step 10.

Step 7.

(from Step 6)

Did you arrive at the Test Completed, Problem Detected menu?

NO   Go to Step 8.

YES   Go to Step 9.

Step 8.

(from Step 7)

Did the system stop with a steady number displayed in the LEDs?

NO   Go to MAP 1540, Step 1.

YES   Perform the following:

                         1. Record SRN 101-*xxx*, where *xxx* is the number displayed in the LEDs.

                         2. Go to Step 9.

Step 9.

(from Steps 2, 4, 5, 7, and 8)

1. Find the SRN in the "Service Request Number List" in Chapter 2 of the *POWERstation and POWERserver Common Diagnostics and Service Guide.*

2. Proceed to the MAP listed in the Description and Action column.

Step 10.

(from Step 6)

All built-in diagnostics have run without error. If you are trying to IPL over a communications network, problems could be caused by configuration errors, network errors, or host problems. Local problem determination procedures should be used before returning to operating system diagnostics.

Go to "MAP 0020: Problem Determination Procedure," Step 1 in the *POWERstation and POWERserver Common Diagnostics and Service Guide.*

Chapter 3. Removal and Replacement Procedures

Before performing any of the removal or replacement procedures in this chapter, read the following notice.

Handling Static-Sensitive Devices

Warning: Adapters, planars, diskette drives, and disk drives are sensitive to static electricity discharge. These devices are wrapped in antistatic bags, as shown in this illustration, to prevent this damage.

Take the following precautions:

- If you have an antistatic wrist strap available, use it while handling the device.

- Do not remove the device from the antistatic bag until you are ready to install the device in the system unit.

- With the device still in its antistatic bag, touch it to a metal frame of the system.

- Grasp cards and boards by the edges. Hold drives by the frame. Avoid touching the solder joints or pins.

- If you need to lay the device down while it is out of the antistatic bag, lay it on the antistatic bag. Before picking it up again, touch the antistatic bag and the metal frame of the system unit at the same time.

- Handle the devices carefully in order to prevent permanent damage.

Antistatic Bag

DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.

When adding or removing any additional devices to or from the system, ensure that the power cables for those devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

During an electrical storm, do not connect cables for display stations, printers, telephones, or station protectors for communications lines.

Chassis Assembly

Removal

1. Have the customer unlock and remove the security protection devices, if any are attached to the security protection port.
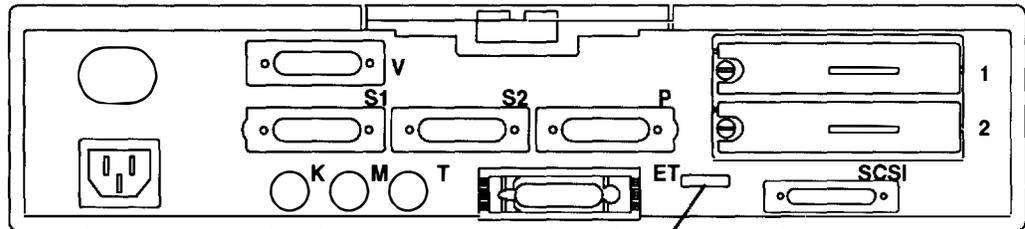
Security Protection Port

2. Set the power switches of the attached devices to Off.

3. Set the power switch of the system unit to Off.

4. Set the key mode switch to the Service position.

5. Unplug the system unit power cable, display power cable, and attached device power cables from electrical outlets.

6. While pressing down on the plastic tab that extends from the upper edge of the rear cover, slide the chassis assembly out of the cover by pulling on the plastic tab.

Plastic Tab

Rear of System Unit
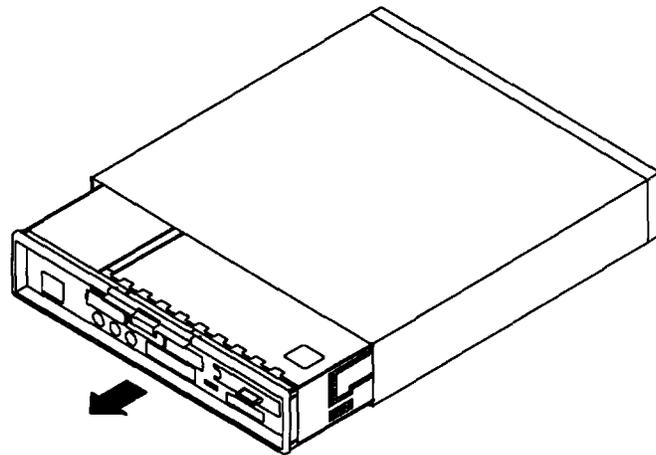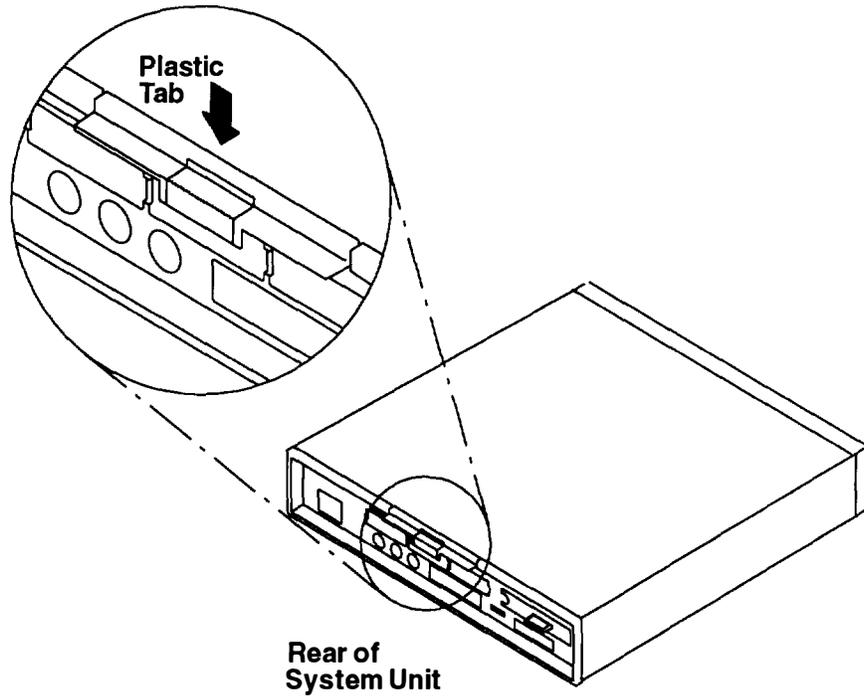
7. Disconnect any attached cables that restrict movement of the chassis assembly.

Replacement

1. Slide the chassis assembly into the cover until it latches. You should hear an audible click.

2. Check that the chassis assembly is properly latched by pulling on the plastic tab. The chassis assembly will not move if it is properly latched in the cover.

3. Connect any cables that were disconnected during the removal procedure.

4. Plug the system unit power cable, display power cable, and attached device power cables into electrical outlets.

5. Set the power switches of the attached devices to On.

6. Set the power switch of the system unit to On.

7. Remind the customer to install and lock any security protection devices that were previously removed.

Chassis Cover

Removal

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Remove two screws from the chassis cover.

Rear of Chassis

Chassis Cover Screws
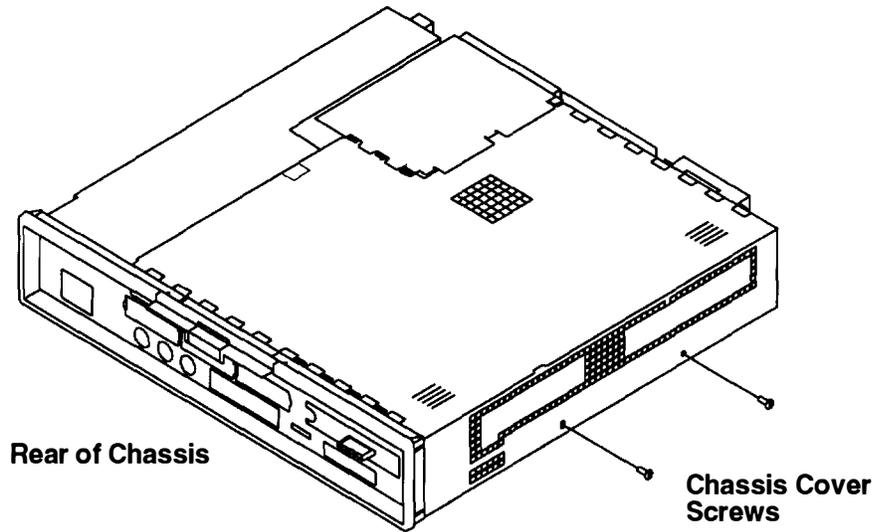
3. Place a coin or screwdriver in the cover slot and pry the cover in the direction of the arrows.

Cover Slot

Rear of Chassis
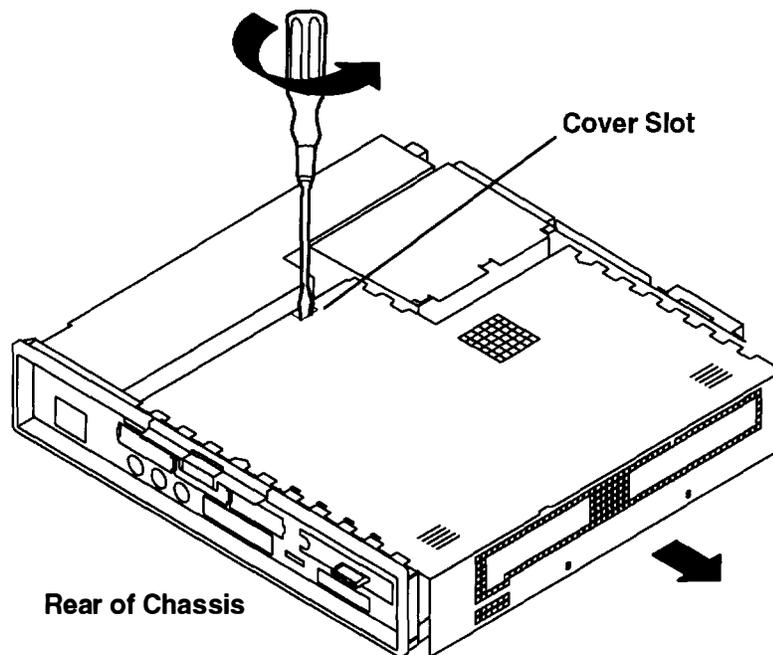
4. Place your thumbs on the chassis cover thumb grips and grip the bottom of the chassis cover with your fingers.

   a. Cover movement is approximately 12.7 mm (1/2 inch).

   b. Ensure that the arrow shaped cutouts align with the arrow shaped tabs on the chassis.

Cutout

Tab

Cover Slot

Rear of Chassis
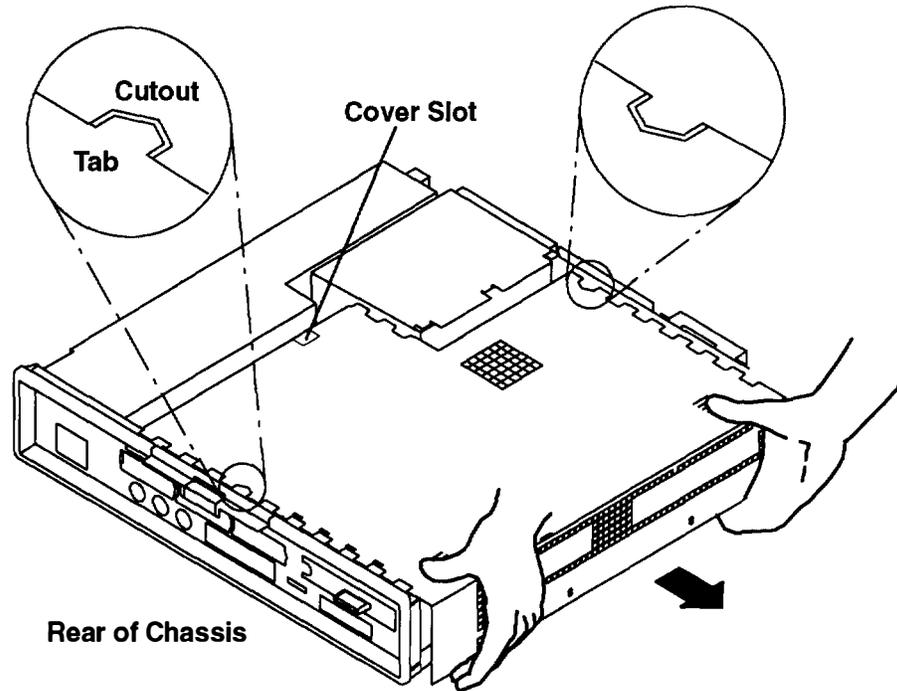
5. Lift chassis cover off.

Rear of Chassis
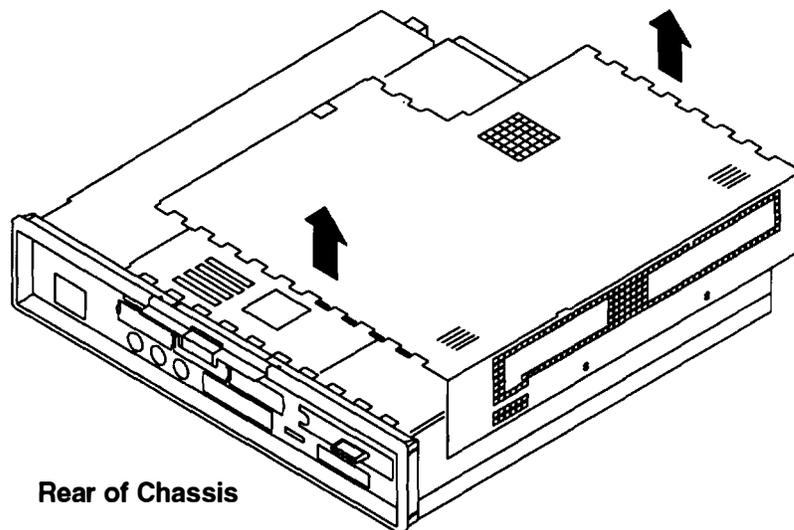
Replacement

1. Place the chassis cover on the chassis.

Rear of Chassis
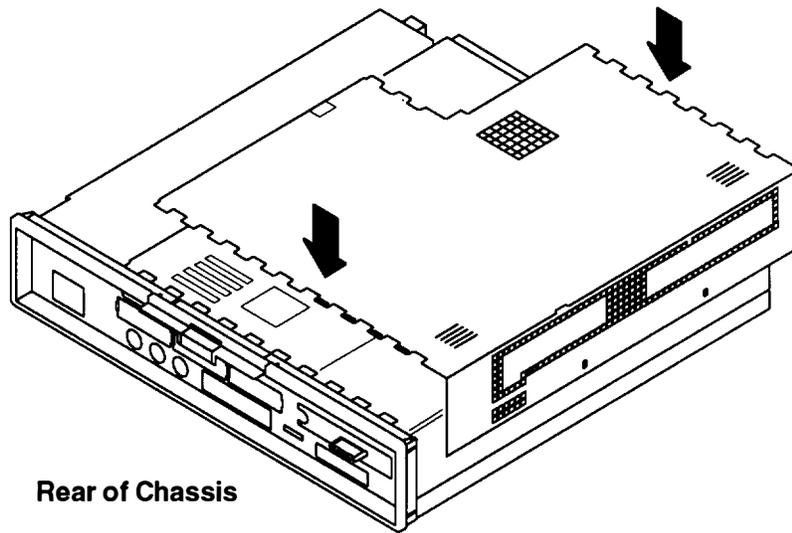
2. Align chassis cover cutouts with tabs.

   a. Ensure that the arrow shaped cutouts align with the arrow shaped tabs on the chassis.

   b. Slide the cover toward the chassis approximately 13 mm (1/2 inch).

Cutout

Tab

Rear of Chassis
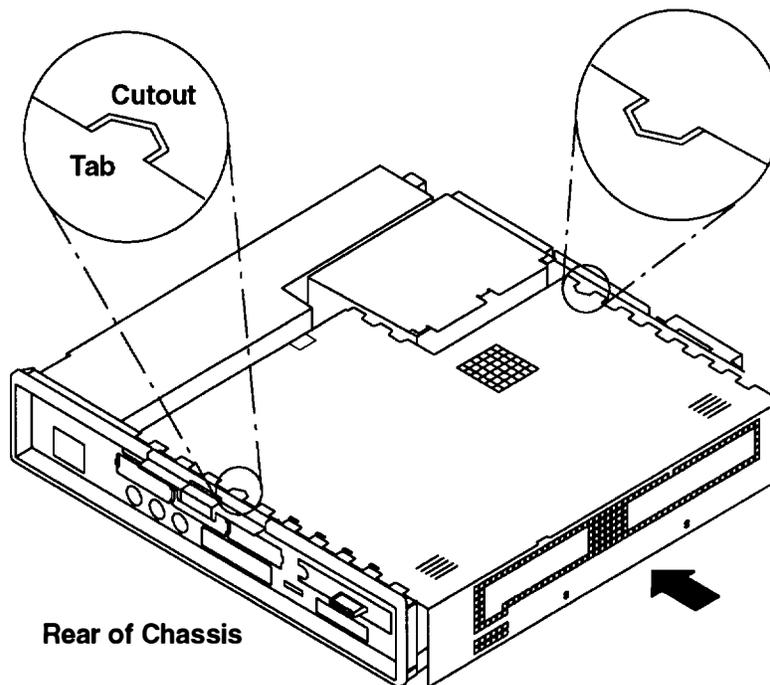
3. Install and tighten the two screws in the chassis cover. Failure to tighten the screws may prevent installation or later removal of the outer cover.

Rear of Chassis

Chassis Cover Screws
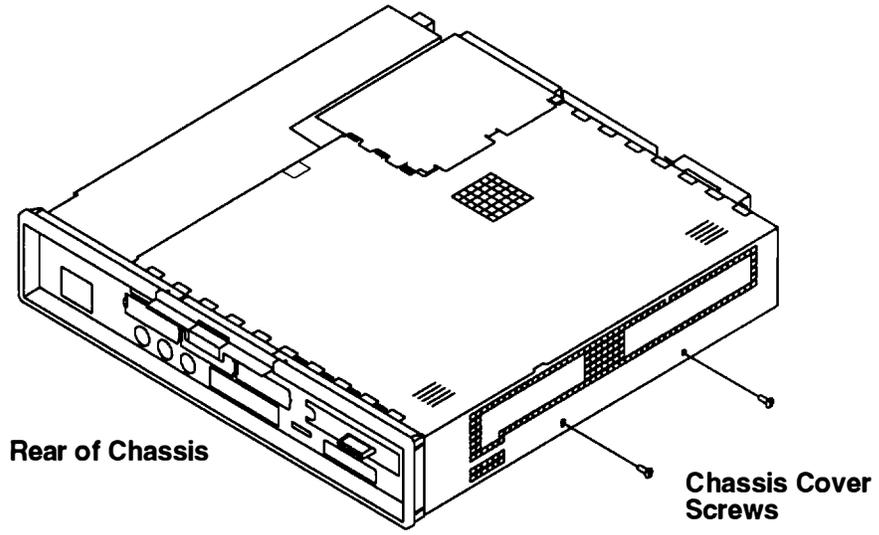
Power Supply

DANGER

Do not attempt to open the covers of the power supply. Power supplies are not serviceable and are to be replaced as a unit.

Removal

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Unplug the power cord from the power supply.

4. Remove the riser card support.
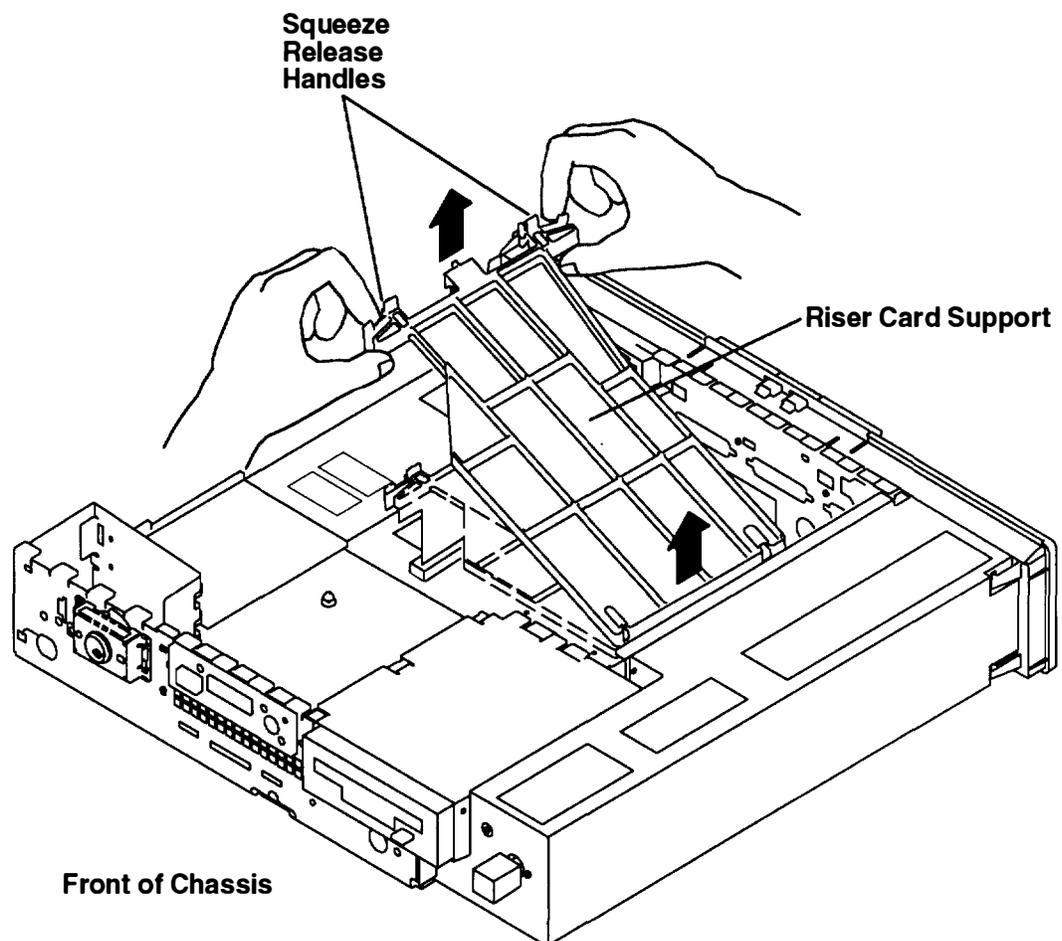
5. If a graphics adapter is installed, perform the removal procedure in "POWER Graphics Adapters" on page 3-47.

6. Disconnect the power supply cable connector from the system board.

   a. For the Models 220 and 230, the power supply connector is labeled J11.
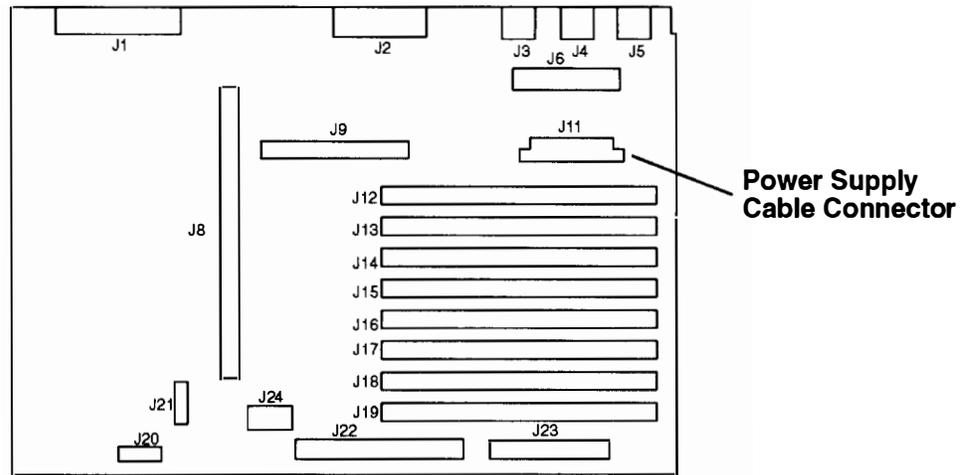
   b. For the Model 250, the power supply connector is labeled J18.
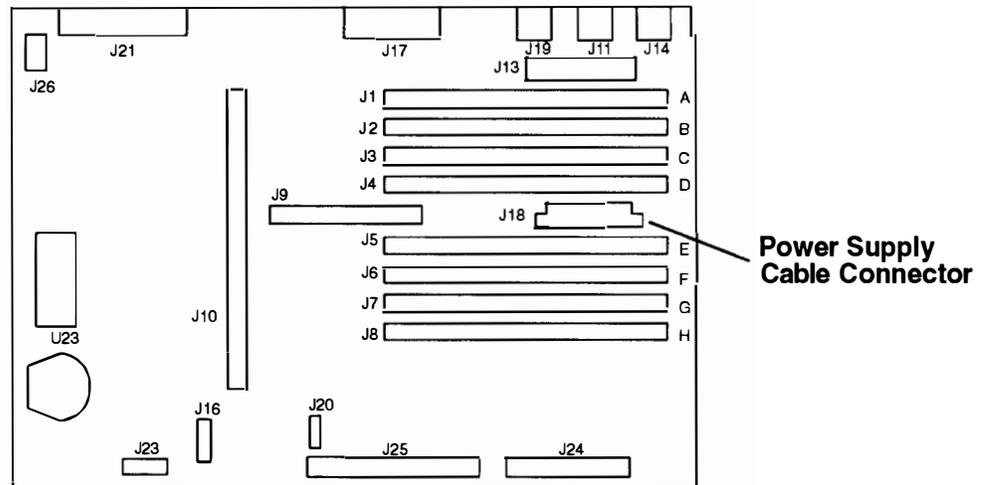
7. Remove the screw from the front of power supply.
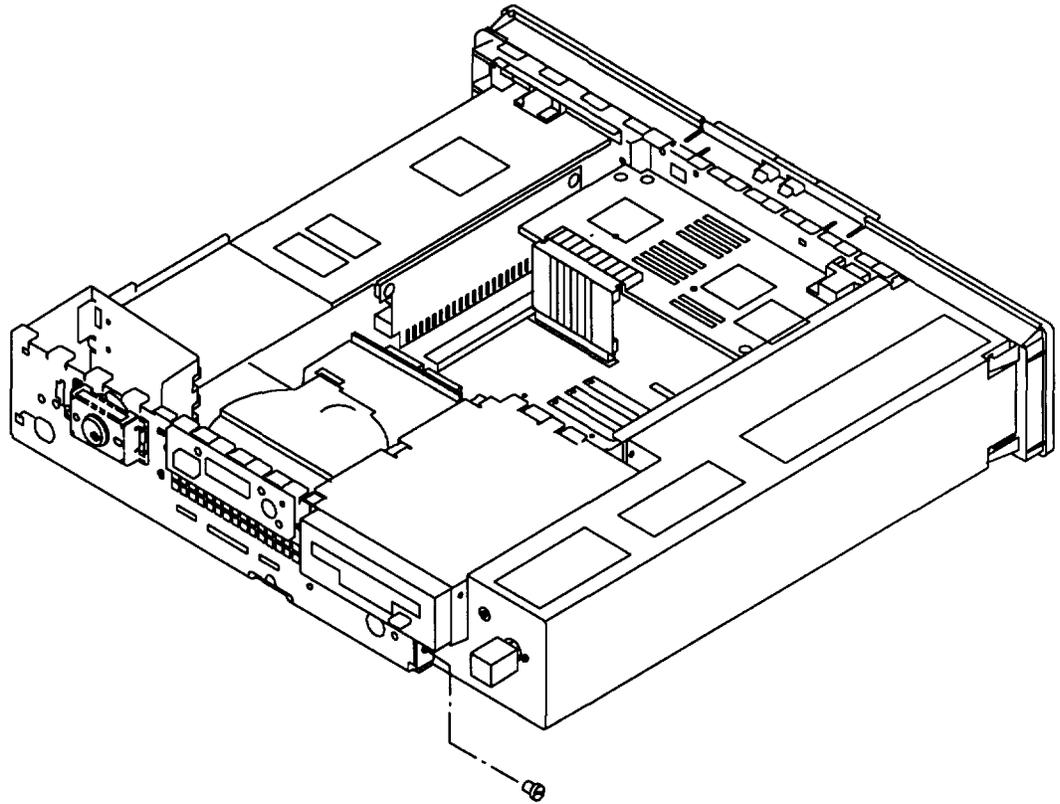
8. Unlatch the two plastic latches from the rear of the power supply and slide the power supply forward and then outward to the right.
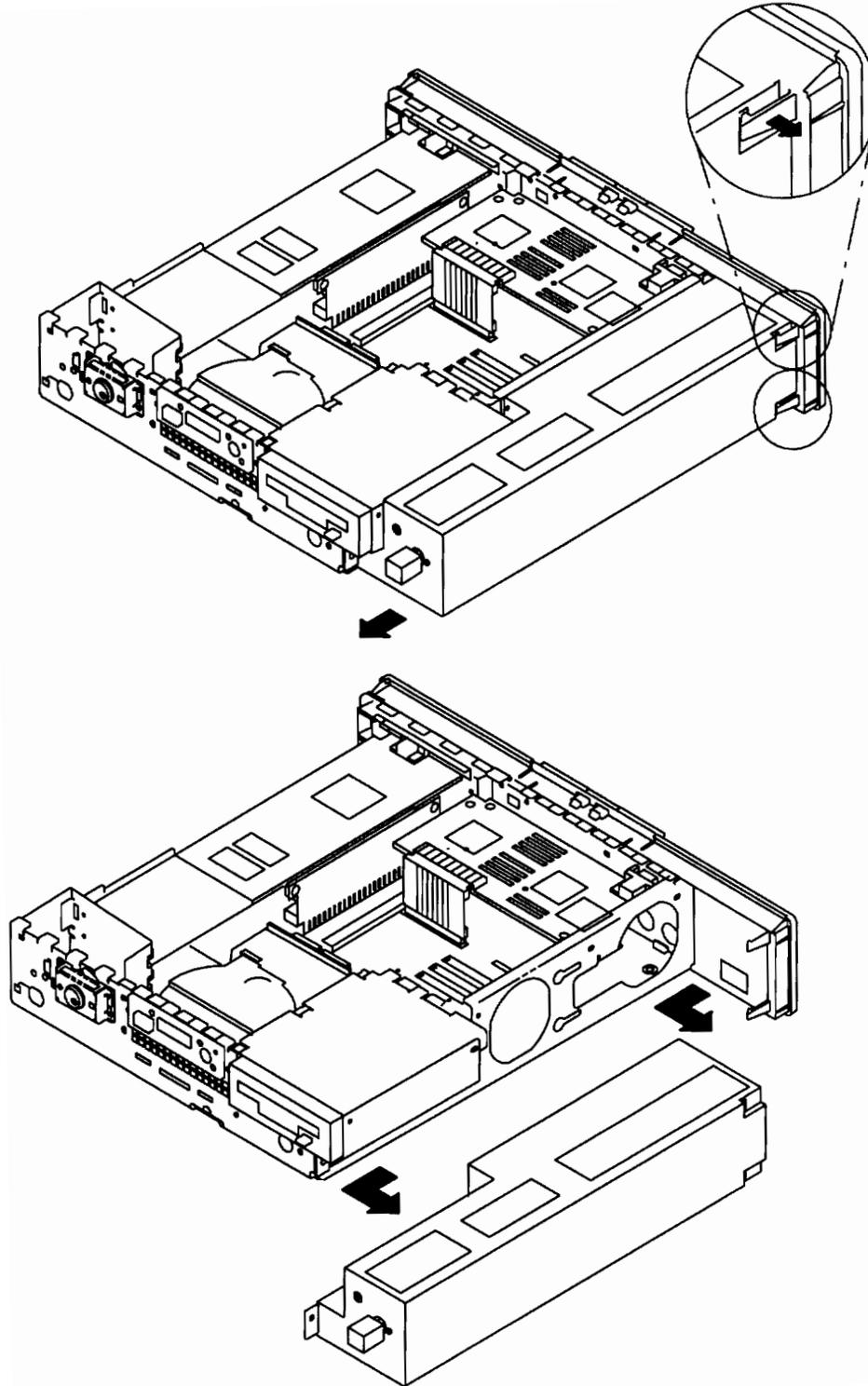
Replacement

To replace the power supply, perform the removal steps in the reverse order.

Diskette Drive

Removal

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Remove the riser card support.

Squeeze Release Handles

Riser Card Support

Front of Chassis
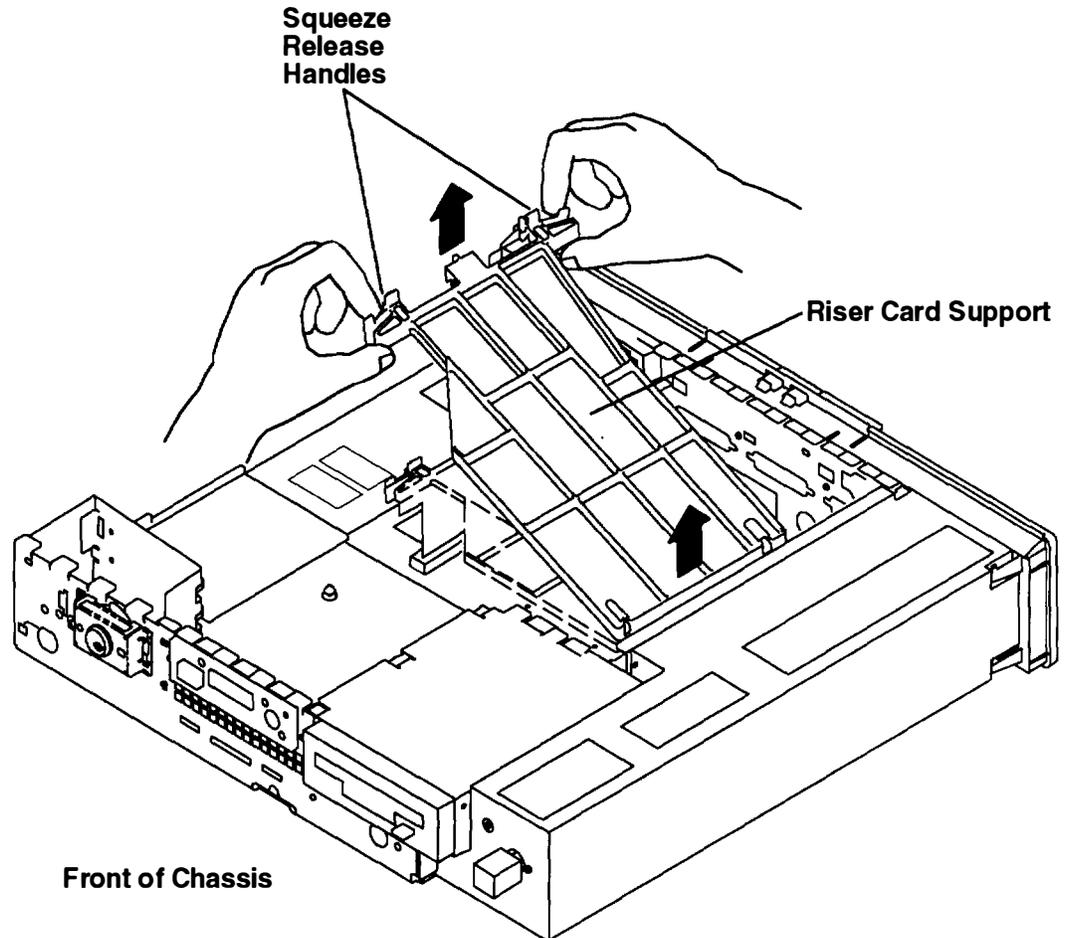
4. Disconnect the signal cable from the connector on the rear of the drive.

5. Lift up on the release tab and slide the diskette drive out the front.

Diskette Drive

Release Tab
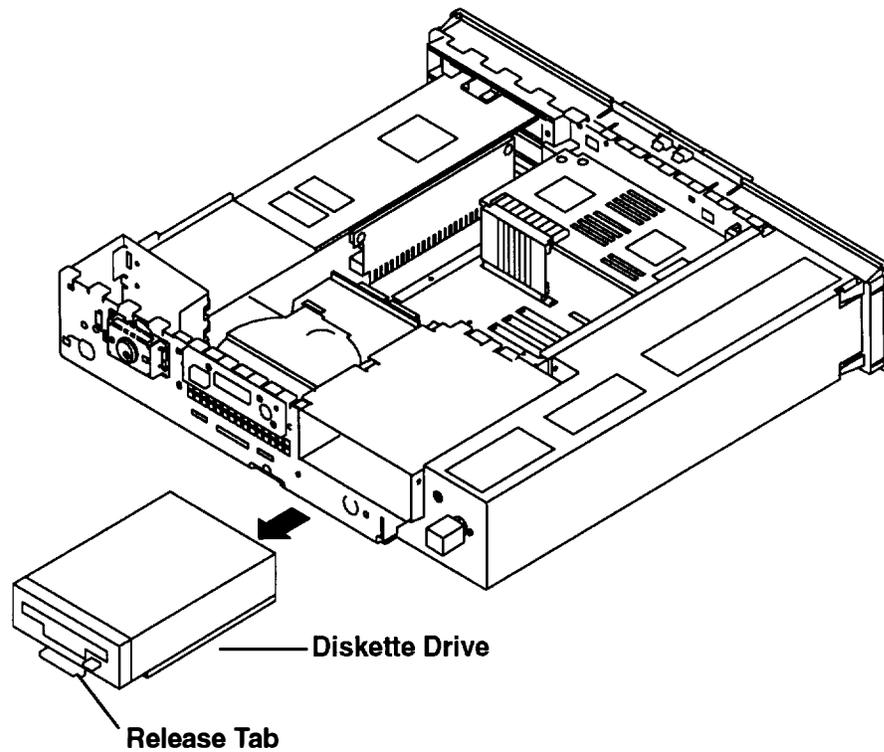
Replacement

To replace the diskette drive, perform the removal steps in the reverse order.

Disk Drive

Removal

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Remove the riser card support.

**Squeeze
Release
Handles**

Riser Card Support

Front of Chassis
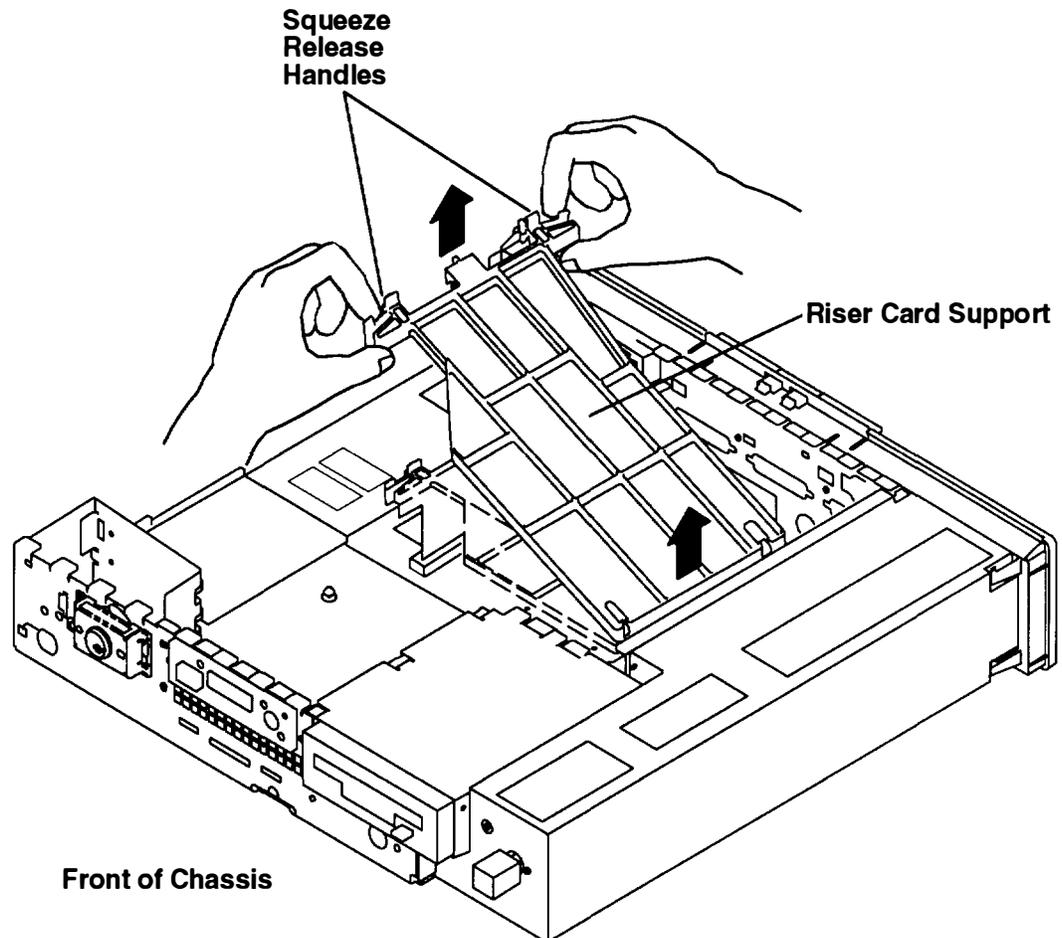
4. Disconnect the signal cable from the connector on the system board:

   a. For Models 220 and 230, the disk drive signal connector is labeled J22.

   b. For the Model 250, the disk drive signal connector is labeled J25.

5. Disconnect the power cable from the connector on the system board.

   a. For Models 220 and 230, the disk drive power connector is labeled J24.

   b. For the Model 250, the disk drive power connector is labeled J20.

6. Press down on the release latch located on the front of the disk drive and slide the disk drive to the rear.

Release Latch
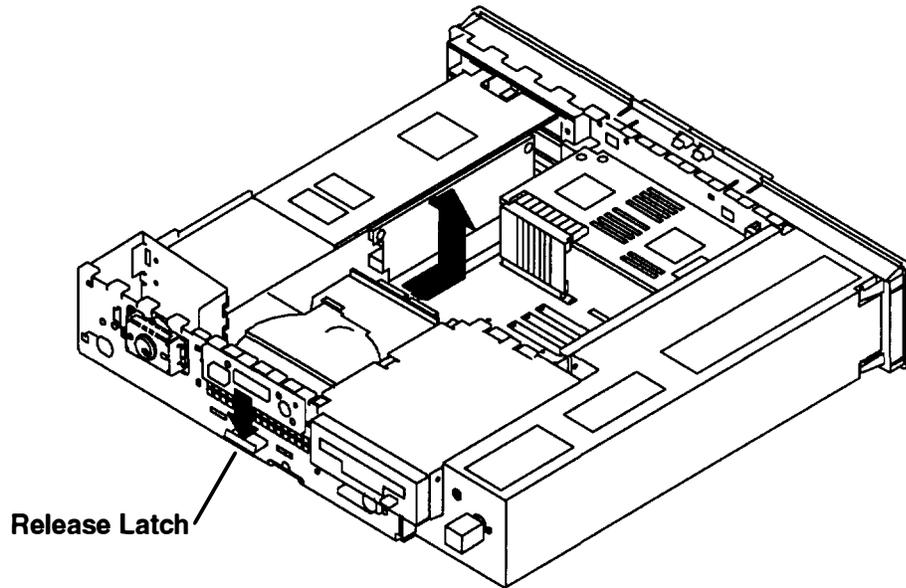
7. Lift disk drive up from the mounting studs.

8. Remove the signal and power cables from the disk drive.

9. Record the jumper settings for all disk drives installed.

10. If only one disk drive is installed, remove the four screws holding the base mounting plate to the bottom of the disk drive.

If two disk drives are installed (200M-byte disk drives only), remove the four screws holding the base mounting plate to the bottom of the lower disk drive. Also remove the four screws holding the side mounting brackets to the top disk drive as shown in the following illustration.
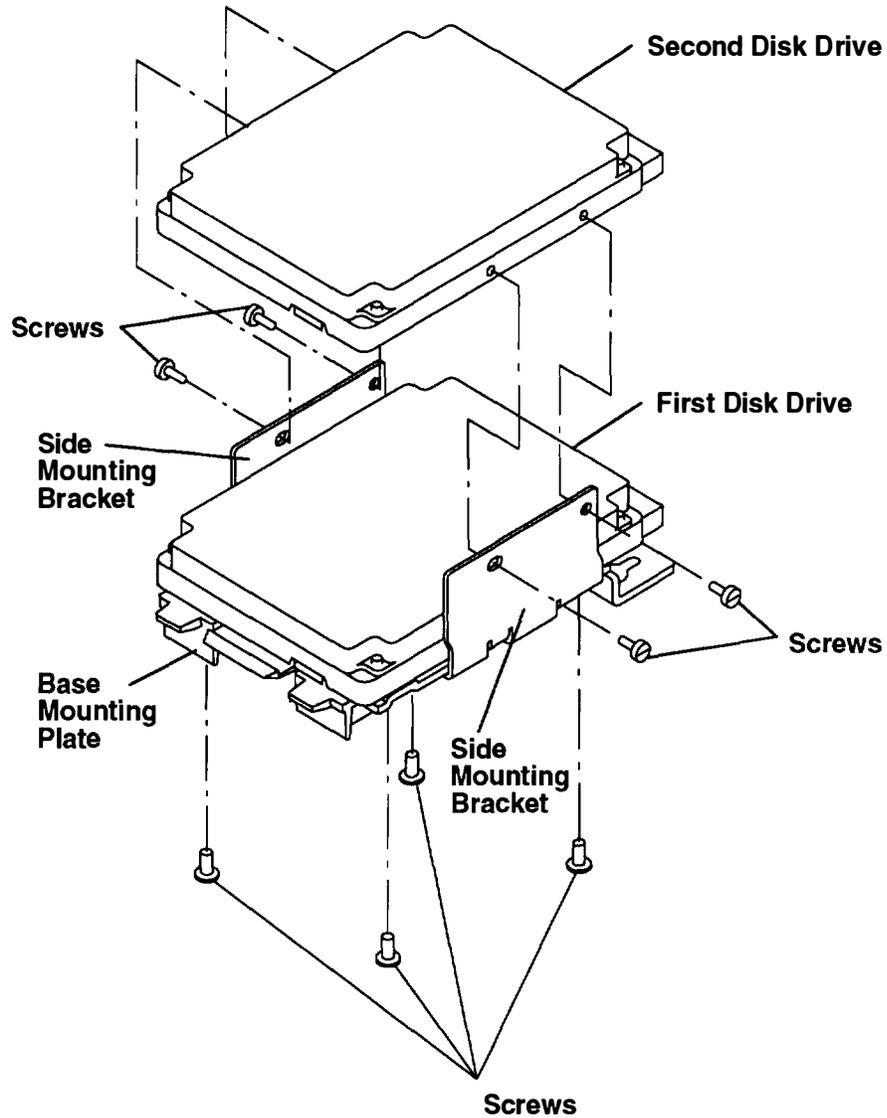
Replacement

1. Set the jumpers on the new disk drive to match those on the removed disk drive. For information on how to set the jumpers, see Chapter 9 of the *POWERstation and POWERserver Common Diagnostics and Service Guide.*

2. Install the mounting plate and side mounting plates (200M-byte disk drives only) with the screws removed in step 10 of the removal procedures on page 3-18.

3. Connect the signal and power cables to the connectors on the rear of the disk drive.

4. Place the disk drive keyhole slots on mounting studs and slide the drive to the front until it latches in the latch slot.
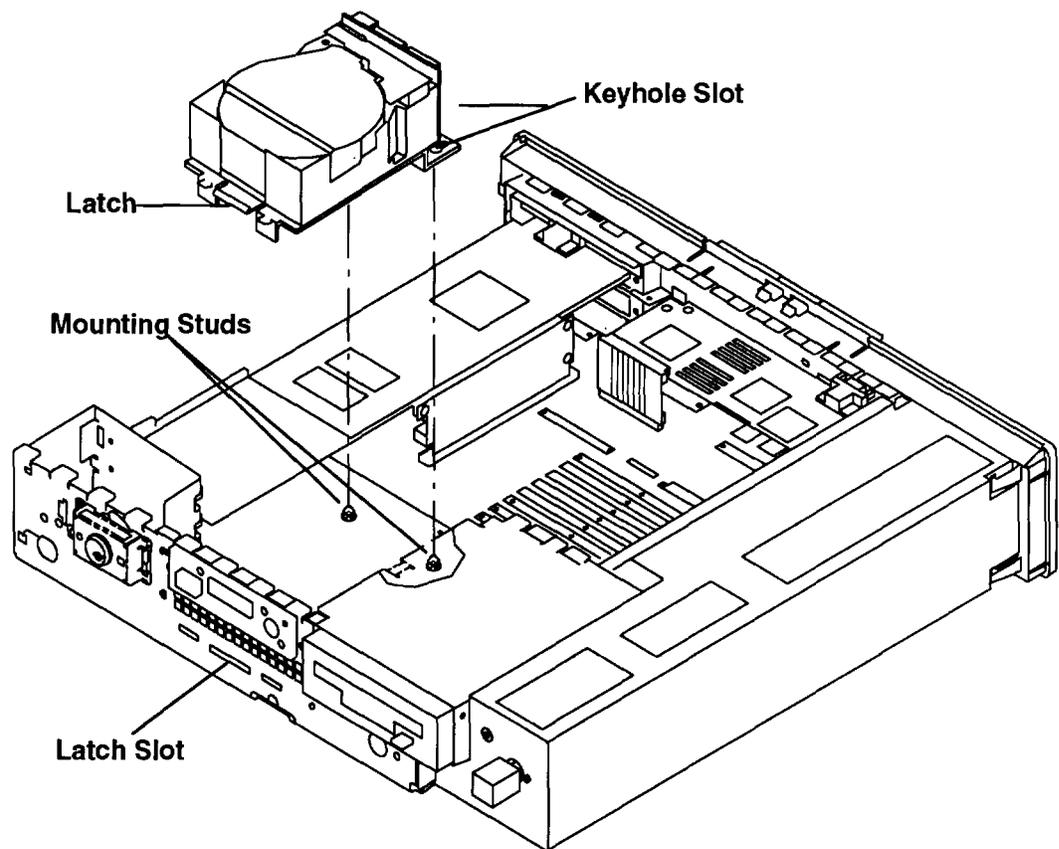
5. Connect the disk drive signal cable to the connector on the system board.

   a. For Models 220 and 230, the disk drive signal connector is labeled J22.

   b. For the Model 250, the disk drive signal connector is labeled J25.

6. Connect the disk drive power cable to the connector on the system board.

   a. For Models 220 and 230, the disk drive power connector is labeled J24.

   b. For the Model 250, the disk drive power connector is labeled J20.

7. Install the riser card support.

8. Do the replacement procedure in "Chassis Cover" on page 3-6.

9. Do the replacement procedure in "Chassis Assembly" on page 3-3.

Adapters

## Removal

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Make sure that the riser card support is installed.

4. Disconnect the adapter cable from the adapter.
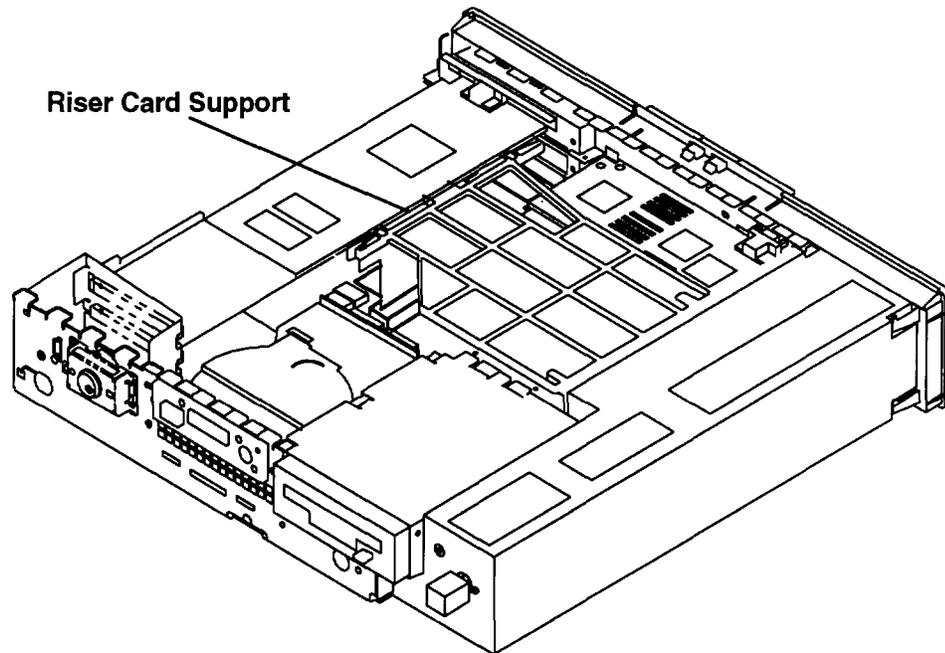
5. Loosen the serrated knob securing the adapter to the rear cover.
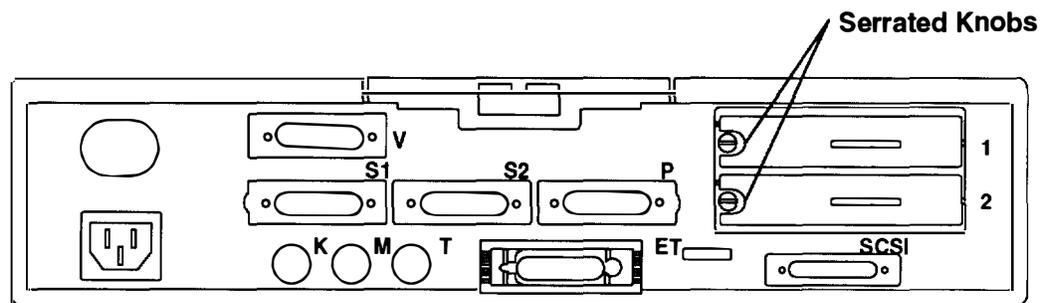
6. Press down on the adapter retainer and lock it behind the side cover.

Front of Chassis
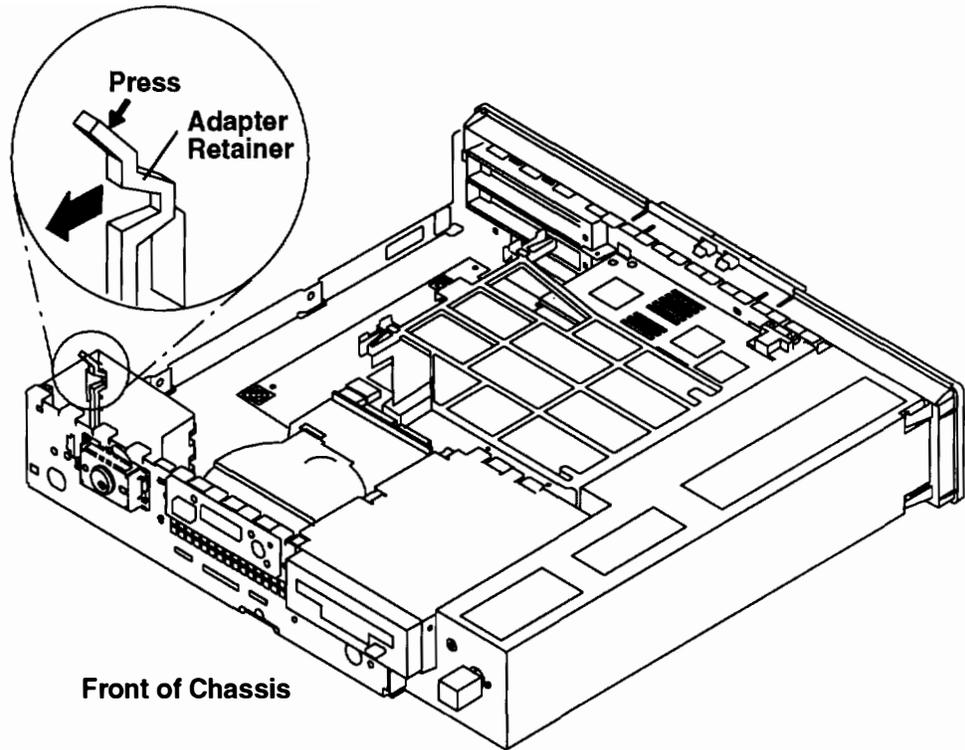
7. Slide the adapter out of the guide rails.
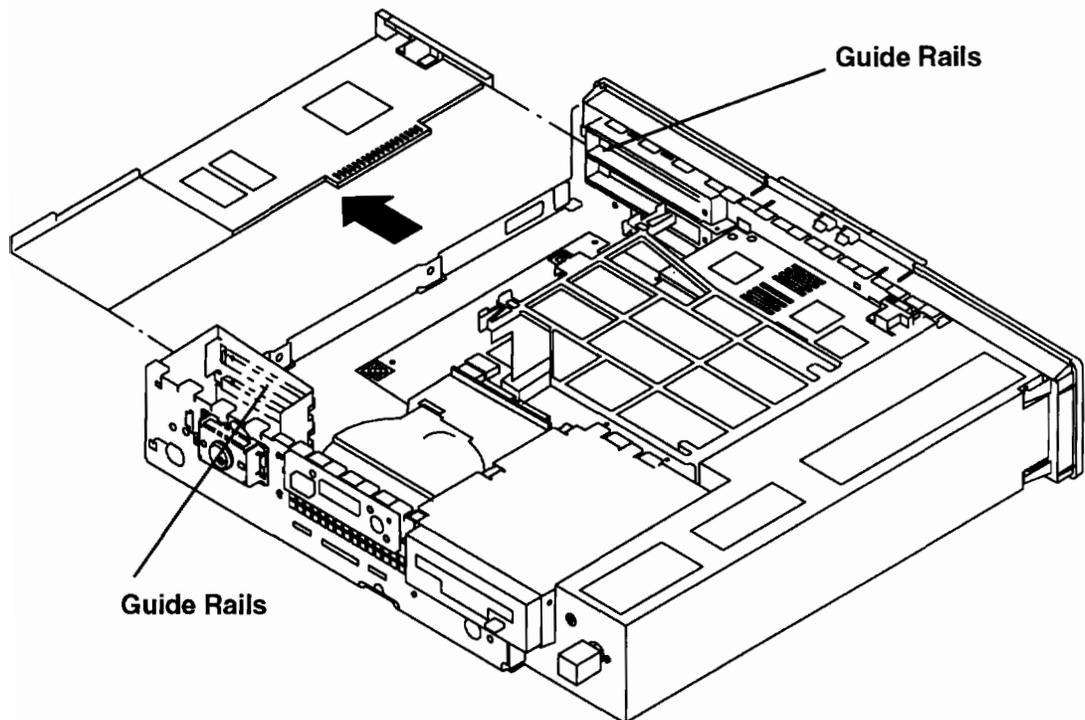
Replacement

1. Make sure that the riser card support is installed and the serrated knob is backed out several turns.

Riser Card Support
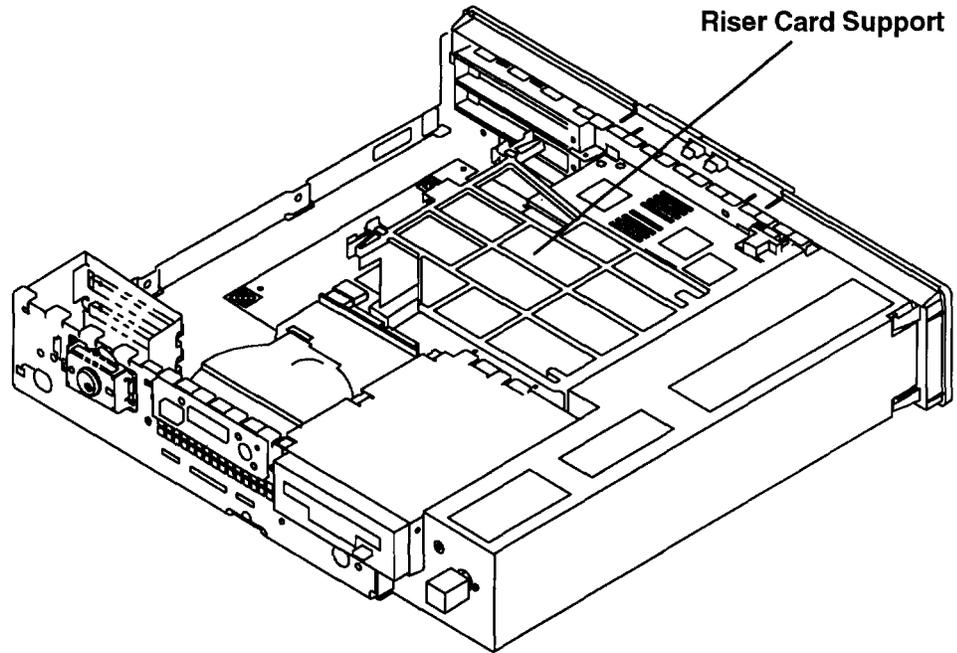
2. Slide the adapter into the front and rear guide rails and push the adapter into the appropriate riser card slot (1 or 2). The adapter is fully seated when the edge of the adapter contacts the end of the guide rail slots.

Riser Card

Slot 1

Slot 2

Rear Guide Rail (Slot 1)
Rear Guide Rail (Slot 2)

Front Guide Rail (Slot 1)

Front Guide Rail (Slot 2)

Front of Chassis
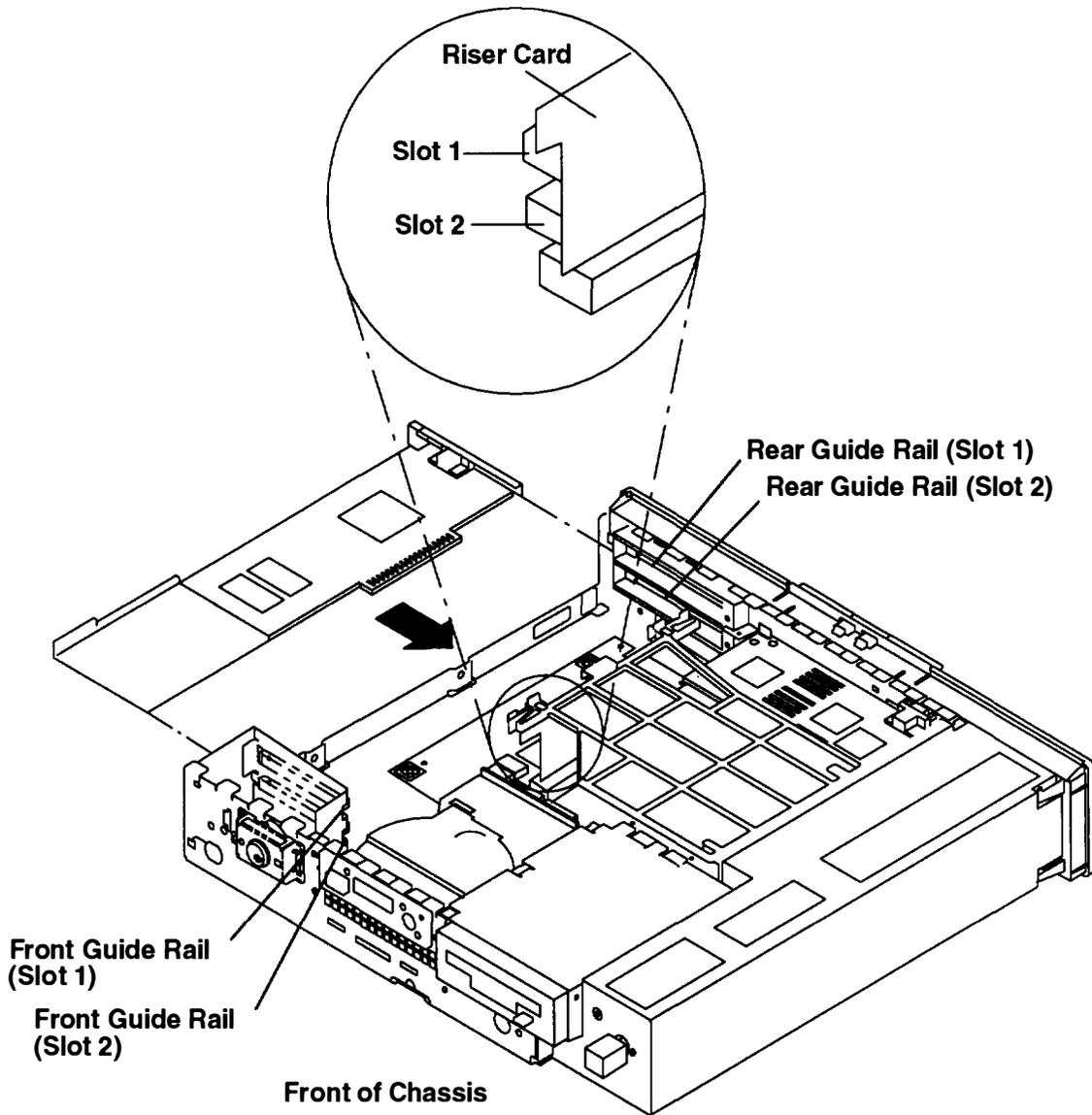
3. Press down on the adapter retainer to release it behind the adapter.

Front of Chassis
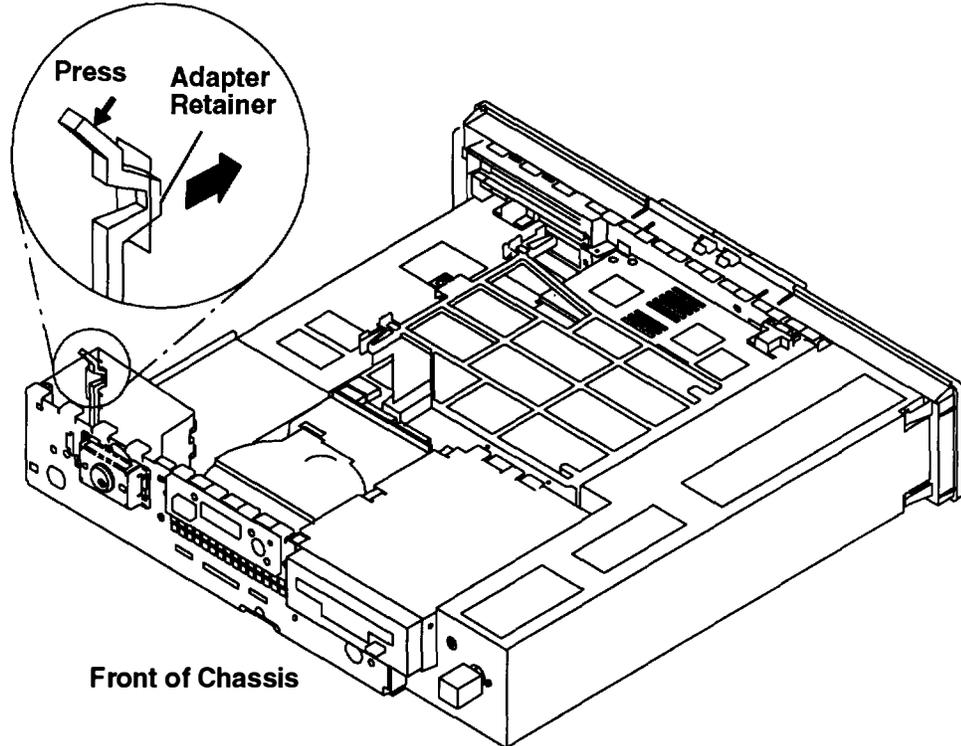
4. Tighten the serrated knob on the rear cover.
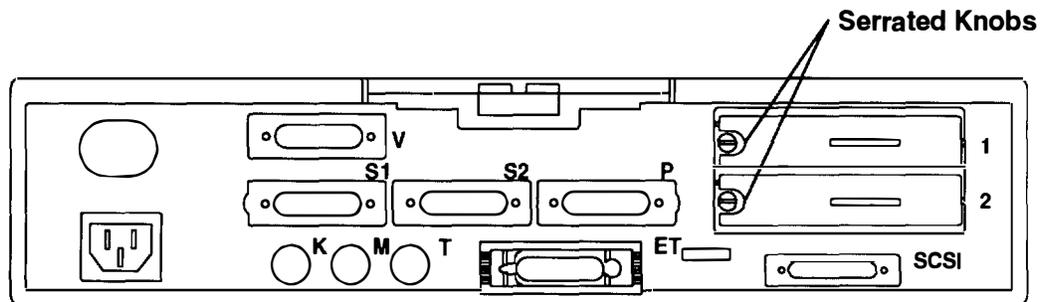
5. Connect the adapter cable to the adapter.

6. Do the replacement procedure in "Chassis Cover" on page 3-6.

7. Do the replacement procedure in "Chassis Assembly" on page 3-3.

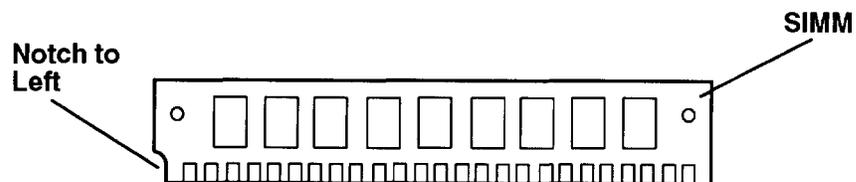# Memory

## Removal

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Remove the riser card support.

**Squeeze
Release
Handles**

Riser Card Support

Front of Chassis
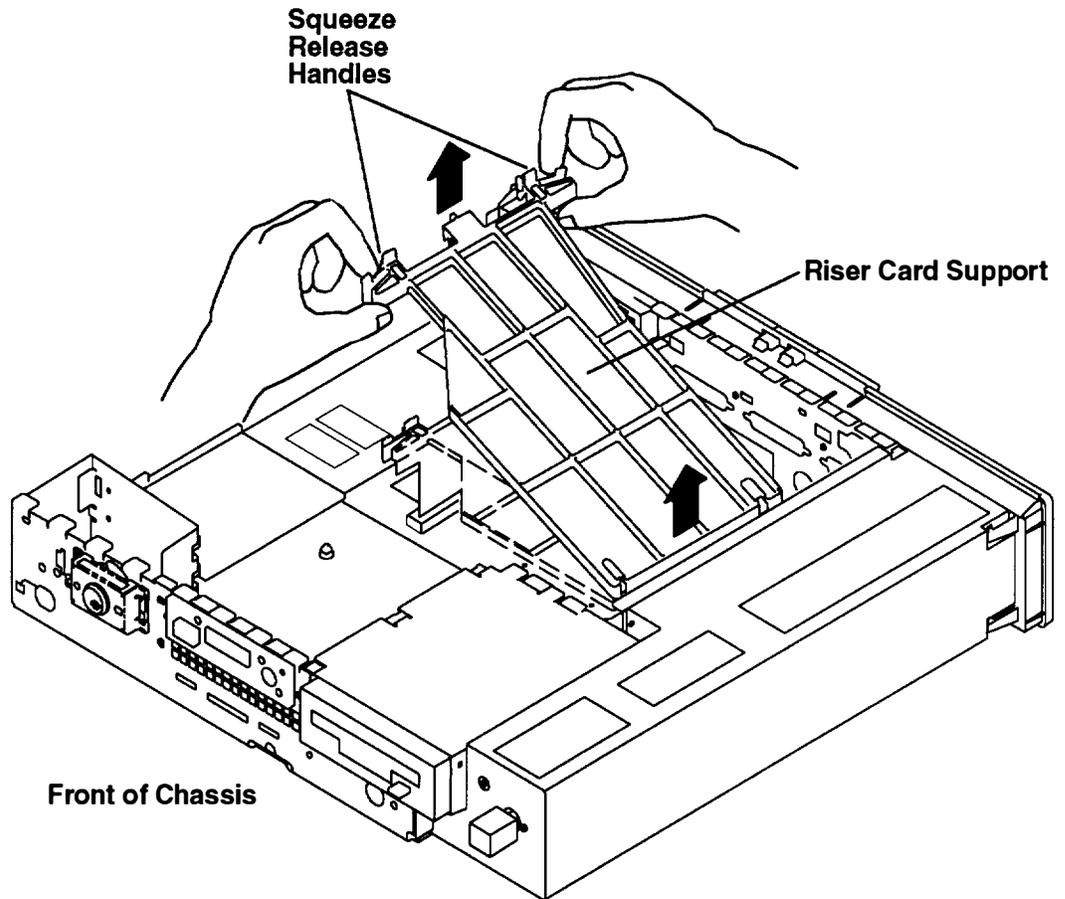
Model 220 and 230 SIMMs

1. Locate the SIMMs on the system board.

2. With one hand, momentarily touch any metal surface of the chassis to minimize static electrical charges.

System Board

Front

3. Press both locking tabs outward to release the SIMM.

Front View of SIMM
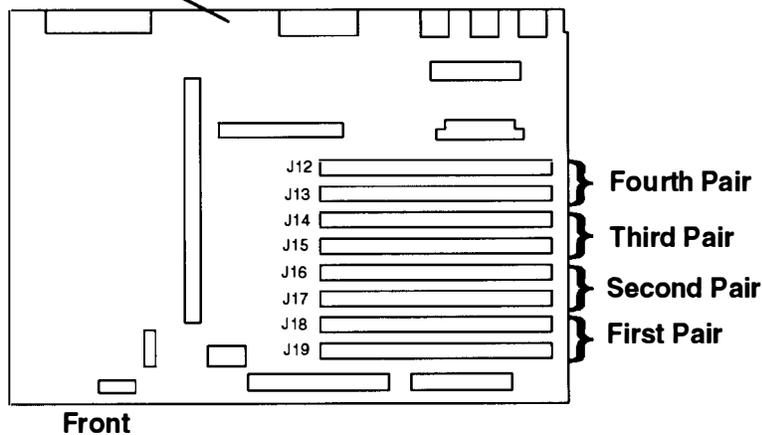
Push Locking Tabs Out to Release SIMM
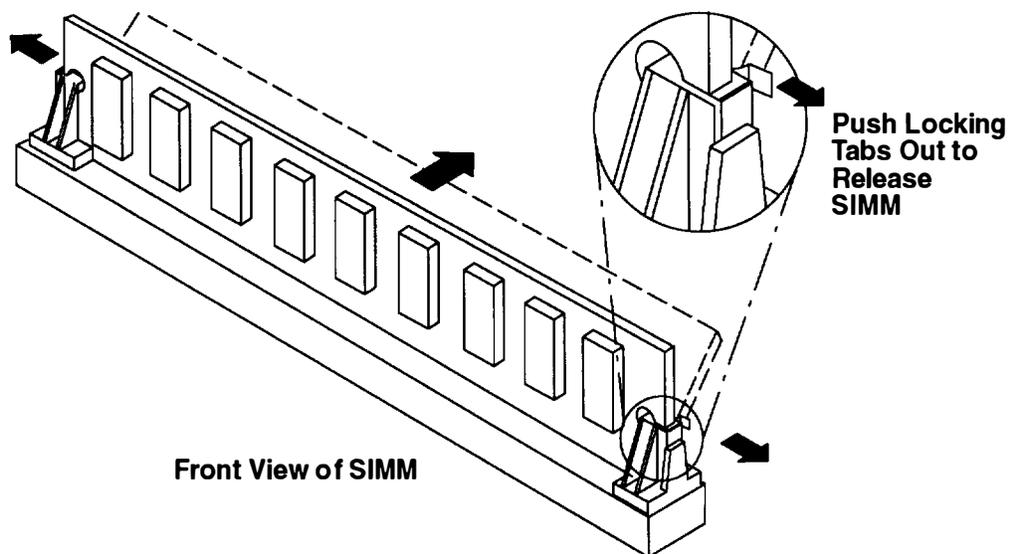
4. While pressing the locking tabs outward, tilt the SIMM toward the rear of chassis, and pull it out of the socket.

Model 250 SIMMs

1. Locate the SIMMs on the system board.

System Board

Power Supply Connector

Front

First SIMM Quad

Second SIMM Quad
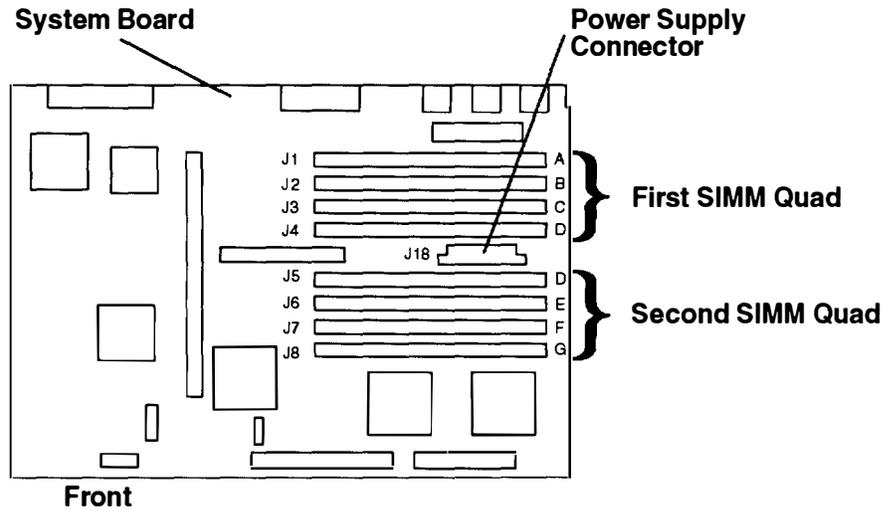
2. If it is necessary to remove or install SIMMs in the first SIMM quad, you must first:

   a. Remove the graphics adapter (if installed). For graphics adapter removal and installation instructions refer to page 3-47.

   b. Remove the power supply cable from the power supply connector (J18) on the system board

3. With one hand, momentarily touch any metal surface of the chassis to minimize static electrical charges.

4. Press both locking tabs outward to release the SIMM.

Tilt Toward Front

Push Locking Tabs Out to Release SIMM
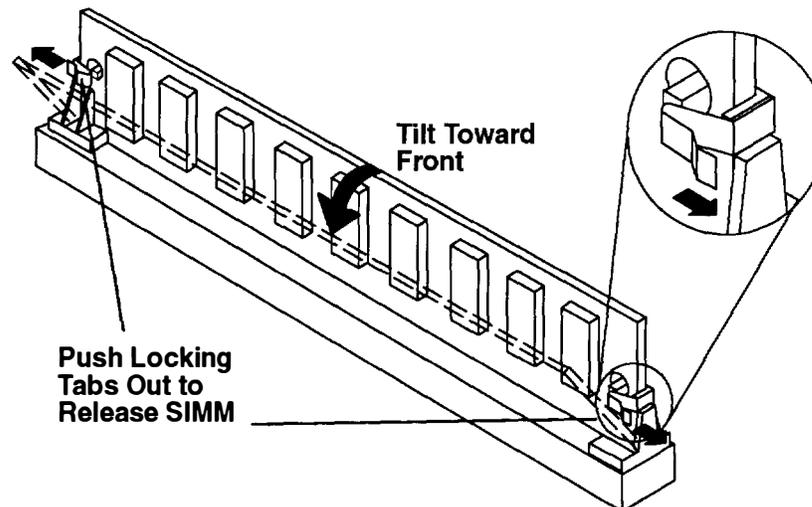
5. While pressing the locking tabs outward, tilt the SIMM toward the front of chassis, and pull it out of the socket.

Replacement

With one hand, touch any metal surface of the chassis to minimize static electrical charges, and then pick up a SIMM.

Model 220 and 230 SIMMs

1. Locate the SIMM sockets on the system board.

Memory
Sockets
Locations

Front of
Chassis
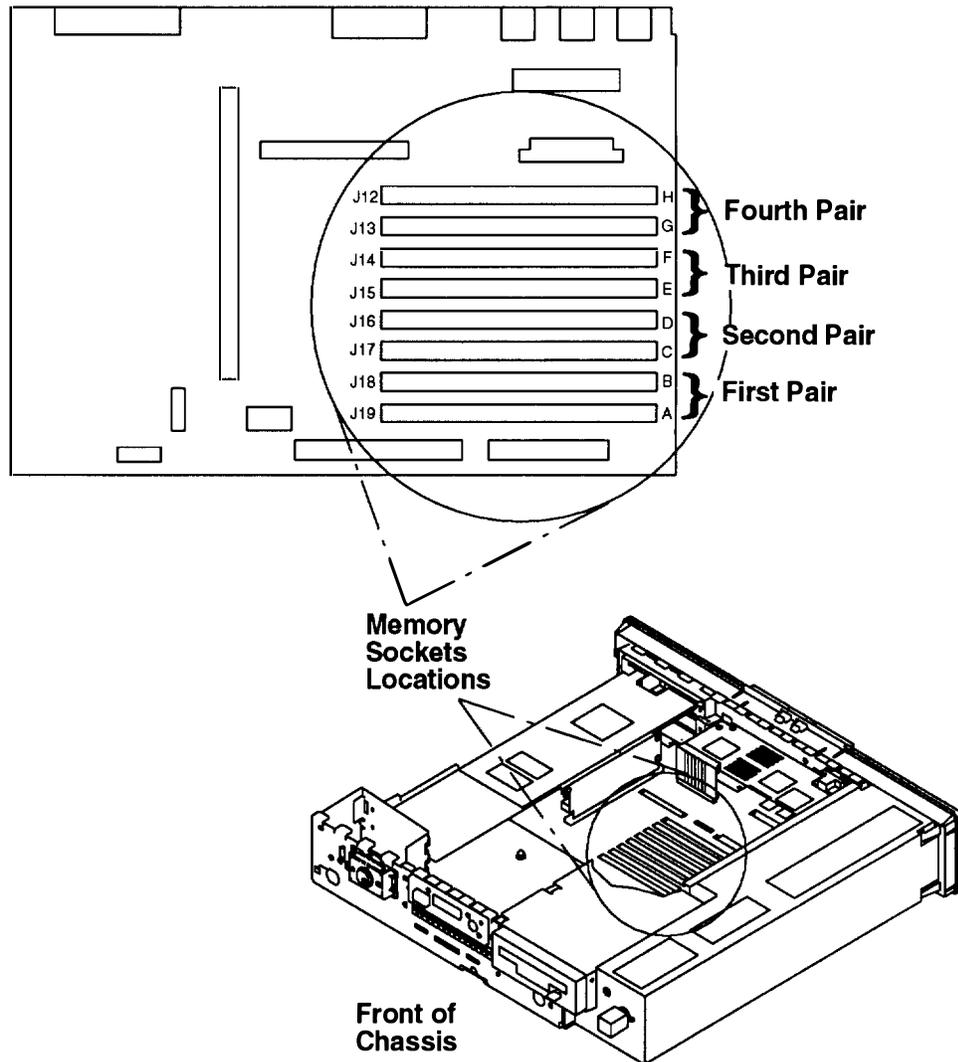
2. Align the SIMM with the notch to the right of the system board as shown below.

Notch to Right
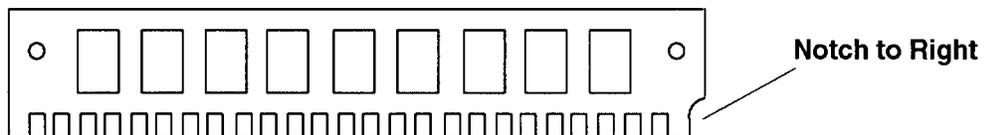
3. Insert the SIMMs at an angle in the first unused socket pair (J19 through J12), and pull the SIMMs back to a vertical position. When the SIMMs are at the proper upright position, the locking tabs will snap into place behind the SIMM.

Front View of SIMM
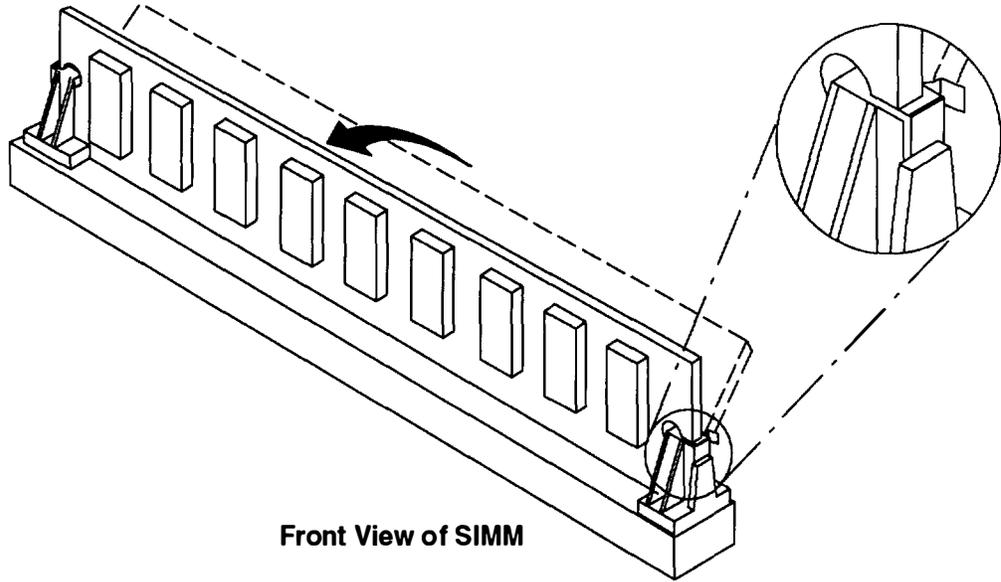
4. Install the riser card support.

5. Do the replacement procedure in "Chassis Cover" on page 3-6.

6. Do the replacement procedure in "Chassis Assembly" on page 3-3.

Model 250 SIMMs

1. Locate the SIMM sockets on the system board.

System Board

Power Supply Connector

J1 — A
J2 — B
J3 — C
J4 — D

First SIMM Quad

J5 — E
J6 — F
J7 — G
J8 — H

Second SIMM Quad

Front

SIMM Sockets

Front of Chassis
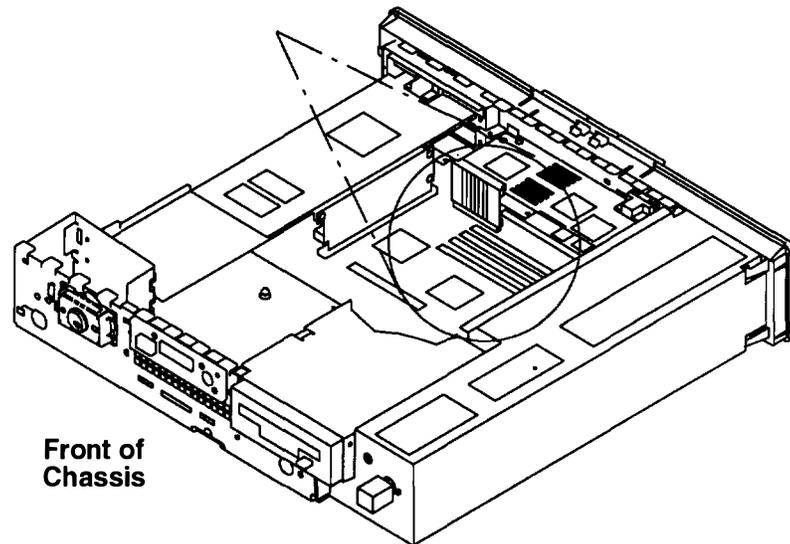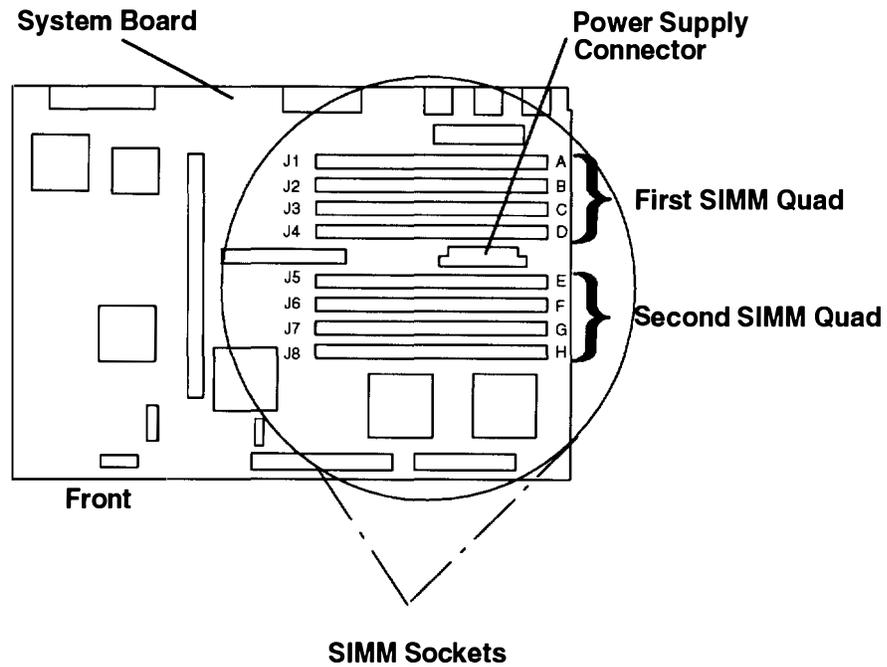
2. Turn the SIMM so that the notch is to the left as shown below.

SIMM

Notch to Left

3. Insert the SIMMs at an angle in the first unused socket quad (J1 through J4 or J5 through J8), and tilt the SIMMs backward to a vertical position. When the SIMMs are at the proper upright position, the locking tabs snap into place in front of the SIMM.

Tilt toward rear

(Snap)

Notched End of SIMM
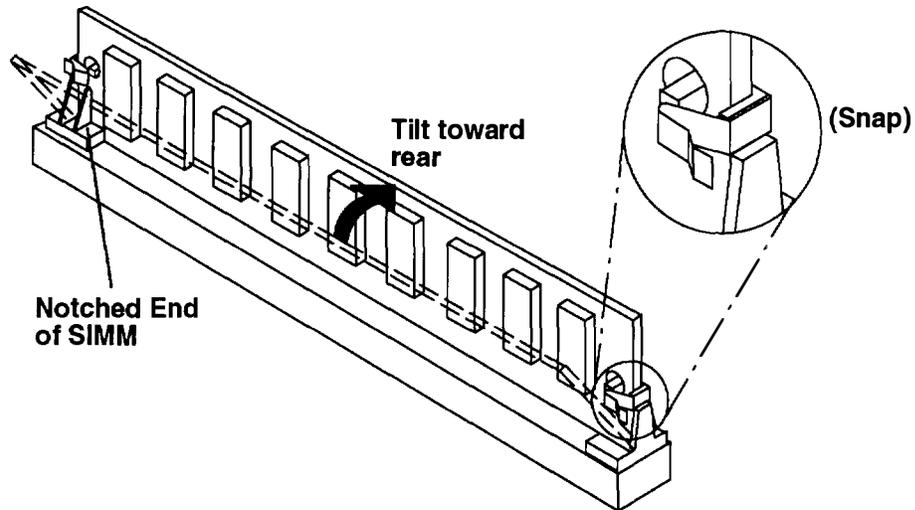
4. SIMMs must be installed in quads; refer to the illustration on page 3-30.

5. If you have removed the graphics adapter, reinstall it now. Refer to page 3-47 for graphics adapter installation instructions.

6. If you have disconnected the power supply cable, reconnect it to the power supply connector (J18) on the system board. See the illustration on 3-30.

7. Install the riser card support.

8. Do the replacement procedure in "Chassis Cover" on page 3-6.

9. Do the replacement procedure in "Chassis Assembly" on page 3-3.

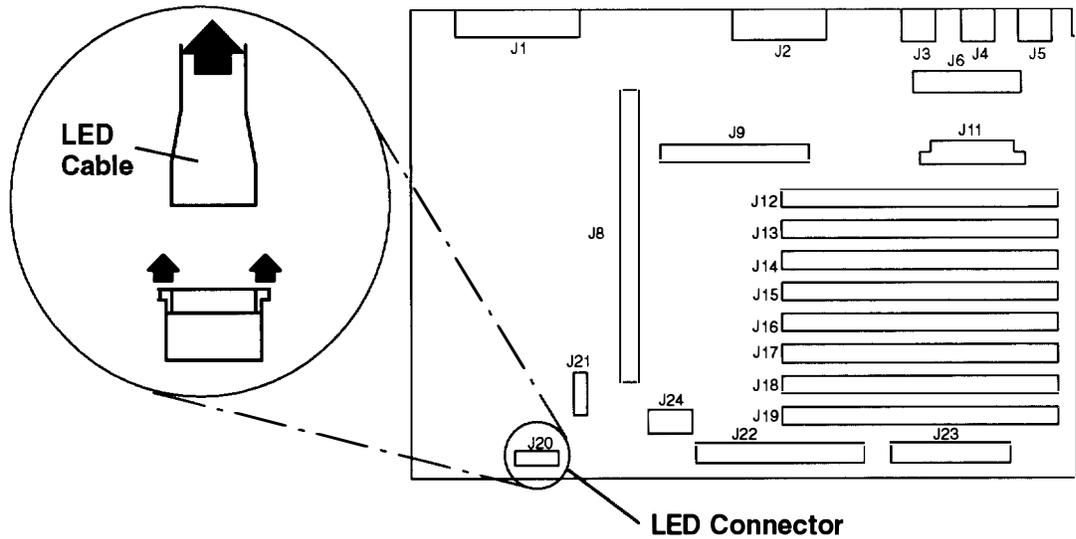# POWER Gt1 or POWER Gt1B VRAM

Removal

Note: Video random access memory (VRAM) modules can only be removed and replaced on the POWER Gt1 and Gt1B graphics adapters.

1. Do the removal procedure in "POWER Graphics Adapters" on page 3-47.

2. Place the module extraction tool (Part Number 75X5893) centrally over the module to be removed. Ensure that the tool grips under the module body.

Module Extraction Tool

Video Memory Module

Tool Grips Under Module Body
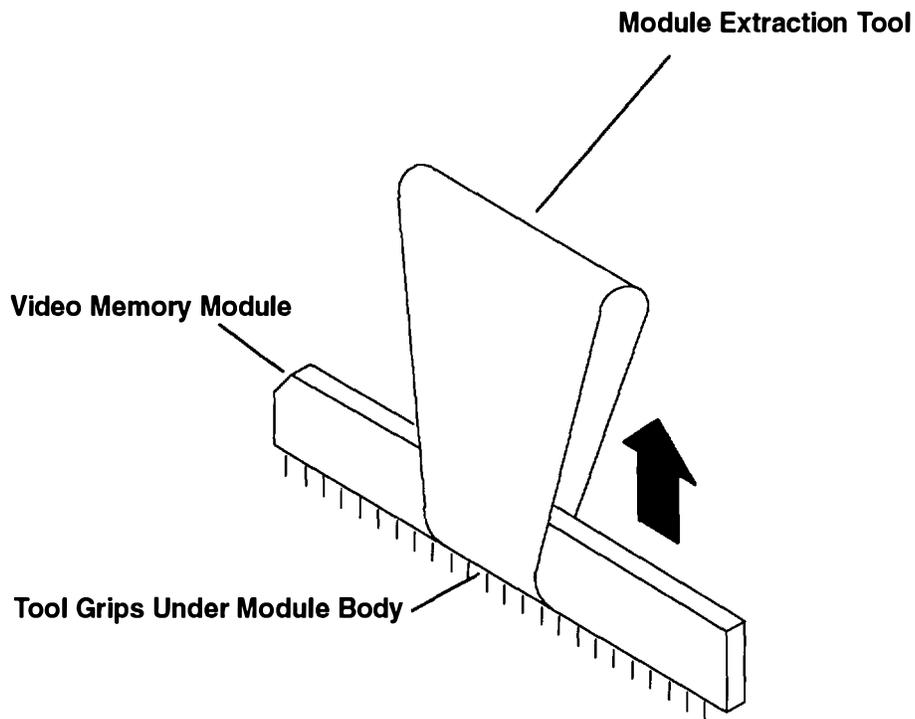
3. Squeeze the module extraction tool firmly against the sides of the module; then pull straight up while holding down on the adapter.

Replacement

1. Place the adapter on a hard, rigid surface.

2. Place the module insertion guide (Part Number 07F2518) over the module socket.

3. With one hand, touch any metal surface of the chassis to minimize static electrical charges, and then pick up a memory module.

4. Visually check that module pins are straight and in line.

5. Place the module into the insertion tool *with the beveled end to the right* as viewed from the front of the chassis.

6. With the module insertion guide in place, press down simultaneously on both module ends until the module is firmly seated in the socket.

Note: You will encounter resistance as you press the module down. You will hear a snapping sound when the module seats in the socket.

VRAM Module

Beveled End to Right

Module Socket

Module Insertion Guide

COLOR UPGRADE
A
B
C
D
E
F
G
H
GREYSCALE UPGRADE
J
K
MONO

J and K Are Standard

Front of POWER Gt1 or POWER Gt1 B Graphics Adapter
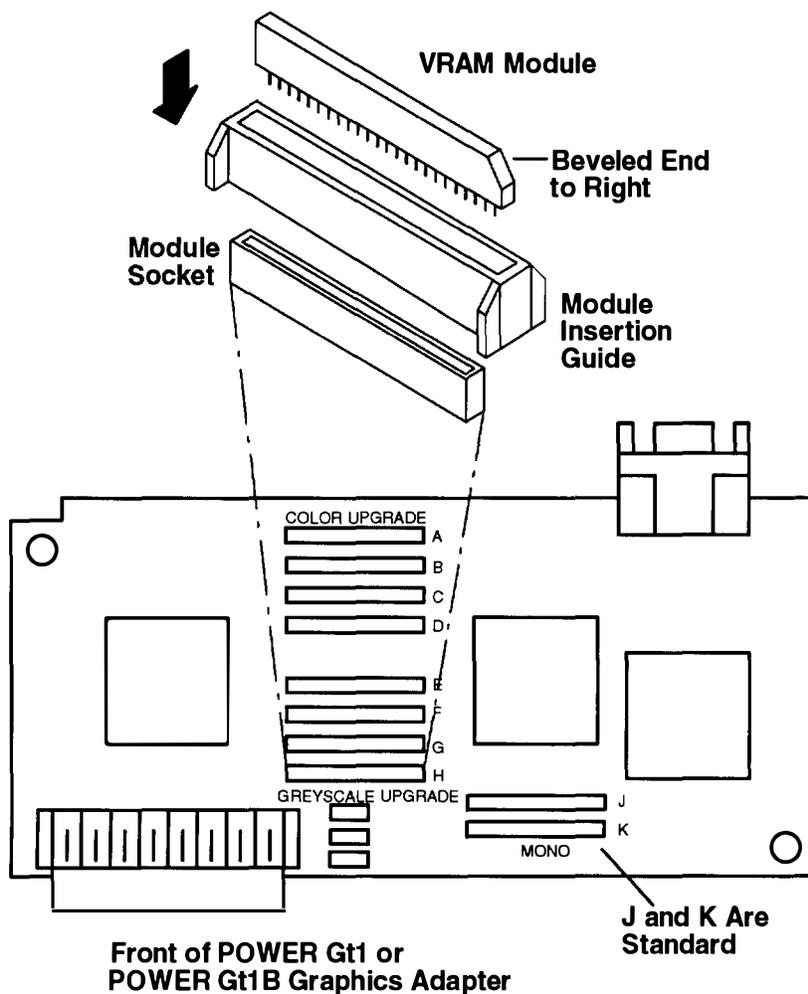
7. Remove the insertion guide, and visually inspect the module pins for proper seating.

8. Do the replacement procedure in "POWER Graphics Adapters" on page 3-47.

9. Do the replacement procedure in "Chassis Cover" on page 3-6.

10. Do the replacement procedure in "Chassis Assembly" on page 3-3.

System Board

Removal

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Disconnect all cables attached to the rear cover.

4. Do the removal procedure in "Adapters" on page 3-20, and remove any installed adapters.

5. Remove the riser card support.

Squeeze Release Handles

Riser Card Support

Riser Card

Front of Chassis
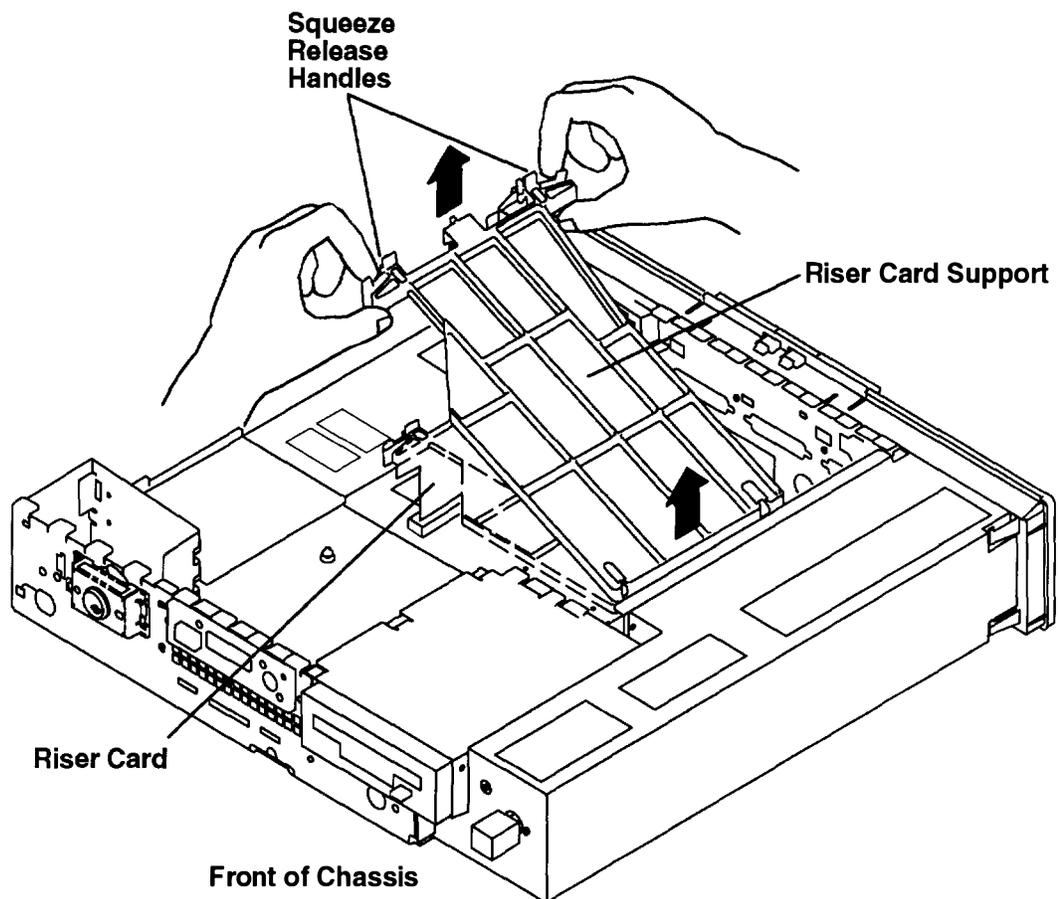
6. Remove the riser card.

7. If a graphics adapter is installed, do the removal procedure in "POWER Graphics Adapters" on page 3-45.

8. If removing the system board from a Model 220 or 230, proceed to step 9 on page 3-35. If removing the system board from a Model 250, proceed to step 12 on page 3-36.

9. Open the plastic cable lock on the LED connector (J20) by pulling each end up (with a small screwdriver or your fingers). Remove the LED cable from the cable lock.

LED Connector

10. Disconnect the keylock cable from the system board connector (J21).

Serial/Parallel Connector

Power Supply Cable Connector

Diskette Signal Cable Connector

Keylock Cable Connector **Disk Power Cable Connector** **Disk Signal Cable Connector**
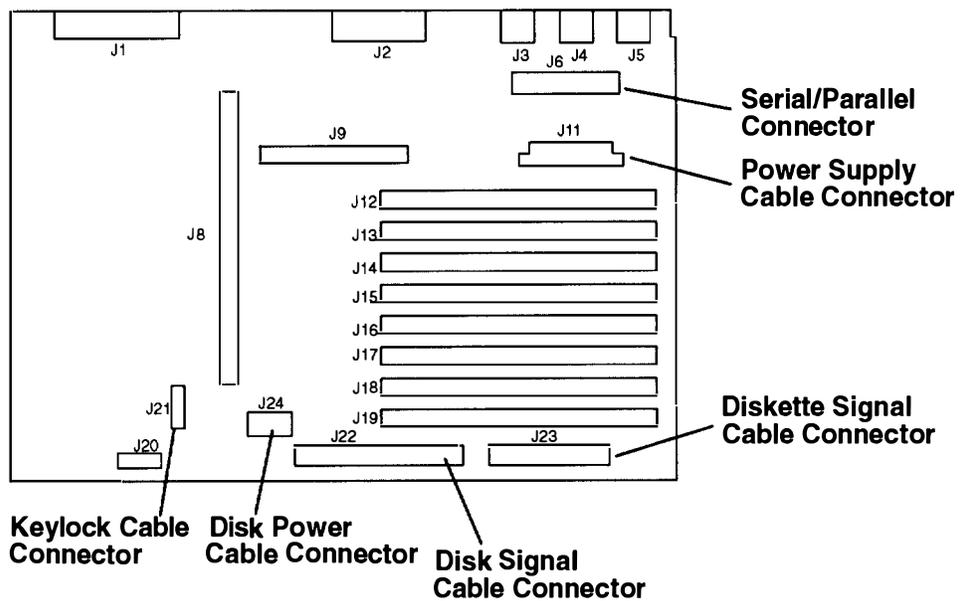
11. Go to step 14 on page 3-36.

12. Open the plastic cable lock on the LED connector (J23) by pulling each end up (with a small screwdriver or your fingers). Remove the LED cable from the cable lock.

LED Connector

13. Disconnect the keylock cable from the system board connector (J16).

Serial/Parallel Connector

Power Supply Cable Connector

Diskette Signal Cable Connector

Keylock Cable Connector   Disk Power Cable Connector   Disk Signal Cable Connector
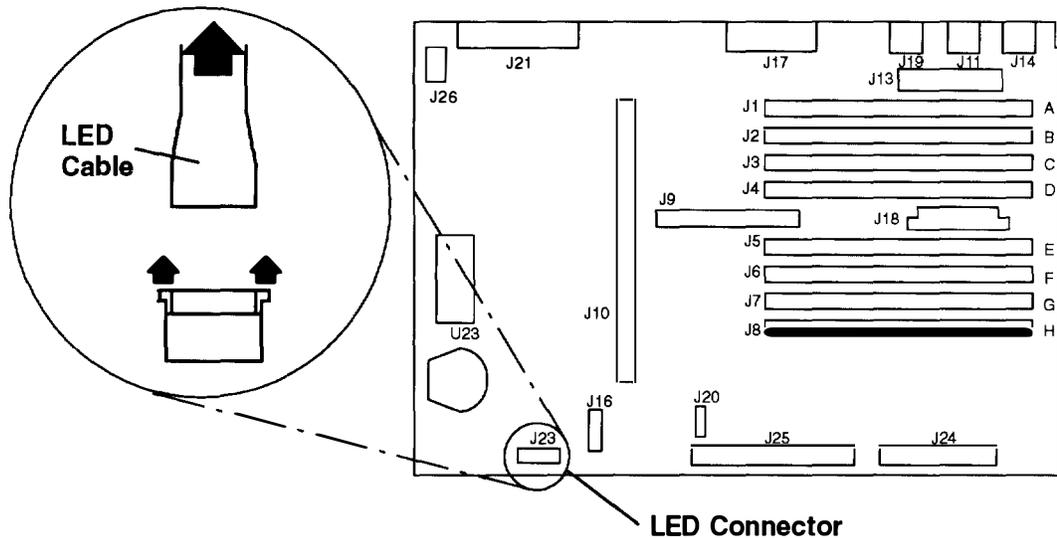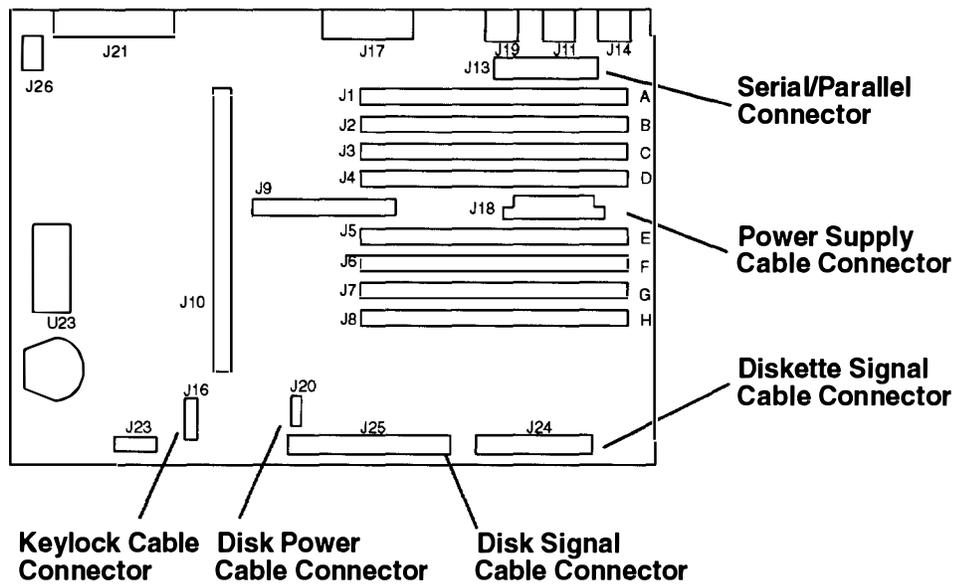
14. Do the removal procedure in "Memory" on page 3-25 to remove the SIMMs from the system board.

15. If a disk drive is installed, do the removal procedure in "Disk Drive" on page 3-16. Remove the disk drive signal cable from the system board connector (J25) and the disk drive power cable from the system board connector (J20).

16. If a diskette drive is installed, do the removal procedure in "Diskette Drive" on page 3-14. Remove the diskette drive signal cable from the system board connector (J24).

17. Disconnect the power supply cable from the system board connector (J18).

18. Remove the two screws, latch, and handle from the Ethernet connector (ET) on the rear cover.
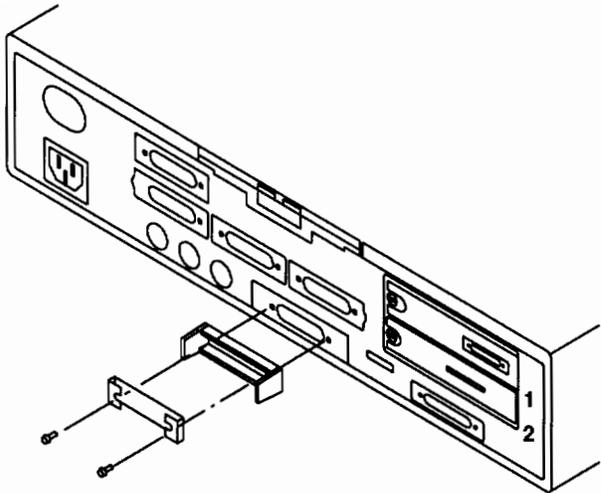
19. Remove the six hex standoffs from the rear cover.

Hex Standoffs
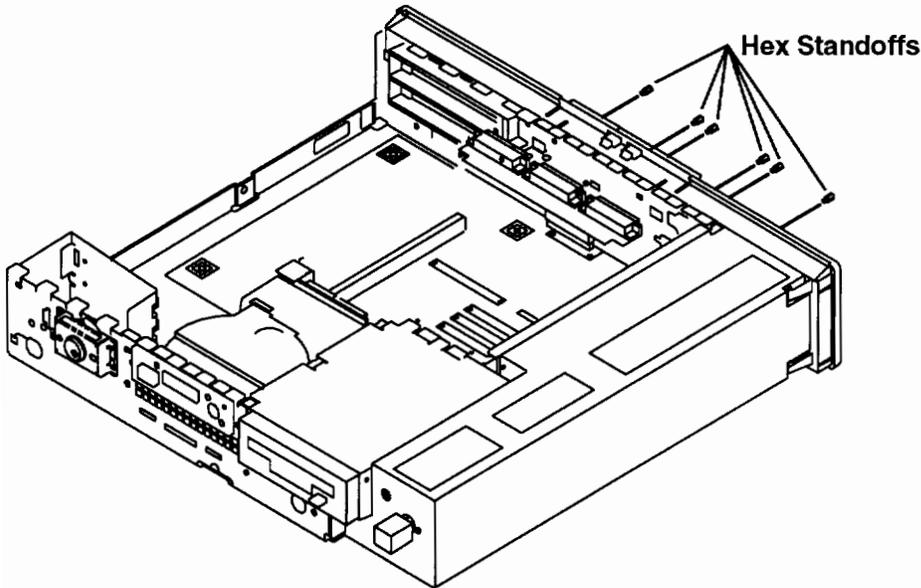
20. Remove six screws from the system board.
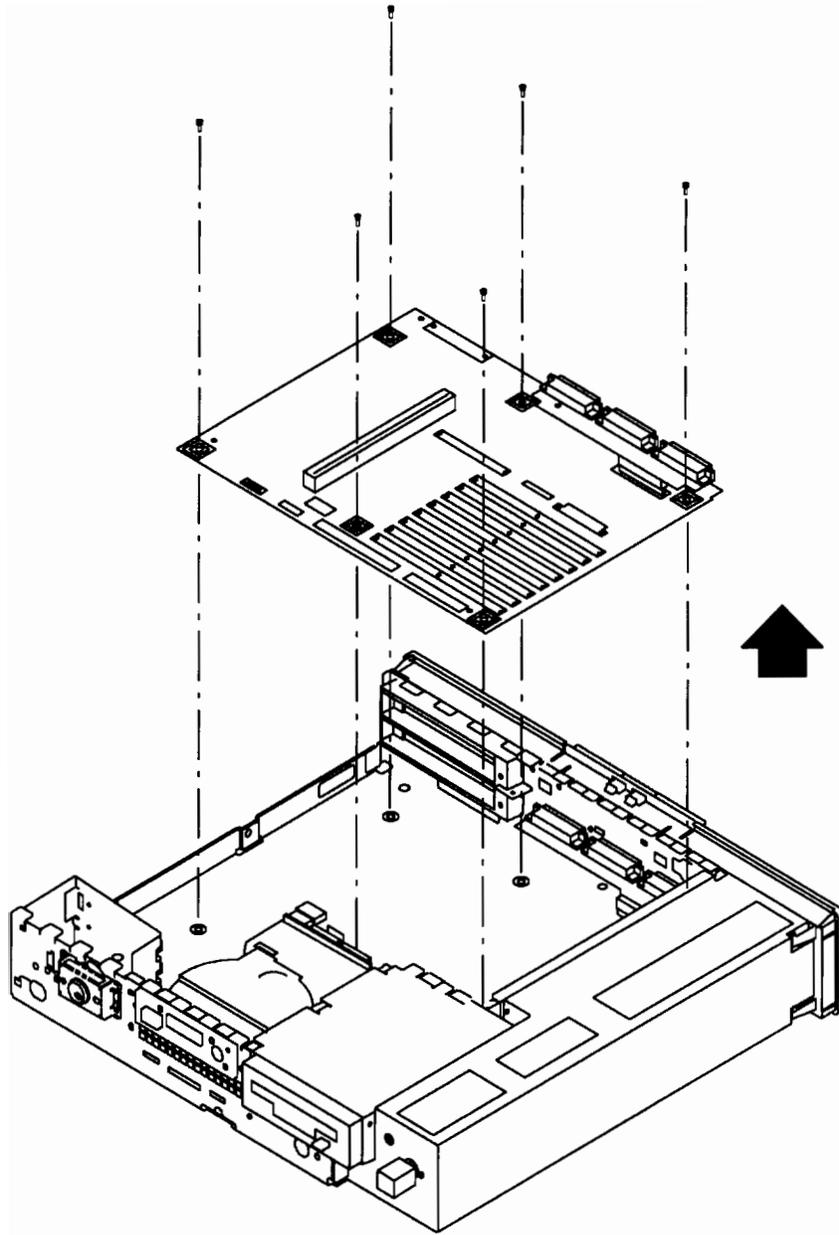
21. Move the system board forward (toward the front) to allow the serial/parallel connector card to be removed from the system board.
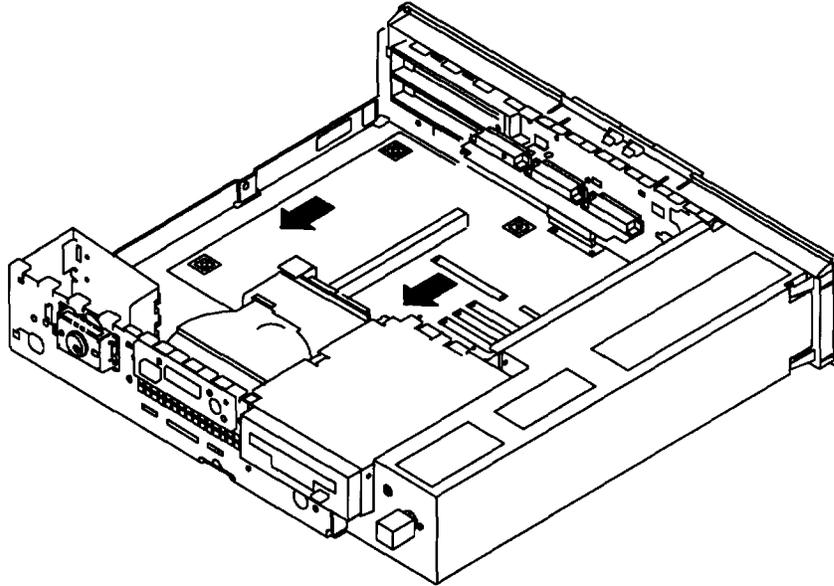
22. Locate the serial/parallel connector on the system board. For Models 220 and 230, go to substep 22a; for the Model 250 , go to substep 22b on page 3-40.

   a. For the Models 220 and 230, the serial/parallel connector is labeled J6. Disconnect the serial/parallel connector card from the system board, then disconnect the I/O toroid from the system board connector.

Serial/Parallel Connector
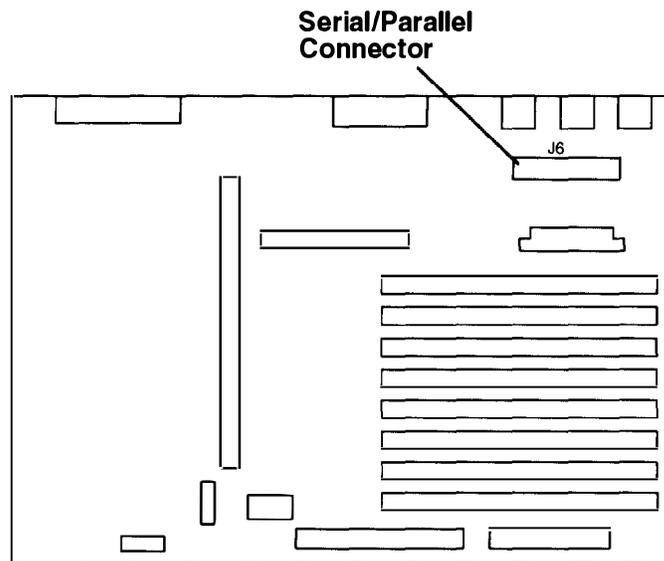
b. For the Model 250 the serial/parallel connector is labeled J13. Disconnect the serial/parallel connector card from the system board, then disconnect the I/O toroid from the system board connector.

**Serial/Parallel
Connector**
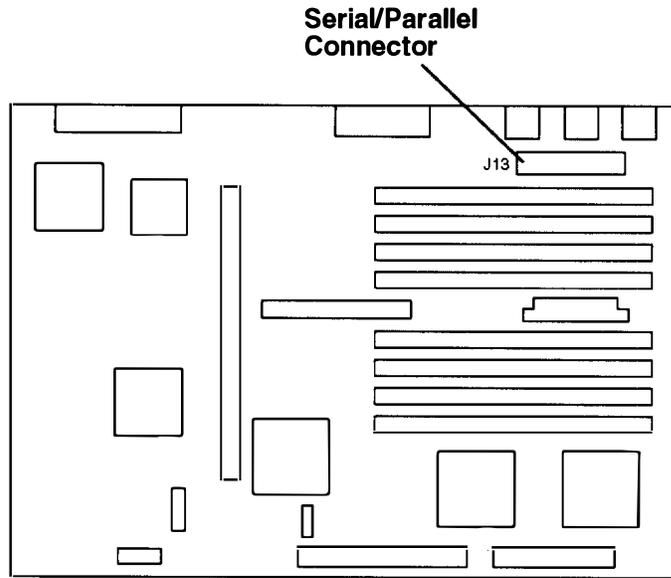
23. Lift the system board from the chassis.

Replacement (for Models 220 and 230)

1. Set the system board in the chassis.

2. Set the SCSI jumpers. Refer to "Disable or Enable the SCSI Connector" on page 1-7.

3. Place the I/O toroid around the system board connector (J6).

4. Move the system board toward the front of the chassis and connect the serial/parallel connector card to the system board connector (J6).

5. Move the system board toward the rear of the chassis, ensuring that the keyboard, mouse, and tablet connectors (J5, J4, and J3) slide under the clips on the rear of the chassis.

6. Install the six screws in the system board in the sequence shown.
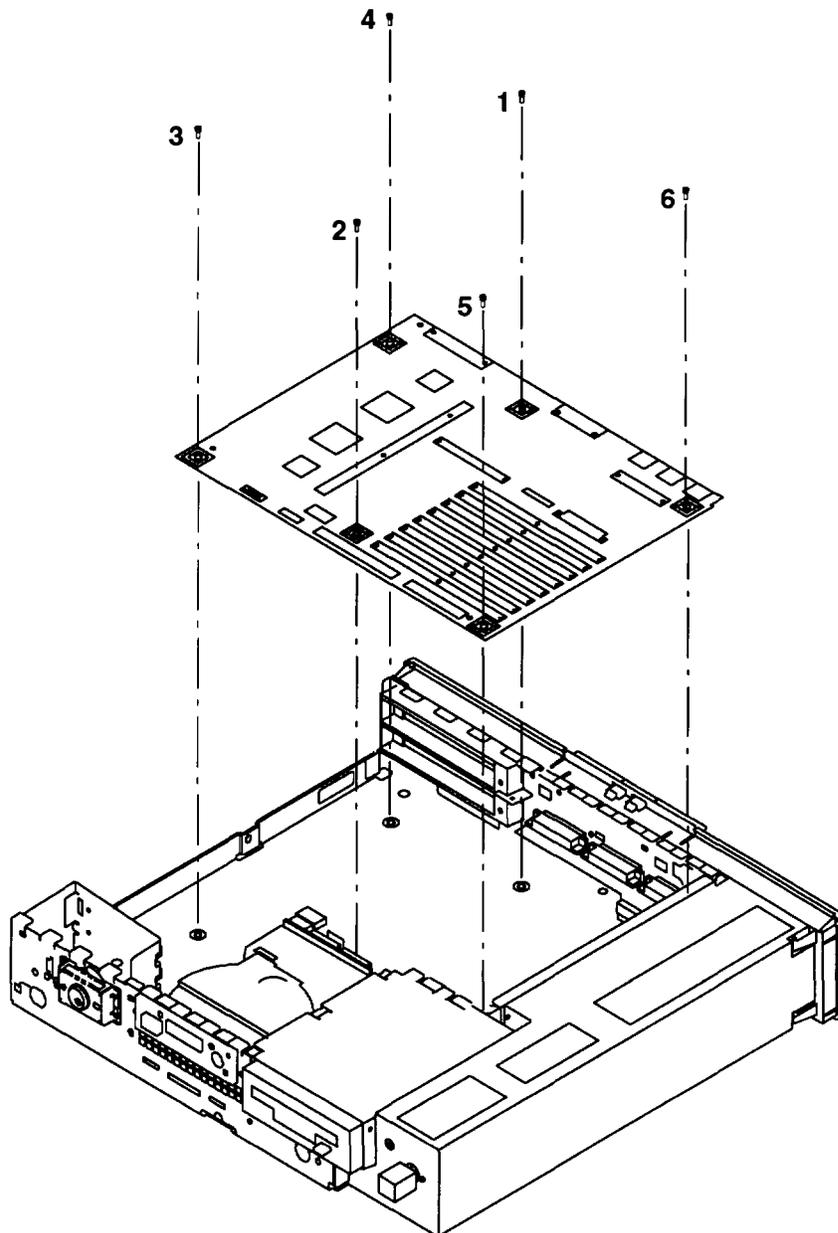
7. Install the six hex standoffs in the rear cover.

8. Install the latch and handle with two screws into the Ethernet connector (ET) on the rear cover. Make sure that the small notch of the cable lock is to the left.
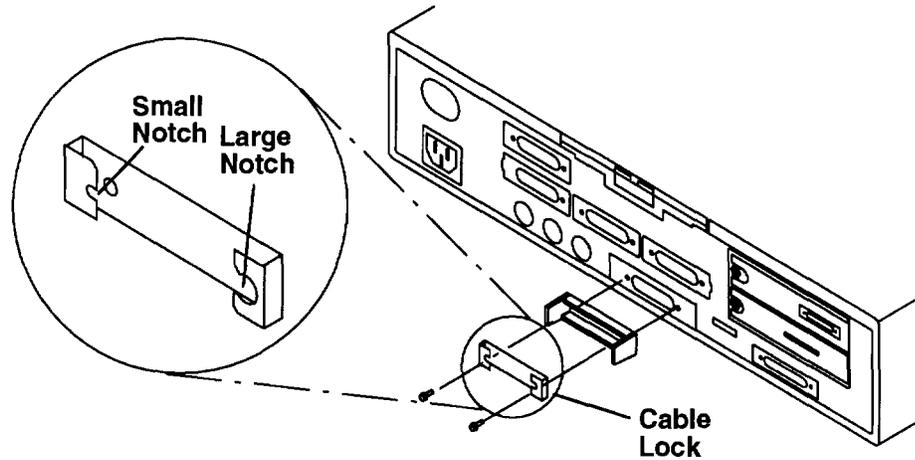
9. If a diskette drive was removed, connect one end of the diskette drive signal cable to the system board connector (J23).

10. If a disk drive was removed, connect one end of the disk drive signal cable to the system board connector (J22), and one end of the disk drive power cable to the system board connector (J24).

11. Do the replacement procedure in "Memory" on page 3-25 to replace any SIMMs that were removed from the system board.

12. Connect the power supply cable to the system board connector (J11).

13. Install the LED cable into the LED connector (J20), making sure that the side with the signal contacts is facing the front, and push down on the connector cable lock.

14. Connect the keylock cable to the system board connector (J21).

15. If a diskette drive was removed, do the replacement procedure in "Diskette Drive" on page 3-14.

16. If a disk drive was removed, do the replacement procedure in "Disk Drive" on page 3-16.

17. If installed, do the replacement procedure in "POWER Graphics Adapters" on page 3-45.

18. Install the riser card in the system board connector (J8).

19. Install the riser card support.

20. If any optional adapters were removed, do the replacement procedure in "Adapters" on page 3-20.

21. Connect all cables removed from the rear cover.

22. Do the replacement procedure in "Chassis Cover" on page 3-6.

23. Do the replacement procedure in "Chassis Assembly" on page 3-3.

24. Be sure to tell the customer that the time and date need to be reset after system board replacement.

   Reminder to Service Representative: After you exchange the system board, notify the customer that the unique identification number of the system unit has changed. The customer needs to update the authorization number for any program that uses the identification number for access.
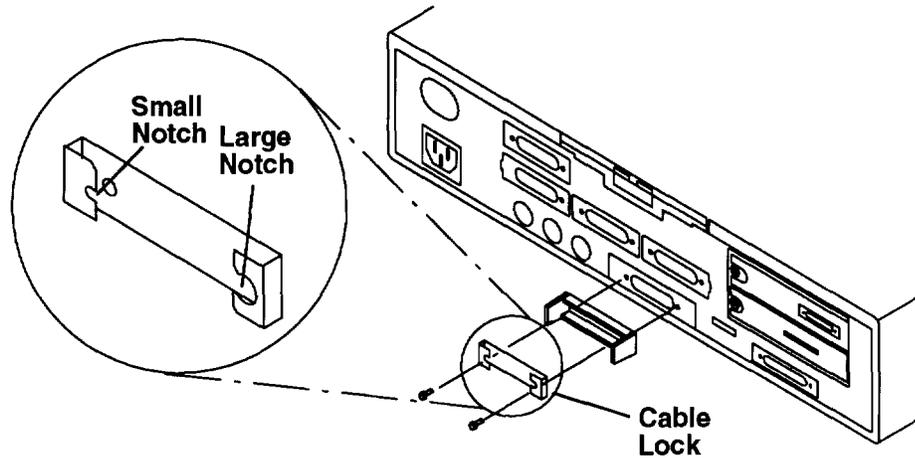
Replacement (for Model 250)

> **Note:** The Model 250 may contain either a 60 Mhz 601 CPU system board or an 80 Mhz 601 CPU system board. Refer to the *POWERstation and POWERserver Common Diagnostics and Service Guide* for Part Number information.

1. Set the system board in the chassis.

2. Set the SCSI jumpers. Refer to "Disable or Enable the SCSI Connector" on page 1-7.

3. Place the I/O toroid around the system board connector (J13).

4. Move the system board toward the front of the chassis and connect the serial/parallel connector card to the system board connector (J13).

5. Move the system board toward the rear of the chassis, ensuring that the keyboard, mouse, and tablet connectors (J14, J11, and J19) slide under the clips on the rear of the chassis.

6. Install the six screws in the system board in the sequence shown.
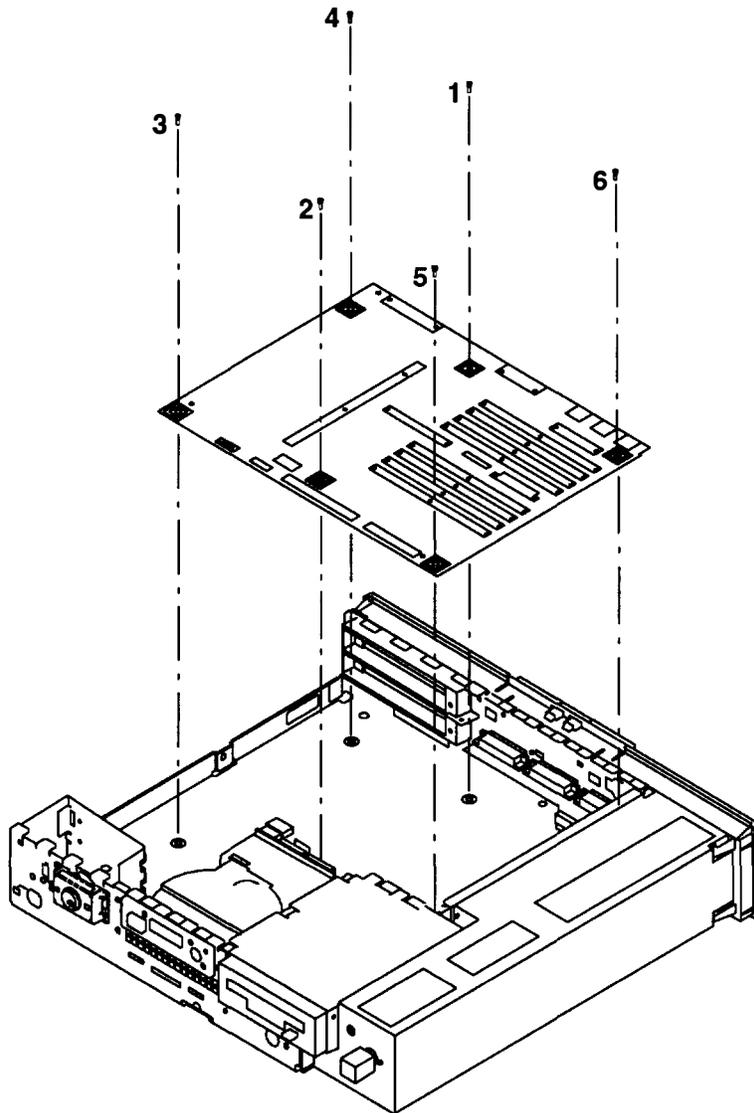
7. Install the six hex standoffs in the rear cover.

8. Install the latch and handle with two screws into the Ethernet connector (ET) on the rear cover. Make sure that the small notch of the cable lock is to the left.

9. If a diskette drive was removed, connect one end of the diskette drive signal cable to the system board connector (J24).

10. If a disk drive was removed, connect one end of the disk drive signal cable to the system board connector (J25), and one end of the disk drive power cable to the system board connector (J20).

11. Do the replacement procedure in "Memory" on page 3-25 to replace any SIMMs that were removed from the system board.

12. Connect the power supply cable to the system board connector (J18).

13. Install the LED cable into the LED connector (J23), making sure that the side with the signal contacts is facing the front, and push down on the connector cable lock.

14. Connect the keylock cable to the system board connector (J16).

15. If a diskette drive was removed, do the replacement procedure in "Diskette Drive" on page 3-14.

16. If a disk drive was removed, do the replacement procedure in "Disk Drive" on page 3-16.

17. If installed, do the replacement procedure in "POWER Graphics Adapters" on page 3-45.

18. Install the riser card in the system board connector (J10).

19. Install the riser card support.

20. If any optional adapters were removed, do the replacement procedure in "Adapters" on page 3-20.

21. Connect all cables removed from the rear cover.

22. Do the replacement procedure in "Chassis Cover" on page 3-6.

23. Do the replacement procedure in "Chassis Assembly" on page 3-3.

24. Be sure to tell the customer that the time and date need to be reset after system board replacement.

   Reminder to Service Representative: After you exchange the system board, notify the customer that the unique identification number of the system unit has changed. The customer needs to update the authorization number for any program that uses the identification number for access.
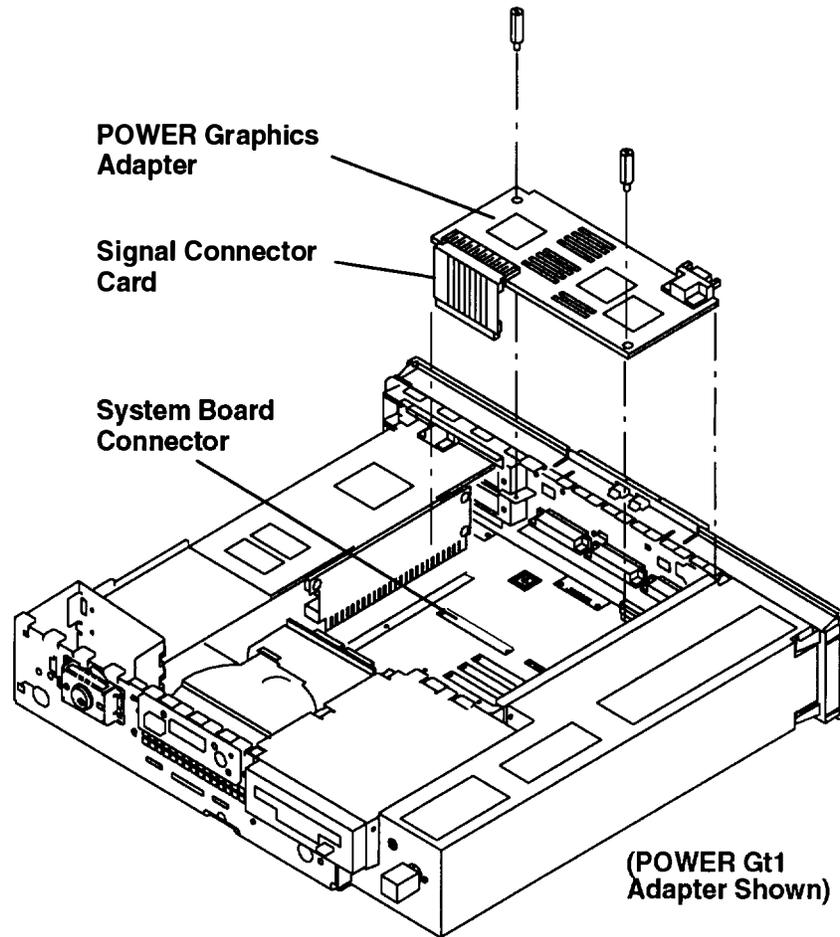
POWER Graphics Adapters

Removal

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Remove the riser card support.

Squeeze Release Handles

Riser Card Support

Front of Chassis
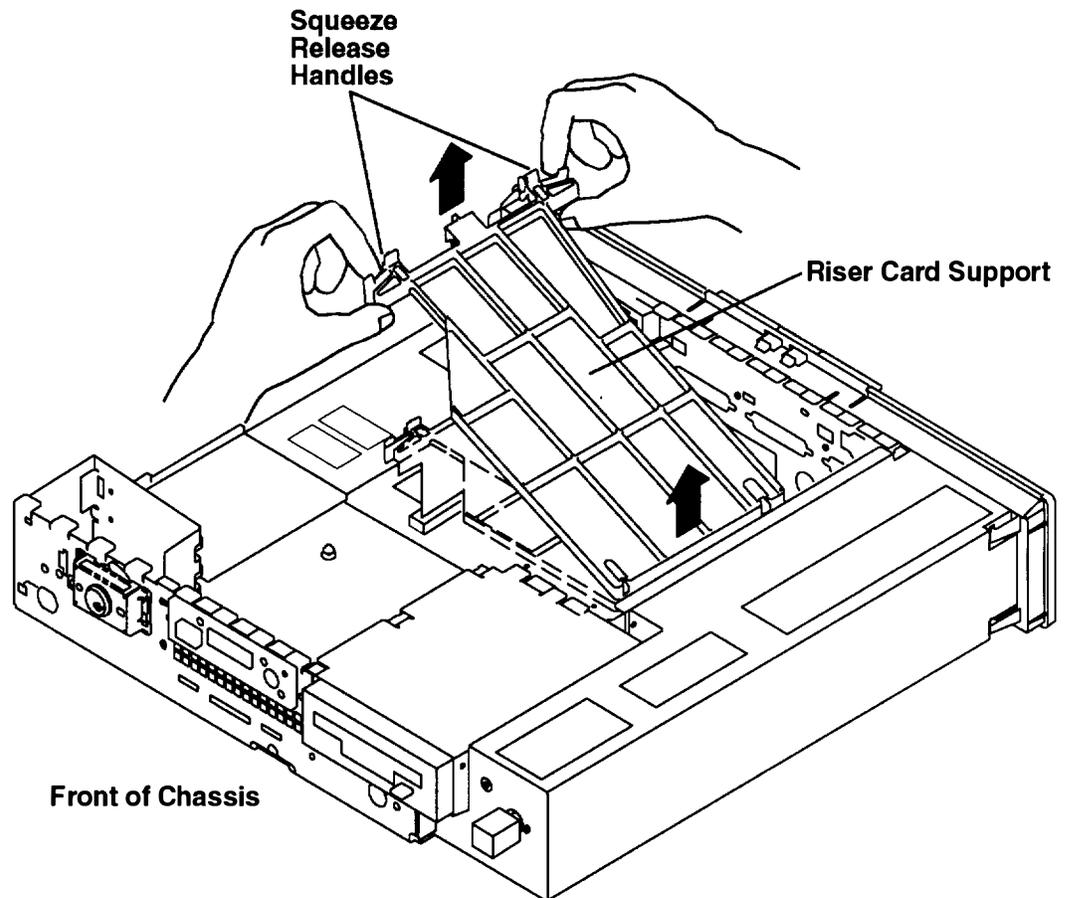
4. Remove two screws from the adapter.

POWER Graphics Adapter

Signal Connector Card

System Board Connector

(POWER Gt1 Adapter Shown)

5. Disconnect the signal connector card from the system board connector.

6. Remove the adapter and signal connector card.

7. Separate the signal connector card from the adapter.

Replacement

1. If replacing a POWER Gt1 or POWER Gt1B Graphics Adapter with video random access memory (VRAM), do the removal and replacement procedures in "POWER Gt1 or POWER Gt1B VRAM" on page 3-32 to install the video memory modules on the new adapter.

2. Set the display jumpers on the adapter. Refer to "Setting the Display Jumpers" on page 1-10 for more information on setting the jumpers.

3. Attach the signal connector card to the adapter.

   Note: To attach the signal connector card to the POWER GXT100 or POWER GXT150, turn the signal connector card so that the side with two arrows faces forward. Make sure the arrows point upward, then attach the signal connector card to the underside of the graphics adapter.

POWER GXT100 or POWER GXT150 Graphics Adapter

Signal Connector Card

Two Arrows Toward Front
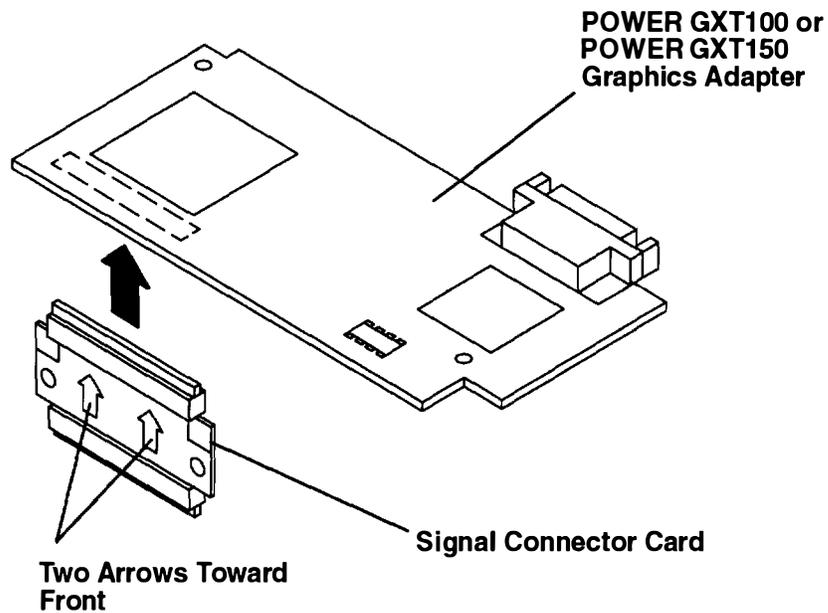
4. Place the adapter on the mounts provided. Make sure the adapter is seated between the guide rails located on the rear cover.

Guide Rails (on Models 220 and 230)

Front of Chassis

Guide Rails (on Model 250)
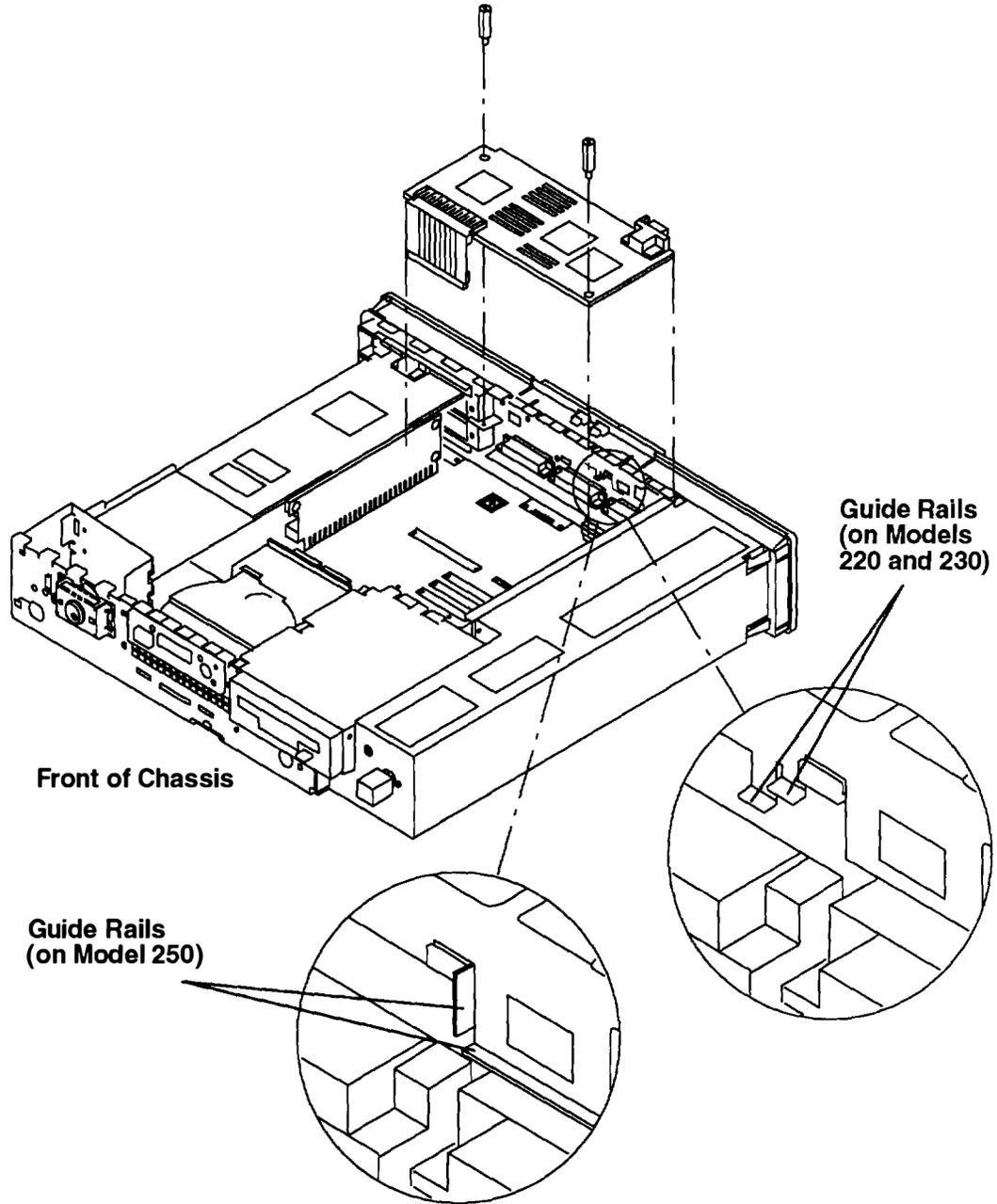
5. Connect the signal connector card to the system board connector.

   a. To install a POWER Gt1, POWER Gt1B, or POWER Gt1x in a Model 220 or a POWER Gt1x in a Model 230, connect the adapter signal connector card to the indicated system board connector (J9).

**POWER Graphics
Adapter Connector**
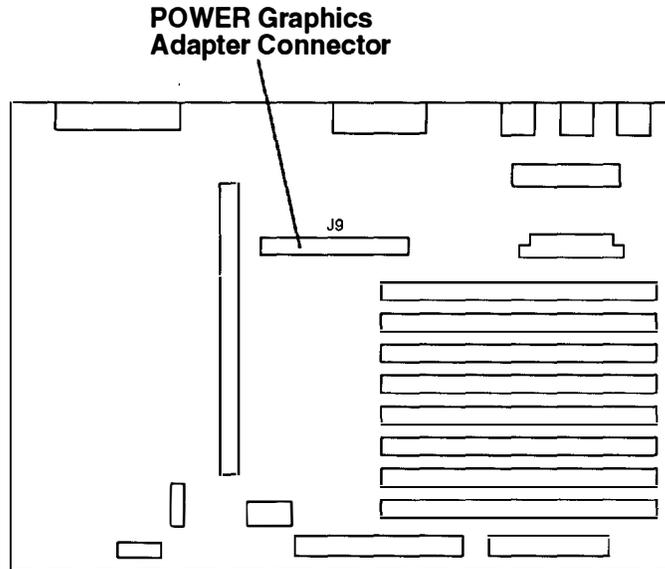
   b. To install a POWER GXT100 or POWER GXT150 graphics adapter in a Model 250, connect the signal connector card to the indicated system board connector (J9).

**POWER Graphics
Adapter Connector**
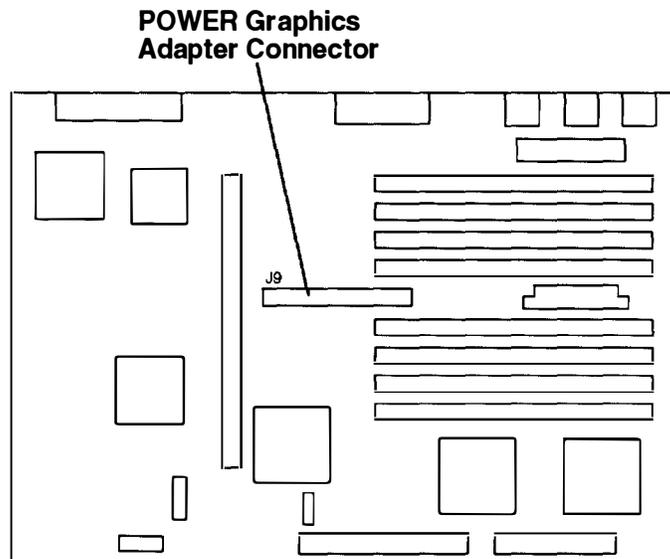
6. Install two screws in adapter card and tighten with a screwdriver.

7. Install the riser card support.

8. Do the replacement procedure in "Chassis Cover" on page 3-6.

9. Do the replacement procedure in "Chassis Assembly" on page 3-3.

Three-Digit Display

Removal

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Make sure the riser card support is installed.

Riser Card Support
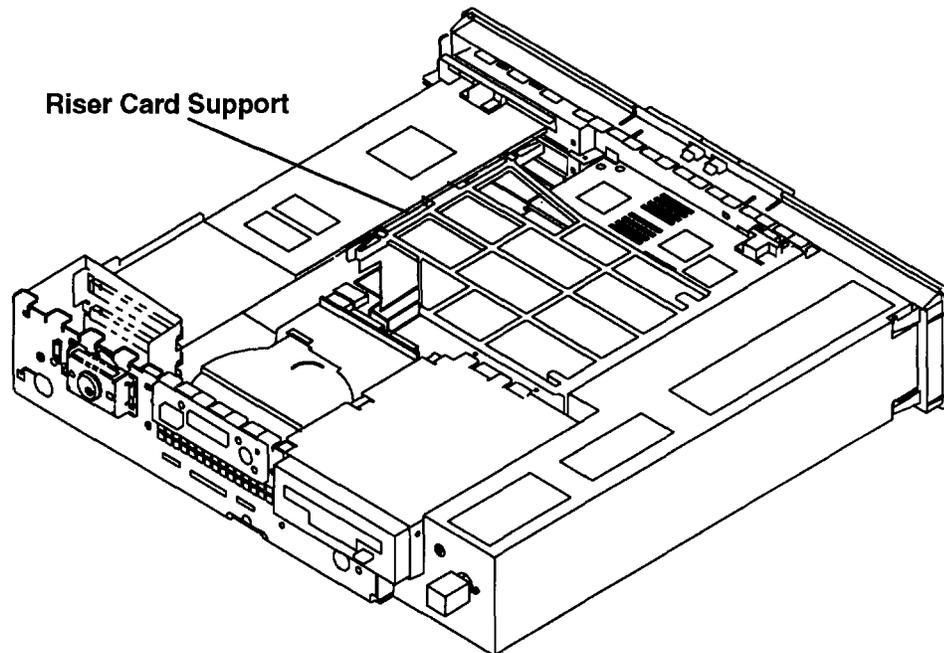
4. Do the removal procedure in "Adapters" on page 3-20 if any optional adapters are installed.

5. Do the removal procedure in "Keylock" on page 3-59.

6. If removing the three-digit display from a Model 220 or 230, proceed to step 7 on page 3-51.

   If removing the three-digit display from a Model 250, proceed to step 10 on page 3-52.

7. Open the plastic cable lock on the LED connector (J20) by pulling each end up (with a small screwdriver or your fingers). Remove the LED cable from the cable lock.
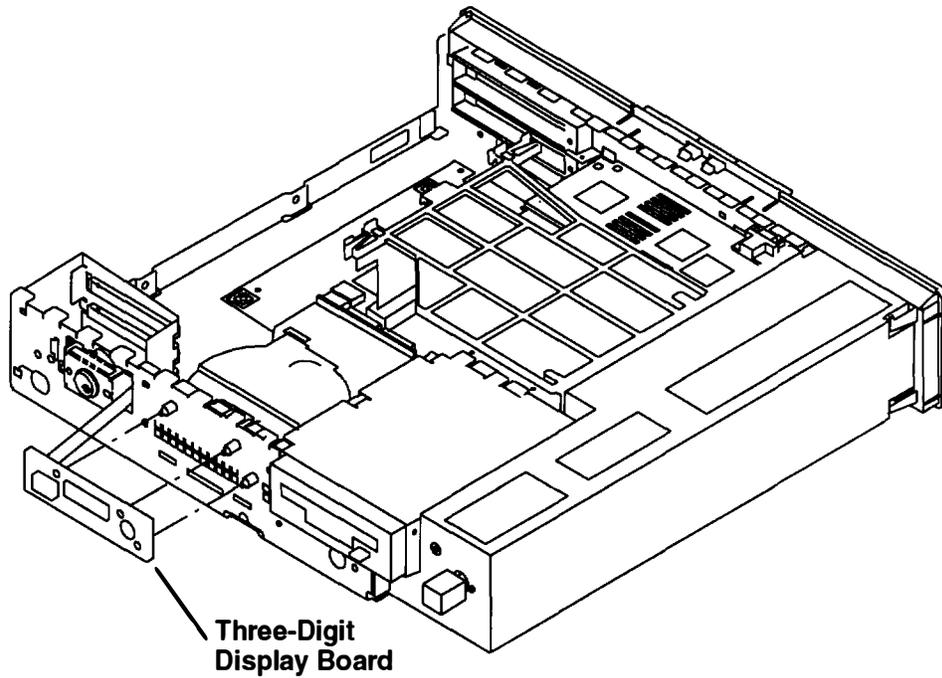

LED Connector

8. Disconnect the keylock cable from the system board connector (J21).
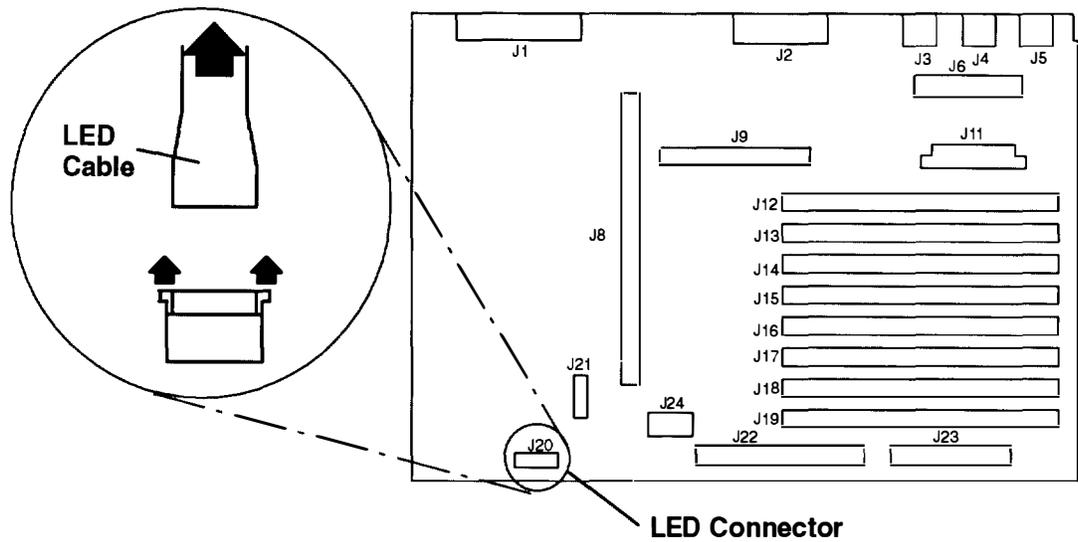
Keylock Cable Connector
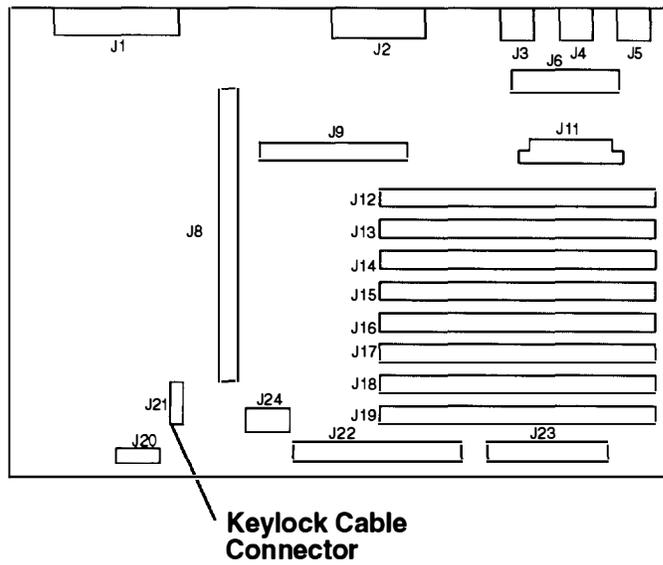
9. Go to step 12 on page 3-53.

10. Open the plastic cable lock on the LED connector (J23) by pulling each end up (with a small screwdriver or your fingers). Remove the LED cable from the cable lock.

LED Connector

11. Disconnect the keylock cable from the system board connector (J16).
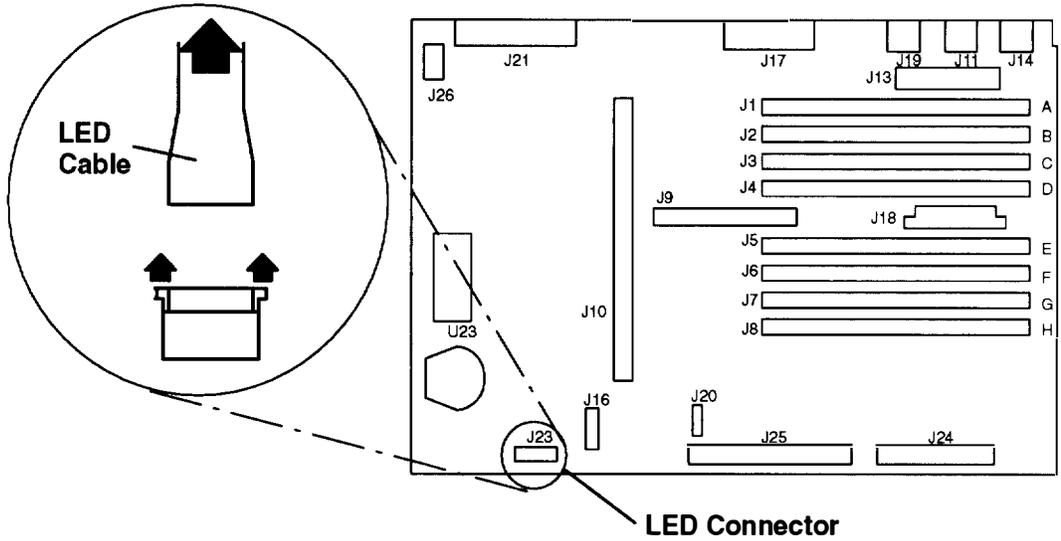
Keylock Cable Connector
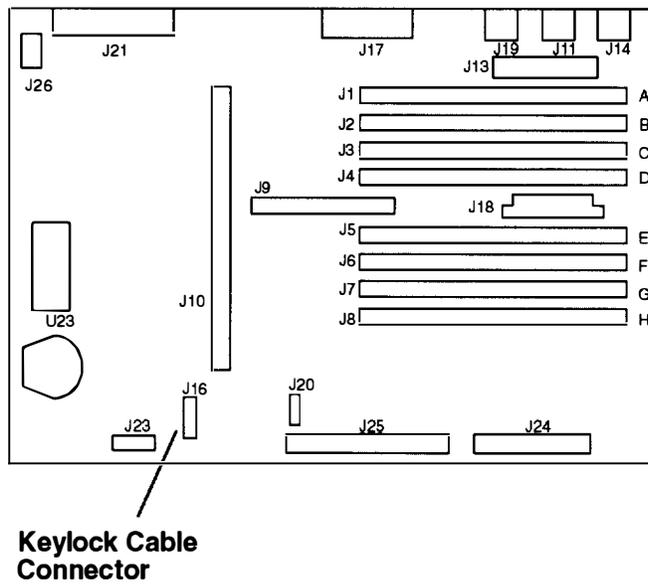
12. Note the LED cable routing and remove the grounding clip by pushing down on the clip and sliding it to the rear.

Grounding Clip
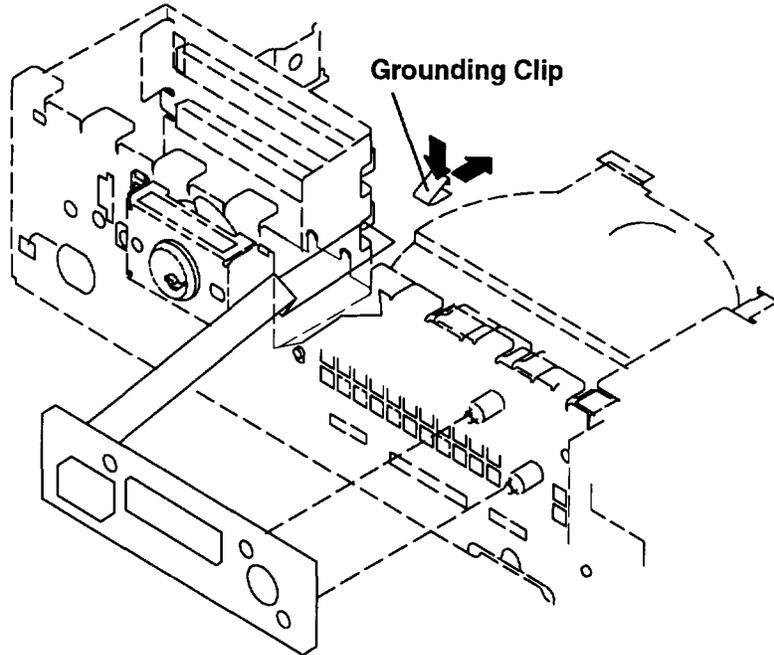
13. Pry the three-digit display board off the plastic mounts.

Three-Digit Display Board

Replacement

1. Install the three-digit display board on the plastic mounts.

2. Open the plastic cable lock on the connector by pulling it up.

3. Install the cable into the three-digit display connector, making sure that the signal contact side is facing the front.

4. Push down on the three-digit display connector to secure the cable.

5. Install the grounding clip.

6. Do the replacement procedure in "Keylock" on page 3-59.

7. Do the replacement procedure in "Adapters" on page 3-20 and replace any installed optional adapters.

8. Do the replacement procedure in "Chassis Cover" on page 3-6.

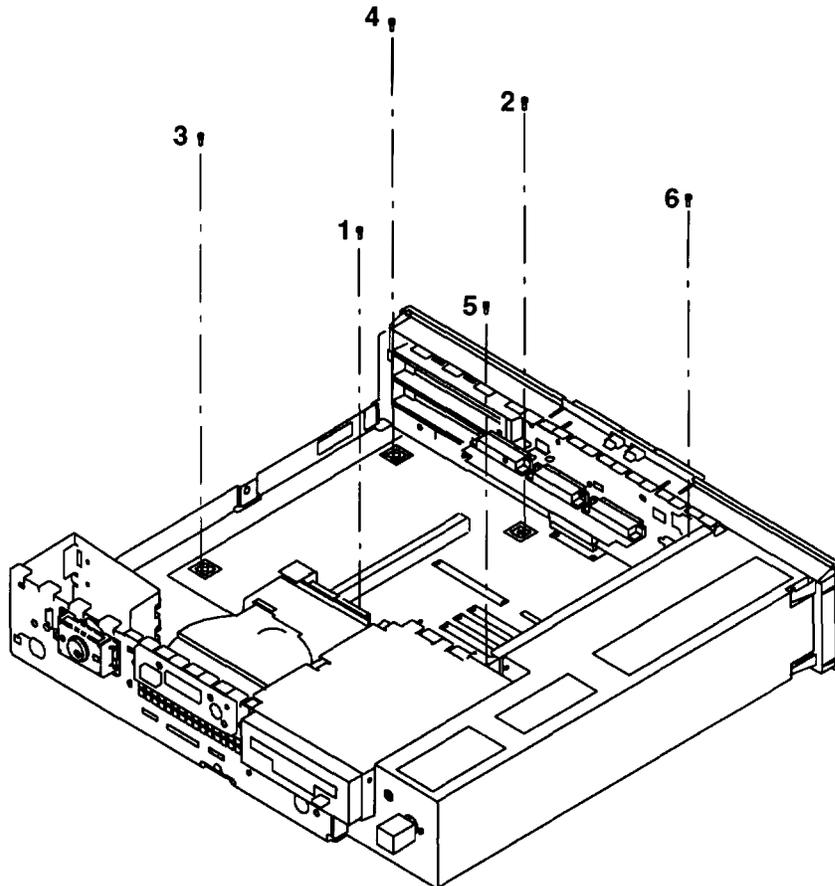9. Do the replacement procedure in "Chassis Assembly" on page 3-3.

Serial/Parallel Card Connector

Removal

Do steps 1 through 22 of the removal procedure in "System Board" on page 3-34.
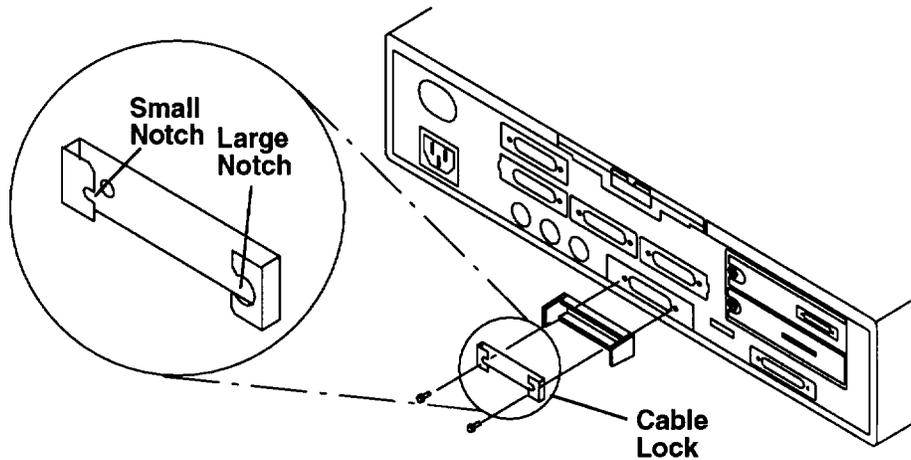
Replacement (for Models 220 and 230)

1. Place the I/O toroid around the system board connector (J6).

2. Move the system board toward the front of the chassis and connect the serial/parallel connector card to the system board connector (J6).

3. Move the system board toward the rear of the chassis, ensuring that the keyboard, mouse, and tablet connectors (J3, J4, and J5) slide under the clips on the rear of the chassis.

4. Install the six screws in the system board in the sequence shown.
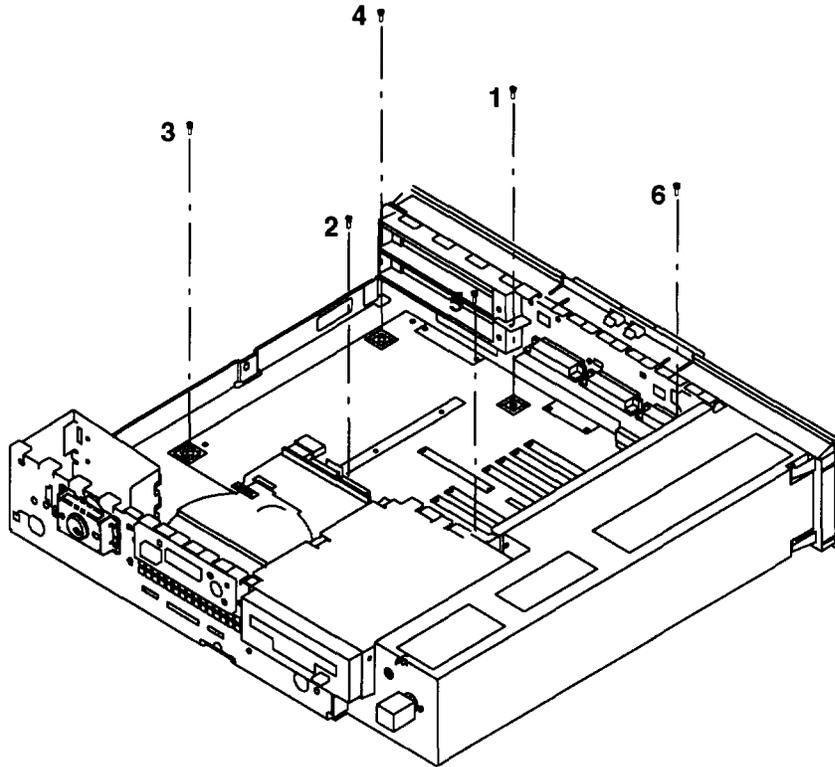

5. Install the six hex standoffs in the rear cover.

6. Install the latch and handle with two screws into the Ethernet connector (ET) on the rear cover. Make sure that the small notch of the cable lock is to the left.
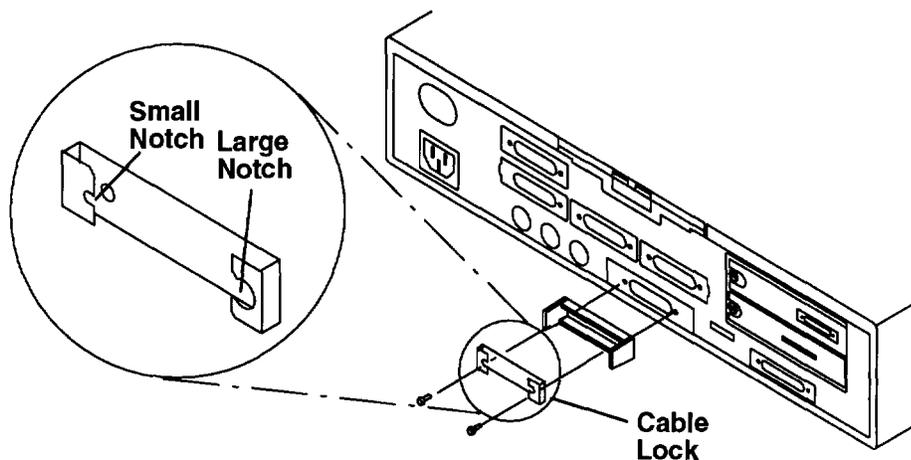

7. Do the replacement procedure in "Memory" on page 3-25 to replace any SIMMs that were removed from the system board.

8. Connect the power supply cable to the system board connector (J11).

9. Install the LED cable into the LED connector (J20), making sure that the side with the signal contacts is facing the front, and push down on the connector cable lock.

10. Connect the keylock cable to the system board connector (J21).

11. If a diskette drive was removed, do the replacement procedure in "Diskette Drive" on page 3-14.

12. If a disk drive was removed, do the replacement procedure in "Disk Drive" on page 3-16.

13. Install the LED cable into the LED connector (J20), making sure that the side with the signal contacts is facing the front, and push down on the connector.

14. If a Graphics Adapter was removed, do the replacement procedure in "POWER Graphics Adapters" on page 3-45.

15. Install the riser card in the system board connector (J8).

16. Install the riser card support.

17. If any optional adapters were removed, do the replacement procedure in "Adapters" on page 3-20.

18. Connect all cables removed from the rear cover.

19. Do the replacement procedure in "Chassis Cover" on page 3-6.

20. Do the replacement procedure in "Chassis Assembly" on page 3-3.

Replacement (for Model 250)

1. Place the I/O toroid around the system board connector (J13).

2. Move the system board toward the front of the chassis and connect the serial/parallel connector card to the system board connector (J13).

3. Move the system board toward the rear of the chassis, ensuring that the keyboard, mouse, and tablet connectors (J14, J11, and J19) slide under the clips on the rear of the chassis.

4. Install the six screws in the system board in the sequence shown.

5. Install the six hex standoffs in the rear cover.

6. Install the latch and handle with two screws into the Ethernet connector (ET) on the rear cover. Make sure that the small notch of the cable lock is to the left.

7. Do the replacement procedure in "Memory" on page 3-25 to replace any SIMMs that were removed from the system board.

8. Connect the power supply cable to the system board connector (J11).

9. Install the LED cable into the LED connector (J23), making sure that the side with the signal contacts is facing the front, and push down on the connector cable lock.

10. Connect the keylock cable to the system board connector (J16).

11. If a diskette drive was removed, do the replacement procedure in "Diskette Drive" on page 3-14.

12. If a disk drive was removed, do the replacement procedure in "Disk Drive" on page 3-16.

13. If installed, do the replacement procedure in "POWER Graphics Adapters" on page 3-45.

14. Install the riser card in the system board connector (J10).

15. Install the riser card support.

16. If any optional adapters were removed, do the replacement procedure in "Adapters" on page 3-20.

17. Connect all cables removed from the rear cover.

18. Do the replacement procedure in "Chassis Cover" on page 3-6.

19. Do the replacement procedure in "Chassis Assembly" on page 3-3.

Keylock

Removal

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Remove the riser card support.

Squeeze Release Handles
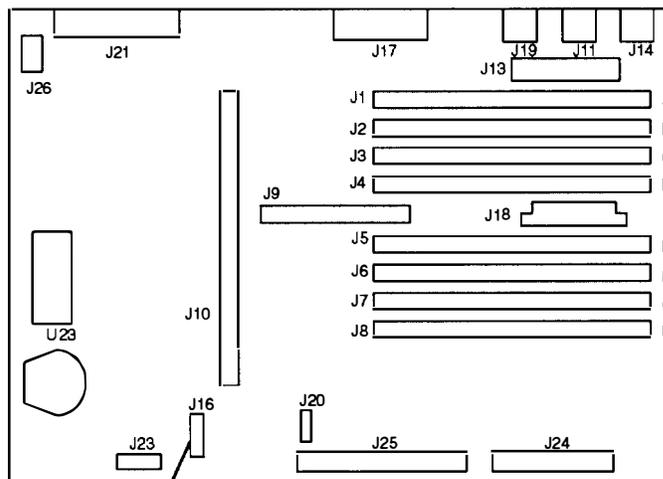
Riser Card Support

Front of Chassis
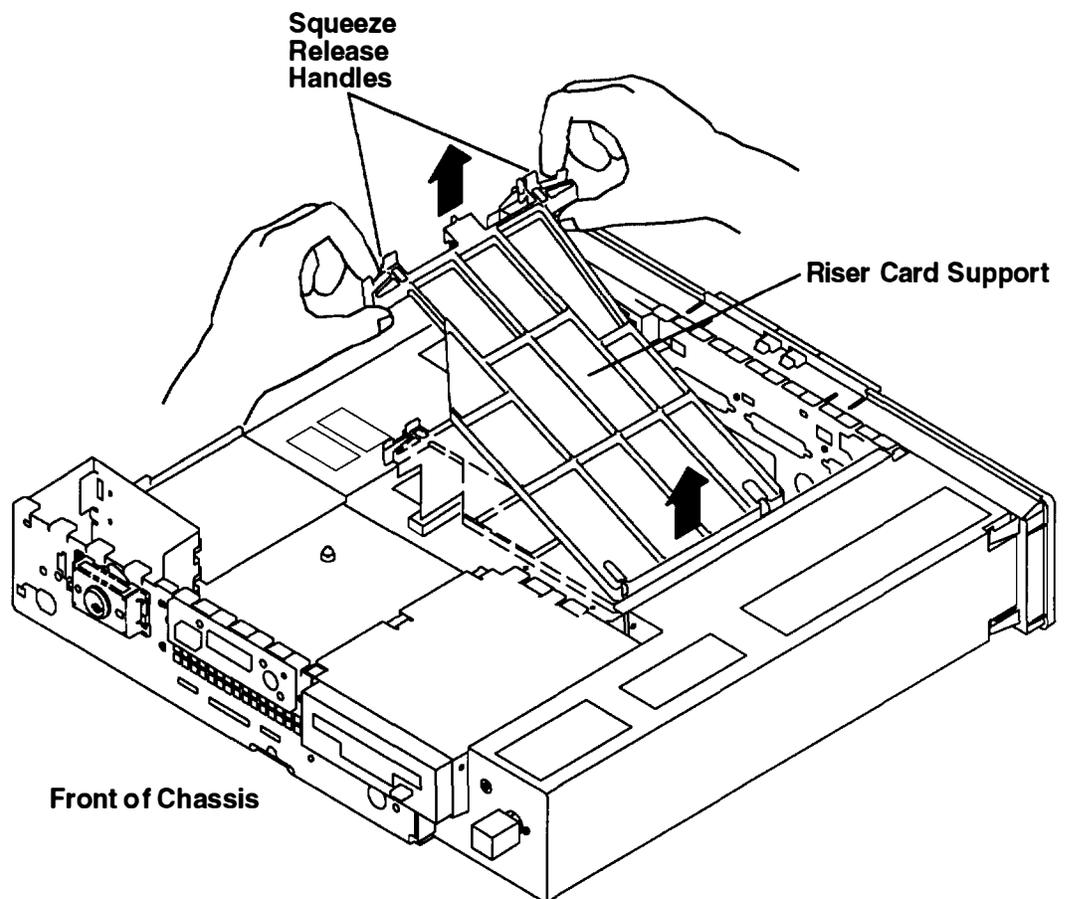
4. Do the removal procedure in "Adapters" on page 3-20 to remove any installed optional adapters.

5. Remove the keylock cable from the system board connector:

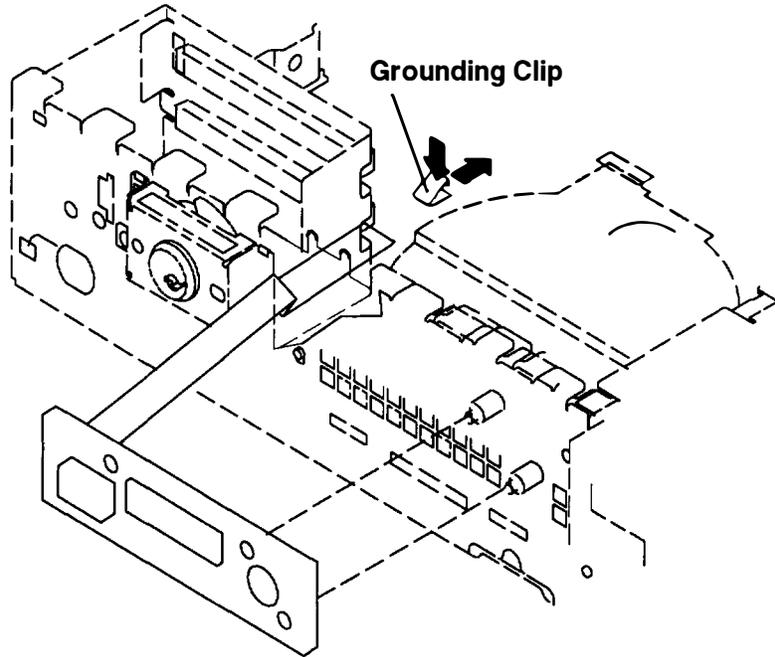   a. For the Models 220 and 230, the keylock cable connector is labeled J21.
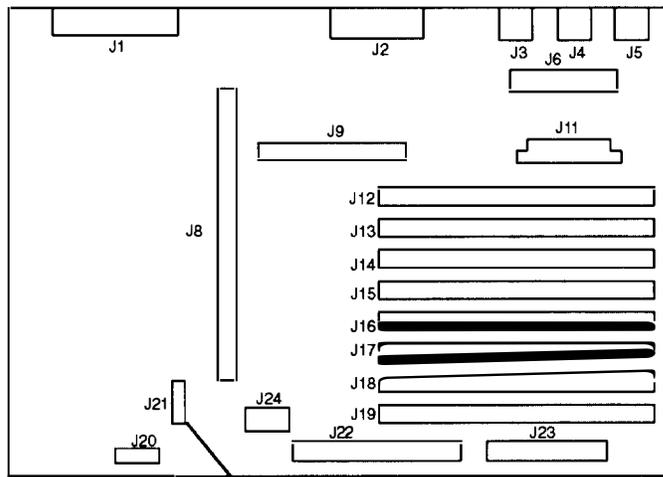
Keylock Cable Connector

   b. For the Model 250, the keylock connector is labeled J16.

Keylock Cable Connector

6. Note the LED cable routing and remove the grounding clip by pushing down on the clip and sliding it to the rear.
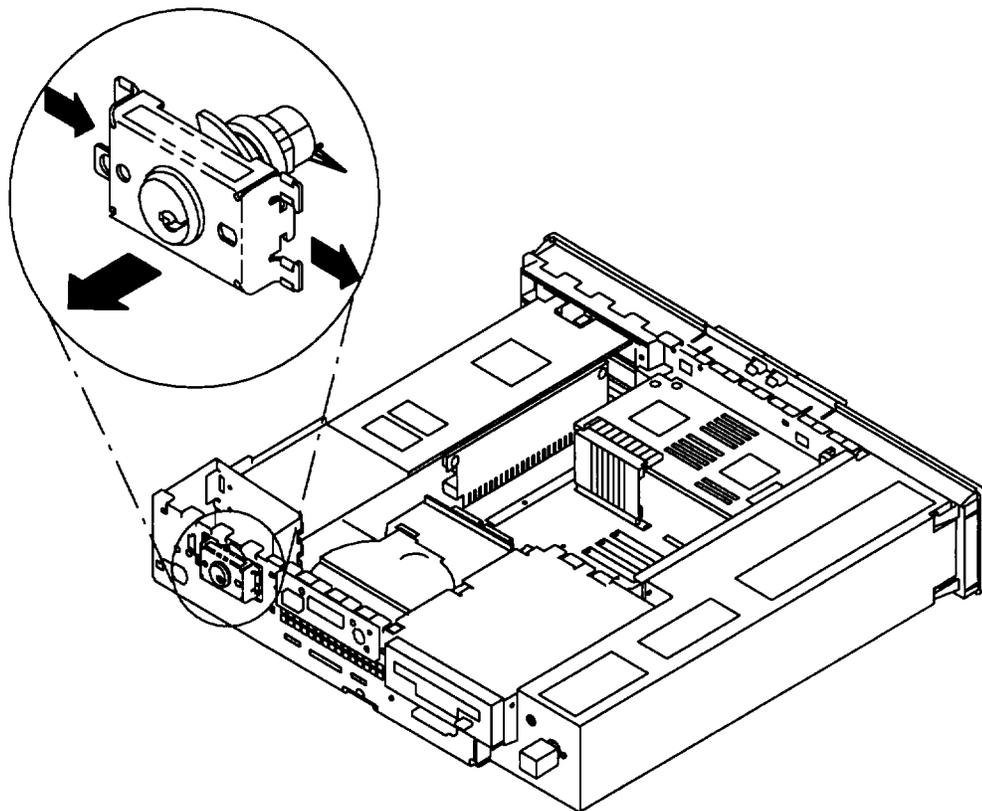
Grounding Clip

7. If the keylock plate is the plastic version, go to Step 11. If the keylock is the metal version, proceed to Step 8.

8. Remove the plastic rivet holding the keylock by pushing in on the rivet plunger from the rear.
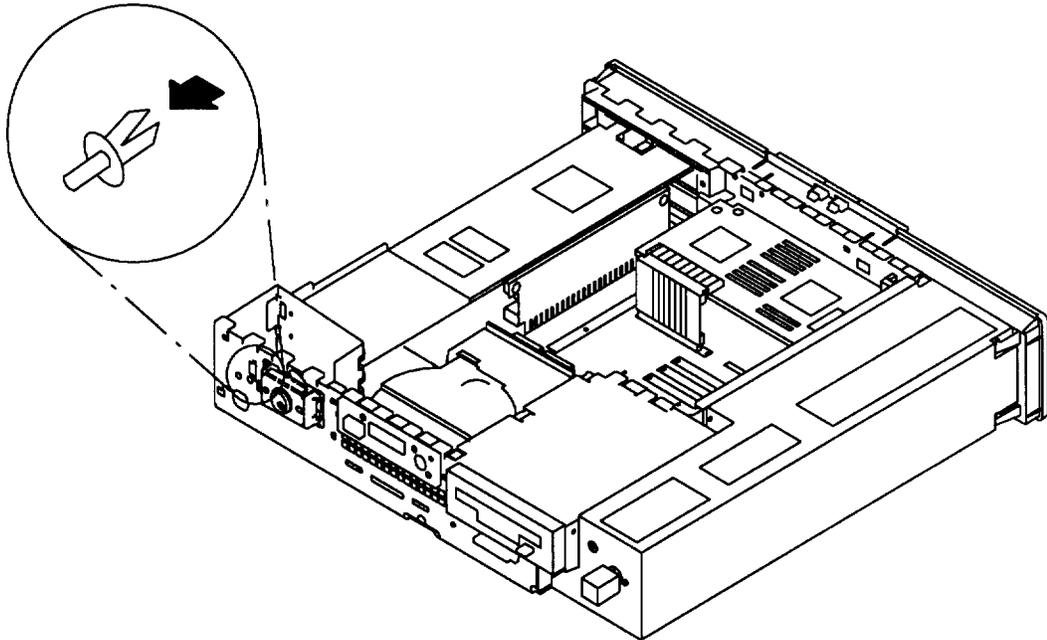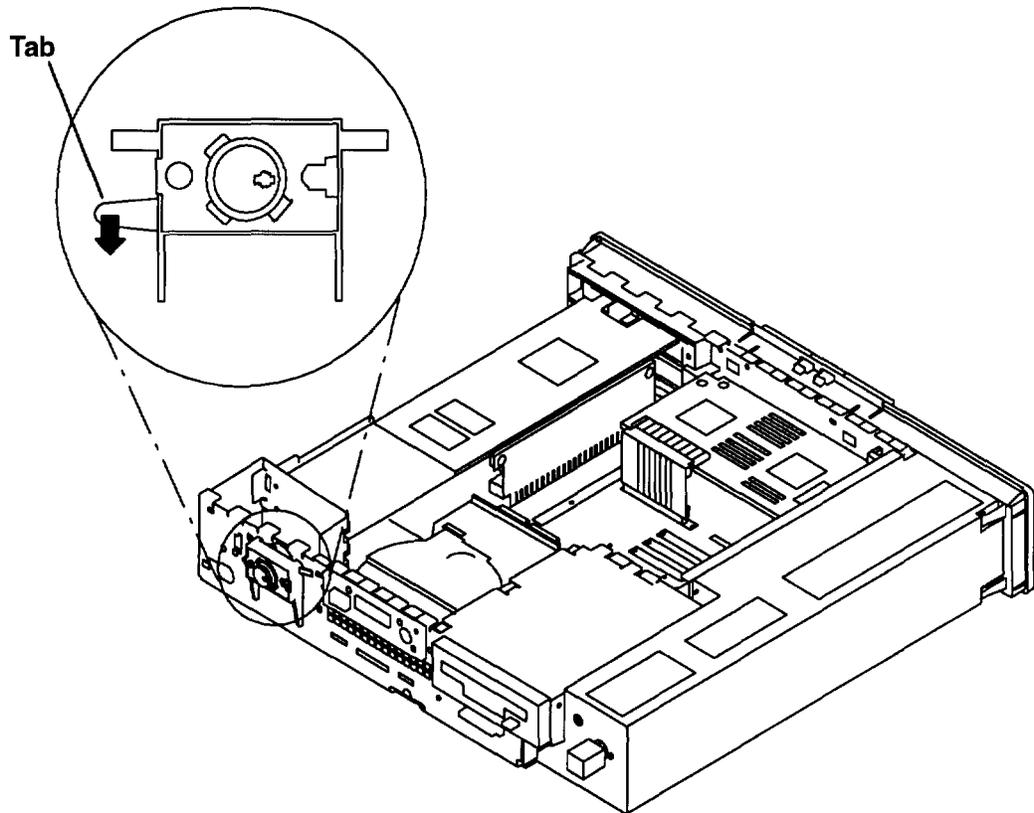
9. Slide the keylock to the right and pull out forward.

10. To replace the metal keylock with the plastic version, go to "Replacement" on page 3-63.

11. Lift the tab on the left side of the keylock out of the hole in the system unit chassis. Then, slide the keylock assembly to the right and pull the keylock forward out of the system unit chassis.

Replacement

1. Install the keylock in the slots provided.

2. Connect the keylock cable to the system board connector (J21).

   a. For the Models 220 and 230, the keylock cable connector is labeled J21.

   b. For the Model 250, the keylock connector is labeled J16.

3. Install the LED grounding clip.

4. Do the replacement procedure in "Adapters" on page 3-20 if you have removed any optional adapters.

5. Do the replacement procedure in "Chassis Cover" on page 3-6.

6. Do the replacement procedure in "Chassis Assembly" on page 3-3.

Battery

Note: For a translation of the safety notices, refer to the *System Unit Safety Information*, Order Number SA23-2652.

CAUTION:
A lithium battery can cause fire, explosion, or a severe burn. Do not recharge, disassemble, heat above 100°C (212°F), solder directly to the cell, incinerate, or expose cell contents to water. Keep away from children. Replace only with the part number specified for your system. Use of another battery may present a risk of fire or explosion.

The battery connector is polarized; do not attempt to reverse the polarity.

Dispose of the battery according to local regulations.

Removal

1. Do the removal procedure in "Chassis Assembly" on page 3-3.

2. Do the removal procedure in "Chassis Cover" on page 3-6.

3. Make sure the riser card support is installed.

Riser Card Support
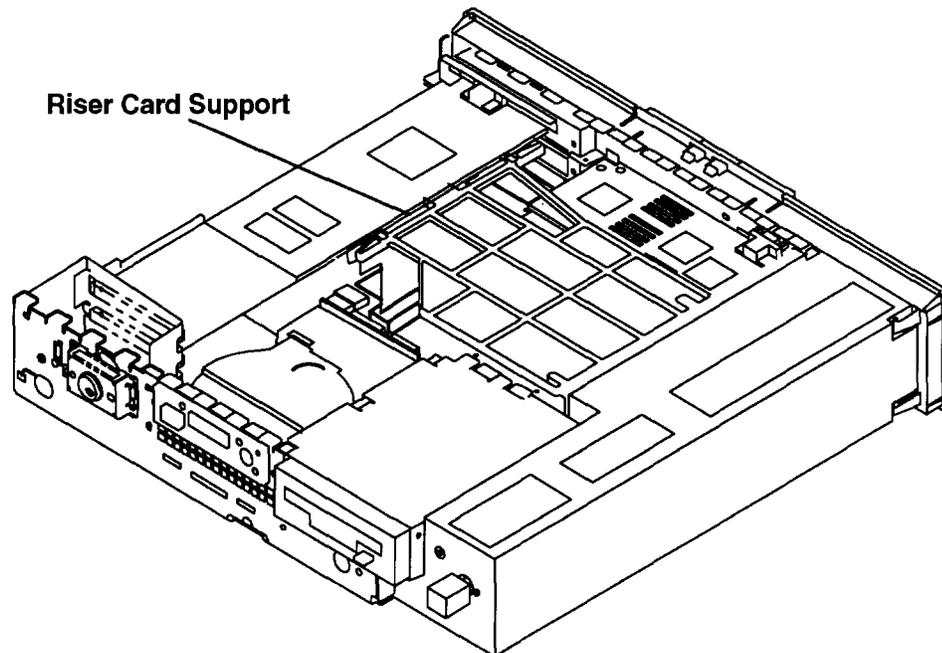
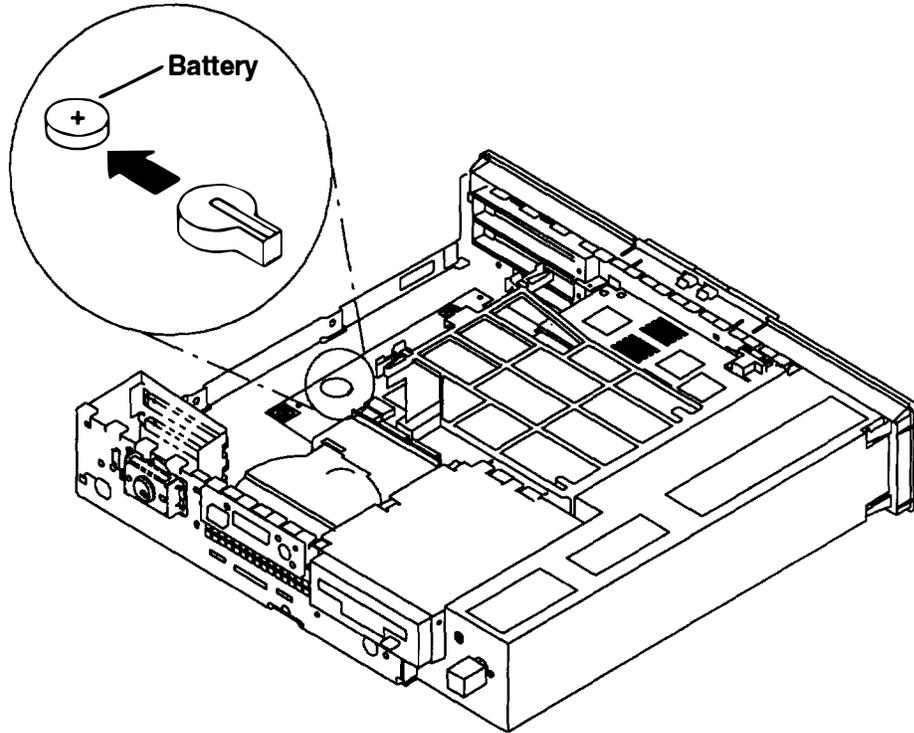4. Do the removal procedure in "Adapters" on page 3-20 and remove any installed optional adapters.
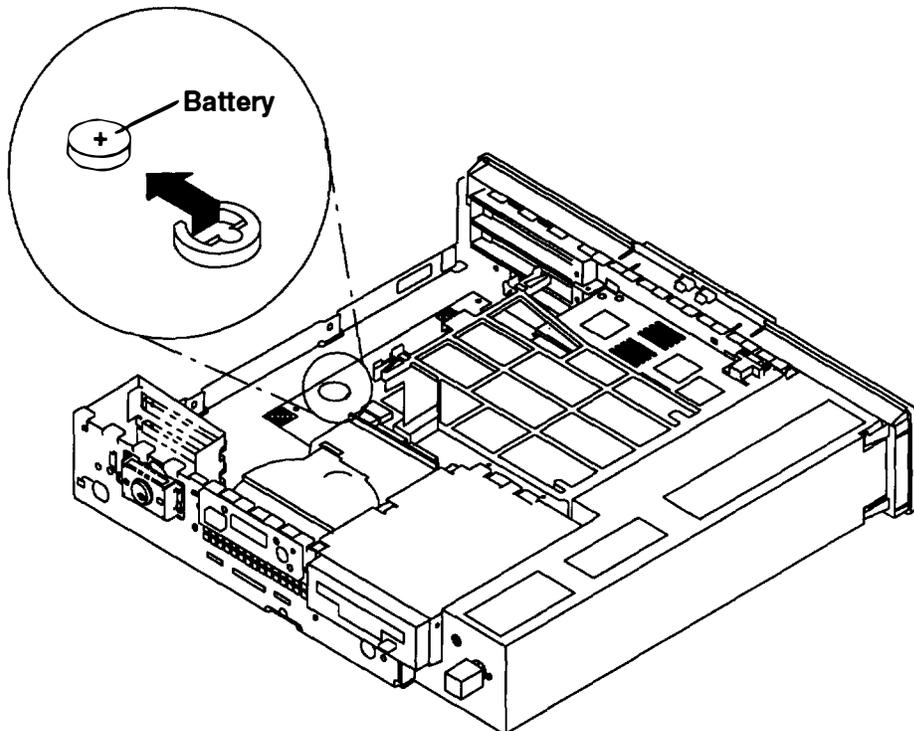
5. Remove the battery.

   a. For Models 220 and 230, lift up on the clip holding the battery and remove the battery.

      Warning: Be careful not to damage the battery holding clip when removing the battery.

   b. For the Model 250, press down on the edge of the battery, then lift the battery out of the holder.

Replacement

1. Install the battery in the holder, being careful to observe correct polarity (positive side up).

2. Do the replacement procedure in "Adapters" on page 3-20 and replace any installed optional adapters.

3. Do the replacement procedure in "Chassis Cover" on page 3-6.

4. Do the replacement procedure in "Chassis Assembly" on page 3-3.

5. Be sure to tell the customer that the time and date need to be reset.

Chapter 4. Diagnostics

Diagnostics

The built-in diagnostics complement the basic troubleshooting techniques featured in "Chapter 2. Maintenance Analysis Procedures (MAPS)."

1. Set the system unit power switch to the Off position if it is not already off.

2. Set the key mode switch to the Secure position.

3. Turn on all attached devices, such as terminals, tape drives, monitors, and external disk drives.

4. Open the operator panel door.

5. Set the system unit power switch to the On position.

6. Wait for `200` to appear in the three-digit display, then continue with step 7.

7. Set the key mode switch to the Service position.

8. Press the yellow Reset button. After a minute, the Main Menu should appear.

```
                          Main Menu
                 Configuration and Diagnostics

      1    Select BOOT (Startup) Device
      2    Select Language for these Menus
      3    Send Test Transmission (PING)
      4    Show Hardware Configuration
      5    Perform Built-In Diagnostics
      6    Exit Main Menu and Start System (BOOT)
      .








      Type the number for your selection, then press "ENTER"
      (Use the "Backspace" key to correct errors)
```

9. Select the `Perform Built-In Diagnostics` option (5) from the Main Menu. The Diagnostics screen should be displayed.

```
                      Diagnostics


  1. Perform Built-In Basic Diagnostics
     Use this selection for system check-out and problem
     determination. Service equipment (such as wrap plugs)
     is not needed


  2. Perform Built-In Advanced Diagnostics
     This selection in normally used by Service personnel.
     Service equipment (such as wrap plugs) is needed.



  NOTE: In addition to your Built-In Diagnostics,
  diagnostic programs may be provided along with your
  operating system. Refer to your operating system's
  diagnostic documentation for instructions on how to use
  these diagnostic programs.

  99. Return to Main Menu


  Type the number for your selection, then press "ENTER"
  (Use the "Backspace" key to correct errors)
```

10. Select the `Perform Built-In Advanced Diagnostics` (option 2) from the
    Diagnostics menu. The Perform Built-In Advanced Diagnostics Test Selection Menu
    should be displayed.

```
            Perform Built-In Advanced Diagnostics
                    Test Selection Menu

  NOTE: An * in front of the selection indicates that the
  test has been run.
    1.   Run ALL built-in ADVANCED diagnostic tests


        LOCATION              TEST DESCRIPTION
    2.                        Memory
    3.   00-00-S1            Serial port
    4.   00-00-S2            Serial port
    5.   00-00-0P            Parallel port
    6.   00-00-0M            Mouse port
    7.   00-00-0T            Tablet port
    8.   00-00-0K            Keyboard port




    Page 1 of 3


    88.   Next Page of Test Selection Menu
    99.   Return to Main Menu

    Type the number for your selection, then press "ENTER"
    (Use the "Backspace" key to correct errors)
```

```
            Perform Built-In Advanced Diagnostics
                    Test Selection Menu


NOTE: An * in front of the selection indicates that the
test has been run.

        LOCATION          TEST DESCRIPTION
  9.   00-00-0D           Diskette port
 10.   00-00-0S           SCSI port
 11.   00-00-0E           Integrated Ethernet Standard
                          Adapter
 12.   00-00-0K           Keyboard-101 keys
 13.   00-00-05-00        400 MB SCSI Disk Drive
 14.   00-00-0D           3.5 Inch 2.88 MB Diskette Drive
 15.   00-0J              POWER Gtxx


Page 2 of 3


 88.   Next Page of Test Selection Menu
 77.   Previous Test Selection Menu
 99.   Return to Main Menu

Type the number for your selection, then press "ENTER"
(Use the "Backspace" key to correct errors)
```

```
            Perform Built-In Advanced Diagnostics
                    Test Selection Menu


NOTE: An * in front of the selection indicates that the
test has been run.

        LOCATION              TEST DESCRIPTION
 16.   00-01                  Token-Ring High-Performance
                              Network Adapter






Page 3 of 3


 77.   Previous Test Selection Menu
 99.   Return to Main Menu

Type the number for your selection, then press "ENTER"
(Use the "Backspace" key to correct errors)
```
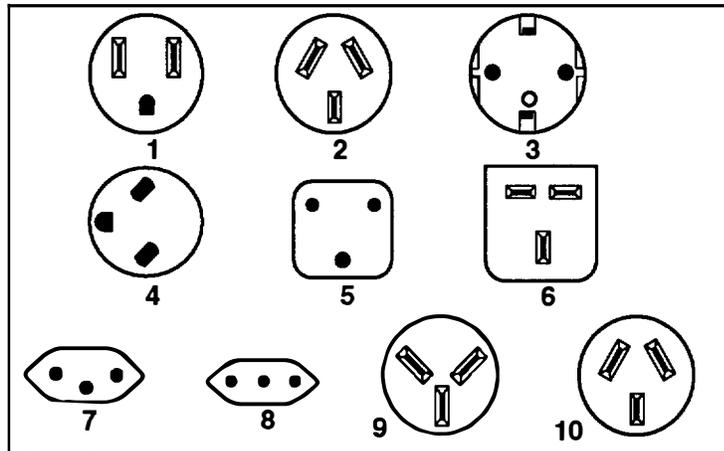
11. Select the advanced diagnostic test that you want to run.
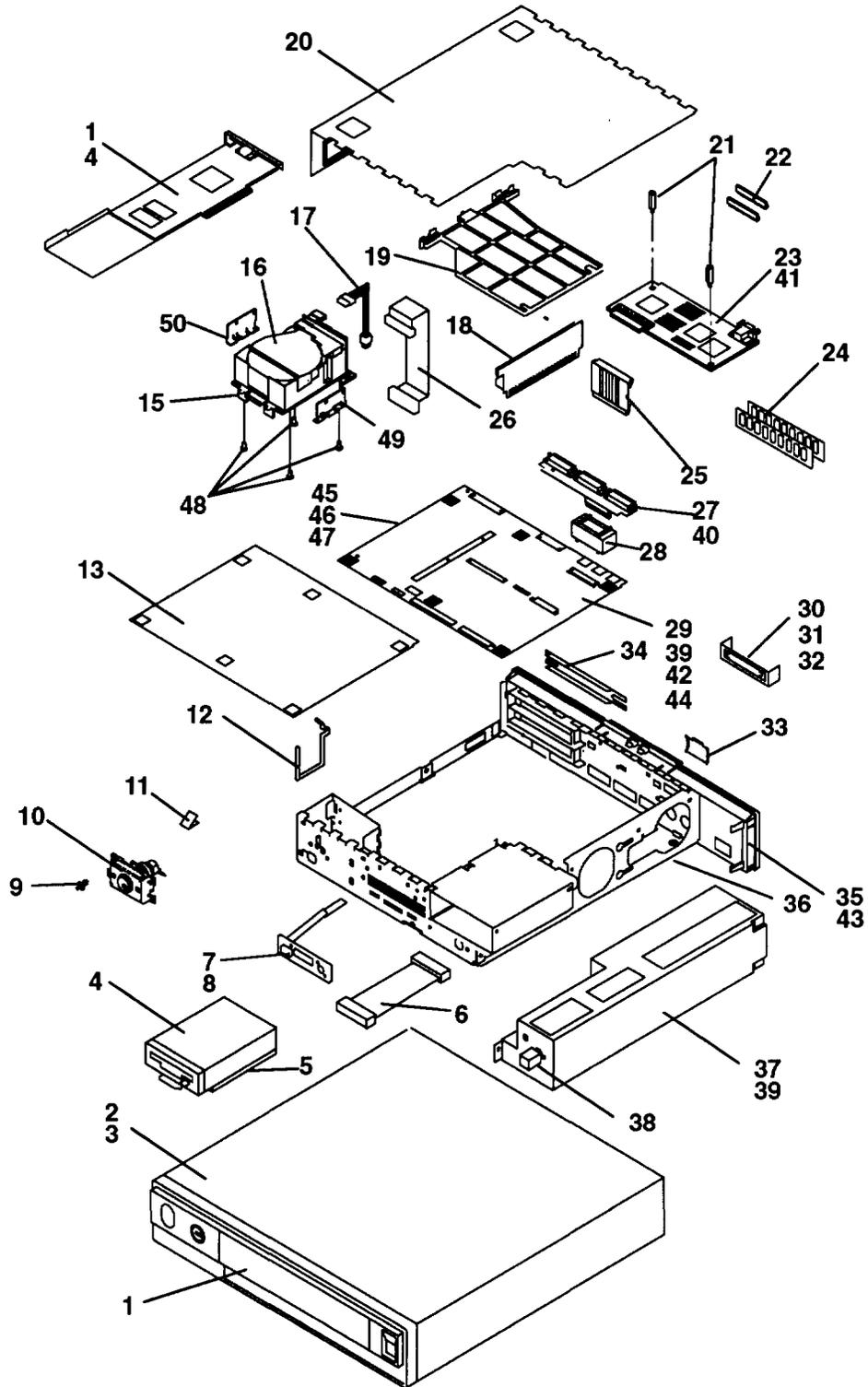
Chapter 5. Parts Information

This chapter contains information on 7011 system unit parts and accessories.

Power Cables and Plugs

Part Number	Country	Index
62X0663	Bahamas, Barbados, Bermuda, Bolivia, Brazil, Canada, Cayman Islands, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Korea (South), Mexico, Netherlands Antilles, Nicaragua, Panama, Peru, Philippines, Puerto Rico, Saudi Arabia, Suriname, Trinidad, Taiwan, U.S.A., Venezuela	1
13F9940	Argentina, Australia, New Zealand,	2
13F9979	Abu Dhabi, Austria, Belgium, Bulgaria, Botswana, Egypt, Finland, France, Germany, Greece, Iceland, Indonesia, Korea (South), Lebanon, Luxembourg, Macau, Netherlands, Norway, Portugal, Saudi Arabia, Spain, Sudan, Sweden, Turkey, Yugoslavia	3
13F9997	Denmark	4
14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka	5
14F0033	Bahrain, Bermuda, Brunei, Channel Islands, Cyprus, Ghana, Hong Kong, India, Iraq, Ireland, Jordan, Kenya, Kuwait, Malawi, Malaysia, Nigeria, Oman, People's Republic of China, Qatar, Sierra Leone, Singapore, Tanzania, Uganda, United Arab Emirates (Dubai), United Kingdom, Zambia	6
14F0051	Liechtenstein, Switzerland	7
14F0069	Chile, Ethiopia, Italy	8
14F0087	Israel	9
13F9939	Paraguay, Colombia, Uruguay	10

System Unit Parts

Index Number	Part Number	Units Per Asm	Description
1	81F9152	1	Door, Front
2	81F9159	1	Cover
3	81F9149	4	Foot, Cover
4	00G2326	1	Diskette Drive (With Mounting Bracket)
5	1057004	1	Mounting Bracket, Diskette
6	31F4283	1	Cable, Diskette
7	31F4287	1	LED Cable
8	81F9167	3	Plastic Standoff
9	81F9177	1	Plasti-Rivet
10	00G2360	1	Keylock Assembly, Locking
	00G2361	1	Keylock Assembly, Nonlocking
11	00G2500	1	Grounding Clip, LED Cable
12	81F9174	1	Adapter Retainer
13	00G2113	1	Insulator
14	See note	1	Adapter
15	81F9142	1	Base Mounting Plate, Disk Drive
16	42G1842	1	200M-byte Disk Drive (Without Mounting Plate)
	51G8237	1	540M-byte Disk Drive (Without Mounting Plate)
	55F5855	1	1G-byte Disk Drive (Without Mounting Plate)
17	31F4285	1	Disk Drive Power Cable (One Disk Drive)
	51G7647	1	Disk Drive Power Cable (Two Disk Drives)
18	31F4288	1	Riser Card
19	81F9132	1	Riser Card Support
20	32G0222	1	Chassis Cover
21	00G3492	2	Screws, POWER Gt1 Graphics Adapter
	27F4212	2	Screws, POWER GXT100 and GXT150 Adapters
22	00G2393	1	1MB VRAM (POWER Gt1 and Gt1B only)
23	81F8015	1	POWER Gt1 Graphics Adapter
	51G8017	1	POWER Gt1B Graphics Adapter
	51G7773	1	POWER Gt1x Graphics Adapter
	51G8070	1	POWER GXT100 Graphics Adapter
	51G8092	1	POWER GXT150 Graphics Adapter
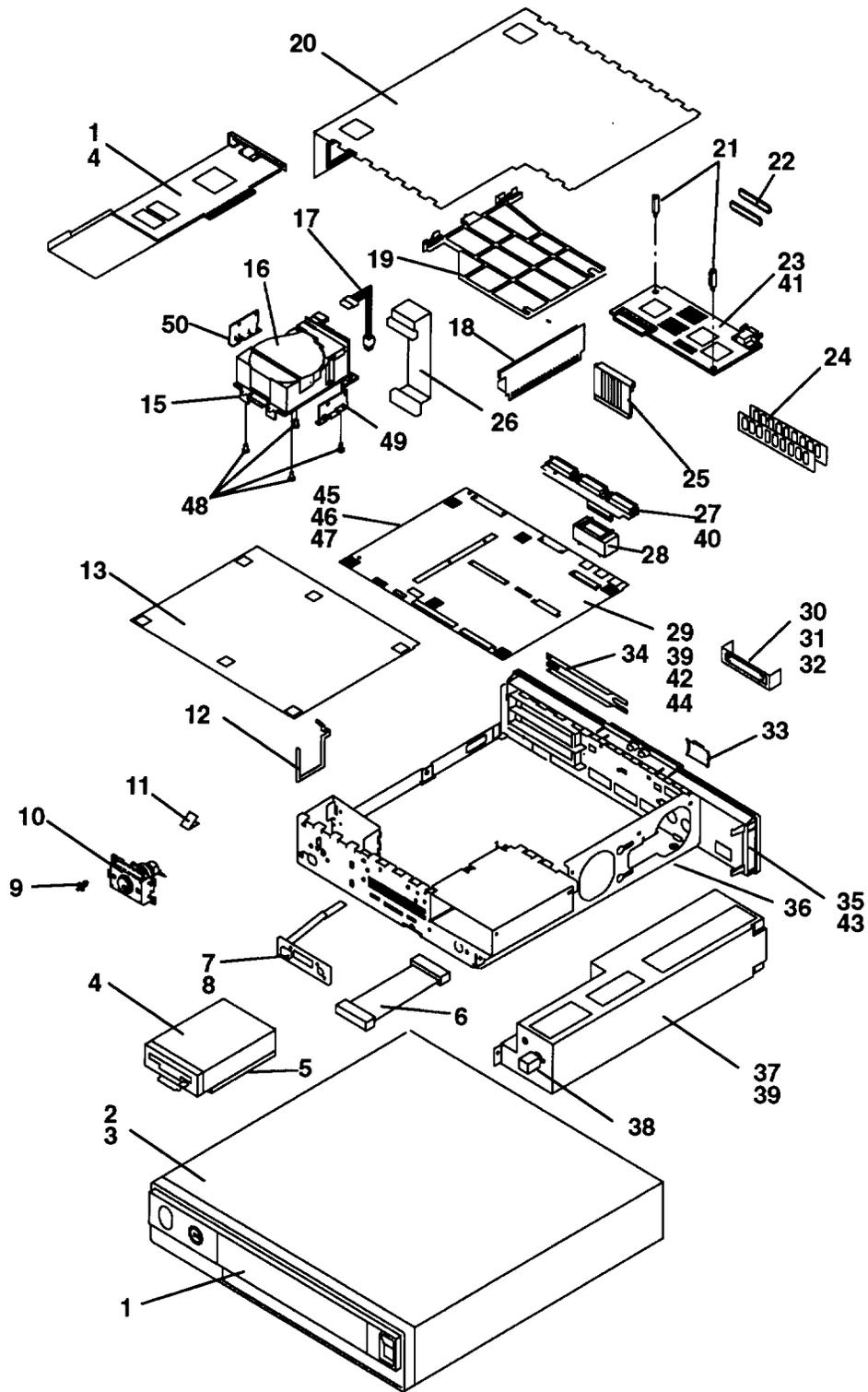
Index Number	Part Number	Units Per Asm	Description
24	92F0105	1	4MB Memory SIMM (Model 220 only)
	64F3606	1	8MB Memory SIMM (Model 220 only)
	8184416	1	2MB Memory SIMM (Model 250)
	51G8553	1	4MB Memory SIMM (Models 220, 230, or 250)
	51G8554	1	8MB Memory SIMM (Models 220, 230, or 250)
	8184379	1	16MB SIMM (Model 250)
	8184380	1	32MB SIMM (Model 250)
25	31F4292	1	POWER Gt1, POWER Gt1B, or POWER Gt1x Adapter Connector
	8184016	1	POWER GXT100 or POWER GXT150 Adapter Connector
26	31F4284	1	Disk Drive Signal Cable (One Disk Drive)
	51G7648	1	Disk Drive Signal Cable (Two Disk Drives)
27	31F4289	1	Serial/Parallel (Card With Interposer Card)
28	00G3501	1	I/O Toroid Assembly (Models 220 and 230)
	51G8193	1	I/O Toroid Assembly (Model 250 only)
29	See note	1	System Board
30	00G2095	1	Handle, Ethernet Latch
31	81F9137	2	Screw Stud, Slider
32	81F9178	1	Latch, Ethernet
33	32G1977	1	Cover, Video Connector
34	6279235	2	Bracket, EMI
35	81F9129	1	Rear Bezel
36	00G2310	1	Chassis
37	51G8440	1	Power Supply
38	81F8932	1	Power Supply Button
39	27F4212	7	Screw, System Board and Power Supply
40	62X0388	6	Hex Standoff
41	81F9135	1	Graphics Adapter Connector Shield
42	81F9136	1	SCSI Connector Shield
43	81F9133	2	Thumbscrews, Adapter Card
Note: See the *Common Diagnostics and Service Guide.*			
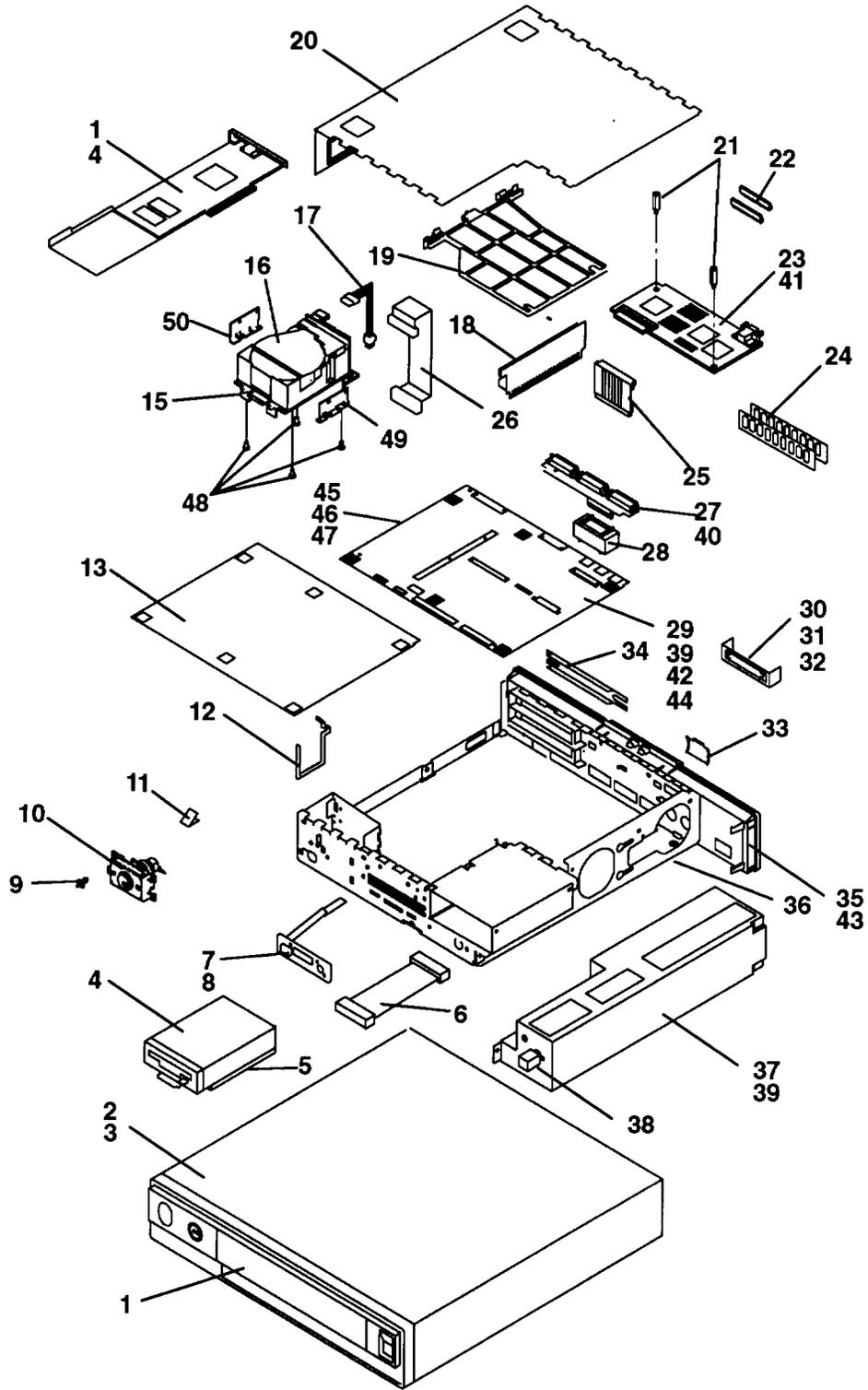
Index Number	Part Number	Units Per Asm	Description
44	1383417	2	Fuse, Ethernet and +5V External (220 and 230 only)
45	1675209	5	Jumpers
46	32G2026	1	ROM Module
47	15F8409	1	Battery
48	1621190	4	Screw, Disk Mounting Plate (All but 540M-Byte)
	0010170	4	Screw, Disk Mounting Plate (540M-byte Disk Drive)
49	43G2896	1	Right Side Mounting Bracket, Disk Drive (for Mounting Two 200M-byte Disk Drives)
50	43G2897	1	Left Side Mounting Bracket, Disk Drive (for Mounting Two 200M-byte Disk Drives)
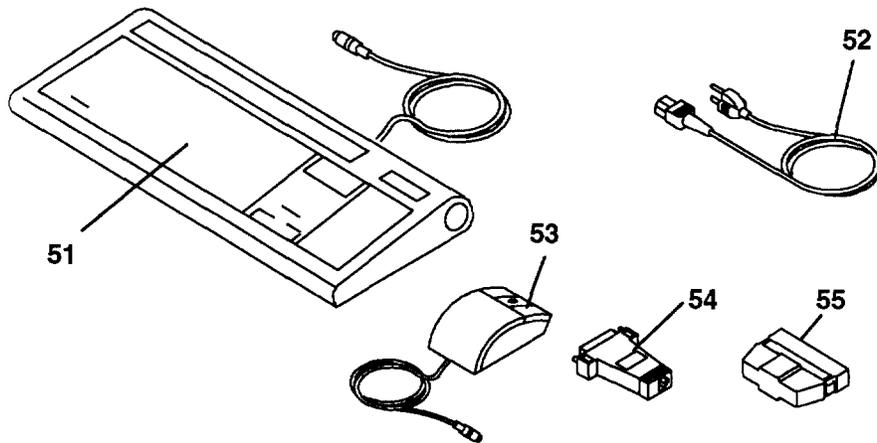
Index Number	Part Number	Units Per Asm	Description
51	1394540	1	Keyboard, United States English
	1394541	1	Keyboard, French Canadian
	1394542	1	Keyboard, German
	1394544	1	Keyboard, Danish
	1394545	1	Keyboard, Finnish/Swedish
	1394546	1	Keyboard, French
	1394547	1	Keyboard, Italian
	1394548	1	Keyboard, Norwegian
	1394549	1	Keyboard, Portuguese
	1394550	1	Keyboard, Spanish
	1394551	1	Keyboard, Swiss German/French
	1395968	1	Keyboard, Icelandic
	1395984	1	Keyboard, CSA166
	1395985	1	Keyboard, United Kingdom English
	1396077	1	Keyboard, Turkish
	1396078	1	Keyboard. Greek
	1396079	1	Keyboard, Arabic
	1396080	1	Keyboard, Hebrew
	30F9388	1	Keyboard, Kanji
52		1	Power Cable (See Power Cables and Plugs)
53	11F8895	1	Mouse, three-button
54	51G8479	1	Twisted-Pair Cable Adapter (Model 250 Only)
55	43G0378	1	Model 220 System Unit SCSI Terminator
	51G7737	1	Models 230 and 250 System Unit SCSI Terminator

Appendix A. Display Sizes

The POWERdisplay 20 features a Trinitron™ CRT with a maximum viewable screen size of 486 mm (19.1) inches measured diagonally.

The POWERdisplay 17 features a Trinitron CRT with a maximum viewable screen size of 409 mm (16.1) inches measured diagonally.

The 6091-19i display features a Trinitron CRT that has a fixed screen size of 439 mm (17.3 inches) for the 1280 X 1024 resolution measured diagonally.

The POWERdisplay 19 features a Trinitron CRT that has a fixed screen size of 439 mm (17.3 inches) for the 1280 X 1024 resolution measured diagonally.

The 6091-019 display features a Trinitron CRT that has a fixed screen size of 439 mm (17.3 inches) for the 1280 X 1024 resolution measured diagonally.

The 5081-019 display features a Trinitron CRT that has a fixed screen size of 439 mm (17.3 inches) for the 1280 X 1024 resolution measured diagonally.

The 6091-023 display features a Trinitron CRT that has a fixed screen size of 544 mm (21.4 inches) for the 1280 X 1024 resolution measured diagonally.

The 6091-016 display features a Trinitron CRT that has a fixed screen size of 375 mm (14.8 inches) for the 1280 X 1024 resolution measured diagonally.

The 6091-016 display features a Trinitron CRT that has a fixed screen size of 375 mm (14.8 inches) for the 1280 X 1024 resolution measured diagonally.

The 5081-016 display features a Trinitron CRT that has a fixed screen size of 377 mm (14.9 inches) for the 1280 X 1024 resolution measured diagonally.

The 1091-051 display features a Trinitron CRT that has a fixed screen size of 375 mm (14.8 inches) measured diagonally.

The 8508 display features a screen size of 445 mm (7.5 inches) measured diagonally.

The 8507 display features a screen size of 445 mm (17.5 inches) measured diagonally.

Index

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