Bull

D10 and D20 I/O Drawers
Service Guide

ORDER REFERENCE
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Bull

D10 and D20 I/O Drawers
Service Guide

Hardware

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To order additional copies of this book or other Bull Technical Publications, you are invited to use the Ordering Form also provided at the end of this book.

Trademarks and Acknowledgements

Contents

Safety Notices

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

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

- viii
- viii
- 41
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- ix

Note: For a translation of these notices, see *System Unit Safety Information*, order number SA23-2652.

Rack Safety Instructions

- Do not install this unit in a rack where the internal rack ambient temperatures will exceed 35 degrees C.
- Do not install this unit in a rack where the air flow is compromised. Any side, front or back of the unit used for air flow through the unit must not be in direct contact with the rack.
- Care should be taken to ensure that a hazardous condition is not created due to uneven mechanical loading when installing this unit in a rack. If the rack has a stabilizer it must be firmly attached before installing or removing this unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to the rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement for the supply circuit.
- An electrical outlet that is not correctly wired could place hazardous voltage on the 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.

Electrical Safety

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

In the system you are about to setup or service:

- The ac power interface connector is considered the main power disconnect device.
- This system has redundant power supply capabilities, meaning that it has the ability to have two power supplies running simultaneously in the same system unit. When instructed to disconnect the power source, ensure that all power cables have been unplugged.

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.
D05

CAUTION:
This product is equipped with a three-wire power cable and plug for the user's safety. Use this power cable with a properly grounded electrical outlet to avoid electrical shock.
C01

CAUTION:
This unit has more than one power supply cord. To reduce the risk of electrical shock, disconnect two power supply cords before servicing.
C21

Laser Safety Information

CAUTION:
This product may contain a CD-ROM, DVD-ROM, or laser module on a PCI card, which are class 1 laser products.
C30

Laser Compliance

All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with the IEC 825 (first edition 1984) as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:
All laser modules are designed so that there is never any human access to laser radiation above a class 1 level during normal operation, user maintenance, or prescribed service conditions. Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. Only trained service personnel should perform the inspection or repair of optical fiber cable assemblies and receptacles.
C25, C26

Data Integrity and Verification

These computer systems contain mechanisms designed to reduce the possibility of undetected data corruption or loss. This risk, however, cannot be eliminated. Users who experience unplanned outages, system failures, power fluctuations or outages, or component failures must verify the accuracy of operations performed and data saved or transmitted by the system at or near the time of the outage or failure. In addition, users must establish procedures to ensure that there is independent data verification before relying on such data in sensitive or critical operations. Users should periodically check our support websites for updated information and fixes applicable to the system and related software.

About This Book

This book provides maintenance information that is specific to the D10 and D20 I/O subsystems, as well as adapters and attached devices that do not have their own service information. In this book, the I/O subsystems are referred to as the D10 I/O subsystem or the D20 I/O subsystem.

MAPs that are common to all systems are contained in the *Diagnostic Information for Multiple Bus Systems*.

This book is used by the service representative to repair system failures. This book assumes that the service representative has had training on the processor subsystem to which an I/O subsystem is attached, in addition to training on the I/O subsystem drawer.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

Highlighting

The following highlighting conventions are used in this book:

Bold	Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels, and icons that the user selects.
Italics	Identifies parameters whose actual names or values are to be supplied by the user.
`Monospace`	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you should actually type.

Related Publications

The following publications provide additional information about your system:

- The *D10 I/O Drawer Installation Guide*, order number 86 A1 32EG, contains information on how to install the D10 I/O subsystem.
- The *Installation Guide*, order number 86 A1 39EG, contains information on how to install the D20 I/O subsystem.
- The *PL420T and PL420R User's Guide*, order number 86 A1 41EG, contains information to help users use the system, use the service aids, and solve minor problems.
- The *Diagnostic Information for Multiple Bus Systems*, order number 86 A1 26HX, contains diagnostic information, service request numbers (SRNs), and failing function codes (FFCs).
- The *Adapters Information for Multiple Bus Systems*, order number 86 A1 27HX, contains information about adapterss for your system. This manual is intended to supplement the service information found in the *Diagnostic Information for Multiple Bus Systems*.
- The *Site Preparation for Rack Systems Guide*, order number 86 A1 30PX, contains information to help you plan your installation.
- The *System Unit Safety Information*, order number 86 X1 11WD, contains translations of safety information used throughout this book.

Chapter 1. Reference Information

This chapter provides reference information for the D10 and D20 I/O subsystems.

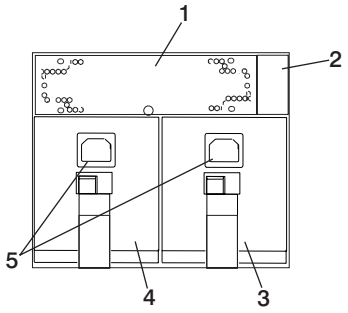
D10 Overview

The D10 is a 19-inch, rack-mountable I/O subsystem that is attached to a processor subsystem drawer to extend the system's capacity for I/O adapters. The I/O drawer includes redundant concurrently maintainable power and cooling.

Five PCI-X slots and one PCI slot are available for PCI adapters. PCI adapters are installed through the rear of the I/O subsystem using PCI adapter cassettes. Because the PCI slots support hot-pluggable adapters, the I/O subsystem can have adapters installed without turning off power or removing covers. The D10 is 4 EIA units high. Two D10s can be installed side-by-side in a 19-inch rack enclosure.

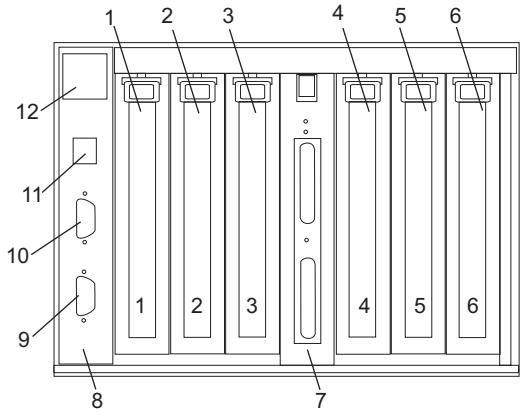
D10 I/O Subsystem Features

The following figure shows the front view of I/O subsystem.



1 Cooling Fan
2 Power cord channel
3 Power Supply 2
4 Power Supply 1
5 Power cord receptacles

The following figure shows the rear view of the I/O subsystem.



1 PCI adapter slot 1

2 PCI-X adapter slot 2
3 PCI-X adapter slot 3
4 PCI-X adapter slot 4
5 PCI-X adapter slot 5
6 PCI-X adapter slot 6

7 RIO bus adapter card
Upper connector 0
Lower connector 1
8 SPCN connector card
9 Lower SPCN connector J16
10 Upper SPCN connector J15
11 Rack beacon connector
12 Power cord channel

D10 Operator Indicators

LEDs are used on the D10 as operator indicators. Tables found in “I/O Subsystem PCI-X Slot LED Definitions” and “D10 Power” on page 4 describes the LED states and their definitions. For more information on LEDs and their definitions, see Chapter 5, “Fault and Attention LEDs”, on page 169. LEDs can be found on or near the following FRUs:

- LED indicators visible on each PCI adapter cassette
- LED indicators on the I/O subsystem backplane
- Attention/Identify LEDs for power supplies and fans

D10 PCI-X Slots

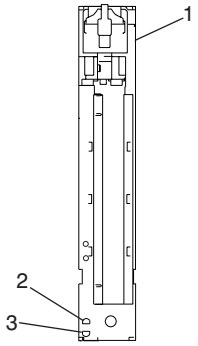
The D10 has five PCI-X slots and one PCI slot. Adapters are installed and removed using a PCI adapter cassette, which allows adapters to be installed without turning off the power or opening the I/O subsystem covers.

PCI adapters are installed using an adapter cassette, each adapter cassette shows two LEDs for each adapter. There is a green power indicator LED (upper) and an amber fault/identify LED (lower). The slots are numbered on the rear of the chassis from left to right 1 through 6. Slot 1 is a 5V PCI slot. Slots 2 through 6 are 3.3V PCI-X.

I/O Subsystem PCI-X Slot LED Definitions

The green and amber LEDs (viewed on the rear of the PCI adapter cassette when installed) are used to indicate the state of the PCI slot during removal and replacement of an adapter. The following table

describes the LED states and their definitions.

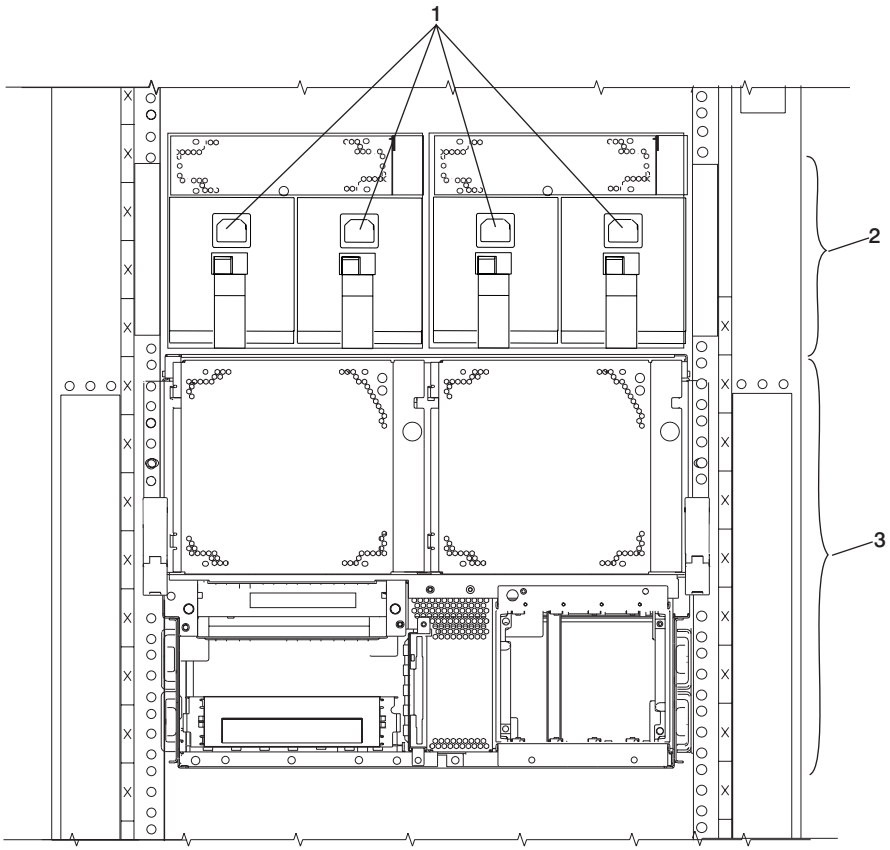


1 PCI Adapter Cassette
2 Power LED (Green)
3 Fault/Identify LED (Amber)

Green PCI Slot LED Indication	**Amber PCI Slot LED**	**PCI Slot Power/Status**	**Definition**
On	Off	On/No action	The PCI slot power is on and the slot is operational. Do not remove or install adapters.
On	Flashing	On/Identify	The PCI slot power is on, and the slot has been identified by the software or firmware. Do not remove or install adapters.
Off	Flashing	Off/Action	The PCI slot power is off, and the slot has been identified by the software or firmware. If directed by the PCI hot-plug procedures, perform PCI adapter removal, replacement, or installation.
Off	Off	Off/No power	The PCI slot power is off. If the system power is off, perform non-hot-plug PCI adapter removal, replacement, or installation procedures.

D10 Power

The following figure shows the front view of the pocessor subsystem and two I/O subsystems. Each unit has two power supplies and two power cords for redundancy. Connect the power cords from one side of the system to one power distribution bus in the rack. Connect the power cords from the other side of the system to a different power distribution bus in the rack. To ensure that the systems in a rack keep running if power is interrupted, a separate branch power line for each side of the rack must be used.



1 Power supplies, power receptacles

2 Two D10 I/O subsystems mounted side-by-side.

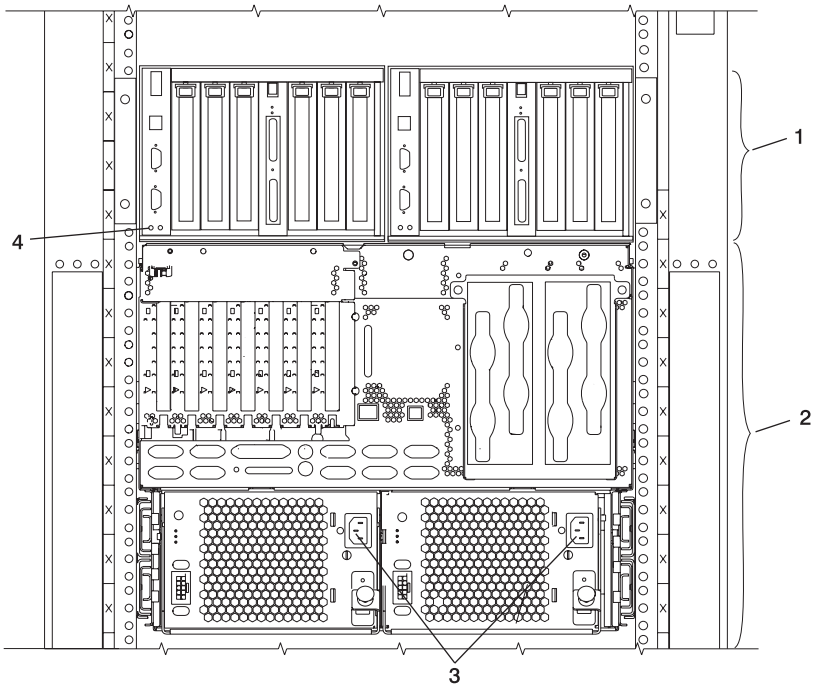
3 One 386/50 processor subsystem

The D10 I/O subsystem has two power supplies. Either power supply is capable of providing the necessary voltages and currents, independent of the other power supply. Each power supply provides 5V dc, 3.3V dc, -12V dc, and 5V dc standby. The power supplies are hot-pluggable and may be changed one at a time while the system is operational.

The following table describes power-supply LED indicators that are available on the D10.

LED Status	LED Definition
Off	Power source not connected
Blinking green LED	System power source connected, but power is not turned on
Blinking green LED, visibly begins to blink faster after the power button has been pressed.	System power source connected, the power-on button has been pressed and power-on initiated
Solid (not blinking) green LED, (There is approximately a 30-second transition period from the time the power-on button is pressed to the time the power LED is on solid.)	System power source connected and turned on

The following figure shows the rear view of the processor subsystem and two I/O subsystems.



1 D10 I/O subsystem

2 386/50 processor subsystem

3 Processor subsystem power supplies, power receptacles

4 I/O backplane power (green) and fault/identify (amber) LEDs

D10 Cooling

Fans mounted inside each I/O subsystem power supply and an additional fan mounted on the front of the subsystem provide cooling. The power supplies and the fan can be removed and replaced with the power turned on, as long as only one fan is removed from the I/O subsystem at a time.

D10 Input/Output Ports

The connector ports on the rear of the D10 I/O subsystem are used to connect the RIO-2 cables, the SPCN cables, and the rack-beacon LED.

Subsystem Positioning and Cabling

I/O subsystems can be installed in a standard 19-inch EIA rack in any location. The cables that connect the subsystems allow some flexibility in drawer placement, but the I/O subsystems should be located above the processor subsystem to which they are connected in the same rack.

Up to eight I/O subsystems can be connected to a processor subsystem. Use the following guidelines:

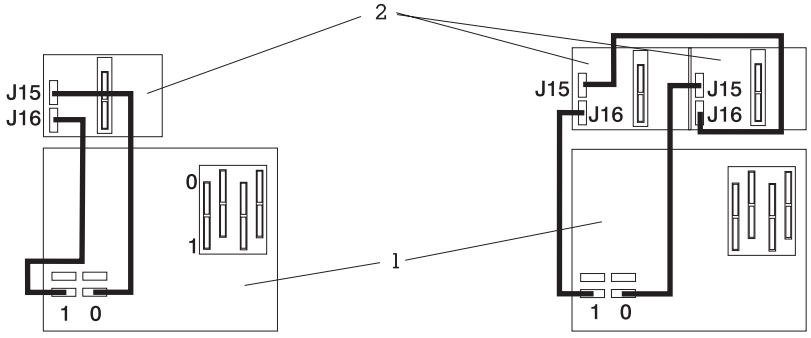
- Each I/O subsystem connects to the processor subsystem using one system power control network (SPCN) cable loop.
- Each I/O subsystem connects to the processor subsystem using one or more remote I/O (RIO) cable loops.
- Lowest cost configurations allow up to four I/O subsystems connected to the processor subsystem using a single RIO loop.
- Optimum performance is achieved when each I/O drawer is connected to the processor subsystem through its own RIO loop.

SPCN Cabling

I/O subsystem SPCN cables are connected to the processor subsystem unit in a loop configuration. The SPCN cables are connected in a loop so that the system has two paths to each I/O subsystem. Up to eight I/O subsystems are supported on one SPCN loop.

One I/O Subsystem, Two I/O Subsystems: The illustrations on the left show one I/O subsystem connected to the processor subsystem. The illustrations on the right show two I/O subsystems connected to the processor subsystem using one SPCN loop.

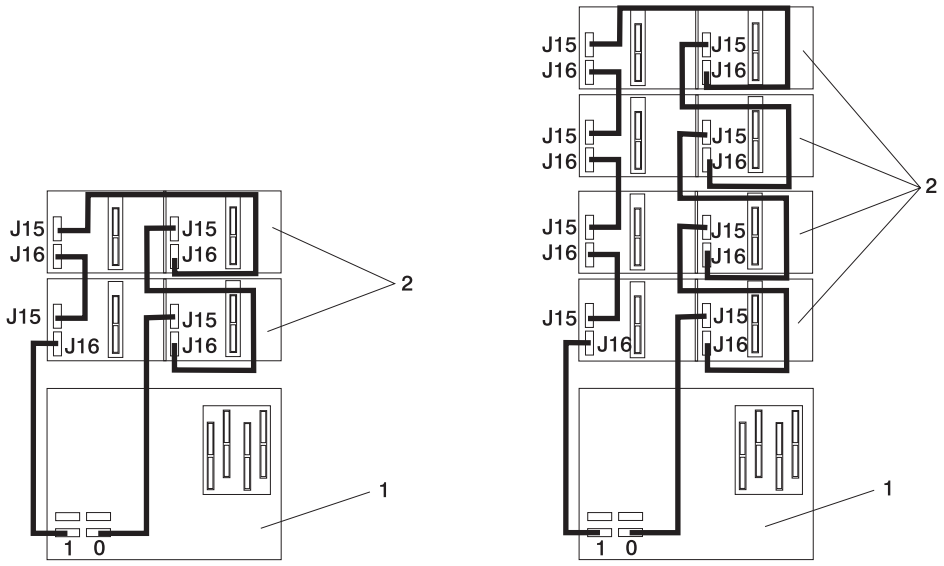
Processor Subsystem Connected to One or Two D10 I/O Subsystems:



1 Processor Subsystem
2 I/O Subsystem

Four I/O Subsystems, Eight I/O Subsystems: The illustration on the left shows four I/O subsystems connected to the processor subsystem using one SPCN loop. The illustration on the right shows eight I/O subsystems connected to the processor subsystem using one SPCN loop.

Processor Subsystem Connected to Four or Eight D10 I/O Subsystems:



1 Processor Subsystem
2 I/O Subsystem

RIO Cabling

I/O subsystems are connected to the processor subsystem through remote I/O (RIO) cable loops. The cable loops are connected to ports that are on the rear of the processor subsystem. The RIO cables are connected in loops so that the system has two paths to each I/O subsystem when more than one I/O drawer is in a loop.

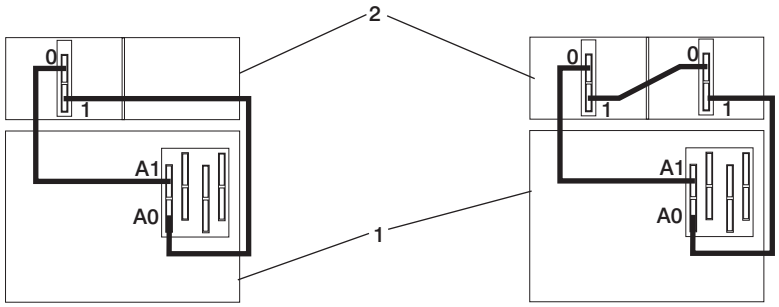
If only one I/O subsystem is in a RIO loop and both the processor subsystem and the I/O subsystem are RIO-2 capable, the RIO-2 cables are used as one two-cable path to the I/O subsystem. In this cable configuration, the data rate is increased by a factor of 2.

- A maximum of eight D10 drawers are supported on one processor subsystem.
- If both D10 I/O drawers are connected to the same processor subsystem, the total number of I/O subsystems supported is eight.
- The maximum number of I/O subsystems supported on one RIO loop is four.
- The D10 I/O drawers must be on separate RIO loops.
- The D10 with RIO cabling and D10 with RIO-2 cabling can share one RIO loop.

The system can have up to four RIO loops. A total of eight I/O drawers can be connected to the processor subsystem in a variety of cabling configurations. For optimum performance, connect the RIO loops in a configuration that distributes multiple I/O drawers among as many RIO loops as possible. A dedicated RIO loop for each I/O drawer can provide optimum performance. Some examples of valid cabling examples follow.

One I/O Subsystem or Two I/O Subsystems: The illustration on the left shows one I/O subsystem drawer connected to the processor subsystem. The illustration on the right shows two I/O subsystem drawers connected to the system unit using one RIO loop.

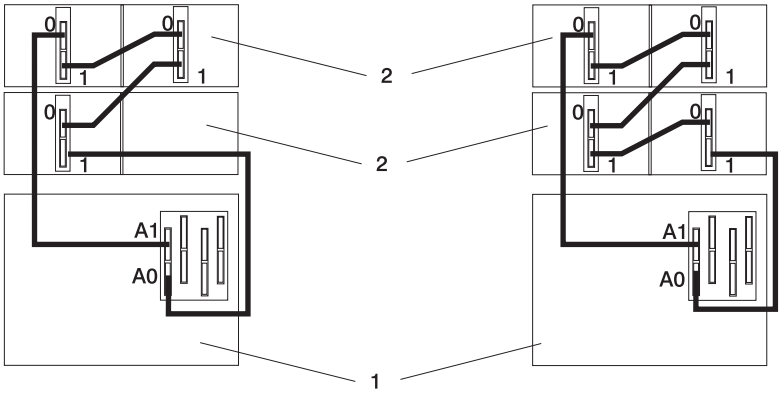
Processor Subsystem Connected to One or Two D10 I/O Subsystems:



1 Processor Subsystem
2 I/O Subsystem

Three I/O Subsystems or Four I/O Subsystems: The illustration on the left shows three I/O subsystem drawers connected to the system unit using one RIO loop. The illustration on the right shows four I/O subsystem drawers connected to the system unit using one RIO loop.

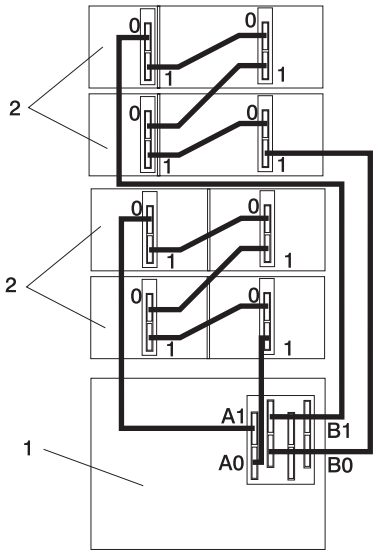
Processor Subsystem Connected to Three or Four D10 I/O Subsystems:



1 Processor Subsystem
2 I/O Subsystem

Eight I/O Subsystems with Two RIO Loops: The following illustrations show eight I/O subsystem drawers connected to the processor subsystem unit using two RIO loops.

Processor Subsystem Connected to Eight D10 I/O Subsystems:

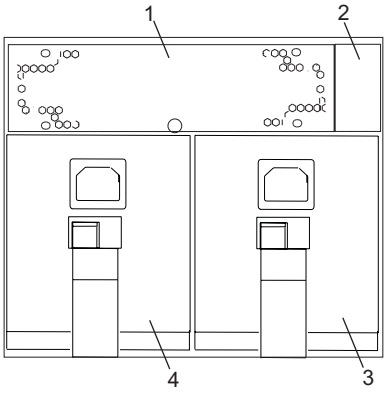


1 Processor Subsystem
2 I/O Subsystem

D10 I/O Subsystem Locations

This system uses physical location codes to provide mapping of the failing field replaceable units. The location codes are produced by the processor subsystem's firmware and AIX. For information about how to read a location code, see the service guide for the processor subsystem to which your I/O subsystem is connected.

D10 I/O Subsystem Front Locations



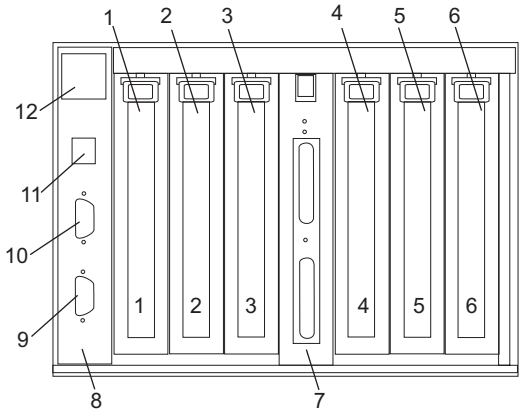
1 Cooling fan

2 Power cord channel

3 Power Supply 2
U0.*dd*-V2

4 Power Supply 1
U0.*dd*-V1

D10 I/O Subsystem Rear Locations



1 PCI adapter slot 1
U0.*dd*-P1-I1

2 PCI-X adapter slot 2
U0.*dd*-P1-I2

3 PCI-X adapter slot 3
U0.*dd*-P1-I3

4 PCI-X adapter slot 4
U0.*dd*-P1-I4

5 PCI-X adapter slot 5
U0.*dd*-P1-I5

6 PCI-X adapter slot 6
U0.*dd*-P1-I6

7 RIO bus adapter card
U0.*dd*-P1.1

8 SPCN connector card
U0.*dd*-P1 (part of the I/O backplane FRU)

9 SPCN Connector 2/J16
U0.*dd*P1/Q5

10 SPCN Connector 1/J15
U0.*dd*P1/Q4

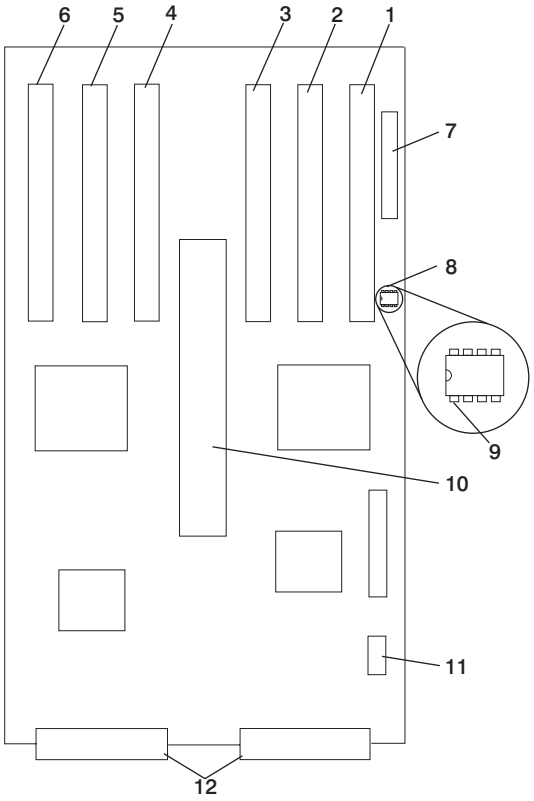
11 Rack beacon connector

12 Power cord channel

Note: In the preceding table, *dd* is equal to the number assigned to each I/O subsystem by the connected processor subsystem.

D10 I/O Backplane Locations

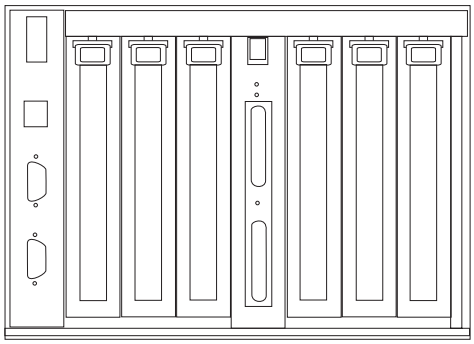
The following illustration of the I/O backplane identifies the primary connectors used in your subsystem.



1 PCI adapter connector 1
2 PCI-X adapter connector 2
3 PCI-X adapter connector 3
4 PCI-X adapter connector 4
5 PCI-X adapter connector 5
6 PCI-X Adapter connector 6
7 SPCN connector
8 VPD module
9 VPD module pin 1 orientation
10 RIO bus adapter connector
11 Fan connector
12 Power supply connectors

D10 I/O Subsystem PHB

Each D10 I/O Subsystem has two PCI host bridges (PHBs) through which the PCI slots are connected.



Slot	PHB	Slot Characteristics
1	1	64-bit 5V, 33 MHz
2	1	64-bit 3.3V, 131.5 MHz
3	1	64-bit 3.3V, 131.5 MHz
4	2	64-bit 3.3V, 131.5 MHz
5	2	64-bit 3.3V, 131.5 MHz
6	2	64-bit 3.3V, 131.5 MHz

D10 Location Codes

This system (processor subsystem and attached I/O subsystems) use physical location codes in conjunction with AIX location codes to provide mapping of failing field replaceable units (FRUs). The location codes are produced by the processor subsystem's firmware and AIX. For information about how to read a location code, see the service guide for the processor subsystem to which your I/O subsystem is connected.

AIX and Physical Location Code Table

This section covers the AIX and Physical Location Code tables for the D10.

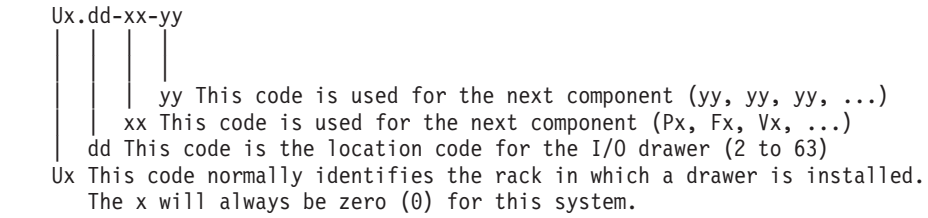
The tables in this section contain the location codes for I/O subsystems when they are attached to the system unit. In the tables, the location code for the I/O subsystem number is represented by *dd*. The first time that an installed system is powered on, the I/O subsystems are numbered. For example, if a system is first powered on with eight I/O subsystems connected, the *dd* value for the subsystems should be numbered from 2 through 9.

Note: If the system was powered on with I/O subsystems connected before delivery to the customer, the I/O subsystem location codes for the connected I/O subsystems are permanently set.

If at a later time, an I/O subsystem is removed from the system and a different I/O subsystem is substituted, the substitute is assigned the next higher number available for its value of *dd*, which in the earlier example, is 10. If the original I/O subsystem is reinstalled in the system configuration, the system uses the original *dd* value for the I/O subsystem.

To keep the system from renumbering the I/O drawer when an I/O backplane is replaced, the VPD module from the old I/O backplane must be moved over to the new I/O backplane.

The following diagram defines each part of a location code.



D10 I/O Subsystem Location Code Table

The following table lists the location codes for a D10 I/O subsystem. The location code for the I/O subsystem connected to a system unit is U0.*dd* (where *dd* can be any number from 2 through 63).

FRU Name	Physical Location Code
D10 I/O Drawer U0.*dd* (*dd* = any number from 2 through 63)	
I/O subsystem 1 drawer	U0.*dd*
I/O backplane	U0.*dd*-P1
RIO connector riser card	U0.*dd*-P1.1
RIO port 0 (upper connector)	U0.*dd*-P1.1/Q1
RIO port 0 cable	U0.*dd*-P1.1/Q1#
RIO port 1 (lower connector)	U0.*dd*-P1.1/Q2
RIO port 1 cable	U0.*dd*-P1.1/Q2#
PHB1	U0.*dd*-P1
EADS_X under PHB1	U0.*dd*-P1
PCI slot 1	U0.*dd*-P1/I1
PCI slot 1 adapter	U0.*dd*-P1-I1
PCI slot 2	U0.*dd*-P1/I2
PCI slot 2 adapter	U0.*dd*-P1-I2
PCI slot 3	U0.*dd*-P1/I3
PCI slot 3 adapter	U0.*dd*-P1-I3
PHB2	U0.*dd*-P1
EADS_X under PHB2	U0.*dd*-P1
PCI slot 4	U0.*dd*-P1/I4
PCI slot 4 adapter	U0.*dd*-P1-I4
PCI slot 5	U0.*dd*-P1/I5
PCI slot 5 adapter	U0.*dd*-P1-I5
PCI slot 6	U0.*dd*-P1/I6
PCI slot 6 adapter	U0.*dd*-P1-I6
Power supply 1 (with 2 fans)	U0.*dd*-V1
Power supply 2 (with 2 fans)	U0.*dd*-V2
Cooling fan 5	U0.*dd*-F5
Rack indicator connector (4-pins)	U0.*dd*-P1/Q3
SPCN connector 1/J15	U0.*dd*-P1/Q4
SPCN connector 2/J16	U0.*dd*-P1/Q5
Subsystem VPD	U0.*dd*-P1

D20 Overview

The D20 is a 19-inch, rack-mountable I/O subsystem that is attached to a processor subsystem to extend the system's capacity for I/O adapters and disk drives. The I/O subsystem includes redundant concurrently maintainable power and cooling.

Seven PCI slots are available for PCI adapters. Because the PCI slots support hot-pluggable adapters, the I/O subsystem can have adapters installed without turning off power. The D20 is 4 EIA units high and is compatible with 19-inch EIA rack enclosures.

D20 I/O Subsystem Features

The features of the D20 enable this I/O subsystem to extend the input and output capabilities of the processor subsystem. Features such as PCI-X adapters and internal SCSI disk drives are supported.

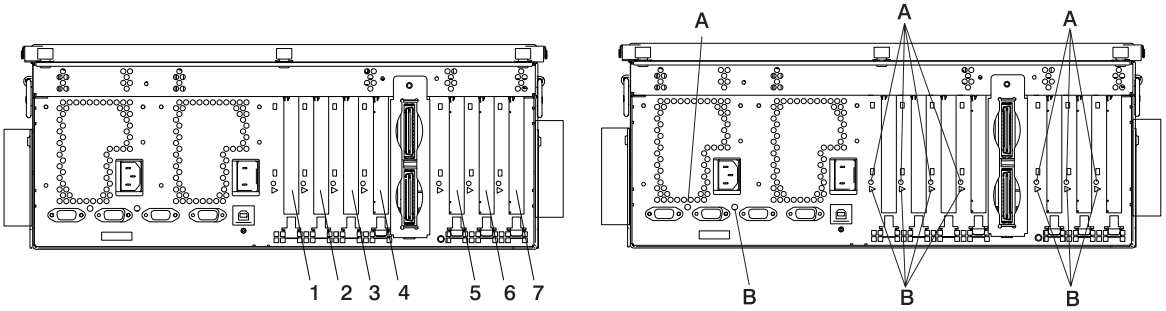
D20 Operator Indicators

LEDs are used on the D20 as operator indicators. Tables found in "D20 PCI-X Slots" and "D20 Power" on page 18 describes the LED states and their definitions. For more information on LEDs and their definitions, see Chapter 5, "Fault and Attention LEDs", on page 169. LEDs can be found on or near the following FRUs:

- LED indicators visible on each PCI adapter light pipe
- LEDs for power on, attention, SCSI activity
- Attention/Identify LEDs
- Rack Beacon

D20 PCI-X Slots

Seven PCI-X slots are available. The slots are 64-bit capable at up to 131.5 Mhz, 3.3 volts. The slots are numbered on the rear of the chassis from left to right 1 through 7. The I/O backplane and each I/O slot have green power indicator LEDs and amber identify LEDs. The following illustration shows the LED locations when viewing from the rear of the I/O drawer.



1 PCI-X Expansion Slot 1
2 PCI-X Expansion Slot 2
3 PCI-X Expansion Slot 3
4 PCI-X Expansion Slot 4
5 PCI-X Expansion Slot 5
6 PCI-X Expansion Slot 6
7 PCI-X Expansion Slot 7
A Green Power LEDs
B Amber Identify LEDs

The green LEDs for the PCI-X adapter slots (viewed on the rear of the I/O subsystem) indicate the state of the PCI slot during removal and replacement of an adapter.

PCI LED (Green) Indication	PCI Slot Status	Definition
Off	Off	Slot power is Off. It is safe to remove or replace adapters.
On (not flashing)	On	Slot power is On. Do not remove or replace adapters.
Flashing slowly (one flash per second)		Slot has been identified by the software. Do not remove or replace adapters at this time.
Flashing rapidly (six to eight flashes per second)		Slot is ready removing or replacing an adapter.

D20 Disk Drives

There are 12 hot-plug disk-drive bays provided. The bays are located behind the D20 front bezel. The D20 has from 18.2 GB to 1.7 terabytes of disk storage capacity. The following disk drive sizes and speeds are available:

- 18.2 GB Ultra3 10K RPM 1 inch
- 36.4 GB Ultra3 10K RPM 1 inch
- 73.4 GB Ultra3 10K RPM 1 inch
- 146.8 GB Ultra3 10K RPM 1 inch

For an updated listing of hot-plug disk-drive sizes, contact your sales representative.

D20 Power

The D20 is standard with one power supply. If the customer wants redundant power in their I/O subsystem, an optional power supply can be ordered. Either power supply, in a D20 that is configured with two power supplies, can provide the necessary voltages and currents, independent of the other power supply. The left and right power-supply output voltages are connected and monitored by the power distribution board contained in the I/O subsystem.

The left and right power supplies are hot-pluggable and may be changed one at a time while the system is operational. Each power supply is capable of converting available 110/220 V ac to the proper internal voltages used by the system components. The internal voltage range is 5 volts system standby, 3.3 volts, 5 volts, 12 volts and -12 volts. When operating correctly, each supply will share the current load when powered on. When in a fault state, the operating power supply will supply standby current to the faulted supply for the DEVROS module. The following table describes power-related LED indicators that are available on the D20. The operator panel LED referred to in the following table is on the front of the processor subsystem to which the I/O subsystem is attached.

Status of LED	**Operator Panel LED (processor subsystem)**
Off	Power Source not connected
Blinking green LED	System power source connected, but power is not turned on
Blinking green LED, visibly begins to blink faster after the power-button has been pressed.	System power source connected, the power-on button has been pressed and power-on initiated
Solid (not blinking) green LED, (There is approximately a 30-second transition period from the time the power on button is pressed to the time the power LED is on solid.)	System power source connected and turned on

D20 Cooling

Four blowers are mounted on the top of the I/O subsystem to provide cooling.

Attention: The four cooling blowers mounted on top of the D20 are hot-plug. The one exception is when your subsystem has only one power supply either installed or functioning, in which case you *must* shut down the system and subsystem. Failure to do so will automatically shut down the system.

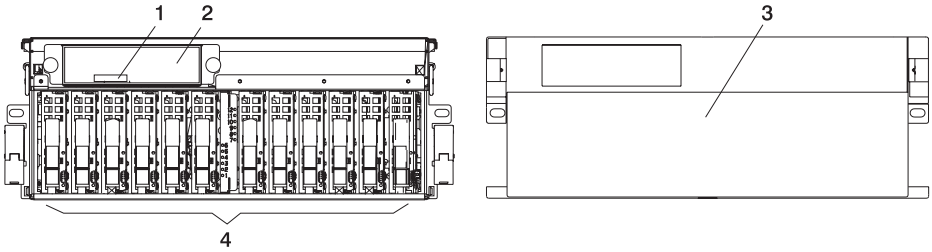
D20 Input/Output Ports

The connector ports on the rear of the D20 I/O subsystem are used to connect the RIO-2 cables, the SPCN cables, and the rack-beacon LED.

D20 I/O Subsystem Locations

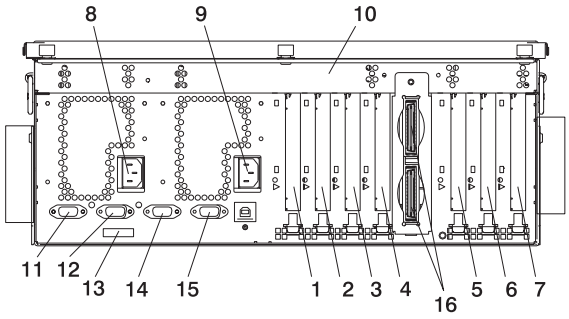
The system uses physical location codes to provide mapping of the failing field replaceable units. The location codes are produced by the processor subsystem's firmware and AIX. For information about how to read a location code, see the service guide for the processor subsystem to which your I/O subsystem is connected.

D20 Front View



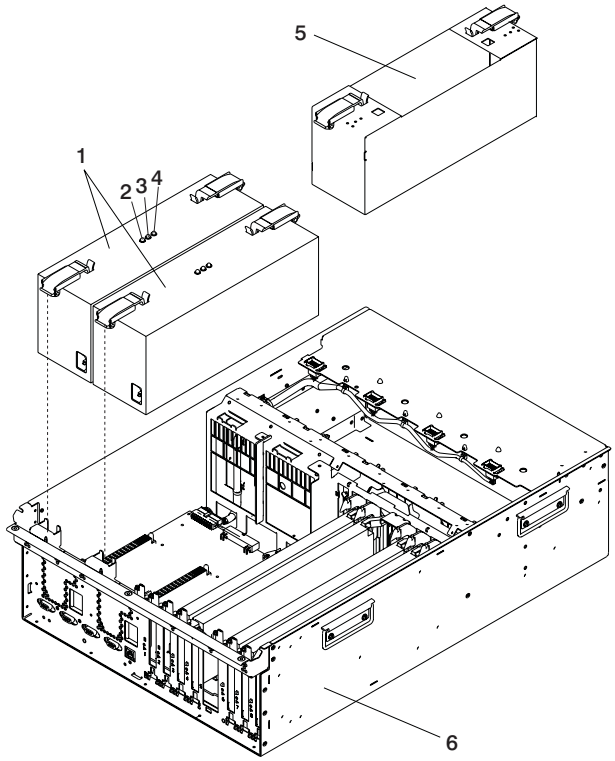
1 Serial Number
2 Operator Panel
3 D20 Front Bezel
4 Disk Drives (maximum quantity 12)

D20 Rear View



1 PCI-X Expansion Slot 1
2 PCI-X Expansion Slot 2
3 PCI-X Expansion Slot 3
4 PCI-X Expansion Slot 4
5 PCI-X Expansion Slot 5
6 PCI-X Expansion Slot 6
7 PCI-X Expansion Slot 7
8 Redundant Power Supply Receptacle
9 Primary Power Supply
10 D20 I/O Drawer
11 Connector J11 (Not Used)
12 Connector J14 (Not Used)
13 Rear Serial Number Label
14 Connector J15 (SPCN 3)
15 Connector J16 (SPCN 4)
16 RIO Connectors
Upper Connector = 1
Lower Connector = 0

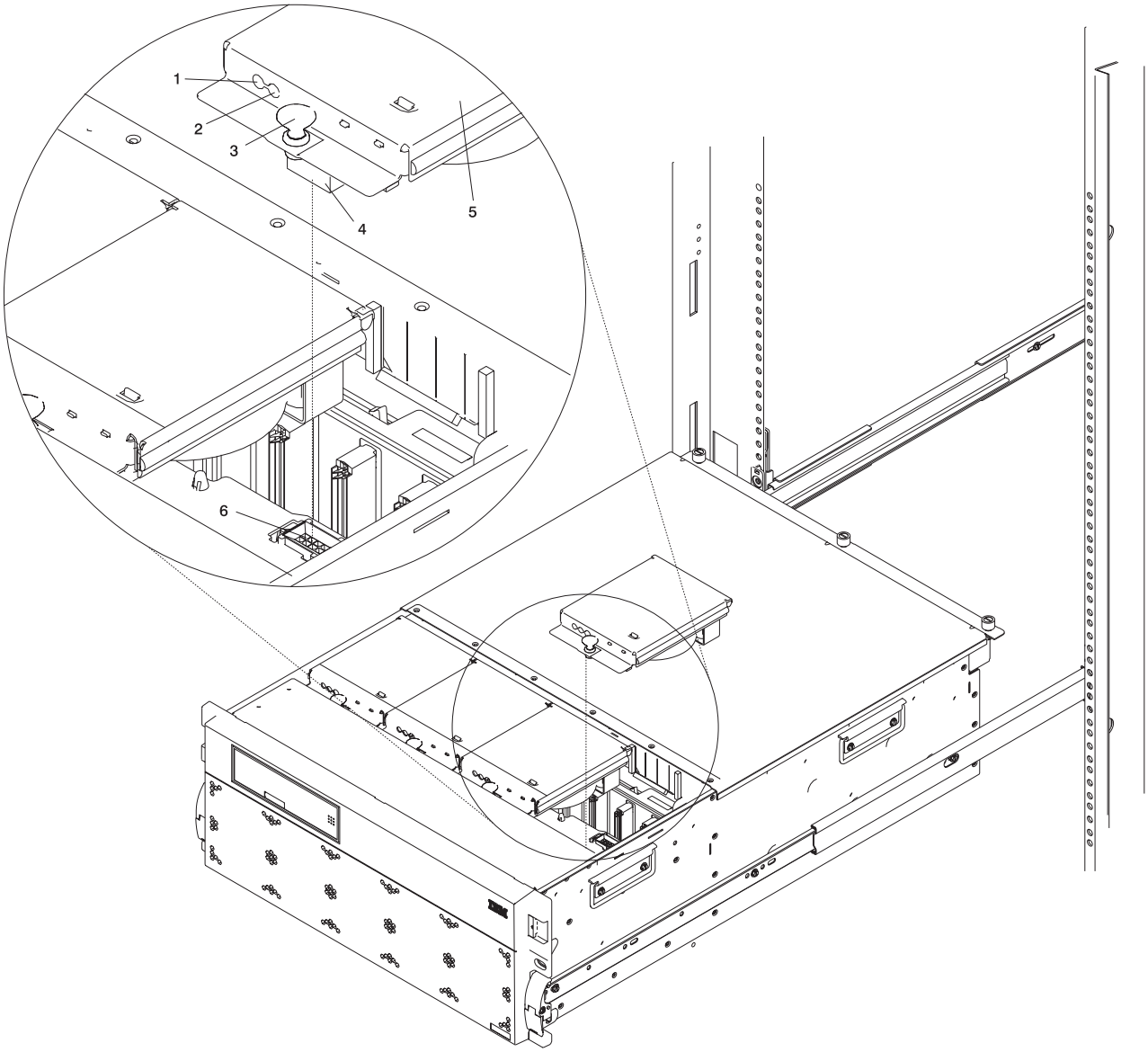
D20 Power Supply Locations



1 Power Supplies
2 Amber Fault/Identify LED
3 Green DC Good LED
4 Green AC Power LED
5 Power Supply Filler
6 D20 I/O Drawer

D20 Blower Locations

The following illustration identifies the I/O subsystem cooling blowers. Each blower has a green power LED and an amber identify LED located on the front blower housing. The green LED indicates that a blower has power and is operating correctly. The amber LED is in the identify state when blinking.

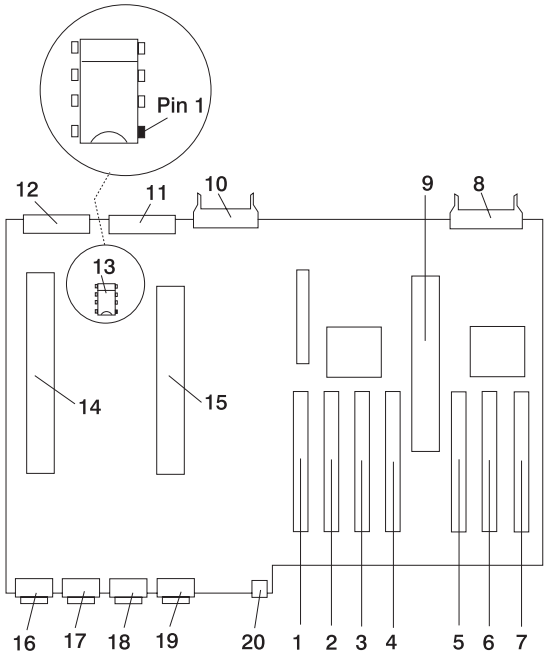


1 Green LED
2 Amber LED
3 Snap Button
4 Blower Connector
5 Hot-Plug Blower Assembly
6 Docking Connector

D20 I/O Backplane Locations

The following illustration of the I/O backplane identifies the primary connectors used in your subsystem.

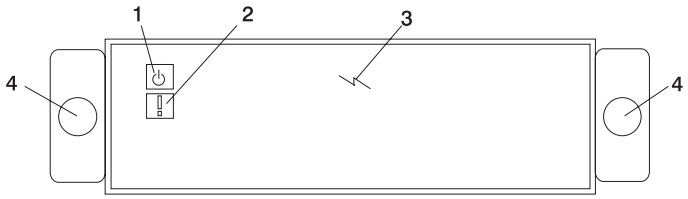
Note: Before replacing the I/O backplane, note the position of pin 1 on the VPD module.



1 PCI-X Adapter Connector 1
2 PCI-X Adapter Connector 2
3 PCI-X Adapter Connector 3
4 PCI-X Adapter Connector 4
5 PCI-X Adapter Connector 5
6 PCI-X Adapter Connector 6
7 PCI-X Adapter Connector 7
8 Operator Panel Connector
9 RIO Bus Adapter Connector
10 Disk Drive System Power Control Network (SPCN) Connector
11 Disk Drive Power Connector
12 Cooling Blower Connector
13 VPD Module
14 Redundant Power Supply Connector
15 Primary Power Supply Connector
16 Connector J11 (Not Used)
17 Connector J14 (Not Used)
18 Connector J15 (SPCN 3)
19 Connector J16 (SPCN 4)
20 4-pin Connector, Rack Beacon Connector

D20 Reading the Operator Panel and I/O Backplane LEDs

The following illustration shows the component location on the operator panel

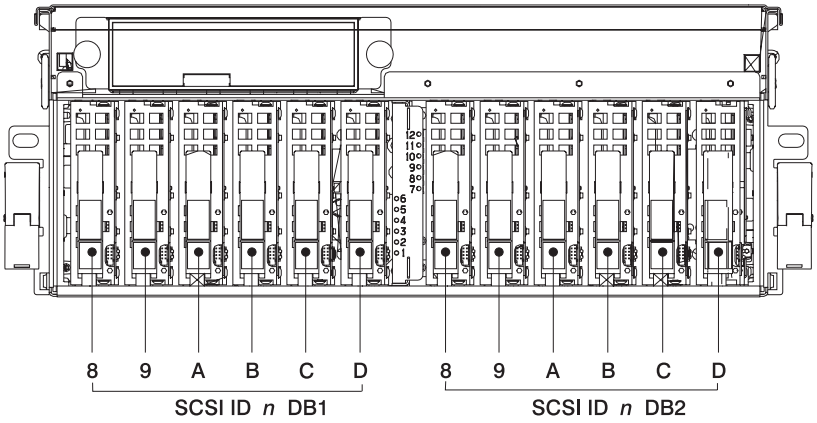


1 Power-On LED
2 Attention LED
3 Operator Panel
4 Snap Buttons

The following table defines each LEDs function on the operator panel.

Number	Component Name	Component Description
1	Green Power LED	Standby State - Blinking LED (System connected to power source but not powered on.) Powered On - LED is turned on solid (not blinking).
2	Amber Attention LED	Normal State - LED is off.

D20 SCSI IDs and Bay Locations



Index	Bay Location	Drive Name	SCSI Bus ID
8 DB1	D01	Hot-Plug Disk Drive	8 - DB1
9 DB1	D02	Hot-Plug Disk Drive	9 - DB1
A DB1	D03	Hot-Plug Disk Drive	A - DB1
B DB1	D04	Hot-Plug Disk Drive	B - DB1
C DB1	D05	Hot-Plug Disk Drive	C - DB1
D DB1	D06	Hot-Plug Disk Drive	D - DB1
8 DB2	D07	Hot-Plug Disk Drive	8 - DB2
9 DB2	D08	Hot-Plug Disk Drive	9 - DB2
A DB2	D09	Hot-Plug Disk Drive	A - DB2
B DB2	D10	Hot-Plug Disk Drive	B - DB2
C DB2	D11	Hot-Plug Disk Drive	C - DB2
D DB2	D12	Hot-Plug Disk Drive	D - DB2

Note: The SCSI bus IDs are the recommended values and indicate how the IDs are set when the system is shipped from the factory. Field installations might not comply with these recommendations.

Cabling the D20 to a 286/C4

The D20 subsystem can be installed in any location in a standard 19-inch EIA rack. The cables that connect the subsystems allow some flexibility in drawer placement. Up to two D20s can be connected to a 286/C4. Each I/O subsystem is connected to the processor subsystem using a system power control network (SPCN) cable loop and a remote I/O (RIO) cable loop. One SPCN cable loop is needed to connect the I/O subsystems to one processor subsystem.

Before connecting the RIO-2 and SPCN cables to the D20, do the following:

1. Ensure that your 286/C4 is running the latest level firmware. Refer to the ″Firmware Updates″ section of the ″Using the Service Processor″ chapter in the *286/C4 and 286/E4 Service Guide*, order number SA23-1277. For information about checking or upgrading the firmware level of your 286/C4.
2. After ensuring that your firmware is at the latest level, turn off the power and disconnect the 286/C4 power cables from the power source.
3. Attach the RIO-2 and SPCN cables. For cabling diagrams, see “RIO-2 (Remote Input Output) Cabling” on page 26.
4. After connecting the RIO-2 and SPCN cables from the D20 to your system, reconnect the system’s power cables to the power source and refer to “Stopping and Starting the System” on page 42.
5. Run system verification. Refer to the ″Verifying the Hardware″ chapter in the *286/C4 and 286/E4 Installation Guide*, order number SA23-1277.

Your 286/C4 is expandable when connected up to two D20 I/O drawers. Each D20 can contain up to 7 I/O PCI adapter slots, and two 6-pack disk drive (DASD) bays.

RIO-2 (Remote Input Output) Cabling

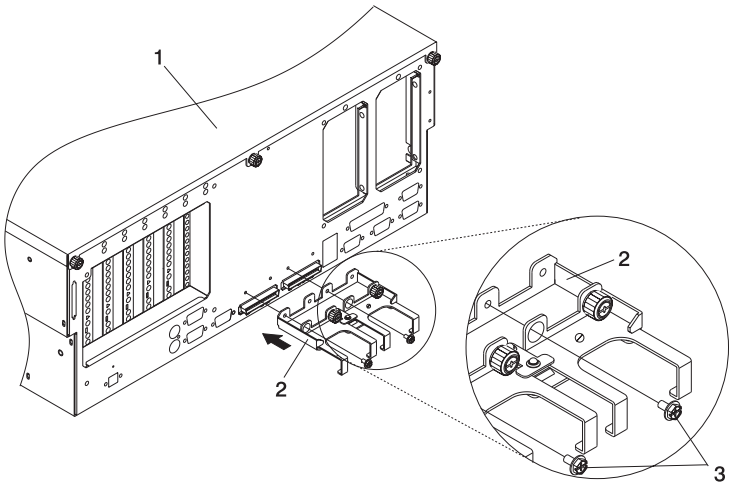
The following rules apply to RIO-2 cable connections:

Notes:

1. To connect to a D20, you will be using the RIO-2 (Remote Input Output) and SPCN (System Power Control Network) connectors and cables. The RIO-2 and SPCN cables provide two functions, remote data bus connection, and power control.
2. The I/O drawers must be connected in a loop for both the RIO-2 and SPCN cables. The loop connection provides redundant paths so that if a failure occurs in part of a cable, the system will continue to operate. If a failure does occur, a message is displayed on the system console; however, the system does continue to operate. See the following illustrations for possible cabling configurations.

To connect the RIO-2 cables to the rear of the 286/C4, do the following:

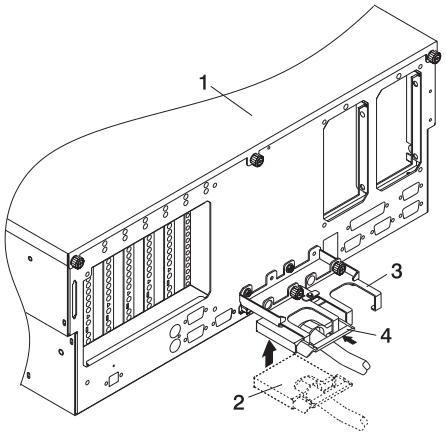
1. Locate the RIO-2 cable-support bracket.
2. Using two M3 x 6 retaining screws, secure the RIO-2 cable-support bracket to the rear of the 286/C4 chassis. See the following illustration.



1 286/C4
2 RIO-2 Cable-Support Bracket
3 M3 x 6 Retaining Screws (Quantity 2)

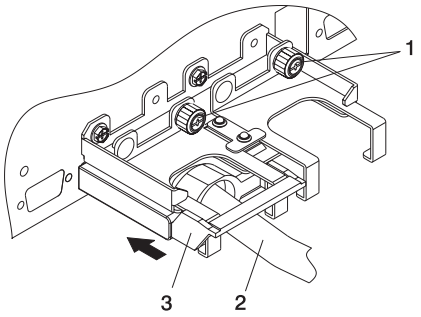
3. Pull the sliding portion of the RIO-2 cable-support bracket back from the 286/C4 chassis. The sliding portion of the cable support bracket will stop before being fully separated.
4. Align the RIO-2 cable connector with the bottom of the sliding portion of the RIO-2 cable support bracket.

5. Lift the RIO-2 cable and cable connector into the bottom of the RIO-2 cable-support bracket.



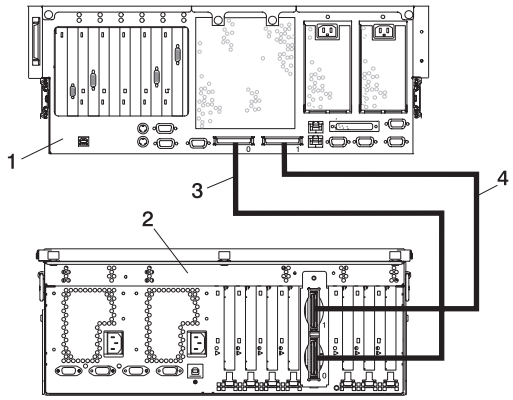
1 286/C4
2 RIO-2 Cable-Support Bracket
3 Slide Portion of RIO-2 Cable-Support Bracket
4 RIO-2 Connector Support Lever

6. Pull the RIO-2 connector back until the connector is seated against the support hook.
7. Push the RIO-2 connector forward, ensuring that the RIO-2 connector lever slides over the top of the connector hooks.
8. Slowly push the assembly toward the chassis.
9. Secure the RIO-2 cable-support bracket with the captive thumbscrew, the RIO-2 connector and slide portion of the RIO-2 support bracket to the back of the 286/C4 chassis.



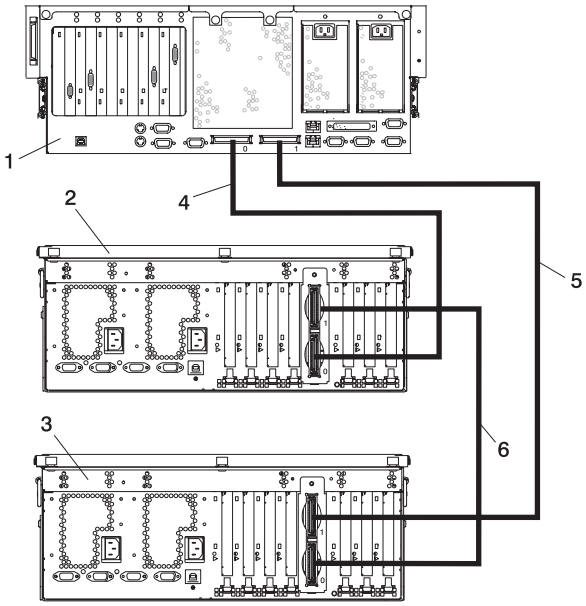
1 Captive Thumbscrews
2 RIO-2 Cable and Connector
3 RIO-2 Connector Support Lever

286/C4 Attached to One I/O Drawer:



1 286/C4
2 D20
3 Cable from 286/C4 Connector RIO-2 0 to D20 Connector RIO-2 0
4 Cable from 286/C4 Connector RIO-2 1 to D20 Connector RIO-2 1

286/C4 Attached to Two I/O Drawers:

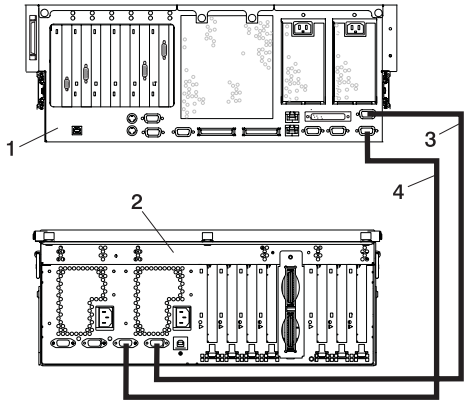


1 286/C4
2 D20 I/O Drawer
3 D20 I/O Drawer
4 Cable from 286/C4 Connector RIO-2 0 to D20 Connector RIO-2 0
5 Cable from 286/C4 Connector RIO-2 1 to D20 Connector RIO-2 1
6 Cable from D20 Connector RIO-2 1 to D20 Connector RIO-2 0

SPCN (System Power Control Network) Cabling

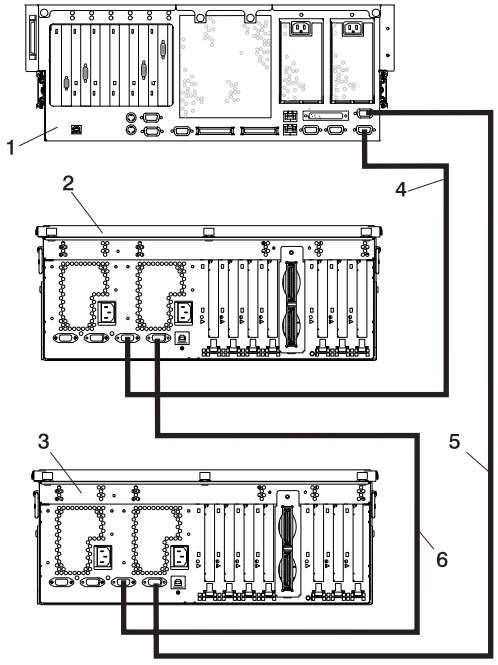
The following figures provide cabling examples for all valid cabling configurations. Match your configuration to the correct figure and connect your SPCN cables as shown.

286/C4 Attached to One I/O Drawer:



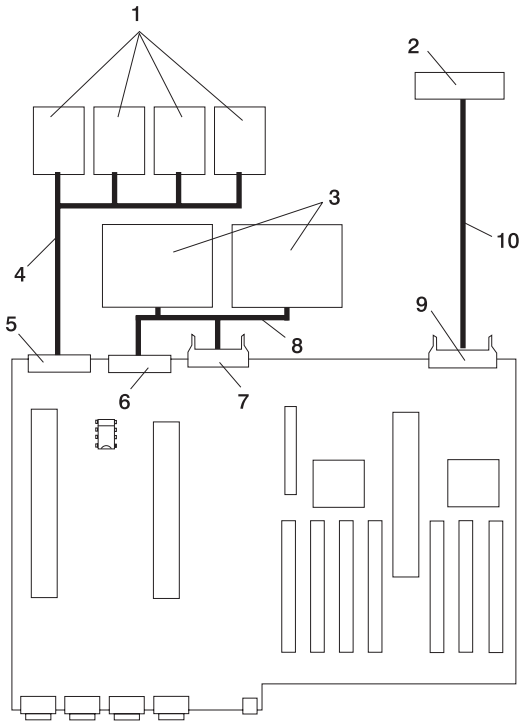
1 286/C4
2 D20
3 Cable from 286/C4 Connector SPCN 2 to D20 Connector SPCN 4 (J16)
4 Cable from 286/C4 Connector SPCN 1 to D20 Connector SPCN 3 (J15)

286/C4 Attached to Two I/O Drawers:



1 286/C4
2 D20 I/O Drawer
3 D20 I/O Drawer
4 Cable from 286/C4 Connector SPCN 1 to D20 Connector SPCN 3 (J15)
5 Cable from 286/C4 Connector SPCN 2 to D20 Connector SPCN 4 (J16)
6 Cable from D20 Connector SPCN 4 (J16) to D20 Connector SPCN 3 (J15)

D20 Internal Cabling



1 Cooling Blowers (Quantity 4)
2 Operator Panel
3 Disk Drive Backplanes
4 Cooling Blower Cable 53P0419
5 Cooling Blower Connector
6 Disk Drive Power Connector
7 Disk Drive SPCN Connector
8 Disk Drive Power/Signal Cable 53P0416
9 Operator Panel Connector
10 Operator Panel Cable 53P0414

D20 Location Codes

This system (processor subsystem and attached I/O subsystems) uses physical location codes in conjunction with AIX location codes to provide mapping of a failing field replaceable units (FRUs). The location codes are produced by the processor subsystem's firmware and AIX. For information about how to read a location code, see the service guide for the processor subsystem to which your I/O subsystem is connected.

AIX and Physical Location Code Table

This section covers the AIX and Physical Location Code tables for the D20 I/O subsystem.

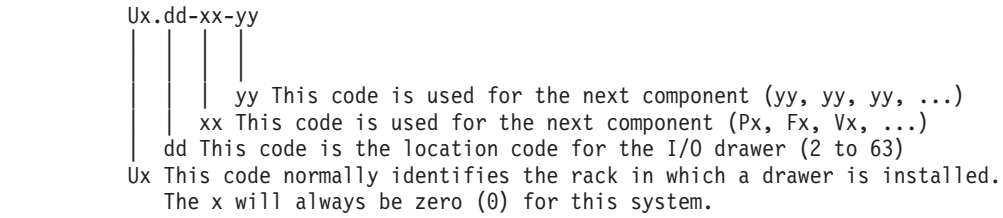
The tables in this section contain the location codes for I/O subsystems when they are attached to the system unit. In the tables, the location code for the I/O subsystem number is represented by *dd*. The first time that an installed system is powered on, the I/O subsystems are numbered. For example, if a system is first powered on with two I/O subsystems connected, then the *dd* value for the connected I/O subsystems should be numbered from 2 and 3.

Note: If the system was powered on with I/O subsystems connected before delivery to the customer, the I/O subsystem location codes for the drawers connected at that time are already assigned.

If at a later time, an I/O subsystem is removed from the system and a different I/O subsystem is substituted, the substitute is assigned the next higher number available for its value of *dd*, which, in the earlier example, is 4. If the original I/O subsystem is reinstalled in the system configuration, the system uses the original *dd* value for the I/O subsystem.

To keep the system from renumbering the I/O drawer when an I/O backplane is replaced, the VPD module from the old I/O backplane must be moved over to the new I/O backplane.

The following diagram defines each part of a location code.



D20 Location Code Table

The following table lists the location codes for a D20 I/O subsystem. The location code for the I/O subsystem connected to a system unit is U0.*dd* (where *dd* can be any number from 2 through 63).

FRU Name	Physical Location Code
D20 I/O Drawer U0.*dd* (*dd* = any number from 2 through 63)	
Rack frame	U0
I/O drawer backplane	U0.*dd*-P1
I/O subsystem drawer	U0.*dd*
RIO Bus Adapter	
RIO bus adapter	U0.*dd*-P1.1
RIO port 1 upper connector	U0.*dd*-P1.1/Q1
RIO port 1 cable	U0.*dd*-P1.1/Q1#
RIO port 0 lower connector	U0.*dd*-P1.1/Q2
RIO port 0 cable	U0.*dd*-P1.1/Q2#
PCI Bus Controller	
PCI bus controller PHB0	U0.*dd*-P1
PCI to PCI bridge EADS-X	U0.*dd*-P1
PCI Bus Controller PHB2	
PCI bus controller PHB2	U0.*dd*-P1
PCI to PCI bridge EADS-X	U0.*dd*-P1
Pluggable Adapter Slots	
PCI slot 1	U0.*dd*-P1/I1
PCI card in slot 1	U0.*dd*-P1-I1
PCI slot 2	U0.*dd*-P1/I2
PCI card in slot 2	U0.*dd*-P1-I2
PCI slot 3	U0.*dd*-P1/I3
PCI card in slot 3	U0.*dd*-P1-I3
PCI slot 4	U0.*dd*-P1/I4
PCI card in slot 4	U0.*dd*-P1-I4
PCI slot 5	U0.*dd*-P1/I5
PCI card in slot 5	U0.*dd*-P1/I5
PCI slot 6	U0.*dd*-P1/I6
PCI card in slot 6	U0.*dd*-P1/I6
PCI slot 7	U0.*dd*-P1/I7
PCI card in slot 7	U0.*dd*-P1/I7
Power Supply	
Power supply 1 (no internal blower)	U0.*dd*-V1
Power supply 2 (no internal blower)	U0.*dd*-V2
Cooling Blowers	
Cooling blower 1	U0.*dd*-F1
Cooling blower 2	U0.*dd*-F2
Cooling blower 3	U0.*dd*-F3

FRU Name	Physical Location Code
Cooling blower 4	U0.*dd*-F4
SPCN Connectors	
SPCN connector 1	U0.*dd*-P1/Q3
SPCN connector 2	U0.*dd*-P1/Q4
SPCN connector 3	U0.*dd*-P1/Q5
SPCN connector 4	U0.*dd*-P1/Q6
Rack Indicator	
Rack beacon (4–pin)	U0.*dd*-P1/Q7
Operator Panel	
Operator panel	U0.*dd*-L1
Temperature Sensor	
Temperature sensor (on operator panel)	U0.*dd*-L1
Disk Drives Backplanes	
Disk drives backplane 1	U0.*dd*-P3
Disk drives backplane 2	U0.*dd*-P4
Disk Drive Locations	
Hot-swap disk drive bay 1	U0.*dd*-P1-Ix/Zn-A8
Hot-swap disk drive bay 2	U0.*dd*-P1-Ix/Zn-A9
Hot-swap disk drive bay 3	U0.*dd*-P1-Ix/Zn-AA
Hot-swap disk drive bay 4	U0.*dd*-P1-Ix/Zn-AB
Hot-swap disk drive bay 5	U0.*dd*-P1-Ix/Zn-AC
Hot-swap disk drive bay 6	U0.*dd*-P1-Ix/Zn-AD
Hot-swap disk drive bay 7	U0.*dd*-P1-Iy/Zn-A8
Hot-swap disk drive bay 8	U0.*dd*-P1-Iy/Zn-A9
Hot-swap disk drive bay 9	U0.*dd*-P1-Iy/Zn-AA
Hot-swap disk drive bay 10	U0.*dd*-P1-Iy/Zn-AB
Hot-swap disk drive bay 11	U0.*dd*-P1-Iy/Zn-AC
Hot-swap disk drive bay 12	U0.*dd*-P1-Iy/Zn-AD
SCSI	
SES0	U0.*dd*-P1-Ix/Zn-AF
SES1	U0.*dd*-P1-Iy/Zn-AF

Powering the System On and Off

Power for the I/O subsystems is controlled by the attached processor subsystem and the System Power Control Network (SPCN).

For information about procedures to power the system on and off, refer to the service guide of the processor subsystem to which the I/O subsystem is attached.

Power-On Self-Test

After power is turned on and before the operating system is loaded, the system does a power-on self-test (POST). The RIO loop that connects the I/O subsystems to the system unit is tested. Tests are also performed on the installed adapters and devices in the I/O subsystems. If an error occurs during the POST, an error code is displayed on the system operator panel LCD that indicates which part is failing and which subsystem contains the error.

D10 and D20 Specifications

This section contains system specifications for both the D10 and D20 I/O subsystems.

D10 Specifications

Dimensions	**7311-D10**		**Two 7311-D10s with Enclosure**
Height	170 mm (6.6 in)		178 mm (7.0 in)
Width	220 mm (8.7 in)		445 mm (17.5 in)
Depth	711 mm (28.0 in)		711 mm (28.0 in)
Weight	16.8 kg (37 lbs)		39.1 kg (86 lbs)
Electrical			
Power source loading for two 7311-D10 (max.)	0.21 kVA		
Voltage range	200 to 240 V ac, (dc not supported)		
Frequency	50 or 60 Hz		
Thermal output (typical)	461 Btu/hr		
Thermal output (max.)	683 Btu/hr		
Power requirements (typical)	135 watts		
Power requirements for two 7311-D10 (max.)	200 watts		
Power factor	0.91		
Inrush current[2]	64 amps		
Maximum altitude[3, 4]	3048 m (10000 ft.)		
Temperature Requirements[3]	**Operating**	**Non-Operating**	**Storage**
	10 to 38°C 50 to 100°F)	1 to 60°C (34 to 140°F)	1 to 60°C (34 to 140°F)
Humidity Requirements[4]	**Operating**	**Non-Operating**	**Storage**
(Noncondensing)	8 to 80%	8 to 80%	8 to 80%
Wet Bulb	23°C (73°F)	27°C (81°F)	29°C (84°F)
Noise Emissions[1, 4]	**Operating**	**Idle**	
L_{WAd}, one 7311-D10	5.6 bels	5.6 bels	
L_{WAd}, two 7311-D10	5.9 bels	5.9 bels	
L_{WAd}, four 7311-D10	6.2 bels	6.2 bels	
$<L_{pA}>_m$, one 7311-D10	40 dBA	40 dBA	
$<L_{pA}>_m$, two 7311-D10	43 dBA	43 dBA	
$<L_{pA}>_m$, four 7311-D10	46 dBA	46 dBA	
Install/Air Flow: Maintaining service clearance allows proper air flow.			
Service Clearances: See *14T/0 and 14T/4 Installation and Service Guide*, order number SA23-2544 for T00 or T42 rack service clearances.			

1. See page 174 for definitions of noise emissions positions. See noise emissions note 4.
2. Inrush currents occur only at initial application of power, no inrush occurs during normal power off-on cycle.
3. The upper limit of the dry bulb temperature must be derated 1°C per 137 m (450 ft.) above 915 m (3000 ft.).
4. The upper limit of the wet bulb temperature must be derated 1°C per 274 m (900 ft.) above 305 m (1000 ft.).

D20 Specifications

Dimensions			
Height		178 mm (7.0 in)	
Width		445 mm (17.5 in)	
Depth		610 mm (24.0 in)	
Maximum Weight		45.9kg (101 lbs)	
Electrical			
Power source loading (max.)		0.358 kVA	
Voltage range		100 to 240 V ac, V dc not supported	
Frequency		50 or 60 Hz	
Thermal output (typical)		774 Btu/hr	
Thermal output (max.)		1161 Btu/hr	
Power requirements (typical)		227 watts	
Power requirements for two 7311-D20 (max.)		340 watts	
Power factor		0.91	
Inrush current[2]		60 amps	
Maximum altitude[3, 4]		3048 m (10,000 ft.)	
Temperature Requirements[3]	**Operating** 5 to 35°C 41 to 95°F)	**Non-Operating** 1 to 43°C (34 to 109°F)	**Storage** 1 to 60°C (34 to 140°F)
Humidity Requirements[4]	**Operating**	**Non-Operating**	**Storage**
(Noncondensing)	8 to 80%	8 to 80%	5 to 80%
Wet Bulb	23°C (73°F)	27°C (81°F)	29°C (84°F)
Noise Emissions[1, 5]	**Operating**	**Idle**	
L_{WAd}	6.1 bels	6.0 bels	
$<L_{pA}>_m$	44 dBA	43 dBA	
Install/Air Flow	Maintaining service clearance allows proper air flow.		
Service Clearances: See *14T/0 and 14T/4 Installation and Service Guide*, order number SA23-2544 for T00 or T42 rack service clearances.			

1. See 174 for definitions of noise emissions positions. See noise emissions note 4.
2. Inrush currents occur only at initial application of power, no inrush occurs during normal power off-on cycle.
3. The upper limit of the dry bulb temperature must be derated 1 degree C per 137 m (450 ft.) above 915 m (3000 ft.).
4. The upper limit of the wet bulb temperature must be derated 1 degree C per 274 m (900 ft.) above 305 m (1000 ft.).

External AC 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 the following:

- Electrical cables, Type SVT or SJT.
- Attachment plugs complying with National Electrical Manufacturers Association (NEMA) 5-15P, that is:

″For 115 V operation (D20 only), 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'.″

For information about the power cables that are available, refer to Chapter 4, "Parts Information", on page 157.

Service Inspection Guide

Perform a service inspection on the system (processor subsystem and connected I/O subsystems) 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 owner of the system is responsible to correct any unsafe conditions.

Perform the following checks:

1. Check the covers for sharp edges and for damage or alterations that expose the internal parts of the system.
2. Check the covers for proper fit to the system. They should be in place and secure.
3. Gently rock the system from side to side to determine if it is steady.
4. Set the power button of the system 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.
9. Check the voltage label on the back of the system 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, 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 cable.
    b. Check for the correctly 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. Diagnostics and Maintenance Procedures

The system uses an integrated set of software diagnostic procedures to help isolate failing components and system maintenance. This book, along with the *Diagnostic Information for Multiple Bus Systems*, is the basis of the diagnostic procedures. Refer to the system service guide when running diagnostics on your I/O subsystem.

Power and Attention LEDs

The Power and Attention LEDs provide a means to identify failing components in your subsystem. When a failing component is detected in your system, the system's Attention LED is turned on.

Component LEDs

To further help you identify the failing component, all system components have individual LEDs that indicate a failure when lit. The LEDs are either on the component itself or on the carrier of the component (memory card, fan, memory module, or CPU).

The LEDs are either green or amber in color. A lit green LED indicates that the system or component is receiving power. A lit amber LED identifies a system or component on the system. The amber LED can also indicate when a system or component on a system has a problem or fault. For more information on LEDs and their definitions, see Chapter 5, "Fault and Attention LEDs", on page 169.

Resetting the LEDs

To reset the LEDs, do the following:

1. Replace the failing component with the new component.
2. Log in as root user.
3. At the command line, type `diag`.
4. Select **Task Selection**.
5. Select **Log Repair Action**.
6. Select the device that was repaired. (If the device is not listed, select **sysplanar0**.)

Checkpoints

The system uses various types of checkpoints, error codes, and SRNs, which are referred to throughout your system's service guide. These codes can appear in the service processor boot progress log, the AIX error log, and the operator panel display. Understanding the definition and relationships of these codes is important to the service personnel who are installing or maintaining the system.

Service Request Numbers (SRNs) are listed in the *Diagnostic Information for Multiple Bus Systems*, order number SA23-2769.

FRU Isolation

For a list of error codes and recommended actions for each code, see your system's service guide. These actions can refer to Chapter 4, "Parts Information", on page 157, "Maintenance Analysis Procedures (MAPs)" on page 40, or provide informational message and directions. If a replacement part is indicated, direct reference is made to the part name. The respective AIX and physical location codes are listed for each occurrence as required. For a list of locations codes, see your system's service guide.

Maintenance Analysis Procedures (MAPs)

The maintenance analysis procedures (MAPs) provide the service representative a step-by-step procedure to analyze a problem with the system and I/O subsystem hardware. Be prepared to record code numbers and other data while using the MAPs.

Because the D10 and D20 are subsystems, refer to your system's service guide. The system's service guide contains all of the MAPs needed for servicing the D10 and D20 I/O subsystems.

Checkpoints

Checkpoints display on the system operator panel and the virtual terminal while the system unit is powering on and going through the initial program load (IPL). See the system's service guide for descriptive information and a complete listing of all checkpoints used by the D10 and D20 I/O subsystems.

Error Code to FRU Index

The Error Code to FRU Index lists fault symptoms and possible causes. The most likely cause is listed first. Use this index to help you decide which FRUs to replace when servicing the D10 or D20 I/O subsystem. See your system's service guide for more information and a complete listing of all error codes and FRUs used by the D10 and D20 I/O subsystem.

Using the Service Processor

The service processor is in the processor subsystem to which your I/O subsystem is connected and runs on its own power boundary. The service processor continually monitors hardware attributes and the environmental conditions within the system and connected I/O subsystems. The service processor is controlled by firmware and does not require the operating system to be operational to perform its tasks.

The service processor menus allow you to configure service processor options, as well as enable and disable functions.

Service processor menus are available using an ASCII terminal or an HMC virtual terminal window when 0K is displayed on the operator panel or when the service processor has detected a system problem (such as a surveillance failure).

For more information about the service processor for the system to which your I/O subsystem is connected, see the system's service guide.

Using System Management Services

Use the system management services menus to view information about the processor subsystem to which the I/O subsystem is connected. For more information about the service processor, see the service guide for the attached system.

Chapter 3. Removal and Replacement Procedures

Before performing any of the removal or replacement procedures in this chapter, read the following danger and caution notices.

Safety Considerations

Observe the following safety precautions anytime you work with these I/O subsystems.

For the I/O subsystem you are about to setup or service:

- The ac power interface connector is considered the main power disconnect device.
- The I/O subsystems have independent redundant power supply capabilities, meaning that each unit might be configured to have two power supplies running simultaneously in the same I/O subsystem. When instructed to disconnect the power source, ensure that all power cables that run to each serviced subsystem are disconnected from the power distribution bus.

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.
D05

CAUTION:
This product is equipped with a three-wire power cable and plug for the user's safety. Use this power cable with a properly grounded electrical outlet to avoid electrical shock.
C01

CAUTION:
This unit has more than one power supply cord. To reduce the risk of electrical shock, disconnect two power supply cords before servicing.
C21

Handling Static-Sensitive Devices

Attention: Electronic boards and disk drives are sensitive to static electricity discharge. These devices are wrapped in antistatic bags 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.
- 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 at the same time.
- Handle the devices carefully to prevent permanent damage.

Stopping and Starting the System

For procedures to power the system on and off, refer to the service guide of the processor subsystem to which the I/O subsystem is attached.

Removal and Replacement Procedures for the D10 I/O Subsystem

The following procedures cover the removal and replacement of the D10 I/O Subsystem FRUs.

Note: Before performing any of the removal or replacement procedures in this chapter, read the danger and caution notices on “Safety Considerations” on page 41.

D10 FRU Replacement Procedure List

Field Replaceable Unit (FRU)	FRU Procedure Name and Page Location
Adapters	“D10 PCI Adapters” on page 45
Bezel	“D10 Front Bezel” on page 43
Cover	“D10 Covers” on page 44
Blower	“D10 Fan” on page 104
I/O Backplane	“D10 I/O Backplane Assembly” on page 106
Operating Position	“D10 Operating Position” on page 43
Power Supplies	“D10 Power Supply” on page 107
RIO Bus Adapter	“D10 RIO Bus Adapter Assembly” on page 105
Service Position	“D10 Service Position” on page 43
Static-Sensitive Devices	“Handling Static-Sensitive Devices”
Stopping and Starting the System	“Stopping and Starting the System”

D10 Service Position

To perform a removal or replacement procedure that requires access to the inside of the I/O subsystem, the subsystem must be removed from the rack and placed on a stable work surface.

To put the drawer into the service position, do the following:

1. Shut down the system unit to which the I/O subsystem is connected.
2. From the rear of the rack, disconnect the I/O subsystem's power cables from the power distribution bus.
3. Remove the retaining screws located on the rear of the I/O subsystem drawer.
4. Label and disconnect all of the cables connected to the rear of the I/O subsystem.
5. From the rear of the rack, pull the I/O subsystem straight back until the subsystem stops.
6. To allow the subsystem to move further to the rear, press the stop latch on the side of the enclosure.
7. Support the I/O subsystem as you pull it toward the rear of the rack.
8. When the I/O subsystem is out of the rack, place it on a stable work surface.

D10 Operating Position

To return the subsystem to the operating position, do the following:

1. From the rear of the rack, insert the I/O subsystem into the position from which it was removed. The end of the I/O subsystem that has the power supplies goes toward the front of the rack.
2. Support the I/O subsystem as you push it toward the front of the rack.
3. Install the retaining screws in the rear of the I/O subsystem drawer.
4. Reconnect the cables to the rear of the I/O subsystem.
5. Reconnect the power cables.
6. Restart the system.

D10 Front Bezel

Before performing the following procedure, read the "Safety Notices" on page vii.

Removal

To remove the front bezel, do the following:

1. Open the front rack door.
2. Simultaneously press in both bezel-release tabs.
3. Pivoting the bezel from the top, swing the top forward.
4. Pull the bottom of the bezel up, then away from the subsystem chassis. This action releases the two tab hooks located on the bottom of the I/O subsystem chassis.

Front Bezel Replacement

To replace the front bezel, do the following:

1. Open the front rack door.
2. Insert the two tabs located on the bottom edge of the bezel into their locking hooks, located on the chassis.
3. Pivot the front bezel up toward the top of the chassis.
4. Align the release tabs to the matching slots located on the front of the subsystem chassis.
5. Gently push the tabs into the slots until the bezel seats against the front of the subsystem.
6. If the subsystem is not completely in the operating position, push the subsystem back into the operating position as described in "D10 Operating Position".
7. Close the rack door.

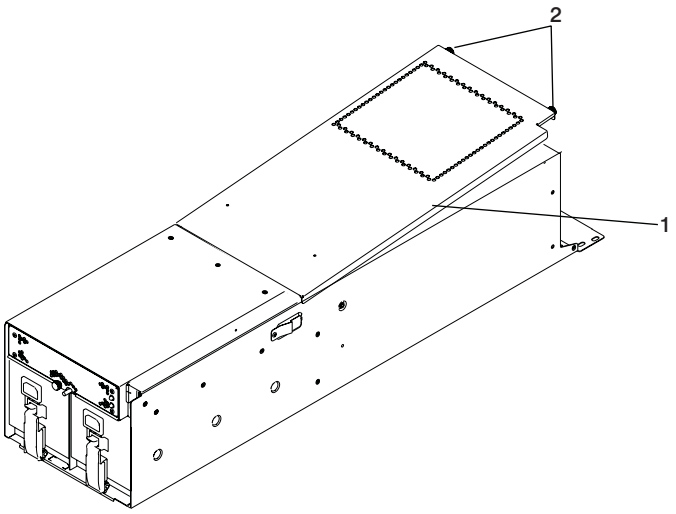
D10 Covers

Before performing the following procedure, read the “Safety Considerations” on page 41.

Service Access Cover Removal

To remove the service access cover, do the following:

1. Put the I/O subsystem into the service position as described in “D10 Service Position” on page 43.
2. Loosen the two captive thumbscrews located on the rear of the cover.
3. From the rear of the I/O subsystem, lift the cover and slide it backwards until the front disengages. Lift the cover off the I/O subsystem drawer.



1 Service access cover

2 Thumbscrews

Service Access Cover Replacement

To replace the service access cover, do the following:

1. Position the cover over the rear of the I/O subsystem.
2. Align the service access cover with the I/O subsystem so that the front portion of the cover engages with the front part of the I/O subsystem chassis. The flanges on the left and right sides of the cover should be on the outside of the I/O subsystem chassis.
3. Hold the service access cover down and slide it forward toward the front of the I/O subsystem. The front edge of the service access cover engages the front portion of the I/O subsystem.
4. Push in to engage and then tighten the thumbscrews located on the rear of the cover.

D10 PCI Adapters

Most PCI adapters can be removed and replaced, or installed in the system without turning off the power to the entire system. These adapters are referred to as *hot-pluggable PCI adapters*. Some adapters are not hot-pluggable and power must be removed from the system for adapter removal, replacement, or installation. Though some adapters are not hot-pluggable, they must still be installed in the cassette.

Note: An adapter or an adapter blank filler must be installed into the PCI adapter cassette assembly before it is reinstalled in a system unit or an I/O drawer.

Before you remove or replace an adapter, determine if the PCI adapter you are working with is hot-pluggable. See the *PCI Adapter Placement Reference*, order number SA23-2504.

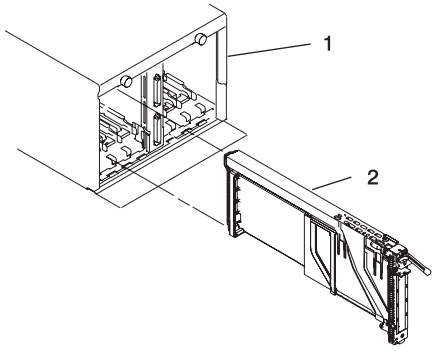
If you are removing a PCI adapter that is:

- Not hot-pluggable, go to “Removing a Non-Hot-Pluggable PCI Adapter”.
- Hot-pluggable, go to “Hot-Pluggable PCI Adapter” on page 46.

Removing a Non-Hot-Pluggable PCI Adapter

To remove a non-hot-pluggable adapter, do the following:

1. Turn off power and remove the power from the system as described in “Stopping and Starting the System” on page 42.
2. Determine the slot from which you are removing the adapter.
3. Disconnect any cables that are connected to the adapter being removed.
4. Press the center of the handle of the PCI card cassette to release the latch, then lower the handle completely.
5. When the handle is completely lowered, push the gray locking cross bar.
6. Carefully pull the PCI card cassette straight out from the I/O subsystem as shown in the following illustration. Take care not to pull EMC gaskets from neighboring cassettes.



1 I/O Subsystem
2 PCI adapter Cassette

7. If you are installing another adapter in this slot, follow the instructions given in “Replacing a Non-Hot-Pluggable PCI Adapter” on page 46.
8. If you are not installing another adapter in this slot, install a blank PCI adapter cassette into the slot.
9. Connect power to the system and turn the power on.
10. Return the system to normal operations.

Replacing a Non-Hot-Pluggable PCI Adapter

Replace the adapter using the following procedure:

Note: Because the adapter you are installing is not hot-pluggable, shut down the system and remove power before performing this procedure.

1. Press the center of the handle of the PCI card cassette to release the latch, then lower the handle completely.
2. When the handle is completely lowered, push the gray locking cross bar.
3. Hold the assembly straight on and level with the slot.
4. Align the bottom edge of the PCI cassette cover with the PCI card guide rail on the I/O backplane.

   Note: If there is a cassette to the left of the one you are installing, align the ridge on the cover with the ″tick″ in the notch of the neighboring cassette.
5. Slide the cassette partially into the guide.
6. Ensure the dovetail on the top track aligns with its mating component(s) on both sides.
7. When the cassette is fully inserted, prepare to activate the handle by lowering the gray locking bar. Lift the handle all the way up until you hear a click. The PCI card should be completely seated.

   Note: To insert the adapter correctly, some minor forward or backward movement of the PCI adapter cassette might be necessary.
8. Set the color slide to blue.
9. Connect power to the system, and turn on the power as described in “Stopping and Starting the System” on page 42.
10. Ensure that the adapter is configured when the system completes the boot process.

Hot-Pluggable PCI Adapter

Before performing the following procedure, read “Safety Notices” on page vii.

Attention: The Linux operating system does not support these hot-plug procedures. Also, Linux does not support hot-plugging any hot-pluggable PCI adapters. Systems with Linux installed on one or more partitions must be shut down and powered off before replacing any PCI adapter assigned to a Linux partition. Follow the non-hot-pluggable adapter procedures when replacing a PCI adapter in any partition with Linux installed.

The following hot-plug procedures take you through removing and replacing hot-plug PCI adapters using software that presents procedures on your display. The LEDs on a PCI adapter cassette are described in “I/O Subsystem PCI-X Slot LED Definitions” on page 2.

Removing and Replacing a Hot-Pluggable PCI Adapter

Note: Use this procedure only when you are replacing an adapter with an identical adapter. If you are replacing an adapter with an adapter that is not identical to the adapter removed, go to “Removing a Hot-Pluggable PCI Adapter” on page 49, and then to “Installing a Hot-Pluggable PCI Adapter” on page 51.

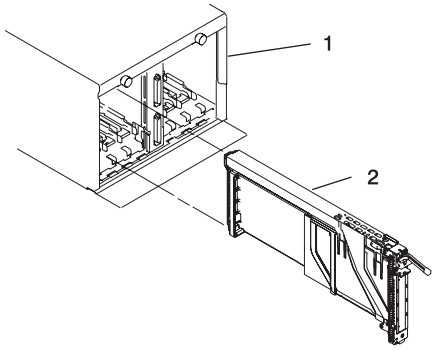
To replace an adapter, perform the following steps:

1. Determine the slot from which you are removing the adapter.
2. Ensure that any processes or applications that might use the adapter are stopped.

   Note: Removing a hot-pluggable PCI adapter requires the system administrator to take the PCI adapter offline before performing any PCI adapter hot-plug procedures. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

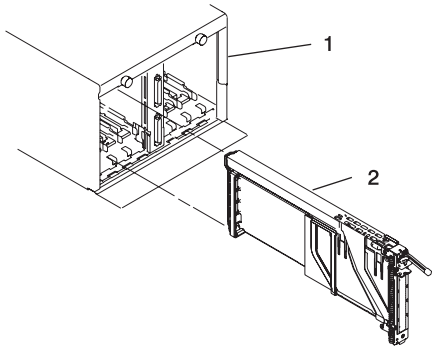
   For additional information about taking an adapter offline or removing it from the system configuration, see the *AIX System Management Guide: Operating System and Devices*.
3. Log in as root user. If the system is a partitioned system, log in as root user on the partition that has the adapter assigned to it.
4. At the command line, type **smitty**.
5. Select **Devices**.
6. Select **PCI Hot Plug Manager**.
7. Select **Unconfigure a Device** and press Enter.
8. Press F4 to display the Device Names menu.
9. From the menu, select the adapter you are removing.
10. Answer YES to **Keep Definition**. Press Enter.
11. The ARE YOU SURE screen displays. Press Enter to verify the information. Successful unconfigure is indicated by the OK message displayed next to the **Command** field at the top of the screen.
12. Press F3 to return to the PCI Hot-Plug Manager menu.
13. Select **Replace/Remove a PCI Hot-Plug Adapter** and press Enter. The Replace/Remove a PCI Hot-Plug Adapter menu displays.
14. Move the cursor to select the adapter that you are removing and press Enter.
15. Press the Tab key until the entry field displays the replace operation and then press the Enter key. Follow the instructions that display on the screen until you are instructed to remove the adapter.
16. When you are instructed to remove the adapter from the adapter slot, disconnect any cables that are connected to the adapter being removed.
17. Press the center of the handle of the PCI card cassette to release the latch, then lower the handle completely.
18. When the handle is completely lowered, push the gray locking cross bar.

19. Carefully pull the PCI card cassette straight out from the rear of the subsystem. Take care not to pull EMC gaskets from neighboring cassettes.



1 I/O Subsystem **2** PCI Adapter Cassette

20. Install the replacement adapter in the PCI adapter cassette, see “PCI Adapter or Blank Filler Removal from a Cassette Assembly” on page 59.
21. When the adapter is installed in the PCI adapter cassette, install the adapter in the adapter slot, as follows:
    a. Lower the black handle completely.
    b. Push the gray locking cross bar until you hear a clicking sound.
    c. Hold the assembly straight on and level with the slot.



1 I/O Subsystem **2** PCI Adapter Cassette

    d. Align the bottom edge of the PCI cassette cover with the PCI adapter guide rail on the I/O backplane.

       Note: If there is a cassette to the left of the one that you are installing, align the ridge on the cover with the tick in the notch of the neighboring cassette.
    e. Slide the cassette partially into the guide.
    f. Ensure that the dovetail on the top track aligns with its mating component(s) on both sides.
    g. When the cassette is fully inserted, prepare to activate the handle, lower the gray locking bar. Lift the handle up completely until you hear a click. The PCI adapter should be completely seated.

       Note: To enable proper insertion of the adapter, some minor forward or backward movement of the PCI adapter cassette might be necessary.
    h. Set the color slide to the orange color indicating that the adapter in the cassette is hot-pluggable.
22. Connect appropriate cables and devices to the adapter.

23. Continue to follow the screen instructions until you receive a message that the replacement is successful. Successful replacement is indicated by the OK message displayed next to the **Command** field at the top of the screen.
24. Press the F3 key to return to the PCI Hot-Plug Manager menu.
25. Select **Install/Configure Devices Added After IPL** and press Enter. Then follow the instructions on the screen. Successful replacement is indicated by the OK message displayed next to the **Command** field at the top of the screen.
26. If you do not have other adapters to replace, continue with the next step.
    OR
    If you have other adapters to replace, press the F3 key to return to the PCI Hot-Plug Manager menu and then return to step 13 on page 47.
27. Press F10 to exit the Hot-Plug Manager.

    If you have added, removed, or replaced any adapters, run the **diag -a** command. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.
28. Install the covers that you removed earlier and return the drawer to the operating position.

Removing a Hot-Pluggable PCI Adapter

If you are permanently removing an adapter from a system, this procedure should be used.

Attention: The Linux operating system does not support these hot-plug procedures. Also, Linux does not support hot-plugging any hot-pluggable PCI adapters. Systems with Linux installed on one or more partitions must be shut down and powered off before replacing any PCI adapter assigned to a Linux partition. Follow the non-hot-pluggable adapter procedures when replacing a PCI adapter in any partition with Linux installed.

Note: If you are removing an adapter and replacing it with an adapter that is identical to the adapter that was removed, use the “Removing and Replacing a Hot-Pluggable PCI Adapter” on page 47 procedure.

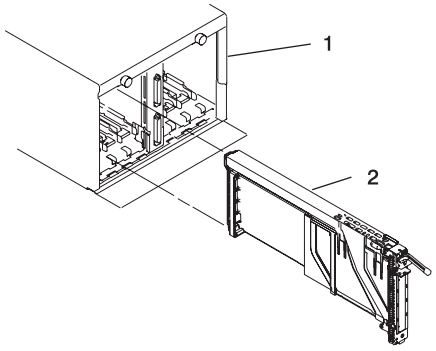
To remove an adapter, perform the following steps:

1. Open the door of the rack.
2. Determine the slot from which you are removing the adapter.
3. Ensure that any processes or applications that might use the adapter are stopped.

   Note: Removing a hot-pluggable PCI adapter requires the system administrator to take the PCI adapter offline before performing any PCI adapter hot-plug procedures. Before taking an adapter offline, the devices attached to the adapter must also be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

   For more information on taking the PCI adapter online, see the AIX operating system documentation. Documentation for the AIX operating system is available from the IBM @server pSeries Information Center at http://publib16.boulder.ibm.com/pseries/en_US/infocenter/base. Select **AIX documentation**. The *AIX Documentation* CD contains the base set of publications for the operating system, including system-management and end-user documentation.

4. Log in as root user. If the system is a partitioned system, log in as root user on the partition that has the adapter assigned to it.
5. At the command line, type **smitty**.
6. Select **Devices**.
7. Select **PCI Hot Plug Manager**.
8. Select **Unconfigure a Device** and press Enter.
9. Press F4 to display the Device Names menu.
10. Select the adapter you are removing from the menu.
11. Use the Tab key to answer NO to **Keep Definition**. Press Enter.
12. The ARE YOU SURE screen displays. Press Enter to verify the information. Successful unconfigure is indicated by the OK message displayed next to the **Command** field at the top of the screen.
13. Press F3 to return to the PCI Hot-Plug Manager menu.
14. Select **Replace/Remove a PCI Hot-Plug Adapter** and press Enter. The Replace/Remove a PCI Hot-Plug Adapter menu displays.
15. Move the cursor to select the adapter that you are removing and press Enter. (The description entry displays as unknown).
16. Press the Tab key until the entry field displays the remove operation and then press the Enter key. Follow the instructions that display on the screen until you are instructed to remove the adapter.
17. When you are instructed to remove the adapter from the adapter slot, disconnect any cables that are connected to the adapter being removed.
18. Press the center of the handle of the PCI card cassette to release the latch, then lower the handle completely.
19. When the handle is completely lowered, push the gray locking cross bar.
20. Carefully pull the PCI adapter cassette straight out from the I/O subsystem, as shown in the following illustration. Take care not to pull EMC gaskets from neighboring cassettes.



1 I/O Subsystem **2** PCI adapter Cassette

21. If you are not installing another adapter in this slot, install a blank PCI adapter cassette into the slot.
22. Continue to follow the screen instructions until you receive a message that the adapter removal is successful. Successful removal is indicated by the OK message displayed next to the **Command** field at the top of the screen.
23. If you do not have other adapters to remove, continue with the next step.
    OR
    If you have other adapters to remove, press the F3 key to return to the PCI Hot-Plug Manager menu and then return to step 14.
24. Press F10 to exit the Hot-Plug Manager.
25. Install any covers that you removed earlier, and return the drawer to the normal operations.

Installing a Hot-Pluggable PCI Adapter

Attention: The Linux operating system does not support these hot-plug procedures. Also, Linux does not support hot-plugging any hot-pluggable PCI adapters. Systems with Linux installed on one or more partitions must be shut down and powered off before replacing any PCI adapter assigned to a Linux partition. Follow the non-hot-pluggable adapter procedures when replacing a PCI adapter in any partition with Linux installed.

Note: Before installing a new adapter, ensure the device driver for the adapter is installed. Check with the system administrator if the device driver is not already installed.

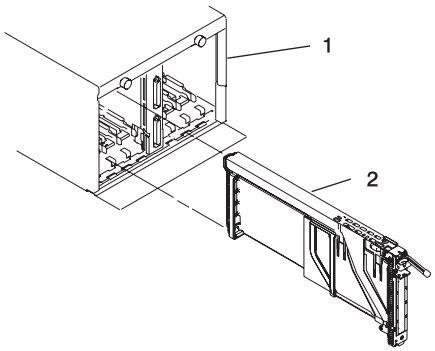
To install an adapter, perform the following steps:

1. Install the new adapter into a PCI adapter cassette, see “PCI Adapter or Blank Filler Removal from a Cassette Assembly” on page 59.
2. Log in as root user. If the system is a partitioned system, log in as root user on the partition that has the adapter assigned to it.
3. At the command line, type **smitty**.
4. Select **Devices**.
5. Select **PCI Hot Plug Manager**.
6. From the PCI Hot-Plug Manager menu, select **Add a PCI Hot-Plug Adapter** and press Enter. The Add a Hot-Plug Adapter window displays.
7. See the *PCI Adapter Placement Reference*, order number SA23-2504, for adapter placement information. Select an empty PCI slot for the adapter.
8. Select the appropriate empty PCI slot from the ones listed on the screen, and press Enter.
9. Follow the instructions on the screen to install the adapter until the visual indicator (LED) for the specified PCI slot is set to the Action state.
10. Install the new adapter in the adapter slot by performing the following:
    a. Lower the black handle completely.
    b. Push the gray locking cross bar until you hear a clicking sound.
    c. Hold the assembly straight on and level with the slot.
    d. Align the bottom edge of the PCI cassette cover with the PCI card guide rail on the I/O backplane.

       Note: If there is a cassette to the left of the one you are installing, align the ridge on the cover with the ″tick″ in the notch of the neighboring cassette.

e. Slide the cassette partially into the guide.

f. Ensure that the dovetail on the top track aligns with its mating component(s) on both sides.



1 I/O Subsystem **2** PCI adapter Cassette

g. When the cassette is fully inserted, prepare to activate the handle, lower the gray locking bar. Lift the handle all the way up until you hear a click. The PCI Card should be completely seated.

h. Set the color slide to the orange color indicating that the adapter in the cassette is hot-pluggable.

11. Connect appropriate cables and devices to the adapter.
12. Continue to follow the screen instructions until you receive a message that the installation is successful. Successful installation is indicated by the `OK` message displayed next to the **Command** field at the top of the screen.
13. Press the F3 key to return to the PCI Hot-Plug Manager menu.
14. Select **Install/Configure Devices Added After IPL** and press Enter. Then follow the instructions on the screen. Successful installation is indicated by the `OK` message displayed next to the **Command** field at the top of the screen.
15. If you do not have other adapters to install, continue with the next step.
    OR
    If you have other adapters to install, press the F3 key to return to the PCI Hot-Plug Manager menu and then return to step 6 on page 51.
16. Press F10 to exit the Hot-Plug Manager.

    If you have added, removed, or replaced any adapters, run the **diag -a** command. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.
17. Install any covers that you removed earlier, and return the drawer to normal operations.

PCI Hot-Plug Manager Access

Attention: The Linux operating system does not support these hot-plug procedures. Also, Linux does not support hot-plugging any hot-pluggable PCI adapters. Systems with Linux installed on one or more partitions must be shut down and powered off before replacing any PCI adapter assigned to a Linux partition. Follow the non-hot-pluggable adapter procedures when replacing a PCI adapter in any partition with Linux installed.

The installation instructions for hot-pluggable PCI adapters refer you to these procedures when it is appropriate to perform them.

Note: A PCI adapter is only hot-pluggable if the PCI adapter supports hot-plug applications. See the *PCI Adapter Placement Reference*, order number SA23-2504.

Accessing Hot-Plug Management Functions

Note: Removing or installing a Hot-Pluggable PCI adapter requires the system administrator to take the PCI adapter offline prior to performing the operation. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

For additional information about taking an adapter offline or removing it from the system configuration, see the *AIX System Management Guide: Operating System and Devices*.

To access the hot-plug menus, do the following:

1. Log in as root user. If the system is a partitioned system, log in as root user on the partition that has the adapter assigned to it.
2. At the command line, type **smitty**.
3. Select **Devices**.
4. Select **PCI Hot Plug Manager** and press Enter.
5. The PCI Hot-Plug Manager menu displays. Return to the procedure that directed you here. For a description of the menu options, see below.

PCI Hot-Plug Manager Menu

The following options are available from the PCI Hot Plug Manager menu:

Note: For information about the PCI slot LED states, see “I/O Subsystem PCI-X Slot LED Definitions” on page 2.

List PCI Hot-Plug Slots

Provides a descriptive list of all slots that support PCI hot-plug capability. If the listing for a slot indicates it holds an “Unknown” device, select the **Install/Configure Devices Added after IPL** to configure the adapter in that slot.

Add a PCI Hot-Plug Adapter

Allows the user to add a new PCI hot-plug-capable adapter to the slot with the system turned on. You will be asked to identify the PCI slot that you have selected prior to the actual operation. The selected PCI slot will go into the Action state and finally into the On state.

Note: The system will indicate the slot holds an “Unknown” device until you perform the **Install/Configure Devices Added After IPL** option to configure the adapter.

Replace/Remove a PCI Hot-Plug Adapter

Allows the user to remove an existing adapter, or replace an existing adapter with an identical one. For this option to work, the adapter must be in the Defined state (see “Unconfigure a Device” option below).

You will be asked to identify the PCI slot prior to the actual operation. The selected PCI slot will go into the Action state.

Identify a PCI Hot-Plug Slot

Allows the user to identify a PCI slot. The selected PCI slot will go into the Identify state. See “I/O Subsystem PCI-X Slot LED Definitions” on page 2.

Unconfigure a Device

Allows the user to put an existing PCI adapter into the Defined state if the device is no longer in use.

This step must be completed successfully before starting any removal or replacement operation. If this step fails, the customer must take action to release the device.

Configure a Defined Device

Allows a new PCI adapter to be configured into the system if software support is already available for the adapter. The selected PCI slot will go into the On state.

Install/Configure Devices Added After IPL

The system attempts to configure any new devices and tries to find and install any required software from a user-selected source.

The add, remove, and replace functions return information to the user indicating whether the operation was successful. If additional instructions are provided on the screen, complete the recommended actions. If the instructions do not resolve the problem, see the following:

- If the adapter is listed as Unknown, perform the **Install/Configure Devices Added After IPL** option to configure the adapter.
- If you receive a warning indicating that needed device packages are not installed, the system administrator must install the specified packages before you can configure or diagnose the adapter.
- If you receive a failure message indicating a hardware error, the problem might be either the adapter or the PCI slot. Isolate the problem by retrying the operation in a different PCI slot, or trying a different adapter in the slot. If you determine that you have failing hardware, call your service representative.

Removing and Replacing a PCI Adapter Cassette

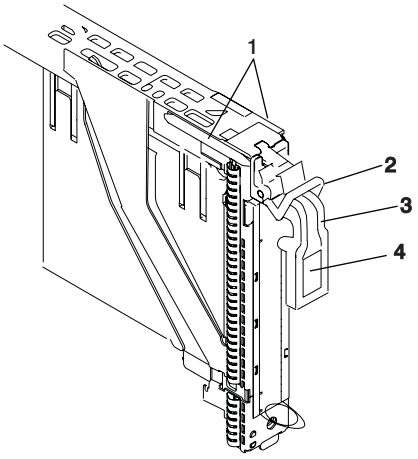
Perform these procedures only when you are directed to by the “Removing a Non-Hot-Pluggable PCI Adapter” on page 45 or “Hot-Pluggable PCI Adapter” on page 46.

Removing a PCI Adapter Cassette

Attention: Perform this procedure only when you are instructed to by the removal and replacement procedures for a “Removing a Non-Hot-Pluggable PCI Adapter” on page 45 or “Hot-Pluggable PCI Adapter” on page 46.

Note: An adapter or a blank filler must be installed into the PCI adapter cassette assembly before it is reinstalled in a processor subsystem or an I/O subsystem.

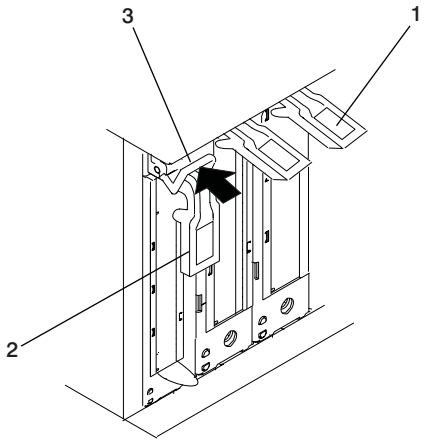
The following illustration shows the PCI adapter cassette with the handle lowered.



1 dove-tail
2 Gray locking crossbar
3 Handle in the lowered position
4 Center of handle

1. Determine the slot from which you are removing the PCI adapter cassette.
2. Disconnect any cables that are connected to the adapter cassette being removed.

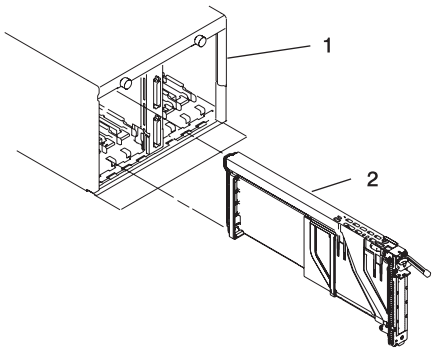
3. Press the center of the handle of the PCI card cassette to release the latch, then lower the handle completely.



1 Center of handle
2 Handle in the lowered position
3 Gray locking crossbar

4. When the handle is completely lowered, push the gray locking cross bar. This action prevents the handle from pulling up while the adapter is being removed from the unit.
5. Carefully pull the PCI card cassette straight out from the subsystem as shown in the following illustration. Take care not to pull EMC gaskets from neighboring cassettes.

   Attention: Do not remove more than one adapter cassette at at time.



1 Processor subsystem
2 PCI adapter cassette

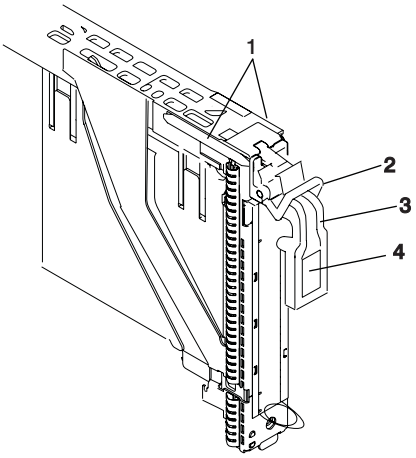
Replacing a PCI Adapter Cassette

Attention: Perform this procedure only when instructed to by “Removing a Non-Hot-Pluggable PCI Adapter” on page 45 or “Hot-Pluggable PCI Adapter” on page 46. Check the following:

- An adapter or blank filler must be installed in each PCI adapter cassette and the top cover for the unit must be installed before installing PCI adapter cassette in the system.
- Check the adapter in the cassette that you are about to install and make sure that the adapter is held firmly by the retaining arms and rachet clips on all four corners.
- Review the procedures beginning with “PCI Adapter or Blank Filler Removal from a Cassette Assembly” on page 59 to make sure that the adapter is correctly installed in the cassette.

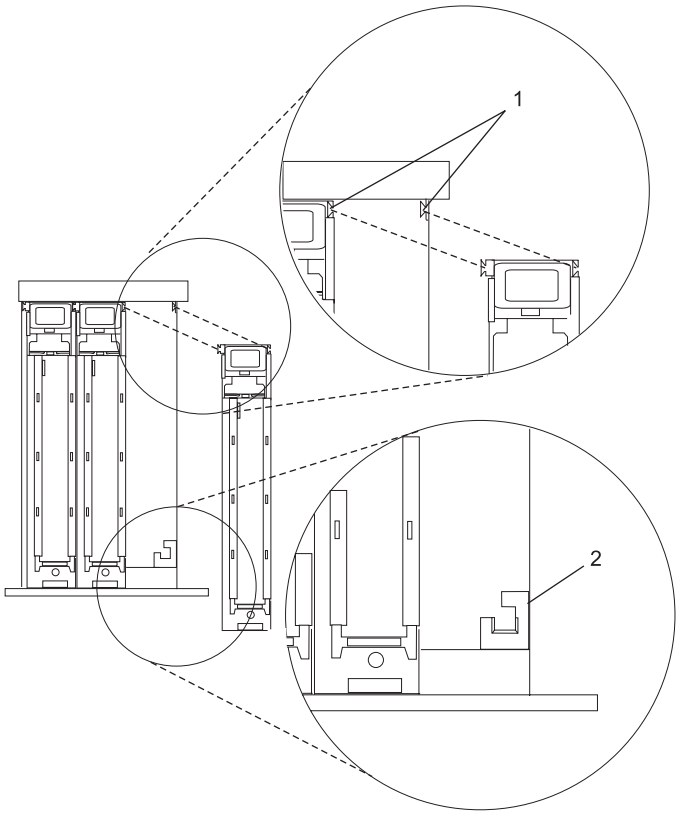
Replace the PCI adapter cassette in the unit using the following procedure:

1. Press the center of the handle of the PCI card cassette to release the latch, then lower the handle completely.



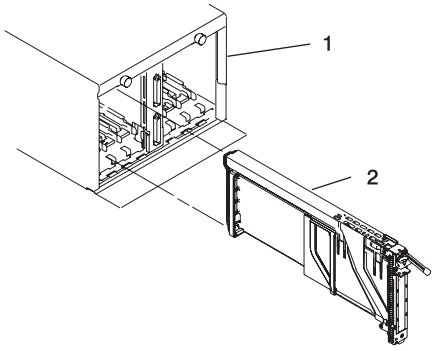
1 Dove-tail
2 Gray locking crossbar
3 Handle in the lowered position
4 Center of handle

2. Study the PCI adapter slot opening carefully and note the location the dove-tail channels and the cassette guide slot. Use a flashlight to better see the dove-tail channels and the cassette guide slot



1 Dove-tail channels
2 PCI cassette guide slot

3. Hold the assembly straight on and level with the slot.



1 Processor subsystem **2** PCI adapter cassette

4. Align the bottom edge of the PCI cassette cover with the PCI cassette guide rail on the of the system or I/O unit.

   Note: If there is a cassette to the left of the one you are installing, align the ridge on the cover with the ″tick″ in the notch of the neighboring cassette.

5. Slide the cassette partially into the guide.

   Attention: If the cassette does not slide in smoothly, the cover might not have engaged PCI cassette guide rail. Carefully pull the adapter back out and start again. Also, the cassette might bind if it hits the top cover as it is inserted.

6. As you slide the cassette into the slot, ensure the dove-tails on the top of the cassette align with the mating components on both the left and right sides.
7. Push the cassette in until its bezel is even with the next cassettes (to the left or right).

   Note: Viewed from the rear, the left and right dove tail channels must be properly engaged. Check the following on the cassette after it is completely inserted into the unit.

   - There should be no freedom of movement of the cassette when pressure is applied to the handle in a back and fourth motion.
   - The PCI cassette bezel should be even with the other cassettes that are already installed.
   - Visually check to ensure that the cassette is parallel with the cassettes to the left or right. If the cassette is not parallel with the neighboring cassettes, the cassette dove-tail channels might not have engaged, pull the cassette out a few inches, reinsert it, and check the alignment again. You might need to apply light pressure to the left or right neighboring cassettes against the new cassette in order to engage both of the dove-tails correctly.

8. When the cassette is fully inserted, ensure that the gray locking bar is in the unlocked position (pulled out).

   Attention: Do not force the handle into the raised postion. To enable proper insertion of the adapter, press down on the adapter tailstock (metal tab just below the handle hinge) at the rear of the adapter cassette when lifting the handle. Some minor forward or backward movement of the PCI adapter cassette might be necessary.

9. Carfully lift the handle all the way up until you hear and feel a click. The PCI adapter is pushed into the PCI adapter slot when the handle is raised.

PCI Adapter or Blank Filler Removal from a Cassette Assembly

Use this procedure when you are preparing to install or replace an adapter or an adapter blank filler in the system unit or an I/O drawer.

Note: An adapter or an adapter blank filler must be installed into the PCI adapter cassette assembly before it is reinstalled in a system unit or an I/O drawer.

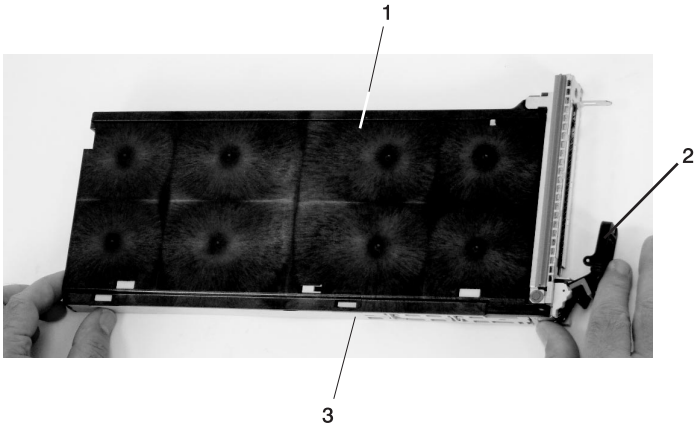
Determine the slot of the system or I/O drawer in which you plan to install or remove an adapter, and refer to the procedures for removing an adapter from the system. Remove the PCI adapter cassette assembly from the system unit or I/O drawer before beginning this procedure.

Note: It may take approximately 30 to 40 minutes to perform this procedure the first time. This time includes using the instructions in this guide and performing the steps. Thereafter, performing this procedure usually takes approximately 10 minutes.

Before performing the following steps, familiarize yourself with the entire procedure.

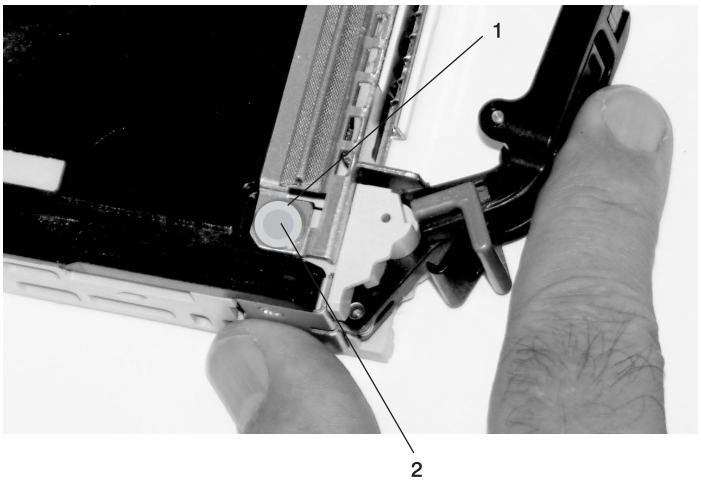
To remove a PCI adapter or blank filler from a cassette assembly, do the following:

1. Place the PCI adapter cassette assembly on a flat work surface with the cover facing up, and the top of the adapter facing you. See the following illustration.



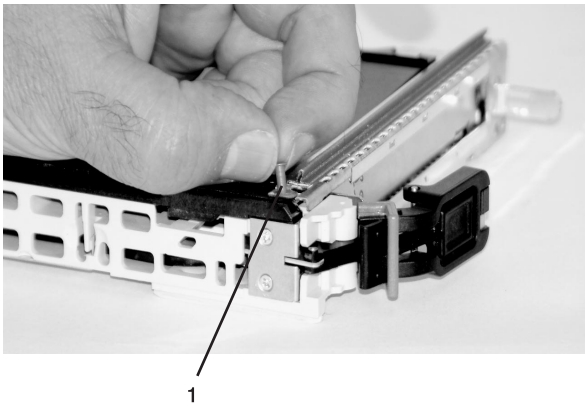
1 Cover
2 Handle
3 Top of Cover

2. Using two fingers, remove the bushing-lock pin from the bushing. The pin can be removed by pulling it out of the bushing with your fingernails.



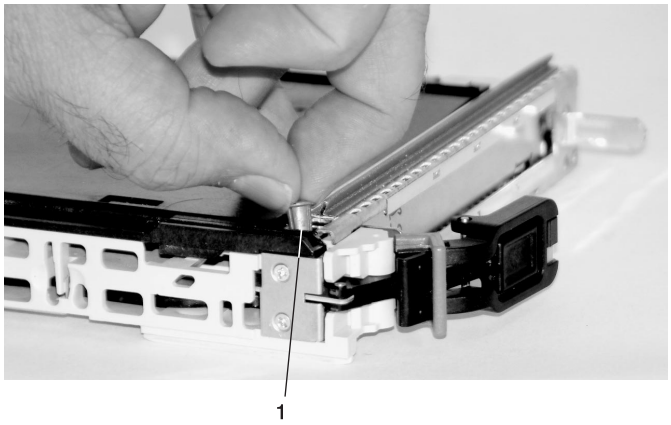
1 Bushing

2 Bushing-Lock Pin



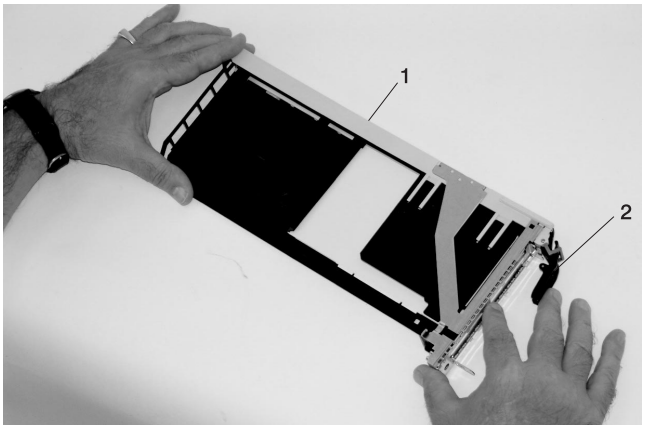
1 Bushing-Lock Pin

3. Remove the bushing. The bushing can be removed by pulling it out of the PCI adapter cassette assembly with your fingernails.



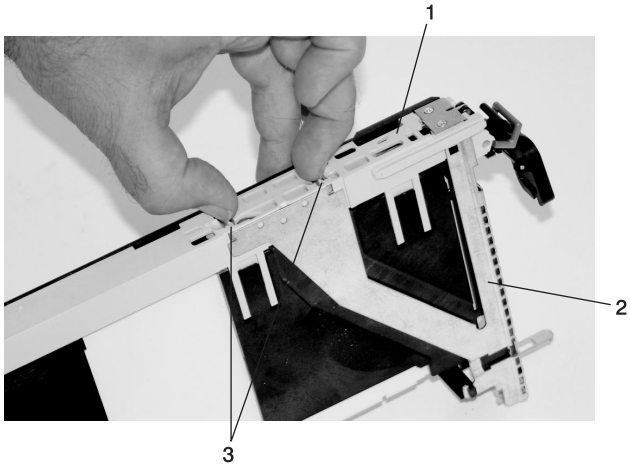
1 Bushing

4. Turn over the PCI adapter cassette assembly so that the top is facing away from you.



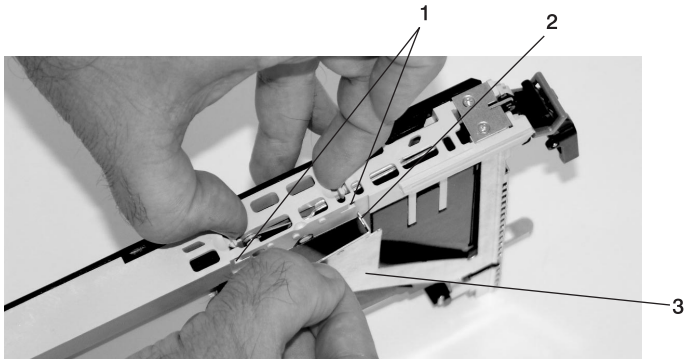
1 Top of Adapter
2 Handle

5. Remove the bezel, as follows:
   a. Locate the plastic latch fingers in the top part of the cassette.



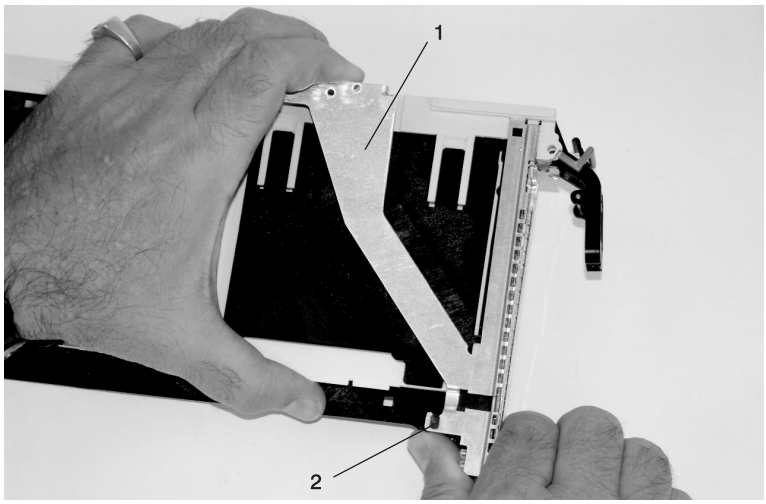
1 Top of Cassette
2 Bezel
3 Plastic Latch Fingers

   b. Using one hand, pinch the plastic latch fingers, and with your other hand, carefully lift the top part of the bezel extension out until the tabs clear the slots in the PCI adapter cassette assembly.



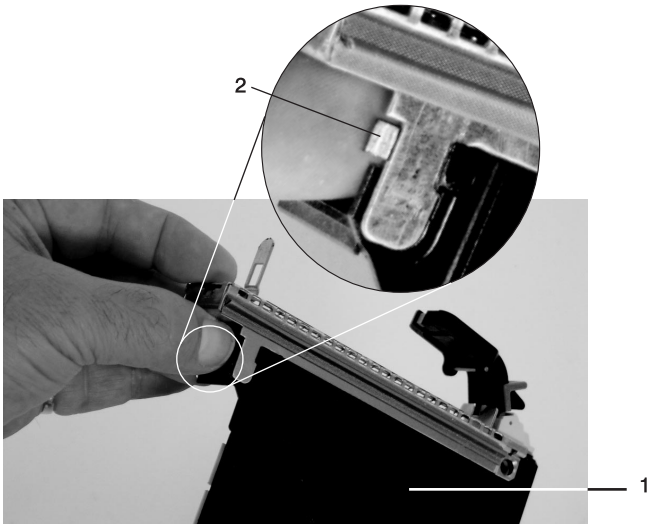
1 Slots
2 Tab
3 Bezel Extension

c. While holding the bezel extension out, push the plastic cover latch out of the bezel hook, as shown in the following illustration. This action allows the bezel to be removed.



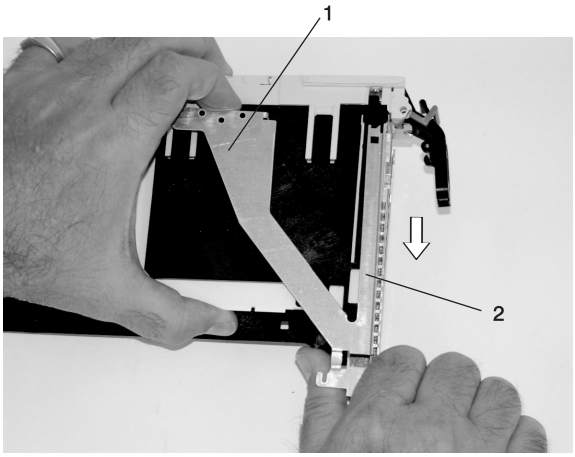
1 Bezel Extension
2 Plastic Cover Latch in Bezel Hook

d. On the opposite side of the cassette (cover side), push the cover latch to release the bezel.

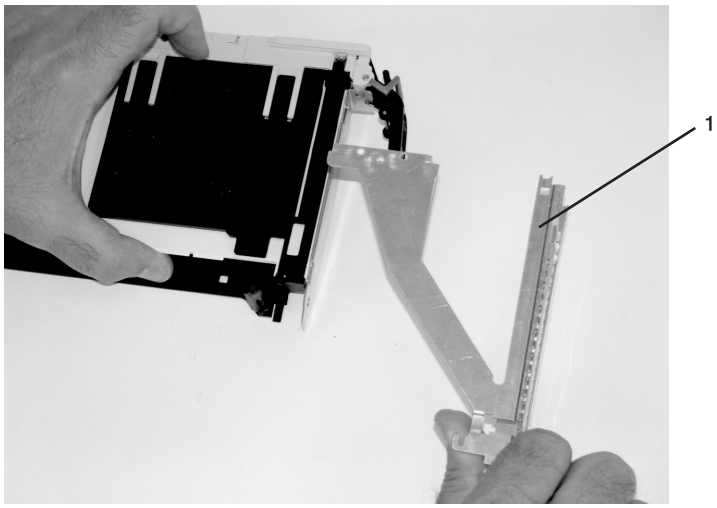


1 Cover Side
2 Cover Latch

e. While holding the bezel extension out, carefully slide the bezel off. You might have to work from both sides to loosen the bezel assembly from the cassette assembly. When the bezel is free, slide it completely off the cassette assembly, and set it aside.



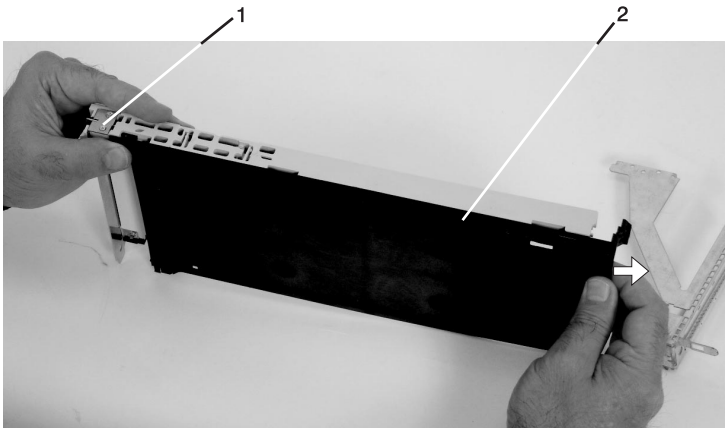
1 Bezel Extension
2 Bezel



1 Bezel

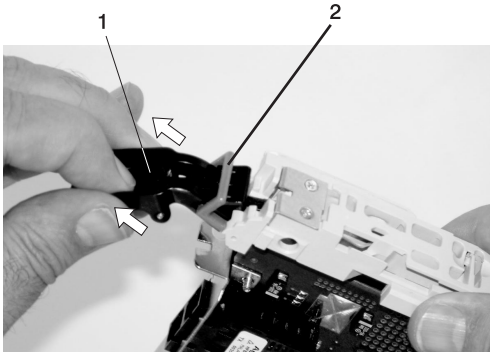
6. Turn over the cassette so that the cover is facing up, as shown in the following illustration. Remove the cover from the cassette as follows:
   a. Slide the cover until it releases from the cassette assembly.

      Attention: The cover might be tight and difficult to slide. If you grasp the left end (handle end) of the cassette and the right end of the cover, you can use enough force to pull the cover off the PCI adapter cassette assembly.



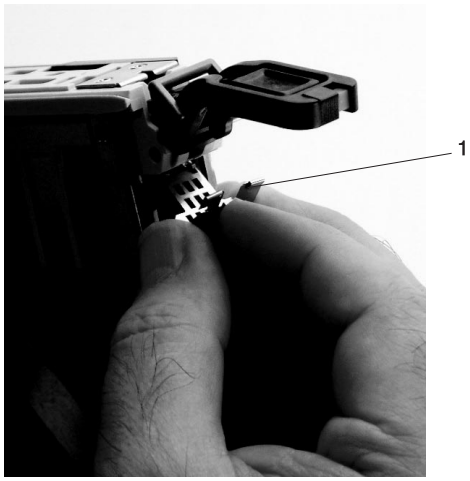
1 Left End of the Cassette
2 Cassette Cover

   b. Lift the cover off the assembly, and set it aside.
   c. By pulling on both sides of the gray plastic locking bar, which is located on the handle, ensure that the handle is pulled into the unlocked position. Raise the handle on the cassette linkage assembly until it locks into the up position (the blank filler or adapter moves downward).



1 Handle
2 Gray Plastic Locking Bar

7. Remove the metal EMC shield from the top of the tailstock.



1 Metal EMC Shield

8. Remove the blank filler or adapter that is installed in the cassette linkage assembly.

   Note: If there is a blank filler in the cassette linkage assembly, as shipped from the manufacturer, there are two adapter arms. One adapter arm is used with short adapters (short adapter arm) and the other adapter arm is used with long adapters (long adapter arm).

   If you are removing a short adapter or blank filler, see “Short Adapter or Blank Filler Removal” on page 67.

   If you are removing a long adapter, see “Long Adapter Removal” on page 69.

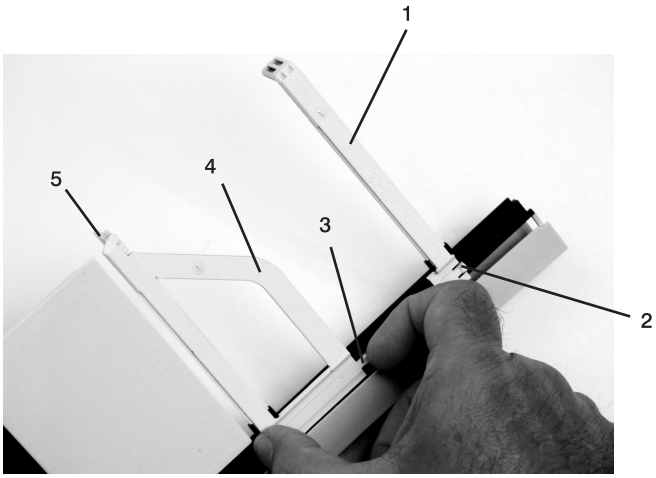
Short Adapter or Blank Filler Removal

To remove a short adapter or blank filler, do the following:

1. Slide the long and short adapter arms away from the adapter or blank filler by doing the following:
   a. Each adapter arm has a release tab that allows the arm to be moved away from the adapter or blank filler in the cassette assembly. Use your fingernail to lift the tab, to allow each arm to be moved away from the adapter or blank filler. Lift the release tab on the short adapter arm, and push on the slotted tab to release the end of the blank filler.

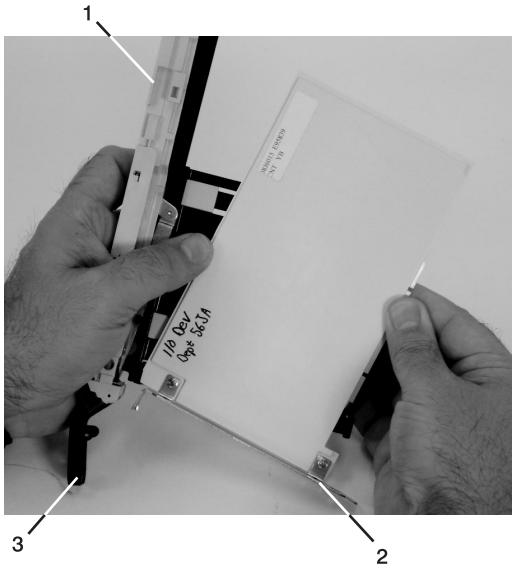
      Note: If you plan to install a short adapter, leave the long adapter arm on the cassette linkage assembly. If you plan to install a long adapter, remove both the long and short adapter arms from the cassette linkage assembly in the next step.

   b. Slide the long and short adapter arms away from the blank filler or adapter.



1 Long Adapter Arm
2 Release Tab
3 Release Tab
4 Short Adapter Arm
5 Slotted Tab

2. Remove the adapter or blank filler from the cassette linkage assembly by rotating the bottom of the tailstock out, as shown in the following illustration. Store the adapter or blank filler in a safe place.



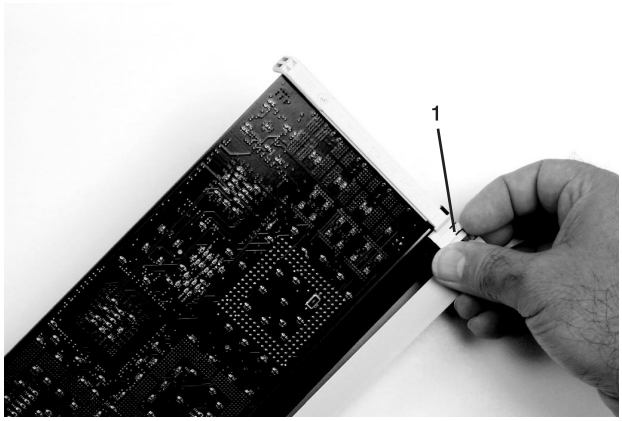
1 Cassette Linkage Assembly
2 Bottom of Tailstock
3 Handle

3. The removal procedure for the PCI adapter cassette assembly is complete. To install a new adapter or blank filler in the cassette, go to “Installing a Hot-Pluggable PCI Adapter” on page 51.

Long Adapter Removal

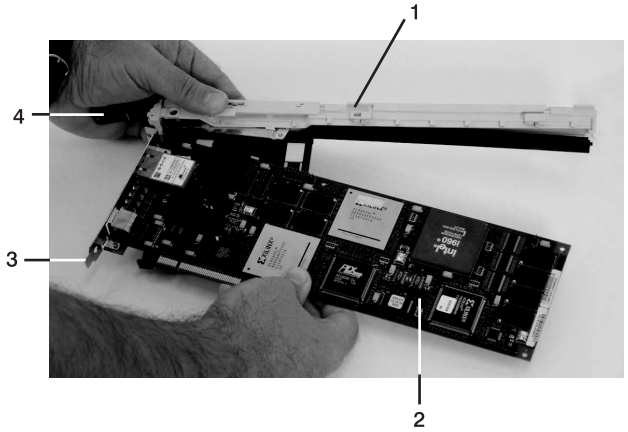
To remove a long adapter, do the following:

1. Each adapter arm has a release tab that allows the arm to be moved away from the adapter in the cassette assembly. Use your fingernail to lift the tab, to allow the arm to be moved away from the adapter. Lift the release tab on the long adapter arm, and slide it off the cassette linkage assembly.



1 Release Tab

2. Remove the adapter from the cassette linkage assembly by rotating the bottom of the tailstock out, as shown in the following illustration. Store the adapter in a safe place.



1 Cassette Linkage Assembly
2 Adapter
3 Bottom of Tailstock
4 Handle

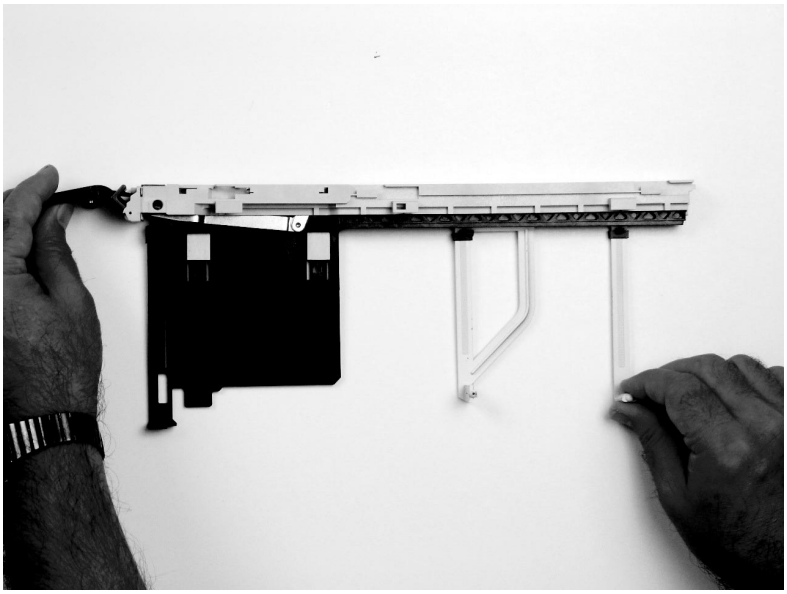
3. The removal procedure for the PCI adapter cassette assembly is complete. To install a new adapter or blank filler in the cassette, go to “Installing a Hot-Pluggable PCI Adapter” on page 51.

Replacing an Adapter in a PCI Adapter Cassette

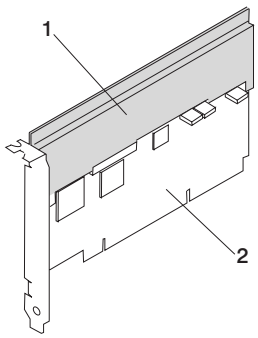
This procedure is performed when preparing to install a new adapter or a blank filler in the processor subsystem or an I/O drawer. Familiarize yourself with the entire procedure before performing the following steps.

1. Place the empty PCI adapter cassette linkage on a flat work surface in front of you. Position the cassette so that the handle is in the raised (up position), and on the left, with the top of the linkage facing away from you.

   Note: Your PCI adapter cassette linkage might not have the short or long adapter retaining arms installed if you removed them during the remove procedure. In the following figure, both arms are shown.

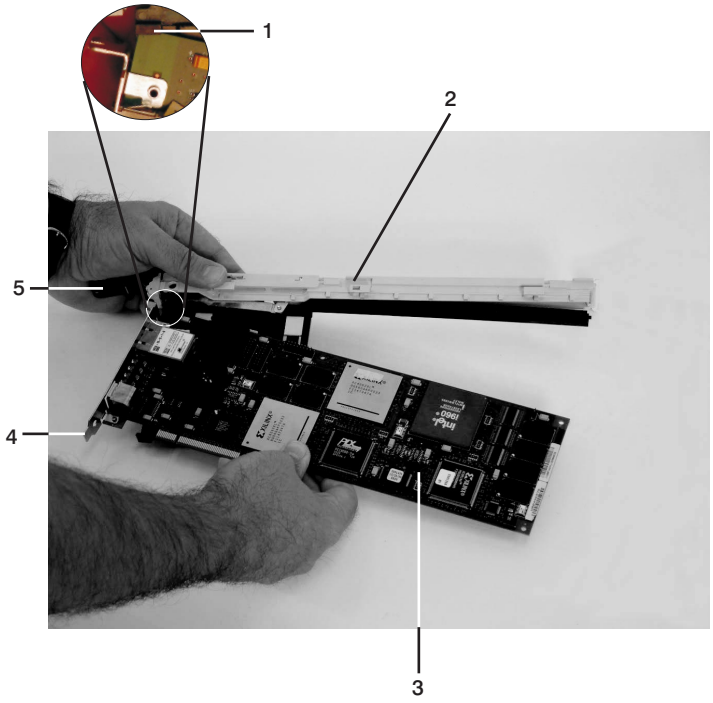


Note: If you are installing an adapter that is in the following list, use the additional brackets listed to help when you seat the adapter during installation. There are unique brackets **(1)** for each adapter type **(2)**:



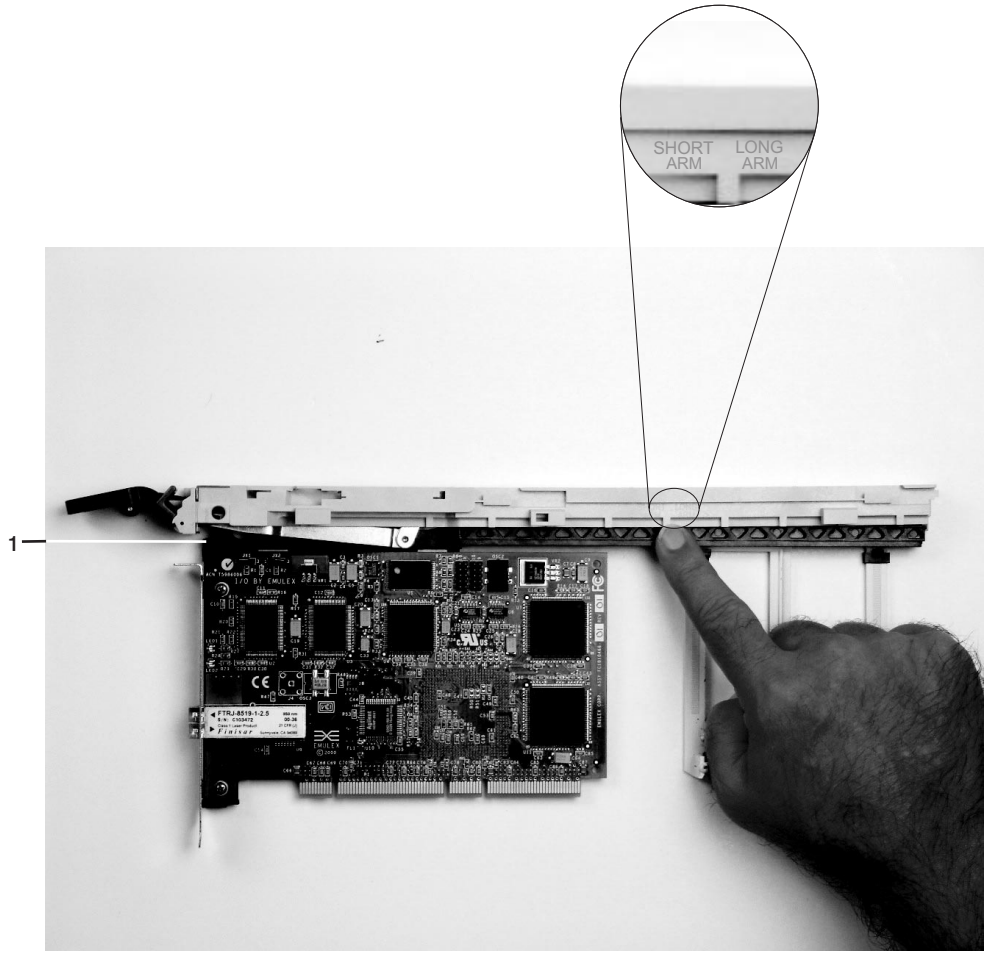
53P5450	Bracket for Gigabit Ethernet PCI-X Adapter, FC 5700 or 10/100/1000 Base-TX Ethernet PCI-X Adapter, FC 5701
44P2661	Bracket for Dual Channel Ultra3 SCSI PCI Adapter, FC 6203 Type 4Y
44P0321	Bracket for 10/100 BaseT Ethernet PCI Adapter, FC 4962 Type AF
44P2675	Bracket for 2 Gigabit Fibre Channel Adapter, FC 6228 Type 4W
44P2676	Bracket for Gigabit Ethernet - SX PCI Adapter, FC 2969 Type 9U, or 10/100/1000 Base-T Ethernet PCI Adapter, FC 2975 Type A-A

2. Use the following procedure to determine if you are installing a long adapter or a short adapter. If you know the length of your adapter, skip the following steps and proceed to step 3 on page 73.
   a. Remove the adapter from its protective packaging and, if present, remove the plastic extension handle from the end of the adapter.
   b. Place the adapter or a blank filler over the cassette with the upper left corner aligned into the top adapter-retaining clip.



1 Top Adapter-Retaining Clip
2 Cassette Linkage Assembly
3 Adapter
4 Bottom of Tailstock
5 Handle

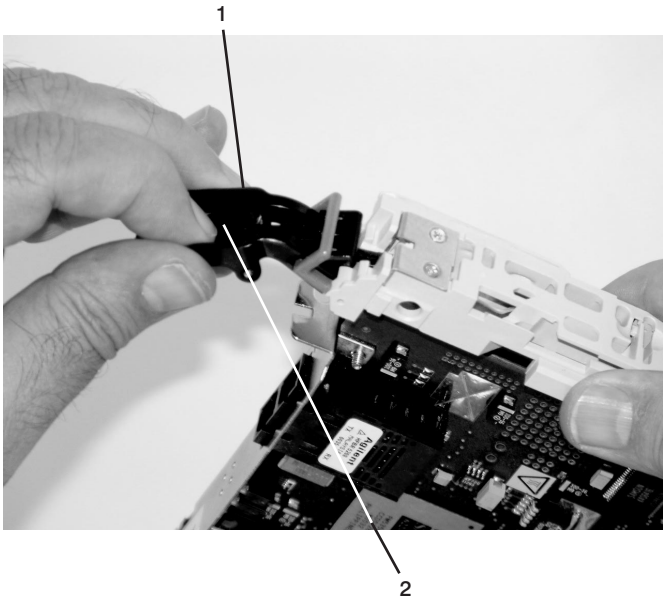
c. The cassette linkage is marked to show long or short adapters similar to the adapter shown in the following figure. Check the right end of the adapter to determine if it is long enough to fall into the long area of the cassette linkage. Ensure that the corner on the left end of the adapter is still aligned into the top adapter-retaining clip and determine the length of the adapter.



1 Top Adapter-Retaining Clip

3. Remove the adapter or blank filler and ensure that the handle is in the up position. If you need to move the handle, ensure that the gray locking bar is pulled into the unlocked position, and then rotate the adapter handle until the handle is in the up position (the cassette linkage will extend down beyond the cassette top).

   If you are installing a short adapter or blank filler, proceed to “Short Adapter or Blank Filler Installation” on page 74. If you are installing a long adapter, proceed to “Long Adapter Installation” on page 89.

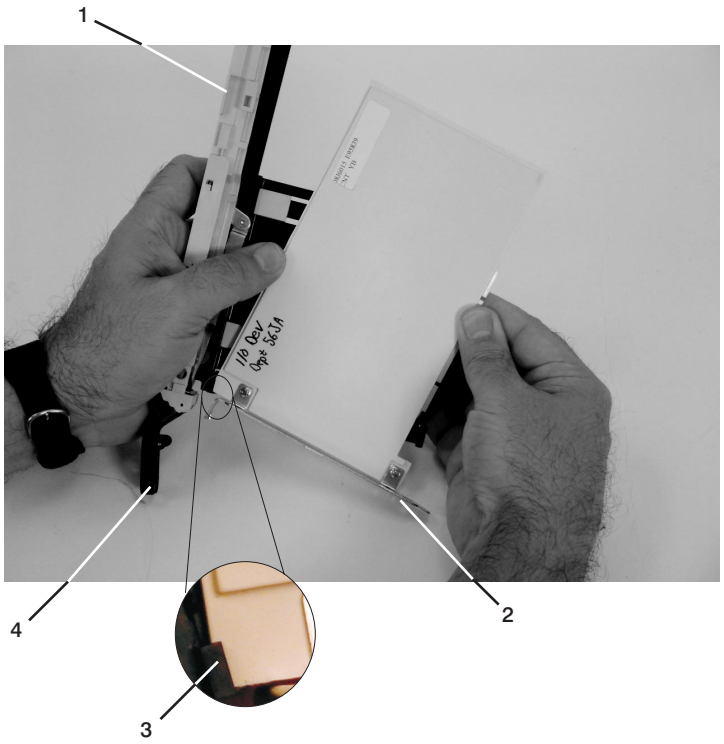


1 Handle
2 Lock

Short Adapter or Blank Filler Installation

Use the following procedure to install a short adapter or blank filler.

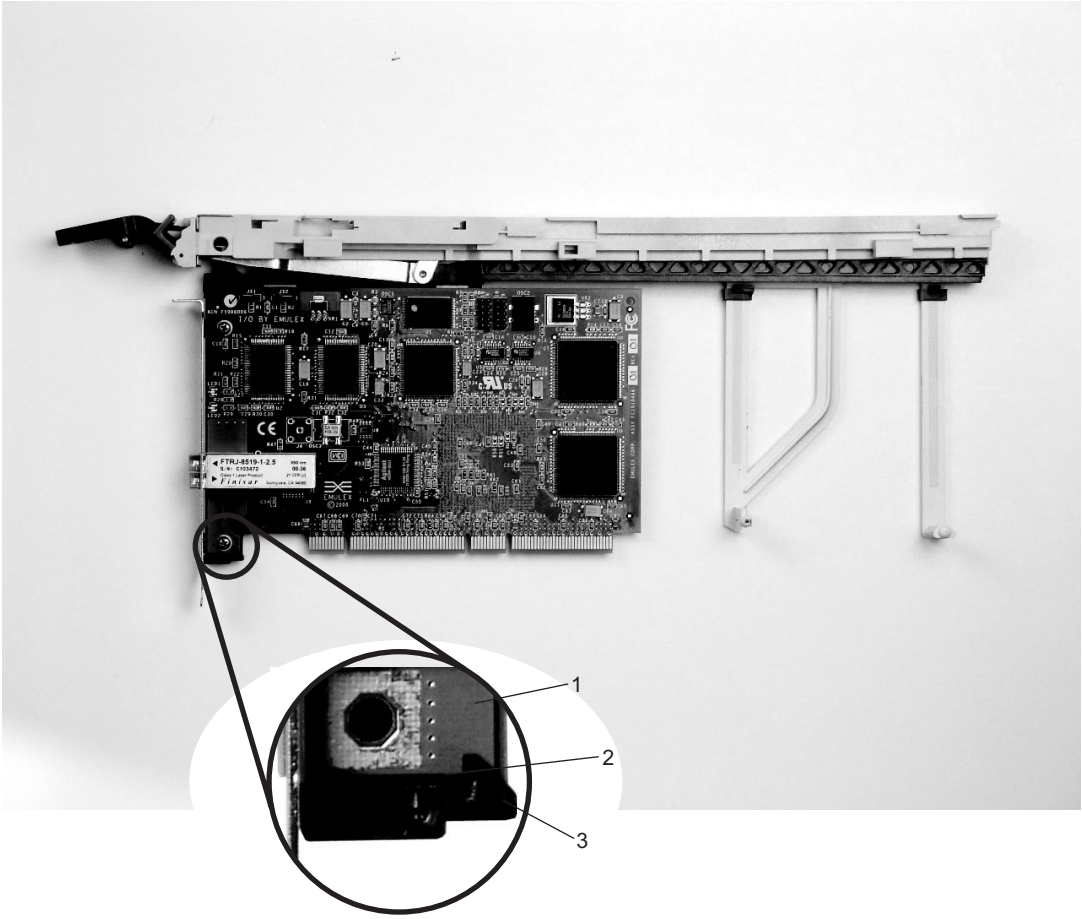
1. Install the adapter or blank filler by doing the following:
   a. Place the adapter or blank filler into the cassette so that the upper-left corner of the adapter engages the adjustable top adapter-retaining clip as shown in the following figure.



1 Cassette Linkage Assembly
2 Bottom of Tailstock
3 Retaining Clip
4 Handle

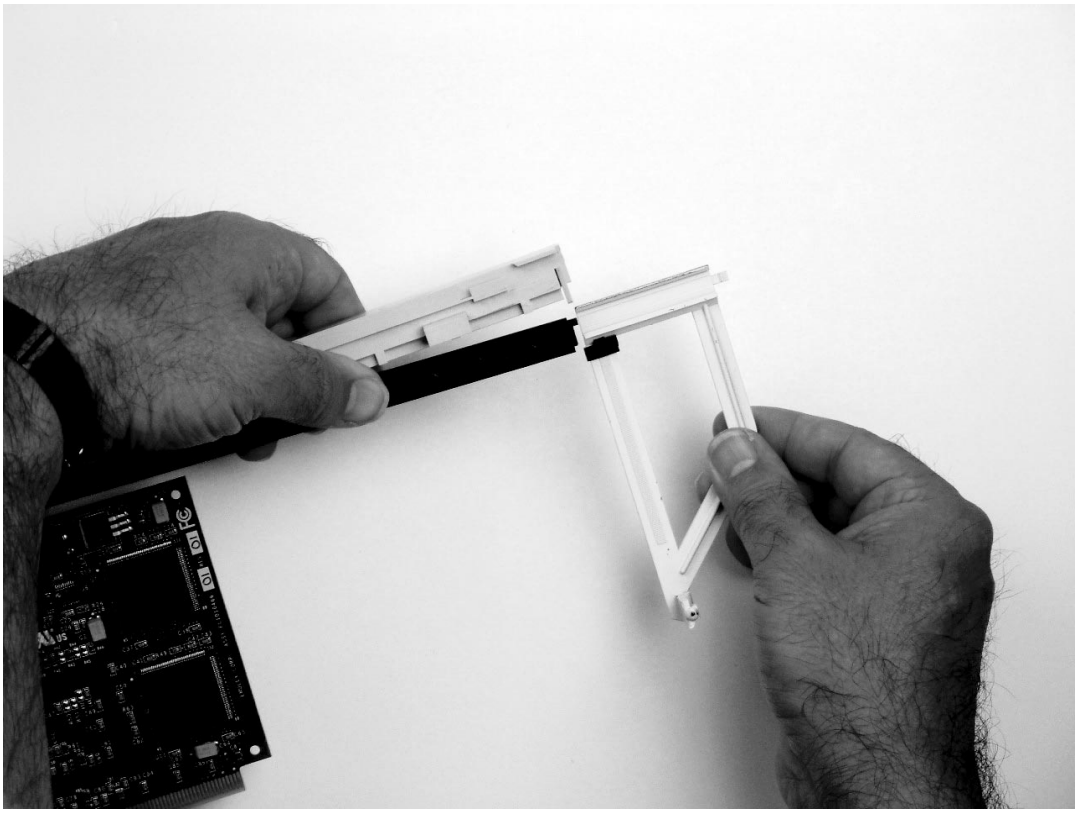
b. Rotate the adapter so that the adapter engages the slot in the bottom adapter-retaining clip and the top corner of the adapter is seated into the adjustable top adapter-retaining clip.

Note: If the adapter is not a full-height adapter, you must slide the adjustable top adapter-retaining clip downward until the lower edge of the adapter is seated into the slot on the bottom adapter-retaining clip.

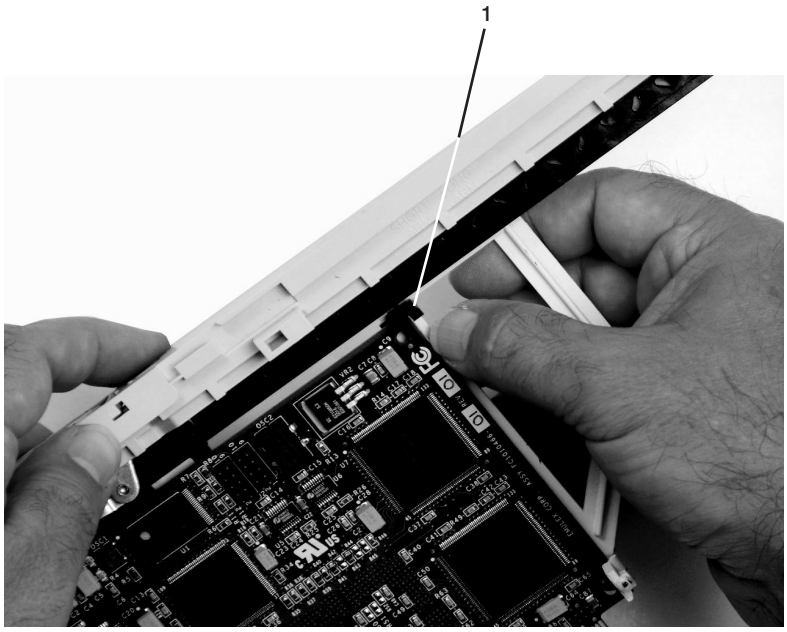


1 Adapter
2 Slot
3 Bottom Retaining Clip

c. Slide the short-adapter retaining arm toward the adapter or blank filler on the cassette linkage rail.
   1) If the short-adapter retaining arm has been removed from the cassette linkage rail, install the short-adapter retaining arm and then slide the arm until it contacts the adapter or blank filler as shown in the following figure.



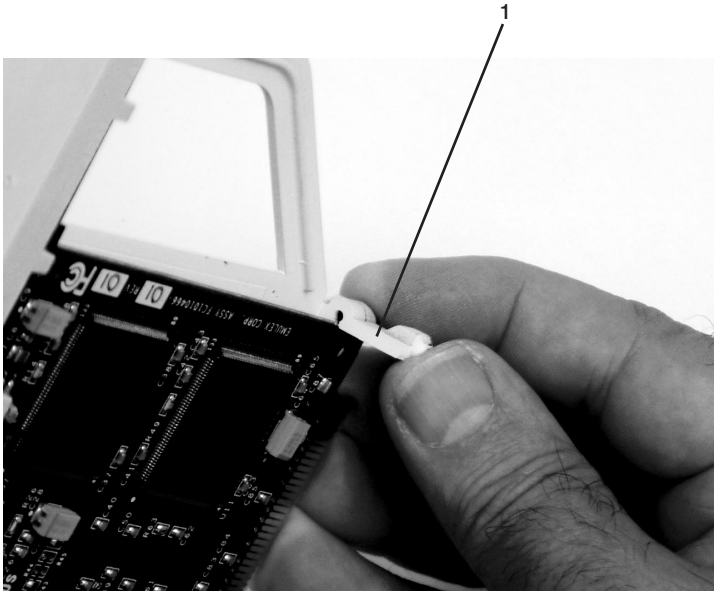
d. Ensure that the adjustable top retainer clip catches the corner of the adapter as shown in the following figure:



1 Short Adapter Top Retaining Clip

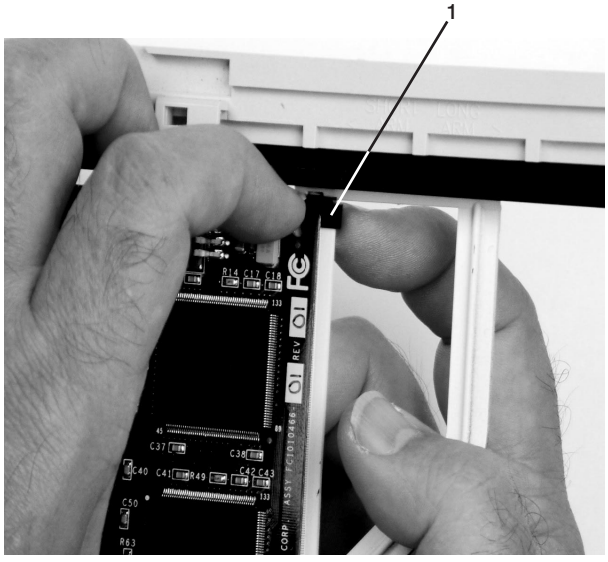
e. Use the lower short adapter-retaining clip to engage and hold the bottom of the adapter.

Note: It might be necessary to apply pressure to engage and hold the bottom of the adapter.



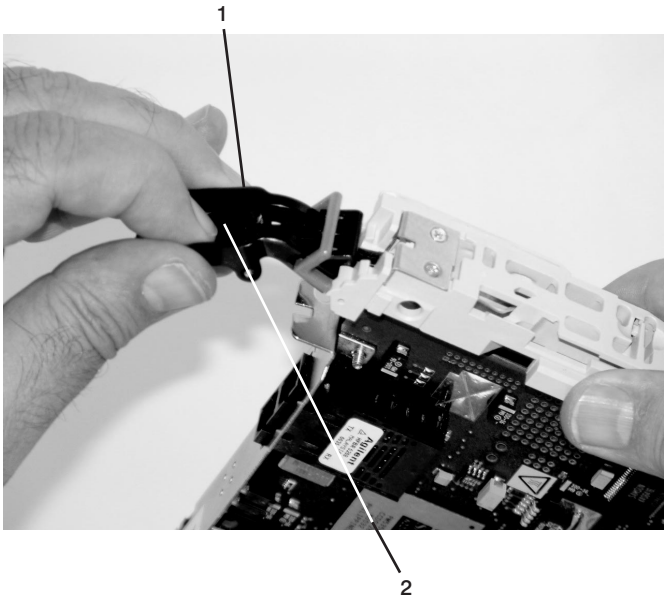
1 Lower Short Adapter Arm Clip

f. To hold the top of the adapter, slide down the adjustable top adapter-retaining clip on the retaining arm. Ensure that the bottom edge of the adapter is held by the lower part of the adapter retaining arm.



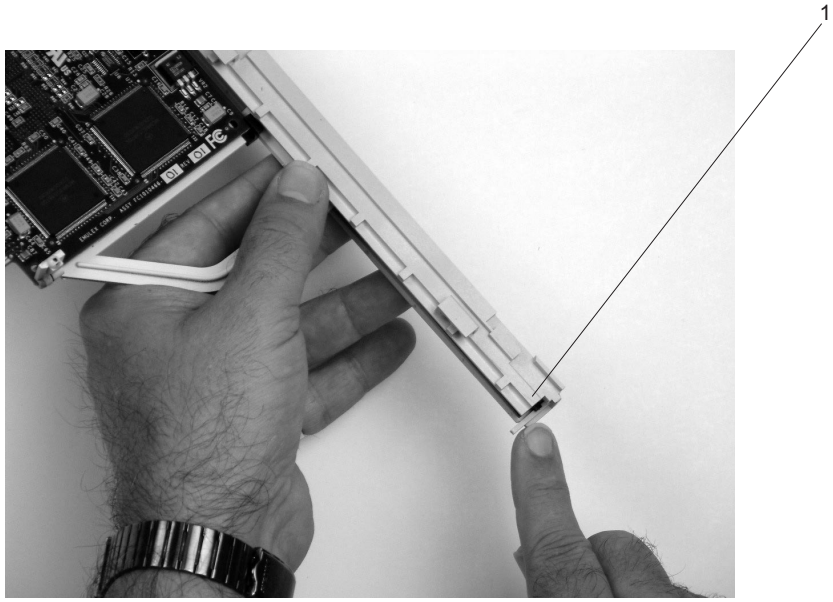
1 Short Adapter Adjustable Retaining Clip

g. Press the lock on the handle, and rotate the adapter handle until it is in the down position (adapter or blank filler moves up into the cassette assembly).



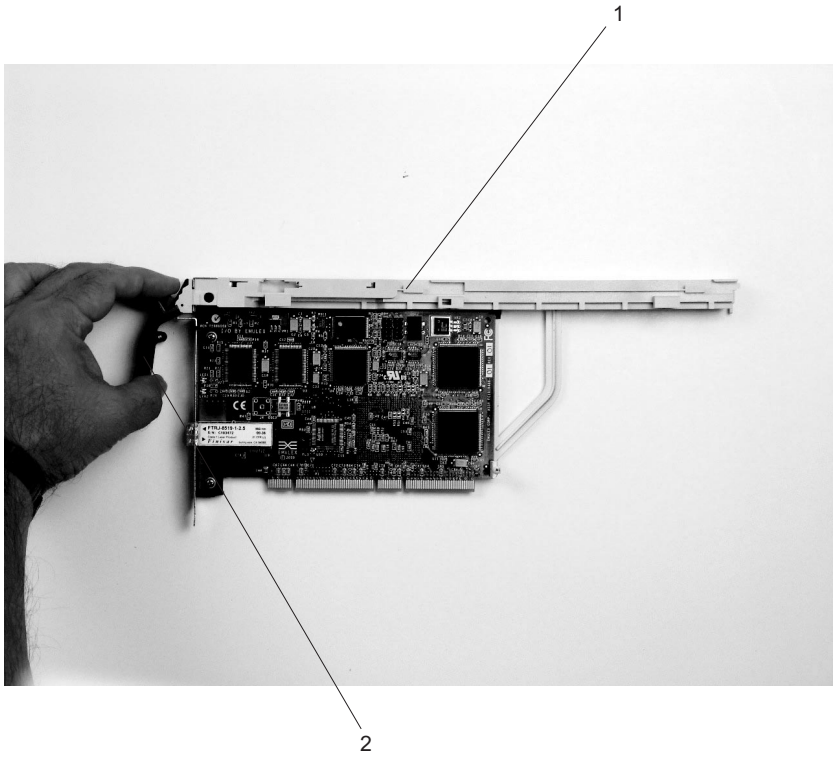
1 Handle
2 Lock

Ensure the right end of the cassette linkage rail moves up into the cassette linkage assembly as shown in the following figure:



1 Right End of Cassette Linkage

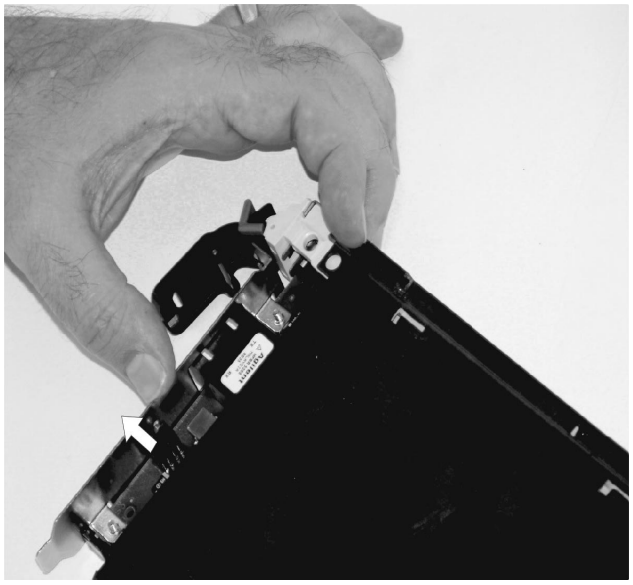
h. Position the adapter and cassette assembly with the handle on the left (in the down position) and the top facing away from you.

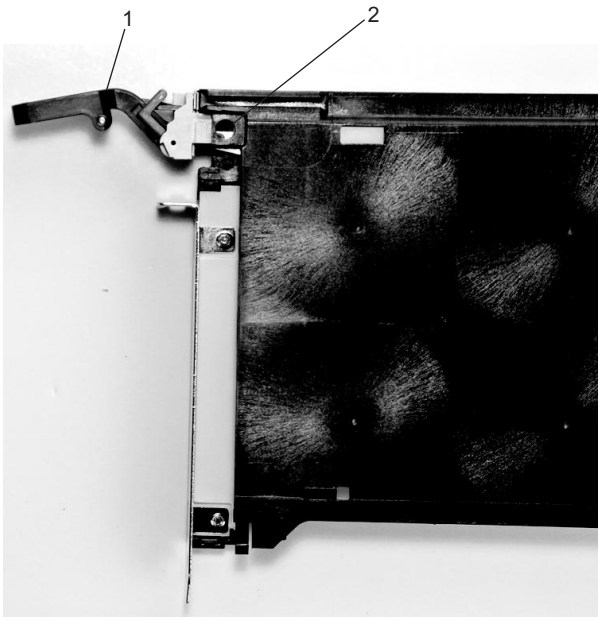


1 Top of Cassette
2 Handle

i. Install the cover on the cassette assembly:

1) Place the cassette cover on the cassette assembly as shown below. Slide the cover toward the handle until the hole in the cover aligns with the hole in the cassette assembly.

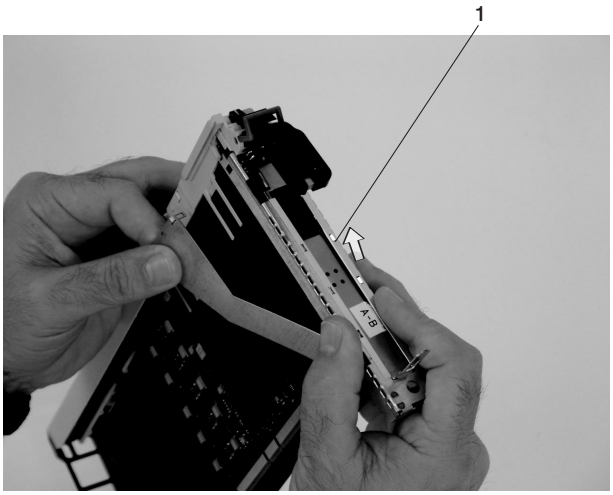




1 Handle
2 Holes Aligned

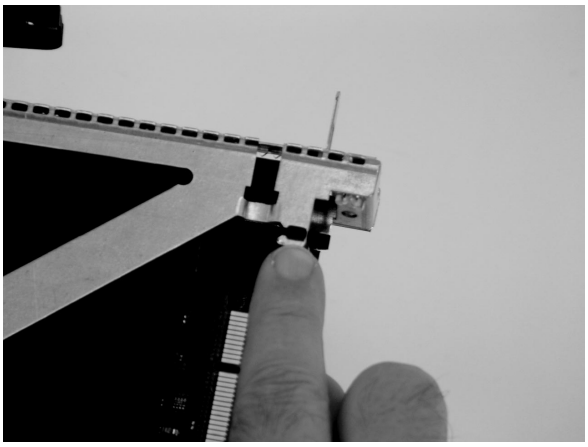
j. Install the bezel assembly using the following procedure.

1) Carefully slide the bezel onto the cassette assembly.

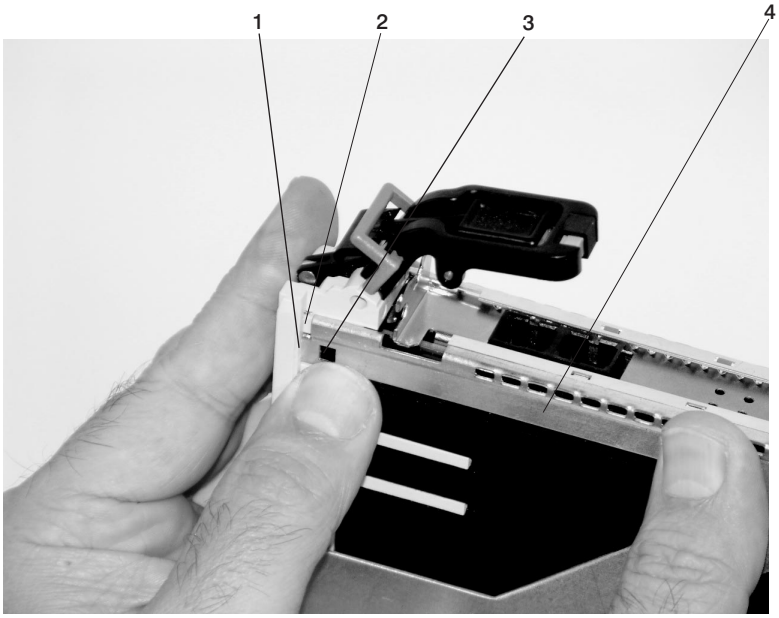


1 Bezel

2) Align and insert the cover arm latch in the hooked notch in the bezel.

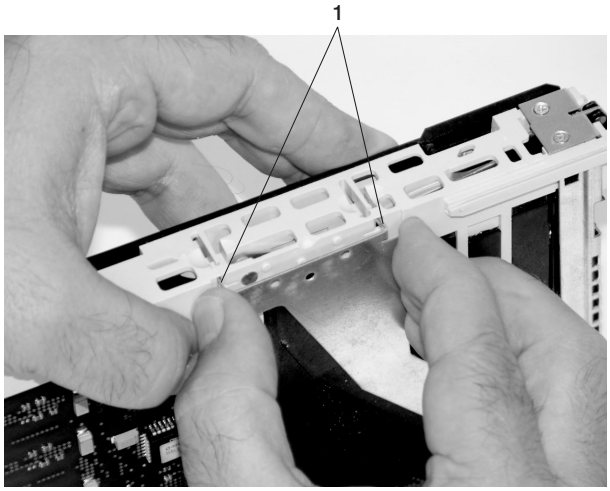


3) Align the top of the bezel assembly into the grooves on the top of the cassette assembly. Push the bezel onto the cassette linkage until the tab on the top of the bezel is seated in the recess of the cassette assembly.



1 Recess
2 Groove
3 Tab
4 Bezel Assembly

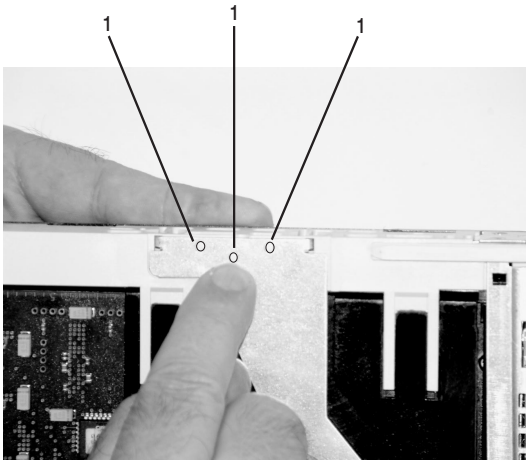
4) Insert the two tabs on the bezel extension into the two slots on the cassette assembly.



1 Tabs

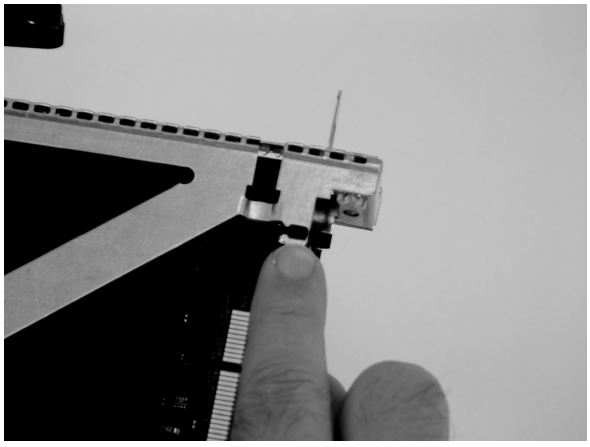
k. Check for the following:

1) Ensure that the extension arm engages the pins on the cassette. You should be able to see the three pins in the holes in the arm. The bezel tab should be seated as shown in the following figure.

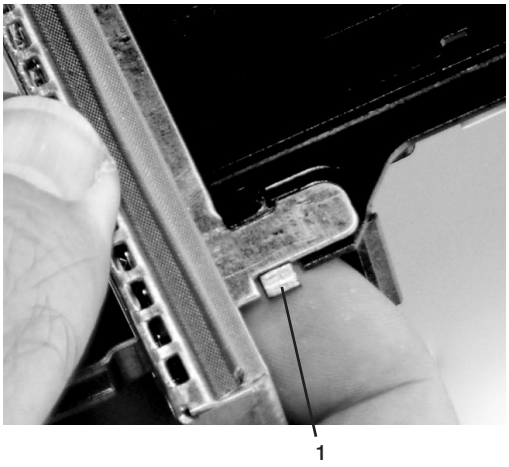


1 Pin

2) Ensure the cover arm latch is completely pressed into the hooked slot on the bezel as shown.

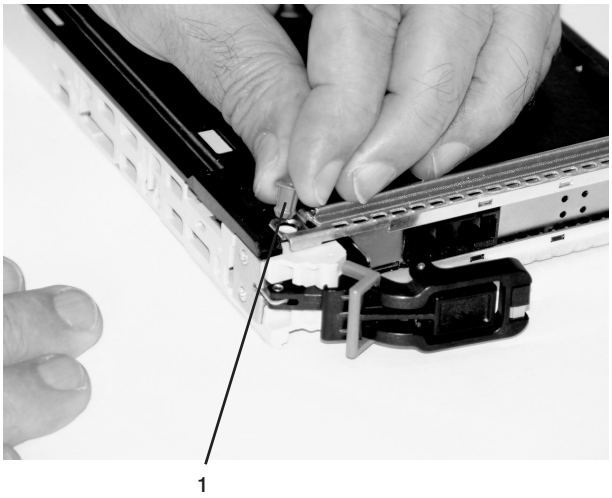


3) Turn the cassette assembly over so the cover is up. Check the cover latch to ensure it is holding the bezel to the cover as shown.



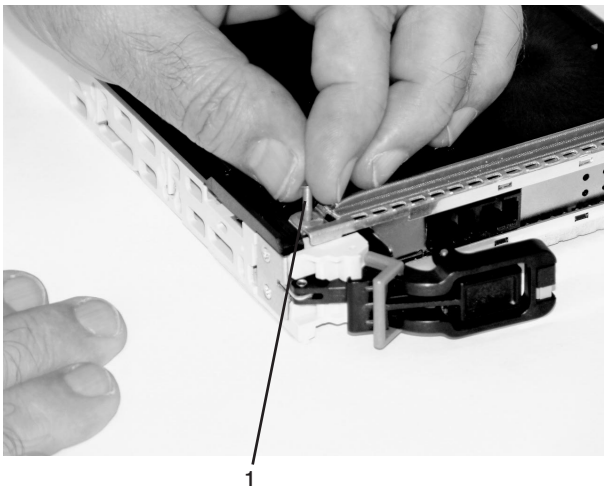
1 Cover Latch

l. Ensure the holes are aligned, and insert the bushing as shown.



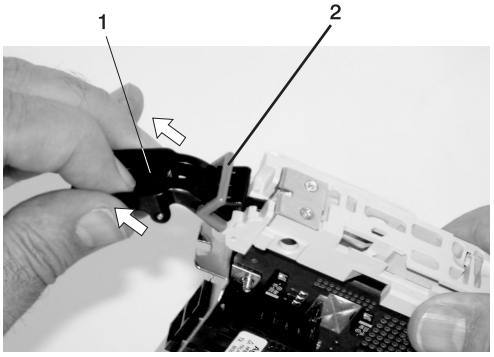
1 Bushing

m. Insert the bushing lock pin into the hole in the bushing and push it in until it seats.



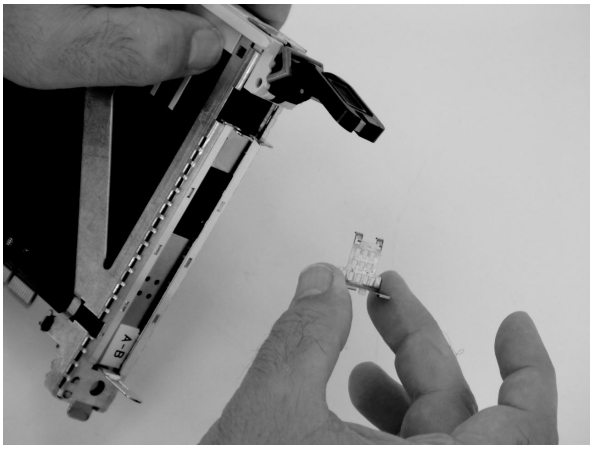
1 Bushing Lock Pin

n. By pulling on both sides, ensure the gray plastic locking bar on the handle is pulled into the unlocked position. Raise the handle on the cassette linkage until it locks into the up position (the blank filler or adapter moves downward).

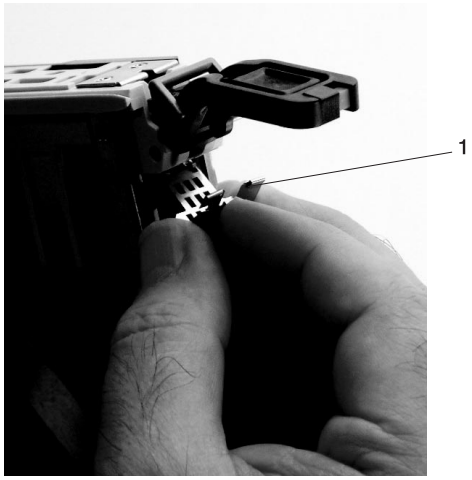


1 Handle
2 Gray Plastic Locking Bar

o. To install the metal EMC shield on the adapter bracket, do the following:

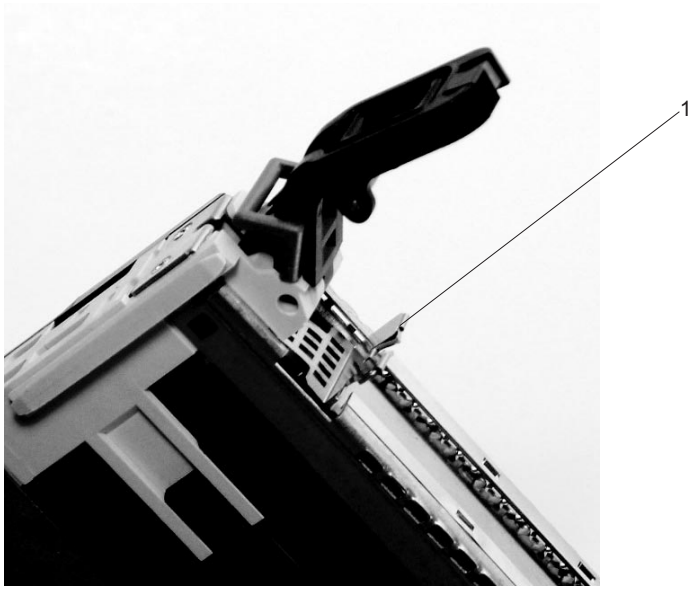


1) Ensure that the shield slides up inside the top of the cassette.



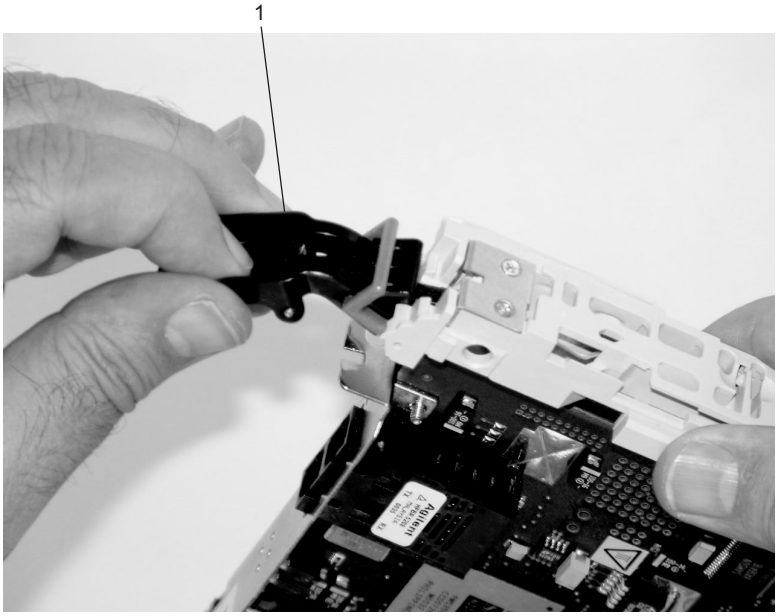
1 Metal EMC Shield

2) The metal shield has clips that slide over the top of the tailstock. Ensure that these clips are holding the EMC shield to the tailstock.



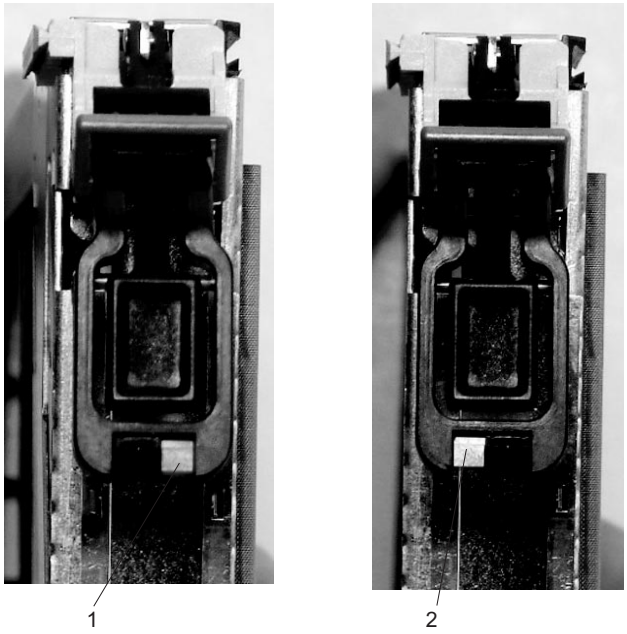
1 Top of Tailstock

p. Press the lock on the handle and rotate the adapter handle until the handle is in the down position (adapter or blank filler moves up into the cassette assembly).



1 Handle

q. Using the system documentation, determine if the adapter you are installing is hot-swappable. If the adapter is hot-swappable, move the slider on the color indicator to allow the orange to be visible. If the adapter is not hot-swappable, the blue color is visible.



1 Orange for Hot-Swappable **2** Blue for Not Hot-Swappable

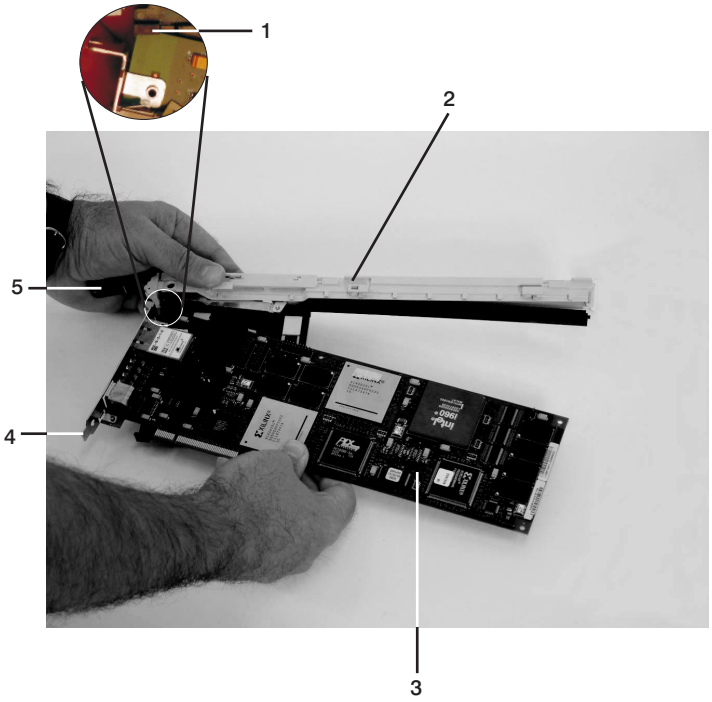
r. The adapter is ready to be installed into a system or an I/O drawer.

Long Adapter Installation

Use the following procedure to install a long adapter.

Note: Ensure that both the retaining arms for the long and short adapters are removed from the cassette linkage. Before continuing, see step 1a on page 67 to remove the arms.

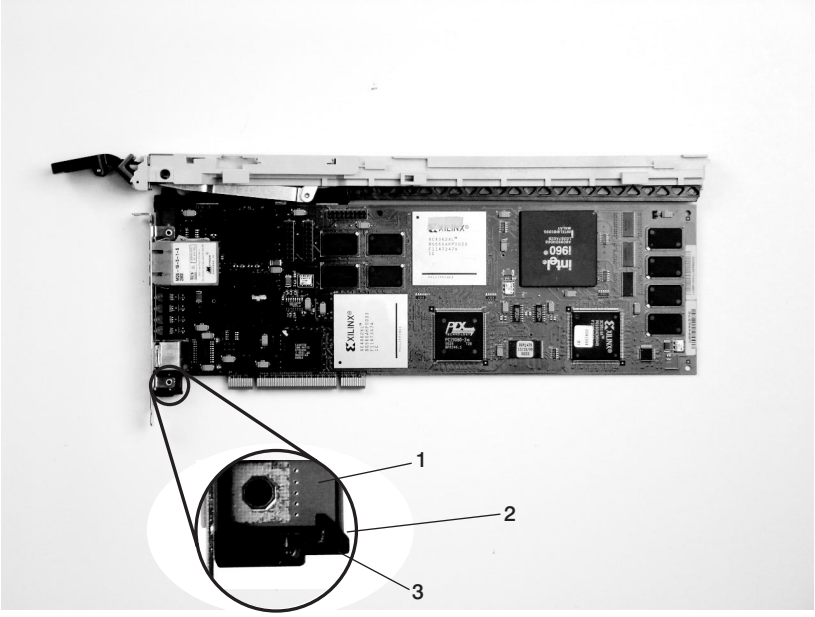
1. Install the long adapter by doing the following:
   a. Place the adapter into the cassette so that the upper left corner of the adapter engages the top adjustable adapter-retaining clip as shown in the following figure:



1 Top Adapter-Retaining Clip
2 Cassette Linkage Assembly
3 Adapter
4 Bottom of Tailstock
5 Handle

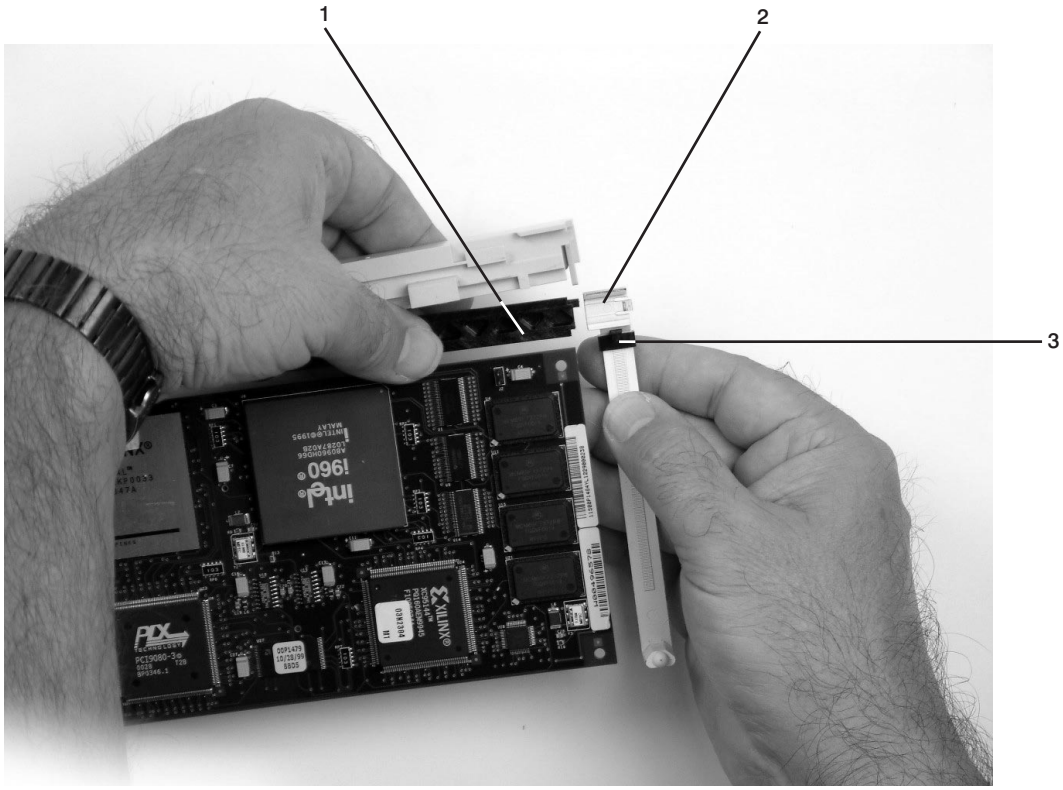
b. Rotate the adapter so that the adapter engages the slot in the bottom retaining clip and the top corner of the adapter is seated into the top adjustable adapter-retaining clip.

Note: If the adapter is not a full-height adapter, slide the top adjustable adapter-retaining clip downward until the lower edge of the adapter is seated into the slot on the bottom retaining clip.



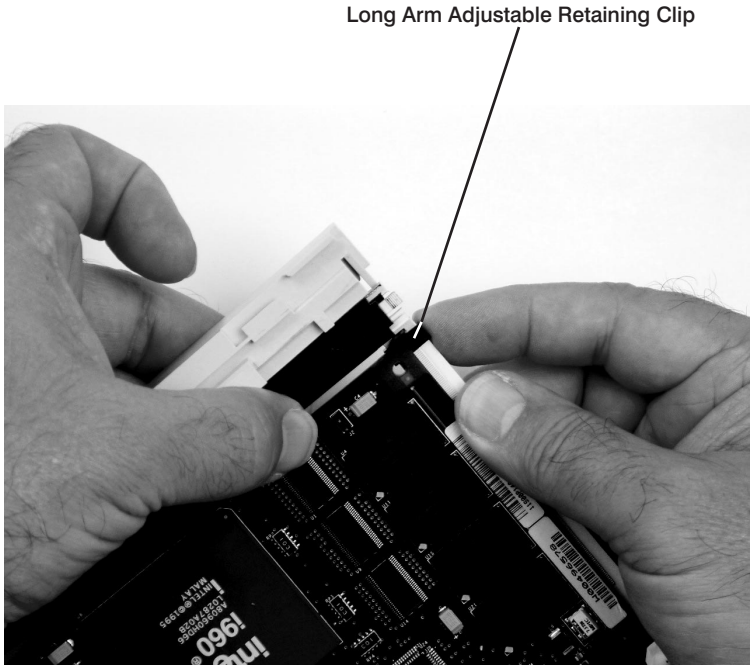
1 Adapter
2 Slot
3 Bottom Retaining Clip

c. Install the long adapter-retaining arm onto the cassette linkage rail, as shown in the following figure, and slide the arm toward the adapter.



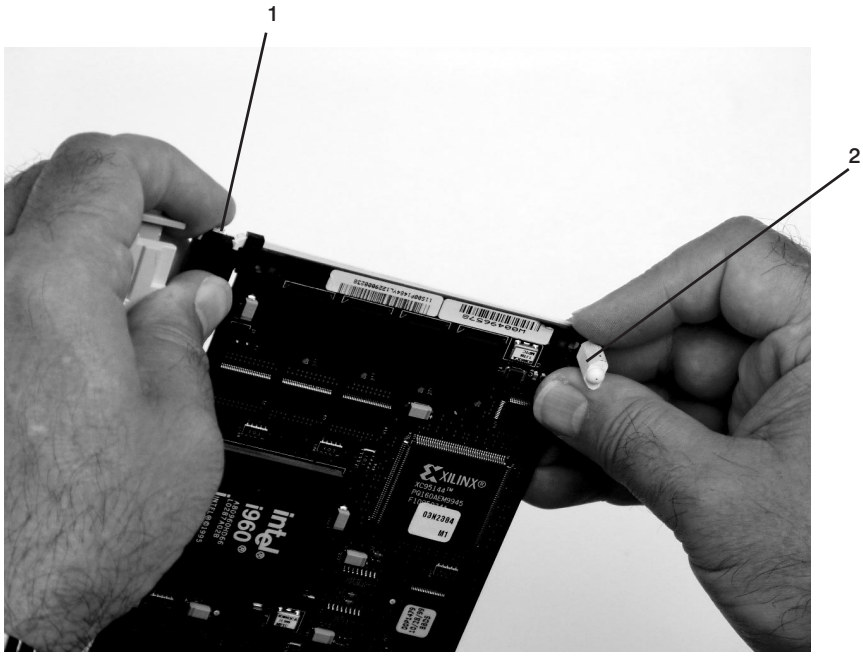
1 Cassette Linkage Assembly
2 Adapter Retaining Arm
3 Top Adapter Retaining Clip

d. Ensure that the top adjustable adapter-retaining clip catches the corner of the adapter as shown in the following figures.



1 Long Arm Adjustable Retaining Clip

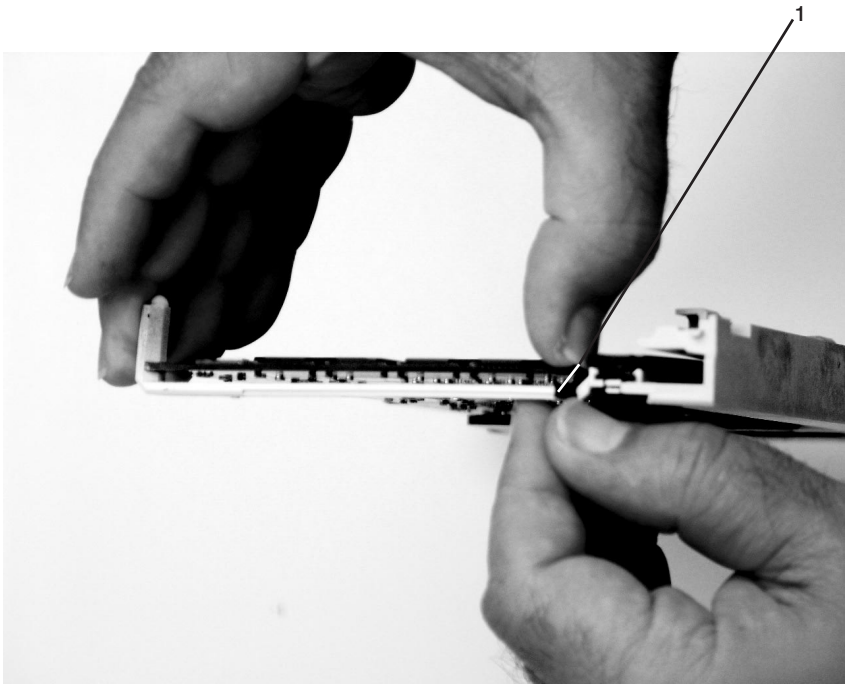
e. Ensure that the bottom edge of the adapter is held by the groove in the lower part of the adapter-retaining arm.



1 Long Adapter Arm Adjustable Retaining Clip

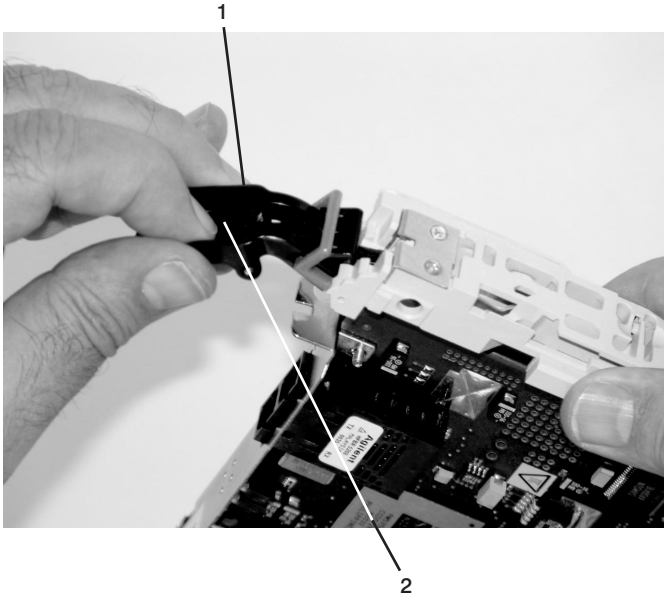
2 Long Adapter Retaining Arm Slot

f. To hold the top of the adapter, slide down the top adjustable adapter-retaining clip on the retaining arm.



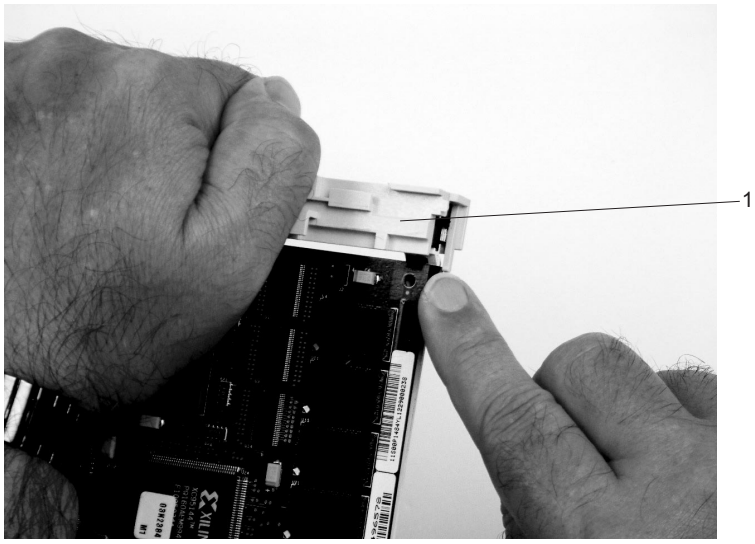
1 Long Adapter Retaining Arm

g. Press the lock on the handle and rotate the adapter handle until it is in the down position (adapter or blank filler moves up into the cassette assembly).



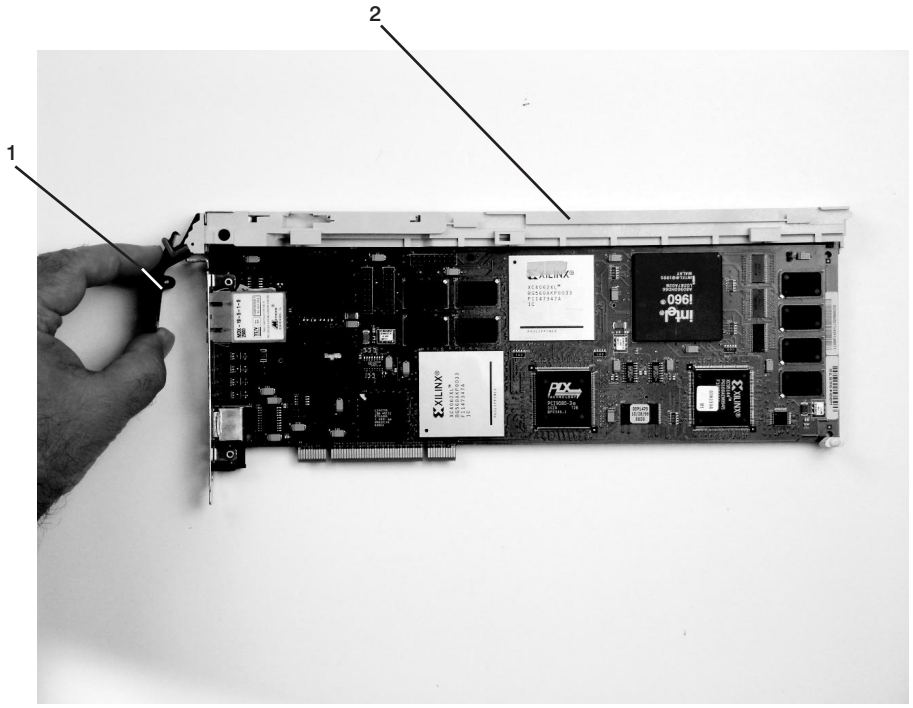
1 Handle
2 Lock

Ensure the right end of the cassette linkage rail moves up into the cassette linkage assembly as shown below:



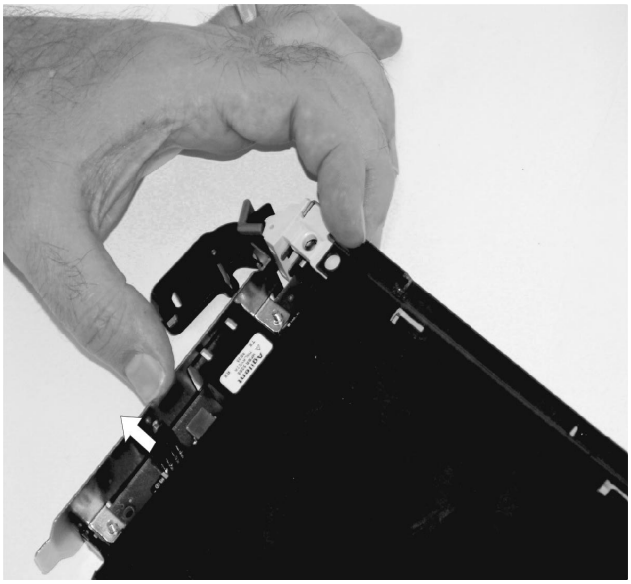
1 Right End of Cassette Linkage

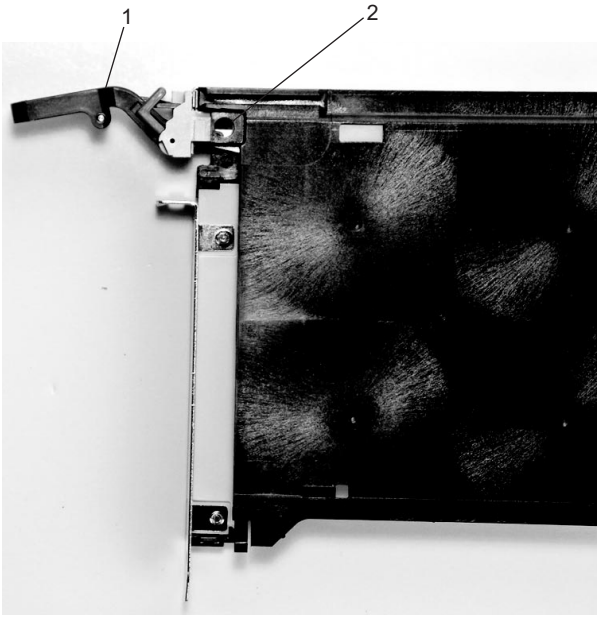
h. Position the adapter and cassette assembly with the handle on the left (in the down position) and the top facing away from you.



1 Handle
2 Top of Cassette

i. Install the cover on the cassette assembly by placing the cassette cover on the cassette assembly as shown below. Slide the cover toward the handle until the hole in the cover aligns with the hole in the cassette assembly.

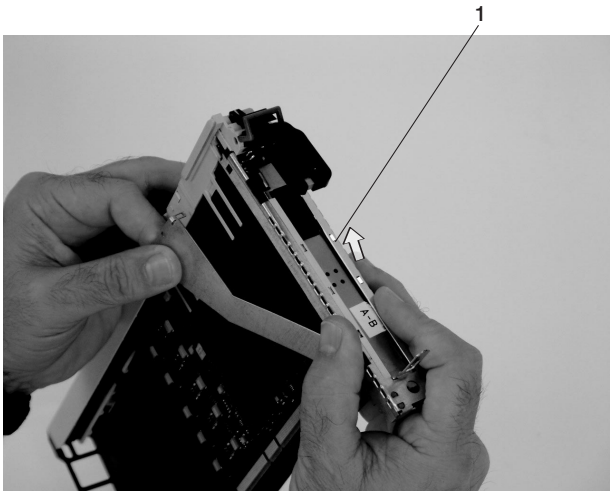




1 Top of Cassette
2 Handle

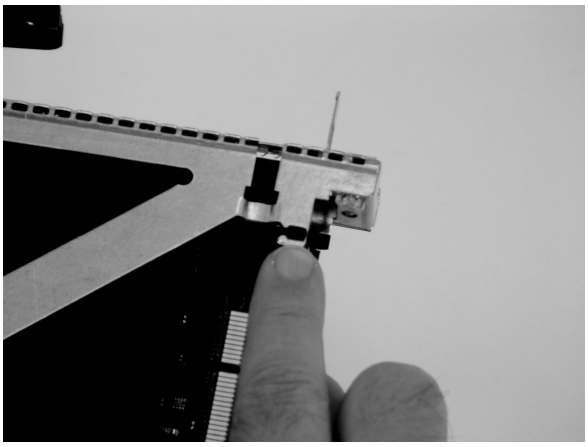
j. Install the bezel assembly using the following procedure:

1) Carefully slide the bezel onto the cassette assembly.

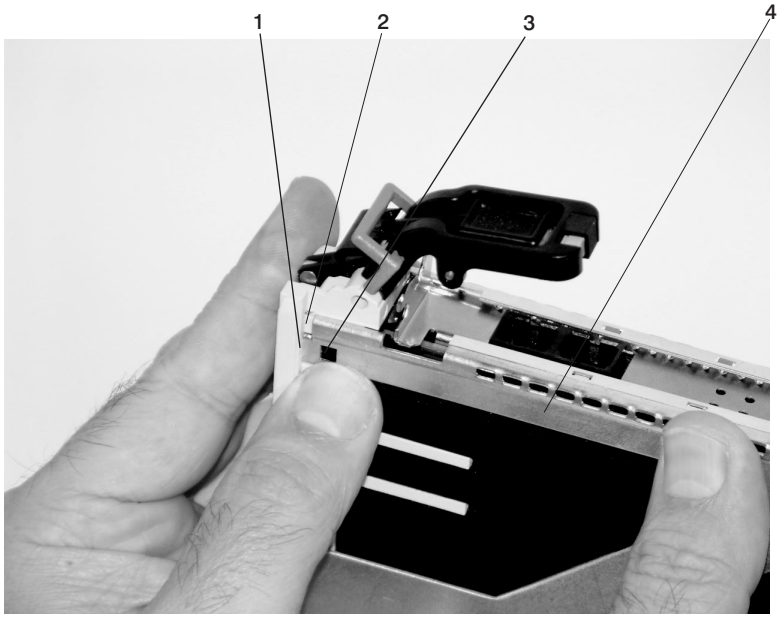


1 Bezel

2) Align and insert the cover arm latch in the hooked notch in the bezel.

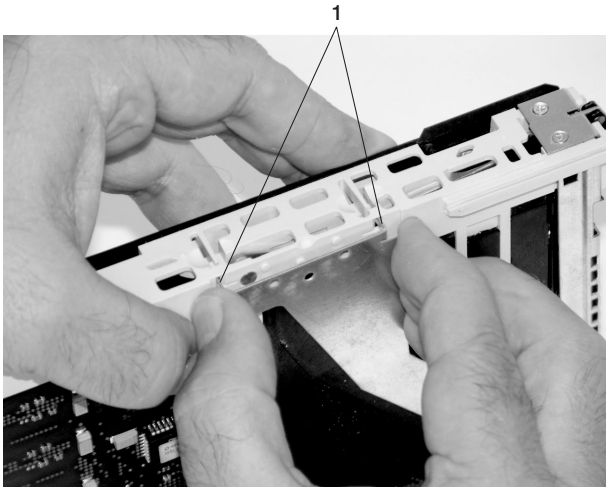


3) Align the top of the bezel assembly into the grooves on the top of the cassette assembly and then push the bezel onto the cassette linkage until the tab on the top of the bezel is seated in the recess of the cassette assembly.



1 Recess
2 Groove
3 Tab
4 Bezel

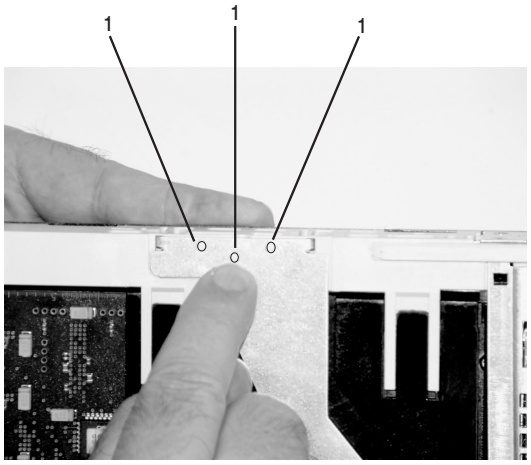
4) Insert the two tabs on the bezel extension into the two slots on the cassette assembly.



1 Tabs

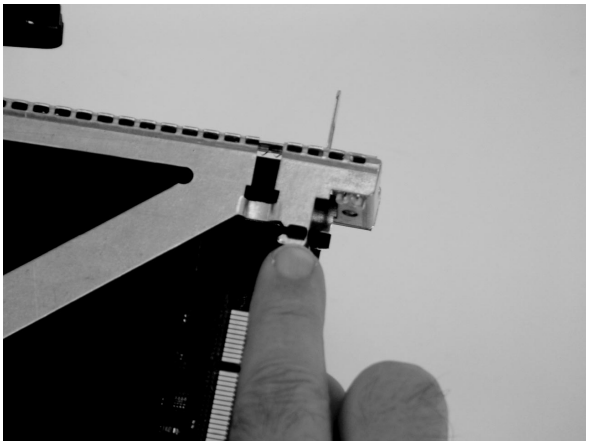
k. Check for the following:

1) Ensure that the extension arm engages the three pins on the cassette. You should be able to see the pins in the holes in the arm. The bezel tab should be seated as shown in the following figure.

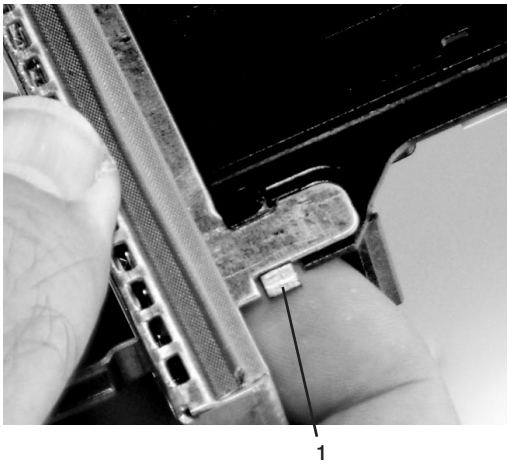


1 Pins

2) Ensure the cover arm latch is completely pressed into the hooked slot on the bezel as shown.

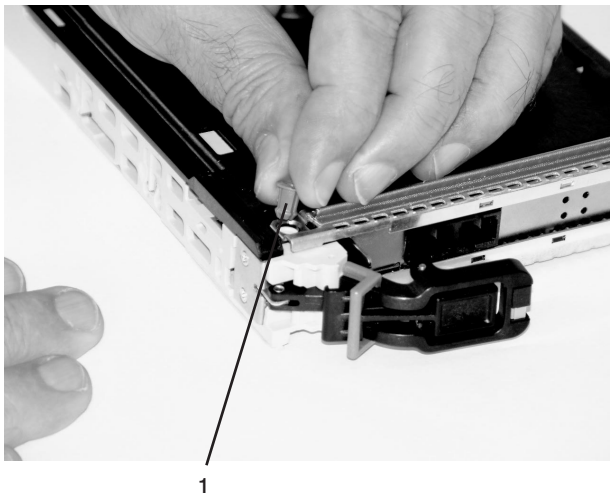


3) Turn the cassette assembly over so the cover is up and check the cover latch to ensure it is holding the bezel to the cover as shown.



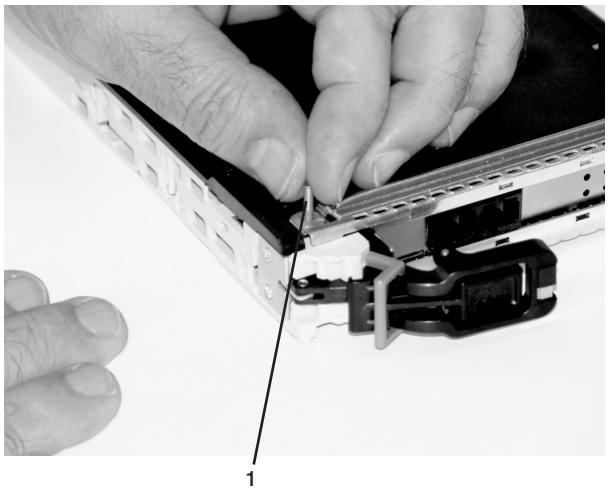
1 Cover Latch

l. Position the adapter with the cover side up. Ensure the holes are aligned and insert the bushing as shown.



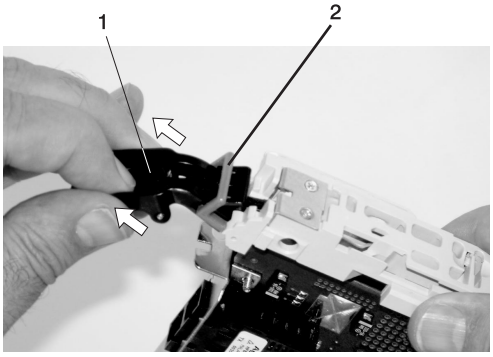
1 Bushing

m. Insert the bushing lock pin into the hole in the bushing. Push on the pin until it seats.



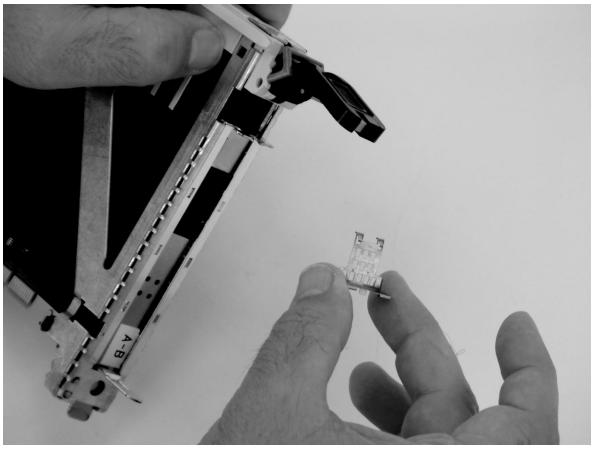
1 Bushing Lock Pin

n. By pulling on both sides, ensure the gray plastic locking bar on the handle is pulled into the unlocked position. Raise the handle on the cassette linkage until it locks into the up position (the blank filler or adapter moves downward).

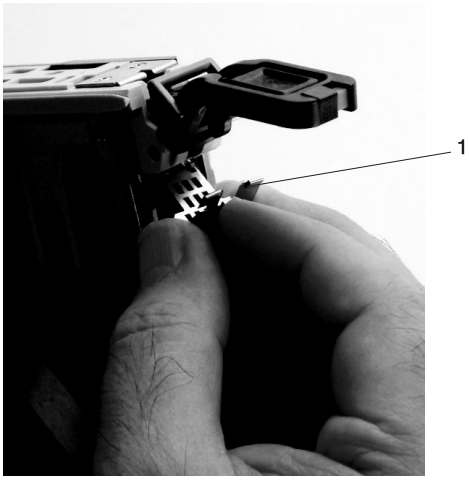


1 Handle
2 Gray Plastic Locking Bar

o. To install the metal EMC shield on the adapter bracket, do the following:

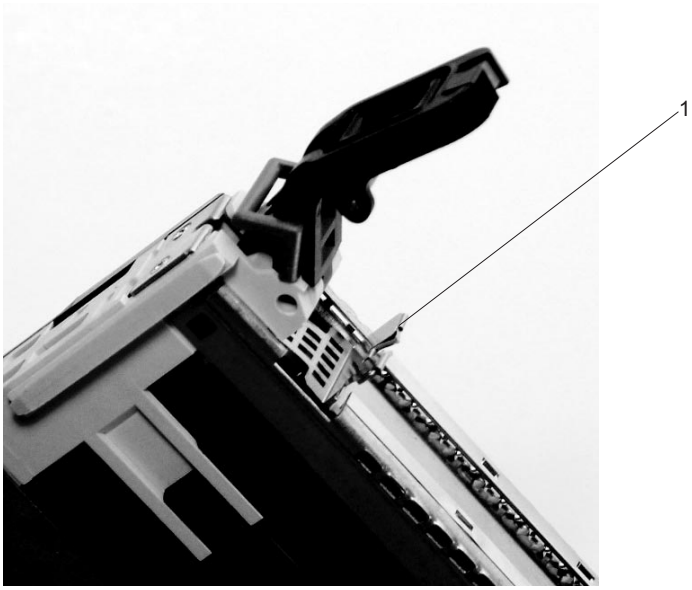


1) Ensure that the shield slides up inside the top of the cassette.



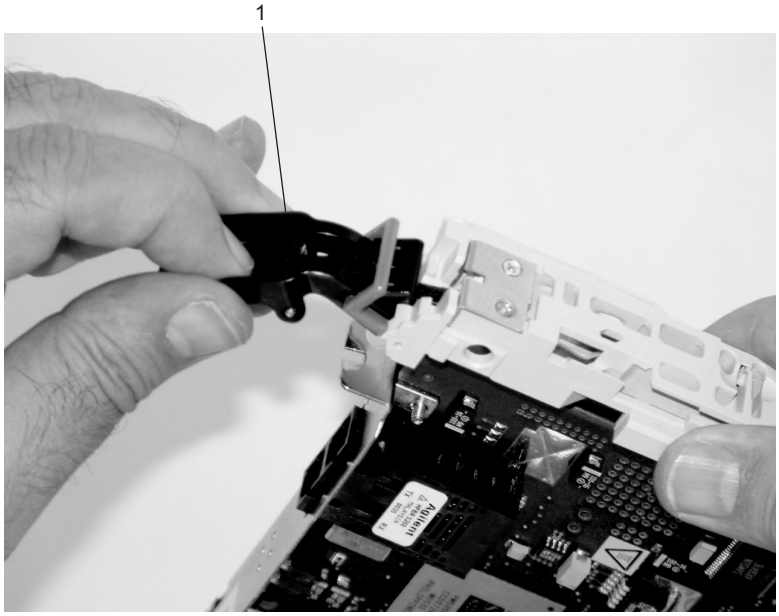
1 Metal EMC Shield

2) The metal shield has clips that slide over the top of the tailstock. Ensure that these clips are holding the EMC shield to the tailstock.



1 Top of Tailstock

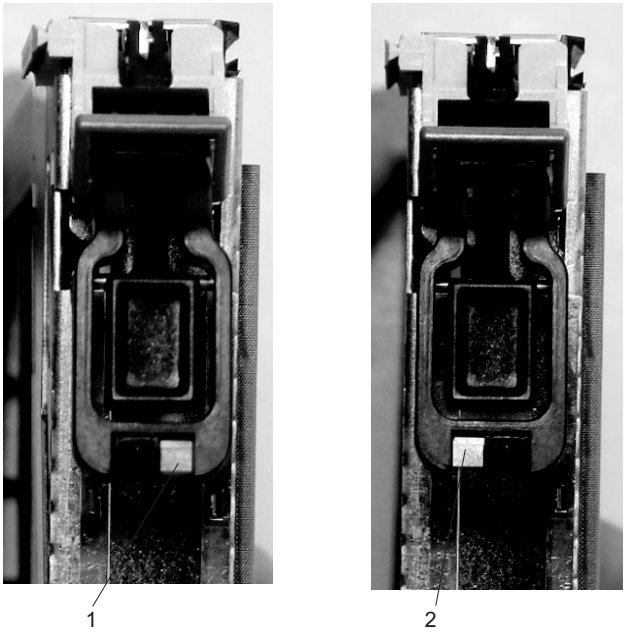
p. Press the lock on the handle and rotate the adapter handle until the handle is in the down position (adapter or blank filler moves up into the cassette assembly).



1 Handle

q. Using your system documentation, determine if the adapter you are installing is hot-swappable. If the adapter is hot-swappable, move the slider on the color indicator to allow the orange to be

visible. If the adapter is not hot-swappable, the blue color is visible.



1 Orange for Hot-Swappable
2 Blue for Not Hot-Swappable

r. The adapter is ready to be installed into a system or an I/O drawer. Refer to your system documentation for more information.

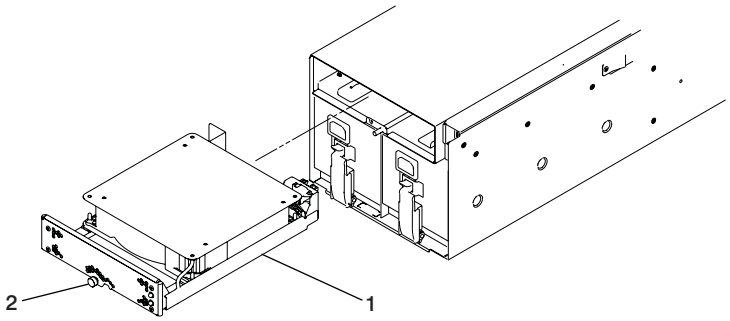
D10 Fan

Before performing the following procedure, read “Safety Considerations” on page 41.

Hot-Swap Fan Assembly Removal

To remove a hot-swap fan, do the following:

1. Locate the cooling fan assembly on the front of the I/O subsystem.
2. Unscrew the thumbscrew that holds the fan into the I/O subsystem.
3. Pull the fan assembly straight out until it is clear of the I/O subsystem.



1 Fan **2** Thumbscrew

Hot-Swap Fan Assembly Replacement

To replace your subsystem’s hot-swap fan, do the following:

1. Position the fan with the connector (located on the fan housing) facing in toward the I/O subsystem.
2. Insert the replacement fan assembly into the I/O subsystem as far as possible.
3. Screw in the thumbscrew to hold the fan in position.

D10 RIO Cable

Removal

1. Turn off the power to the system.
2. Release the RIO cable retainers.
3. Disconnect the RIO cable.

Replacement

Replace in reverse order.

D10 RIO Bus Adapter Assembly

Removal

Before performing the following procedure, read the “Safety Considerations” on page 41.

1. Turn off the system power.
2. Perform the procedure to put the I/O subsystem into the service position as described in “D10 Service Position” on page 43.
3. Remove the service access cover. (See “D10 Covers” on page 44).
4. Remove the screws that attach the RIO riser card to the I/O subsystem chassis.
5. Carefully pull the card straight up and out of the slot.

Replacement

Replace in reverse order.

D10 I/O Backplane Assembly

Before performing the following procedure, read the “Safety Considerations” on page 41.

Note: The I/O backplane and the SPCN riser card are replaced as a pair.

Removal

1. Turn off the system power.
2. Put the I/O subsystem into the service position as described in “D10 Service Position” on page 43.
3. Label and remove the PCI adapters. (See “D10 PCI Adapters” on page 45).
4. Remove the service access cover. (See “D10 Covers” on page 44).
5. Disconnect the fan cable from the I/O backplane.
6. Remove the power supplies. (See “D10 Power Supply” on page 107).
7. Remove the RIO bus adapter. (See “D10 RIO Bus Adapter Assembly” on page 105).
8. Remove the two screws that hold the SPCN connector card, and remove it from the I/O backplane.
9. Remove the screws that hold the PCI adapter mounting-guide, and remove the guides from the I/O backplane.
10. Remove the screws that secure the I/O backplane to the subsystem chassis.
11. Lift the I/O subsystem backplane straight up and out of the subsystem chassis.

    Note: If you are replacing the I/O subsystem backplane, mark and remove the VPD module (see “D10 I/O Backplane Locations” on page 12 for VPD module location) from the old backplane and move it to the replacement I/O subsystem backplane.

Replacement

Note: If the power supplies are not removed from the I/O subsystem chassis, remove them before replacing the I/O subsystem backplane.

1. Place the I/O subsystem backplane assembly into the chassis. Align the backplane with the mounting screw holes.

   Note: If you are replacing an I/O subsystem backplane with a new one, remove the VPD module from the old backplane and move it to the replacement I/O subsystem backplane. For VPD module location, see “D10 I/O Backplane Locations” on page 12. Put the module from the new backplane onto the old backplane.
2. Position the PCI adapter mounting-guides on the I/O backplane, and install the screws to secure the mounting-guides.
3. Secure the backplane with the remaining mounting screws removed earlier.
4. Reconnect the fan cable to the I/O backplane.
5. Install the new SPCN connector card on the new I/O subsystem backplane using the screws that you removed earlier.

   Note: The I/O backplane and the SPCN connector card are replaced as a pair.
6. Reinstall the RIO bus adapter card. (See “D10 RIO Bus Adapter Assembly” on page 105).
7. Reinstall the power supplies. (See “D10 Power Supply” on page 107).
8. Reinstall the cover. (See “D10 Covers” on page 44).
9. Reinstall all PCI adapters. (See “D10 PCI Adapters” on page 45).
10. Return the I/O subsystem to the operating position (see “D10 Operating Position” on page 43) and connect RIO, SPCN, and adapter cables.
11. Connect the power cables.
12. Power the system on.

D10 Power Supply

Before performing the following procedure, read the “Safety Considerations” on page 41.

Removal

Attention: Do not remove two power supplies at the same time if performing hot-plug procedures. Power supplies are considered as hot-pluggable FRUs only if you remove one power supply at a time. The power supplies can be removed from the front of the I/O subsystem.

1. Disconnect the power cord from the power supply.
2. Unlatch the power supply handle and rotate the handle downward to unseat the power supply.

   Attention: Do not remove a power supply for more than four minutes. If you cannot replace the power supply in less than four minutes, shut down the system and then remove the power supply.
3. Pull the power supply straight out from the I/O subsystem.

Replacement

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

Removal and Replacement Procedures for the D20 I/O Subsystem

Notes:

1. All of the parts in the D20 I/O Subsystem can be replaced with the subsystem installed in a rack. The power supplies, blowers, disk drives, and PCI adapters are hot-pluggable. Under normal conditions, during the swapping of these FRUs, there is no need to shut down or unplug the system.
2. Before performing any of the removal or replacement procedures in this chapter, read the danger and caution notices on “Safety Considerations” on page 41.

D20 FRU Replacement Procedure List

Field Replaceable Unit (FRU)	FRU Procedure Name and Page Location
Adapters	“D20 PCI Adapters” on page 123
Bezel	“D20 Front Bezel” on page 112
Cover	“D20 Service Access Cover” on page 111
Disk Drives	“D20 Hot-Plug Disk Drives” on page 137
Disk Drive Backplanes	“D20 Disk Drive Backplane” on page 144
Disk Drive 12 Pack Cage	“D20 Disk Drive Cage” on page 142
Disk Drive Configuration or Deconfiguration	“Deconfiguring (Removing) or Configuring a Disk Drive” on page 137
Blowers	“D20 Blowers” on page 115
I/O Backplane	“D20 I/O Backplane Assembly” on page 151
Operating Position	“D20 Operating Position” on page 110
Operator Panel	“D20 Operator Panel” on page 113
Power Supplies	“D20 Power Supplies” on page 146
Power Bulkhead	“D20 Power Supply Bulkhead” on page 148
RIO Bus Adapter	“D20 RIO Bus Adapter Assembly” on page 120
Service Position	“D20 Service Position” on page 109
Static-Sensitive Devices	“Handling Static-Sensitive Devices” on page 42
Stopping and Starting the System	“Stopping and Starting the System” on page 42

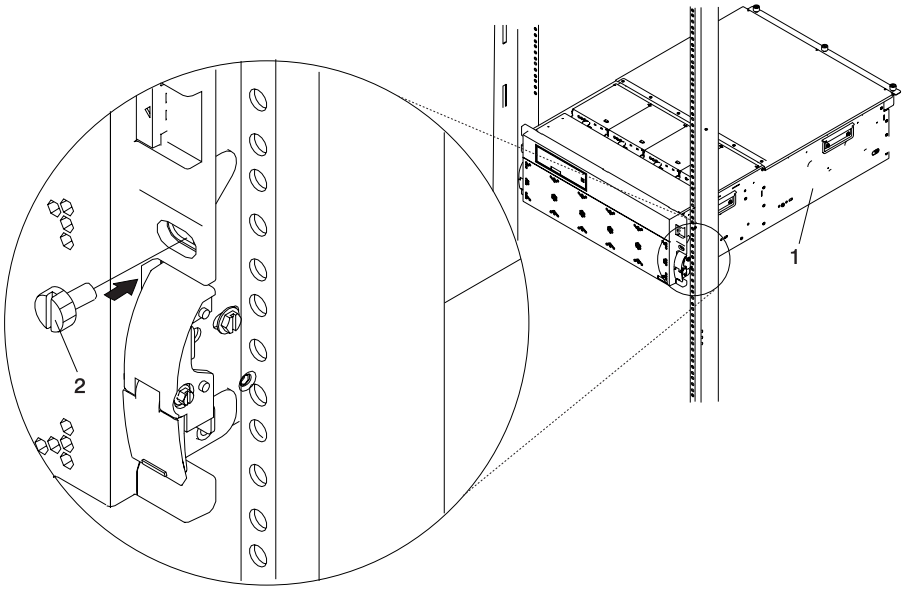
D20 Service Position

Attention: When placing your D20 subsystem into the service position, all stability plates must be firmly in position to prevent the rack from toppling. Ensure that only one system drawer is in the service position at a time.

Before doing any service actions inside your D20 subsystem, put the D20 subsystem into the service position.

To place the drawer into the service position, do the following:

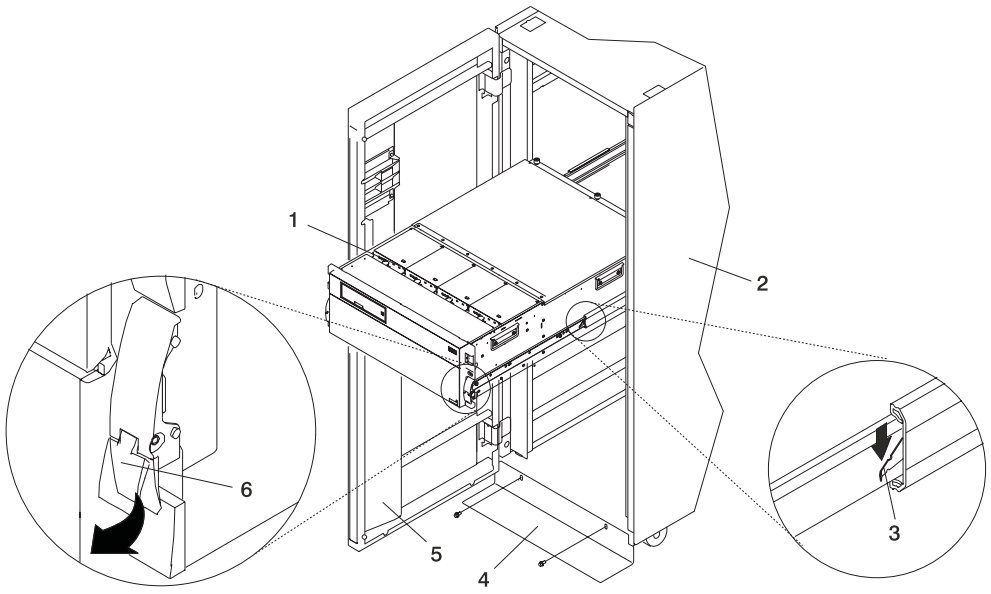
1. Open the front rack door.
2. If your D20 subsystem is equipped with two blue thumbscrews securing it to the rack, remove the thumbscrews at this time. The screws are located on the bezel, just above each subsystem release latch.



1 Front Bezel
2 Transport Retaining Screw for System Drawer

3. Release the subsystem release latches located on the left and right side.
4. Pull the system drawer out from the rack until the rails are fully extended.

Note: When the system rails are fully extended, safety latches on the slide rails lock into place. This action prevents the system from being accidentally pulled out too far and dropped. The following illustration shows a system drawer in the service position.



1 D20 Subsystem
2 19-Inch Rack
3 Extension Rail Safety Release Latch
4 Stabilizing Bar
5 Front Rack Door
6 System Drawer Release Latch

After completing the service actions, return the D20 subsystem to the operating position.

D20 Operating Position

To return your D20 subsystem to the operating position, do the following:

1. Release the rail release latches located on each rail. See the illustration on page 110 for the location of the release tabs.

   Note: To release the left rail, pull the release latch up. To release the right rail, push the right latch down.
2. Release latches must be in the open position. See the illustration on page 110 for the location of the subsystem release latches.
3. Push the system drawer straight back into the rack until both release latches on the subsystem have locked into position.
4. If you removed two thumbscrews from the front bezel, replace them at this time.
5. Close the front rack door.

D20 Service Access Cover

Before performing the following procedure, read the “Safety Considerations” on page 41.

Opening the Service Access Cover

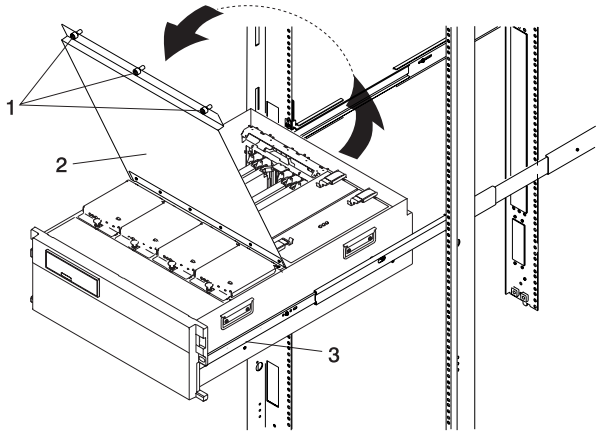
To open the service access cover, do the following:

1. Open the front rack door and place the D20 subsystem into the service position as described in “D20 Service Position” on page 109.
2. Loosen the three captive thumbscrews located on the rear of the cover. See the following illustration for thumbscrew locations.

   Note: The service access cover pivots on a piano hinge located directly behind the four cooling blowers.
3. To open the service access cover, lift the cover up from the back edge. The hinges allow the service access cover to swing open to about 170 degrees. Do not force the cover to come to a rest on top of the cooling blowers.

   Note: When you open the service access cover, ensure you have enough height clearance.
4. Close and then secure the service access cover with the three thumbscrews located on its back edge.

Attention: For proper cooling and airflow, close the cover before turning on the system. Operating the system for extended periods of time (over 30 minutes) with the cover opened might damage the system components.



1 Thumbscrews
2 Service Access Cover
3 D20 Subsystem

Service Access Cover Removal

If you need to remove the service access cover from the subsystem, do the following:

1. Open the cover as described in the previous procedure.
2. Remove the four retaining screws that secure the cover hinge to the chassis.
3. Remove the cover.

Service Access Cover Replacement

To install the service access cover, do the following:

1. Open the hinge, located on the service access cover.
2. Align the four holes located on the hinge with the four screw holes located on the top of the chassis.
3. Start and then tighten the four retaining screws that secure the service access cover to the chassis.
4. Close and then secure the service access cover with the three thumbscrews located on its back edge.

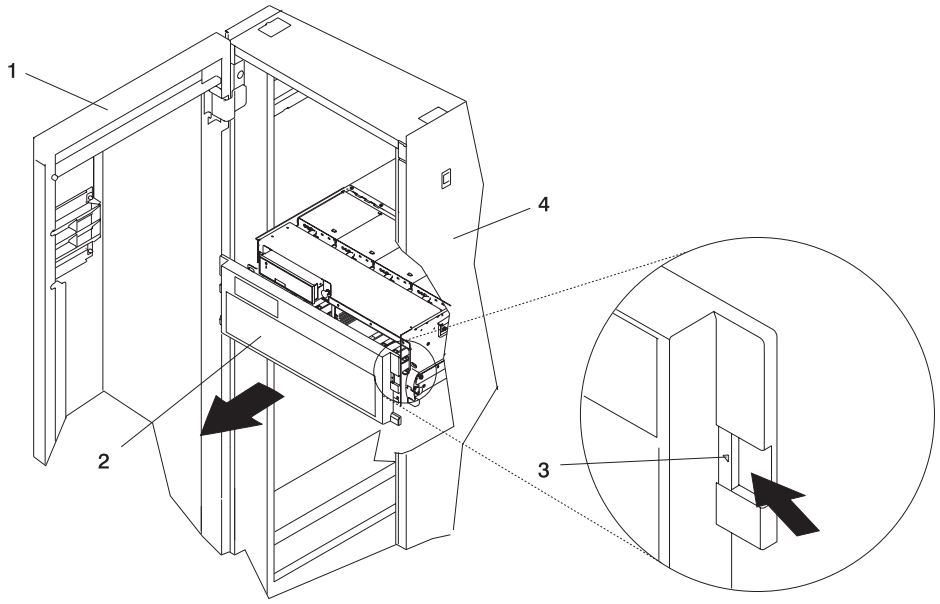
D20 Front Bezel

Before performing the following procedure, read the “Safety Considerations” on page 41.

Front Bezel Removal

To remove the front bezel, do the following:

1. Open the front rack door. If necessary, place the D20 subsystem into the service position as described in “D20 Service Position” on page 109.
2. Simultaneously press in both bezel-release tabs. See the following illustration for bezel-release tab locations.
3. Pivoting the bezel from the bottom, swing the top of the bezel out.
4. Pull the bottom of the bezel up, and then away from the subsystem chassis. This action releases the two tabs located on the bottom of the bezel.
5. Put the bezel in a safe place.



1 Rack Door

2 Bezel

3 Bezel-Release Tab (Located on each side of bezel)

4 19-Inch Rack

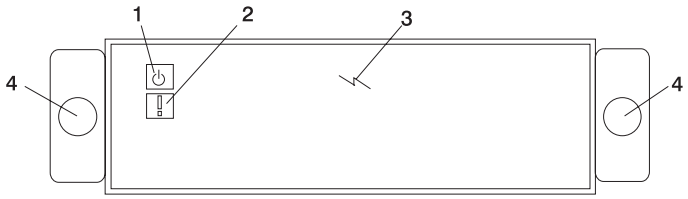
Front Bezel Replacement

To replace the front bezel, do the following:

1. Open the front rack door. If necessary, put the D20 subsystem into the service position as described in “D20 Service Position” on page 109.
2. Insert the two tabs located on the bottom edge of the bezel into their locking slots, located on the chassis.
3. Pivot the front bezel up toward the top of the chassis.
4. Align the release tabs to the matching slots located on the front of the subsystem chassis.
5. Gently push the tabs into the slots until the bezel seats against the front of the subsystem.
6. If the subsystem is in the service position, put the subsystem back into the operating position as described in “D20 Operating Position” on page 110.
7. Close the rack door.

D20 Operator Panel

Before performing the following procedure, read “Safety Considerations” on page 41.



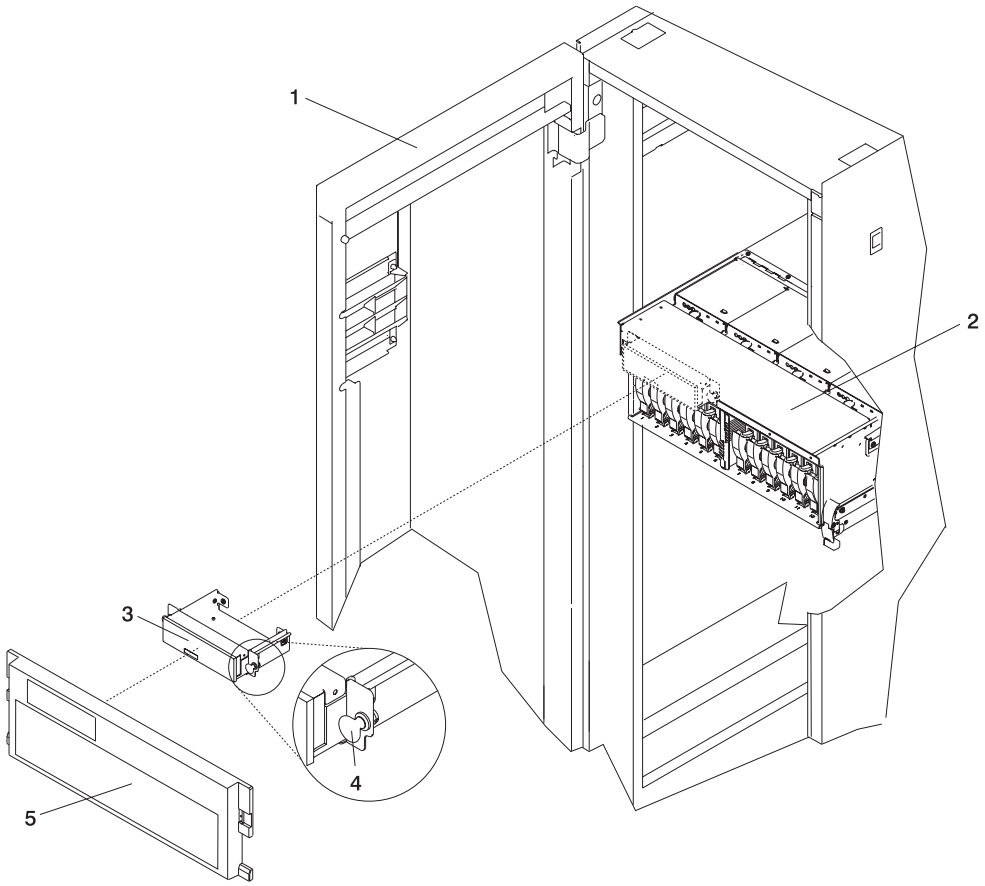
1 Power LED (Green)
2 Attention LED (Amber)
3 Operator Panel
4 Snap Buttons

Operator Panel Removal

To remove the operator panel from the subsystem, do the following:

1. Open the rack front door.
2. Shut down the system as described in “Stopping and Starting the System” on page 42.
3. If necessary, put the D20 subsystem into the service position as described in “D20 Service Position” on page 109.
4. Disconnect the power source from the system.

   Note: This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
5. Remove the front bezel as described in “Front Bezel Removal” on page 112.
6. Locate the operator panel, as shown in the following illustration.
7. Pull out the two snap buttons located on each side of the operator panel.
8. Remove the operator panel by grasping its edges and slowly pulling it out of its bay.
9. Disconnect the power/signal cable connector from the back of the operator panel.
10. Put the operator panel in a safe place.



1 Rack Front Door
2 D20
3 Operator Panel
4 Snap Buttons
5 Front Bezel

Operator Panel Replacement

To replace the operator panel, do the following:

1. Connect the power/signal cable connector to the back of the operator panel.
2. Carefully slide the operator panel back into the system bay.
3. Ensure that the two snap buttons are in the unlocked position.

   Note: Snap buttons are in the unlocked position when the button component is pulled back as far as possible.
4. Push the operator panel into the bay until it comes to rest against the subsystem chassis.
5. Push in each snap button, locking the operator panel against the subsystem chassis.
6. Replace the front bezel as described in “Front Bezel Replacement” on page 112.
7. If the system is in the service position, return it to the operating position as described in “D20 Operating Position” on page 110.
8. Reconnect the power source to the system.
9. Power on the system as described in “Stopping and Starting the System” on page 42.
10. Close the rack front door.

D20 Blowers

Before performing the following procedure, read “Safety Considerations” on page 41.

Each cooling blower assembly has a green LED and an amber LED. The green LED indicates when the cooling blower is receiving power. A blinking amber LED indicates when the cooling blower needs attention from a potential cooling problem. When you are standing in front of and facing the I/O subsystem, the cooling blowers are labeled from left to right, 1 through 4, across the top blower retaining bracket.

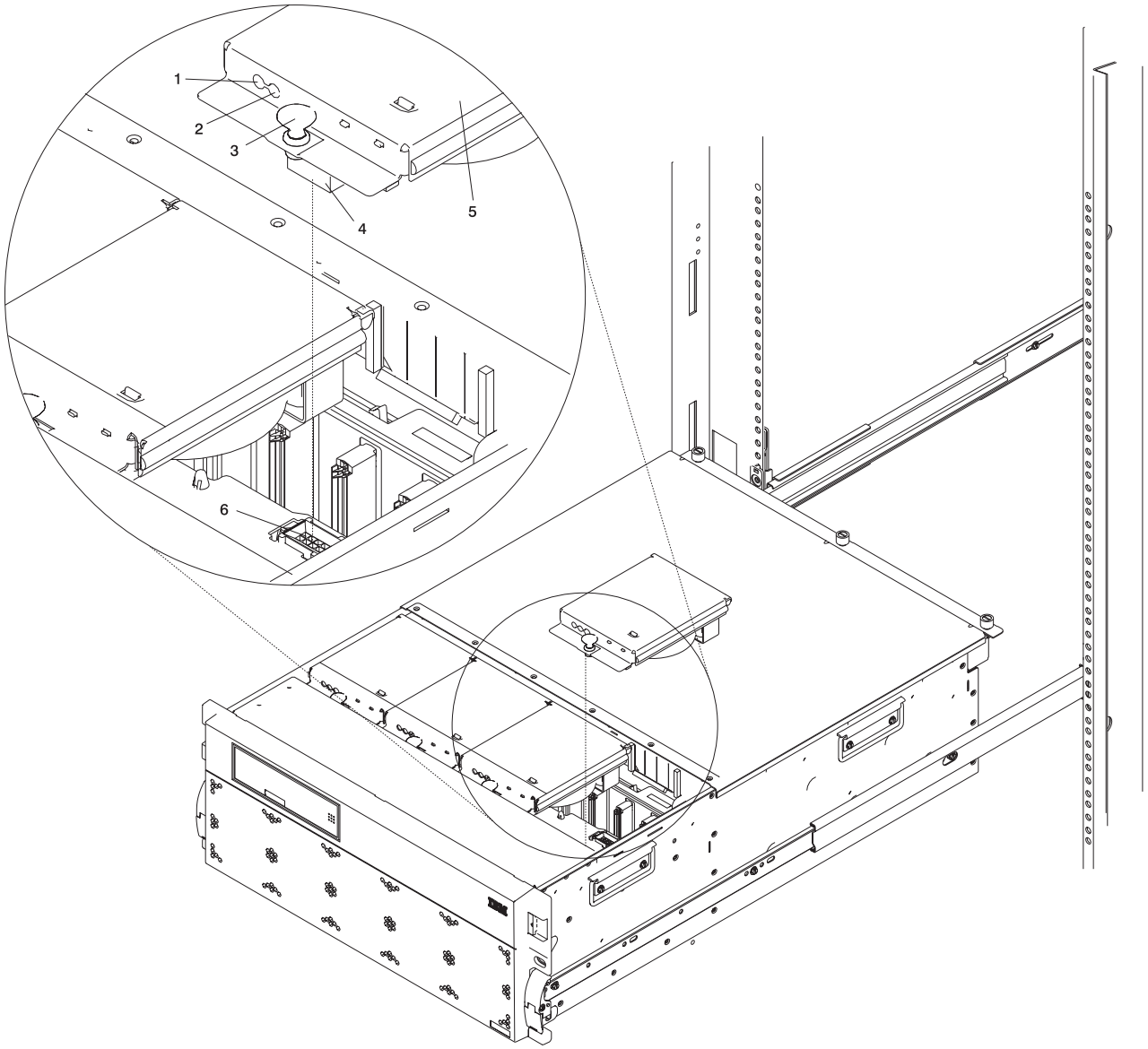
Attention: If the I/O subsystem does not have two functional power supplies installed, do not remove a blower with the power turned on. If only one power supply is functional, removing of a blower will cause the system to turn power off.

Hot-Swap Blower Removal

To remove a hot-swap blower, do the following:

1. Put the D20 subsystem into the service position as described in “D20 Service Position” on page 109.
2. Locate the cooling blower assemblies, as shown in the following illustration.
3. Pull out the snap button located on the front flange of the failing blower.
4. Using the snap button as a handle, pull the front of the blower up, allowing the back edge to pivot on a recessed ledge located just below the back edge of the blower.

   Note: Using the snap button, lift the blower from the chassis. The blower connector will disconnect from its docking connector, which is located on the underside of the blower.
5. Pull the blower away from the system. Ensure that the two back tabs, located on the bottom back edge of the blower assembly, have cleared their retaining slots.



1 Green LED
2 Amber LED
3 Snap Button
4 Blower Connector
5 Hot-Plug Blower Assembly
6 Docking Connector

Hot-Swap Blower Replacement

Note: If a blower assembly is being replaced for a redundant failure, after the service repair action is completed, ask the customer to check the **crontab** file for any power/cooling warning messages. When a power or cooling error is encountered, AIX adds an entry to the **crontab** file to ″wall″ a warning message every 12 hours, to alert or remind the customer of the problem. Replacing the faulty part does not clear this **crontab** entry, so unless the **crontab** file is edited to remove this entry, the customer continues to be reminded of the failure despite its having been repaired. The **crontab -l** command reads the **crontab** file to determine if an entry exists. The **crontab -e** command edits the file.

To replace a hot-swap blower, do the following:

1. Grasp the blower by its snap button, and ensure that the snap button is in the unlocked position.

   Note: Snap buttons are in the unlocked position when the button component is pulled back as far as possible.
2. Install the two alignment tabs located on the lower back edge of the blower assembly into the two retaining slots located on the chassis ledge.
3. Pivoting from the back, lower the front of the blower onto its docking connector.
4. Push down on the front of the blower until the front flange of the blower is seated on top of the chassis ledge.
5. Push down on the snap button, locking the blower in place.
6. Return the subsystem back to the operating position as described in “D20 Operating Position” on page 110.
7. Close the rack door.

D20 Cooling Blower Cable

This procedure must be performed with the power turned off.

Cooling Blower Cable Removal

To remove the cooling blower cable, do the following:

1. Open the rack front door.
2. Shut down the system as described in “Stopping and Starting the System” on page 42.
3. Put the D20 subsystem into the service position as described in “D20 Service Position” on page 109.
4. Disconnect the power source from the system.

   Note: This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
5. Remove the four cooling blowers as described in “Hot-Swap Blower Removal” on page 115.
6. Open the service access cover as described in “Opening the Service Access Cover” on page 111.
7. Remove the power supplies and, if applicable, the power supply filler.
8. If necessary, remove the power supply bulkhead as described in “Power Supply Bulkhead Removal” on page 148.
9. Disconnect the blower cable from the I/O board.
10. Unclip the three cable ties from the chassis and the three cable ties from the blower connector-support bracket.
11. Remove the blower docking connectors from the chassis.

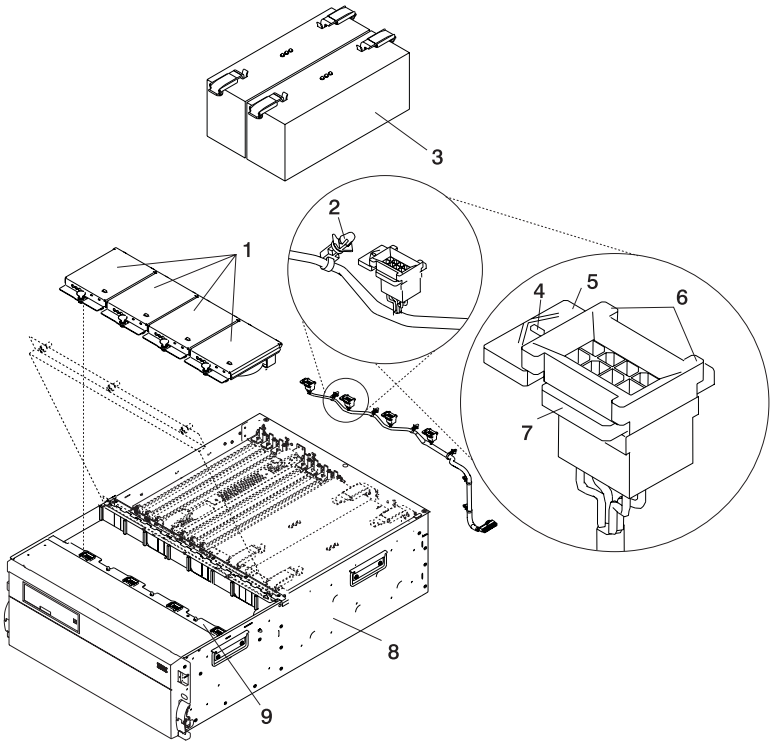
    To remove each blower docking connector from the chassis, do the following:

    a. Depress the connector release tab next to the blower docking connector. The connector release tab has a small tab retaining clip that locks the blower docking connector into the blower connector support bracket. Depress the connector release tab far enough so that the tab retaining clip clears the bottom of the blower connector-support bracket.

    b. With the connector release tab still depressed, slide the blower docking connector toward the depressed tab.

    c. Align the blower docking connector’s four retaining ears with the four small slots located on the blower connector-support bracket.

    d. Push down on the blower docking connector to free it from the blower connector-support bracket.
12. Remove the cable from the subsystem.



1 Cooling Blowers
2 Cable Ties
3 Power Supply
4 Tab Retaining Clip
5 Connector Release Tab
6 Connector Retaining Ears
7 Blower Docking Connector
8 D20
9 Blower Connector Support

Cooling Blower Cable Replacement

Replace in reverse order.

D20 RIO Bus Adapter Assembly

Before performing this procedure, read “Safety Considerations” on page 41.

In the following RIO bus adapter removal and replacement procedures, the RIO bus adapter assembly is referred to as the *RIO adapter*.

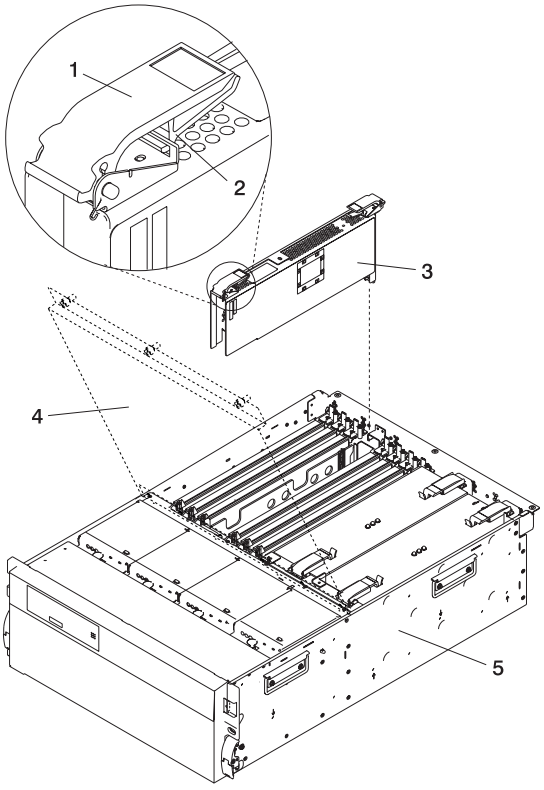
RIO Bus Adapter Removal

To remove the RIO adapter from the subsystem, do the following:

1. Open the rack front door.
2. Shut down the system as described in “Stopping and Starting the System” on page 42.
3. Put the D20 subsystem into the service position as described in“D20 Service Position” on page 109.
4. Disconnect the power source from the system.

   Note: This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
5. Open the service access cover as described in “Opening the Service Access Cover” on page 111.
6. Disconnect the RIO-2 cables from the RIO connectors located on the rear of the subsystem.
7. Identify, and then disconnect and label all cables that cross over the top of the RIO adapter. These cables might interfere with the removal and installation of the RIO adapter.
8. Release the release latches located on top of the RIO adapter.
9. Simultaneously lift both retention handles.
10. Pivot the release handles up until they are perpendicular (90 degrees) to the top of the RIO adapter.

    Note: By placing the handles perpendicular to the top of the RIO adapter, the base or hinged portion of each handle acts as a cam and will gently pry the RIO adapter up, disconnecting it from its docking connector.
11. Remove the RIO adapter from the subsystem chassis, and put it in a safe place.



1 RIO Bus Adapter Release Handle
2 RIO Bus Adapter Release Latch
3 RIO Bus Adapter
4 Service Access Cover
5 D20 Subsystem

RIO Bus Adapter Replacement

To replace the RIO bus adapter, do the following:

1. Grasp the two RIO adapter release handles.
2. Pivot both handles upward to 90 degrees, ensuring that the handles are perpendicular to the RIO adapter. The handle cams have now been placed into the correct position to assist you when seating the RIO adapter into its docking connector.
3. Before inserting the RIO adapter into its bay, observe the alignment bracket. The alignment bracket is secured to the power bulkhead.
4. Insert the RIO adapter into its bay. Ensure that the power cable receptacle located on the back of the RIO adapter is facing the back of the subsystem chassis.
5. Lower the RIO adapter through the alignment bracket. The alignment bracket will catch the back edge of the RIO adapter closest to it.

   The RIO adapter should now be resting on the top of its docking connector. The docking connector has two large alignment pins located on each end. These alignment pins will ensure alignment of the RIO adapter to its docking connector when seated.
6. Lower the RIO adapter locking handles, carefully seating the RIO adapter into the docking connector. The plastic latch located beneath each handle clicks when the RIO adapter is fully seated. This click also indicates that the handle is locked in the closed position.
7. Reconnect the RIO-2 cables to the RIO adapter connectors located on the back of the chassis.
8. Reconnect the cables that were disconnected during the RIO adapter removal.
9. Reconnect the power source to the system.
10. Close and then secure the service access cover with the three thumbscrews located on its back edge.
11. Return the D20 to the operating position as described in “D20 Operating Position” on page 110.
12. Power on the system as described in “Stopping and Starting the System” on page 42.
13. Close the rack front door.

D20 PCI Adapters

Before performing this procedure, read “Safety Considerations” on page 41.

Notes:

1. Some PCI adapter cards are shipped from the manufacturer with a blue handle or support along the back edge of the card. In this system unit, you *must* remove the blue handle or support from the card.
2. With this system, you can install PCI adapters with the power on. These adapters are referred to as *hot-pluggable PCI adapters*. Some adapters are not hot-pluggable, and the system must be powered off for this type of adapter installation.

Before you install the adapter, determine if the PCI adapter you are installing is hot-pluggable. See the *PCI Adapter Placement Reference*, order number SA23-2504.

If you are removing a PCI adapter that is:

- Non-hot-pluggable, go to “Non-Hot-Pluggable PCI Adapter Removal” on page 126.
- Hot-pluggable, go to “Hot-Pluggable PCI Adapter Removal” on page 129.

PCI Hot-Plug Manager Access

The installation instructions for hot-pluggable PCI adapters refer you to these procedures when it is appropriate to perform them.

Note: A PCI adapter is only hot-pluggable if the PCI adapter is supported for hot-plug applications. For complete information regarding your PCI adapter, see the *PCI Adapter Placement Reference*, order number SA23-2504.

Accessing Hot-Plug Management Functions:

Note: Removing or installing a hot-pluggable PCI adapter requires the system administrator to take the PCI adapter offline prior to performing the operation. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

For additional information about taking an adapter offline or removing it from the system configuration, see the *AIX System Management Guide: Operating System and Devices*.

This publication is also contained on the AIX Documentation CD. The documentation is made accessible by loading the documentation CD onto the hard disk or by mounting the CD in the CD-ROM drive.

To access the hot-plug menus, do the following:

1. Log in as root user.
2. At the command line, type `smitty`.
3. Select **Devices**.
4. Select **PCI Hot Plug Manager** and press Enter.
5. The PCI Hot-Plug Manager menu displays. Return to the procedure that directed you here. The following section describes the menu options.

PCI Hot-Plug Manager Menu: The following options are available from the PCI Hot Plug Manager menu:

Note: For information about the PCI slot LED states, see “D20 PCI-X Slots” on page 16.

List PCI Hot-Plug Slots

Provides a descriptive list of all slots that support PCI hot-plug capability. If the listing for a slot indicates it holds an “Unknown” device, select the **Install/Configure Devices Added after IPL** to configure the adapter in that slot.

Add a PCI Hot-Plug Adapter

Allows the user to add a new PCI hot-plug-capable adapter to the slot with the system turned on. You will be asked to identify the PCI slot that you have selected prior to the actual operation. The selected PCI slot will go into the Action state and finally into the On state.

Note: The system will indicate the slot holds an “Unknown” device until you perform the **Install/Configure Devices Added After IPL** option to configure the adapter.

Replace/Remove a PCI Hot-Plug Adapter

Allows the user to remove an existing adapter, or replace an existing adapter with an identical one. For this option to work, the adapter must be in the Defined state (see the “Unconfigure a Device” option).

You will be asked to identify the PCI slot prior to the actual operation. The selected PCI slot will go into the Action state.

Identify a PCI Hot-Plug Slot

Allows the user to identify a PCI slot. The selected PCI slot will go into the Identify state. See “D20 PCI-X Slots” on page 16.

Unconfigure a Device

Allows the user to put an existing PCI adapter into the Defined state if the device is no longer in use.

This step must be completed successfully before starting any removal or replacement operation. If this step fails, the customer must take action to release the device.

Configure a Defined Device

Allows a new PCI adapter to be configured into the system if software support is already available for the adapter. The selected PCI slot will go into the On state.

Install/Configure Devices Added After IPL

The system attempts to configure any new devices and tries to find and install any required software from a user-selected source.

The add, remove, and replace functions return information to the user indicating whether the operation was successful. If additional instructions are provided on the screen, complete the recommended actions. If the instructions do not resolve the problem, do the following:

- If the adapter is listed as Unknown, perform the **Install/Configure Devices Added After IPL** option to configure the adapter.
- If you receive a warning indicating that needed device packages are not installed, the system administrator must install the specified packages before you can configure or diagnose the adapter.
- If you receive a failure message indicating a hardware error, the problem might be either the adapter or the PCI slot. Isolate the problem by retrying the operation in a different PCI slot, or trying a different adapter in the slot. If you determine that you have failing hardware, call your service representative.
- *Do not* use **Install/Configure Devices Added After IPL** if your system is set up to run HACMP clustering. Consult with your system administrator or software support to determine the correct method to configure the replacement device.

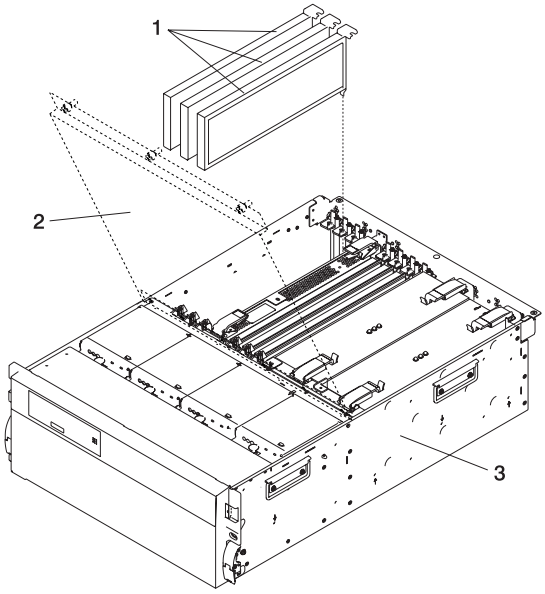
Non-Hot-Pluggable PCI Adapter Removal

To remove a PCI adapter, do the following:

1. Open the front and rear rack doors, and place the subsystem into the service position as described in “D20 Service Position” on page 109.
2. Shut down the system as described in “Stopping and Starting the System” on page 42.
3. Disconnect the power source to the system.

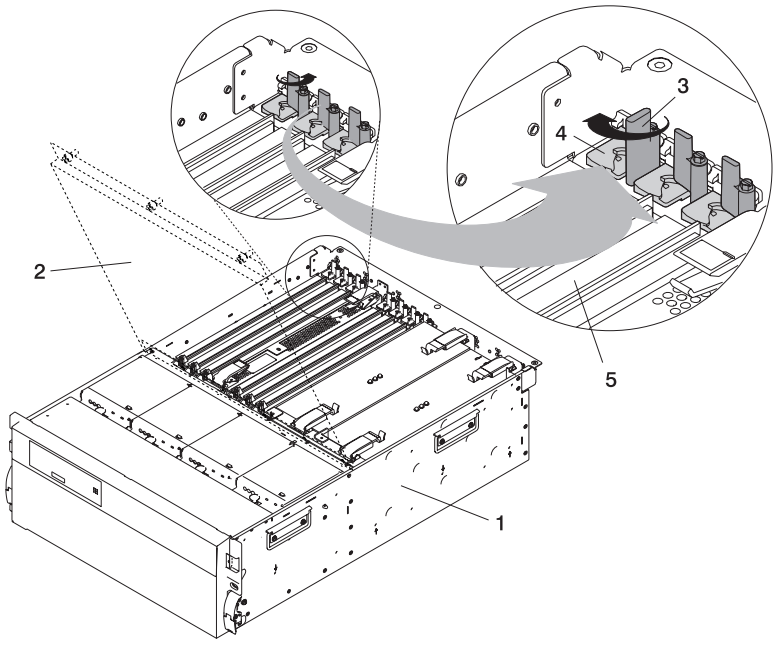
   Note: This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the system power source has been completely disconnected.
4. Open the service access cover as described in “Service Access Cover Removal” on page 111.
5. Determine which adapters you plan to remove, and then label and disconnect all cables attached to that adapter.
6. Record the slot number and location of each adapter being removed.

   Note: Adapter slots are numbered on the rear of the subsystem unit.
7. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 42.



1 Hot-Plug PCI Adapters
2 Service Access Cover
3 D20 Subsystem

8. Rotate the adapter retainer clip counterclockwise, as shown in the following illustration.
9. Lift the adapter retaining seat that is resting on the adapter retention bracket.
10. Carefully grasp the PCI adapter by its top edge or upper corners, and remove it from the system.
11. Store the adapter in a safe place.
12. If you do not plan to install another adapter into the vacated slot, seal the expansion slot using an expansion-slot cover. If you are installing another adapter, go to “Adding or Replacing a Non-Hot-Pluggable PCI Adapter” on page 128.
13. If you have other options to install, refer to “D20 FRU Replacement Procedure List” on page 108. If you do not have other options to install, continue on to the next step.
14. Close and then secure the service access cover with the three thumbscrews located on its back edge.
15. Connect the adapter cables.
16. Reconnect the power source to the system.
17. Route the cables through the cable-management arm.
18. Push the system drawer back into the operating position as described in “D20 Operating Position” on page 110.
19. Power on the system as described in “Stopping and Starting the System” on page 42.
20. Close the rack doors.



1 D20
2 Service Access Cover
3 Retainer Clip
4 Retainer Seat
5 PCI Adapter

Adding or Replacing a Non-Hot-Pluggable PCI Adapter

To add or replace an adapter, do the following:

1. Open the front and rear rack doors, and place the system into the service position as described in “D20 Service Position” on page 109.
2. Shut down the system as described in “Stopping and Starting the System” on page 42.
3. Disconnect the power source to the system.

   Note: This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the system has been completely disconnected from its power source.
4. Open the service access cover as described in “Service Access Cover Removal” on page 111.
5. Refer to the *PCI Adapter Placement Reference* for information regarding slot restrictions for adapters that can be used in this subsystem.
6. If necessary, remove the adapter expansion slot shield.
7. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 42.
8. If necessary, remove the adapter from the antistatic package.

   Attention: Avoid touching the components and gold-edge connectors on the adapter.
9. Place the adapter, component-side up, on a flat, static-protective surface.
10. Set any jumpers or switches as instructed by the adapter’s manufacturer.
11. Carefully grasp the adapter by its top edge, and align the adapter with the expansion slot and its connector on the PCI riser card.
12. Press the adapter *firmly* into its connector.

    Attention: When you install an adapter into your subsystem, be sure that it is completely and correctly seated in its connector.
13. Lower the adapter retaining seat onto the PCI adapter EMC shield/connector faceplate. Rotate the adapter retainer clip over the adapter retaining seat until it comes to a stop.
14. Close and then secure the service access cover with the three thumbscrews located on its back edge.
15. Connect the adapter cables.
16. Reconnect the power source to the system.
17. Route the cables through the cable-management arm.
18. Push the system drawer back into the operating position as described in “D20 Operating Position” on page 110.
19. Power on the system as described in “Stopping and Starting the System” on page 42.
20. Close the rack doors.

Hot-Pluggable PCI Adapter Removal

Attention: The Linux operating system does not support these hot-plug procedures. Also, Linux does not support hot-plugging any hot-pluggable PCI adapters. Systems with Linux installed on one or more partitions must be shut down and powered off before replacing any PCI adapter assigned to a Linux partition. Follow the non-hot-pluggable adapter procedures when replacing a PCI adapter in any partition with Linux installed.

Note: Removing a hot-pluggable PCI adapter requires the system administrator to take the PCI adapter offline before performing any PCI adapter hot-plug procedures. Before taking an adapter offline, the devices attached to the adapter must also be taken offline. This action prevents a service representative or user from causing an unexpected outage for system users.

For additional information about taking an adapter offline or removing it from the system configuration, see the *AIX System Management Guide: Operating System and Devices*.

This publication is also contained on the AIX Documentation CD. The documentation is made accessible by loading the documentation CD onto the hard disk or by mounting the CD in the CD-ROM drive.

To remove a hot-pluggable PCI adapter, do the following:

1. Open the front and rear rack doors, and place the system into the service position as described in “D20 Service Position” on page 109.
2. Open the service access cover as described in “Service Access Cover Removal” on page 111.
3. Determine which adapters you plan to remove.
4. Record the slot number and location of each adapter being removed.

   Note: Adapter slots are numbered on the rear of the system unit.
5. Ensure that any processes or applications that might use the adapter are stopped.
6. Refer to “PCI Hot-Plug Manager Access” on page 123, and follow the steps in the access procedure to select **PCI Hot Plug Manager**. Then return here to continue.
7. Select **Unconfigure a Device** and press Enter.
8. Press F4 to display the Device Names menu.
9. Select the adapter you are removing.
10. Use the Tab key to answer NO to **Keep Definition** and YES to **Unconfigure Child Devices**. Press Enter.
11. The ARE YOU SURE screen displays. Press Enter to verify the information. Successful unconfiguration is indicated by the OK message displayed next to the **Command** field at the top of the screen.
12. Label and disconnect all cables attached to that adapter.
13. Press F3 to return to the PCI Hot-Plug Manager menu.

14. Select **Replace/Remove a PCI Hot-Plug Adapter** and press Enter. The Replace/Remove a PCI Hot-Plug Adapter menu displays.

    Note: If the PCI Hot-Plug Adapter menu indicates that the slot for the just replaced adapter is reading `empty`, do the following:

    a. From the Replace/Remove a PCI Hot-Plug Adapter menu, select **F3** to cancel.

    b. Select **Add PCI Hot-Plug Adapter**, and press Enter. The display screen indicates that the PCI slot is empty.

    c. On the display screen, select the indicated empty slot. Look at the adapter you intend to replace. A slow blinking amber LED located next to the adapter on the PCI riser card is indicating that the slot has been identified. Press Enter. The adapter, has been put into the action state.

    d. Completely remove the hot-plug adapter from the slot. The LED goes off.

    e. Reinstall the adapter, ensuring that it is correctly seated. Press Enter.

    f. Select **F3** to return to the PCI Hot-Plug Adapter Menu.

    g. Select **Install/Configure Devices Added after IPL**.

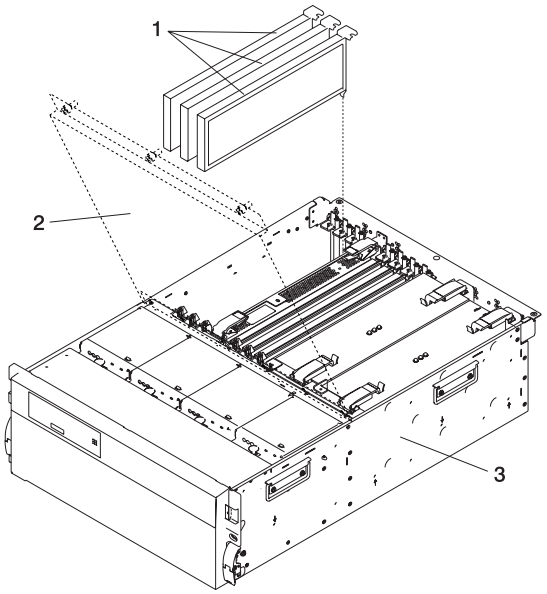
    h. At the display screen, identify the PCI hot-plug slot that your adapter is using. If it still shows as being empty, redo steps a through g. However, before you reinstall the adapter, test it. If the adapter fails the test, redo steps **a** through **g** with a new adapter.

15. Move the cursor to select the adapter that you are removing and press Enter. (The description entry displays as `unknown`).

16. Press the Tab key until the entry field displays the remove operation and then press the Enter key. Follow the instructions that display on the screen until you are instructed to remove the adapter.

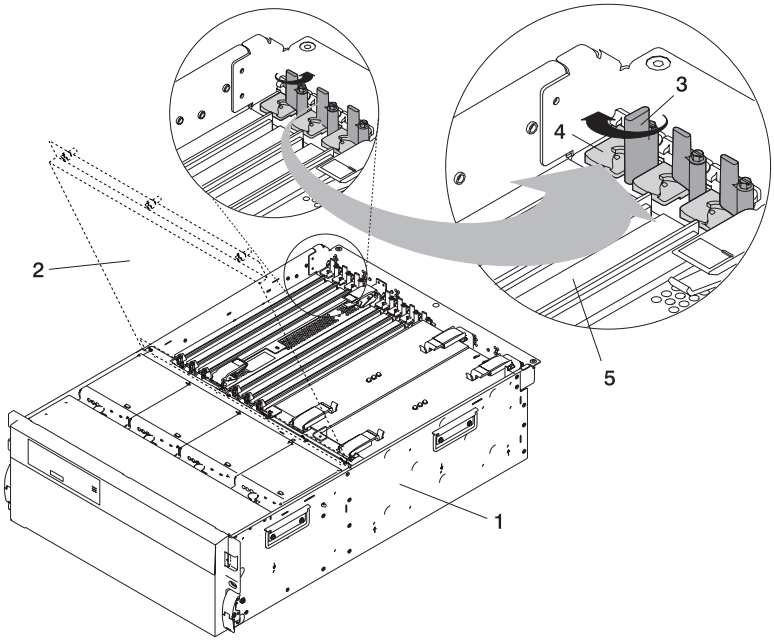
17. When you are instructed to remove the adapter from the adapter slot, disconnect any cables that are connected to the adapter being removed.

18. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 42.



1 Hot-Plug PCI Adapters
2 Service Access Cover
3 D20 Subsystem

19. Turn the retainer clip and lift the adapter retaining seat off the adapter.



1 D20
2 Service Access Cover
3 Retainer Clip
4 Retainer Seat
5 PCI Adapter

20. Carefully grasp the adapter by the edges and pull it straight out from the PCI riser card.
21. If you are not installing another adapter in this slot, place an expansion slot cover in the adapter slot opening.
22. Lower the plastic retainer seat over the PCI adapter faceplate.
23. Rotate the locking latch clockwise until it clicks into the locked position.
24. Continue to follow the screen instructions until you receive a message that the adapter removal is successful. Successful removal is indicated by the `OK` message displayed next to the **Command** field at the top of the screen.
25. If you do not have other adapters to remove, continue with the next step.

    OR

    If you have other adapters to remove, press the F3 key to return to the PCI Hot-Plug Manager menu, and then return to step 14 on page 130.
26. Press F10 to exit the Hot-Plug Manager.
27. If you have added, removed, or replaced any adapters, run the **diag -a** command. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.

28. If you have other options to install, refer to “D20 FRU Replacement Procedure List” on page 108. If you do not have other options to install, continue on to the next step.
29. Replace the service access cover as described in “Service Access Cover Replacement” on page 111.
30. Push the system drawer back into the operating position as described in “D20 Operating Position” on page 110.
31. Connect the adapter cables.
32. Route the cables through the cable-management arm.
33. Close the rack doors.

Replacing a Hot-Pluggable PCI Adapter

Attention: The Linux operating system does not support these hot-plug procedures. Also, Linux does not support hot-plugging any hot-pluggable PCI adapters. Systems with Linux installed on one or more partitions must be shut down and powered off before replacing any PCI adapter assigned to a Linux partition. Follow the non-hot-pluggable adapter procedures when replacing a PCI adapter in any partition with Linux installed.

Notes:

1. Use this procedure only when you are replacing an adapter with an identical adapter. If you are replacing an adapter with an adapter that is not identical to the adapter removed, go to “Hot-Pluggable PCI Adapter Removal” on page 129 and “Installing a Hot-Pluggable PCI Adapter” on page 135.
2. Removing a hot-pluggable PCI adapter requires the system administrator to take the PCI adapter offline before performing any PCI adapter hot-plug procedures. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

   For additional information about taking an adapter offline or removing it from the system configuration, see the AIX *System Management Guide: Operating System and Devices*.

   This publication is also contained on the AIX Documentation CD. The documentation is made accessible by loading the documentation CD onto the hard disk or by mounting the CD in the CD-ROM drive.

To replace a hot-plug PCI adapter, do the following:

1. Open the front and rear rack doors, and place the system into the service position as described in “D20 Service Position” on page 109.
2. Remove the service access cover as described in “Service Access Cover Removal” on page 111.
3. Refer to the *PCI Adapter Placement Reference*, order number SA23-2504, for information regarding slot restrictions for adapters that can be used in this system.
4. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 42.
5. Determine the slot from which you are removing the adapter.
6. Ensure that any processes or applications that might use the adapter are stopped.
7. Refer to “PCI Hot-Plug Manager Access” on page 123, and follow the steps in the access procedure to select **PCI Hot Plug Manager**. Then return here to continue.

8. Select **Unconfigure a Device** and press Enter.

   Note: If the adapter or device has a problem that prevents it from being replaced by hot-plug, it must be replaced by shutting down the system. Go to “Adding or Replacing a Non-Hot-Pluggable PCI Adapter” on page 128.
9. Press F4 to display the Device Names menu.
10. From the menu, select the adapter you are removing.
11. Use the tab key to answer YES to **Keep Definition** and YES to set **Unconfigure Child Devices**. Press Enter.
12. The ARE YOU SURE screen displays. Press Enter to verify the information. Successful unconfiguration is indicated by the `OK` message displayed next to the **Command** field at the top of the screen.
13. Press F3 to return to the PCI Hot-Plug Manager menu.
14. Select **List PCI Hot-Plug Slots** and press Enter.

    Note: If the List PCI Hot-Plug Slots menu indicates that the slot for the adapter you intend to replace or reseat is empty, do the following:

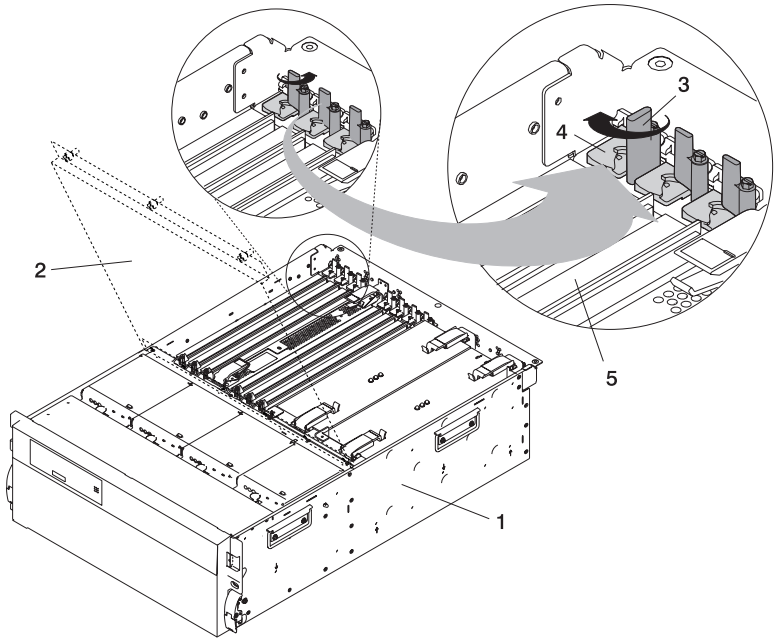
    a. Press F3 to cancel.
    b. Select **Add PCI Hot-Plug Adapter**, and press Enter. The display screen indicates that the PCI slot is empty.
    c. On the display screen, select the indicated empty slot. Examine at the adapter you intend to replace or reseat. A slow blinking amber LED located on the PCI riser card is indicating that the slot has been identified. Press Enter. The adapter is now in the action state.
    d. Completely remove the hot-plug adapter from the slot. The LED goes off.
    e. Reinstall the adapter, ensuring that it is correctly seated. Press Enter.
    f. Press F3 to return to the ″PCI Hot-Plug Adapter Menu″.
    g. Connect the appropriate cables and devices to the adapter.
    h. Select **List PCI Hot-Plug Slots**, then press Enter.
    i. Return to the error code or procedure that sent you here, if the ″List PCI Hot-Plug Slots″ menu indicates that the slot for the just-replaced or reseated adapter is empty.
15. Press F3 to cancel.
16. Select **Replace/Remove a PCI Hot-Plug Adapter**, then press Enter. The ″Replace/Remove a PCI Hot-Plug Adapter menu displays.

    Note: If the PCI Hot-Plug Adapter menu indicates that the slot for the just replaced adapter is reading `empty`, do the following:

    a. From the Replace/Remove a PCI Hot-Plug Adapter menu, press F3 to cancel.
    b. Select **Add PCI Hot-Plug Adapter**, and press Enter. The display screen indicates that the PCI slot is empty.
    c. On the display screen, select the indicated empty slot. Examine at the adapter you intend to replace. A slow blinking amber LED located on the PCI riser card is indicating that the slot has been identified. Press Enter. The adapter has been put into the action state.
    d. Completely remove the hot-plug adapter from the slot. The LED goes off.
    e. Reinstall the adapter, ensuring that it is correctly seated. Press Enter.
    f. Press F3 to return to the PCI Hot-Plug Adapter Menu.
    g. Select **Install/Configure Devices Added after IPL**.
    h. At the display screen, identify the PCI hot-plug slot that your adapter is using. If it still shows as being empty, redo steps a through g. However, before you reinstall the adapter, test it. If the adapter fails the test, redo steps **a** through **g** with a new adapter.

17. Move the cursor to select the adapter that you are removing, and press Enter.
18. Press the Tab key until the entry field displays the replace operation, and then press Enter. Follow the instructions that display on the screen until you are instructed to remove the adapter.
19. When you are instructed to remove the adapter from the adapter slot, disconnect any cables that are connected to the adapter being removed.
20. Turn the retainer clip, and lift the adapter retaining seat off the top of the adapter.
21. Carefully grasp the adapter by the edges, and pull it straight up and out of the subsystem.
22. If necessary, remove the replacement adapter from the antistatic package.

    Attention: Avoid touching the components and gold-edge connectors on the adapter.



1 D20
2 Service Access Cover
3 Retainer Clip
4 Retainer Seat
5 PCI Adapter

23. Place the adapter, component-side up, on a flat, static-protective surface.
24. Set any jumpers or switches as instructed by the adapter manufacturer.
25. Replace the adapter into the adapter slot. Carefully grasp the adapter by the edges and align the adapter in the slot guides. Insert the adapter fully into the adapter slot connector. If you are installing a full-length adapter, ensure that both ends of the adapter engage the card guides.
26. Lower the adapter retaining seat over the PCI adapter faceplate. Rotate the retainer clip until it stops.
27. Connect appropriate cables and devices to the adapter.
28. Continue to follow the screen instructions until you receive a message that the replacement is successful. Successful replacement is indicated by the OK message displayed next to the **Command** field at the top of the screen.
29. Press F3 to return to the PCI Hot-Plug Manager menu.

30. Select **Install/Configure Devices Added After IPL** and press Enter. Follow the instructions on the screen. Successful replacement is indicated by the OK message displayed next to the **Command** field at the top of the screen.

    Do not use **Install/Configure Devices Added After IPL** if your system is set up to run HACMP clustering. Consult with your system administrator or software support to determine the correct method to configure the replacement device.
31. If you do not have other adapters to replace, continue with the next step.

    OR

    If you have other adapters to replace, press the F3 key to return to the PCI Hot-Plug Manager menu and then return to step 14 on page 133.
32. Press F10 to exit the Hot-Plug Manager.

    If you have added, removed, or replaced any adapters, run the **diag -a** command. If the system responds with a menu or prompt, follow the instructions to complete the device configuration.
33. Close and then secure the service access cover with the three thumbscrews located on its back edge.
34. Connect the adapter cables.
35. Route the cables through the cable-management arm.
36. Push the system drawer back into the operating position as described in “D20 Operating Position” on page 110.
37. Close the rack doors.

Installing a Hot-Pluggable PCI Adapter

Attention: The Linux operating system does not support these hot-plug procedures. Also, Linux does not support hot-plugging any hot-pluggable PCI adapters. Systems with Linux installed on one or more partitions must be shut down and powered off before replacing any PCI adapter assigned to a Linux partition. Follow the non-hot-pluggable adapter procedures when replacing a PCI adapter in any partition with Linux installed.

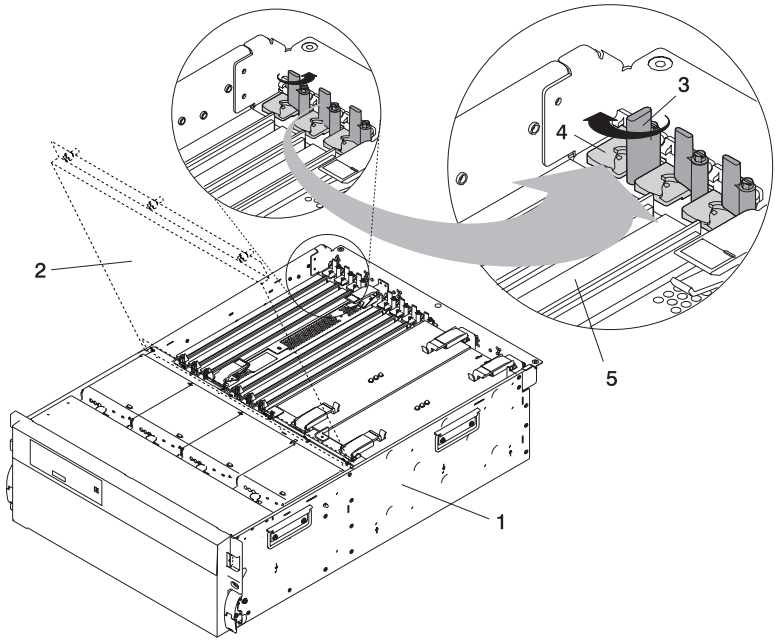
Note: This system supports PCI hot-pluggable adapters, so the system does not need to be shut down and the power cables removed before adding or replacing an adapter.

To add or install an adapter, do the following:

1. Open the front and rear rack doors, and place the system into the service position as described in “D20 Service Position” on page 109.
2. Open the service access cover as described in “Service Access Cover Removal” on page 111.
3. Refer to the *PCI Adapter Placement Reference*, order number SA23-2504, for information regarding slot restrictions for adapters that can be used in this system.
4. If necessary, remove the adapter expansion slot shield.
5. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 42.
6. If necessary, remove the adapter from the antistatic package.

   Attention: Avoid touching the components and gold-edge connectors on the adapter.
7. Place the adapter, component-side up, on a flat, static-protective surface.
8. Set any jumpers or switches as described by the adapter’s manufacturer.

9. Refer to “PCI Hot-Plug Manager Access” on page 123, and follow the steps in the access procedure to select **PCI Hot Plug Manager**. Then return here to continue.
10. From the PCI Hot-Plug Manager menu, select **Add a PCI Hot-Plug Adapter** and press Enter. The Add a Hot-Plug Adapter window displays.
11. See the *PCI Adapter Placement Reference*, order number SA23-2504, for adapter placement information. Then select an empty PCI slot for the adapter.
12. Select the appropriate empty PCI slot from the ones listed on the screen, and press Enter.
13. Rotate the retainer clip, lift the adapter retainer seat, and remove the expansion slot cover.



1 D20
2 Service Access Cover
3 Retainer Clip
4 Retainer Seat
5 PCI Adapter

14. Follow the instructions on the screen to install the adapter until the LED for the specified PCI slot is set to the Action state. See “D20 PCI-X Slots” on page 16.
15. When you are instructed to install the adapter in the adapter slot, carefully grasp the adapter by the edges and align the adapter in the slot guides. Insert the adapter fully into the adapter slot connector. If you are installing a full-length adapter, ensure that both ends of the adapter engage the card guides.
16. Lower the adapter retainer seat onto the PCI adapter faceplate. Rotate the adapter retainer clip until it stops.
17. Close and then secure the service access cover with the three thumbscrews located on its back edge.
18. Connect the adapter cables.
19. Route the adapter cables through the cable-management arm.
20. Push the system drawer back into the operating position as described in “D20 Operating Position” on page 110.
21. Close the rack doors.

D20 Hot-Plug Disk Drives

Attention: The Linux operating system does not support these hot-plug procedures. Also, Linux does not support hot-plugging any hot-pluggable PCI adapters. Systems with Linux installed on one or more partitions must be shut down and powered off before replacing any PCI adapter assigned to a Linux partition. Follow the non-hot-pluggable adapter procedures when replacing a PCI adapter in any partition with Linux installed.

Before performing the following procedure, read “Safety Considerations” on page 41.

Note: You do not have to power off the system to remove a hot-plug disk drive. Before you perform these procedures, ensure that the customer has taken appropriate actions to back up the data for the drive you are removing, and that the drive has been removed from the configuration. Physically removing a hot-plug disk drive from the system before it has been removed from the system configuration can cause unrecoverable data corruption.

Deconfiguring (Removing) or Configuring a Disk Drive

Use this procedure if you are removing or installing a drive while the system power is turned on.

Deconfiguring (Removing)

Before removing a disk drive from a volume group, do the following:

1. Log in as root user.
2. Before a disk can be removed from a volume group, all data must be backed up and the data removed from the disk to be replaced. Use AIX Logical Volume Manager to perform this task.
3. At the command line, type `smitty`.
4. Select **System Storage Manager (Physical and Logical Storage)** and press Enter.
5. Select **Logical Volume Manager** and press Enter.
6. Select **Volume Groups** and press Enter.
7. Select **Set Characteristics of a Volume Group** and press Enter.
8. Select **Remove a Physical Volume from a Volume Group**.
9. Press F4 to list the available volume groups, then select the volume group name and press Enter.
10. Press F4 to select a physical volume, and follow the instructions on the screen to select the physical volume. Then press Enter.
11. Press F3, Cancel, to go back to the first menu and select **System Storage Management (Physical and Logical Storage)**.
12. Select **Removable Disk Management**.
13. Select **Remove a Disk**.
14. Select the desired disk from the list on the screen and press Enter.

15. Follow the instructions on the screen to remove the drive.
16. When you are asked ″Are you sure?″, press Enter. The power LED on the drive that you selected will remain on.
17. Remove the disk drive by pulling the disk drive lever toward you until it is completely open.
18. Remove the disk drive from the slot. The LED on the top of the slot will turn off when the disk drive is removed.
19. Press F10 to exit **smitty**.

Configuring (Replacing)

1. Remove the disk drive from its protective packaging, and open the drive latch handle.
2. Install the disk drive in the drive slot. Align the disk drive with the drive slot rails, and slide the disk drive into the slot until it contacts the backplane at the rear of the drive bay. The drive should be in far enough for the latch handle to engage the latch. Push the disk drive lever up and to the rear to lock the disk drive. The LED above the slot will turn on.
3. Log in as root user.
4. At the command line, type `smitty`.
5. Select **Devices**.
6. Select **Install/Configure Devices Added After IPL** and press Enter. Successful configuration is indicated by the `OK` message displayed next to the Command field at the top of the screen
7. Press F3, Cancel, to go back to the first menu and select **System Storage Management (Physical and Logical Storage)** and press Enter.
8. Select **Logical Volume Manager** and press Enter.
9. Select **Volume Groups** and press Enter.
10. Select **Set Characteristics of a Volume Group** and press Enter.
11. Select **Add a Physical Volume to a Volume Group**.
12. Fill in the fields for the drive you are adding to the system. Press **F4** for a list of selections.
13. See the *AIX System Management Guide: Operating System and Devices* to finish the drive configuration.
14. Press F10 to exit **smitty**.

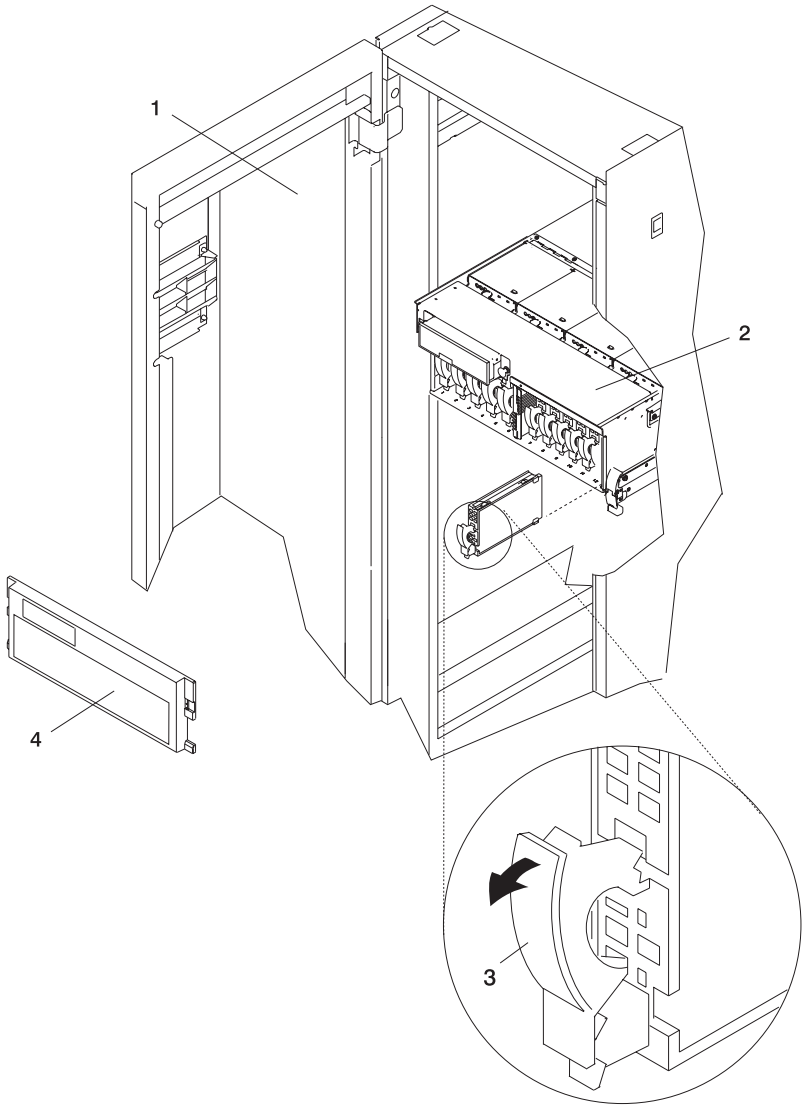
Hot-Plug Disk Drive Removal

Attention: The Linux operating system does not support these hot-plug procedures. Also, Linux does not support hot-plugging any hot-pluggable PCI adapters. Systems with Linux installed on one or more partitions must be shut down and powered off before replacing any PCI adapter assigned to a Linux partition. Follow the non-hot-pluggable adapter procedures when replacing a PCI adapter in any partition with Linux installed.

Attention: Before you perform the following procedure, ensure that the customer has taken appropriate actions to back up the data for the drive you are removing, and that the drive has been removed from the configuration. Physically removing a hot-plug drive from the system before it has been removed from the system configuration can cause unrecoverable data corruption. Refer to “Deconfiguring (Removing) or Configuring a Disk Drive” on page 137.

To remove a hot-plug disk drive, do the following:

1. Before removing the disk, ensure that all data has been saved.
2. Deconfigure the drive that you are removing from the system. See “Deconfiguring (Removing) or Configuring a Disk Drive” on page 137.
3. Open the rack front door.
4. Remove the front bezel as described in “Front Bezel Removal” on page 112.
5. Locate the hot-plug disk drive you plan to remove. If you are removing a faulty disk drive, a lit amber LED located at the front right side of each disk drive will help you isolate the faulty drive. Before physically removing any disk drive, do the following:
   a. Log in as root user.
   b. At the command line, type `smitty`.
   c. Select **System Storage Management (Physical and Logical Storage)**.
   d. Select **Removable Disk Management**.
   e. Select **Remove a Disk**.
   f. Select the desired disk from the list on the screen and press Enter.
6. Remove the disk drive by placing the handle on the disk drive into the open position (perpendicular to the drive).
7. Pull the hot-plug disk drive out of the disk drive bay. The lit LED on the disk drive will turn off when the disk drive is removed.
8. Press F10 to exit **smitty**.



1 Rack Front Door
2 D20
3 Disk Drive Release Handle
4 Front Bezel

Hot-Plug Disk Drive Replacement

Attention: The Linux operating system does not support these hot-plug procedures. Also, Linux does not support hot-plugging any hot-pluggable PCI adapters. Systems with Linux installed on one or more partitions must be shut down and powered off before replacing any PCI adapter assigned to a Linux partition. Follow the non-hot-pluggable adapter procedures when replacing a PCI adapter in any partition with Linux installed.

Attention: Before you perform these procedures, ensure that the customer has taken appropriate actions to back up the data for the drive you are removing, and that the drive has been removed from the configuration. Physically removing a hot-plug drive from the system before it has been removed from the system configuration can cause unrecoverable data corruption. Refer to “Deconfiguring (Removing) or Configuring a Disk Drive” on page 137.

Do not use **Install/Configure Devices Added After IPL** if your system is set up to run HACMP clustering. Consult with your system administrator or software support to determine the correct method to configure the replacement disk.

1. To install a hot-plug disk drive, do the following:
   a. Ensure the tray handle is open (perpendicular to the drive).
   b. Align the drive/tray assembly so that it engages the guide rails in the bay.
   c. Push the drive assembly into the bay until the tray handle engages the lock mechanism.
   d. Push the tray handle in until it locks. The lit LED on the disk drive will turn on.
2. Log in as root user.
3. At the command line, type `smitty`.
4. Select **Devices**.
5. Select **Install/Configure Devices Added After IPL** and press Enter. Successful configuration is indicated by the `OK` message displayed next to the **Command** field at the top of the screen.
6. Press **F10** to exit **smitty**.
7. Replace the front bezel as described in “Front Bezel Replacement” on page 112.
8. Close the rack doors.

D20 Disk Drive Cage

Before performing the following procedure, read “Safety Considerations” on page 41.

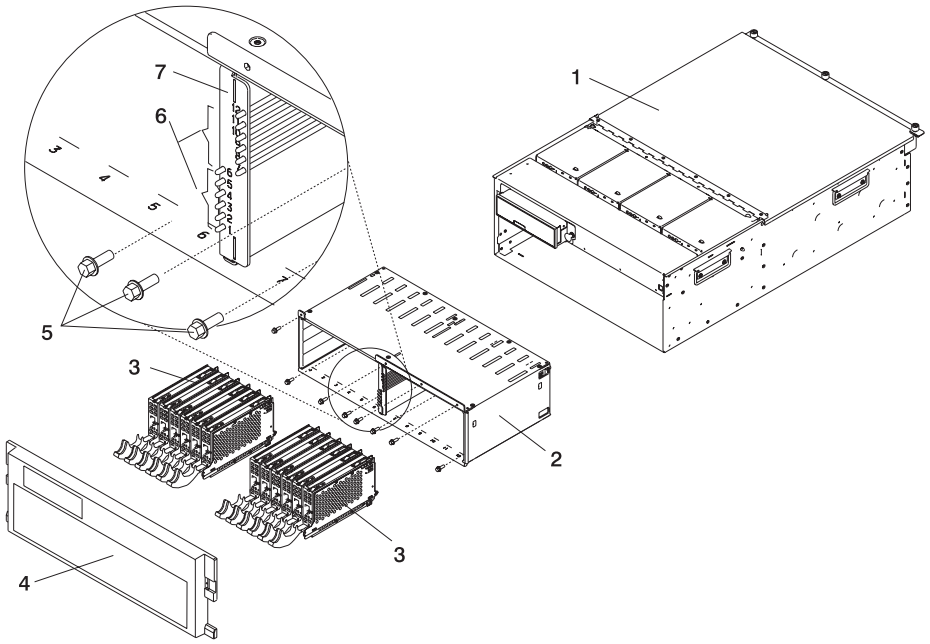
Disk Drive Cage Removal

To remove the disk drive cage, do the following:

1. Open the rack front door.
2. Shut down the system as described in “Stopping and Starting the System” on page 42.
3. Place the system into the service position as described in “D20 Service Position” on page 109.
4. Disconnect the power source from the system.

   Note: This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
5. Remove the front bezel as described in “Front Bezel Removal” on page 112.
6. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 42.
7. Label and then remove all hot-plug disk drives as described in “Hot-Plug Disk Drive Removal” on page 139.
8. Remove the 8 retaining screws that secure the disk drive cage to the front of the system chassis. See the following illustration.
9. Pull the disk drive cage assembly out of the subsystem.

   Note: When pulling the disk drive cage out of the subsystem, use the center post and pull straight back toward you. *Do Not* grab, hold or pull on the light pipes.



1 D20
2 Disk Drive Cage
3 Disk Drives
4 Front Bezel
5 Retaining Screws (Quantity 8)
6 Light Pipes
7 Light Pipe Support Bracket

Disk Drive Cage Replacement

To replace the disk drive cage, go the following:

1. Insert the disk drive cage assembly into the subsystem.
2. Insert the 8 retaining screws that secure the disk drive cage to the front of the system chassis.
3. Replace all hot-plug disk drives as described in “Hot-Plug Disk Drive Replacement” on page 141.
4. Replace the front bezel as described in “Front Bezel Replacement” on page 112.
5. Reconnect the power source to the system. If the system has two power supplies, two power cables need to be reconnected.
6. Put the system back into the operating position as described in “D20 Operating Position” on page 110.
7. Start the system as described in “Stopping and Starting the System” on page 42.
8. Close the rack door.

D20 Disk Drive Backplane

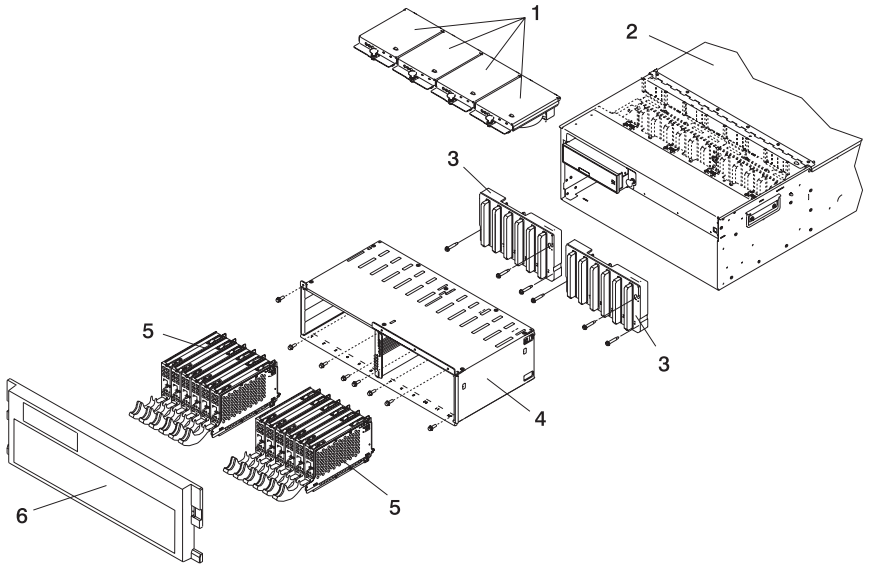
Before performing the following procedure, read “Safety Considerations” on page 41.

Disk Drive Backplane Removal

To remove the disk drive backplane, do the following:

1. Remove all hot-plug disk drives as described in “Hot-Plug Disk Drive Removal” on page 139.
2. Remove the four cooling blowers as described in “Hot-Swap Blower Removal” on page 115.

   Note: Removing the cooling blowers enables you to view the disk drive backplanes.
3. Disconnect the cables connected to the disk drive backplane.
4. Remove the 8 retaining screws that secure the disk drive cage as described in “Disk Drive Cage Removal” on page 142.
5. Pull the disk drive cage assembly out of the system.
6. Remove the 2 retaining screws that secure the disk drive backplane to the subsystem chassis.
7. Grasp the disk drive backplane from the bottom of one of the connectors and pull it out of the chassis, bottom first.



1 Cooling blowers
2 D20
3 Disk Drive Backplane
4 Disk Drive Cage
5 Disk Drives
6 Front Bezel

Disk Drive Backplane Replacement

To replace the disk drive backplane, do the following:

1. Reconnect the power/signal cable to the connector located on the top edge of the disk drive backplane.
2. Grasp a bottom edge of one of the connectors located on the disk drive backplane, and insert the backplane into the disk drive bay.
3. Using the 3 supplied retaining screws, secure the disk drive backplane to the subsystem chassis.
4. Carefully insert the disk drive cage assembly into the system.
5. Align and then secure the disk drive cage to the subsystem chassis with the 7 previously removed retaining screws.
6. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 42.
7. Replace all hot-plug disk drives as described in “Hot-Plug Disk Drive Replacement” on page 141.
8. Reconnect the power source to the system.
9. Replace the front bezel as described in “Front Bezel Replacement” on page 112.
10. Power on the system as described in “Stopping and Starting the System” on page 42.
11. Close and then secure the service access cover with the three thumbscrews located on its back edge.
12. Return the subsystem into the operating position as described in “D20 Operating Position” on page 110.
13. Close the rack front door.

D20 Power Supplies

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.
D02

The D20 subsystem has power supplies that have hot-swap capabilities. To use this feature, you *must* have two power supplies in place.

Power Supply Removal

D20 subsystems configured at the factory with one power supply have a power supply filler panel. The filler panel protects the vacant power supply connector from dust or damage. If you plan to remove one of the power supplies from a subsystem configured with two power supplies, obtain the power supply filler panel. The part number for the power supply filler panel is 53P0233.

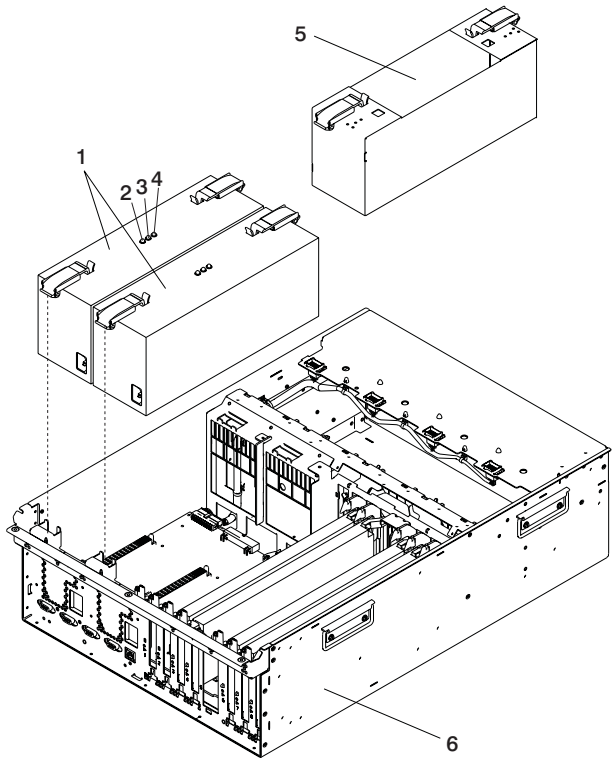
Note: You need not shut down the system to change a subsystem power supply.

Before performing any of the following procedure, read and understand all of the safety notices beginning with “Safety Considerations” on page 41.

To remove a power supply from your subsystem, do the following:

1. Put the subsystem into the service position as described in “D20 Service Position” on page 109.
2. Open the service access cover as described in “D20 Service Access Cover” on page 111.
3. If your subsystem is configured with two power supplies, visually check the power supply LEDs. If one of the power supplies has an amber LED that is lit or blinking, suspect that power supply to be faulty.
4. Remove the power cable from the rear of the power supply. Wait at least 10 seconds before performing the next step.
5. Release, and then lift the power supply handles.
6. Lift the handles until they are perpendicular (90 degrees) to the top of the power supply. By placing the handles perpendicular to the top of the power supply, the base or hinged portion of each handle acts as a cam and will gently pry the power supply from its docking connector located on the subsystem system board.

7. Carefully remove the power supply from the subsystem.



1 Power Supplies
2 Green Power LED
3 Amber Fault/Identify LED
4 Green DC Good LED
5 Power Supply Filler
6 D20 Subsystem

Note: During normal operation, each power-supply bay must have either a power supply or filler panel installed for proper cooling.

Power Supply Replacement

To replace a power supply, do the following:

1. Ensure the handles are in the unlocked position and perpendicular to the power supply.
2. Carefully insert the new power supply into the power supply bay.
3. Press the power supply onto the docking connectors.
4. Put the power supply handles into the locked position.

   Note: The handles act as a cam and will correctly seat the power supply.
5. Reconnect the power source to the replaced power supply. The green LED located on the power supply comes on solid.
6. Close and then secure the service access cover with the three thumbscrews located on its back edge.
7. Put the D20 subsystem back into the operating position as described in “D20 Operating Position” on page 110.
8. If your system has successfully powered on, close the rack doors.

D20 Power Supply Bulkhead

Before performing the following procedure, read the “Safety Considerations” on page 41.

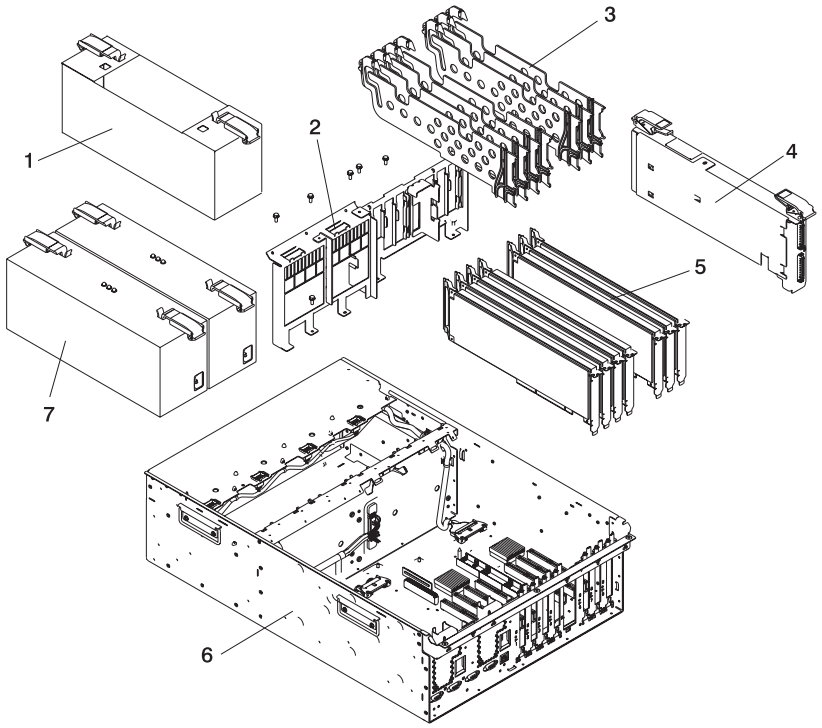
Power Supply Bulkhead Removal

To remove the power supply bulkhead, do the following:

1. Open the rack front door.
2. Shut down the system as described in “Stopping and Starting the System” on page 42.
3. Put the D20 subsystem into the service position.
4. Disconnect the power source from the system.

   Note: This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
5. Open the service access cover as described in “Opening the Service Access Cover” on page 111.
6. Disconnect the RIO-2 cables from the RIO connectors located on the rear of the subsystem.
7. Disconnect the power cables from the power supplies
8. Label and then disconnect all PCI adapter cables from their respective adapters.
9. Remove the power supplies or power supply filler as described in “Power Supply Removal” on page 146.
10. Remove the RIO bus adapter as described in “RIO Bus Adapter Removal” on page 120.
11. Remove all PCI adapters as described in “Non-Hot-Pluggable PCI Adapter Removal” on page 126.

    Note: Alternately remove the PCI dividers as you are removing the PCI adapters.
12. Remove the three upper-retaining screws that secure the top edge of the power supply bulkhead to the subsystem chassis.
13. Remove the three lower-retaining screws that secure the bottom portion of the power supply bulkhead to the subsystem chassis.
14. Remove the power supply bulkhead by lifting it straight up and out of the subsystem.



1 Power Supply Filler
2 Power Supply Bulkhead
3 PCI Dividers
4 RIO Bus Adapter
5 PCI-X Adapters
6 D20
7 Power Supplies

Power Supply Bulkhead Replacement

To replace the power supply bulkhead, do the following:

1. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 42.
2. Insert the power supply bulkhead into the subsystem.
3. Align the three screw holes located on the top of the power supply bulkhead with the three threaded screw holes located on the subsystem chassis.
4. Align the three screw holes located on the bottom of the power supply bulkhead with the three threaded screw holes located on the subsystem chassis base.
5. Tighten the six retaining screws for the power supply bulkhead.
6. Replace the power supplies or the power supply filler as described in “Power Supply Replacement” on page 147.
7. Reconnect the power cables to the power supplies.
8. Replace the RIO bus adapter as described in “RIO Bus Adapter Replacement” on page 122.
9. Reconnect the RIO-2 cables from the RIO connectors located on the rear of the subsystem.
10. Replace all of the previously removed PCI adapters as described in “Adding or Replacing a Non-Hot-Pluggable PCI Adapter” on page 128.

    Note: When you are reinstalling the PCI adapters, alternately reinstall the PCI dividers.
11. Reconnect all PCI adapter cables to their respective adapters.
12. Reconnect the power source to the system. The green LED located on the power supply comes on solid.
13. Close then secure the service access cover with the three thumbscrews located on its back edge.
14. Put the D20 subsystem back into the operating position as described in “D20 Operating Position” on page 110.
15. After the system has successfully powered on, close the rack doors.

D20 I/O Backplane Assembly

Before performing the following procedure, read the “Safety Considerations” on page 41.

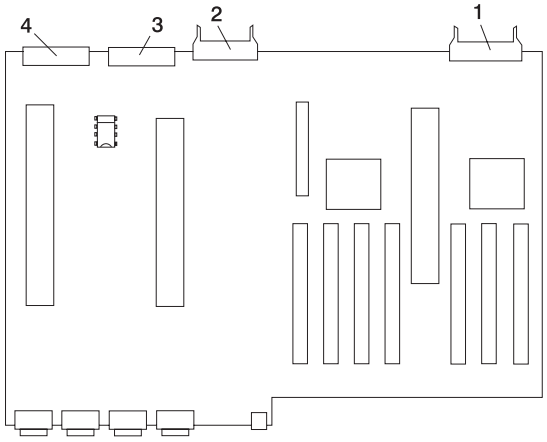
I/O Backplane Removal

To remove the I/O backplane from the subsystem, do the following:

1. Open the rack front door.
2. Shut down the system as described in “Stopping and Starting the System” on page 42.
3. Put the D20 subsystem into the service position.
4. Disconnect the power source from the system.

   Note: This system may be equipped with a second power supply. Before continuing with this procedure, ensure that the power source to the system has been completely disconnected.
5. Open the service access cover as described in “Opening the Service Access Cover” on page 111.
6. Disconnect the RIO-2 cables from the RIO connectors located on the rear of the subsystem.
7. Disconnect the power cables from the I/O subsystem power supplies.
8. Disconnect the SPCN connectors from the back of the subsystem chassis.
9. Label, and then disconnect all PCI adapter cables from their respective adapters.
10. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 42.
11. Remove the RIO bus adapter as described in “RIO Bus Adapter Removal” on page 120.
12. Remove all of the power supplies or power supply filler as described in “Power Supply Removal” on page 146.
13. Remove all PCI adapters as described in “Non-Hot-Pluggable PCI Adapter Removal” on page 126.

    Note: When you are removing the PCI adapters, alternately remove the seven PCI dividers.
14. Disconnect the following cables in the order listed from the connectors located on the front of the I/O backplane. See the following illustration for connector locations.
    - Operator panel cable
    - Disk drive SPCN cable
    - Disk drive power cable
    - Cooling blower cable



1 Operator Panel Connector

2 Disk Drive System Power Control Network (SPCN) Connector

3 Disk Drive Power Connector

4 Cooling Blower Connector

15. Remove the plastic membrane from the top of the I/O backplane by first removing the five retaining screws that secure the plastic membrane to the I/O backplane.

    Note: When removing the plastic membrane, slide the membrane under the light pipes that identify the green and amber power LEDs.
16. Remove the three retaining screws that secure the front edge of the I/O backplane to the subsystem chassis.
17. Go to the rear of the subsystem, and remove the two retaining screws that secure the back edge of the I/O backplane to the back chassis bulkhead.

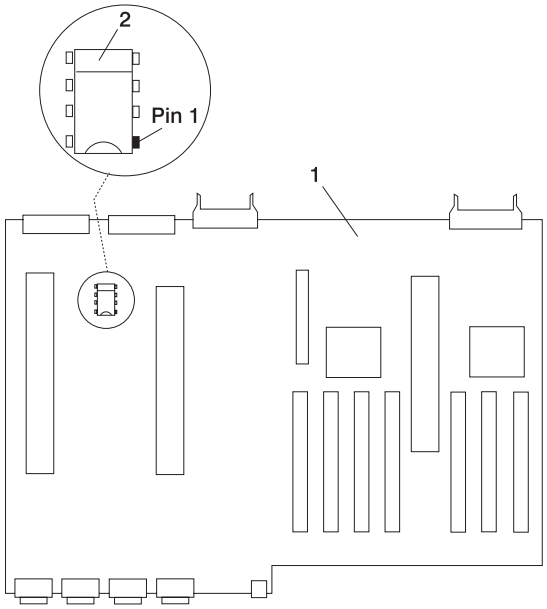
    Note: The two retaining screws that secure the back edge of the I/O backplane to the rear chassis bulkhead are located just below the left SPCN connector and the rack indicator connector.
18. Remove the two retaining screws that secure the SCSI cable bracket to the subsystem-chassis bracket.
19. Remove the SCSI cable bracket by wiggling it up and down, then pulling it straight out and away from the PCI adapter-headstock bracket and the subsystem chassis bracket.
20. Remove the four retaining screws that secure the PCI adapter-headstock bracket to the chassis and power supply bulkhead.
21. Remove the PCI adapter-headstock bracket by lifting it up, then out of the subsystem chassis.
22. Remove the four retaining screws that secure the power-supply bulkhead to the chassis
23. Remove the power-supply bulkhead by doing the following:
    a. Lift the slotted tab off the alignment pin. The slotted tab and alignment pin are located at the bottom edge of the power-supply bulkhead.
    b. Move the lower portion of the power-supply bulkhead out and away from the alignment pin.

       Notes:

       1) Ensure that the back edge of the power-supply bulkhead clears the disk drive backplane's plastic alignment pin. The disk drive backplane's plastic alignment pin is located on the disk drive-backplane support bracket between the power-supply bulkhead and the PCI adapter-headstock bracket.
       2) The disk drive backplane-support bracket is not shown in the following illustration; however, it is easily located. This is the bracket that secures the service access cover to the chassis. It also supports the disk drive backplanes, cooling blowers, power supply bulkhead, and PCI adapter headstock bracket.
    c. Push the power-supply bulkhead toward the center of the I/O subsystem chassis.

       Note: The upper-right corner of the power-supply bulkhead might get caught on the underside of the chassis support. If the power-supply bulkhead gets caught on the underside of the chassis support, wiggle the bulkhead until it is freed from under the chassis support.
24. Remove the I/O backplane by sliding the backplane toward the front of the I/O subsystem.
25. Slowly lift the I/O backplane straight up and out of the subsystem.

26. Locate the VPD module.



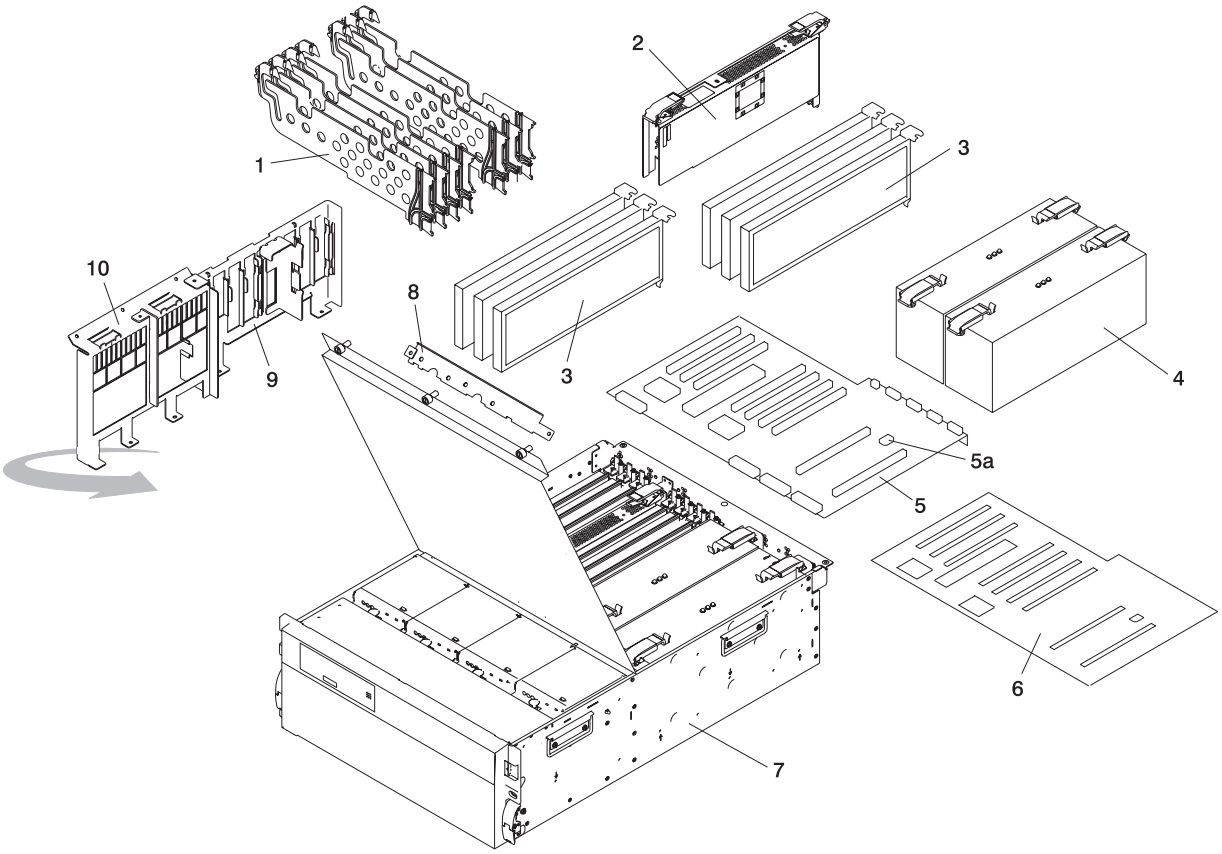
1 I/O Backplane

2 VPD Module

Attention: Note the location of Pin 1 before removing.

27. Note the location of pin 1 on the VPD module.
28. Gently remove the VPD module and put it in a safe place.

Note: You will be installing the old VPD module onto the new I/O backplane.



1 PCI Adapter Dividers (maximum quantity 7)
2 RIO Bus Adapter
3 PCI-X Adapters (maximum quantity 7)
4 Power Supplies
5 I/O Backplane
5a VPD Module
6 Plastic Membrane
7 D20
8 SCSI Cable Bracket
9 PCI Adapter-Headstock Bracket
10 Power-Supply Bulkhead

I/O Backplane Replacement

To replace the I/O backplane, do the following:

1. Before handling any card, board, or memory DIMM, be sure to use your electrostatic discharge strap to minimize static-electric discharge. Refer to “Handling Static-Sensitive Devices” on page 42.
2. Note the location of pin 1 on the VPD module.
3. Remove the VPD module that was installed on the new I/O backplane.
4. Install the VPD module from the old I/O backplane onto the new I/O backplane.

   Note: When installing the VPD module, ensure that pin 1 is in the correct orientation.
5. Carefully align the I/O backplane to the alignment pins located on the chassis base.
6. Replace the three front retaining screws that secure the I/O backplane to the chassis.
7. Correctly align and then place the plastic membrane that protects the I/O backplane over the I/O backplane. Secure it in place with five retaining screws.
8. Reconnect the following cables, in the order listed, to their respective connectors located on the front of the I/O backplane:
   - Cooling blower cable
   - Disk drive power cable
   - Disk drive SPCN cable
   - Operator panel cable
9. Go to the rear of the subsystem chassis, and replace the two rear retaining screws.

   Note: The two threaded screw holes used to secure the rear of the I/O backplane to the rear of the subsystem chassis are located just below the left SPCN connector and the rack-indicator connector.
10. Replace the power-supply bulkhead by doing the following:
    a. Rotate the power-supply bulkhead, placing the top right corner under the chassis support bracket.
    b. Align the slotted tab, located on the lower edge of the power supply bulkhead, with the alignment pin, located on the subsystem chassis.
    c. Align the four clearance holes located on the power-supply bulkhead with the four screw holes located on the upper and lower subsystem chassis.

       Note: When aligning the power-supply bulkhead, wiggle it until properly seated.
    d. Secure the power-supply bulkhead to the subsystem chassis with four retaining screws.
11. Replace the PCI adapter-headstock bracket.
12. Align the four clearance holes on the bracket with the four screw holes located on the chassis.
13. Secure the PCI adapter-headstock bracket to the chassis with four retaining screws.
14. Replace the SCSI cable bracket, aligning the two screw holes and securing it with two retaining screws to the chassis retaining bracket.
15. Reconnect the SPCN connectors from the back of the subsystem chassis.
16. Replace the power supplies or the power supply filler as described in “Power Supply Replacement” on page 147.
17. Replace the RIO bus adapter as described in “RIO Bus Adapter Replacement” on page 122.
18. Reconnect the RIO-2 cables from the RIO connectors located on the rear of the subsystem.

19. Replace all of the previously removed PCI adapters as described in “Adding or Replacing a Non-Hot-Pluggable PCI Adapter” on page 128.

    Note: Alternately reinstall the PCI dividers, when reinstalling the PCI adapters.
20. Reconnect all PCI adapter cables to their respective adapters.
21. Reconnect the power cables to the power supplies.
22. Reconnect the power source to the system. The green LED located on the power supply comes on solid.
23. Close and then secure the service access cover with the three thumbscrews located on its back edge.
24. Put the D20 subsystem back into the operating position as described in “D20 Operating Position” on page 110.
25. After the system has successfully powered on, close the rack doors.

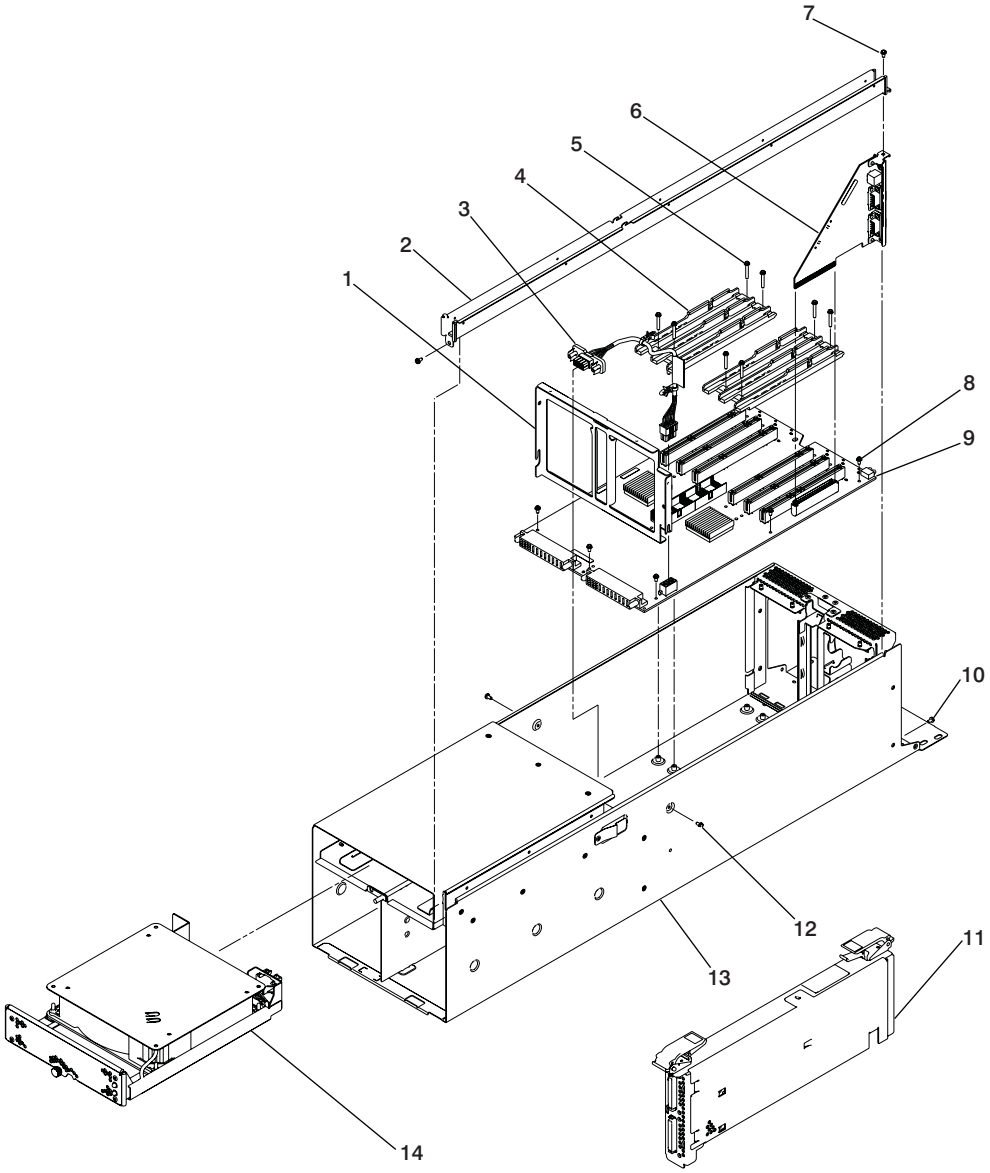
Chapter 4. Parts Information

This chapter contains parts information for the D10 and D20 I/O drawers.

D10 I/O Subsystem

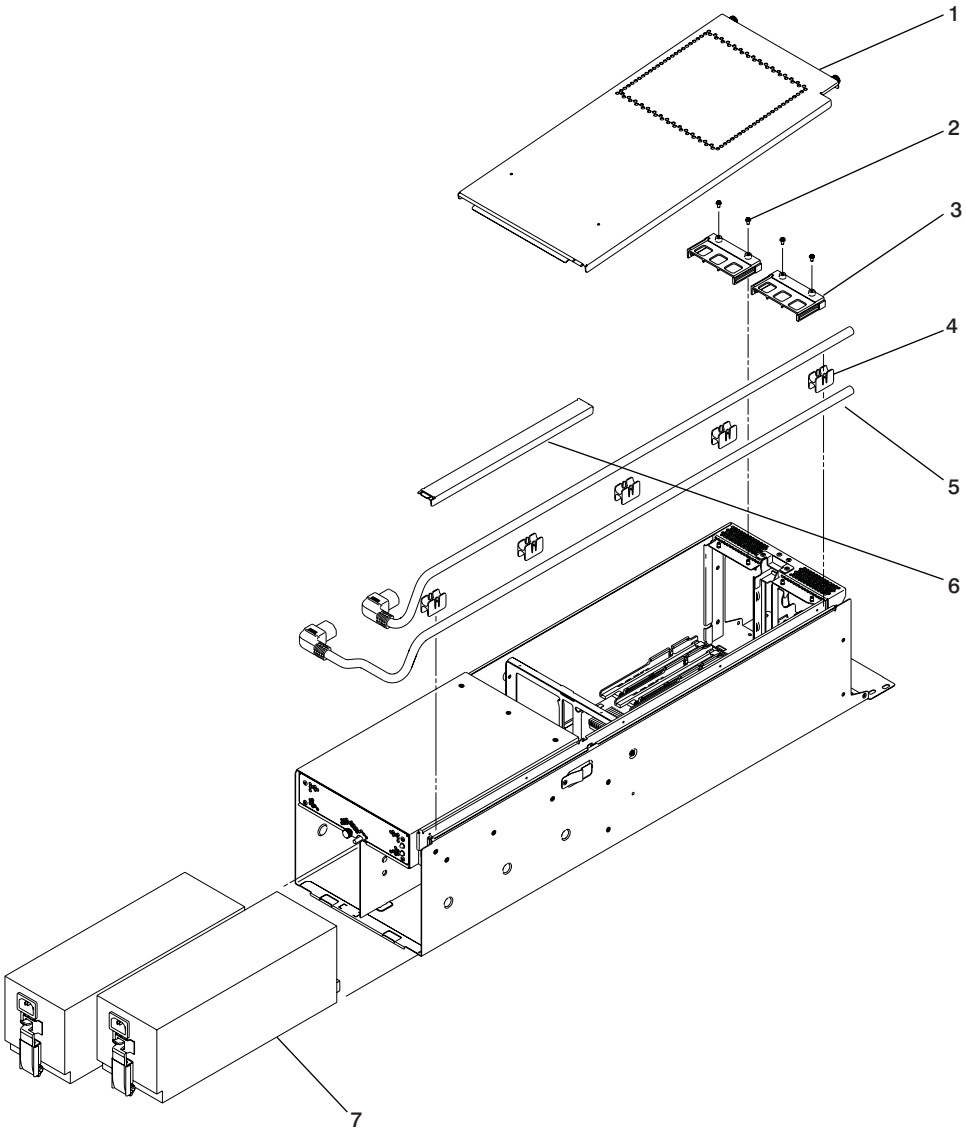
This section lists part numbers for the D10 I/O Subsystem. This I/O subsystem is used in conjunction with a system unit. Depending on your configuration, the quantities of parts listed may increase by the actual number of I/O subsystems connected to the system unit.

D10 I/O Subsystems Parts



Index	Part Number	Units Per Assy	Description
1	00P2752	1	Bracket, Bulkhead
2	09P4656	1	Tray, cable
3	09P5417	1	Cable, fan
4	09P3128	2	Guide, mounting
5	1624749	8	Screw, guide mounting
6	*******		See index number 9
7	1621829	2	Screw, tray mounting
8	1624743	6	Screw, backplane mounting
9	09P5921	1	I/O backplane assembly (includes SPCN connector card)
10	1621829	1	Screw, tailstock cover mounting
11	00P4053	1	Dual port RIO bus adapter
	00P4080	1	Dual port RIO-2 bus adapter
12	1621829	2	Screw, midplate cover mounting
13	00P2751	1	Drawer chassis assembly
14	09P4664	1	Fan assembly

D10 I/O Subsystem Parts (continued)



Index	Part Number	Units Per Assy	Description
1	00P2753	1	Cover, access
	09P5159		Front bezel, white
2	1624743	4	Screw, guide mounting
3	00P2750	2	Guide, adapter cassette top
	44P0239		Empty PCI adapter cassette kit
	00P3842		PCI adapter cassette blank filler, long
	00P3843		PCI adapter cassette blank filler, short
	53P5450		PCI bracket (used in PCI adapter cassette to install Gigabit Ethernet PCI-X adapter)
	44P2661		PCI clip (used in PCI adapter cassette to install Ultra SCSI adapter)
	44P0321		PCI clip (used in PCI adapter cassette to install 10/100 Eternet adapter)
	44P2675		PCI clip for (used in PCI adapter cassette to install FCAL 2GBS adapter)
	44P2676		Clip for FC 2969 bracket (used in PCI adapter cassette to install Gigabit Ethernet PCI adapter)
4	09P3185	5	Guide, power cable support
5	09P2401	2	Cable, power
6	09P4665	1	Cover, power cable channel
7	09P3354	2	Power supply
	09P4778	1	Front Bezel
8	09P5159	1	Front Bezel

D10 SPCN, RIO, and Rack Beacon Cables (These parts are not shown.)

Index	Part Number	Units Per Assy	Description
1	53P2231	Up to 12	Rack beacon junction box, 7-port mini connector (4693)
2	53P2237	Up to 12	Rack beacon connector cable, subsystem to junction box, 4-pin std to 4-pin mini connector, 3 meter (4691)
	07H6655	As needed	Hook-and-loop fastner
3	53P2854	Up to 12	Rack beacon connector cable, 4-pin mini to 4-pin mini 0.25 meter (4692)
4	87G6235	Up to 9	SPCN cable, 2 meter
	09P1251	Up to 9	SPCN cable, 3 meter
	21F9469	Up to 9	SPCN cable, 6 meter
	21F9358	Up to 9	SPCN cable, 15 meter
5	21P5454	Up to 10	RIO-2 cable, 1.2 meter
	53P2676	Up to 10	RIO-2 cable, 3.5 meter
	21P5456	Up to 10	RIO-2 cable, 10 meter

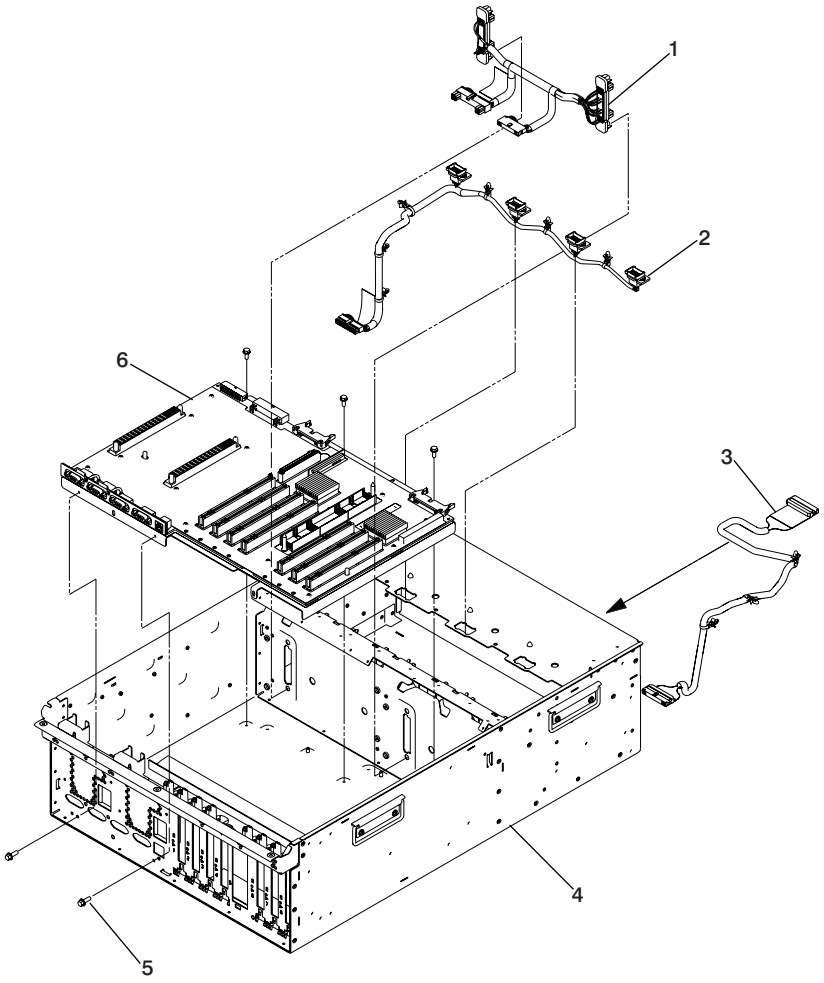
D10 Rack Mounting Enclosure (These parts are not shown.)

Index	Part Number	Units Per Assy	Description
1	09P4746	1	Two position I/O subsystem mounting assembly
2	03N3845	1	Left rail
	03N3847	1	Right rail
3	00P2402	2	Cable support bracket
4	09P4911	1	Mounting bracket
5	09P4912	1	Rear filler for empty I/O subsystem space in mounting assembly

D20 I/O Subsystem

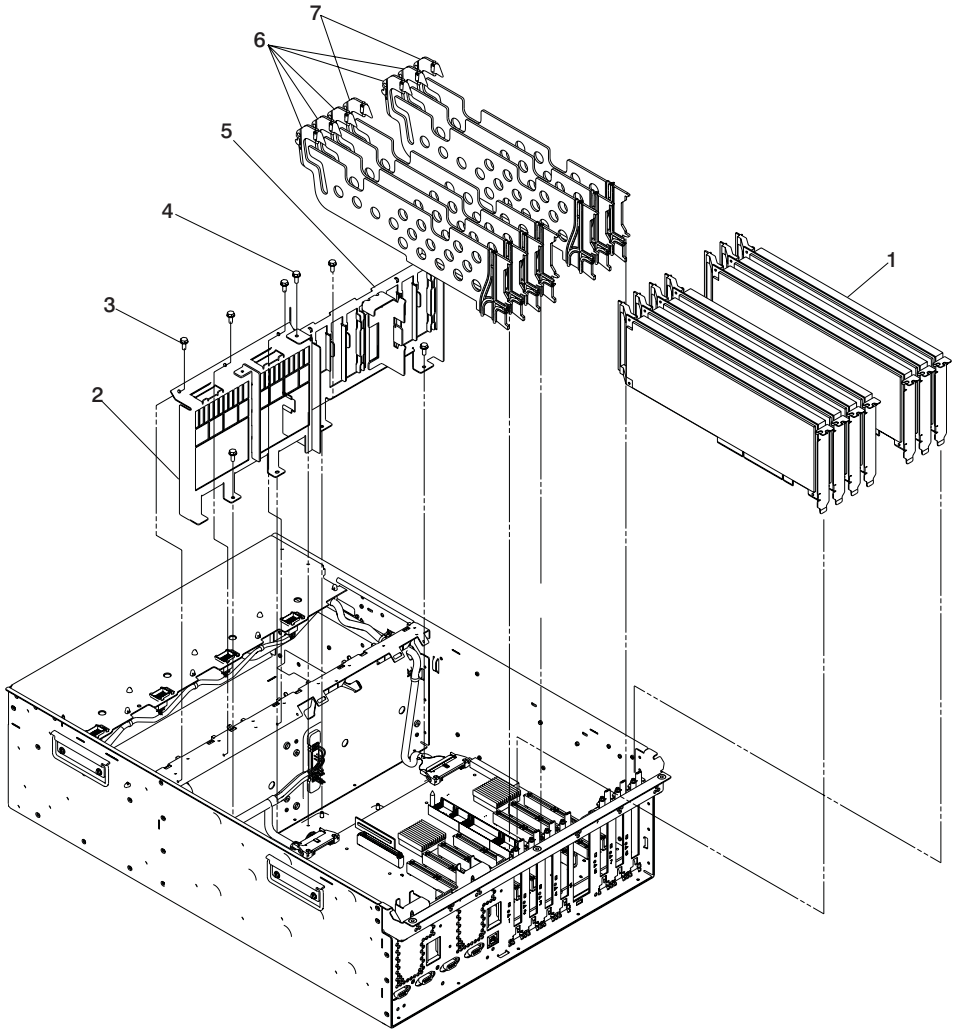
This section lists part numbers for the D20 I/O Subsystem. This I/O subsystem is used in conjunction with a system unit. Depending on your configuration, the quantities of parts listed may increase by the actual number of I/O subsystems connected to the system unit.

D20 I/O Backplane and Cabling



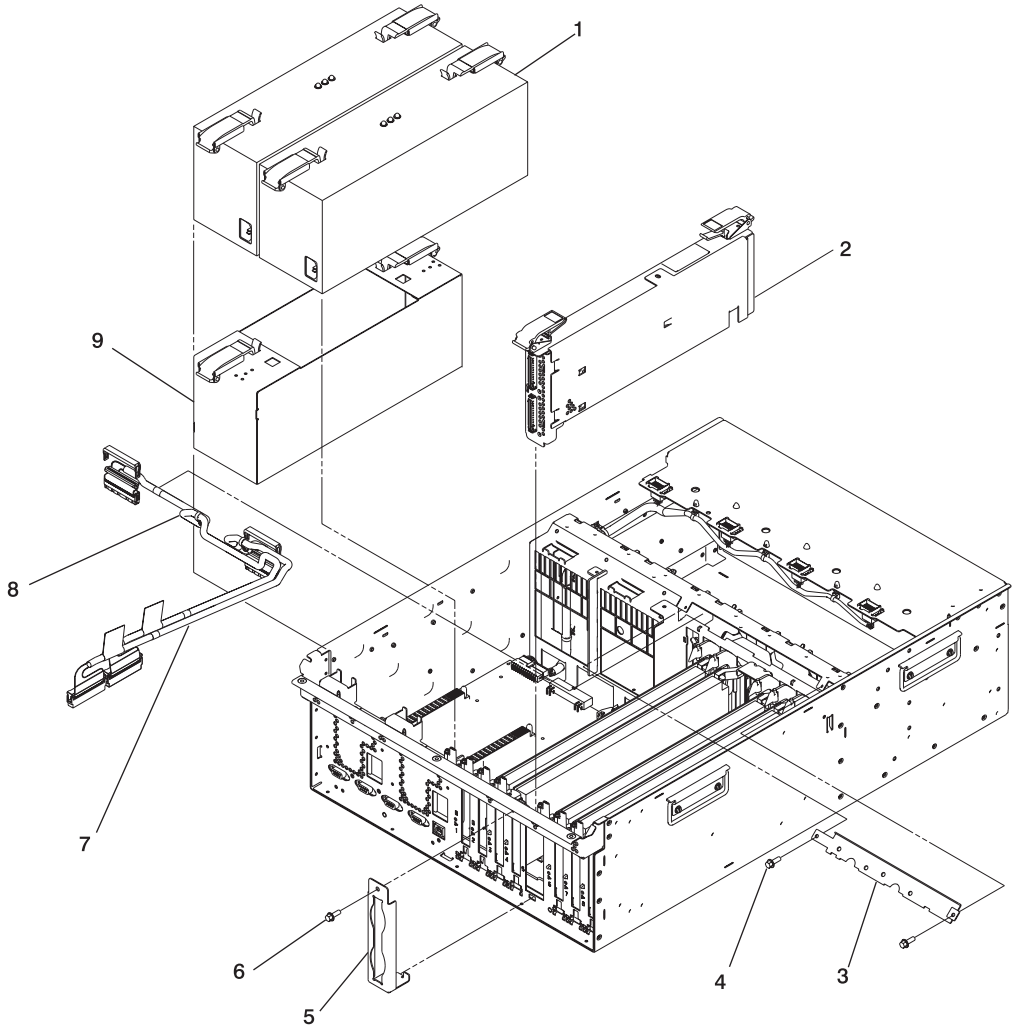
Index	Part Number	Units Per Assy	Description
1	53P0416	1	DASD cable
2	53P0419	1	Blower cable
3	53P0414	1	Operator panel cable
4	53P0220	1	Chassis assembly
5	44H7366	5	Mounting screw, stiffener
6	53P3472	1	I/O Backplane

D20 PCI Slots



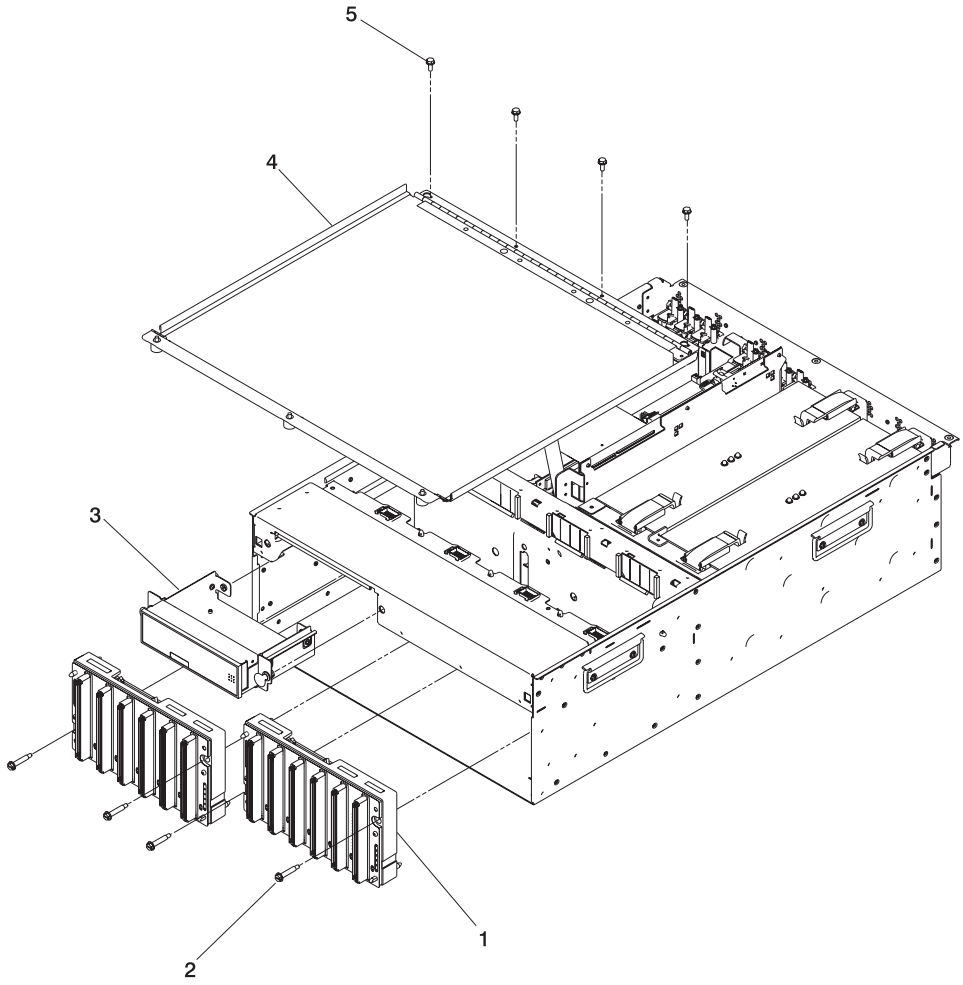
Index	Part Number	Units Per Assy	Description
1	See Note	7 (maximum quantity)	PCI adapter
2	53P0248	1	Power supply bulkhead
3	44H7366	4	Screw, power bulkhead mounting
4	44H7366	3	Screw, PCI plate mounting
5	53P0249	1	PCI adapter headstock bracket
6	53P2728	5	PCI dividers
7	53P2729	2	PCI dividers
Note: See *Diagnostic Information for Multiple Bus Systems* for part numbers.			

D20 Power, RIO Adapter, Cabling



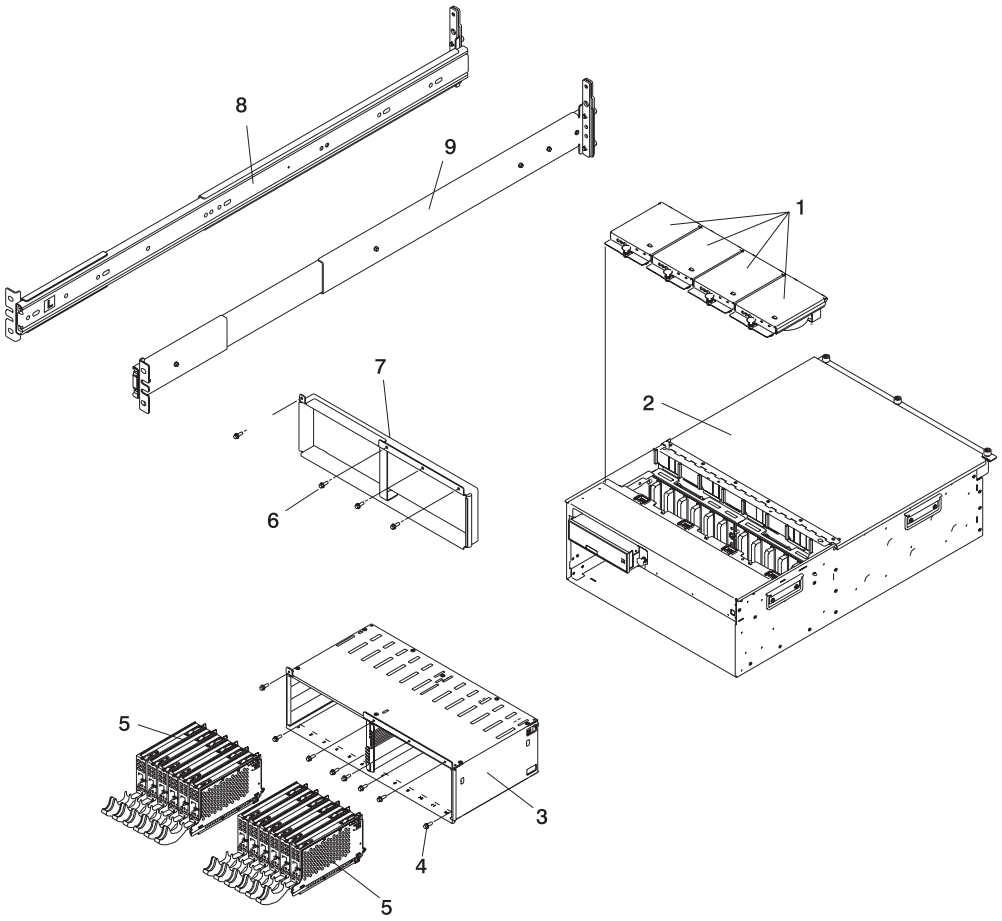
Index	Part Number	Units Per Assy	Description
1	53P4832	2 (maximum quantity)	Power supply
2	53P3800	1	RIO bus adapter
	97H2459	1	RIO-2 bus adapter
3	53P2690	3	Cable bracket, SCSI
4	44H7366	1	Screw, SCSI cable
5	53P0639	5	RIO-2 cable bracket
6	44H7366	2	Screw, RIO-2 cable bracket
7	53P0417	Configuration dependent	SCSI bus cable
8	53P0418	Configuration dependent	SCSI bus cable
9	53P0233	1	Power supply filler

D20 Operator Panel



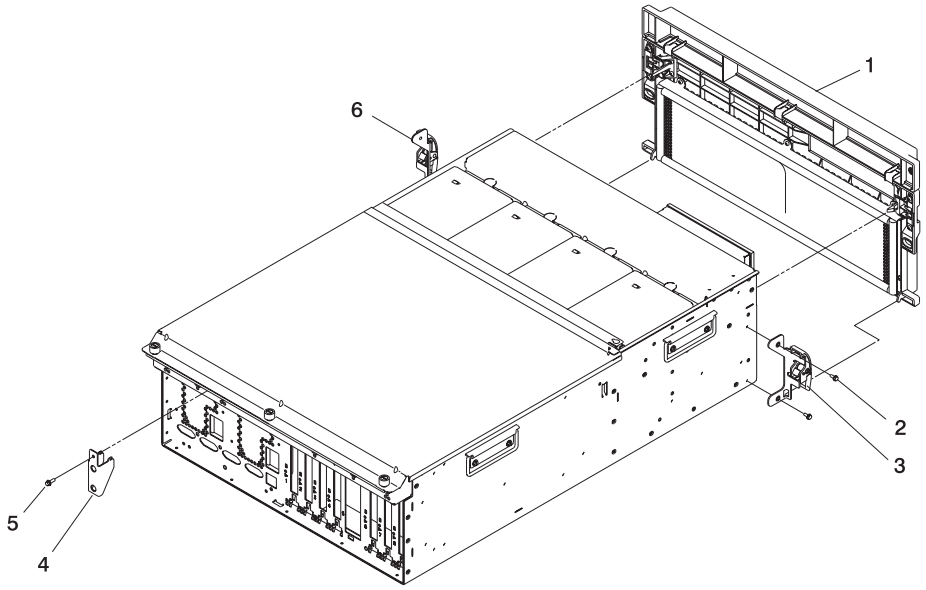
Index	Part Number	Units Per Assy	Description
1	53P0257	2	Disk-drive-backplane (disk drive cage included)
2	53P0321	4	Screw, disk-drive-backplane mounting
3	53P0330	1	Operator panel
4	53P0275	1	Processor cover
5	44H7366	4	Screw, cover-mounting

D20 Fans and Disk Drives



Index	Part Number	Units Per Assy	Description
1	53P0262	4	Blower
2			D20
3	53P0257	1	Disk-drive cage 12 pack (disk drive back planes included)
4	53P0319	8	Screw, DASD-cage mounting
5			Disk Drives
6	53P0234	4	Screw, filler-plate mounting
7	44H7366	1 (optional)	Disk-drive filler plate
8	53P3451	1	Left Rail
9	53P3452	1	Right Rail

D20 Covers and Brackets

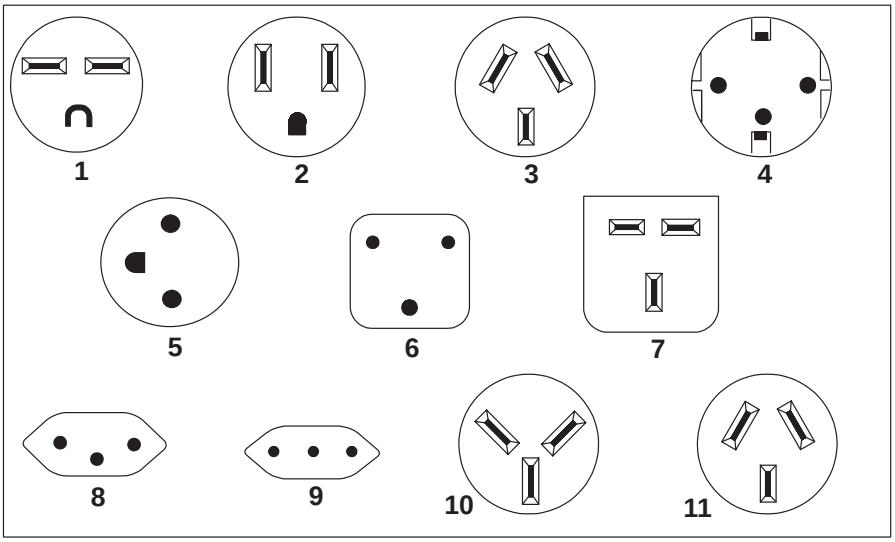


Index	Part Number	Units Per Assy	Description
1	53P1457	1	Front bezel
2	44H7366	2	Screw, latch bracket
3	53P2572	1	Latch bracket assembly left
4	53P0295	4	Cable arm bracket
5	44H7366	1	Screw, cable arm bracket
6	53P2573	1	Latch bracket assembly right

D20 RIO, SPCN, and Rack Beacon Cables

Index	Part Number	Units Per Assy	Description
1	53P2231	Up to 12	Rack beacon cable junction box
2	53P2237	Up to 12	Rack beacon connector cable, 4-pin connector
3	53P2854	Up to 12	Rack beacon connector cable, 4-pin
	87G6235		SPCN cable, 2 meter
	09P1251		SPCN cable, 3 meter
	21F9469		SPCN cable, 6 meter
	21F9358		SPCN cable, 15 meter
4	53P2676		RIO-2 cable, 3.5 meter
	21P5456		RIO-2 cable, 10 meter

Power Cables



Index	Part Number	Country or Region
1	1838574	Bahamas, Barbados, Bolivia, Brazil, Canada, Costa Rica, Dominican Republic, El Salvador, Ecuador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Japan, Netherlands Antilles, Panama, Peru, Philippines, Taiwan, Thailand, Trinidad, Tobago, U.S.A. (except Chicago), Venezuela
2	86G7648	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. (except Chicago), Venezuela
2	62X1045	Chicago, U.S.A.
3	6952311	Argentina, Australia, New Zealand
4	13F9979	Abu Dhabi, Austria, Belgium, Bulgaria, Botswana, China (Macau S.A.R), Egypt, Finland, France, Germany, Greece, Iceland, Indonesia, Korea (South), Lebanon, Luxembourg, Netherlands, Norway, Portugal, Saudi Arabia, Spain, Sudan, Sweden, Turkey, Yugoslavia
5	13F9997	Denmark
6	14F0015	Bangladesh, Burma, Pakistan, South Africa, Sri Lanka
7	14F0033	Bahrain, Bermuda, Brunei, Channel Islands, Cyprus, China (Hong Kong S.A.R), Ghana, 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
8	14F0051	Liechtenstein, Switzerland
9	14F0069	Chile, Ethiopia, Italy
10	14F0087	Israel
11	6952291	Paraguay, Colombia, Uruguay
	42F6841	AC Power Cable, (Power distribution bus to AC power supply, 286/C4 only)

Chapter 5. Fault and Attention LEDs

This chapter contains information about fault and attention LEDs, which assist in identifying failing components in your system.

Component LEDs

Individual LEDs are located on or near the failing components. The LEDs are located either on the component itself or on the carrier of the component (for example, PCI adapters and disk drives). LEDs are either green or amber.

Green LEDs indicate one of two things:

- Electrical power is present.
- Activity is occuring on a link. (The system could be sending or receiving information.)

Amber-colored LEDs indicate a fault or identify condition. If your system or one of the components on your system has an amber-colored LED turned on or blinking, identify the problem and take the appropriate action to restore the system to normal.

The following table identifies the location, color and status of your system component LEDs.

Unit (FRU)	LED Function	Location	Viewable Location	LED Color	OFF	ON	Blink
Power and Packaging LEDs							
Rack Indicator	Rack Summary	Top of Rack	External	Amber	Normal	Fault	Identify
	AC Input		External Front	Green	No Input	AC Good	Fault
I/O Subsystem Drawer	Attention	Operator Panel	External Front	Amber	Normal	Fault	Identify
	Power		External Front	Green	No AC	System On	Standby
Fans	Identify	FRU	External	Amber	Normal	Identify	N/A
	Power	FRU	External	Green	Power Off	Power On	N/A
Power Supply	Input Source	FRU	External Back	Green	No Input	AC Input Good	N/A
	Identify/ COM Fail	FRU	External Back	Amber	Normal	N/A	1 Hz=Identify .25 Hz=Comm. Failed
	DC Output Good	FRU	External Back	Green	Standby Off	System On	Standby
Disk Drives (DASD)	Slot Power	DASD Backplane	External Front	Green	Power Off	Power On	N/A
	Activity	DASD Backplane	External Front	Green	Not Active	N/A	Activity
	Identify	DASD Backplane	External Front	Amber	Normal	Action Remove	Identify
Media	Slot Power	Backplane	External Front	Green	Power Off	Power On	N/A
	Activity/ Identify	Backplane	External Front	Amber	Normal	Action	Identify
Electronic Component LEDs							
RIO Connector Card	Identify	FRU (Top)	Internal Only	Amber	Normal	Identify	N/A
RIO Extender Card	Identify	FRU (Top)	Internal Only	Amber	Normal	Identify	N/A
I/O Backplane	Identify	FRU	Internal Only	Amber	Normal	Identify	N/A
PCI Adapter Connectors (Slots)	Slot Power	Backplane	External Back	Green	Power Off	Power On	N/A
	Action/ Identify	Backplane	External Back	Amber	Normal	N/A	Grn off - Action Grn on - Identify
Disk Drive Backplane	No LED						
Port LED Indicators							
RIOPorts	Identify	Top of Each External Connector	External Back	Amber	Normal	N/A	Identify

Resetting the LEDs

After the repair action is completed, do the following:

1. Log in as root user.
2. At the command line, type `diag`.
3. Select **Task Selection**.
4. Select **Log Repair Action**.
5. Select the device that was repaired.
6. Press F10 to exit diagnostics.

If the attention LED remains on after you have completed the repair action and reset the LEDs, call for service support.

Appendix A. Environmental Notices

Product Recycling and Disposal

Components of the system unit, such as structural parts and circuit boards, can be recycled where recycling facilities exist. Companies are available to disassemble, reutilize, recycle, or dispose of electronic products. Contact your account representative for more information. This system unit contains parts such as circuit boards, cables, electromagnetic compatibility gaskets and connectors which may contain lead and copper/beryllium alloys that require special handling and disposal at end of life. Before this unit is disposed, these materials must be removed and recycled or discarded according to applicable regulations. This book contains specific information on each battery type where applicable.

This product may contain a sealed lead acid, nickel cadmium, nickel metal hydride, lithium, or lithium ion battery. Consult your user manual or service manual for specific battery information. The battery must be recycled or disposed of properly. Recycling facilities may not be available in your area. For information on disposal of batteries, contact your local waste disposal facility.

Acoustical Noise Emissions

The equivalent continuous A-weighted sound pressure level at workstations (emission sound pressure level at the 1-meter bystander positions) does not exceed 70 dB(A).

Der Geräuschpegel der Einheit ist kleiner oder gleich 70 db(A).

D10 Declared Acoustical Noise Emissions

Product Configuration	Acoustical Characteristic			
	Declared A-Weighted Sound Power Level, L_{WAd} (B)		Declared A-Weighted Sound Pressure Level, LpAm (dB)	
	Operating	Idle	Operating	Idle
One D10 I/O subsystem	5.6[5]	5.6[5]	40[6]	40[6]
Two D10 I/O subsystems	5.9[5]	5.9[5]	43[6]	43[6]
Four D10 I/O subsystems	6.2[5]	6.2[5]	46[6]	46[6]

Notes:

1. Noise levels cited are for the typical configuration (A-Frame: Bulk Power, CEC cage, battery option, media drawer, and two I/O drawers).
2. The 0.6-B (6-dB) reduction in noise emission levels with the acoustical rear door corresponds to a factor of 4 reduction. That is, the noise level of a single A-Frame with Slimline covers is about the same as the noise level of four A-Frames with acoustical covers.
3. L_{WAd} is the upper-limit A-weighted sound power level; LpAm is the mean A-weighted sound pressure level at the 1-meter bystander positions; 1 B = 10 dB.
4. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296.

D20 Declared Acoustical Noise Emissions

Product Configuration	Acoustical Characteristic			
	Declared A-Weighted Sound Power Level, L_{WAd} (B)		Declared A-Weighted Sound Pressure Level, LpAm (dB)	
	Operating	Idle	Operating	Idle
D20 I/O subsystem	6.1[5]	6.0[5]	44[6]	43[6]

Notes:

1. Noise levels cited are for the typical configuration (A-Frame: Bulk Power, CEC cage, battery option, media drawer, and two I/O drawers).
2. The 0.6-B (6-dB) reduction in noise emission levels with the acoustical rear door corresponds to a factor of 4 reduction. That is, the noise level of a single A-Frame with Slimline covers is about the same as the noise level of four A-Frames with acoustical covers.
3. L_{WAd} is the upper-limit A-weighted sound power level; LpAm is the mean A-weighted sound pressure level at the 1-meter bystander positions; 1 B = 10 dB.
4. All measurements made in conformance with ISO 7779 and declared in conformance with ISO 9296.

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