

0595, 5095, and 7311 Model D20

Service Guide



ESCALA

0595, 5095, and 7311

Model D20

Service Guide

Hardware

July 2008

BULL CEDOC
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FRANCE

REFERENCE
86 A1 51EV 02

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Safety and environmental notices

Safety notices may be printed throughout this guide:

- **DANGER** notices call attention to a situation that is potentially lethal or extremely hazardous to people.
- **CAUTION** notices call attention to a situation that is potentially hazardous to people because of some existing condition.
- **Attention** notices call attention to the possibility of damage to a program, device, system, or data.

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Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, a safety information booklet is included in the publications package shipped with the product. The booklet contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information in the booklet. You should also refer to the booklet any time you do not clearly understand any safety information in the U.S. English publications.

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Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

Laser safety information

IBM servers can use I/O cards or features that are fiber-optic based and that utilize lasers or LEDs.

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 IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

CAUTION:

This product might contain one or more of the following devices: CD-ROM drive, DVD-ROM drive, DVD-RAM drive, or laser module, which are Class 1 laser products. Note the following information:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

(C026)

CAUTION:

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. (C027)

CAUTION:

This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

CAUTION:

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

Power and cabling information for NEBS (Network Equipment-Building System) GR-1089-CORE

The following comments apply to the IBM servers that have been designated as conforming to NEBS (Network Equipment-Building System) GR-1089-CORE:

The equipment is suitable for installation in the following:

- Network telecommunications facilities
- Locations where the NEC (National Electrical Code) applies

The intrabuilding ports of this equipment are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of this equipment *must not* be metalically connected to the interfaces that connect to the OSP (outside plant) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metalically to OSP wiring.

Note: All Ethernet cables must be shielded and grounded at both ends.

The ac-powered system does not require the use of an external surge protection device (SPD).

The dc-powered system employs an isolated DC return (DC-I) design. The DC battery return terminal *shall not* be connected to the chassis or frame ground.

Product recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. IBM encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed. IBM offers a variety of product return programs and services in several countries to assist equipment owners in recycling their IT products. Information on IBM product recycling offerings can be found on IBM's Internet site at <http://www.ibm.com/ibm/environment/products/prp.shtml>.

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Note: This mark applies only to countries within the European Union (EU) and Norway.

Appliances are labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Remarque : Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège.

L'étiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

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In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local IBM representative.

Battery return program

This product may contain 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 outside the United States, go to <http://www.ibm.com/ibm/environment/products/batteryrecycle.shtml> or contact your local waste disposal facility.

In the United States, IBM has established a return process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and other battery packs from IBM Equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Please have the IBM part number listed on the battery available prior to your call.

For Taiwan: Please recycle batteries.



For the European Union:



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Batteries or packaging for batteries are labeled in accordance with European Directive 2006/66/EC concerning batteries and accumulators and waste batteries and accumulators. The Directive determines the framework for the return and recycling of used batteries and accumulators as applicable throughout the European Union. This label is applied to various batteries to indicate that the battery is not to be thrown away, but rather reclaimed upon end of life per this Directive.

Les batteries ou emballages pour batteries sont étiquetés conformément aux directives européennes 2006/66/EC, norme relative aux batteries et accumulateurs en usage et aux batteries et accumulateurs usés. Les directives déterminent la marche à suivre en vigueur dans l'Union Européenne pour le retour et le recyclage des batteries et accumulateurs usés. Cette étiquette est appliquée sur diverses batteries pour indiquer que la batterie ne doit pas être mise au rebut mais plutôt récupérée en fin de cycle de vie selon cette norme.

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Perchlorate Material - special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate.

The foregoing notice is provided in accordance with California Code of Regulations Title 22, Division 4.5 Chapter 33. Best Management Practices for Perchlorate Materials. This product, part, or both may include a lithium manganese dioxide battery which contains a perchlorate substance.

About this publication

This publication provides users and service providers with installation and maintenance information for the IBM® System i™ 0595, 5095, and IBM System p™ 7311 Model D20 expansion units. This publication includes reference, parts, and service information for the expansion units.

For information about the accessibility features of this product, for users who have a physical disability, see “Accessibility features,” on page 127.

How to send your comments

Your feedback is important in helping to provide the most accurate and highest quality information. If you have any comments about this publication, use the **Feedback** button at <http://www.ibm.com/systems/infocenter>. Alternatively, you can send your comments to pubsinfo@us.ibm.com. Be sure to include the name of the book, the form number of the book, and the specific location of the text you are commenting on (for example, a page number or table number).

Chapter 1. Reference information

The 0595, 5095, and 7311 Model D20 expansion unit reference information describes the LED indicators and the types and locations of disk drives, power supplies, fans, and adapters.

Power and fault indicators

The 0595, 5095, and 7311-D20 are I/O expansion units that attach to a server. They contain seven hot-swap PCI-X I/O slots and twelve hot-swap disk drive bays. Each expansion unit occupies 4U (7 inches) of space in standard 19-inch rack drawer. The fans, power supplies, and PCI adapters, are accessible from the top of the drawer while the disk drives are accessible from the front.

Light emitting diodes (LEDs) are located either on or near the major serviceable components in the enclosure. When it is lit, the LEDs emit either a green or amber light.

When it is lit, a green LED indicates either of the following:

- Electric power is present.
- Activity is occurring on a link. For example, the enclosure could be sending or receiving information.

When it is lit, an amber LED indicates a fault or identify condition. If the enclosure or one of the components on your system has an amber LED turned on solid (not blinking) or blinking, identify the problem and take the appropriate action to restore the component to a normal operating condition.

For more information about specific LEDs found on or near the major serviceable components in your enclosure, see “Component and attention LEDs” on page 77.

Storage

The disk-drive enclosure has from 18.2 GB to 1.7 TB of disk storage capacity. Storage is accomplished through the use of standard size SCSI U320 (LVD) disk drives. The disk drives must be housed in a U3 disk carrier with a standard interposer card (part number 24L0787). Light pipes located on the disk carriers transmit light from LEDs located on the disk-drive backplane. The LEDs aid in the identification and failure diagnostics of each disk drive. For more information concerning disk-drive LEDs used by this enclosure, see “Component and attention LEDs” on page 77. The following disk drive sizes and speeds are available:

- 73.4 GB Ultra320 10K RPM 1 inch
- 146.8 GB Ultra320 10K RPM 1 inch
- 300 GB Ultra320 10K RPM 1 inch
- 36.4 GB Ultra320 15K RPM 1 inch
- 73.4 GB Ultra320 15K RPM 1 inch
- 146.8 GB Ultra320 15K RPM 1 inch
- 300 GB Ultra320 15K RPM 1 inch

For an updated listing of supported disk-drive sizes, contact your sales representative or next level of support.

There are 12 hot-plug disk-drive bays provided. The bays are located behind the front bezel. Any disk drive bay not populated with a disk drive must contain a “dummy carrier” to control the airflow within the enclosure. The dummy carrier does not contain light pipes or electrical connection, so enclosure services cannot detect if a carrier is installed. If the dummy carriers are not installed in empty disk drive bays, enclosure components can overheat. For an illustration of the disk-drive locations, see “Locating

FRUs” on page 5. Each disk drive bay contains an amber LED. For more information about these LEDs, see “Component and attention LEDs” on page 77.

Power

The base model enclosure contains one power supply. If your system contains only one power supply, you must install a power supply filler to control airflow and EMC wave leakage from your enclosure. For the power supply filler part number, see Chapter 4, “Part information,” on page 67. To enable redundant power supply, you can install a second power supply in the enclosure. If your enclosure contains two power supplies, either of the power supplies can provide the necessary voltages and currents, independent of each other. Having redundant power supplies enables you to remove a power supply without powering off the system. When operating correctly, each power supply shares the current load when powered on. If one of the power supplies goes into a fault state, an amber LED, located on the faulted power supply, will be lit indicating a fault condition. The other operating power supply will supply enough power to the system until the faulty supply can either be powered back on or is replaced.

The power supply assembly has four LEDs:

- Two green LEDs (ac power good and dc power good)
- Two amber LEDs (the rightmost LED indicates the power supply status)

To better understand the LEDs located on your power supply, see the table in “Component and attention LEDs” on page 77. The table explains the status of the power supply when the green or amber LEDs are lit or not lit. For an illustration of the power supply locations, see “Locating FRUs” on page 5.

Cooling

To provide cooling, four fans are located on the top of the I/O expansion unit. For an illustration of the fan locations, see “Locating FRUs” on page 5.

Attention: The four fans are hot-plug components except for the following condition. If your subsystem has only one power supply (either installed or functioning), you must shut down the system and subsystem before replacing a fan. Failure to do so will automatically shut down the system.

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 I/O backplane and each I/O slot have green power indicator LEDs and amber identify LEDs. For an illustration of the PCI-X slot locations, see “Locating FRUs” on page 5.

Cabling

The cables that connect the I/O expansion units allow some flexibility in drawer and tower placement. Up to two disk drive enclosures can be connected to a system unit. Each I/O expansion unit 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. For detailed cabling information, see the *Site and Hardware Planning Guide*, SA76-0091, at <https://www-01.ibm.com/servers/resourcelink/lib03030.nsf/p>.

Chapter 2. Using location codes

Location codes are produced by system firmware to identify replaceable parts. Learn how to read and understand the sections of a location code string and the comprehensive list of location codes that are used by the I/O enclosure.

Use the following table to link to a specific topic for additional information when reading and understanding your location code.

Table 1. Location code topics

Location code topics	Description
"Location code overview"	Contains background information about using location codes.
"Physical location codes" on page 4	Provides definitions for physical location codes.
"Logical location codes" on page 4	Provides definitions for logical location codes.
"Location code format" on page 4	Provides format information of the U_n value in the location code string. For example U7031.001.
"Location code labels" on page 5	Provides definitions for location code labels. The location code labels begin with an alphabetic character and follow the system serial number. For example, U7031.001.10ABCDE-P3-C31-T2-L23. (The system serial number is the "10ABCDE".) The P3, C31, T2, and L23 all contain an alphabetic character that is identified in the Location code labels table.
"Worldwide unique identifier" on page 5	Provides definitions for the worldwide unique identifiers. This group of digits follows the resource code labels and always begins with the letter <i>W</i> .

Location code overview

Servers (system unit and expansion units) use physical location codes to provide mapping of replaceable units. Location codes are produced by the server's firmware, which structures them so that they can be used to identify specific parts in a system. The location code format is the same for all servers.

If you are working with a specific location code, the unit type and model immediately follow the first character (Utttt.mmm).

- If the location code ends with **-Txx-Lxx**, the server's firmware could not identify the physical location. When a physical location cannot be identified, a logical location code is provided. Where logical location codes occur in enclosures, the locations article for the enclosure has the known conversions listed. For logical location codes with no conversion, contact your next level of support.
- If the location code begins with **UTMPx**, the expansion I/O unit's machine type, model number and serial number have not been set yet and this is a temporary unit identifier. To identify the unit, do the following:
 1. Examine the display panels on all of the I/O enclosures that are connected to the server until you find one with the same characters in the first 5 digits of the top line in the enclosure's display.
 2. Record the I/O enclosure's real machine type and model from the I/O enclosure label.
 3. Match the I/O enclosure's machine type and model in the unit type and locations table and then follow the link to determine the service information.

Note: If you have a location code that does not follow the location code format as described in “Location code format” it is either not supported or there is a problem in the firmware. Contact your next level of support.

Physical location codes

Physical location codes provide a mapping of logical functions and components, such as backplanes, removable modules, connectors, ports, cables, and devices, to their specific locations within the physical structure of the server.

Logical location codes

If the physical location cannot be mapped to a physical location code, the server’s firmware will generate a logical location code. A logical location code is a sequence of location labels that identify the path that the system uses to communicate with a given resource.

A resource has as many logical location codes as it has logical connections to the system. For example, an external tape device connected to two I/O adapters will have two logical location codes.

An example of a logical location code is:

U7031.001.10ABCDE-P3-C31-T2-L23

The first part of the location code (through the T2 label) represents the physical location code for the resource that communicates with the target resource. The remainder of the logical location code (L23) represents exactly which resource is indicated.

Location code format

The location code is an alphanumeric string of variable length, consisting of a series of location identifiers, separated by a dash. An example of a physical location for a fan is $Un-A1$.

The first position, represented by Un (where n is equal to any string contained between the U and the hyphen) in the preceding example, is displayed in one of the following forms:

Note: In location codes, the U is a constant digit. However, the numbered positions following the U are variables and are dependent on your server. Each row in the following table defines the numbers following the U in the beginning of the location code.

Table 2. Location code format description

Machine type and model number in its location code	Description
$Utttt.mmm.ssssss-A1$	The leftmost code is always U.
$tttt$	Represents the unit type of the enclosure (drawer or node).
mmm	Represents the model of the enclosure.
$ssssss$	Represents the serial number for the enclosure.
Note: The mmm or ccc number might not be displayed on all location codes for all servers. An example of the mmm value not being displayed is $Utttt.ssssss-A1$.	

The location code is hierarchical; that is, each location identifier in the string represents a physical part. The order (from left to right), in which each identifier is shown, allows you to determine which parts contain other parts in the string.

The - (dash) separator character represents a relationship between two components in the unit. In the example of the fan, whose location code is *Un-A1*, the - (dash) shows that the fan (A1) is contained in the base unit (or *Un*). Modules, adapters, cables, and devices are all parts that are plugged into another part. Their location codes will always show that they are plugged into another part as components of the server. Another example, *Un-P1-C9* is a memory DIMM, with (C9) plugged into a backplane (P1), which is inside the unit (*Un*).

For more information about the various location code label prefixes, refer to Location code labels.

Note: For devices, certain error conditions might cause an i5/OS® device to display the device location in an AIX® format.

Location code labels

The following table describes the location code label prefixes. These labels apply to system units only.

Table 3. Location code label prefixes for system units

Prefix	Description	Example
A	Air-moving device	Fan, blower
C	Card connector	IOP, IOA, DIMM, processor card
D	Device	Diskette, control panel
E	Electrical	Battery, power supply, ac charger
L	Logical path SCSI target	IDE address, Fibre Channel LUN
N	Horizontal placement for an empty rack location	
P	Planar	System backplane
T	Port	
U	Unit	
V	Virtual planar	
W	Worldwide unique ID	
X	EIA value for an empty rack location	
Y	Firmware field replaceable unit (FRU)	

Worldwide unique identifier

A worldwide unique identifier location label consists of the prefix "W" followed by a maximum of 16 uppercase hexadecimal digits with no leading zeros. A location code may or may not consist of a worldwide unique identifier. When present, the worldwide unique identifier location label follows the location label of the resource that interfaces with the resource having the worldwide unique identifier, usually a port.

Locating FRUs

Learn how to locate field replaceable units (FRUs) by using logical and physical location codes.

Note: The known logical location codes for this unit are listed next to the corresponding physical location in the following information. If you are working with a logical location code for this unit and it is not listed in the following information, contact your next level of support.

The following diagrams show field replaceable unit (FRU) layout in the expansion unit. Use these diagrams with the following tables.

Note: Some units may have labels that designate location codes other than those shown in the following illustrations and tables. If that is the case, use the location codes shown in the following illustrations and tables.

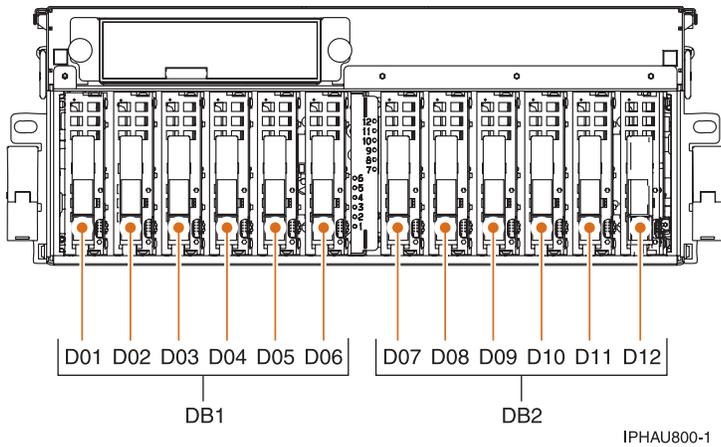


Figure 1. Front view of the expansion unit

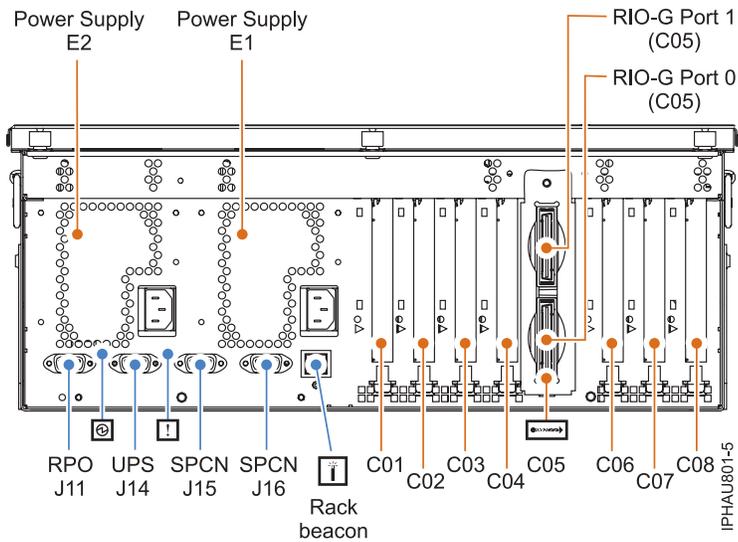


Figure 2. Back view of the expansion unit

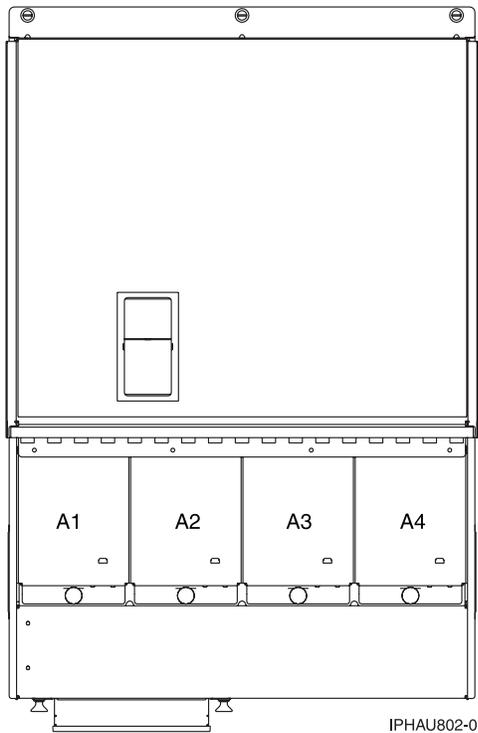


Figure 3. Top view of the expansion unit

The following table gives the components available for callout on the expansion units, and matches those components with the FRU containing the component. For part numbers associated with failing components, see Chapter 4, “Part information,” on page 67.

Table 4. FRU locations and failing components for the expansion unit

Failing item name	Physical location code	Identify LED	Failing item removal and replacement procedures
Backplane <ul style="list-style-type: none"> • SPCN • Card enclosure or backplane • Multi-adapter bridge (all) 	Un-P1	Yes	“I/O Backplane” on page 64
PCI adapter in slot 1	Un-P1-C01	Yes	“PCI Card” on page 56
PCI adapter in slot 2	Un-P1-C02	Yes	“PCI Card” on page 56
PCI adapter in slot 3	Un-P1-C03	Yes	“PCI Card” on page 56
PCI adapter in slot 4	Un-P1-C04	Yes	“PCI Card” on page 56
RIO/HSL adapter	Un-P1-C05	Yes	“NIC Card” on page 53
RIO/HSL adapter connector (bottom connector)	Un-P1-C05-00	Yes	“External Cables” on page 15
RIO/HSL adapter connector (top connector)	Un-P1-C05-01	Yes	“External Cables” on page 15
PCI adapter in slot 6	Un-P1-C06	Yes	“PCI Card” on page 56
PCI adapter in slot 7	Un-P1-C07	Yes	“PCI Card” on page 56
PCI adapter in slot 8	Un-P1-C08	Yes	“PCI Card” on page 56

Table 4. FRU locations and failing components for the expansion unit (continued)

Failing item name	Physical location code	Identify LED	Failing item removal and replacement procedures
PCI bridge set 1	Un-P1 Un-P1-C01 Un-P1-C02 Un-P1-C03 Un-P1-C04		Replace the system backplane and cards using the removal and replacement procedures corresponding to the locations indicated.
PCI bridge set 2	Un-P1 Un-P1-C06 Un-P1-C07 Un-P1-C08		Replace the system backplane and cards using the removal and replacement procedures corresponding to the locations indicated.
EPO connector (J11)	Un-P1-T1		
UPS connector (J14)	Un-P1-T2		
SPCN connector (J15)	Un-P1-T3		
SPCN connector (J16)	Un-P1-T4		
Rack beacon connector	Un-P1-T5		
Fan 1	Un-A1	Yes	"Air Moving Device (Fan)" on page 17
Fan 2	Un-A2	Yes	"Air Moving Device (Fan)" on page 17
Fan 3	Un-A3	Yes	"Air Moving Device (Fan)" on page 17
Fan 4	Un-A4	Yes	"Air Moving Device (Fan)" on page 17
Device physical locations			
Disk drive 1	Un-DB1-D01		"Disk Drive" on page 28
Disk drive 2	Un-DB1-D02		"Disk Drive" on page 28
Disk drive 3	Un-DB1-D03		"Disk Drive" on page 28
Disk drive 4	Un-DB1-D04		"Disk Drive" on page 28
Disk drive 5	Un-DB1-D05		"Disk Drive" on page 28
Disk drive 6	Un-DB1-D06		"Disk Drive" on page 28
Disk drive 7	Un-DB2-D07		"Disk Drive" on page 28
Disk drive 8	Un-DB2-D08		"Disk Drive" on page 28
Disk drive 9	Un-DB2-D09		"Disk Drive" on page 28
Disk drive 10	Un-DB2-D10		"Disk Drive" on page 28
Disk drive 11	Un-DB2-D11		"Disk Drive" on page 28
Disk drive 12	Un-DB2-D12		"Disk Drive" on page 28
Power supply 1	Un-E1		"Power Supply" on page 59
Power supply 2	Un-E2		"Power Supply" on page 59
Disk drive backplane	Un-DB1		"Device Board" on page 22
Disk drive backplane	Un-DB2		"Device Board" on page 22

Notes:

1. J11 is an RPO connection, J14 is an uninterruptible power supply connector, J15 is an SPCN 1 connector, and J16 is an SPCN 2 connector.
2. Multi-adapter bridge domains are labeled **PCI Bridge Set** inside the expansion unit.
3. The following table provides information necessary to identify the IOP to which an IOA is assigned.
 - The left column indicates the domain in which IOA assignment is allowed.
 - The right column is used to determine the IOP to which an IOA is assigned.
 - The first position in the list must be an IOP. The remaining positions may be IOPs or IOAs. IOAs are assigned to the first IOP located to their left in the list. Although IOAs can be manually reassigned using SST/DST, the IOA assignments return to the default order after each IPL.

Table 5. IOA domains and assignments

Multi-adapter bridge domain / PCI bridge set	IOA assignments rules
C01 - C04	C01, C02, C03, C04
C06 - C08	C06, C07, C08

Addresses — 0595 and 5095 expansion units

Find part locations using location codes.

Table 6. IOP, IOA, and device address information

Position	Possible failing item	DSA (BBBBcbb)	Unit address
		IOA and device DSAs do not conform to the following rules if the IOA is manually reassigned after IPL.	
C01 (IXS capable position)	IOP	xxxx-20-00	FFFFFFFF
C02 (empty if IXS in C01)	Storage IOA	xxxx-20-00	2FFFFFFFF
C02 (empty if IXS in C01)	Communication or workstation IOA	xxxx-20-00	E2FFFFFFFF
C03	IOP	xxxx-24-00	FFFFFFFF
C03	Storage IOA	xxxx-20-00	4FFFFFFFF
C03	Communication or workstation IOA	xxxx-20-00	E4FFFFFFFF
C03	IXS attached IOA	xxxx-20-00	E004FFFF
C04	Storage IOA	The IOA has the same DSA as the first IOP found in the following list: C03, C01.	6FFFFFFFF
C04	Communication or workstation IOA	The IOA has the same DSA as the first IOP found in the following list: C03, C01.	E6FFFFFFFF
C04	IXS attached IOA	The IOA has the same DSA as the first IOP found in the following list: C03, C01.	E006FFFF
C06	IOP	yyyy-20-00	FFFFFFFF
C07	Storage IOA	yyyy-20-00	2FFFFFFFF

Table 6. IOP, IOA, and device address information (continued)

Position	Possible failing item	DSA (BBBBcbb)	Unit address
C07	Communication or workstation IOA	yyyy-20-00	E2FFFFFF
C08	Storage IOA	yyyy-20-00	6FFFFFFF
C08	Communication or workstation IOA	yyyy-20-00	E6FFFFFF
C08	IXS attached IOA	yyyy-20-00	E06FFFFF
D01, D07	Disk unit	The disk unit has the same DSA as the IOP controlling the storage IOA.	xy0100FF (where x is the same as the first character of the xFFFFFFF IOA Unit Address and y is I/O bus 0, 1, 2, or 3. Storage IOA buses begin with 0 and are numbered from the tailstock toward the middle of the card. Find the storage IOA with the same DSA and xFFFFFFF address, then trace the I/O bus cable to determine if the position is D01 or D07.)
D02, D08	Disk unit		xy0200FF (where x is the same as the first character of the xFFFFFFF IOA Unit Address and y is I/O bus 0, 1, 2, or 3. Storage IOA buses begin with 0 and are numbered from the tailstock toward the middle of the card. Find the storage IOA with the same DSA and xFFFFFFF address, then trace the I/O bus cable to determine if the position is D02 or D08.)
D03, D09	Disk unit		xy0300FF (where x is the same as the first character of the xFFFFFFF IOA Unit Address and y is I/O bus 0, 1, 2, or 3. Storage IOA buses begin with 0 and are numbered from the tailstock toward the middle of the card. Find the storage IOA with the same DSA and xFFFFFFF address, then trace the I/O bus cable to determine if the position is D03 or D09.)

Table 6. IOP, IOA, and device address information (continued)

Position	Possible failing item	DSA (BBBBcbb)	Unit address
D04, D10	Disk unit		xy0400FF (where x is the same as the first character of the xFFFFFF IOA Unit Address and y is I/O bus 0, 1, 2, or 3. Storage IOA buses begin with 0 and are numbered from the tailstock toward the middle of the card. Find the storage IOA with the same DSA and xFFFFFF address, then trace the I/O bus cable to determine if the position is D04 or D10.)
D05, D11	Disk unit		xy0E00FF (where x is the same as the first character of the xFFFFFF IOA Unit Address and y is I/O bus 0, 1, 2, or 3. Storage IOA buses begin with 0 and are numbered from the tailstock toward the middle of the card. Find the storage IOA with the same DSA and xFFFFFF address, then trace the I/O bus cable to determine if the position is D05 or D11.)
D06, D12	Disk unit		xy0F00FF (where x is the same as the first character of the xFFFFFF IOA Unit Address and y is I/O bus 0, 1, 2, or 3. Storage IOA buses begin with 0 and are numbered from the tailstock toward the middle of the card. Find the storage IOA with the same DSA and xFFFFFF address, then trace the I/O bus cable to determine if the position is D06 or D12.)

Chapter 3. Removal and replacement procedures

Use the removal and replacement procedures when you repair, maintain, or exchange your system parts.

Before you begin a replacement, perform these tasks:

1. If you are performing a replacement procedure that might put your data at risk, ensure, if possible, that you have a current backup of your system or logical partition (including operating systems, licensed programs, and data).
2. Review the installation or replacement procedure for the feature or part.
3. Note the significance of color on your system. Blue or terra-cotta on a part of the hardware indicates a touch point where you can grip the hardware to remove it from or install it in the system, open or close a latch, and so on. Terra-cotta might also indicate that the part can be removed and replaced with the system or logical partition power on.
4. Ensure that you have access to a medium, flat-blade screwdriver.
5. If parts are incorrect, missing, or visibly damaged, contact your service provider or next level of support.

DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

Attention: Failure to follow the step-by-step sequence for FRU removal or installation may result in FRU or system damage.

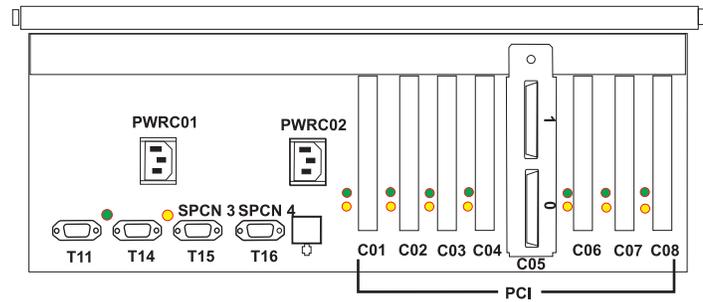
Use the following precautions whenever you handle electronic components or cables.

- The electrostatic discharge (ESD) kit and the ESD wrist strap must be used when handling logic cards, SCMs, MCMs, electronic boards, and disk drives.
- Keep all electronic components in the shipping container or envelope until you are ready to install them.
- If you remove, then reinstall an electronic component, temporarily place the component on an ESD pad or blanket.

External Cables

1. Remove the External Cables

Use the graphic to locate the cable and remove it.



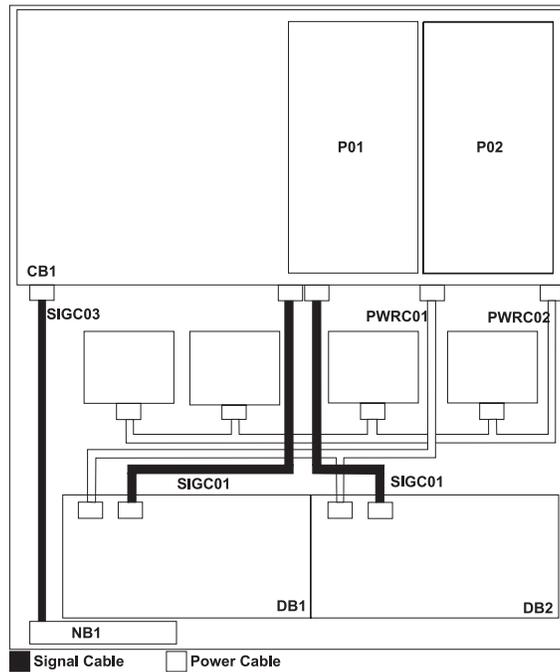
2. Install the External Cables

Locate the location where the cable is to be installed and install it.

Internal Cables

1. Remove the Internal Cables

1. Remove the power cord.
2. Use the graphic to locate the cable and remove it.



2. Install the Internal Cables

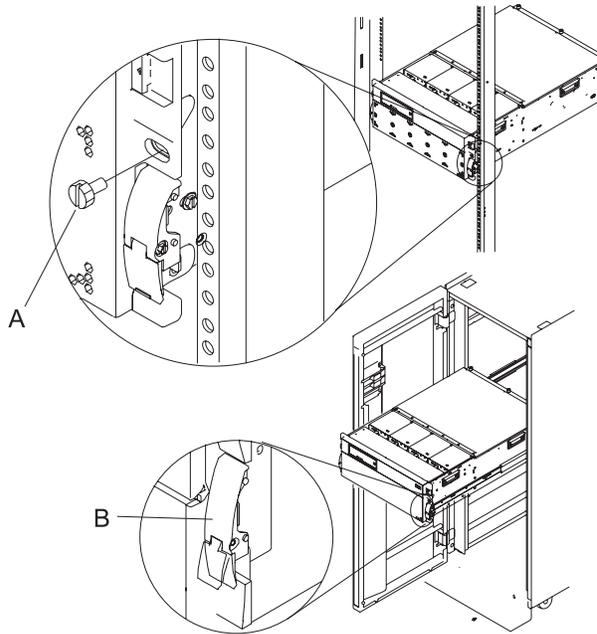
1. Locate the location where the cable is to be installed and install it.
 2. Install the power cord.
-

Air Moving Device (Fan)

1. Place unit into Service Position

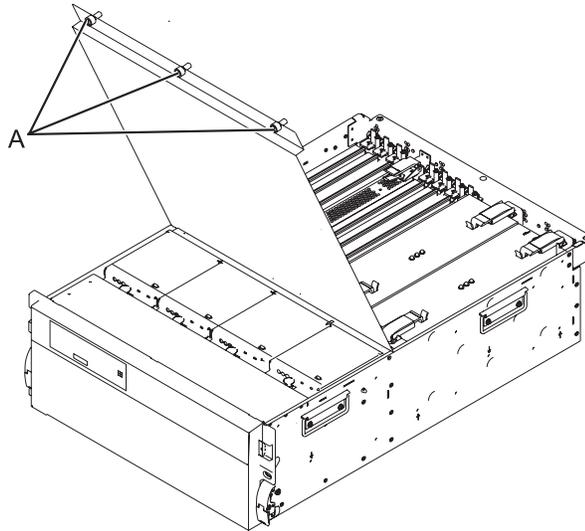
Attention: When placing your system into the service position, all stability plates must be firmly in position to prevent the rack from tipping over. Ensure that only one system unit is in the service position at a time.

1. Open the front rack door.
2. If your system is equipped with two blue thumbscrews securing it to the rack, remove the thumbscrews (**A**) at this time. The screws are located on the right and left side of the bezel, just above each subsystem release latch.
3. Release the subsystem release latches (**B**).
4. Pull the system unit out from the rack until the rails are fully extended.
5. 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.



2. Open the Service Access Cover

1. Open the front rack door and place the system into the service position.
2. Loosen the three captive thumbscrews (A) located on the rear of the cover. 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.

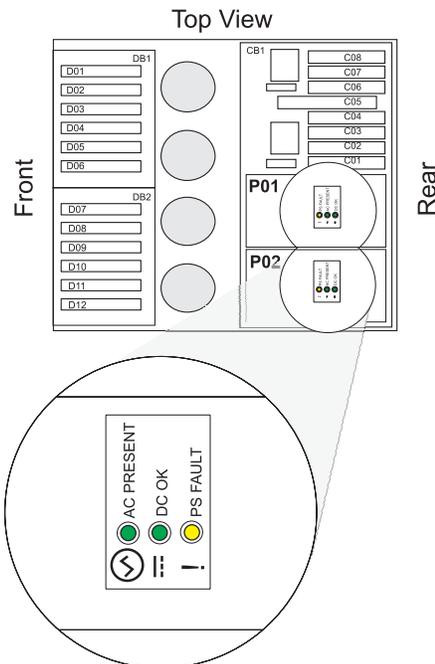


3.

You must determine if the repair can continue concurrently. To continue the repair concurrently, the following conditions must be true:

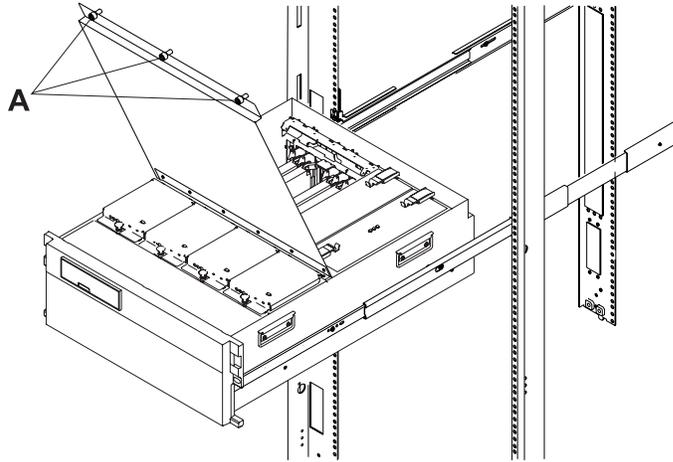
- Power supplies must already be installed at locations P01 and P02. These power supplies have three LEDs. The LEDs must be set as follows:
 - DC Ok - on, not blinking
 - AC Present - on, not blinking
 - PS Fault - off

If any of these conditions are not true, the repair can continue only after powering off the unit containing the FRU that is being repaired. If the unit is already powered off, you may proceed with a non-concurrent repair.



4. Close the Service Access Cover

Close and then secure the service access cover with the three thumbscrews (A).

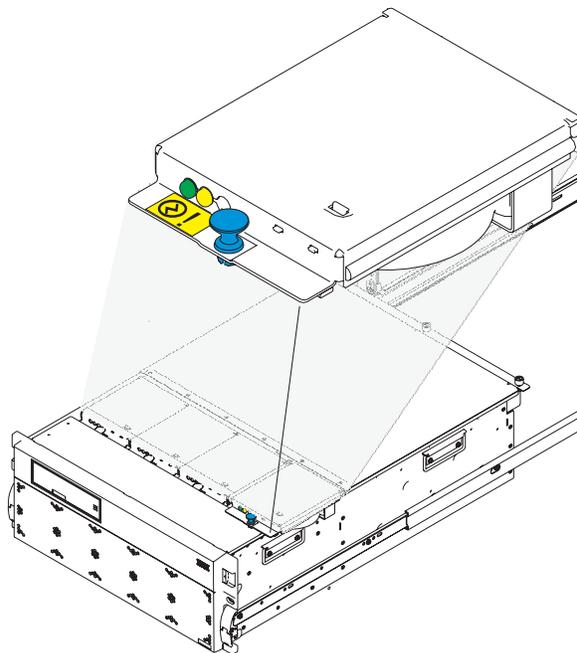


5.

You must determine if the repair can continue concurrently. To continue the repair concurrently, the following conditions must also be true:

- Air moving devices (AMDs) must already be installed in all AMD locations. Each of these AMDs has a green LED and an amber LED. The LEDs must be set as follows:
- Green - on
- Amber - on or off

If any of these conditions are not true, the repair can continue only after powering off the unit containing the FRU that is being repaired. If the unit is already powered off, you may proceed with a non-concurrent repair.



6.

Continue the repair concurrently or non-concurrently.

Select an action:

Concurrent repair.	Non-concurrent repair.	Delay the repair.
Continue the repair with unit power on.	Power off the unit and continue the repair.	
Continue with step 7.	Go to step 8.	This ends the procedure.

7.

The component will be serviced concurrently. Do not remove power to the unit during this \ repair procedure.

Go to step 9.

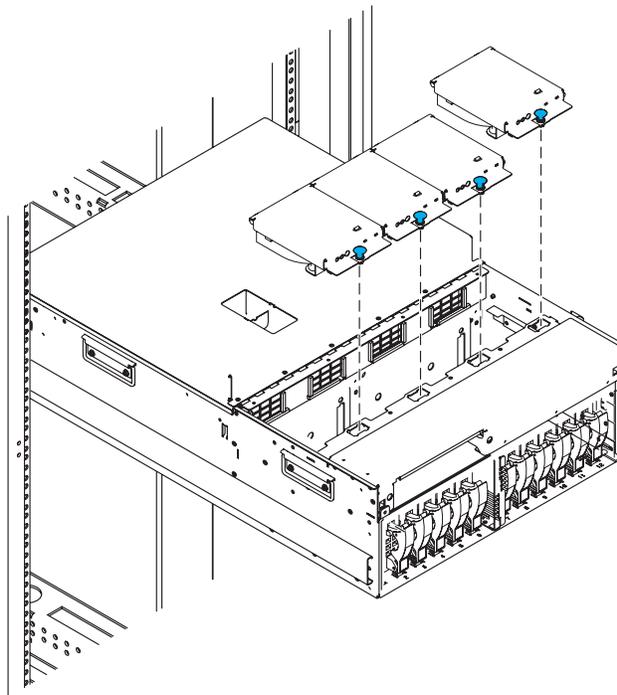
8.

The component will be serviced non-concurrently.

Power should be removed from the uni. If this unit is powered on, power it off now. When the unit is completely powered off, disconnect the AC input source by removing the power cord from the unit. Do not apply power to the unit until directed to do so in this procedure.

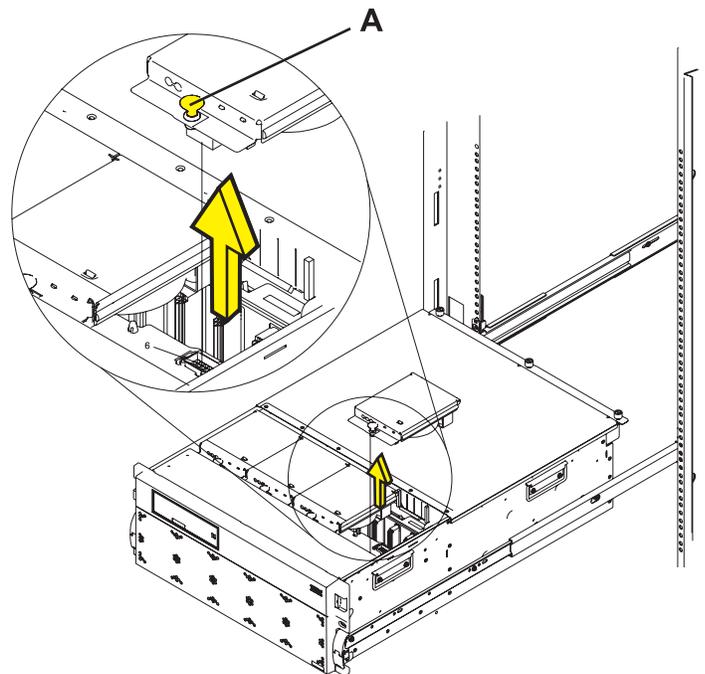
9. Remove the Air Moving Device (AMD)

1. Pull the snap button (A) on the front of the AMD casing.
2. Remove the AMD by pulling it straight out of the system.



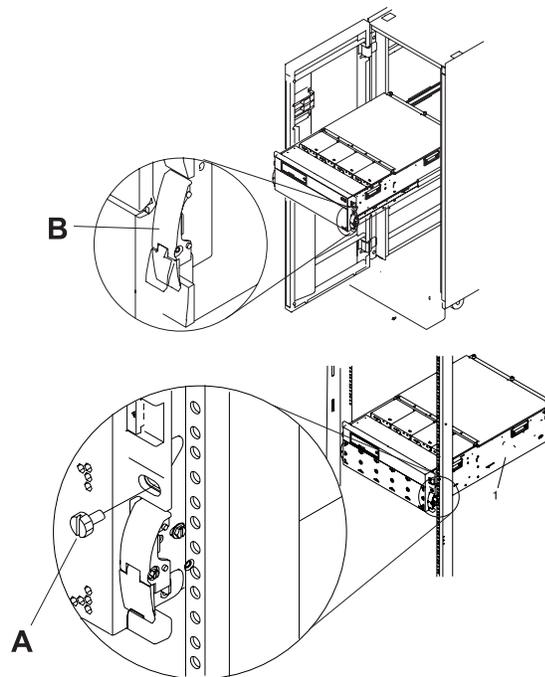
10. Install the Air Moving Device (AMD)

1. Install the AMD by pushing it straight into its location in the system.
2. Push the snap button (A) on the front of the AMD casing to secure the AMD.



11. Place unit into Operating Position

1. Release the rail release latches (B) located on the left and right rail by pulling the release latches up into the open position.
2. Push the system unit straight back into the rack until both release latches on the subsystem have locked into position.
3. If you removed two thumbscrews (A) from the front bezel, replace them at this time.
4. Close the front rack door.



Device Board

1.

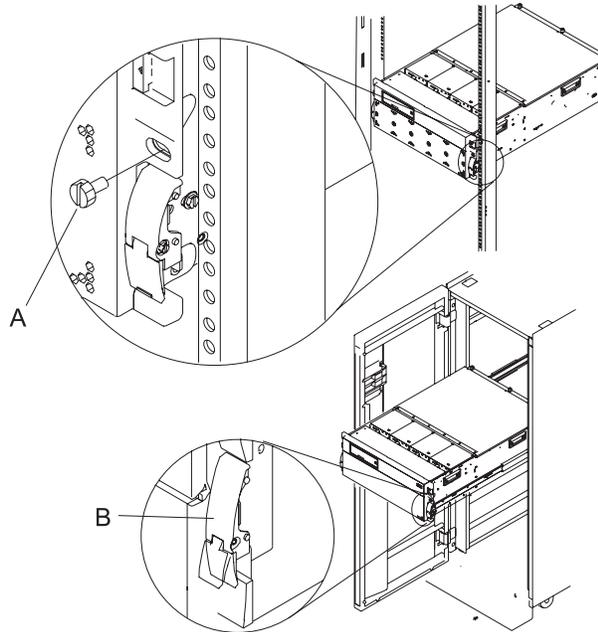
The component will be serviced non-concurrently.

Power should be removed from the unit. If this unit is powered on, power it off now. When the unit is completely powered off, disconnect the AC input source by removing the power cord from the unit. Do not apply power to the unit until directed to do so in this procedure.

2. Place unit into Service Position

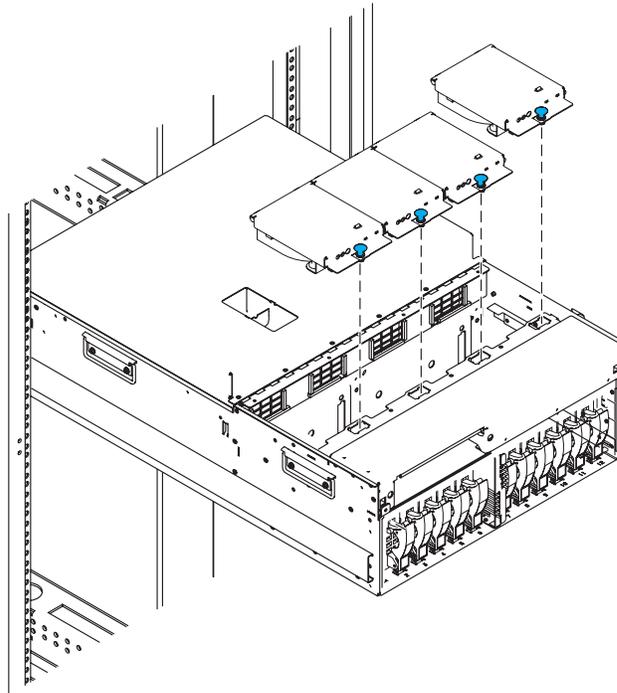
Attention: When placing your system into the service position, all stability plates must be firmly in position to prevent the rack from tipping over. Ensure that only one system unit is in the service position at a time.

1. Open the front rack door.
2. If your system is equipped with two blue thumbscrews securing it to the rack, remove the thumbscrews (**A**) at this time. The screws are located on the right and left side of the bezel, just above each subsystem release latch.
3. Release the subsystem release latches (**B**).
4. Pull the system unit out from the rack until the rails are fully extended.
5. 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.



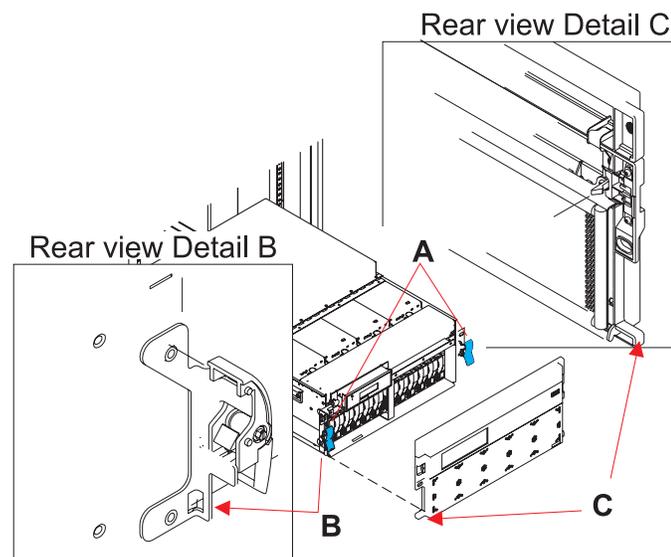
3. Remove the Air Moving Devices (AMDs)

1. Pull the snap button (A) on the front of the AMD casing.
2. Remove the AMD by pulling it straight out of the system.
3. Repeat these steps until all AMDs have been removed from the system.



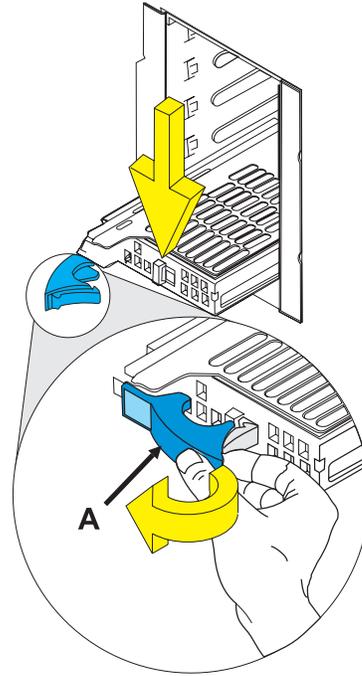
4. Remove The Front Bezel

1. Open the front rack door.
2. Simultaneously press in both bezel-release tabs (A).
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 (B). This action releases the two tabs (C) located on the bottom of the bezel.
5. Put the bezel in a safe place.



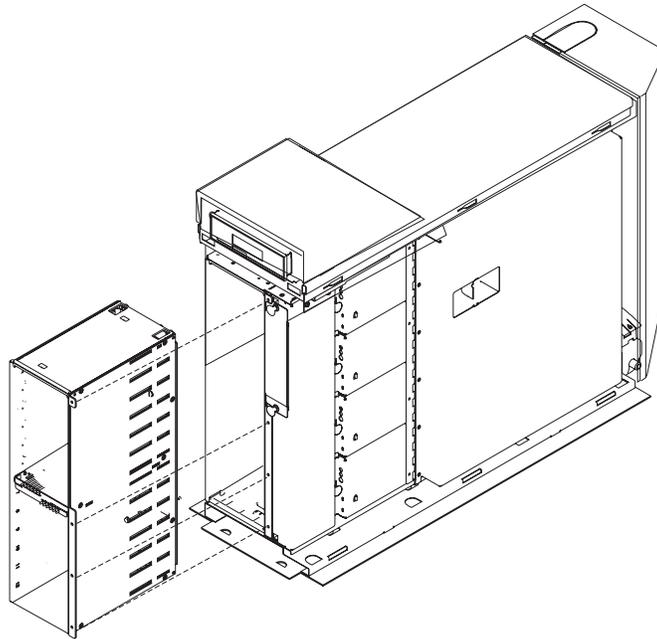
5. Remove the disk units

1. Label all disk units in the enclosure.
2. Pinch the two surfaces of the latching mechanism together and pull the handle (A) towards you to release the disk unit from the slot.
3. Remove the disk unit from the tower by sliding it straight out of the enclosure.
4. Repeat these steps until all disk units have been removed.



6. Remove the disk unit cage

1. Label and remove all remaining disk units from the disk unit cage.
2. Unplug and remove the fan cables plugged into the rear of the device board.
3. Remove the eight screws (A) holding the disk unit cage to the frame.
4. Remove the disk unit cage by pulling it straight out of the frame.

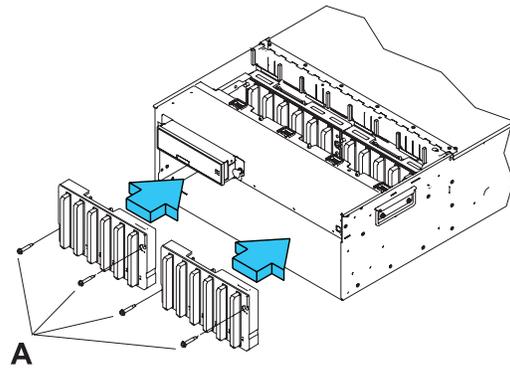


7. Remove the device board

1. Remove the two screws (**A**) holding the device board to the frame.
 2. Remove the device board from the back of the disk unit cage.
-

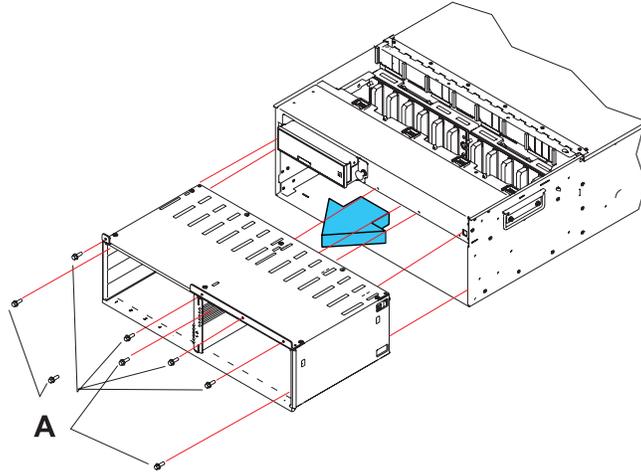
8. Install the device board

1. Install the device board into the back of the disk unit cage.
2. Install the two screws (**A**) that hold the device board to the frame.



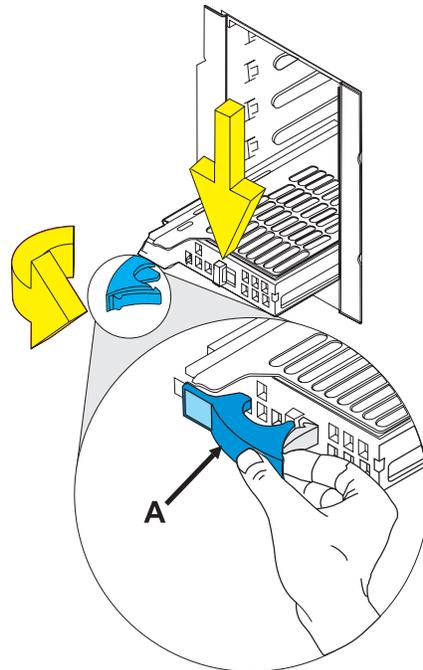
9. Install the disk unit cage

1. Install the disk unit cage to the frame by pushing it straight in.
2. Install the eight screws (A) that hold the disk unit cage to the frame.
3. Reconnect the fan cables that were previously removed from the rear of the device board.



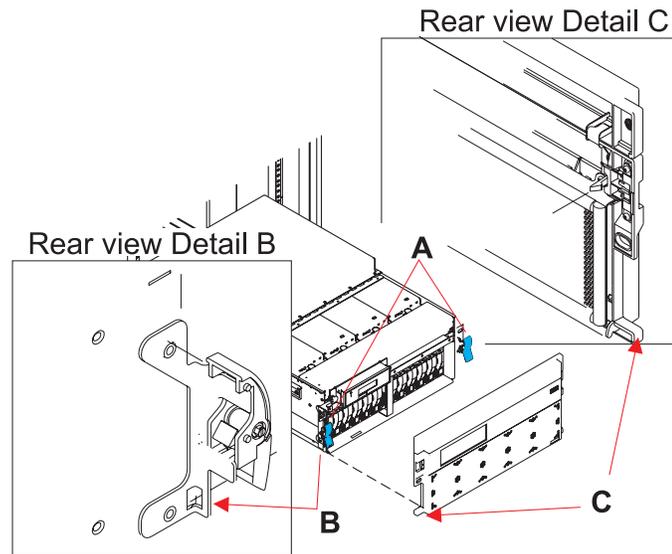
10. Install the disk units

1. Install the disk unit in the proper location in the disk unit enclosure by sliding it in with the handle (A) out, then pushing the handle towards the unit to lock it into place.
2. Repeat these steps until all disk units have been installed.



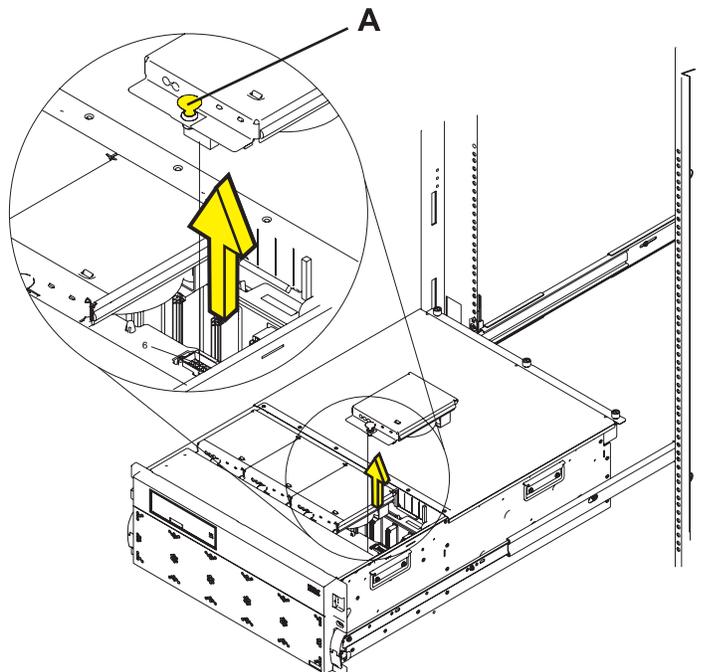
11. Install The Front Bezel

1. Open the front rack door.
2. Insert the two tabs (C) located on the bottom edge of the bezel into their locking slots (B), located on the chassis.
3. Pivot the front bezel up toward the top of the chassis.
4. Align the release tabs (A) to the matching slots located on the front of the subsystem chassis.
5. Gently push the release 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.
7. Reconnect the power source.
8. Close the rack door.



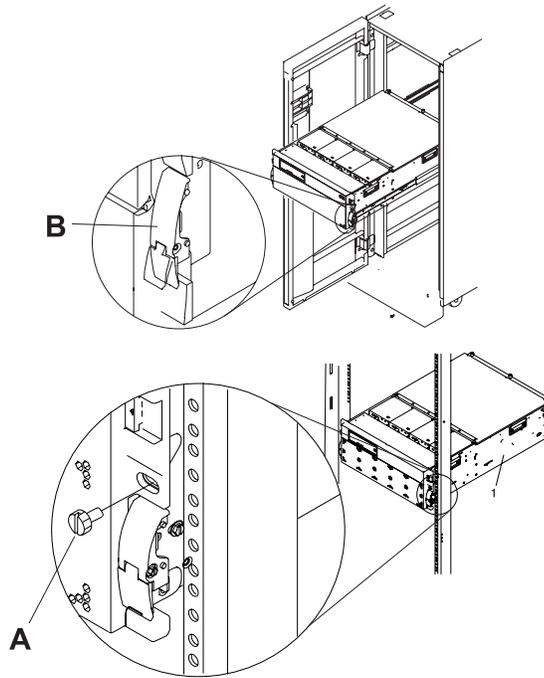
12. Install the Air Moving Devices (AMDs)

1. Install the AMD by pushing it straight into its location in the system.
2. Push the snap button (A) on the front of the AMD casing to secure the AMD.
3. Repeat these steps until all AMDs have been installed in the system.



13. Place unit into Operating Position

1. Release the rail release latches (B) located on the left and right rail by pulling the release latches up into the open position.
2. Push the system unit straight back into the rack until both release latches on the subsystem have locked into position.
3. If you removed two thumbscrews (A) from the front bezel, replace them at this time.
4. Close the front rack door.



Disk Drive

Use this procedure to replace the disk drive.

Your system can be powered off or powered on when you replace the disk drive. If the system is running, you can replace a disk drive with the power on. If it is not, or if the disk drive to be replaced is in the AIX or Linux® root volume group (rootvg) and it is not protected with either a redundant array of independent disks (RAID) or mirroring, use the procedure for replacing the disk drive with the power off.

1.

Do you want to replace the disk drive concurrently with system operations and the unit powered on?

Yes

No

↓

Go to "Replace the disk drive nonconcurrently" on page 40.

2.

Choose the procedure for the operating system running in the partition that the disk drive resource is assigned to.

For AIX, go to "Replace the disk drive using AIX."

For Linux, go to "Replace the disk drive using Linux" on page 32.

For i5/OS, go to "Replace the disk drive using i5/OS" on page 42.

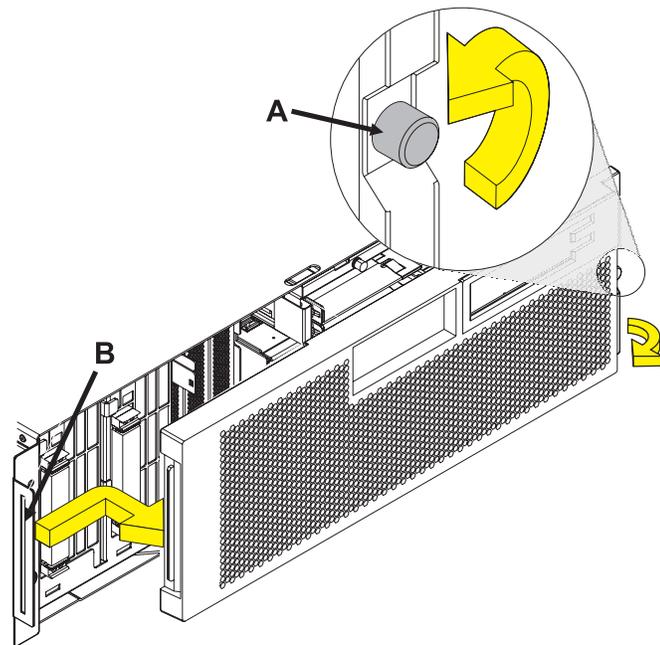
Replace the disk drive using AIX

Use this procedure to remove and replace a disk drive Concurrently with AIX.

1.

Access the unit by:

1. Open the front rack door.
2. Loosen the thumbscrew (A) on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot (B).



2.

Remove the disk drive as a resource:

1. Log in as root user or use CE Login.
2. At the command line, type **diag** and press Enter.
3. Press Enter to continue.
4. On the Function Selection display, select **Task Selection**.
5. Select **Hot Plug Task**.
6. Select **RAID Hot Plug Devices**.
7. Select the adapter that is connected to the array that contains the disk drive you want to replace and press Enter.
8. Select **Commit**.
9. On the Identify and Remove Resources display, select **Identify**.
10. Select the disk drive you want to remove and press Enter.

The disk drive slot enters the Identify state. The concurrent maintenance light for the slot begins flashing. The following figures show the locations of the concurrent maintenance lights **A**. Verify that the flashing light corresponds to the location for the disk drive you want to remove, and press Enter.

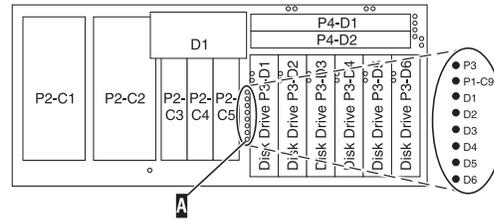
The disk drive slot exits the Identify state.

11. On the Identify and Remove Resources display, select **Remove**.

A list of the disk drives that you can remove is shown. If the disk drive you want to remove does not appear on the list, ask your system administrator to put the disk drive in the Failed state before continuing with this procedure. For information, see **AIX System Management Guide: Operating System and Devices**.

12. Select the disk drive you want to remove and press Enter.

The disk drive slot enters the Remove state and power is removed from the slot. The concurrent maintenance light for the slot begins flashing rapidly.



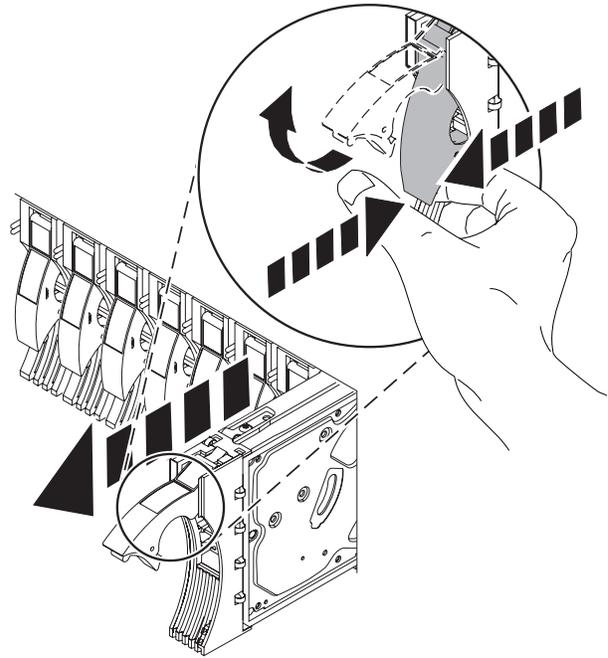
Note: If the disk drive slot is not in the Remove state, contact your next level of support.

3.

Remove the Disk Drive by:

1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

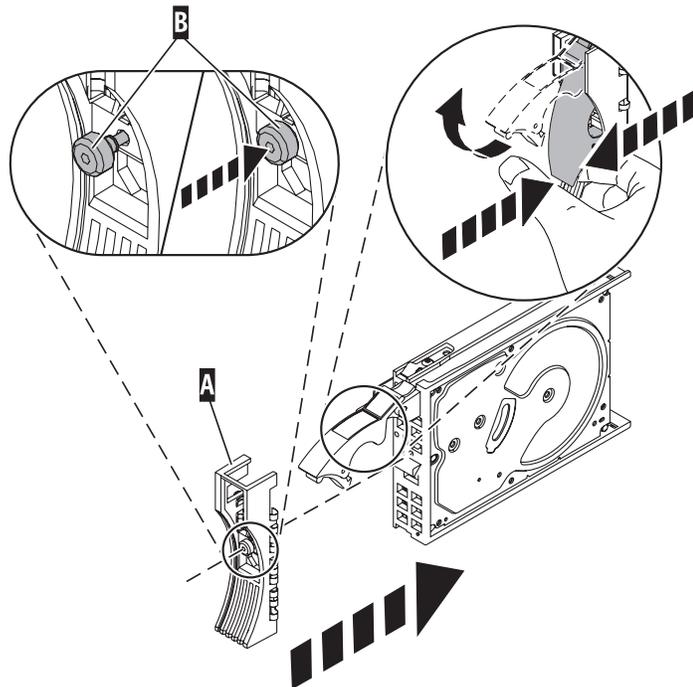
The concurrent maintenance light for the slot turns off when you remove the disk drive.



4.

Install the bezel on the new disk drive:

1. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel **A** to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



5.

Install the disk drive:

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
2. Slide the disk drive into the system until it stops.
3. Push the disk drive handle in until it locks.

Note: It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.

6.

Add the new disk drive as a resource:

1. Press Enter.
The disk drive slot exits the Remove state and enters the Normal state.
 2. Exit to the RAID Hot-Plug Devices menu. 7.2 .Press the F3 or ESC 3 key to return
 3. Exit to the Task selection display.
 4. Select **Log Repair Action**.
 5. Select the disk drive that you replaced and then press Enter.
 6. Select **Commit** after you have made your selection and then press Enter.
 7. Exit to the command line.
-

7.

To rebuild data on the replacement disk drive, refer to the information for the controller to which the disk drive is attached.

- If the disk drive is attached to a PCI-X SCSI RAID controller, see the **PCI-X SCSI RAID Controller Reference Guide for AIX**.
- If the disk drive is attached to a PCI SCSI RAID adapter (feature code 2498), see the **PCI 4-Channel Ultra3 SCSI RAID Adapter Reference Guide**.

For more information, see the **AIX System Management Guide: Operating System and Devices**.

8. Go to Verify a repair in your host server's service guide. **This completes this procedure.**

Replace the disk drive using Linux

To replace a disk drive in a location that is controlled by a system or logical partition that is running Linux:

Prepare to remove the disk drive

1. Log in as root user.
2. Type `iprconfig` on the command line of the Linux session and press Enter.
The IBM Power RAID Configuration Utility display is shown.
3. Select **Analyze log**. Press Enter. The Kernel Messages Log display is shown.



Figure 4. Kernel Messages Log

4. Select **View most recent ipr error messages** from the Kernel Messages Log display. Press Enter.
5. Find the entry in the log for the disk drive you want to replace.
6. Record the location information for the disk drive.

Note: The location information has the form of 2:0:8:0. In this example, 2 is the SCSI host number, 0 is the SCSI bus, 8 is the SCSI target ID, and 0 is the LUN (logical unit).

7. Return to the command line.
8. Type the following:
`ls -ld /sys/class/scsi_host/host#/device`
where # is the SCSI host number. Press Enter.
9. Record the PCI location information.

Note: The PCI location information has the form of 61:01:0:2.

10. Type `iprconfig` on the command line and press Enter.
The IBM Power RAID Configuration Utility display is shown.
11. Select **Display hardware status** from the IBM Power RAID Configuration Utility display. Press Enter.
The Display Hardware Status display is shown.

```

Display Hardware Status

Type option, press Enter.
1=Display hardware resource information details

OPT Name  PCI/SCSI Location      Description      Status
-----
          0000:01:01.0.0/        PCI-X SCSI Adapter  Operational
          0000:41:01.0.1/        PCI-X SCSI Adapter  Operational
sda       0000:41:01.0.1/0:3:0    Physical Disk       Active
sdb       0000:41:01.0.1/0:4:0    Physical Disk       Active
sdc       0000:41:01.0.1/0:8:0    Physical Disk       Active
sdd       0000:41:01.0.1/1:3:0    Physical Disk       Active
sde       0000:41:01.0.1/1:4:0    Physical Disk       Active
sdf       0000:41:01.0.1/1:5:0    Physical Disk       Active
          0001:61:01.0.2/        PCI-X SCSI RAID Adapter  Operational
sdg       0001:61:01.0.2/0:3:0    Physical Disk       Active
          0001:61:01.0.2/0:6:0    Advanced Function Disk  Active
sdi       0001:61:01.0.2/0:9:0    Physical Disk       Active
sdh       0001:61:01.0.2/255:0:0   RAID 10 Disk Array   Failed
          0001:61:01.0.2/0:4:0    RAID 10 Array Member  Failed
          0001:61:01.0.2/0:5:0    RAID 10 Array Member  Failed

e=Exit  q=Cancel  r=Refresh  t=Toggle

```

Figure 5. Example Display Hardware Status

12. Look for the disk drive at the PCI location you recorded. The disk drive might have a Failed status.
13. If the disk drive you want to replace is unprotected or in use, move the data from the disk drive before continuing with this procedure.
For information, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*.
14. Type option 1 (Display hardware resource information details) next to the disk drive you want to replace. Press Enter.
A Disk Hardware Resource Information Details display similar to the following is shown.

```

Disk Unit Hardware Resource Information Details

Manufacturer . . . . . : IBM
Product ID . . . . . : ST336607LC
Firmware Version . . . . . : 43353048 (C50H)
Serial Number. . . . . : 00006719
Capacity . . . . . : 36.40 GB
Resource Name. . . . . : /dev/sdd

Physical location
PCI Address. . . . . : 0001:50:01.0
SCSI Host Number . . . . . : 2
SCSI Channel . . . . . : 0
SCSI Id. . . . . : 4
SCSI Lun . . . . . : 0

Extended Details
FRU Number . . . . . : 00P2676

Press Enter to Continue

e=Exit  q=Cancel  f=PageDn  b=PageUp

```

Figure 6. Example Disk Hardware Resource Information Details display

15. Record the physical location information.
16. Return to the IBM Power RAID Configuration Utility display.

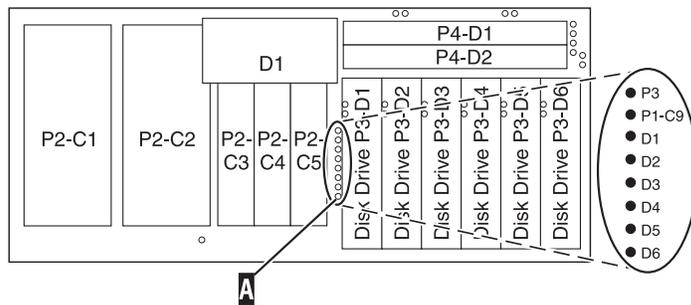
Remove the disk drive

1. From the IBM Power RAID Configuration Utility display, select **Work with disk unit recovery**. Press Enter.
2. From the Work with Disk Unit Recovery display, select **Concurrent remove device**. Press Enter. A Concurrent Device Remove display is shown, similar to the following display.

Concurrent Device Remove				
Choose a single location for remove operations				
1=Select				
OPT	Name	PCI/SCSI Location	Description	Status
sdc		0000:41:01.0.1/0:8:0	Physical Disk	Active
		0000:41:01.0.1/0:5:		Empty
sdb		0000:41:01.0.1/0:4:0	Physical Disk	Active
sda		0000:41:01.0.1/0:3:0	Physical Disk	Active
		0000:41:01.0.1/1:8:		Empty
sdf		0000:41:01.0.1/1:5:0	Physical Disk	Active
sde		0000:41:01.0.1/1:4:0	Physical Disk	Active
sdd		0000:41:01.0.1/1:3:0	Physical Disk	Active
		0001:61:01.0.2/0:8:		Empty
sdh		0001:61:01.0.2/0:9:0	Physical Disk	Active
sdg		0001:61:01.0.2/0:3:0	Physical Disk	Active

Figure 7. Example Concurrent Device Remove display

3. Type option 1 (Select) next to the location for the disk drive you want to replace. Press Enter.
4. The Verify Device Concurrent Remove display is shown. The concurrent maintenance light turns on for that disk drive slot.



5. On the Verify Device Concurrent Remove display, verify that the selected disk drive is the disk drive you want to replace, then press Enter. The identify light turns on for the disk drive.

Note: Ensure that the disk drive is not in use to prevent loss of data.

6. The Complete Device Concurrent Remove display is shown.

Attention:

- Attach a wrist strap to an unpainted metal surface of your hardware to prevent electrostatic discharge from damaging your hardware.
 - When using a wrist strap, follow all electrical safety procedures. A wrist strap is for static control. It does not increase or decrease your risk of receiving electric shock when using or working on electrical equipment.
 - If you do not have a wrist strap, just prior to removing the product from ESD packaging and installing or replacing hardware, touch an unpainted metal surface of the system for a minimum of 5 seconds.
7. Squeeze and pull the handle of the disk drive out toward you before you remove the disk drive as shown in Figure 8 on page 36 or Figure 9 on page 36. If the handle is not all the way out, the disk

drive will not slide out of the system or expansion unit.

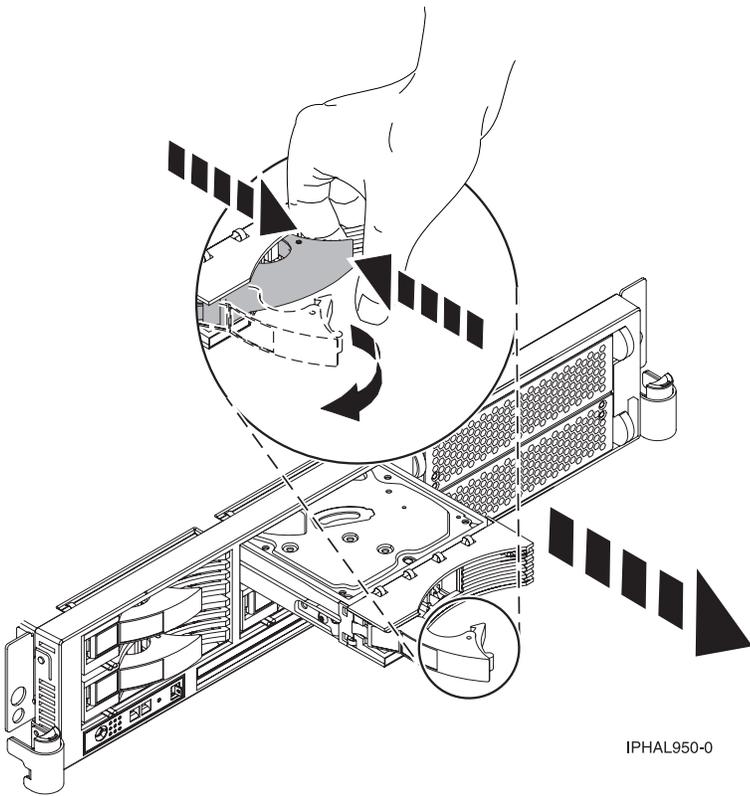


Figure 8.

OR

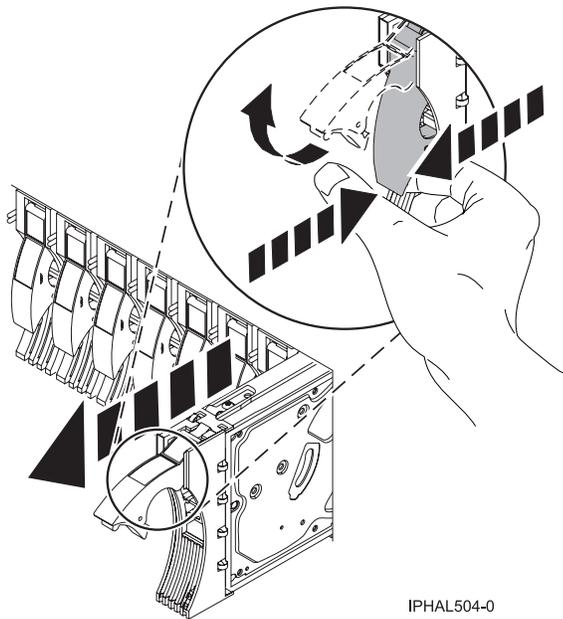
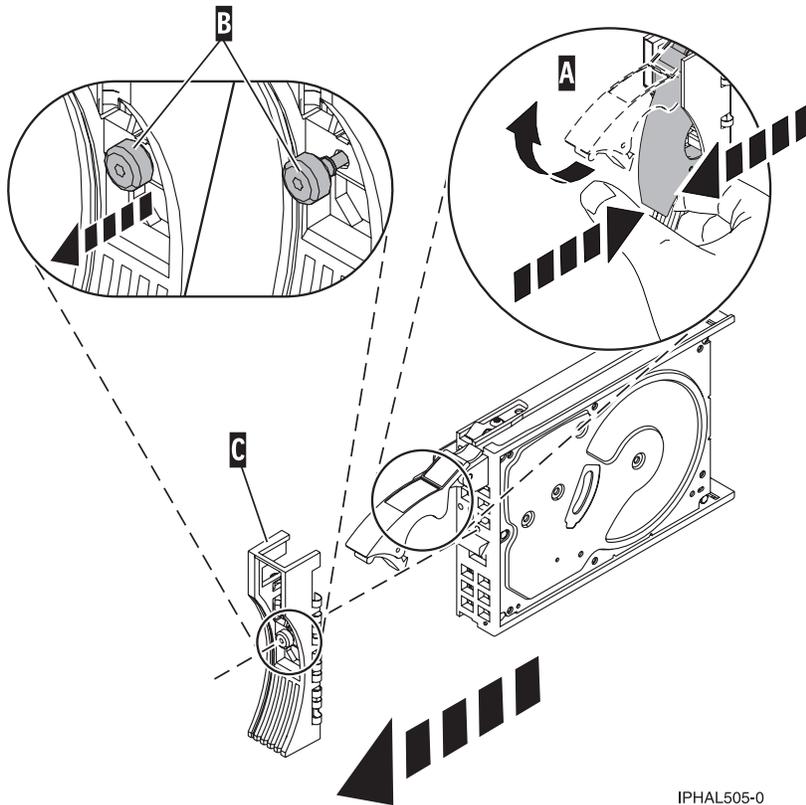


Figure 9.

- Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.
- Loosen and pull out on the thumbscrew **B** to release the disk-drive bezel **C** from the disk drive, as shown in the following figure.



IPHAL505-0

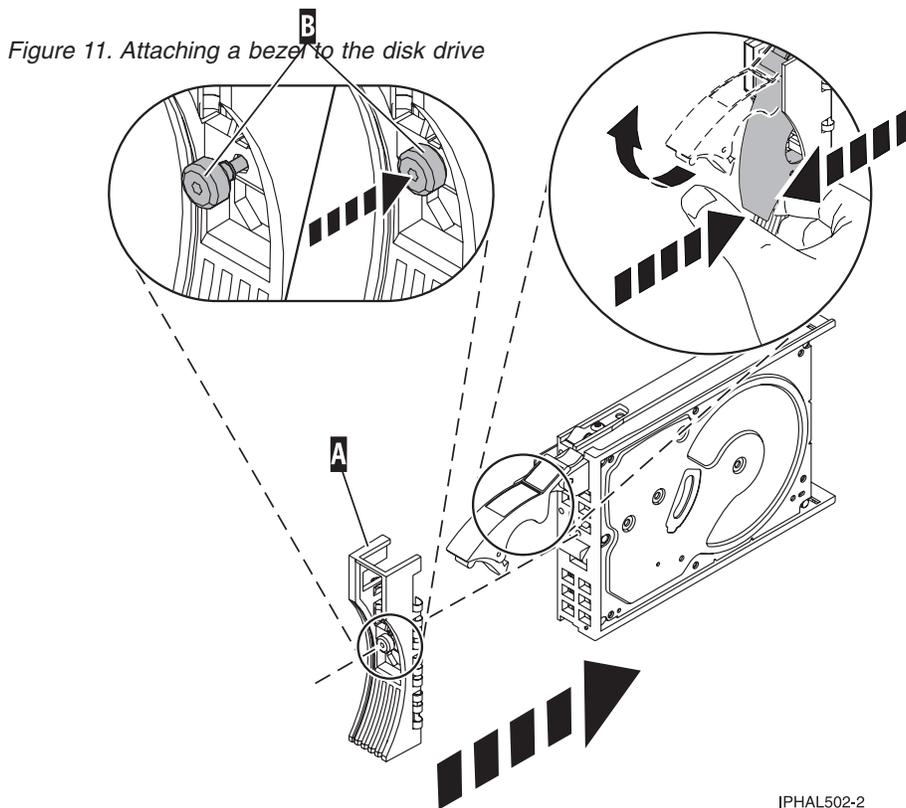
Figure 10. Removing a disk-drive bezel

- Press Enter on the IBM Power RAID Configuration Utility to indicate that you have removed the disk drive.

Replace the disk drive

- Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle them with care.
- Remove the disk drive from its protective package.
- Unlock the disk drive handle by squeezing and pulling it out toward you before you install the disk drive. If the handle is not all the way out, the disk drive will not slide into the system or expansion unit.
- Follow these steps to install the disk-drive bezel on the replacement disk drive:
 - Attach the bezel **A** to the disk drive, as shown in the following figure.

- b. Press in and then tighten the thumbscrew **B** to secure the bezel to the disk drive.



IPHAL502-2

5. From the IBM Power RAID Configuration Utility display, select **Work with disk unit recovery**. Press Enter.
6. From the Work with Disk Unit Recovery display, select **Concurrent add device**. Press Enter.
A Concurrent Device Add display similar to the following is shown.

Concurrent Device Add			
Choose a single location for add operations			
1=Select			
OPT Name	PCI/SCSI Location	Description	Status
	0000:41:01.0.1/0:5:		Empty
	0000:41:01.0.1/1:8:		Empty
	0001:61:01.0.2/0:8:		Empty

Figure 12. Example Concurrent Device Add display

7. Type option1 (Select) next to the location from which you removed the disk drive.
The Verify Device Concurrent Add display is shown.
8. Press Enter on the Verify Device Concurrent Add display. The Complete Device Concurrent Add display is shown.
9. Support the bottom of the disk drive as you align it with the guide rails in the system or expansion unit. Do not hold the disk drive by the handle.
10. Slide the disk drive all the way into the system or expansion unit and then lock it in place by pushing in the disk drive handle, as shown in Figure 13 on page 39 or Figure 14 on page 39.

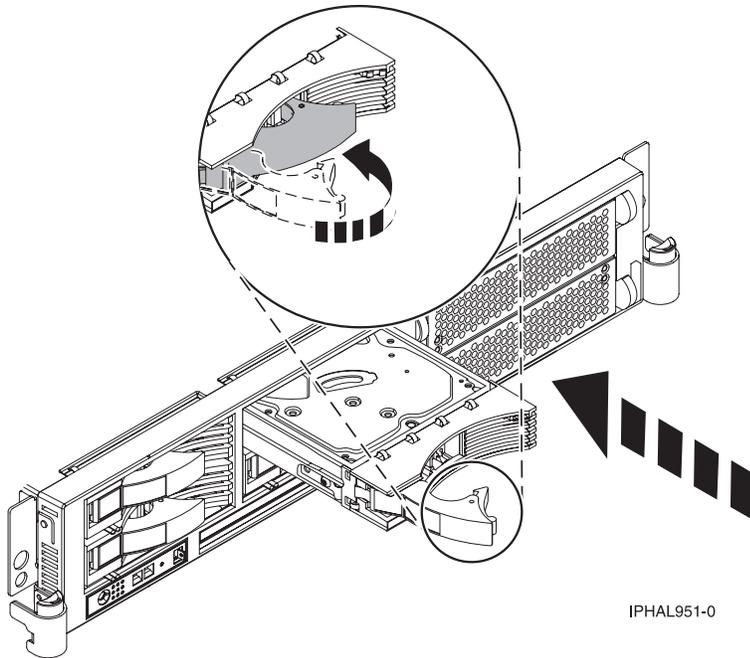


Figure 13.

OR

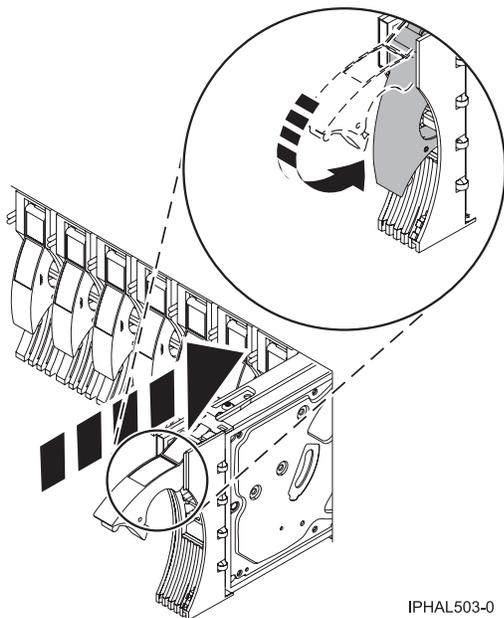


Figure 14.

11. Press Enter on the Complete Device Concurrent Add display to indicate that the disk drive is installed.
12. Rebuild the data on the replacement disk drive. For instructions, go to “Rebuild data on a replacement disk drive using Linux” on page 50.
13. Go to Verify a repair in your host server’s service guide. **This completes this procedure.**

Replace the disk drive nonconcurrently

Use this procedure to remove and replace a disk drive nonconcurrently.

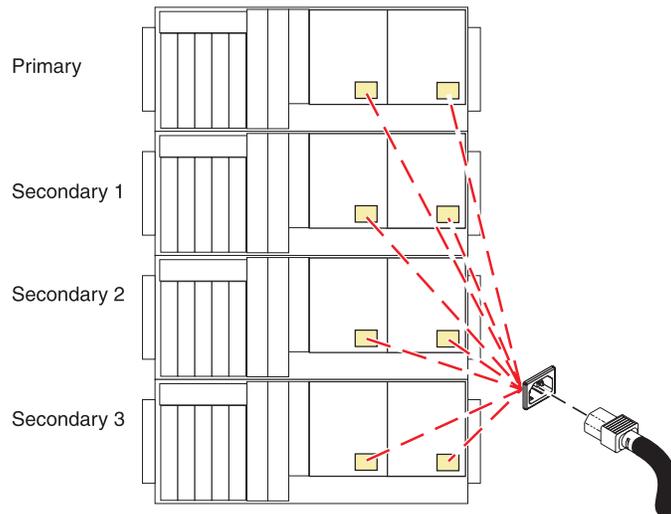
1.

The component will not be serviced concurrently.

If this system is powered on, power it off before continuing.

If possible, shut down any running applications and the operating system before powering off the system.

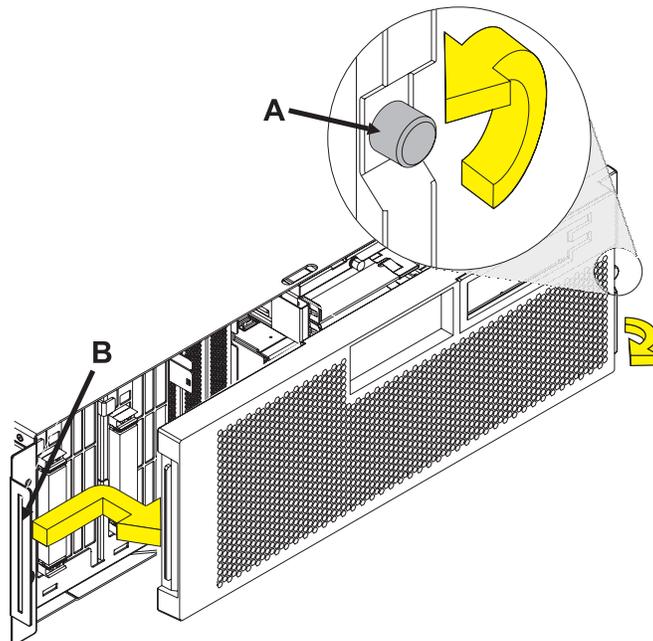
Once the system is powered off, remove all power cords from all of the processor enclosures starting with the primary processor enclosure (topmost) and then each secondary enclosure working from top to bottom.



2.

Access the unit by:

1. Open the front rack door.
2. Loosen the thumbscrew **(A)** on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot **(B)**.

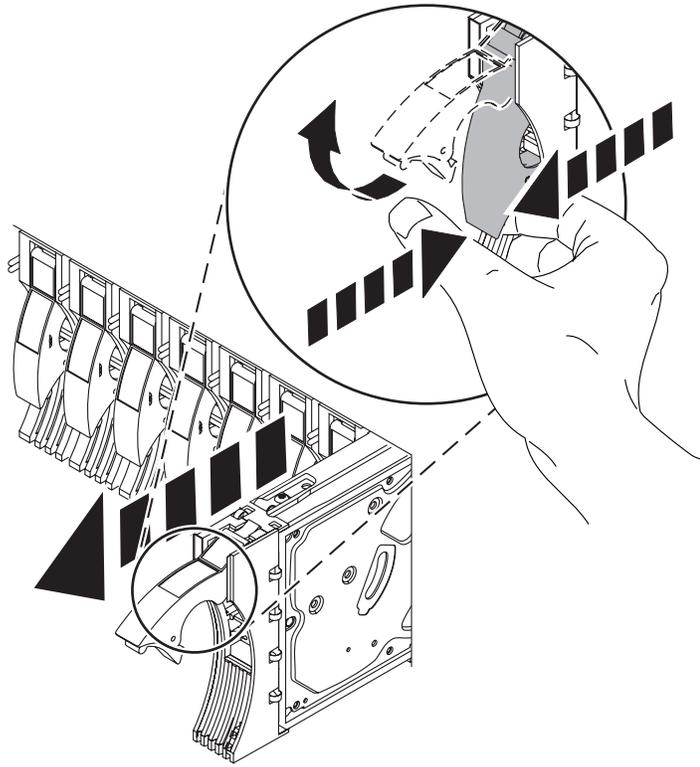


3.

Remove the Disk Drive by:

1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

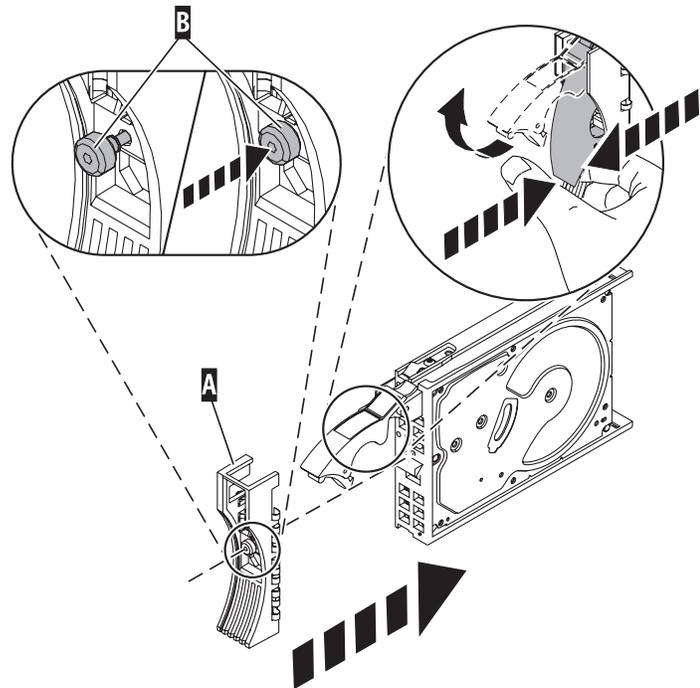
The concurrent maintenance light for the slot turns off when you remove the disk drive.



4.

Install the bezel on the new disk drive:

1. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel A to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew B to secure the bezel to the disk drive.



5.

Install the disk drive:

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
2. Slide the disk drive into the system until it stops.
3. Push the disk drive handle in until it locks.

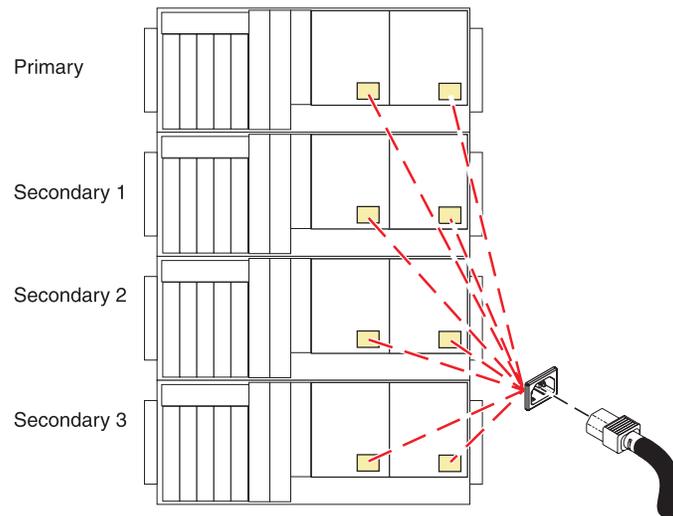
Note: It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.

6.

If you removed the power cords, reinstall the power cords for all of the processor enclosures.

Install the cords in the following order:

1. Secondary 2
2. Secondary 3
3. Primary
4. Secondary 1



7.

Go to “Verifying a repair” on page 118. **This completes this procedure..**

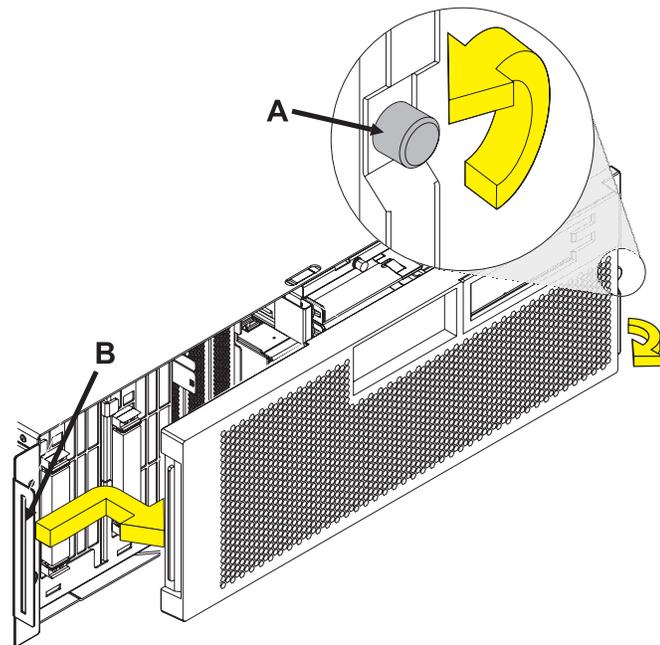
Replace the disk drive using i5/OS

Use this procedure to remove and replace a disk drive Concurrently with i5/OS.

1.

Access the unit by:

1. Open the front rack door.
2. Loosen the thumbscrew (A) on the right side of the cover.
3. Slide the cover to the right and remove it from the system unit slot (B).



2.

To recover any data that might be lost when a disk drive is replaced, you must know if the disk drive has data protection.

Do you know the protection status of the disk drive to be removed?

No: Continue with the next step.

Yes: If the disk drive is mirrored, record the status of both disk drives in the mirrored pair and go to step 6 on page 45. If the disk drive is parity protected, go to step 4 on page 44.

3.

Determine the protection status of the disk drive to be removed:

1. Sign on the operator console with at least service level authority.
 2. Type strsst on the command line of the i5/OS session and press Enter.
 3. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter.
 4. Select **Work with disk units** from the System Service Tools (SST) display. Press Enter.
 5. Select **Display Disk Configuration** from the Work with Disk Units display. Press Enter.
 6. Select **Display Disk Configuration Status** from the Display Disk Configuration display. Press Enter.
A list of each auxiliary storage pool (ASP) displays, showing the disk drives that are members of the ASPs..
 7. Is the status of the failing disk drive **Mirrored**?
No: Continue with the next step.
Yes: Record the status of both disk drives in the mirrored pair and continue at step 6 on page 45.
-

4.

Determine if the failing disk drive is parity protected:

Check the status of the failing disk drive for one of the following:

- DPY/Active
- DPY/Failed
- DPY/HDW Failure
- DPY/Degraded
- DPY/Power Loss
- DPY/Not Ready
- DPY/Unknown

If the status of the failing disk drive and all other disk drives in the array is shown in the preceding list, the failing disk drive is parity protected.

Is the failing disk drive parity protected?

- Yes:** Go to step 9 on page 46.
 - No:** Continue with the next step.
-

Note: An ASP with a status of Unprotected might contain disk drives that are device parity protected.

5.

Perform a backup of the data in the failing ASP.

Go to step 9 on page 46.

Note: This is a customer task. Refer to the system's Operations Guide for instructions.

6.

Does the disk drive you are replacing have a status of Suspended?

Yes: Go to step 9 on page 46.

No: Check the status of the disk drive that is mirrored to the disk drive you are replacing. If it is Suspended, go to step 8. If it is Active, continue with the next step.

7.

Suspend the disk drive that you are replacing by performing the following:

1. Press F3 from the Display Disk Configuration display to return to the Work with Disk Units display.
 2. Select Work with Disk Unit Recovery from the Work with Disk Units display and press Enter.
 3. Select Suspend mirrored protection from the Work with Disk Unit Recovery display and press Enter.
 4. Select the option to suspend the disk drive that you are replacing from the Suspend Mirrored Protection display and press Enter.
 5. Go to step 9 on page 46
-

8.

The suspended mirrored pair of the failing drive has also failed and must be replaced.

Note: Performing a backup is a customer task. Refer to the system's Operations Guide for instructions.

Perform a backup of the data in the failing ASP.

Go to step 9 on page 46 to replace the failing mirrored disk.

Return to the beginning of this procedure to replace the disk that you originally intended to replace.

9.

Select Device Concurrent Maintenance from the Hardware Service Manager display. Press Enter. The Device Concurrent Maintenance display is displayed.

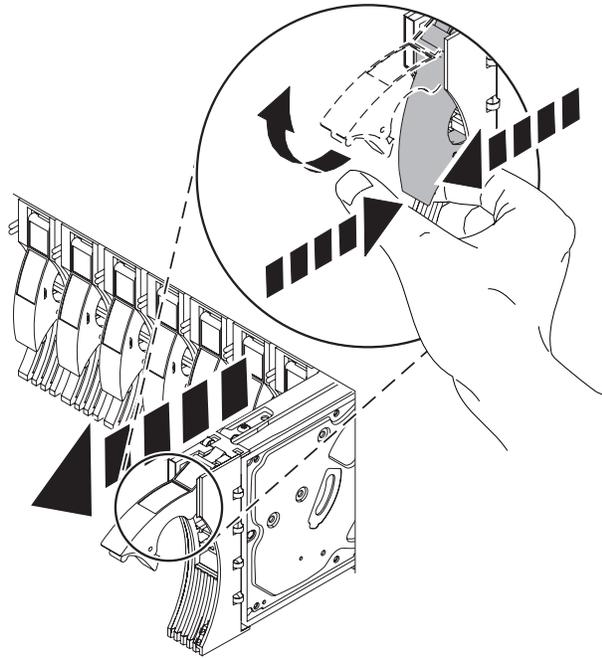
1. Enter the location code of the disk drive being replaced in the form of: U787A.001.AAAXXX-P3-D4
 2. Select option 1 (Remove device) for the **Action to be performed**.
 3. Set the time delay for one minute: 01. **Important:** Do not press Enter at this time.
 4. Locate the concurrent maintenance light that corresponds to the position of the disk drive that you are replacing.
Important: When you press Enter, after a one minute delay, this light comes on and begins to blink rapidly. You then have nine seconds to remove the disk drive.
 5. Press Enter on the console.
 6. When the light blinks rapidly, perform the next step to remove the disk drive within 9 seconds.
-

10.

Remove the Disk Drive by:

1. Unlock the disk drive handle by squeezing it and pulling it out toward you as shown.
2. Support the bottom of the disk drive as you slide it out of the system or expansion unit. Do not hold the disk drive by the handle.

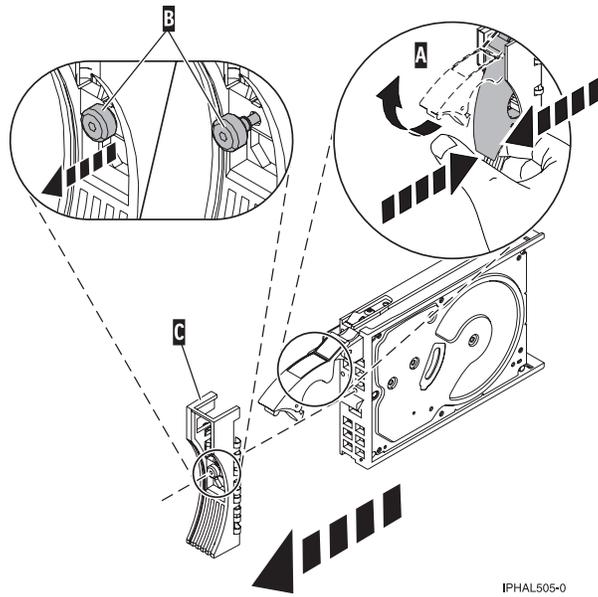
The concurrent maintenance light for the slot turns off when you remove the disk drive.



11.

Loosen and pull out on the thumbscrew B to release the disk-drive bezel C from the disk drive, as shown in the graphic.

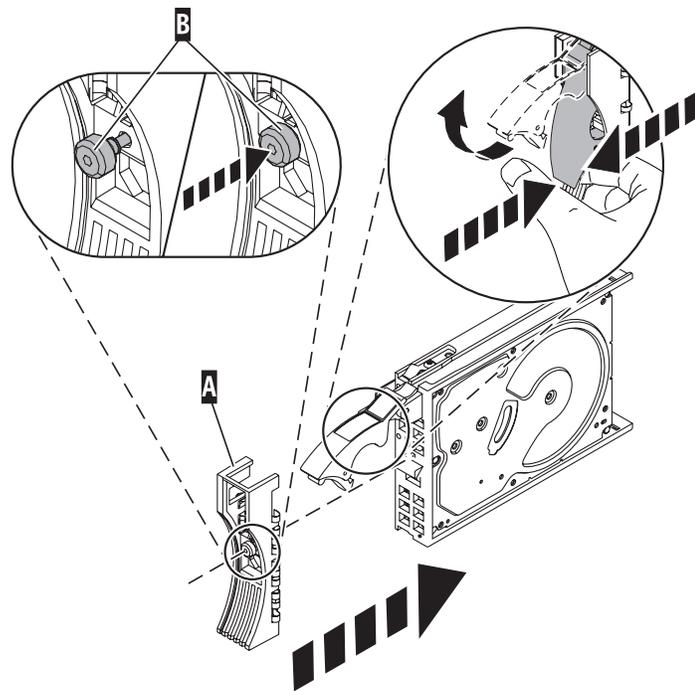
Continue with the next step.



12.

Install the bezel on the new disk drive:

1. Find the package that contains the new disk drive.
Attention: Disk drives are fragile. Handle with care.
2. Remove the disk drive from its static protective package.
3. Unlock the handle of the replacement disk drive by squeezing and pulling it out toward you. If the handle is not all the way out, the disk drive will not slide into the system.
4. Attach the disk drive bezel A to the replacement disk drive as shown.
5. Press in and then tighten the thumbscrew B to secure the bezel to the disk drive.



13.

1. Return to the console and wait until the Concurrent Maintenance Results display is shown. Press F12.
 2. The physical locations you entered in step 6 of this procedure might still appear on the display. If not, retype the physical location where you will be installing the new disk drive.
 3. Select option 2 (Install device) for the **Action to be performed**.
 4. Set the time delay for one minute: 01. **Important:** Do not press Enter at this time.
 5. Locate the concurrent maintenance light that corresponds to the position of the disk drive that you are replacing
 6. **Important:** When you press Enter, after a one minute delay, this light comes on and begins to blink rapidly. You then have nine seconds to install the disk drive.
 7. Continue with the next step.
-

14.

Install the disk drive:

1. Support the bottom of the disk drive as you align it with the guide rails in the system unit. Do not hold the disk drive by the handle.
 2. Slide the disk drive into the system until it stops.
 3. Press Enter on the console.
 4. When the light blinks rapidly, perform the next step to install the disk drive within 9 seconds.
 5. Push the disk drive handle in until it locks.
Note: It is important to ensure that when installing a disk drive, that the drive is fully seated and all the way into the system.
 6. Continue with the next step.
-

15.

1. If you removed a front cover, install the front cover
 2. Install or close the system, expansion unit or rack front door.
 3. Return to the console and wait until the Concurrent Maintenance Results display is shown. Press Enter.
 4. If you return to the Service Action Log display, exit the service action log.
 5. When the Hardware Service Manager display is shown, press F3.
 6. Continue with the next step.
-

16.

Rebuild the data on the replacement disk drive by:

1. If necessary, start System Service Tools (SST) by typing strsst on the command line of the i5/OS® session and pressing Enter.
2. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display. Press Enter. **Note:** The service tools password is case sensitive.
3. Select **Work with disk units** from the Start System Service Tools (SST) display. Press Enter.
4. Select **Work with disk unit recovery** from the Work with Disk Units display. Press Enter.

Was the failing disk drive mirrored?

Yes: Go to step 20 on page 50.

No: Continue with the next step.

17.

Was the failing disk drive parity protected?

Yes: Go to step 20 on page 50.

No: Continue with the next step.

18.

Restore the data on the replacement disk drive from the latest backup available.

Note: Performing a restore is a customer task. Refer to the system's Operations Guide for instructions.

19.

1. Select **Rebuild disk unit data** on the Work with Disk unit recovery display. Press Enter.
 2. Select 1 to rebuild the disk drive displayed (the disk drive displayed is the disk drive that you removed) on the Rebuild Disk Unit Data display. Press Enter.
 3. Press Enter on the Confirm Rebuild Disk Unit Data display. The rebuild process might take several minutes to complete.
 4. Press F5 to refresh the display until the **Percent complete** shows 5%.
 5. When the display shows at least 5% complete, you can either continue to monitor this display to completion, or press F3 (Exit) to return to the Work with disk units display.
 6. Press F3 (Exit) to return to the System service tools display.
 7. Press F3 (Exit) to return to the Exit SST display and press Enter.
-

20.

1. Select **Replace configured unit** on the Work with Disk unit recovery display. Press Enter.
2. Select the configured disk drive that you are exchanging (suspended drive) on the Select Configured Unit to Replace display. Press Enter.
3. Select the disk drive that you just installed on the Select Replacement Unit display. This drive has a non-configured status.
Note: In some cases, it might take several minutes for a new disk drive to display. Repeat these steps until the new drive is shown.
Press Enter.
4. Press Enter on the Confirm Replace of Configured Unit display to confirm your choice for replacement.
The replacement process might take several minutes to complete.
When the process is complete, the Work with Disk unit recovery display is shown.
5. Press F3 (Exit) to return to the Work with disk units display.
6. Select **Display disk configuration** on the Work with disk units display.
7. Select **Display disk configuration status** on the Display Disk Configuration display.
Mirrored status shows Resuming. When complete, the mirrored status shows Active. This process might take several minutes to complete. You can either monitor this display to completion, or press F3 (Exit) three times, and then press Enter to return to the main menu.

Was the failing disk drive mirrored?

Yes: Go to step 22.

No: Continue with the next step.

21.

To rebuild data on the replacement disk drive, refer to the information for the controller to which the disk drive is attached.

- If the disk drive is attached to a PCI-X SCSI RAID controller, see the **PCI-X SCSI RAID Controller Reference Guide for AIX**.
- If the disk drive is attached to a PCI SCSI RAID adapter (feature code 2498), see the **PCI 4-Channel Ultra3 SCSI RAID Adapter Reference Guide**.

For more information, see the **AIX System Management Guide: Operating System and Devices**.

22. Go to Verify a repair in your host server's service guide. **This completes this procedure.**

Rebuild data on a replacement disk drive using Linux

To rebuild data on the replacement disk drive, complete the steps listed here.

For an unprotected disk drive

If the disk drive you are replacing is in a RAID Level 0 disk array or in a failed RAID Level 5 or RAID Level 10 disk array, perform these tasks:

1. Re-create the disk array.
2. Re-create the file systems on the disk array.
3. Copy the data back to the restored disk array from your backup media.

For information on these tasks, see the *PCI-X SCSI RAID Controller Reference Guide for Linux*, SA23-1327.

Display Panel

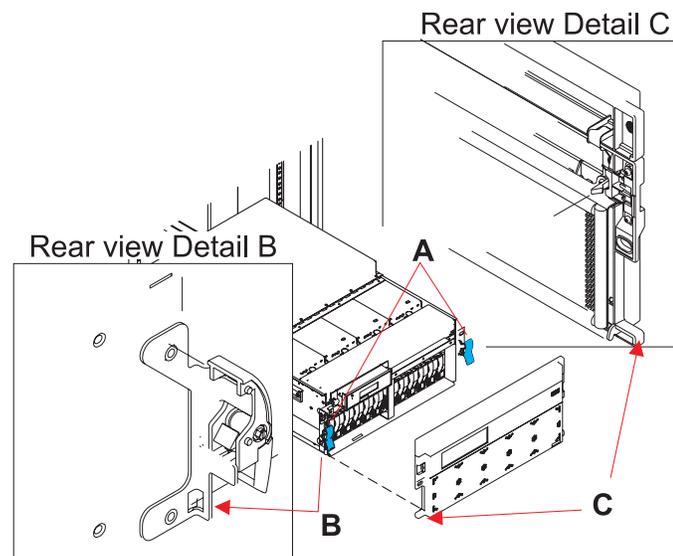
1.

The component will be serviced non-concurrently.

Power should be removed from the unit. If this unit is powered on, power it off now. When the unit is completely powered off, disconnect the AC input source by removing the power cord from the unit. Do not apply power to the unit until directed to do so in this procedure.

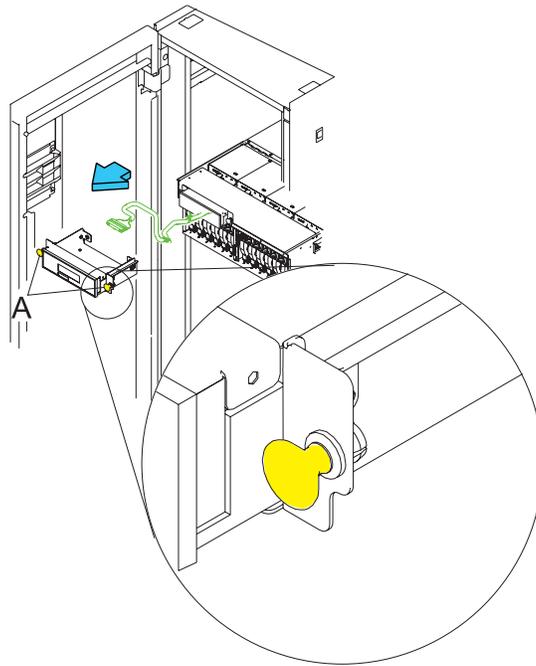
2. Remove The Front Bezel

1. Open the front rack door.
2. Simultaneously press in both bezel-release tabs (A).
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 (B). This action releases the two tabs (C) located on the bottom of the bezel.
5. Put the bezel in a safe place.



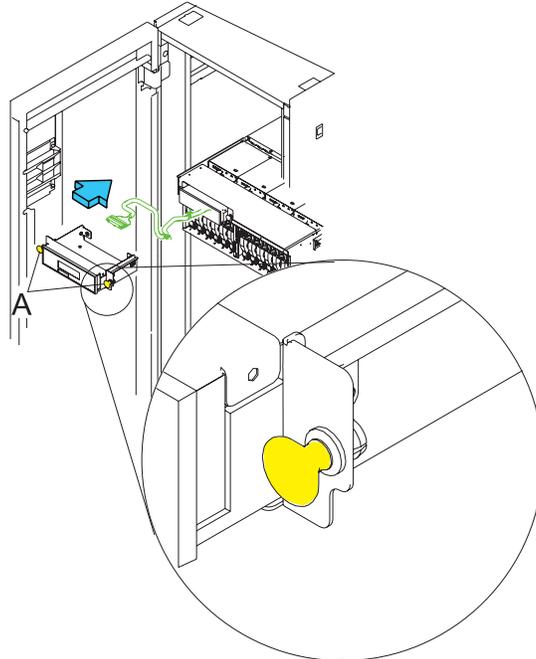
3. Remove the display panel

1. Remove the display panel by pulling out on the two side handles (A) and sliding the display panel partially out of the frame.
2. Disconnect the cable that is attached to the rear of the display panel.
3. Remove the display panel by grasping its edges and slowly pulling it out of the enclosure.



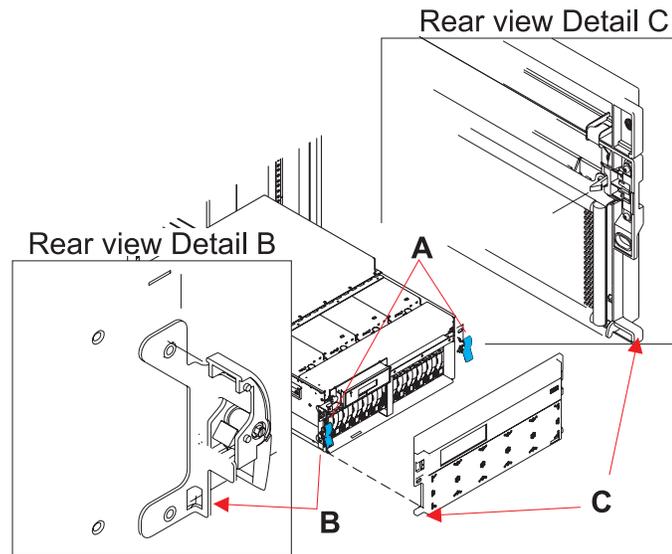
4. Install the display panel

1. Slide the new display panel assembly partially into the frame by pushing in on the handles (A) on each side of the assembly.
2. Connect the end of the display panel cable to the rear of the display panel.
3. Install the display panel by pushing in on the handles (A) on each side of the assembly and sliding it into the enclosure.



5. Install The Front Bezel

1. Open the front rack door.
2. Insert the two tabs (C) located on the bottom edge of the bezel into their locking slots (B), located on the chassis.
3. Pivot the front bezel up toward the top of the chassis.
4. Align the release tabs (A) to the matching slots located on the front of the subsystem chassis.
5. Gently push the release 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.
7. Reconnect the power source.
8. Close the rack door.



NIC Card

- 1.

The component will be serviced non-concurrently.

Power should be removed from the unit. If this unit is powered on, power it off now. When the unit is completely powered off, disconnect the AC input source by removing the power cord from the unit. Do not apply power to the unit until directed to do so in this procedure.

2. CAUTION:

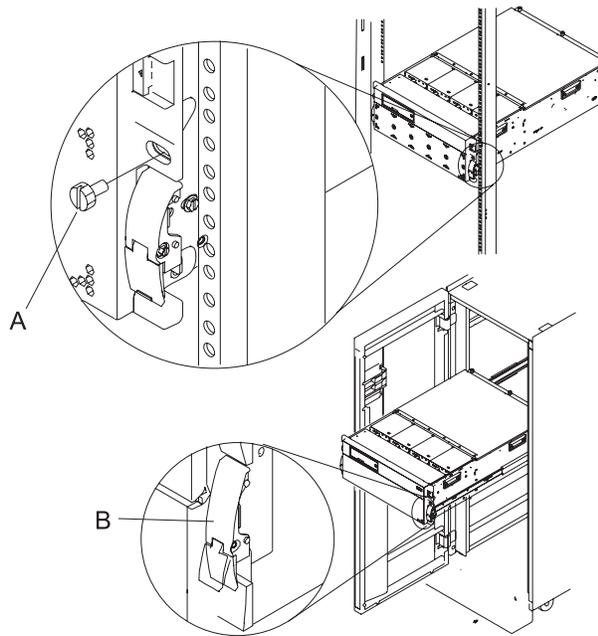
The system contains circuit cards and/or assemblies that contain lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the circuit card as instructed by local regulations. (C014)

Attention: All cards are sensitive to electrostatic discharge.

3. Place unit into Service Position

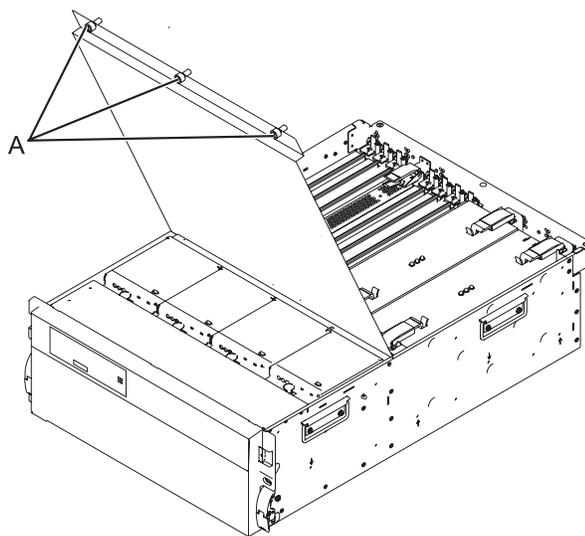
Attention: When placing your system into the service position, all stability plates must be firmly in position to prevent the rack from tipping over. Ensure that only one system unit is in the service position at a time.

1. Open the front rack door.
2. If your system is equipped with two blue thumbscrews securing it to the rack, remove the thumbscrews (**A**) at this time. The screws are located on the right and left side of the bezel, just above each subsystem release latch.
3. Release the subsystem release latches (**B**).
4. Pull the system unit out from the rack until the rails are fully extended.
5. 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.



4. Open the Service Access Cover

1. Open the front rack door and place the system into the service position.
2. Loosen the three captive thumbscrews (**A**) located on the rear of the cover. 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.

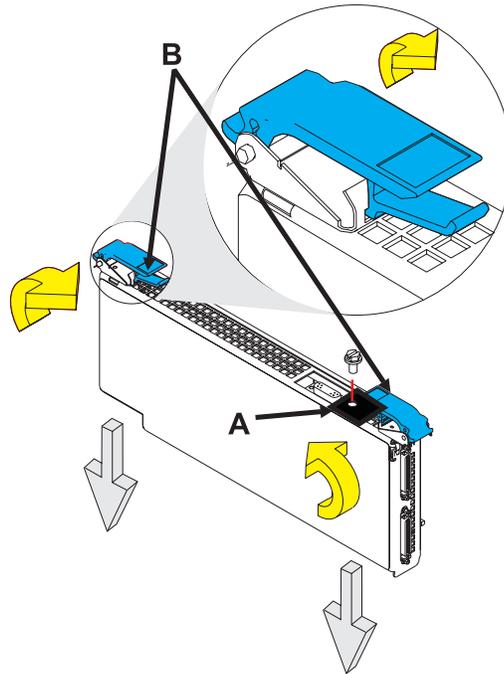


5. Remove the HSL/RIO Adapter Card

1. Disconnect the HSL/RIO cables from the HSL/RIO Adapter Card connectors located on the rear of the subsystem.
 2. Label and disconnect all cables that cross over the top of the HSL/RIO Adapter Card. These cables might interfere with the removal and installation of the card.
 3. Remove the latch cover (**A**) (if present), by loosening its screw and sliding it off of the card.
 4. Squeeze the release latches (**B**) to release them from the card and rotate them in the direction shown.
 5. Gently pull the card straight out of the card cage assembly.
-

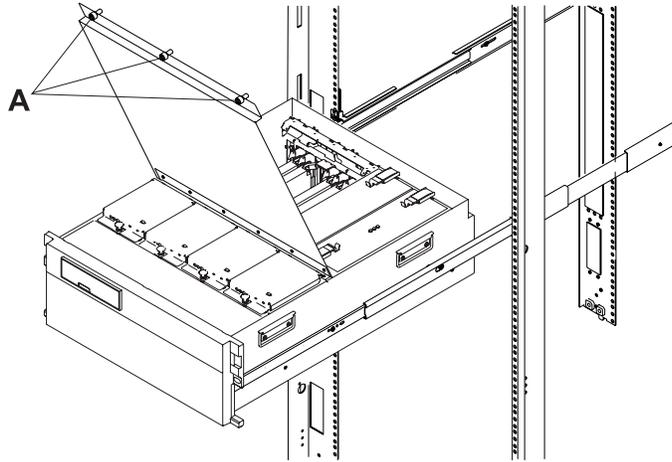
6. Install the HSL/RIO Adapter Card

1. Insert the HSL/RIO Adapter Card straight into its slot in the card cage assembly.
2. Lower the card through the alignment bracket.
3. Push in on the blue latches (**B**) for the card you are installing.
4. Install the latch cover (**A**) (if present), by sliding it onto the card and tightening its screw.
5. Reconnect the cables that were disconnected during the HSL/RIO Adapter Card removal.
6. Reconnect the HSL/RIO cables to the HSL/RIO Adapter Card connectors located on the back of the chassis.



7. Close the Service Access Cover

Close and then secure the service access cover with the three thumbscrews (A).



8. Reconnect the power source.

PCI Card

Use this procedure to service the PCI Card.

1.

The component will be serviced non-concurrently.

Power should be removed from the unit. If this unit is powered on, power it off now. When the unit is completely powered off, disconnect the AC input source by removing the power cord from the unit. Do not apply power to the unit until directed to do so in this procedure.

2.

The component will be serviced concurrently. Do not remove power to the unit during this repair procedure.

3. CAUTION:

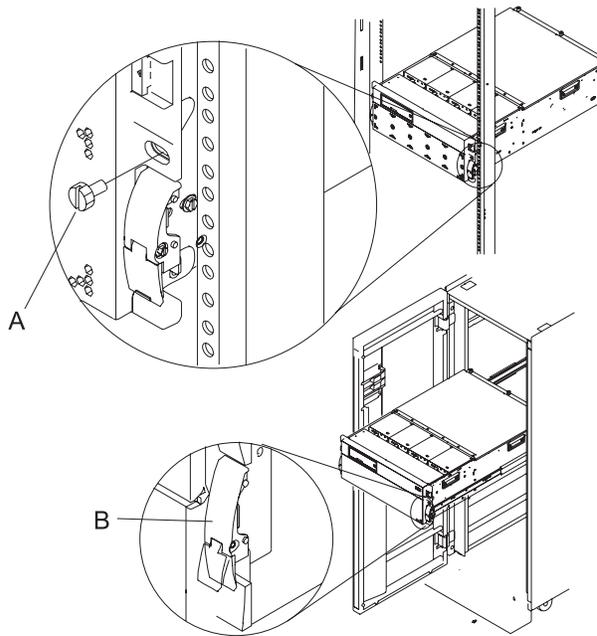
The system contains circuit cards and/or assemblies that contain lead solder. To avoid the release of lead (Pb) into the environment, do not burn. Discard the circuit card as instructed by local regulations. (C014)

Attention: All cards are sensitive to electrostatic discharge.

4. Place unit into Service Position

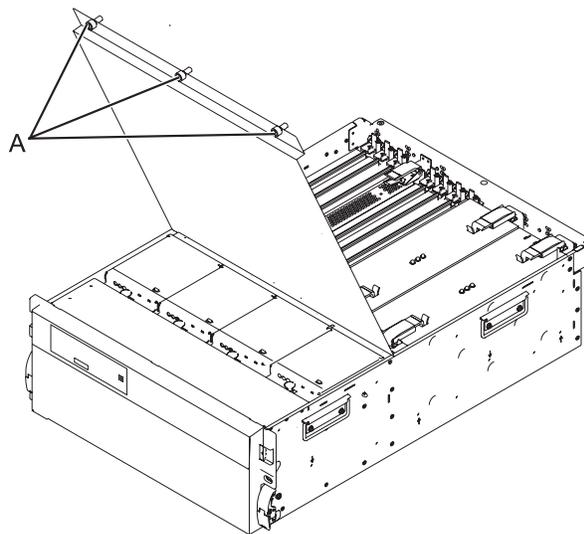
Attention: When placing your system into the service position, all stability plates must be firmly in position to prevent the rack from tipping over. Ensure that only one system unit is in the service position at a time.

1. Open the front rack door.
2. If your system is equipped with two blue thumbscrews securing it to the rack, remove the thumbscrews (A) at this time. The screws are located on the right and left side of the bezel, just above each subsystem release latch.
3. Release the subsystem release latches (B).
4. Pull the system unit out from the rack until the rails are fully extended.
5. 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.



5. Open the Service Access Cover

1. Open the front rack door and place the system into the service position.
2. Loosen the three captive thumbscrews (A) located on the rear of the cover. 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.

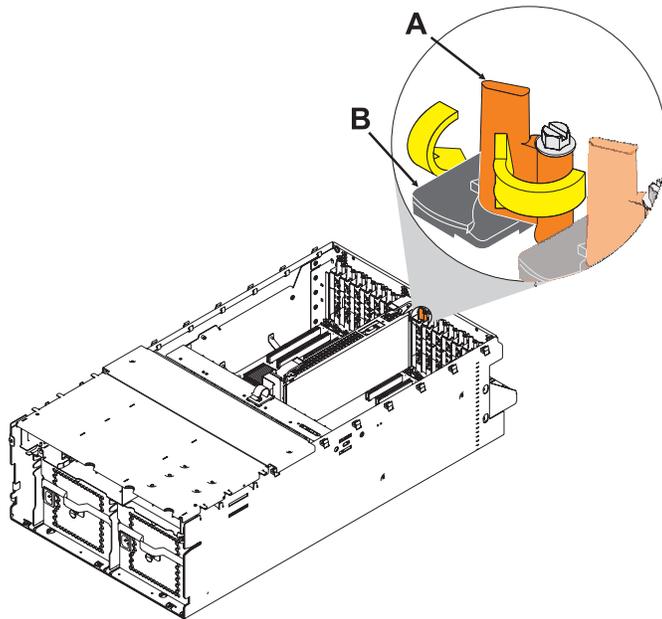


6. Remove the PCI card

1. Look at the power LED for the card that you are removing to ensure that it is powered off. The power LED is located to the left of and directly above the card slot. If the LED is flashing or it is off, then the card is powered off.
 2. Disconnect and label any cables from the card that you wish to remove.
 3. Turn the orange latch **(A)** counter-clockwise and lift up on the black latch **(B)** to release the card.
 4. Gently pull the card straight out of the card cage assembly.
-

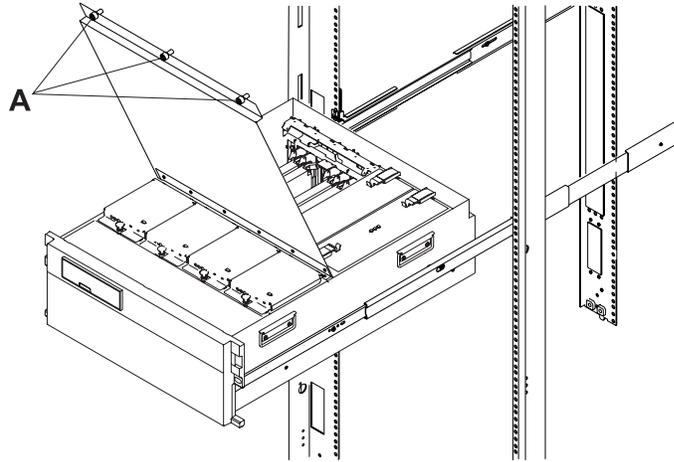
7. Install the PCI card

1. Push the card straight into its slot in the PCI card cage assembly.
2. Push down on the black latch **(B)**, then turn the orange latch **(A)** clockwise to secure the card.
3. Connect any cables to the card that you previously removed.



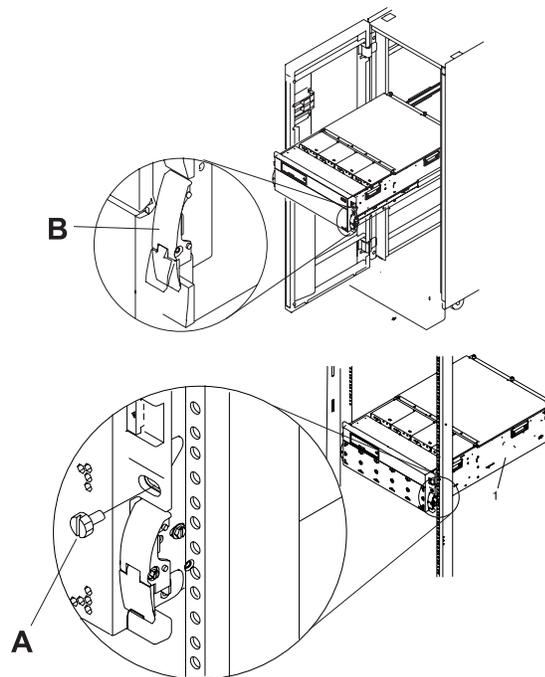
8. Close the Service Access Cover

Close and then secure the service access cover with the three thumbscrews (A).



9. Place unit into Operating Position

1. Release the rail release latches (B) located on the left and right rail by pulling the release latches up into the open position.
2. Push the system unit straight back into the rack until both release latches on the subsystem have locked into position.
3. If you removed two thumbscrews (A) from the front bezel, replace them at this time.
4. Close the front rack door.



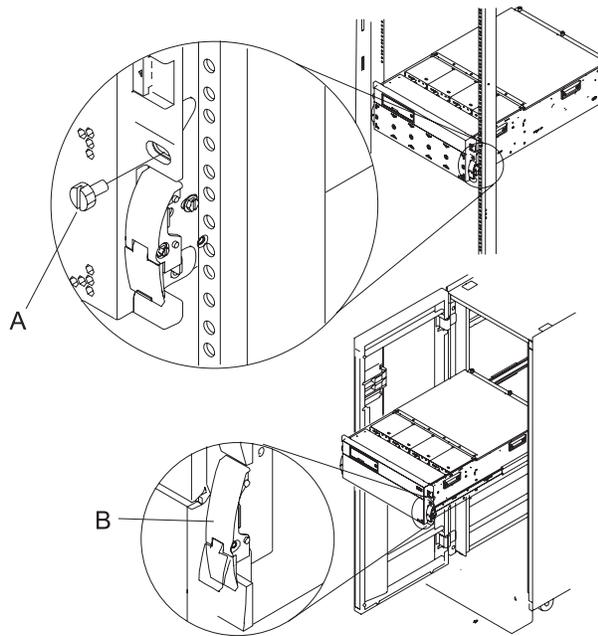
Power Supply

Use this procedure to service the power supply.

1. Place unit into Service Position

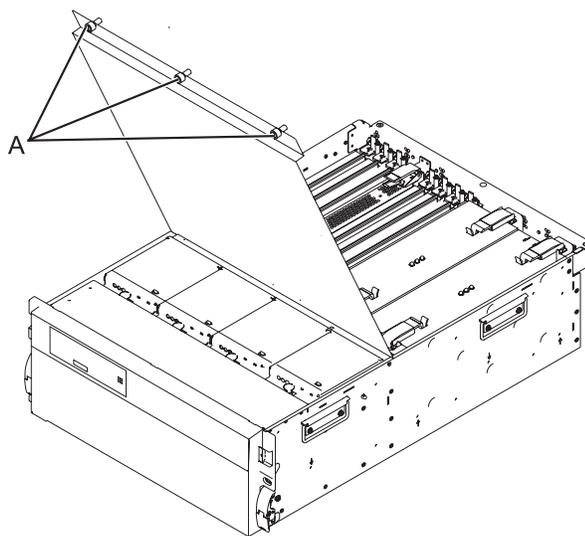
Attention: When placing your system into the service position, all stability plates must be firmly in position to prevent the rack from tipping over. Ensure that only one system unit is in the service position at a time.

1. Open the front rack door.
2. If your system is equipped with two blue thumbscrews securing it to the rack, remove the thumbscrews (**A**) at this time. The screws are located on the right and left side of the bezel, just above each subsystem release latch.
3. Release the subsystem release latches (**B**).
4. Pull the system unit out from the rack until the rails are fully extended.
5. 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.



2. Open the Service Access Cover

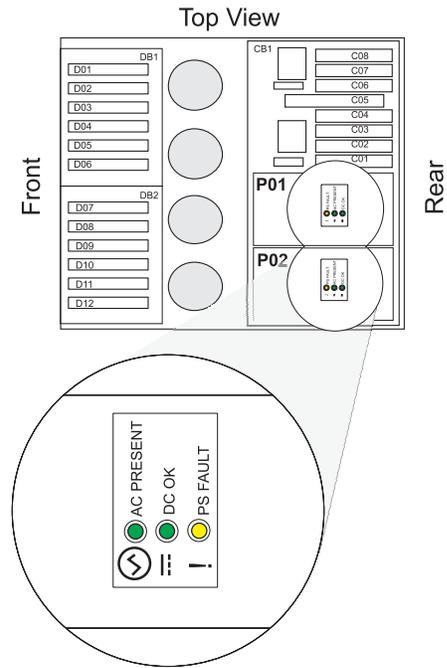
1. Open the front rack door and place the system into the service position.
2. Loosen the three captive thumbscrews (**A**) located on the rear of the cover. Note: The service access cover pivots on a piano hinge located directly behind the four cooling blowers.
3. To open the service access cover, lift 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.



3.

You must determine if the repair can continue concurrently. To continue the repair concurrently, the following conditions must be true:

- Another power supply must already be installed.
- This power supply has three LEDs. The LEDs must be set as follows:
- AC Present - on, not blinking
- DC Ok - on, not blinking
- PS Fault - off



4.

Continue the repair concurrently or non-concurrently.

Select an action:

Concurrent repair. Continue the repair with unit power on. ↓	Non-concurrent repair. Power off the unit and continue the repair. Go to step 6	Delay the repair. This ends the procedure.
---	--	--

5.

The component will be serviced concurrently. Do not remove power to the unit during this \ repair procedure.

Continue with step 7 on page 62.

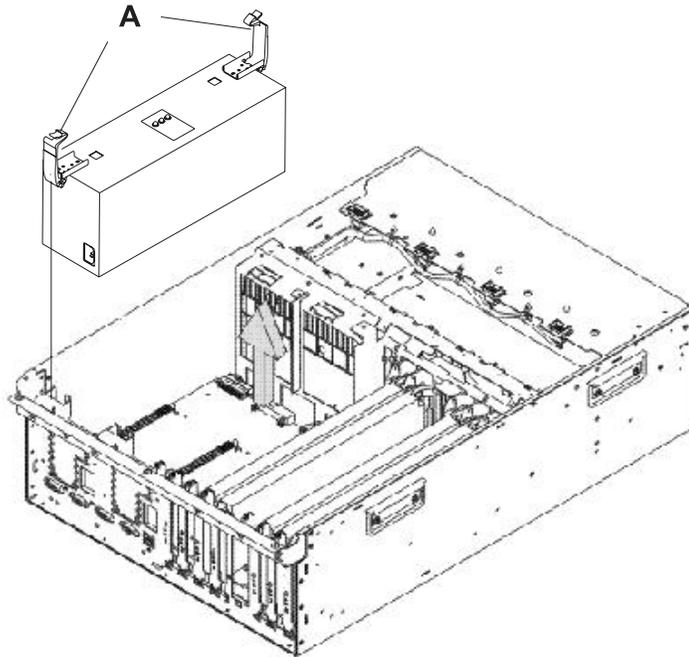
6.

The component will be serviced non-concurrently.

Power should be removed from the unit. If this unit is powered on, power it off now. When the unit is completely powered off, disconnect the AC input source by removing the power cord from the unit. Do not apply power to the unit until directed to do so in this procedure.

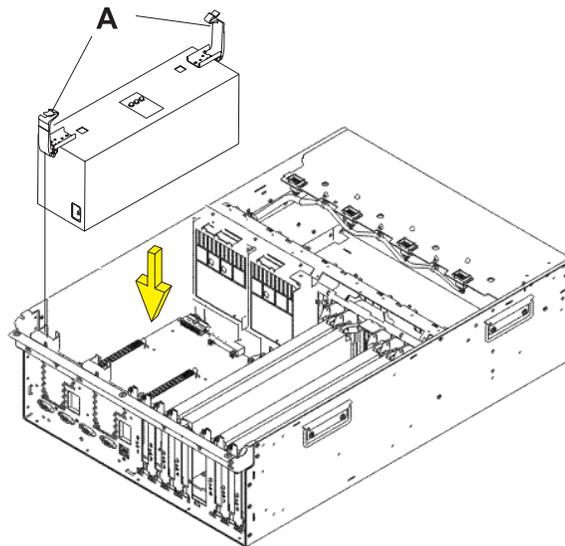
7. Remove the power supply

1. Disconnect the power jumper cord from the unit that you are replacing.
2. Release and pull the latch handles (A) upwards until they are perpendicular to the top of the power supply you are removing.
3. Pull the power supply from the expansion unit.



8. Install the power supply

1. Ensure the latch handles are in the unlocked position and perpendicular to the power supply.
2. Carefully insert the power supply into the expansion unit and onto the docking connectors.
3. Push the latch handles (A) downwards into the locked position on the power supply you are installing.
4. Connect the power jumper cord to the unit that you are replacing.



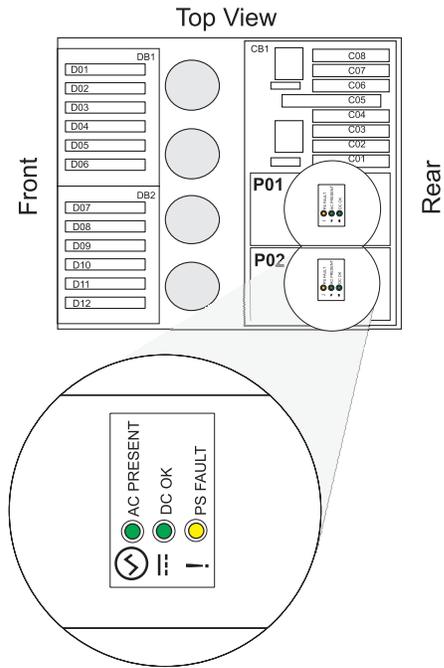
9.

You must determine if the new power supply is operational. The new power supply is operational if its LEDs are set as follows:

- AC Input - on, not blinking
- DC Output - on, not blinking
- Fault/Identify - blinking or off

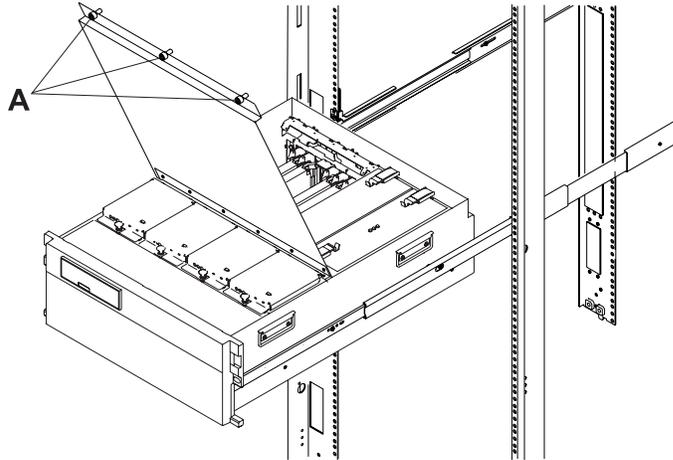
For a non-concurrent repair, you may have to continue this repair procedure until FRU level activation completes, before using the LEDs to determine if the new power supply is operational.

If the LEDs are set differently, you must determine why. Make sure the power supply is plugged into a working AC power source, try installing a different power supply, or call your next level of support.



10. Close the Service Access Cover

Close and then secure the service access cover with the three thumbscrews (A).



Selectable PCI Card

1. This FRU class extends ISXorNormalPCICard. It is not a "normal" FRU class.

I/O Backplane

Use this procedure to remove and replace a 0595, 5095, or 7311-D20 I/O backplane.

1.

Record the activated firmware level of the server for use in this procedure. The activated firmware level of the server can be found in the upper-right corner of the ASMI utility.

2.

If this is a 7311-D20 expansion unit connected to a System p server with an activated firmware level that is earlier than SF235, the partitions that own slots in the expansion unit must be powered off during this procedure. Power the partitions off now. This power-off action can be accomplished by powering off individual partitions, or powering off the server.

3.

Power off the expansion unit (see "Powering off an expansion unit" on page 101).

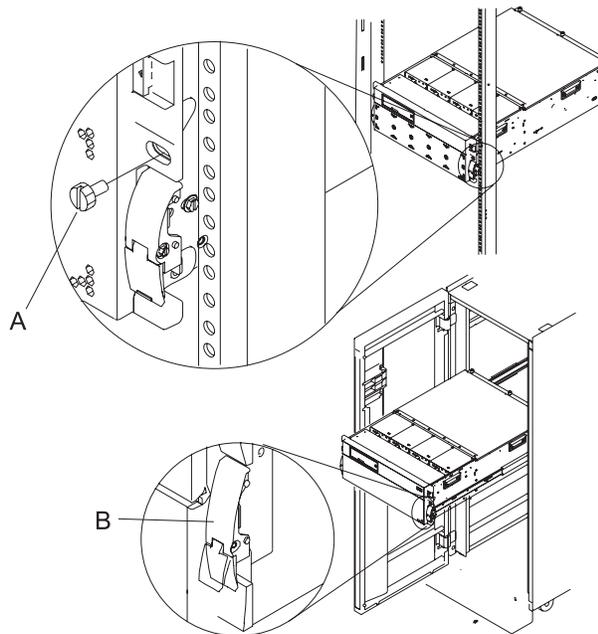
4.

Remove the ac power cord(s) from the expansion unit.

5. Place unit into Service Position

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

1. Open the front rack door.
 2. If your system is equipped with two blue thumbscrews securing it to the rack, remove the thumbscrews (A) at this time. The screws are located on the right and left side of the bezel, just above each subsystem release latch.
 3. Release the subsystem release latches (B).
 4. Pull the system unit out from the rack until the rails are fully extended.
 5. 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.
-

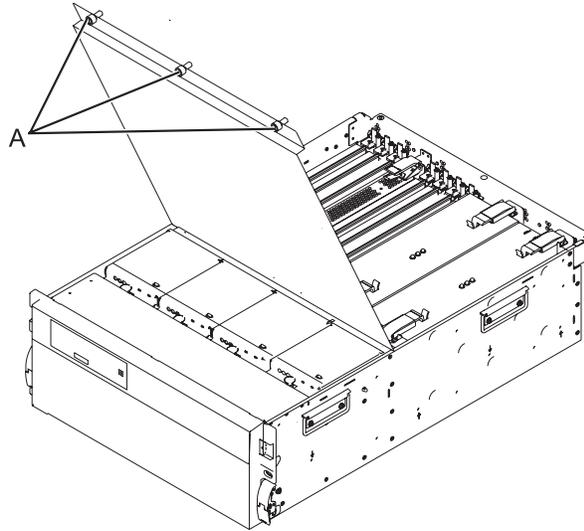


6.

If you are servicing a tower unit, remove the side cover.

7. Open the Service Access Cover

1. Open the front rack door and place the system into the service position.
2. Loosen the three captive thumbscrews (A) located on the rear of the cover. 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.



8.

Remove the following:

- PCI cards (see “PCI Card” on page 56)
- RIO/HSL I/O bridge adapter
- card dividers

9.

Remove the power supplies (see “Power Supply” on page 59).

10.

Remove the five screws (three from the side and two from the back) that hold the backplane to the expansion unit. Notice the aligning pins near the top of the board, and the power connections near the bottom of the board, for use later when you reinstall the board.

11.

Install the new backplane by reversing the procedure described in step 5 on page 64 to step 10.

12.

Reconnect the power cord(s) and/or the power supply cords that you disconnected earlier.

Note: If the server is powered on, the expansion unit will power on automatically.

13.

Perform “Setting I/O enclosure configuration ID and MTMS value” on page 110, and then continue with the next step of this procedure.

Note: If this is a 7311-D20 expansion unit connected to a System p server with an activated firmware level that is lower than SF235, and the server is currently powered off, when instructed to power on the server in Setting expansion unit configuration ID and MTMS value it must be powered on to firmware standby, not firmware running.

14.

If this is a 7311-D20 expansion unit connected to a System p server with an activated firmware level that is lower than SF235, go to step 15. Otherwise, go to step 17.

15.

If the server is HMC-managed, disconnect one of the SPCN cables from the expansion unit (only one of them). Wait 30 seconds, then reconnect it. For a server that is not managed by an HMC, this step can be omitted.

16.

An SPCN microcode download to the expansion unit may or may not be occurring.

- If an SPCN microcode download does not occur, go to step 17.
 - If an SPCN microcode download does occur, wait for the download to finish. Then power the server off and back on again. Partitions may be started at this time. Then go to step 17.
 - There are two ways to determine if an SPCN download is occurring:
 - Look at the Error/Event Logs using the ASMI utility
 - Expand **System Service Aids**.
 - Select **Error/Event Logs**.
 - A 1xxx9107 SRC in the informational logs section indicates that an SPCN download was started.
 - A 1xxx91DD SRC in the informational logs section indicates that an SPCN download completed.
 - Look at the expansion unit rack address using the ASMI utility.
 - Expand **System Configuration**.
 - Select **Configure I/O Enclosures**.
 - If the rack address for the expansion unit is a 1-byte value, an SPCN download is occurring.
 - If the rack address is a 2-byte value, the SPCN download has completed or is not needed.
-

17.

Go to “Verifying a repair” on page 118.

This ends the procedure.

Chapter 4. Part information

The part information provides indexed drawings and tables that cross-reference the enclosure's FRUs (field replaceable units) to part numbers and descriptions.

0595 and 7311-D20 I/O backplane and cabling assembly

Note: For external cable FRU part numbers and descriptions, see the *Site and Hardware Planning Guide*, order number SA76-0091, and refer to Cables available from IBM.

In this information, RoHS refers to European Union Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment.

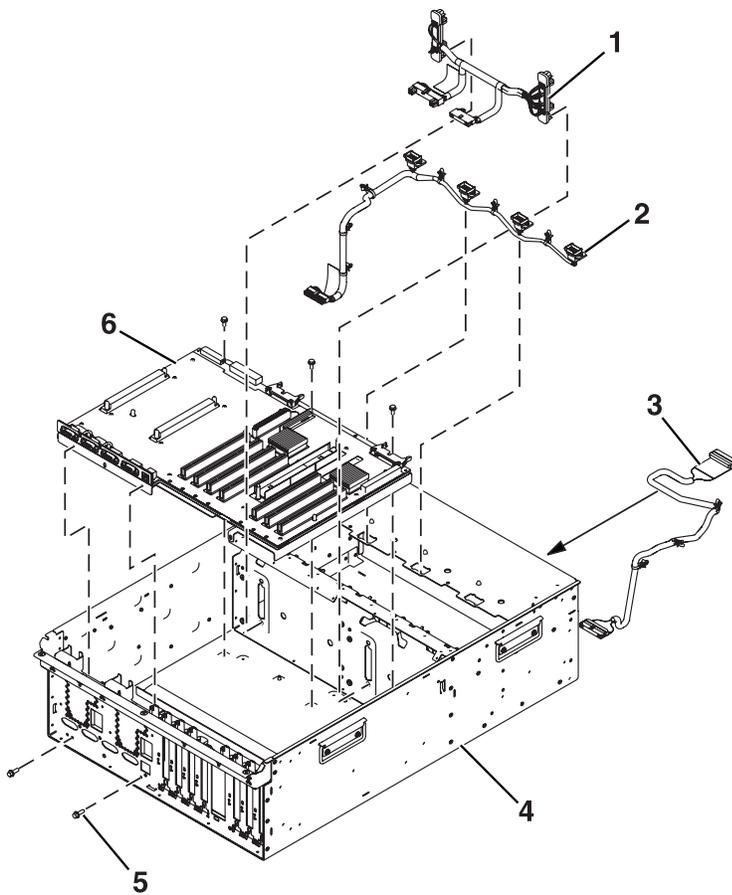


Table 7. 0595 and 7311-D20 I/O backplane and cabling assembly part numbers

Index number	CCIN	Part number	Units	Description
1		53P0416*	1	DASD cable
2		53P4065*	1	Blower cable
3		53P0414*	1	Control panel cable
4		39J1173* 53P0220**	1	Chassis assembly
5		44H7366*	5	Mounting screw, stiffener

Table 7. 0595 and 7311-D20 I/O backplane and cabling assembly part numbers (continued)

Index number	CCIN	Part number	Units	Description
6		39J0515* 53P3472**	1	I/O backplane

* Designed to comply with RoHS requirement

** Not designed to comply with RoHS requirement

PCI adapters assembly

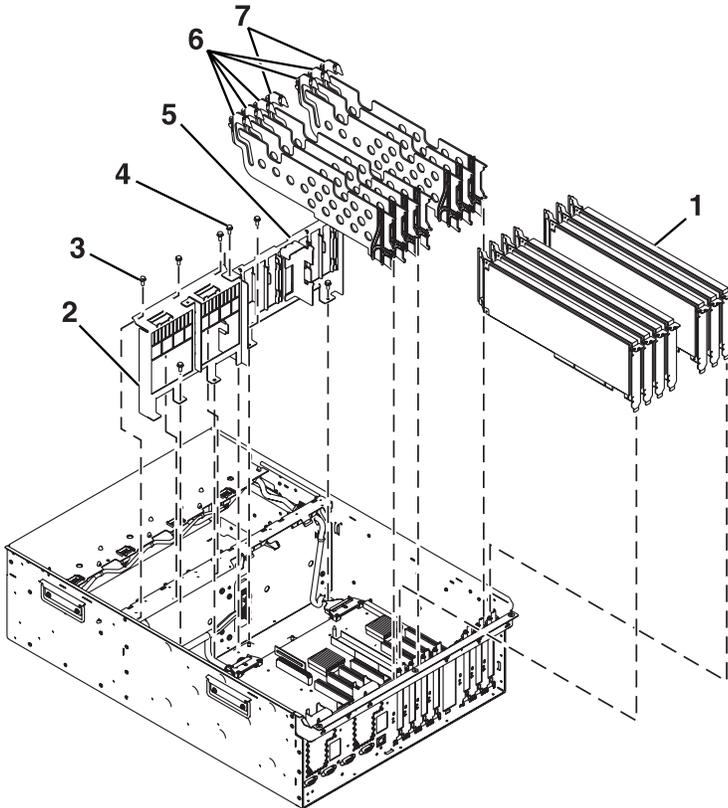


Table 8. 0595 and 7311-D20 PCI adapters assembly part numbers

Index number	CCIN	Part number	Units	Description
1		See <i>Managing PCI Adapters</i> , SA76-0092.	7 (maximum quantity)	PCI adapter
2		39J1118* 53P0248**	1	Power supply bulkhead
3		44H7366*	4	Screw, power bulkhead mounting
4		44H7366*	3	Screw, PCI plate mounting
5		39J1119*	1	PCI adapter headstock bracket
6		53P2728*	5	PCI dividers
7		53P2729*	2	PCI dividers

* Designed to comply with RoHS requirement

** Not designed to comply with RoHS requirement

Power, RIO/HSL adapter, and cabling assembly

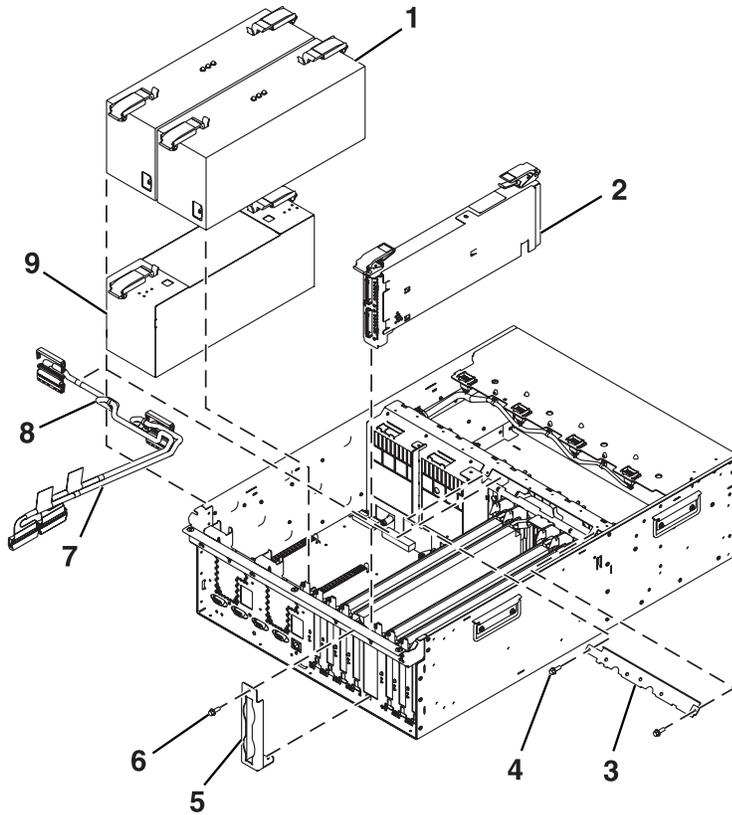


Table 9. 0595 and 7311-D20 power, RIO/HSL adapter, and cabling assembly part numbers

Index number	CCIN	Part number	Units	Description
1		39J2781* 53P4832**	2 (maximum quantity)	Power supply
2	2887	39J0527* 97P2670**	1	bus adapter RIO/HSL card (bus adapter with two external ports)
	28E7	39J0523* 97P2459**	1	-2 bus adapter RIO/HSL-2 card
3		39J1170*	3	Cable bracket, SCSI
4		44H7366*	1	Screw, SCSI cable
5		39J3287* 53P0639**	5	RIO/HSL-2 cable bracket
6		44H736*	2	Screw, RIO/HSL-2 cable bracket
7		53P0417*	Configuration dependent	SCSI bus cable
8		53P0418* 53P0418**	Configuration dependent	SCSI bus cable
9		39J1175* 53P0233**	1	Power supply filler

* Designed to comply with RoHS requirement

** Not designed to comply with RoHS requirement

Operator panel assembly

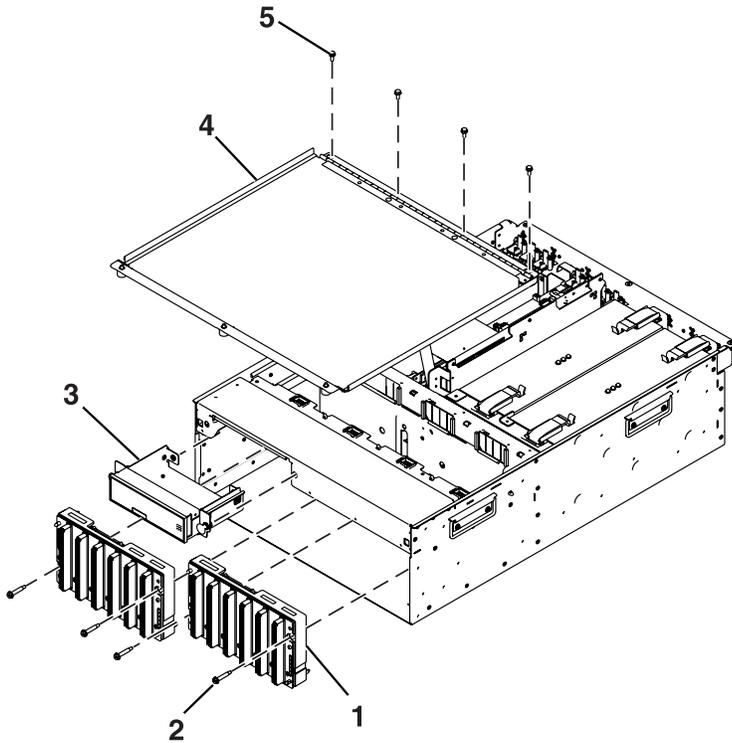


Table 10. 0595 and 7311-D20 operator panel assembly part numbers

Index number	CCIN	Part number	Units	Description
1		39J1695 [*] 97P3138 ^{**}	2	Disk drive backplane (disk drive enclosure included)
2		39J3284 [*]	4	Screw, disk-drive-backplane mounting
3	250D	39J3087 [*] 53P2535 ^{**}	1	Operator panel
4		39J1178 [*] 53P0275 ^{**}	1	Processor cover
5		44H736 [*]	4	Screw, cover-mounting

* Designed to comply with RoHS requirement

** Not designed to comply with RoHS requirement

Fans and disk drives assembly

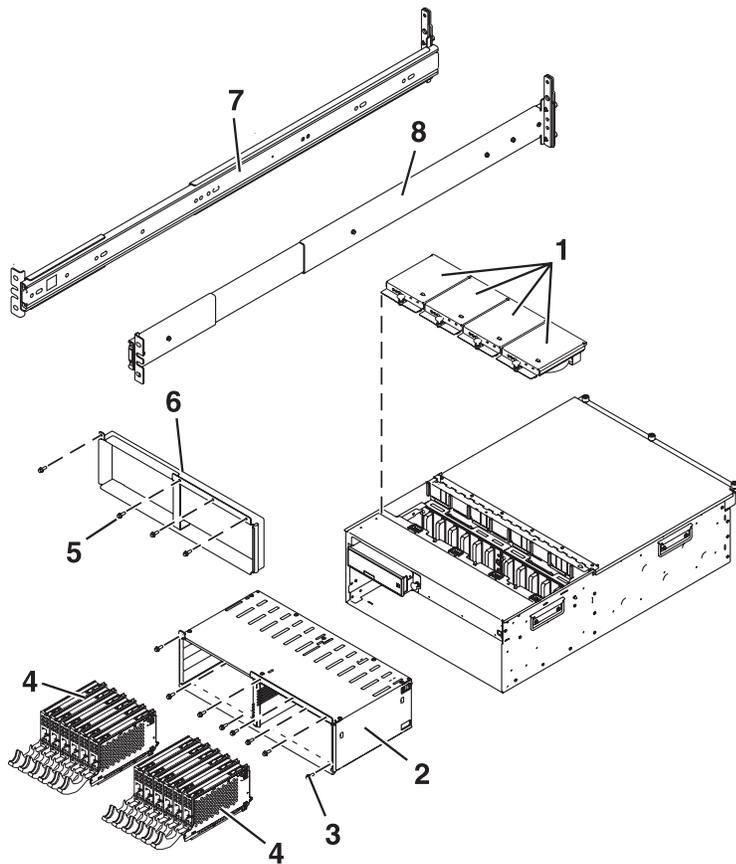


Table 11. 0595 and 7311-D20 fans and disk drives assembly part numbers

Index number	CCIN	Part number	Units	Description
1		39J1176* 53P0262**	4	Fan assembly
3		39J3383* 53P0250**	1	Disk-drive enclosure 12 pack (disk drive backplanes included)
4		39J3283*	8	Screw, disk drive enclosure mounting
5		03N5270* 80P3157** 03N6335* 80P3400**		300 GB Ultra320 10K rpm 80 pin SCSI disk drive/carrier
5		80P3161** 00P2697**		36.4 GB 15K RPM Ultra3 SCSI disk drive/carrier
5		09P3928** 09P4890**		73.4 GB 10K RPM, 80-pin SCSI disk drive/carrier
5		00P3829** 00P3064**		18.2 GB 10K RPM SCSI disk drive/carrier Note: The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.

Table 11. 0595 and 7311-D20 fans and disk drives assembly part numbers (continued)

Index number	CCIN	Part number	Units	Description
5		00P3831** 00P3068**		36.4 GB 10K RPM SCSI disk drive/carrier Note: The FRU part numbers are interchangeable. Order the FRU part number that matches the FRU part number you are replacing.
5		05J7982*		Front spring for 36.4 GB 10K RPM ultra320 SCSI disk drive assembly
6		44H736*	4	Screw, filler-plate mounting
7		44H736*	1 (optional)	Disk drive filler plate
8		42R5254* 53P3451**	1	Left rail
9		42R5255* 53P3452**	1	Right rail

* Designed to comply with RoHS requirement

** Not designed to comply with RoHS requirement

Covers and brackets assembly

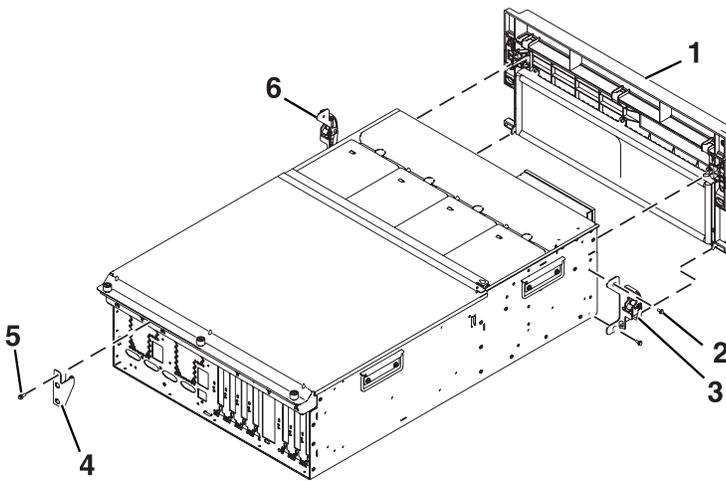
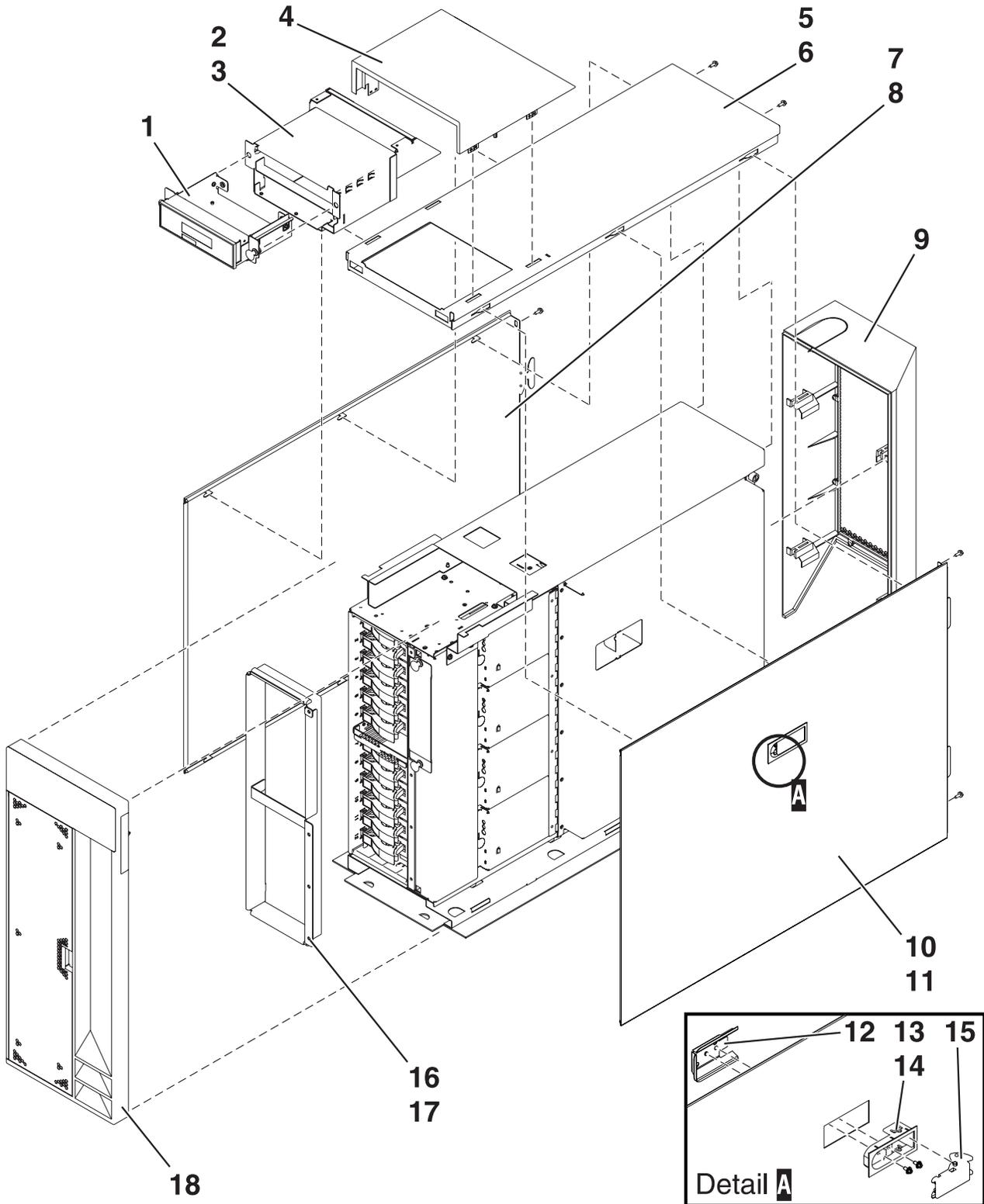


Table 12. 0595 and 7311-D20 cover and bracket assembly part numbers

Index number	CCIN	Part number	Units	Description
1		0595: 39J3326* 53P1457** and 7311-D20: 39J4661	1	Front cover
2		44H736*	2	Screw, latch bracket
3		53P2572*	1	Latch bracket assembly left
4		42R4299* 53P6019**	4	Cable arm bracket
5		44H736*	1	Screw, cable arm bracket
6		53P2573*	1	Latch bracket assembly right

* Designed to comply with RoHS requirement
** Not designed to comply with RoHS requirement

Cover assembly for 5095



RZAR6690-0

Table 13. Cover assembly part numbers for 5095

Index	CCIN	Part number	Units	Description
1		39J3084* 53P0330**	1	Display panel tray assembly
2		NONUM	1	Display panel enclosure assembly
3		53P0320	5	Screw
4		53P0308*	1	Cover, display panel
5		53P0280	1	Cover, top
6		53P0320	2	Screw
7		53P0285*	1	Cover, left side
8		53P0320	2	Screw
9		53P0303*	1	Cover assembly, back
10		39J1179* 53P0286**	1	Cover assembly, right side
11		53P0320	2	Screw
12		(order part listed in index 10)	1	EMC bracket
13		06P5858 (order part listed in index 10)	1	Latch housing
14		03K9553* (order part listed in index 10)	2	Screw, M3.5 x 7
15		06P5857 (order part listed in index 10)	1	Latch handle
16		NONUM	1	Bracket, DASD filler
17		NONUM	4	Screw
18		39J3317* 53P1359**	1	Cover assembly, front

* Designed to comply with RoHS requirement

** Not designed to comply with RoHS requirement

Table 14. Cables

CCIN	Description	Part number
	Operator panel cable	42R4054*
	SCSI bus 0 cable	42R4057*
	SCSI bus 1 cable	42R4058*
	3000 MM GX Dual-port 4x HCA cable	42R6244*
	8000 MM GX Dual-port 4x HCA cable	42R6245*
	1500 MM GX Dual-port 4x HCA cable	42R6243*
	Y cable	52G0173*
	ASM differential SCSI-2 cable	52G4291**
	ASM differential SCSI-2 cable	52G4233**
	SCSI-4 drop table	42R4756*
	1 meter RIO G cable	39J2562*
	3.5 meter RIO G cable	39J2554*

Table 14. Cables (continued)

CCIN	Description	Part number
	10 meter RIO G cable	39J2561*
	3.7 meter serial cable	10N7158*
	2 meter SPCN cable	22R5217*
	3 meter SPCN cable	22R5239*
	15 meter SPCN cable	22R5221*
	6 meter SPCN cable	22R5219*

* Designed to comply with RoHS requirement

** Not designed to comply with RoHS requirement

Table 15. Miscellaneous parts

CCIN	Description	Part number
	External cables	See <i>Site and Hardware Planning Guide</i> , SA76-0091.
	Removable media	See <i>Managing Devices</i> , SA76-0107.
	PCI adapters	See <i>Managing PCI Adapters</i> , SA76-0092.
	Bezel filler	97P4179* 53P6213**
	Wrap plug	12R9315* 12R6249**
	Wrap plug	42R4761* 6298964**
	Scurry card bracket	80P7033**
	Plug 232	10N6539*
	Wrap, 15 pin	34F0876*
	Wrap connector	33F8985*
	Wrap plug	43G0928*
	Wrap plug	73H2508**
	Wrap plug	87H3442**
	Wrap plug	87H3588**
	Wrap plug	40F9904**
	128 MB DRAM option card	34L5388**
	Bracket	12R6965*
	Remote asynchronous node (rack).	09P4096**
	Differential SCSI adapter	11K0671**
	Front cover	39J4661* 53P2020**
	PCI cover	39J1177* 53P0268**
	Bracket	00P4885**
	Front cover	53P1355**

Table 15. Miscellaneous parts (continued)

CCIN	Description	Part number
	V.35 wrap	71F0163**
	Fiber-Distributed Data Interface (FDDI) adapter	73H3401**
	Hot plug kit	44P0322**
	Wrap plug	04H7648**
	Battery pack	44L0305**
	Bracket	44P3912**
	PCI slot filler	80P2341**

* Designed to comply with RoHS requirement

** Not designed to comply with RoHS requirement

Chapter 5. Common service procedures

Use common service procedures to find the most frequently used procedures for servicing your system or expansion unit.

The following table contains, in alphabetical order, the common service procedures for your expansion unit.

Table 16. Service procedures

Procedure title
"Closing a service call" on page 123
"Component and attention LEDs"
"Concurrent PCI adapter removal and replacement using AIX" on page 79
"Concurrent PCI adapter removal and replacement using Linux" on page 83
"Control panel functions" on page 99
"Determining if an enclosure is configured as switchable under i5/OS OptiConnect" on page 100
"Determining the I/O enclosure's power-controlling system and the owner of the logical system ownership of a I/O enclosure" on page 101
"Performing a slow boot" on page 123
"Powering off an expansion unit" on page 101
"Powering on an I/O enclosure" on page 107
"Powering on and powering off" on page 109
"Prerequisites for hot-plugging PCI adapters in Linux" on page 110
"Running the online and eServer™ stand-alone diagnostics" on page 123
"Setting I/O enclosure configuration ID and MTMS value" on page 110
"Switching ownership of a enclosure's switchable resources" on page 110
"Switching the mode of a I/O enclosure's switchable resources" on page 112
"Using the ASMI to verify and set the configuration ID and MTMS value" on page 112
"Using the control panel to set the configuration ID" on page 115
"Verify that the Linux, hot-plug PCI tools are installed" on page 116
"Verifying a repair" on page 118
"Verifying the repair in AIX" on page 119
"Verifying the repair in Linux" on page 122
"Verify the RIO/HSL loops with an HMC" on page 116
"Verify the RIO/HSL loops without an HMC" on page 117

Component and attention LEDs

Find detailed information about the location, color, and status of component and attention LEDs.

The component and attention LEDs assist in identifying failing components in your server. If a failing component is detected in your system, an amber-colored attention LED on the operator panel is turned on solid (not blinking). Use the information in this topic along with the Start of call procedure to isolate a

failing FRU. You can use the service processor menus (available from the Advanced System Management Interface) or AIX Service Aid menu to blink the FRU LED for the failing FRU.

Individual LEDs are located on or near the failing field replaceable unit (FRU). The LEDs are located either on the component itself or on the carrier of the component (for example, memory card, fan, memory module, CPU). LEDs are either green or amber.

Green LEDs indicate either of the following:

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

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

The following table identifies the color and status of the component and attention LEDs. Units or FRUs may not have all of the LEDs listed in the table.

Table 17. LED color and status

Unit (FRU)	LED Function	LED Color	Off	On	Blink
System attention	Attention	Amber	Normal	Fault	Identify
System power	Power	Green	No AC	System on	Standby
Fan	Identify	Amber	Normal		Identify
	Power	Green	No power	Power on	
Power supply	AC input good	Green	No Input	Input good	
	Identify	Amber	Normal	Fault	Identify
	DC output good	Green	All power supply outputs off	All power supply outputs on	Control voltage good
Disk drives	Activity	Green	No disk activity	Disk being accessed	
	Identify	Amber			Identify
PCI slot	Power	Green	No power	Power on	
	Identify	Amber	Normal		Identify
RIO/HSL	Identify	Amber	Normal		Identify
Memory DIMM	Identify	Amber	Normal		Identify
System backplane	Identify	Amber	Normal		Identify
PCI riser card	Power	Green	No power	Power on	
	Identify	Amber	Normal		Identify
Disk drive backplane	Identify	Amber	Normal		Identify
Media backplane	Identify	Amber	Normal		Identify
Service processor card	Identify	Amber	Normal		Identify
Voltage regulator module	Identify	Amber	Normal		Identify
RAID adapter card	Identify	Amber	Normal		Identify

Table 17. LED color and status (continued)

Unit (FRU)	LED Function	LED Color	Off	On	Blink
HMC port	Link	Green	No link	Link	
	Activity	Green	No activity		Activity
Imbedded Ethernet	Link	Green	No link	Link	
	Activity	Green	No activity		Activity
Node assembly	Power	Green	No power	Power on	
	Identify	Amber	Normal		Identify
Motor drive assembly (MDA)	Power	Green	No power	Power on	
Motor scroll assembly (MSA)	Identify	Amber	Normal		Identify
MCM	Identify	Amber	Normal		Identify
Light strip	Power	Green	No power	Power on	
	Identify	Amber	Normal		Identify

Concurrent PCI adapter removal and replacement using AIX

The following procedure describes the removal of a PCI adapter concurrently (with the system power on) using AIX as the operating system.

Note:

1. The illustrations seen in this procedure might be slightly different than what you are seeing on the system that you are servicing.
2. Use this procedure if you intend to remove a failing PCI adapter and replace it with the same type of adapter.
3. Procedures performed on a PCI adapter with the system power on, also known as hot-plug procedures, require 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.

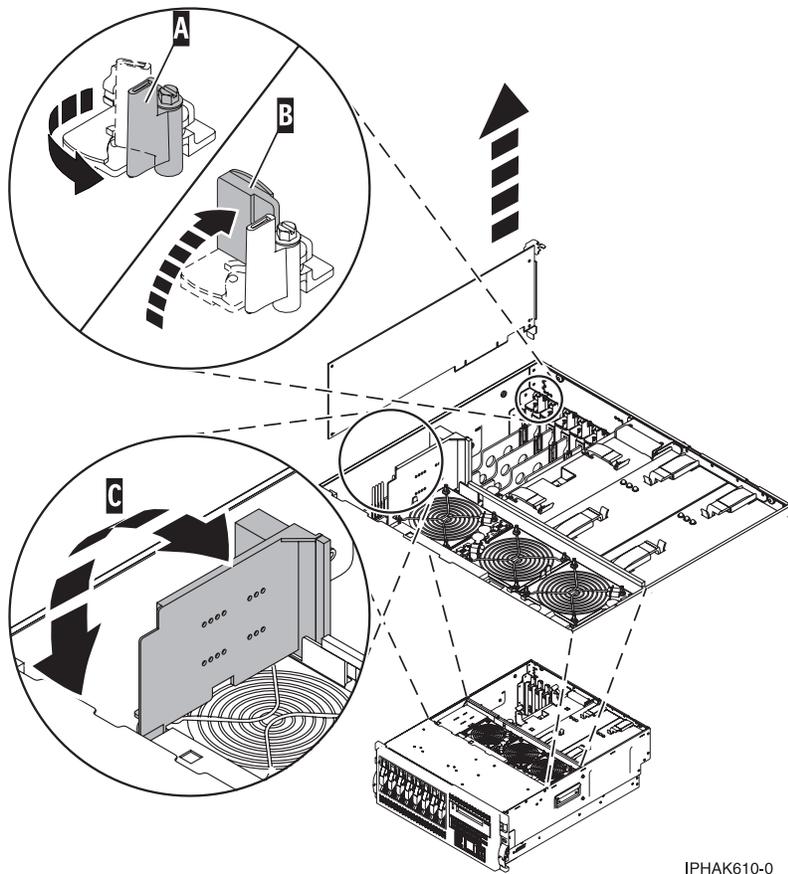
To replace a failing PCI adapter concurrently, do the following:

1. Open the front rack door and back rack doors and place the system into the service position.
2. Remove or open the service access cover.
3. Determine which adapter you plan to remove.
4. Adapter slots are numbered on the rear of the system unit, record the slot number and location of each adapter being removed.
5. Ensure that any processes or applications that might use the adapter are stopped.
6. Enter the system diagnostics by logging in as root user or as the celogin user, type **diag** at AIX command line.
7. When the DIAGNOSTIC OPERATING INSTRUCTIONS menu displays, press Enter.
8. At the FUNCTION SELECTION menu, select **Task Selection**, then press enter.
9. At the Task Selection list, select **PCI Hot Plug Manager**.
10. Select **Unconfigure a Device**, then press Enter.
11. Press F4 (or Esc +4) to display the Device Names menu.
12. Select the adapter you are removing in the **Device Names** menu.

13. In the **Keep Definition** field, use the Tab key to answer Yes if you are replacing the adapter being removed with a same type adapter. Answer No if you will not be replacing the adapter with the same type of adapter or will be leaving the slot blank.
14. In the **Unconfigure Child Devices** field, use the Tab key to answer YES, then press **Enter**.
15. 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.
16. Press F4 (or Esc +4) twice to return to the **Hot Plug Manager** menu.
17. Select **replace/remove PCI Hot Plug adapter**.
18. Select the slot that has the device to be removed from the system.
19. Select **remove**.

Note: A fast-blinking amber LED located at the back of the machine near the adapter indicates that the slot has been identified.

20. Press **Enter**. This places the adapter in the action state, meaning it is ready to be removed from the system.
21. Label, and then disconnect all cables attached to the adapter you plan to remove.
22. Remove the adapter. If you are removing a short adapter, continue to the next step.
If you are removing a long adapter, unlatch and open the PCI adapter light-pipe plate **C** attached to the fan tray as shown in Figure 15 on page 81.
23. Rotate the adapter locking latch **A** counterclockwise.
24. Lift the black tab **B** attached to the adapter retainer assembly, and keep the black tab in a vertical position.
25. Carefully grasp the PCI adapter by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.



IPHAK610-0

Figure 15. Detail of retaining latch used to secure a PCI adapter

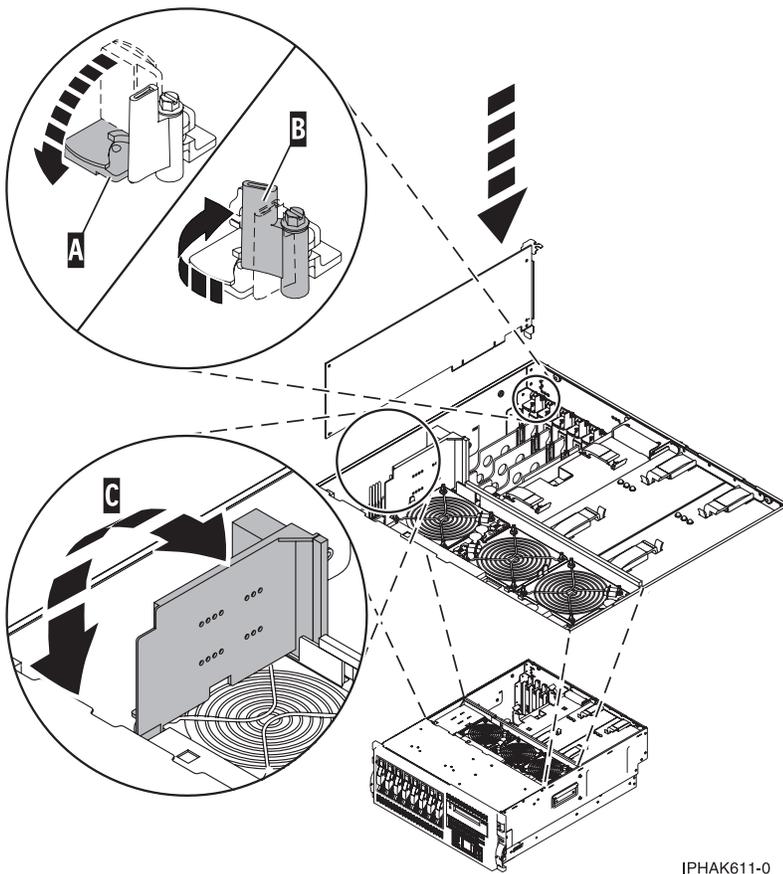
26. If you are replacing the adapter, remove the replacement adapter from the antistatic package and continue to step 27. If you are not replacing the adapter, do the following:
 - a. Seal the expansion slot using an expansion-slot cover.
 - b. Lower the plastic retainer seat over the PCI adapter faceplate.
 - c. Rotate the locking latch clockwise until it clicks into the locked position.
 - d. Continue to follow the online instructions until you receive a message that the adapter removal is successful.
 - e. If you have other adapters to remove, press the F3 key to return to the PCI Hot Plug Manager menu.
 - f. When you are finished removing adapters, press F10 to exit the Hot-Plug Manager.
 - g. From an AIX command line, run the **diag -a** command. If the host system responds with a menu or prompt, follow the instruction to complete the device configuration.
 - h. Go directly to step 44 to complete this procedure.

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

27. Carefully grasp the replacement adapter by its top edge, and align it with the expansion slot and its connector on the system backplane.
28. Press the adapter firmly into its connector.
Ensure that it is completely and correctly seated in its connector.

29. If you are replacing a short adapter, continue to the next step. If you are replacing a long adapter, do the following:
 - a. Close and latch the PCI adapter light-pipe plate **C** attached to the fan tray as shown in Figure 15 on page 81.

Note: The light pipes below the light-pipe plate must fit through the holes in the plate for it to latch correctly.
 - b. Note the guide grooves located toward the front of the system in the disk drive backplane, and align the adapter properly.
30. Secure the adapter. Lower the tab **A** onto the PCI adapter faceplate as shown in the following figure. Rotate the adapter locking latch **B** clockwise until it covers the tab at approximately a 45-degree angle.



IPHAK611-0

Figure 16. Detail of the retaining latch being secured

31. Connect the adapter cables.
32. Press enter and 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.
33. Press the F3 (or Esc+3) key to return to the **PCI Hot-Plug Manager** menu.
34. Press the F3 (or Esc+3) key to return to the **TASK** selection list.
35. Select **Log Repair Action**.

36. Select the resource just replaced, press Enter, press Commit (F7 or Esc+7), then press Enter.
37. Press F3 (or Esc+3) to return to **TASK Selection List**.
38. Select **Hot Plug Task**, press enter.
39. Select **PCI Hot Plug Manager**, then select **Configure a defined device**, then press Enter.
40. Select the device just replaced from the list, then press Enter. The device is now configured.
41. Press the F10 key to exit the diagnostic program.

Note: If you are running the standalone diagnostics, do not exit the program completely.

42. Verify the PCI adapter by using the following instructions:
 - a. Did you replace the adapter with the system power on?
 - Yes - Go to the next step.
 - No - Load the diagnostic program by doing the following:
 - If AIX is available, boot AIX, login as root or CELOGIN, then enter the **diag** command.
 - If AIX is not available, boot the standalone diagnostics
 - b. Type the **diag** command if you are not already displaying the diagnostic menus
 - c. Select **Advance Diagnostic Routines**, then select **Problem Determination**.
 - d. Select the name of the resource just replaced from the menu. If the resource just replaced is not shown, choose the resource associated with it. Press Enter, then press **Commit** ((F7 or Esc+7)).
 - e. Did the Problem Determination identify any problems?
 - No: Continue to the next step.
 - Yes: A problem is identified.
 - If you are a customer, record the error information, then contact your service provider.
 - If you are an authorized service provider, return to map 210-5.
43. Press the F10 key to exit the diagnostic program.
44. Close the rack's back door.
45. Close the service access cover.
46. Go to Verify a repair in your host server's service guide. **This completes this procedure.**

Concurrent PCI adapter removal and replacement using Linux

The following procedure describes the removal of PCI adapters with the system power on in a server or a partition running linux.

Before performing this procedure, do the following:

- Ensure that the system meets the "Prerequisites for hot-plugging PCI adapters in Linux" on page 110
- "Verify that the Linux, hot-plug PCI tools are installed" on page 116.

To remove a PCI adapter with the system power on, do the following:

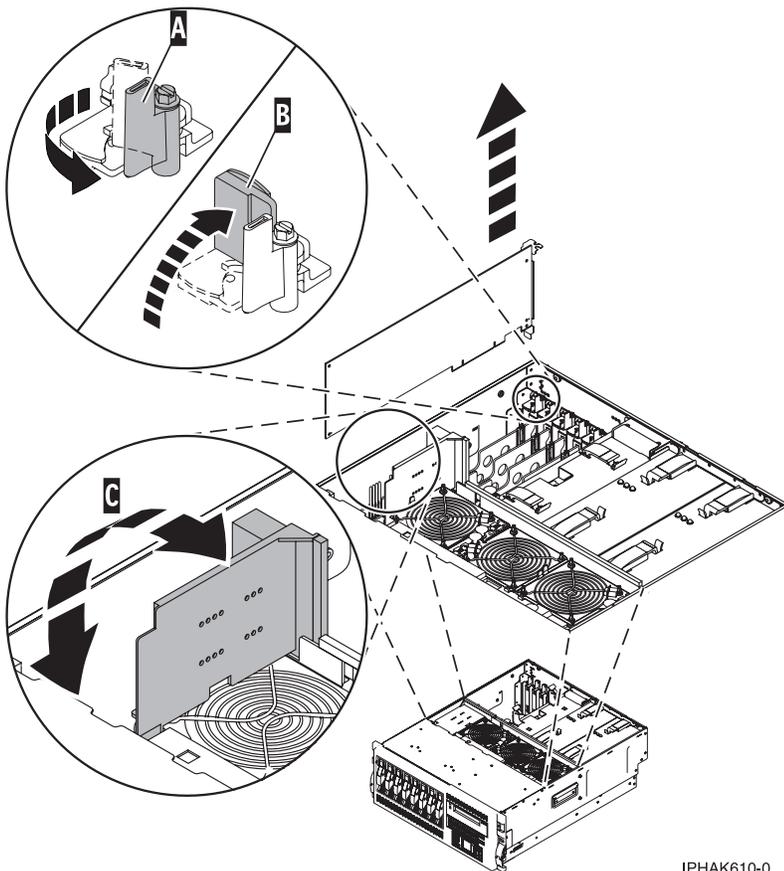
1. Open the front and rear rack doors.
2. If you are servicing a system drawer installed in a rack, put the drawer into the service position, then go to the step 3. If you are servicing a system drawer that gets serviced from either the front or the back of the drawer, go to the step 3. If you are servicing a desktside system, rest the side opposite the service access cover on the floor or desktop.
3. Depending on your system configuration, either remove or open the service access cover.
4. Determine which adapters you plan to remove.
5. Record the slot number and location of each adapter being removed.

Note: Adapter slots are numbered on the rear of the system unit.

6. Ensure that any processes or applications that might use the adapter are stopped.
7. Label, and then disconnect all cables attached to the adapter you plan to remove.

Note: Before performing a PCI hot-plug removal of storage devices, ensure file systems on those devices are unmounted.

8. Run the `drslot_chrp_pci` command to enable the adapter to be removed. For example, to remove the PCI adapter in slot U7879.001.DQD014E-P1-C3 run this command:
`drslot_chrp_pci -r -s U7879.001.DQD014E-P1-C3`
9. Follow the instructions on the display to complete the task.
10. If you are removing a short adapter, continue to step 11. If you are removing a long adapter, do the following:
 - a. Unlatch and open the PCI adapter light-pipe plate C attached to the fan tray as shown in the following figure.
 - b. Rotate the adapter locking latch A counterclockwise.
 - c. Lift the black tab B attached to the adapter retainer assembly, and keep the black tab in a vertical position.



IPHAK610-0

Figure 17. Detail of adapter retaining tab and latch.

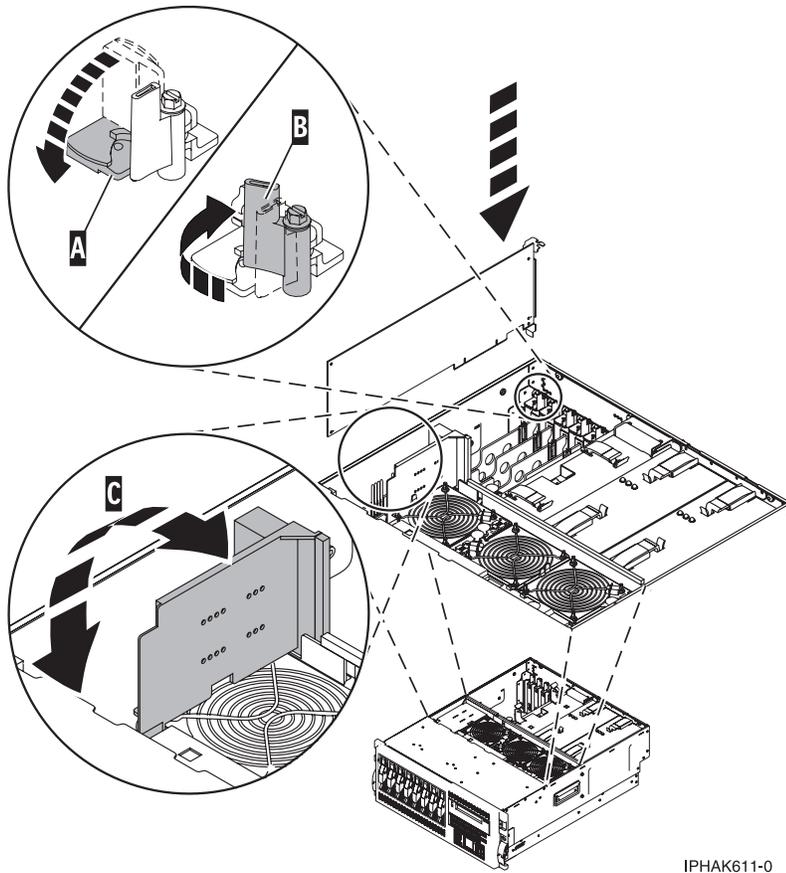
11. Carefully grasp the PCI adapter by its top edge or upper corners, and remove it from the system. Store the adapter in a safe place.

12. If you are removing a PCI adapter as part of another procedure, return to that procedure. If not, continue to step 13.
13. If you plan to install a long adapter into the vacated slot, go to step 14. If you plan to install a short adapter or do not plan to install another adapter into the vacated slot do the following:
 - a. Seal the expansion slot using an expansion-slot cover.
 - b. Lower the plastic retainer seat over the PCI adapter faceplate.
 - c. Rotate the locking latch clockwise until it clicks into the locked position.
 - d. Go to 15.
14. If you do not plan to install another adapter into the vacated slot, do the following:
 - a. Run the `drslot_chrp_pci` command to enable an adapter to be installed. For example, to install the PCI adapter in slot `U7879.001.DQD014E-P1-C3` run this command:

```
drslot_chrp_pci -a -s U7879.001.DQD014E-P1-C3
```
 - b. Follow the instructions on the display to complete the task.
 - c. When you are instructed to install the adapter in the adapter slot, do the following:
 - 1) 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.
 - 2) Press the adapter firmly into its connector.

Attention: After installing the adapter into the system, ensure that it is correctly seated into the connector.
 - 3) Close and latch the PCI adapter light-pipe plate **C** attached to the fan tray as shown in Figure 18 on page 86.

Tip: The light pipes below the light-pipe plate must fit through the holes in the plate for it to latch correctly.
 - 4) Secure the adapter. Lower the tab **A** onto the PCI adapter faceplate as shown in Figure 18 on page 86. Rotate the adapter locking latch **B** clockwise until it covers the tab at approximately a 45-degree angle.
 - 5)



IPHAK611-0

Figure 18. Detail of the locking tab and latch and an adapter being replaced into system or I/O enclosure

- d. Connect any adapter cables.
- e. Run the `lsslot` command to verify that the slot is occupied. For example, Enter `lsslot -c pci -s U7879.001.DQD014E-P1-C3`

The following is an example of the information displayed by this command:

```
# Slot      Description      Device(s)
U7879.001.DQD014E-P1-C3 PCI-X capable, 64 bit, 133MHz slot 0001:40:01.0
```

15. Replace or close the service access cover.
16. If necessary, on rack-mounted system's, put the system drawer into the operating position and close the front and back rack doors.
17. Go to Verify a repair in your host server's service guide. **This completes this procedure.**

Remove and replace a PCI adapter contained in a cassette in the system with the power on in i5/OS

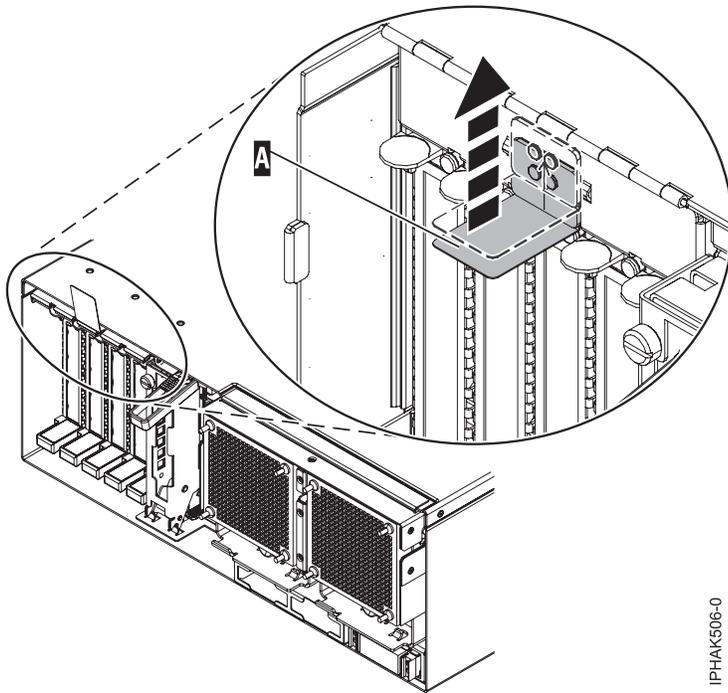
Procedures performed on a PCI adapter with the system power on in i5/OS, also known as hot-plug procedures, require the system administrator to take the PCI adapter offline prior to performing the operation. Before taking an adapter offline, the devices attached to the adapter must be taken offline as well. This action prevents a service representative or user from causing an unexpected outage for system users.

To remove and replace an adapter, do the following steps:

1. Determine the location of the PCI adapter in the system.
2. Record the slot number and location of each adapter being removed. Adapter slots are numbered either below or along the side of each adapter slot.
3. Ensure that any processes or applications that might use the adapter are stopped.
4. Go to your terminal and type **strsst** on the command line of the Main Menu and press Enter.
5. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter.
6. Select **Start a service tool** from the System Service Tools (SST) display. Press Enter.
7. Select **Hardware service manager** from the Start a Service Tool display and press Enter.
8. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display. Press Enter.
9. Type **9** (Hardware contained within package) in the System Unit or Expansion Unit field of the unit where you are removing the card, then press Enter.
10. Select the option to **Include empty positions**.
11. Select **Concurrent Maintenance** on the card position where you want to remove the card and then press Enter.
12. Select the option to **Toggle LED blink off/on**. A light-emitting diode (LED) located on your system or I/O enclosure blinks identifying the PCI adapter position you chose. Physically verify that this is the slot where you want to remove the adapter.
13. Select the option to **Toggle LED blink off/on** to stop the blinking LED.
14. Select the option to **Power off domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
15. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message: Power off complete
16. Label, and then disconnect all cables attached to the adapter you plan to remove.
17. Record the slot number and location of each adapter being removed.

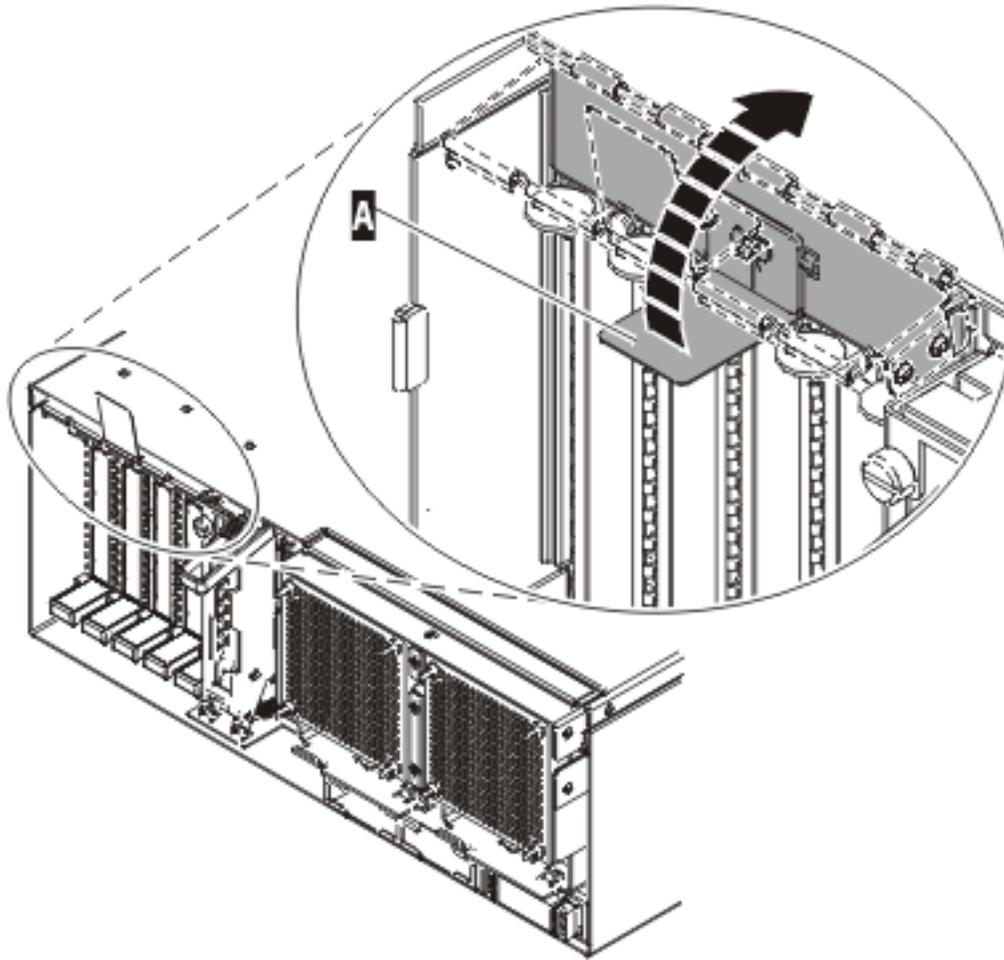
Note: Adapter slots are numbered below or along side of each PCI adapter slot.

18. Lift up on the PCI adapter EMC shield **A** as shown in Figure 19 on page 88, and then rotate it up and away from the cassette as shown in Figure 20 on page 89.



IPHAK506-0

Figure 19. Lift up on the EMC shield

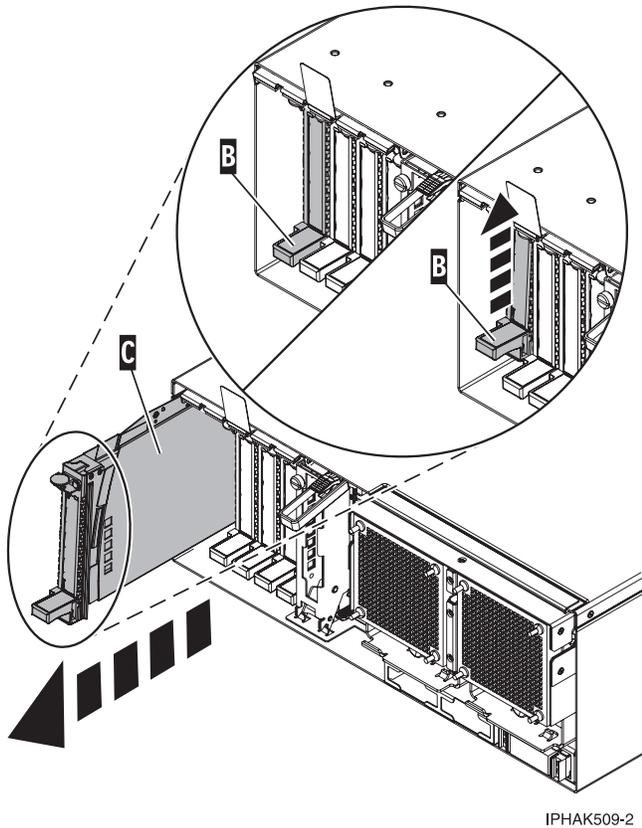


IPHAK907-0

Figure 20. Rotate the EMC shield into the open position

19. Remove the cassette. Lift up the lower cassette handle **B** as shown in the following figure. Pull the PCI cassette **C** out of the system.

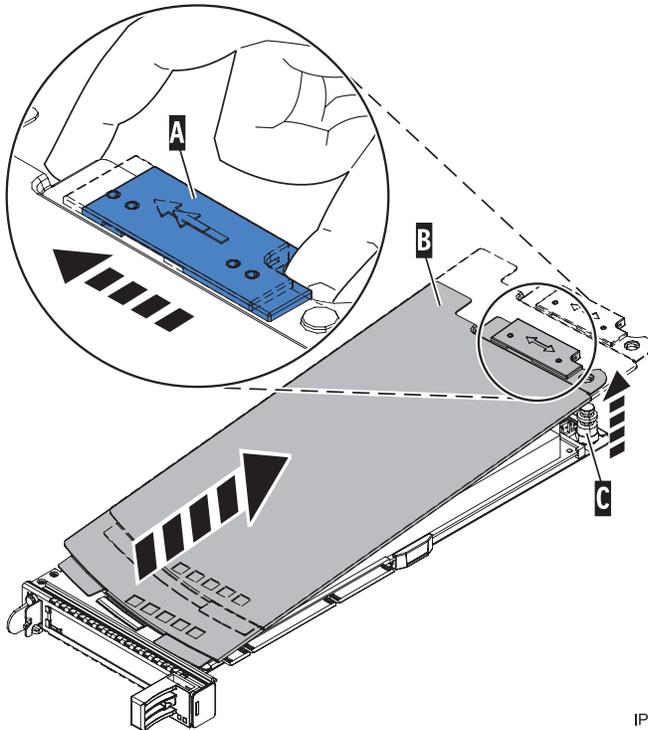
Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling.



IPHAK509-2

Figure 21. PCI adapter cassette removed from the system unit

20. Place the cassette with the cover facing up on an approved ESD surface. The cover will have a label on it.
21. Install the replacement adapter into the PCI adapter cassette using the following instructions. If the cassette is not going to contain a replacement adapter, use this same procedure to place an adapter filler panel in the cassette. Follow these steps:
 - a. Remove the cassette cover by doing the following steps:
 - 1) Slide the cover latch **A** to disengage it from the pivot pin **C** as shown in the following figure.
 - 2) Lift the cover **B** off of the pivot pin.
 - 3) Slide the cover off of the cassette.



IPHAK520-0

Figure 22. PCI adapter cassette cover removed

b. Remove the adapter from the cassette by doing the following steps:

- 1) Unlock the adapter retainers by rotating the retainer clip **A** into the horizontal position. See Figure 23 on page 92.

Notes:

- The edge of the adapter located at the end of the cassette that contains the cassette handles is called the adapter **tailstock**.
 - Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock.
 - When the retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide away from the card.
 - If the corner support retainer is used, unlock it, and then slide the corner support retainer away from the card.
- 2) Push the adapter retainers **B** away from the adapter.
 - 3) Unlock the adapter tailstock clamp **C**.
 - 4) Rotate the adapter out of the cassette by grasping the edge of the adapter opposite the tailstock, and then firmly rotate the adapter toward the bottom of the cassette.
 - 5) Lift the adapter out of the tailstock retaining channel.

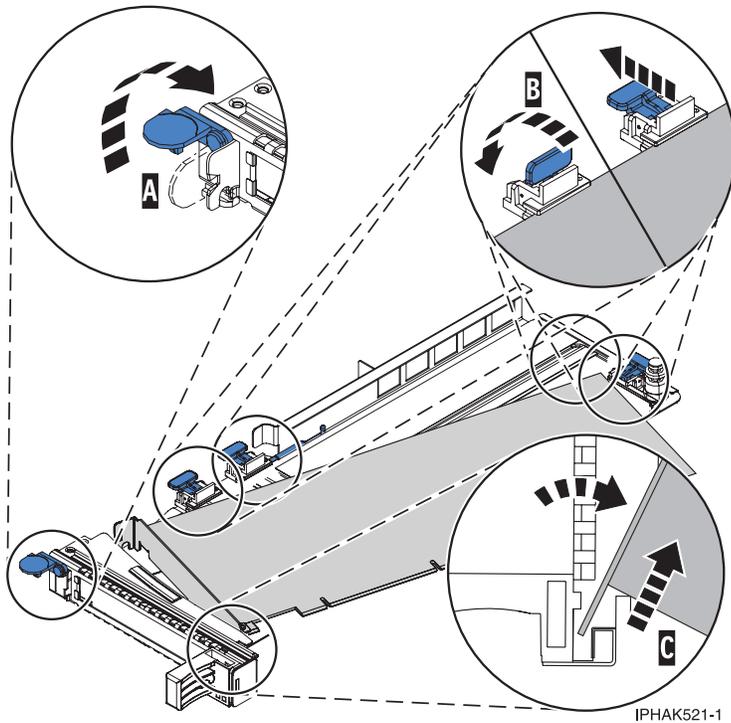
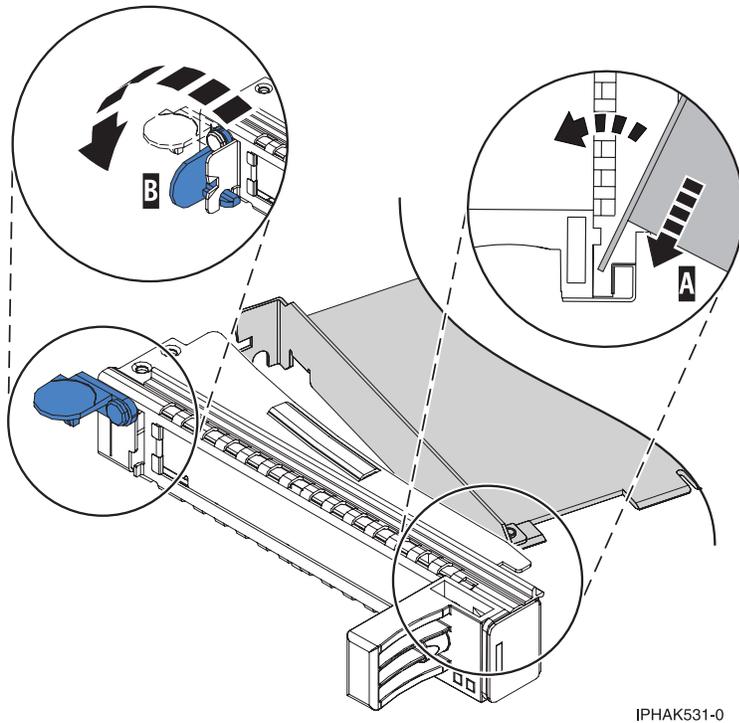


Figure 23. Adapter removed from the PCI adapter cassette

- c. Place the new adapter in the cassette.

Attention: A cassette containing either a PCI adapter or filler panel must be placed in the PCI adapter slot of the system unit for proper air flow and cooling. If the cassette is not going to contain a PCI adapter, use this same procedure to place an adapter filler panel in the cassette.

- 1) Remove any shipping handles or brackets attached to the adapter.
- 2) With the tailstock clamp in the open position, insert the adapter firmly into the tailstock retaining channel **A**. See Figure 24 on page 93.
- 3) Rotate the adapter toward the top of the cassette and into place.
- 4) Close the tailstock clamp.



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Figure 24. Adapter removed from the PCI adapter single-width cassette

- 5) Position the adapter retainers to support the adapter, and then rotate the retainer clip **B** into the closed position. See Figure 24

Note: Two retainers are located at the top of the cassette, along the top edge of the adapter. Two more retainers are located at the edge of the cassette opposite of the adapter tailstock. When the adapter retainer clip is in the horizontal position, the adapter retainers are unlocked and can slide toward the adapter. Place the retainers on the adapter according to the length of the adapter being used. Select the appropriate instructions:

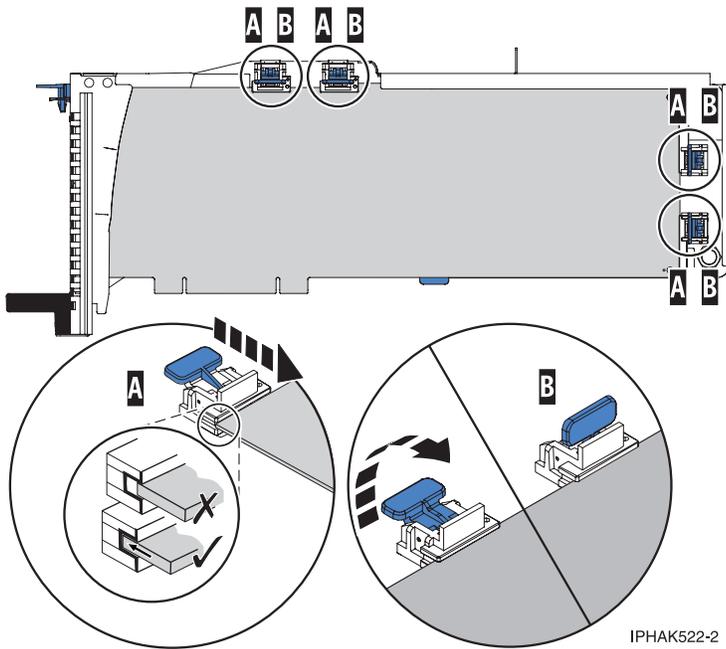
- Adapter-cassette retainer placement for large adapters
- Adapter-cassette retainer placement for mid-sized adapters
- Adapter-cassette retainer placement for small adapters

Adapter-cassette retainer placement for large adapters

- Place and lock the retainers **B**. See Figure 25 on page 94.

Attention: Use of the lower corner support retainer might interfere with the docking of the PCI card when positioned within the system. Ensure the retainer does not interfere with the adapter connectors on the system backplane.

- Ensure the adapter edge is seated in each retainer groove **A**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

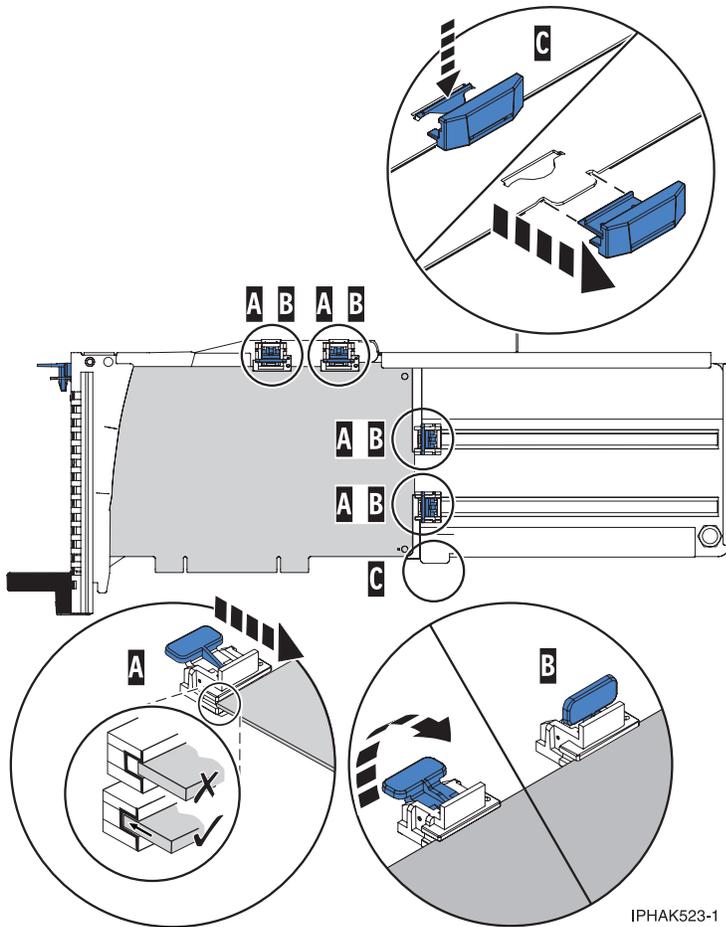


IPHA522-2

Figure 25. Long adapter in the PCI adapter cassette with the supports and stabilizer in place

Adapter-cassette retainer placement for mid-sized adapters

- Remove the adapter stabilizer **C**. See Figure 26 on page 95.
- Place and lock the retainers **B**.
- Ensure the adapter edge is seated in each retainer groove **A**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.

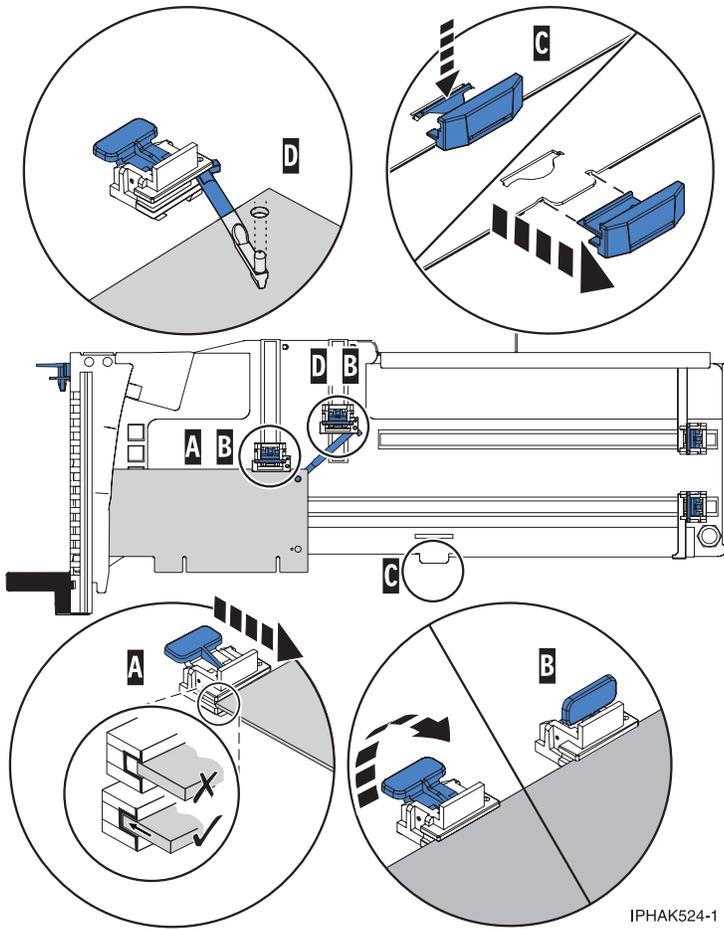


IPHA523-1

Figure 26. Medium-length adapter in the PCI adapter cassette with the supports in place

Adapter-cassette retainer placement for small adapters

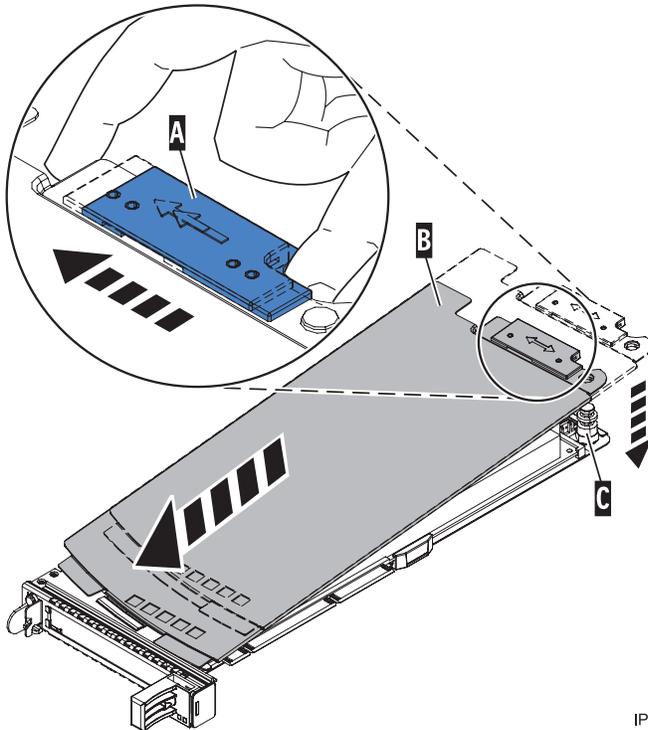
- Remove the adapter stabilizer **C**. See Figure 27 on page 96.
- Place the hook arm **D** into the hole in the corner of the adapter. This supports the card when it is undocked from the connector on the system backplane.
- Place and lock the retainers **B**.
- Ensure the adapter edge is seated in each retainer groove **A**. If the shape of the adapter or the presence of a connector will not allow the adapter edge to be seated into the retainer groove, ensure the retainer is still locked firmly against that edge or connector.



IPHA524-1

Figure 27. Short adapter in the PCI adapter cassette with the supports and the hook arm in place

- d. Replace the cassette cover by doing the following steps:
- 1) Slide the cover **B** into position on the cassette.
 - 2) While holding the cover latch **A** in the open position, place the cover over the pivot pin **C**.
 - 3) Release the cover latch to lock the cover into place.



IPHAK530-0

Figure 28. PCI adapter cassette cover replaced

22. At the back of the system, lift the cassette cover flap and identify the cassette slot you want to use.
23. Ensure the lower cassette handle is pressed up toward the retainer clip. This places the adapter in the correct position to be docked in the system.
24. Lift and hold the PCI adapter EMC shield in the open position. See Figure 19 on page 88 and Figure 20 on page 89.
25. Slide the cassette **C** into the cassette slot as shown in the following figure.
26. When the cassette is fully inserted into the system, firmly press downward on the lower cassette handle **B** to lock the adapter in its connector.

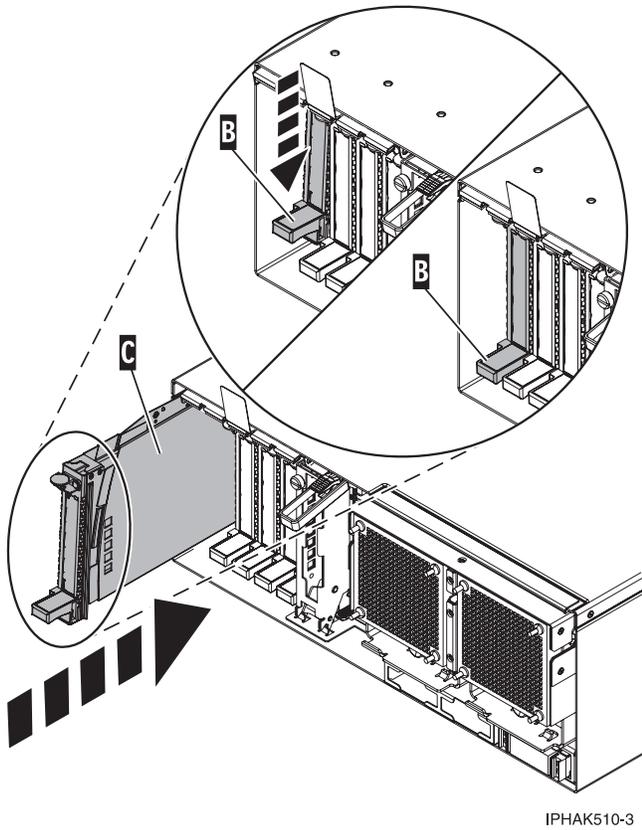
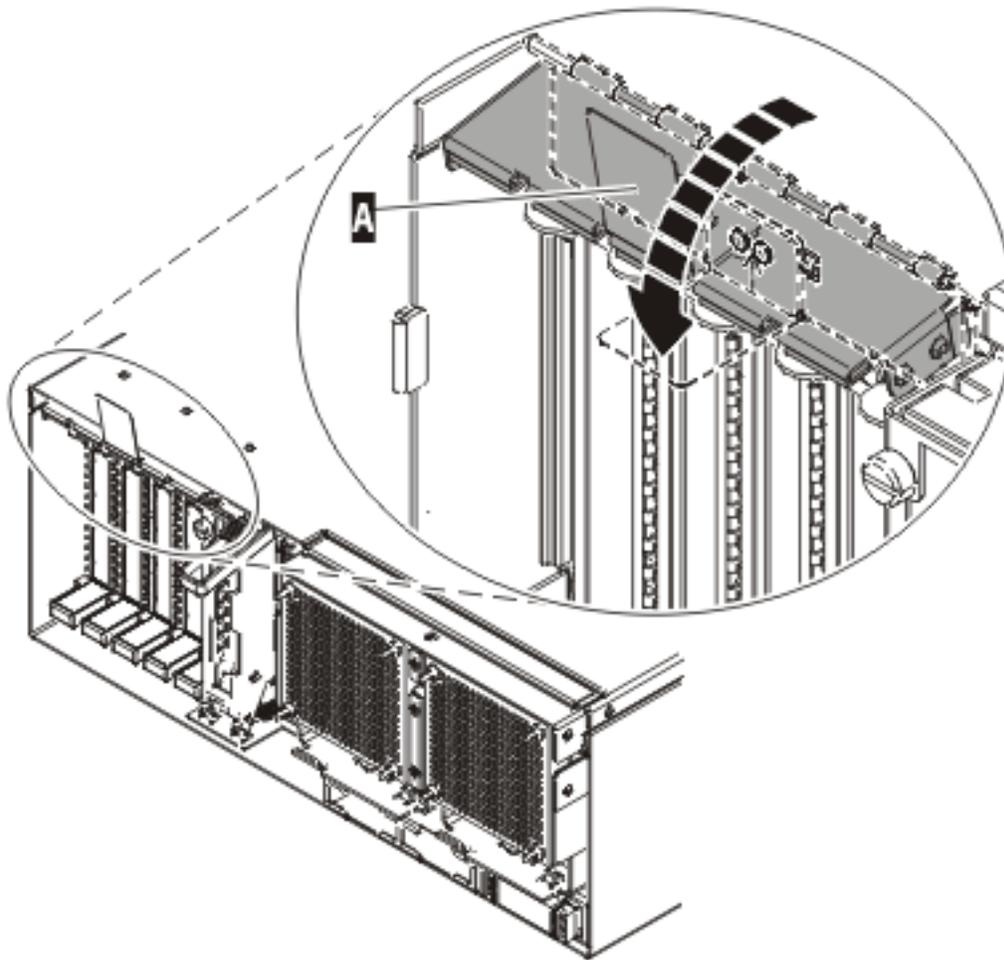


Figure 29. PCI adapter cassette removed from the system unit

27. Connect the adapter cables.
28. Lower the PCI adapter EMC shield **A** into the closed position, close the shield latch, then close the rear rack door.



IPHAK508-0

Figure 30. PCI adapter EMC shield in the closed position

29. Return to your terminal and the i5/OS screen.
30. Select **Power on domain** on the Hardware Resource Concurrent Maintenance display and press Enter.
31. Select **Assign** to on the resource that has an asterisk (*) on the Work with Controlling Resource display. Press Enter.
32. Wait for the Hardware Resource Concurrent Maintenance display to appear with this message: Power on complete
The device is now configured. **This ends this procedure.**

Control panel functions

Covers some control panel functions. Systems managed by an Hardware Management Console (HMC) should use the HMC to perform control panel functions.

For details on using the control panel, see the following information.

Notes:

1. Systems managed by an HMC should use the HMC to perform control panel functions. For information on performing control panel functions using an HMC, see the *Operations Guide for the Hardware Management Console and Managed Systems*, SA76-0085.

2. Some control panel functions might not be available on all system types.
3. The x can be any number 0 through 9, any letter A through F, or a blank.
4. If the customer was performing the function, find out why the customer selected the function and verify whether it is complete.
5. If you cannot change the *Function/Data* display or complete the selected function, contact your next level of support.

Determining if an enclosure is configured as switchable under i5/OS OptiConnect

You can determine if an enclosure is configured as a switchable enclosure under i5/OS OptiConnect by performing the following procedure.

Note: To perform this procedure, you must have the resource name of the high speed link (HSL) I/O bridge resource.

1. Move to the console of the system where you know the name of the HSL I/O bridge resource in the enclosure.
2. Sign on to the System Service Tool (SST) or Dedicated Service Tool (DST).
3. From the SST or DST, select **Start a service tool**, then **Hardware Service Manager**.
4. From the Hardware Service Manager, select **Logical Hardware Resources**.
5. From the Logical Hardware Resources display, select **High Speed Link Resources**.
6. From the High Speed Link Resources display, select the function **Include non-reporting resources**.
7. Move the cursor to the HSL I/O bridge resource of the enclosure and select the **Display detail** option. The Display HSL Information display appears.

```

Display HSL Information

HSL loop number . . . . . : 257

HSL I/O bridge resource
Type-model . . . : 1999-999          Status . . . . . : Operational
Serial number . . : 21-1111111      Part number . . . : 11111111111
Resource name . . : BC06           Mode: Switchable

Leading port to next resource . . . . . :
Link status . . . : Operational      Link type . . . . : Copper
Type of connection . . . . . : Internal

Trailing port from previous resource . . . . . : A1
Link status . . . : Disabled         Link type . . . . : Optical
Type of connection . . . . . : External

F3=Exit  F6=Print  F7=Follow trailing port  F8=Follow leading port
F9=Include non-reporting resources  F11=Display system information
F12=Cancel

```

Figure 31. Example Display High Speed Link (HSL) Information display

8. At the Display HSL Information display, locate the **Mode** information of the resource.

Note: If you cannot locate the **Mode** information, then this HSL resource is not part of a Cluster Resource Group (CRG) and the enclosure where this HSL I/O bridge resource is located cannot be configured as switchable under i5/OS OptiConnect.

9. Is the mode listed as *Private* or is the mode not displayed for this resource?

- **Yes** = the enclosure where this HSL I/O bridge resource is located cannot be configured as switchable under i5/OS OptiConnect. **This ends the procedure.**
 - **No** = the HSL I/O bridge resource has a mode of *switchable*. The enclosure is configured as a switchable enclosure under i5/OS OptiConnect. Continue with the next step of this procedure.
10. Record the HSL loop number, the type-model, and the serial number of the HSL I/O bridge resource.

Note: You will need the type-model and serial number to identify the HSL I/O bridge on the other system that can own this resource.

Determining the I/O enclosure's power-controlling system and the owner of the logical system ownership of a I/O enclosure

Use this procedure when needing to determine the I/O enclosure's power-controlling system.

To determine the power-controlling system of a I/O enclosure, do the following:

1. From the Logical Hardware Resources window, select **High-Speed Link Resources**.
2. Go to the HSL Loop with the enclosure that you want to learn about. Select **option 5** (Display detail) and press Enter.
3. Press F8 (Follow Leading Port) until you reach the enclosure that you want to learn about.
4. Press F11 (Display System Information) to view the SPCN System Information. The system serial number for the power controlling system is displayed. The current logical owning system is labeled as Owner.

Powering off an expansion unit

Provides detailed instructions for powering off an expansion unit.

Before beginning, read this entire procedure. If there are procedural steps that cannot be performed at this time, the procedure must be delayed until a later time.

Attention: If the server is not HMC-managed and there is no i5/OS service partition, the expansion unit power cannot be turned off with the server power turned on.

Attention: Do *not* use this procedure to replace disk units that are supported under device concurrent maintenance. Use the device concurrent maintenance procedure instead.

Attention: Do *not* use this procedure on the system unit or the system unit's integrated expansion unit. For system units and system units integrated expansion units see "Powering on and powering off" on page 109

Notes:

1. References to the console in this procedure refer to the console of the logical partition in which you are working.
2. Throughout this procedure, the term *HSL I/O bridge* is interchangeable with *RIO adapter*.
3. Throughout this procedure, the term *tower* is interchangeable with *expansion unit*.
4. Messages that may be generated on the HMC during the procedure refer to specific partitions by their partition IDs. A partition's ID is a numeric value that represents the order in which the partitions were created. The partitions listed in the Server Management content area are not necessarily listed in order of partition ID. A partition's ID is listed under the *General* tab in the Partition Properties.

Perform the following with the assistance of the customer:

1. If you have not already done so, record the expansion unit's location code and machine type-model-serial numbers (MTMS).
2. Can the expansion unit be powered off with the server powered on (the server is HMC-managed or has an i5/OS service partition), and does the customer want to perform the procedure with the server powered on?

No: The expansion unit must be powered off by powering off the server. See "Powering on and powering off" on page 109 for instructions on powering off the server, then return to the procedure that sent you here.

Yes: Go to step 3.

Note: If the activated firmware level of the server to which the expansion unit is attached is lower than SF235, there is a small chance that bus numbers for the PCI buses in the expansion unit will change if the I/O backplane in the expansion unit is replaced with the server powered off. If this occurs on a server with multiple logical partitions, the I/O slot resources in the expansion unit will have to be reassigned to the appropriate partitions. Additionally, AIX logical resource names of the I/O resources in the expansion unit may change requiring some manual reconfiguration in the partition. If the I/O backplane is replaced with the server powered off, be prepared to perform these reconfiguration activities after the procedure. If the I/O backplane is replaced with the server powered on, either to firmware standby or firmware running, reconfiguration will not be required.

If it is desirable to replace the I/O backplane with the server powered off, but configuration changes cannot be tolerated, powering off the server and then powering it on to firmware standby state before performing the procedure might be a satisfactory alternative.

The activated firmware level of the server is displayed in the upper right corner of the ASMI utility.

3. Verify that the expansion unit being powered off is the correct one. If the expansion unit has an alphanumeric display on the control panel, verify that the type, model, and serial number of the expansion unit displayed on the user interface match that shown on the control panel display. Or activate the identify indicator on the expansion unit. To activate the identify indicator on the expansion unit, do the following:
 - From the HMC use: **Service Focal Point** → **Service Utilities** → **Identify LED processing**.
 - From i5/OS use: **System (or Dedicated) Service Tools** → **Start a service tool** → **Hardware service manager** → **Packaging hardware resources** → **Concurrent maintenance** → **Toggle LED blink off/on**.
 - Are you powering off the correct expansion unit?

No: Choose the correct expansion unit. Then perform this procedure again.

Yes: Go to step 4.

4. The system will not allow the expansion unit to be powered off if there are failed or inactive links in the HSL loop that the expansion unit is on, other than the links adjacent to the expansion unit. If an attempt is made to power off the expansion unit under these circumstances, a descriptive error message will be presented. Determine if there are failed or inactive links. .

Are there external links that are not operational in the HSL loop, other than those adjacent to the expansion unit being powered off?

No: Go to step 5.

Yes: Repair the failed or inactive links, except those adjacent to the expansion unit being powered off. If you need assistance, contact your service provider. Then perform this procedure again.

5. Verify that the SPCN loop is complete. A 10009135 reference code in the error log indicates an incomplete SPCN loop. A complete SPCN loop is not required, but is highly recommended. Powering off an expansion unit with an incomplete SPCN loop could cause lost contact with other expansion units on the SPCN loop. The expansion units that the system lost contact with will

continue to function; however, the system may log additional errors and will not be able to monitor those units. Work with the customer to determine whether the SPCN loop is complete, whether correction is necessary, and then go to step 6.

6. If the system has only partitions running AIX or Linux, skip to step 10, if not go to step 7.
7. The system will not allow the expansion unit to be powered off if the expansion unit is configured as switchable and the system that owns the HSL I/O bridge (the logical owner of the expansion unit) is not the system that provides power to the expansion unit (the system whose SPCN the expansion unit resides in, or SPCN system). If an attempt is made to power off the expansion unit under these circumstances, a descriptive error message will be presented. Determine if the expansion unit is configured as a switchable unit, either by asking the customer or referring to Determining if a tower is configured as switchable under iSeries™ OptiConnect.

Note: Switchable expansion units will exist only if the server makes use of Switchable Independent Disk Pools.

Is the expansion unit configured as switchable?

No: The expansion unit is configured as private to this system. Go to step 10.

Yes: Go to step 8.

8. Determine if the logical owner of the expansion unit is the SPCN system by asking the customer or referring to Determining if a tower is configured as switchable under iSeries OptiConnect.

Is the logical owner of the expansion unit also the SPCN system?

No: Work with the customer to switch logical ownership of the HSL I/O bridge in the expansion unit to the SPCN system. This should be done using the iSeries OptiConnect user interface. If that is not successful due to problems with the iSeries OptiConnect user interface, it may be attempted as described in Switching ownership of a tower's switchable resources, however, this should be used only as a last resort since it may result in Cluster Resource Group (CRG) problems. If the switch cannot be performed, contact your service provider for assistance. Otherwise, continue with step 9 from the SPCN system.

Yes: Go to step 9.

9. The system will not allow the expansion unit to be powered off if it contains resources included in an active Cluster Resource Group (CRG). If an attempt is made to power off the expansion unit under these circumstances, a descriptive error message will be presented. Determine if the expansion unit contains resources included in an active CRG by asking the customer.

Does the expansion unit contain resources included in an active CRG?

No: Go to step 10.

Yes: Work with the customer to end each active CRG that contains resources in the expansion unit.

10. Determine if any of the I/O resources in the expansion unit are owned by partitions running Linux. Are any of the I/O resources in the expansion unit owned by partitions running Linux?

No: Go to step 11.

Yes: Power off the partitions running Linux and go to step 11.

11. Determine if any of the I/O resources in the expansion unit are owned by partitions running AIX. Are any of the I/O resources in the expansion unit owned by partitions running AIX?

- **No:** Go to step 12.

- **Yes:** Do the partitions have a code level that supports the powering off and on of an expansion unit with the partition running? The required level for AIX 5.2 is 5.2.0.61 or later and the required level for AIX 5.3 is 5.3.0.22 or later. You can determine the level of AIX by invoking the command **lslpp -l devices.chrp.base.rte** from the AIX command line.

- **Yes:** Does the HMC have a code level that supports power off and on of an expansion unit with I/O resources assigned to active partitions running AIX? The required HMC code level is version 4, release 5.0 or later. You can view the HMC code level by accessing: **Licensed Internal Code Maintenance** → **HMC Code Update**. The code level appears in the content area.

Yes: Go to step 12.

No: Power off the partitions that are running AIX and that own I/O resources in the expansion unit, then go to step 12.

- **No:** Power off the partitions that are running AIX and that own I/O resources in the expansion unit, then go to step 12.

12. Work with the customer to end I/O activity to the expansion unit by performing the following. If all partitions that own I/O resources in the expansion unit have been powered off, skip this step and go to step 13.

- In i5/OS partitions:

- Work with the customer to vary off all configuration descriptions (for example, ctl, device, line, network server, etc.) that use resources in the expansion unit. This can be done using the **vrycfg** command. The system will not allow the expansion unit to be powered off unless all configuration descriptions that use resources in the expansion unit are varied off. If an attempt is made to power off the expansion unit when there are configuration descriptions that use resources in the expansion unit that are varied on, a descriptive error message will be presented.

Note: If configuration descriptions that use resources in the expansion unit cannot be varied off, the procedure must be delayed until they can be varied off or the partitions that have such configuration descriptions must be powered off.

- If the expansion unit contains disk unit IOPs and/or IOAs, and the disk units are not mirrored to disk units in other expansion towers, work with the customer to end all communications activities to these disk units by ending all subsystems.

Note: The system allows you to power off the expansion unit even if this is not done, however, doing so may result in a disk unit attention SRC and a partial or complete hang of the partition until the expansion unit is powered on.

- If the expansion tower contains disk unit IOPs and/or IOAs and these disk units are mirrored to disk units in other expansion towers, you do not need to end all subsystems. Mirroring will assist during the service action.

- In AIX partitions:

- Work with the customer to unconfigure all logical device resources that use resources in the expansion unit. This can be done using the **rmdev** command. The system will not allow the expansion unit to be powered off unless all logical device resources that use resources in the expansion unit are unconfigured. If an attempt is made to power off the expansion unit when there are configured logical device resources that use resources in the expansion unit, a descriptive error message is presented.
- If logical device resources that use resources in the expansion unit cannot be unconfigured, the procedure must be delayed until they can be unconfigured or the partitions that have such resources must be powered off.
- Following is an example of the type of message that is displayed if there are logical AIX resources that must be unconfigured. It shows two messages. The first indicates that logical device resource pci11 with physical name U5294.001.23B2424-CB1-C01 must be unconfigured. To unconfigure this resource invoke the AIX command **rmdev -R -l pci11**. The second indicates that logical device resources pci6 and ent0 with physical name U0595.001.435DF30-CB1-C02 must be unconfigured. To unconfigure these resources invoke the AIX command **rmdev -R -l pci6**.

Reporting partition type: RPA

Return code type: Failure (hard stop or user intervention required).

Message:

com.ibm.hsc.client.rmc.HSCRMCEException: Query operation for slot resource has failed on partition 2.

The partition command is:

```
drmgr -Q -c slot -s U5294.001.23B2424-CB1-C01 -w 0 -d 3
```

The partition standard output is:

```
drsloc_chrp_slot: slot_type=1 all slots=0x20042d68
```

The partition standard error is:

0931-029 The specified slot contains a device or devices that are currently configured. Unconfigure the following device or devices and try again.

pc11

The RMC return code is 0. The AIX return code is 1.

Reporting partition type: RPA

Return code type: Failure (hard stop or user intervention required).

Message:

com.ibm.hsc.client.rmc.HSCRMCEException: Query operation for slot resource has failed on partition 2.

The partition command is:

```
drmgr -Q -c slot -s U0595.001.435DF30-CB1-C02 -w 0 -d 3
```

The partition standard output is:

```
drsloc_chrp_slot: slot_type=1 all slots=0x20042ca8
```

The partition standard error is:

0931-029 The specified slot contains a device or devices that are currently configured. Unconfigure the following device or devices and try again.

ent0

pci6

The RMC return code is 0. The AIX return code is 1.

- The following AIX commands are helpful in determining which logical device resources use an expansion unit. In the following examples, U0595.001.435DF30 is the location code of the expansion unit being powered off.

Displays information about logical device resource pci5:

```
lscfg -l pci5
```

Displays all logical resources in U0595.001.435DF30:

```
lscfg | grep U0595.001.435DF30
```

```
* pci5      U0595.001.435DF30-CB1          PCI Bus
+ sisioa0   U0595.001.435DF30-CB1-C01        PCI-X Dual Channel U320 SCSI RAID Adapter
+ scsi0     U0595.001.435DF30-CB1-C01-T1     PCI-X U320 SCSI RAID Adapter Physical bus
+ hdisk0    U0595.001.435DF30-CB1-C01-T1-L6-L0 16 Bit LVD SCSI Disk Drive (36400 MB)
* ses0      U0595.001.435DF30-CB1-C01-T1-L15-L0 SCSI Enclosure Services Device
+ scsi1     U0595.001.435DF30-CB1-C01-T2     PCI-X U320 SCSI RAID Adapter Physical bus
+ sisraid0  U0595.001.435DF30-CB1-C01-C1-T1  PCI-X U320 SCSI RAID Adapter Logical bus
```

Displays the rootvg hdisk(s):

```
lsvg -o
```

- The resources representing the partition's LAN connection to the HMC, such as ent0 and en0, must not be unconfigured or the procedure will not work. If these resources use the expansion unit, the partition must be powered off to continue with the procedure.

Attention: If resources in the expansion unit are assigned to I/O server partitions and are being used by I/O server partitions (also known as virtual I/O servers), work with the customer to determine whether powering off the expansion unit will negatively impact the client partitions. If so, the client partitions should be powered off before continuing.

13. Power off all external DVD-RAM storage devices (containing their own power supplies) connected to resources in the expansion unit, then go to step 14.
14. Use one of the following procedures to power off the expansion unit. Carefully follow the instructions provided by the utility to complete the power off.

Attention: If the server is not HMC-managed and there is no i5/OS service partition, the expansion unit power cannot be turned off with the server power turned on.

To turn off the power in an expansion unit with the server power on, do one of the following procedures:

- If the server is HMC-managed, the power off and power on functions must be performed using the Power On/Off Unit utility on the HMC, do the following:
 - a. In the navigation area, open the Service Applications folder.
 - b. Select **Service Focal Point**.
 - c. In the contents area, select **Service Utilities**.
 - d. In the Service Utilities window, select the system on which you are working.
 - e. Select **Selected** → **Power On/Off Unit**
- If the server is not HMC-managed, the power off and power on functions must be performed using the Packaging Hardware Resources utility from the i5/OS service partition, do the following:
 - a. Access the System Service Tools or the Dedicated Service Tools on the i5/OS service partition.
 - b. Select **Start a service tool**
 - c. Select **Hardware service manager**
 - d. Select **Packaging hardware resources**
 - e. Select **Concurrent maintenance**

Notes:

- a. If the procedure is being done from an i5/OS partition, the system will not allow it to be done from a console or terminal session connected through the expansion unit being powered off. A different console or terminal session not connected through the expansion unit being powered off must be found, or the server must be powered off. See “Powering on and powering off” on page 109 for instruction on powering off the server, then return to the procedure that sent you here.
- b. If I/O activity to resources in the expansion unit was not ended as described in step 12, the power off will not be allowed and messages will be presented indicating which partition resources need to be varied off or unconfigured. Similarly for other conditions described previously in this page that prevent the power off.
- c. Carefully follow all instructions given by the utility. For instance, you may be informed that critical disk resources exist in the expansion unit and that panel function 69 must be used to power the expansion unit back on.
- d. Wait for the expansion unit to power off. This might take up to 15 minutes depending on the configuration.
- e. When the utility gives notification that the power off has completed, ensure that the expansion unit is actually powered off by verifying that one of the two air moving devices (AMDs) in the expansion tower has stopped and that the power LED/indicator on the expansion unit control panel is off.
- f. If the expansion unit does not power off after more than 15 minutes, the system may be hung. If this occurs, contact your service provider for assistance.

15. Were you directed here to power off the expansion unit to set the expansion unit configuration ID or the machine type-model-serial numbers (MTMS)?
No: Go to step 16.
Yes: Return to the procedure that sent you here.
16. Does the procedure that sent you here instruct you to remove the ac power from the expansion unit?
No: Return to the procedure that sent you here.
Yes: Go to step 17.
17. Is this an expansion unit with ac power cords connected from this unit's ac input/charger to an SPCN controlled expansion unit (for example: a 5088 expansion I/O unit)?
No: This expansion unit can be serviced without affecting an SPCN controlled expansion unit. Return to the procedure that sent you here.
Yes: Servicing this expansion unit may affect an SPCN controlled expansion unit that is receiving ac power from this tower. Go to step 18.
18. You may be able to maintain ac power to the expansion unit that is receiving ac power from this expansion unit and remove power from this expansion unit so that you can service it. The following steps will help you to determine what you can do. Were you directed to this procedure as part of a procedure to exchange the ac input/charger, any of the device boards, or the power board?
No: You can maintain ac power to the expansion unit receiving ac power from this expansion unit while you are servicing this expansion unit. When the expansion unit is powered off, open the rear cover and trace the ac jumper cords from the three power supplies to the ac input charger. Then disconnect them at the ac charger. Power is now removed from the components that you will be working with or near. Return to the procedure that sent you here.
Yes: You must search for an alternate ac power source for the expansion unit receiving ac power from this expansion unit. Go to step 19.
19. Can you find an alternate ac power source for the expansion unit that is receiving ac power from this expansion unit?
No: You must power off the system to service this expansion unit. See "Powering on and powering off" on page 109 for instructions on powering off the system, then return to the procedure that sent you here.
Yes: Move each of the expansion unit's ac power cords one at a time to the alternate ac power source to prevent the expansion unit from losing ac power. Return to the procedure that sent you here.

Powering on an I/O enclosure

This topic provides the procedures used when powering on an I/O enclosure either managed by a hardware managed console (HMC) or not managed by a HMC.

Attention:

- Before beginning, read this entire procedure. If there are procedural steps that cannot be performed at this time, the entire procedure must be delayed until a later time.
- If the server is managed by a HMC, the power off and power on functions must be performed using the Power On/Off Unit utility on the HMC. To use the Power On/Off Unit utility, from the HMC display, do the following:
 1. Expand the Systems Management topic
 2. Select **Servers**
 3. From the Select column, select the server you are working on.
 4. In the Tasks area select the following:
 - a. Select **Serviceability**.
 - b. Select **Hardware**.

- c. Select **Power on/off I/O unit**.
- d. Select **Power on**.

Attention:

If the server is not managed by a HMC, the power off and power on functions must be performed using the Packaging Hardware Resources utility from the i5/OS service partition. To use the Packaging Hardware Resources, go to the System Service Tools or the Dedicated Service Tools and do the following when instructed to in the procedure below:

1. Select **Start a service tool**
2. Select **Hardware service manager**
3. Select **Packaging hardware resources**
4. Select **Concurrent maintenance**

If the server is not managed by a HMC and there is no i5/OS service partition, the enclosure cannot be powered off and on with the server powered on.

Attention: Do not use this procedure in either of the following situations:

- To replace disk units that are supported under device concurrent maintenance. Use the device concurrent maintenance procedure instead.
- On the system unit or the system unit's integrated I/O enclosure. For system units and system units integrated I/O enclosures, see the "Powering on or off a system". This procedure is located in your host system's service guide.

Note:

1. References to the console in this procedure refer to the console of the logical partition in which you are working.
2. Throughout this procedure, the term *HSL I/O bridge* is interchangeable with *RIO adapter*.
3. Messages that may be generated on the HMC during the procedure refer to specific partitions by their partition IDs. A partition ID is a numeric value that represents the order in which the partitions were created. The partitions listed in the Server Management content area are not necessarily listed in order of partition ID. A partition ID is listed under the *General* tab in the Partition Properties.

Perform the following with the assistance of the customer.

1. If the ac power cords were disconnected when the enclosure was powered off and have not been reconnected, reconnect them now. If they are already connected, go to step 2.
 - The enclosure will automatically power on when the ac power cords are connected.
 - If this is non-HMC-managed iSeries server, go to step 2.
 - If this is a server managed by a HMC, power off the enclosure again. See "Powering off an expansion unit" on page 101. Then go to step 3.
2. Were you instructed to perform a function 69 to power on the enclosure?
 - No:** Go to step 3.
 - Yes:** Perform function 69 (with the control panel set to manual mode) from the system unit control panel. See Control panel functions. Then go to step 4.
3. Power on the enclosure using either the Power On/Off Unit utility from the HMC, or the Packaging Hardware Resources utility from the i5/OS service partition, as described at the top of this page. Follow the instructions provided by the utility. Go to step 4.

Note: If you are required to do this step using the Packaging Hardware Resources utility from the i5/OS service partition, but the Packaging Hardware Resources utility cannot be accessed, you might be able power on the enclosure using the system control panel as follows:

- a. With the control panel set to manual mode, select function **07** and press Enter.
 - b. Increment to A1 and press Enter. This will send out a **Rack Power On** command is issued on the SPCN, which will restore power any enclosure that is powered off.
 - c. For further information about control panel functions and how to use them, see Control panel functions.
4. Wait for I/O resources in the enclosure to be brought back online to a functional state, then go to step 5.

It may take between five and ten minutes after the enclosure is powered on for i5/OS resources in the enclosure to return to a operating state. Using the Packaging Hardware Resources and Logical Hardware Resources utilities in the Hardware Service Manager utility, you can determine when resources in the enclosure return to a operating state by observing the transition of the resources from non-reporting (designated by a "?" next to the resources) to reporting (designated by the absence of a "?" next to the resources) or Unknown, Not Connected, Failed, or Disabled status to Operational status. If there is a disk unit attention SRC in the partition operator panel and the Hardware Service Manager is not available, the transition to functional/operational has occurred when the disk unit attention SRC disappears and the partition resumes normal operation.

5. Work with the customer to restart all I/O bus activity that was ended when the enclosure was powered off, then go to step 6
- In i5/OS partitions:
 - Work with the customer to vary on all configuration descriptions (ctl, device, line, network server, etc.) that were varied off when the enclosure was powered off. Use the **vrycfg** command.
 - Start all subsystems that were ended when the enclosure was powered off.
 - In AIX partitions:
 - Work with the customer to configure all logical resources that were unconfigured when the enclosure was powered off. Use the **cfgmgr** command.
6. If you moved the ac power cords of an enclosure from this enclosure to an alternate ac power source when this enclosure was powered off, move them back to this enclosure. To prevent the enclosure from losing ac power, move only one of the enclosure's ac power cords at a time. Then go to the next step.
7. If the enclosure was configured as switchable when you powered off the enclosure, and you changed the mode to private, work with the customer to restore the mode of the enclosure to switchable using Switching the mode of a I/O enclosure's switchable resources. Then go to step 8.
8. If you ended Cluster Resource Groups (CRGs) when you powered off the enclosure, work with the customer to start the CRGs. Then go to step 9.
9. If ownership of the enclosure's HSL I/O bridge was changed when the enclosure was powered off, work with the customer to restore the desired ownership.
10. Return to the procedure that sent you here.

Powering on and powering off

Provides information on how to power on and power off the system.

For information about powering on and powering off the system, see your system service guide.

Prerequisites for hot-plugging PCI adapters in Linux

In the course of installing, removing, or replacing a PCI adapter with the system power on in Linux you might need complete some prerequisite tasks. Use the information in this section to identify those prerequisites.

The Linux, system administrator needs to take the PCI adapter offline prior to removing, replacing, or installing a PCI adapter with the system power on (hot-plugging). 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.

Before hot-plugging adapters for storage devices, ensure file systems on those devices are unmounted. After hot-plugging adapters for storage devices, ensure the file systems on those devices are remounted.

Before hot-plugging an adapter, ensure that the server or partition is at the correct level of the Linux operating system (Linux 2.6 or later).

Install the POWER™ Linux Service Aids. These service aids enable system serviceability, as well to improve system management.

If you are using a Linux on POWER distribution with Linux kernel version 2.6 or greater, you can install the Service Aids that gives you access to more capabilities, which can help you diagnose problems on your system.

This software is available at the Service and productivity tools for Linux on POWER Web site. (<http://techsupport.services.ibm.com/server/lopdiags>)

Setting I/O enclosure configuration ID and MTMS value

Provides instructions for setting important system values.

To set the configuration ID, use the Advanced System Management Interface (ASMI). However if the ASMI is not available you can use the physical control panel.

Set the machine type-model-serial (MTMS) value for the enclosure to match the original value, which can be found on a label affixed to the enclosure. Updating the MTMS value keeps the configuration and error information in sync, and is used by the system when creating the location codes. To update the MTMS values you *must* use ASMI, *not* with the control panel. However, if you do not have access to the ASMI, the system will still operate without updating this information

Note: For information about setting up the ASMI, go to Managing the Advanced System Management Interface (ASMI) chapter in your host server service guide. For information on using the ASMI, including updating the system configuration settings, go to the Managing your server using the Advanced System Management Interface chapter in your host server service guide.

Switching ownership of a enclosure's switchable resources

It may be necessary for the local system to take or release ownership of a switchable resource.

To have the local system take ownership of a resource or to have the local system release its ownership of a resource, you can use the *Take/release ownership* option on the Select I/O Debug Function display. Ownership of a resource indicates which system controls the functions of a resource. Ownership can be released only by the system that presently owns it.

To switch ownership of switchable resources in a enclosure from the current owner to the alternate system that can own those resources, use the following procedure.

To perform this procedure, ensure the following:

- The system that currently owns the switchable resources in a enclosure. This is the system that you are going to *release* the resources from.
- The alternate system that can *take* ownership of the switchable resources.
- The resource name of the high speed link (HSL) I/O bridge resource and the HSL loop number on the currently owning system that will *release* ownership.
- The resource name of the high speed link (HSL) I/O bridge resource and the HSL loop number on the system that will *take* ownership.

Attention: Perform this procedure only if you are not able to switch the ownership of the resource using the iSeries OptiConnect user interface. Cluster Resource Group (CRG) problems may occur as the result of using this procedure when the iSeries OptiConnect user interface is available.

1. Determine the current owner of the switchable resources in the enclosure if you have not already done so. (See the procedure “Determining the I/O enclosure’s power-controlling system and the owner of the logical system ownership of a I/O enclosure” on page 101.)
2. Move to the console of the system that is the current owner of the switchable resources in the enclosure.
3. Sign on to System Service Tool (SST) or Dedicated Service Tool (DST).
4. Select **Start a service tool**.
5. Select **Hardware Service Manager**.
6. Select **Logical Hardware Resources**.
7. Select **High speed link resources**.
8. Select **Include non-reporting resources**.
9. Select **Resources associated with loop**.
10. Select the **HSL I/O bridge resource in the enclosure**. Search for the resource name that the currently owning system assigned to the HSL I/O bridge resource.
11. Select the **I/O Debug** option.

When you select the I/O debug option on an HSL I/O bridge that has the capability of being switched, the following screen is displayed:

12. From the Select I/O Debug Function window, select **Take/release ownership**.

Note: If you select option 2 to release ownership of the resource and another system currently owns it, the following is displayed appears at the bottom of the screen:

Ownership of this resource cannot be released. It is owned by another system.

13. Record the type-model and the serial number of the HSL I/O bridge resource if you have not already done so.
14. Press Enter to confirm releasing the resource.
15. Move to the console of the other system that can take ownership of the switchable resources in the enclosure.
16. Sign on to System Service Tool (SST) or Dedicated Service Tool (DST).
17. Select **Start a service tool**.
18. Select **Hardware Service Manager**.
19. Select **Logical Hardware Resources**.
20. Select **High speed link resources**.
21. Select the function **Include non-reporting resources**.
22. Move the cursor to the HSL I/O bridge resource in the enclosure. Search for the resource name that this system assigned to the HSL I/O bridge resource.
23. Select the **I/O Debug** option.

24. From the Select I/O Debug Function window, select **Take/release ownership**.
25. Press Enter to confirm the ownership change. **This ends the procedure.**

Switching the mode of a I/O enclosure's switchable resources

This procedure provides instructions on how to switch the mode of switchable resources in an enclosure.

Note: To perform this procedure, the switchable resources in the enclosure must be owned by the power controlling system for the enclosure. For information on switching ownership of the switchable resources in an enclosure, see the procedure "Switching ownership of a enclosure's switchable resources" on page 110.

Attention: Perform this procedure only if you are not able to end the Cluster Resource Group (CRG) using the iSeries OptiConnect user interface. CRG problems may occur as the result of using this procedure when the iSeries OptiConnect user interface is available.

1. Move to the console of the power controlling system of the enclosure.
2. Sign on to System Service Tool (SST) or Dedicated Service Tool (DST).
3. Select **Start a service tool**.
4. Select **Hardware Service Manager**.
5. Select **Logical hardware resources**.
6. Select **High speed link resources**.
7. Select the function **Include non-reporting resources**.
8. Select the **HSL I/O bridge resource in the enclosure** Search for the resource name that the currently owning system assigned to the HSL I/O bridge resource.
9. Select the **I/O Debug** option.
10. From the **Select I/O Debug Function** display, select the **Change mode** option.
11. Is the present value of the enclosure mode a value that you want to change?
No Go to step 12.
Yes The power is already in the appropriate mode. **This ends the procedure.**
12. Press Enter to confirm changing the mode of the resource.
If you press Enter at the Confirm Mode Change display, one of the following messages is displayed:
 - Change mode was successful.
 - Unable to change mode for this hardware resource.**This ends the procedure.**

Using the ASMI to verify and set the configuration ID and MTMS value

Provides detailed instructions for setting the configuration ID and MTMS value.

To perform this operation, verify that the following prerequisites have been met:

- The server *must* be powered on to a firmware standby or a firmware running state.
 - The enclosure *must* have ac power and be correctly installed in the system power control network.
 - Your authority level *must* be one of the following:
 - Administrator
 - Authorized service provider
1. Log in to ASMI.
 2. Expand **System Configuration**.
 3. Select **Configure I/O Enclosures**.

4. Select **Clear Inactive Enclosures**.
5. If you were directed here from a FRU replacement procedure, the FRU that was replaced contained the non-volatile storage where the enclosure machine type-model-serial numbers (MTMS) was stored. It is necessary to restore the enclosure MTMS now. For information on restoring the MTMS values, see “Setting I/O enclosure configuration ID and MTMS value” on page 110.

Note: It might also be necessary to set or change the enclosure configuration ID (power control network identifier).

The non-volatile storage where the enclosure MTMS value is stored in a new replacement FRU is uninitialized. The system will detect the uninitialized value and assign an obvious, unique value of the form TMPx.xxx.xxxxxxx, where x can be any character 0-9 and A-Z. As a result, the location code for the enclosure will change to UTMPx.xxx.xxxxxxx. You must use the new UTMPx.xxx.xxxxxxx location code in the following instructions when selecting the enclosure to power off and selecting the enclosure to change its settings.

6. From the ASMI utility, expand **System Configuration**.
7. Select **Configure I/O Enclosures**.
8. Verify the configuration ID and MTMS data.
 - a. Compare the power control network identifier value shown for the enclosure you are working with to the power control network identifier (configuration ID) values in the following list.
 - 0x71 for 1519-100 or 1519-200 IXA
 - 0x81 for 5074, 5079, and 5097-002 enclosures
 - 0x89 for 5088 and 0588 enclosures
 - 0x8A for 5094, 5097-001, 5294, 8294, and 9094 enclosures
 - 0x8B for 5095 and 0595 enclosures
 - 0x88 for 7311-D10, 7311-D11, and 5790 enclosures
 - 0x8C for 7311-D20 enclosures
 - b. Compare the values shown on the Type-Model and Serial number columns for the enclosure you are servicing to the type, model, and serial values on the label located on the enclosure. The location code format for the enclosure will be either UTMPx.xxx.xxxxxxx or UTTTT.MMM.SSSSSS, where TTTT, MMM, and SSSSSS are the enclosure type (TTTT), model (MMM), and serial number (SSSSSS).

Note:

- A 10009132 information log will be produced following a platform IPL, or when an enclosure is added, indicating that a temporary MTMS was assigned to an enclosure. The temporary MTMS has the location code format of UTMPx.xxx.xxxxxxx. This is an indication that the MTMS should be updated.
 - Serial numbers are case sensitive. (All alphabetic characters contained in the serial number must be entered as a capital letter.)
- c. If any changes must be made, go to step 9. Otherwise, go to step 21 on page 114.
9. If the server is powered on to the firmware running state, go to step 10. If the server is powered on to the firmware standby state, go to step 11 on page 114.
 10. If the configuration ID must be changed, see the following notes, and go to “Powering off an expansion unit” on page 101. Go to step 11 on page 114. If the MTMS data must be changed and the system has partitions running AIX or Linux and any of the resources in the enclosure are owned by active partitions running AIX or Linux, see the notes below and go to “Powering off an expansion unit” on page 101. Go to step 11 on page 114.

If neither of the above statements apply, go to step 11 on page 114.

Note:

- Do not disconnect the AC power cables after powering off the enclosure.

- If the enclosure does not immediately appear on the service utility used to power off the enclosure, refresh the utility periodically for up to ten minutes until it does. If it still does not appear, go step 1 on page 112 and repeat this procedure.
- If you were directed here from a replacement procedure, use the new UTMPx.xxx.xxxxxxx location code when selecting the enclosure to power off .
- If the procedure that directed you here involved powering off the enclosure and while powering off the enclosure, you were instructed to use panel function 69 to power on the enclosure, perform panel function 69 now (with the control panel set to manual mode) from the system unit control panel. Do this even though the enclosure is already on. Refer to “Control panel functions” on page 99.

11. From the ASMI utility, expand **System Configuration**.
12. Select **Configure I/O Enclosure**.
13. Select the enclosure you are working with.
14. Select **Change settings**.
15. If in step 8 on page 113 you determined that the power control network identifier (configuration ID) value is not correct, enter the correct value now.
16. If in step 8 on page 113 you determined that the Type-Model and Serial number values are not correct, enter the correct values now.

Note: Serial numbers are case sensitive. All alphabetic characters contained in the serial number must be entered as a capital letter.

17. Click **Save settings** to complete the operation.
18. Verify that the values you just entered are reflected in the Power Control Network Identifier, Type-Model, Serial number, and Location code columns for the enclosure you are servicing. Do not use the browser Back button to do this. Rather, expand System Configuration. Then select **Configure I/O Enclosures**.
19. If the server is powered on to a firmware standby state and you entered a new power control network identifier (Configuration ID) in step 15, the enclosure will power off and back on automatically. If this is the case, go to step 21. Otherwise go to step 20.
20. If you powered off the enclosure in step 10 on page 113, do the following:
 - a. If the system is not managed by a HMC, do the following:
 - 1) Disconnect all power to the enclosure by disconnecting the cables from the power supplies on the enclosure.
 - 2) Wait for the display panel to go off, wait an additional 30 seconds, and then reconnect the power cables.

The enclosure will power on automatically.
 - b. If the system is managed by a HMC, do the following:
 - 1) Power on the enclosure using the Power On/Off Unit utility under the service focal point application on the HMC.
 - 2) If the values you just entered are not immediately reflected in the location code of the enclosure in the Power On/Off Unit utility, restart the utility periodically for up to ten minutes until the values you entered are reflected. Go to “Powering on an I/O enclosure” on page 107 for detailed instructions, then continue with step 21.
21. Log off and close ASMI.
22. Return to the procedure that sent you here.

Using the control panel to set the configuration ID

Use this procedure when setting the configuration ID or to display the frame address of an I/O enclosure from the control panel.

Before performing this procedure, verify that the following prerequisites have been met:

- The server *must* be powered on.
- The enclosure *must* be correctly installed in the system configuration and have ac power.

If you were directed here from a FRU replacement procedure, the FRU that was replaced contained the non-volatile storage where the enclosure's machine type-model-serial number (MTMS) was stored. The non-volatile storage where the enclosure MTMS value is stored in a replacement FRU is uninitialized. The system will detect the uninitialized value and assign an obvious, unique value. For example, TMPx.xxx.xxxxxx, where x can be any character 0-9 and A-Z. As a result, the location code of the enclosure changes to UTMPx.xxx.xxxxxx.

To set the configuration ID from the control panel, do the following:

1. Power off the enclosure using the new UTMPx.xxx.xxxxxx location code. For information on powering off the enclosure, see "Powering off an expansion unit" on page 101. *Do not* remove the ac power cord from the enclosure.

Note: If you were instructed by the procedure that sent you here to use panel function 69 when you were powering off the enclosure, perform panel function 69 now. The control panel must be set to manual mode. For more information on control panel functions, see Control panel functions.

2. Select function 07 on the control panel and press Enter.

Note: Use control panel function 07 to query and set the configuration ID and to display the frame address of an enclosure connected to the SPCN network.

3. Select subfunction A6 to display the address of all attached units. The frame address is displayed on all units for 30 seconds. Make a note of the frame address on the enclosure that you are servicing.

Note: If the enclosure does not immediately appear on the service utility used to power off the enclosure, refresh the utility periodically until it does. If a code update is occurring to the enclosure, which is likely during a FRU replacement procedure that directs you here, it could take an extended period for the enclosure to appear (possibly several hours on a large system).

4. Select sub function A9 to set the ID of a enclosure.
5. Use the arrow keys to increment or decrement to the first two digits of the frame address noted above. Press Enter
6. Use the arrow keys to increment or decrement to the last two digits of the frame address noted above. Press Enter
7. Using the arrow keys again, increment or decrement to a configuration ID for the type of unit you are servicing:
 - 71 for 1519-100 or 1519-200 IXA
 - 81 for 5074, 5079, and 5097-002 enclosure
 - 89 for 5088 and 0588 enclosures
 - 8A for 5094, 5097-001, 5294, 8294, and 9094 enclosures
 - 8B for 5095 and 0595 enclosures
 - 88 for 7311-D10, 7311-D11, and 5790 enclosures
 - 8C for 7311-D20 enclosure
8. Press Enter (078x 00 will be displayed).

9. Use the arrow keys to increment or decrement until 07** is shown.
10. Press Enter to return the panel to 07.
11. Disconnect all ac power to the unit, wait for the display panel to go off, and then reconnect the ac power.

Note: The enclosure will automatically power on.

Verify that the Linux, hot-plug PCI tools are installed

In the course of installing, removing, or replacing a PCI adapter with the system power on in Linux you might need use the hot-plug PCI tools. Use the procedure in this section to verify that you have the hot-plug PCI tools installed.

1. Enter the following command to verify that the hot-plug PCI tools are installed:

```
rpm -aq | grep rpa-pci-hotplug
```

If the command does not list any rpa-pci-hotplug packages, the PCI Hot Plug tools are not installed.

2. Enter the following command to ensure that the rpaphp driver is loaded:

```
ls -l /sys/bus/pci/slots/
```

The directory should contain data. If the directory is empty, the driver is not loaded or the system does not contain hot-plug PCI slots. The following is an example of the information displayed by this command:

```
drwxr-xr-x 15 root root 0 Feb 16 23:31 .
drwxr-xr-x  5 root root 0 Feb 16 23:31 ..
drwxr-xr-x  2 root root 0 Feb 16 23:31 0000:00:02.0
drwxr-xr-x  2 root root 0 Feb 16 23:31 0000:00:02.2
drwxr-xr-x  2 root root 0 Feb 16 23:31 0000:00:02.4
drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.0
drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.2
drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.4
drwxr-xr-x  2 root root 0 Feb 16 23:31 0001:00:02.6
drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.0
drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.2
drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.4
drwxr-xr-x  2 root root 0 Feb 16 23:31 0002:00:02.6
```

If the directory does not exist, run the following command to mount the filesystem:

```
mount -t sysfs sysfs /sys
```

3. Ensure the following tools are available in the /usr/sbin directory.
 - lsslot
 - drslot_chrp_pci
4. Return to the procedure that sent you here.

Verify the RIO/HSL loops with an HMC

Use this procedure when you system is managed by a HMC and you want to verify the RIO/HSL cabling loops are correct.

To verify the RIO/HSL cabling loops are hooked up and seated correctly, complete the following steps with an HMC and the system unit power on:

1. If you were sent here from Powering off an I/O enclosure as part of a repair procedure, skip to step 3 on page 117.
2. Use the HMC to verify that there are no B700 69xx errors by completing the following steps:
 - a. In the Navigation area, expand **System Management** by clicking on its '+
 - b. Select **Service Management**

- c. Select **Manage Events**.
- d. In the Manage Serviceable Events window, do the following:
 - 1) Select **Serviceable Events**
 - 2) Select **Open for the Serviceable Event Status**
 - 3) Select the machine type and model (MTM) numbers of the server you are working with for Reporting MTMS
 - 4) Select **ALL** for all other fields.
- e. Click OK.
- f. Scan for any B700 69xx errors.
- g. If there are no errors, click **Cancel** to exit, then go to 3.

Note: If there are errors, they must be corrected before continuing. If you need assistance, contact your service provider.

3. Use the HMC to verify the existing RIO/HSL loops. To verify the existing RIO/HSL loops from the HMC display, do the following:
 - a. From the navigation bar, located on the left side of the HMC display screen, expand Systems Management.
 - b. Select **Servers**.
 - c. Select the server you are working from.
 - d. From the Tasks area, do the following:
 - 1) Expand **Hardware (information)** by clicking on its '+' .
 - 2) Select **View RIO Topology**
 - e. Verify that all of the entries of type External (ignore Internal links) have a LinkStatus of Operational. If the LinkStatus for all of the external entries is operational, continue to the next step. If the LinkStatus is not operational for any of the external entries, the links must be repaired before continuing. If you need assistance, contact your service provider.

Note:

If you were sent here from Powering off an I/O enclosure during a repair procedure, it is possible that the LinkStatus values will not be operational for the ports on the enclosure being powered off and repaired. It is not necessary to correct those failures before proceeding.

4. Return to the procedure that sent you here.

Verify the RIO/HSL loops without an HMC

Complete the following steps to verify the RIO/HSL loops on a system that is not managed by an HMC with the system unit power on.

Note: This procedure must be done from a partition running i5/OS.

Complete the following steps to verify the RIO/HSL loops on a system that is not managed by an HMC with the system unit power on:

1. If you were sent here from Powering off an I/O enclosure as part of a repair procedure, skip to step 3 on page 118.
2. Use the service action log to verify there are no B700 69xx errors. Complete the following steps to view the service action log:
 - a. Signed on to i5/OS with at least service level authority.
 - b. On the command line of the i5/OS session, type `strsst` and press Enter.

Note: If you cannot get to the System Service Tools display, use function 21 from the control panel.

- c. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter. The service tools password is case sensitive.
 - d. Select **Start a service tool** from the System Service Tools (SST) display. Press Enter.
 - e. Select **Hardware service manager** from the Start a Service Tool display. Press Enter.
 - f. Select **Work with service action log** from the Hardware Service Manager display. Press Enter.
 - g. On the **Select Timeframe** display, change the **From: Date and Time** to the appropriate date and time range. The suggested range is 30 days.
 - h. Search for any B700 69xx errors.
 - If there are no errors, press F3 to exit and return to the Hardware Service Manager display. Go to step 3.
 - If there are errors, they must be corrected before continuing. If you need assistance, contact your service provider.
3. Use the Hardware Service Manager to verify the existing RIO/HSL loop by completing the following steps:
- a. Type your service tools user ID and service tools password on the System Service Tools (SST) Sign On display. Press Enter. The service tools password is case sensitive.
 - b. Select **Logical hardware resources** from the Hardware Service Manager display. Press Enter.
 - c. Select **High-speed link resources** from the Logical Hardware Resources display. Press Enter.
 - d. Select **Display port information for the first RIO/HSL loop**. Press Enter.
 - e. For each row that has a connection type of **External**, verify that the status is Operational. If the status is operational, press F12 to cancel and select **Display port information for the next HSL/RIO loop**. If all of the external RIO/HSL connections are operational, press F3 to exit and continue to the next step. If the status is not operational for any one of the external RIO/HSL connections, the links must be repaired before continuing. If you need assistance, contact your service provider.
- Note:** If you were sent here from Powering off an I/O enclosure during a repair procedure, it is possible that the status values will not be operational for the ports on the enclosure being powered off and repaired. It is not necessary to correct those failures before proceeding.
4. Return to the procedure that sent you here.

Verifying a repair

Use this information to verify hardware operation after making repairs to the system.

Choose from the following:

- To verify the repair of a system that is currently powered off, go to step 1.
- To verify the repair of a system that is currently powered on with no operating system loaded, go to step 3 on page 119.
- To verify the repair of a system that is currently powered on and an operating system is loaded, go to step 5 on page 119.

1. Power on the server and all attached I/O enclosures.

Did all the enclosures power on?

No	Yes
↓	Go to Step 3 on page 119.

2. Choose from the following:

- If the original problem was that an enclosure would not power on and you have another FRU to replace, locate and replace the next FRU.
 - If the next FRU in the FRU list is an isolation procedure, perform the isolation procedure.
 - If the original problem was that an enclosure would not power on and you have an isolation procedure to perform, perform the isolation procedure.
 - If the original problem was that an enclosure would not power on and there are no more FRUs or isolation procedures in the FRU list, contact your next level of support.
 - If you have a new problem, perform problem analysis and repair the new problem.
-

3. Load the operating system.

Did the operating system load successfully?

No	Yes
↓	Go to Step 5.

4. Choose from the following:

- If the original problem was a failing disk drive that contained the operating system software, go to step 5.
 - If the original problem was that the operating system would not load and you have another FRU to replace, go to your FRU locations section to locate the next FRU.
 - If the next FRU in the FRU list is an isolation procedure, perform the isolation procedure.
 - If the original problem was that the operating system would not load and you have an isolation procedure to perform, perform the isolation procedure.
 - If the original problem was that the operating system would not load and there are no more FRUs or isolation procedures in the FRU list, contact your next level of support.
 - If you have a new problem, perform problem analysis and repair the new problem.
-

5. Choose from the following:

Verifying the repair in AIX

Use this MAP to check out the server after a repair is completed.

1. Did you replace a disk drive in the root volume group?

NO	Go to step 3 on page 120
YES	Continue with the next step.

2. Run standalone diagnostics from either a CD or from a Network Installation Management (NIM) server.

Did you encounter any problems?

NO	Reinstall the operating system and continue with step 5 on page 120.
YES	If the original problem still exists, replace the FRU or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support. If a new problem has occurred, go to Beginning Problem Analysis.

3. Did you replace a FRU with power on and concurrently with system operations?

NO Go to step 5.

YES Continue with the next step.

4. Did you use an AIX diagnostics service aid hot-swap operation to change the FRU?

YES Go to step 6.

Note: The AIX diagnostic service aid was used if a resource was removed using the **Hot Plug** task.

NO Go to step 7.

5.

Note: If any FRUs have been removed that should be reinstalled, reinstall them now.
Perform the following:

1. If the system is not powered on, power it on now.
2. Perform a slow boot.
3. Wait until the AIX operating system login prompt displays or until system activity on the operator panel or display apparently has stopped.
4. Did you encounter any problems?

NO Continue at step 6.

YES If the original problem still exists, replace the FRU or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support.

If a new problem has occurred, go to Beginning Problem Analysis.

6. If the **Resource Repair Action** menu is already displayed, go to step 9 on page 121; otherwise, perform the following:

1. Log into the operating system either with root authority (if needed, ask the customer to enter the password) or use the CE login.
 2. Enter the `diag -a` command and check for missing resources. Follow any instructions that display. If an SRN displays, suspect a loose card or connection. If no instructions display, no resources were detected as missing. Continue with the next step.
-

7. Perform the following:

1. Enter `diag` at the command prompt.
2. Press Enter.
3. Select the **Diagnostics Routines** option.
4. When the DIAGNOSTIC MODE SELECTION menu displays, select **System verification**.
5. When the DIAGNOSTIC SELECTION menu displays, select the **All Resources** option or test the FRUs you exchanged, and any devices that are attached to the FRU(s) you exchanged, by selecting the diagnostics for the individual FRU.

Did the RESOURCE REPAIR ACTION menu (801015) display?

NO Continue with the next step.

YES Go to step 9 on page 121.

8. Did the TESTING COMPLETE, no trouble was found menu (801010) display?

YES Use the **Log Repair Action** option, if not previously logged, in the TASK SELECTION menu to update the AIX error log. If the repair action was reseating a cable or adapter, select the resource associated with that repair action.

If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.

Note: If the system attention indicator is on, this action will set it back to the normal state.

Go to step 11 on page 122.

NO If the original problem still exists, replace the FRU or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support.

If a new problem has occurred, go to Beginning Problem Analysis.

9. When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the RESOURCE REPAIR ACTION menu displays.

After replacing a FRU, you must select the resource for that FRU from the RESOURCE REPAIR ACTION menu. This updates the AIX error log to indicate that a system-detectable FRU has been replaced.

Note: If the system attention indicator is on, this action will set it back to the normal state.

Perform the following:

1. Select the resource that has been replaced from the RESOURCE REPAIR ACTION menu. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.
2. Press **Commit** after you make your selections.

Did another Resource Repair Action (801015) display?

NO If the No Trouble Found menu displays, go to step 11 on page 122.

YES Continue with the next step.

10. The parent or child of the resource you just replaced may also require that you run the RESOURCE REPAIR ACTION service aid on it.

When a test is run on a resource in system verification mode, and that resource has an entry in the AIX error log, if the test on the resource was successful, the RESOURCE REPAIR ACTION menu displays.

After replacing that FRU, you must select the resource for that FRU from the RESOURCE REPAIR ACTION menu. This updates the AIX error log to indicate that a system-detectable FRU has been replaced.

Note: If the system attention indicator is on, this action will set it back to the normal state.

Perform the following:

1. From the RESOURCE REPAIR ACTION menu, select the parent or child of the resource that has been replaced. If the repair action was reseating a cable or adapter, select the resource associated with that repair action. If the resource associated with your action is not displayed on the resource list, select **sysplanar0**.
 2. Press COMMIT after you make your selections.
 3. If the No Trouble Found menu displays, continue with the next step.
-

11. If you changed the service processor or network settings, as instructed in previous MAPs, restore the settings to the value they had prior to servicing the system. If you ran standalone diagnostics from CD-ROM, remove the standalone diagnostics CD-ROM from the system.

Did you perform service on a RAID subsystem involving changing of the PCI RAID adapter cache card or changing the configuration?

Note: This information does not apply to the PCI-X RAID adapter or cache.

- NO** Go to Close of Call.
YES Continue with the next step.
-

12. Use the **Recover Options** selection to resolve the RAID configuration. To do this, perform the following:
 1. On the PCI SCSI Disk Array Manager screen, select **Recovery options**.
 2. If a previous configuration exists on the replacement adapter, this must be cleared. Select **Clear PCI SCSI Adapter Configuration**. Press F3.
 3. On the Recovery Options screen, select **Resolve PCI SCSI RAID Adapter Configuration**.
 4. On the Resolve PCI SCSI RAID Adapter Configuration screen, select **Accept Configuration on Drives**.
 5. On the PCI SCSI RAID Adapter selections menu, select the adapter that you changed.
 6. On the next screen, press Enter.
 7. When you get the Are You Sure selection menu, press Enter to continue.
 8. If you get a Failed status message, verify that you selected the correct adapter, then repeat this procedure. When the recovery is complete, exit the operating system.
 9. Go to "Closing a service call" on page 123.
-

Verifying the repair in Linux

1. Run standalone diagnostics from either a CD or from a Network Installation Management (NIM) server. For more information, see Running the eServer stand-alone diagnostics from CD-ROM.

Did you encounter any problems?

NO Reboot the operating system and continue with “Closing a service call.”

YES If the original problem still exists, replace the FRU or perform the isolation procedure that is next in the FRU list. If you have reached the end of the FRU list, contact your next level of support.

If a new problem has occurred, perform problem analysis and repair the new problem.

Running the online and eServer™ stand-alone diagnostics

Use these tools to diagnose hardware problems on your AIX or Linux systems or partitions.

Use these diagnostics only if you are directed to do so by your next level of support or your hardware service provider.

Diagnostics are available for AIX and Linux systems or logical partitions which can help you perform hardware analysis. Additionally, there are various service aids in AIX diagnostics that can help you with service tasks on the system or logical partition. If there is a problem, you will receive a Service Request Number (SRN) that can help you pinpoint the problem and determine a corrective action.

If you have AIX installed and it is running, you can perform online diagnostics. However, if the installed AIX cannot be started, or you have Linux installed, you will need to run the diagnostics from CD or from a NIM server.

Running the eServer stand-alone diagnostics from CD-ROM

If the system or logical partition where you would like to run diagnostics has AIX installed but it cannot be started, or you have Linux installed, use this procedure to perform diagnostic procedures from CD-ROM when directed from another procedure or by your next level of support.

Diagnostics, which are available for AIX and Linux systems and logical partitions, can help you perform hardware analysis. If a problem is found, you will receive a service request number (SRN) or a service reference code (SRC) that can help pinpoint the problem and determine a corrective action.

Additionally, there are various service aids in the diagnostics that can help you with service tasks on the system or logical partition.

Performing a slow boot

Learn how to perform a slow boot using the HMC, control panel, or ASMI menus depending on your configuration.

In some cases, you need to perform a slow-mode boot in order to perform extended diagnostic testing.

Note: A slow-mode boot might yield a new reference code on the control panel, or new errors in the service processor error log. When the server reports a new error code, record it for use in subsequent steps.

Closing a service call

Use this information to close a service call for your I/O enclosure.

Closing a service call for your I/O enclosure is accomplished through the enclosure’s host server. For information on closing a service call for your server, go to the topic *Closing a service call* located in the host server’s service guide.

Activating and deactivating LEDs

Use this procedure to activate or deactivate LEDs.

Choose from the following:

- “Deactivate a system attention LED or partition LED using the HMC”
- “Activate or deactivate identify LED using the HMC”
- “Deactivate a system attention LED or partition LED using the ASMI” on page 125
- “Activate or deactivate identify LED using the ASMI” on page 125

Deactivate a system attention LED or partition LED using the HMC

You can deactivate a system attention LED or a logical partition LED. For example, you might determine that a problem is not a high priority and decide to repair the problem at a later time. However, you want to be alerted if another problem occurs, so you must deactivate the system attention LED so that it can be activated again if another problem occurs.

1. In the navigation area, open **Systems management**.
2. Select the server you are working on by checking the box next to its name.
3. Open **Operations**.
4. Open **LED Status**.
5. Select **View System Attention**. The system attention LED window opens. The selected system and its LED state are displayed in the upper part of the window. The logical partition and its LED state are displayed in the lower part of the window. From the system attention LED window, you can deactivate both the system attention LED and the logical partition LED.
6. Select **Deactivate System Attention LED** from the **Action** menu. A confirmation window is displayed that provides the following information:
 - A verification that the system attention LED was deactivated.
 - An indication that there still might be open problems within the system.
 - An indication that you cannot activate the system attention LED.
7. Select one of the logical partitions in the lower table, and select **Deactivate partition LED** from the **Partition Operations** menu. A confirmation window is displayed that provides the following information:
 - A verification that the logical partition LED was deactivated.
 - An indication that there still might be open problems within the logical partition.
 - An indication that you cannot activate the logical partition LED.

Activate or deactivate identify LED using the HMC

The system provides several LEDs that help identify various components, such as enclosures or field replaceable units (FRUs), in the system. For this reason, they are called *Identify LEDs*.

You can activate or deactivate the following types of identify LEDs:

- **Identify LED for an enclosure** If you want to add an adapter to a specific drawer (enclosure), you need to know the machine type, model, and serial number (MTMS) of the drawer. To determine whether you have the correct MTMS for the drawer that needs the new adapter, you can activate the LED for a drawer and verify that the MTMS corresponds to the drawer that requires the new adapter.
- **Identify LED for a FRU associated with a specified enclosure** If you want to hook up a cable to a specific I/O adapter, you can activate the LED for the adapter which is a field replaceable unit (FRU), and then physically check to see where you should hook up the cable. This is especially useful when you have several adapters with open ports.

To activate or deactivate an identify LED for an enclosure or FRU, follow these steps:

1. In the navigation area, open **Systems management**.

2. Select the server you are working on by checking the box next to its name.
3. Open **Operations**.
4. Open **LED Status**.
5. Select **Identify LED**. The Identify LED, Select Enclosure window opens.
6. To activate or deactivate an identify LED for an enclosure, select an enclosure from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.
7. To activate or deactivate an identify LED for a FRU, select an enclosure from the table, select **Selected** → **List FRUs**.
8. Select one or more FRUs from the table, and click either **Activate LED** or **Deactivate LED**. The associated LED is either turned on or off.

Deactivate a system attention LED or partition LED using the ASMI

The system attention indicator provides a visual signal that the system as a whole requires attention or service. Each system has a single system attention indicator. When an event occurs that either needs your intervention or that of service and support, the system attention indicator lights continuously. The system attention indicator is turned on when an entry is made in the service processor error log. The error entry is transmitted to the system level and operating system error logs.

To perform this operation, your authority level must be one of the following:

- Administrator
- Authorized service provider

To turn off the system attention indicator, do the following:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration** and **Service Indicators**.
3. Select **System Attention Indicator**.
4. In the right pane, click **Turn off system attention indicator**. If the attempt is unsuccessful, an error message is displayed.

Activate or deactivate identify LED using the ASMI

You can specify the location code of any indicator to view or modify its current state. If you provide the wrong location code, the advanced system manager attempts to go to the next higher level of the location code.

The next level is the base-level location code for that field replaceable unit (FRU). For example, a user types the location code for the FRU located on the second I/O slot of the third enclosure in the system. If the location code for the second I/O slot is incorrect (the FRU does not exist at this location), an attempt to set the indicator for the third enclosure is initiated. This process continues until a FRU is located or no other level is available.

To perform this operation, your authority level must be one of the following:

- Administrator
- Authorized service provider

To change the current state of an indicator, do the following:

1. On the ASMI Welcome pane, specify your user ID and password, and click **Log In**.
2. In the navigation area, expand **System Configuration** and **Service Indicators**.
3. Select **Indicators by Location code**.
4. In the right pane, enter the location code of the FRU and click **Continue**.
5. Select the preferred state from the list.

6. Click **Save settings**.

Appendix. Accessibility features

Accessibility features help users who have a physical disability, such as restricted mobility or limited vision, to use information technology products successfully.

Accessibility features

The following list includes the major accessibility features:

- Keyboard-only operation
- Interfaces that are commonly used by screen readers
- Keys that are tactilely discernible and do not activate just by touching them
- Industry-standard devices for ports and connectors
- The attachment of alternative input and output devices

IBM and accessibility

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